#### MISSISSIPPI GEOLOGICAL SOCIETY

# CBULLETIN

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# PRESIDENT'S LETTER

Cragin Knox



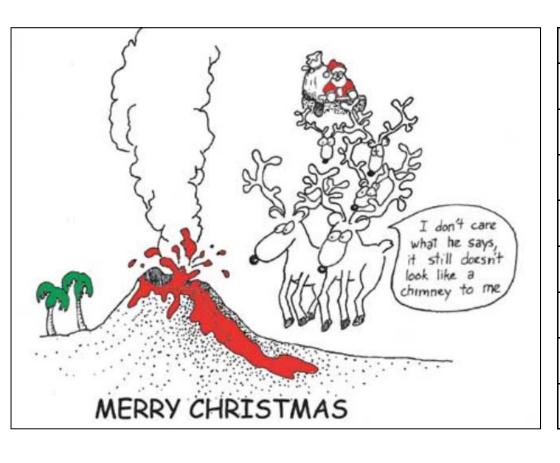
# MERRY CHRISTMAS

and

# HAPPY NEW YEAR

From MGS

2016-2017 MGS MEETING SCHEDULE			
When	What/Who	Where	
September 8, 2016	Fall BBQ	Jackson Yacht Club-5:30pm	
October 13, 2016	Deep Lakes in Early Mars—Ezat Heydari	River Hills – 11:30am	
November 10, 2016	Tuscaloosa Marine Shale Paul Hackley et al. USGS	River Hills – 11:30am	
	MAPL Christmas Party CANCELLED		
January 12, 2017	TBD	River Hills – 11:30am	
February 9, 2017	TBD	River Hills – 11:30am	
March 9, 2017	TBD	River Hills – 11:30am	
April 13, 2017	Boland Scholarship Awards	River Hills – 11:30am	
May 11, 2017	Spring Fling	Jackson Yacht Club- 5:30pm	



OFFICERS MEETINGS
September 6, 2015
October 11, 2015
November 8, 2015
January 10, 2016
February 7, 2016
March 7, 2016
April 11, 2016
May 9, 2016



# **IMPERIAL BARREL AWARD**

#### Team Members





From left to right:

Tim Palmer, Kalli Dubois, Shannon Vattikuti, Rayford Parnell, and Brenden Lomago.



### **IMPERIAL BARREL AWARD (IBA)**

#### Team Members



#### Tim Palmer:

Undergraduate Information – B.S., Geophysics, Millsaps College

Research Interests – Carbonates, evaporites, petrophysics, and economic geology.

Thesis Topic – Formation water geochemistry of the Smackover.

#### Kalli Dubois (Team Captain):

Undergraduate Information – B.S., Geology, University of Louisiana at Lafayette

Research Interests – Petroleum geology, stratigraphy, carbonates, and unconventional hydrocarbon resources.

Thesis Topic – Regional stratigraphy and petroleum system component study of the Tuscaloosa Marine Shale, and the potential for fracking with supercritical carbon dioxide.

#### Shannon Vattikuti:

Undergraduate Information – B.S., Geosciences, Mississippi State University

Research Interests – Hydrology, GIS, and computer programming.

Thesis Topic – Groundwater modeling of northeast Mississippi.

#### Rayford Parnell:

Undergraduate Information – B.S., Geoscience, Mississippi State University

Research Interests – Sedimentology, geomorphology, and geophysics.

Thesis Topic – GIS and remote sensing applications in geologic mapping of the Sparta 7.5-minute quadrangle.

#### Brenden Lomago:

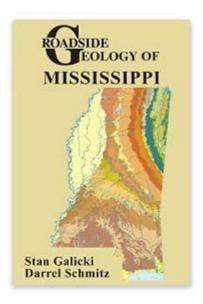
Undergraduate Information – B.S., Geology, University of Florida

Research Interests – Geochemistry, petroleum geology, and seismology.

Thesis Topic – Geochemical analysis of ocean floor authigenic carbonates.

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#### Roadside Geology of Mississippi (Roadside Geology Series) Paperback –

October 15, 2016 by Stan Galicki (Author), Darrel Schmitz (Author) Be the first to review this item

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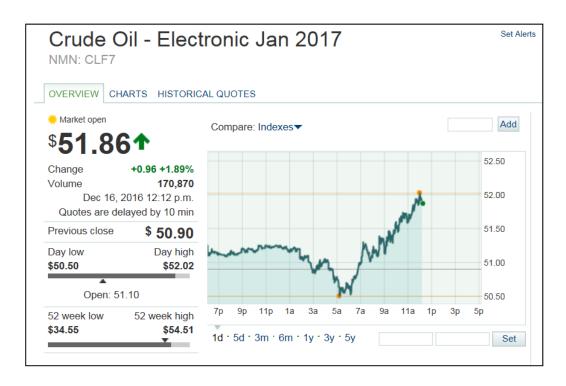
It's a little-known fact, but Mississippi has a volcano. True, it's buried under 2,600 feet of sediment, but it was red hot and active roughly 79 to 69 million years ago, and evidence of its bulging remains are visible in the Jacksonville area.

Mississippi emerged along the edge of a massive tear that

Read more



# **OIL & GAS FUTURES**









#### **GEOLOGY POST**



Assessment of Lithium-Rich Brine from the Smackover Formation by Analyzing Core, Geochemical, Petrophysical, and Productivity Data: Insights from Deep Evaporite-Carbonate Transitions. Timothy Palmer<sup>1</sup>, Rinat Gabitov<sup>1</sup>

1. Geosciences, Mississippi State University, Starkville, MS, United States.

Smackover oil-field brines are considered a resource for lithium and exist as metal-rich brine anomalies in reservoir rocks across the Gulf Coast from east Texas to Florida. Very little, however, is known about the concentrating environment, grade-variability, and spatial distribution of lithium-rich water in the Jurassic Smackover Formation. Therefore, a preliminary study of published geochemical data, core, petrophysical logs, and production curves has been carried out to identify geologic and geochemical controls related to lithium-rich brines. The main objectives, are to (1) calculate lithium reserves by analyzing production curves and volumetric methods, (2) map connected zones between the upper Smackover, source rocks, and Norphlet, and (3) identify the concentrating environment of the lithium-rich brines.

Lithium-rich produced water from Smackover and Norphlet completions in east-central Mississippi, are deep basinal brines, and are defined from Sulin's classification of water as the "chloride-calcium" type. Further, as evidenced by the (Cl<sup>-</sup> - Na<sup>+</sup>)/Mg<sup>2+</sup> ratio, the lithium-rich brines are highly concentrated in chlorine with respect to sodium and magnesium. The Na+/Clratio of Smackover brines is .35 and, according to Bojarski, brines of this nature can be present in hydrocarbon accumulations. Scatter-plots of anions and cations were analyzed to determine the source of the brine relative to evaporating seawater, and indicate that the brines have been significantly altered versus the highest concentrations of lithium encountered in east-central Mississippi. Therefore, the probable lithium brine concentrating environment is located in the sabkha to playa lake facies of the lower and middle Norphlet Formation, as freshwater mixing, carbonate diagenesis, and clay dissociation all appear to be the controlling factors in altering the brine. Several petrophysical logs and production curves were gathered to analyze fluid volume, porosity, and production rates with known lithium-rich brine wells, and, core intervals reveal that the Norphlet-lower Smackover contact is gradational. The results of this assessment can be used to gain insight into (1) the potential source and concentrating environment of the lithium-rich brine trapped in the upper Smackover Formation, (2) brine geochemistry and diagenesis in sabkha environments, (3) the grade-variability and volume of lithium-rich brines in east-central Mississippi, and (4) connectivity between the Norphlet and Smackover Formations.

## **GEOLOGY POST**

#### **ARTICLES, PAPERS or NEWS?**

**ATTENTION!!!!!** Industry, Professors and Students:

I am adding a dedicated section that includes more content from the industry and our schools.

Submissions can include anything from professional papers, thesis abstracts, job opportunities to pictures. Anything!!!!

If you have any information or news you would like to share with the Society **PLEASE** email them to the MGS Editor at:

mcaton@tellusoperating.com

Thanks & Regards,

Matt Caton Editor



# **BOLAND SCHOLARSHIP WATCH**

Faculty & Students,

The school year is halfway through and the Mississippi Geological Society along with the Boland Scholarship Fund would like to remind you that we want to honor the most outstanding overall students for the 2016-2017 year.

Each year, the Boland Scholarship awards 1 student from each institution a check that rewards students for their hard work and dedication to the Geosciences and their community.

We look forward to a great year and hope to see you at our monthly meetings.

Best Regards,











# **MONTHLY POST**

#### Dr. David T. Dockery lll RPG

#### U.S. GEOLOGICAL SURVEY ENERGY ASSESSMENT UTILIZES MDEQ'S CORE AND SAMPLE LIBRARY

David T. Dockery III, RPG, Office of Geology

Paul Hackley, Celeste Lohr, and Javin Hatcherian of the U.S. Geological Survey's energy assessment team visited MDEQ's Core and Sample Library at 2525 North West Street on November 9, 2016, where they collected 45 samples from 20 legacy wells that cut core in the Tuscaloosa Group, especially from the Tuscaloosa marine shale (Figure 1).



Figure 1. Cores from the Tuscaloosa marine shale sampled by the U.S. Geological Survey at MDEQ's Core and Sample Library in Jackson.

Their study is to assess the unconventional resources potential (of oil production) and the sealing properties for carbon sequestration. Hackley relayed to us the importance of having access to the MDEQ facility. "Storage and archival of Mississippi's subsurface rock library from oil and gas exploration provides an important service to our agency and others. Without access to your facility and the ability to sample from the rocks stored therein, we could not accomplish our core mission goals."



# **MONTHLY POST**

#### Dr. David T. Dockery lll RPG

The first oil production in Mississippi in 1939 came just before World War II at a critical time in the nation's history when energy was needed for the war effort. Domestic production of oil and gas make for a more secure country, thus the need for a national assessment of the nation's reserves. On November 10 Hackley gave a presentation on findings from previous core samples taken from MDEQ's Core and Sample Library at the River Hills Club before a monthly noon meeting of the Mississippi Geological Society (figures 2-3).



Figure 2. Left to right, Javin Hatcherian, Celeste Lohr, and Paul Hackley at the November 10, 2016, meeting of the Mississippi Geological Society.



# **MONTHLY POST**

#### Dr. David T. Dockery lll RPG



Figure 3. Paul Hackley, standing upper left, presenting data obtained from MDEQ's Core and Sample Library and elsewhere at the November 10, 2016, meeting of the Mississippi Geological Society (composite image).

Unconventional oil and gas production has greatly increased U.S. oil and gas reserves and made the nation less dependent on foreign oil. In 1999, U.S. Geological Survey geologist Leigh Price used analyses of cores at the North Dakota Geological Survey Core Repository at Grand Forks, North Dakota, to estimate the total range of oil "in place" in the Bakken Shale at 271 billion to 503 billion barrels with a mean of 413 billion barrels. Price died in 2000 before his paper was published; however, that same year Bakken oil successes began with the discovery of Elm Coulee Oil Field in Richland County, Montana. Reports by the USGS and the state of North Dakota in April 2013 estimated up to 7.4 billion barrels of oil, 6.7 trillion cubic feet of natural gas, and 530 million barrels of natural gas liquids to be "recoverable" in the Dakotas and Montana, using current technology. In July 2013, Bakken wells in North Dakota produced 811,000 barrels of oil per day, raising North Dakota to second behind Texas in oil production. The Bakken oil boom has provided lease bonuses and royalties for mineral rights owners, reduced unemployment, and has given the state of North Dakota a billion-dollar budget surplus. November 17 of this year the USGS announced the largest recoverable (with new technologies) oil and gas discovery ever in the United States in the Wolfcamp shale of West Texas, which is estimated to contain 20 billion barrels of oil and 16 trillion cubic feet of gas, an amount nearly three times that of the Bakken Shale. Bloomberg News reported this reserve to have a value of \$900 billion at current prices.



# **2016-2017 BOLAND FUND DONATIONS**

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Thanks for your generous donations to the 2016-2017 Boland Fund

# **GEO LINK POST**

USGS TAPESTRY OF TIME AND TERRAIN <a href="http://tapestry.usgs.gov">http://tapestry.usgs.gov</a> The CCGS is donating to all of the 5th and 6th grade schools in the Coastal Bend. Check it out—it is a spectacular map. You might want a framed one for your own office. The one in my office has glass and a metal frame, and it cost \$400 and it does not look as good as the ones we are giving to the schools. Call Owen 510-6224 if you want one for your office for \$150. Duncan, Mike, Chris, Dave, Bob Randy, Seb., Kevin, Ken, Craig, Patrick, Robert.

FREE TEXAS TOPO'S <a href="http://www.tnris.state.tx.us/digital.htm">http://www.tnris.state.tx.us/digital.htm</a> these are TIFF files from your state government that can be downloaded and printed. You can add them to SMT by converting them first in Globalmapper. Other digital data as well.

FREE NATIONAL TOPO'S <a href="http://store.usgs.gov/b2c\_usgs/b2c/start/(xcm=r3standardpitrex\_prd)/.do">http://store.usgs.gov/b2c\_usgs/b2c/start/(xcm=r3standardpitrex\_prd)/.do</a> go to this webpage and look on the extreme right side to the box titled TOPO MAPS <a href="https://doi.org/10.2007/DOWNLOAD">DOWNLOAD</a> TOPO MAPS FREE.

http://www.geographynetwork.com/ Go here and try their top 5 map services. My favorite is 'USGS Elevation Date.' Zoom in on your favorite places and see great shaded relief images. One of my favorites is the Great Sand Dunes National Park in south central Colorado. Nice Dunes.

<u>http://antwrp.gsfc.nasa.gov/apod/astropix.html</u> Astronomy picture of the day — awesome. I click this page everyday.

http://www.spacimaging.com/gallery/ioweek/iow.htm Amazing satellite images. Check out the gallery.

http://www.ngdc.noaa.gov/seg/topo/globegal.shtml More great maps to share with kids and students.

www.geo.org Don't forget we have our own web page.

http://micro.magneet.fsu.edu/primer/java/scienceoptiscu/owersof10/

http://asterweb.jpl.nasa.gov/galery/default.htm Great satellite images of volcanoes

http://terra.nasa.gov/gallery/ More here

www.ermapper.com They have a great free downloadable viewer for TIFF and other graphic files called ER Viewer.

www.drillinginfo.com This is an incredible (subscription) well and completion data service for independents. Can be demo'ed for free.

http://terrasrver.com/ Go here to download free aerial photo images that can be plotted under your digital land and well data. Images down to 1 meter resolution, searchable by Lat Long coordinate. Useful for resolving well location questions.

http://www.fs.fed.us/gpnf/volcanocams/msh/ This is a live cam of Mt. St. Helens refreshed every 5 minutes. At the bottom are old videos of past eruptions in this cycle. It is worth a watch especially now.



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Professional Listing (1/2" x 3")	\$ 50	\$

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Professional Listing/Link	\$100	\$

(Note: Please contact Steve Walkinshaw at (601) 607-3227 or mail@visionexploration.com for details concerning placing your ad on the MGS web site.)

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#### Joe R. White, Jr.

Petroleum Geologist

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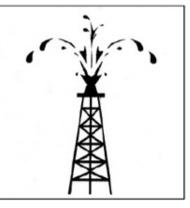
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		2011-2012	Stanley King
		2012-2013	Jim Files
		2013-2014	Neil Barnes
		2014-2015	Ezat Heydari
		2015-2016	Jack Moody
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