



The mission of the Mississippi Department of Environmental Quality is to safeguard the health, safety, and welfare of present and future generations of Mississippians by conserving and improving our environment and fostering wise economic growth through focused research and responsible regulation.

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Mississippi Department of Environmental Quality Environmental News

VOLUME 12 ISSUE 9

OCTOBER 2015

MDEQ Announces Two *Deepwater Horizon* Oil Spill Documents Available for Public Comment

On October 5, MDEQ announced that two documents needed to forge the path forward for *Deepwater Horizon* oil spill restoration plans on the Gulf Coast were available for public comment. Once approved, the total compensation to offset injuries resulting from the 2010 *Deepwater Horizon* oil spill disaster will reach at least \$2.17 billion for Mississippi.

The Consent Decree, the Programmatic Damage Assessment and Restoration Plan (PDARP)/Programmatic Environmental Impact Statement (PEIS) are the two documents available for public comment for the next 60 days.

"We have worked diligently with all parties to forge a path for the future environmental and economic restoration of Mississippi. Thousands of Mississippians have followed this journey of response, recovery and restoration from the beginning and have faithfully engaged to provide a vision for restoring Mississippi. We want to hear from the public on these documents because their insight is invaluable and vital to the process," said Gary Rikard, MDEQ Executive Director. Rikard serves as Mississippi's Trustee for the Natural Resource Damage Assessment under the Oil Pollution Act and is tasked with leading Mississippi's recovery from the *Deepwater Horizon* oil spill.

The Consent Decree details what BP must pay to the Gulf States and the United States to resolve environmental claims, economic governmental claims and civil penalties. It contains information on the proposed resolution of natural resource damage claims (NRDA) and the state's economic loss claim under the Oil Pollution Act.

The documents and supplemental materials are available for review and comment at

www.gulfspillrestoration.noaa.gov. Comprehensive information about all aspects of Mississippi's restoration efforts can be found at www.restore.ms.

The Consent Decree also includes proposed civil penalties under the Clean Water Act, of which 80 percent will be directed to the Gulf States for environmental and economic restoration via the RESTORE Act. This Consent Decree must be approved by the court before any settlement is final and will only be finalized after the consideration of public comments.

The Programmatic Damage Assessment and Restoration Plan (PDARP) and companion Programmatic Environmental Impact Statement (PEIS) describes the injury to the environment studied through the Natural Resource Damage Assessment (NRDA) under the Oil Pollution Act. The PDARP/PEIS lays out the restoration pathway to restore natural resources and services that were injured and lost as a result of the oil spill. Once approved, additional restoration plans will be developed that identify specific restoration projects in Mississippi, the other Gulf States, and the Gulf of Mexico. It will only be final if approved by the Court and after the parties take into account public comment and review. Following the public meetings and at the close of the public comment period, the NRDA Trustees and the United States Department of Justice will consider the input received on both documents, make appropriate modifications and present the final documents to the Court for review and approval.

The Consent Decree and PDARP/PEIS stem from the previously announced Agreement in Principle that called for \$1.5 billion in additional relief to Mississippi to recover environmental and economic damages resulting from the *Deepwater Horizon* oil spill. Combined with \$659 million in early funding, Mississippi is on tap to receive a minimum of nearly \$2.17 billion in compensation. Total global settlement values to resolve civil claims under the Clean Water Act and natural resource damage claims under the Oil Pollution Act, as well as remaining economic claims of the five Gulf States and municipalities, are worth more than \$20 billion.

A meeting will be held on October 20 to allow the public the opportunity to review these documents and to submit comments. It begins at 5:00 p.m. in the FEC Auditorium at the University of Southern Mississippi Gulf Coast campus, 730 East Beach Boulevard in Long Beach.



EPA Lowers Ozone Air Quality Standard

On October 1, EPA lowered the primary and secondary National Ambient Air Quality Standards (NAAQS) for ground-level ozone from 0.075 parts per million (ppm) to 0.070 ppm. Air quality data submitted to EPA for 2012 to 2014 shows several Mississippi counties close to the new standard and Jackson County just over at 0.071 ppm (see chart on the following page). However, preliminary air quality data for the 2013 to 2015 period indicates that all ambient air monitoring sites would meet this standard, but the data is incomplete until ozone monitoring for this year ends October 31. By late 2016, the Governor will recommend that the entire state should be designated as attainment by EPA based on the 2013 to 2015 data, if the rest of the 2015 data indicates attainment. By late 2017, EPA plans to issue final designations based on 2014 to 2016 data.

In 2008, EPA lowered the primary and secondary NAAQS for ozone from 0.08 parts per million (ppm) to 0.075 ppm, and the final designations were made in April 2012. EPA designated the state as attainment except for DeSoto County, and it was designated nonattainment because EPA stated that the county's emissions affected ozone concentrations in the rest of the Memphis nonattainment area including Shelby County, Tennessee, and Crittenden County, Arkansas. However, based on 2012 to 2014 data, the entire Memphis nonattainment area is attaining the 2008 standard at 0.069 ppm, and Mississippi, Arkansas, and Shelby County, Tennessee, are submitting documentation to request that the area be redesignated.

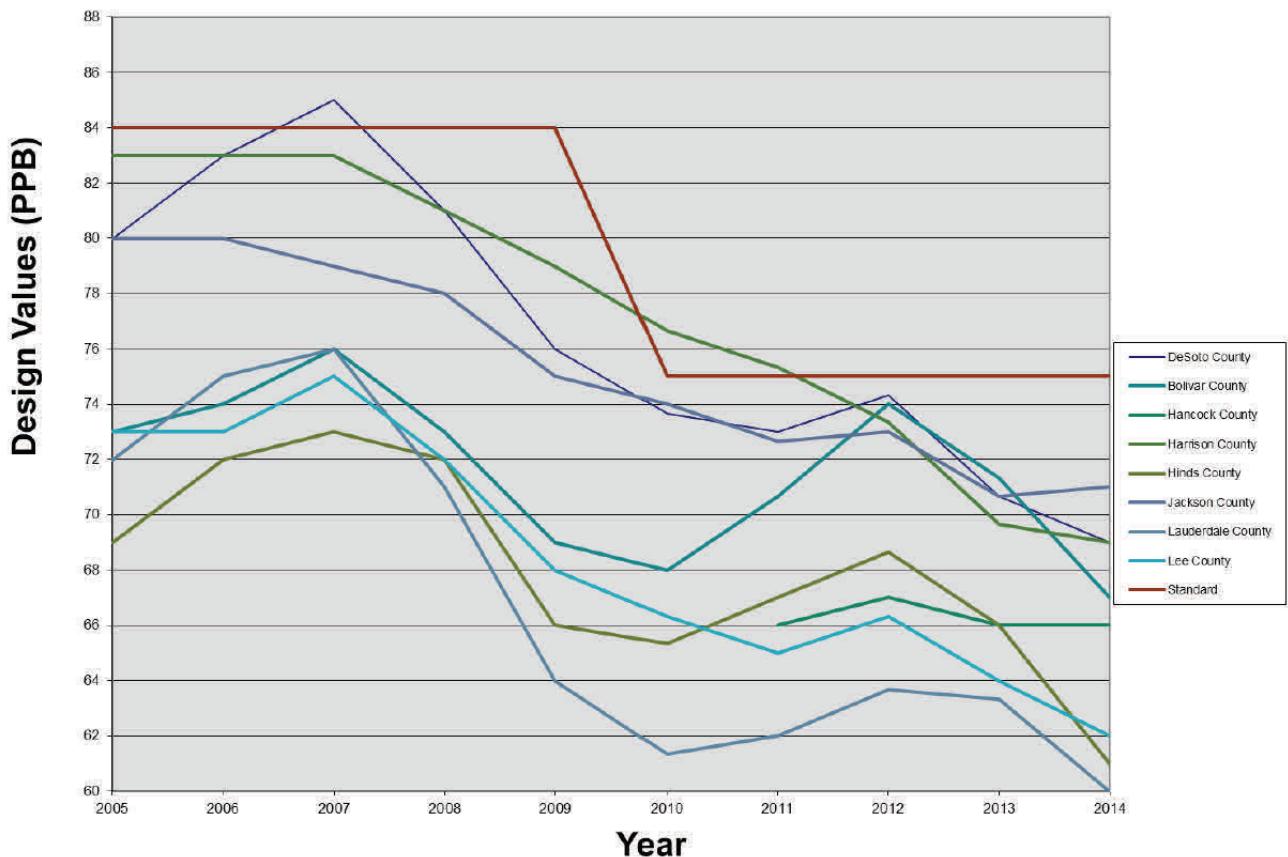
Areas designated as nonattainment face potential economic development constraints including limits to industrial growth and transportation improvement such as restrictions on highway expansion and development. Because the Gulf Coast and DeSoto County are close to the new standard, these areas have developed voluntary plans to reduce ozone levels. Mississippi Air Quality Action Groups, formed by MDEQ, cities, county agencies, industries, government agencies, and public interest groups, help citizens, businesses, and industries become aware of the issue and how they can be part of the solution. They are developing outreach materials and planning promotional events to encourage ozone reduction steps such as carpooling, vehicle idle reduction, and postponing vehicle refueling and lawn maintenance until after 6:00 p.m.

These groups are also developing more efficient ways to notify residents and businesses on ozone action days. The Air Quality Action Groups and MDEQ are resolved to protect air quality and maintain healthy economic growth.

MDEQ sends out daily three-day air quality forecasts from April through October. These forecasts are available on the MDEQ website, Twitter (@MDEQ), by email (contact Rodney Cuevas rcuevas@deq.state.ms.us to join). Ozone Action Days are issued when the Ozone Air Quality Index (AQI) is expected to exceed 100 due to weather conditions predicted to be conducive to ozone formation. There are bans on all open burning in DeSoto County and on the Mississippi Gulf Coast on ozone action days.

The Mississippi Gulf Coast Air Quality Action Group and the DeSoto County Air Quality Action Group are actively recruiting new members. For more information, please contact Jerry Beasley at (601) 961-5134.

10 Year Ozone Trends



Mississippi Based RESTORE Act Center of Excellence Selected as the RESTORE Research Center of Excellence

MDEQ announced on October 15 that the Mississippi Based RESTORE Act Center of Excellence (MBRACE) has been selected as the RESTORE Research Center of Excellence. Following the *Deepwater Horizon* disaster, Congress passed the RESTORE Act to direct a portion of Clean Water Act civil penalties collected from responsible parties to the states impacted by the oil spill, and it includes a 2.5 percent funding designation to establish Research Centers of Excellence.

MBRACE is a consortium made up of Mississippi's four major research institutions: the University of Southern Mississippi, Jackson State University, the University of Mississippi, and Mississippi State University. The University of Southern Mississippi will serve as the lead institution with the MBRACE program administered within the University's Center for Gulf Studies.

"The Mississippi Based RESTORE Act Center of Excellence will further our understanding of the condition of our natural resources and how to better protect them. It will also be of assistance as we implement restoration projects across the Coast," said Gary Rikard, Executive Director of the Mississippi Department of Environmental Quality.

The Research Centers of Excellence in each Gulf state, including Mississippi, will focus on science, technology, and monitoring in the following disciplines:

- ▶ Coastal and deltaic sustainability, restoration and protection, including solutions and technology that allow citizens to live in a safe and sustainable manner in a coastal delta in the Gulf Coast Region;
- ▶ Coastal fisheries and wildlife ecosystem research and monitoring;

- Offshore energy development, including research and technology to improve the sustainable and safe development of energy resources in the Gulf of Mexico;
- Sustainable and resilient growth, economic and commercial development in the Gulf of Mexico; and
- Comprehensive observation, monitoring, and mapping of the Gulf of Mexico.

The results of studies conducted by the center will be shared with other scientists, agencies and research groups to enhance coastal resource management and develop practical applications that can drive technology innovation and business development.

“This is a key milestone in the process of repairing the damage done in Mississippi by the *Deepwater Horizon* oil spill, and the best way to find new solutions for preventing future damage to our Coast,” said Dr. Gordon Cannon, USM Vice President for Research.

Dr. Monty Graham added: “The Center for Gulf Studies and MBRACE brings together for the first time the state’s highest caliber scientists to use respective institutional capacities to address the most critical issues facing Mississippi’s Gulf Coast and its incredible natural resources.” Dr. Graham is the Chair of the Department of Marine Science and Interim Director of the USM Gulf Coast Research Lab.

Comprehensive information on all aspects of Mississippi’s oil spill restoration efforts can be found at www.restore.ms.



Triennial Review of Mississippi's Water Quality Standards Commit Period

The Clean Water Act requires all states to develop, review, revise, and adopt water quality standards every three years--the Triennial Review. Water quality standards must include three components: (1) the designated uses of the state's water bodies, (2) the water quality criteria (narrative or numeric) necessary to protect those uses, and (3) antidegradation provisions to protect water quality.

The modifications proposed for the 2015 Triennial Review include:

- Water quality criteria for Mississippi's recreational waters have been updated based on EPA's most recent recommendations that were released in 2012. Based on these recommendations, MDEQ proposes to update the bacterial indicator for freshwaters from the current indicator, fecal coliform, to the recommended indicator, *E.coli*.
- Based on the latest science and recommendations within EPA's 2012 guidance for Recreational Water Quality Criteria, seasonal criteria for bacteria are no longer recommended. Therefore, MDEQ proposes to remove the seasonal bacteria option from the following water body classifications: Fish and Wildlife Support and Public Water Supply. Under the proposed modifications, waters within these classifications would have the same criteria for *E.coli* throughout the entire year.
- The pH standard was slightly modified to clarify the intent of the standard.

MDEQ proposes the above listed modifications to water quality criteria for recreation based on the latest guidance from EPA. The recommendations from EPA rely on the latest research and science, including studies that show a link between illness and fecal contamination in recreational waters. These studies are based on the use of two bacterial indicators, *E.coli* and *enterococci*. The new criteria are designed to protect primary contact recreation, including swimming, bathing, surfing, water skiing, tubing, water play by children, and similar water contact activities where a high degree of bodily contact with the water, immersion and ingestion are likely. MDEQ has chosen the recommended values for *E.coli* to replace the current criteria values for fecal coliform.

Coliforms are bacteria that live in the intestines of warm-blooded animals. *Fecal coliform* bacteria are a kind of coliform associated with human or animal wastes. *E.coli* is a portion of the fecal coliform measurement. However, *E.coli* has performed better than fecal coliform as an indicator showing a relationship to illness. For permitted discharges, the use of *E.coli* as the indicator organism will have additional benefits. The use of *E.coli* should also reduce incidences of false positives. Fecal coliform measurements can be affected by multiple sources and may show high results even if the particular organisms present and measured are not the specific organisms that would cause a risk to human health.

In addition to the change in indicator, the latest EPA guidance does not include recommendations for seasonal bacteria values. Studies completed did not show a statistical difference in the chances of becoming ill between exposure due to incidental contact activities such as wading (typically described as Secondary Contact Recreation) and exposure due to higher contact activities such as swimming (Primary Contact Recreation). Therefore, the proposed modifications state that MS's water body classifications that previously had seasonal bacteria values will now have the same criteria for *E.coli* for the entire year.

MDEQ believes the proposed modifications are based on sound science and will allow for more effective and improved protection of human health. The public comment period for the triennial review of water quality standards will begin on October 1, 2015. Any interested party may submit comments regarding the proposed modifications in writing to the Mississippi Department of Environmental Quality, Attn: Kim Caviness-Reardon, P.O. Box 2261, Jackson, Mississippi, 39225. Written comments must be provided by the close of business on Thursday, November 5, 2015. Comments may also be provided at the public hearing scheduled at 6 p.m. on Thursday, November 5, 2015, in the Commission Hearing Room at the MDEQ office located at 515 East Amite Street in Jackson.

An electronic copy of the proposed water quality standards along with additional information on the proposed triennial review modifications can be found on the MDEQ website at <http://bit.ly/1Qfip43>. For further information, contact Kim Caviness-Reardon at Kim_Caviness-Reardon@deq.state.ms.us or Alina Young at Alina_Young@deq.state.ms.us.



A delegation from China, including Mr. Jon Li, Vice President and Secretary General of NSUH and HPCA, met on September 21 with MDEQ Executive Director Gary Rikard, Air Director Dallas Baker, MDEQ staff, and local Air & Waste Management Association members.



On September 30, MDEQ Air Division staff met with Hancock County School District officials to verify the decommissioning of an old bus and posed with a new one purchased with help from an MDEQ Diesel School Bus Replacement Program Grant. L-R: Superintendent Alan Dedeaux, MDEQ's Jessica Forbus, Chuck Rainey, Gracie Kelker, and School District Transportation Director Michael Ladner.

NetDMR Training Offered in November and December

MDEQ is implementing the use of EPA's NetDMR for the submittal of Discharge Monitoring Reports (DMRs). Any permittee in the State of Mississippi that is required to submit DMRs in order to demonstrate compliance with their NPDES, Pretreatment, or General Permit, is eligible to submit electronic DMRs.

MDEQ will be offering classroom training sessions for the regulated community to provide an overview of NetDMR including registration, data entry, and importing data. Each class will include a hands-on training exercise that will allow permittees to register and submit a DMR to the training environment.

Classes are limited to 25 people, and registration is required. To register, please contact Annette Brocks at 601-961-5252 or by email at Annette_Brocks@deq.state.ms.us. Please include name, phone number, and the class to attend. If more than one person is attending from a company, each person must register separately.

Class # 8

Date: November 4, 2015, 1:00 pm-4:00 pm

Location: Fleming Education Center, Room 302, USM Gulf Park Campus, Long Beach.

Class # 11 Participants will need to bring own laptop

Date: November 17, 2015, 8:30 am-11:30 am

Location: Trotter Seminar Room, Center for Advanced Vehicular Systems (CAVS), Mississippi State University, Starkville.

Class # 12- Participants will need to bring own laptop

Date: November 17, 2015, 1:00 pm-4:00 pm

Location: Trotter Seminar Room, Center for Advanced Vehicular Systems (CAVS), Mississippi State University, Starkville.

For any questions or additional information, please contact Kayra Johnson, Data Administration Branch, at 601-961-5106 or via email at Kayra.Johnson@deq.state.ms.us.

Class # 13

Date: December 2, 2015, 8:30 am – 11:30 am

Location: McLendon Library, Media Center Classroom # 4, Hinds Community College, Raymond.

Class # 14

Date: December 2, 2015, 1:00 pm – 4:00pm

Location: McLendon Library, Media Center Classroom # 4, Hinds Community College, Raymond.

Class #15- Participants need to bring their own laptops

Date: December 15, 2015, 8:30 am — 11:30 am

Location: The University of Mississippi-Tupelo Campus, Banquet Room, 1918 Briar Ridge Road, Tupelo.

Class #16- Participants need to bring their own laptops

Date: December 15, 2015, 1:30 pm —4:30 pm

Location: The University of Mississippi-Tupelo Campus, Banquet Room, 1918 Briar Ridge Road, Tupelo.

Class #17- Participants need to bring their own laptops

Date: December 16, 2015, 8:30 am —11:30 am

Location: The University of Mississippi-Tupelo Campus, Banquet Room, 1918 Briar Ridge Road, Tupelo.

Class #18- Participants need to bring their own laptops

Date: December 16, 2015, 1:30 pm —4:30 pm

Location: The University of Mississippi-Tupelo Campus, Banquet Room, 1918 Briar Ridge Road, Tupelo.

Classes are being added so please check MDEQ's website for an updated schedule.



2015 Mississippi Fall Recycling Conference: "Viva Recycling"

The Mississippi Recycling Coalition is hosting its Fall Recycling Conference in the birthplace of “the King of Rock and Roll,” Tupelo, Mississippi. The conference will be held October 27 and 28, at the BancorpSouth Conference Center and will include sessions and workshops on commodity market conditions, special materials recycling, pay-as-you throw programs, resources for assisting communities, public incentives and education, and a variety of other topics on building sustainable recycling programs. Taking a lead from “the King,” the conference theme, “Viva Recycling” will include a fun blend of all things Elvis with all things recycling! For more information and to register, go to: <https://www.msrecycles.org/conference2015reg>.

Save the Date!

The Governor’s Delta Sustainable Water Resources Task Force is hosting another Irrigation Summit in Stoneville, Mississippi, on Tuesday, December

15th. The Task Force is still making final arrangements, but the agenda will include at least 10 different presentations by researchers, water conservationists, and producers. The format will be similar to last year’s event, allowing producers to choose to attend one of multiple concurrent presentations.



Photo from 2014's Irrigation Summit.

Myers Selected as ASDSO President-Elect

Dusty Myers, Chief of MDEQ's Dam Safety Division, was recently selected as president-elect of the Association of State Dam Safety Officials (ASDSO). ASDSO is a national non-profit organization with around 3,000 members comprised of state and federal dam safety professionals, dam owners and operators, engineering consultants, emergency managers, manufacturers, suppliers, academia, contractors, and others interested in improving dam safety.

The mission of ASDSO is to improve the condition and safety of dams through education, support for state dam safety programs, and fostering a unified dam safety community. Myers is a graduate of Mississippi State University, a Registered Professional Engineer, and has been part of the Dam Safety Division since 2007.



Dusty Myers (center) discusses an emergency situation at Percy Quin State Park's dam with Governor Phil Bryant in 2012.

Making Strides Against Breast Cancer

For the last nine years MDEQ has been among the top supporters of the American Cancer Society's Making Strides against Breast Cancer walk in the Jackson area raising more than \$17,000. On October 31, MDEQ's team, "Thinking Pink and Going Green," will once again represent the agency and join thousands of Mississippians in the fight against breast cancer.



Above: memorial ribbon tree in MDEQ's building. Left: observing Breast Cancer Awareness Month at MDEQ's Amite Street building.

Greater Metro Area Business E-Waste Collection & Paper Shred Day

Friday, October 23, 2015
8:00 AM - 2:00 PM

at:



929 High Street
Jackson, MS 39202

Contact Info

Greater Jackson Chamber Partnership

Ms. Niki Carr Lowery
(601) 948-7575, ext. 234
nlowery@greaterjacksonpartnership.com

Keep Jackson Beautiful

Ms. Marsha Hobson
(601) 398-5219
keepjack@bellsouth.net

Iron Mountain

Mr. Corey Johnson
(601) 324-6727
Corey.Johnson@ironmountain.com

Magnolia Data Solutions

Mr. Christopher Lumaghini
(601) 919-0062
christopher@magnoliadatasolutions.com

Acceptable Electronics

Computers, Desktop Copiers, Computer Components, Fax Machines, Radios, Televisions, Cell Phones, Desk Phones, VCR Players, DVD Players, Electronic Games, Monitors, Keyboards, Printers, Laptops, Scanners, and Stereos/Radios

\$2 Fee for LCD Monitors

\$5 Fee for CRT Monitors

\$15 Fee for ALL Televisions

No cost for other items!

Contact Magnolia Data Solutions (see Contact Info) to inquire about items not listed above or make arrangements for large loads.

Event Information

- Businesses or individuals from the Jackson Metro area (Hinds, Madison, & Rankin County) may participate.
- All traffic in the drop-off area is **one-way only!**
- For your safety, stay in your vehicle as event staff unload materials from your vehicle.
- **All materials collected will be recycled!**
- The fee charged for televisions and monitors is to pay for the proper handling of hazardous components such as lead and mercury contained in these devices.
- Paper and document shredding will be available and provided by Iron Mountain. Please direct inquiries to them (see Contact Info) if you have other document destruction/handling needs.

Sponsored by:



Geologic Map Day

Robert T. Berry, RPG, Office of Geology



Understanding the type of geology under your feet is the first step in understanding the world around you. Our understanding of the geology of an area has a significant effect on many things, from helping to sustain a healthy environment around us, to understanding and mitigating geologic hazards, from finding and understanding desirable minerals and natural resources, to understanding how the landscape is shaped and what kinds of plants grow best there.

What is a geologic map? Where can I find geologic maps of Mississippi? Who makes geologic maps for where I live?

A geologic map is designed to show where things are; however, unlike road maps or city maps, a geologic map is designed to illustrate the distribution of geologic features across an area of interest. A geologic map is usually printed on top of a base map, and the geology of the area is represented by colors, lines, and special symbols unique to geologic maps.

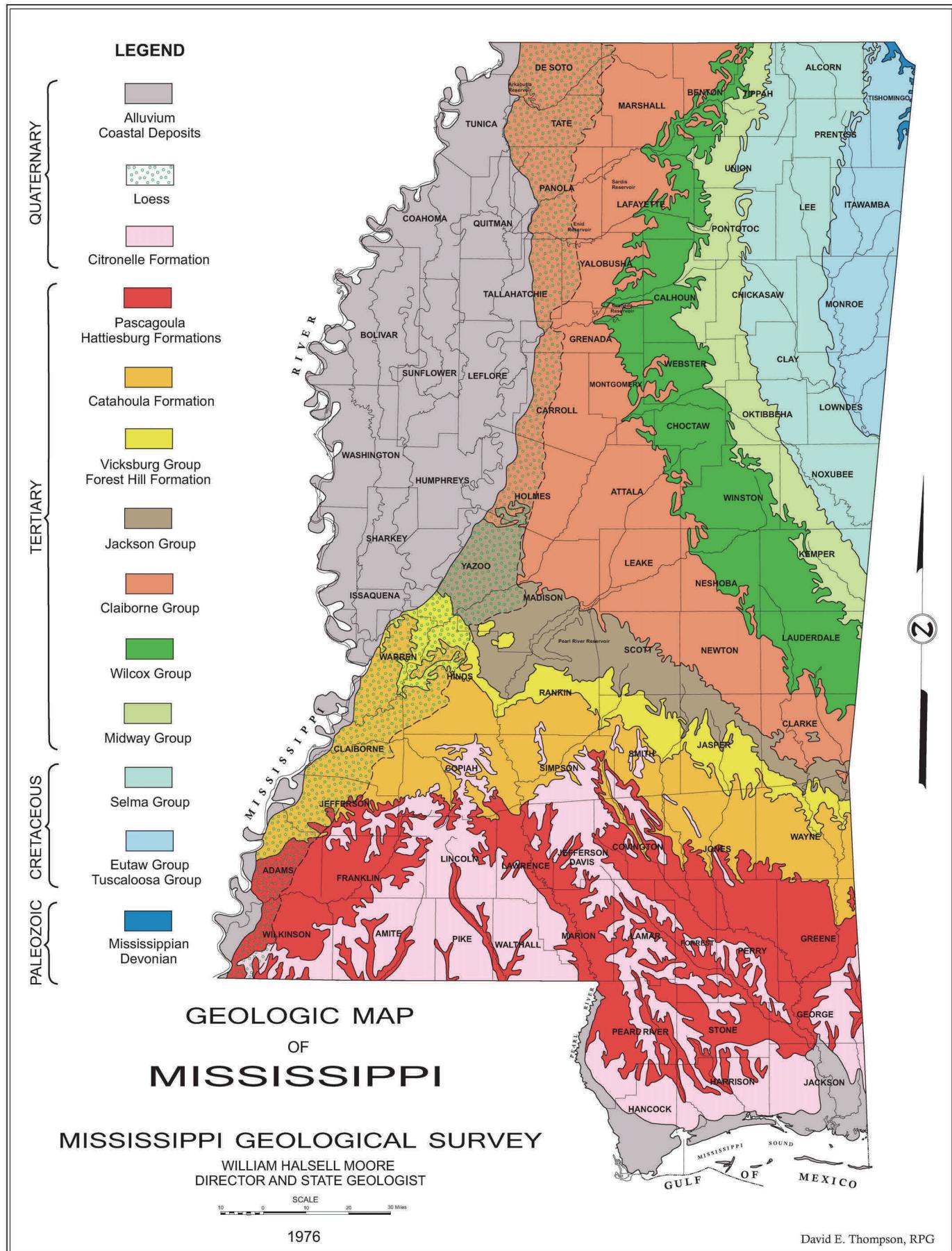
Topographic maps, typically used as the base maps for geologic maps, are produced by the U.S. Geological Survey in conjunction with each state. Geologic maps of each state are usually produced by their respective state agency. Thus, the geologic maps that are so essential to understanding our state are produced by MDEQ's Office of Geology.

October 16 was National Geologic Map Day, and the staff at MDEQ wants to illustrate geologic maps of Mississippi that are available from this agency. Geologic maps of the State of Mississippi, many of the counties, and 139 individual quadrangles may be viewed online and are available for free download at:

[http://www.deq.state.ms.us/MDEQ.nsf/page/Geology_surface?
OpenDocument](http://www.deq.state.ms.us/MDEQ.nsf/page/Geology_surface?OpenDocument)

Now that you know who makes Mississippi's geology maps and where you can find them, you may ask yourself, "How can a geologic map help me?"

Following are a few interesting questions our map makers get asked regularly, with answers provided by geologic maps and associated links you can view online.



Is my house located on the Yazoo Clay that is responsible for foundation issues in the Jackson metro area?

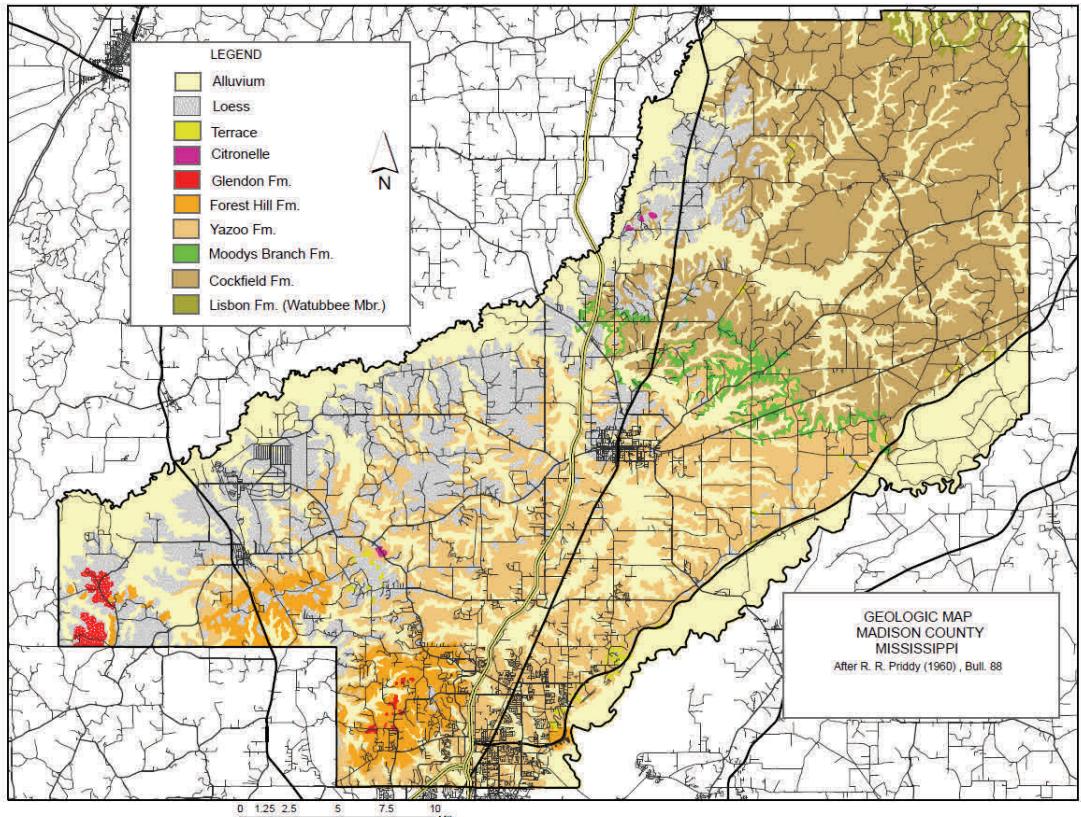
The answer to this question is very important to potential home buyers. Fortunately, there are geologic maps to help answer that question:

[http://www.deq.state.ms.us/MDEQ.nsf/page/Geology_Bulletin105?
OpenDocument](http://www.deq.state.ms.us/MDEQ.nsf/page/Geology_Bulletin105?OpenDocument)

[http://www.deq.state.ms.us/MDEQ.nsf/page/Geology_Bulletin115?
OpenDocument](http://www.deq.state.ms.us/MDEQ.nsf/page/Geology_Bulletin115?OpenDocument)

[http://www.deq.state.ms.us/MDEQ.nsf/page/Geology_Bulletin88?
OpenDocument](http://www.deq.state.ms.us/MDEQ.nsf/page/Geology_Bulletin88?OpenDocument)

These three links direct you to three separate geologic bulletins published for Hinds, Rankin, and Madison counties. Each of these bulletins includes geologic maps to help you understand the distribution and location of the Yazoo Clay and a scientific narrative to help understand its origin and nature. Prior to buying or building a new home, a prospective buyer or builder can view a geologic map to determine if their desired location is on the outcrop of an expansive clay.



Where can I find "Dinosaur age" fossils in Mississippi?

The answer is found on the state geologic map at:

[http://www.deq.state.ms.us/MDEQ.nsf/pdf/
Geology_MSGeology1969Map/\\$File/MS_Geology1969.pdf?
OpenElement](http://www.deq.state.ms.us/MDEQ.nsf/pdf/Geology_MSGeology1969Map/$File/MS_Geology1969.pdf?OpenElement)

"Dinosaur age" fossils are only found in areas of Mississippi where the rock layers exposed at the surface are between approximately 65 and 100 million years old, a span of geologic time known as the late Cretaceous Period. In Mississippi, these beds only occur at the surface in the northeastern part of the state. In the western, central, and southern regions of the state, they dip below the surface and are buried beneath successively younger beds.

In northeastern Mississippi, nine major Late Cretaceous beds, called "formations" by geologists, are exposed that contain "Dinosaur age" fossils and potentially dinosaur bones. These formations are depicted on the state's geologic map by the greenish and blueish colored units starting in the northeastern part of Kemper County and extending north through Tippah County.

A poster size Geologic Map of Mississippi is available for purchase at the Map and Publication Sales Office. Call 601-961-5523 for information about ordering and postage charges.

Is coal mined in Mississippi? If so, from what formation(s) is the coal being mined?

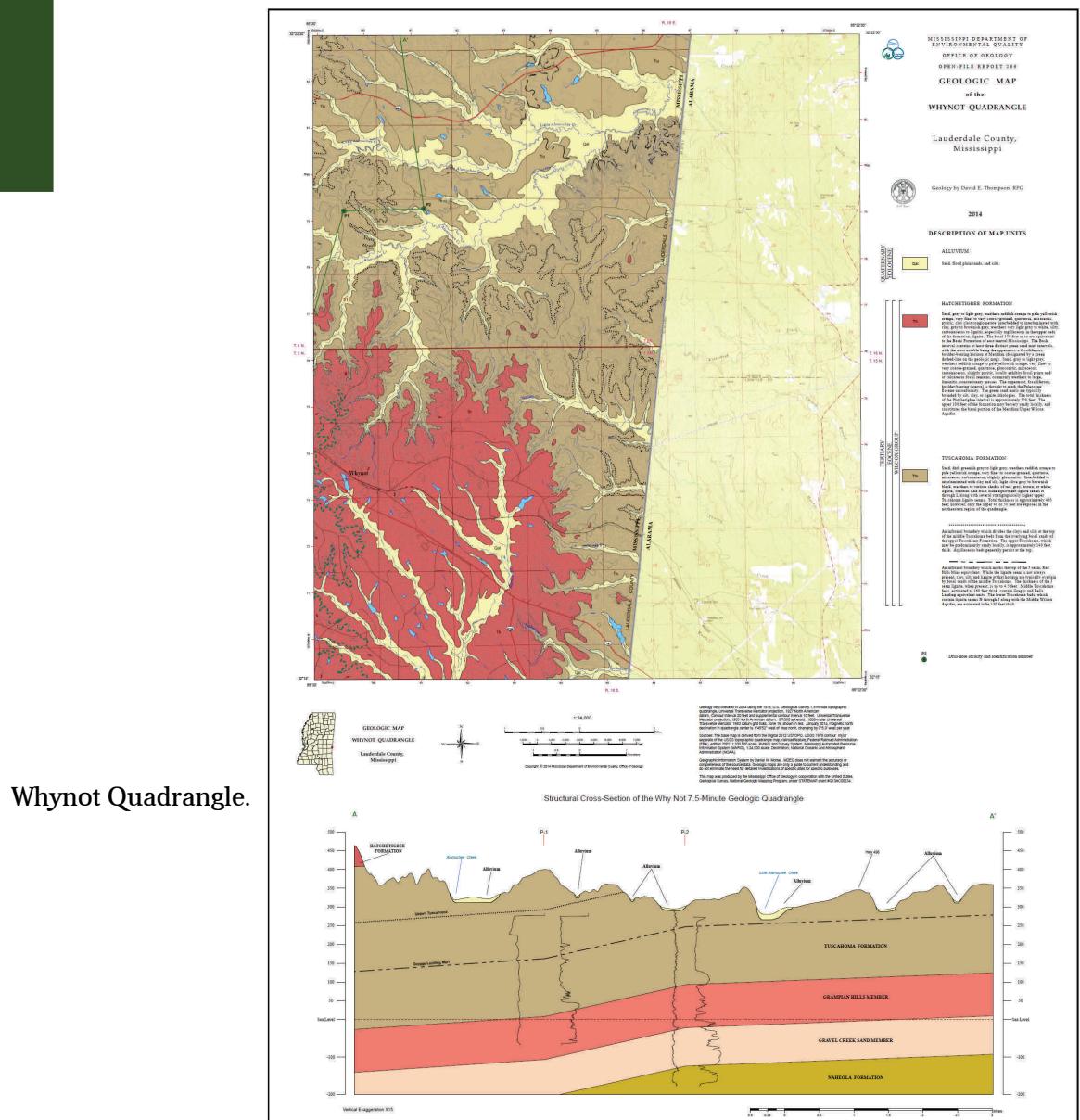
The answer to this question can be found in one of our recent 7.5-minute quadrangles, located at:

[http://www.deq.state.ms.us/MDEQ.nsf/pdf/Geology_OF-
266GeologicMapoftheWhyNotQuadrangle/\\$File/
of_266_WhyNot_32088c4.pdf?OpenElement](http://www.deq.state.ms.us/MDEQ.nsf/pdf/Geology_OF-266GeologicMapoftheWhyNotQuadrangle/$File/of_266_WhyNot_32088c4.pdf?OpenElement)

Mississippi has an estimated five billion tons of surface minable lignite, or low grade coal. Currently, Mississippi has two active lignite mines. The majority of economic lignite deposits are found within the outcrop belts of the Wilcox and Claiborne groups.

Illustrated on the Whynot quadrangle are the Hatchetigbee and Tuscaloosa formations of the Wilcox group, which is identified by red and brown colors, respectively. Both of these formations contain multiple seams of lignite. The J-seam lignite, illustrated as a black dashed line, is located within the Tuscaloosa Formation and has a thickness of up to 4.5 feet when present. Additionally, the lower Tuscaloosa formation includes lignite seams H through J (130-foot section of lignite), which are not illustrated on the map.

What other questions do you have about geologic maps? To look for answers, go to MDEQ's website, scroll down to the Office of Geology link and start exploring. The List of Publications provides links to free downloads, and the county geologic reports are found in the list of Bulletins, and the geologic quadrangles are found under Open-File Reports.



Coring The Eocene-Oligocene Boundary in Mississippi



David T. Dockery III, RPG, and James E. Starnes, RPG, Office of Geology

MDEQ's Office of Geology cooperated with LSU geology professor Dr. Brooks Ellwood to core the Eocene-Oligocene boundary near the Chickasawhay River at Hiwannee in Wayne County, Mississippi, on October 5 to 7, 2015. The core will be analyzed by Dr. Ellwood as part of a regional study of the boundary. Mississippi is well situated for such a study as the Late Eocene Shubuta Clay Member of the Yazoo Clay Formation of the Jackson Group and the overlying Early Oligocene Red Bluff Formation of the Vicksburg Group contain a well preserved marine fossil record, including a record of global events. A volcanic ash layer altered to bentonite in the uppermost Yazoo Clay in the Mossy Grove core in northwestern Hinds County placed the age of the Eocene-Oligocene boundary about 33.7 million years ago. The strontium isotopes of fossil oyster and pecten shells from the various formations of the Jackson and Vicksburg groups in Mississippi (sampled from the Office of Geology collections), as published by Denison et al. 1993, showed a continual shift in isotopic ratios upward through the section, with strontium from the erosion of continental rocks dominating over that contributed by seafloor volcanic eruptions (Figure 1).

Though halfway around the world, Mississippi's Eocene-Oligocene section records the continental collision of India and Asia and the uplift of the Himalayan Mountains and Tibetan Plateau. Associated events with this mountain-building episode were the exposure of new rock, sequestered carbon dioxide due to increased weathering, Antarctic glaciation, extinctions, and the transition from a "greenhouse to icehouse" global climate (Figure 2). In Mississippi the greenhouse to icehouse transition is recorded by the appearance of fossil oak pollen in the upper Yazoo Clay and the boundary extinction of certain Eocene planktonic Foraminifera, mollusks, and archaeocete whales (including the State Fossil).

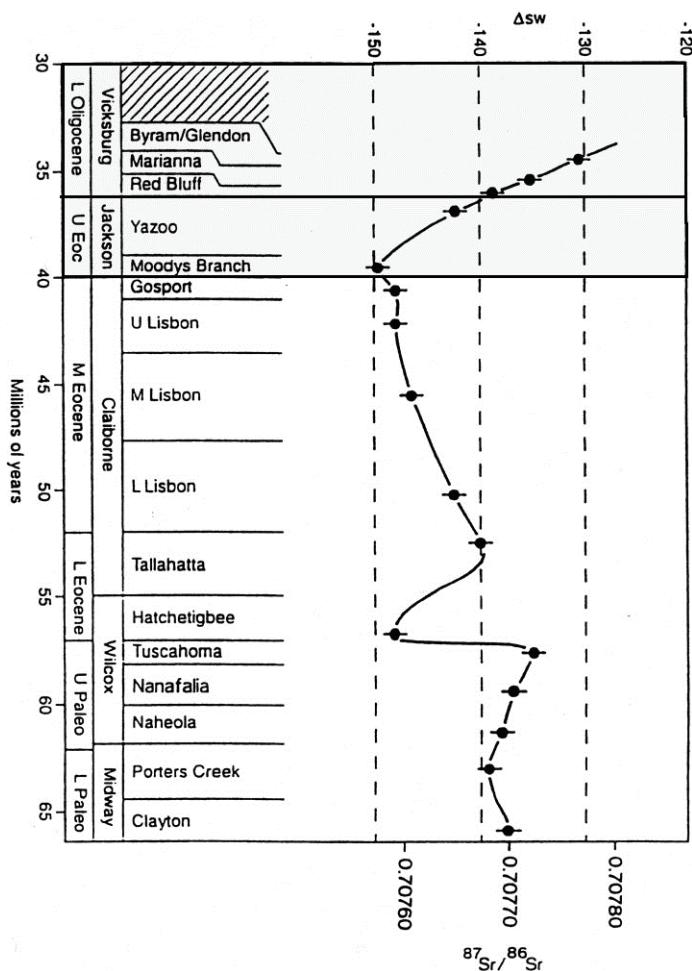


Figure 1. Strontium isotope ratios for ancient seawater as determined from Paleogene oyster and pecten shells collected from Mississippi and Alabama (Denison et al., 1993).

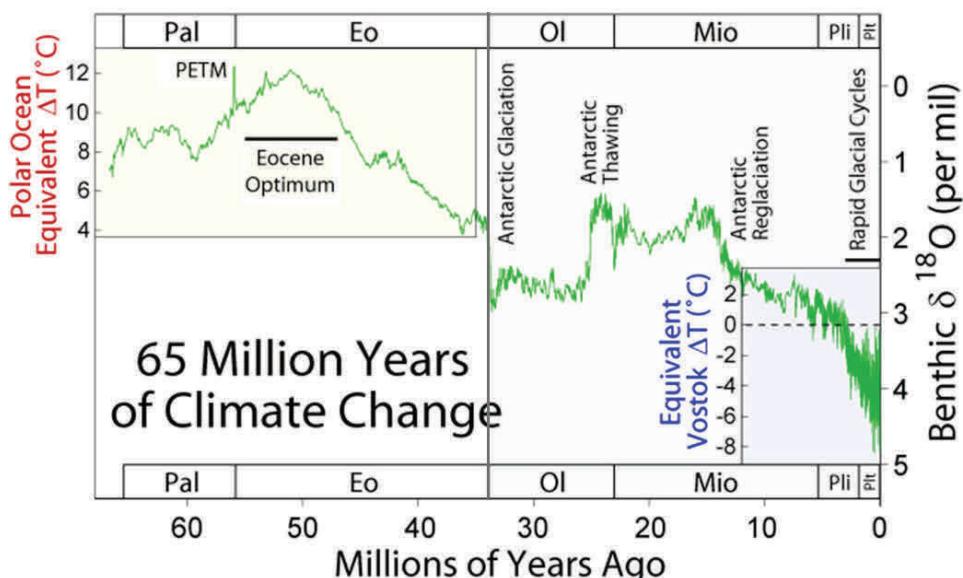


Figure 2. The Eocene-Oligocene boundary transition from “greenhouse to icehouse” climate and the inception of Antarctic Glaciation in the Oligocene Period (Ol), which occurs at the Jackson-Vicksburg Group boundary in Mississippi (Wikimedia Common).

Figure 3 shows Dr. Ellwood's sample site across the Eocene-Oligocene boundary on the east banks of the Chickasawhay River below the core-hole site. A second site on the river's west bank, where the boundary has been freshly scoured by the river, is shown in Figure 4. The drill site and the extrusion of a weathered section of the Forest Hill Formation are shown in Figure 5. Figure 6 shows the core containing the boundary and the location of the Eocene-Oligocene boundary in the core.

The core hole was drilled to a total depth of 214 feet and penetrated, in descending order: (1) colluvium, (2) the Forest Hill Formation, (3) the Red Bluff Formation, (4) the Shubuta Clay Member of the Yazoo Formation, (5) the Pachuta Marl Member of the Yazoo Formation, (6) the Cocoa Sand Member of the Yazoo Formation, and (7) the North Twistwood Creek Member of the Yazoo Clay Formation.



Figure 3. Left, Brooks and Sue Ellwood standing on the Shubuta Clay Member of the Yazoo Formation on the east bank of the Chickasawhay River at Hiwannee. The contact with the overlying Red Bluff Formation is marked by a yellow X here and at sample site at right.



Figure 4. The Shubuta-Red Bluff contact at MGS locality 34 on the west bank of the Chickasawhay River, where it is better exposed. Machete blade is stuck in contact at left and in the closeup view at right, where burrows in the Red Bluff extend downward into the Shubuta Clay.



Figure 5. Left, drill site at Hiwannee. Right, the first core from the weathered zone of the Forest Hill Formation, which overlies the Red Bluff Formation (October 5, 2015).



Figure 6. Left, Sue and Brooks Ellwood; Sue is pointing to the Shubuta-Red Bluff contact in the core. Right, a quarter is on the Red Bluff Formation; the contact with the Shubuta is marked by the red X.

We thank Rebecca Nored for giving us permission to drill on her property. The red color of the cliffs comes from the weathering of glauconite in the Red Bluff Formation to iron oxides such as limonite and goethite. The type locality of the Red Bluff Formation is on the west bank of the Chickasawhay River north of Hiwannee at Red Bluff, a name that appears on the 1860 State Geologic Map by Eugene Hilgard.



MDEQ ENVIRONMENTAL ACTION LINKS

- Draft permits currently at public notice, <http://opc.deq.state.ms.us/publicnotice.aspx>.
- Permits and certificates issued in the last 90 days, http://opc.deq.state.ms.us/report_permits.aspx.
- General permit coverages issued in the last 90 days, http://opc.deq.state.ms.us/report_gnp_issued.aspx.
- Notices of Intent for coverage under a Statewide General permit received by the Environmental Permits Division, http://opc.deq.state.ms.us/report_gnp_notice.aspx.
- List of the 401 Water Quality Certifications currently at public notice, http://opc.deq.state.ms.us/report_wqc_public_notice.aspx.
- List of the compliance inspections recently conducted, http://opc.deq.state.ms.us/report_eced_tasks.aspx.
- Orders issued by the Mississippi Commission on Environmental Quality, http://opc.deq.state.ms.us/report_orders.aspx.

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PICTURE OF THE MONTH

Sunset over Lake Eddins in Pachuta, Mississippi.

Taken by James Starnes,
Office of Geology.

