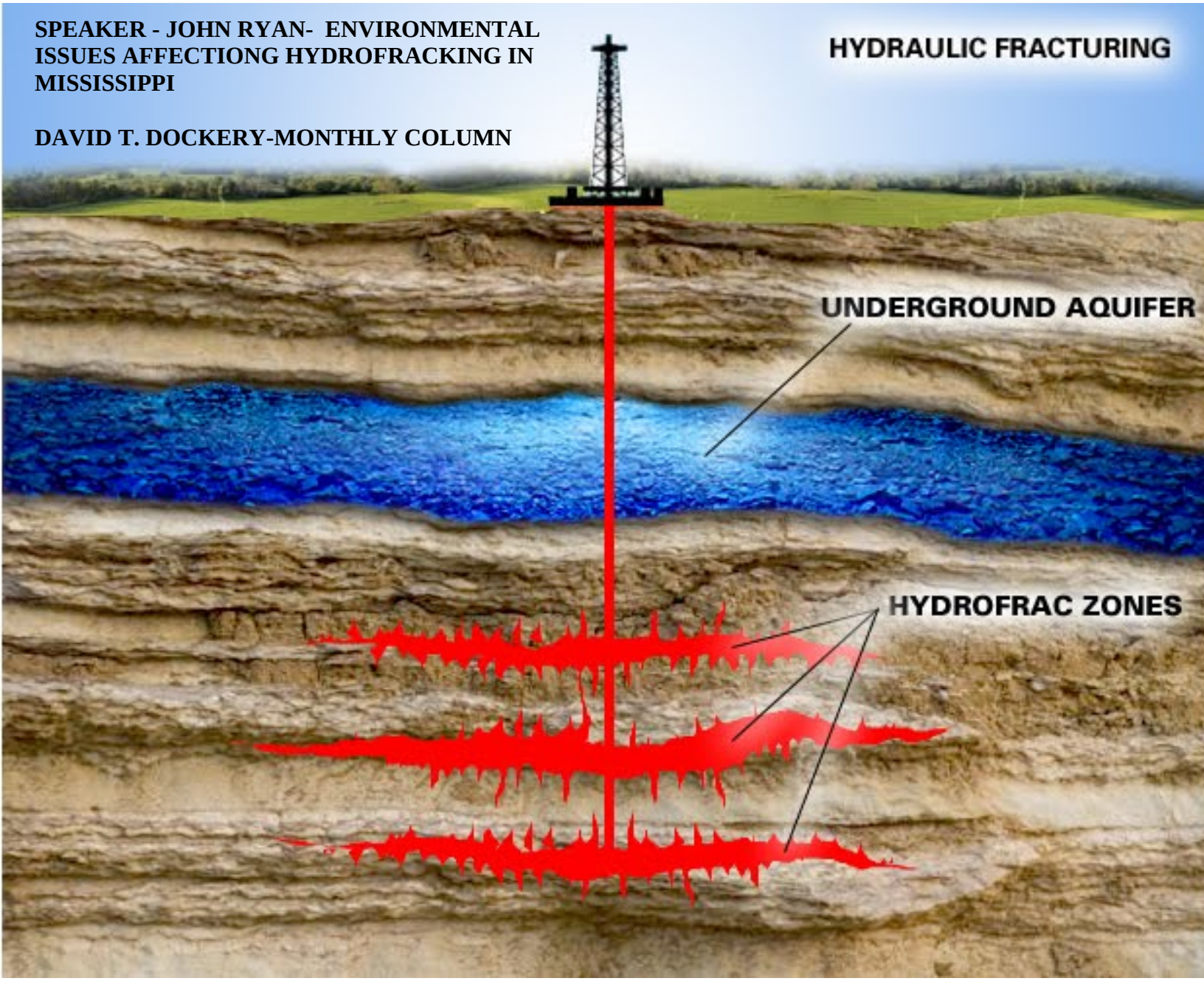
eBULLETIN

MISSISSIPPI GEOLOGICAL SOCIETY

Volume 62 No. 5 January 2014

SPEAKER - JOHN RYAN- ENVIRONMENTAL ISSUES AFFECTIONG HYDROFRACKING IN MISSISSIPPI

DAVID T. DOCKERY-MONTHLY COLUMN



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PRESIDENT'S LETTER

Neil Barnes

Greetings!

I hope you all have enjoyed a wonderful holiday season.

Whether last week, today, or next week we'll all soon be seriously focused on 2014. The Mississippi Geological Society is already focused. The first officers' meeting of the year was last week. At that meeting we welcomed as the student liaison for Jackson State University Jerryl Roberts. We are delighted that he has agreed to liaise with us. Welcome, Jerryl! (For the time being, I will be the professional liaison for JSU.)

I am told by Matt (Bulletin) and Steve (Website) that content is king! Content, Content, Content. I am pleased to announce that Dr. David Dockery has agreed to provide a regular column on Mississippi geology for both the Bulletin and Website. David used to do this column years ago. He knows what he's talking about! It'll be great! Thanks, David! We are also visiting with the Mississippi Oil & Gas Board about their supplying some regular content to the Bulletin and Website. Look for something in the near future. Do you have a suggestion for a regular column or perhaps a one-off feature?

The MSU Imperial Barrel Award team will be in Houston during the Spring for a short course on Basin Analysis sponsored by Shell. Good for them. Some immediate benefit for participation!

Now, I got to the end of the letter and had to backtrack and make a comment here – What you see below are some ideas for advancing the mission and vigor of the Society. With the exception of the MSU Brown Bag lunches the Society is not committed to any of them, yet. Now, is the time to invest your time and interest in the Society. I believe we have a really good opportunity to set a healthy course for years to come if we will but invest now. What we will need to do any of them is participation by the membership. We've all heard about the 80/20 rule – 80% of the work is done by 20% of the people. Well, the Society needs to find its 20%! Are you part of the Society's future? If you are willing to engage in the work of the Society on any level for anything you are interested in, call me or one of the other officers. You'll be glad you did!

As mentioned in the last letter, Mississippi State University Department of Geology hosts a weekly "brown bag" lunch for students every Friday during the semester. These lunches are informal times of presentations on various topics and run from noon to 12:50 (in time for students to make their 1 pm clases.) MGS has committed to supplying a speaker for the last Friday of January through April. We get an opportunity to communicate about geology – petroleum, environmental, physical, whatever topic interests you *will* interest them. What a great opportunity to influence these young folks. Every MGS professional member can surely talk for 50 minutes about something they enjoy. It's informal. Leave plenty of time for questions. Please let me know if you are interested in speaking.

PRESIDENT'S LETTER

Neil Barnes

Something that came up during the Officers' meeting was the Yazoo Clay. Everyone living in the Jackson area has heard about the Yazoo Clay. But, it sounds like it is not a very well-studied section. Here's an idea – might the Society sponsor a working group to study the Yazoo Clay? Because this is essentially basic research - as opposed to petroleum or environmental - all of our members could participate. Students could participate. And we'd build "community" within the Society. What do you think?

Red Book updates – another possibly great, high leverage idea. What about matching professional members with students and letting the pair work on a Red Book field update? Great for students, great for the Society, really good for professional members…….

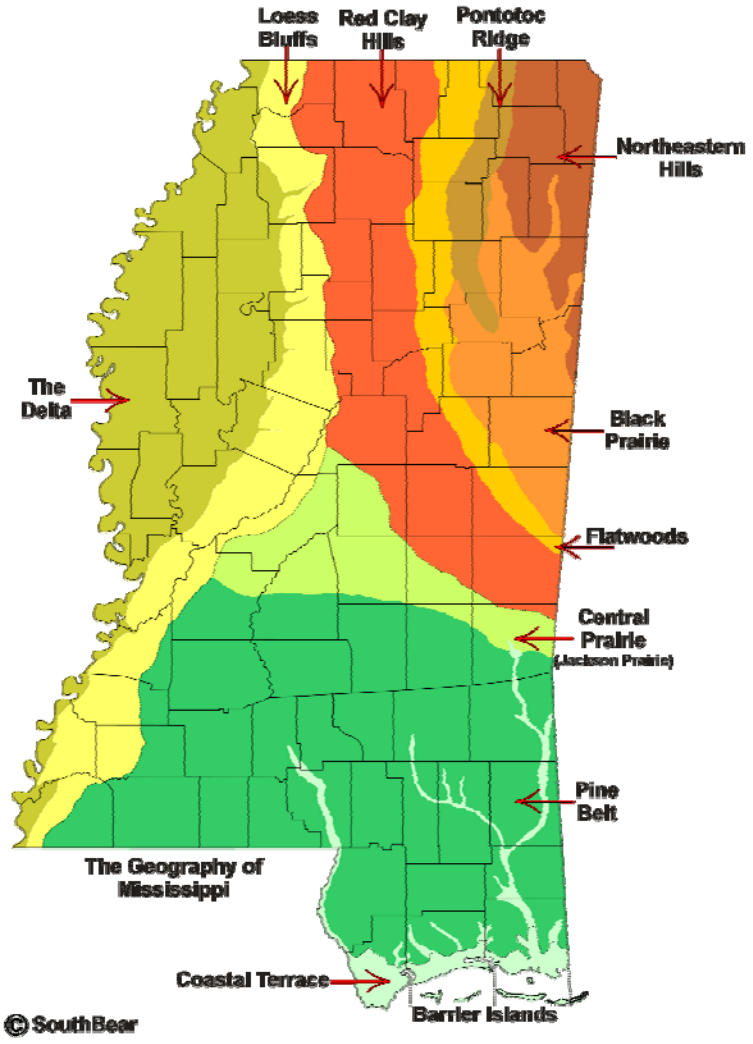
Symposium – We discussed again the possibility of hosting a symposium in the not too distant future. Wisely the officers suggested that we first find a chairman. We'd probably let him or her strongly influence the topic!

As I started – 2014 is here and it's time to get to work. Let's all invest in a good start to 2014 for the Society.

Neil

2013-2014 MGS MEETING SCHEDULE

When	What/Who	Where
September 12, 2013	Fall BBQ	Jackson Yacht Club-5:30pm
October 10, 2013	Steve Craft **Recent Activity: Smackover South Alabama**	River Hills – 11:30am
November 22, 2013	**MSOGB**	River Hills – 11:30am
December 14, 2013	MAPL Christmas Party and Dance	Duling Hall, Fondren District 7:00pm
January 9, 2014	John Ryan HydroFracking - Mississippi Operators	River Hills – 11:30am
February 13, 2014	TBD	River Hills – 11:30am
March 13, 2014	TBD	River Hills – 11:30am
April 10, 2014	Boland Scholarship Awards	River Hills – 11:30am
May 8, 2014	Spring Fling	Jackson Yacht Club– 5:30pm



OFFICERS MEETINGS
August 4, 2013
September 10, 2013
October 8, 2013
November 20, 2013
December 12, 2013
January 7, 2014
February 11, 2014
March 11, 2014
April 8, 2014
May 6, 2014

JANUARY SPEAKER

JOHN RYAN

JOHN M. RYAN is a senior consulting geologist with Allen Engineering and Science (formerly known as Eco-Systems Inc.) in their Jackson, Mississippi office. He represents various commercial and industrial clients, including oil and gas operators and service companies. He covers multi-disciplined technical matters associated with environmental due diligence, surficial and at-depth assessment and remediation, emergency response, permitting and compliance as well as emerging issues related to water supply, contamination, and vulnerability. Mr. Ryan's 19 years of experience, including 11 with a private energy services company's corporate Environmental Health and Safety department, has equipped him with the ability to work effectively with operational personnel, technical peers, stakeholders, attorneys, regulators, and responsible parties. Mr. Ryan completed his Master of Science and Bachelor of Science geological studies at the University of Arkansas – Fayetteville and University of Maine – Farmington, respectively.

HYDROFRACKING – ARE MISSISSIPPI OPERATORS AND E&P PROFESSIONALS PREPARED FOR THE ENVIRONMENTAL RISK

By: John M. Ryan, Senior Geologist
Allen Engineering and Science
January 9, 2013

Advances in directional well drilling and reservoir stimulation (i.e., hydrofracking) techniques have revolutionized the effectiveness of economically producing oil and gas (O&G) within rock once considered too tight and/or deep to exploit. Unfortunately, the exponential successes that have come from these advances have in some regard been off-set by significant controversy from a variety of different regulatory agencies and environmental advocacy groups. The hydraulic fracturing treatments used to stimulate production from unconventional formations have stirred environmental concerns over excessive water consumption, drinking water well contamination, and surface water contamination from both drilling activities and management of the fracturing (i.e., frack) fluid. We will examine some of the key regulatory and advocacy issues besieging the O&G industry in states away from Mississippi and discuss whether operators working or considering working within Mississippi are prepared for the elevated risk and negative exposure associated with the play.

NEWS

MGS WEBSITE

Members

Please take the time to visit us on our website. You can view current and previous bulletins, update your address, access local and regional organizations, well records/data, oil and gas boards, neighboring societies and upcoming events. There are also several links to interesting articles and papers.

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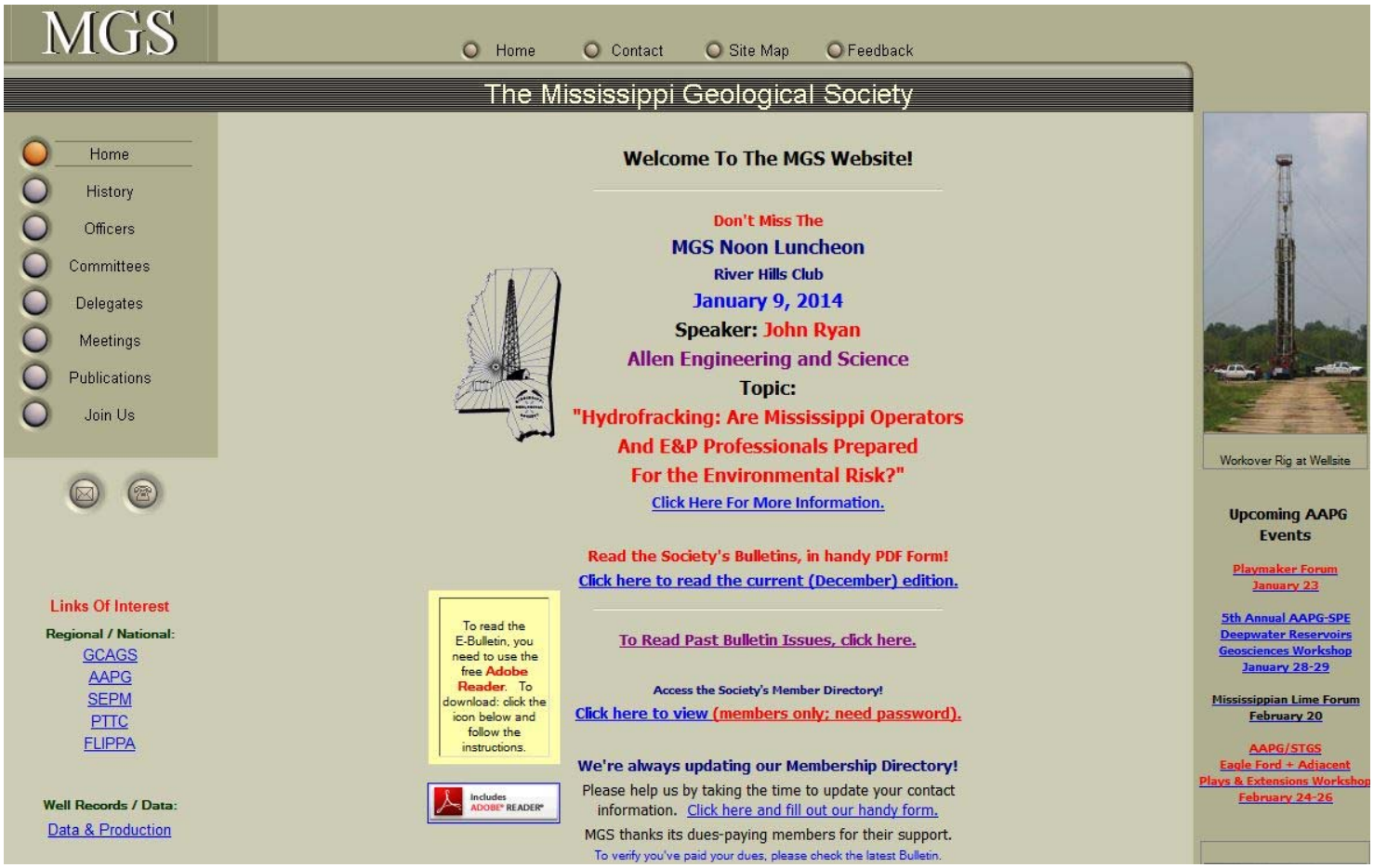


MONTHLY COLUMN

David T. Dockery

VALUE OF A CORE AND SAMPLE LIBRARY

David T. Dockery III

When Neil Barnes asked if I would be willing to do a regular column for the MGS Bulletin, I didn't just say "Yes;" I said …. "Yes, and thanks for asking." We (MDEQ, Office of Geology) regularly contributed to the MGS bulletin when it was published in hardcopy. Neil also told me that I could use some of the articles we have published in the monthly Mississippi Department of Environmental Quality newsletter. The following article about the value of a core and sample library is from the October 2013 issue of MDEQ's newsletter, *Environmental News*. If you have a success story based on the use of the Office of Geology Core and Sample Library, please send the details to me at david_dockery@deq.state.ms.us.

My earliest summer work with MDEQ's Office of Geology in 1969 (then the Mississippi Geological Survey) was as a driller's helper for work on the Rankin County Geology Bulletin and in cutting cores to be stored in the office's Core and Sample Library. Many of the cores I cut were of the Smackover Limestone, the lower part of which comprises the Brown Dense Play in Arkansas and Louisiana. The organic-rich carbonate rocks of the Brown Dense are believed to be the source of much of the Jurassic and Cretaceous oil reserves in southern Mississippi. Figure 1 shows an upper Smackover Limestone core from the MDEQ Core and Sample Library that is bleeding oil, a sight any petroleum geologist would love to see. The following examples highlight the value of core and sample libraries such as the MDEQ library in Jackson.

Canada. Jeff Lewis' article (posted September 29, 2013) entitled "Unlocking oil secrets stored in Alberta's core sample archive" noted that cores of the Grosmont carbonate at the Core Research Centre in Calgary (figures 2-3) indicate the presence of a 400-billion-barrel mother lode of super-viscous crude in the formation. As new technology advances oil recovery in Alberta's oil patch, the 193,750-square-foot Calgary core and sample facility (with a $50-billion sample inventory based on replacement cost) is an uncommon asset. An oil-shale play in the Duvernay Shale, based on core sampling done at the Calgary facility, revealed the formation to hold 443 trillion cubic feet of gas, 11.3 billion barrels of natural gas liquids, and 61.7 billion barrels of oil. Companies such as Encana Corp., Chevron Corp., and ExxonMobil Corp. have spent billions in recent years leasing properties over the Duvernay Shale, but no one would have "taken a swing at the Duvernay if they didn't have a bunch of core to look at beforehand."

Texas. Geologist Gregg Roberston (Figure 4) was named Caller-Times 2012 Newsmaker of the Year for his role in the development of the Eagle Ford Shale-Oil Play (Figure 5). Robertson re-examined drill cuttings from a dry hole drilled in the Eagle Ford Shale in 1952. These samples were stored on Row 57, Bay H, Shelf 4, at the Texas core and sample library at Austin. Roberston's fresh look at dry-hole cuttings led to an oil boom in southwestern Texas that can be seen from space (Figure 6). According to Todd Yates of the Corpus Christi Caller-Times (posted December 29, 2012), "the discovery transformed sleepy villages into boomtowns, poured millions of dollars into rural school, city and church coffers, turned struggling ranchers into millionaires and gave thousands of people new careers across South Texas."

MONTHLY COLUMN

David T. Dockery

North Dakota. 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, has given the state of North Dakota a billion-dollar budget surplus, and can be seen from space in the night sky (Figure 7).

Michigan. Michigan Geological Survey's Michigan Geological Repository for Research and Education (MGRRE) in conjunction with the Michigan Potash Company announced the "rediscovery" of a mineral deposit in Western Michigan described as "the United States' only shovel-ready potash project" (Yvonne Zipp, posted September 10, 2013). At current market prices, the deposit is estimated to be worth $65 billion based on cores of the potash-rich Borgen Bed at the Michigan Geological Repository. Midwest corn and soybean farmers get their potash from New Mexico or Canada for upward of $400 at ton, of which about $40 to $60 is in the cost of transportation. So, the new deposit will also be an economic boom to the minerals industry and to local famers. The Borgen Bed cores are part of the 500,000 feet of cores housed in the Michigan Geological Repository (Figure 8). According to independent laboratory analyses, the Borgen Bed deposits contain the purest and highest-grade potash being produced in the world—six times higher than that mined in New Mexico. Some layers contain essentially 100 percent potassium chloride.

Alabama. Recent initiatives have been made to develop the oil sands of the Hartselle Sandstone in Alabama, which have estimated reserves of 7.5 billion barrels of oil. This reserve estimate was made by Gary Wilson (1987, Geological Survey of Alabama Bulletin 111, pages 30-31) based on analyses of 50 cores. Data from the cores gave: (1) an average reservoir thickness of 14 feet, (2) with 13% porosity, and (3) 30% oil saturation present, (4) within an area of 2,800 square miles or 1.8 million acres, which is equivalent to 7.5 billion barrels of oil. Such analyses could not have been done without the Hartselle cores at the Geological Survey of Alabama, State Oil and Gas Board, State Core Storage Repository (Figure 9). This repository contains samples from more than 10,000 oil and gas wells, more than 400 coal and mineral exploration cores, 200 offshore sediment cores, and 1,000 samples from water wells.

MONTHLY COLUMN

David T. Dockery

Mississippi. Following the discovery of the Tinsley Oil Field in 1939 by Mississippi Geological Survey geologist (now MDEQ's Office of Geology) Fred Mellen, Germany invaded Poland and began a march on the Galacian and Romanian oilfields. War quickly spread to North Africa and to the Pacific, including oil-rich British Malaya and Dutch East Indies (Japanese paratroopers seized the Dutch oil fields largely intact). To conserve oil and encourage exploration, the U.S. Government established the Office of Petroleum Coordination and staffed it with 72 leaders from America's oil industry. As the newest of the major oil producers, Mississippi's oil potential seemed unlimited. Drilling in the state reached record levels, and, in the years from 1943-1945, there were large oil finds at Brookhaven, Eucutta, Cranfield, Heidelberg, Mallalieu, and Baxterville. Major gas finds included Gwinville, Soso, and Hub. By the war's end, the state's proven reserve was placed at one billion barrels of oil and 3.5 trillion cubic feet of gas (after Alan Cockrell, 2005, Drilling Ahead; University Press of Mississippi, p. xxii).

Discoveries continued, and, in 1960, state government and the oil industry partnered to build a new facility in Jackson to house the Mississippi Geological Survey and the survey's core and sample repository. By August 1, 1965, the core repository was full of core and samples; space had run out. Fred Mellen, then the State Geologist, circulated a petition to Governor Paul B. Johnson that was signed by politicians (Ross Barnett), those in the oil industry (including MDEQ's Roy Furrh's father and Dan Morse's father and grandfather), and those in the Mississippi Gem and Mineral Society (signed by my parents and Heather Pitts' grandparents) to build a new and modern core and sample library. The petition succeeded only in fostering a cheaper solution—adding on to the existing facility.

Mississippi's core and sample facility grew as a string of metal buildings, which housed a wealth of new oil and gas well samples (Figure 10). The facility supported Mississippi's oil industry through the boom times. By January 1, 1970, the year of peak oil production for the nation, Mississippi ranked 7th among oil producing states. Following 1970 there was a decline in domestic production and an increased dependence on foreign oil. Today, an upturn in domestic production has come about through advances in drilling technologies, which have unlocked new reservoir possibilities. These new technologies are being used in Mississippi's Black Warrior Basin and the southwestern part of the Mississippi Interior Salt Basin. Our state's next big oil find may be "hiding" in a core or sample box on a shelf in MDEQ's Core and Sample Repository.

Figure 1. Oil-stained cores from the upper Smackover Limestone in Clarke County, Mississippi, at a depth of 10,780 feet. Picture was taken at MDEQ's Core and Sample Library on March 11, 2013.

Figure 2. Views of the sample examination room at the Core Research Centre at the University of Calgary. At left, Conoco Phillips geologists look at cores. Pictures were taken by Todd Korol for the National Post.

Figure 3. Core (left) and drill cutting (right) sample storage at the Core Research Centre at the University of Calgary. Pictures were taken by Todd Korol for the National Post.

Figure 4. Geologist Gregg Roberston was named Caller-Times 2012 Newsmaker of the Year for his role in the development of the Eagle Ford Shale. Picture was taken by Todd Yates for the Corpus Christi Caller-Times.

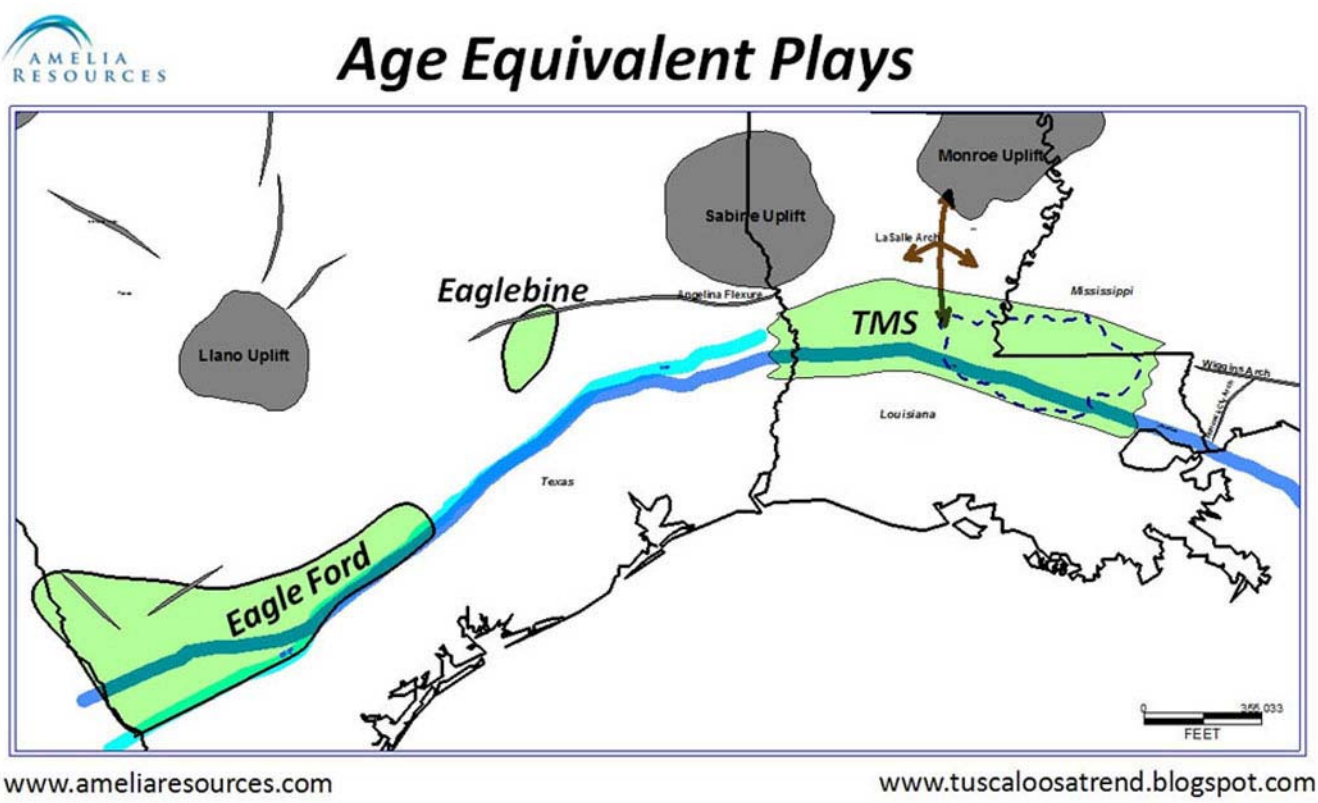


Figure 5. The Eagle Ford Trend of South Texas and the Tuscaloosa Marine Shale Trend of Louisiana and Mississippi; the Tuscaloosa is actually a little older than the Eagle Ford.

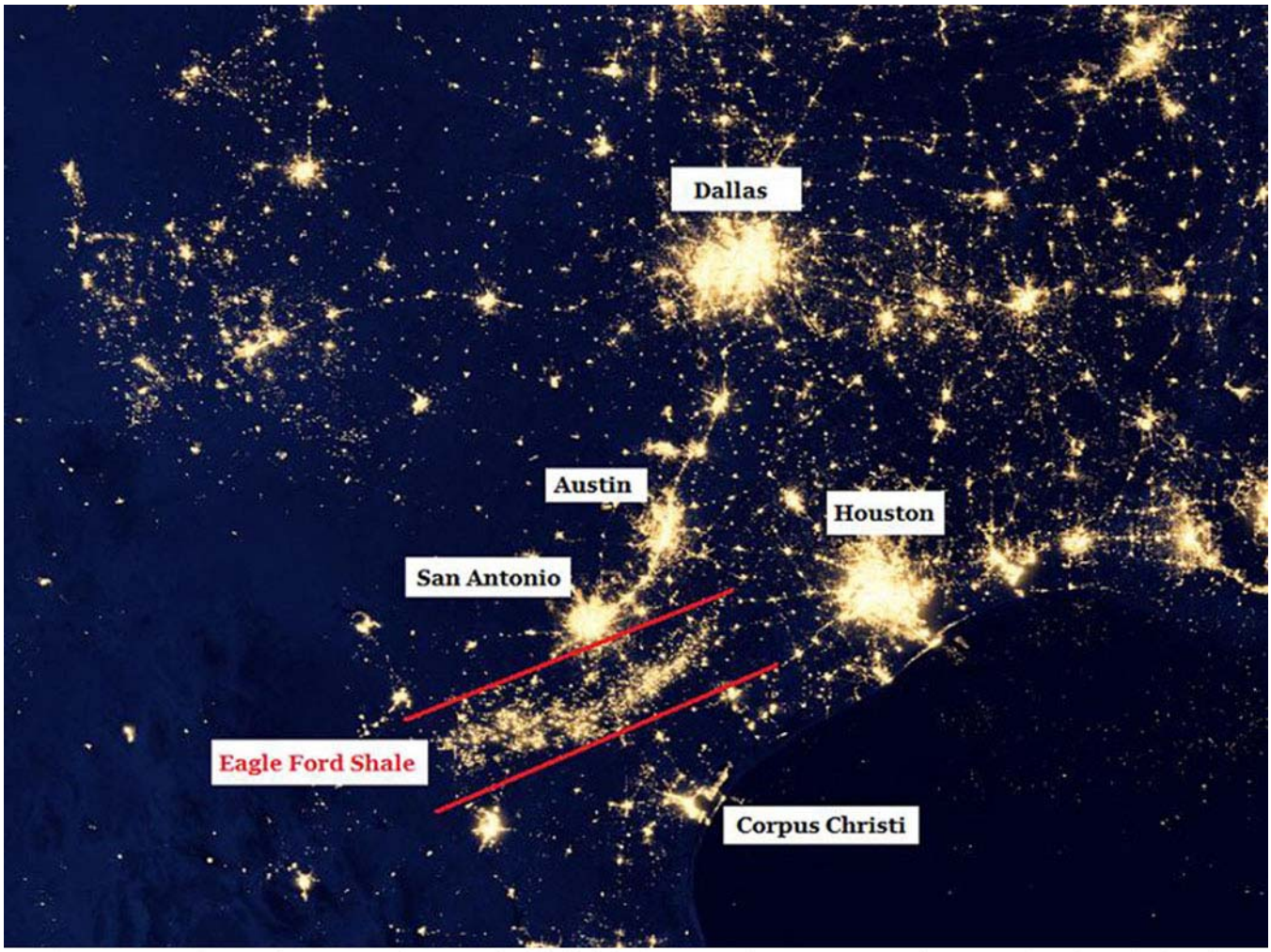


Figure 6. Flares from Eagle Ford oil fields in South Texas can be seen in the night sky from space, rivaling the lights of San Antonio and Austin.

Figure 7. Left, flares of the Bakken oil fields as seen from space in the night sky; Eagle Ford flares can be seen in South Texas. Right, oil-rich cores of the Bakken Shale.

Figure 8. At left, from left to right, William Harrison, professor emeritus Western Michigan University, Theodore Pagano, general manager of Michigan Potash, and Linda Harrison, administrator of the WMU Michigan Geological Repository. At right, a core of the potash-rich Borgen Bed.

Figure 9, Cores stored in the Geological Survey of Alabama and State Oil and Gas Board State Core Repository.

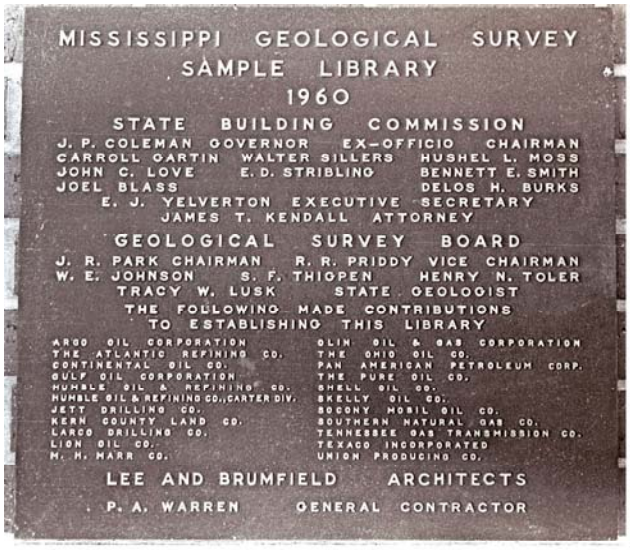


Figure 10. Left, dedication plaque at MDEQ's core and sample library, listing 12 oil industry companies that partnered with the state to build the facility in 1960. Right, a long line of multiple metal buidings house the core and sample collection. Pictures were taken around 1980.

american geosciences institute

23 October 2013

GEOSCIENCE CURRENTS

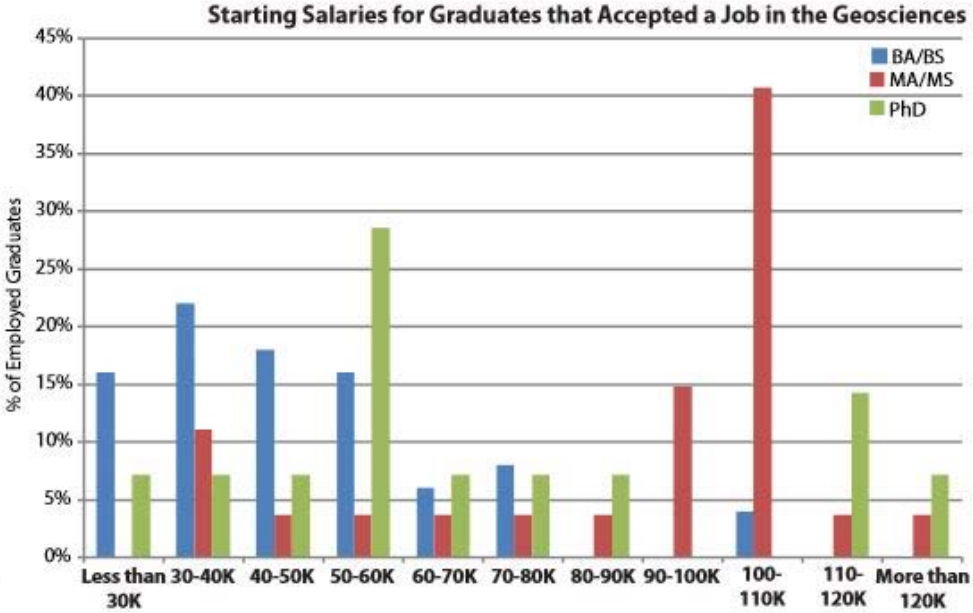
No. 81

Salaries and Employment Locations of Recent Geoscience Graduates

AGI's National Geoscience Student Exit Survey measures the relevant experiences in school and the immediate career plans upon graduation of recent geoscience degree recipients. In spring 2013, AGI distributed this survey nationally and received 428 responses from 71 geoscience departments. This *Currents* examines the results from questions focused on the information about students' employment in the geosciences.

Graduates were asked about their new job position if they had accepted employment within the geosciences, including the location of their new job and their starting annual salary. While graduates attended school in all regions of the country, the majority of the new job locations were in Texas, California, and Oklahoma. For example, the highest number of survey participants graduated from universities in Pennsylvania, but only four graduates found a job in that state. The graduates with jobs in Texas and Oklahoma were nearly all hired into the petroleum industry. Most of the graduates with jobs in California found positions in environmental services, research institutes, and government agencies.

Most bachelor's graduates found jobs with an annual salary between $20,000 and $60,000. However, while the salary range for master's and doctoral graduates varied widely depending on position, the majority of master's graduates tended to find higher paying jobs compared to the doctoral graduates. Also, every graduate making an annual salary of more than $90,000 found their job in the petroleum industry.



Check out the **2013 Status of Recent Geoscience Graduates** report for more data from AGI's Geoscience Student Exit Survey.

The report can be accessed through the following link:
http://www.agiweb.org/workforce/reports.html

- Carolyn E. Wilson

If you have any questions or would like your department to participate in AGI's Exit Survey, please contact Carolyn at **cwilson@agiweb.org**

ARTICLE OF THE MONTH

Methane Hydrate

The Next Energy "Game Changer"?

As natural gas from shale becomes a global energy "game changer," oil and gas researchers are working to develop new technologies to produce natural gas from methane hydrate deposits. This research is important because methane hydrate deposits are believed to be a larger hydrocarbon resource than all of the world's oil, natural gas and coal resources combined. [1] If these deposits can be efficiently and economically developed, methane hydrate could become the next energy game changer.

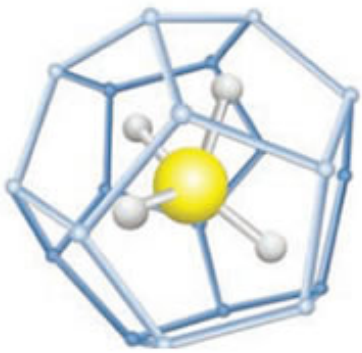
Enormous amounts of methane hydrate have been found beneath Arctic permafrost, beneath Antarctic ice and in sedimentary deposits along continental margins worldwide. In some parts of the world they are much closer to high-population areas than any natural gas field. These nearby deposits might allow countries that currently import natural gas to become self-sufficient. The current challenge is to inventory this resource and find safe, economical ways to develop it.

What is Methane Hydrate?

Methane hydrate is a crystalline solid that consists of a methane molecule surrounded by a cage of interlocking water molecules . Methane hydrate is an "ice" that only occurs naturally in subsurface deposits where temperature and pressure conditions are favorable for its formation.

If the ice is removed from this temperature/pressure environment it becomes unstable. For this reason methane hydrate deposits are difficult to study. They can not be drilled and cored for study like other subsurface materials because as they are brought to the surface the pressure is reduced and the temperature rises. This causes the ice to melt and the methane to escape.

Several other names are commonly used for methane hydrate. These include: methane clathrate, hydromethane, methane ice, fire ice, natural gas hydrate, and gas hydrate. Most methane hydrate deposits also contain small amounts of other hydrocarbon hydrates. These include propane hydrate and ethane hydrate.



Left: A ball-and-stick model of methane hydrate showing the central methane molecule surrounded by a "cage" of water molecules. Other hydrocarbon molecules such as pentane and ethane can occupy the central position in this structure. (United States Department of Energy image). **Right:** A burning specimen of methane hydrate ice (United States Geological Survey image).

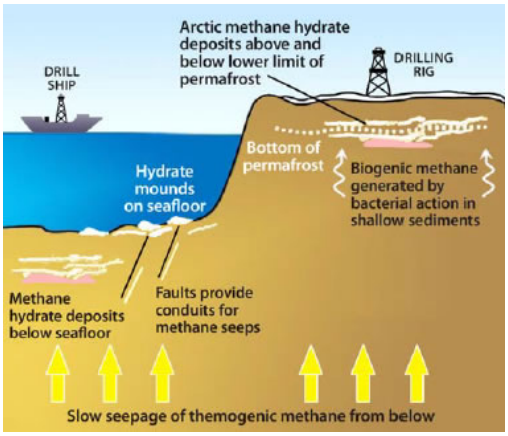
ARTICLE OF THE MONTH

Methane Hydrate

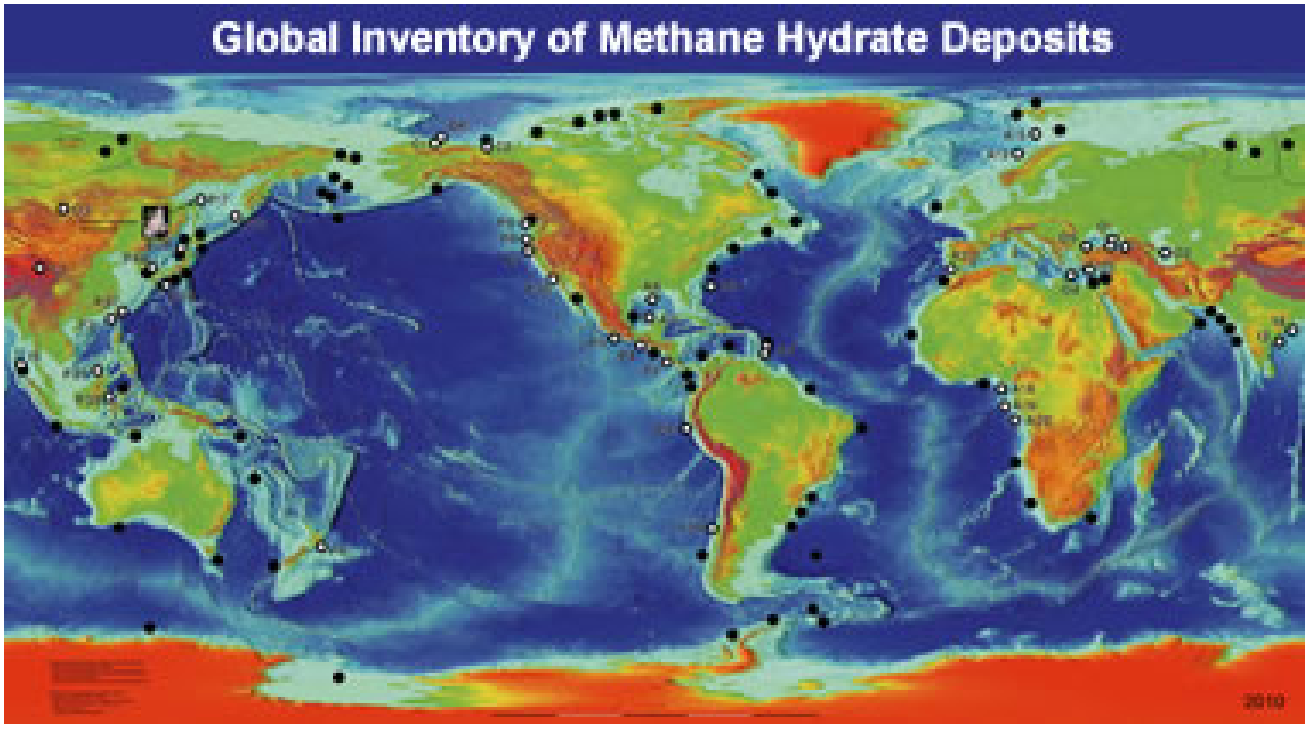
Where Are the Methane Hydrate Deposits?

Four Earth environments have the temperature and pressure conditions suitable for the formation and stability of methane hydrate. These are: 1) sediment and sedimentary rock units below Arctic permafrost; 2) sedimentary deposits along continental margins; 3) deep-water sediments of inland lakes and seas; and, 4) under Antarctic ice. [10]. With the exception of the Antarctic deposits, methane hydrate accumulations are not very deep below Earth's surface. In most situations the methane hydrate is within a few hundred meters of the sediment surface.

In these environments methane hydrate occurs in the sediment as layers, nodules and intergranular cements. The deposits are often so dense and laterally persistent that they create an impermeable layer that traps natural gas moving upwards from below.



In 2008, the United States Geological Survey estimated the total undiscovered gas hydrate resource for the Alaska North Slope area. They estimate that the total undiscovered natural gas resource in the form of gas hydrate ranges between 25.2 and 157.8 trillion cubic feet. Because very few wells have been drilled through the gas hydrate accumulations, the estimates have a very high level of uncertainty. [5]



Hobart King - Geology.com

Greetings!

AAPG value's our relationship with you! Because of this we want to make your website and events visible to AAPG members and website visitors, by adding you to the AAPG Website!

Simply send us your society name (or name of a specific upcoming event), logo, and a link to your website (the main portal page, or a page within the site). People who visit our site will have a direct link to the web pages you'd like them to visit.

In return, we ask that you list our events on your calendar or website and include a link to the specific event as listed below.

Playmaker Forum
23 January 2014 // Houston, Texas
http://www.aapg.org/forum/2014/playmaker/index.cfm

Fifth Annual AAPG-SPE Deepwater Reservoirs Geosciences Technology Workshop
28-29 January 2014 // Houston, Texas
http://www.aapg.org/gtw/2014/houston/index.cfm

Mississippian Lime Forum
20 February 2014 // Oklahoma City, OK
http://www.aapg.org/forum/2014/MississippianLime/index.cfm

AAPG/STGS Eagle Ford plus Adjacent Plays & Extensions Workshop
24-26 February 2014 // San Antonio, Texas
http://www.aapg.org/gtw/2014/eagleford/index.cfm

To receive your gift, simply complete the following easy steps:

1. Email Grant Smith -- gsmith@aapg.org, and include your logo, link, and what you'd like the link to say (your society's name? an upcoming event?).

2. Tell us where you're posting the AAPG events (calendar? website?) by emailing us a link.

Thank you for participating in this partnership designed for big results!

Sincerely,

AAPG Education

American Association of Petroleum Geologists
P. O. Box 979
Tulsa, OK 74101-0979

GRADUATE STUDENTS

The following is a preliminary list of current graduate students and their thesis work. I would encourage you to offer your knowledge and expertise and help our future geologists gain the experience they need as they move forward in their careers.

Name: David Luke Thompson
Email: dlt168@msstate.edu
Phone: 601-750-5497
Career Goal: mining industries and/or economic geology industries
Thesis Title: "Stratigraphy, Environments of Deposition, and Mineralogical Characterization of Heavy Minerals from Selected Cretaceous Formations of the Northern Mississippi Embayment"

Name: Ryan Travis
Email: rtravis1123@gmail.com and rwt85@msstate.edu
Phone: 214-796-2443
Career Goal: Hydrocarbon Industry
Thesis Title: Void Collapse as Related to Dissolution Megaporosity.
I am developing new collapse equations, based off of Loucks' (1999) Cave Collapse Model, to better understand and model paleokarst reservoirs.
I am also working on an ongoing research project with Dr. Jon Sumrall utilizing petrographic and geochemical tools to understand the diagenetic history of a paleosol collapse breccia on Aruba.

Name: Michael Brooke
Phone: 601-594-6309
Email: jmb374@msstate.edu
Thesis Title: A Sequence Stratigraphy of the Haynesville/ Bossier interval in Jefferson County, MS using SEM analysis.
Interested in someone who has worked in the newer shale plays. Also information about the Burkley-Phillips #1 well will be greatly appreciated.

Name: Natalie Odegaarden
Phone: 601-826-3903
Email: nao23@msstate.edu and napsamai@yahoo.com
I would like to focus my thesis on the Smackover Formation in the Jay Field. I need help locating a core and logs in order to perform correlation, sequence stratigraphy, depositional environment and thin section analysis to name a few.

Name: Claire E. Babineaux
Email: ceb445@msstate.edu and clairegeobx@gmail.com
Thesis Title: Glass cullet as an alternative aggregate for beaches: an ecological compatibility and public opinion survey. Area of research: Coastal processes-- The research I do focuses on the ecological compatibility of glass cullet to natural beach sand. I will simulate a natural beach environment and determine what grows naturally on sand. Then I will simulate a beach environment in which the composition is 100% glass cullet and determine what will grow naturally on the glass cullet as compared to natural sand. During this process, I will also be monitoring how coastal grasses and native biota within each of the simulated environments in order to determine whether it is affected. Sample will be taken and analyzed using microscopes and SEM. I will also be doing a public opinion survey to determine whether the general public will accept glass on the beaches in areas in which they live or visit in Mississippi.

Name: Courtney Killian
Email: ck695@msstate.edu
Phone: 724-549-3544
My thesis will be geared towards hydrology, groundwater and surface water interactions.

GEOLOGY POST

New Discovery about How Water Moves Through Soil

Some of the most fundamental assumptions of water movement might be incorrect

Republished from a January, 2010 press release by Oregon State University.

Behavior of Water in Soil Surprises Researchers

Researchers have discovered that some of the most fundamental assumptions about how water moves through soil in a seasonally dry climate such as the Pacific Northwest are incorrect - and that a century of research based on those assumptions will have to be reconsidered.

A new study by scientists from Oregon State University and the Environmental Protection Agency showed - much to the surprise of the researchers - that soil clings tenaciously to the first precipitation after a dry summer, and holds it so tightly that it almost never mixes with other water.

Implications of the Discovery

The finding is so significant, researchers said, that they aren't even sure yet what it may mean. But it could affect our understanding of how pollutants move through soils, how nutrients get transported from soils to streams, how streams function and even how vegetation might respond to climate change.

The research has been published in Nature Geoscience, a professional journal, with a title of "Ecohydrologic separation of water between trees and streams in a Mediterranean climate".

Two Modes of Water Occurrence in Soil

"Water in mountains such as the Cascade Range of Oregon and Washington basically exists in two separate worlds," said Jeff McDonnell, an OSU distinguished professor and holder of the Richardson Chair in Watershed Science in the OSU College of Forestry. "We used to believe that when new precipitation entered the soil, it mixed well with other water and eventually moved to streams. We just found out that isn't true."

"This could have enormous implications for our understanding of watershed function," he said. "It challenges about 100 years of conventional thinking."

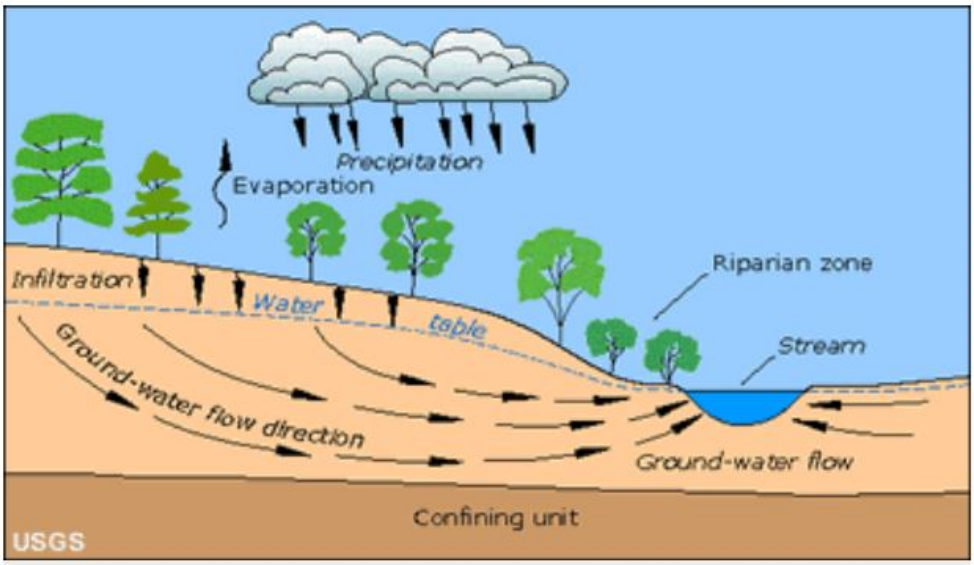
Soil Near Plant Roots Attracts and Holds Water

What actually happens, the study showed, is that the small pores around plant roots fill with water that gets held there until it's eventually used up in plant transpiration back to the atmosphere. Then new water becomes available with the return of fall rains, replenishes these small localized reservoirs near the plants and repeats the process. But all the other water moving through larger pores is essentially separate and almost never intermingles with that used by plants during the dry summer.

The study found in one test, for instance, that after the first large rainstorm in October, only 4 percent of the precipitation entering the soil ended up in the stream - 96 percent was taken up and held tightly by soil around plants to recharge soil moisture. A month later when soil moisture was fully recharged, 55 percent of precipitation went directly into streams. And as winter rains continue to pour moisture into the ground, almost all of the water that originally recharged the soil around plants remains held tightly in the soil - it never moves or mixes.

"This tells us that we have a less complete understanding of how water moves through soils, and is affected by them, than we thought we did," said Renee Brooks, a research plant physiologist with the EPA and courtesy faculty in the OSU Department of Forest Ecosystems and Society.

GEOLOGY POST



The study found in one test that after the first large rainstorm in October, only 4 percent of the precipitation entering the soil ended up in the stream – 96 percent was taken up and held tightly by soil around plants to recharge soil moisture. A month later when soil moisture was fully recharged, 55 percent of precipitation went directly into streams. This is contrary to widely-held assumptions of how water behaves in soils. USGS image.

Mathematical Models Have Incorrect Assumptions

"Our mathematical models of ecosystem function are based on certain assumptions about biological processes," Brooks said. "This changes some of those assumptions. Among the implications is that we may have to reconsider how other things move through soils that we are interested in, such as nutrients or pollutants."

Stable Isotope "Fingerprints" of Water

The new findings were made possible by advances in the speed and efficiency of stable isotope analyses of water, which allowed scientists to essentially "fingerprint" water and tell where it came from and where it moved to. Never before was it possible to make so many isotopic measurements and get a better view of water origin and movement, the researchers said.

The study also points out the incredible ability of plants to take up water that is so tightly bound to the soil, with forces nothing else in nature can match.

Support and Acknowledgement

The research was conducted in the H.J. Andrews Experimental Forest near Blue River, Ore., a part of the nation's Long Term Ecological Research, or LTER Program. It was supported by the EPA.

About the OSU College of Forestry: For a century, the College of Forestry has been a world class center of teaching, learning and research. It offers graduate and undergraduate degree programs in sustaining ecosystems, managing forests and manufacturing wood products; conducts basic and applied research on the nature and use of forests; and operates 14,000 acres of college forests.

GEOLOGY POST

ARTICLES, PAPERS or NEWS?

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

I would like to add 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,

Matt Caton
Editor

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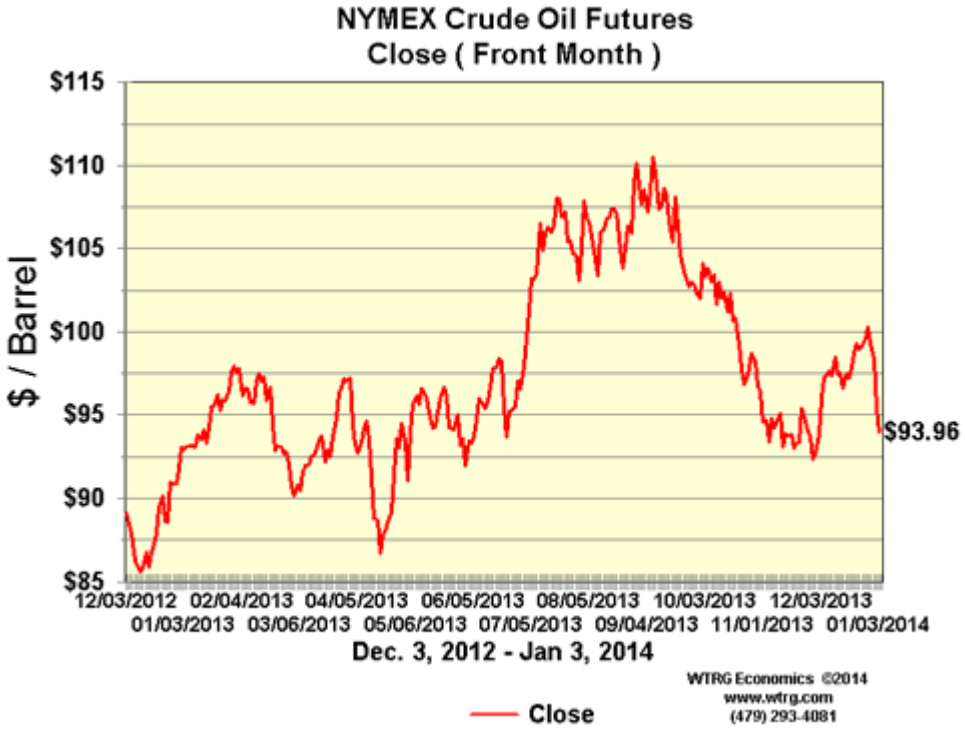

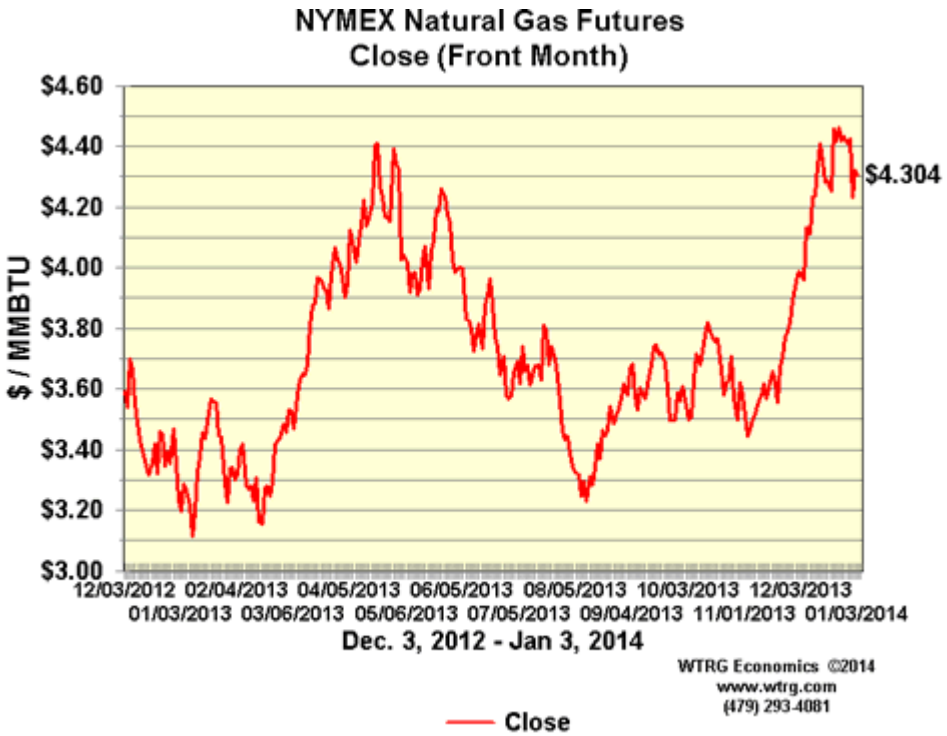

BOLAND SCHOLARSHIP WATCH

Faculty & Students,

This is a new year and the Mississippi Geological Society along with the Boland Scholarship Fund would like to remind you that we want to honor the most out-standing overall students for the 2013-2014 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,

Matt Caton
Editor

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GEO LINK POST

USGS TAPESTRY OF TIME AND TERRAIN http://tapestry.usgs.gov 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 http://www.tnris.state.tx.us/digital.htm 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.

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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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1967-1968	Julius M. Ridgway
1968-1969	Edward D. Minihan
1969-1970	Kevin E. Cahill
1970-1971	John Lancaster
1971-1972	Larry Boland
1972-1973	Charles Barton
1973-1974	Larry Walter
1974-1975	W. E. "Gene" Taylor
1975-1976	Jerry E. Zoble
1976-1977	P. David Cate
1977-1978	Sarah Childress
1978-1979	Les Aultman
1979-1980	Philip R. Reeves
1980-1981	Marshall Kern
1981-1982	Stephen Oivanki
1982- 1983	James W. "Buddy" Twiner
1983- 1984	Charles H. Williams
1984- 1985	C. Kip Ferns
1985-1986	Steven S. Walkinshaw
1986-1987	J. R. ""Bob" White
1987-1988	Harry Spooner
1988-1989	Stanley King
1989-1990	Stan Galicki
1990-1991	E. James Files, Jr.
1991-1992	Stephen L. Ingram, Sr.
1992-1993	Michael Noone/Stanley King
1993-1994	Brian Sims
1994-1995	C. W. "Neil" Barnes
1995-1996	Lester Aultman
1996-1997	Jack S. Moody
1997-1998	George B. Vockroth
1998-1999	Rick L. Ericksen
1999-2000	Stanley King
2000-2001	John C. Marble
2001-2002	Andrew T. Sylte
2002-2003	Aaron Lasker
2003-2004	John G. Cox
2004-2005	James E. Starnes
2005-2006	Todd Hines
2006-2007	Bob Schneeflock
2007-2008	Tony Stuart
2008-2009	Lisa Ivshin
2009-2010	Joe Johnson
2010-2011	Brian Sims
2011-2012	Stanley King
2012-2013	Jim Files