HGS Bulletin
Houston Geological Society
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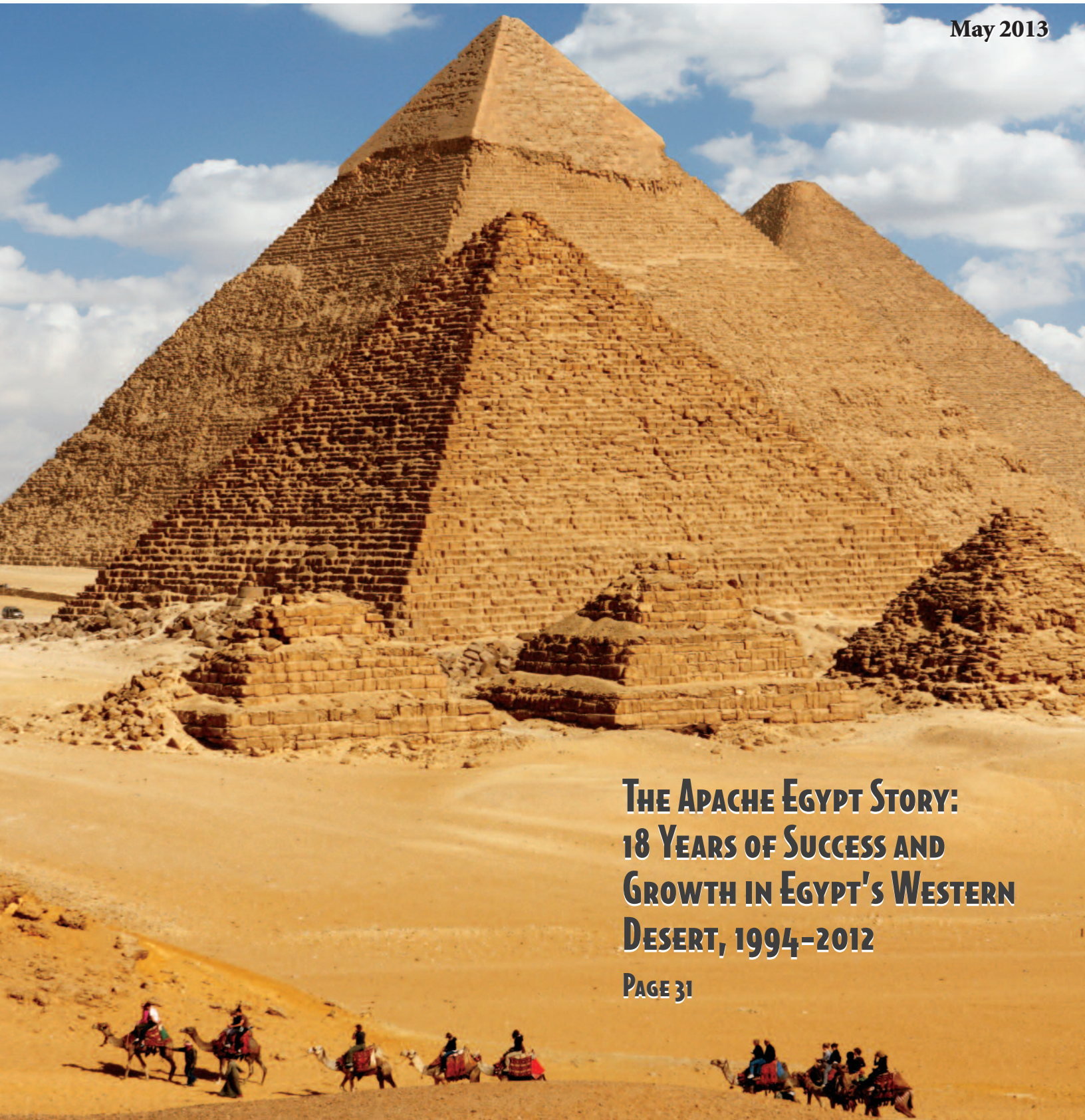

The Apache Egypt Story: 18 Years of Success and Growth in Egypt's Western Desert, 1994-2012

Page 31

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The Bulletin
Houston Geological Society

Volume 55, Number 9 May 2013

In Every Issue

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Technical Meetings

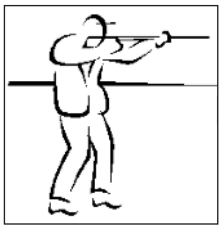
Other Features

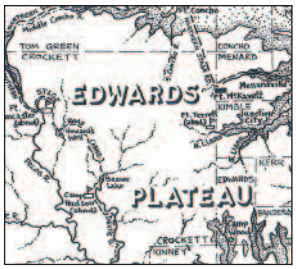
About the Cover: There are 138 pyramids in Egypt, most built for the regions' Pharaohs and their consorts. The most famous pyramids are those at Giza, on the outskirts of Cairo. Featured on our cover, foreward, is the Pyramid of Menkaure, the Pyramid of Khafre (center), and in the background, the Great Pyramid of Khufu. The three smaller pyramids in the foreground are structures associated with Menkaure's pyramid. The Great Pyramid is the largest Egyptian pyramid and the only one of the Seven Wonders of the Ancient World still in existence.

Wikipedia seems to know that these monumental structures are constructed of dressed masonry, but that was not always and may not yet be common knowledge. See page 15 for more details on "Of What are the Pyramids Made".

HGS Continuing Education
Unconventional Resource Evaluation and Exploitation – A Practical Approach
page 4


page 17


page 18



page 25


page 42

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The Houston Geological Society Continuing Education Committee Presents

Unconventional Resource Evaluation and Exploitation – A Practical Approach

Speaker: Fred B. Poland

Thursday, May 16, 2013 – Half Day Course

Overview and Outline

The workshop will present a practical approach to the evaluation and exploitation of unconventional resources. An overview of the drivers for a successful unconventional resource play will be presented followed by a demonstration of a practical application of these drivers in a comprehensive workflow in a popular software package. The workflow will characterize the resource using advanced petrophysical modeling techniques. The target zone will be identified and modeled in 3D using both well and geophysical data. Curvature and semblance geophysical attributes will be generated and examined to determine their applicability to predicting fractures and faulting. A well plan will be designed along target points defined on the 3D target surface followed by correlating and geosteering the horizontal well within the 3D geomodel. Proposed completion stages and perforation clusters will be picked along the well in vertical section based upon a key log character. Finally production reserve categories modeled in an industry standard economic evaluation software will be visualized in the mapping environment to determine their special distribution. Following the workshop the attendee should understand the major characteristics necessary for identifying a viable unconventional resource and be familiarized with a practical method to evaluate and exploit the reservoir.

Pricing	
HGS / GSH Member:	$60.00
Non-Member:	$80.00
Emeritus/Life/Honorary	$40.00
Student Member	$40.00
Student Non-Member	$55.00

Date: Thursday, May 16, 2013 • 8:30 a.m. – 11:30 a.m.

Location: Marathon Oil Tower • 555 San Felipe Road • Houston, TX 77056

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 Sketch

Fred B. Poland is the product manager for the GeoGraphix geological applications at LMK Resources. He started at GeoGraphix in 1990 and has held the positions of support specialist, consulting service manager, technical services manager, consultant/trainer, and product manager. Mr. Poland has extensive domestic and international experience helping GeoGraphix clients derive the most value from their software investment.

Mr. Poland has both a B.S. and M.S. in Geology, an M.B.A., and a B.S. in Computer Information Science. He has worked at both major and independent oil companies as a petroleum exploration geologist and geological manager and as an environmental geologist and an IT manager at a major engineering firms.

Martin Cassidy
mcassidy.hgs@gmail.com

Outreach to the Community
Serve Others and Use Our Special Skills

We in the oil and gas business are fortunate in that we have special skills in science and engineering that we apply to our craft. Many of those skills are transferable to activities of the general public. This is especially true in the area of education. Not only are many of us able to explain how the earth works but also the managers among us are able to organize and lead groups in great endeavors. Consider those who direct groups in lease sales, in the evaluation of farm-out offers, or more difficultly, to sell farm-out deals. Then there are those of us who work on our own to generate prospects, construct reports, consult, or teach. All of these require self-discipline, time management, and planning, the very skills needed in volunteer activities so valuable to the community around us. Such activities can be grouped as Outreach.

All of these require self-discipline, time management, and planning, the very skills needed in volunteer activities so valuable to the community around us.

As part of the Houston community, HGS reaches out to those around us who can use our help; particularly to students. The HGS has two college scholarship programs, the Calvert Fund, for graduate students of geoscience, and the HGS Foundation Fund, for undergraduate students of geoscience. They are funded by donations from our members and from companies who participate in events such as Legends Night whose profits are split between the two funds. The HGS matched the amounts donated from our general treasury for a total addition this year of $16,722 to each fund. This was made possible by the work of HGS member volunteers and staff led by **John Tubb**. Those of you who were at Legends Night will remember that scholarships were awarded to seven undergraduates from seven local colleges. Their pictures and biographies are on pages 11 and 12 of the March HGS *Bulletin*. What a pleasure it was to hand them a certificate of scholarship in that large meeting of their fellow geoscientists, some of whom later may be their employers.

On page three of the HGS *Bulletin*, under "Committees", take note of the three entries heading the "E"s. First, Earth Science Week is a week in October when the HGS joins others in a celebration of the Earth. Many programs for youth are offered and volunteers are needed to staff our exhibit. Find more in the HGS website under committees.

Next on this page is Educational Outreach that includes the "Bones in Schools" program soon to be launched after the curriculum printing. Opportunities to carry the program to schools will be available to interested HGS member-volunteers with training provided. A major new Outreach is the successful effort by **Linda Sternbach** to undertake video-taping of HGS programs. The video of Bob Shoup's climate presentation has been praised by many. For example, *Henry Wise* just returned from a long trip and opened the HGS website. When he scrolled down he found and clicked on "New Video" to view the complete presentation from the humorous disclaimer to serious close. When the program was complete Henry then forwarded it to two friends. That is successful outreach!

The third "E" is the Engineering Council of Houston (ECH) whose full title is the Engineering, Science and Technology Council of Houston. We are a member of this group along with the GSH, TSPE, AIChE, ASME, IEEE, SAME, and the HMNS and nine other groups not listed! These 15 organizations, which consist mainly of engineers, join annually to plan and fund the Science and Engineering Fair of Houston. This Science Fair, held in the spring, brings together students to compete in projects in a number of science categories, including Earth Science, in three grade levels, 7-8, 9-10, and 11-12. I judged this year and found it a very interesting half or full day.

The HGS is a Silver Level $5000 sponsor of the Fair, which is held in the George R. Brown Convention Center. This year, the awards ceremony was held in the Cullen Performance Theatre at the University of Houston. HGS presented awards to the first place winners in geoscience projects in each of the three grade levels.

From The President *continued on page 9*

Patricia Santogrossi
editor@hgs.org

What are Global Temperatures Doing and Why are They Doing It?

Bob Shoup's General Luncheon talk on February 27th at the Petroleum Club was given to a capacity crowd anxious to know the answers to the four questions he posed in his abstract in the February *Bulletin*. Underlying his queries was the ultimate question of "Is there a real crisis?" or, do some of the "experts" have hidden agendas?

First of all, Bob showed the audience that average temperature profiles differed slightly by reporting agency, NASA (Hansen), NOAA, Hadley (Climate Research Unit of East Anglia University). All have similar, but different temperature curves. Moreover, the data reported by a given agency are sometimes changed and most of the data sets on which climate change predictions are based had been either deliberately altered to show a warming bias or have had a warming bias introduced through the collection, homogenization, and processing of the data.

Of NASA's five proclaimed warmest years over the last century it was supported by for only a third of the raw data in 2008. In fact, while a third of the stations are clearly warming since 1970, a third of the stations' records are flat, and a third show cooling since 1970. This distribution can no longer be confirmed, however, as many of the temperature records in the NASA GISS data base (http://data.giss.nasa.gov/gistemp/station_data/) have been altered between 2008 and 2012 (**Figure 1**).

Another question Bob raised is "What do average temperatures really mean?" Well that depends on where the actual stations are. Actual station temperatures can vary widely even when in relatively close proximity, with some profiles showing warming trends and others showing cooling trends.

Question 1: What are temperatures actually doing?

Bob's first answer was that global temperatures are changing. This was not a facetious answer; global temperatures can be shown to change cyclically, with a number of wavelengths and amplitudes.

- Over 100's of millions of years, the cycles have a wavelength of 150-200 million years and amplitude of ~15°C.
- Over tens of millions of years, the cycles have a wavelength of 15-20 million years and amplitude of ~4°C.
- Over a period of hundreds of thousands of years, the cycles have a wavelength of 100 thousand years and amplitude of ~10°C. At this scale it becomes apparent that the current "global warming" trend started 15,000 years ago and therefore could not be caused by humans.

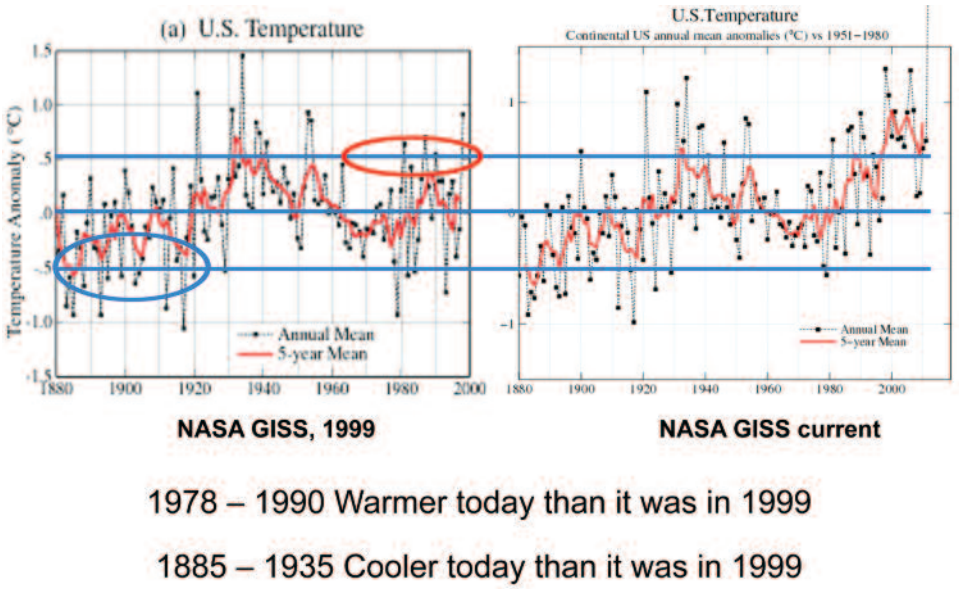

Figure 1: *NASA average temperature profiles*

From The Editor *continued on page 9*

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UNCONVENTIONAL RESOURCES TECHNOLOGY CONFERENCE

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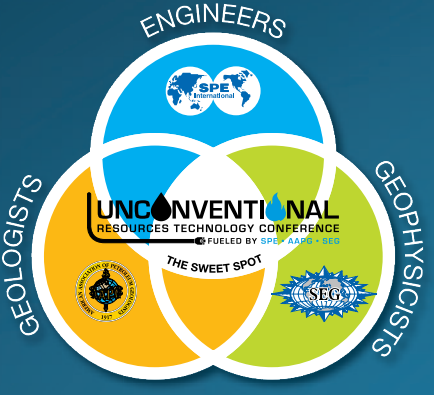
Make plans to attend the Unconventional Resources Technology Conference (URTeC), 12-14 August 2013 in Denver. URTeC is a multi-disciplinary event focusing on multiple resource plays and is supported by three of the world's leading scientific organizations — SPE, AAPG and SEG.

URTeC will kick off with an unforgettable Plenary Session — Unconventional Resources: Breakthrough Integration Changes Everything. This dynamic session will explore the foundational scientific, technical, and business technologies and practices that, when leveraged by innovative integration in a multi-disciplinary environment, differentially "moves the needle" across the value chain of unconventional resource identification, assessment and monetization.



Plenary Speakers:

- **Scott D. Sheffield**, Chief Executive Officer, Pioneer Natural Resources
- **John Richels**, President & Chief Executive Officer, Devon Energy Corporation
- **Vello Kuuskraa**, President, Advanced Resources International
- **William Scoggins**, President, Colorado School of Mines

Other Panels Include:

- Nimble Independents: "Moving the Needle" with Innovation and Execution Excellence
- Technologies that May Transform the Future
- Making it Happen in the Field: Converting Technology into Dollars
- Sustainability, Job Creation, and Public Image
- Transportation and Processing Capacity of Market Infrastructure in Emerging Plays
- Energy Policy Forum: Government Regulations that Affect Unconventional Resource Development

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From the President continued from page 5

The winners are invited, with their parents and their teachers, to HGS' Guest Night this June at the Museum of Natural Science to be recognized.

That brings us to the last discussion of outreach. Reach out to your spouses! How many of you have spouses who are not much interested in the monthly general, international, Northsiders, luncheon, or dinner meetings? Quite a group I suspect! Now is your chance to do something they will enjoy; good food in a fascinating venue that is"Dining with the Dinosaurs" and includes a huge flying West Texas predator. The new exhibit is amazing!

Save the date – June 8th – and come enjoy a presentation of the new findings from Mars by a person who "drives" the Curiosity rover. Here is your chance for personal outreach. Bring your spouse and family and join us! ■

From the Editor continued from page 7

- Climate cycles of hundreds of years have a wavelength of 600-700 years and an amplitude range of ~0.6°C to ~0.8°C
- Climate cycles of tens of years have a wavelength of 30-40 years and an amplitude range of ~0.5°C to ~0.6°C
- Climate cycles of a few years have a wavelength of 3-5 years and an amplitude range of ~0.3°C to ~0.4°C.

So he had to advance a corollary question 1A: "How much have Global temperatures changed?" The answer depends on the reference point one chooses.

- We have warmed ~8°C since the Pre-Cambrian;
- And cooled ~8°C from the Eocene to today.
- If you change the reference point to the end of the Pleistocene, we have been warming except for the last 10,000 years that we have been cooling!
- If we change the reference point to the Roman Warm, approximately 2000 years ago, we have been gradually cooling.

We have been warming since the end of the "Little Ice Age" in 1820. So how much has temperature changed?

- We have warmed ~0.8°C for 1919 to 1998 or about 0.009°C per year. That amount of warming is neither abnormal nor unprecedented. Most temperature stations show more than 0.8°C annual variation!
- A graph of UAH Satellite-based temperature of the global lower atmosphere from 1979 to present shows that temperatures have been constant to cooling from 1998 to Present.

What is causing temperatures to do what they are doing?

The Intergovernmental Panel on Climate Change (IPCC) was established in 1988. Its aim it is to demonstrate a human-cause to climate change as a means of promoting the UN's Agenda 21 state that "globally averaged temperatures have increased since the mid-20th century due to anthropogenic (man-made) greenhouse gas concentrations". Stated another way, humans are causing global warming, principally through their use of fossil fuels.

Just because the rise of CO_2 emissions associated with fossil fuel use correlates to increased temperature, does not mean it is the cause; correlation does not imply causation. There are many flaws in the hypothesis that CO_2 is the cause of Global warming. Here are a few.

- The first flaw in this logic is that earth is not a closed system. Constant earth temperatures would require "Radiative Energy Balance"; that is, the amount of incoming sunlight would have to exactly equal the emitted infrared radiation. Although greenhouse gases do affect the amount of infrared radiation back into space, the system is not closed.
- The second flaw is the signature of increased greenhouse effect would result in a hot spot 10 kilometers in the atmosphere over the tropics. Radiosonde data show no such hot spot.
- Flaw three is that CO_2 is not a pollutant. Plants, trees and algae all need CO_2 and recent studies show that increased CO_2 levels are beneficial to the biosphere. One tree over 100 years will absorb 1100 kg of CO_2 from the atmosphere. Plants that grow the fastest (weeds?) or produce the most biomass consume the most CO_2. The CO_2 turnover may be 45% higher than thought. So if you are worried about CO_2, help plant some trees. Go to the National Forest websites, become a reforestation volunteer, or help reforest Colorado. Reforestation of damaged rainforests is more efficient at carbon capture than softwood monoculture plantations.
- Flaw four is that CO_2 levels are 380 ppm at present, which is highly diluted. If you drank 380 gallons of scotch, it would be lethal, unless it was mixed with a million gallons of water!
- Flaw five notes that water vapor is the most significant greenhouse gas and it is not included in climate models.
- Flaw six centers on the fact that temperature increases cause CO_2 increases, not the other way around; therefore CO_2 increases cannot be the cause of global warming.

From The Editor *continued on page10*

From the Editor continued from page 9

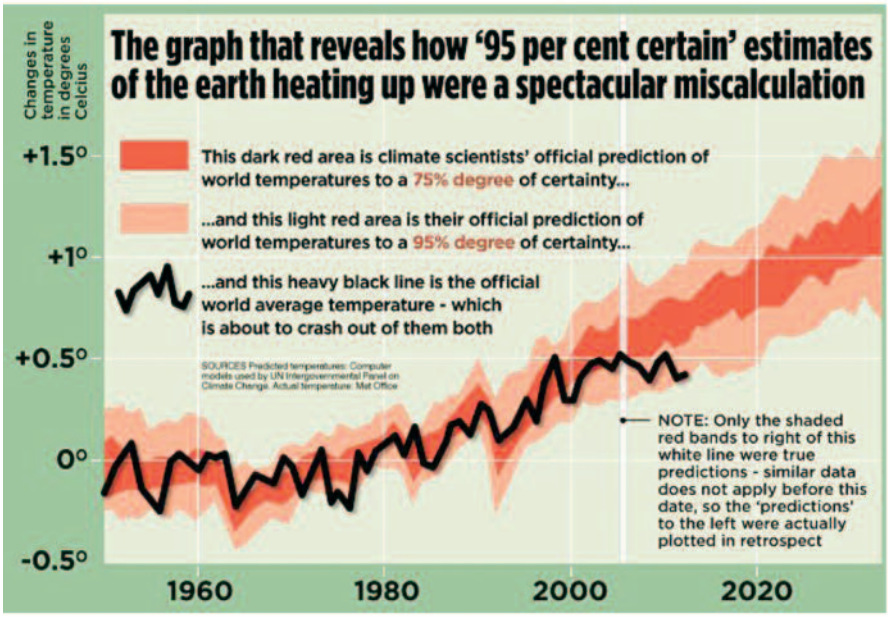


Figure 2: *Source of predicted temperatures (shaded red bands): Computer models used by the UN Intergovernmental Panel on Climate Change (IPCC). Actual temperature (black line): Met Office.*

- The final and fatal flaw pointed in Bob's thorough and logical presentation was that a molecule of human caused CO_2 is identical to a molecule of naturally-caused CO_2. A chart of the Total Atmospheric CO_2 from 1800 through 1960 shows that total atmospheric CO_2 levels have decreased from the 1800's.

Bob paused at this point to ask that if CO_2 does not cause global warming, can the atmospheric concentration of CO_2 become so great as to create a "tipping point" such that CO_2 impacts global temperatures? The answer to this question was "Absolutely – in theory". But does it?

There are two slope changes in the plot of human-caused CO_2 one at ~1890 and a second one at ~1950. The NOAA Global Mean Temperatures chart shows slight temperature increases 4 to 6 years after those slope changes in the human-caused CO_2. It should be noted, however, that these two possible CO_2 effects on temperature are only small perturbations in the overall temperature cycles.

At this point Bob directed our attention to solar activity. Solar flare activity wa high in the periods between 1973 and 1984, 1987 and 1993, and between 1997 and 2002. All periods of high solar flare activity show a corresponding temperature increase. So may there be a cosmic ray climate link? Well, ions associated with cosmic rays influence cloud formation. Harken back to the statement made earlier that "that water vapor is the most significant greenhouse gas and it is not included in climate models". The data from 1850 to 2000 (NOAA's Global Mean Temperatures chart) show 20-30 year cycles in temperature – cooling from 1880-1910 and from 1940-70 and warming from 1850-80, 1910-40 and from 1970-2000 close to the current climate "crisis".

The cause of the 20-30 year cycles is, at least in part, the Pacific Decadal Oscillation or PDO. PDO also influences the El Nino Southern Oscillation (ENSO) and ENSO affects on global climate is well documented. The high temperatures observed in the years 1982, 1987, 1991, 1992, 1995, 1998 (?), 2001, 2007, 2010, and 2012 can be related to ENSO events.

So, in conclusion for the 2nd question "What is causing temperatures to do what they are doing?" Temperature data reflect strong control by solar activity, a strong effect by oceanic currents, and a possible weak effect of CO_2.

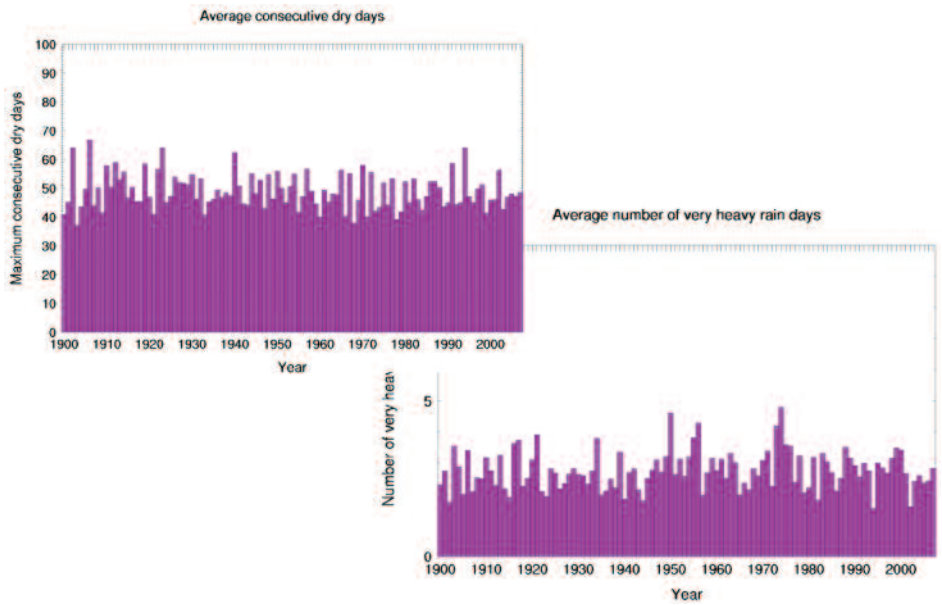


Figure 3: *There has been no increase in the number of dry spells and heavy rainsotrms*

So, What will temperatures do?

Temperatures will continue to change in multiple cycles of varying wavelength and amplitude and those changes will happen no matter what anyone says or does.

The IPCC prediction that world temperatures could be raised by 1.1-6.4°C (i.e., 2- 11.5 °F) has been shown to be grossly inaccurate, as current temperatures fall below the predicted IPCC 95% confidence-level prediction (**Figure 2**).

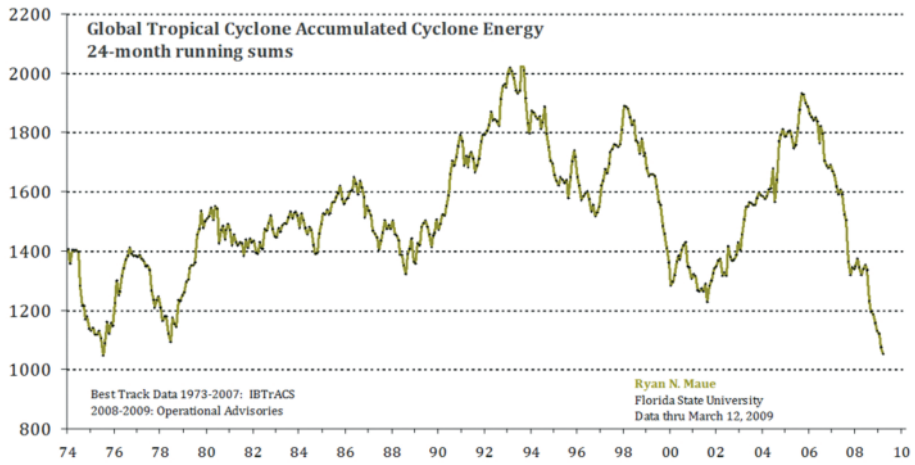


Figure 4: *Cyclonic storm activity at a 30 year low*

It is important to recall that their predictions are model-based and that many of the assumptions in their current model are incorrect. Since 1998 temperatures have been flat to cooling in spite of increased CO_2 levels.

Fundamentally we do not know exactly what temperatures will do, but the PDO has shifted to a cool phase and solar flare activity is at very low levels – together these suggest a prolonged period of cooling.

Just what are the consequences of climate change?

The doomsayers have predicted that the Nile will shrink, the Sahara desert will expand and civilizations in North Africa and the Middle East will collapse due to major drought. IPCC says that sea levels will probably rise by 18 to 59 cm (7.08 to 23.22 inches). They cite a >90% confidence level that there will be more frequent warm spells, heat waves, and heavy rainfall. And they cite a >66% confidence level that there will be an increase in droughts, tropical cyclones, and extreme high tides. There has been no increase in the number of dry spells and heavy rainstorms in the period 1900 to 2000 (**Figure 3**). There has been no increase in maximum hurricane wind speeds or the number of violent Atlantic hurricanes. In fact cyclonic storm activity is at a 30 year low (**Figure 4**). Sea level increases are following a 150-year trend of a seven inch per century rise from 1850-2000, completely insensitive to when hydrocarbon use increased post-WWII. At this rate IPCC's prediction will be realized in the year 3000. If cooling continues, sea level will drop.

Things that make the headlines, such as retreat of the Greenland and other glaciers, are often noted out of context. Glaciers have been shrinking on a 180 year trend, since well before the advent of industrialization. Greenland was green in the year it was discovered too - 876 A.D. In 1992 the ice cover was greater than it was in 2002 (**Figure 5**).

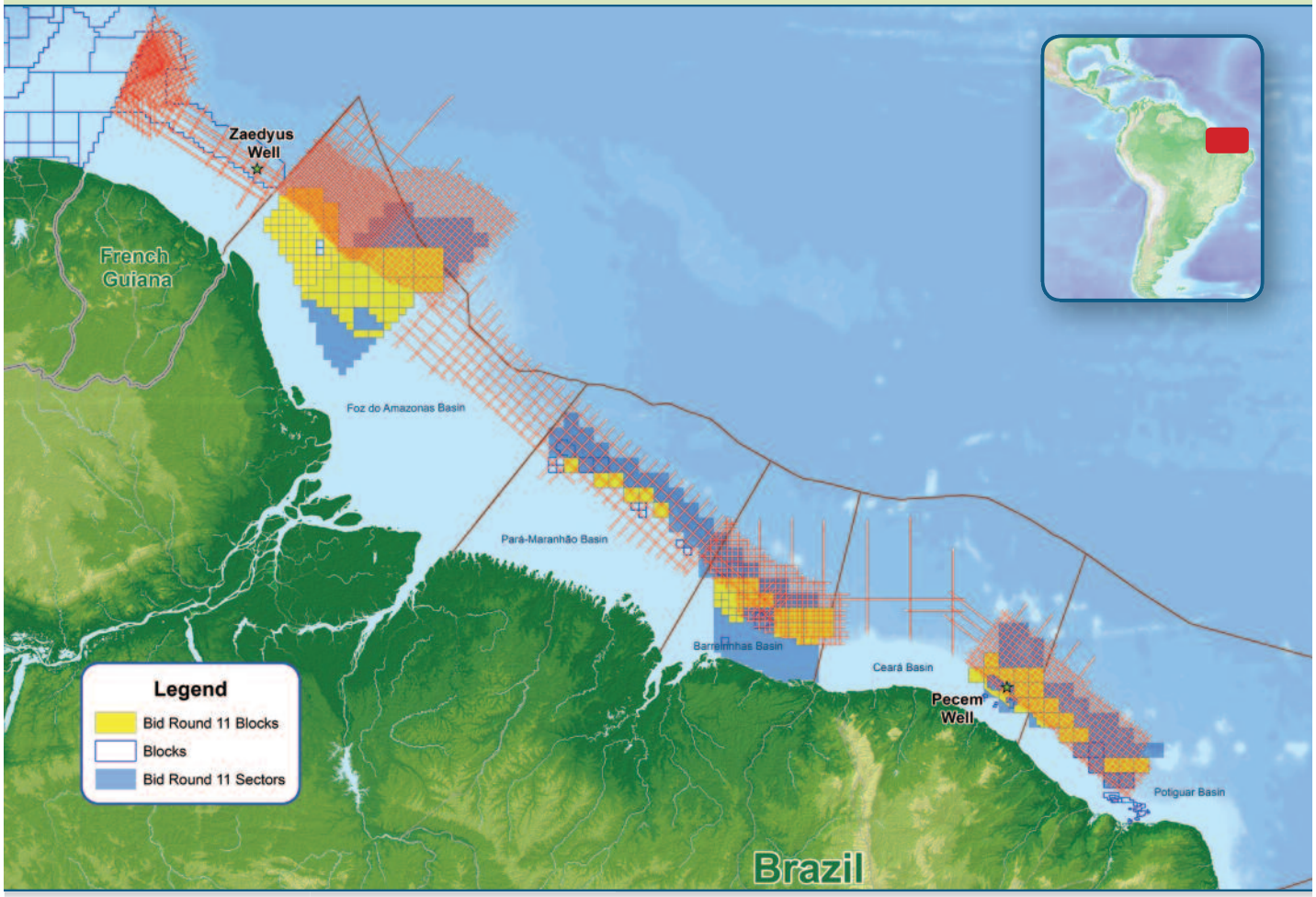
Arctic ice was deemed to be melting in 1979; by 1999 and 2008 it was back with a vengeance. Similar dire predictions and scary photos were shown of shrinking habitat for polar bears in 1922 (**Figure 6**). Guess what? The polar bears are still with us and so is Arctic ice.

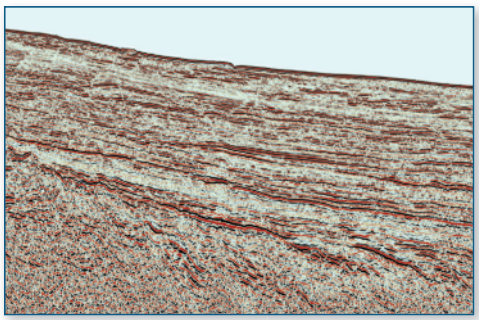
From The Editor *continued on page 13*

Figure 5

Equatorial Margins Brazil

Multi-Client Seismic - Data Available for Brazil Round 11





Seismic section from the Potiguar Basin data

Spectrum is active in five basins along the Equatorial Margins of Brazil that are on offer in Round 11. We have new PSTM and PSDM data available for each of the Foz do Amazonas, Barreirinhas, Ceara and Potiguar surveys all of which were acquired with 10,000m offsets and 13 second record lengths.

Two reprocessing efforts are underway along the Equatorial Margins, one a 9,600 kilometer program in the Para-Maranhao basin that links the Foz do Amazonas basin to the Barreirinhas Basin. The second project is an 7,783 kilometer project in the deep waters of French Guiana, which will link the Zaedyus discovery with the recently acquired data in Brazil. The well tie data will be available in late March and the remaining data in April.

Our Multi-Client team is committed to delivering high quality data in advance of the upcoming Round 11. Companies participating in Spectrum's programs will have a competitive advantage in this round.

Spectrum

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www.spectrumasa.com

From the Editor continued from page 11

Glacial retreat can be documented in pictures of Mount Kilimanjaro in 1970 to 2000 (**Figure 7**). But in 2008, the ice cover was greater than ever. Modern satellite data shows that Asian glaciers are actually growing, not shrinking.

So is there any real crisis at present or is everything about global warming alarmist hype? Well if everything that "correlated" with the rise in the Global Temperatures Index, then the Federal debt is also "caused" by global warming!

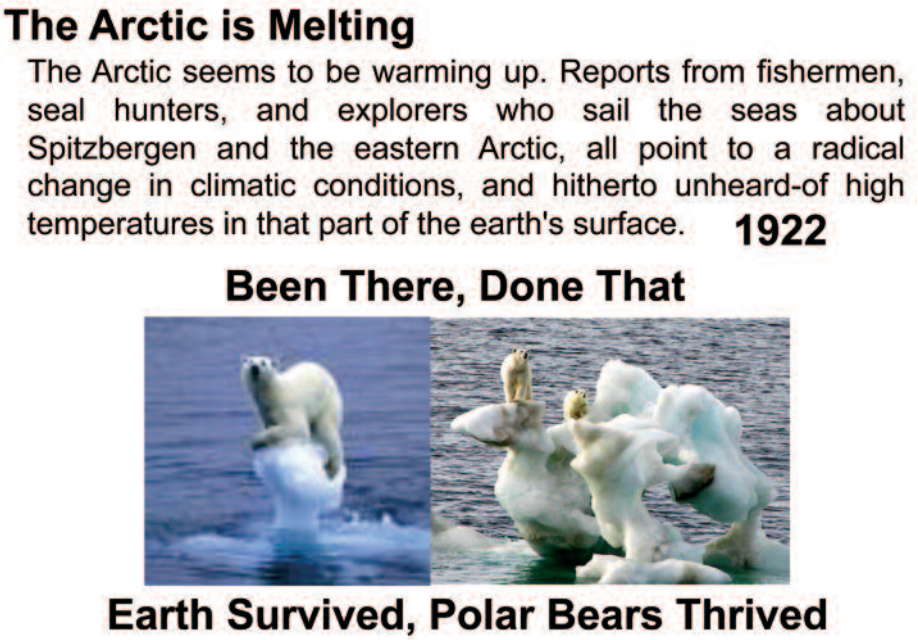


Figure 6

To summarize:

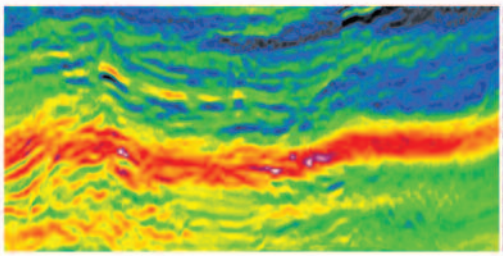
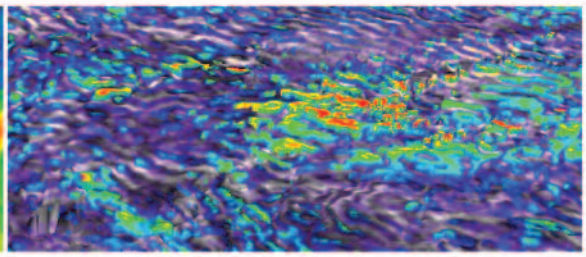
- A historical rate of 0.07 inches per year is not a catastrophic rate of sea level rise, nor is it unprecedented – and it may go down as glacial forces resume during cooling.
- There are no more droughts or storms than normal.
- Ice melting is normal for interglacial periods.
- CO_2 is not the cause of global warming. Rather, temperature increases cause CO_2 increases. CO_2 may be high enough to impact climate.
- Solar flare activity has a stronger impact on climate than CO_2.
- Changes in oceanic circulation have a stronger impact than CO_2.
- Based on global averages, temperatures increased 0.8°C from the 1800's to1998; from 1998 to present, the temperature trend has been essentially flat.
- Low solar activity levels combined with the PDO in a cool phase suggest we may be in for a period of cooling, perhaps similar in scale to the last "Little Ice Age".

So what can we learn from history about the consequences of global warming:

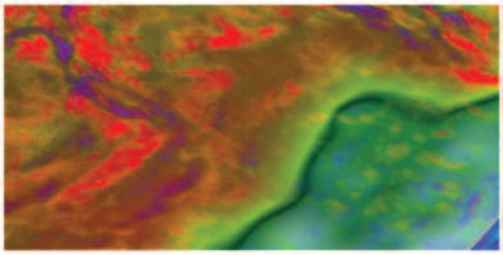
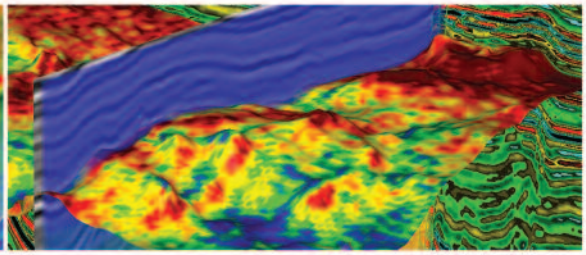
- Recall the Roman Empire prospered during the Roman Warm from 25 to 200 A.D as globally warmer temperatures allowed for prosperity and food surpluses.
- The crisis of the third century occurred during a period of global cooling which shortened growing seasons and reduced crop yields.
- The age of the Viking Exploration AD 793-1066 and the Renaissance AD 1300-1600 occurred during warming phases, again facilitated by crop surpluses.
- The Little Ice Age, from 1550-1850,was a time of hunger and famine, which in turn drove colonial expansion of the European powers seeking to maintain their prosperity.

Human kind seems to do better when it is warmer so does it make sense to fear it and to spend billions of dollars to see if we can make it colder? ■

Figure 7*: Glacial retreat is reversing*

a ROCK SOLID OPPORTUNITY

Are you interested in working with a team of dedicated geoscience professionals to create and apply leading-edge technology to geophysical problems?

If so, Rock Solid Images, an acknowledged leader in Quantitative Interpretation grounded in rock physics, is interested in hearing from you about your interest in the following positions:

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This senior scientist will play an integral role in the development and implementation of our reservoir characterization services through their expertise in rock physics and seismic inversion methods. This key team member will work directly with our clients, our QI services organization and our R&D group to deliver solutions for complex exploration and production challenges. As an industry recognized expert in seismic processing and rock-physics, a passion for mentoring and learning is paramount.

Senior Research Geophysicist

As a senior member of our R&D team, this geophysicist will make major contributions to our need-driven research in the areas of seismic and electromagnetic reservoir characterization, and interact regularly with our services group. With a working knowledge of signal and seismic processing, seismic inversion algorithm processes and practice, and seismic attribute analysis, the successful candidate will have an intuitive feel for seismic data. A wide degree of creativity and latitude is expected.

Contact our CTO, Lucy MacGregor, in confidence at:
opportunity@rocksolidimages.com

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Of What are the Pyramids Made?

Michel Barsoum is a well-respected researcher in the field of ceramics, whose career has taken him down a path of history, archaeology, and "political" science, mixed in with materials research.

A distinguished professor in the Department of Materials Science and Engineering at Drexel University, his daily routine consists mainly of teaching students about ceramics, or performing research on a new class modern ceramics that can be machined, are thermal-shock resistant, and are better conductors of heat and electricity than many metals. This makes them potential candidates for use in nuclear power plants, the automotive industry, jet engines, and other high-demand systems.

But what did he and his colleagues and students know of the mysteries surrounding the building of the Great Pyramids of Giza, the only remaining of the seven wonders of the ancient world?

A widely accepted theory is that the pyramids were crafted of carved-out giant limestone blocks that workers carried up ramps. More than two decades ago, Joseph Davidovits, Director of the Geopolymer Institute in St. Quentin, France claimed that the stones of the pyramids were actually made of a very early form of concrete created using a mixture of limestone, clay, lime, and water.

Someone should have proven it beyond a doubt by now, in this day and age, with just a few hours of electron microscopy. It turned out that nobody had yet completely proven the theory.

Aided by a grad student and a colleague in France, Barsoum started what might have been a two-hour project that turned into a five-year odyssey.

After a year and a half and extensive scanning electron microscope observations and other testing, Barsoum and his research group finally began to draw some conclusions about the pyramids. They found that the tiniest structures within the inner and outer casing stones were indeed consistent with a reconstituted limestone. The cement binding the limestone aggregate was either silicon dioxide or a calcium and magnesium-rich silicate mineral.

The stones also had a high water content which would be unusual for the normally dry, natural limestone found on the Giza Plateau. The cementing phases, in both the inner and outer casing stones, were amorphous; that is their atoms were not arranged in a regular and periodic array. Sedimentary rocks such as limestone are seldom, if ever, amorphous.

The sample chemistries the researchers found do not exist anywhere in nature. Therefore, it is improbable that the outer and inner casing stones, that were examined, were chiseled from a natural limestone block.

More recently, Barsoum and another of his graduate students discovered the presence of silicon dioxide nano-scale spheres with diameters only billionths of a meter across in one of the samples. This discovery further confirms that these blocks are not natural limestone.

Generations Misled

It is ironic that this 4,500-year-old limestone is so true to the original that it has misled generations of Egyptologists and geologists. Hey Dr. Folk, the ancient Egyptians were the original, albeit unknowing, nanotechnologists.

The following are common sense reasons why the pyramids were not likely constructed entirely of chiseled limestone blocks:

- The blocks are too perfectly matched, so they must have been cast.
- Not one copper chisel has ever been found on the Giza Plateau.
- The basic raw materials used for this early form of concrete, limestone, lime, and diatomaceous earth, can be found virtually anywhere in the world.

Replicating this method of construction to repair the pyramids would be cost effective, long lasting, and much more environmentally friendly than the current building material of choice: Portland cement. Portland cement manufacture alone pumps roughly 6 billion tons of CO_2 annually into the atmosphere. ■

HGS Guest Night – Saturday, June 8, 2013

Houston Museum of Natural Science 6:00 P.M.–10:00 P.M.

Curiosity on Mars: The Latest Results from the First Grey Rocks on the Red Planet

Speaker:
Dr. Dawn Sumner
co-investigator for NASA's Mars Science Laboratory team

The rover in the background is Curiosity's twin at JPL, used to test commands before sending them to the real rover.

The Guest Night Program includes a Social Hour, Buffet Dinner and Featured Speaker Presentation:
6:30 – 7:30 Cash Bar and Buffet Dinner – Tour the Museum Exhibits and Visit with Guests
7:30 Move into Theater for Presentation of Awards and Speaker
Short Intermission
9:00 Movie (to be determined)
No payments accepted at the door. You must prepay online (www.hgs.org)
or send this form with credit card information.

Member name: _____ Member # _____

Names: _____

Email address: _____

Number of Guest Night Tickets _____ @ $30 each Guest Night Tickets Amount $ _____

Total Amount remitted $ _____

Send check and form to: HGS Office, Guest Night 2012, 14811 St. Mary's Lane, Suite 250, Houston, Texas 77079
or fax this form with credit card number to 281-679-5504

Credit Card number and type: _____ **Expiration Date (required):** _____

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Guest Night 2013
Dr. Sumner to Speak on the Most Recent Results from the Mars Science Laboratory Mission, a Roving Geochemist on Mars!

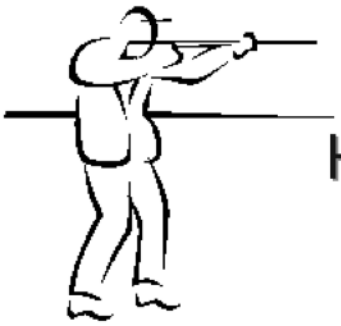
by ***Dave Reynolds***

This year our annual Guest Night event at the Houston Museum of Natural Science will feature Dr. Dawn Sumner talking about the most recent results from NASA's Curiosity mission on Mars. Dr. Sumner is a key part of that mission as a science team member who is coordinates geological mapping and helps interpret depositional environments. She describes herself as a geobiologist – whose research on Earth has worked with carbonate rocks to seek an understanding of microbial evolution, particularly to develop ways to constrain early evolution of life. This research also involves stratigraphy and sedimentology to constrain depositional environments, and employs 3D visualization software from the KeckCAVES group to show these features of her research. These skills are now being applied to sedimentology and stratigraphy on Mars.

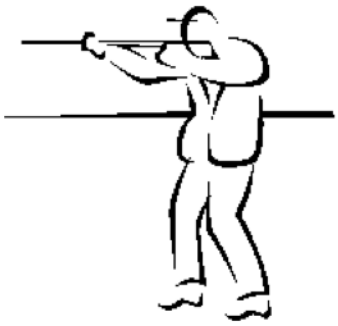
Dr. Dawn Sumner earned a Ph.D. from Massachusetts Institute of Technology in 1995 and is currently a Professor at University of California at Davis. Her research has looked at the way life has shaped the atmosphere we breathe by producing oxygen and removing carbon dioxide. Carbonate rocks, record the history of Earth's ocean chemistry, and, indirectly, atmospheric chemistry and life processes. Any change in one of these processes has feedbacks that affect the others as well as future chemical conditions. Eventually, these processes produced an Earth that is habitable by humans. How that happened is an intriguing question that can be partially answered by looking at Earth's history as preserved in carbonate rocks.

As a co-investigator for NASA's Mars Science Laboratory team, Dr. Sumner helped develop and test scientific interpretations of what is observed by the Curiosity rover on Mars, including planning science campaigns and observations. She expects to bring some 3D visualization of the landing site to show during her talk at Guest Night.

Make your reservations for Guest Night early to be sure to hear this fantastic lecture and to visit with friends! We will start at 6:30 with cash bar and a buffet dinner in the new Paleo Hall. After dinner there will be awards presentations in the IMAX Theater followed by Dr Sumner's talk. Tickets to the event are a great value at $30 each and must be purchased from the HGS web site in advance only. There will be no tickets sold at the door.



30th Annual HGS SKEET SHOOT



Saturday, June 22, 2013
Greater Houston Gun Club
6702 McHard Road, Missouri City

This tournament is a 50 target event. Shells are provided, however **you must bring eye and ear protection**. Greater Houston Gun Club and National Skeet Shooting Association safety rules will be in effect. Trophy winning shooters will be determined by the Lewis class system. Door prizes will be awarded by blind drawing after the conclusion of shooting. All competitors are automatically entered into the door prize drawing, but you must be present at the time of the drawing to win. BBQ lunch will be provided from 11:30 until 1:30. Refreshments will be available throughout the day.

IMPORTANT!!

WE ARE LIMITED TO 160 SHOOTERS IN FOUR ROTATIONS. ENTRY FEE IS $80 PER SHOOTER FOR REGISTRATIONS RECEIVED BY FRIDAY, JUNE 14. AFTER JUNE 14, REGISTRATION WILL BE STRICTLY ON A "SPACE AVAILABLE" BASIS AND THE ENTRY FEE WILL BE $95 PER SHOOTER. REGISTER EARLY!!

For more information, contact: Tom McCarroll at (713) 419-9414 or tom_mccarroll@yahoo.com.

For directions to the club, visit www.greaterhoustongunclub.com.

****

ONLINE REGISTRATION INFORMATION AT: http://www.hgs.org/eventskeetshoot

If you prefer to pay by credit card, please call the HGS office, (713) 463-9476.

If you prefer to pay by check, mail this form with a check made out to HGS to:

Tom McCarroll, 2668 HWY 36S #329, Brenham, TX 77833

Name: _____ Company: _____

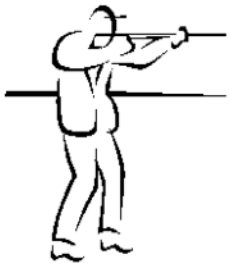
Email: _____ Phone: _____

Preferred time: (circle one) 9:00 10:00 11:00 12:00 Ammo: (circle one) 12 gauge 20 gauge

Registration Fee: $ _____ + Sponsor Contribution: $ _____ = Total: $_____

If you wish to register as a squad, please return forms for all squad members together.

ALL SHOOTERS WILL BE REQUIRED TO SIGN A DISCLAIMER OF RESPONSIBILTY BEFORE THEY WILL BE ALLOWED TO SHOOT!



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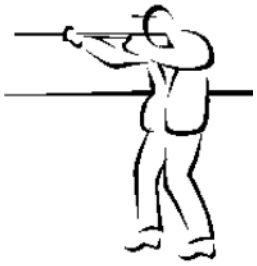

SPONSORSHIP APPLICATION

Ammo Sponsor- $ 750.00

- Paid squad of 5 Shooters
- Recognized signage at the Club
- Recognition at Awards

Beverage Sponsor- $ 750.00

- Paid squad of 5 Shooters
- Recognized signage at the Club
- Recognition at Awards

Field Sponsor - $ 750.00

- Paid squad of 5 Shooters
- Recognized signage at the Club
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Flurry Sponsor- $ 750.00

- Paid squad of 5 Shooters
- Recognized signage at the Club
- Recognition at Awards

Cigar Sponsor - Sold

- Paid squad of 5 Shooters
- Recognized signage at the Club
- Recognition at Awards

To sponsor, please indicate your sponsorship level _____ with payment (payable to HGS) to:
HGS - 14811 St. Mary's Lane, Ste. #250 - Houston, Texas 77079 - Attn: Nina
Or you can email your sponsorship form to Nina@hgs.org

Name _____ Phone_____ Amt. Enclosed_____
Company _____ Email_____
Billing Address _____
Credit Card #_____ Exp. Date_____ Sec. Code#_____
Approved by_____ Date_____

If you would like HGS to invoice your sponsorship please complete the section below:

Invoicing Address _____
Accounting Contact Name _____ Contact Email Address_____
Special Billing Codes_____
Approved by_____ Date_____

Please email your company logo to Nina@hgs.org. Note: Company logos (300+ dpi) must be received no later than MAY 1ST, 2013

If there are any questions, please contact Tom McCarroll—713-419-9414 or tom_mccarroll@yahoo.com

TO REGISTER ONLINE GO TO: https://www.hgs.org/civicrm/event/info?reset=1&id=1298

Marcellus Fairway Program

Exploring Boldly

To date over 1,000 square miles, of the proposed 1,500, have been acquired of the multi-client data consisting of four high quality 3D surveys in the heart of the Marcellus. The CGGVeritas programs will be completed next year with imaging objectives ideal for the Marcellus Shale. Explore boldly with high-quality data in the right location.

Contact: Dennis Langlois
+1 832 351 1052
dennis.langlois@cggveritas.com

Delivering SeisAble Benefits
cggveritas.com/multi-client

CGGVERITAS

Wednesday, May 8, 2013

Black Lab Pub, Churchill Room • 4100 Montrose Blvd.

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

Cost: $25 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.

Michael D. Campbell, P.G., P.H.
I2M Associates, LLC, Houston and Seattle

Henry M. Wise, P.G.
SWS Environmental Services, La Porte,Texas

Hydrogeologic Risks in the Ground-Water Supply of Harris County, Texas: Radioactive Constituents, Natural Gas, and Growth Faults

We have been involved in a number of environmental projects in Harris County where ground water was found to contain radioactive constituents and natural gas, all related in one way or another to the presence of growth faults in the immediate area. Radioactive constituents, including radon-222 and radium-266, taken from selected areas of northwest and south-central Harris County in the early 1980s, exhibited unusually high concentrations. Uranium was reported to be present across Harris County during the United States Department of Energy's Natural Uranium Resource Evaluation (NURE) program in the 1970s and 1980s. We will place these occurrences in a geological context of the associated growth faults in the area. The likely source of these radioactive gases in ground water from the Evangeline Aquifer or below will be postulated.

We have also conducted investigations on selected high-production municipal utility district (MUD) water wells. Two such MUD wells were investigated by downhole closed circuit television (CCTV) and by sampling the produced ground water and headspace of the particular well for natural gas, including methane, ethane, ethylene, propane, propylene, iso-butane, n-Butane, iso-pentane, n-pentane, and hexanes. The results of this sampling will be considered with some discussion regarding the actions taken. Further investigations revealed that another MUD well in the FM-1960 area also contains anomalous natural gas in the produced ground water. Steps were subsequently taken by the particular MUD to remove these contaminants from the produced ground water by adding de-gassing systems at the wellhead. The source of the natural gas produced in ground water from the Evangeline Aquifer or deeper will be discussed. The application of carbon-13 and deuterium in methane to determine the likely source of methane also will be discussed based on samples from a rural water well and a nearby natural gas well located in East Texas.

The distribution of growth faults in Harris County will be discussed as the context of the occurrences of radon-222 and radium-266, uranium, and natural gas; occurrences will also be compared in the context of local infrastructure such as the location of pipelines, permitted and unpermitted landfills, old dumps, and some shallow features revealed by ground-penetrating radar experiments in the moist soils of Harris County, Texas. ■

Biographical Sketches

Mr. Campbell earned a Bachelor's Degree in geology and hydrogeology from Ohio State University in1966 and a Master's Degree from Rice University in geology and geophysics in 1976 via the Mills Bennett Fellowship. He has worked in the United States and overseas in Australia, Southeast Asia, and Africa for American companies on natural resource development and environmental projects. In the United States, he has also been involved in a variety of mining and associated environmental projects. Before entering private practice, he served DuPont Environmental as Regional Technical Manager and Chief Hydrogeologist.

Over the past 40 years, Mr. Campbell also produced a number of EPA-sponsored guidance documents and associated reports involving ground-water resource development and associated contamination assessment and abatement. He has written three technical books, many papers and reports, and has served on a number of editorial boards of the major technical journals in his field. He is a Fellow in the Geological Society of America, a Fellow in the Society of Economic Geologists, a CPG in AIPG, and is a member of other societies, many for more than 40 years. This

HGS Environmental and Engineering Dinner *continued on page 23*

HGS Environmental & Engineering Dinner *continued from page 21*

includes HGS, which published a book on the *Geology and Environmental Considerations] of Alternate Energy Resources* in 1977 under his leadership (see: http://i2massociates.com/geology-and-environmental-considerations-alternate-energy-resources). He is a licensed professional geologist and hydrogeologist in Texas, Washington, Wyoming, Mississippi, and Alaska, and serves as Chairman of the Uranium Committee of the Energy Minerals Division of the AAPG. Mr. Campbell and the members of the EMD Uranium Committee and I2M Associates, LLC contributed the final chapter of the text of the EMD-AAPG Memoir 101 that will be released soon. (see:PressRelease: http://www.i2massociates.com/downloads/AAPG_Memoir_101-July18-2012.pdf). He also has served the legal community as an expert witness and consulting expert on more than 40 cases.

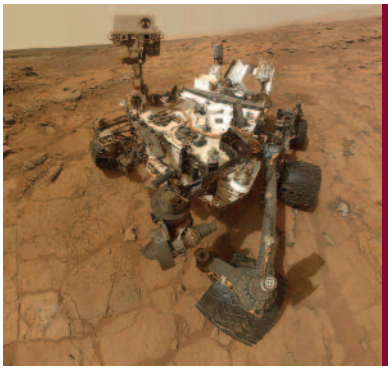
Mr. Wise has more than 30 years of professional experience in geological and environmental remediation. He also has substantial experience in ground-water assessment and remediation projects in Texas and the eastern United States. He also has substantial experience in exploration and production of uranium in Texas. Mr. Wise is a graduate of Boston University, with a Bachelor's degree in geology, and obtained a Master's degree in geology from the University of Texas at El Paso. He is a Licensed Professional Geologist in Texas and Alabama, and is a Certified Professional Geologist from the AIPG. As a long-time member of the HGS, Mr. Wise is Co-Chairman of the Government Affairs Committee and publishes "Governmental Update" in the HGS *Bulletin* every month. In addition, he publishes the semi-weekly blog "The Wise Report" on the HGS and AIPG-TX.com websites. He was a founding member of the Energy Minerals Division of AAPG in 1977 and is a member of the EMD Uranium Committee.

Hot Potato? History of the National Uranium Resource Evaluation / Hydrogeochemical and Stream Sediment Reconnaissance Program

The National Uranium Resource Evaluation (NURE) program was initiated by the Atomic Energy Commission (AEC) in 1973 with a primary goal to identify uranium resources in the United States. When the AEC was abolished by an act of Congress in 1974, the NURE program was transferred to the newly created Energy Research and Development Administration (ERDA). In 1977, Congress terminated ERDA; at that time all its functions, which included the NURE program, were transferred to the new Cabinet-level Department of Energy (DOE).

The Hydrogeochemical and Stream Sediment Reconnaissance (HSSR) program, initiated in 1975, was one of nine components of NURE. Planned systematic sampling for uranium over the entire United States began in 1976 under the responsibility of four DOE national laboratories. In 1977, the NURE program changed from a study area basis such as State, County, or geomorphic provinces to a 1° x 2° quadrangle basis. Out of a total of 625 quadrangles that cover the entire lower 48 States and Alaska, only 307 quadrangles were completely sampled and another 86 quadrangles were partially sampled.

The NURE program effectively ended about 1983-84 when funding disappeared. At this time, the HSSR data consisted of 894 separate data files stored with 47 different formats! The University of Oklahoma's Information Systems Programs of the Energy Resources Institute (ISP) converted only 817 of the 894 original files before their funding ended. The sample archive was transferred from Oak Ridge Gaseous Diffusion Plant (ORGDP) to the U.S. Geological Survey (USGS) in 1985. ■



HGS Guest Night – Saturday, June 8, 2013

Curiosity on Mars: The Latest Results from the First Grey Rocks on the Red Planet

Monday, May 13, 2013

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

Cost: $28 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.

Peter R. Rose
Rose & Associates, LLP

Influence of the Edwards Plateau on Frontier History of the Texas Hill Country

Figure 1: *Generalized geology of the area of "The Reckoning", modified from American Association of Petroleum Geologists, Geological Highway Maps of Texas (1979), and Bureau of Economic Geology, Report of Investigations No. 65, Lower Cretaceous Stratigraphy, Northern Coahuila, Mexico, by C. I. Smith (1970), with permission. County boundaries as of 1880.*

The Edwards Plateau is an immense, high-standing tableland that covers more than 25,000 square miles of west-central Texas and is the geomorphic expression of the thick, resistant Edwards Limestone. Rainfall tends to sink into the permeable limestone terranes on top of the Plateau, rather than run off. Because the clayey formations underlying the porous Edwards Limestone mass are relatively impervious, ground water accumulates in the lower part of the Edwards, forming an extensive regional aquifer up to 300 feet thick. This ground water is the

HGS General Dinner *continued on page 27*

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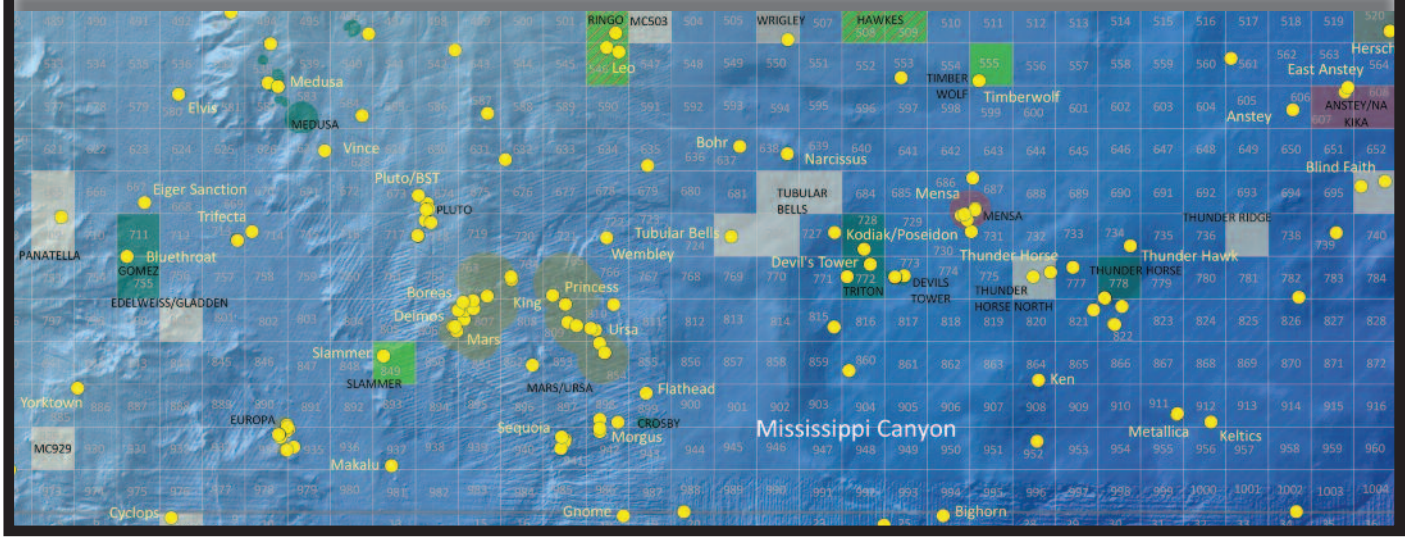


HGS General Dinner continued from page 25

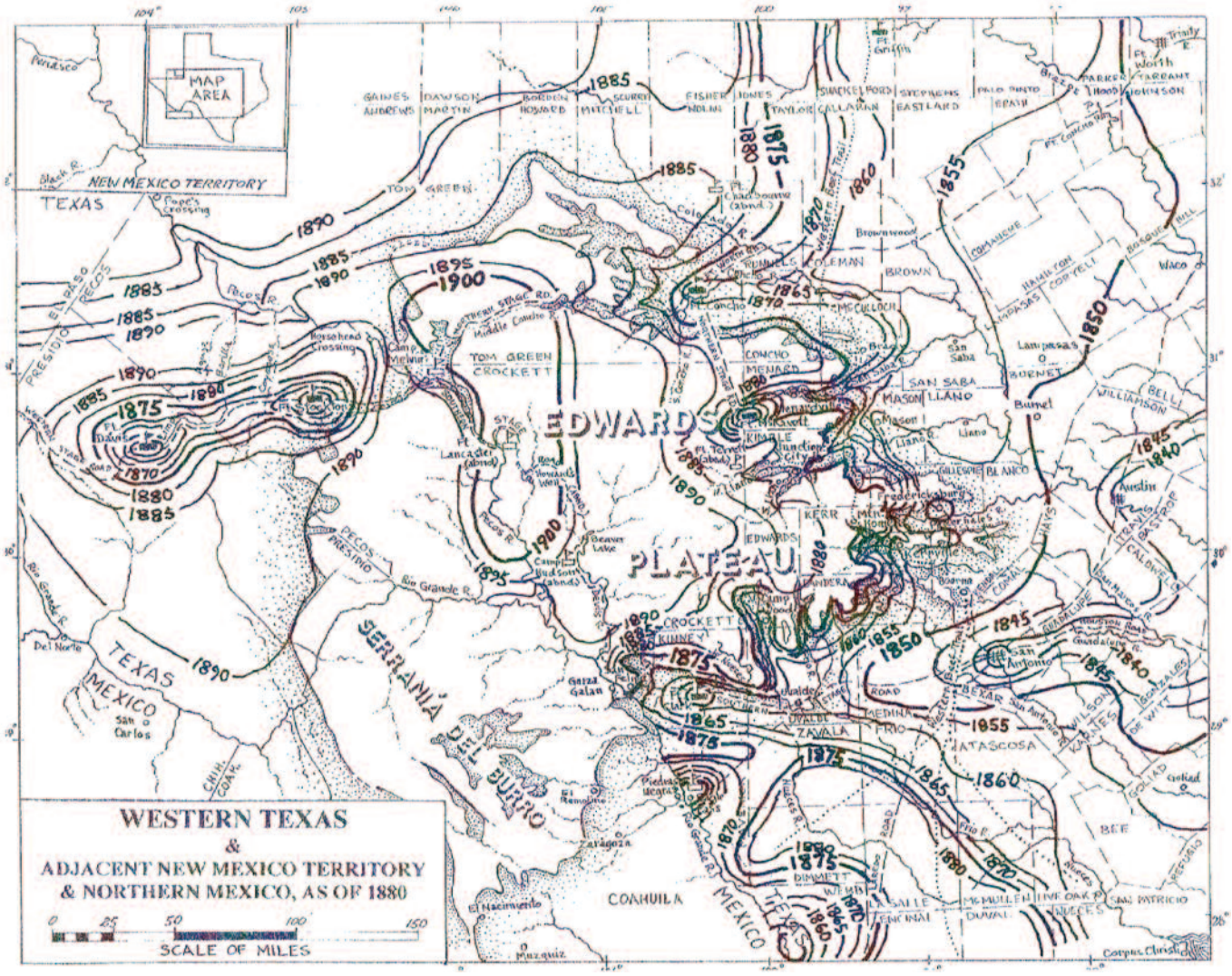


Figure 2: *Edwards Plateau, a barrier to westward settlement; "Civilization Contours" based on dates of establishment of permanent settlement, or organized county government, modified after Rose (2004), with permission.*

source of all the springs around the margins of the Plateau. The consequences of this geology are unusual: a vast, elevated, waterless plain, dissected around its margins by deep, limestone-cliffed canyons, each fed by perennial springs that form the headwaters of all the rivers in west-central Texas.

This singular geologic / geomorphic / hydrologic combination exerted a profound influence on settlement and development of the region during the late 19th century. All frontier settlements were proximal to perennial, spring-fed streams, but the Edwards Plateau itself, because of its rugged margins and the absence of dependable surface water on top, constituted a formidable wilderness barrier to permanent habitation. Early road networks mostly went around the Plateau, and the Western Beef Trail skirted its eastern margins. During the 1870s, Indians who raided southeastward from the High Plains, and northeastward from Coahuila State, Mexico, utilized the flat, thick-turfed plateau uplands as wilderness pathways to fall suddenly upon unsuspecting settlements around the margins of the Plateau. Their presence inhibited permanent Anglo settlement.

In 1873, the U. S. Army began to suppress raids into Texas by Comanche and Kiowa Indians. Even though Kickapoo and Lipan Indians continued to raid from safe-havens in northern Mexico, opportunistic Anglo-Celtic cattlemen and homesteaders began to settle the wide apron of open, stream-laced lands that bordered the Edwards Plateau on the east. Family-based criminal confederations were also attracted to such isolated locations because of the sparse populations, lack of organized government and law, proximity to clandestine livestock markets along the Mexican border, and the adjacent wilderness as a waiting refuge from pursuit by lawmen.

HGS General Dinner *continued on page 29*

HGS General Dinner continued from page 27

Isolated by geology and by-passed by history, the canyon lands around the forks of the Llano River, in unorganized and lawless Kimble County, provided an ideal location for such a confederation of frontier outlaws from 1874. They preyed on neighboring settlers, north-bound trail herds, and stock raisers in adjacent counties, sometimes disguised as Indians. Outnumbering and intimidating law-abiding settlers, they took over the Kimble County government shortly after it was organized in 1876. They robbed stagecoaches repeatedly. They were known to trade stolen livestock regularly in Mexican border markets alongside Mexican Indian raiders, and they may have participated with Mexican Indians in the brutal massacre of four young people of the Dowdy family in Kerr County in 1878.

Sustained campaigns by the Frontier Battalion, Texas Rangers, aided fearful settlers and beleaguered county lawmen, and gradually brought order and law to the region. In 1882 regional railroads were completed that skirted the Edwards Plateau, which put an end to the cattle drives and regional stagecoach lines. The plateau uplands began to be settled in the mid-1880s, when the widespread use of cable-tool drilling and windmills began to provide reliable water sources for livestock and permanent habitations; barbed wire allowed ranchers to control their grazing herds. The frontier era in the western Hill Country of Texas was over. ■

Biographical Sketch

Dr. Peter R. Rose, who earned his Ph. D. in geology at the University of Texas, has been a professional geologist for 53 years. He specializes in petroleum geology, Exploration and Production risk analysis, and mineral economics.

Before going on his own in 1980 as an independent prospector and consultant, he worked for Shell Oil Company, the United States Geological Survey, and Energy Reserves Group, Inc. After 10 years as an internationally-recognized authority on the evaluation of exploration drilling ventures, in 1998 he founded Rose & Associates, LLP. Dr. Rose retired in 2005; the firm continues its consulting business.

In 2001, Dr. Rose wrote a seminal geological monograph on the Edwards Limestone of Texas. His book, *Risk Analysis and Management of Petroleum Exploration Ventures* is now in its 7th printing, and has been translated into Chinese, Japanese, and Russian. He has authored or co-authored more than 75 articles on a wide variety of geological topics.

In 2005 he was elected the 89th president of the American Association of Petroleum Geologists.

In 2006-07, he was a member of the National Petroleum Council, involved with their summary of the global energy situation, *Facing the Hard Truths about Energy*, and also participated in successful efforts to encourage the U. S. Securities and Exchange Commission to modernize its rules that govern estimation and disclosure of oil and gas reserves.

Dr. Rose is a 5th-generation Texan. He and his wife, Alice, have five children and eight grandchildren, and divide their time between Austin and their El Segundo Ranch near Telegraph, Texas. In retirement, he has taken up a new career as a historian. In September 2012, Texas Tech University published his book, *The Reckoning: the Triumph of Order on the Texas Outlaw Frontier*, about the coming of order and law to the western Hill Country and Edwards Plateau regions of Texas in the period from1873 to1882.

Monday, May 20, 2013

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

Cost: $28 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.

Martin J. Oldani, Thomas M. Maher, and Joe Versfelt
Apache Egypt Companies, Cairo, Egypt

Rodney J. Eichler, and David Monk
Apache Corporation, Houston, Texas

The Apache Egypt Story: 18 Years of Success and Growth in Egypt's Western Desert, 1994-2012

Apache Corporation, founded in 1954, is one of the largest independent oil and gas exploration and production companies in the United States, with operations in the United States, Canada, Egypt, the United Kingdom North Sea, Australia and Argentina. Apache's global production averaged over 800,000 barrels of oil equivalent (BOE) per day during the fourth quarter of 2012. Over the past 18 years, Apache's Egypt Region has grown to be a significant contributor to this total, having closed out 2012 with fourth quarter average daily production at over 161,000 net barrels of oil equivalent (BOE), just over 20% of Apache's total production.

Apache entered Egypt in 1994 by acquiring a 25 percent non-operated interest in the Qarun Concession with Phoenix Resource Companies. After several encouraging early discoveries, Apache increased its exposure to the country's multiple producing basins via a merger with Phoenix in May 1996. This action tripled Apache's interest in the Qarun Concession and added a 40 percent interest in the Western Desert's prolific Khalda Concession. By year-end 1996, the company held over 6 million net acres in Egypt, had booked reserves of nearly 59 MMBOE, and had net production of 12,000 barrels of oil per day. In contrast, at the end of 2012 and on the heels of producing a net 516 million barrels of oil since 1996 (**Figure 1**), Apache Egypt's booked reserves stood at just over 273 MMBOE.

In 2001, Apache's $410 million Repsol acquisition made them the largest producer of liquid **HGS International Dinner** *continued on page 33*

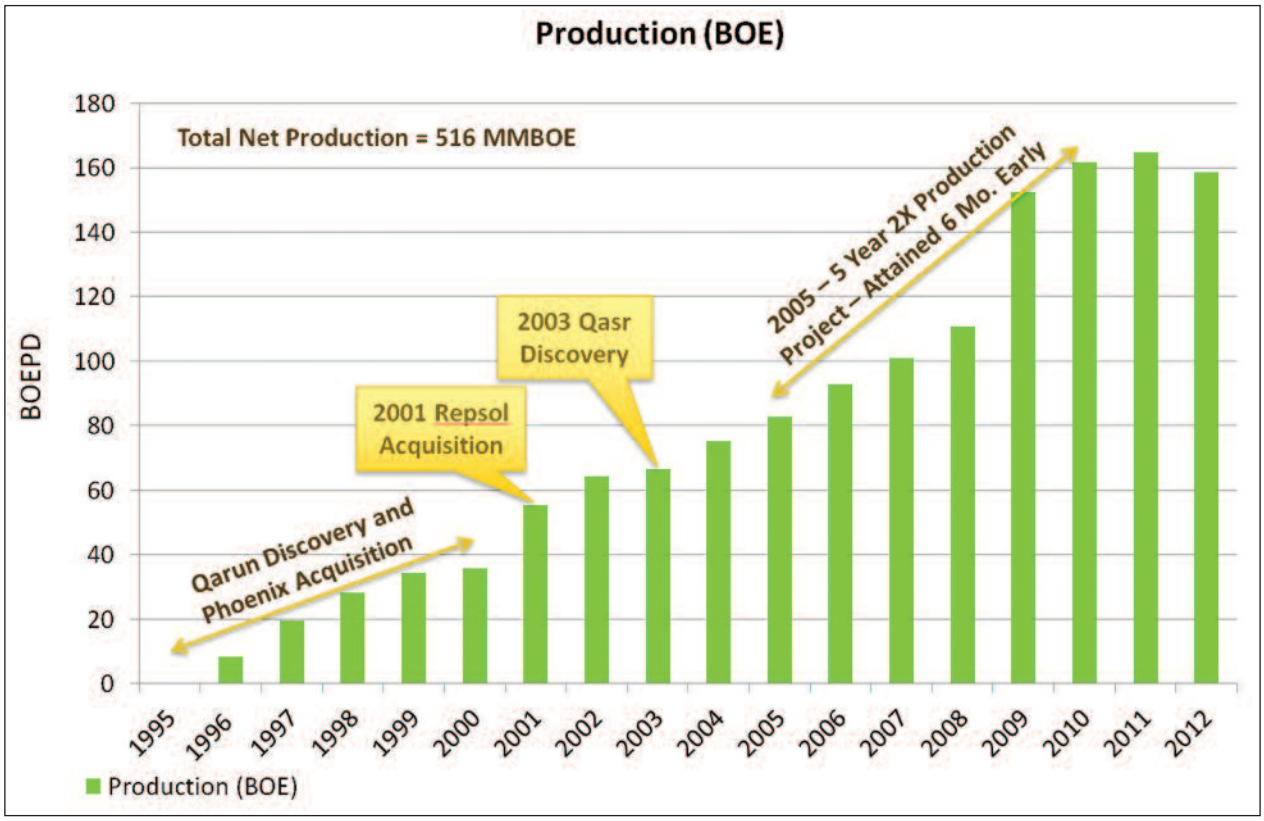


Figure 1. *Apache net production*

continued from page 31

hydrocarbons in Egypt's Western Desert and the second largest producer of natural gas. Apache became the operator in seven Western Desert concessions, the most significant of which was and still is the prolific Khalda/Khalda Offset Concession. With increased interests and a very active exploration and development program, Apache also became Egypt's largest U.S. investor. In mid-2003, Apache experienced another step change in Egypt with the drilling of Qasr 1X, located in the south-central portion of the Khalda Concession. It remains the largest discovery in the company's history and in the Western Desert of Egypt. Logs identified a 670-foot hydrocarbon column. Reserves for the 13,000-acre structure, after the drilling of only three wells, were estimated to be 2 trillion cubic feet of natural gas and 20 to 70 million barrels of condensate.

At the close of 2012, Apache remains the largest producer in the Western Desert and has grown to be the second largest producer in all of Egypt. Apache holds 9.7 million gross acres in 23 concessions, 20 with established production (Figure 2). Apache has built the largest onshore 3D seismic database in Egypt, with 71 surveys that cover 44,200 km2, an area the size of Vermont plus New Hampshire. The company is the most active driller in Egypt; Apache has drilled over 2,151 wells in Egypt since 1995 (Figure 3). Apache's activities are spread across eight petroleum basins in the western desert, and are operated by three business units: Apache Egypt, Khalda Petroleum Company (NW), and Qarun Petroleum Company (SE). Reservoir objectives consist of Eocene carbonates, interbedded Cretaceous and Jurassic sandstones and dolomites, and Paleozoic sandstones, typically targeted in stacked intervals.

Apache's success in Egypt can be attributed to several factors: strong financial commitment, effective working relationship with the Egyptian government, evolving geophysical technology, favorable geology, a consistent aggressive exploration and development drilling program, hydraulic fracturing technology, and full-field development water-flood programs. By the end of 2012, Apache had invested $10.8 billion in Egypt. In 2012, Apache drilled 58 (61%) of the 96 exploration wells drilled by the industry in Egypt, with a 53% success rate, a trend that has been consistent for a number of years. Water-flood operations are active in 58 fields with over 250 MBW injected per day. As a result of Apache's success in Egypt, not only has an extensive 3D seismic database been built, but extensive infrastructure and a high degree of technical expertise as well. The two joint-venture operating companies are well established, with the ability to drill and complete wells rapidly, at low operating costs, and high drilling success rates. Khalda and Qarun regularly book new reserve additions at low capital costs and maintain a consistent inventory of opportunities for the future. Apache has had the good fortune to make a number of significant field discoveries over the years, the most significant of which is the aforementioned Qasr Field, with 56 MMBO and over 1 TCFG of

HGS International Dinner *continued on page 35*

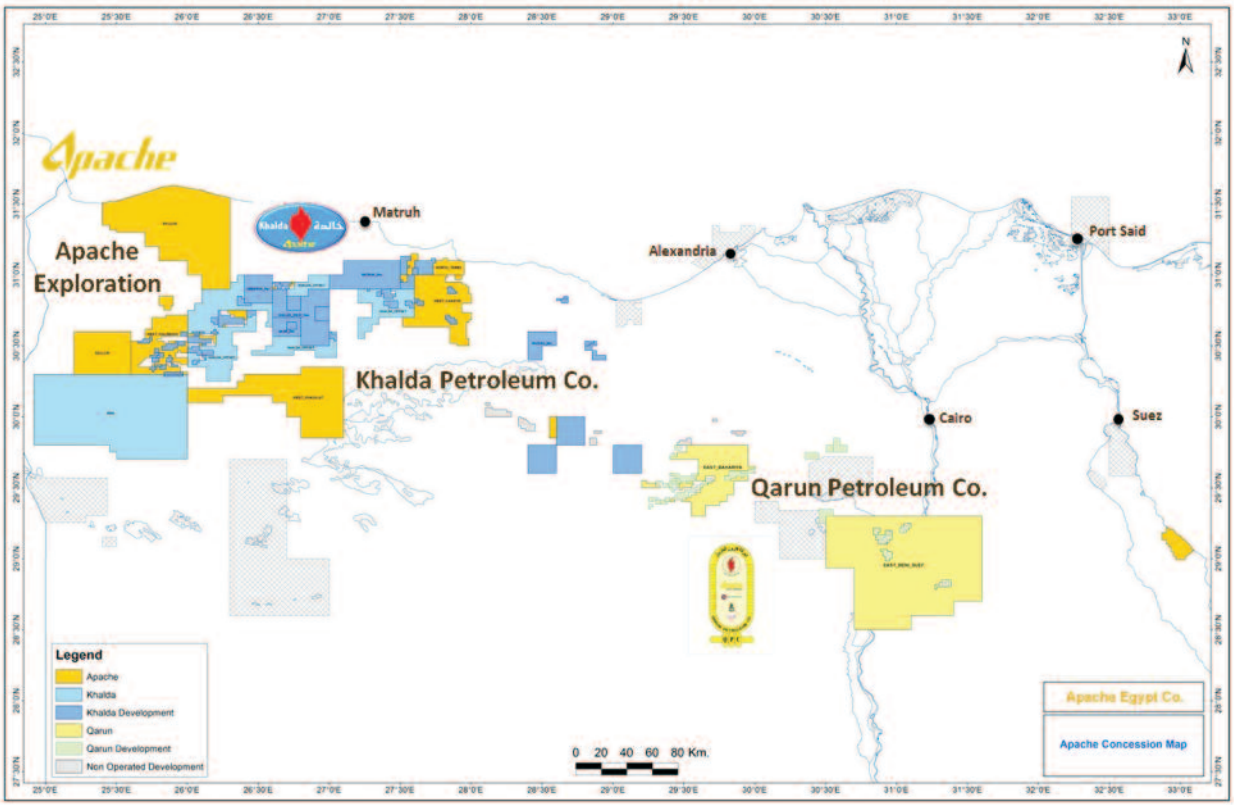


Figure 2. *Apache Egypt concessions*

 continued from page 33

production through 2012. Other examples with production figures through 2012 include Qarun Field, where it all started (67 MMBO), Jade Field (12 MMBO, 127 BCFG), Heba Ridge (21 MMBO), Asala Ridge (17 MMBO), and ED-NED Field (17 MMBOE). Most recently, since the acquisition of the Abu Gharadig-Razzak development leases from BP in late 2010, 10 new field discoveries have been drilled and extensive development drilling and waterflood programs have been put in place as of the end of 2012. These actions raised production from 22 MBOE/D to over 45 MBOE/D on these properties.

Apache is well positioned for continued exploration success in Egypt's Western Desert. The track record for industry exploration success rates remain high at over 50%. Oil quality is good and condensate-rich gas is typical. A large number of reasonably sized (5-20 MMBOE) prospects remain and 3D seismic continues to improve imaging of new and deeper prospects. The Western Desert creaming curve continues to trend upward through time which indicates that the province is not yet fully mature. In 2013 Apache plans to continue to exploit these remaining opportunities aggressively with 66 exploration and approximately 200 development wells planned. ■

Biographical Sketch

Martin J. Oldani is a geologist currently on assignment in Cairo, Egypt with Apache Corporation as Exploration Manager for Apache Egypt's operating company, Khalda Petroleum. While in Egypt he has filled several roles with Apache Egypt, initially in June 2000 as a Senior Geological Advisor with Apache Egypt's operating company Qarun Petroleum, from 2001-2010 as the Exploration Manager for Qarun Petroleum, and since January 2010 in his current capacity at Khalda Petroleum. During his tenure in Egypt, he has continuously been in a leading role and contributed to Apache's successful exploration and development efforts across the Western Desert of Egypt. Mr. Oldani has been with Apache for the past 22 years, where he worked in the Gulf Coast Onshore Region and as an explorationist involved with Apache's exploration and development activities in South Louisiana and the Upper Texas Gulf Coast prior to his move overseas. Prior to joining Apache, his career focus was primarily exploration in South Louisiana, with side efforts offshore in the Gulf of Mexico, in South Texas, and in the East Texas Basin with Sandefer Oil and Gas, Wintershall (Tricentrol), Texas Brine Corporation's Solar Petroleum subsidiary, and with First Mississippi Corporation's First Energy subsidiary.

Throughout his career, Mr. Oldani has been very active with professional society activities. He is a State of Texas Licensed Professional Geologist, and an American Association of Petroleum Geologists' Certified Petroleum Geologist, and he remains an active member of the AAPG, EAGE, and HGS. He has served on numerous HGS and AAPG convention committees, in the AAPG House of Delegates, and was an HGS President's Award Recipient for 1991-1992. He also sat on the Baylor University Geology Advisory Board from 1998-2000. Mr. Oldani earned both his degrees, a Bachelor of Science in 1979 and Master of Science in 1988 in geology from Baylor University.

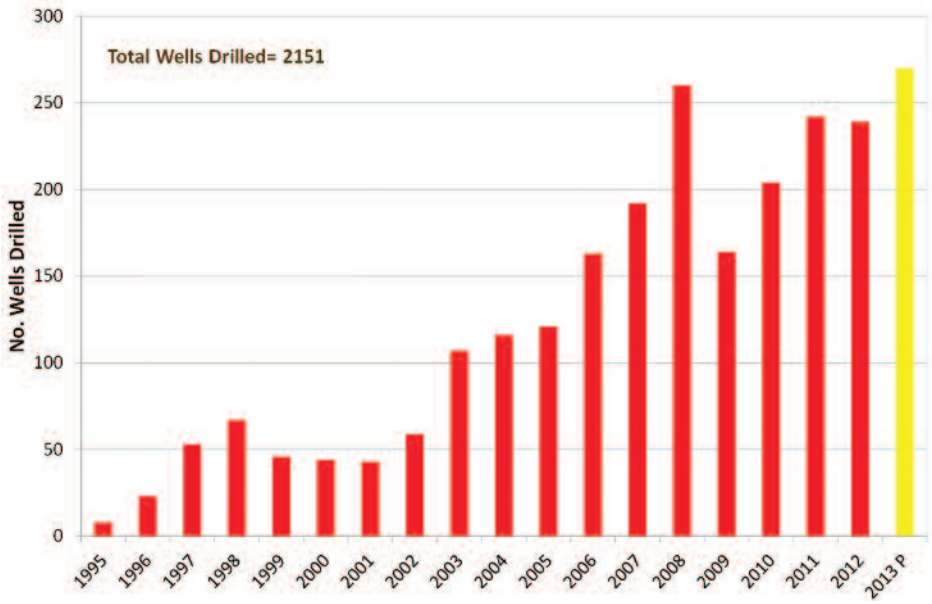


Figure 3. *Apache Egypt wells drilled*

Back to Table of Contents

Tuesday, May 28, 2013

Hyatt North Houston (former Crowne Plaza Hotel - Greenspoint)
425 North Sam Houston Pkwy E

Social 11:15 AM, Luncheon 11:30 AM

Cost: $31 pre-registered members; $35 for 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 Northsiders Luncheon Meeting

Paul Mann
University of Houston

Mesozoic to Recent Tectonic Events and Petroleum Potential of the Offshore Nicaraguan Rise and Onland Areas of Central America, Jamaica, and Haiti

The Nicaraguan Rise in the Caribbean is one of the least explored, offshore carbonate margins to remain in the western hemisphere. As a starting point, there will be a review of what we know about the geologic and tectonic history of the surrounding onshore areas of Central America, Jamaica, and Haiti. This information was then used to better understand seismic reflection and well data from the offshore Nicaraguan Rise. Key events to be covered include:

- Formation of the large late Cretaceous Caribbean igneous province and overlying deepwater sediments;
- Suturing of the Caribbean igneous province with arc and continental rocks in northern Central America;
- Widespread extension and rift formation in the early Cenozoic; and
- Development of the Nicaraguan Rise carbonate platform.

Known and potential source and reservoir rocks associated with each of these events will be discussed. ■

Biographical Skecth

Paul Mann is a professor of geology at the Department of Earth and Atmospheric Sciences at the University of Houston. He was previously a senior research scientist and lecturer at the University of Texas at Austin. He received his Bachelor of Arts in geology from Oberlin College and his Ph.D. in geology from the State University of New York at Albany. His main interests are tectonics, basin analysis and petroleum geology. He is the principal investigator of an oil industry-funded consortium at the University of Houston called "Caribbean Basins, Tectonics, and Hydrocarbons" that employs 25 University of Houston graduate and undergraduate students who work on a variety of research projects in the Gulf of Mexico, Caribbean, and northern South America region.

AAPG GEOSCIENCES TECHNOLOGY WORKSHOP

Focused Workshops to Enhance Your Career

Geomechanics and Reservoir Characterization of Carbonates and Shales

16-17 July 2013 • Baltimore, Maryland USA

The goal of this intensive two-day workshop is to engage geologists, geophysicists, engineers, and geochemists in a lively, multi-disciplinary discussion of new findings, lessons learned, and emerging ("young") technologies related to shale and carbonates geomechanics and reservoir characterization as they relate to finding sweet spots, mapping fractures and fracture behavior, optimizing hydraulic fracturing, understanding fracturing fluid behavior, selecting proppants, optimizing horizontal drilling and staged completions. The focus will be on established and emerging plays.

Topics and themes:

- Rock mechanics of shales and carbonates
- Variability of geomechanical properties in shales and carbonates
- Sequence stratigraphy
- Fracture sizing and orientation
- Fracture behavior
- Chert behaviors
- Geomechanics and reservoir fluid behavior(s)
- "Must have" core studies
- Seismic imaging and reservoir characterization
- Cluster analysis, neural networking, mathematical methods and reservoir modeling
- Geochemistry and reservoir characterization

Reservoir Compartmentalization and Connectivity: Multiple Methods for Shales, Carbonates, Deepwater

6-7 August 2013 • Houston, TX

The goal of this workshop is to bring together multiple methods of understanding and describing reservoir connectivity and compartmentalization across different plays and reservoir types, including shales, carbonates, and deepwater plays. Presentations will focus on describing and identifying the factors that give rise to both connectivity and compartmentalization, and will look at geological models, as well as geophysical interpretations and engineering models.

Topics include fluvial architectures, predicting facies changes, fluid flow models, thermodynamic modeling, seismic imaging, and reservoir characterization.

Examples will include Jubilee (offshore Ghana) and the Mississippian Lime (chat), as well as other illustrative and instructive examples.

INFORM – DISCUSS – LEARN – SHARE • THE AAPG GTW EXPERIENCE

For information on these AAPG GTW's, please log on to our website at http://www.aapg.org/gtw.

Wednesday, May 29, 2013

Petroleum Club • 800 Bell (downtown)
Social 11:15 AM, Luncheon 11:30 AM

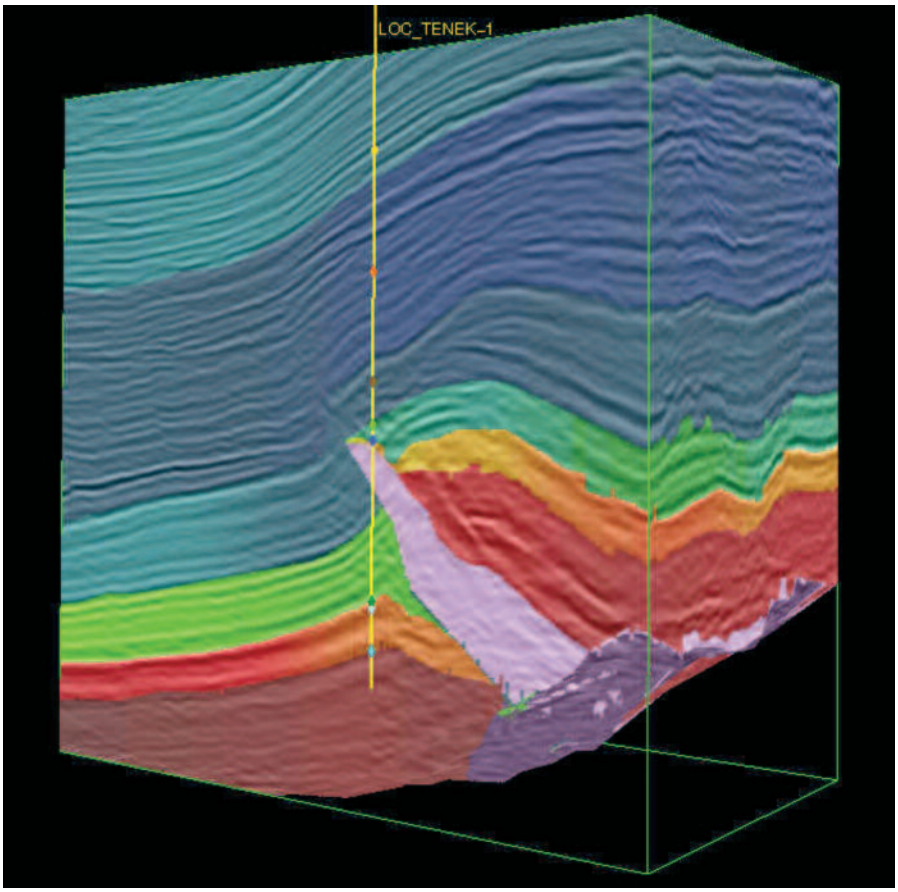
Cost: $30 pre-registered members; $35 for non-members/walk-ups; Emeritus/Life/Honorary: $15; Students: FREE

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.

Peter Bartok
Bartok Inc.

The Geologic Development of Reforma, Southern Mexico

The Reforma Oil Province produces the bulk of the light oil consumed in Mexico. The Reforma geologic region of México is unique to the Gulf of Mexico. The well-documented Gulf of Mexico Mesozoic salt and carbonate sequences persist into the Reforma region. However, in Reforma, the typical Gulf passive margin facies were overprinted by Pacific plate-induced transform faults and compressional systems during the Paleogene and Neogene. The region is further complicated by the placement of an allochthonous terrain called the Chiapas Massif during the Mesozoic and uplift of the terrain during the Tertiary. This makes the basin structurally complex, yet allows for the development and preservation of giant fields. The study will review the general sedimentation patterns of the region, the structural development of the region, comment on the hydrocarbon habitat, and offer some insights as to its future potential.



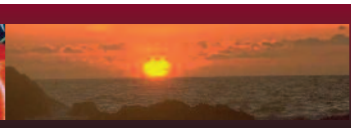
3-D cube that shows the compression at Reforma

The Reforma region corresponds to the Maya tectonic block. Studies have shown that the block has been displaced to the south by approximately 1,000 kilometers. The exact timing for juxtaposition of the Chiapas Massif onto the Maya Block, the subsequent interplay with the Chortis Block, and the subduction of the Cocos Plate are also discussed. ■

Biographical Sketch

Peter Bartok has worked as a consultant for Bartok Inc. for 15 years. Previously he was at BP for 10 years where he was Project Manager for Latin America and US Chief Onshore Geologist. He has worked on exploration and production projects in over 40 basins in the world with special emphasis on Latin America. As a consultant Peter worked five years with PEMEX. His current efforts focus on the application of rock physics to exploration in the Gulf of Mexico region both for conventional and unconventional resources. Peter recently joined Petroskills as an instructor of Seismic Interpretation and Structural Geology where he will teach the courses in both English and Spanish. Peter was trained as a geologist and received his Bachelor's and Master's Degrees from the State University of New York at Buffalo. He has worked as a geophysicist for the past 20 years.

May 2013



Sunday	Monday	Tuesday	Wednesday
	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.**		1
5	6	7 **HGS Board Meeting** *6 p.m.*	8 **HGS Environmental & Engineering Dinner Meeting** *"Hydrogeologic Risks in the Ground-Water Supply of Harris County, Texas: Radioactive Constituents, Natural Gas, and Growth Faults," Michael D. Campbell and Henry M. Wise Black Lab Pub, Houston, TX, Page 21*
12	13 **HGS General Dinner Meeting** *"Influence of the Edwards Plateau on Frontier History of the Texas Hill Country," Peter R. Rose, Westchase Hilton, Houston, TX, Page 25*	14	15
19 **AAPG Annual Convention and Exhibition** *Pittsburgh, PA*	20 **HGS International Dinner Meeting** *"The Apache Egypt Story: 18 Years of Success and Growth in Egypt's Western Desert, 1994-2012," Martin J. Oldani, Westchase Hilton, Houston, TX, Page 31*	21	22
26	27	28 **HGS Northsiders Luncheon Meeting** *"Mesozoic to Recent Tectonic Events and Petroleum Potential of the Offshore Nicaraguan Rise and Onland Areas of Central America, Jamaica, and Haiti," Paul Mann, Hyatt North Houston, Houston, TX, Page 37*	29 **HGS General Luncheon Meeting** *"The Geologic Development of Reforma, Southern Mexico," Peter Bartok, Petroleum Club, Houston, TX, Page 39*


GeoEvents

Thursday Friday Saturday

2	3	4
9	10	11
16 **HGS Continuing Education Unconventional Resource Evaluation and Exploitation – A Practical Approach** *8:30 a.m. – 11:30 a.m.* *Marathon Oil Tower, Houston* *Page 4*	17 **Also on the 16th SIPES Luncheon Meeting** *"Quantitative Seismic Geomorphology: Revolutionizing our Picture of the Paleo-Earth," Dr. Lesli J. Wood, Houston Petroleum Club, Houston, TX, Page 53*	18
23	24	25
30	31 **You can make your reservations NOW online at ww.hgs.org**	**Members Pre-registered Prices:** General Dinner Meeting..... $28 Nonmembers & walk-ups ..... $35 Env. & Eng. ..... $25 Luncheon Meeting ..... $30 Nonmembers & walk-ups ..... $35 International Explorationists ..... $28 North American Explorationists $28

Upcoming GeoEvents

August 12-14, 2013
Unconventional Resources Technology Conference
Colorado Convention Center
Denver, CO

September 11-12, 2013
12th PESGB / HGS Conference on African E & P
London, UK

October 12-15, 2013
2013 AAPG Mid-Continent Section Bi-Annual Meeting
"New Technologies in the Mid-Continent"
Wichita, KS

November 6-7, 2013
Applied Geoscience Conference
Interdisciplinary Micro to Macroscale Geomechanics
Westin Memorial City
Houston, TX

April 6-9, 2014
AAPG Annual Convention & Exhibition
Houston, TX

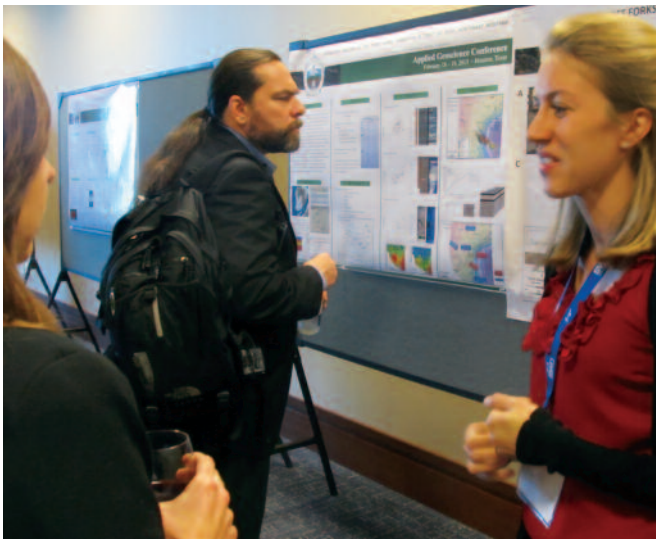
2013 Mudrocks Conference

The 2013 HGS Applied Geosciences aka "Mudrocks" Conference (AGC) entitled "Integrated Approaches to Unconventional Reservoir Assessment & Optimization" was a great success! The sold-out event of 500+ attendees spent over two days immersed in the technical presentations, professional camaraderie, insights, core displays, vendor booths, and student poster sessions.

The Conference presentations were organized as follows:

Part 1: Outcrop to Subsurface Characterization
Part 2: Emerging Plays
Part 3: Mudrock Systems Characterization
Part 4: Reservoir Characterization towards Optimized Stimulation and Production

Check in for the Mudrocks Conference February 18



Ross Peebles looks at the student poster session at the Mudrock Conference

Dr Calum Macauley, Shell showing speaker award and the log for the IONA-1 test well

In addition, the event included a Sunday evening Technical Presenter Reception, a Monday evening Attendee / Sponsor Reception that included university student poster sessions and Consortium and company core materials workshop. Monday and Tuesday offered luncheons and, during the day on Tuesday, university student poster presenters and industry core materials were again available.

The HGS AGC Mudrocks event provides a service to our industry, in promoting the communication of knowledge of advanced unconventional reservoir characterization, assessment, and optimization of unconventional mudrocks currently being developed by the energy and service industry, government and university.

This event genrates income for the HGS professional organization to provide services for their member community, the university community in the form of scholarships, and for community outreach in geosciences. For the oil and gas industry it offers communication of technical advances. ■

Gretchen Gillis at the Saudi Aramco booth at Mudrocks Conference

Attendees ready for a full day of mudrocks talks

New shale technologies from vendors

Sincere thanks to each one of the AGC Mudrocks Committee members for their extraordinary personal contribution of time and effort to the success of the 2013 Conference!

Frank Walles, Talisman Energy
Mike Cameron, Hess Corporation
Bruce Martin, Baker Hughes
Dave Tonner, Weatherford
Greg Moredock, Core Laboratories
Paul Collins, Statoil
Kathy McDonald, Southwestern Energy
Mike Van Horn, Newfield Energy
Randy LaFollette, Baker Hughes
Steve Macalello, ConocoPhillips
Simon Hughes, Weatherford
Claudia Hackbarth, Shell
Amy Garbowicz, Shell
L. Taras Bryndzia, Shell
Harris Cander, BP
Paul Babcock, Sabine Oil & Gas LLC
Wayne Camp, Anadarko Petroleum
Obie Djordjevic, Apache
John Breyer, Marathon
Heather Davey, Wintershall/CSM
Nina Hoeny, HGS
Crystal Alavarces, Weatherford
Roxanna Irizarry, Devon Energy
Bruce Woodhouse, Conestoga-Rover & Assoc.
Marc Viola, Conestoga-Rovers & Associates
Gretchen Gillis, Aramco Services

Kevin Bohacs during a break at the Mudrocks Conference

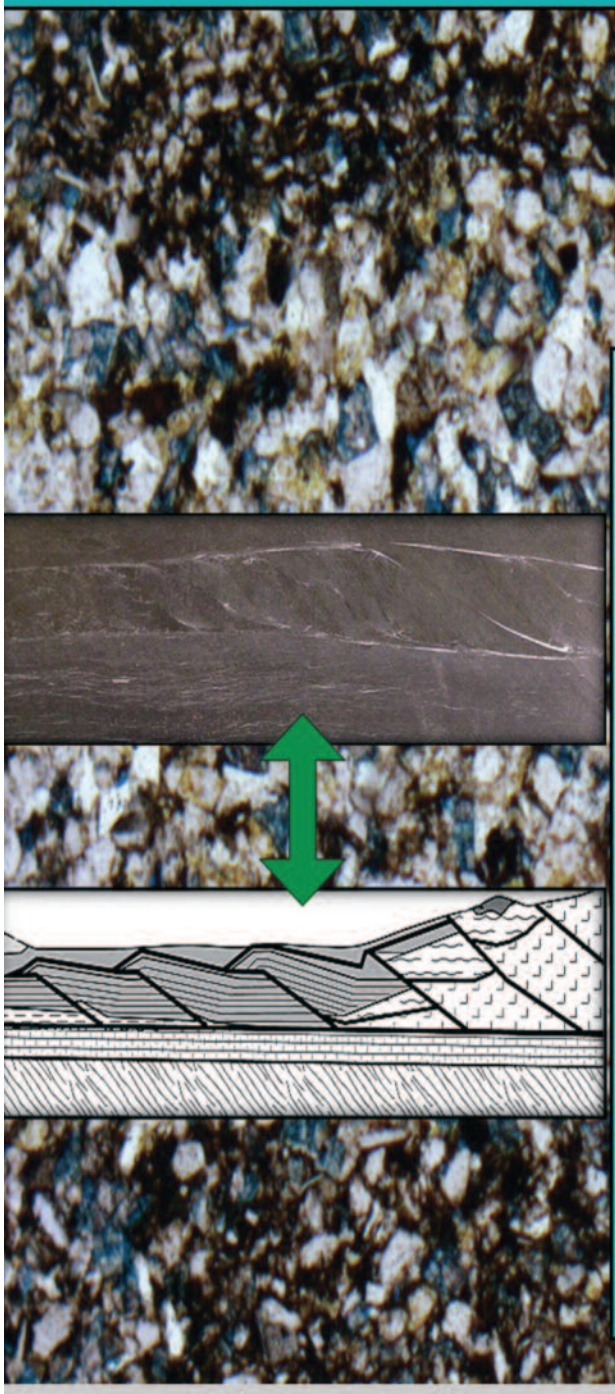
Poster session on the Niobrara formation

Randy Miller accepts speaker award at the 2013 Mudrocks Conference from Bruce Hart

Applied Geoscience Conference

Interdisciplinary Micro to Macroscale Geomechanics

November 4 - 5, 2013



WESTIN MEMORIAL CITY
945 Gessner Road
Houston, TX 77024

Geomechanical Approaches for Optimization of Unconventional Reservoirs

Geomechanical rock properties are dependent on factors from the nano-pore scale to the seismic scale. Examining case studies where an interdisciplinary approach was utilized to understand the value of geomechanics at all reservoir scales is fundamental to further characterization of unconventional reservoirs.

Day 1 sessions will focus on:

- Petrophysical & Geomechanical Integration
- Engineering & Geomechanical Integration

Day 2 sessions will focus on:

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- Dedicated signage during Conference reception
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Program - $5,000

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- 2 complimentary Conference registrations
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- Dedicated signage during Conference

Speaker Reception - $3,500

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

Lunch - $2,500

Availability: 5 of 5

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

Wifi - $1,500

Availability: 1 of 1

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Coffee - $1,000

Availability: 4 of 4

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PESGB

The 12th PESGB/HGS Conference on African E&P
Wembley Stadium, London, September 11th-12th 2013

The 12th PESGB/HGS Conference on African E&P

Africa: Success in Rift, Sag and Passive Margin Settings

Wembley Stadium, London,
September 11th-12th, 2013

This annual conference, alternating between London and Houston has established itself as the primary technical E & P conference on Africa, with an attendance regularly exceeding 400. There will be about 25 high quality talks plus a large poster session covering E & P in all regions of Africa. Keynote presentations already confirmed include:

Origin of Palaeozoic Sag Basins - Mike Daly (BP)
Cretaceous Fan Fairway of West Africa - Paul Dailly (Kosmos) and Robin Sutherland (Tullow)
Exploring giant turbiditic reservoirs offshore Mozambique - the ENI experience - F. Fonnesu
African Rifts and Source Rocks - Alain Huc

Details of sponsorship opportunities and display booths will be available from Rebecca Dibley at PESGB office: Email: rebecca@pesgb.org.uk or Tel: +44(0)20 7408 2000

Main Conference on 11th-12th. Additional events on Tuesday 10th include a course 'Petroleum Basins of Sub-Saharan Africa' by D. Macgregor, stadium tours, an evening talk and an icebreaker reception. For details see website www.pesgb.org.uk

Registration will open on 1 April 2013 – Early Bird rates will be available

PESGB

Background basins image courtesy of the Exploration Fabric of Africa project compiled in memory of Ed Purdy, a former contributor to many African conferences.

PESGB

Petroleum Basins of Sub-Saharan Africa
Wembley Stadium, London, September 10th 2013

Petroleum Basins of Sub-Saharan Africa

This one day course presented in conjunction with the PESGB/HGS Africa conference but available for separate registration, aims to provide an overview of the tectonic, climatic and topographic controls exerted on Sub-Saharan petroleum systems and resulting hydrocarbon distribution.

The course will concentrate on two main settings, rifts and deepwater turbidite plays, examining the various influences on charge and reservoir in these settings. Short exercises on play cross-sections and petroleum systems charts will be used to segment the lectures on each set of basins, ordered as follows:

Overviews - Plate and Intraplate Tectonic History, Play Development and Exploration History
Pan - African Foreland Settings
Rifts - Karroo, Jurassic, Cretaceous, Neogene
Marginal and Deepwater Plays - SW Africa, Equatorial Margin, NW Africa, East Africa

PESGB Tanqua Karroo field trip, 2007 outcropping turbidite fan systems in foreland setting

Target Audience:
Young Geoscientists working on Africa & experienced staff working within licences and requiring a regional overview or refresher.

The course fee includes:
Lunch and refreshments, USB memory-stick containing non-copyright course material and all stationery.

Registration:
Registration will open early next year and is limited to 50 places.
Registration cost £250 or £75 students*

Please check the website for more information.

www.pesgb.org.uk

*Limited to 5 places, proof of status required

Petroleum Exploration Society of Great Britain, 5th Floor, 9 Berkeley Street, London, W1J 8DW
Tel: +44 (0)20 7408 2000 ♦ Fax: +44 (0)20 7408 2050 ♦ Web: www.pesgb.org.uk ♦ Email: pesgb@pesgb.org.uk

PESGB

12th PESGB/HGS Conference on African E&P
10th-12th September 2013

Preliminary Timetable

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Africa: Success in Rift, Sag and Passive Margin Settings

Wednesday & Thursday, 11-12 September 2013

Wembley Stadium Conference Centre, London

Tuesday 10th – day course – Petroleum Basins of Sub-Saharan Africa, D. Macgregor
Tuesday 10th 6.30 pm talk - West Africa Pre-Salt Rush: new ideas on proven and emerging trends. Fabio Lottaroli, ENI (combined with normal PESGB monthly talk at WEMBLEY)

Wednesday 11th September

8.30	***Registration & Coffee***	
9.20	Welcome and Introduction	*John Austin – President PESGB*
	Session 1: INTRACRATONIC SAG BASINS AND NORTH AFRICA **Session Chairs : Richard Moody, Mike Daly (BP)**	
9.30	KEYNOTE: Palaeozoic Sag Basins	*Mike Daly,* ***BP***
10.00	Oil and gas exploration in the Ghadames Basin of Southern Tunisia	*P. Krois, F.Adouani, K. Pelz & G. Cantarella,* ***OMV***
10.25	Appraising and developing a tight gas reservoir in the Illizi Basin, Algeria.	*K. English, J. Valentine,* ***Petroceltic***
10.50	***Coffee & Poster Presentations***	
11.20	The Tamar Field from Discovery to Production	*D. Needham, J. Hosler, S. Nowak, C. Christensen and J. Ffrench,* ***Noble Energy***
11.45	Sources and pathways of Levant Basin deposits, offshore Cyprus and Lebanon	*J. Fürstenau, J. Comstock, C.J. Lowrey,* ***PGS Norway***
12.10	Oil exploration and ore mineral data: a new model of Tethyan rifting, hydrocarbon maturation, Atlasic thrusting and fluid flow in northern Tunisia.	*A. W. Baird,* ***Univ of Kingston*** *& C. J. Clayton,* ***Mejerda Exploration***
12.35	***Lunch & Poster Presentations***	
	Session 2: WEST AFRICA DEEP WATER TURBIDITE PLAYS **SESSION CHAIRS : Richard Dixon (BP), Fabio Lottaroli (ENI)**	
13.45	KEYNOTE – Exploring the Deepwater Cretaceous Play in West Africa and the Discovery of the Jubilee Field	*P.Dailly,* ***Kosmos***
14.10	KEYNOTE – Post-Jubilee Exploration of African and South American Equatorial Margins	*R.Sutherland,* ***Tullow Oil***
14.35	Influences of Tectonics, Drainage and Sediment Supply on Upper Cretaceous Deepwater Deposits in the Deep Ivorian Basin of Western Ghana and Cote D'Ivoire.	*D. Addis, A. Brown, J. Grant, P. Kline, J. Layman, and P. Towle* ,* ***Anadarko Petroleum Corporation***
15.00	Structural Control of Slope Morphology and Depositional Setting in Parts of the Douala Basin	*T. Akingbade , A. Gogola, G. Olson,* ***Noble Energy*** *and P. Nguema, SNH*
15.25	***Coffee & Poster Presentations***	
16.00	Structural Deformation, Traps and Reservoir Distribution in Deepwater Southern Equatorial Guinea: A Tale of Two Basins	*S. E Thornton, G. Kidd, T. Stellman, P. Mullin and E. Goter,* ***Panatlantic Petroleum***
16.25	Angola – Lower Congo Basin (Blk. 15/06) – Rupelian Channel Complexes & their exploration potential	*P. Giaj-Via, L. Baglioni, Y. Amokrane, B.Yacine, R. Brajucha, M. Mantovani .G. Knezaurek, F. Lottaroli, E.Trincianti, Ahmad W., L. Baruffini ,****Eni E&P***
16.50	Integrated analysis of shallow fluid flow phenomena and hydrocarbon migration in the southern Kwanza Basin, offshore Angola	*C. Serié, M. Huuse,* ***Univ of Manchester****, N. H. Schødt, Maersk, J.M. Brooks, and A. Williams, Fugro NPA.*
17.15	*TBA*	
17.45	***Evening Reception, Entertainment and Exhibits***	

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Thursday 12th September

8.30	***Registration & Coffee***	
	Session 3: WEST AFRICAN RIFTS AND PRE-SALT **SESSION CHAIRS : Shane Cowley (Tullow), Prof. Aberra Mogessi (Geological Society of Africa)**	
9.00	Rifting & opening above a mantle plume in the Central South Atlantic	*D. Quirk, E.Willersely, J.Jeppesen, M. Hertle, M.Raven, M.Howe, A.Madsen, J.Kofoed, M. Winfield, N.Schmidt,* ***Maersk***
9.25	First Commercial Oil Discovery Pre Salt in Onshore Cabinda (Angola), after more than three decades	*A. Viera, M. Rosso, E.Gobbo, M. Pereira, E. Tudisca,* ***Pluspetrol***
9.50	Warp, rift, invert and sag: new insights into the tectono-stratigraphy of Gabon	*R. Crossley, V. Cole* ***CGG****, S.McKenna, T. Kubli, Addax*
10.15	***Coffee & Poster Presentations***	
	Session 4: EAST AFRICAN RIFTS AND PASSIVE MARGIN **SESSION CHAIRS : Shane Cowley (Tullow), Prof. Aberra Mogessi (Geological Society of Africa)**	
10.45	KEYNOTE : African Rifts and Source Rocks	*A.Y. Huc,* ***University Pierre and Marie Curie,***
11.15	The Cretaceous and Cenozoic Palaeoclimatological Evolution of African Hinterlands	*P.J., Markwick,, B.M. Harland,* ***Getech****, P.J. Valdes, D. Lunt, Univ of Bristol*
11.45	Hydrocarbon Migration and Trapping Mechanism in the Lake Albert Basin, Uganda.	*P. Lays, P.Chavagnac and S.Tenepalli,* ***Total Exploration & Production Uganda***
12.10	The Ruwenzori Mtns, Albertine Rift: Thermal evolution on the long run	*F.U. Bauer, U.A. Glasmacher,* ***Heidelberg Univ****., U. Ring, Stockholm Univ., R.W. Grobe, GmbH, V.S. Mambo, Ruwenzori Univ.*
12.35	***Lunch & Poster Presentations***	
	Session 4 continued **SESSION CHAIRS : Andrei Belopolsky (Premier), John Argent (BG Group)**	
13.40	Understanding the structural history of the Livingstone Basin, Malawi Rift	*D. Jones,* ***Surestream Petroleum***
14.05	Geophysical Exploration in the Tanzanian Rift Valleys	*B. Smith, B. Downie, P. Holley,* ***Heritage Oil***
14.30	Why have there been no oil discoveries so far in Tanzania? - How advanced basin modelling may progress their discovery.	*M. C Pereira-Rego,* ***Aminex*** *,A.D. Carr, Global Exploration Services and N.R. Cameron, GeoInsight*
14.55	**Coffee & Poster Presentations**	
15.25	KEYNOTE - The Mamba Complex supergiant gas discovery (Mozambique): an example of turbidite fans modified by deepwater tractive bottom currents.	*Franco Fonnesu –* ***ENI E & P***
15.55	Mozambique and its role in the downfall of Gondwana	*C.V. Reeves,* ***Earthworks****, E.S. Mahanjane, INP*
16.20	Rifting of the Zambezi Delta region, northern Mozambique Basin and its implications for a Jurassic marine source rock	*L. Anderson, A.Caillot, L. Gatter, C. Barrere,* ***CEPSA*** *and E. Mahanjane, INP*
16.45	Closing Address and Invite to Houston, 2014	*Al Danforth, HGS*

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POSTERS

Poster Session : throughout conference	
Strike-Slip Nature of the Structure of the Levant Basin offshore Lebanon	*J. Comstock et al, PGS*
Using sequence stratigraphy and geochemistry to highlight the petroleum potential of the conjugate North-West African and eastern North American margins	*N. Harper et al, Neftex*
The Story of Petroleum Plays in Western Desert, Egypt	*V. de Feo et al , IHS*
Play Fairway Mapping and Risk Assessment of the Sirt Rift Province, Libya	*G. Williams and D. Boote, Lynx/DBS Consulting*
Taoudeni Basin: Frontier exploration in a data-poor basin	*K. Gould et al, Neftex*
Cretaceous Salt Tectonics Of The Douala Basin	*T. Akingbade et al, Noble Energy*
Geometry of Upper Miocene deepwater plays	*S. Baer et al , PGS*
Harper Basin – exploration potential identified from 2D and new 3D seismic data	*R. Masotti et al, TGS*
3D modelling offshore Ivorian Basin, African equatorial margin: Application of a sequence stratigraphic framework in regional exploration screening	*C. Saunders et al, Neftex*
Petroleum Potential of the Offshore Namibe Basin, Angola	*J. Greenhalgh, C.Koch, R.Borsato, PGS*
New insights into South West Africa margin evolution; integrating reconstructions and restorations	*D.A. Paton, M. Mohammed , R.E.L.I. Collier, Leeds Univ, A. Quallington, P. Markwick, Getech*
Use of Public-Source Data to High-Grade Areas For Detailed Exploration: An Example From Offshore SW Africa	*M . Alexander et al, Consultant / IGC*
Defining Frontier Petroleum Systems with Higher Granularity: Examples with Plate Reconstructions of the Atlantic Margins	*W. Dickson et al, DIGS*
A New Structural and Tectonic map of West Africa	*A. Quallington et al, Getech*
Ultradeep Lower Congo basin	*S. Tewari, WesternGeco*
West Africa Pre-Salt Carbonates (title tba)	*A.McAfee et al, CoreLabs*
New insights on the prospectivity of the Morondava Basin, Offshore Madagascar based on new seismic data.	*G. Roberts et al, SpecPartners*
A development and interpretation history of borehole imaging through a range of lacustrine and fluvial successions and the consequences for depositional understanding, Albert Basin, Uganda	*C. Buchan, Task Geoscience*
Structural complexities of the East African rifts and the implications for exploration and production.	*D. Brown, Gaffney Cline*
Variable age of breakup along the Kenya-Tanzania-N Mozambique margin	*A.Danforth et al, ION*
De-risking exploration plays in East Africa: Integrating seismic data with bio and lithostratigraphy	*D.J.A Spofforth et al, Robertson Geospec/CGG*
Hinterland control on East African turbidite plays : The effects of successive regional kilometre-scale uplifts	*D. Macgregor, Surestream/MacGeology*
The tectonic development of Africas elevated passive continental margins and implications for exploration	*P. Green et al, Geotrack*
NW-Namibia´s passive continental margin, thermochronological data and interpretation.	*U. Glasmacher et al, Heidelberg Univ.*
Defining the outer continental shelf beyond 200 nautical miles – extending to the final limits of Africa's oil wealth	*L. Parsons and R. Edwards, Maritime Zone Solutions/Nat. Oceanography Centre*

Warren L. and Florence W. Calvert Memorial Scholarship Fund

The Warren L. and Florence W. Calvert Memorial Scholarship Fund provides scholarships to United States citizens who are graduate students that major in the earth sciences. Each year, half of the earnings of monies invested in the fund are paid out in scholarships, while the remaining half is added to the corpus of the fund. This growth factor, along with donations from individual HGS members, allows the fund to award larger scholarships each year to meet, at least in part, the increasing costs of a college education. This year the fund was also aided by matching funds from the HGS Vendors Corner. For 2012, the fund awarded eight $3500 scholarships and one half-year $1750 scholarship to nine exceptional graduate students.

The HGS and the Memorial Scholarship Fund Board gratefully acknowledge the following contributions to the Fund in 2012. The three categories of contributions are Patron at $500 or more, Donor $100 to $500, and Contributor at less than $100.

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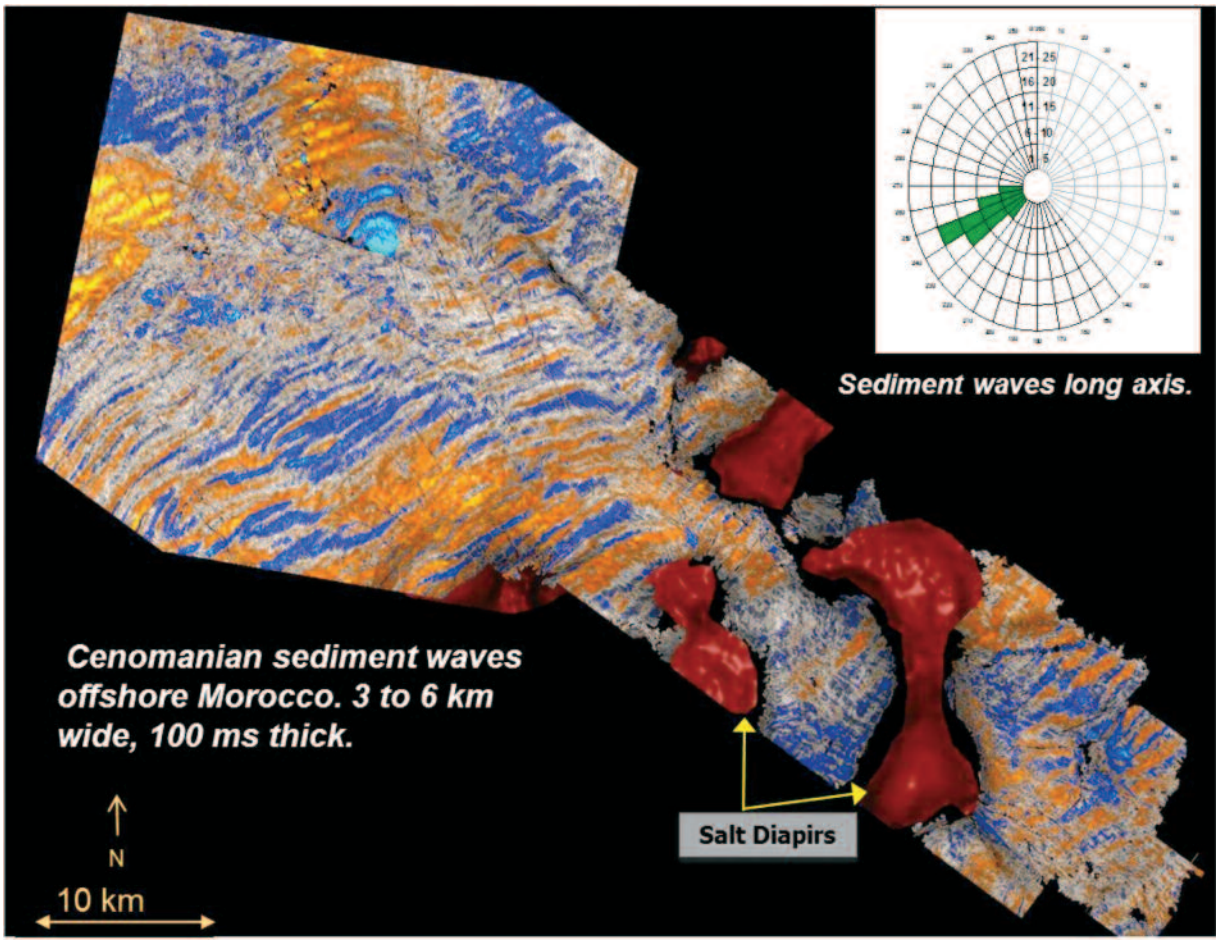
HGS Foundation Scholarship winners (standing left to right) Joey Durkin, Texas A&M University; Marshall Davis, Sam Houston State University; Frasier Liljestrand, Rice University (Maby Scholarship winner); Chelsea Horn, Lamar University; Daniel Sutton, Stephen F. Austin University; Tiffany Kocis, University of Texas; Johnathon Osmond, University of Houston. Seated in front: John Tubb, Jr., Legends Night organizer and Martin Cassidy, HGS President.

SIPES May Luncheon Meeting
Quantitative Seismic Geomorphology: Revolutionizing our Picture of the Paleo-Earth

by ***Dr. Lesli J. Wood,*** *Quantitative Clastics Laboratory Industrial Associates Program, Bureau of Economic Geology, Jackson School of Geosciences, University of Texas at Austin.*



Quantitative seismic geomorphology (QSG), the extraction of quantitative geomorphic insights from predominantly 3D seismic data, is a rapidly evolving discipline that facilitates the study of the subsurface, by use of plan-view seismic images. Where available, these data can be combined with core and well data to add real insight into the processes active in, and the geomorphologic history of, entire paleo-continental margins. A variety of analytical techniques is employed to image and visualize depositional elements and other geologically significant features. Likewise, over a century of study of modern geomorphic systems and processes, enables empirical relationships to be derived from study of reservoir morphologies in seismic data. QSG offers the geoscientist new data to add to their interpretation and renders a detail of spatial understanding not afforded through the sole study of outcrops, wells, and cores. We will look at several case studies in Indonesia, Morocco, and the northern and southern Gulf of Mexico, in both deep water and shallow water systems, and examine the manner in which these insights can be applied to better understand those issues which will affect the exploratory and developmental success in similar deposits.

Fluvial deltaic deposits in Indonesia and the Gulf of Mexico show strong correlation between morphology and lithology, as well as the influence of regional tectonics on reservoir orientations. Deep water mass failure deposits are currently being studied in areas around the world to better understand the processes that control sediment movement from shelf edge to slope to basin floor, as well as the hazards associated with exploration in these boundary zones between shallow and deep water. In addition, seismic analysis of paleo-drainage systems and their deposits offers opportunity to evaluate proxies of climate change. These quantitative data are used to condition reservoir models, assess uncertainty, plan field developments, and design seismic data acquisitions. This talk will discuss the manner in which QSG revolutionizes our picture of the earth, past and present. ■

SIPES Luncheon *continued on page 55*

Remembrance

Laura Rosemary Heath Smith

(November 8, 1935 - February 2, 2013)

Laura Rosemary nee Heath Smith, age 77, of Houston, joined her Lord and Savior on Sunday, the 2nd of February 2013. She was born on the 8th of November 1935 in El Paso to Wayne Edward Heath and Leah Gibson nee McDaniel Heath.

Laura spent most of her growing-up years in San Antonio where she attended Woodlawn Hills Elementary and graduated from Jefferson High School in 1953. There she played the clarinet in the marching band. She attended and graduated from The University of Texas (UT) at Austin with a BA in Fine Arts in 1958. Upon graduation, Laura began her career as a commercial artist.

Laura met her husband, Daniel Lester Smith, while she attended UT. They wed on the 7th of March 1960 and were married for 53 years.

She was a member of Alpha Gamma Delta sorority, Heather & Thistle Society, Clan Donald Society, Houston Geological Auxiliary (HPAC), a lifetime member of the Texas Exes Association, and the founder and past president of The Houston Highland Games Association.

Laura was a devout Christian and shared the gospel with everyone she met. Hence, she never met a stranger. Laura was a long-time member of Sharpstown Baptist Church and began attending Tallowood Baptist Church later in life. A generous and kind-hearted lady, Laura was confident in her convictions, a trait she definitely passed on to her children. It was one of her best qualities.

She was a talented artist, fabulous designer, and accomplished seamstress who made purses, designed costumes and dresses for her children and their friends' weddings, school dance teams, and more.

Active in the Scottish community, Laura was a life-long participant in, and had a true passion for, all things Scottish. Whether it was Scottish history, Scottish highland dancing or bagpipes, Laura knew it all too well; a love she passed on to her children and grandchildren.

Her family lineage meant a great deal to her. Since genealogy was a hobby, she traced her lineage back to the Isle of Skye and Armadale Castle from which her Clan Donald ancestors came.

Laura loved books and was an avid reader. From Agatha Christie to John Hagee to the American frontier, not a day went by when she was not reading something. Because of this, she was a great source of the most trivial of information, which allowed her to finish the daily crossword puzzle in record time. Her Highlander Magazine collection, books about American history, more books on Scottish history, and countless other books are the envy of any historian.

Very active in her grandchildren's lives, Laura was their greatest fan. She was the glue that held her family together, event coordinator extraordinaire. She will be greatly missed.

Her family envisioned she was welcomed into Heaven with Heaven's largest bagpipe band and greeted by her granddaughter, Hailey.

Laura was preceded in death by her parents, Wayne and Leah Heath; brother, James Edward Heath; and grandaughter, Hailey Kathleen Bunch. She is survived by her husband, Daniel Lester Smith; children, James Raymond Smith, Rosemary Smith Bunch, and husband Mark, Heather Smith Vacker, and Laura Leanne, and husband Rick Davis; grandchildren, Petty Officer Third Class Austin Rogers Heath, and wife Heather Smith, Courtney Alaine Vacker, John Daniel Bunch, Laura Victoria Bunch, Ian Jackson Davis and Heath Andrew Davis; great-granddaughter, Kaydin Nicole Smith, as well as numerous nieces and nephews. She was a "mom" and "grandmommy" to many others.

Laura is also survived by her long-time companion and caregiver, Carmen. The family thanks Carmen for all the love and support she provided for so many years.

In lieu of customary remembrances, for those who wish, memorial contributions may be directed to the Houston Highland Games Association, P.O. Box 66, Bellaire, TX, 77402-0066.

Should you hear of a fellow HGS member's or contributor's passing, please send information to editor@hgs.org

SIPES Luncheon continued from page 53

Biographical Sketch

Dr. Lesli Wood is a Senior Research Scientist and Lecturer with the Bureau of Economic Geology, a unit of the John A. and Katherine G. Jackson School of Geosciences at the University of Texas at Austin. She holds a Ph.D. from Colorado State University earned in1992. Dr. Wood has served as national Secretary-Treasurer of SEPM, the Society for Sedimentary Geology and as GCSSEPM president. She is active in the Geological Society of America, the American Association of Petroleum Geologists, and the Geological Society of Trinidad and Tobago. She also served as Chairman of the 2012 Technical Program Committee for the 2012 GCAGS Annual Convention. Dr. Wood sits on the Ultra-Deepwater Advisory Committee for the U.S. Secretary of the Department of Energy and has published widely on the nature of modern and ancient deep-water to shallow-water systems around the world.

After completion of her Ph.D., Dr. Wood was employed for five years with Amoco in their international exploration group, worked South America and was engaged with the integration of seismic attribute technology into Exploration and Production processes. She has been with the Bureau of Economic Geology at the University of Texas at Austin since 1997, where she directs the Quantitative Clastics Laboratory research group. Her research interests are in outcrop and subsurface studies of ancient and modern clastic depositional systems, quantitative seismic geomorphology, shale diapirism, ancient marine landslides, the distribution and influence of gas hydrates on margin development, and the geomorphology of Mars. She has authored numerous papers on these subjects, presented hundreds of lectures and posters at society meetings, universities, and public venues, and won numerous best paper and poster awards.

Thursday, May 16, 2013

Houston Petroleum Club in the Discovery Room, 800 Bell St. (downtown Houston). Social 11:15 AM, Luncheon 12 noon
Reservations Required: *Make reservations by telephone (713-651-1639), fax (713-951-9659), website (www.sipeshouston.org), or e-mail bkspee@aol.com to B. K. Starbuck-Buongiorno by 12:00 noon on Tuesday preceding the meeting. You can now sign up for the meeting online at www.sipes-houston.org, but payment is still required by regular mail or at the door.*
Cost: *$30 for SIPES Members and Chapter Affiliates who register by 12:00 Noon Tuesday; $35 for new registrations at the door. The price for guests, non-members and walk-ins is $35. No-shows will be billed.*

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

HGS Welcomes New Members

New Members Effective April 2013

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David Vance
Paul Wellman
Rachel Storniolo
Kevin Schmidt

STUDENT MEMBERS

Courtney Beck
Alyssa Franklin
Hannah Gutierrez
Joseph Landry
Joseph Oyebanji
Kara Worley

Welcome New Members

National Helium Reserve

The National Helium Reserve, also known as the Federal Helium Reserve, is a strategic reserve of the United States that holds over a billion cubic meters of helium gas. The helium is stored at the Cliffside Storage Facility about 12 miles (19 km) northwest of Amarillo, Texas, in a natural geologic gas storage formation, the Bush Dome reservoir. The reserve was established in 1925 as a strategic supply of gas for airships and in the 1950s became an important source of coolant during the Space Race and Cold War.

The facilities were located to be close to the Hugoton and other natural gas fields in southwest Kansas and the panhandles of Texas and Oklahoma. The natural gas in these fields contains unusually high percentages of helium, from 0.3% to 2.7%; they constitute the largest source of helium in the United States. The helium is separated as a byproduct from the produced natural gas.

Exxon Mobil, with roughly 25% of the nation's helium, is the single largest domestic producer of helium in the United States. The large helium reserves in the LaBarge anticline in Southwest Wyoming were discovered by Mobil in 1962 though production did not begin until Exxon's Shute Creek gas plant came on stream in 1986. This reserve, whose net helium content only ever averaged 0.6% of the produced volume, is now near depletion.

Why do we care about helium? Helium is important in Magnetic Resonance Imaging (MRI) functionality, Space Shuttle launches, and cold-temperature physics laboratories which may use up to 2 MMCF per year.

[Thanks to Dave Miller of Statoil for the tip and Bo Sears for Inter-American Corporation for the information on LaBarge. – Ed]

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.*

AGI Government Affairs Monthly Review (February 2013)

Sally Jewell Nominated for Secretary of the Interior

In February, President Barack Obama nominated Recreational Equipment Inc. (REI) Chief Executive Officer Sally Jewell to serve as the next Secretary of the Interior. Jewell would replace outgoing Secretary Ken Salazar who served during Obama's first term.

As Secretary of the Interior, Jewell would oversee the National Park Service, the Bureau of Land Management, the United States Geological Survey, and several other land management and regulatory agencies. She previously worked as an engineer for Mobil and commercial banker and has experience in conservation. The Senate Energy and Natural Resources Committee will hold a hearing to review her nomination on March 7, 2013

House Proposes Bipartisan Bill to Avoid Helium Shortage

Representatives Doc Hastings (R-WA) and Edward Markey (D-MA) introduced the Responsible Helium Administration and Stewardship Act (H.R. 527) on February 6, 2013.

The bill would keep the Federal Helium Reserve open until nearly all the helium is sold, raise BLM helium prices closer to market value, open the sale of helium to more than just a few companies by implementation of a semi-annual auction, improve transparency, and prevent supply disruptions. It would require studies of international and domestic helium resources as well as the development of domestic and global helium demand forecasts, domestic helium use accounts, assessments and research into the extraction and refining of the isotope helium-3, and the viability of creating a facility to separate the isotope helium-3.

On February 14, 2013, the House Committee on Natural Resources held a hearing to receive testimony about the evaluation of domestic helium demand, the role / future of the Federal Helium Reserve in the domestic market, and the proposed H.R. 527. AGI submitted a letter of support for H.R. 527 to the Natural Resource Committee; the Geoscience Policy web site includes a summary of the hearing.

The Federal Helium Reserve provides 42 percent of the domestic and 35 percent of the global helium supply. The Helium Preservation Act of 1996 (P.L. 104-273) directed the Bureau of Land Management (BLM) to sell the helium until the Reserve's debt was paid. The debt is set to be paid in October and the Reserve will close ahead of the predicted closure date with significantly more helium remaining than the target amount.

Sanders and Boxer Unveil Climate Change Bill

Senators Bernie Sanders (I-VT) and Barbara Boxer (D-CA) introduced the Climate Protection Act of 2013 (S. 332) on February 14, 2013 that would price carbon, end the exemption of hydraulic fracturing from the Safe Drinking Water Act, require disclosure of fracturing chemicals, increase investment in energy efficiency and renewable energy technologies, establish a monthly rebate program for legal U.S. residents, and assess a carbon fee on imports from countries without similar carbon-pricing standards. Senator Sanders intends to introduce a companion bill that would eliminate fossil fuel subsidies and preserve the renewable energy tax incentive program.

The carbon price proposed of $20 per ton of carbon emitted with an annual 5.6 percent increase over ten years time, is projected to raise $1.2 trillion in revenue in ten years and decrease greenhouse gas emissions by 20 percent by 2025 from 2005 levels. Investments in efficiency and renewable resources include weatherizing one million homes every year, tripling the budget for the Advanced Research Projects Agency - Energy, investing $500 billion in efficiency and renewable technology, and creating a worker training program for the clean energy industry.

Sanders and Boxer hope the momentum initiated by President Obama's call to address climate issues in his State of the Union will help move the bill forward. Environmental groups supporting the bill include 350.org, the Sierra Club, Public Citizen, the National Community Action Foundation, and the Center for American Progress.

Senate Environment Committee Hosts Climate Briefing

Senator Barbara Boxer (D-CA), Chair of the Senate Environment and Public Works Committee, hosted a briefing on February 13, 2013 to address the latest findings in climate science research.

The participants were Donald Wuebbles, professor of Atmospheric Science from the University of Illinois; Marshall Shepherd, president of the American Meteorological Society; John Balbus, senior advisor for Public Health at the National Institute of Environmental Health Sciences; and James McCarthy, professor of Biological Oceanography at Harvard University. An archived webcast of the event can be found on the committee's website http://www.epw.senate.gov/public/index.cfm?FuseAction=Hearings.Hearing&Hearing_ID=cf67a715-fca18682-f7dd-13242e8035d1.

CRS Report: Oil and Gas Production on Federal and Non-Federal Lands

The Congressional Research Service (CRS) released a report on February 28, 2013 outlining trends of decreasing oil and gas production on federal lands and increasing levels on non-federal lands.

The percentage of oil produced on federal lands decreased by seven points from fiscal years (FY) 2007 **Government Update** *continued on page 58*

Government Update continued from page 55

to 2012. Within that time frame, production on federal lands surged to a high of 36.5 percent of total U.S. production in FY2010, and then fell below FY2007 levels to 26 percent by FY2012. Historically, oil production on federal lands amounted to less than 20 percent and only rose to 30 percent in the early 2000s. On non-federal lands, modest shifts in production levels between FY2008 and FY2010 were followed by substantial growth between FY2010 and FY2012.

Domestic natural gas production increased 20 percent or four trillion cubic feet since 2007. Non-federal lands witnessed an increase in production by 40 percent, while federal lands witnessed a decrease of 33 percent. The report noted that major shale gas plays are located principally on non-federal lands.

Landsat Data Continuity Mission Launch Successful

On February 11, 2013 the National Aeronautics and Space Administration (NASA) launched the Landsat Data Continuity Mission (LDCM), or Landsat 8, from Vandenberg Air Force Base, CA. Landsat 8 is equipped with visible, near-infrared, short-wave infrared, and thermal infrared imaging capabilities and a moderate-resolution of 15 m to 100 m. One hundred days after the launch, the U.S. Geological Survey (USGS) will take control of Landsat 8's operation and data collection and dissemination.

The Landsat program has provided 40 years of continuous data and Landsat 8 ensures the continuation of data collection beyond the operation of the aging Landsats 5 and 7. Landsat images assist in tracking, understanding, and managing landscape changes, especially in terms of food, water, and forest resources.

2013 USGS Mineral Commodity Summaries Released

On February 7, 2013, the U.S. Geological Survey announced the release of the Mineral Commodity Summaries for 2013 which details events, trends, and issues related to each mineral commodity. The report contains data on domestic industry structure, government programs, tariffs, 5-year salient statistics, and world production and resources. Over 90 minerals and materials are included as well as information on government stockpiled mineral commodities.

The report indicates that the reopening of Molycorp, Inc.'s Mountain Pass mine in California has created a domestic source of rare earth elements (REE) and reduced dependence on importation of REE's. Exports of raw mineral and scrap amounted to $21 billion. For the third year in a row, U.S. nonfuel mineral production increased. Almost all metals experienced a decrease in production and prices while other industrial mineral commodities witnessed an increase.

EPA Draft Climate Adaptation Plan Available for Comment

The U.S. Environmental Protection Agency (EPA) released the draft of their 2013 climate change adaptation plans in February 2013 as required by President Obama's 2009 Executive Order 13514.

The report establishes a framework for support and prioritization of the EPA's future actions to adapt their operations with regard to climate change. EPA states that climate change will require them to adjust their operations due to sea-level rise, snowpack reduction, drought, high

temperatures, and more extreme weather. These impacts necessitate improved watershed, wetland, and water supply protection; emergency management plans; grant and loan plans; contamination reduction; and understanding of energy efficiency programs.

Other federal agencies, that include the Environmental Protection Agency (EPA), U.S. Department of Agriculture (USDA), Department of the Interior (DOI), National Aeronautics and Space Administration (NASA), Department of Energy (DOE), and National Oceanic and Atmospheric Administration (NOAA), released climate change adaptation plans in 2012.

DOE Defends Decision to Continue Collecting Fees for Nuclear Waste

On January 31, 2013, the National Association of Regulatory Utility Commissioners (NARUC) filed a motion to reopen a 2011 case against the Department of Energy (DOE) and review its 2010 Secretarial Determination of the Adequacy of the Nuclear Waste Fund Fee. On February 14, 2013 DOE responded saying it would not object to reopening the case.

Under the Nuclear Waste Policy Act (24 U.S.C. 10101), nuclear power generators have to pay a fee of one mill per kilowatt hour of nuclear-generated electricity. Revenues generated by the fee are deposited into a Nuclear Waste Fund and available to DOE to pay for the permanent disposal of commercial spent fuel and high-level radioactive waste. NARUC originally opened the lawsuit because of the Obama Administration's decision to terminate the proposed Yucca Mountain geologic repository.

Fukushima Nuclear Plant Flooded Daily By 400 Tons Of Groundwater

http://rt.com/news/fukushima-nuclear-plant-disaster-013/

Groundwater flooding has become a major problem for Tokyo Electric Power Co (Tepco), with hundreds of tons of water seeping daily into the damaged reactor buildings. Experts predict overall clean-up works at the site could take up to 40 years.

Stopping the groundwater is crucial, says Tepco's general manager for research and development of Fukushima Daiichi decommissioning, Shunichi Suzuki, adding that "Every day we have approximately 400 metric tons of groundwater."

Tepco is now building a bypass system to try to stop the water that flows from high ground into the buildings and mixes with the water already being poured onto the leaking reactors through a jerry-rigged cooling system.

"One approach we are considering is to use a grout-like cement that would block all the holes," Suzuki said, as cited by Reuters. He added that removal of the groundwater may take from two to four more years.

One of the most challenging tasks for the operator remains the disposal of water contaminated after it is poured onto the reactors. Radioactive material must be filtered out and stored.

Work to treat and store the contaminated water is behind schedule, partly because of the groundwater flooding. On Thursday, the company announced another delay in an operation to remove radioactive material from the water.

The Japanese government has told the facility to revise its roadmap for clean-up at the site, which is expected to take well over a quarter of a century, by June.

"What we need to do is isolate, remove and store the damaged and broken nuclear fuel safely. This work will take 30 to 40 years to complete," plant manager Takeshi Takahashi told the media. Experts say it could cost at least $12 billion to close the reactors down.

It is now more than two years since the worst atomic disaster since Chernobyl in 1986. On March 11, 2011, an earthquake and a subsequent tsunami knocked out cooling equipment at the company's Fukushima Daiichi plant north of Tokyo, leading to the meltdown of three reactor cores. More than 160,000 people were forced from their homes.

Another earthquake or tsunami could be fatal for the crippled Fukushima nuclear plant, according to a nuclear engineer, as two years after the disaster it's still vulnerable to natural disasters.

"What remained intact after the disaster is completely fragile and when the next one comes it's going to collapse," he told The Weekend Australian newspaper.

Local residents are still unaware if it's safe to return to their homes in the disaster area of Fukushima prefecture. The displacement caused huge psychological distress which became one of the biggest health issues which emerged from the disaster, according to experts. Attention is also focused on the potential cancer risks years after the tragedy.

A health questionnaire sent to Fukushima residents by the Fukushima Medical University found that around 15 percent of the 67,500 respondents indicated high levels of stress – much higher than the 3 percent among the general population of the country. ■

Full Color Ads Now Available!

HGS *Bulletin* Instructions to Authors

All materials are due by the 15th of the month, 6 weeks before issue publication. Abstracts should be 500 words or less; extended abstracts up to 1000 words; articles can be any length but brevity is preferred as we have a physical page limit within our current publishing contract. All submissions are subject to editorial review and revision.

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.

Advertising

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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7	$665	$1,123	$2,014	$3,834	$4,600					
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We still offer Geo-Jobs - where your company can post job openings for 14 days at $50.00 or 30 days at $100.00.

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

Application to Become a Member of the Houston Geological Society

Qualifications for Active Membership

1) Have a degree in geology or an allied geoscience from an accredited college or university; or
2) Have a degree in science or engineering from an accredited college or university and have been engaged in the professional study or practice of earth science for at least five (5) years.

Qualifications for Associate Membership (including students)

1) Be involved in the application of the earth or allied sciences.
2) Be a full-time student enrolled in geology or in the related sciences.

Apply online at www.hgs.org and click on Join HGS

Annual Dues Expire Each June 30. (Late renewals – $5 re-instatement fee)
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To the Executive Board: I hereby apply for ❑ Active or ❑ Associate membership in the Houston Geological Society and pledge to abide by its Constitution and Bylaws. ❑ Check here if a full-time student.

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❑ Environmental Geology
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Degree _____ *Major* _____ *Year* _____

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Earth Science Work Experience _____

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Applicant's Signature _____ *Date* _____

Endorsement by HGS member (not required if active AAPG member)

Name: _____

Signature _____ *Date* _____

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revised 8/6/10

Houston Petroleum Auxiliary Council News

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

May is going to be a busy month for Houston geologists and their spouses. Of high priority will be the journey to Pittsburgh, Pennsylvania for the AAPG national convention starting May 19th. This is a new venue for convention attendees and everyone is excited! Personally, I'm really looking forward to a visit with former HGS board member Andrea Reynolds and her husband Matt and to check on their twins. Regardless of the plans, whether they include the field trip to Drake's Well or the tour of Frank Lloyd Wright's Fallingwater, we are all must think about what to pack. For the ladies who make the trip, HPAC offers a solution to this dilemma with their Spring Style Show on Friday May 3rd.

This year's style show and business meeting will be at the Houston Racquet Club at 10:30 a.m. Scruples Boutique will furnish their stunning clothing for our own beautiful members to model for you and your guests. In 1978, the book *Scruples* was on the best-seller list and a women's clothing store with the same name opened in the Champions area of town. While the buzz that surrounded the book has faded, the buzz about the boutique has not. The store still carries the unique clothes that have provided longtime owner, Betty Griffin, continued success.

Co-Chairs **Phyllis Carter, Daisy Wood** and their committee M**ary Ann Cole, Linnie Edwards, Ann Koster, Sheri McQuinn, Mickey Murrell,** and **Myrtis Trowbridge** have organized an outstanding event and arranged a delicious lunch as only the Houston Racquet Club can provide. Valet parking is available as a courtesy. Please make plans to join your fellow HPACers on May 3 for this last meeting of the season. Remember, guests are always welcome to attend!

On May 6th the Book Club will meet in the home of **Barbara Peck**. Discussion Leader **Marge Shea** has chosen the book *Paths of Glory* by Jeffery Archer. This book is a true story of a man who climbed Mt. Everest. As Book Club Co-Chair, **Phyllis Carter** opined at a recent luncheon at the Junior League, "While the book is interesting, the author is equally interesting. Lord Archer has topped the bestsellers list with sales of more than 135 million copies. He is a British author who served in the House of Lords and the House of Commons. During this time, he also served a year in a British jail for perjury and embezzlement. Of course, the British press loves him and his style!" Thanks to **Phyllis** and her Co-Chair **Anita Weiner** for arranging a wonderful year of great reading for all the bookworms. If you are interested in joining this group, please give a call to **Phyllis** (281-397-9888) or **Anita** (713-572-9874). Guaranteed to please!

Luncheon Chair Person Millie Tonn with Sam Houston, aka Charley Forgerty at the Spring Luncheon

Also many thanks go to HPAC President **Mickey Murrell** and Vice President **Barbara Peck** for putting together programs that have provided much pleasure for our members. Additionally, thanks to our Special Interest Chairs **Martha Lou Broussard, Linnie Edwards, Anita Weiner, Phyllis Carter, Audrey Thompkins**, and **Daisy Wood** for adding flavor to our organization. And to the rest of the Board, congratulations on a grand year!

Remember that in addition to our regular luncheon programs and these special interest groups, we have other interest groups: **Cinco Mas Bridge**: **Audrey Tompkins**, 713-868-0005, and **HPAC Exploring Houston**: **Martha Lou Broussard**, 713-665-4428 or **Linnie Edwards**, 713-785-7115. *Spouses and guests are also welcome to attend these events.*

Geologists, please encourage your spouses to join HPAC, where they will have the 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*. Please contact **Edie Bishop** at 713-467-8707 or at ewbishop@bishorb.com. ■

Book Club Chair Anita Weiner and Third Vice President Winona LaBrant at a recent Board Meeting at the Junior League.

You are invited to become a member of

HPAC

2012–2013 dues are $20.00 Mail dues payment along with the completed yearbook information to **Winona LaBrant,** 10123 Valley Forge Drive, Houston, Texas 77042

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