HGS Bulletin
Houston Geological Society
Volume 56 Number 2
October 2013

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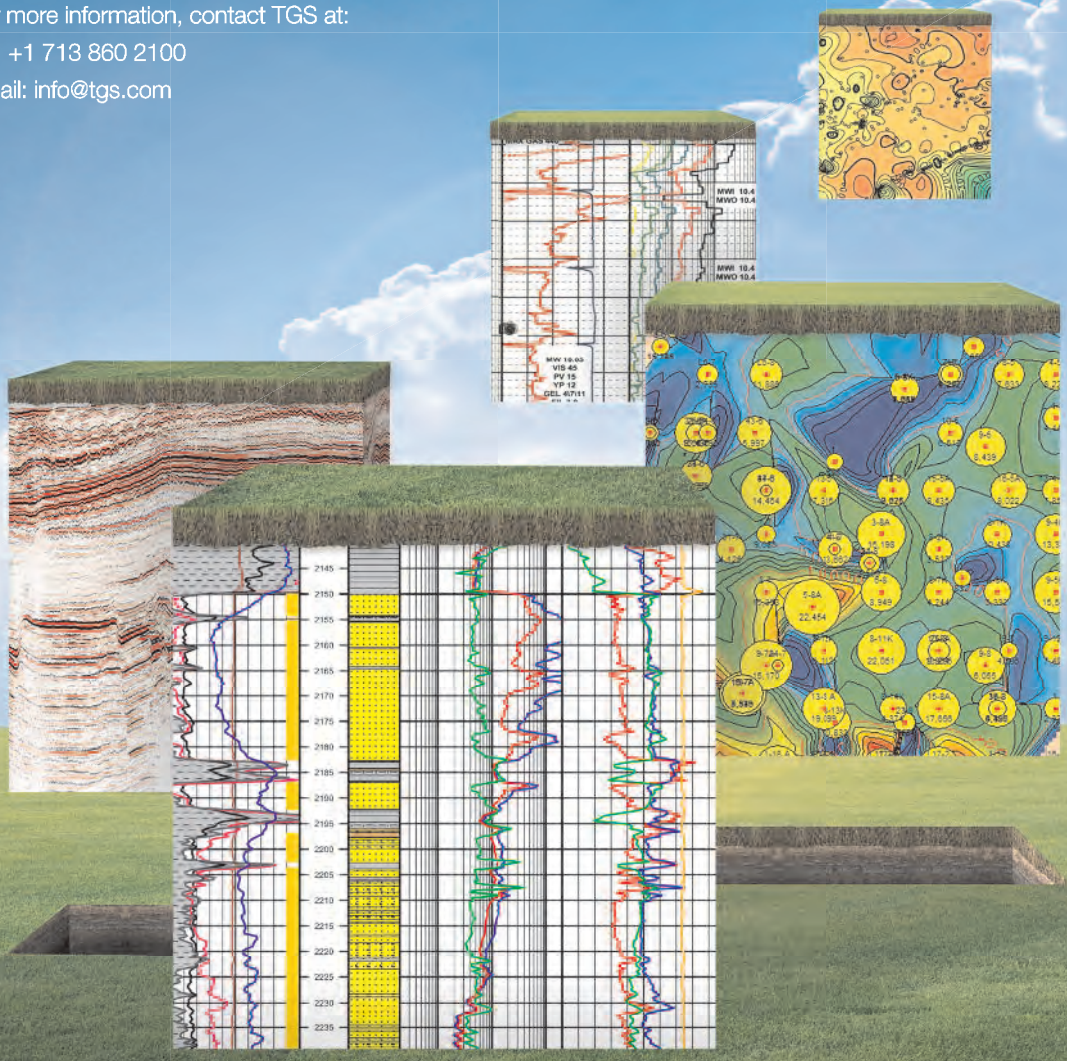

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TGS See the energy.

The Bulletin
Houston Geological Society

Volume 56, Number 2 October 2013

In Every Issue

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Technical Meetings

Other Features

About the Cover: Frank J. Schlueter (1874-1972) took the original photograph of Goose Creek's "Sweet Evangeline" 35,000 barrel of oil per day gusher. Well-known for his oilfield photographs, he also chronicled other industries and events in the Houston and Texas City areas. This well was probably the Simms-Sinclair No. 11 Sweet, completed on August 4, 1917.

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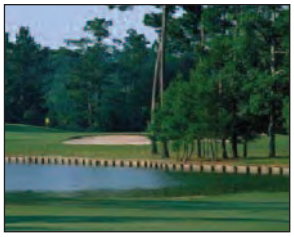

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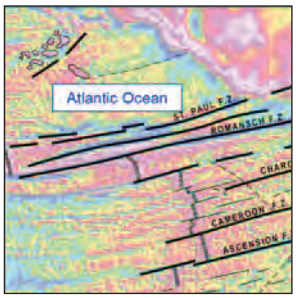

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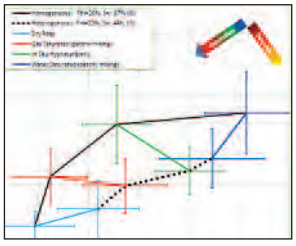

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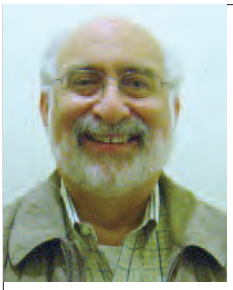


Barry Katz

bjkatz.hgs@gmail.com

Building a Legacy

It has been an interesting past few weeks. As interest rates have turned slightly upward, a number of my long-time colleagues have begun to pre-announce their retirement plans. The demographic cliff that human resources staffers and management have been talking about is no longer over the horizon but is within clear sight. Discussions at various leadership meetings have taken on a new character. Within industry, the questions at these meetings now focus on whether the succession and training plans were sufficient to deal with "the great crew change." Within professional organizations and societies the questions focus on how to maintain and grow their relevance to the "young professional."

Within professional organizations and societies the questions focus on how to maintain and grow their relevance to the "young professional."

I, too, have been looking at things a bit differently. I realize that more of my career and professional life is behind me, rather than in front of me. The questions that I have been asking myself focus on whether or not I will leave behind a legacy. Legacies are important as they remind the world that you have been here, and hopefully, contributed in some way. Part of one's legacy is represented by their children and grandchildren. Knowing that my two daughters, Rebecca and Michelle, are generous with their volunteer time and contribute to their communities, I rest comfortably that one portion of my legacy is secure.

Now I must examine my professional legacy. Where do I believe that I stand? More than three decades have passed since I first drove through the gates at Texaco. Many of my thoughts and ideas have been documented in a history of publications and presentations at a number of conferences in the US and around the globe. These contributions to the science represent part of my legacy. However, the most important part of my legacy will be the people that I have touched through teaching and mentoring. I have been engaged in formal and informal mentoring for about half of my career. With each one of my mentees, we sit and review data and discuss possible interpretations. We speculate on career opportunities and consider how one develops professionally. During these times together, we often talk about a data set or problem that is similar to one that I dealt with in the past. Today's young professionals are well-trained academically, but lack experience and with the "crew change" approaching, it is the lack of "stories" that will represent the challenge. The lack of experience will lead us down a path where Abraham Maslow's quote "if you only have a hammer, you tend to see every problem as a nail" becomes a reality. Yes, part of my role as a mentor is to show the new arrivals how to do a number of things and provide them with the "facts" as we know them today, but more importantly it is to fill their toolbox with stories. The telling of stories is an important part of mentoring and knowledge transfer. It also turns out to be fun and reinvigorating by bringing us back to where we made our geologic marks.

So why the above discussion? First, a little bit of sentimentality and more importantly a request that you become engaged in mentoring. For those of you with a "few" years of experience, seek out a mentor or a groups of mentors. They will provide you with knowledge well beyond your years, on the technical side of your career, and how to develop and enhance your career. For those of you that have had a long and successful career seek out someone to mentor. Your legacy can only grow.

One last note, registration is open for the first HGS Geomechanics Conference. The conference will be held at the Westin Memorial City, November 4-5. Consider making this conference part of your continuing education program.

Until next month…

--The HOUSTON GEOLOGICAL SOCIETY
Save the Dates
Local Geology Activities for the Whole Family coming in October!

Earth Science Week, 2013
October 6-21

Please visit the HGS website and look for the Earth Science Week tab under Educational Outreach for details and current updates. http://www.hgs.org

The American Geosciences Institute (AGI) is pleased to announce that the theme of Earth Science Week 2013 will be "**Mapping Our World**." This year's event will promote awareness of the many exciting uses of maps and mapping technologies in the geosciences.

The HGS will be hosting these two exciting events:

Saturday, October 12 (10:00am – 2:00pm)

Annual Family Energy Festival – Houston Museum of Natural Science:
Hands-on activities for kids and guided tours of the Wiess Energy Hall and the new Paleontology Hall.

Sunday, October 20 (11:00am – 3:00pm)

HGS sponsors a family friendly outdoor geology fieldtrip to the fossil location at Whiskey Bridge near Bryan, Texas.

Information will be updated on the HGS Educational Outreach webpage at http://www.hgs.org/education_EarthScienceWeek.

These are great opportunities to share your love of earth science with family and friends.

HGS needs you to make this event a success. If you are interested in volunteering for these events, please contact the ESW committee coordinator: Marc Fagelman at mfagelman@comcast.net or our HGS Volunteer Coordinator: Sue Pritchett at pritchettsue@gmail.com for more information.

Teachers – please visit http://www.earthsciweek.org/materials/index.html and order your 2013 Earth Science Week ToolKit.



Photos of 2012 McFaddin Beach Field Trip

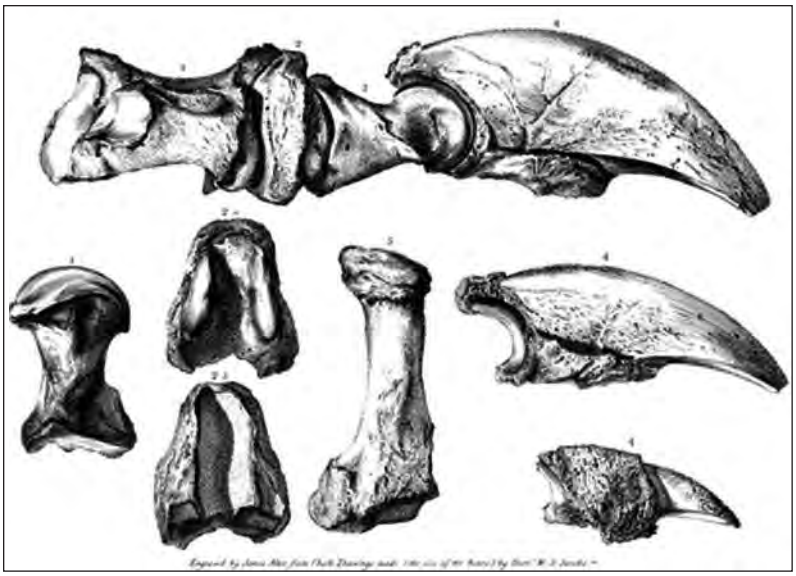
Michael Forlanza, P.G.
hgs.forlenza@gmail.com

America's First Paleontologist: Thomas Jefferson and *Megalonyx*

Thomas Jefferson, founding father and author of the Declaration of Independence, was a keen observer of the natural world and was greatly interested in the developing fields of geology, mineralogy, and vertebrate paleontology. This interest led to his encounter with the mysterious creature that he called *Megalonyx*, "a carnivorous clawed animal entirely unknown to science."

In the 18th century, most Europeans and Americans embraced a world view in which nature was seen as complete, full, and perfect, as created by God. Within this model, each species was as the creator made it and no species ever became extinct because such an event would destroy the perfection of nature. Toward the end of the 18th century, the concept that no species had ever become extinct was increasingly challenged by evidence from the fossil record. The developing science of geology was going through a revolution as the field transitioned from a series of casual observations of the natural world by gentlemen scholars to a rigorous science. In 1788, the Scottish physician James Hutton, published *Theory of the Earth; or an Investigation of the Laws observable in the Composition, Dissolution, and Restoration of Land upon the Globe* in the *Transactions of the Royal Society of Edinburgh*. His work laid out the fundamental principles of geology postulating that erosion and sedimentation were part of continuing processes that had occurred throughout Earth's history. With these precepts, he recognized the great age of the Earth.

Portrait of Thomas Jefferson by Rembrandt Peale in 1800.



Engraving of the bones of the foot, toe, and clay of Megalonyx, as published in a paper by Caspar Wistar titled, A description of the Bones deposited by the President, in the Museum of the Society, and represented in the annexed plates. Jefferson's 1799 Megalonyx paper, which had no illustrations of the bones, was published in the same volume of the American Philosophical Society Transactions.

In the decades preceding the American Revolution and for a period afterwards, tales of strange and gigantic creatures roaming the interior of the barely charted North American continent made their way east. Thomas Jefferson avidly collected such accounts as they were important for his view of science. Jefferson believed that these accounts described undiscovered species of mastodons, mammoths, wooly rhinoceros, and huge predators. While Jefferson did not believe in extinction and may not have grasped the concept of deep time, he maintained a life-long interest in fossils. Because his interest in fossils was widely known, many people sent him unusual specimens of large bones found on the American frontier. Over many years he amassed a large collection of "mammoth" remains, which he displayed in the entrance hall of Monticello, his great house in Virginia.

From The Editor *continued on page 9*

Geoscience Day

2013 Geoscience Day

The Life of an Oilfield

An Overview of Geophysical and Geological Practices for Individuals New to the Industry

Thursday, October 17, 2013

Presented By:

$100.00 Early Registration

Geophysical Society of Houston

Houston Geological Society

$110.00 Late Registration (after September 17th)

A full day of

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From the Editor continued from page 7

So it was, that in 1799 that Colonel John Stuart sent Jefferson some bones of a huge mammal "of the clawed kind" that had been found in a cave in the Blue Mountains in Greenbrier County (present-day West Virginia) by workmen mining sodium nitrate. The bones consisted of parts of an upper and lower arm with extremely large claws at the end of each finger. Jefferson was fascinated. By careful comparisons with the anatomical accounts of other animals, he ultimately concluded the bones were those of a huge unknown cat of some sort "three times as large as the lion."

By careful comparisons with the anatomical accounts of other animals, he ultimately concluded the bones were those of a huge unknown cat of some sort "three times as large as the lion."

Jefferson described this creature in his writings and named it *Megalonyx* or "great claw." In March 1797, he presented his findings to the American Philosophical Society under the title, *A Memoir of the Discovery of Certain Bones of an Unknown Quadruped, of the Clawed Kind, in the Western Part of Virginia.* Many consider this to be the first scientific report on paleontology published in the United States.

Before Thomas Jefferson was elected as the third president of the United States of America, he was elected president of the American Philosophical Society in 1797. He held the office of president of the American Philosophical Society until 1814, throughout serving two terms as the President of the United States.

The American Philosophical Society was founded in Philadelphia by Benjamin Franklin in 1743. The American Philosophical Society website (www.amphilsoc.org) states that the society is "an eminent scholarly organization of international reputation, the American Philosophical Society promotes useful knowledge in the sciences and humanities through excellence in scholarly research, professional meetings, publications, library resources, and community outreach. This country's first learned society, the APS has played an important role in American cultural and intellectual life for over 250 years."

Benjamin Franklin advocated for the society by noting that, "the first drudgery of settling new colonies is now pretty well over and there are many in every province in circumstances that set them at ease, and afford leisure to cultivate the finer arts, and improve the common stock of knowledge." Early members included doctors, lawyers, clergymen, and merchants interested in science, and also many learned artisans and tradesmen like Franklin. Many founders of the republic were members: George Washington, John Adams, Alexander Hamilton, Thomas Paine, Benjamin Rush, James Madison, and John Marshall; as were many distinguished foreigners: Lafayette, von Steuben, and Kosciusko. Later, illustrious names were continually added to the membership roster, reflecting the society's scope. These included Charles Darwin, Robert Frost, Louis Pasteur, Elizabeth Cabot Agassiz, John James Audubon, Linus Pauling, Margaret Mead, Maria Mitchell, and Thomas Edison.

Thomas Jefferson's contributions to the study of geology in the United States were considerable. He established the United States Geodetic Survey and the United States Coast Survey (1807), the forerunner of the United States Geological Survey. Jefferson proposed the adoption of the Public Land Survey System that was the foundation of the township and range system familiar to most geologists. He sponsored the Corps of Discovery Expedition in 1804 to the newly-acquired Louisiana Purchase under the command of Captain Meriwether Lewis and Second Lieutenant William Clark and encouraged the search for minerals and fossils. Jefferson very much hoped that the expedition would find evidence of both living mastodons and *Megalonyx* in the vast unexplored American West beyond the Appalachian Mountains:

> *"In the present interior of our continent there is surely space and range enough for elephants and lions, if in that climate they could subsist; and for the mammoth and megalonyxes who may subsist there. Our entire ignorance of the immense country to the West and North-West, and of its contents, does not authorise us so say what is does not contain."*

Big Bone Lick, located in Boone County, northern Kentucky, was one of the most famous paleontological sites in North America. Throughout the mid 1700s, vast quantities of "elephant" bones were collected from this area and transported to museums throughout the world. In 1807, Captain William Clark was commissioned by President Jefferson at his own expense to excavate bones from Big Bone Lick for scientific study. This made Big Bone Lick the first official paleontological collecting site in North America. Jefferson later unpacked, sorted, and studied a shipment of the fossils from Big Bone Lick in the East Room of the White House.

From The Editor *continued on page 11*

The Houston Geological Society Continuing Education Committee Presents

Microseismic Monitoring Fundamentals

Speakers: Joël Le Calvez, Ph. D. / Paolo Primiero, Ph.D, Schlumberger

October 3, 2013

Overview and Outline

Understanding fracture geometry is key to effective stimulation treatments and well economics. Microseismic fracture monitoring provides imaging of the geometry of a hydraulic fracture to accurately measure fracture geometry. Accurately measuring the fracture geometry offers precise data on hydraulic fracture systems to increase understanding of the fracturing process. This increased understanding in real time will:

- Reduce well stimulation costs
- Optimizes field drilling plans
- Allows changes in perforation strategies and plan diversion schemes to be made on fly

The course is intended for geologists and geophysicists who need to have fundamental understanding about microseismic and/or identify and interpret fracture geometry from microseismic data.

The following will be covered in this one-day course:

- Source of microseismic signals
- Detection and location in microseismic acquisition
- Select monitoring systems
- Interpret and integrate microseismic data

Pricing

HGS/GSH Member:	$105.00
Non-Member:	$125.00
Emeritus/Life/Honorary	$70.00
Student Member	$70.00
Student Non-Member	$85.00

There is room for 100 attendees.

Date: Thursday, October 3, 2013 • 8 a.m. – 5 p.m.

Location: Western Geco, 10001 Richmond Ave., Houston, TX 77042

Please make your reservations on-line through the Houston Geological Society website at www.hgs.org

For more information about this event, contact HGS Office • 713-463-9476 • office @hgs.org

Biographical Sketches

Joël Le Calvez graduated with a B. Sc. degree in Physics from the University of Nice. He completed a M. Sc. degree in Geosciences from the University of Nice-Sophia Antipolis prior to graduating from the University of Paris VI with a pre-doctoral degree in Geodynamics. He has since earned a Ph. D. in Geology at the University of Texas at Austin where he specialized in structural geology, salt tectonics and physical modeling. He worked for the Bureau of Economic Geology at the Applied Geodynamics Laboratory, where he developed an interest in graben and fault linkage, extensional tectonics, and modeling. Since 2001, Joel has been working for Schlumberger as a geologist, focusing on the field of induced microseismicity and hydraulic fracturing. He actively participates in the development of the processing, visualization and interpretation software which Schlumberger currently uses in monitoring of the induced microseismicity coupled with hydraulic fracture treatment and other applications (e.g., CO_2 sequestration, geothermal injection, etc.) utilizing downhole, shallow wellbores and surface arrays. He is currently the North America Microseismic Domain Expert for Schlumberger and manages the processing groups in US Land while providing training and support to the international processing groups.

Dr. Primiero joined Schlumberger in 2003 as a post doctorate researcher in Japan to work on induced microseismicity for hydraulic fracture monitoring. He has held various technical positions within the company in different domains and geographical areas which include engineering, research and development in East Asia, Middle East and the United States. His expertise expands from the implementation of algorithms for microseismic data processing and source mechanism characterization, product development for permanent monitoring applications and rock physics laboratory measurements for carbonate characterization. Currently a Senior Geophysicist for Microseismic Services, he provides data analysis support and training for downhole, surface and shallow wells field acquisitions.

Dr. Primiero completed his Bachelor degree in structural geology and applied geophysics from University of Trieste, Italy. After graduation he received a fellowship at imperial College London, to specialize in modeling and seismic tomography. In 2003 he obtained a PhD from Imperial College in the Computational Physics and Geophysics group for his research on applications of tomography and full-waveform inversion of seismic data.

From the Editor continued from page 9

Megalonyx wheatleyi. Exhibit in the fossil collection of the American Museum of Natural History, New York City, New York.

In his 1951 article *Thomas Jefferson and the Geological Sciences*, Joel Martin Halpern, Professor of Anthropology at the University of Massachusetts, noted that Jefferson, like scientific thinkers before him, puzzled with the problem of marine fossils in the rocks on mountain tops. While studying fossil shells found in the Andes of South America at an elevation of 15,000 feet above sea level, Jefferson was not willing to accept this as evidence of a global, biblical deluge. Jefferson observed that there was no source of water that could cover the Earth to a depth of 15,000 feet. He calculated that converting the entire atmosphere to liquid would cover the globe only to a depth of 35 feet. Jefferson concluded that the deluge hypothesis was "unsatisfactory and we must be content to acknowledge that this great phenomenon is yet unsolved."

A fine mathematician and astronomer, Jefferson could reckon latitude and longitude as well as a ship captain. He calculated the eclipse of 1778 with great accuracy and was able to make suggestions for the improvement of almanacs on the calculation of time. Jefferson was considered expert in anatomy, civil engineering, physics, mechanics, meteorology, architecture, and botany. He was able to read and write Greek, Latin, French, Spanish and Italian.

While addressing guests attending the April 29, 1962 dinner honoring the Nobel Prize winners of the Western Hemisphere, President John F. Kennedy remarked: "I want to tell you how welcome you are to the White House. I think this is the most extraordinary collection of talent, of human knowledge, that has ever been gathered together at the White House, with the possible exception of when Thomas Jefferson dined alone."

Because of his wide range of knowledge and skilled power of observation, Jefferson was ahead of many contemporary scientists along several lines of inquiry. Even so, Jefferson never failed to acknowledge that in science he was "an amateur." Thomas Jefferson was many things: statesman, revolutionary, author, university founder, politician, surveyor, and agronomist. But was he a geologist?

Jefferson was wrong about *Megalonyx*. The fossils were not the remains of an enormous American lion as he postulated. In 1799, Caspar Wistar, Philadelphia physician, anatomist, and president of the American Philosophical Society succeeding Jefferson, correctly identified the remains as belonging to a giant ground sloth. In 1822, Dr. Wistar proposed naming the species *Megalonyx jeffersonii* in honor of the former president.

Jefferson's view of the history of life on Earth was burdened by centuries of religious belief and entrenched dogma. He had no formal training in earth sciences and he had few contemporaries to collaborate with and explore new concepts. In the December 6, 1935 issue of *Science*, noted geologist and Columbia University professor Henry Fairfield Osborn wrote, "Jefferson was a pioneer in the natural sciences and specifically in paleontology." So, even though he erred in his analysis of the *Megalonyx* fossils, Jefferson earned his place as a founding father of geology in the United States. ■

HGS Golf Tournament

Monday – October 21, 2013
Kingwood Country Club

Dust Off The Clubs, Polish The Shoes, And Pad The Handicaps, It's Time For Golf!

Come out and join us for golf, food, friends and fun at the annual HGS Golf Tournament at Kingwood Country Club. This year's format will be a four man scramble, with three flights determined by handicap. First, second, and third place awards (blind draw for 3rd place) will be awarded for each flight. There will be prizes awarded for closest to the pin and long drive as well as many great door prizes and raffle prizes for participants.

The entry fee is $125.00 per person or $500.00 per team on entries received by October 11th. Entries will be accepted after October 11th, but a $25.00 late fee will be applied per golfer. Individual entries will be grouped with other individual golfers to make a foursome. Entries are limited and will be accepted on a first-in basis.

Companies or individuals interested in sponsoring the event should contact Mark Dennis at 281-494-2522 (office), 281-705-4346 (cell) or by email at mdennis@petrolog.com.

To enter, please fill out the entry form and email, fax or mail along with your entry fee (payable to HGS Entertainment Fund) to:

Petro Log International, Inc.
One Sugar Creek Center Blvd., Suite 945
Sugar Land , TX 77478
Office: 281-494-2522 Fax: 281-494-2526
Email: mdennis@petrolog.com & mlange@petrolog.com

SCHEDULE OF EVENTS

8:00 – 9:45 a.m.	Registration and free use of driving range (Breakfast will be provided by **Petro Log International, Inc.**)
10:00 a.m.	Shotgun start
3:00 p.m.	Cash bar, open buffet
3:30 p.m.	Door prizes and awards presentation

Team Captain _____ Phone _____ Amount Enclosed _____

Company _____ Email _____

Billing Address _____

Credit card # _____ Exp. Date _____ Code# _____

Please Provide Email Addresses For All Team Members. All Communications Will Be Done Via Email.

Foursome Members *(Please Print)*	**Company**	**Phone Number/Email**	**Hdcp/ Avg. Score**
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

*Please provide email addresses for **all** team members. All communications will be done via email.*

HGS Golf Tournament

Monday – October 21, 2013
Kingwood Country Club

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Trevino Sponsorship $500.00

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Name _____ Phone _____ Amount Enclosed _____

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Exp. Date _____ Security Code# _____

Please email your company logo to Mark Dennis at mdennis@petrolog.com.
Note: Company logos (high resolution file) must be received no later than October 5th.
If there are any questions, I can be reached at 281-705-4346 (cell) or 281-494-2522 (office).

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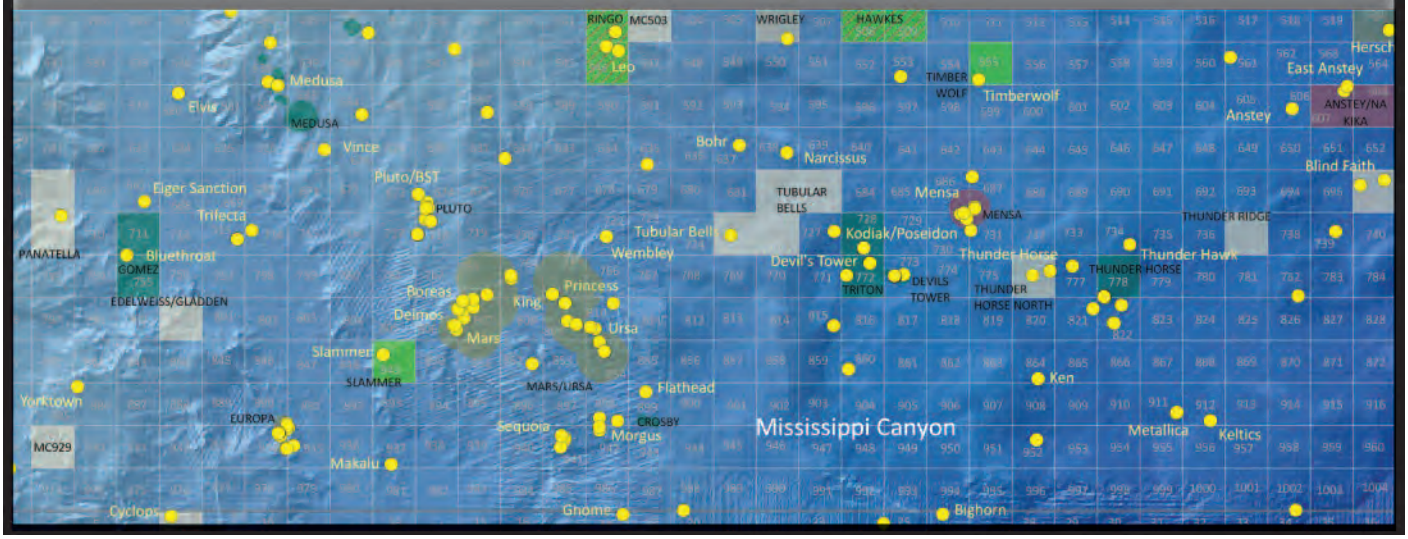

Applied Geoscience Conference

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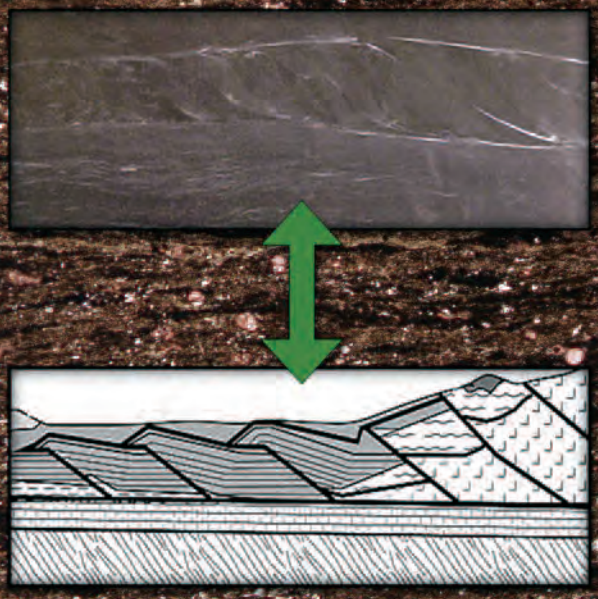

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- Petrophysical & Geomechanical Integration

Day 2 sessions will focus on:

- Microseismic & Geomechanics
- Engineering & Geomechanical Integration

Speakers include technical experts from industry, government and university.

For more information and to register please visit www.hgs.org

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TECHNICAL PROGRAM

2013 Applied Geoscience Conference
Westin Memorial City, Houston, Texas

MONDAY, NOVEMBER 4, 2013

7:00 am Registration Opens.....Fourth Floor
7:00 am Breakfast.....Fourth Floor
8:00 am - 5:00 pm Technical (Oral)Sessions.....Fourth Floor, Azalea Room
11:35am - 1:00 pm **Poster Sessions**.....Fourth Floor, Cedar and Cypress Room
Invited Presentations from Industry and Academic Consortia
5:00 pm - 7:00 pm **Poster Sessions and Social Hour**.....Fourth Floor, Cedar and Cypress Room
Invited Presentations from Industry and Academic Consortia

PLAY SCALE GEOMECHANICS SESSION CHAIRS: HEATHER DAVEY & LANS TAYLOR	SESSION 1
8:00 - 8:10	*Opening Remarks*
8:15 - 8:50	Geomechanics: From Mantle Plume to Molecular Cohesion, What is the Scale of the Problem? *W. Lansing Taylor, Talisman, USA*
8:55 - 9:30	Geomechanics to Solve Structure-Related Issues in Petroleum Reservoirs *Laurent Maerten, Schlumberger*
9:35 - 10:10	Geomechanical Parameters and Their Impact on Exploration of Unconventional Resources, Saudi Arabia *Mohammed Ameen, Saudi Aramco*
10:10 -10:30	*Break*
10:30 - 11:05	Holistic Geomechanics Workflow *Dr. Amy Fox, Canadian Discovery, CANADA*
11:05 - 12:00	*Open Floor Discussion*
12:00 - 12:45	*Lunch Break*

KEYNOTE ADDRESS	
12:45-1:15	Shale Composition, In Situ Stress and Multi-stage Hydrualic Featuring *Mark Zoback, Stanford University*

PETROPHYSICAL & GEOMECHANICAL INTEGRATION SESSION CHAIRS: AMY FOX & GANG HAN	SESSION 2
1:15 – 1:50	Shale Rock Physics, Fractures, and Stress Changes Due to Production *Colin Sayers, Schlumberger*
1:50 - 2:25	TBA *Younane Abousleiman, University of Oklahoma, USA*
2:25 - 3:00	Experimental Geomechanics & Rock Physics Testing in Shale *Dave Dewhurst*
3:00 - 3:20	*Break*
3:20 - 3:55	Petrophysical & Geomechanical Integration *Roberto Suarez Rivera*
4:00 - 4:55	*Open Floor Discussion*

http://www.hgs.org

TUESDAY, NOVEMBER 5, 2013

7:00 am Registration Opens.....Fourth Floor
7:30 am Breakfast.....Fourth Floor
8:00 am - 5:00 pm Technical (Oral) Sessions.....Fourth Floor, Azalea Room
11:35am - 1:00 pm **Poster Sessions**.....Fourth Floor, Cedar and Cypress Room
Invited Presentations from Industry and Academic Consortia

MICROSEISMIC & GEOMECHANICS SESSION CHAIRS: ROBERT HURT & SCOTT WESSELS	SESSION 3
8:00 - 8:35	Integration of Reservoir Modeling and Forward MS Modeling for Unconventional Reservoirs *Tony Settari, Taurus Reservoir Modeling*
8:40 - 9:15	Spectral Characteristics of Tensile Microseismic Events *Dave Eaton, University of Calgary, CANADA*
9:20 - 9:55	Inferences from Microseismic Source Mechanisms *Michael Thorton*
10:00 - 10:20	*Break*
10:20 - 10:55	Unconventional Wisdom in Shale Oil/Gas Completions & Microseismic Interpretation *Neal Nagel, Itasca*
11:00 -12:00	*Open Floor Discussion*
12:00 -1:00	*Lunch*

ENGINEERING & GEOMECHANICAL INTEGRATION SESSION CHAIRS: PATRICK HOOYMAN & MIKE VAN HORN	SESSION 4
1:00 – 1:36	Integrated Fracture Mechanics Modeling *Robert Hurt, Baker Hughes, Houston, TX, USA*
1:40 - 2:15	Fracture Complexity Issues *Mike Vincent, Fracwell*
2:20 - 2:40	*Break*
2:45 - 3:20	Integration of Geomechanics with Completions & Production—Eagle Ford Formation *Dale Kokowski, Marathon Oil*
3:25 - 4:00	Brittle to Ductile Transition, Generation of Complex Fracture Networks and Engineering Implications *Reza Safari, Weatherford*
4:05 - 5:00	*Open Floor Discussion*

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Applied Geoscience Conference

Interdisciplinary Micro to Macroscale Geomechanics

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- Complimentary vendor table

Student Technical Poster Session - $10,000

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- All sponsored student Conference registrations
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- Dedicated signage at student technical poster session
- Complimentary vendor table

Reception: $5,000

Availability: 3 of 5

- 2 complimentary Conference registrations
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- Dedicated signage during Conference reception
- Complimentary vendor table

Speaker Reception - $3,500

Availability: 1 of 2

- Company name & logo displayed at event, online event website, and related HGS communication
- 10 complimentary passes for speaker reception

Lunch - $2,500

Availability: 4 of 5

- Company name & logo displayed at event, online event website, and related HGS communications
- Dedicated signage during Conference lunch

Wifi - $1,500

Availability: 0

- Company name & logo displayed at event, online event website, and related HGS communications
- Special recognition

Coffee - $1,000

Availability: 3 of 4

- Company name & logo displayed at event, online event website, and related HGS communications
- Dedicated signage at Conference break stations

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HGS - 14811 St. Mary's Lane, Ste. #250 - Houston, Texas 77079 - Attn: Sandra, or you can email your sponsorship form to *Sandra@hgs.org*

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If there are any questions, please contact Heather Davey @ heather.davey@wintershall.com or Lans Taylor @lxtaylor@talismanusa.com

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Monday, October 7, 2013

Westchase Hilton • 9999 Westheimer
Social Hour 5:30–6:30 p.m.
Dinner 6:30–7:30 p.m.

Cost: $30 Preregistered members; $35 non-members/walk-ups

To guarantee a seat, pre-register on the HGS website & pre-pay by credit card.
Pre-registration without payment will not be accepted.
Walk-ups may pay at the door if extra seats are available.

Alan R. Huffman
SIGMA³ Integrated Reservoir Solutions Inc.

Geohazard Prediction in Deepwater Wells: When the Reservoir Becomes the Enemy

In recent years, drilling safety requirements have become more challenging as ultra-deep wells have demonstrated that basic undercompaction models are inadequate to predict pressures in high pressure-high temperature (HP-HT) environments. The requirements of these wells have forced pressure prediction to adapt to environments where diagenetic processes and hydrocarbon maturation are dominant (unloaded environments), and where chemical compaction takes over from undercompaction as the dominant factor in determining rock property changes (secondary compaction environments). Adding to the complexity of the pressure prediction process is the interplay between shales and reservoir rocks.

As pressures and temperatures increase, the window between the formation pore pressure and fracture pressure narrows. In HP-HT environments, the lateral extent, structural position, and architecture of the reservoirs become much more critical to the viability of a prospect. They also determine the range of safe depths where a specific reservoir can be penetrated without the risk of a pressure influx that could jeopardize the drilling operation. In this setting, geopressure prediction and reservoir pressure computation become essential components of the prospect risking exercise. While the explorationist desires large reservoir bodies in deep prospects to allow sufficient reserves to justify the high cost of an ultra-deep well, he must also recognize that large reservoir extents can threaten the viability of the prospect. To mitigate this risk, the exploration team must use all the available information to determine the extent of the reservoir, its structural position, and its interaction with faults and other potential flow conduits. This information can then be integrated with 3D shale pressure volumes to predict column heights for specific fluids and the reservoir pressures at any specific penetration point in the subsurface. The accurate prediction of the reservoir pressures at a specific penetration point can be the difference between an efficiently managed drilling operation and a potentially catastrophic pressure influx event. ■

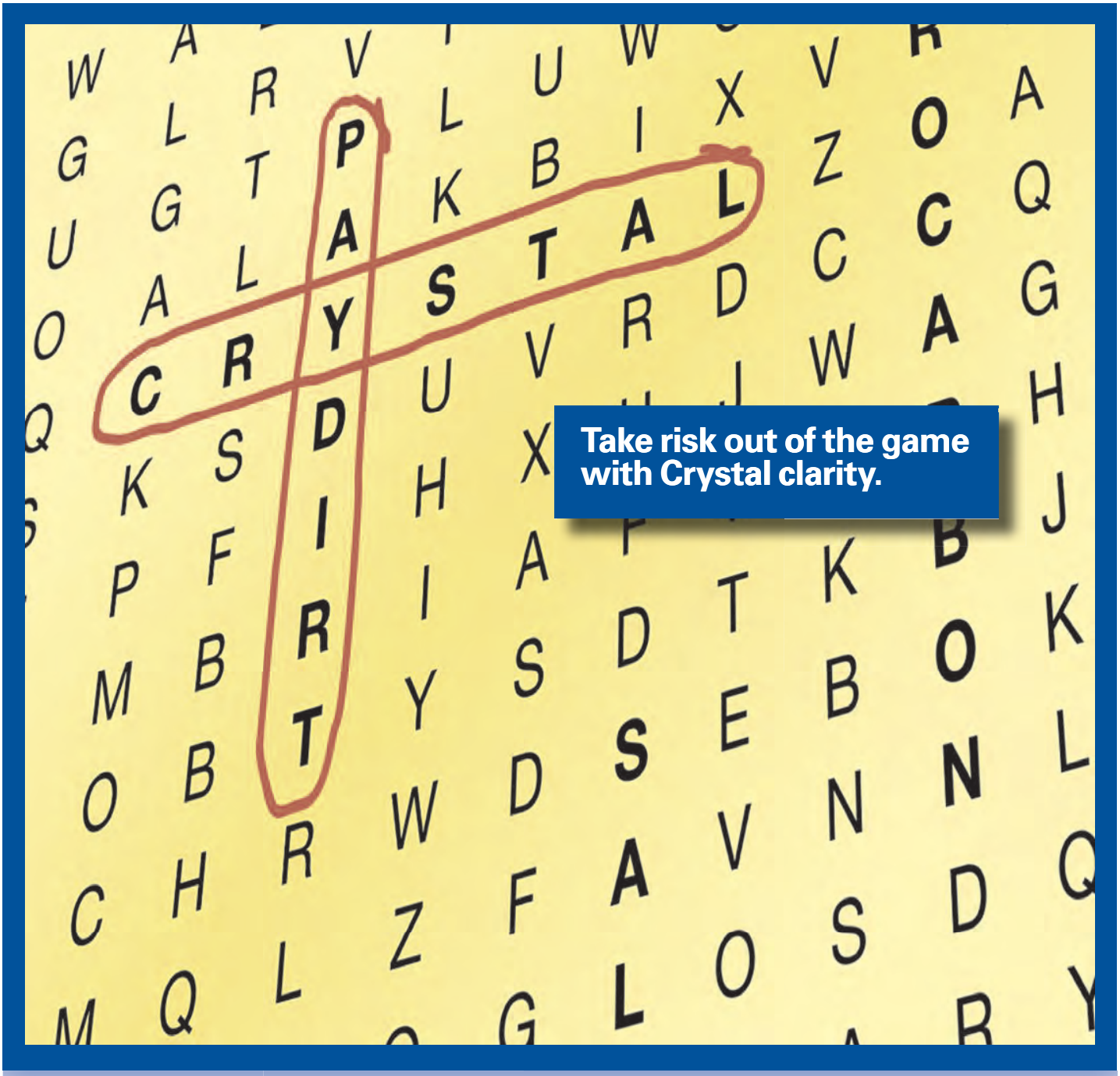
Biographical Sketch

Alan R. Huffman is a recognized technical and business leader with over 25 years of experience in international exploration and production. He received his bachelor's degree in geology from Franklin & Marshall College in 1983 and his Ph.D. in geophysics from Texas A&M University in 1990. In 1986-87, he was privileged to perform the seismic hazard analysis for the successful proposal for the Superconducting Supercollider in Waxahachie, Texas. In 1989-1990, he served as Science Manager of DOSECC, the U.S. Continental Drilling Program.

As the Chief Technology Officer of SIGMA3 Integrated Reservoir Solutions LLC, Dr. Huffman manages the technical operations and technology development of the company. Prior to the merger with SIGMA3, Dr. Huffman served as the Chairman and CEO of FusionGeo Inc. where he was responsible for the strategic growth and expansion of the enterprise since 2003. He was the primary architect of Fusion's rapid growth from a small consulting practice to a global business enterprise with over 300 clients and offices in multiple countries. Dr. Huffman was also the Lyssa & Cyril Wagner Professor of Geology and Geophysics in the School of Geology and Geophysics at the University of Oklahoma in Norman, OK in 2003 and 2004.

From 1997-2002, Dr. Huffman was Manager of the Seismic Imaging Technology Center (SITC) with Conoco. In this role, he managed the geophysical technology division of Conoco, with responsibility for worldwide technology development and technical services. From 1990 to 1997 at the Exxon Corporation, he worked as a technology specialist on exploration and production projects in the United States, West Africa and the Far East, and was also actively involved in technology and software development.

Dr. Huffman is a recognized industry expert in the fields of geopressure prediction, shallow hazards prediction, direct detection of hydrocarbons, and exploration risking. He is active in industry and professional affairs, having chaired numerous technical conferences and having served on organizing committees for the Society of Exploration Geophysicists (SEG), the American Association of Drilling Engineers, the American Association of Petroleum Geologists (AAPG), and the Society of Petroleum Engineers. He was the recipient of the 2004 Robert H. Dott, Sr. Memorial Award from the AAPG for the publication of AAPG Memoir 76 and he also received the 2002 Best Paper Award from the SEG. He has published numerous papers in refereed journals, authored articles in international publications, and prepared 40 abstracts. He has nine U.S. patents in the field of geophysics.



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Wednesday, October 9, 2013

Black Lab Pub, Churchill Room • 4100 Montrose Blvd.

Social 5:30 p.m., Dinner 6:30 p.m.

Cost: $30 Preregistered members; $30 non-members/walk-ups

To guarantee a seat, pre-register on the HGS website & pre-pay by credit card.
Pre-registration without payment will not be accepted.
Walk-ups may pay at the door if extra seats are available.

Paul Parsons
Energy Training Resources, LLC

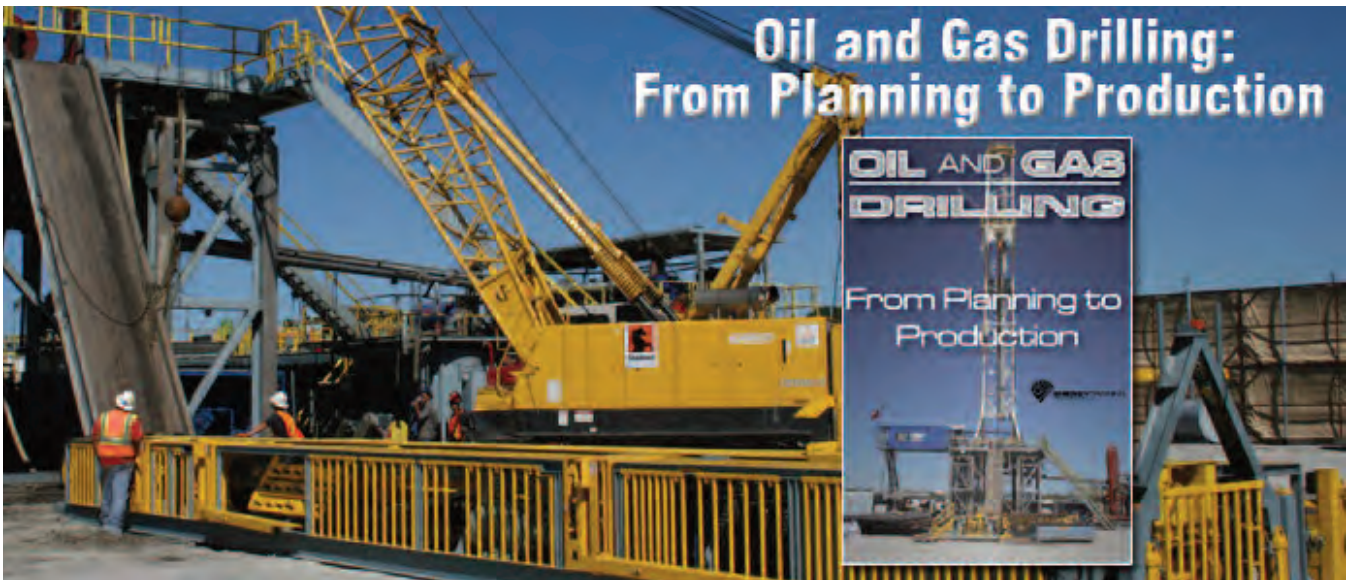
An Up-Close View of Oil and Gas Drilling and Completion

There are about 1,800 drilling rigs operating in the United State right now and almost half of these are working in Texas. Some of the areas of highest activity in Texas include the Permian Basin in West Texas, the Eagle Ford Shale in South Texas, and the Barnett Shale around Fort Worth. A large portion of the rigs are drilling horizontal shale wells that are completed with hydraulic fracturing.

Paul Parsons will present a discussion of the boom in shale drilling and the reasons for the recent shift away from gas-prone shale to the current focus on liquids-prone shale. Then, he will show segments of a video about how a horizontal well is drilled and completed. These segments are excerpts from a two-hour video produced by his company called "Oil and Gas Drilling: From Planning to Production." Mr. Parsons scripted and directed the video. This video is being used by more than 400 different companies, investors, and educational institutions. The video sells for $500 per copy, so this is a good opportunity to be able to see key portions during this HGS meeting. ■

Biographical Sketch

Paul Parsons is Managing Director and founder of Energy Training Resources, LLC, which provides industry overview courses for oil and gas companies and other clients. He previously spent 27 years working for a large oil and gas company in senior financial roles. Mr. Parsons has a Bachelor in Business Administration in accounting from the University of Texas, a Masters in Business Administration from the University of Houston, and is a Certified Public Accountant. He also has a certificate in Professional Land Management.



13th ANNUAL
GSH / HGS
SALTWATER TOURNAMENT

Friday, October 11, 2013

The TopWater Grill Marina
815 Avenue O, San Leon, TX
Galveston Bay Complex and Offshore

This year's Saltwater Fishing Tournament will include an Offshore Division to be held on Friday, October 11, 2013 at The TopWater Grill Marina, San Leon, Texas. We are looking forward to a big event this Fall and we encourage full family participation.

Galveston Bay Complex Division

Trophies will be awarded for

The Heaviest Individual:
Redfish (Non-Tagged)
Speckled Trout
and Flounder

The Heaviest Individual Stringer:
1 Redfish
3 Speckled Trout
and 1 Flounder

Galveston Offshore Division

Trophies will be awarded for:

The Heaviest Individual:
Ling (aka - Cobia)
King Mackerel
and Mahi-mahi

Registration will be online at: http://www.gshtx.org/en/cev/997

Fishing Participants are $60 in advance which includes:
Launch Fee, GSH/HGS Fishing Cap, Fish Fry Meal after weigh-in, Refreshments, Trophies, and DOOR PRIZES.

Non-fishing family and guests are $10 in advance for the Fish Fry Meal.

For more information, please contact: Bobby Perez (HGS & GSH)
281-240-1234 ext. 3103 Office
281-240-4997 Fax
281-787-2106 Cell
281-495-8695 Home
E-mail: rdphtx@aol.com or r_perez@seismicventures.com

The Geophysical Society of Houston, a non-profit organization, and the Houston Geological Society, a not-for-profit, are serving the Geosciences Community. Corporate and individual contributions are appreciated and will be acknowledged on several sponsor boards and banners at the Weigh-In Station and Marina. All contributors will be recognized in multiple media including linked logos on the GSH and HGS websites. This is a great way to entertain friends, family, business associates, and clients. So come ON BOARD!

DISCLAIMER:
The Geophysical Society of Houston / Houston Geological Society will not be held responsible for injury or accidents during this event. PRACTICE SAFETY!!!!!

Monday, October 14, 2013

Westchase Hilton • 9999 Westheimer
Social Hour 5:30–6:30 p.m.
Dinner 6:30–7:30 p.m.

Cost: $30 Preregistered members; $35 non-members/walk-ups

To guarantee a seat, pre-register on the HGS website & pre-pay by credit card.
Pre-registration without payment will not be accepted.
Walk-ups may pay at the door if extra seats are available.

HGS International Dinner Meeting

Scott E Thornton (speaker), Gerald Kidd, Terry Stellman, Hector del Castillo, Peter Mullin, Edwin Goter, and Pratt Barndollar
PanAtlantic Exploration Company

Straddling the Basin Boundary in Equatorial Guinea and Gabon: Contrasting Structural Style, Trapping Styles and Reservoirs

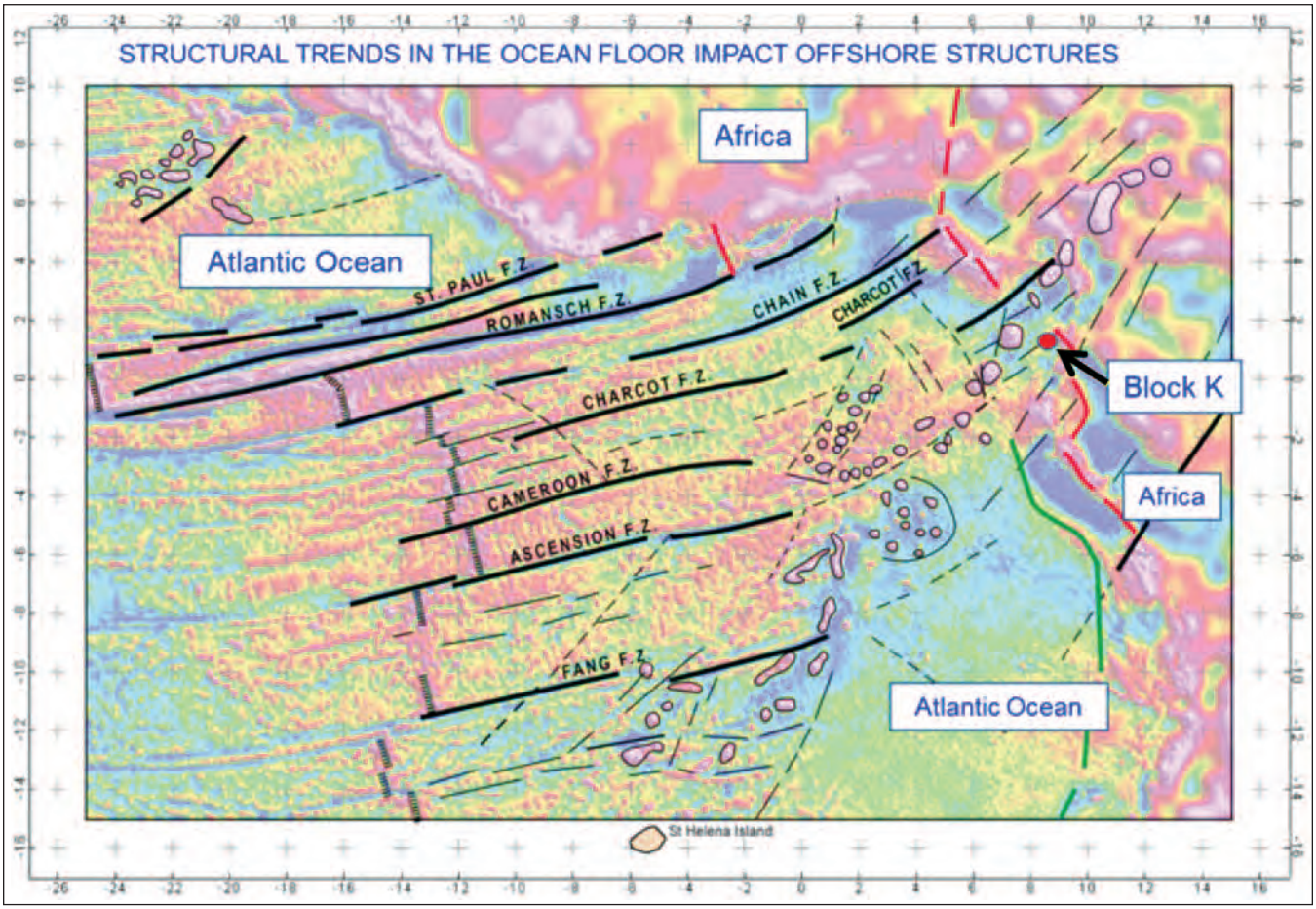


Figure 1. *Location of Study Area with Seafloor and Land Gravity. Note fracture zones in vicinity of Block K.*

The area of Block K, in the southernmost part of Equatorial Guinea (Figure 1), is an emerging exploration province with proven plays to the north and south. The area straddles two basins, the Rio Muni Basin and the North Gabon Basin within the block (Lawrence et al., 2003). The structural framework of the basin is best understood by oblique spreading and an active Ascension Fracture Zone, which separates the two basins within Block K (Turner et al., 2003). The continental margin of southern Equatorial Guinea is also quite narrow (Tari et al., 2002) due to oblique extension and some transform movement.

In the northern part of Block K, reservoirs and structures are typical of the adjacent Rio Muni Basin (Figure 2). Paleocene and Turonian reservoirs consist of relatively flat-lying, undeformed toe-of-slope submarine fans analogous to the deepwater Campos Basin

HGS International Dinner *continued on page 27*

Pelotas Basin Brazil

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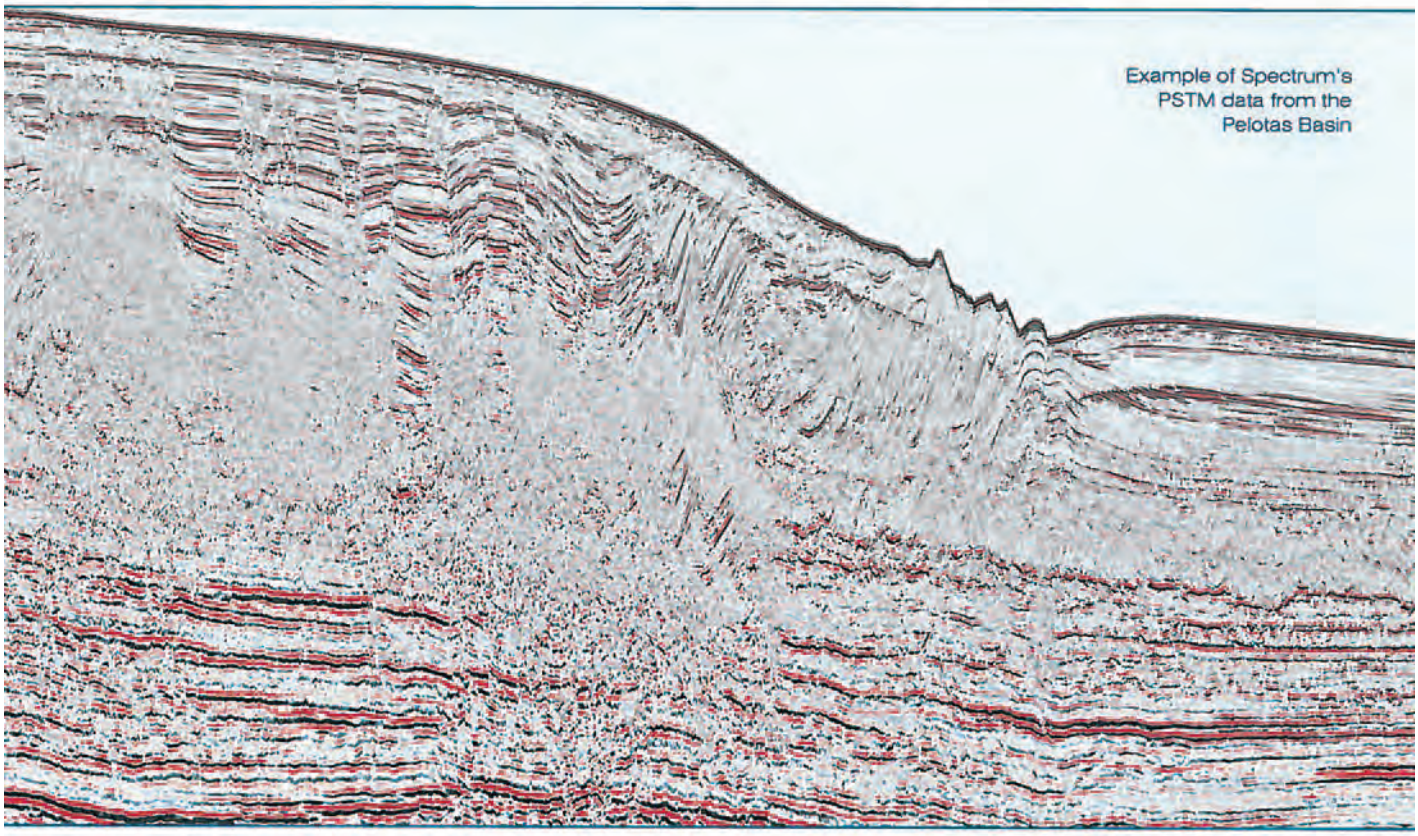
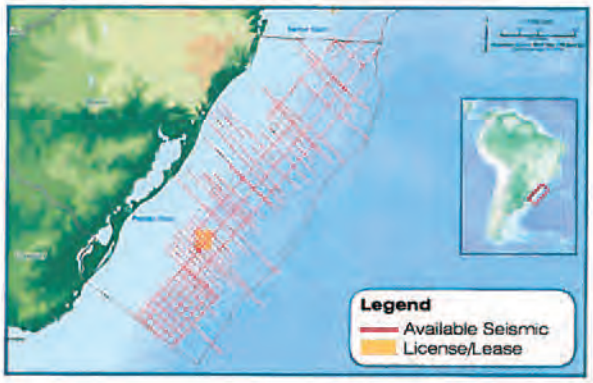


Example of Spectrum's PSTM data from the Pelotas Basin

Pelotas Basin in the southern most part of Brazil has not previously seen the same level of exploration as other basins in the region. However, Spectrum's new long-offset seismic shows promising indications of an active petroleum system in the Pelotas Basin.

The processing flow includes both pre-stack time and pre-stack depth migration. Deliverables are expected to be available to clients Q3 2013.



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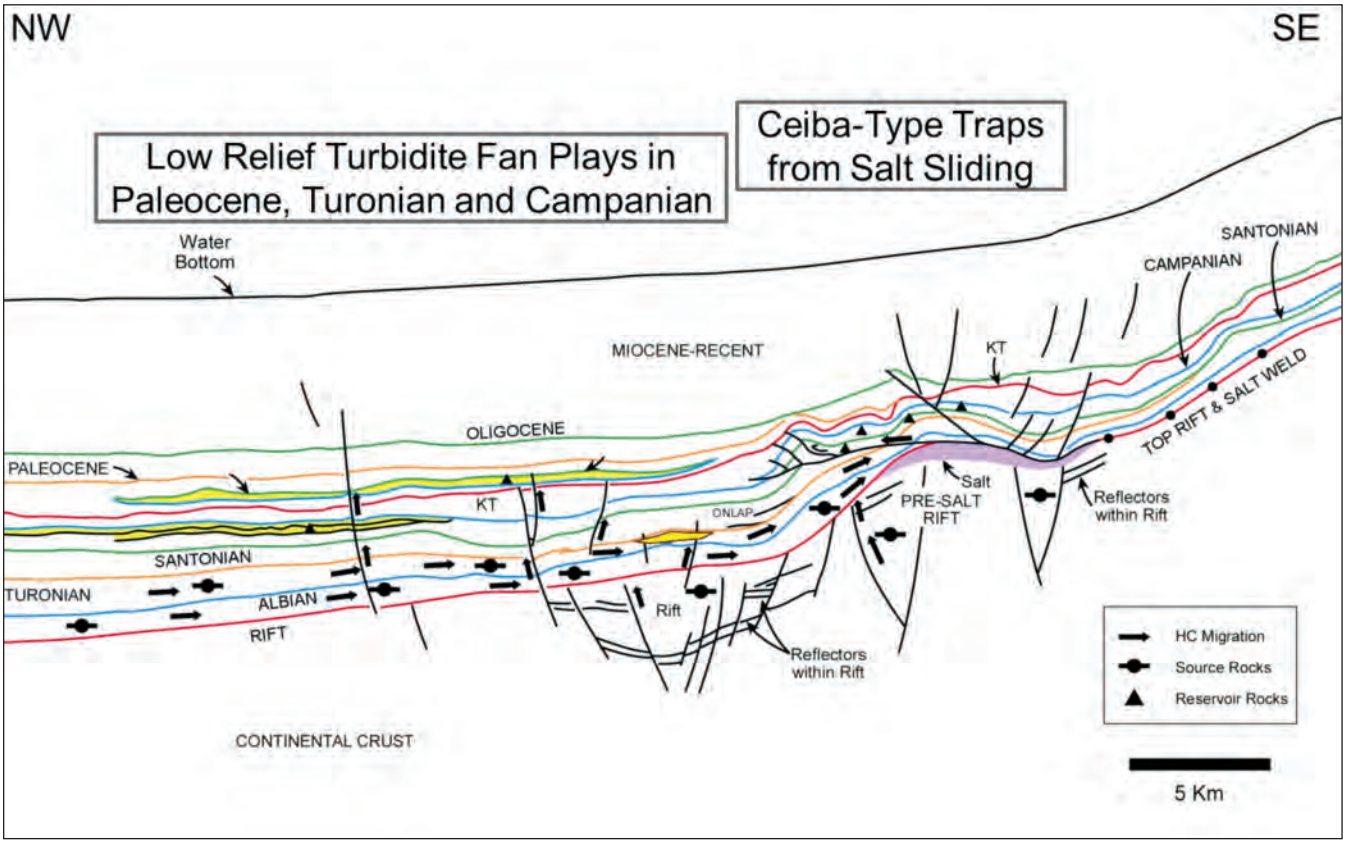

Figure 2. *Geoseismic Cross Section: Northern Block K, Rio Muni Basin*

of Brazil. Play extension of channelized Senonian reservoirs from producing fields, such as Ceiba and Okume to the north (Dailley et al., 2001), is focused on analogous compressional anticlines formed by sliding on salt. Uplift events in the platform and onshore in the Senonian Uplift (Santonian) and Middle Eocene tilted the basin and caused sliding and thrusting. As much as two to five kilometers of overthrusting of relatively undeformed Upper Cretaceous section is evidenced in these Ceiba-type traps.

The southern half of Block K (**Figure 3**) is radically different than the northern one. It is actually an extension of the North Gabon Basin, with much more northwesterly movement of salt nappes than within Gabon. Multiple uplifts in the shallow platform and onshore (Turner et al., 2008) have driven a radial pattern of downslope movement of two spectacular salt nappes. They have been transported 20 to 40 kilometers northwest into the deepwater emerging exploration area from a source area on the present-day continental shelves of Equatorial Guinea and Northern Gabon. The salt nappes are most likely sourced from the shallow platform. This interpretation, rather than a deeper in-place salt from other models (Tari et al., 2002), is based on careful salt mapping, Upper Cretaceous marine as well as Lower Cretaceous rifted sequences below the salt nappes never had autochthonous salt. Salt nappe movement initiated in Campanian and ended in the early Paleocene, although subtle folding continued into the present.

Traps in the Lower Cretaceous rift sequence, which one would normally call "pre-salt", are, in fact, beneath allochthonous salt and an Albian marine sequence.

Sub-salt structural traps in the Upper Cretaceous represent a new deepwater play for the country, and could provide significant volume potential. Turonian, Cenomanian, and Albian turbidite sandstone reservoirs, all present in nearby wells in Equatorial Guinea and North Gabon are probable sub-salt objectives. Traps in the Lower Cretaceous rift sequence, which one would normally call "pre-salt", are, in fact, beneath allochthonous salt and an Albian marine sequence. We will call them rift sequence traps. These traps evidence structural inversion, mostly likely caused by the same event which caused thrusting and nappes in the shallow platform, "an otherwise undetectable process active during the transition from a rift basin to a passive continental margin" (Turner, 1995). The structural inversion likely occurred at the close of the

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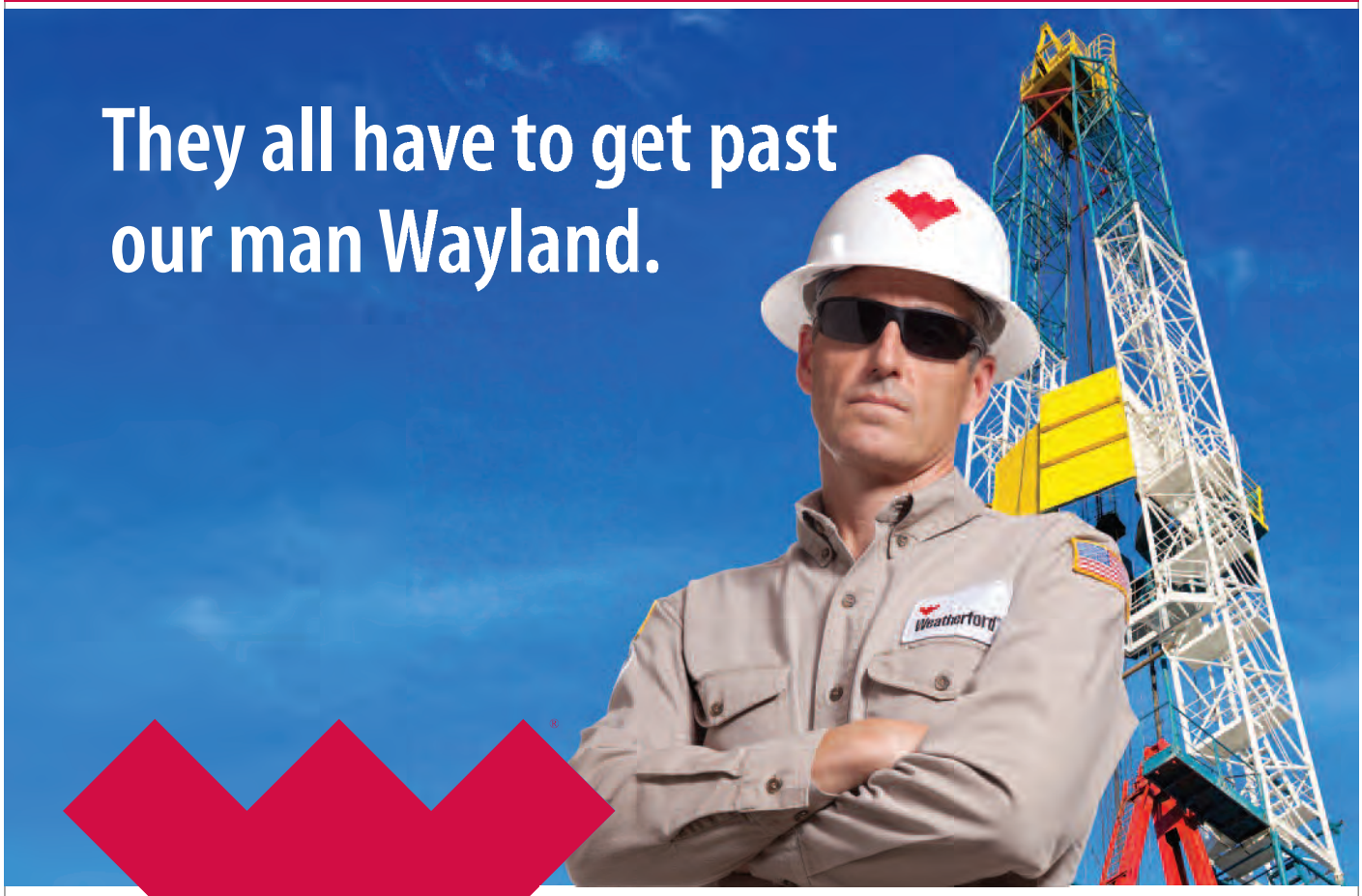

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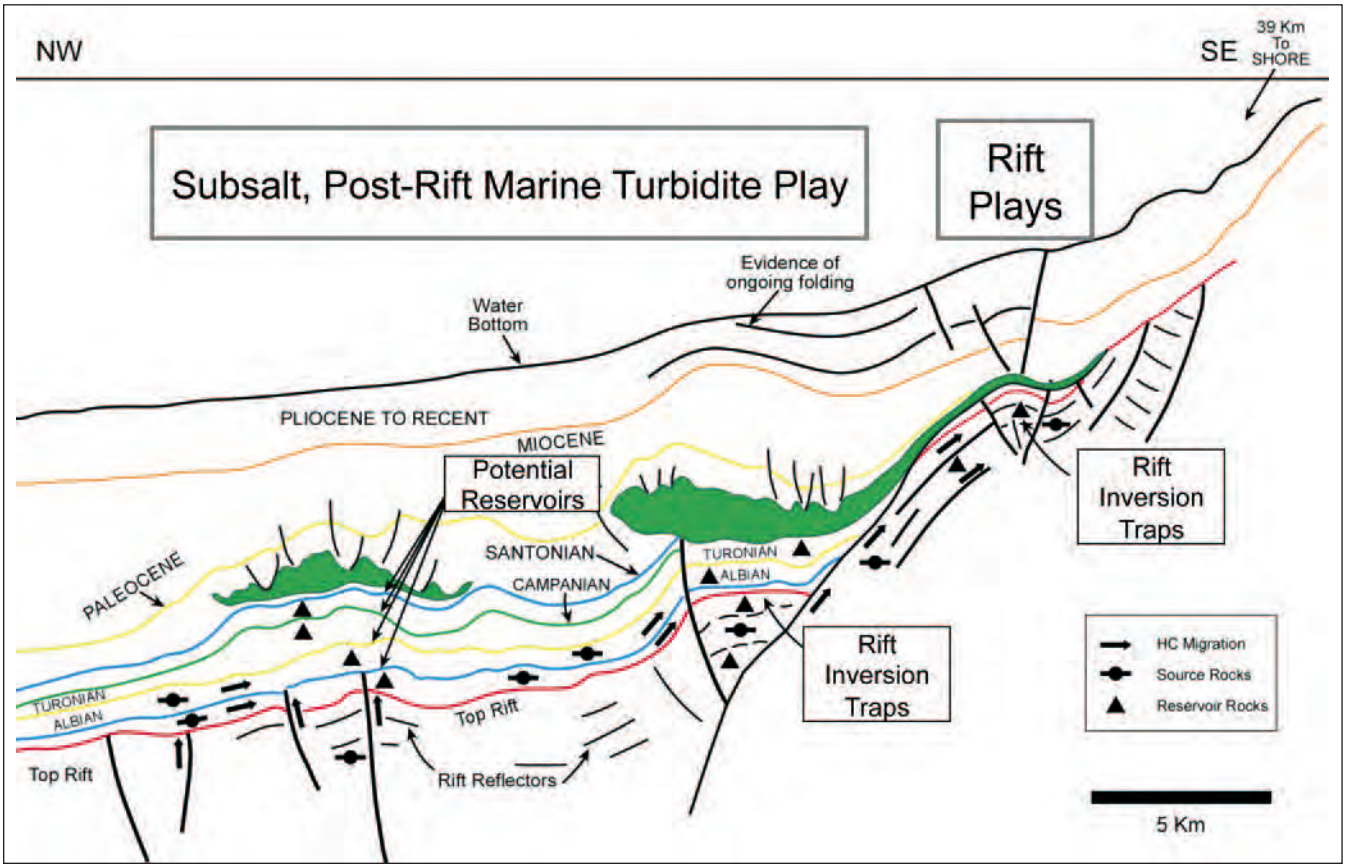

Figure 3. *Geoseismic Cross Section: Northern Block K, North Gabon Basin*

Aptian-Albian synrift episode, as the ocean deepened (Turner, 1995), but before uplift in the Senonian-generated downslope movement of salt nappes. These rift sequence traps differ from pre-salt traps in northern and central Gabon, which are overlain by autochthonous salt.

Rift sequence Gamba and pre-Gamba (N'Toum) fluvial-lacustrine sandstone reservoirs are present in nearby wells. They are overlain with thin autochthonous salt. These rift sandstones represent potential reservoirs in southern Equatorial Guinea with gross sections greater than 1500 meters. In this untested area of Block K, Equatorial Guinea, the diversity of trap types, reservoirs and salt tectonics are quite different that the rest of the Rio Muni Basin, as well as the Northern Gabon Basin. It is an untested deepwater emerging play area in an intriguing structural province. ■

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Biographical Sketch

Scott Thornton is currently Team Lead and Senior Geologist for PanAtlantic Exploration Company in Houston, Texas. He has over

HGS International Dinner *continued on page 31*

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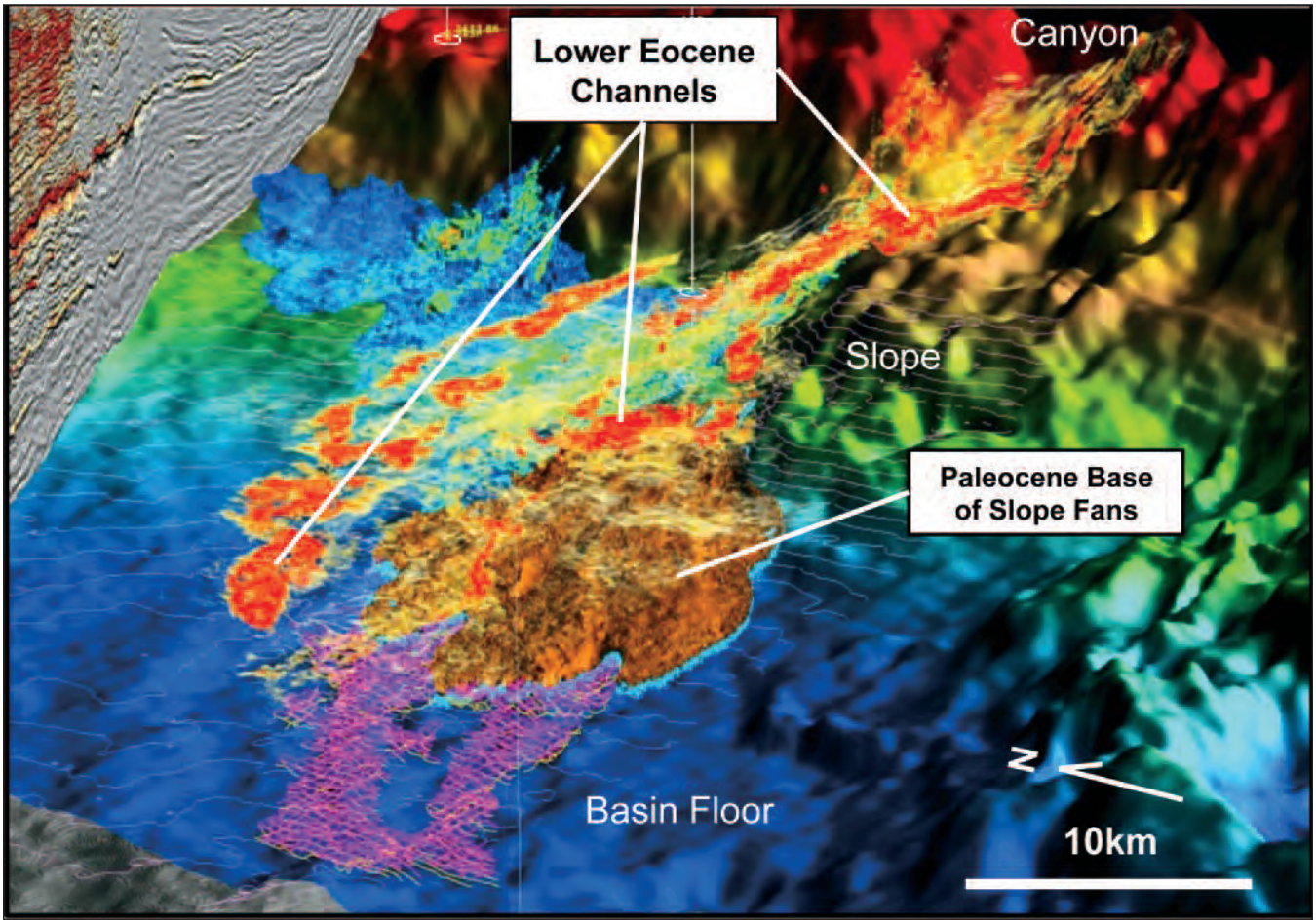

Figure 4. *Voxel Amplitude Visualization of Paleocene and Eocene Turbidite Systems*

30 years in international oil and gas exploration, with two-thirds of his experience at Unocal and Shell. Over 14 years of his career has focused on offshore Brazil and West Africa new ventures and asset evaluations. He received his B.A. from the University of Wisconsin, Madison, his M.S. from Duke University, and his Ph.D. from the University of Southern California.

Dr. Thornton has published or presented papers covering coastal sedimentation, shallow marine carbonates, turbidites, basin studies, lacustrine source rocks, Brazil deepwater fold belts, transform margins, and pre-salt South Atlantic reservoir plays. He has been active in the Petroleum Exploration Society of Australia (PESA), SEPM (Society for Sedimentary Geology), Houston Geological Society (HGS), and International Association of Sedimentologists. In the HGS, he has twice served as Chair, International Explorationists Group, and received the President's Award in 2001. While living in Australia he taught short courses on Petroleum Systems Analysis and Lacustrine Petroleum Systems Analysis for PESA. He was an Honorary Associate with the University of Sydney from 2009-2011.

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HGS Northsiders Luncheon Meeting

Jeff Spencer
President of the Petroleum History Institute
Amromco Energy

Early Texas Oilfield Photographers

Churches often sponsored missions into the oilfields and these twenty-two men, women, and children appear to be attending one. The note on the reverse of this 1913 postmarked postcard mentions one of the early concerns at Electra: lack of good water. "Everybody here have to buy every drop of water they use. Get it from Vernon. Ship it in." The town of Vernon is 23 miles from Electra. Photograph by Benjamin Loden; postmarked 1913.

Commercial photographers captured many great views of early Texas oil booms. Common scenes included oil gushers, oilfield fires, fields of wooden derricks, and boomtowns. These photographs were produced and sold, often as real photo postcards (RPPCs).

Port Arthur, Texas, photographer Frank Trost (1868-1944) had the good fortune to photograph early scenes of the Spindletop oilfield and to capture perhaps the most famous photograph of the Lucas Gusher. The Spindletop oil field was discovered in 1901. Trost sold over 45,000 prints of this photograph in just a few months. His other Spindletop views include dozens of derricks so close together they appear to be touching, the field's first oilfield fire, and several views of early gushers. Postcards were also made from Trost photographs.

Benjamin Harrison Loden (1871?-1926) was the founder and owner of Loden's Studio in the North Texas town of Electra. His work appears to be limited to scenes from the town and the Electra oil field (discovered in 1911). His postcards include oilfield fires, derricks, gushers, and a missionary group ready to venture into the oilfield.

Frank J. Schlueter (1874-1972) and his wife, Lois, opened a photography studio in Houston in 1907 or 1908. Schlueter captured scenes in many Texas Gulf Coast oil fields, including Goose Creek, Humble, Orange, Sugarland, Pierce Junction, Hull, West Columbia, Damon Mound, Barbers Hill, Markham, Thompson, Rabbs Ridge, Manvel, Blue Ridge, South Houston, and

HGS Northsiders Luncheon *continued on page 35*

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HGS Northsiders Luncheon *continued from page 33*

Vinton, Louisiana. Though perhaps best-known for his oilfield photography, Schlueter also documented the growth of Houston and the surrounding area's industries and agriculture until his retirement in 1964 at the age of 90. Much of Schlueter's work is preserved at the Houston Public Library as the Schlueter Photographic Collection.

Two additional Texas oilfield photographers were F. (Frank) G. Allen (1881-1921) and L. (Lester) L. Allen (~1875-?). Whether these two contemporaries were related is still being researched. Frank, formerly a New York newspaper photographer, photographed scenes in Goose Creek, West Columbia, and Pierce Junction oil fields including the destruction at Goose Creek caused by a May 24, 1919 "cyclone" (hurricane). L. L. Allen captured images in the 1920s of Raccoon Bend, Orange, and Spindletop (second boom) oil fields. On the back of some of L.L. Allen's postcards, the cities of Houston, Galveston, or Texas City are stamped. He maintained a studio in Houston until at least in 1912. Census records list him living in the Texas cities of Houston (1910), West Columbia (1920), and Orange (1930).

Jack Nolan (1889-1972) was a pioneer Texas photographer and newspaperman who documented the East Texas oil boom of the early 1930s. Nolan's real photo postcards are highly collectible and capture the hustle and bustle of the boom towns and oilfield camps, as well as spectacular images of oil gushers and oilfield fires. He also documented the enforcement of martial law in the oilfields by the Texas National Guard. Nolan photographed some of the early gushers and boomtowns of West Texas before venturing to East Texas. Jack's postcards are also known for their highly descriptive captions. ■

Perhaps Jack Nolan's most famous oilfield photograph bears the caption, "A great Texas gusher fire the most unusual picture ever taken in an oil field snaped [sic] the instant the well burst into flames". Another version of this photograph identifies the well as the "Skelly-Amarada Univ. No. 1 Ector County". The location of this well has also been placed and dated near the town of Penwell in Ector County, April 27, 1930.

Biographical Sketch

Jeff A. Spencer is a Charter Member and currently serves as the President of the Petroleum History Institute. Mr. Spencer is a geologist with Amromco Energy in Houston, Texas. He received a BS in geology from the University of Cincinnati and an MS in earth sciences from the University of New Orleans. Prior to his employment with Amromco, he was employed by Midstates Petroleum Company (2010-2013), Black Pool Energy (2005-2010), Samson (2005), Osprey Petroleum (2000-2005), Unocal (1998-2000), and Amoco Production Company (1981-1998).

Mr. Spencer has spent most of his career exploring the Gulf Coast onshore and the Gulf of Mexico shelf. He has authored or co-authored more than 20 oil field history papers on topics such as early oil fields of Louisiana, Ohio oil field history, oil-related trade cards, and oil-related postcards of West Virginia, California, Ontario, Kansas, Pennsylvania, and Texas. He is co-author (with Mark J. Camp) of the book *Ohio Oil and Gas* (2008). He collects oil field-related postcards, trade cards, movie posters, stereoviews, and postal covers. Mr. Spencer also serves as the historian for the Gulf Coast Association of Geological Societies. He is the author of the book *Texas Oil and Gas* which will be released in September 2013.

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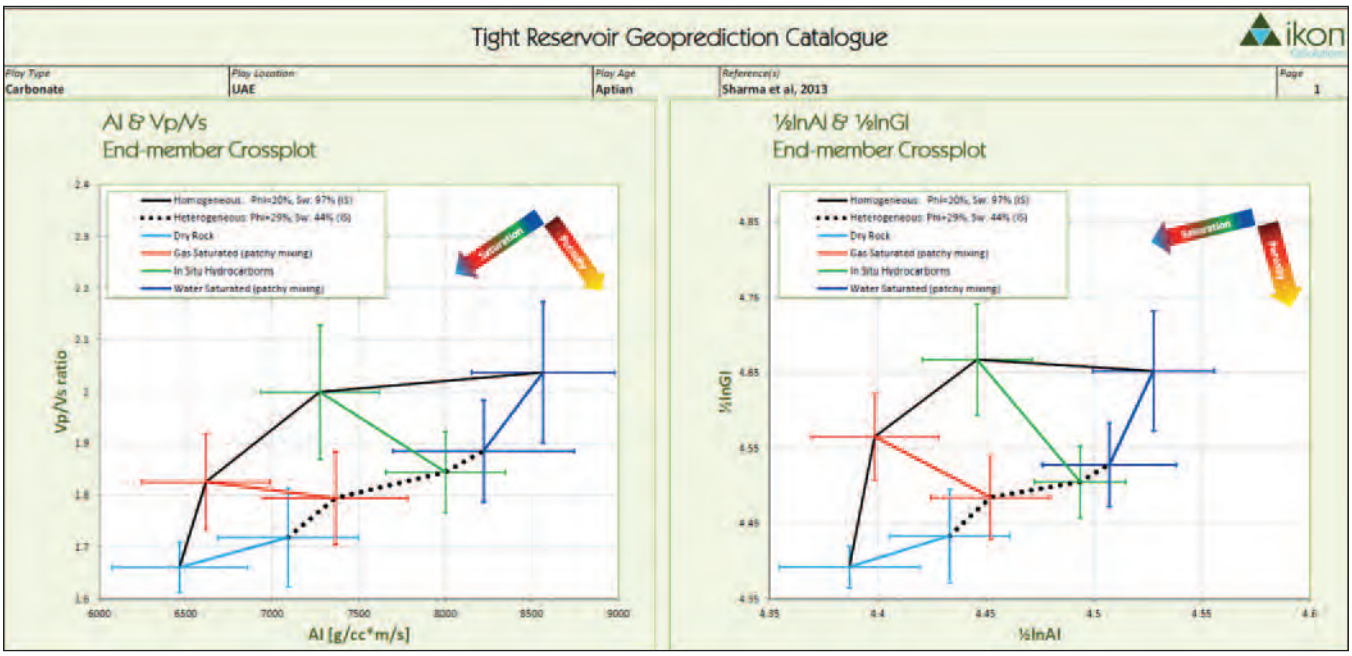
HGS North American Dinner Meeting

Cristian H. Malaver
Ikon Science Americas

Quantitative Geoprediction of Tight Carbonate Reservoir Quality



The search for hydrocarbons in tight reservoirs is becoming a common task for explorers these days. However, predicting the reservoir quality indicators of tight unconventional shales, tight carbonates, and tight sands is a real challenge, demanding a multi-disciplinary effort. By following an integrated geosciences approach, the quantitative interpretation of facies heterogeneity, pore distribution, organic content, and multi-phase saturation has become a valuable methodology. This generates reservoir quality indicators. The reservoir quality indicators combine conceptual elements from petrophysics, rock physics, petroleum geology, geomechanics, and geophysical analysis.

Best practices developed on tight reservoirs around the globe over the years are based on robust elastic and mechanical rock property end-member models. The models have been widely applied to predict reservoir quality and performance, both at and away from well locations. Such core-based rock physics and mechanical earth models are supported by regional petroleum systems. The models are used to predict the seismic response from the highest expected quality reservoir facies using both in-situ and substituted pressure, mineral, pore, and fluid conditions. High quality reservoir facies might have high-total organic carbon content, high-porosity, and a high dolomite percentage or be brittle facies.

This geoprediction process helps to quantitatively interpret high-quality facies to identify and de-risk areas of hydrocarbon accumulation. These interpretations are used to optimize future well drilling and completion plans. Examples from well-known carbonate reservoirs around the globe, including dolopackstones and dolowackestones from the McElroy field in the Permian basin in Texas will be presented. ■

Biographical Sketch

Cristian Malaver has almost 20 years of experience in the oil and gas industry in Quantitative Interpretation, and working knowledge of reservoir geophysics and geophysical operations. He has significant oil company experience with exploration and development projects across the five continents while holding geophysical positions at Oxy, ConocoPhillips, EP Energy, Cepsa,

HGS North American Dinner *continued on page 39*

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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 but no later than March 15, 2014 to the technical committee, 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.

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Registration will be available from April 2014and 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 and 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).

HGS North American Dinner continued from page 37

and BHP Billiton. He has worked also as a geophysical consultant and geosciences manager with reservoir characterization teams and geophysical service providers based in Europe, Middle East, and South America. As a research geophysicist, he integrated rock physics and seismic analysis methodologies using petrophysical data and 4D/3C seismic inversions to characterize and monitor carbon capture and storage in depleted mixed reservoirs.

Mr. Malaver has a strong background and expertise in Quantitative Interpretation technology experience. His broad expertise covers the entire exploration and production cycle in many basins around the globe. He holds an M.Sc. in geophysical engineering from Colorado School of Mines and a B.Sc. in engineering from the Universidad de los Andes.

Mr. Malaver is currently the Technical Director for Ikon Science Americas. He is in charge of technical teams of specialists focused on service and software solutions in Quantitative Interpretation, geopressure, and geomechanics across the Americas.

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Apache Corporation

Geoscience Plays Key Role in Forties Field Brownfield Redevelopment Success

Modern seismic methods are supporting a "drilling machine" that is increasing oil production in a United Kingdom North Sea field that, measured by discovery date, is just a decade shy of qualifying as an antique.

Production at the Forties field started in 1975. Production peaked in 1979 at approximately 550,000 barrels of oil per day (bopd), but when Apache took over as operator in 2003, production had declined to little more than 30,000 bopd. After the acquisition, Apache immediately initiated an intensive rejuvenation program that included infill drilling, workovers, and facilities upgrades. By 2008, 50 new targets had been drilled, and several projects were completed to upgrade power generation, export pumps, and water injection systems. By 2008/2009, Forties was the second largest producing field on the United Kingdom continental shelf and in July 2009, monthly production averaged 73,500 bopd, the highest monthly average since May 1999. To date, Apache has invested in excess of $2.8 billion on facility upgrades, maintenance, and infill drilling. A new "4D snapshot" seismic survey was acquired in 2010 and is providing further information to optimize target locations.

Apache is keeping three drill strings busy continuously, which in turn keeps the geoscientists busy. The pace is close to having a target drilled every other week.

Apache is keeping three drill strings busy continuously, which in turn keeps the geoscientists busy. The pace is close to having a target drilled every other week. Because Forties is a mature field, the moment you stop drilling the production rate immediately starts going into decline. That directly affects the bottom line.

At times, the constant activities may seem like an assembly line. Little time passes between the identification of a drilling target and when that borehole reaches total depth. A reservoir model, continually updated on the basis of drilling results, is used to generate information for drilling decisions. With decades of production history from 300 wells, the amount of data that is available is staggering.

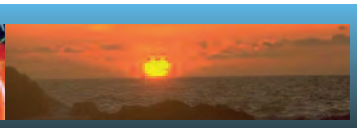
The pressure to supply new targets means that interpretation and processing of the newly-recorded time-lapse data must occur quickly. The integration of the results is almost instantaneous. The technical improvements implemented since the 2005 survey have resulted in unprecedented data quality and interpretation. ■

Biographical Sketch

Klaas Koster recently transferred from Apache North Sea to Apache's Technology department as Manager Seismic Interpretation. He has held positions of increasing responsibility in Apache's North Sea Region culminating in his final role as development manager. Dr. Koster has 20 years of industry experience and previously worked for Shell and Amoco in diverse locations such as Oklahoma, Colorado, Netherlands, Norway, Australia, and Louisiana. He is Past President of the Society of Exploration Geophysicists and holds a Ph.D. in geophysics from Delft University of Technology, Delft, Netherlands.

October 2013

Sunday	Monday	Tuesday	Wednesday
FYI If you have NOT PAID YOUR DUES this is your last issue.		1 HGS Board Meeting	2 You can make your reservations NOW online at ww.hgs.org
Earth Science Week *Page 6*	HGS General Dinner Meeting *"Geohazard Prediction in Deepwater Wells: When the Reservoir Becomes the Enemy," Alan R. Huffman, SIGMA3 Integrated Reservoir Solutions Inc. Page 21*	8	9 HGS Environmental & Engineering Dinner Meeting *"An Up-Close View of Oil and Gas Drilling and Completion," Paul Parsons, Energy Training Resources, LLC Page 23*
13 Earth Science Week *Page 6*	14 HGS International Dinner Meeting *"Straddling the Basin Boundary in Equatorial Guinea and Gabon: Contrasting Structural Style, Trapping Styles and Reservoirs," Scott E Thornton, PanAtlantic Exploration Company Page 25*	15 HGS Northsiders' Luncheon *"Early Texas Oilfield Photographers," Jeff Spencer, Amromco Energy Page 33*	16
20 Earth Science Week HGS Family Geology Field Trip *Whiskey Bridge, Bryan, TX page 6*	21 HGS Golf Tournament *Kingwood Country Club Page 12*	22	23
27	28 HGS North American Dinner *"Quantitative Geoprediction of Tight Carbonate Reservoir Quality," Cristian H. Malaver, Technical Director, Ikon Science Americas Page 37*	29 SME: Offshore Technology Conference *SME: Offshore Technology Conference Rio De Janeiro, Brazil*	30 HGS General Luncheon *"Geoscience Plays Key Role in Forties Field Brownfield Redevelopment Success," Klaas Koster, Apache Corporation Page 41*

GeoEvents

Thursday	Friday	Saturday
3 **HGS Short Course** **Microseismic Monitoring Fundamentals** *Western Geco* *Page 10*	**4** **Members Pre-registered Prices:** General Dinner Meeting..... $30 Nonmembers & walk-ups ..... $35 Env. & Eng. ..... $30 Luncheon Meeting ..... $30 Nonmembers & walk-ups ..... $35 International Explorationists ..... $30 North American Explorationists $30	**5**
10	**11** **13th Annual GSH/HGS Saltwater Tournament** *The TopWater Grill Marina* *Page 24*	**12** **Annual Family Energy Festival** *Page 6*
17 **Geoscience Day** *"The Life of an Oilfield"* *Schlumberger Western Geco Facility* *Page 8*	**18**	**19**
24	**25**	**26**
31	**Reservations:** The HGS prefers that you make your reservations on-line through the HGS website at www.hgs.org. If you have no Internet access, you can e-mail reservations@hgs.org, or call the office at 713-463-9476. **Reservations for HGS meetings must be made or cancelled by the date shown on the HGS Website calendar, normally that is 24 hours before hand or on the last business day before the event.** If you make your reservation on the Website or by email, an email confirmation will be sent to you. If you do not receive a confirmation, check with the Webmaster@hgs.org. Once the meals are ordered and name tags and lists are prepared, no more reservations can be added even if they are sent. **No-shows will be billed.**	

October 6-8, 2013
GCAGS and SEPM, 63rd Annual *Convention, New Orleans, Louisiana*

October 6-10, 2013
Clay Minerals Society – 50th Anniversary Meeting, *University of Illinois Urbana Champaign*

October 17, 2013
Environmental Challenges and Innovations Conference
Texas Association of Environmental Professionals, *Houston, TX*

October 23-26, 2013
AIPG 50th Annual National Meeting
Broomfield, CO

October 27-30, 2013
GSA Annual Meeting & Exposition Celebrating 125th Anniversary
Denver, CO

October 30-November 2, 2013
Society of Vertebrate Paleontology 73rd Annual Meeting
Los Angeles, CA

November 4 – 5, 2013
HGS Applied Geoscience Conference, *Interdisciplinary Micro to Macroscale Geomechanics, Houston, Texas*

November 8-10
Houston Gem and Mineral Society 60th Annual Show
Humble Civic Center, Humble, Texas

December 3-6
National Groundwater Association Expo, *Nashville, TN*

December 9 – 13, 2013
AGU Fall Meeting, *San Francisco, CA*

February 10-12, 2014
Arctic Technology Conference
Houston, TX

February 17-18
HGS Applied Geoscience Conference, *Integrated Approaches of Unconventional Reservoir Assessment and Optimization, Houston, TX*

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TECHNICAL PROGRAM

MONDAY, FEBRUARY 17, 2014

7:00 am	Registration Opens.....Fourth Floor
Breaks & Social Hour	**Core Display**.....Fourth Floor, Pecan and Pine Rooms
	Selected Core from Emerging and Established Unconventional Reservoirs
8:00 am - 5:00 pm	Technical Talks (Oral)Sessions.....Fourth Floor, Azalea Room
11:35am - 1:00 pm	**Poster Sessions**.....Fourth Floor, Cedar and Cypress Rooms
	Invited Presentations from Industry and Academic Consortia
5:00 pm - 7:00 pm	**Poster Sessions and Social Hour**.....Fourth Floor

MORNING — *DAY 1*

OUTCROP TO SUBSURFACE CHARACTERIZATION / MESOZOIC — *SESSION 1* SESSON CHAIRS: FRANK WALLES / JOHN BREYER	
8:00 - 8:10	***Opening Remarks***
8:10 - 8:45	Eagle Ford/ Boquillas BEG Talk *TBD*
8:45 - 9:20	Eagle Ford Outcrop to Log Characterization *TBD*
9:20 - 9:55	Niobrara Outcrop to Subsurface *TBD*
9:55 - 10:25	***Coffee Break***

OUTCROP TO SUBSURFACE CHARACTERIZATION / PALEOZOIC — *SESSION 2* SESSON CHAIRS: MIKE CAMERON / ERIK KVALE	
10:25 - 11:00	Utica Shallow Subsurface to Subsurface *Tina Gammill, Anadarko*
11:00 - 11:35	Woodford - Shallow Subsurface to Subsurface *Erik Kvale, Devon Energy*
11:35 - 1:00	***Lunch Break***

Poster Sessions

Invited Presentations from Industry and Academic Consortia

View them Monday from
11:35 am - 1:00 pm
During Social Hour.....5:00 pm - 7:00 pm

Cedar and Cypress Rooms.....Fourth Floor

Core Display.....

Selected Core from Emerging and Established Unconventional Reservoirs Supporting the Oral Technical Presentations

Open during Coffee and Lunch Breaks

Pecan and Pine Rooms.....Fourth Floor

AFTERNOON — *DAY 1*

EMERGING PLAYS / MESOZOIC — *SESSION 3* SESSION CHAIRS: MIKE VAN HORN / GRETCHEN GILLIS	
1:00 - 1:35	Unita Basin, Utah *Newfield TBD*
1:35 - 2:10	Colombia La Luna / Gachetta—Middle Magdalena, Llanos, and Catatumbo Basins *Dr. Joel Walls, INGRAIN*
2:10 - 2:45	Unconventional Targets in Saudi Arabia *Brian Gratto, Saudi Aramco*
2:45 - 3:15	***Coffee Break***

EMERGING PLAYS / PALEOZOIC — *SESSION 4* SESSION CHAIRS: OBIE DJORDJEVIC / ROB BEFUS	
3:15 - 3:50	Resource Potential of the Wolfcamp-Cline and Other Formations in the Permian Basin *Jackie Reed, Reed Geochemical Consulting*
3:50 - 4:25	Liard Basin, British Columbia *TBD*
4:25 - 5:00	Mississippian Lime KS/OK - Hybrid Conventional / Unconventional Components of the Inner Ramp Areas *Dr. Evan K. Franseen, University of Kansas*

SOCIAL HOUR

Monday from 5:00—7:00 PM

FOURTH FLOOR

TECHNICAL PROGRAM

2014 Applied Geoscience Conference
Westin Memorial City, Houston, Texas

TUESDAY, FEBRUARY 18, 2014

7:00 am	Registration Opens.....Fourth Floor
Breaks & Social Hour	**Core Display**.....Fourth Floor, Pecan and Pine Rooms
	Selected Core from Emerging and Established Unconventional Reservoirs
8:00 am - 5:00 pm	Technical Talks (Oral) Sessions.....Fourth Floor, Azalea Room
11:35am - 1:00 pm	**Poster Sessions**.....Fourth Floor, Cedar and Cypress Rooms
	Invited Presentations from Industry and Academic Consortia

MORNING — *DAY 2*

MUDROCK SYSTEMS CHARACTERIZATION - RESERVOIR INSIGHTS FOR INTEGRATION — *SESSION 5*

SESSON CHAIRS: TARAS L. BRYNDZIA / WAYNE CAMP

8:00 - 8:10	***Opening Remarks***
8:10 - 8:45	Microbial Relationships to TOC Original Elemental Suite Controls *TBD*
8:45 - 9:20	Mudrock Subsurface Diagenesis—Impact and Attributes *TBD*
9:20 - 9:55	Eagle Ford System Integration—3D Geophysics, Microseismic to Well and Completions *TBD*
9:55 - 10:25	***Coffee Break***

MUDROCK SYSTEMS CHARACTERIZATION - NEW GEOPHYSICAL INSIGHTS — *SESSION 6*

SESSION CHAIRS: BRUCE HART / PAUL COLLINS

10:25 - 11:00	Barnett—Full Integration of Geophysical Characterization Through Microseismic *TBD*
11:00 - 11:35	Full Integration Case Example *TBD*
11:35 - 1:00	***Lunch Break***

Poster Sessions

Invited Presentations from Industry and Academic Consortia

11:35 am - 1:00 pm

Cedar and Cypress Rooms.....Fourth Floor

Core Display.....

Selected Core from Emerging and Established Unconventional Reservoirs Supporting the Oral Technical Presentations

Open during Coffee and Lunch Breaks

Pecan and Pine Rooms.....Fourth Floor

AFTERNOON — DAY 2

RESERVOIR CHARACTERIZATION TOWARDS OPTIMIZED STIMULATION AND PRODUCTION — SESSION 7

SESSION CHAIRS: RANDY LAFOLLETTE / JOEL GEVIRTZ

1:00 - 1:35	How Many Fracs Are Producing in My Horizontal Well *TBD*
1:35 - 2:10	Duvernay vs EagleFord *Dr. Marc Bustin, University of British Colombia*
2:10 - 2:45	Diagnostics for Evaluating Production within Unconventional Laterals *TBD*
2:45 - 3:15	***Coffee Break***

RESERVOIR CHARACTERIZATION TOWARDS OPTIMIZED STIMULATION AND PRODUCTION — SESSION 8

SESSION CHAIRS: SUNIL GULRAJANI / GREG GETZ

3:15 - 3:50	Regional PVT Consideration for Unconventional Liquid Production *Kevin Ferworn, GeoMark*
3:50 - 4:20	Reservoir Reach– How Do We Utilize Reservoir Characterization and Put It All Together for Enhanced Producibility for Specific HC Phases *TBD*
4:20 - 4:50	Geomechanical Considerations, Natural Fracture Fabric Systems for Effective Completion Approaches *TBD*

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Frank Walles–Talisman Energy
David Tonner–Weatherford
Paul Collins–Statoil
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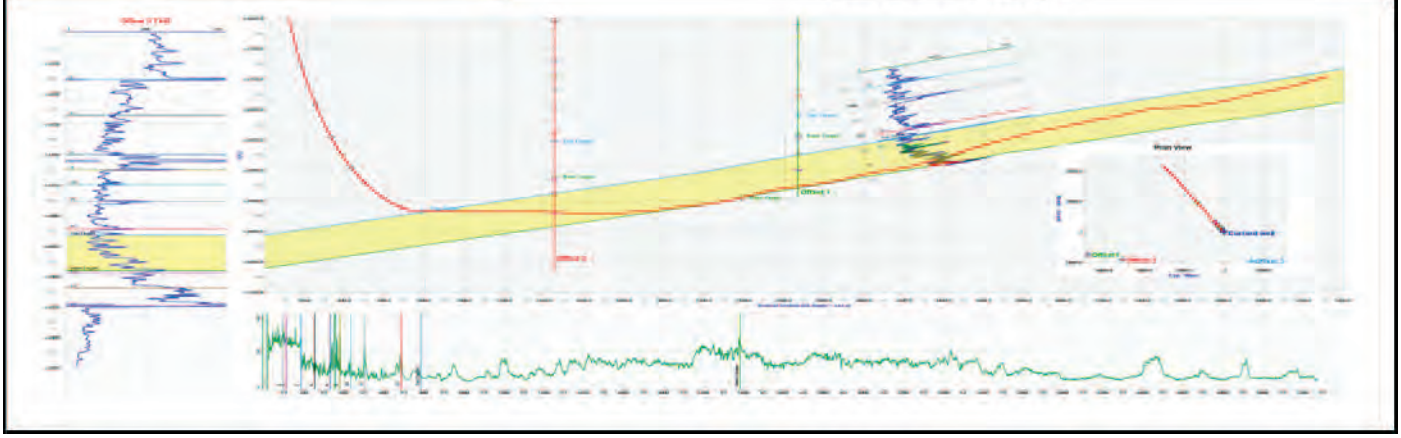

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Student Technical Poster Session - $10,000
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Reception - $5,000
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Lunch - $2,500
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- Dedicated signage during Conference lunch

Wifi - $1,500
Availability: 0

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- Special recognition

Coffee - $1,000
Availability: 3 of 5

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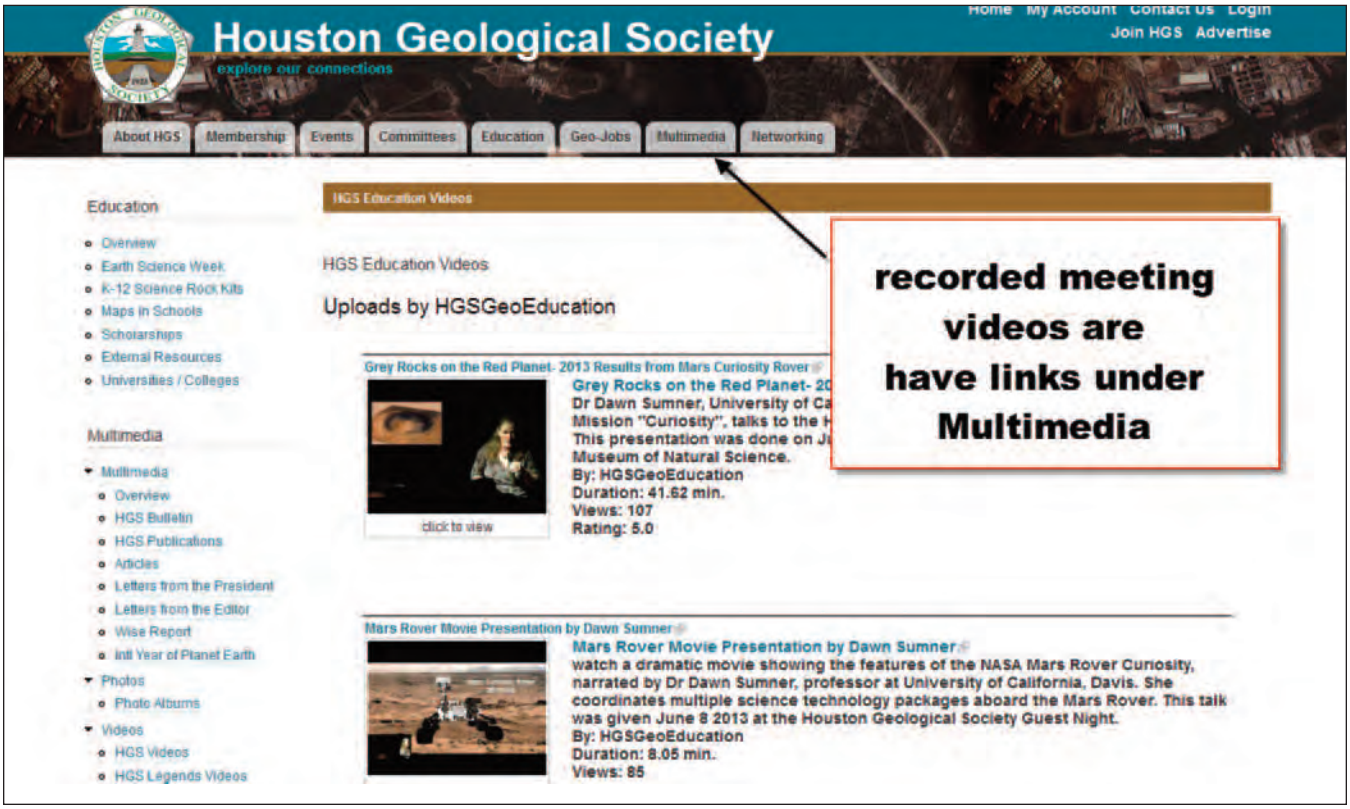


Figure 1. *Access the vidoes from the HGS webpage.*

The new HGS webpage can be a source of continuing education for HGS members. Over 40 recorded HGS events and meetings are posted on two HGS YouTube channels. The video recording project started in September 2011, and is now entering its third year. The Video Committee records the HGS on a video camera with microphones, and then, using the author's presentation slides and camera files, creates a one-hour long high definition video. These are then uploaded to the Internet for public access. The YouTube website has made this possible by providing free hosting. This article will explain how to find and view HGS programs either on the HGS website at www.hgs.org/multimedia or by going directly to the HGSGeoEducation channel on www.youtube.com. Once you find the HGS channels you can "subscribe" to the channel on the YouTube sidebar to bookmark it for future announcements and to return to the page when you want to see more videos.

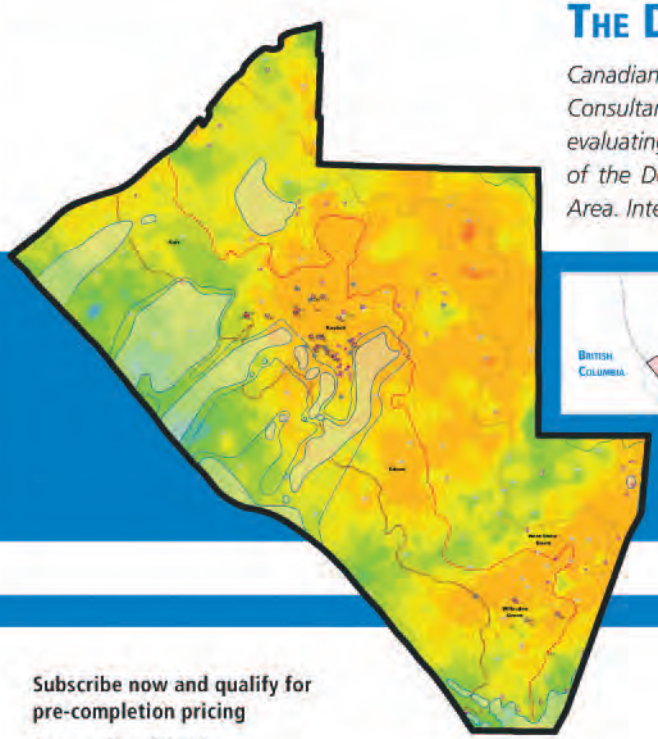
Take a few minutes and review the list of recorded HGS meeting videos you might want to watch by going to the HGS webpage www.hgs.org (home page) and scroll down to see the latest three thumbnails of videos under the calendar section. Click on a video to watch it or click on the link "See all educational videos" which will take you to the YouTube Channel HGSGeoeducation where you can see the full list of uploaded meeting videos. Another way to review past presentations is to go to the Multimedia tab at the top of the HGS home page and look on the left side bar for the links HGS Meeting video and HGS Legends (**Figure 1**). These links will transfer you to a panel of thumbnails of videos. As you select a video to watch by clicking on the thumbnail, your webpage is transferred to the YouTube webpage channel for HGS (**Figure 2**).

Some of the latest videos are from the June 8 Guest Night presentation about the Mars Curiosity Rover. The web address for Dr Dawn Sumner's recorded talk on the Mars Curiosity Rover results is http://youtu.be/WFIgup8Hs0M (**Figure 3**). YouTube makes it easy to send video links to your favorite video to other people. Under the video, look for "Share" and copy the link to an email or paste the link into your LinkedIn or Facebook page. The link will be posted automatically with the thumbnail image in the email or update post.

HGSGeoEducation Channel *continued on page 55*

The Duvernay Project

Canadian Discovery in partnership with Graham Davies Geological Consultants and Trican Geological Solutions launch a new multi-client study evaluating the Geomechanics, Hydrocarbon Systems and Geological Setting of the Devonian Duvernay Formation in the Kaybob to Willesden Green Area. Interim deliverables available December 2013.



The study will include:

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- Hydrocarbon phase distribution and the relationship to geochemistry and thermal history
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Image Left: Geothermal Gradient (All Units)

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HGSGeoEducation Channel continued from page 53

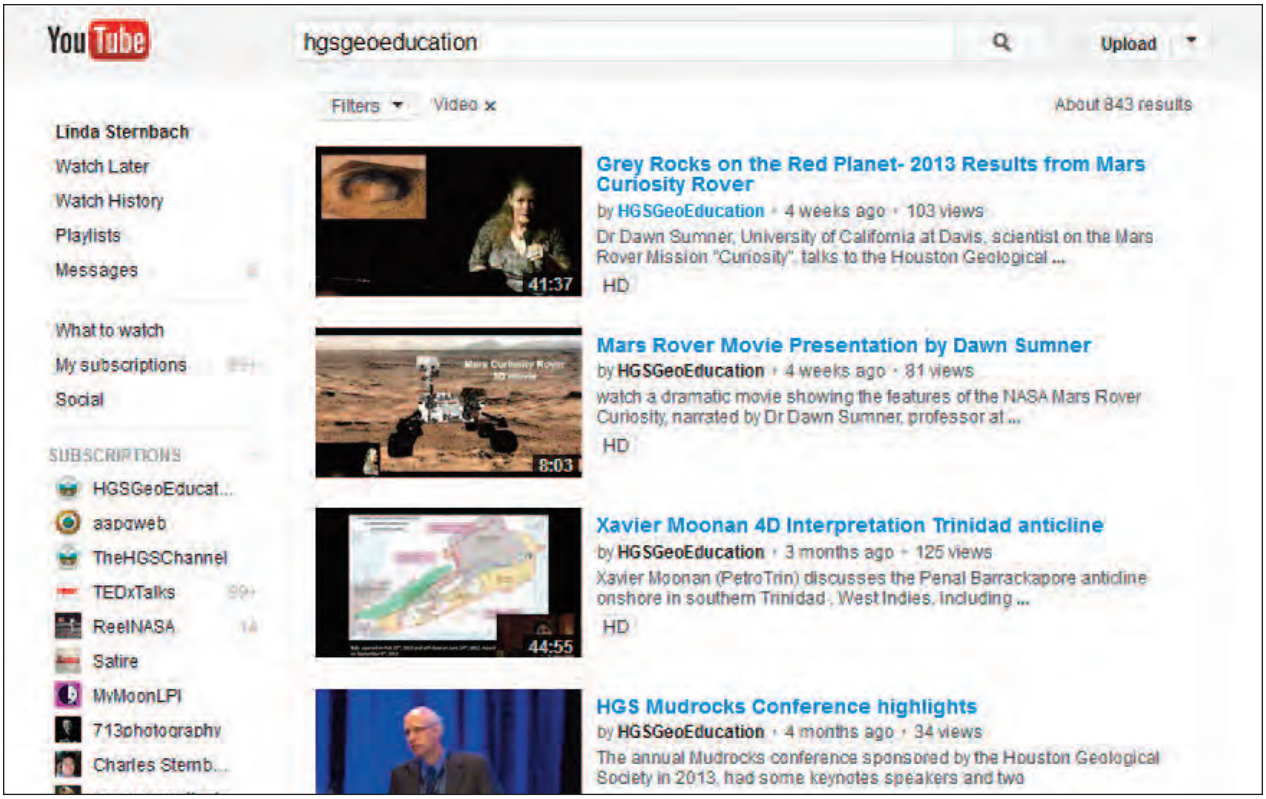


Figure 2. *HGS Geoeducation YouTube page.*

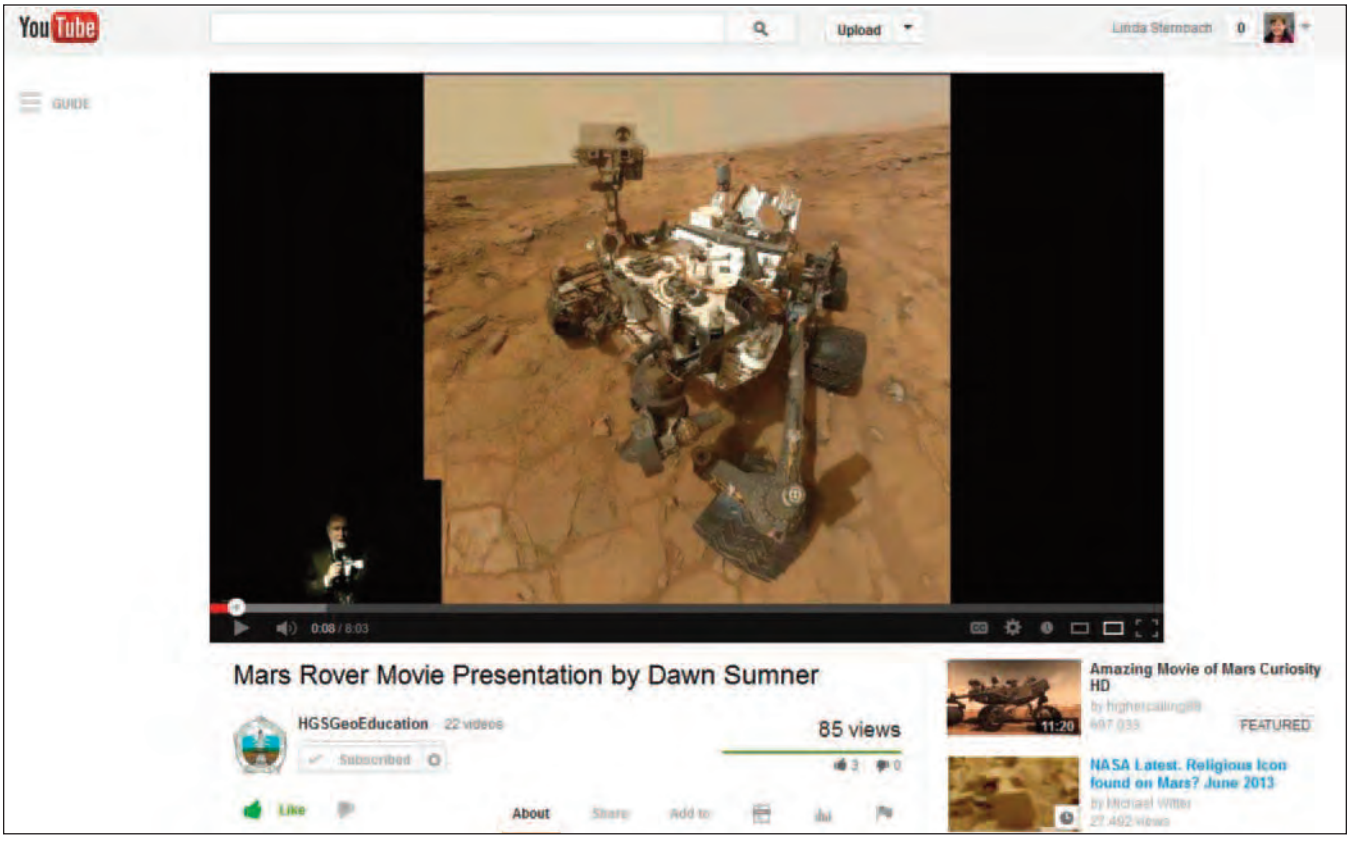
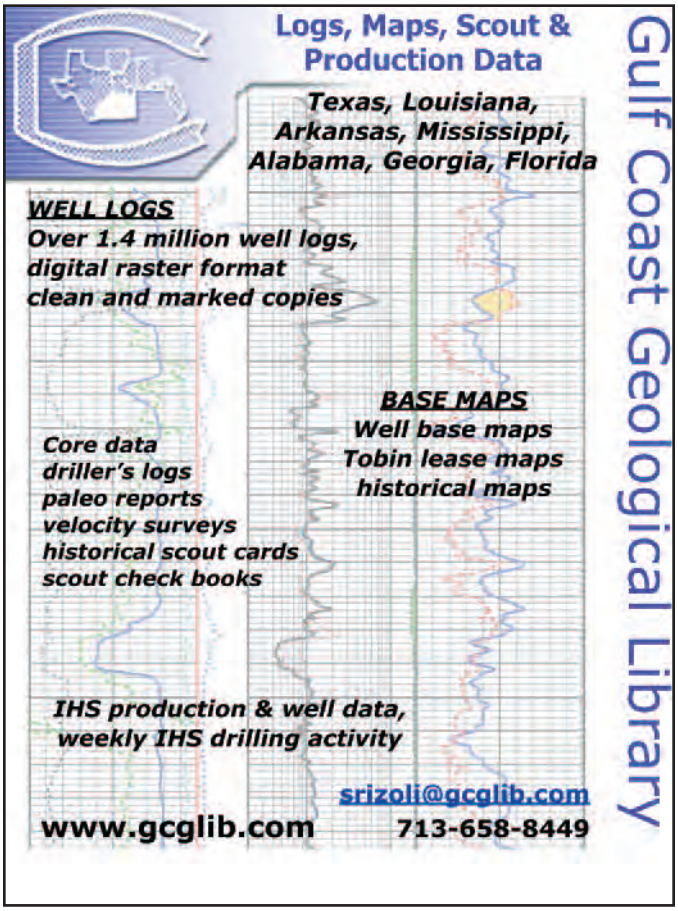


Figure 3. *Watch the video on the Mars Rover.*

HGSGeoEducation Channel *continued on page 57*



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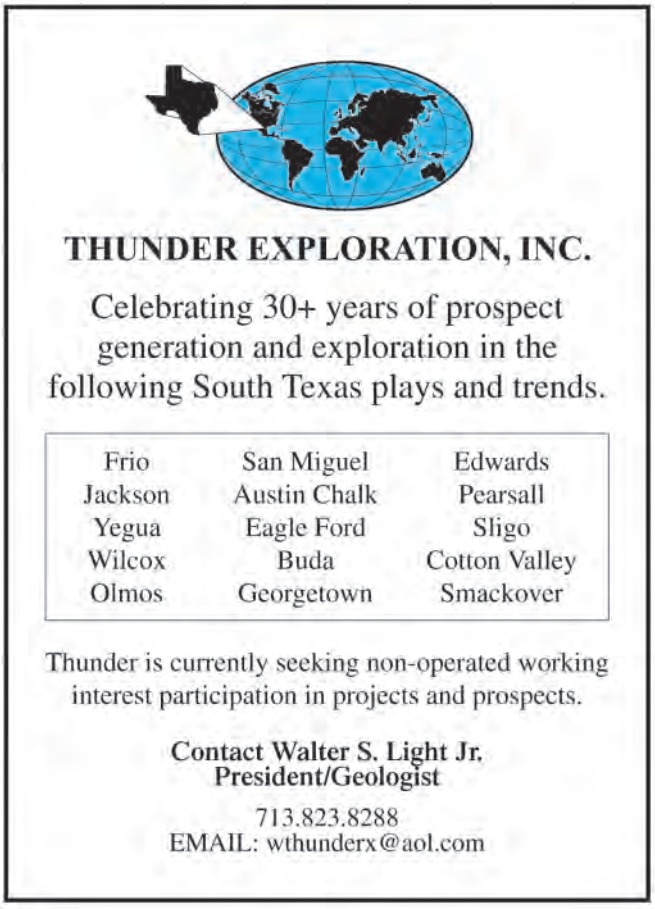

HGSGeoEducation Channel continued from page 55

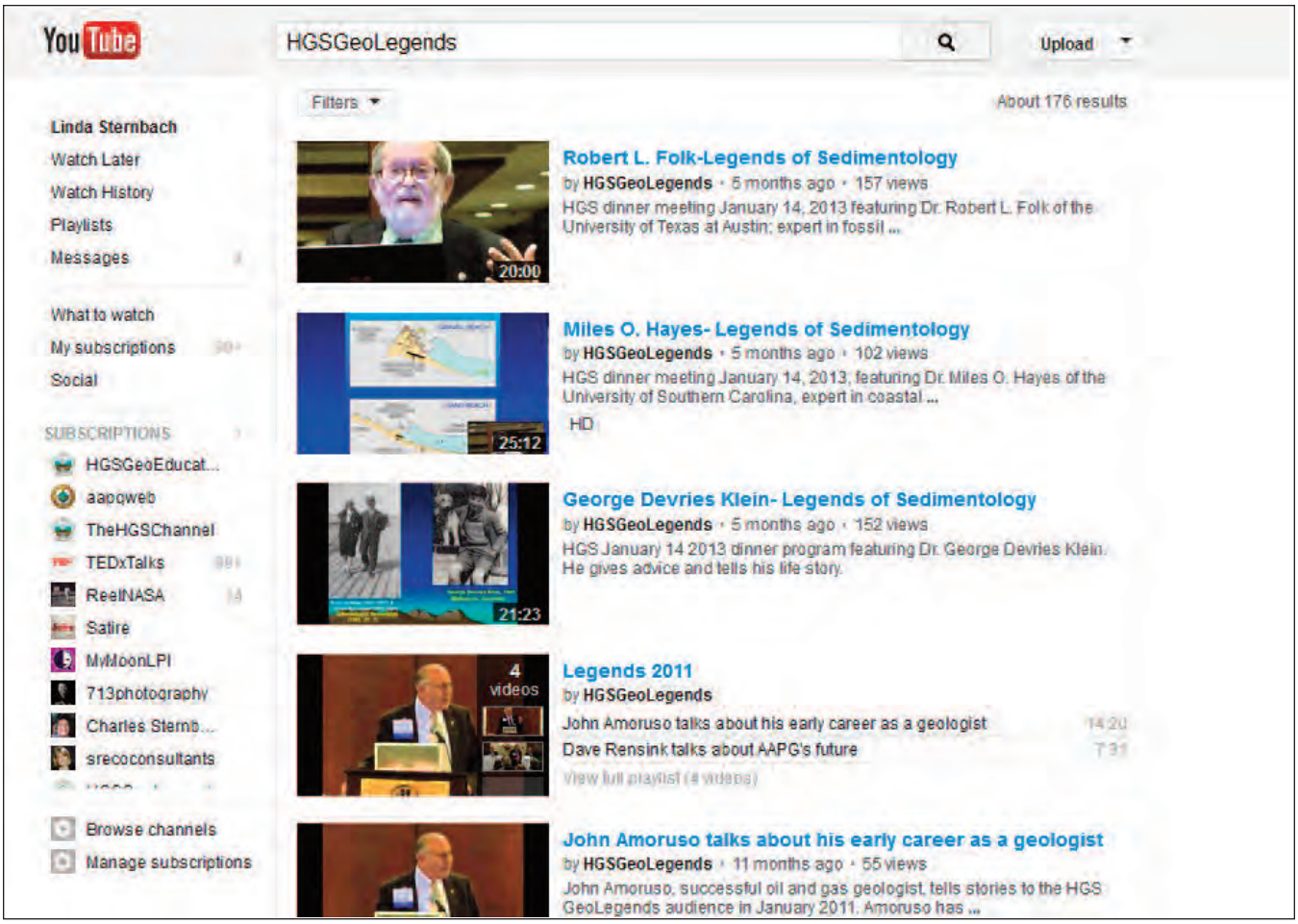

Figure 4. *HGS Geo Legends page.*

If you remember attending one of the past January GeoLegends programs, you can watch the presentations again on the HGSGeoLegends channel on YouTube (**Figure 4**). This is a separate channel from the channel with the meeting videos. For example, on the HGSGeoLegends YouTube channel you can watch all three of the Legends presentations from January 2012 "Legends of Sedimentology," or you can scroll down and watch the four legends talks on Unconventional Shale recorded in January 2011 at the Westin Hilton. There are older videos posted from the January Legends panels back in 2000 and 2003, featuring Michel T. Halbouty and other famous wildcatters. The HGS GeoLegends channel contains both recent and older videos to watch and learn from.

Audience reception of this HGS video project has been increasingly favorable, judging by the "hits" recorded as people click on the video thumbnails. We have found the best way to make these videos available to members and users is to post the thumbnail on the HGS LinkedIn and Facebook pages including the Twitter account called @HouGeoSoc. Videos that have been popular include Bob Shoup's talk on Climate Change (http://youtu.be/6-9yJAPxf6Y), which, as of early August, had about 1300 hits or views, and Richard Bishop's talk about "How to Assess World Oil Prices" (http://youtu.be/slMWhzji_mM) which has over 900 views. The most popular GeoLegends video is Gregg Robertson's Eagle Ford Shale talk from 2011 at http://youtu.be/_uepHzSBsYo with 500 views.

Here's how to keep up with the latest videos posted by HGS: Go to www.youtube.com and create a user ID or login with an existing user ID. YouTube subscriptions are based on your personal email address and are not part of the HGS website. On the YouTube homepage enter a search for HGSGeoeducation. On the left side bar you will read Subscribe to this Channel. Click on subscribe and YouTube will send you emails on recent uploads. You can also, go to the HGSGeoLegends channel page and subscribe to that page as well.

The HGS webpage can be a continuing source of geology education material and well worth the easy steps to access the videos whenever you want, whether at home, on the road, or in the office. ■

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Vintage Geology

by Michael Forlenza

A Tasting of Geologically-Themed Wines

Vintage Geology is informal investigation of geologically-themed wines. Geologically-themed wines have a name or illustration on the label related to rocks, minerals, or earth science. This feature will review the geological setting of the vineyard and assess the potential influence of the setting on the product.

In the oldest wine-grape-growing regions in Europe, oenophiles speak of terroir, pronounced "teh-RWAHR." The term has its roots in the Latin word terratorium, from terra meaning land or earth. The same root used for the words terrain and territory. The French often use the phrase goût de terroir (taste of the soil) to refer to the earthy flavor of some wines, not always in a complimentary way.

In 1831, Dr. Denis Morelot, a wealthy landowner in Burgundy, observed in his Statistique de la Vigne Dans le Département de la Côte-d'Or that nearly all of the producers in the area made wine essentially the same way using the same grape varietal, so the reason that some tasted better than others must be due to the terroir — specifically, the substrata underneath the topsoil of a vineyard. Wine, Dr. Morelot claimed, derived its flavor from the site's geology: in essence, from rocks.

When viniculture experts use the term terroir, it not only includes reference to the type of soil (chalky, claylike, gravelly, sandy), but also to other geographic factors that might influence the quality of the finished wine like altitude, position relative to the sun, angle of incline, water drainage, prevailing wind direction, and climate. The concept of terroir embodies a sense of place and a connection to the land and to the geology. In the United States, wine producers use the term microclimate to encompass the same considerations.

2011 Subduction Red
Syncline Wine Cellars
www.synclinewine.com

syn•cline \'sin-kl n\ n (1873) : a trough of stratified rock in which the beds dip toward each other from either side

This column features Subduction Red from Syncline Wine Cellars, in Lyle, Washington. The 2011 Subduction Red is approximately $23 at retail in Houston. Lyle is in southern Washington on the north side of the Columbia River in the Columbia Gorge American Vinicultural Area (AVA). AVAs are designated wine grape-growing regions in the United States with boundaries defined by the Alcohol Tobacco Tax and Trade Bureau, a branch of the United States Department of the Treasury. AVAs are established by the request of wineries and other petitioners to encapsulate areas of unique terroir. Local agricultural agents note that within the compact area (4,432 acres) of the Columbia Gorge AVA lays an extraordinary combination of climate, soil, and geology creating distinctly different "micro-climates" perfect for growing a wide variety of premium winemaking grapes. Syncline Wine Cellars produces wines primarily from Rhone and Burgundy varietal grapes.

According to the wine makers, Poppie and James Mantone, the location in the eastern Columbia River Gorge is unique place for growing wine grapes. Directly west of the winery is a series of 300-foot high cliffs rising up into the surrounding mountains straight out of the Columbia River. Locally known as the Coyote Wall Syncline and to geologists as the Bingen Syncline or Mosier Syncline, a fold in the Columbia Flood Basalts is well exposed in the cliff in this part of the gorge. It is from this dramatic feature that the winery takes its name. This is the area where the rainy western Columbia Gorge transitions to the semi-arid eastern Gorge.

The 2011 Syncline Red wine is a blend of the classic French varietal grapes Mourvedre, Grenache, Syrah, Carignan, Counoise, and Cinsault. According the wine maker, Subduction Red is more an exploration of the Columbia Valley than a representation of any one varietal with fruit sourced from four nearby vineyards. The explanation continues, "this wine is a Washington state version of

Vintage Geology *continued on page 61*

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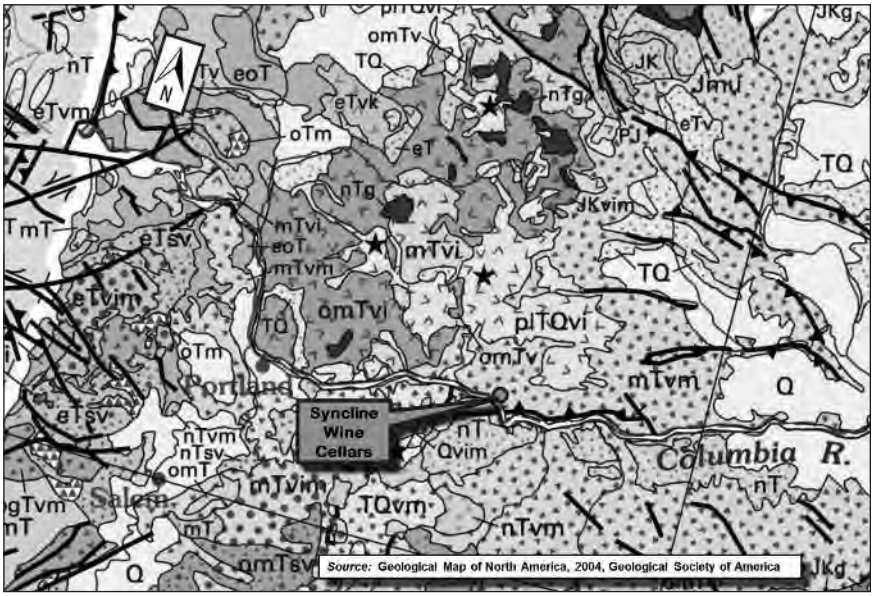
Vintage Geology continued from page 59

a Cotes-du-Rhone Villages wine from southern France. A blend of classic southern French varieties that are unique and expressive on their own; yet each contributes to create a harmonious whole. Ripe and hedonistic, with vivid ruby color, this charming wine exhibits black cherry, raspberry, baking spice and black pepper aromas and flavors. The bright, fresh finish provides a wine that is harmonious with many foods and occasions."

Location of the Columbia Gorge AVA.



Geological map of Columbia Gorge AVA.

Geological Setting

The name Subduction Red likely has the purpose of sounding very much like "seduction," an appealing concept for a wine. However, contrary to the suggestion on the bottle label, there is no subduction zone in the area of the winery. Rather, the vineyards for the Subduction Red are set on slopes formed where the Columbia River has cut into the Columbia River Basalt. According to the United States Geological Survey, Bulletin 1161-D, Geologic Reconnaissance of the Antelope-Ashwood Area, North-Central Oregon (www.cr.nps.gov/history/online_books/geology/publications/bul/1161-d/sec1b.htm), flows of Columbia River Basalt of middle Miocene age, at the southern margin of the Columbia Plateau, cap a prominent south-facing scarp in the area. The basalt thins southward from a maximum thickness of more than 800 feet as the result of erosion and the lapping out of successively higher flows.

The basalt here occurs as thick columnar-jointed flows of dense, fine-grained dark-gray rock. A thin section of a sample from the lower part of the basal flow in Cow Canyon consists of fine-grained hyaloophitic basalt containing poorly-terminated laths of sodic labradorite (1/4 to 1/2 mm in length), granules and stubby prisms of augite, and scattered granules of magnetite in light-brown glass; the glass is crowded with tiny dendrites of magnetite and crystallites of plagioclase and pyroxene.

Tasting Panel Notes

Maybe the wine should be called Seduction Red due to its fragrant allure. The deep, rich color is reminiscent of almandine garnet. The taste of ripe red berries and pepper is balanced with the tannins on the finish. The acidity is bright and works with the alcohol content (13.5% by volume) to provide structure. The tasting panel did not detect the taste of basalt, laboradorite, or pyroxene, but found the wine to be smooth and drinkable. Searching for a geological connection, one panelist noted earthy-woody aromas.

After a long day of logging sections and mapping layered basalts, this wine would be a nice accompaniment to a hearty campfire chili or stew under a clear night sky filled with stars. Cheers! ■

Daniel C. Huston
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Remembrances

by David Miller

Should you hear of a fellow HGS member's or contributor's passing, please send information to the Editor-Elect at davidwayne.miller55@gmail.com.

George P. Mitchell

Oil Field Pioneer

May 21, 1919 – July 26, 2013

George Mitchell, a philanthropist, Texas oilman and real estate developer, passed away on Friday, July 26 at age 94. He was born to Greek immigrant parents in Galveston, Texas. Mr. Mitchell attended Texas A&M University finishing first in his class and earning a degree in petroleum engineering. He will be remembered for his many accomplishments, among which are the development of the Woodlands and significant charitable contributions to various causes, programs, and institutions.

Members of the Houston Geological Society will perhaps best remember George Mitchell as the founder of Mitchell Energy and Development Corp, which he built into a Fortune 500 company, later acquired by Devon Energy. His company participated in the drilling of several thousand wells, including more than 1000 wildcat wells. His biggest contribution to the energy business almost certainly was his work on hydraulic fracturing, which involves injecting sand, water, and other substances into formations to release oil and gas locked in tight rock or shale.

According to a biography on the website of the Cynthia and George Mitchell Foundation, Mitchell and his colleagues began testing the process in the early 1980s in North Texas. "Against the prevailing sentiments both within and outside the company, George persisted through 17 years of failures and incremental successes," the biography says. "Finally, as he approached his 80th birthday, gas from these experimental wells began to flow in hugely profitable volumes."

A life-long philanthropist, Mr. Mitchell distributed or pledged more than $400 million in grants to causes, programs, and institutions. The vast majority of this amount is related to science, environmental sustainability, and sustainability science-related fields. Enabled by Mr. Mitchell's donation of $35 million, the Texas A&M University physics department relocated to two new buildings in late 2009: the George P. and Cynthia W. Mitchell Fundamental Physics and Astronomy Building and the George P. Mitchell Physics Building. In 2012, he committed an additional $20 million to the Mitchell Institute for Fundamental Physics and Astronomy.

This quote from the *Economist* (July 2012) captures the impact of Mr. Mitchell as well as any other this author could find: "The rise (in shale gas) has been helped along by a variety of factors…But the biggest difference was down to the efforts of one man: George Mitchell, …who saw the potential for improving a known technology, fracking, to get at the gas. Big oil and gas companies were interested in shale gas, but could not make the breakthrough in fracking to get the gas to flow. Mr. Mitchell spent ten years and $6 million to crack the problem (surely the best spent development money in the history of gas). Everyone, he said, told him he was just wasting his time and money."

We can all be grateful that persistence was also of Mr. Mitchell's qualities.

Remembrances continued from page 63

Raymond John Forbish
August 18, 1935 – August 1, 2013

Raymond John Forbish was born April 18, 1935, in Colby, WI, and was the youngest son of Elvira and Gordon Forbish. Growing up on a dairy farm in rural Wisconsin, Ray learned the value of hard work and graduated as the top boy from his high school class. Excelling in school, Ray attended the University of Wisconsin, Madison, where he graduated with a degree in mining engineering. During college and prior to graduation, Ray entered the United States Army and was stationed at NORAD in Colorado Springs, CO, as a code breaker. While stationed in Colorado Springs, Ray was an active member of the local Rock and Mineral Society. He enjoyed mining and actually filed a claim in an area he loved to frequent. Upon his honorable discharge, Ray deeded this property to this Rock and Mineral Society, and the property was ultimately given to the U. S. Parks and Wildlife. Ray enjoyed great topaz finds and was especially proud to have mined the stone in Fredna's, his first wife, engagement ring.

Upon graduation, Ray was hired by Shell Oil Company in New Orleans, LA where he worked for 18 years. He then accepted a position with Houston Oil & Minerals and would later become Vice President of Challenger Minerals, a subsidiary of Global Marine in Houston, TX. Ray was the President of Raedejon Oil & Gas that had production in Jefferson Davis Parish, Louisiana. The name "Raedejon" took portions of each of his children's first names, Rae Marie, D'Ann, and John.

He loved working and, therefore, did not retire but continued to work as an independent geological consultant. Ray was a member of the Houston Geological Society, the American Association of Petroleum Geologists, and the University of Wisconsin Alumni Association. While Ray worked projects on fields in many parts of the United States and Egypt, his specialty and passion was the Gulf Coast offshore. He loved rock formations wherever he could find them, and delighted in sharing that love with his children and grandchildren. Ray relished working across generations of geologists — always willing to mentor as well as learn from other perspectives. He made sure he kept up to date on new techniques and computer applications.

Directory of Oil Company Name Changes
23rd Edition (April 2013)

New Edition

The new 23rd edition, of the HGS publication, "Directory of Oil Company Name Changes", is now available through the Bureau of Economic Geology. This publication is a cross-referenced list of domestic oil and gas, exploration and production companies that have sold major assets or have changed their names due to a merger, acquisition, or reorganization. The purpose of this directory is to provide an oil company road map that may assist geologists in tracking down logs, samples, cores, paleo, drilling reports, production histories and other well data that may be obscured by these numerous name changes.

The cost of the directory is $20.00 and it can be obtained from the BEG.
The contact information is as follows:
Bureau of Economic Geology
University of Texas in Austin • Attn: Publication Sales
University Station, Box X • Austin, Texas 78713-8924
Phone: (888) 839-4365 • www.beg.utexas.edu

James L. (Jim) Smith
September 3, 1926 – June 19, 2013

James L. (Jim) Smith, 86, of Houston passed away on June 19, 2013. Jim was born in Massena, NY. Following his graduation from Massena High School, he served in the U.S. Army Air Corps. While pursuing a geology degree at Cornell University, he played on the "Big Red" football team. It was at Cornell that he met Jacqueline Fulton and they were married in 1951.

Jim worked as a petroleum geologist for various companies, including Cities Service, Partners Oil Company and Nasser Oil & Gas, for over 40 years. In his free time, he enjoyed bowling, hunting, fishing, golf, gardening, and barbequing. He participated in several service organizations and was a long-term member of the Knights of Columbus. Jim was a member of Houston Geological Society for many years and left his daughter, Anne, with many fond memories of accompanying her father to HGS functions and field trips and meeting his friends and colleagues. During his retirement, he served as a volunteer at Memorial Hermann Southwest Hospital.

The family graciously suggests that any memorial contributions be made to the Alzheimer's Foundation in memory of James Smith at http://alz.org/join-the-cause-donate.asp.

James Allen Wood
January 9, 1941 – July 17, 2013

James Allen Wood — more widely known as Jim, Jimmy, JAW, Gramps, Dad, and Pops — was born January 9, 1941, in Hotchkiss, Colorado. His college career at the Colorado School of Mines began with a clerical error which left him without housing and forced the school to bend the rule prohibiting freshman from living at fraternities. He rarely spoke of the resulting living situation to his children, but would occasionally let slip highly edited stories of "milk punch" and dogs who completed ROTC training. More common were his stories of slide rules and sports teams studying on the bus while travelling to games. Nearly 50 years later he still had at his fingertips the advanced math he learned there on his way to a degree in geophysical engineering.

Extremely dedicated to the work he loved, he was a long-time Houston Geological Society member and fifty-year continuous member of the Society of Exploration Geophysicists. When not coaching little league or attending swim meets, he would often have seismic maps spread across the dining room table at home, explaining to his children how to read the strata of the earth and letting them play with the thin colored tapes he used to mark them.

Memorial donations can be made out to: Jim Wood Memorial Fund
and sent to: First Colorado National Bank, 150 Gunnison River Drive, Delta, Colorado 81416

Proceeds from this fund will be used for a memorial bench or marker at the new sports park in Paonia, CO. The project is called Flight of the Eagle and will create fields for all different types of sports as well as a walking trail and amphitheater.

HGS Welcomes New Members

New Members Effective August 2013

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Dave Riddhi
Crystal Saadeh
Kristian Smith
Casey Snyder
Michael Sullivan
Gabriel Valadez
Maria Velasco
Leon Zhu

Welcome New Members

Candidate Search Underway

The nominations committee of the Houston Geological Society has begun its search for candidates in the two spring elections, one for delegates for the AAPG House of Delegates, of which a number of candidates are needed, and the other to elect a new HGS Board. To be considered for either of these you must be an active member of the HGS. Additionally, to run for the AAPG House of Delegates you must be a member of the AAPG.

If you are interested in running for an HGS office or for the AAPG House of Delegates, please contact Nominations Committee Chair **Martin M. Cassidy** at mcassidy.hgs@gmail.com or by phone 713-503-8331. If you have any questions you may direct them to Martin. Information about the AAPG House of Delegates is also available from **Martha Lou Broussard** or **Bonnie Milne** immediate past chair of the House of Delegates. Join the leadership, help guide the ship!

Government Update

*by **Henry M. Wise, P.G.** and **Arlin Howles, P.G.***

If you'd like the most up-to-date Texas rules, regulations, and governmental meeting information, we direct you to the HGS website to review The Wise Report. *This report, which comes out as needed but not more often than once a week, offers the most up-to-date information that may be of interest to Texas geologists.*

Louisiana Professional Geoscientist Licensure Update

The Louisiana Geoscience Practice Act has been updated, effective August 1, 2013. As of August 10, 2013, eight of the nine Board members have been appointed. Application fees have been approved by the Legislature, but the exact figure has not been determined. In addition, the grandfathering period has been extended to December 31, 2013. Applications should be available in late September 2013. There is a possibility that the grandfather may be extended through the end of 2014, but that would require the a state legislature vote, so if you're interested in obtaining a Louisiana license without having to take the ASBOG exam, you should apply this year.

The Board is expected to let the various Louisiana geological societies and the geological boards of neighboring states, Texas included, know when they are ready to accept applications. For more information go to: www.nogs.org/LA%20Professional%20Geoscience%20Practices%20Act.docx.

AGI Government Affairs Monthly Review (June 2013)

House Natural Resources Committee hearing on OCS leasing

On June 6, 2013 and June 11, 2013 the House Natural Resources Committee held hearings on the Offshore Energy and Jobs Act (H.R. 2231). The proposed bill would open new outer continental shelf (OCS) land for leasing, unlocking an estimated 2.5 billion barrels of oil, and more than 7.5 trillion cubic feet of natural gas for production.

Subcommittee Chairman Doug Lamborn (R-CO) and other supporters of the bill argued that although oil and gas production in the U.S. has increased in the past year, production on federal lands has decreased. They also argued that because exploration and full-scale production and of oil and natural gas reserves takes time to develop, we need to begin the process as early as possible.

Opponents of the bill, including Subcommittee Ranking Member Rush Holt (D-NJ), said that since production in the U.S. is at a high, we do not need to start leasing new areas. Michael Conathan, Director of the Ocean Policy Center for American Progress Action Fund, claimed that leasing new areas would unnecessarily expose new areas to the risks of drilling. Instead, Conathan said, we should begin focusing on alternative energy sources, such as offshore wind.

AGI's full hearing summaries are available at www.agiweb.org/gap/legis113/energy_hearings.html#jun6. Opening statements and witness testimony, as well as a video archive of the entire hearing, are available at http://naturalresources.house.gov/calendar/eventsingle.aspx?EventID=335881.

BOEM and NMFS hold Gulf of Mexico public scoping meetings

The Bureau of Ocean Energy Management (BOEM) and the National Marine Fisheries Service (NMFS) held a series of public scoping meetings across the U.S. regarding the Programmatic Environmental Impact Statement (PEIS) to analyze the impacts of geological and geophysical activity in the Gulf of Mexico.

The PEIS will extend from the shoreline to the outer continental shelf, and will take into account all geological and geophysical activity in the Gulf of Mexico, including seismic, magnetic, and gravitational activity, as well as drilling, and other assessments. The PEIS will also analyze the impacts of increased oil and gas production on sociological, biological, and physical resources in the Gulf of Mexico.

The final PEIS is expected to be released in early- to mid-2015.

Permitting for federal lands in the Dakotas may be expedited

On June 19, 2013 the Senate passed S. 244, a bill designed to amend the Energy Policy Act of 2005 to streamline permitting for oil and gas projects on federal lands in North and South Dakota. Introduced by John Hoeven (R-ND) and Heidi Heitkamp (D-ND), the bill extends a Bureau of Land Management federal permit streamlining program to include federal lands in the Dakotas. A related bill, H.R. 767, passed the House on May 15, 2013.

The USGS estimates that the Bakken and Three Forks Formations contain approximately 7.4 billion recoverable barrels of oil and 6.7 trillion cubic feet of associated/dissolved natural gas. Currently, the majority of development has occurred on private lands where permitting is faster.

EIA report on US crude oil production

In the U.S. Energy Information Agency's (EIA) Annual Energy Outlook 2013 (AEO2013), which presents yearly projections and analysis of energy topics based on current conditions, projected domestic crude oil production ranges from 6-8 million barrels per day for the next 30 years. However, using greater supply assumptions, domestic crude oil production could be sustained at

Government Update *continued on page 68*

Government Update continued from page 67

approximately10 million barrels per day between 2020 and 2040. This higher resource case was developed by the EIA to analyze the effects of higher domestic production on energy demand, imports, and prices. In this scenario, total domestic liquid fuel production (which includes crude oil, natural gas liquids, biofuels, and other liquid fuels) increases to greater than 18 million barrels per day in 2040. This level of domestic production reduces projected imports to just 7% or less of total demand, a significant decrease when compared to nearly 40% in 2012.

Senators investigate private funding solutions for struggling national parks

On June 6, 2013, the Senate Committee on Energy and Natural Resources held a full committee hearing to review programs and activities of the Department of the Interior (DOI).

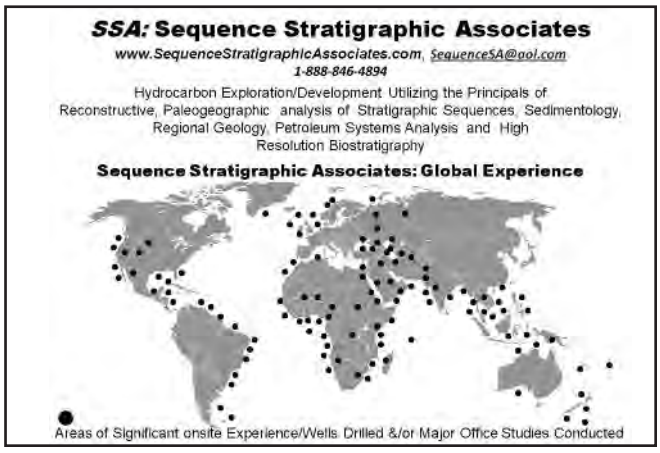
Chairman Ron Wyden (D-OR), Ranking Member Lisa Murkowski (R-AK), and Rob Portman (R-OH) urged Secretary of the Interior Sally Jewell to consider partnerships with the private sector to improve funding for the National Park Service (NPS) that has been limited due to the sequestration. Secretary Jewell reported that the DOI and NPS Director Jon Jarvis are "very willing to support and enhance private sector engagement." However, Jewel pointed out that "Private philanthropy should be the margin of excellence for the parks, not the margin for survival" and that the federal government needs to step up to support these assets.

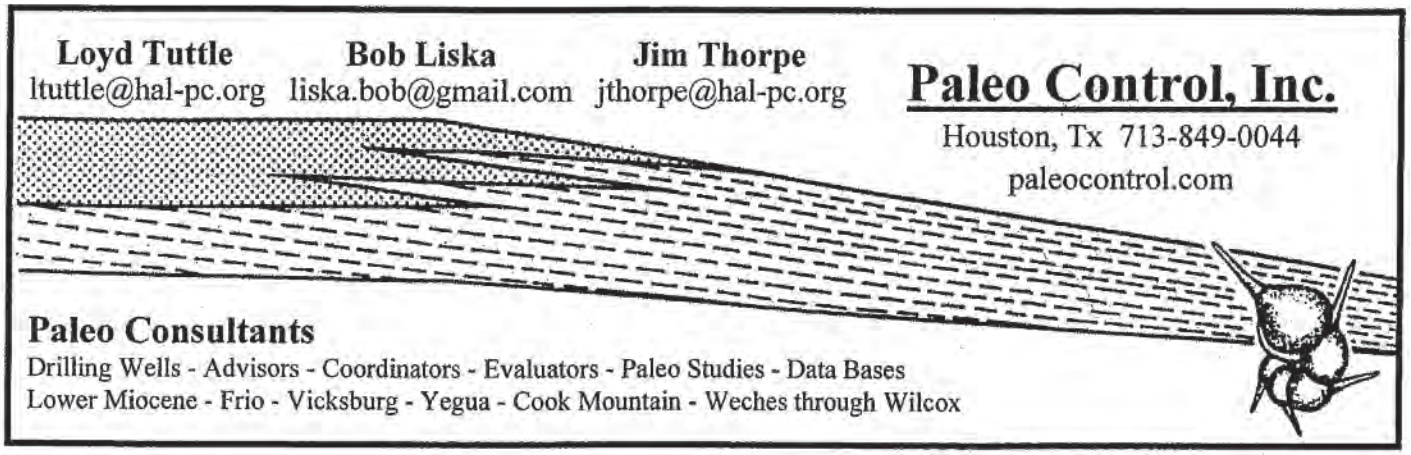
A report released May 23, 2013 by the House Committee on Natural Resources detailed the effects of sequestration on the NPS. The report found that, among other impacts, sequestration will delay much-needed maintenance, reduce hours, delay openings, close campgrounds, and reduce the number of employees hired to meet seasonal demands. A report released March 19, 2013 by the National Parks Hospitality Association and National Parks Conservation Association suggests several possible funding sources, including establishing a National Park Endowment based on non-federal contributions and income from developing natural resources on federal land.

Senate ENR questions Secretary Jewell over hydraulic fracturing

On June 6, 2013, the Senate Committee on Energy and Natural Resources held a full committee hearing to review programs and activities of the Department of the Interior (DOI). Witness testimony from Secretary of the Interior Sally Jewell addressed the various programs and activities of the Department, as well as issues DOI will face in the future.

John Barrasso (R-WY), Al Franken (D-MN), and Rob Portman (R-OH) focused on hydraulic fracturing and the Bureau of Land Management's revised proposed rule on Oil and Gas; Well Stimulation, Including Hydraulic Fracturing, on Federal and Indian Lands. The new rule would provide standards for hydraulic fracturing on public lands. Sen. Franken and Sen. Portman both had questions about the permitting process, with Sen. Franken asking about the consideration of water issues when issuing permits, and Sen. Portman expressing concern about the length of the permitting processes, even in states with well-established regulations.





President Obama reveals Climate Action Plan

President Obama revealed his new Climate Action Plan on June 25, 2013. Building on his "all-of-the-above" energy strategy, the plan is primarily concerned with cutting carbon pollution in America, preparing for domestic impacts of climate change, and leading international efforts to combat and prepare for climate change. The proposed plan includes a variety of executive actions, and would institute new pollution standards for power plants, set new fuel and energy efficiency standards, and help to strengthen the US's position as a top natural gas producer. You can read the full action plan at: www.whitehouse.gov/sites/default/files/image/president27sclimateactionplan.pdf.

USGS releases assessment of US geologic CO_2 storage potential

The USGS released the first-ever assessment of the geologic carbon sequestration storage capacity of the United States. The new estimate, 3000 metric gigatons of storage, is based on USGS assessments of the nation's technically accessible storage resources, and is based on peer-reviewed methodology.

Ultimately, the USGS identified 36 viable basins for carbon storage, and determined that approximately 65 percent of the storage capacity is located in the Coastal Plains region of the southeastern United States. Basins were chosen based on depth, proximity to groundwater, and the presence of a sealing rock layer to prevent the injected carbon from escaping.

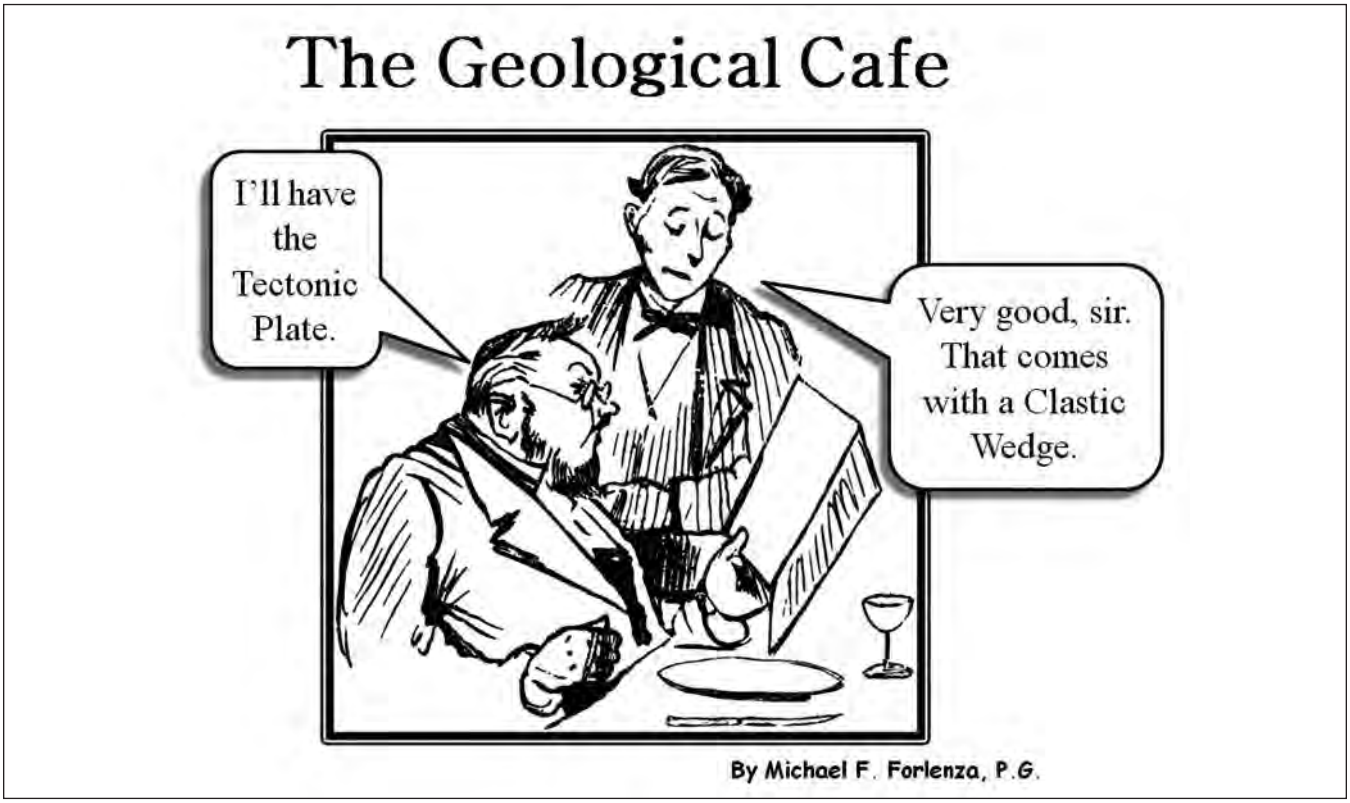
House Committee holds oversight hearing on hardrock mining

The House Committee on Natural Resources Subcommittee on Energy and Mineral Resources held a mining oversight hearing on June 13, 2013. The hearing focused on mining fees and royalties, the withdrawal of certain lands from new mining claims, and Good Samaritan legislation for the cleanup of abandoned mine lands (AMLs).

Committee members Doug Lamborn (R-CO) and Peter DeFazio (D-OR) highlighted the need for mining law reform. Witnesses Steve Moyer of Trout Unlimited and Lauren Pagel of Earthworks voiced their support for mining legislation such as the Fair Payment for Energy and Mineral Production on Public Lands Act (H.R. 3446) that would institute federal mining royalties and levy a fee on mining operations to pay for the cleanup of AMLs. However, Kris Hefton, Chief Operating Officer of Vane Minerals, declared that royalties could make mining cost-prohibitive.

Moyer and Harold Roberts, Chief Operating Officer of Energy Fuels Resources Corp., also emphasized the need for improved Good Samaritan legislation such as S. 1777 or H.R. 3203 to enable organizations to voluntarily remediate AML sites without incurring liability under environmental laws.

Opening statements, witness testimonies and an archived webcast of the hearing can be found on the committee's website http://naturalresources.house.gov/calendar/eventsingle.aspx?EventID=336551. ■



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Text should be submitted by email as an attached text or Word file or on a clearly labeled CD in Word format with a hardcopy printout to the Editor.

Figures, maps, diagrams, etc., should be digital files using Adobe Illustrator, Canvas or CorelDraw. Files should be saved and submitted in .ai (Adobe Illustrator) format. Send them as separate attachments via email or CD if they are larger than 1 MEG each, accompanied by figure captions that include the file name of the desired image. DO NOT EMBED them into your text document; they must be sent as separate files from the text. DO NOT USE POWERPOINT, CLIP ART or Internet images (72-DPI resolution) as these do not have adequate resolution for the printed page and cannot be accepted. All digital files must have 300-DPI resolution or greater at the approximate size the figure will be printed.

Photographs may be digital or hard copy. Hard copies must be printed on glossy paper with the author's name, photo or figure number and caption on the back. Digital files must be submitted in .tif, .jpg or .eps format with 300-DPI or greater resolution at the printing size and be accompanied by figure captions that are linked by the file name of the image. The images should be submitted as individual email attachments (if less than 1 MB) or on CD or DVD.

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The *Bulletin* is printed digitally using QuarkXPress. We no longer use negatives or camera-ready advertising material. Call the HGS office for availability of ad space and for digital guidelines and necessary forms or email nina@hgs.org. Advertising is accepted on a space-available basis. **Deadline for submitting material is 6 weeks prior to the first of the month in which the ad appears.**

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For more information regarding website advertising visit HGS.org or email nina@hgs.org.

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revised 8/6/10

Houston Petroleum Auxiliary Council News

Edie Bishop, *HGS Liaison* 713-467-8706 or ewbishop@bishorb.com

As most folks are staring longingly at their bucket list, HPAC members are happily scratching things off their list thanks to our special interest group, **HPAC Exploring Houston**. This year promises to be another rousing success.

This just in from Chair **Martha Lou Broussard**: "HPAC will be exploring Houston on Thursday, October 31. This is actually two tours in one, which we know will be enjoyable but be sure to wear walking shoes."

In the morning, we will have a tour of the Co-Cathedral of the Sacred Heart. Completed in 2008, it was designed by Houston architecture firm Ziegler Cooper. The new building, which features a classic design with a free-standing bell tower reminiscent of cathedrals of Italy, can hold over 1820 parishioners underneath its vaulted ceiling and metal dome. The design is a simplified Italian Romanesque style with a cruciform shape. The exterior is clad in Indiana Limestone and the interior is accented with 30,000 square feet of marble. One hundred and eight stained glass panels and windows were designed and constructed in Florence, Italy by Mellini Art Glass and Mosaics.

After lunch at Brio Tuscany Grill, the tour will travel to the Rice University campus. Rice has long been known for its distinctive architecture and canopy of stately trees. Now it is also the setting for some major works of public art. Rice debuted the "Magnificent Seven" by American artist James Suris plus Aurora Robson's "Lift' and "The Great Indoors." Also, the University recently installed Charles Mary Kubrict's "Envirionmental Exigencies" with its four beautiful oak leaves on eight foot panels. Rice is also the setting for one of the skyspaces by noted artist James Turrell who also designed the MFAH tunnel lighting under Main Street. This is a must see as shown by the September success of the MFAH exhibit entitled James Turrell: The Light Inside.

Members Georgeann Massell and Sheri McQuinn at Fall Board Meeting.

To begin the day, we will leave from Memorial Drive Presbyterian Church promptly at 9:15 AM and will return at about 3:30 PM. Reserve a spot on the bus by sending a check for $17 made to HPAC and mailed to **Linnie Edwards** at 9350 Shady Lane Circle, Houston 77063 no later than October 25. Guests are welcome. If you have questions, please call Martha Lou (713-348-4492) or Linnie (713-785-7115). These well-received tours are always thoroughly researched and offered at such an incredible low cost. We thank you Martha Lou, and Linnie.

Discussion Leader Martha Lou Broussard setting the tone for the book on Egypt.

The September Luncheon at the Hess Club featuring Deborah Duncan was a huge success, thanks to Chair **Shirley Gordon**. Shirley and George are long time leaders of our geological community and both the Auxiliary and Society owe much of their success due to individuals such as this couple. We are indeed fortunate organizations.

Technology Chairs **Wanda Shaw** and **Mickey Murrell** are putting the final touches on the revision of HPAC's own web site. They have done a wonderful job which is much appreciated. Be sure to go on line and check it out at www.hpacauxiliary.com.

Remember that in addition to our regular luncheon programs and this special interest group, we have other interest groups: **Bridge: Audrey Tompkins** 713-868-0005 or **Daisy Wood** 832-581-3231, and **Book Club: Phyllis Carter** 281-397-9888 or **Anita Weiner** 713-572-9874.

Geologists, please encourage your spouses to join HPAC, where they will have an opportunity to meet other spouses of geologists, geophysicists, engineers, and landmen. They will participate in informative and entertaining programs, delicious lunches and welcoming fellowship. The HPAC membership form is included in the HGS *Bulletin*. Contact **Edie Bishop** at 713-467-8707 or ewbishop@bishorb.com for more information. ■

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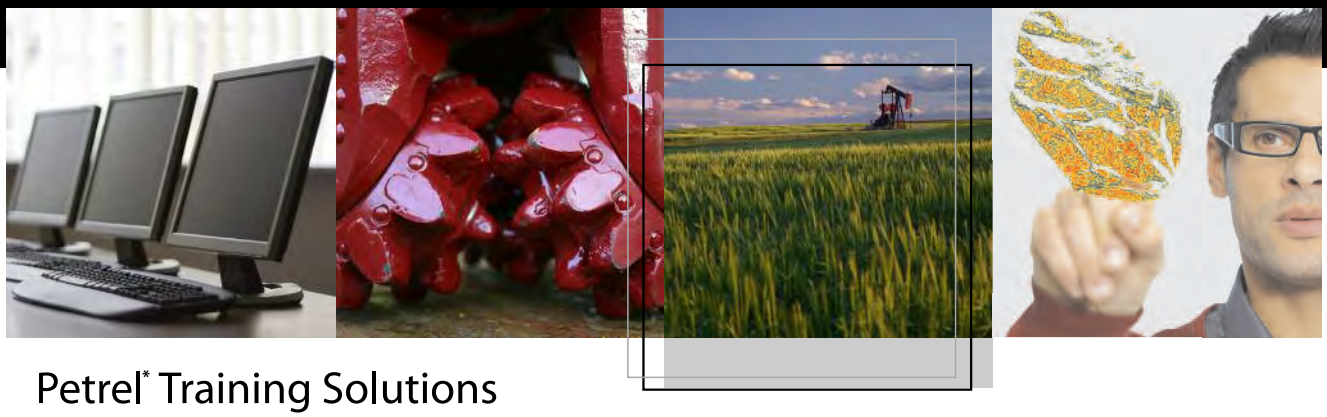

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