Mississippi Department of Environmental Quality

Environmental News

VOLUME 12 ISSUE 7 AUGUST 2015

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.

INSIDE THIS ISSUE:

MDEQ Remembers Hurricane Katrina

There are positive and negative milestones in life—some for individuals, some that are collective, and ones that change forever whatever comes after. For MDEQ, Hurricane Katrina was one such event which altered the mission and the perception of the agency. This year marks the tenth anniversary of Katrina, and while everyone has a story from the aftermath of the storm, the anniversary provides an opportunity to reflect on how our agency and its people responded in a time of great need. There were many unsung MDEQ heroes, particularly those employees who lived on the Coast and were directly impacted by the storm personally, who continued to serve their fellow Mississippians in a time of tragedy for all. For some, life will never be the same and anniversaries bring back difficult memories; however, their dedication to their neighbors and their jobs in the "new normal" environment should not be forgotten.

As everyone knows, Hurricane Katrina devastated the Coast and caused major problems in other areas of the state. Along with the myriad of issues left by the storm there were immediate environmental problems that had to be addressed under MDEQ's authority.

"Our first mission was to protect citizens and responders from hazardous chemicals that were shifted around during the storm. Secondly, we removed any containers that were blocking roads that hindered traffic. Then land areas were sectioned off and inspected and above ground storage tanks and other containers were removed," said Ernie Shirley, Chief of MDEQ's Emergency Services Division.

The storm created more than 46 million cubic yards of storm debris across the state and about 24 million cubic yards in the three coastal counties. MDEQ staff monitored debris removal and disposal including more than 340 debris management sites. Nearly 400,000 cubic yards of marine debris was also removed and more than 330 derelict vessels were pulled out of Mississippi waterways. Decisions had to be made eye-to-eye with public officials who had lost everything and were doing their best to keep their communities functioning.

"Debris removal and management was one of the most important environmental needs following Katrina. The volume of debris impacted rescue, recovery, and rebuilding. Without sufficient disposal capacity at existing permitted solid waste facilities, MDEQ had no choice but to allow emergency disposal facilities and operations. Given the volume of debris, real environmental impacts could have occurred had the debris been mismanaged. The development of solid waste management policies and MDEQ's quick response to have those policies implemented allowed debris removal to begin quickly after the storm, yet doing so in an environmentally sound manner," said Chris Sanders, Chief of MDEQ's Environmental Compliance and Enforcement Division.

The management of debris relied not only on personnel deployed on the Coast, it also required staff in the Jackson office answering questions and making decisions quickly and decisively.

"When not deployed to the Coast I spent my time in the 'Ready Room' answering questions from all over the state, communicating with MDEQ personnel out in the field, and working on policy documents. Although being deployed out in the field was a great experience, working the 'Ready Room' was a completely different and unique experience," stated Ethan Mayeu, MDEQ engineer and solid waste expert.

Another task for the agency was determining the status of the wastewater treatment facilities on the Coast and what needed to be done to help them get back online (Emergency Support Function 3 or ESF-3). It is key to remember that staff from MDEQ's South Regional Office (SRO) who participated in this work, and their other responsibilities, did so without an office for a year and their MDEQ vehicles were disabled. Staff experience along with some long hours helped get these facilities operating quickly with the additional challenge of requesting resources for the systems and tracking the status of those resources.

"I believe that Katrina was the 'big stage' that showed many who knew little about MDEQ the expertise and professionalism of our employees. Problems were seen as challenges to overcome rather than obstructions. If one path to a solution didn't work, then we looked for another way that would. As far as our role with ESF-3, I saw water and wastewater operators working long hours and with very limited resources trying to restore drinking water and

wastewater collection and treatment systems, even as their own families had needs," said Rusty Lyons, retired MDEQ engineer.

Mississippi's coastal environment took a battering from Katrina's storm surge and winds. Beaches were washed away, barrier islands were breached and eroded, and wetlands were destroyed. Those whose livelihoods depended on a healthy coastal environment were directly affected. The barrier islands were particularly devastated, and the footprint of these islands was reduced an estimated 25 percent. In many instances, island elevations were eroded to near sea level and at least 50 percent of their vegetative cover was lost. These islands provide unique environmental habitats to a vast array of floral and faunal species and also serve to guard the state against oncoming hurricanes. In the weeks and months after Hurricane Katrina, MDEQ, along with its state and federal partners, worked hard to evaluate environmental conditions along the Coast. This monitoring included sampling of the Mississippi Sound, the connected bays and bayous, and the freshwater inflows into the bays. It encompassed air, water, soil sediment, fish, shrimp, and crabs. This work necessitated forging partnerships among agencies.

"I believe that we had to make sure the water quality, sediment and seafood were safe prior to the opening of beaches and letting fishermen get back on the water. I worked with Mississippi Department of Marine Resources and the USM Gulf Coast Research Laboratory in collecting water and seafood samples. The three agencies bonded together to cover the Coast and make sure the coastal waters were safe. We shared equipment, and it was nothing for me to be out with a different group of personnel and on a different boat every day collecting data," said Barbara Viskup, biologist and current manager of the SRO.

While the response efforts continued for the Coast and MDEQ staff for months and years to come, there was soon an unprecedented role for MDEQ to help rebuild the Coast and its infrastructure. The Gulf Region Water and Wastewater Plan transformed much of the public service infrastructure with almost $650 million devoted to building and upgrading water and wastewater systems.

A "backbone" network of regional water and sewer systems submitted by local governments—treatment facilities, pump stations, elevated water tanks, water supply wells, and the interconnecting pipelines—were constructed. This new infrastructure fostered development away from the coastline and created water and wastewater systems less vulnerable to future hurricanes. The plan MDEQ developed, in consultation with local officials and hundreds of concerned citizens, has funded 67 projects across five counties: more than 620 miles of new water and sewer lines, 31 water tanks, 32 water wells, 59 wastewater pumping stations, and 17 wastewater treatment facilities.

Clearly the agency was altered as it took on tremendous response duties and later the creation of the program to administer the infrastructure planning and construction. The years that followed seemed to bring new disasters and challenges almost every year including flooding, hurricanes, tornadoes, and the BP oil spill.

Three MDEQ staff reflect on changes the storm response brought to the agency.

Chris Sanders: "I believe the storm and MDEQ's response transformed this agency's way of thinking about being an agency of service. Since then 'service' seems to be our mission. Everyone understands MDEQ is here to serve. Everyone expects MDEQ to respond at whatever capacity necessary when disaster strikes. MDEQ has become efficient and effective in this role and is better equipped for response. Many policies exist for a variety of disasters and are readily available for implementation."

Barbara Viskup: "The SRO still works closely with MDMR and USM GCRL on many projects, and we have helped one another with other coastal disasters (both major and minor). It is important that everybody works as a team regardless of anyone's position. Every job is important regardless if you work the disaster or continuing working your normal job to keep everything in the agency running smoothly."

Ethan Mayeu: "I believe that MDEQ has always strived to be assistance oriented, especially when it comes to natural disasters. But since Hurricane Katrina, the agency appears to have been more proactive in preparing for and responding to natural disasters. Whether it was the 2011 flood and tornado outbreak or other hurricanes, including Isaac in 2012 and Gustav in 2008, MDEQ has the experience and personnel in place and ready to assist local governments, industry, and the residents of Mississippi in recovering from natural disasters and their related environmental matters."

The stories regarding Katrina include many that are humorous and many more that are heart breaking and in this limited space cannot all be recounted. However, for many MDEQ staff and the agency itself, it is a seminal event that changed everything.

China's Air Problem and What They're Doing

By Dallas Baker, MDEQ Air Director

Mississippi has relatively clean air, and I for one take it for granted. Well, I did until July. I accepted an invitation to speak as Air & Waste Management Association (A&WMA) President at a China / U.S. Clean Air Conference in Beijing. The hosts were very cordial and even recognized the Association as a co-host. No less than five A&WMA members joined me as keynote speakers, and we learned and shared together with top officials. Former Vice President Al Gore headlined the event, along with Deping Hu, Vice Chairman of All-China General Chamber of Industry & Commerce and Vice Minister of the Propaganda Department of the Communist Party of China. My time in country allowed me to see and sense poor air quality, and the experience helped me understand the gravity of what I do for a living. Over a three-day period earlier this year, Beijing averaged 257 µg/m³ of PM2.5 (note the 24-hour average U.S. standard for PM2.5 is 35 µg/m³). It reminded me how far the West has come in developing policies and technology that control emissions. Our work is not over, but we should recognize our accomplishments and assist developing countries in navigating through rapid economic growth.

A comparison of Beijing's air quality.

We don't have to look back too far to see this leap to healthier air. Having the A&WMA headquarters in Pittsburgh provides a good case study. In the 1940s, the city was dark all day, requiring streetlights and headlights to remain on. Contemporary Pittsburgh Mayor David Lawrence in his first inaugural speech said, "I am convinced that our people want clean air. There is no other single thing which will so dramatically improve the appearance, the health, the pride, the spirit of the city." Through improvements in transportation and new smoke ordinances, the city saw a 90 percent reduction in smoke by 1956. As the era of big iron and steel faded from the Pittsburgh landscape, bluer horizons returned. Today as I pull up airnow.gov, I see their Air Quality Index is "Good." Pittsburgh air is what Beijing leaders want; however, in a city projected to house 50 million people by 2050, the challenges are many.

Beijing is doing things to improve air quality. They shut down and moved what seemed to me a majority of the factories and power plants to more rural parts of the country. They established the equivalent of our National Ambient Air Quality Standards and in 2013 adopted a five-year plan they call the Air Pollution Control Action Plan of China. It's having a positive impact: 50 percent reduction in air pollution since the 2008 Olympic Games and dramatic differences in visibility from 2012 to today. Comparing my experience to those of one of our staff who traveled there in 2012, it's improved, despite visibility being far worse than our worst city and what I expected. The smog irritated my eyes and "tasted" acidic to me. I just sensed the air was not healthy in which to live, work and play. When I landed in Dallas on the way home and could clearly see both the Dallas and Fort Worth skylines, it hit me how blessed we are to live where we do.

Baker Testifies Before U.S. Senate Committee

Dallas Baker, Chief of MDEQ's Air Division and Air Director, testified before the Senate Environment and Public Works Subcommittee on Superfund, Waster Management and Regulatory Oversight on August 4. Dallas testified regarding the impact of "sue and settle" on the regulatory process. His testimony and more information about the hearing can be found at: http://1.usa.gov/1MKHYeV.

National Prescription Drug Take-Back Day

The next Drug Take-Back Day sponsored by the Drug Enforcement Administration will be September 26 nationwide. After September 1, use this website to find local drop off locations: http://www.deadiversion.usdoj.gov/drug_disposal/takeback/index.html.

The National Prescription Drug Take-Back Day aims to provide a safe, convenient, and responsible means of disposing of prescription drugs, while also educating the general public about the potential for abuse of medications. In addition, taking advantage of this opportunity keeps prescription medication out of the household waste stream and from being flushed down toilets.

Gulf Coast Ecosystem Restoration Council Releases Draft Initial Funded Priorities List

The Gulf Coast Ecosystem Restoration Council (Council) released a draft Initial Funded Priorities List (draft FPL) on August 13. The Council, which is comprised of governors from the five Gulf States affected by the Deepwater Horizon oil spill as well as the federal partners, is proposing to focus on 10 key watersheds across the Gulf. Using funds from the settlement with Transocean Deepwater Inc., the Council is seeking to provide near-term, on-the-ground ecosystem benefits, while also conducting planning activities designed to build a foundation for future success as additional funds become available from other parties.

The Council is proposing to focus on 10 key watersheds across the Gulf in order to concentrate and leverage funds to address critical ecosystem needs in high priority locations. The Council also proposes a suite of Gulf-wide investments designed to support holistic ecosystem restoration and lay the foundation for future success.

This draft FPL would fund approximately $139.6 million in restoration activities such as hydrologic restoration, land conservation and planning for large-scale restoration projects. In addition, the Council is reserving approximately $43.6 million for implementation of additional activities in the future, subject to further Council review.

The proposed Mississippi projects that are included on the draft FPL include:

- Land Conservation (~$15.5 million).
- Education and Outreach of the benefits of Land Conservation (~$750,000).
- The Mississippi Sound Estuarine Program (~$2.3 million).
- Enhancing Beneficial Opportunities for Use of Dredge Sediments (~$2.2million).

“This announcement means more than $21 million is directly being invested in Mississippi’s continued efforts to restore our Gulf Coast. An additional $11 million through Gulf-wide investments

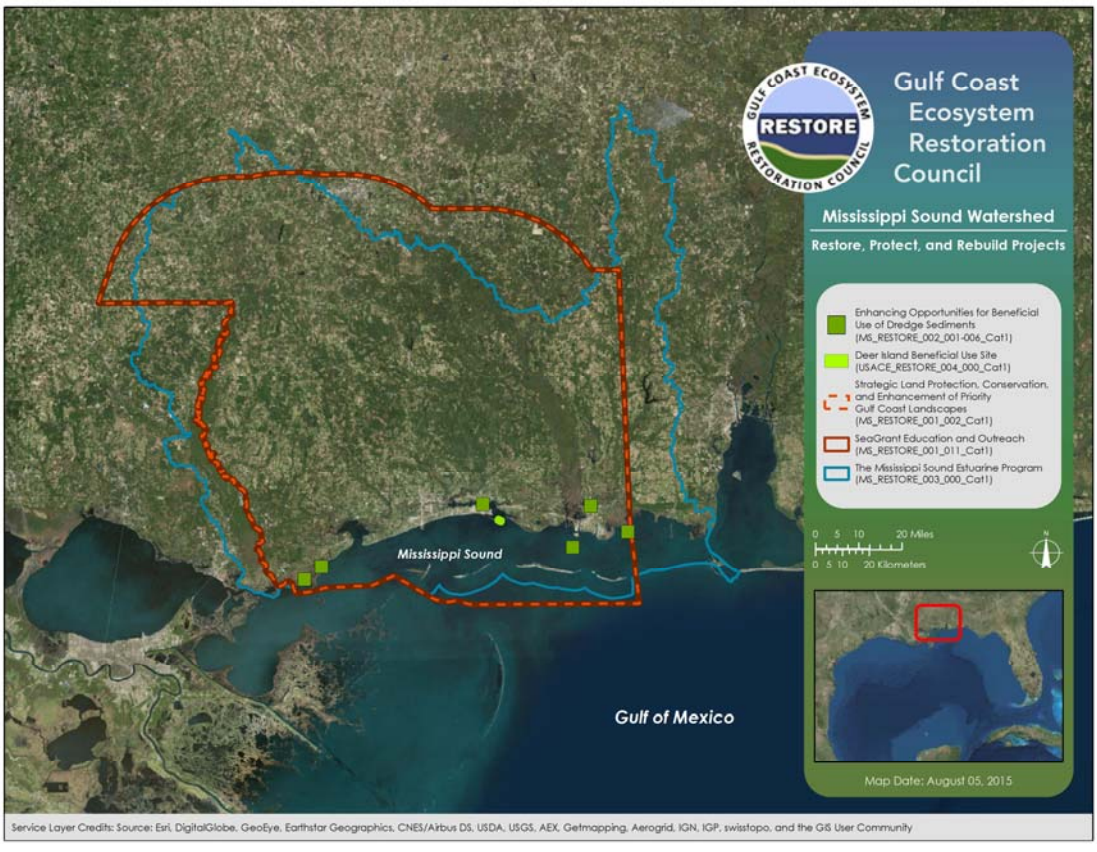
Mississippi's Public Meeting is September 10 at the Coast Coliseum and Convention Center.

will touch Mississippi in some shape or form. We believe all of these investments further our principle of making Mississippi whole, and represent priorities as established by the broader Mississippi stakeholder community," said Gary Rikard, MDEQ Executive Director.

The draft FPL is available for review and comment through September 28, 2015, and the Council will host a series of public meetings across the Gulf Coast. The meeting in Mississippi will take place on September 10 at 5:00 p.m. at the Coast Coliseum and Convention Center, 2350 Beach Boulevard in Biloxi.

Comments can also be submitted online at www.RestoreTheGulf.gov; by mail to Gulf Coast Ecosystem Restoration Council, Attention: Draft FPL Comments, Hale Boggs Federal Building, 500 Poydras Street, Suite 1117, New Orleans, LA, 70130; by e-mail to draftfplcomments@restorethegulf.gov; or in person at any of the public meetings.

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



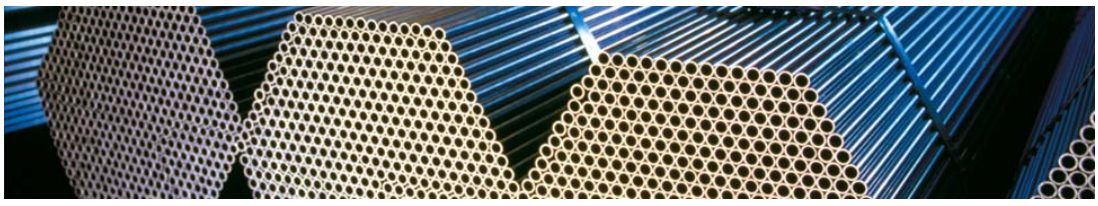
enHance Profile — Plymouth Tube Company

The Plymouth Tube Company in Eupora joined the enHance program in 2015 at the Associate level. enHance is a voluntary environmental stewardship recognition program initiated by MDEQ. Learn more, including how to apply, at www.enhance.ms.

1. Why did Plymouth Tube Company apply for the enHance program? To show not only are we meeting environmental compliance and that we are also working hard to be good stewards to our community and environment. And, to share what we have done to reduce our environmental impact so it might help others. We also looked at this as a great networking opportunity too.

2. How is membership beneficial for your company? It provides networking connections with other companies to see what they are doing to improve their environmental objectives. The workshops put on by enHance are an excellent way to learn about energy savings and waste reduction that we can use to improve our company.

3. What steps has your company taken to be more environmentally friendly? Over the last few years we have completed three noteworthy environmental initiatives. Recently, we replaced our old lighting with more energy efficient lighting throughout our building. This has saved approximately 436,000 kWh per year. Secondly, we were able to revise our waste water handling process and reuse waste streams to reduce our water requirement. As a result, we reduced our fresh water usage by 2/3 over the last five years. Lastly, we introduced a more energy efficient heat treating furnace. This not only reduced our natural gas usage, but we were able to reduce our hazardous waste haul outs to zero per year. Our waste generation status changed from large quantity hazardous waste status to small quantity exempt.



Why? To be a good steward to our community as well as the environment. In addition, waste reduction and reuse not only is good for the environment but it positively impacts the bottom line financial performance of our company.

4. **How are you involved in your community?** We recently gave away 1,000 CFL light bulbs to the community.

5. **Would you recommend enHance to others?** Yes I would. Members can learn a lot from the other members. They are a great help and freely share things they did to improve.

6. Tell us about Plymouth Tube. What do you manufacture? Plymouth Tube Company began supplying manufacturing and processing companies with precision tubing in 1924. Today, Plymouth operates a network of ten metalworking mills for the manufacture of precision steel tubing, steel and titanium Near-Net Shapes, and steel and titanium Cold Drawn Shapes. With headquarters in Warrenville, Illinois, the company is divided into two divisions: White Metals and Carbon and Alloy Tubing (CAT). As part of the CAT group, the Eupora, Mississippi, mill manufactures carbon steel tubes in diameters ranging from 0.25" to 1.75". The Eupora mill began its operation in 1985. Growing to 330,000 feet over five years the mill now employs 135 people to manufacture carbon steel tube. The mill's products are manufactured to meet the demanding requirements of a host of markets including: transportation, construction, firearms, and agriculture, ending up in recognizable end users such as John Deere, Bobcat, and Remington.

Join enHance!

MDEQ is accepting applications for the enHance program from July 1 to September 30. Check out the enHance website for information on current members, a calendar, training workshop materials, and information on how to apply.

enHance is open to all types of facilities with a separate initiative for municipalities.

enHance is a voluntary initiative to recognize environmental leaders in Mississippi. Participating organizations make a commitment to address and achieve on-going environmental improvements. More information, benefits, an application, and application instructions can be found at www.enhance.ms. Send the completed application to enhance@deq.state.ms.us.

enHance hosts an annual training workshop and awards luncheon along with other educational opportunities throughout the year.

Staff Change

Mike Pigford has been named Chief of the Underground Storage Tank (UST) Compliance and Enforcement Branch within the Groundwater Assessment & Remediation Division. The UST Compliance and Enforcement Branch ensures that all UST owners install and operate their systems in a manner as to prevent any leaks from happening and when they do occur, to find them in a timely manner to mitigate the threat to human health and the environment.

"I am honored to be chosen for this position and feel so blessed to work with the great group of people in GARD," said Mike Pigford.

Mike has been with the agency for almost nine years (including three years when he worked for the agency right out of college). He has worked for the UST Compliance and Enforcement Branch since his return to the agency in 2009. He has lived most of his life in the Jackson area and earned a B.S. in Industrial Engineering from Mississippi State University. Mike, his wife Terri, and their son Jacob reside in Ridgeland. Their son, Josh, his wife Ashley, and their daughters, Sindy, Marietta, and Savannah live in Birmingham.

Cochran Fellows Visit MDEQ

Kay Whittington and Natalie Segrest (center right) recently met with U.S. Department of Agriculture Cochran Fellows from Bosnia and Herzegovina to discuss water issues and agriculture in Mississippi. The group was hosted by Mississippi State University and spent almost two weeks in Mississippi studying the issues of Agricultural Water Management, Irrigation, and Drainage.

Empowering Child Care Centers for a Healthy Mississippi

Recently MDEQ's Office of Community Engagement's Small Business Environmental Assistance Program presented its second "Empowering Child Care Centers for a Healthy Mississippi" workshop in Jackson. The workshop, in conjunction with the Mississippi State Department of Health and other agencies, serves as a professional development opportunity for child care center owners and operators to improve education and awareness of common environmental health and safety issues.

Licensed child care providers received four contact hours for participation in the workshop. Presenters included Gay Logan, Director, Child Care Facilities Licensure Division and Crystal Veazey, Genetic Services Bureau, Mississippi State Department of Health; Mark Williams, MDEQ's Solid Waste Policy, Planning and Grants Branch; Dennis Kelly, MDEQ Lead Program Director; and, Cassandra Johnson and Taaka Scott Bailey, with MDEQ's Office of Community Engagement. Additional events are being planned for North and South Mississippi. Video from the workshop is available on MDEQ's YouTube channel at: https://www.youtube.com/user/MdeqChannelOne.

How to Reduce Building Energy Costs

When:
August 27, 2015
9:30 Registration
10:00—3:00 Program

Where:
Woolfolk State Office Building Room 145
501 North West St.
Jackson, MS 39201
Parking: Barefield Lot

Who:
Energy Managers
Maintenance Supervisors
Building Managers
& anyone interested in reducing energy usage and costs for offices, schools and other commercial buildings

Cost:
There is no charge. Advance registration is required as space is limited.
Lunch will be provided.

TOPICS include:

- Understanding Utility Bill Charges
- Financing Options & the Business Case for Energy Reduction
- Technologies & Operations
  - Lighting
  - Submetering
  - HVAC Management
  - Plug Load Management
- Success Stories— Case Studies

Learn and take action!

Presented by:
the enHance Stewardship Program &
MDA Energy and Natural Resources Division

Click here to Register
Registration Deadline August 24

For more information contact:
Mary Jean Gates
662-846-0448
maryjeangates@bellsouth.net

Resource Assessment and Science at MDEQ's Core and Sample Library

David T. Dockery III RPG, Office of Geology

The Tuscaloosa Marine Shale (TMS) is the object of oil exploration in southwestern Mississippi., and oil companies are hopeful that this formation might be as productive as the Eagle Ford Shale in southern Texas, a formation of similar age to the TMS. The Texas oil boom began in 2008 when geologist Gregg Robertson studied the cuttings of Eagle Ford Shale from an exploration well drilled in 1952. Those cutting samples were stored at a core and sample library in Austin, Texas, and analyses of the cuttings were promising for oil production and set off an oil boom that hit a fever pitch in 2012. Several Texas ranchers and farmers suddenly became millionaires.

Now, Paul Hackley, Brett Valentine, and Celeste Lohr, with the U.S. Geological Survey, are studying the oil potential of well cutting samples from the TMS in Mississippi stored at MDEQ's Office of Geology Core and Sample Library in Jackson (Figure 1). They collected 85 samples from the TMS and 10 samples from sands of the Lower Tuscaloosa. Figure 2 shows a sample of the shale cuttings in a glass dish.

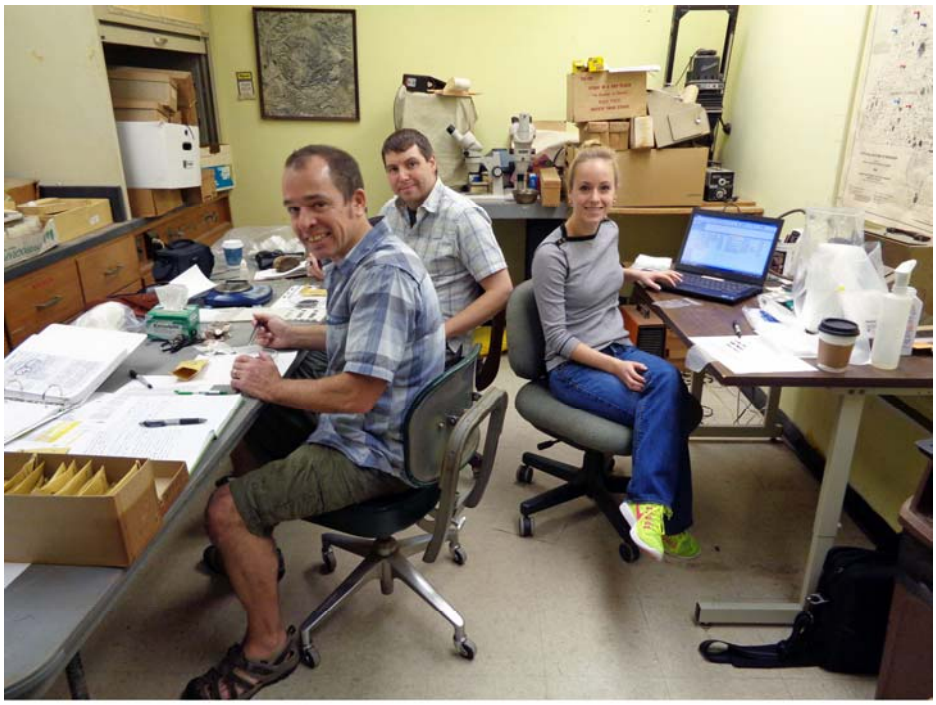


Figure 1. Paul Hackley (left), Brett Valentine (center), and Celeste Lohr of the U.S. Geological Survey examining samples at MDEQ's Core and Sample Library in Jackson on March 2, 2015.

Figure 2. Well cuttings of the Tuscaloosa Marine Shale from MDEQ's Core and Sample Library in Jackson as examined on March 2, 2015.

We have recently enjoyed the pictures of Pluto sent back by the New Horizons spacecraft after a nine-year-long mission to our outermost planet. What new explorations are left for us? How about this: getting in a time capsule and traveling back millions of years to Earth's early history and studying ancient climates, habitats, and animals? That is exactly what scientists do routinely at MDEQ's Core and Sample Library as illustrated in the next two studies. The total cost of the New Horizons mission was about $700 million. The total replacement cost of the cores and samples in MDEQ's Core and Sample Library is about $13.548 billion, or more than 19 times the cost of the New Horizons mission!

The research interest in Mississippi's Core and Sample Library is worldwide. Stuart Robinson and his Ph.D. graduate student Lauren O'Conner of the Department of Earth Sciences, University of Oxford, Oxford, England, recently sampled cores of Cretaceous chalk from Shuqualak, Mississippi (Figure 3). An earlier study of these cores had provided excellent data, and they then sampled the core at finer intervals. Using fossil molecules (TEX_{86}) of the distinct lipids of marine archaea bacteria as a proxy for seawater temperature, the cores showed a cooling trend during the Campanian Stage of the globally warm Late Cretaceous Period (Figure 4). Also in the Shuqualak cores were fossil shells and biotite mica ash from the eruption of the Jackson Volcano some 75 million years ago (Figure 5).

Figure 3. Lauren O'Conner and Stuart Robinson of the University of Oxford sampling a Cretaceous chalk core from Shuqualak, Mississippi, at MDEQ's Core and Sample Library in Jackson on April 27, 2015.

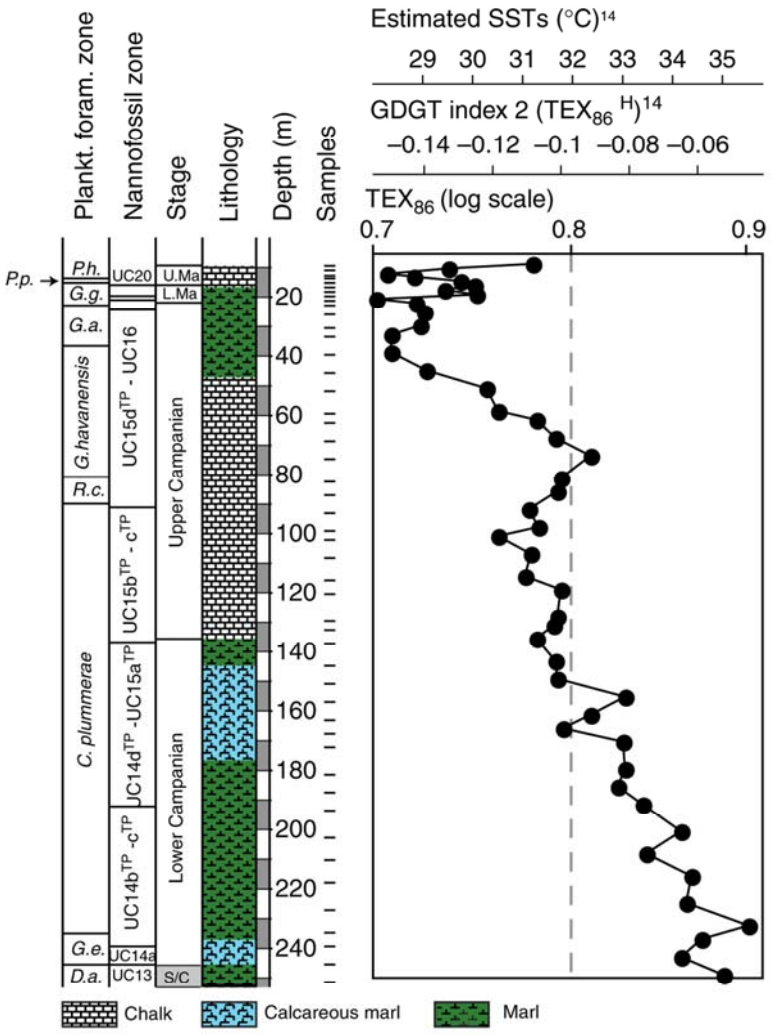


Figure 4. TEX86 data and calculated surface seawater temperatures from the Shuqualak core from Linnert et al., 2014, Evidence for global cooling in the Late Cretaceous: *Nature Communications*, June 2014, 7 p.

Figure 5. Bedding planes in the Cretaceous chalk core from Shuqualak, Mississippi, in MDEQ's Core and Sample Library in Jackson. At left is the fossil pecten *Neithea quinquecostata* and at right are biotite crystals (black) from a volcanic eruption at Jackson 75 million years ago.

Another researcher, Guy Harrington (Figure 6), is getting to be an old friend of the Office of Geology, working with us on the geology of the Walmart site in Meridian and the Red Hills Lignite Mine in 2000. He recently took a position as Senior Palynologist/ Stratigrapher with PetroStrat of Wales, UK, and is assisting in the exploration for oil in the North Sea. Guy was first to discover the carbon isotope excursion event at the base of the Paleocene-Eocene Thermal Maximum (PETM) in the Harrell and Walmart cores in Lauderdale County, Mississippi (see the October 2009 issue of *Environmental News*, p. 13-18). The PETM was a 170,000-year-long warm spell that occurred 55.8 million years ago. It is the subject of considerable research as it provides the best past analog of global warming from massive carbon input to the ocean and the atmosphere. Harrington explained the importance (internationally) of the Harrell and Walmart cores in that they are the only cores with plant fossils that preserve the PETM in the Western Hemisphere between localities in Colombia, South America, and Wyoming (Wing and Currano, 2013, Plant response to a global greenhouse event 56 million years ago: *American Journal of Botany*, v. 100, no. 7, p. 1234-1254).

Harrington returned to MDEQ's Core and Sample Library this year to take additional samples of the Harrell and Walmart cores. Figure 7 is an analysis of the PETM in the Harrell core as published in A. Sluijs, L. van Roij, G. J. Harrington, S. Schouten, J. A. Sessa, L. J. LeVay, G.-J. Reichart, and C. P. Slomp, 2013, Extreme warming, photic zone euxinia and sea level rise during the Paleocene/ Eocene Thermal Maximum onthe Gulf of Mexico Coastal Plain; connecting marginal marine biotic signals, nutrient cycling and ocean deoxygenation: Climate Past Discussion, 9, 6459-6494.

Figure 6. Guy Harrington, Senior Palynologist/Stratigrapher with PetroStrat of Wales, United Kingdom, collecting samples from the Harrell core in Lauderdale County, Mississippi, at MDEQ's Core and Sample Library in Jackson on June 1, 2015.

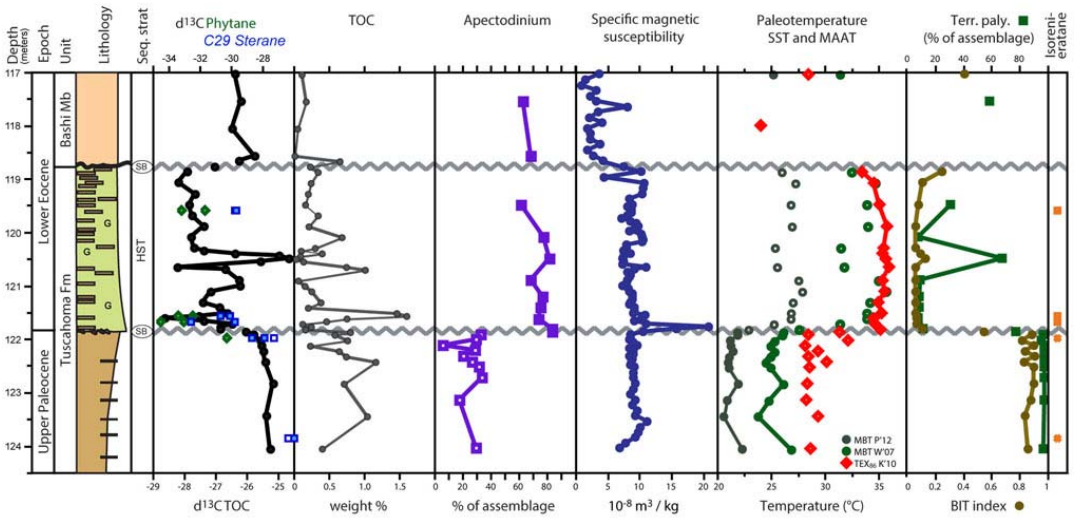


Figure 7. Analyses of the PETM in the Harrell core from Lauderdale County, Mississippi, as published in Sluijs et al., 2013, Extreme warming, photic zone euxinia and sea level rise during the Paleocene/ Eocene Thermal Maximum on the Gulf of Mexico Coastal Plain; connecting marginal marine biotic signals, nutrient cycling and ocean deoxygenation: Climate Past Discussion, 9, 6459-6494, fig. 2.

The research above follows the proverb: "For the want of a nail the shoe was lost; for want of the shoe the horse was lost; for want of a horse the rider was lost; for want of a rider the message was lost; for want of a message the battle was lost; for want of a battle the kingdom was lost." What if Texas had no core and sample library, and someone had disposed of cutting samples from a dry hole drilled in 1952? What if Gregg Robertson had no samples to test the Eagle Ford Shale? What if the oil industry found it too risky to invest in an unconventional oil prospect without sound data from samples? The answer is: many struggling Texas ranchers would still be struggling, and the state would have missed out on a tax windfall. The U.S. would have imported that amount of oil from foreign nations, increasing our trade deficit. Like the Texas facility, MDEQ's Core and Sample Library continues to be a valuable asset for Mississippi's future.

Interior, Core and Sample Library.

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

Toothache Grass
(Ctenium Aromaticum)

Taken in the DeSoto National Forest, Harrison County, by James Starnes, Office of Geology.