# PROFESSIONAL EARTH

### **New Orleans Chapter Newsletter**

Society of Independent Professional Earth Scientists
Volume 14, Number 1 January 2013

# LSU'S JEFF NUNN TALKS ABOUT THE ASCENSION PARISH SINKHOLE



At the end of May 2012, methane bubbles were first observed in Bayou Corne in northeast Assumption Parish, LA. Geochemical analysis revealed that the methane was thermogenic rather than biogenic. Additional sites of methane bubbling in Bayou Corne and nearby Grand Bayou have developed over time. Bayou Corne and Grand Bayou flow above the Napoleonville salt dome which has been an active area for oil and gas exploration since the 1920s. In addition, the dome is a site of dissolution salt mining which has produced numerous large caverns with diameters of up to 300 ft and heights of 2000 ft. Some old caverns are used for storage of millions of barrels of LNG and Butane. In addition, there are gas pipelines in the region. In mid-July, some local residents felt tremors. Microseismic activity was confirmed by the USGS at the Earthscope seismic station in White Castle, LA. The USGS set up seismic stations in the area which recorded more than 60 microseismic events in late July and the first couple of days of August, 2012. These microseismic events were located on the western side of the dome. Estimated focal depths place the events just above the top of salt. In the first week of August, 2012, a sinkhole approximately 400 ft in diameter and more than 400 ft deep at its center developed overnight just to the northwest of a plugged and abandoned brine filled cavern. The sinkhole continues to grow in size due to slumping and has consumed a pipeline right of way. Microseismic activity stopped for several weeks following the formation of the sinkhole. A relief well drilled into the abandoned cavern found that the bottom 2/3 of the cavern is now filled with sediment. A 2007 seismic survey suggests that the bottom of the abandon cavern breached the edge of the salt dome allowing direct contact with permeable formations. Recently, microseismic events have reoccurred but less frequently than before formation of the sinkhole. Geophysical logging of shallow wells has found gas in the Mississippi River Alluvial Aquifer on the western side of the Napoleonville dome.

# Tuesday, January 15th Andrea's - Metairie

Registration & Networking - 11:30 AM Program - Noon Reservations and quests: Carol St. Germain - 504-267-3466

### **Chairman's Column**

Last month approximately 20 of our members attended the joint API luncheon downtown at the Roosevelt Hotel. Tommy Beaudreau, Director of BOEM and Don Briggs, President of the LA Oil and Gas Association, jointly addressed the group. Without going into details, Briggs' talk was far and away the most interesting and informative. A bizarre twist to the end of the meeting was when a group of anti oil and gas protestors entered the rear of the meeting room and began to chant their usual "clap trap". Hopefully they all got back to their bikes and pedaled safely back to wherever they came from!

This month is our annual "no speaker" meeting, back at Andrea's on Tuesday, December 18. Bring your jokes, gripes, suggestions, etc.

The meeting dates for next year are: January 15, February 19, March 19, April 16 and May 21 (evening) We will adjust dates if there is a conflict with any other significant events. All of the meetings will be at Andrea's. We have submitted a membership application for L. W. "Dick" Paxton for approval.

Reese recently sent out e-mail notices to members with unpaid dues; while the response has been good a few are still outstanding. Check to make sure you are not delinquent!

Since this is our last newsletter for this year, I want to take this opportunity, on behalf of your officers and committee chairmen, to wish everyone a Merry Christmas and Happy New Year!

Louis E. Lemarié

Chairman

### JEFF NUNN - BIO



Jeffrey A. Nunn is the Ernest and Alice Neal Professor of Geology and Pereboom Professor of Science at Louisiana State University in Baton Rouge. He received his Ph.D. from Northwestern University working on the Thermal-Mechanical Evolution of the Michigan Basin under the supervision of Norman H. Sleep and Lawrence L. Sloss. He has been a faculty member at Louisiana State University since 1981. His research interests include: geodynamics of sedimentary basins, thermal and pore pressure history of sediments in the Gulf of Mexico and Alaska, and subsurface fluid flow with associated heat and solute transport especially along faults/fracture networks and salt structures.

### ANOTHER SALT-RELATED SINKHOLE: Daisetta, Texas



Initial Daidsetta sinkhole

Daisetta, Texas sits on a salt dome. In 1969, 1981, and again in 2008, sinkholes formed

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in the area. The 1981 sinkhole, which grew out of the smaller 1969 sinkhole, is thought to have formed from a collapse in the salt dome and is now a lake. The cause of the 2008 sinkhole is not yet known, but a collapse in the salt dome that Daisetta sits on is thought to be the cause and suspected to be caused by a company drilling oil out of the area. The 1981 sinkhole grew to 250 feet (75 m) wide and 30 feet (9 m) deep. By the evening of the day after the 2008 sinkhole formed, its growth had stabilized, but officials still saw it as a potential risk to the safety of city residents. With its length of 600×525 feet (180×160 m) and maximum depth of 150 feet (45 m), it was nicknamed the "Sinkhole de Mayo" by local residents (a pun on "Cinco de Mayo").



Daisetta sinkhole today

# GAO: Oil, gas, NGLs provide bulk of federal mineral revenue

Crude oil, natural gas, and natural gas liquids provided the vast majority of federal mineral leasing revenue in fiscal 2011 and 2012, the Government Accountability Office reported.

Oil, gas, and NGLs produced \$10.1 billionâ€"largely from royaltiesâ€"of the \$11.3 billion received from federal mineral leases in 2010 and \$11.4 billion received in 2011, it said in a report that it publicly released on Dec. 12.

GAO said its analysts used data compiled by the US Department of the Interior' s Office of Natural Resources Revenue. It showed that the government collected \$5.4 billion of royalties from 739 million bbl of crude produced from federal onshore, offshore, and Indian tribal leases in the 12 months ended Sept. 30, 2010, and \$6.6 billion from 645.6 million bbl of production in the same period a year later.

Federal gas royalties totaled \$2.8 billion on more than 5.4 bcf of production in 2010 and \$2.4 billion on nearly 4.9 bcf produced in 2011, according GAO. It said royalties from NGL production from federal leases totaled \$400 million on 4.8 billion gal in 2010 and \$600 million on 4.7 billion gal in 2011.



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# Many sinkholes can be human-induced

New sinkholes have been correlated to land-use practices, especially from ground-water pumping and from construction and development practices. Sinkholes can also form when natural water-drainage patterns are changed and new water-diversion systems are developed. Some sinkholes form when the land surface is changed, such as when industrial and runoff-storage ponds are created. The substantial weight of the new material can trigger an underground collapse of supporting material, thus causing a sinkhole.



Shallow drilling rig collapsing in to sinkhole

The overburden sediments that cover buried cavities in the aquifer systems are delicately balanced by ground-water fluid pressure. The water below ground is actually helping to keep the surface soil in place. Ground-water pumping for urban water supply and for irrigation can produce new sinkholes In sinkhole-prone areas. If pumping results in a lowering of ground-water levels, then underground structural failure, and thus, sinkholes, can occur.

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### **Mark Your Calendars!**

2013 New Orleans Chapter Luncheon Meetings

January 15 - Jeff Nunn
February 19 - Carlo Christina
March 19 - tba
April 16 - tba
May 21 - evening dinner
June 17-20 - Santa Fe SIPES

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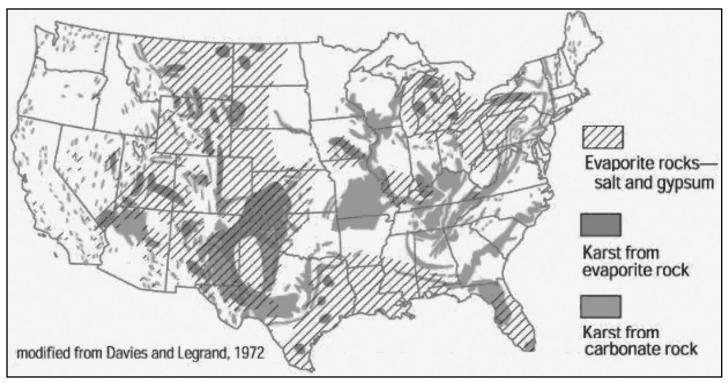
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The map below shows areas of the United States where certain rock types that are susceptible to dissolution in water occur. In these areas the formation of underground cavities can form and catastrophic sinkholes can happen. These rock types are evaporites (salt, gypsum, and anhydrite) and carbonates (limestone and dolomite). Evaporite rocks underlie about 35 to 40 percent of the United States, though in many areas they are buried at great depths.

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