



Mississippi Department  
of Environmental Quality

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# Annual Report



## Fiscal Year 2015



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**STATE OF MISSISSIPPI**  
PHIL BRYANT, GOVERNOR  
**MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY**  
GARY C. RIKARD, EXECUTIVE DIRECTOR

December 31, 2015

The Honorable Phil Bryant  
Governor, State of Mississippi  
Post Office Box 139  
Jackson, Mississippi 39205

Dear Governor Bryant:

I hereby submit to you the annual report for the Mississippi Department of Environmental Quality for the state fiscal year ending June 30, 2015, and additional information about the agency for calendar year 2015.

The programs and initiatives promulgated by the agency further our mission to protect human health and the environment. The staff at the Mississippi Department of Environmental Quality are committed to conserving and improving our state's abundant natural resources and will continue to work together to achieve our mission. We are proud to be the stewards of the state's air, land, and water which provide a multitude of benefits for our citizens.

We appreciate your support and hope you find this report useful and informative.

Sincerely,

A handwritten signature in blue ink, appearing to read "Gary C. Rikard".

Gary C. Rikard  
Executive Director

GCR:jb

cc: Lieutenant Governor Tate Reeves

cc: Members of the Mississippi Legislature



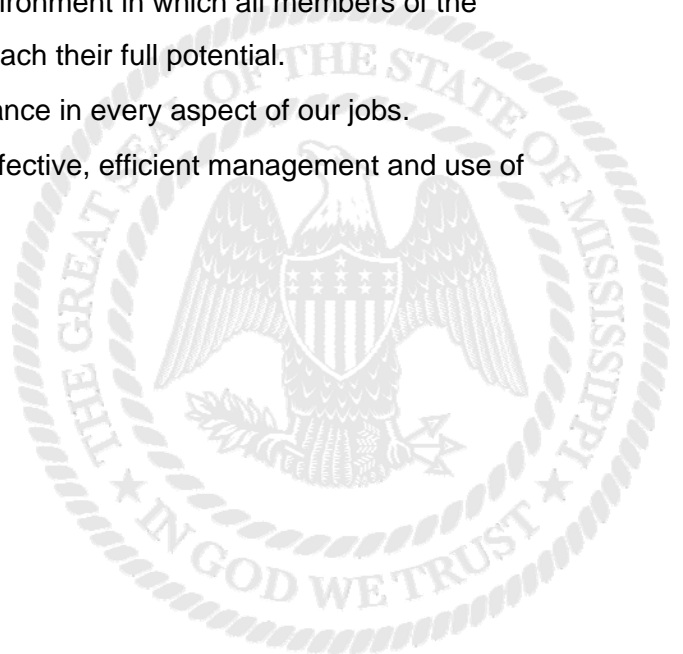


## Comprehensive Mission Statement

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.

## Philosophy

- ◆ Truth is the foundation of everything we do.
- ◆ We vigilantly resist bias and prejudice.
- ◆ We respond promptly, courteously, and as completely as possible to every complaint, question, or request for assistance.
- ◆ Inside the agency, we respect the capabilities, responsibilities, and contributions of every member of the MDEQ family. Outside the agency, we respect everyone, regardless of who they are or why we are brought together.
- ◆ We strive for a secure, stimulating, rewarding work environment in which all members of the MDEQ family are empowered and encouraged to reach their full potential.
- ◆ We are committed to the highest standards of performance in every aspect of our jobs.
- ◆ We are accountable, individually and collectively, for effective, efficient management and use of the resources provided to accomplish our mission.



# State Strategic Goals

*Building a Better Mississippi: The Statewide Strategic Plan for Performance and Budgetary Success* contains goals applicable to MDEQ and its mission. This annual report seeks to incorporate the goals of the agency's strategic plan with the results of its work in Fiscal Year 2015.

**Statewide Goal #1 - Natural Resources** – To ensure that current and future generations have access to the state's abundant natural resources through restoration, protection, conservation, and wise development of those resources.

**Statewide Goal #2 - Infrastructure** – To ensure that construction and maintenance of infrastructure are adequate to meet the needs of citizens and the business community and to foster economic growth.

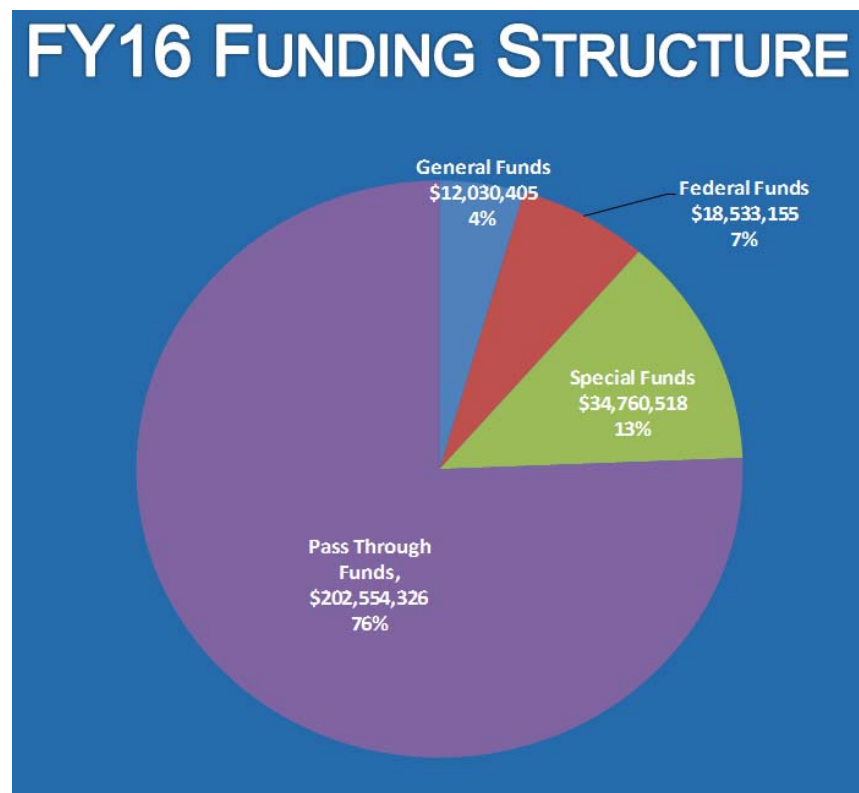
**Statewide Goal #3 - Health** – To protect Mississippians from risks to public health and to provide them with the health-related information and access to quality healthcare necessary to increase the length and quality of their lives.

**Statewide Goal #4 - Economic Development** – To develop a robust state economy that provides the opportunity for productive employment for all Mississippians.

**Statewide Goal #5 - Public Safety and Order** – To protect the public's safety, providing timely and appropriate responses to emergencies and disasters and to operate a fair and effective system of justice.

**Statewide Goal #6 - Government and Citizens** – To create an efficient government and an informed citizenry that helps to address social problems.

Source: Building a Better Mississippi: The Statewide Strategic Plan for Performance and Budgetary Success, July 2014





## Gary Rikard



**Gary Rikard**, Executive Director  
of the Mississippi Department of  
Environmental Quality

Gary Rikard assumed the position of Mississippi Department of Environmental Quality (MDEQ) Executive Director beginning September 1, 2014, after being appointed by Governor Phil Bryant in July, 2014.

As MDEQ Executive Director, he manages a staff of more than 400 and a budget of over \$250 million. MDEQ is responsible for protecting the state's environment and administers most of the U. S. EPA programs, including air, water and waste management activities; monitors, models, and regulates water use; and functions as the state geological survey.

In addition to his duties as 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.

Rikard, previously a partner with Butler Snow, LLP, has practiced environmental law since 1996, including serving as senior attorney at MDEQ from 1996-1998. His specialized legal experience included negotiating complex permitting and enforcement issues. Prior to earning his law degree, he worked as an environmental engineer at MDEQ, specializing in permitting and water quality compliance issues.

Rikard is experienced in a wide array of state and federal environmental standards including the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act, the Mississippi Air and Water Pollution Control Law and the Mississippi Solid Waste Act.

He served more than 22 years in the Mississippi National Guard, retiring with the rank of Major. During his service, he served as assistant staff judge advocate acting as the primary legal officer for environmental matters.

Rikard earned a bachelor's degree in civil engineering from Christian Brothers University, completed graduate studies in environmental engineering at the University of Mississippi School of Engineering, and holds a juris doctor degree from the University of Mississippi School of Law. He is a native of DeSoto County and, along with his wife Karen and their daughter Laura, resides in Madison.

## Commission on Environmental Quality

**Chair: W. J. (Billy) Van Devender** - At Large

**Vice Chair: Jack Winstead** - 3rd District

**R. B. (Dick) Flowers** - 1st District

**Brenda Lathan** - 2nd District

**Charles Dunagin** - 4th District

**John Dane III** - 5th District

**Chat Phillips** - At Large



Phillips, Dunagin, Dane, Van Devender, Winstead, Lathan, Flowers

## Mississippi Environmental Quality Permit Board



Riecke, Bograd, Hoffmann, Boyd, Snodgrass, Royals, Lipe

**Chair: David H. Snodgrass** - Mississippi State Oil & Gas Board

**Vice Chair: Michael B.E. Bograd** - Mississippi Department of Environmental Quality

**Jan Boyd** - Mississippi Department of Marine Resources

**James Hoffmann** - Mississippi Department of Environmental Quality

**Jim Lipe** - Mississippi Department of Agriculture & Commerce

**Dennis Riecke** - Mississippi Department of Wildlife, Fisheries & Parks

**Leslie Royals** - Mississippi State Department of Health

# I. Restoration

## A. *Deepwater Horizon* [MC-252] Oil Spill

The Mississippi Department of Environmental Quality (MDEQ) continues to lead the state's efforts to restore and enhance Mississippi's natural resources following the *Deepwater Horizon* oil spill in 2010. Executive Director Gary Rikard serves as Mississippi's Trustee on the Deepwater Horizon Natural Resource Damage Assessment (NRDA Council) Trustee Council and the Gulf Coast Ecosystem Restoration Council (RESTORE Council), and serves as the state's representative for the National Fish and Wildlife Foundation (NFWF) Gulf Environmental Benefit Fund (GEBF). Together these bodies, comprised of federal agencies, Gulf states, and a congressionally mandated non-governmental organization are working to implement multiple projects and initiatives to restore the natural resources of the Gulf of Mexico region.

At the state level, using a team of scientists and other subject matter experts, MDEQ is working with state and federal agencies, local governments, NGO's, residents, industries, and business owners to "Make Mississippi Whole."

Mississippi continues to engage the public throughout the restoration process. Mississippi's citizens have the opportunity to submit restoration project ideas into the state's project idea portal at its website, [www.restore.ms](http://www.restore.ms). As of October 2015, the project idea portal consists of over 800 project submissions across the coastal landscape ranging from ecological projects, to economic development, to infrastructure projects. Additionally, MDEQ and Executive Director Rikard disseminate information about the agency's upcoming projects, public meetings, and other information concerning restoration work using a direct texting service, the [www.restore.ms](http://www.restore.ms) website, and Twitter, among other outreach methods.

## B. Mississippi Restoration Funds and the BP Agreement in Principal

As a result of the *Deepwater Horizon* oil spill, Mississippi will receive a total of approximately \$2.174 billion to support the state's recovery and restoration efforts. These funds are allocated to Mississippi from civil and criminal penalties levied against the responsible parties under the Clean Water Act, penalties levied against the responsible parties under the Oil Pollution Act, and from the state's economic losses claim.

Prior to the BP Agreement in Principal (AIP) in July 2015, the State of Mississippi received a total allocation of \$659.725 million:

- NFWF Gulf Environmental Benefit Fund - \$356 million
- Initial Response Injury - \$85.168 million
- Transocean Settlement under the RESTORE Act
  - Bucket 1: \$56 million
  - Bucket 3: \$46 million
  - Bucket 5: \$4 million
- Natural Resource Damage Assessment Early Restoration - \$112.557 million



July 2 press conference with Attorney General Jim Hood, Governor Phil Bryant, and Gary Rikard, MDEQ Executive Director.

On July 2, 2015, the State of Mississippi, the United States, and the other Gulf states reached Agreements in Principal with BP covering outstanding federal and state claims, including Clean Water Act civil penalties (distributed via the RESTORE Act), natural resource damage claims under the Oil Pollution Act (OPA), state economic claims, and local government claims. Mississippi's allocation under the AIP will be paid out over a 15 year period beginning in 2017. Under the AIP, the state will receive:

- Natural Resource Damage Assessment Final Restoration: \$183 million
- Restore Act: \$582 million
  - Bucket 1: \$308 million
  - Bucket 3: \$251.790 million
  - Bucket 5: \$22 million
- State Economic Claims: \$750 million

Mississippi may also receive additional monies under "Bucket 2" of the RESTORE Act (see below). There is a competitive process whereby members of the RESTORE Council may receive funds for restoration projects.

### C. Office of Oil Spill Restoration

In 2014, MDEQ established the Office of Oil Spill Restoration to oversee and manage the implementation of the state's restoration efforts stemming from the *Deepwater Horizon* oil spill. The office manages all aspects of restoration including programs and projects resulting from the Natural Resource Damage Assessment process, the RESTORE Act, and the National Fish and Wildlife Foundation. In 2015 the office added staff and resources to assist with the ever increasing number of projects that will be managed for many years. The office works with stakeholders, state and federal agencies, local governments, non-governmental organizations, and the public to implement projects that support the natural resource and economic recovery of the Mississippi Gulf Coast and to ensure funds are spent in the most effective and strategic ways.



### D. GoCoast 2020

In August 2012, Governor Bryant announced the creation of GoCoast 2020 to serve as the official advisory body for the allocation of funds received by the State of Mississippi under the RESTORE Act. The RESTORE Act directs 80 percent of certain penalties assessed as a result of the *Deepwater Horizon* oil spill be directed to the five Gulf Coast states impacted by the spill. GoCoast 2020 was established to set a foundation and road map of priorities for Mississippi so the state will be better prepared as the final federal guidelines and regulations are set forth under RESTORE.



GoCoast 2020 committees, or GoTeams, are organized by project eligibility and promote projects that will enhance Mississippi's coastal ecosystem, health, function, and economy. In late 2014 and early 2015, the Chairs of the GoTeams were convened to formulate a list of priority projects from a list of projects submitted by the public through a portal and were matched by keywords to their specific GoTeam.

### E. The RESTORE Act

The RESTORE Act makes available 80 percent of Clean Water Act (CWA) civil penalties paid by the responsible parties for the Oil Spill (*i.e.* BP and Transocean) for programs, projects, and activities that restore and protect the environment and economy of the Gulf Coast Region through the Gulf Coast Restoration Trust Fund. Within the RESTORE Act, there are five funding components (commonly referred to as "buckets"), which make funds available to each of the Gulf States in accordance with certain legal parameters. These components are:

- Direct Component (Bucket 1)
- Comprehensive Plan Component (Bucket 2)
- Spill Impact Component (Bucket 3)
- National Oceanic and Atmospheric Administration (NOAA) Science Program (Bucket 4)
- Centers of Excellence Research Grants Program (Bucket 5)

The Direct Component and the Centers of Excellence Research Grants Program Component are administered by the U.S. Department of the Treasury. The Comprehensive Plan Component and the Spill Impact Component are administered by the Gulf Coast Ecosystem Restoration Council. The NOAA Science Program is administered by NOAA.

The Gulf Coast Ecosystem Restoration Council was established by the RESTORE Act to develop and oversee implementation of a comprehensive plan to help restore the ecosystem and economy of the Gulf Coast Region in the wake of the *Deepwater Horizon* oil spill.

The Council is comprised of governors from the five affected Gulf States, the Secretaries from the U.S. Departments of Interior, Commerce, Agriculture, and Homeland Security as well as the Secretary of the Army and the Administrator of the U.S. Environmental Protection Agency. The Gulf States selected and President Obama appointed, the Secretary of Commerce as the Council's Chair. MDEQ's Gary Rikard serves for Governor Phil Bryant on the Council.

## RESTORE Act Events in Mississippi

### 1. Direct Component (Bucket 1)

On June 4, 2015, MDEQ submitted a planning grant application under “Bucket 1” to the U.S. Department of the Treasury. The planning grant provides planning funds for MDEQ to write the required Multiyear Implementation Plan (MIP). The MIP will describe the projects, programs, and activities for which Mississippi will spend “Bucket 1” funds available to the state. As a result of the Transocean Settlement in 2013, Mississippi has approximately \$56 million in “Bucket 1.” There will be additional funding for Mississippi when BP Settlement payments begin in 2017.

The RESTORE Act requires the state, through MDEQ, to prepare the MIP for Direct Component Funding which is administered by the U.S. Department of the Treasury.

Some of the eligible activities that can be included in the state’s MIP include: restoration and protection of natural resources; mitigation of damage to natural resources; workforce development and job creation; improvements to state parks; infrastructure projects, including ports; coastal flood protection; and promotion of tourism and Gulf seafood.

On December 9, 2015, Governor Bryant announced the MIP which includes nine proposed projects totaling more than \$54.1 million. The following projects were proposed to the governor by the GoCoast 2020 Commission:

- **Stennis International Airport Hangar (\$2 million)** -- The proposed hangar facility will increase the capability of Stennis International Airport to provide aeronautical services to the Mississippi Gulf Coast
- **Port Bienville Trans-Loading Dock Completion (\$8 million)** -- The proposed Port Bienville Trans-Loading Dock Completion Project would improve the terminal use for trans-loading, become functional for containers on barge operations, extend an existing rail line, and be used to support supply vessels in the offshore industry.
- **Affordable Ultra-High Speed Internet Access (\$5 million)** -- The proposed project would improve access to ultra-high speed internet, one-gigabit or more, by advancing fiber optic networks along the Mississippi Gulf Coast.
- **Mississippi Aquarium (\$17 million)** -- The proposed Mississippi Aquarium is envisioned as a family and education and research-centered tourism facility for the Gulf Coast market.
- **Jackson County Corridor Connector (\$10.2 million)** -- The proposed Jackson County Corridor Connector will provide a critical link between major commercial developments in the St. Martin/D’Iberville area.
- **Work-Ready Community Program (\$4 million)** -- The proposed Mississippi Gulf Coast Work-Ready Community Program is designed to aid coastal citizens in the attainment of basic skills, employability skills, and specific industry skills that are needed in high-demand industry sectors.
- **Support for William Carey University School of Pharmacy (\$1 million)** -- The proposed project will support William Carey University in establishing its School of Pharmacy on the Mississippi Gulf Coast.
- **Off-Bottom Oyster Aquaculture Program (\$1 million)** --The proposed project would establish a program to provide training on the ecological, economic, and business components of off-bottom aquaculture to support the seafood workforce.
- **Project Management System (\$900,000)** -- The proposed project management system would assist MDEQ in the management of projects that restore or protect the Gulf Coast Region.

Additionally, Direct Component Funding will also include \$5 million for Strategic Stream Restoration. This project would undertake various aspects of stream restoration such as engineering and design, planning, and implementation across the Mississippi Gulf Coast. It is designed to improve the water quality that empties into the Mississippi Sound and reduce the amount of beach closures due to water quality.



## 2. Council Selected Component (Bucket 2)

On October 16, 2014, MDEQ hosted two webinars to discuss Mississippi's strategy for RESTORE "Bucket 2" proposal submissions. The publicly available English and Vietnamese webinars described the RESTORE "Bucket 2" submission process and the proposals that Mississippi intended to submit to the RESTORE Council for inclusion on the Council's first draft Funded Priorities List (FPL). As a trustee on the RESTORE Council, Mississippi had the opportunity to submit project proposals for the first round of funding within "Bucket 2." On November 17, 2014, MDEQ announced the state's "Bucket 2" proposals submitted to the RESTORE Council for inclusion on the Council's first Funded Priorities List. The Council focused on habitat and water quality projects that emphasized foundational ecosystem elements for this initial FPL. The projects and programs were evaluated by the RESTORE Council for best available science, and a draft Funded Priorities List was compiled and published for public comment.

On December 9, 2015, the following projects were approved by the RESTORE Council meeting in Biloxi:

- ***Strategic Land Protection, Conservation, and Enhancement of Priority Gulf Coast Landscapes (\$15.5 million)*** -- This project will protect lands through acquisition and conservation easement programs in areas across the Mississippi Gulf Coast. Priority areas include the Gulf Islands National Seashore, Grand Bay National Wildlife Refuge, and the DeSoto National Forest.
- ***Enhancing the Opportunities for Beneficial Use of Dredge Sediments (\$2.18 million)*** -- This project will provide funding for planning, engineering and design, and permitting to use dredge material for coastal restoration.
- ***The Mississippi Sound Estuarine Program: A Programmatic Vision for Bridging Coastal Restoration (\$2.27 million)*** -- The Mississippi Sound Estuarine Program will act as a coordinating body to ensure Mississippi restoration success is maximized. The program will look across the Gulf to leverage existing restoration efforts to the benefit of Mississippi.
- ***SeaGrant Education and Outreach – Undertake education and outreach activities to describe the values of land protection for habitat, water quality improvement and for securing the future of the Gulf of Mexico in Mississippi (\$750,000)*** -- This project will establish an education and outreach program in Mississippi. The program will provide grants to fund education activities focused on restoration activities such as land conservation, habitat stewardship, and water quality.

## 3. Centers of Excellence Component (Bucket 5)

On April 6, 2015, MDEQ released a Request for Proposals for Mississippi's Center of Excellence (RFP). The Center of Excellence will conduct research and monitoring in a variety of focus areas. In July, 2015, the Mississippi Based Restore Act Center of Excellence (MBRACE) was selected as the State's Center of Excellence. MBRACE is a partnership among Jackson State University, Mississippi State University, University of Mississippi, and University of Southern Mississippi.



## **F. National Fish and Wildlife Foundation**

As a result of criminal settlement a consent decree, \$356 million dollars of ecosystem restoration funding is available to the State of Mississippi. Under this plea agreement the state has funded several rounds of projects.

### **Round 1**

MDEQ initially invested in three broad scoped projects that will begin to start the restoration process in Mississippi. The three projects were:

1. Coastal Streams Initiative with The Nature Conservancy and the Audubon Society-Mississippi.
2. Coastal Bird Stewardship Program with the Audubon Society-Mississippi.
3. Coastal Preserves Invasive Species Program with the Mississippi Department of Marine Resources

All three projects are currently underway with expected completion dates 2016.

### **Off-Cycle Planning Project**

NFWF funded a critical coast wide planning effort in March of 2014. Over the last year, Mississippi has conducted a robust vision mapping through innovative upstream stakeholder engagement by soliciting the views and visions of the people of the Gulf Coast. The planning process will continue through 2017 as relevant planning documents, current restoration efforts, and stakeholder input are merged with science based data to help determine the most effective, and comprehensive plan for restoring the Gulf Coast.

In August 2014, as an initial part of Mississippi's Restoration Planning project and continued public engagement strategy, MDEQ held a series of Community Conversations, one in each of the coastal counties. A number of non-governmental organizations, community organizations and state and federal agencies assisted in facilitating small group discussions where community members were able to voice individual values, ideal characteristics, and visions for their communities. Participants were also able to identify and prioritize restoration targets and activities or actions associated with those targets. The full Community Conversation report may be found at [www.restore.ms](http://www.restore.ms).

Following the Community Conversations, MDEQ engaged in Resource Summits where the residents were engaged to understand how the community conversations have led to the identification of three restoration programs: 1) water resources, 2) land resources, and 3) living coastal and marine resources. Technical experts were asked to present on the respective topics.

### **Round 2**

On November 17, 2014, Governor Phil Bryant announced that Mississippi had been awarded more than \$28 million dollars from the National Fish and Wildlife Foundation for three restoration projects spanning across Harrison, Hancock, and Jackson counties. This brings to date nearly \$39 million dollars in restoration and planning projects awarded to Mississippi through the Gulf Environmental Benefit Fund.

#### **1. Reef Fish Assessment**

The expansion of a Reef Fish Assessment Program was funded with \$4 million to bolster the fishing industry. This two year project will gather vital data on abundance, distribution and life-history characteristics of red snapper and other reef fish occurring at the more than 16,000 acres of permitted offshore artificial reef sites.



## 2. Marsh Restoration and Creation

More than \$21 million will be used for vital marsh creation and restoration in three priority bay systems along the Gulf Coast including St. Louis Bay, Back Bay of Biloxi, and the Pascagoula - Escatawpa system. Over many decades, these priority bays have experienced significant impacts due to shoreline erosion, storm damage, and alterations to sediment transport contributing to the loss of thousands of acres of tidal marsh habitat. This project will advance Mississippi's beneficial use program to facilitate a cost-effective, sustainable approach to restoring and protecting significant coastal marsh and bay shorelines. Currently the marsh restoration project is pursuing a partnership with the Mississippi Department of Marine Resources, the Port of Pascagoula, and the U.S. Army Corps of Engineers that could result in the creation of 220 acres at Round Island that will be a big boost to the coastal marsh restoration effort across the Coast. Ancillary benefits to accrue from this effort are recreational fishing, bird watching, and camping just to name a few.



## 3. State Lands Invasive Species Management

The third project, totaling more than \$2.6 million, will continue enhancement of habitat value of state lands in coastal Mississippi through improved management of invasive species. This project is an expansion of the 2013 Gulf Environmental Benefit Fund awarded to address invasive species management on land within Mississippi's Coastal Preserves Program. In addition, this project engages with the Mississippi Department of Wildlife Fisheries, and Parks. Invasive species management work will take place in Buccaneer and Shepard State Parks as well as in the Ward Bayou Wildlife Management Area. An invasive species assessment will take place in the Pascagoula River Wildlife Management Area. Work to control persistent invasive species will include prescribed burning, mechanical and chemical control of invasive vegetation, and feral hog control. This project will focus on improving significant coastal marsh and transitional upland habitat through the control and eradication of non-native and invasive plant species and the improved tidal connectivity of these habitats to the Mississippi Sound.



The three projects were developed in consultation with MDEQ and federal resource agencies and are designed to remedy harm or reduce the risk of future harm to natural resources that were affected by the *Deepwater Horizon* oil spill.

### Round 3

In November 2015, Governor Phil Bryant announced a third round of four NFWF projects totaling almost \$30 million.

- **Habitat Restoration: Federal Lands Program – Phase I (\$9,905,300)**

This project will enhance and restore habitat on federal lands in coastal Mississippi including restoration of over 30,000 acres through invasive species removal, forest thinning, and prescribed burns. The Mississippi Department of Environmental Quality (MDEQ), the U.S. Fish and Wildlife Service, the National Park Service, and the U.S. Forest Service will direct this effort.

- **Habitat Restoration and Conservation in Turkey Creek (\$7,536,400)**

This project seeks to conserve important habitat and enhance water quality in the 30,000 acre Turkey Creek watershed in Harrison County through habitat conservation and restoration along with stream restoration. MDEQ will partner with the Land Trust for the Mississippi Coastal Plain, the Mount Pleasant United Methodist Church Environmental Ministries, the North Gulfport Community Land Trust, the Turkey Creek Community Initiative, the Turkey Creek Watershed Team, and the USDA Natural Resources Conservation Service in carrying out these project activities.



- **Oyster Restoration and Management (\$11,780,000)**  
This project seeks to improve oyster populations and sustainability by conducting several studies to better understand why oyster populations are not more resilient and how productivity can be improved. MDEQ will partner with the Mississippi Department of Marine Resources for this project.
- **Design Challenge for Improvement of Water Quality from Beach Outfalls (\$544,600)**  
Under the terms of this project, MDEQ will host a design challenge to address the water quality impacts of beach outfalls on the Mississippi Sound. Individuals and teams will compete to create innovative solutions for untreated storm water and it is expected that the winning design will be implemented at a larger scale across the Mississippi Coast.

### G. Natural Resource Damage Assessment (NRDA)

The *Deepwater Horizon* Natural Resource Damage Assessment (NRDA) is the legal process for developing the public’s claim for natural resource damages against the party or parties responsible for the oil spill and to seek compensation for the harm done to natural resources and those services they provide. It also provides for the development of a restoration plan or a series of plans to restore or replace those resources as well as the structure by which Mississippi and others will plan and implement restoration of the Gulf of Mexico and/or compensation for damages.

Working with trustees from the U.S. Department of Commerce (NOAA), the U.S. Department of the Interior, U.S. Environmental Protection Agency, U.S. Department of Agriculture as well as the four other Gulf States, MDEQ is determining how the oil spill affected the Gulf of Mexico’s natural resources, ecosystems, and the associated human uses. On October 5, 2015, BP, the United States Trustees, and the five Gulf states announced a settlement resolving claims for federal civil penalties and natural resource damages related to the *Deepwater Horizon* oil spill. The Natural Resource Damage Assessment Settlement is \$297,557,000 which funds the following restoration initiatives and project types:

Category	Funding Amount	Description
Phase 1 Early Restoration	\$13,600,000	Oyster cultch and nearshore artificial reefs.
Phase 3	\$68,957,000	Living shorelines, subtidal reefs, recreational loss projects.
Phase 4	\$30,000,000	Living shorelines, intertidal and subtidal reefs in four bays in the Mississippi Sound.
Additional Early Restoration Funding	\$18,443,000	Early Restoration Settlement Remaining from \$1 billion.
Long Term Restoration Projects	\$166,557,000	Money to restore and conserve habitat; restore water quality, replenish and protect living coastal and marine resources, and provide and enhance recreational opportunities, and for monitoring, adaptive management and administrative oversight.

### Long Term Restoration

On October 5, 2015, the federal and state Trustees released the *Draft Programmatic Damage Assessment and Restoration Plan and Draft Programmatic Environmental Impact Statement (Draft PDARP/PEIS)*. The draft document fulfills two purposes:

- It provides a natural resource damage assessment and proposed restoration plan framework, and;
- It presents an examination of the environmental impacts of various restoration alternatives under the National Environmental Policy Act (NEPA).

The plan for Mississippi will include spending the remaining \$183 million in restoration funds in the following categories:

<b>Restoration Goals and Project Types</b>	<b>Remaining Restoration Funding</b>
<b>Goal 1: Restore and Conserve Habitat</b>	
Wetlands, Coastal and Nearshore Habitats	\$55,500,000
Habitat Projects on Federally Managed Lands	\$5,000,000
<b>Goal 2: Restore Water Quality</b>	
Nutrient Reduction (non-point source)	\$27,500,000
<b>Goal 3: Replenish and Protect Living Coastal and Marine Habitats</b>	
Sea Turtles	\$5,000,000
Marine Mammals	\$10,000,000
Birds	\$25,000,000
Oysters	\$22,500,000
<b>Goal 4: Provide and Enhance Recreational Opportunities</b>	\$5,000,000
<b>Goal 5: Monitoring, Adaptive Management, Administrative Oversight</b>	
Monitoring and Adaptive Management	\$7,500,000
Administrative Oversight and Comprehensive Planning	\$22,500,000
Total	\$183,000,000

The NRDA process provides clear guidelines for assessing damages by calculating the value of the restoration required to return the injured resources to their pre-spill conditions and to compensate for interim losses. From the early days of the spill, and continuing even now, NRDA teams collected data related to a wide range of natural resources. Mississippi, in partnership with the federal Trustees, will work in a Trustee Implementation Group (TIG) to generate future restoration plans that identify specific restoration projects. These restoration plans will be consistent with the PDARP/PEIS, and each plan will be integrated with the appropriate analysis of tiered environmental impacts. TIG decisions will be made by consensus and documented through a public Administrative Record. The Trustees will ensure that the public is involved through public notice of proposed restoration plans, opportunities for public comment, and consideration of all comments received.

### **Early Restoration**

Under a NRDA, plans for the implementation of early restoration projects prior to the final quantification of injury may be developed to achieve restoration faster. On April 21, 2011, the Trustees announced the Framework for Early Restoration Addressing Injuries Resulting from the *Deepwater Horizon* oil spill (Framework Agreement), in which BP agreed to fund \$1 billion in Early Restoration projects. Under the agreement, DOI, NOAA, and the five spill-affected Gulf states each will receive \$100 million dollars to implement early restoration projects. The remaining \$300 million will be allocated by NOAA and DOI for early restoration projects proposed by state trustees.

The full NRDA process will continue until the trustees have determined the extent of damages caused by the *Deepwater Horizon* oil spill. At the end of the damage assessment process, the trustees will take into account any benefits that were realized from these early restoration projects. In addition to funding early restoration projects, BP will continue to fund the damage assessment and, together with other responsible parties, is obligated to compensate the public for the entire injury.

## Phase I Projects

Completed projects from Phase 1 include the laying of the largest oyster cultch in the history of the Mississippi Sound totaling \$11 million, and \$2.6 million on a near shore artificial reef(s) enhancement project. Completed projects brought jobs to the Mississippi Gulf Coast as local contractors were hired to perform this work.

## Phase III Projects

Phase III Projects were approved in a Record of Decision in October 2014. MDEQ, working with Mississippi contractors and project sponsors, has been busy in the design, permitting and implementation of four Phase III projects which total \$68,957,000 dollars.



Oyster cultch being deployed in the fall of 2012.

- **Hancock County Marsh Living Shoreline**

The project would provide for construction of up to six miles of living shoreline. Benefits would include reduction of erosion, re-establishment of oyster habitat, and enhanced fisheries resources and marsh habitat. Approximately 46 acres of marsh would be constructed to protect and enhance the existing shoreline near Heron Bay. In addition, 46 acres of sub-tidal oyster reef would be created in Heron Bay to protect the shallow bay and increase oyster production in the area. The estimated cost of this project is approximately \$50 million of which NOAA is funding a portion. The project is in the final design and permitting phases. Construction start is estimated for early 2016.

- **Restoration Initiatives at the INFINITY Science Center**

INFINITY is a state-of-the-art interactive science research, education, and interpretive center located in Hancock County. Early restoration funds would be used to develop interactive exhibits at the INFINITY Science Center. These enhancements would replace lost recreational opportunities through enhanced visitors' access to coastal natural resources. The estimated cost of this project is approximately \$10.4 million. Environmental permitting is complete. Improvements to the approximate three mile portion of the Heritage Trail-Possum Walk have been completed. Facility improvements to visitor parking is complete, and construction of the native landscape areas are underway.

- **Popp's Ferry Causeway Park**

The project in Harrison County would provide for construction of an interpretive center, trails, boardwalks, and other recreational enhancements. This project would replace lost recreational opportunities by enhancing existing amenities allowing visitors to fish, crab, and observe nature. The estimated cost of this project is approximately \$4.7 million. Permitting for the project is completed. Design and construction are anticipated in 2016-2017 timeframe

- **Pascagoula Beachfront Promenade**

Early restoration funds for this project would be used to help complete a two-mile, ten foot wide lighted concrete pathway complete with amenities. The purpose would be to restore the loss of recreational opportunities by enhancing access to the Mississippi Sound and its natural resources. The estimated cost of this project is approximately \$3.8 million. Design and construction is anticipated in 2016-2017 timeframe.



## Phase IV Project

Restoring Living Shorelines and Reefs in Mississippi Estuaries was a Phase IV Early Restoration project that was approved in the Phase IV Early Restoration Plan/Environmental Review which was released September 23, 2015. The project includes restoration of intertidal and subtidal reefs and the use of living shoreline techniques including breakwaters. The projects will be implemented at locations in Grand Bay, Graveline Bay, Back Bay of Biloxi and vicinity, and St. Louis Bay in Jackson, Harrison, and Hancock Counties, respectively. The project builds on recent collaborative projects implemented by the Mississippi Department of Marine Resources, National Oceanic and Atmospheric Administration, and The Nature Conservancy. When completed at all locations, the project will provide for construction of over four miles of breakwaters, five acres of intertidal reef habitat and 267 acres of subtidal reef habitat at four locations across the Mississippi Gulf Coast. For the Grand Bay and Graveline Bay project locations, intertidal and subtidal reefs will be created in a number of sites. Over time, the breakwaters, intertidal and subtidal restoration areas will develop into living reefs that support benthic secondary productivity, including, but not limited to oysters/bivalve mollusks, annelid worms, shrimp, and crabs. Breakwaters will reduce shoreline erosion as well as marsh loss. Project design and permitting will be initiated in 2016 with a construction start anticipated in 2017.

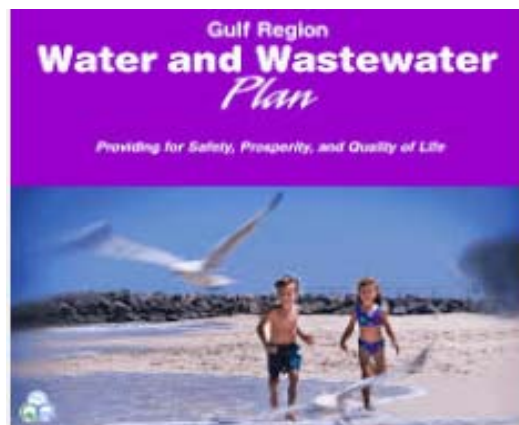
## II. Gulf Region Water and Wastewater Plan

This program was one of many in response to the devastation of Hurricane Katrina, and it has transformed much of the Gulf Coast public service infrastructure. MDEQ took seriously Governor Haley Barbour's plea in 2005 to rebuild the Gulf Coast "better than ever," and especially his directive to learn from the lessons of Hurricane Camille. Of the \$5 billion Mississippi's Congressional Delegation and Governor Barbour obtained from the federal government for long-term recovery assistance, about \$650 million was devoted to building and upgrading water and wastewater systems on the Coast. MDEQ was assigned the responsibility for carrying out this task under the auspices of the Mississippi Development Authority and with the approval of the U.S. Department of Housing and Urban Development.

Applying the lessons from the aftermath of the Camille experience, and building this infrastructure so it would be "better than ever" meant adopting the following principles:

- New water and wastewater infrastructure would be built in areas less vulnerable to damage from future hurricanes in order to encourage growth to these areas.
- This new infrastructure would be built in such a way that it could recover quickly from a major hurricane and facilitate the rapid recovery of water and wastewater systems in high impact areas.
- Focus on the Gulf Coast region, rather than individual units of government, encourage centralization and consolidation to save money, increase efficiencies, eliminate duplication, and foster cooperation.
- Creation of economic development opportunities would be a chief criterion in the selection of projects.
- Projects would be identified and prioritized within the framework of a comprehensive regional plan.

Utilizing these principles allows municipalities and developers to connect to networks— treatment facilities, pump stations, elevated water tanks, water supply wells, and the interconnecting pipelines — at a fraction of the cost of constructing stand-alone systems. In addition, this new infrastructure fosters development away from the coastline and create water and wastewater systems less vulnerable to future hurricanes. The plan developed in consultation with local officials and hundreds of concerned citizens has funded 67 projects across five counties.



The plan is under budget, nearly complete, and achieving its goals. When complete, the Gulf Coast region will have a significant amount of new water and wastewater facilities including:

- 620 miles or more new water and sewer lines.
- 31 new water tanks.
- 32 new water wells.
- 59 new wastewater pumping stations.
- 17 new wastewater treatment facilities.



### III. Air Quality

**Air Quality Strategic Goal:** Ensure that Mississippi air quality is protective of the health and welfare of its citizens.

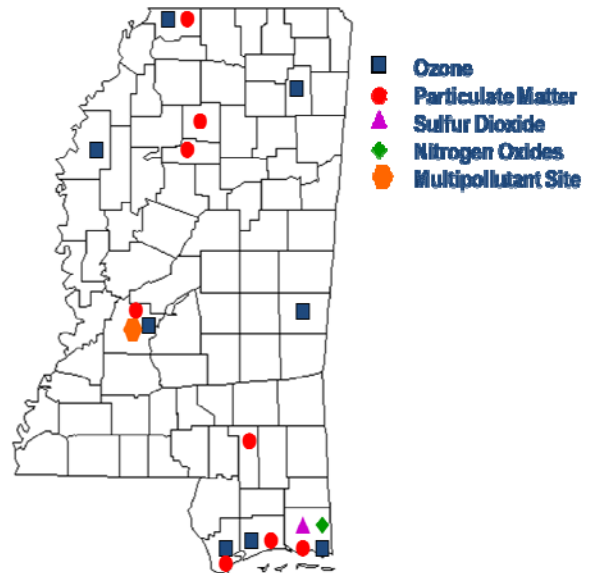
#### A. Air Monitoring

MDEQ operates a network of automated continuous air analyzers and 24-hour manual samplers for the purpose of measuring ambient air levels of ozone, particulate matter, sulfur dioxide, nitrogen dioxide, lead, and carbon monoxide.

This monitoring network serves many purposes including:

- Determining attainment and nonattainment areas for ground-level ozone, particulate matter, sulfur dioxide, nitrogen dioxide, and carbon monoxide.
- Generating data to assist in determining methods to reduce visibility obscuration.
- Supporting ozone reduction programs and hazardous air pollutant programs.
- Determining general air quality trends.

#### 2015 Mississippi Ambient Air Quality Monitoring Sites



Air Quality Index Levels of Health Concern	Numerical Value	Meaning
Good	0 to 50	Air quality is considered satisfactory, and air pollution poses little or no risk.
Moderate	51 to 100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy	151 to 200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	201 to 300	Health warnings of emergency conditions. The entire population is more likely to be affected.
Hazardous	301 to 500	Health alert: everyone may experience more serious health effects.

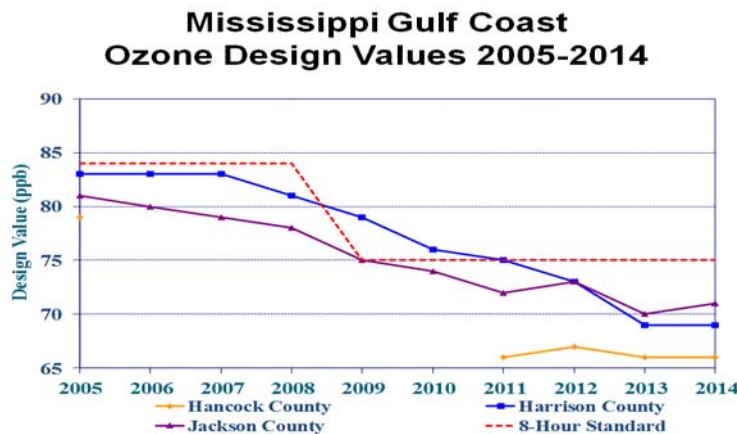
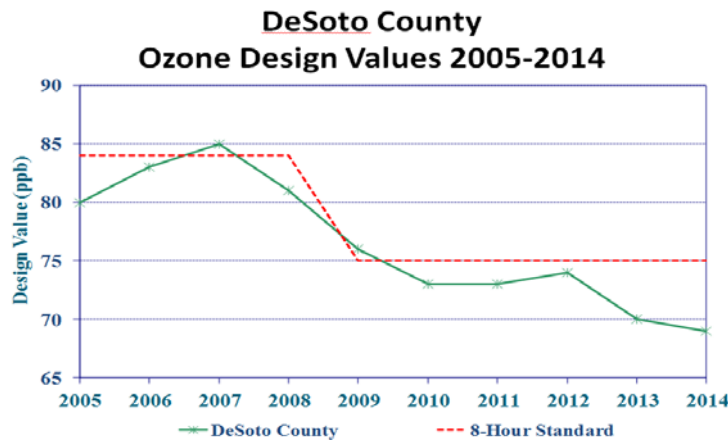
MDEQ issues daily air quality forecasts for the Mississippi Gulf Coast and the Jackson Metropolitan Area from April through October each year. Also, MDEQ, in association with the Memphis-Shelby County Health Department, issues air quality forecasts for DeSoto County. These forecasts are made available through e-mail, the MDEQ web site, and Twitter. The purposes of these forecasts are to keep the public informed about the status of air quality, to issue health advisories when needed, and to notify the members of the respective ozone precursor reduction programs when they should implement their emissions reduction plans.



**AIR OBJECTIVE - Maintain Compliance with Federal Air Quality Standards**

**Outcome - Percentage of Counties that Meet National Ambient Air Quality Standards**

Emissions reductions in Mississippi and adjoining states, as well as favorable meteorological conditions, resulted in a recent downward trend in ozone concentrations culminating with all Mississippi counties being designated by EPA as attainment with the ozone standard of 75 parts per billion (ppb) in 2012, with the exception of DeSoto County. Although DeSoto County met the standard, most of the county was designated as part of the Memphis Nonattainment Area. EPA proposed a new ozone standard within a range of 65-70 ppb in December 2014, and the final standard was issued in October 2015 at 70 ppb. MDEQ is continuing a voluntary ozone precursor air pollution control program in partnership with governmental and business leaders on the Coast and in DeSoto County in efforts to prevent or mitigate future nonattainment.



In 2008, EPA issued a new lead standard that required MDEQ to monitor for lead starting in December 2011 to determine if the state will meet the new standards. Mississippi is meeting that standard, based on incomplete data. In 2012, EPA designated all Mississippi counties as attainment with the nitrogen dioxide.

New sulfur dioxide designations have not been issued yet to states attaining the standard using monitoring data, including Mississippi. However, a sulfur dioxide consent decree was issued in March 2015 that affected a utility in the state. The court-ordered decree required that emissions modeling be performed for the utility to determine its attainment status. The modeling indicated attainment but EPA has not designated the area near the facility yet. In addition, EPA issued a sulfur dioxide data requirements rule in September 2015 that will affect other facilities in the state. Additional modeling, monitoring, or permit actions may be required as a result of this rule. EPA retained the current standards for carbon monoxide, and Mississippi is meeting those standards.

Final standards for annual mean fine particulate matter were made in December 2012. The primary standard was reduced from 15 micrograms per meter cubed ( $\mu\text{g}/\text{m}^3$ ) to  $12 \mu\text{g}/\text{m}^3$ . Final designations of the standard were made in December 2014 showing attainment for all particulate matter monitoring sites. The 24-hour average standard remained at  $35 \mu\text{g}/\text{m}^3$ . Mississippi is meeting both of those standards.

## B. Southeast Modeling, Analysis, and Planning (SEMAP)

Mississippi is working with nine other southeastern states to address the many new air quality standards, that have or will come out, in a more efficient and effective way. The SEMAP group, which includes several MDEQ staff members, is addressing the new standards from a regional perspective. This is necessary because air emissions from Mississippi may impact other states' air quality and other states can impact Mississippi's air quality. It is also more efficient and cost effective because the group can hire contractors to help develop inventories and perform air quality modeling and analysis for much less than each state trying to do the work on their own. The modeling effort has been continuing and results will be available to use for the new standards.

In addition, addressing the Clean Power Plan (CPP) requires a regional effort. This is due to the way that electricity is generated and distributed across the grid and due to the fact that the rule is very complex and broad. Since Mississippi is split between several large power grids, we are working with two regional groups: The Nicholas institute in the Southeast and the Mid-Continental States Energy and Environmental Regulators (MSEER). It is necessary to work with these groups in addressing the CPP and developing a plan, if necessary, to ensure the best implementation of the rule for the State of Mississippi.

## C. Air Emission Inventory Branch

The Air Division develops an inventory that quantifies the air emissions from various sources each year. Every third year, EPA requires a complete inventory that quantifies emissions from all major Title V sources on a detailed level and estimated emissions from smaller stationary and mobile sources. The inventory quantifies emissions for over 200 air pollutants and also includes emissions-related information such as control devices, exhaust stack parameters, and fuel type. This work involves gathering the emissions data from the emissions sources, quality assuring it, and submitting it to EPA in a prescribed format. MDEQ has completed and submitted the 2012 major source inventory, and the request for the 2014 inventory was sent out to be reviewed and processed to be submitted to EPA in January 2016. The 2014 year inventory is a major submittal year that requires more resources than other years.

## D. Mississippi Diesel Emissions Reduction Project State Grants (DERA)

In 2014, MDEQ used DERA funding to assist school districts in replacing older diesel buses with newer, cleaner, and more efficient buses. MDEQ helped in the replacement of 10 buses in eight school districts. Again in 2015, MDEQ utilized DERA funds for the replacement of older school buses. MDEQ worked with six districts to replace seven buses with 2015 model year buses. Due to the success of this grant program, MDEQ expects to continue this program with a new DERA State Grant from EPA.



## E. Asbestos

Asbestos is a potential danger with most building demolition and renovation operations. The regulations implemented by MDEQ require affected facilities to inspect for asbestos before work begins and specify work practices and procedures for asbestos abatement when the material is present and may be disturbed by demolition and/or renovation activity. Implementation activities include communicating the requirements of the regulations to project owners and operators, demolition/renovation project inspections to ensure regulation compliant operations, and providing home owners with information and assistance to help them perform activity in a safe manner.



MDEQ also gives close attention to the handling of asbestos in schools for the protection of children. Inspections are performed in schools to review compliance with Asbestos Management Plan requirements and school officials and administrators are provided technical assistance to help them comply with the regulations. Additionally, individuals who engage in asbestos abatement must have proper training for their work through an asbestos abatement certification program.

During 2015, MDEQ inspected 234 building demolition and renovation projects and investigated 27 complaints. There were also 1345 applicants who received certification to perform asbestos abatement activity and 36 school districts inspected for asbestos management plan review and guidance.

## F. Lead-Based Paint Program

Exposure to lead-based paint is a serious health concern for everyone, but especially children that are six years of age and under and for developing fetuses.

Facts about Lead-Based Paint:

- Lead is a heavy metal which has been a serious public health problem for centuries.
- Lead-based paint was used extensively throughout residences before 1978, and is still present under newer paint.
- Dust and debris from activities that disturb lead-based paint can be dangerous if not managed properly.
- Lead poisoning does not usually present apparent symptoms so even children that seem healthy can have high levels of lead in their bodies.
- Lead poisoning can cause permanent learning and behavior problems and have medical consequences throughout a person's life.

Mississippi's Lead-Based Paint Program operates a certification program that has been delegated to the state by EPA. The Program establishes requirements for the certification of persons and firms engaged in lead-based paint activities, and it establishes work practice standards for performing such activities. The Program also establishes procedures and requirements for the accreditation of lead-based paint activity training programs. The regulations are applicable to all persons engaged in lead-based paint abatement and renovation activities in target housing and child-occupied facilities.



Another important step in the goal to eliminate childhood lead poisoning was taken with the EPA's Renovation, Repair, and Painting (RRP) rule. The rule addresses hazards created by renovation, repair, and painting activities that disturb lead-based paint in target housing and child-occupied facilities. MDEQ's RRP regulations were modeled after the federal rules and went into effect in April 2010. MDEQ's Lead-Based Paint regulations were amended in 2013 to reflect changes to the EPA's regulation.

In addition to certifying persons and firms engaged in lead-based paint activities, staff perform audits of training courses and perform inspections of job sites to ensure compliance with the regulations. During FY2015, the MDEQ Lead-Based Paint Section performed six training course audits, 46 site inspections (including investigations at six complaint sites), and certified 565 individuals and firms involved in lead-based activities.

This year the Lead-Based Paint Program has entered into agreements with the Mississippi Coalition of Black Mayors and the City of Jackson NED Rehab Division. The agreements allowed the organizations to receive grants from the EPA to increase awareness of lead hazards in Itta Bena, Durant, Yazoo City and the City of Jackson.





## **G. Air Toxics**

Many facilities are regulated for “air toxics” - air emissions that may cause acute or chronic health conditions. These are hazardous air pollutant (HAP) emissions that are primarily controlled or reduced through regulations called Maximum Achievable Control Technology (MACT) standards. Facilities are typically required to install additional control equipment or to change other process equipment or materials in order to reduce HAP emissions to meet the emission limitations set by the rules. There are 174 different source categories of major HAP emission facilities affected by MACT standards and 70 different categories of smaller HAP emitting facilities, called area sources. Therefore, there are many different HAP regulations and standards and a wide range of applicability. The types of affected facilities range from large chemical plants and petroleum refineries to small dry cleaning facilities, gasoline stations, and even backyard auto body repair and painting shops.

MDEQ works to stay abreast of all regulations affecting Mississippi facilities and operations. Existing HAP regulations and MACT standards continue to be revisited and amended and new regulations continue to emerge through rule promulgations by EPA. The new federal regulations and regulation amendments must be processed into Mississippi regulations and the activities of MDEQ to maintain the program delegations, meet the needs of the state, and responsibly administer the regulations. Activities include identifying and communicating new requirements to the affected facilities and providing assistance to compliance and permitting staff to ensure proper application of the rules and regulations.

Air toxic activities also include the implementation of accidental release prevention regulations. These regulations target chemicals that could be very dangerous to public health in the event of a chemical accident or an uncontrolled release. Facilities that have a regulated substance on site in excess of the applicable threshold quantity must employ necessary process safety measures and must also be prepared to mitigate the consequences of a release should that occur. The actual planning, techniques, and procedures that regulated facilities rely upon must be outlined in a Risk Management Plan and submitted for agency review. Activities also include regulated facility identification for an ever changing regulated source population and facility inspections. During 2015, there were 153 active regulated facilities and 82 facility RMP inspections performed.

## **H. Title V Program**

Mississippi received full approval from EPA in January 1995 to administer the Title V Air Operating Permit program. This program originated in the amendments to the Clean Air Act enacted in 1990. Each major source of air pollution is required to obtain a Title V Operating Permit which sets out all air requirements applicable to the source and specifies the methods by which the source must demonstrate compliance. All aspects of Title V permitting are handled by the MDEQ Environmental Permits Division, while all compliance certifications and demonstrations are handled by the MDEQ Environmental Compliance and Enforcement Division.

The Air Division meets regularly with the Air Advisory Council to keep them updated with the Title V work and the level of effort. The Air Division evaluates the annual revenue and expenditures and the Air Advisory Council uses this data to recommend the Title V fee for the next year. The revenue needs are reported to the Commission on Environmental Quality so that the appropriate fee rate can be adopted prior to the September 1 annual fee payment date. The Air Division also handles the collection of emissions information from fee-subject sources and provides this fee-assessment information to the MDEQ Office of Administrative Services which handles fee billing and collection.

In FY2015 the Air Division received \$4,985,849 from 279 Title V sources. The revenue is based on the annual Title V fees where facilities paid \$41 per ton for their actual emissions for the previous calendar year, 2014. Some of the revenue, about 2.5 percent, came from late fees associated with the annual Title V fee.

## **I. Greenhouse Gases**

On December 7, 2009, the EPA Administrator signed the Endangerment Finding for Greenhouse Gases for mobile sources. EPA has used this finding as the basis to expand its regulatory efforts to regulate large stationary sources of greenhouse gas emissions. Many of these sources are found in the energy sector. In response to these regulations, the MDEQ Air Division formed the Greenhouse Gas and Energy Branch in 2014 to monitor, assess, and implement these new regulations. Initial regulatory efforts of greenhouse gases include regulations for the power sector, oil and natural gas industries, and landfills. The most significant of these regulations to date is the final release of the Clean Power Plan in August of 2015. In dealing with these regulations, the agency is engaging in unprecedented inter-agency collaboration, affected stakeholder outreach and public participation.

## IV. Waste Management

Solid wastes include all types of garbage, refuse, debris, sludges, or other discarded materials from residential, commercial, industrial and institutional sources. MDEQ’s regulatory programs address the management of solid waste at transfer stations, composting operations, rubbish sites, landfills and other types of solid waste facilities. Solid wastes can also include “hazardous wastes.” Hazardous wastes are discarded materials that have properties that make the waste dangerous or potentially harmful to human health or the environment. In regulatory terms, a hazardous waste is either a “listed” waste (a waste that appears on one of four federal hazardous waste lists due to its potential inherent dangers) or a waste that exhibits at least one of four characteristics: ignitability, corrosivity, reactivity, or toxicity.

**Waste Management Strategic Goal:** Protect Mississippi’s soil and water resources through proper non-hazardous solid waste, hazardous solid waste and petroleum product management.

MDEQ also gathers information about suspected contamination due to old landfills, illegal dumps, and abandoned facilities called uncontrolled sites. MDEQ oversees the investigation and remediation of sites that have been or are suspected to have been contaminated by toxic metals, chemicals, petroleum, or other pollutants or contaminants. MDEQ also maintains a database inventory of identified contaminated sites. MDEQ regulates coal and non-coal surface mining activities so as to minimize injurious effects by requiring proper reclamation of surface-mined lands, while balancing the economic necessities of developing natural resources with protection of the natural environment.

**WASTE OBJECTIVE:** Ensure statewide waste management activities focus on recycling, proper handling, transportation, and disposal to prevent release of contaminants to the environment.

Outcome – Number of Tons of Solid Waste Material Properly Disposed

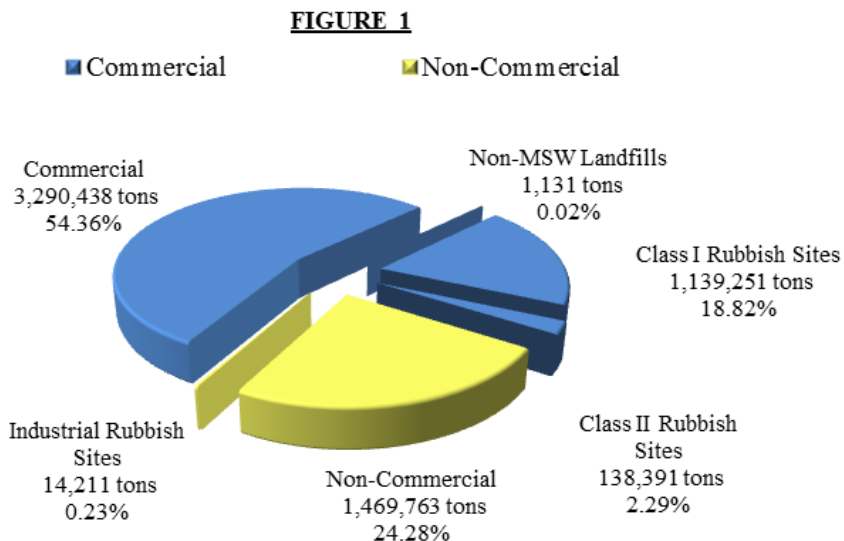
Outcome – Number of Tons of Material Recycled Per Year

### A. Mississippi Solid Waste Annual Summary Report

Throughout 2015, the MDEQ Solid Waste Management and Recycling Programs worked on issues, projects and programs to ensure the proper management of solid wastes, to promote the reduction and recycling of solid wastes, and to plan for the future solid waste management needs of the state.

Each year, MDEQ collects an annual report from the owners or operators of permitted solid waste management facilities on solid waste management activities conducted during the preceding calendar year. Solid waste management facilities that report to MDEQ include commercial and non-commercial landfills, commercial and non-commercial rubbish disposal sites, land application sites, composting facilities, solid waste processing facilities, and solid waste transfer stations.

In 2015, MDEQ developed a report on solid waste disposal activities conducted during Calendar Year 2014. This report indicated that just over six million tons of wastes were disposed at permitted landfills and rubbish sites in Mississippi. Approximately 3.3 million tons (54.38%) of the total waste was disposed at commercial landfills, 1.5 million tons (24.28%) at non-commercial landfills, 1.3 million tons (21.11%) at commercial rubbish sites, and 14,000 tons (0.23%) at non-commercial rubbish sites.



About 4.6 million tons of solid wastes were disposed at commercial disposal facilities and the remaining 1.5 million tons of wastes were disposed at noncommercial disposal facilities. Mississippi received a little less than 750,000 tons of solid waste from out-of-state sources representing approximately 12 percent of the total solid waste that was disposed during 2014.

In addition, a total of approximately 19,000 dry tons of wastes were applied at the permitted land application sites, about 24,000 tons of material was received for management at solid waste composting facilities. These annual reports also indicated that approximately 123,000 tons of material was received for management at solid waste processing facilities and just over 730,000 tons of wastes was managed by solid waste transfer stations in the state.

## **B. Solid Waste and Waste Tire Grants Programs**

The Solid Waste Programs also continued the management and dispersal of various solid waste and recycling grant program funds. Through the Solid Waste Grant Programs, MDEQ awarded over \$3.5 million in Fiscal Year 2015 for solid waste management and recycling projects, solid waste planning projects and waste tire projects across the state. Of that total, over \$2.2 million was awarded in Solid Waste Assistance Grants to local governments. These grants are used by local governments to clean up illegal dumps, establish collection programs for bulky wastes and recyclables, fund the hiring of a local solid waste enforcement officer, for household hazardous collection days/programs, for public information efforts on solid waste and recycling programs, and for other waste management activities at the local level. These funds are annually awarded through two different categories of grants: the non-competitive (or allocated) grants to county governments and the competitive grants available to municipalities, counties, solid waste authorities, solid waste districts and other local government organizations. In addition to these grants, supplemental solid waste enforcement officer grant funds were awarded in the amount of \$136,153 to communities that have maintained successful local illegal dumping prevention and enforcement programs.

### ***Solid Waste Assistance Grants – Fiscal Year 2015***

- \$1,156,533 - Total Non-Competitive Grants
- 77 Counties Received Non-Competitive Grants
- \$1,080,496 - Total Competitive Grants
- 35 Municipalities and Counties Received Competitive Grants

Twenty-one new waste tire grants totaling \$1,160,133 were awarded to local governments to fund local waste tire collection and clean-up programs during FY2015. These new waste tire program grants along with those tire grants previously awarded assisted local governments in the proper collection and disposal of over 700,000 passenger tire equivalents in calendar year 2014.

Local governments receiving waste tire grants during FY2015 included: Adams, Alcorn, Carroll, Claiborne, DeSoto, Grenada, Hancock, Harrison, Hinds, Leflore, Panola, Rankin, Sharkey, Stone, Sunflower, Tallahatchie, Walthall, Warren, Yazoo counties; the Northeast, Pine Belt, Three Rivers and South Central Solid Waste Management Authorities.

### ***Waste Tire Assistance Grants – Fiscal Year 2015***

- \$1,160,133 – Total Local Government Waste Tire Assistance Grants
- 700,000 Waste Tires Collected through local government programs

## **C. Cooperative Recycling Grants**

MDEQ has continued to work during 2015 with the four regional cooperative projects that received grant awards made through the Regional Recycling Cooperative Grants Program. The cooperative program was developed to encourage local governments to work together on the collection and marketing of municipal recyclables. The Commission on Environmental Quality awarded grants totaling \$1,067,938 the four “hub” communities in 2014 to build and enhance regional recycling systems with other partner communities. The four communities and their partners receiving Regional Recycling Cooperative Grants included: City of Greenwood (in partnership with Leflore County, the Cities of Itta Bena and Indianola, and the Town of Sidon); City of McComb (in partnership with Pike County and the Cities of Osyka, Magnolia and Summit); City of Natchez (in partnership with the City of Brookhaven, Wilkinson County and various other institutions and organizations); and City of Oxford (in partnership with the Cities of Calhoun City and Batesville, Panola and Lafayette Counties, and the University of Mississippi). MDEQ has worked with the recipient communities to implement the various aspects of the four regional projects focused on growing recycling in the state. The agency is evaluating the opportunities for another round of the regional recycling cooperative grant awards in the near future.

## D. Corrective Action Trust Fund Assistance

MDEQ awarded funding assistance through a cooperative agreement to the city of Hattiesburg through the Nonhazardous Corrective Action Trust Fund in the amount of \$78,390 in 2015. The funds awarded were to assist the City in its continued evaluation and assessment of the historic, closed city landfill that borders Gordon's Creek and the Leaf River. The city completed this study of the initial phase looking at stabilization options for the landfill banks along the former Gordon's Creek Landfill site. The project evaluated various alternatives from both an economic and engineering perspective to select the best design option to stabilize the stream bank and to prevent further erosion and environmental and water quality degradation. The city has submitted a report to the MDEQ with the findings and recommendations of the evaluation.

## E. Waste Tire Management Program

The Waste Tire Management Program continued its efforts to develop and implement the state's strategy to achieve statewide recycling of waste tires. The program has experienced continued success in achieving significant recycling of waste tires, and this success is reflected in the most recent annual program information collected from Calendar Year 2015 indicating that the overall waste tire recycling rate was 93 percent and the recycling rate for tires generated in Mississippi was 86 percent. It is anticipated that the state's waste tire recycling and reuse rates for waste tires will continue to approach the current national average of approximately 96 percent (Rubber Manufacturers Association Figures for 2013). Overall, waste tire processors in the state managed approximately 4.9 million waste tire equivalents in 2015 with around 52 percent of the tires being imported from out-of-state.



MDEQ conducted compliance assurance activities at approximately 150 local government waste tire collection sites, 10 commercial waste tire processing and collection facilities, and numerous tire retail businesses. Additionally, MDEQ has continued to manage the permitting and reporting activities of approximately 115 registered waste tire haulers. Also, nearly 100 complaints involving the mismanagement or unauthorized dumping of waste tires were reported to and investigated by the MDEQ. MDEQ also manages a Waste Tire Abatement Program which provides assistance for the clean-up of unauthorized tire dumps. Through the abatement program, MDEQ has cleaned up approximately 2.5 million waste tires that had been indiscriminately dumped around the state over the past several years since the program was started. In 2015, MDEQ completed the clean-up of four unauthorized dump sites. These clean-ups resulted in the proper recycling or disposal of about 74,000 waste tires.

In addition, the Waste Tire Management Program reviewed or otherwise handled the processing of various applications for waste tire management permits and authorizations for waste tire processing facilities, collection sites and disposal facilities. MDEQ also conducted a special initiative with the Mississippi State University Extension Service to collect tires from farms and agricultural sources in conjunction with two agricultural pesticide collection events in Leflore and Coahoma Counties. Because of the need to assist with agricultural tires, Leflore and Coahoma Counties provided waste tire collection services at the events through their MDEQ waste tire collection program grants. Finally, MDEQ continued work on other waste tire program improvement efforts which include continued work to attract new waste tire recycling businesses to south Mississippi.

## F. Electronic Waste Management

Electronic waste or "e-waste" continues to be one of the fastest growing waste streams nationally and continues to present management and disposal problems for Mississippians. In 2015, MDEQ continued its work to assist communities, businesses, and private citizens with understanding the proper methods for recycling and disposing of electronic wastes. MDEQ maintains comprehensive web resources for interested persons seeking to recycle used electronics including a directory of electronic recycling companies as well as other options for managing and recycling electronics wastes.





MDEQ provides information and resources to support the implementation of the provisions of the Certified Electronics Recyclers Law which requires all state agencies to use a certified electronics recycler for the disposal of electronics such as personal computers, computer components, audio players, videocassette players, facsimile machines, cellular telephones, wireless paging devices, or any electronic items containing an intact or broken cathode-ray tube.

The law requires that MDEQ develop a program to promote the certification of electronics recyclers. MDEQ has continued its promotion of the use of certified recycling companies for the management of electronics wastes. In particular, MDEQ promotes certification programs managed by two organizations, Sustainable Electronics Recycling International (SERI – formerly R2 Solutions) and the Basel Action Network. These two organizations provide certification of those recycling businesses that collect and recycle used electronic products in a safe and responsible manner. MDEQ encourages the state’s communities, businesses and local and state government agencies when making decisions on electronics recycling services to consider the benefits of using an electronics recycling company certified under one of these programs. In addition, MDEQ encourages any recycling business that collects and manages electronics to consider obtaining certification of its processes for managing and recycling the electronic products. Magnolia Data Solutions of Jackson, and Logista Solutions of Columbus are both currently certified to the R2-2013 standard. There are additional electronics recycling businesses that can be found on the MDEQ website.



The Certified Electronics Recycler Law also requires MDEQ to maintain a listing of certified electronics recyclers for the reference and use of state agencies. State agencies are required under the law to use a recycler from that listing.



MDEQ assists with and sponsors various e-waste collection and recycling events and programs for residents and small businesses. MDEQ provided grants to communities to sponsor electronics collection events for the public, often as part of a larger household hazardous waste collection event. MDEQ also joined with the Jackson Metro Chamber Partnership and various other partners to host e-waste collection and recycling events for small businesses and residents in the Jackson Metropolitan area in October 2014 and April 2015 collecting more than 37,000 pounds of electronics. Electronics collected at these events included used computers, televisions, cell phones, printers, fax machines and various other e-wastes. These events were serviced by Magnolia Data Solutions of Jackson.

In addition, the agency continued its support for a computer refurbishment program at Jackson State University (through a partnership agreement with Hinds County). MDEQ provides grant support to assist the program in collection and restoration of used computers. The program collects used computers from area businesses and residents and works to renovate and repair the computers. Several thousand refurbished computers have been donated to low-income families, churches, summer programs, nonprofit organizations, day care centers and the Jackson Zoo. In addition, the program helps to provide technical training to young adults on computer repair and restoration.



## G. Medical Waste Management

MDEQ's solid waste management programs are responsible for oversight of the commercial management of medical wastes in the state. This responsibility includes the oversight of medical wastes collected and transported from health care facilities, veterinary care facilities, medical wastes generated by emergency and trauma response, medical wastes generated by business and institutional clinics and medical wastes generated in private residences through home healthcare. In addition, MDEQ oversees commercial medical waste management facilities in the state. There are two existing commercial autoclave facilities in the state that are actively operating for the treatment of infectious medical wastes. In addition, there is a third autoclave facility that has been permitted but is not currently operating.



While MDEQ has not developed specific medical waste regulations, the agency has continued to maintain web-based resources to better communicate proper management conditions for various types of medical wastes, particularly those originating from health care facilities. MDEQ has seen an increase in the number of medical waste service providers collecting wastes from health care facilities and other generators over the past several years. A listing of these active service providers is maintained on the agency's website for reference by the health care industry.

MDEQ also works with the state's citizens to assist them in managing medical wastes that are generated in the home. MDEQ has developed and implemented a statewide educational program to inform the public of the safe disposal of home-generated medical sharps to promote proper management and disposal of such household medical devices as syringes, needles, lancets, and other similar items. MDEQ's public outreach efforts included placing additional educational material in medical offices throughout the state and speaking with professional nurses about the program. MDEQ also conducted a number of educational and outreach activities to promote the program including speaking and exhibiting at numerous stakeholder meetings and local health fairs.

MDEQ has worked to create and expand its household sharps collection network in the state, including community drop-off locations at pharmacies, fire stations, and other business locations. During 2015, MDEQ assisted 33 new businesses in joining the network as collection stations bringing the total number of public drop-off locations to 240. Three of the state's medical waste service provided collection of the sharps.

The number of people participating in the sharps program and the number of sharps collected has increased every year since the program's inception in 2009. In FY 2015, the program experienced its largest 12-month increase ever. A total of 7,137 pounds of medical sharps was collected, an increase of 54 percent over the previous year. It is estimated that the program is now working to reduce the number of home-generated syringes placed in home trash bags by more than one million needles per year.

Another growing area of environmental concern that MDEQ is working to address is the management of pharmaceutical wastes and household personal care products. MDEQ encourages the proper management of pharmaceutical wastes and to discourages flushing or washing of household medications and other similar products down the toilet or sink. MDEQ also helped promote a collection event sponsored by the U.S. Drug Enforcement Administration to collect obsolete pharmaceutical wastes on September 26, 2015. In sponsoring this program, the DEA worked with numerous local law enforcement agencies throughout Mississippi and the country to set up a local one-day collection event for prescription drugs and other pharmaceuticals.



These collection efforts help to avoid discharge of these materials into the environment through wastewater systems. The September event collected over 350 tons of pharmaceuticals from 5,000 collection sites across the country. Another state initiative that MDEQ has helped promote are the current efforts of the Mississippi Department of Public Safety to provide drop-off collection sites for prescription drugs and expired pharmaceutical wastes at the agency's Driver's License offices around the state. MDEQ has developed a brochure promoting the program and the various drop-off locations are available on the MDEQ website and distributed at various health fairs and public events.

## **H. Organic Wastes**

In 2015, the MDEQ continued efforts to promote organics waste reduction and recycling. Organics wastes originate from plants or animals and are biodegradable. These wastes include grass clippings, leaves, limbs and woody debris, food wastes, biosolids and other organic sludges, animal manures, and certain commercial and industrial woody or plant based wastes. The re-use or recycling of organics wastes usually involves a process such as composting or processing the materials into a form that can be useful. MDEQ's efforts to recycle organics have focused on encouraging and promoting activities and facilities that can compost or process the material into re-usable products.

MDEQ's Pilot Composting Program, started in 2011, eases the authorization process for start-up composting operations. The streamlined approval process helps businesses and community composting operations to begin under a less formal and less rigid form of authorization. This program has allowed new composting facilities to develop and build sustainable operations. The feedback continues to be overwhelmingly positive, and MDEQ receives frequent inquiries on the program and how to start up new composting operations. MDEQ's 2014 Status Report on Solid Waste Management Facilities and Activities indicated that an estimated 24,226 tons of material was diverted to Mississippi composting facilities in 2014, an increase over the 22,258 tons of material reported in 2013.

In conjunction with the pilot program, the MDEQ has continued to work towards streamlining and simplifying the state's composting facility regulations. Current regulations require new composting facilities to submit to a rigorous permitting process similar to that of a municipal landfill. MDEQ has been working through 2015 to improve and streamline this permitting process for composting operations and businesses in an effort to increase and expand composting activities and businesses.

In 2015, the agency also continued its efforts to promote mulching operations. Many communities in the state do not conduct traditional composting operations but do manage chipping and mulching operations for various types of woody debris. MDEQ has developed a guidance document for start-up mulching operations (both public and private) that seek to create useful products from wood wastes and debris. In addition, MDEQ is modifying regulations governing mulching facilities. Mulching facilities have historically operated under an exclusion to the definition of a solid waste processing facility with little to no operating and siting requirements. The lack of minimal operating criteria has resulted in problems at some facilities including noise, fires, and storm water management issues. Consequently, MDEQ has developed minimum operating criteria for mulch facilities but with a similar streamlined permitting process to that of composting sites.

Also in 2015, MDEQ staff developed the Biosolids Land Application General Permit issued by the Mississippi Environmental Permit Board. Coverage under this general permit will now be issued to most biosolids land application sites unless MDEQ determines that an individual solid waste management permit is needed due to public interest or site specific requirements. Considering the number of sites needed to manage the increasing amount of biosolids being produced. MDEQ believes that the process of covering multiple sites under a general permit as opposed to individual permits for different locations will be easier and less time consuming for both MDEQ and permit applicants. MDEQ staff continues to receive new biosolids land application site permit applications, and will begin issuing overages under the newly issued general permit in the near future.

MDEQ made significant progress in 2015 in the process to revise the state solid waste regulations. These revised regulations include proposed changes to facilities that manage organics wastes including changes to rules governing composting, mulching and land application facilities. It is anticipated that these regulatory efforts by MDEQ will continue into 2016 with additional review and comment by stakeholders and the public.



MDEQ also conducted numerous outreach activities as part of the agency's efforts to promote organics waste reduction and recycling in 2015. MDEQ has updated online resources to include a list of existing composting facilities, the latest in composting news, and current composting related events and activities. These resources also provide important information to the public on home composting, to businesses and government on the MDEQ's Pilot Composting Program, and to schools and families on composting educational resources for kids. The MDEQ's composting web resources also provide information on the benefits and importance of composting and recycling organic materials. Outreach efforts on composting are described in greater detail in the Outreach section.

### **I. Landfill Methane Outreach Program (LMOP)**

MDEQ continued its partnership with EPA to promote the use of landfill gas as an alternative energy source through the Landfill Methane Outreach Program (LMOP). Landfill gas is a by-product of the decay of municipal solid wastes in landfills and contains methane, a potent greenhouse gas that can be captured and used to fuel power plants, manufacturing facilities, vehicles, homes, and more. Since joining LMOP, MDEQ has worked towards the development of landfill gas projects, and currently Mississippi has six landfill gas to energy projects including the direct use and leachate evaporator projects at Waste Management's Pecan Grove Landfill (Pass Christian); the landfill gas to electricity projects at Golden Triangle Regional Landfill (West Point), Three Rivers Regional Landfill (Pontotoc), and Waste Management's Prairie Bluff Landfill (Houston); and the landfill gas powered leachate evaporator also at Prairie Bluff.

Through the LMOP program, MDEQ has also identified numerous other landfills that appear to be candidates for future energy project development. In 2015, a potential landfill gas end user presented a proposal for a landfill gas to energy project which involves converting landfill methane, produced at one of the candidate landfills, to compressed natural gas. It is with these types of projects in mind that the agency updates and maintains an inventory listing of Landfill Methane Outreach Program (LMOP) Candidate Landfills on the MDEQ's LMOP web page and conducts similar activities to connect landfill operators with project developers and end users.

### **J. By-product Beneficial Use Program**

The Solid Waste Programs at MDEQ promote the beneficial use of non-hazardous byproduct materials that would otherwise be disposed in landfills or managed under a solid waste management permit. The state's beneficial use regulations allow for industries to request that their nonhazardous industrial byproduct materials be evaluated for use in the place of products or raw materials. If MDEQ's evaluation of a beneficial use request confirms that the material has suitable physical and chemical properties for the proposed use, then MDEQ issues a Beneficial Use Determination (BUD) for the material which means that the use of the material can be conducted in the state and will not be regulated as a solid waste. In early 2015, MDEQ collected information on the volume of materials distributed for use in the State of Mississippi in 2015. These reports indicated that BUD holders distributed 731,956 tons of by-product materials and, just over 90 percent of the by-products distributed were used for construction purposes while the remaining 10 percent of materials were used in soil amendment applications.

In addition, during 2015, MDEQ approved three new BUDs for new materials and uses and rescinded one BUD for a material that is no longer being generated by the industry. All of the new beneficial use determinations were issued for the use of Class A/Exceptional Quality Biosolids.

MDEQ continues to work with the suppliers throughout the region who provide by-products and other material for construction uses and soil amendment uses. One way that MDEQ does this is through "demonstration projects," which is a key part of the beneficial use program that allows an industry or company to conduct a short term pilot project with the material to demonstrate the suitability of the material for a proposed use. MDEQ is in the process of working with several suppliers on demonstration projects involving the use of certain digested poultry processing sludge, foundry sands, processed silica, and also land spreading uses of horizontal directional drilling mud materials. MDEQ approved and continues to oversee five active beneficial use demonstration projects to help evaluate the beneficial use of the material and the appropriateness of the BUD process. Through these demonstration projects, these materials and associated uses are being evaluated for both environmental and physical performance. The results of each demonstration project will be submitted to MDEQ in the near future for further review and consideration to assist MDEQ in making determinations about the impacts of the long term use of the by-product material.



## K. Solid Waste Planning

The MDEQ Solid Waste and Recycling Program works with local governments to develop and implement long range solid waste planning efforts. Each local government is required by state law to develop and implement a comprehensive local, solid waste management plan for a 20 year period. Most of the original local government solid waste plans were adopted in the early 1990s, so many of these 20 year solid waste plans are reaching the end of life.

Comprehensive Local Solid Waste Plans have been granted final approval for Adams County and the City of Natchez and for Jefferson County and the City of Fayette. In addition, a draft revision to the Pine Belt Regional Solid Waste Plan has been given final approval to incorporate Greene County into that regional solid waste plan. Local solid waste plans are also being finalized for Lauderdale County and the City of Meridian and Kemper County and the City of DeKalb. Draft plans have also been completed for the City of Canton, Hancock County, Simpson County, Scott County, and Warren County. The development of comprehensive, updated solid waste management plans are also in process for Holmes County, Golden Triangle Solid Waste Authority, and Washington County.

MDEQ also works on the review and finalization of certain amendments to existing plans to assure adequate disposal services and capacity for various jurisdictions. These amendments were often conducted to add new disposal or recycling facilities locally or to make other changes to local solid waste plans in the manner that solid wastes were being managed. Communities that completed modifications to their local solid waste plans in 2015 include: Three Rivers Solid Waste Management Authority (Addition of a new class I rubbish site for the City of Oxford and the addition of new onsite landfill for Tronox in Monroe County); Harrison County (operational change for Don Williams class I rubbish site); Hinds County (Addition of land application sites for municipal biosolids); Rankin County (Addition of land application sites for municipal biosolids); and Simpson County (Addition of a new class I rubbish site for the South Central Mississippi Solid Waste Management Authority). Other plan amendments in process include planning actions in Humphreys and Alcorn Counties to address solid waste management needs in those counties. These planning amendments are important to assist local governments with providing needed disposal capacity and services for management of solid wastes as these needs continue to evolve in the affected jurisdictions.

## V. Remediation

### A. Underground Storage Tanks

MDEQ manages the state's Underground Storage Tank (UST) Program, which is aimed at preventing and detecting leaks of petroleum products and hazardous substances. The UST program is responsible for conducting operator training, inspections, and compliance assistance at Mississippi's 3,141 petroleum storage facilities.

Petroleum products are not considered to be wastes. However, leaks from underground storage tanks (UST) or their associated piping systems can contaminate the environment. To prevent leaks and to minimize the extent of a leak, it is important to ensure the underground tanks are properly installed, operated, and inspected. MDEQ learns about contaminated land or water from facility inspections, site investigations, complaints, or emergency response activities. Contamination can result from a variety of activities such as improper practices at existing facilities, accidental spills, or leaks from UST systems.



Underground storage tank installation

**Remediation Strategic Goal:** Protect human health and the environment through proper mitigation, remediation, reclamation, and restoration of natural resources.

The primary goal of the Underground Storage Tanks (UST) Program is to protect groundwater from leaking underground storage tanks. Revenue to operate the UST Program is derived from federal grants and fees imposed on tank owners. The UST Tank Fee has ranged from \$40 per tank in 1988 to \$80 per tank in 1994 and has remained unchanged at \$100 per tank for the past 17 years.

A compliance program inspects UST facilities in order to ensure the systems do not leak. In Mississippi, the UST compliance personnel are responsible for ensuring approximately 8,200 tanks at nearly 3,100 facilities have the appropriately maintained equipment.

Quarterly compliance workshops are offered for additional compliance assistance. A UST certified contractor program is in place to ensure proper installation and maintenance of UST systems. In 2015, 68 licenses were issued, and there are currently 256 certified individuals that perform tank installations and closures. In the event of a release, the Mississippi Groundwater Protection fund is used by MDEQ to assess and cleanup contamination resulting from leaking USTs.

The Mississippi Groundwater Protection fund began in 1987 and has committed \$176 million dollars to reimburse eligible tank owners for the assessment and cleanup of sites contaminated from leaking underground storage tanks. The average fund commitment per site is nearly \$158,000. At the end of FY 2015, the Mississippi Groundwater Protection Trust Fund had assessed 1,148 sites, completed assessment and/or remediation of 941 sites. During the reporting period, MDEQ UST staff actively oversaw 449 sites. During FY 2015, \$7.5 million were used to assess and remediate leaking underground storage tanks in Mississippi. Also, in addition 36 sites were assessed and 59 sites were closed.

In 2015, the first Ozone Sparge remediation system in the state was installed on the Mississippi State Fairgrounds to address petroleum contamination from a former leaking underground storage tank. The ozone system provides high concentrations of ozone gas directly to the contaminated subsurface to break down the hydrocarbon contaminants to oxygen. This safe, effective remediation technology is one of the cleanup methods used in the UST Program to protect human health and the environment while returning property back into a viable resource for future development.

## B. Brownfields

### The Mill at MSU Completes Brownfield Cleanup

In February 2014, the Commission approved a Brownfield Agreement for the redevelopment of the Cooley Center, an old textile mill that sits on the National Register of Historic Places and will serve as the development's centerpiece. The mixed-use development, which sits on the edge of Mississippi State University's campus, has been constructed in phases and involves a hotel, parking garage, infrastructure and the development of outparcels. The Brownfield Agreement included provisions for addressing asbestos abatement and the removal of several underground storage tanks and solid waste. The new Courtyard by Marriott Starkville MSU is now open and is on site with the area's newest development, The Mill Conference Center, features over 10,000 square feet of flexible event space.

**REMEDIATION OBJECTIVE** – Ensure contaminated sites are properly assessed, remediated, and redeveloped in a manner protective of human health and the environment.

**Outcome:** Number of Acres "Ready for Reuse"

### The District at Eastover Brownfield Project

On October 24, 2013, the Commission on Environmental Quality and The District Land Development Company ("The District") reached a Brownfield Agreement regarding the remediation of brownfield property located at the former Mississippi School for the Blind in Jackson. Prior to demolition of the existing buildings onsite, The District agreed to remove asbestos and properly recycle or dispose of abandoned transformers at the site. The end of 2015 will see completion of the office building component of Jackson's District at Eastover followed a few months later by completion of a neighboring Residence Inn by Marriot.



Apartments in The District at Eastover

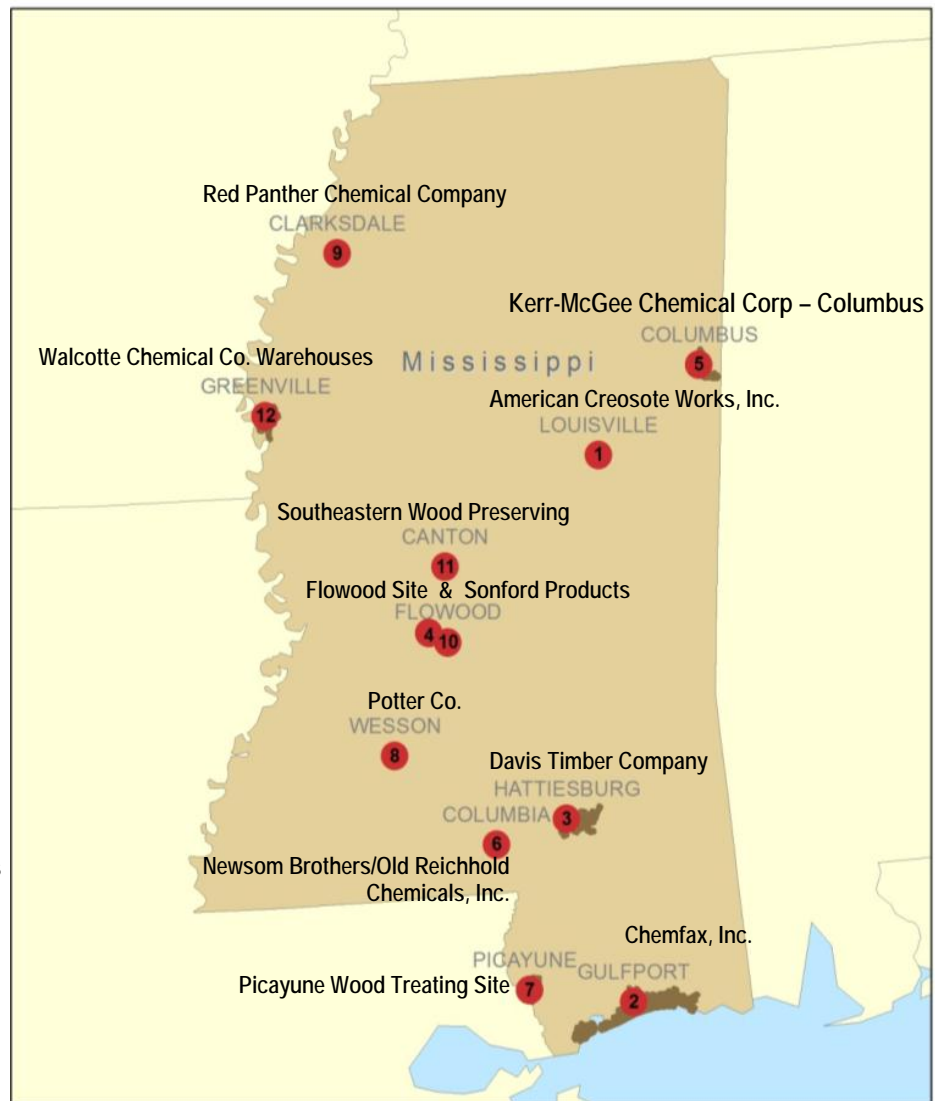
## C. Uncontrolled Sites & Voluntary Evaluation Program

Over the past 12 months, Groundwater Assessment Remediation Division staff actively oversaw 158 assessments and/or cleanups. During that same timeframe, the number of sites brought to GARD's attention was 58, bringing the total number of sites in MDEQ's public record to 1,932 sites. Also, MDEQ issued "State No Further Action" letters for 10 of these sites that were evaluated and remediated to levels protective of human health and the environment. MDEQ issued one Restrictive Use Agreed Order/Environmental Covenants during their reporting period, thereby allowing these sites to be reused with certain activity and use limitations. Through MDEQ's efforts, 60.35 acres were put back into productive use in FY 2015. The staff continues to respond expeditiously to requests from MDOT and other governmental agencies for the review of environmental assessments and remediation of contaminated sites and those sites with economic development potential. The Voluntary Evaluation Program (VEP) offers an opportunity to receive an expedited review of site characterization and remediation plans and reports for parties that are voluntarily cleaning up uncontrolled sites that they have an interest in. The VEP is funded entirely by these participants who pay for MDEQ's oversight costs.

## D. Superfund Cleanup and Redevelopment

Oversight of the site assessment and restoration of hazardous waste sites at federal facilities continues to be a large portion of the work involving the CERCLA Branch of MDEQ. Oversight is conducted at seven Department of Defense (DoD) Sites, a Department of Energy Site (Salmon Test Site), a NASA facility (Stennis Space Center), and several Formerly Used Defense Sites (FUDS). MDEQ is funded for this oversight work through agreements with the Department of Defense, Department of Energy, and NASA.

CERCLA staff performed preliminary assessments, site investigations, and site inspections at hazardous waste sites for National Priority List (NPL) consideration, and coordinated with EPA on emergency and removal projects at Copiah County Manufacturing Co. (Hazlehurst) and the Southeastern Wood Preserving site (Canton). MDEQ also assisted EPA with the assessment and future remediation of four Superfund Sites: Sonford Products (Flowood), Davis Timber (Hattiesburg), American Creosote (Louisville), and Wood Treating (Picayune). It is estimated that the remediation costs for these four sites is approximately \$80 million, and the state will pay 10 percent of these remediation costs or \$7.3 million. In addition, remedial investigations have begun at Red Panther Chemical (Clarksdale), Kerr-McGee (Tronox) (Columbus), and Southeastern Wood (Canton). Estimation of costs for these sites will be developed after the remedial investigations have been completed by EPA.



Superfund Sites in Mississippi

The Red Panther Chemical (Clarksdale) site is a potential responsible party (PRP) site and the responsible party(s) will be paying for the further assessment and remediation of this site. The Kerr-McGee (Tronox) (Columbus) site went into bankruptcy after further legal proceedings. The bankruptcy proceeding resulted in a trust being set up that will provide as much as \$68 million toward the further assessment and remediation of the site. The Southeastern Wood (Canton) site does not have a potentially responsible party and will require a 10 percent state match for the remediation costs.

On April 24, 2015, MDEQ accepted EPA's Excellence in State Engagement Supporting Reuse Award presented by Robin Richardson, EPA's Deputy Director of the Office of Superfund Remediation and Technology Innovation at the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) conference in Little Rock, Arkansas. MDEQ was one of only three states recognized by EPA at the event this year. EPA relies on its state partners to effectively clean up Superfund sites, support the return of these sites to beneficial use and ensure the long-term protection of cleanup actions to human health and the environment.



EPA recognized MDEQ's collaboration to support and encourage the appropriate reuse of Superfund sites across the State of Mississippi through a variety of approaches, including offering assistance in reuse planning processes and implementing environmental covenants through the Uniform Environmental Covenants Act. Mississippi's efforts to develop a process and template to streamline placing restrictive covenants on Superfund site properties within Mississippi ensures that remedial actions remain protective as sites are put back into productive use, playing a key role in revitalizing communities. Collaboration between MDEQ, EPA, site owners and the local community is generating success stories and paving the way for future reuse.

On March 10, 2015, U.S. Environmental Protection Agency (EPA) presented the Region 4 Excellence in Site Reuse Award to Chuck and Gayle Davis, property owners, and the Hub City Humane Society for redeveloping the Davis Timber Superfund site in Hattiesburg. The award recognized their commitment to safely and sustainably reusing the former wood treating property after EPA and the State of Mississippi completed cleanup activities in 2012. Chuck and Gayle Davis and The Hub City Humane Society worked cooperatively with EPA, the State of Mississippi, and local partners to return the 30 - acre Davis Timber Superfund site to productive use as community-based animal shelter. In addition to serving as an adoption center for dogs and cats, future plans include a horse shelter, education center, dog park, community garden and nature trails. By reclaiming, restoring and reinventing the site, this project illustrates how the reuse of Superfund sites can protect human health, advance environmental protection, and return formerly unusable properties into valuable community assets.



Excellence in Site Reuse Award for Davis Timber Project

## VI. Reclamation

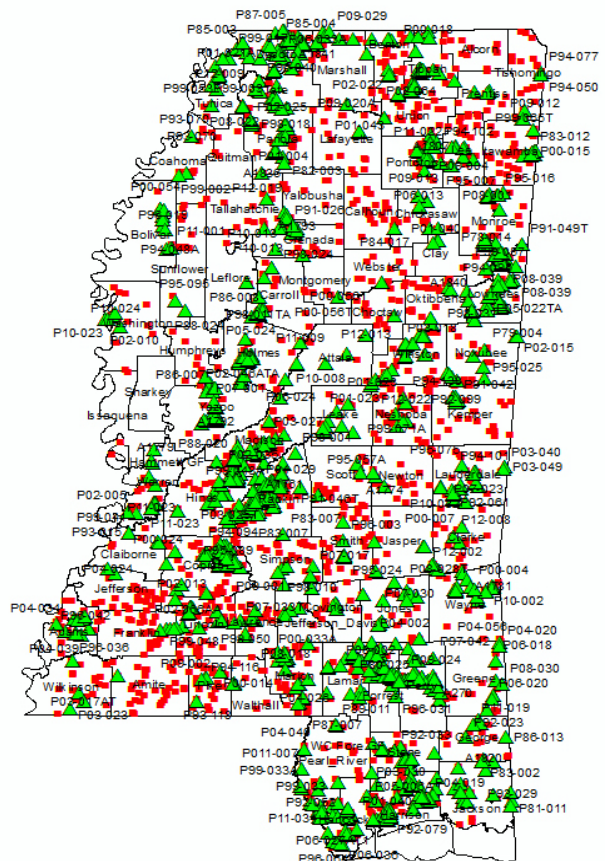
### Surface Mining and Reclamation of Surface-Mined

**RECLAMATION OBJECTIVE – Ensure lands impacted by mining activities are restored to reclamation standards that are protective of human health and the environment.**

**Outcome:** Percentage of Inspected Mining Facilities in Compliance with Regulatory Requirements.

### Lands

MDEQ continued to regulate all non-coal surface mines in the state as provided for in the Mississippi Surface Mining and Reclamation Act of 1977. This includes issuing surface mining permits and notices of exempt operations, inspecting permitted areas and inspecting complaints, overseeing the reclamation done by operators, and enforcing the law as per the promulgated Rules and Regulations and Commission orders. Coal and lignite mines are regulated under the Mississippi Surface Coal Mining and Reclamation Law of 1979, with oversight of the program by the federal Office of Surface Mining. The coal and non-coal regulations were renumbered recently to meet the style mandated by the Administrative Procedures Act.



Map of Surface Mining and Reclamation of Surface-Mined Lands

In FY2015, the Mining and Reclamation Division performed 852 inspections (of which 72 were bond release inspections), recommended to the Permit Board the issuance of 24 initial and 13 amended permits, and received 65 Notices of Exempt Operations (operations less than four acres in size). Approximately 85% of the inspected sites are in compliance with the regulatory requirements. A total of 1,867 exempts are on file, covering approximately 7,468 acres, and 1,266 acres were completely reclaimed as a result of the division's efforts to oversee reclamation. The state currently has 693 permits covering 33,762 acres. The Office of Geology's Mining and Reclamation Division continued to update the mining database that provides valuable mining information in a GIS format so that mining sites can be located and viewed by anyone using the online Mining Viewer.

The Mining and Reclamation Division continued to provide the required Mine Safety and Health Administration (MSHA) training for mining operations in the state. MSHA regulations require an eight hour refresher training course be taught to all mine workers. In FY2015, division staff provided training to 89 miners and 75 contractors working in the mining industry.

A mine in operation...



and after reclamation.



The Coal Mining Division was established during FY2007 to focus on the complexities of coal mine regulation. Mississippi has an industry-estimated five billion tons of surface mineable lignite, a low-grade coal ranked just below sub-bituminous coal. The Mississippi Lignite Mining Company is mining lignite at the Red Hills Mine in Choctaw County to supply fuel for an adjacent 440 megawatt (MW) mine-mouth power plant. The mine produces over 3.5 million tons of lignite per year and has permitted 6,090 acres. This permit was initially issued in 1998, and was renewed in February 2013 for its fourth five-year term. The planned life of the permit is 30 years.



Red Hills Mine in Choctaw County

The Liberty Fuels, LLC mine permit in southwestern Kemper County was issued in December 2011, for 2,299 acres. The Liberty Mine will produce an average of 2.2 million tons of lignite per year for the initial five-year term, and 4.5 million tons per year for the planned 40 year life of mine. The life of mine area is planned to be approximately 18,200 acres, in Kemper and Lauderdale counties. The adjacent Integrated Gasification Combined Cycle power plant under construction is designed to produce 550 MW of electricity and be fueled by gas produced on-site from the lignite; construction is nearing completion.

Staff inspections of both mines are conducted at least monthly. One or more joint inspections of each mine are conducted annually with the federal Office of Surface Mining. Two permit revisions were finalized during FY2015. It is anticipated at least three permit revisions will be submitted during FY2016. One bond release was processed and approved during FY2015. One permit renewal is anticipated in FY2016, which should take approximately one year to review.

Work under Mississippi's Abandoned Mine Land Program to identify and locate abandoned historic coal mines has identified four sites, two in Choctaw County and one each in Winston and Lauderdale counties. All of these sites are believed to have been active sometime in the period from the mid-late 1800s to the late 1920s. The landowners of the two sites in Choctaw County do not wish to have reclamation work done on the sites. The landowners of the Lauderdale and Winston counties sites do want reclamation work done. These two sites have been determined to be a physical threat to public safety and well-being, but not to have any acid mine drainage or to be an environmental hazard. Design of the appropriate reclamation work at each site was completed in FY2015.



## VII. Water Quantity

The Office of Land and Water Resources (OLWR) is responsible for the management of the water resources in Mississippi. Mississippi code requires that "...the water resources of the state be put to beneficial use to the fullest extent of which they are capable, that the waste or unreasonable use, or unreasonable method of use, of water be prevented, that the conservation of such water be exercised ..."

To achieve this requirement, OLWR is pursuing a conjunctive water management approach that coordinates the use of the ground and surface water resources of the state is to satisfy desired water needs. OLWR strives to ensure that the use, storage, allocation, and management of water resources be accomplished to the fullest extent possible; and that water pumped and impounded in Mississippi complies with applicable permit regulations. OLWR has numerous programs that support these requirements. These include the development and implementation of monitoring plans to facilitate the systematic collection, compilation, and management of data related to water wells, streams and lakes in the state; water use surveys and meter reporting tools; application of computer models to assist in making water management decisions; the review and processing of applications for issuance, modification, and enforcement of ground and surface water use permits; and for Fiscal Year 2015, a new Permitting Compliance Branch to enforce applicable terms and regulations. OLWR is also responsible for licensing and regulating water well contractors operating in Mississippi; regulating the design, construction, and modification of certain dams in accordance with regulatory criteria to ensure that lives and property downstream from dams and reservoirs are protected; and assessing potential contamination threats to public, domestic and industrial water supplies.

In FY2015, OLWR engaged in assisting two large water use industries in the state; agriculture and an emerging energy sector. In the Mississippi Delta, OLWR is developing innovative approaches to studying and addressing water sustainability alternatives in the heavily utilized alluvial aquifer. OLWR is also monitoring a trend outside of the Delta where new agricultural wells may come into competition with domestic and public supply drinking water resources. Likewise, the OLWR is actively working with the energy sector as it relates to hydraulic fracturing activities in the southwest portion of the state.

### A. Water Resource Permitting and Management

A primary objective of OLWR is to research and manage the water resources of the state to assure adequate supplies for the future. This is achieved by the coordinated interaction of the water withdrawal permitting process which is informed by the inventorying and assessment of the availability of water associated with fresh water aquifers and major fresh water streams in Mississippi. As the entity responsible for managing the water withdrawal permits of the state, OLWR has issued over 28,000 groundwater permits and over 4,400 surface water diversion permits through June 30, 2015. Included in each permit is an established maximum withdrawal amount and any necessary special terms and conditions associated with a respective permit. For surface water permits, stream flows and lake levels are routinely monitored and in the event that these fall below established standards, permittees are required to cease withdrawing water until flows rise above established minimums.

A Permitting Compliance Branch was created in FY2015 within OLWR for the purpose of bringing into compliance those permittees that have failed to meet defined permit conditions. The branch has begun working with industry, public suppliers, water well contractors and other members of the regulated community to ensure that OLWR maintains the best information possible to understand and manage water balances throughout the state.

### B. Assessment and Study of Water Resources

The abundant water supplies in Mississippi constitute one of the most important and valuable natural resources contributing directly to the quality of life and economic prosperity of the state. However, the water resources available in a given area of the state can vary significantly depending on various hydrogeologic conditions that may affect base flow in streams, water quality and quantity, as well as the prolificacy of local aquifers.

**Water Quantity Strategic Goal:** Maintain sustainable quantities of surface and groundwater in Mississippi.

**WATER QUANTITY OBJECTIVE – Increase the efficiency of water use to improve sustainability of groundwater and surface water in Mississippi.**

**Outcome:** Number of Water Conservation Practices Implemented.



The highly variable nature of these resources means that a concerted effort must be maintained to collect related groundwater and surface water data that will allow proper decisions to be made regarding the management and development of the state's water resources. The office monitors groundwater levels of the state's major freshwater aquifer systems. Reports and potentiometric maps are created to document changes in water levels associated with these aquifer systems. Additionally, OLWR conducts in-depth regional hydrologic investigations to characterize Mississippi's groundwater resources to gain a better understanding of water supply. The office provides a wide range of information useful for planning economic development projects, groundwater modeling and development of groundwater resources for public drinking water supplies.

In 2015, work began on a project to evaluate the groundwater resources in DeSoto County. Subsurface work in the county began and will continue through construction of cross sections, which will illustrate the aquifers available in the project area. Water levels have been measured, and water quality samples have been taken from water wells throughout De-Soto County to identify water quality characteristics at each location.

In the southern third of Mississippi, sand beds of the Catahoula, Hattiesburg, Pascagoula, and Graham Ferry aquifers are the primary sources of water supplies. These formations contain numerous interbedded layers of sand and clay. The complexity of these sediments provides challenges to mapping both the surface geology and delineation of aquifers in the subsurface. The objectives of this groundwater characterization effort are to identify and protect the recharge areas of the aquifers that are sources of water in this region and to correlate and determine the extent of the sand intervals that form these aquifers in the subsurface.

Also in FY2015, work continued on a cooperative agreement with the United States Geological Survey (USGS) to update, refine, and utilize the Mississippi Delta portion of an existing regional groundwater flow model developed by the USGS. This large-scale regional model covers the entire Mississippi embayment and extends through the primary drinking-water aquifers as part of the Mississippi Embayment Regional Aquifer Study (MERAS).

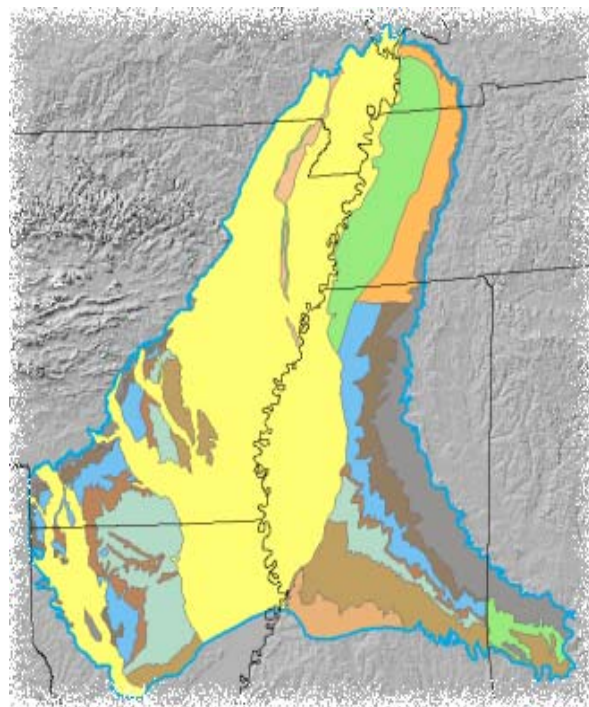
This model will be used to better understand the groundwater flow system, the potential effects of variations in pumping patterns, and to evaluate various water resources management scenarios. New data continue to be collected for integration into the existing groundwater flow model.

Developing new data sets for accurately assessing the water level fluctuations in the Mississippi River Valley Alluvial Aquifer and the Tertiary aquifers in the Delta is a current priority for OLWR.

### **C. Water Resources in the Mississippi Delta**

The future of the Mississippi Delta's economic and environmental viability depends on abundant, accessible water of sufficient quality. Over 17,000 permitted irrigation wells screened in the shallow Mississippi River Valley Alluvial Aquifer (MRVA) are used for irrigation and aquaculture. These wells pump approximately 1.5 billion gallons of groundwater each day. This pumpage demand has continued to exceed recharge to the MRVA, leading to continued overbalances of groundwater withdrawals versus aquifer recharge, disconnected surface and ground water interaction, and notable water-level declines in the aquifer over time. Because of increased yields and profitability that irrigation provides over dry land farming, the number of water withdrawal permit applications continues to increase which further complicates this issue.

To address serious threats to the viability of the Mississippi Delta's MRVA aquifer and Delta-wide stream flows, MDEQ created an executive-level task force to address these water resource challenges in November of 2011. On August 26, 2014 Governor Phil Bryant signed Executive Order No. 1314 creating the Governor's Delta Sustainable Water Resources Task Force. Under the Order, MDEQ is the lead to "...promote conservation measures, irrigation management practices, and plans for the implementation of new Delta surface water and groundwater supplies."



Mississippi Embayment Regional Aquifer Study



The Delta Sustainable Water Resources Task Force and its work groups consist of various state and federal agencies, stakeholder organizations, and academia all focused on the development and implementation of approaches and strategies to ensure sustainable ground and surface water resources for current and future generations in the Mississippi Delta. OLWR worked to revise conservation measures as the permitting tool to encourage the adoption of water conservation practices. During 2014, an initial five percent meter installation and reporting goal was met for all Delta counties. For 2015, the deadline for 10 percent meter installation is December 31, 2015. To promote meter reading and reporting in FY2015, OLWR developed an online web portal specifically designed to receive meter reading data from participants. These initial data have been analyzed and critiqued in preparation for the first full year of reporting concluding February 1, 2016.



New research initiatives include the Delta Drilling Program which has drilled five sets of paired wells in one of the major areas of concern. These paired well sets will be instrumented for real-time data relay. The scope of this project is to provide year round water level data, and to determine what, if any, exchange between aquifers is occurring. Ideally new paired well sets will be installed and instrumented each year as funding becomes available. This initiative will provide daily water level data that can support future modeling exercises and scenarios.

#### **D. Source Water Protection**

The Source Water Assessment Branch in the Office of Land and Water Resources has the primary responsibility of coordinating groundwater quality protection efforts in Mississippi. The 1996 amendments to the Safe Drinking Water Act mandated states to develop and implement a Source Water Assessment Program. The purpose of this program is to notify public water supplies and customers of the relative susceptibility of their drinking water supplies to contamination. Protecting sources of drinking water is essential for maintaining and improving the quality of human health and the environment.



The program also helps site the proper locations for new drinking water wells. The office worked closely with Mississippi's 1,213 Public Water Systems consisting of approximately 3,892 groundwater wells, and four surface water intakes, to strengthen protection efforts of underground sources of public drinking water supply.

Potential sources of contamination are identified for each individual city or town in each water supply protection area to use as support for planning decisions. Information gathering in the assessment process is incorporated into recommendations for actions that can be taken at the local level to protect drinking water sources.

The assessments help to focus protection efforts to minimize risks of individuals drinking contaminated water. These efforts may include developing source water protection plans, encouraging the use of Best Management Practices, establishing local protection teams, and using other source protection measures.

MDEQ is also working to identify abandoned wells so they can be properly plugged by a licensed well driller. Improperly abandoned water wells can serve as potential conduits for the introduction of contaminants into drinking water aquifers. As of June 2015, 103 wells had been properly plugged and abandoned.



## VIII. Water Quality

### Ambient Recreational Monitoring Network

MDEQ maintains a monitoring network for flowing waters in the state that are used for primary contact recreation. These sites are located on the recreational water bodies to monitor fecal coliform for the safety of Mississippi citizens that use these waters for recreational purposes. Monitoring is done at these locations to collect five samples within a 30-day period. This sample frequency allows for the calculation of a geometric mean for the fecal coliform data. In 2015, 44 stations were monitored for recreational purposes in the state. Each location is monitored in both the contact (May-October) and non-contact (November-April) seasons.

**Water Quality Strategic Goal:** Protect and restore surface and groundwater quality in Mississippi.

#### **WATER QUALITY OBJECTIVE – Maintain Compliance with Federal Water Quality Standards and Requirements.**

**Outcome:** Percentage of Waters that have acceptable quality for their designated water use.

### A. Ambient Lake Monitoring

In 2009, MDEQ began collecting chemical, physical and biological samples from public lakes throughout the state. Candidate lakes are greater than 100 acres in size and without nutrient enrichment. Since the program's inception MDEQ has selected 20 lakes per year to sample so that over a five year cycle, approximately 100 lakes will be sampled for the ambient lake monitoring program.

### B. State of Mississippi Water Quality Assessment 2015 Section 305(b) Report

MDEQ is responsible for generating the Water Quality Assessment Report §305(b) of The Clean Water Act. The purpose of Mississippi's 2015 Water Quality Assessment §305(b) Report is to comprehensively describe for EPA, Congress, and the public the status of the quality of the state's surface waters. This 2015 §305(b) report fulfills all reporting requirements under §305(b) of the Clean Water Act. Along with the water quality assessment information, the report also describes the state's assessment methodology and gives the causes, where known, for those waters identified as impaired. Additionally, Mississippi's surface water quality monitoring program is described in this report.

### C. Mississippi Benthic Index of Stream Quality (M-BISQ)

The Mississippi Benthic Index of Stream Quality (M-BISQ) is an index of biological integrity (IBI) that is used to assess all wadeable non-tidal streams in Mississippi with the exception of wadeable streams located in the Mississippi Alluvial Plain. Monitoring efforts completed as part of this effort have greatly increased the number of biological assessments conducted on state waters. The M-BISQ sampling program and the established sampling and analytical methodology contained therein now serves as the foundation for routine biological monitoring in MDEQ's statewide Ambient Monitoring Network. This index was originally developed using biological and environmental data collected from 463 stream locations.

### D. Mississippi Alluvial Plain Monitoring

In 2002, MDEQ began collecting biological community, physical, chemical and habitat data on wadeable streams in the Mississippi Alluvial Plain, commonly referred to as the Mississippi Delta. These data, along with historical monitoring in the Mississippi Alluvial Plain, were used to develop an index of biological integrity for the Mississippi Delta. In addition, the data collected is also being used to evaluate the dissolved oxygen levels in the Delta as well as support nutrient criteria development. With each new set of data collected annually during September to October, the index will be refined and when finalized, biological monitoring in the Mississippi Delta will be incorporated into MDEQ's Ambient Monitoring Program. Since monitoring was initiated in 2002, approximately 120 have been monitored. In 2011, MDEQ has acquired Light Detection and Ranging (LIDAR) data for the Mississippi Alluvial Plain and has used that data to establish drainage areas for each of the monitoring locations. Land use analyses have been completed, and were used to refine the preliminary index. A draft report has been generated and is currently in the review process. The final report should be available in 2016. The effort to develop an index of biological integrity for the Mississippi Alluvial Plain is an ongoing effort with the USGS.

### E. Fixed Station Ambient Monitoring

This network of statewide stations provides systematic water quality sampling at regular intervals and uniform parametric coverage to monitor water quality status and trends over a long-term period. Sampling is carried out by MDEQ scientists from each of the three regional offices.

There are currently 41 stations statewide, and laboratory analyses for the samples are carried out by MDEQ's laboratory located in Pearl. Several stations in the sampling network are historical stations that have monitoring dating back to the 1970s.

### F. Mississippi Agricultural Chemical Groundwater Monitoring Program

Over ninety percent of the population in Mississippi relies on groundwater for drinking water supply. Because of this dependence, there have been growing concerns that agricultural chemicals may be impacting and degrading the valuable groundwater resources in the state. The Agricultural Chemical Monitoring Program was established in 1986 to help determine what, if any, impact these practices may be having. For FY2015, OLWR staff sampled 60 water wells in a continuing effort to ascertain if agricultural practices in the state are affecting the quality of groundwater aquifer systems statewide. These data are recorded and reported to well owners who have concerns about their domestic drinking water. As of June 30, 2015, the program has sampled over 2,140 groundwater sources throughout the state. To date, results indicate that no significant impacts to groundwater quality are directly attributable to agricultural practices in the state.

### G. Fish Tissue Monitoring Program

The MDEQ Laboratory monitors fish tissue for contaminant levels that could be harmful to people that consume fish from the state's waters. When elevated levels of contaminants are found in fish tissue, the data is used by a multi-agency task force to determine if a fish tissue consumption warning or advisory is warranted. Presently, there are advisories for Mercury, DDT, Toxaphene, and PCBs on many state waters. Special fish tissue monitoring for 2015 was focused on sites where advisories for DDT and Toxaphene have been issued. The purpose was to collect additional data to further inform decisions on the advisory for the Mississippi Delta region. In addition tissue was collected from fishing rodeos in the Mississippi Sound for Mercury and Selenium levels.

Laboratory biologists also investigated numerous fish kills throughout the state in 2015. Laboratory biologists are on call during weekends and holidays to respond to fish kill reports and to assist if needed with water sampling and wildlife damages.



### H. Triennial Review of Water Quality Standards

The Clean Water Act requires all states to develop, review, revise (as needed), and adopt water quality standards. States are required to review their water quality standards at least every three years through a process known as the triennial review. The last modifications to Mississippi's Water Quality Standards were adopted by the Mississippi Commission on Environmental Quality in June 2012. The 2015 triennial review is currently underway. A public comment period was held in October 2015 and public hearing was held on November 5, 2015, to receive comments related to the proposed revisions to Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters.

The proposed revisions to Mississippi's water quality standards for 2015 triennial review included:

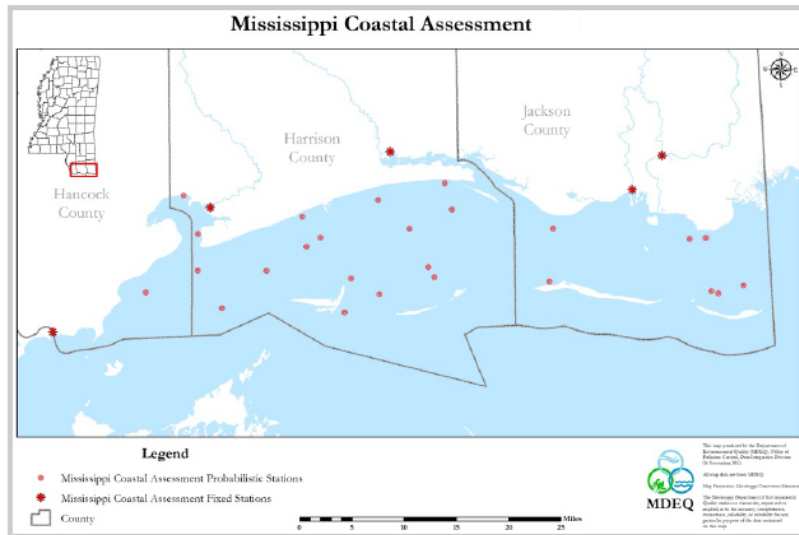
- The water quality criteria for recreational waters were updated based on EPA's most recent recommendations that were released in 2012. Based on the 2012 EPA recommendations, the current bacterial indicator for freshwaters, fecal coliform, was replaced with the latest recommended bacterial indicator, 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, the seasonal bacteria option was removed from the following water body classifications—Fish and Wildlife Support and Public Water Supply. Under the proposed modifications, waters within these classifications now have the same criteria for E.coli throughout the entire year.
- A statistical threshold value (STV) was added for enterococci within marine and estuarine coastal recreational waters. Enterococci samples examined during a 90-day period should not exceed 130 per 100 ml more than 10 percent of the time.

MDEQ is currently working to review and respond to comments received within the public comment period. MDEQ will make any needed modifications to the proposed revisions based on the comments received. Once these modifications have been incorporated, the final proposed revisions will be presented to the Commission for adoption in the first quarter of 2016. Once adopted by the Commission, the revisions will be submitted to EPA Region 4 for approval.

### I. Coastal Monitoring

MDEQ participated in the EPA National Coastal Assessment (NCA) Program from its inception in 2000 through 2006. When EPA suspended funding for the NCA program, MDEQ partnered with the Gulf Coast Research Lab and the Mississippi Department of Marine Resources to continue a very similar sampling program, the Mississippi Coastal Assessment (MCA) Program. This monitoring was planned to help evaluate long term coastal water quality conditions, and was particularly valuable after Hurricane Katrina and during the rebuilding efforts. This data will also be utilized to help examine long term environmental impacts following the *Deepwater Horizon* oil spill.

MCA monitoring is conducted during the late summer index period (July-September) and includes biological, chemical, and physical sampling. Sites are selected using a probabilistic site selection methodology. At the end of a five year cycle, a total of 125 sites will be sampled for the coastal monitoring program.



### J. Beach Monitoring Network

MDEQ’s Beach Monitoring Program, conducts routine bacteria and water chemistry sampling at 21 beach stations located along Mississippi’s Gulf Coast. MDEQ is a partner within the multi-agency Beach Monitoring Task Force comprised of the EPA Gulf of Mexico Program, the Mississippi Department of Marine Resources, the Mississippi Secretary of State’s Office, and the Mississippi State Department of Health, Hancock County, Harrison County and Jackson County. This Beach Monitoring Task Force oversees the program and issues beach advisories when needed. MDEQ and the Beach Monitoring Task Force rely on data collected under this program to assess health and safety issues for users of Mississippi’s recreational beaches. When *Enterococcus* bacteria concentrations reach unsafe levels, beach advisories are issued. In addition, the monitoring data provide information concerning the seasonal water quality conditions of the immediately accessible waters along the public bathing beaches. Beach water quality conditions are made available to the public via a Beach Monitoring webpage, Twitter, by public email and text notification, and releases to local media.



During 2015, a total of 33 advisories were issued for elevated bacteria detected through routine sampling. The average length of advisory was six days. There was only one beach closure issued due to a sewage force main break in 2015. The 33 bacteria advisories and one closure covered 214 beach days or 2.79 percent of the 7,665 beach days available in the year.



## K. Mississippi's Numeric Nutrient Criteria Development Activities

In 2015, MDEQ continued efforts to develop numeric nutrient criteria for Mississippi's various water body types. MDEQ's mission is to develop scientifically defensible criteria that are appropriate and protective of Mississippi's waters. The criteria for each water body type will be coordinated with other water body types to ensure consistency across the state and protection from downstream impacts.

Highlights of MDEQ's numeric nutrient criteria development efforts include:

- MDEQ established the Mississippi Nutrient Technical Advisory Group (TAG) in 2010. The mission of the TAG is to provide technical expertise and regional knowledge to MDEQ for the development of scientifically defensible numeric nutrient criteria. The TAG consists of over 30 members representing multiple state and federal agencies, and four Mississippi universities. In 2015, the Mississippi Nutrient Technical Advisory Group focused on providing continued technical input on developing nutrient criteria for Mississippi's lakes and reservoirs, wadeable and non-wadeable streams, coastal and estuarine waters, and Mississippi Delta waters. MDEQ continues criteria development efforts across all water body types based on recommendations from the TAG.
- In 2015, MDEQ continued to provide Nutrient Criteria Update Sessions for Mississippi stakeholders. MDEQ held two stakeholder update sessions providing an update regarding the work MDEQ is performing to develop the criteria. These update sessions also promote open communication between MDEQ staff and stakeholders. MDEQ plans to hold update sessions regularly with this group throughout the numeric nutrient criteria derivation process.
- In 2015, MDEQ continued to develop the plan for numeric nutrient criteria implementation. While developing the criteria values themselves, MDEQ also focused significant efforts into exploring concerns and questions raised by both internal MDEQ staff and Mississippi stakeholders. The plan for how numeric nutrient criteria will be implemented must also be developed and understood by both MDEQ staff and stakeholders. MDEQ will continue to work concurrently on both criteria development and implementation planning.
- MDEQ continues to collect data and conduct studies to support nutrient criteria development. In 2015, ongoing activities included development of a benthic index for Mississippi's coastal waters, a benthic index for Delta waters, as well as data collection efforts across the state.



MDEQ staff collecting water samples

## L. Total Maximum Daily Load and Modeling

Total Maximum Daily Loads (TMDLs) are a requirement of the Clean Water Act (CWA) to provide direction for restoring the nation's waters. TMDL reports provide an analysis of the ability of a water body to assimilate pollutants from point sources, such as industry and communities, and nonpoint sources, such as stormwater runoff from urban areas or agriculture.

Water bodies that do not meet water-quality standards are identified as "impaired" for the particular pollutants of concern. Under Section 303(d) of the Clean Water Act, states are required to develop a list of waters that are not in compliance with water quality standards and establish a total maximum daily load (TMDL) for each pollutant causing the impairment. MDEQ, biennially, creates a list of these impaired waters called the 303(d) List of Impaired Waters. MDEQ's 2014 list was adopted by the Mississippi Commission on Environmental Quality on June 26, 2014. This list will not be updated until 2016 during which its biennial review is scheduled. MDEQ had four TMDLs approved between October 2014 and September 2015 and is also currently working on six stressor identification (SI) reports on water bodies that are identified as biologically impaired. These SI reports span across the Tombigbee River, Yazoo River, and Pearl River Basins.

• **Yazoo River Nutrient Model Calibration Study Project**

As part of MDEQs' Basin Approach to Total Maximum Daily Loads (TMDLs), the Yazoo River Basin was targeted for TMDL development and Programmatic Activities. Programmatic activities include support of Waste Load Allocation (WLA) requests regarding permit applications or verification of existing permit limits. Support of WLA requests involves site visits and data collection efforts at appropriate sites along the receiving stream.

A water quality study on the Yazoo River located in north-west Mississippi, was initiated in the summer of 2015. The project was a joint collaboration with EPA to evaluate physical and chemical parameters of the river and its segments. The primary objective of this study was to collect water quality samples for the evaluation and development of water quality model inputs to characterize the current conditions of the Yazoo River. Study efforts included water quality sampling for an array of analytes including long-term BOD, nutrients, solids, and algal analyses. The study area included five locations that were selected to provide representative data on waters receiving pollutants from a wide range of agricultural and industrial sources.

Additionally, this study helps generate data to estimate the total nutrient load allowable in the river and the nutrient input from the point source dischargers. This data is being used in MDEQ's nutrient criteria development efforts.



Yazoo River, Greenwood

• **Turkey Creek Fecal Coliform Revised TMDL**

In 2015, Turkey Creek, located in Harrison County and within the Coastal Basin, was selected as 1 of 51 projects by EPA on a national level for restoration. This water body was included in EPA's "Making A Difference in Communities Task Initiative." In an effort to join with EPA on this task, MDEQ voluntarily revised a TMDL report for Fecal Coliform for this water body that was previously completed in 2003. MDEQ collected more substantial data within the last several years and believed a revision in the report was necessary based upon the data. Additionally, the TMDL and Modeling Section held several meetings with the community and local officials to further address concerns of the community. From these meetings, MDEQ is partnering with EPA and other agencies to do more frequent monitoring of the creek. This additional monitoring will be used to set a foundation for helping to restore water quality to this water body and to notify the community of possible violations.



Turkey Creek, Harrison County

• **Modeling for NPDES Permit Limits**

Another program of MDEQ's TMDL Program is Waste Load Allocations (WLAs) for use by the Environmental Permits Division. In addition to the TMDLs and stressor identification efforts, TMDL staff members are actively involved in the ongoing issuance/reissuance of WLAs. This includes the development of new and/ or review of current NPDES permit limits. As a part of this process, the Modeling and TMDL Branch uses water quality models to replicate conditions of a stream and determine the appropriate loads that are allowed from dischargers as a result of those conditions. The Modeling and TMDL Branch completed approximately 73 WLAs from October 2014 to September 2015 to assist the permitting branch in meeting their permitting goals.



## **M. The Gulf of Mexico Alliance (GOMA)**

GOMA is a partnership among the states of Alabama, Florida, Louisiana, Mississippi, and Texas to address the priority issues related to the ecological health of the Gulf of Mexico. In 2015, the Alliance Management Team elected to slightly restructure the priorities addressed by the Gulf of Mexico Alliance Teams. None of the existing priorities were eliminated but were redistributed within the new team structure. Historically, MDEQ has led the Nutrients Team. As a result of the restructuring the previous GOMA Nutrients Team and GOMA Water Quality Team have now merged into the GOMA Water Resources Team. The GOMA Water Resources Team continues to provide a collaborative approach to address multiple focus areas related to water quality and quantity in the region as well as working to protect aquatic health, human health, and economic health in the Gulf of Mexico.

## **N. Mississippi River and Gulf of Mexico Watershed Nutrient Task Force**

MDEQ continues to support the efforts of the Mississippi River and Gulf of Mexico Watershed Nutrient Task Force (Hypoxia Task Force). The Task Force was established in 1997 to understand the causes and effects of eutrophication in the Gulf of Mexico; coordinate activities to reduce the size, severity, and duration; and ameliorate the effects of hypoxia. Activities of the Task Force include coordinating and supporting nutrient management activities from all sources, restoring habitats to trap and assimilate nutrients, and supporting other hypoxia related activities in the Mississippi River and Gulf of Mexico watersheds.

## **O. Nonpoint Source**

Nonpoint Source Pollution (NPS) is rainwater runoff that picks up and carries away a variety of pollutants as it flows over streets, parking lots, construction sites, or farm lands. The pollutants may then flow into rivers, oceans, and underground sources of drinking water. These pollutants include excess fertilizer, sediment, nutrients, pesticides, oil, grease, and bacteria from faulty septic systems.

MDEQ, in cooperation with numerous federal, state, and local stakeholders has been successful in developing a comprehensive statewide NPS pollution control program to help protect and restore valuable water resources. The state's NPS Program fulfills the requirements of Section 319 of the Clean Water Act (CWA) and section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA), two federal laws with NPS pollution control provisions.

MDEQ currently has five active grants, one of which (Grant Year 2011) will be closed out in 2015. During 2015, 27 projects and activities totaling \$2,265,791 in federal funds were completed with 21 projects and activities still ongoing. To date, the ongoing projects have used \$958,869 in federal funds. Those that are ongoing may take from one to four years to complete. These include, but are not limited to: educational projects, water-quality monitoring projects, Best Management Practices (BMPs) demonstration projects, agricultural/chemical waste disposal, and watershed protection and restoration projects.

In FY 2015, MDEQ received approximately \$2.9 million in Section 319 Grant funds. Of this amount, seven percent is allocated for administrative work, 26 percent for program operation and statewide education and public outreach projects, seven percent for NPS watershed planning, 39 percent for NPS watershed project implementation, and 21 percent for support of priority watershed restoration and protection projects.

## **P. Stormwater Permitting**

MDEQ issues water discharge permits that can be facility-specific or for categories of industrial activities. Facility-specific permits are issued to control the discharges of pollutants into the environment from the construction, modification, and operation of water pollution sources. Permit limits, monitoring and recordkeeping requirements, and operational requirements are specified in these permits to ensure discharges will not cause or contribute to violations of water quality standards or impair any beneficial uses of waters of the state. In some instances, MDEQ issues general permits and coverages for specific categories of industrial activity, such as industrial stormwater discharges. Also, MDEQ issues water quality certifications for other agency permits.

These certifications include provisions that must be met to ensure water quality protection related to wetlands and streams. These water quality certifications are required for projects involving dredge and fill activities covered under the Clean Water Act Section 404.

In 2015:

- Environmental Permits Division (EPD) issued general permit coverage for 315 large construction projects (five acres or greater).
- EPD issued general permit coverage for 75 regulated industrial facilities under the Baseline Storm Water General Permit for Industrial Activities.
- EPD received and processed 70 “No Exposure Certifications” from potentially regulated industrial facilities. Facilities that certify “No Exposure” of industrial activity to storm water are not required to obtain storm water coverage under the Baseline General Permit.



## Q. Environmental Operator Training

The Operator Training program began in 1969 to provide instruction and technical assistance to municipal and domestic wastewater personnel and facilities. The training, provided at no cost to the operator, was initially associated with a voluntary certification program offered by the Mississippi Water and Pollution Control Operator's Association. Administration of the certification program was transferred to the agency in 1987 when the State Legislature mandated certification of all municipal and domestic wastewater operators. The certification regulations include a requirement for continuing education during each three year certification period.

The 2015 training calendar included 43 days of agency sponsored training classes. Of these training days, 35 were co-sponsored with the three wastewater related professional associations (Mississippi Water and Pollution Control Operator's Association, Mississippi Water Environment Association, and Mississippi Rural Water Association). Attendance totaled 815 operators, utility managers and engineers. Certification exams were administered to 188 prospective operators with a total number of 196 new and renewal certificates issued. There were 43 wastewater training request approved for wastewater continuing education credits in the classroom and online. There are currently 739 certified pollution control operators in the state. The training program participated in energy conservation studies with EPA Region 4 and a wastewater expert professor in order to save the facilities' energy cost while remaining in compliance with their NPDES permit. The program looks forward to expanding this idea in the future to more facilities through specific training of operators. The program has partnered with other agencies to speak at functions for Mississippi Municipal League with the ultimate goal of increasing communication between operators and municipal officials. The training staff also provides on-site technical assistance to municipal, commercial and industrial wastewater facilities. This assistance program is aimed at providing no cost assistance in returning to or maintaining compliance with their wastewater permit. In 2015, the staff conducted 407 technical assistance and outreach activities through either onsite visits or remotely.

## R. Water Pollution Control Revolving Fund (WPCRLF)

The WPCRLF program provides low interest loans to public entities in the state for construction, repair, or replacement of wastewater, stormwater, and nonpoint source pollution projects. Funding for these projects comes from federal grants, state match, repayments, and interest on deposits. Since 2010, additional subsidy funding, provided through annual Congressional appropriations, has also been made available to "Green" and "Small and Low Income Community" WPCRLF projects. During 2015, MDEQ funded 12 new WPCRLF projects totaling \$76.3 million, which included approximately \$0.73 million of Green or Small and Low Income Community subsidies.

**WATER QUALITY OBJECTIVE – Ensure the improvements funded through the Water Pollution Control (Clean Water) Revolving Loan Fund Program (“SRF”) are adequate to meet the needs of citizens, the business community, and to foster economic growth.**

Long term goals include: 1) maintaining a financially sound State Revolving Fund in perpetuity; 2) meeting a substantial portion of the wastewater needs in the state within a reasonable period of time; and 3) funding fiscally sound projects in order of environmental importance as established by the Commission, while continuing to maintain a program that is attractive to the communities in the state.

## S. Water Pollution Control Emergency Loan Fund

The Water Pollution Control Emergency Loan Fund (WPCEL) program provides loans to communities for the emergency construction, repair, or replacement of wastewater collection and treatment facilities. The WPCEL has approximately \$3.3 million available for such emergency projects. MDEQ encourages communities throughout the state to utilize this program whenever funds for emergency wastewater projects are needed.



Loans for Wastewater Infrastructure Improvements are offered through MDEQ

## T. Basin Management Approach

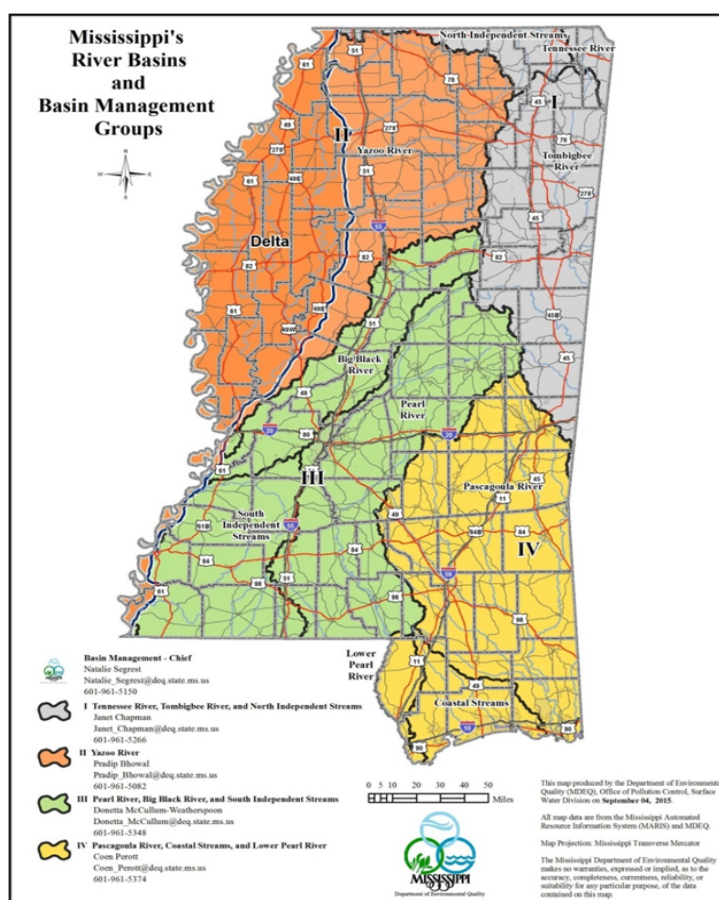
The mission of Mississippi's Basin Management Approach (BMA) is to restore and protect water resources of the state through collaborative development and implementation of effective management strategies that help improve water quality and quantity while fostering sound economic growth. In an effort to effectively carry out the BMA planning and implementation activities, ten of Mississippi's major river basins have been organized into four basin groups (see map insert). Each basin group has a basin team comprised of the representatives from federal, state and local government agencies, non-governmental organizations, and other stakeholders.

Through the Basin Management Approach, staff and resource partners worked diligently to develop nutrient reductions strategies to reduce excessive nutrient loadings to the waters in the Delta (2009), Coastal (2011) and Upland (2011) regions of the state. Continued implementation of these regional nutrient reduction strategies, by using Mississippi's collaborative/leveraged approach, has been ongoing to demonstrate their effectiveness.

Listed below are the key activities conducted to promote Mississippi's BMA:

### Basin Group I

Currently two projects in the upland North Independent Streams Basin are implementing the Upland Nutrient Reduction Strategic Plan. Muddy Creek in Tippah County failed to meet minimum water quality standards for aquatic life support, most likely due to organic enrichment/low dissolved oxygen and nutrients (nitrogen and phosphorus). MDEQ is partnering with Mississippi Soil and Water Conservation Commission, United States Department of Agriculture/ Natural Resources Conservation Service, EPA and the Tippah County Soil & Water Conservation District to install appropriate Best Management Practices on farmland area in the Bell Creek-West Prong Muddy subwatershed of the larger Muddy Creek watershed. Of primary concern are animal waste runoff and animal access to streams from cattle operations in the watershed. To date the BMPs that have been installed are 5,277 feet of stream bank and shoreline protection, 2,742 feet fencing, 14.5 acres of critical planting, 146 acres of nutrient management, four tank or troughs, three water and sediment control basins, 30 grade stabilization structures, and 27 acres of pasture and hay land planting. Soil savings from these BMPs amount to reductions of over 2,125 tons per year of sediment flowing into Mississippi waters. MDEQ is partnering with USGS to conduct water quality monitoring for the project.





MDEQ is conducting a similar project with the Alcorn County Soil & Water Conservation District, MSWCC, USDA NRCS, EPA and USGS in the Tarebreeches Creek-Tuscumbia River Canal subwatershed. Tarebreeches Creek-Tuscumbia River Canal Watershed is biologically impaired due to pollutant loads and is not meeting the watershed's designated use. Practices installed so far include 382 acres in pasture and hay land planting, three heavy use area protection, one tank or trough, 170 acres of nutrient management, 220 feet of stream bank and shoreline protection, one check dam, one stream crossing, one lined waterway, 1,660 feet of fencing, and 12 grade stabilization structures. Resultant soil savings show reductions of over 3,340 tons per year of sediment in Mississippi waters.

Basin Group I is participating in joint work with some Alabama natural resource agencies on Bear Creek in the Tennessee River Basin and the Buttahatchee River in the Tombigbee River Basin. The US Fish and Wildlife Service in Alabama, the Geological Survey of Alabama, the Tennessee Valley Authority, the Alabama Department of Environmental Management, and others are collecting data particularly concerning habitat on Bear Creek to determine where restoration efforts will be most beneficial. MDEQ has represented Mississippi's interest and support for this effort on this shared resource. Water quality data collections at bridge crossings and stream bank surveys have been completed.



Two stage Ditch Low Grade Weir

MDEQ also helped facilitate a recent outreach event at Tishomingo State Park on Bear Creek primarily sponsored by TVA targeted towards middle and high school age students. About 40 students participated in conducting a fish survey and learned proper kayak technique taught by Alabama 4-H and Alabama Scenic River personnel.

The joint Buttahatchee River effort is just beginning. The initial goal of this effort is to determine where to most effectively target restoration and protection efforts to improve water quality, protect aquatic communities and aid in the recovery of threatened and endangered species. Data collection efforts will begin next year. A number of Mississippi and Alabama agencies and organizations are participating.

### Basin Group II

Implementation of the Delta Nutrient Reduction Strategy (DNRS) is currently ongoing at multiple priority watersheds to answer the following key questions:

- What nutrient load reductions are achievable?
- What will be the cost for these reductions?
- What will be the associated environmental and economic benefits from these reductions?

With the determination of what nutrient load reductions are achievable, quantitative reduction targets will be established and consequently, future progress will be evaluated in relation to achieving the targets.

**Harris Bayou watershed:** Harris Bayou, a tributary of the Big Sunflower River, flows through portions of Bolivar and Coahoma counties. The current priority sub-watershed is Overcup Slough, which is located in the headwaters of the watershed and contains both catchments that have been the focus of the Delta Nutrient Reduction Strategy implementation efforts since 2010. BMPs implemented during 2015 in the Overcup Slough sub-watershed include: water control structures (28), low grade weirs (3), and two-stage ditch (3,500 ft). Approximately 300 acres of cover crops are planned for the fall/winter of 2015.

Collection of Tier 1 nutrient data for the treatment/control catchments has ceased after five years and is currently under analysis. With Tier 2 monitoring in place at the pour point of the watershed, the current project will continue to incrementally implement BMPs to address prioritized resource concerns.



Cover Crops

**Porter Bayou watershed:** Porter Bayou, also a tributary of the Big Sunflower River, flows through portions of Bolivar and Sunflower counties. The current priority sub-watersheds are Upper Porter Bayou and Middle Porter Bayou, which contain the catchments that have been a focus of continued DNRS implementation efforts.

The following BMPs have been implemented during 2015:

- Upper Porter Bayou: water control structures (52), low grade weirs (12), and two-stage ditch (15,000 ft)
- Middle Porter Bayou: water control structures (15), low grade weirs (4), and two-stage ditch (5,000 ft)
- Approximately 1,500 acres of cover crops are planned for the fall/winter of 2015.

Collection of Tier 1 nutrient data has ceased after five years and is currently under analysis. With Tier 2 monitoring in place at the pour point of both sub-watersheds, the current project will continue to incrementally implement BMPs to address prioritized resource concerns.

**Coldwater River watershed:** Coldwater River, a tributary of the Tallahatchie River, flows for about 220 miles through portions of Coahoma, DeSoto, Marshall, Quitman, Tate and Tunica counties in northwestern Mississippi. Approximately 500 acres of cover crops are planned for implementation in the fall and winter of 2015. Also, collection of Tier 1 nutrient data has ceased after five years and is currently under analysis.

**Lake Washington watershed:** Lake Washington is another existing project retrofitted for implementation of the Delta nutrient reduction strategies. Several BMPs were installed by using EPA 319, NRCS, and other funds. Currently, USGS is analyzing the collected water quality data to determine the effects of BMP implementation in this watershed.

**Steele Bayou watershed:** Approximately 2,500 acres of cover crops are planned for the fall and winter of 2015.

**Wolf-Broad Lake watershed:** Approximately 2,500 acres of cover crops are planned for the fall and winter of 2015.

**Mississippi Healthy Soils Initiative:** The purpose of this initiative is to help growers be more profitable and sustainable by improving the health of their most valuable asset, the soil. Management systems and practices used to build healthy soils also produce many environmental benefits such as reducing sediment and nutrient loss, reducing irrigation water demand through improved infiltration and holding capacity, and sequestering more carbon from the atmosphere. One of the principle components involved is the use of cover crops. Over 5,000 acres of winter cover crops were planted and evaluated during the 2014-2015 with a similar amount planned for 2015-2016 throughout the Yazoo River Basin. Updates and reports from this Delta F.A.R.M. led initiative can be found here: [www.mscovercrop.com](http://www.mscovercrop.com).

**Mississippi River Basin Healthy Watershed Initiative (MRBI):** The purpose of the MRBI initiative is to assist landowners and producers to voluntarily implement conservation and management practices that prevent, control and trap nutrient runoff from agricultural land. NRCS invested \$1.9 million in 2015 to target Brook Bayou, Christmas Lake Bayou, Long Lake, Stillwater Bayou and Tommie Bayou watersheds located in portions of Bolivar, Sunflower and Washington counties. MDEQ, working with NRCS and other partners, identified these priority watersheds to address the issue of nutrient loading, and evaluate the effectiveness of the Delta Nutrient Reduction Strategy. In addition, MDEQ will provide support to planning, outreach, technical assistance, and monitoring activities within these targeted watersheds.

### **Basin Group III**

**Ross Barnett Reservoir:** Since its construction in the late 1960s, the Ross Barnett Reservoir has been an irreplaceable resource to Central Mississippi. It is the largest source of drinking water in the state, supplying over 15 million gallons of water to local residents, businesses, and industries.

As it has done for more than 50 years, this plentiful water resource provides outstanding recreational opportunities, supports economic growth as well as scenic beauty and vital wildlife habitats. The EPA has designated this area as a Priority Watershed.





In a proactive effort to reduce non-point source (NPS) pollution within the Ross Barnett Reservoir Watershed, MDEQ and the Pearl River Valley Water Supply District, along with other local partners and assigned contractors, are working together to implement a series of best management demonstration projects in and around the Reservoir Watershed as recommended in comprehensive plans developed for the *Rezonate* initiative for the Reservoir. The purpose of this project is to enhance, protect and restore the water quality within the watershed which is primarily impaired due to sediment and nutrients, as a result of urbanization and recreation. The BMP demonstration sites will provide effective education and outreach to numerous targeted audiences within the state.

Currently, through the ongoing Memorandum of Agreement (MOA) between PRVWSD and MDEQ, urban stormwater BMP demonstration projects for water quality improvements have been identified. Sites include Old Trace Park in Ridgeland, Turtle Point Nature Area in Rankin County, Lakeshore Park in Rankin County, and Flag Island, upriver of the Reservoir. Implementation of these water quality improvement projects is scheduled to begin in the fall of 2015 through the spring of 2016. Interpretive signage for these sites and other existing BMP demonstration sites will also be placed to increase knowledge concerning water quality and protection. In addition, educational workshops are being developed to target three key groups: decision makers (elected officials), professionals (architects, engineers, and planners), and developers.

#### **Basin Group IV**

The Rotten Bayou watershed project was developed to implement the Mississippi Coastal Nutrient Reduction Strategy. This strategy used the Gulf of Mexico Alliance (GOMA) Coastal Template and leveraged on work done in the Delta with the Delta Nutrient Reduction Strategy. The Coastal Nutrient Reduction Strategy was developed through local workshops with coastal stakeholder input. Various issues related to livestock, forestry, urban stormwater, and atmospheric deposition were included in the strategy. As part of the federal government's efforts to recover from the *Deepwater Horizon* oil spill, NRCS introduced the Gulf of Mexico Initiative (GoMI), an innovative water and wildlife-conservation effort along the Gulf Coast. GoMI was developed in close collaboration with local, state, and federal partners. It is a new approach to better target conservation activities in the Gulf Coast region to improve the health of the Coast's rivers, wetlands, and estuaries that are integral to jobs and the economy in the Gulf. Because MDEQ had already developed and begun implementation of the Coastal Nutrient Reduction Strategy in Rotten Bayou watershed, NRCS targeted it for their Gulf of Mexico Initiative GoMI Project.

The Rotten Bayou Partnership continued to meet and make progress on the project, this year. Meetings conducted in 2015 include: Rotten Bayou watershed steering committee meetings; an Education and Outreach Subcommittee meeting, Technical Advisory team meetings, Rotten Bayou Watershed Partnership meetings; a Rotten Bayou Watershed Stormwater Workshop for Leadership Professionals on how to connect policies and ordinances to effective implementation of Best Management Practices at the Diamondhead Country Club. The Mississippi Coastal Cleanup, along with the Rotten Bayou Watershed Partnership, held a cleanup on Rotten Bayou. During the project period the Gulf Coast Community Design Studio, a sub-grantee of the Landtrust for the Mississippi Coastal Plain, secured funding from NOAA's Gulf of Mexico Bay-Watershed Education and Training Program for the 2014-2015 school year to work with fifth graders at East Hancock Elementary School Education for Rotten Bayou Watershed. The grant funding not only allowed GCCDS staff to work with students during the 2014-2015 school year but provided supplies and training to teachers to continue the program to improve water quality in the Rotten Bayou watershed.

MDEQ, in conjunction with USGS, conducted water quality monitoring prior to the implementation of BMP activities. Monitoring was suspended to allow for BMP installation. Once BMP installation is completed, MDEQ and USGS will reinstate monitoring activities in an effort to show water quality improvements. MDEQ is also considering monitoring Rotten Bayou for pathogens including Fecal Coliform and E. Coli for an additional year.

Research and Education to Advance Conservation and Habitat (REACH) plans to collect storm runoff samples from the following locations just downstream of where BMPs have been installed in Rotten Bayou Watershed:

- Dry Swale on hole one of Diamondhead's Cardinal Golf Course.
- Naturalized stream segment on hole two of Diamondhead's Cardinal Golf Course.
- Control site at hole one of Diamondhead's Cardinal Golf Course.
- Stream naturalization adjacent to overflow at Diamondhead Duck Pond.

Diamondhead Country Club and Property Owners Association is also looking to implement BMPs on holes two and seven of the Pine Golf Course. REACH plans to monitor these sites through October 2015.

On October 22, 2015, The Landtrust for the Mississippi Coastal Plain hosted an event to celebrate the accomplishments of the Rotten Bayou Partnership. The event opened with a tour to showcase some of the Best Management Practices (BMPs) installed on the Cardinal Golf Course and at the Duck Pond Demonstration Project. These BMPs, along with Agricultural BMPs, which were installed earlier in the project, through the Soil and Water Conservation Commission and the Harrison and Hancock County Soil and Water Conservation Districts, were installed in the Rotten Bayou watershed through the Nonpoint Source 319 Project.



A Watershed Based Plan for the Rotten Bayou Watershed was also introduced to the watershed team, the Pascagoula, Coastal Streams, and Lower Pearl Basin Team, local residents, local officials, and landowners.

The Basin Management Branch and MDEQ continue to work in partnership with other agencies and the Turkey Creek Steering Committee on improving water quality and community engagement in the Turkey Creek Watershed. Basin Management continues to support watershed based teams, which have developed watershed based plans and have implemented Best Management Practices through watershed projects. Basin Management is also working with restoration projects, as they become implemented in water bodies in the Pascagoula, Coastal Streams, and Lower Pearl River Basins, and on the Coast.

## IX. Permitting

### A. Environmental Permitting

The professional staff of MDEQ spends thousands of hours each year developing various types of environmental permits which are then presented to the Mississippi Environmental Quality Permit Board for issuance. The Permit Board issues, reissues, modifies, denies, transfers, and revokes permits and certifications administered under the Clean Water Act, the Clean Air Act, the Resource Conservation and Recovery Act, the Surface Mining Control and Reclamation Act, state mining laws, and state water resource control laws. MDEQ offices that work with permitting matters are the Office of Pollution Control, Office of Geology and the Office of Land and Water Resources.

The Environmental Permit Division (EPD) is responsible for most environmental permitting done for the Office of Pollution Control, including:

- Air Construction and Air Operating
- Air Title V Operating
- Wastewater - State No Discharge
- Wastewater - National Pollutant Discharge Elimination System
- Wastewater - Pretreatment
- Storm Water Construction and Operating
- Solid Waste
- Hazardous Waste
- Tire Programs
- Wetlands Impacts

The Office of Geology is responsible for the permitting of:

- Surface Mining Permits (non-coal)
- Coal Mining Permits

The Office of Land and Water Resources is responsible for the permitting of:

- Groundwater withdrawal
- Surface water
- Dam construction permits

EPD's functions include reviewing the majority of the permit related issues, including permit applications, meeting with the permit applicants, reviewing permit renewal and modification applications, and making recommendations to the Permit Board. Currently there are over 20,000 sites in the permitting data base. Many of these sites have permits that by state and federal regulation expire every five years and have to be reissued. As new companies come into the state and existing companies have changes or modifications, these activities also require permitting actions. The EPD works closely with Mississippi Development Authority (MDA) in helping site new industries to Mississippi. EPD believes that a key element in effectively addressing environmental issues surrounding greenfield projects is early interaction between the proposed company and MDEQ. EPD offers and encourages pre-application meetings. Time spent in refining the information needed for permit applications at the front end of a project typically reduces the overall time to bring a project and permitting to a decision point. EPD and MDA coordinated a training session and numerous MDA project managers and MDA executive staff met with MDEQ executive staff, EPD Branch managers, and other permitting staff to train each other on processes and to reinforce the commitment to working together effectively.



The Mississippi Environmental Quality Permit Board reissued the statewide Multimedia Hot Mix Asphalt Facility General Permit (MSR70) on March 2, 2015. This permit authorizes the discharge of storm water run-off into waters of the state and the construction and operation of air emissions equipment from Hot Mix Asphalt facilities in accordance with the provisions of the Mississippi Air and Water Pollution Control Law. This reissuance will allow the continued operation of Hot Mix Asphalt facilities for an additional five-year period.

The Permit Board also re-issued the statewide Concentrated Animal Feeding Operation (CAFO) Multimedia General Permit (MSG22) on July 6, 2015. This Multimedia General Permit authorizes the operation of a concentrated animal feeding operation, discharges of stormwater associated with agricultural activities, and the release of air emissions associated with the construction and operation of a concentrated animal feeding operation which may include mortality incineration equipment. This reissuance will allow the continued operation of Concentrated Animal Feeding Operations for an additional five-year period.

## **B. Performance Improvements**

EPD continued to partner with the Data Integration Division (DID) of MDEQ in the development of new functionality for the agency's enterprise-wide data management system – enSite. Although it has not replaced the agency's official paper files, enSite has become the agency's primary electronic storage database for information. This has made it possible for the department to provide much more information over the internet to the regulated community, other state agencies, EPA, and citizens.

## **C. Toxic Release Inventory**

The Toxic Release Inventory is required under Section 313 of the federal Emergency Planning and Community Right-To-Know Act of 1986. This report is required to be submitted every year by facilities that utilize toxic substances in their manufacturing processes if the facility has in excess of ten full-time employees and falls into certain Standard Industrial Classification codes as designated by the EPA. These facilities report how toxic substances are utilized in their manufacturing processes and how and to what media they are emitted to the environment. Every year, over 250 facilities from across the state submit over 1,000 reports to MDEQ, as required by federal law.

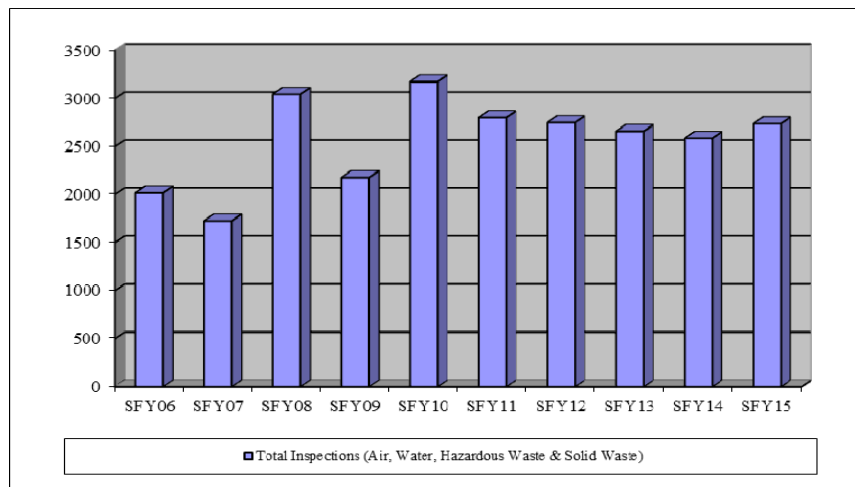


## X. Compliance And Enforcement

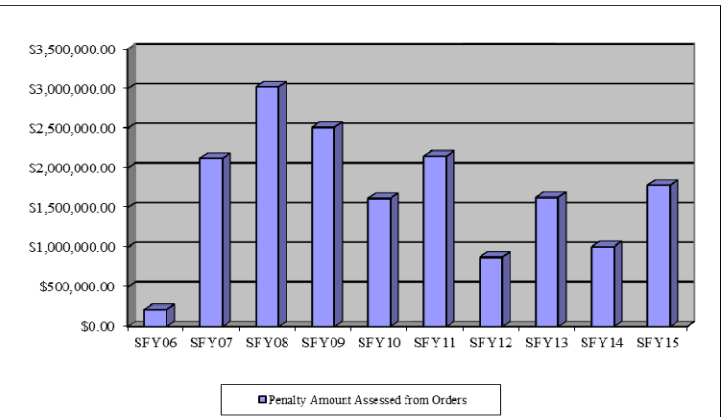
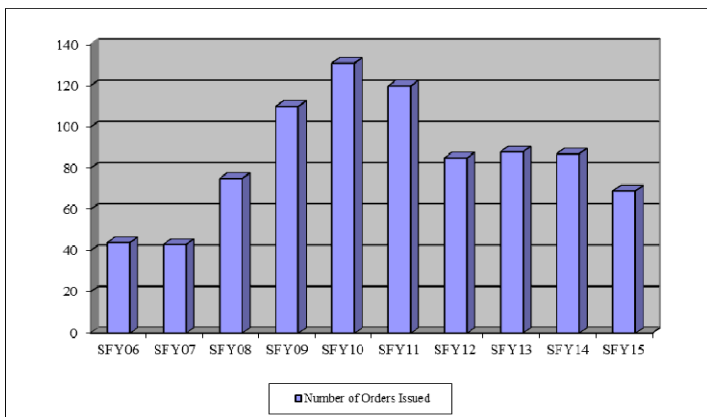
The Environmental Compliance and Enforcement Division (ECED) implements and oversees the majority of the compliance and enforcement programs and is responsible for the regulation of sites for compliance with applicable air, water, hazardous waste, and non-hazardous waste permits and regulations. The goal is for continuous compliance with all applicable environmental laws, regulations and standards. Staff assists Mississippi businesses, industries, and farms with this activity. When a site fails to comply with the permit(s) or regulations, appropriate enforcement action is taken to promptly return the site to compliance

During Fiscal Year 2015, the following numbers of on-site inspections were performed by ECED and the Field Services Division:

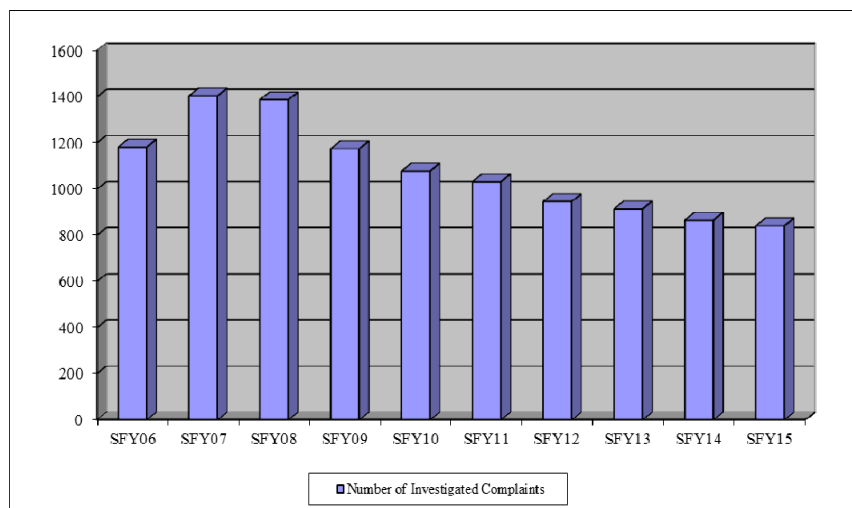
- 210 for compliance with air pollution regulations and permits
- 1,608 for compliance with water pollution regulations and permits
- 77 for compliance with hazardous waste regulations and permits
- 845 for compliance with solid waste regulations and permits



During Fiscal Year 2015, ECED actions resulted in 70 orders being issued for non-compliance with air, water, solid waste, and hazardous waste regulations and permits. Sixty-six of these orders contained provisions for a penalty with a total assessed penalty amount of \$1.784 million. When appropriate, MDEQ allows the use of Supplemental Environmental Projects (SEP), projects that go beyond what is required for compliance with permits and regulations, to offset a portion of the cash penalty. Five orders allowed the use of a SEP.



ECED, in conjunction with the Field Services Division, is also responsible for responding to citizen complaints regarding air, water, solid waste, and hazardous waste matters. When citizens report an environmental problem, they are asked to explain the nature of the problem and give the location of the problem, including directions to the site. A name is not required; however, if a name and a contact information is provided, MDEQ either contacts the complainant during the investigation or provides the results of the investigation after the investigation is complete. OPC staff's endeavor to investigate every citizen complaint. During Fiscal Year 2015, the Office of Pollution Control received 841 complaints related to air, water, solid waste, and hazardous waste matters.



## XI. Emergency Preparedness and Response

MDEQ maintains the resources and readiness to quickly and effectively support local emergency response personnel and communities when an environmental or public health emergency occurs. This readiness is accomplished by training alongside regional response teams, and state agencies such as the Mississippi Emergency Management Agency (MEMA), the Mississippi State Department of Health (MDOH), the Mississippi Department of Public Safety (DPS), and federal agencies such as EPA, Department of Defense (DOD), Homeland Security, and the Federal Emergency Management Agency (FEMA). Additionally, MDEQ maintains expertise in handling hazardous, radioactive materials and biohazard emergencies by participating in advanced-level courses and exercises.

**Emergency Preparedness and Response Strategic Goal:** Prevent, prepare for, and respond to public health, safety, and environmental emergencies.

During Fiscal Year 2015, the Emergency Response Division continued to respond as needed to emergencies across the state involving hazardous materials, oil spills, or any pollutant that poses a threat to human health or the environment. While contractor expenditures for response actions were \$580,927.61 the agency was reimbursed approximately \$260,875.89 from responsible parties. The Emergency Services staff in total handled approximately 914 calls for assistance in 2015.

### A. Emergency Response Training

The training has played a prominent role in responding to disasters affecting the state by providing a prompt and adequate response as the need arises in coordination with other state agencies and the Governor's Office. Part of this response effort includes ensuring that additional personnel are trained and prepared to respond to these disasters in the event that the scope of the disaster exceeds the capabilities of the Emergency Response Division. It is MDEQ's commitment to ensure that additional personnel have an expertise in the National Incident Management System in order to work with local, state, and federal partners.



Currently that percentage stands at 80 percent. Baseline curriculum courses (IS-700 and ICS-100) are required for emergency operation center personnel and field personnel working within the affected area. On Scene Coordinators are required to have ICS-300 plus baseline curriculum courses. Emergency Coordinating Officers are required to have ICS-400, 300, 100 and IS-700 courses. The number of people assigned/required to work within the Incident Command structure during an expanding incident may include emergency operation center personnel, an emergency coordinating officer, on scene coordinators and field personnel. MDEQ remains committed to training and preparing an adequate number of personnel to respond to an expanding incident where a man-made or natural disaster impacts multiple jurisdictions.

**EMERGENCY OBJECTIVE – Maintain staff that is adequately trained and equipped to conduct an environmental emergency response.**  
**Outcome:** Percentage of Staff with Expertise in the National Incident Management System.

MDEQ’s Emergency Response Team is on-call statewide 24 hours a day, seven days a week. MDEQ and MEMA work together to provide effective around-the-clock spill response. MEMA is notified of emergencies by calling 1-800-222-6362. They in turn contact MDEQ personnel who provide on-site response and technical assistance.

### B. Disaster Debris Management And Other Emergency Conditions



In 2015, MDEQ’s solid waste programs worked with federal, state, and local agencies and organizations regarding the management of disaster related debris. The state experienced several storm events during the year that caused damage. MDEQ staff worked to assist communities in the southern part of the state that experienced tornado damage in late December of 2014. Columbia and Marion County were some of the hardest hit areas, but damage also was experienced in Jasper, Covington, Smith, and Jones Counties. MDEQ deployed debris assistance specialists to the area to assist local governments in planning and meeting disaster debris management needs through the local solid waste management systems as well as emergency debris management sites. MDEQ also sponsored an Household Hazardous Waste collection event in Marion County to assist those hit hard by that storm with collection of damaged household items that might have hazardous characteristics. In addition, MDEQ worked with a number of communities in north and central Mississippi that experienced debris from a variety of ice storm events that occurred in early 2015.

MDEQ also continued to work with the City of Louisville and Winston County on disaster recovery and clean up issues in that county from the damage suffered in the Spring of 2014. MDEQ extended the operational dates for the emergency debris management site for the continued management of debris from abandoned sites that were continuing to be cleaned up in the county. In addition, MDEQ was able to work with the county to re-direct some existing solid waste assistance grant resources to the clean-up and disposal of sites damaged by the tornado where the owners had no resources to abate the storm damage conditions.



Yazoo County Crude Oil Spill

MDEQ reviewed and approved “pre-incident” disaster debris management plans for the City of Hattiesburg and for Simpson County. These pre-incident plans will help these communities have the opportunity to receive additional federal assistance in the event of a disaster. In addition, these updated disaster debris plans will be incorporated into the local solid waste management plans for these areas. The “Sandy Act,” adopted by Congress after Hurricane Sandy hit the Northeast, provides that communities that have a pre-incident plan approved and in place may qualify for additional federal assistance for local debris management costs.

### C. Dam Safety

MDEQ requires that dam owners perform annual inspections of their High and Significant Hazard dams and also have periodic inspections performed by a registered professional engineer. Dam owners are required to address any deficiencies noted during inspections resulting in applications for dam modifications/rehabilitation. MDEQ performs random inspections to verify that the conditions of the dams are being accurately reported in the submitted inspection reports.

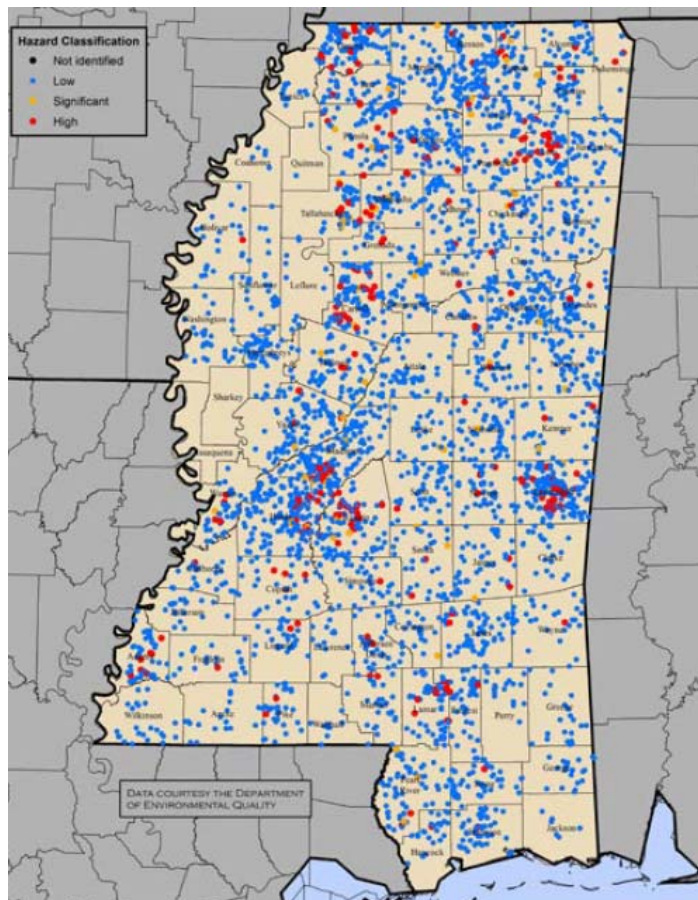
All dams in the state are identified, inventoried and classified with appropriate design criteria, or have had any identified deficiencies noted, reported and subjected to a remediation plan or action. The Dam Safety Division reviews plans for repairs or modifications to existing dams, reviews plans for the construction of new dams, conducts and reviews dam inspections, performs engineering analyses of dams, and reviews and approves Emergency Action Plans (EAPs) for high hazard dams in addition to other duties. There are currently 290 high hazard dams, 58 significant hazard dams, and 3,058 low hazard dams on the state’s inventory.

During FY 2015, 194 dams were inspected and the information produced by these inspections resulted in dam owners initiating repairs or rehabilitation on five high hazard dams and one significant hazard dam. The division also reviewed and approved applications to construct 25 new low hazard dams and one high hazard dam.

There are currently 244 EAPs on file for high hazard dams, which is an increase of three percent over 2014. The division’s goal is to have all owners of high hazard dams submit EAPs for review and approval. Compliance with this goal presently stands at approximately 84 percent. The approval process includes review and approval at the county level by the local Emergency Management Agency and all first responders that would be required to implement the plans. This procedure has extended the anticipated schedule for completing the documents, but the involvement of local agencies in the plan development greatly enhances the value of the plans in safe-guarding lives and property in the event of a dam failure.

The Dam Safety Division has also been working to improve and update the state’s inventory of dams. Most of the existing inventory of low hazard dams had not been reevaluated for changes in downstream development in 30 more than years due to the lack of staffing. As expected, development has occurred downstream of a lot of dams during this time resulting in a need to reclassify a large number of low hazard dams to either high or significant hazard.

**EMERGENCY OBJECTIVE – Protect downstream lives and property by ensuring that dams are properly classified, inspected, and maintained and include a current Emergency Action Plan (EAP) as required.**  
**Outcome:** Percentage of High Hazard Dams inspected with complete and current Emergency Action Plans.

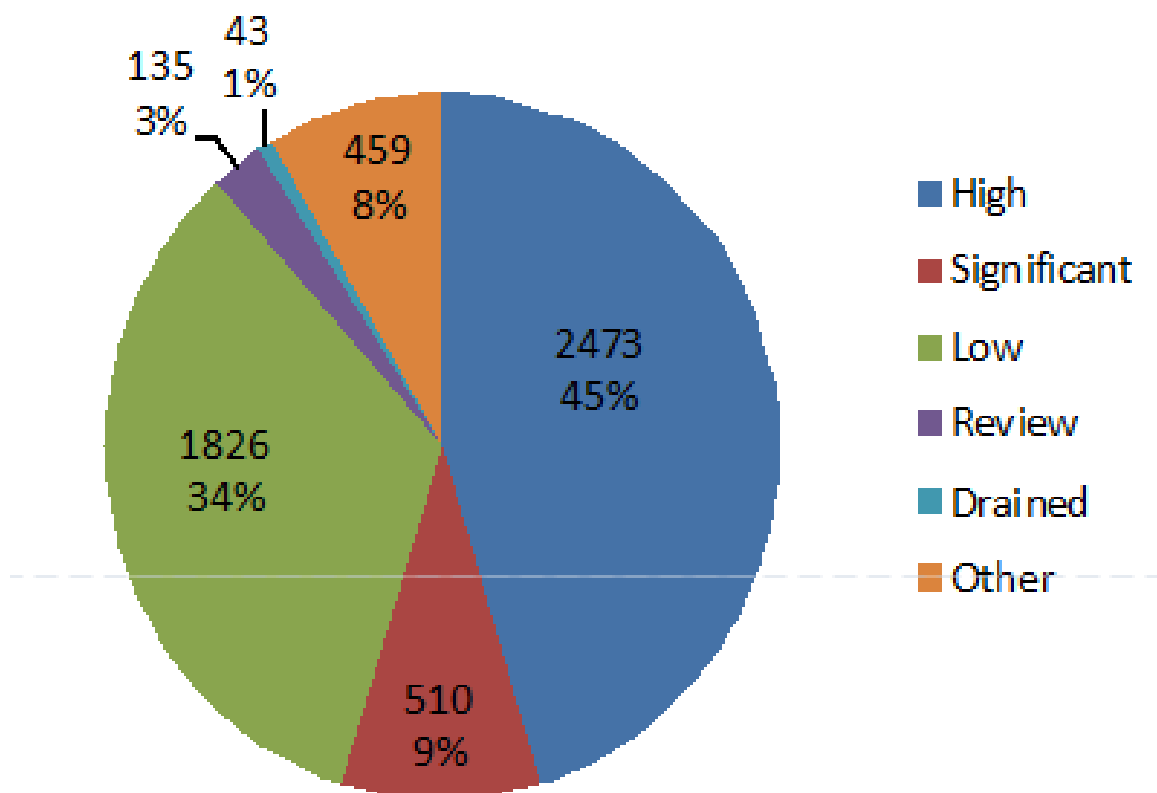


In addition, staff have been working to identify dams that have been constructed in the past 30 years or more without proper authorization that should be included on the state's inventory of dams. To date, the office has collected basic inventory data and performed hazard class assessments for 2,410 dams that weren't previously on the state's inventory. There are still approximately 1,200 potential existing dams that have not been assessed. When the inventory work is complete, the state's inventory of dams will number around 7,000.

Results of the hazard class assessments of low hazard dams, in addition to the 2,410 dams which were not on inventory, are as shown in the figure below (Note: The hazard classifications shown are preliminary and may change as more detailed analysis is performed).

One of the other major duties of the division is to respond to dam incidents and failures. Staff members responded to three dam incidents or failures in FY2015 and were able to mitigate each emergency successfully. During emergencies, the Dam Safety Division provides on-site response and technical assistance to the county emergency managers and dam owners.

Other major projects the division undertook in FY2015 included conducting four Emergency Action Plan tabletop exercises, hosting a hydrology and hydraulics training course for staff and consulting engineers, and working to upgrade our emergency response capabilities.





## XII. Outreach, Research, and Education

Environmental laws, rules, and programs can be complex and difficult to understand. MDEQ's public outreach efforts are aimed at helping citizens, schools, businesses, and communities learn about required and recommended actions to protect the environment and public health and encouraging them to make healthy, sustainable choices.

**Environmental Outreach, Research, and Education Strategic Goal:** Encourage and empower citizens, businesses, and communities to engage in behaviors to protect public health and preserve Mississippi's environment.

### A. Geological Data Collection Activities

The department's geologic mapping program for FY2015 was funded in part by a federal STATEMAP 2014 grant of \$75,597 and a National Coal Resources Data System (NCRDS) grant of \$15,000. Deliverables for the STATEMAP grant include the Stonewall, Sable, and Snell 7.5-minute geologic quadrangle maps in Lauderdale and Clarke counties in east-central Mississippi and the Easen Hill, Vancleave, and Gautier North 7.5-

**OUTREACH OBJECTIVE –** Maintain an adequate level of outreach so that citizens, businesses, and communities engage in behaviors that protect health and preserve Mississippi's environment.

minute geologic quadrangles in George and Jackson counties in southeastern Mississippi. These maps were published in color at a scale of 1:24,000 as Open-File Reports OF 270-275. The 2014 STATEMAP deliverables were due at the end of July 2015. Geologic units mapped in east-central Mississippi in FY2014 and 2015 included the Tuscaloosa, Hatchetigbee, Tallahatta, Winona, Zilpha, and Kosciusko formations of Eocene age and Holocene alluvium. Geologic units mapped in southeastern Mississippi in FY2014 and 2015 included the Pascagoula Formation of Miocene age, the Graham Ferry Formation of Pliocene age, and Holocene alluvium and coastal deposits. Geologic mapping in FY2016 will be funded by the STATEMAP 2015 grant, which was awarded funding of \$69,990. Additional assistance for mapping will come from NCRDS funding of \$5,932. Mapping work for FY2016 includes the Toomsuba, Meridian North, and Center Hill 7.5-minute geologic quadrangle maps in Lauderdale and Kemper counties in east-central Mississippi and the Biloxi, White Plains, and Beatrice 7.5-minute geologic quadrangles in Harrison, Jackson, and Stone counties in southeastern Mississippi.

Nine test holes were drilled to support geologic mapping in George, Jackson, Harrison, and Stone counties: the #1 Horse Shoe Lake to a depth of 320 feet, #1 Sim's Mill Pond to a depth of 300 feet, #1 Parker's Lake to a depth of 500 feet, #3 DeSoto National Forest to a depth of 460 feet, #4 DeSoto National Forest to a depth of 300 feet, #5 DeSoto National Forest to a depth of 480 feet, #6 DeSoto National Forest to a depth of 357 feet, #7 DeSoto National Forest to a depth of 210 feet, and #1 Wayne Waits to a depth of 450 feet. Twenty-four papers were published, including eight articles in *Environmental News*, seven articles in the *Mississippi Geological Society Bulletin*, one abstract in the *Southeastern Association of Vertebrate Paleontologists Abstracts*, one article in the *Mississippi Archaeological Association Newsletter*, one abstract in the *Journal of the Mississippi Academy of Sciences*, and six geologic quadrangle maps as Open-File Reports OF 270-275.

Proposed work for the STATEMAP grant in FY2016 includes six geologic quadrangle maps. These are the Center Hill, Meridian North, and Toomsuba quadrangles in Lauderdale and Kemper counties in east-central Mississippi and the Beatrice, White Plains, and Biloxi quadrangles in Harrison, Stone, and Jackson counties in southeastern Mississippi.

Most of the Office of Geology's publications have been scanned and made available for free download on the agency's web site. This makes out-of-print publications available again and digital publications more accessible to customers. Geologic quadrangle maps are available for viewing or download as PDF files.





*The Geology of Mississippi* is to be released by University Press of Mississippi in February 2016. The page proofs, not including the index, are 734 pages with 1,099 figures, most in color.

The Environmental Geology Division gathers, studies, and archives subsurface geological and geophysical data for on-going projects and other studies within MDEQ. Focused research is being done with regard to groundwater and other environmental issues. The division also provides support to other state agencies and academia. The Environmental Geology Division's geologist answers requests for information on groundwater availability, depth of wells, and potential yield of wells. These requests come from water well contractors, engineering firms, consultants, and private individuals.

MDEQ staff continue to be involved in the eight Central United States Earthquake Consortium (CUSEC) states' work in disaster planning regarding the New Madrid Earthquake Zone (NMEZ). Northwestern Mississippi is at risk of significant damage to roads, bridges, utility systems, power grids, and other infrastructure along this active fault zone. Geologists from the Office of Geology are in contact with and involved in meetings regarding future projects and studies over the next few years.



Environmental Geology's geologists wireline logged a total of 30 test holes in numerous counties throughout the state. Total footage logged was just over 14,000 feet. Six water well contractors and three state agencies took advantage of this program. Water Well Solutions (Brownsville, Tennessee) drilled the shallowest test hole logged to a depth of 91 feet in Benton County. The well was completed as a high yield irrigation well. Conversely, the deepest hole wireline logged was drilled by Water Well Services, Inc. (Brandon) in Jasper County. The total depth of this test hole was 1,000 feet. This well was drilled as a water supply source for poultry houses. The majority of the wells wireline logged during FY2015 were for home well applications followed closely by utility systems, then academia. Geologists use the data to correlate geologic formations across any given study area and are

able to map sands, clays, and others geological groups with increased accuracy to understand how to better construct water wells, estimate potential production rates, define building hazards, and better manage geological resources.

The Environmental Geology Division's technicians pulled, shipped and re-filed samples and cores for 10 scientists in other state agencies and oil and gas explorationists. A total of 310 boxes of cores and cuttings were examined during FY2015. Staff re-boxed 150 boxes of cores. Twenty boxes of whole core were slabbed and archived. Sample splits were done of four wells amounting to 1,065 feet.

The Geospatial Resources Division focused its emphasis on remote sensing (RS) and geographic information systems (GIS) activities. The division manages the Mississippi Flood Map Modernization Initiative (MFMMI) and the Mississippi Risk MAP Program. This program develops and updates digital flood insurance rate maps (DFIRMs) for the 82 counties under funding by the Federal Emergency Management Agency (FEMA).

MDEQ is involved with the Mississippi Coordinating Council for Remote Sensing and Geographic Information Systems (Council) that sets policies and standards that promote the sharing of information, as well as facilitate the cost-sharing potential. The Council is also charged with oversight of the development of the Mississippi Digital Earth Model (MDEM). The Office of Geology is responsible for MDEM's development, and the Geospatial Resources Division handles the assignment. MDEM consists of developing digital geographic information that will serve as the state base map. MDEM consists of eight layers of digital information that will be available online: (1) geodetic control, (2) elevation and bathymetry, (3) orthoimagery, (4) hydrography, (5) transportation, (6) government boundaries, (7) cadastral, and (8) the Gazetteer. Geospatial Resources is responsible for the management and monitoring of MDEM data development contracts and the QA of the MDEM mapping products that result from this work. Products from this work may be used by state and local governments, engineering firms, and construction companies involved in planning, development, construction or regulatory work throughout the state.



During 2015, MDEQ continued monitoring and managing contractors completing work on MDEM data sets. These data included road centerlines, hydrography, and elevation / topography and Lidar data in different areas of the state. All data developed are of MDEM quality and will be made available for distribution through the Mississippi Geospatial Clearinghouse web site at: [www.gis.ms.gov/Portal](http://www.gis.ms.gov/Portal). During FY2016, projects continue that include development of MDEM data, including large-scale hydrography for several Hydrologic Unit Code 8 (HUC 8) river sub-basins in east-central Mississippi, and Lidar development covering the coastal area of the state.

FEMA began its new Risk MAP (Risk Mapping, Assessment and Planning) program in 2010. The program has shifted to HUC 8 sub-basin flood studies and added flood risk assessment and flood hazard mitigation and planning activities and products. As of mid-2015, there are nine HUC 8 Risk MAP projects and one LAMP (Levee Analysis and Mapping Procedure) project on the Tennessee-Tombigbee Waterway in northeastern Mississippi. This project is one of 25 pilot LAMP projects for mapping deaccredited levee systems chosen by FEMA from across the nation.

For an information-rich site for oil and gas related information, access: [www.library.geology.deq.state.ms.us](http://www.library.geology.deq.state.ms.us). A wealth of coastal data from twelve years of active research can be found at: [www.geology.deq.state.ms.us/coastal](http://www.geology.deq.state.ms.us/coastal). A web site for the Mississippi Flood Map Modernization Initiative (MFMMI) is available at: [www.geology.deq.ms.gov/floodmaps](http://www.geology.deq.ms.gov/floodmaps). By visiting this site the public and local government officials are able to learn the current status of their county's DFIRM mapping project. Also, when a county's new preliminary flood maps are available, the public and local government officials will be able to download and review individual DFIRM map panels.



## B. Recycling and Waste Reduction

A primary task of the MDEQ is to promote and grow recycling and waste reduction in the State of Mississippi. State law declares that it is the policy of the state to reduce waste at its source, to re-use the waste materials rather than discard them, to recycle wastes whenever possible and to safely dispose of wastes as a last resort. In support of this policy, MDEQ has continued efforts in 2015 to promote and grow recycling of solid wastes. Although MDEQ does not currently collect recycling information from local governments or recycling businesses, MDEQ has made an effort to measure the access and availability of recycling services. MDEQ's analysis indicates that close to 60 percent of the state's population has access to local government-sponsored recycling programs for residential recyclables. This percentage represents continued growth in access to community-based recycling programs for the state's population. Approximately half of those having access to recycling are provided curbside recycling services with the remaining half having access to drop-off recycling services. It is also important to note that the 40 percent of the population that does not have access to community based programs may still have access to commercial recycling businesses or non-profit recycling programs for certain recyclable material commodities. The access to recycling for the state's population is continuing to grow as more communities add recycling programs and as communities upgrade and expand existing programs.

In order to grow recycling access in the state, MDEQ has continued its emphasis on cooperative efforts among the state's local governments to collect, process, and market recyclables. MDEQ's efforts have been focused particularly on rural and underserved communities. These cooperative efforts give communities greater opportunity to build sustainable recycling programs. In support of this focus, MDEQ worked with four cooperative projects that were funded in the agency's initial round of Regional Recycling Cooperative Grants.





The grants to the Cities of Greenwood, McComb, Natchez, and Oxford were awarded in 2014 by the agency and the components of the regional projects have been initiated and are currently being implemented. These cooperative grant awards are described in greater detail in the "Grants Section" of this summary.



In addition to the focus on local government programs, MDEQ works with various partners to provide education and outreach on the importance of growing recycling in Mississippi. The MDEQ Solid Waste and Recycling Program provides educational and technical assistance to these groups to increase the awareness and the importance of recycling and solid waste reduction measures. One of the key partners that MDEQ works with is the Mississippi Recycling Coalition (MRC). MRC is a non-profit consortium of local governments, state agencies, industries, institutions, businesses, trade organizations, and non-profit groups working together to promote and grow recycling. MDEQ provides key assistance to MRC promoting and managing membership, hosting board meetings, managing the organization's website, developing and assisting with conferences, press releases and MRC programs involving student scholarships, school grants, and awards programs. Other partners include the Mississippi Municipal League, the Mississippi Manufacturers Association, Keep Mississippi Beautiful, Mississippi State University Extension Service, the Jackson Metro Chamber Partnership, the Southeast Recycling Development Council and various other state and local organizations and agencies.

### **C. Solid Waste and Recycling Outreach Efforts**

The Solid Waste and Recycling Programs conduct a variety of outreach efforts throughout the year on various aspects of proper solid waste management and waste reduction and recycling. For example, MDEQ conducts site assistance visits, gives presentations to organizations and schools, and provides recycling and solid waste information via exhibits at various events. MDEQ staff visit K-12 schools, college and university programs, state agency programs, government organizations, community groups, industry group and associations, businesses and commercial recycling companies. The outreach activities that MDEQ's Solid Waste Management and Recycling Programs participated in for 2015 are as follows:

- In January, MDEQ attended the EPA Region 4 Solid Waste and Recycling Manager's Meeting in Atlanta. The meeting focused on a number of state, regional and national issues related to solid waste management including the new Coal Combustion Residuals Regulations, integration of sustainable materials management into state and local solid waste planning, disaster debris management, measurement of recycling and a host of other solid waste regulatory and assistance issues. This meeting, while not a typical outreach event, is a key meeting for MDEQ staff. Staff gains ideas and information from other states and EPA, and uses the information to help in the development of outreach goals.
- In March, MDEQ also joined the MRC to promote Recycling Awareness Day to the state's elected leadership at the State Capitol. "Recyclers of the Year" were recognized in categories for local governments, educational institutions, business and industry, non-profits and state and federal agencies. MDEQ staff also promoted recycling at the Kids in the Woods Event in March sponsored at the Mississippi Museum of Natural Science by the US Forest Service and the Jackson Public Schools. MDEQ also sponsored an exhibit at the Air Show at Keesler Air Force Base in March to promote recycling and composting.
- In April, MDEQ staff joined the International Society of Sustainability Professionals for the inaugural Earth Month Conference in Memphis, including the states of Arkansas, Mississippi and Tennessee. MDEQ also participated in and supported the Keep the Reservoir Beautiful's Recycling Fashion Show where participants modelled outfits made from recycled materials. In addition, MDEQ participated in the Earth Day Fairs at the University of Southern Mississippi and at Mississippi State University to promote the benefits of recycling and composting.



MDEQ also helped to sponsor the Spring E-Waste Collection Event for small businesses in cooperation with the Jackson Metro Chamber Partnership and Keep Jackson Beautiful. Finally, MDEQ participated in the Neshoba County Soil and Water Conservation District "Conservation Carnival" in Philadelphia talking to the fifth grade participants about the importance of proper waste management and recycling.

- In May, MDEQ addressed the state SWANA Conference in Biloxi providing a presentation on updated solid waste and recycling regulatory and assistance programs and also addressed the conference with an update on electronics waste management issues. MDEQ also participated in the Mississippi State Department of Health's "Empowering Communities for a Healthy Mississippi" conference. MDEQ helped conduct a workshop for community representatives attending the conference on a "Holistic Approach to Disaster Resilience."
- In June, MDEQ attended planning and support meetings for Jackson State University's recycling task force that was working to expand and establish recycling at the university's complex at the Jackson Medical Mall. MDEQ also participated in the City of Jackson's environmental camp for elementary aged children promoting recycling and composting for the camp's attendees. MDEQ also promoted recycling and proper waste management at the State Employees Day at the Farmers Market in Jackson.
- In August, MDEQ participated in a meeting of the Oak Grove Upper Elementary "Garden Club" held in Hattiesburg speaking on the benefits of composting and proper waste management.
- In September, MDEQ staff spoke to a meeting of the "Venture Club" at Brandon Elementary on the value and benefits of composting solid wastes.
- In October, MDEQ participated in the Madison County Soil and Water Conservation District's Conservation Day, providing a presentation and exhibit to students on the importance of recycling in their community. MDEQ led a panel on solid waste recycling at a workshop at Delta State University for municipalities in the Mississippi Delta, sponsored by the MDEQ Community Engagement/Small Business Assistance Program. MDEQ also addressed the fall meeting of the state SWANA Chapter addressing the management of biosolids and benefits of the reuse of these materials as soil amendments in the state.
- MDEQ also assisted in sponsoring the MRC's State Recycling Conference held at the Bancorp South Conference Center in Tupelo on October 27 and 28. This statewide recycling meeting was attended by over 80 participants. The conference included sessions on initiatives being conducted in the state, region, and nation to support recycling; reports from the regional recycling cooperative grant recipient communities; updates on regulation changes, electronics waste recycling, and household hazardous waste programs; and information on using transfer stations and existing convenience stations to help with the transportation of recyclables to material recovery facilities.
- In November, MDEQ staff participated in the National Food Waste Summit sponsored by the Southeast Recycling Development Council and the EPA focusing on ways to reduce food waste, donate usable food, and compost or otherwise derive beneficial products from food wastes. MDEQ also participated in the fall "Kids in the Woods" event sponsored by the U.S. Forest Service and the Jackson Public Schools. MDEQ promoted the importance of recycling with the elementary students attending the event from numerous schools in the Jackson Public School District.

#### **D. Solid Waste Training and Certification Programs**

The MDEQ Solid Waste Program administers training and certification programs for solid waste professionals. MDEQ partners with the state and national chapters of the Solid Waste Association of North America (SWANA) to provide training and certification to municipal solid waste landfill operators.

MDEQ worked with SWANA to help sponsor training opportunities at state conferences in May and October. In 2015, there were 33 active certified commercial landfill operators in the state. Over the past year, MDEQ did not receive any applications for new certifications and processed five renewal certifications for operators and provided continuing education training in partnership with the state SWANA Chapter's Spring and Fall Conferences in Biloxi and Natchez, respectively.



In addition, MDEQ hosted the agency's training class and examination session for Class I rubbish site operators at two separate events in February 2015 and December 2015. Both events were held in Jackson with well over 60 attendees at both events. In 2015, there were 123 active certified Class I rubbish site operators in the state. This past year, MDEQ issued certificates from the training and testing events for 13 new Class I rubbish site operators and issued 11 renewals for existing Class I rubbish site operators. MDEQ also worked with the state SWANA chapter to provide CEU training opportunities through the state SWANA Chapter's spring and fall Conferences.

MDEQ did not host a specific training class this year for Local Solid Waste Enforcement Officers. This class is normally offered every other year and has been scheduled for early 2016. However, MDEQ did provide training to an organizational meeting of the Mississippi Code Enforcement Officers Association. The training addressed issues ranging from laws and regulations on illegal dumping, open burning, hazardous materials management, asbestos requirements, and a variety of other topics.

### E. enHance Recognition Program

In its seventh year, enHance currently has 35 members, representing top environmental performers throughout the state. The objective of this program is to recognize those that go beyond compliance and to promote energy efficiency efforts, provide networking and training resources for pollution prevention (P2), and encourage the use of environmental management systems and continuous improvement.

Members have implemented projects resulting in 1.1 million tons of solid waste being diverted from landfills through recycling, reuse or reduction, 2,730 tons of air emissions eliminated, and 75,800 MMBtu of energy use reduced. This has been done through changes in operating procedures, redesign of products or packaging, beneficial reuse of materials, and installation of more efficient equipment, recycling, and other similar alternatives.

The annual training workshop and luncheon was held in April 16, 2015, to recognize new members and provide environmental training and networking opportunities. This year's workshop was "Learn, Lead, Network, Profit: Sustainability through Compliance & Beyond." Presentations included: *What's New in Air, Handling Hazardous Waste-Avoiding the Top 10 Mistakes, Update on Beneficial Uses for Solid Wastes and Using MDEQ's Website For Resources and Reporting, Case studies (Plymouth Tube's Manufacturing Excellence Program, E3 in Action-Profiting from the Economy-Energy-Environment Program-Cooper Tire, Implementing a Successful Sustainability Program: The Baxter Experience), Energy Efficiency Trends for Commercial and Industrial Sectors and Toward Zero Landfilled Waste-Viable Options in Mississippi.*



### F. Energy Efficiency and Energy Star



Energy Star outlines a seven step continuous improvement process to improve the energy performance of buildings. MDEQ's Pollution Prevention program continues to work with state office buildings, schools, and hospitals to benchmark energy usage and develop a plan to reduce energy consumption.

Energy use in the MDEQ main office buildings has been reduced by 50 percent in five years, saving hundreds of thousands of dollars in annual utility cost. Additional state office buildings are evaluating opportunities with the Energy Star Portfolio Manager benchmarking tool. Technical assistance tools, geared toward these target groups, are being developed to assist with energy efficiency project implementation. MDEQ's efforts were recognized by the Mississippi Development Authority and Mississippi Department of Finance and Administration.

Nineteen of twenty-seven Rankin County schools were awarded the Energy Star Label. In 2013 to 2014 and a portion of 2015, the Rankin County School District showed a savings of \$378,379 even with the addition of more students and portable classrooms.



## **G. Pollution Prevention**

The purpose of MDEQ's Pollution Prevention Program within the Environmental Permits Division is to:

- Provide pollution prevention information and technical assistance to local government officials, federal officials, industrial officials, consulting engineers, and system operators on hazardous and non-hazardous waste management and pollution prevention practices.
- Review, manage, and monitor the waste minimization plans, annual waste minimization certified reports, and the EPA/ Mississippi Pollution Prevention Grant (P2G).
- Coordinate and partner with both states and the federal government and non-governmental entities to promote effective pollution prevention practices.
- During FY 2015, the MDEQ Pollution Prevention Program accomplished the following program elements:
  - Three Pollution Prevention (P2) enHance site visits and three Economy, Energy, and Environment (E3) multi-day sustainability audits coordinated with multiple agencies.
  - Three E3 Workshops.
  - Two training workshops on energy efficiency best practices.
  - Three webinars (one lighting, and two energy efficiency).
  - Reviewed and monitored 198 annual waste minimization certified reports; eight P2 plans approved.
  - Met all conditions of the P2G.
  - One recycling site visit, three workshops, and eight presentations were conducted on environmental issues.
  - Processed applicants for the new class of members in the enHance Program.

## **H. Drillers Licensing**

The testing and licensing of water well drillers are managed and maintained through the Office of Land and Water Resources. Applications for licenses are received followed by verification that applicants meet basic requirements through testing in accordance with state law and regulations are performed. These measures ensure that current license holders are in compliance with regulations. During FY2015 the Drillers Licensing Program issued or renewed 265 licenses for drillers or pump installers; data for all water wells drilled in the state were input into a database management system; program personnel taught a continuing education course regarding Mississippi drilling laws and regulations at the Mississippi Water Well Contractors Association conferences, and also a course on the campus of Southwest Mississippi Community College.

## **I. Office of Community Engagement**

In November 2014, the Mississippi Small Business Environmental Assistance Program (SBEAP) merged into the Office of Community Engagement (OCE). By combining these functions, the Office of Community Engagement can increase efforts to sustain and strengthen MDEQ's relationship with communities, including small businesses through technical assistance, outreach, education, and advocacy.

The goals of the Office of Community Engagement are to: (1) Serve as the liaison for MDEQ to communities; (2) Develop outreach strategies that enhance information flow; and (3) Respond to requests for technical assistance from small businesses.

The OCE Environmental Justice staff works to address the needs and concerns of communities through partnerships with community groups, nonprofit organizations, industries, local, state, and federal agencies. The mission is to be transparent, providing opportunities for public participation in regulatory processes, and serving as a resource for communities addressing environmental challenges.

Throughout 2015, the OCE EJ program performed numerous outreach efforts that continued to strengthen MDEQ's connection to communities. The Small Business Environmental Assistance Program (SBEAP) provides education and assistance to small businesses and municipalities to ensure understanding and compliance with environmental laws and regulations. The SBEAP 2015 activities include over 30 technical assistance requests, 15 technical assistance visits, and over 1,500 general assistance calls.

### OCE Environmental Justice Project Highlights

- **Hercules or Ashland, Inc. (Hattiesburg)**— Local officials and community members were informed of current and planned environmental work at the site through public meetings. In addition, fact sheets were distributed to educate the public on progress and inform residents of additional steps that would be taken. The fact sheets addressed the decommissioning of and removal of sludge from the impoundment basins and other tanks, removal of contamination in a shallow groundwater well, installation of a permanent groundwater monitoring well, and dismantling and salvaging of old buildings.
- **Kerr-McGee Chemical Corp or Tronox (Columbus)**— MDEQ continued to encourage stronger community participation to address mitigation of the 14<sup>th</sup> Street drainage ditch that was contaminated during operations of Kerr-McGee. Throughout 2015, OCE EJ participated in monthly Memphis Town Community Advisory Group meetings to discuss ditch improvements, health concerns, and provisions for training the community in worksite cleanup. The 14<sup>th</sup> Street ditch improvement began in late 2014 with excavating contaminated soil and replacing it with clean soil. The improvements to the drainage ditch were completed in July 2015, and enhanced storm water capacity and safety. On July 19, 2015, a ribbon cutting ceremony was held to celebrate the improvements and reopening of the ditch.
- **Turkey Creek (Gulfport)**— The Turkey Creek Watershed includes two historic African American communities that work as partners - the Turkey Creek Community and the North Gulfport Community. Both were settled by emancipated African Americans shortly after the Civil War. MDEQ continues to address concerns raised by the community in Turkey Creek through all of its programs. This project is holistic in that there are concerns that range from water, air, wetlands, and environmental justice.

### OCE Small Business Assistance Project Highlights:

- **Empowering Childcare Centers for A Healthy Mississippi Workshops**— In May 2015, a free workshop for childcare facility owners and operators was developed and held as the direct result of assistance requests from multiple daycare centers using septic tanks or aerobic treatment units. The workshop helped facility owners learn how create safer, healthier environments for children to learn and grow.
- **Mississippi Municipal Environmental Education Workshop**—In May 2015, a Municipal Needs Assessment was developed by OCE staff to identify areas of municipal environmental challenges. Based on the results of the assessment and the number of requests received by the SBEAP for technical assistance, a workshop to provide guidance on compliance issues that affect municipalities, environmental responsibilities of local government in water system management, and funding opportunities for properties reuse was developed and held at Delta State University.



## Internal/External Training

OCE promotes interagency collaboration to ensure that environmental justice principles are integrated into the agency's work processes.

- **The Basics Of Environmental Justice Workshop 2015**

OCE provided agency-wide EJ training to equip staff with knowledge and understanding of EJ communities. This course provided an overview of the history and origins of environmental justice. Participants learned the history of the agency's approach to addressing environmental justice and examined case studies of historical environmental issues across the state.

- **EPA Community Involvement Conference 2015**

OCE Director along with other Region 4 State EJ Coordinators developed and presented *Where Do I Begin? Engaging in the State I'm In* at EPA's Community Involvement Conference in Atlanta. The presentation focused on enhancing community organization's knowledge of existing environmental laws and understanding the permitting process.

### Mississippi Environmental Justice Workshop

This workshop, sponsored by the EPA Gulf of Mexico Program, MDEQ, and Oxfam America, and was held on September 26, 2015, in Gulfport, provided a forum for capacity building and resource sharing relative to promoting just environmental practices and improving conditions in vulnerable communities. The theme, *Encouraging Just Practices in Vulnerable Communities*, is critical to understanding and addressing issues preventing just practices in vulnerable communities and determining a path forward.

### Mississippi State Department of Health Conference 2015

MDEQ partnered with the Mississippi State Department of Health to host the 7<sup>th</sup> Annual *Empowering Communities for a Healthy Mississippi Conference*. Communities around the State of Mississippi are faced with the threat of natural hazards and disasters on a daily basis. The impacts are severe and widespread: extensive loss of life, particularly among vulnerable communities; economic losses, destruction of the built and natural environment, and extensive disruption to local entities and livelihoods.

### Working with Partners

Recognizing the environmental challenges of communities across the state, OCE EJ staff provided assistance to the Mississippi Conference of Black Mayors (MCBM) in their *Regional Approaches to Environmental Justice* initiative. Through this initiative, MDEQ provided recommendations on engaging community members, facilitated discussions in Yazoo City, Itta Bena, and Durant, provided one-on-one and group discussions with community members and elected officials on partnerships, available financial resources, and technical support opportunities to address and develop solutions to the challenges affecting their communities.

Throughout the year, OCE EJ staff supported Itta Bena, Clarksdale, and Canton in their environmental justice and smart growth approaches in helping communities to reach sustainable futures. The initiatives are components of the EPA's Local Foods and Local Place and Infill Development technical assistances grants.





## J. Rezonate

In an continuing effort to leverage resources and to promote the message of protecting and restoring the Reservoir, *Rezonate*, through MDEQ, has sponsored and helped facilitate several events in and around the Ross Barnett Reservoir. *Rezonate* was a major sponsor for the Project Rezway Recycle Fashion show that took place on April 23, 2015, at the Mississippi Craft Center in Ridgeland. The show featured apparel and accessories composed of at least 75 percent recycled materials. Keep the Rez Beautiful hosts this event annually with the aim of raising awareness of the importance of recycling and shows how commonly discarded items can be put to use again instead of littering the environment. Other major sponsors included MDEQ, Kathryn's Steakhouse, Waste Management, Barnett Reservoir Foundation, Mississippi Department of Transportation, Keep Mississippi Beautiful, and PRVWSD.



The PRVWSD and the Barnett Reservoir Foundation hosted its fourth Annual Independence Day Celebration in conjunction with the ninth annual WaterFest event hosted by MDEQ simultaneously at Old Trace and Lakeshore Parks in Madison and Rankin counties. This year's event was part of the 50<sup>th</sup> anniversary celebration of the Ross Barnett Reservoir, which was first impounded in 1965. WaterFest, the signature event for *Rezonate*, is an annual event that spotlights the importance of protecting, restoring, and improving the water quality of the Reservoir. Event activities included educational exhibits, kid zones, water slides, interactive displays, live music, food vendors, face-painting, static military displays, balloon artists, a caricature artist, and a free photo booth. An estimated 5,000 people attended the dual event.

The fifth annual Gator Bait Kayak Race, a 5.5 mile race for competitive and recreational kayakers, canoeists, and stand up paddlers, is another event sponsored through the *Rezonate* initiative. The event was held at Pelahatchie Shore Park (September 19, 2015) on the Ross Barnett Reservoir. This successful event raised awareness about the water quality of the Reservoir and the need to protect it through conservation education and litter control. The second annual Gator Bait Hatchling Race was held at Lakeshore Park, and its goal is to introduce kids to the sport of kayaking, foster a love for the outdoors, and instill a desire to protect the environment for generations to come. Other partners that contributed to these events were the Pearl River Valley Water Supply District, Mississippi Wildlife Federation, Keep the Reservoir Beautiful, Academy Sports and Outdoors, Barnett Reservoir Foundation, Mississippi Museum of Natural Science, Pearl River Kayaks, YMCA, and Service Printers.

*Rezonate* also partnered with the Summer Library Programs in Hinds, Madison and Rankin counties to teach students about the importance of protecting drinking water sources especially in the Ross Barnett Reservoir watershed. Over 500 students and parents were reached through this effort.



## K. Nonpoint Source Education and Outreach

The primary objective of the Nonpoint Source (NPS) Educational Program is to increase public awareness of NPS pollution and to induce behavior changes that will reduce NPS pollution impacts.

### • Environmental Teacher Workshops

Teacher workshops are a major environmental education component of MDEQ's NPS education program each year. During calendar year 2015, 52 teacher workshops were held in all regions of Mississippi with approximately 1,000 educators participating. The teacher workshops included interactive classroom activities and field trips with some of the best environmental and natural resource speakers in Mississippi instructing the teachers and environmental educators. About half of this work was carried out through the *Project Learning Tree* workshop and curriculum with the help of a program coordinator and facilitators. The work included 23 workshops for 477 educators with most of the workshops being held at seven Mississippi universities and community colleges. Other workshops were held at various venues in counties throughout the state. These workshops included sessions on water quality, NPS pollution prevention, green infrastructure, low-impact development, water chemistry, macro-invertebrates, and hands-on water-related activities.



### • Train-the-Trainer Workshops and Decision-Maker Workshop

Three Train-the-Trainer workshops that included new teaching modules were held for 60 participants statewide. One workshop was held specifically for 25 decision-makers such as local supervisors and commissioners. These teaching modules included interactive environmental lesson plans for teachers and students and consisted of written lesson plans, a video on how to conduct the lessons, and supplies and equipment to carry out the lessons. Project coordinators presented the teaching-modules to Soil and Water Conservation District Clerks, Earth Team volunteers, and others so they can use them for classroom presentations, in-service teacher training, and conservation-field days.

### • Adopt-A-Stream

Adopt-A-Stream is an environmental education training program for adults and students that focuses primarily on aquatic ecosystems and the effects of NPS pollution on water quality. During 2015, a two day workshop and nine one day workshops were conducted. A total of 191 adults were taught water-quality subjects. These workshops were conducted in the major watershed basins of Mississippi such as Yazoo River, Tombigbee River, Pascagoula River, the Big Black River, and the Coastal Streams. The coordinator for Adopt-A-Stream, through a subgrant that MDEQ has with the Mississippi Wildlife Federation (MWF) provided other water-quality training in 2015. This training included: 1) educating citizens about water-quality issues and solutions in their own local watersheds; 2) conducting Envirothon team training on aquatic subjects in 18 high-schools; 3) presenting 24 aquatic-ecology programs in classrooms; 4) leading one stream clean-up and one storm-drain marking project and; 5) reaching over 3,000 people through large-venue events, teacher-workshop training sessions, summer environmental camps, and setting up displays at conferences and similar events.





- **Envirothon Competition**

The Envirothon High School Competition tests student knowledge about water, soils, forestry, wildlife, and current environmental issues each year. The focus in 2015 was “Urban Forestry and Green Infrastructure.” The competition measures success by student-oral presentations made to a panel of judges where each team applies their knowledge and field experiences to a real-life environmental problem or situation as well as by written and field tests on each of the five topics. The Mississippi competition is sponsored by MDEQ’s NPS Program and the Mississippi Association of Conservation Districts and is coordinated by the Mississippi Soil and Water Conservation Commission. In 2015, there were 335 high-school students (67 teams) and their advisors who participated in four area competitions. A total of about 110 students (22 teams) participated at the state-level competition which was held at Roosevelt State Park on May 1, 2015. The Oxford High School Envirothon Team won the state’s competition and traveled to Missouri State University in Springfield, Missouri to compete in the National Conservation Foundation Envirothon.



The Oxford High School Envirothon Team

- **Make-A-Splash**

Make-A-Splash, a water education event, is held each September at the Mississippi Museum of Natural Science in Jackson where students visit up to 20 water-related interactive booths and guided museum exhibits to learn about polluted runoff, wildlife, water use, groundwater, surface water, macro-invertebrates, etc. At the September 2015 event, eight schools attended with a total of 571 students participating and 45 teachers receiving Continuing Education Units of credit.



- **Student Environmental Day Camps**

During 2015, the NPS program sponsored four one-week summer-camp sessions at the University of Mississippi Center for Water and Wetland Resources where 50 students were trained. These camps train students on environmental topics such as water quality, land use, forestry, wildlife, and NPS pollution. Additionally, NPS presentations were made at eight summer camps and after-school programs.

- **Enviroscape and Groundwater Models**

The Enviroscape and Groundwater Models show how water is affected by and affects the environment that it comes in contact with. These models continue to enhance NPS educational activities and are widely used by organizations all over the state due to their widespread distribution by MDEQ. Hundreds of presentations are made each year by various environmental organizations, natural-resource agencies, and nonprofit organizations that use these models at conservation carnivals, schools, civic clubs, workshops, summer camps, and Earth Day events.



- **Storm Drain Marking**

The Storm Drain Marking Program is a cooperative program between MDEQ and the Mississippi Wildlife Federation (MWF). MDEQ provides MWF funding for this through one of its Section 319 subgrant agreements to promote awareness of the water-quality impacts of polluted runoff in urbanized communities. Small plastic disks are placed by local volunteers on storm drains with the message “No Dumping, Drains to River.” Volunteers glue the markers to storm drains and distribute door hangers to homes. Students and scouts also talk with residents about stormwater runoff and the need to prevent pollutants from entering storm drains. A new “door-knob hanger” was developed during 2015 for neighborhoods that have drainage ditches instead of storm drains.



- **Field Days**

Field days have been arranged as part of the NPS Watershed Demonstration Projects conducted with the USDA Natural Resources Conservation Service, the Mississippi Soil and Water Conservation Commission and various water-management district staff. Additional field trips are included in Teacher Workshops and Adopt-A-Stream Workshops and are a part of the Storm-Drain Marking Program.

## L. Geology Outreach and Education

- **The Fossil Road Show, Mississippi Museum of Natural Science**

The Fossil Road Show was held on March 7, 2015, at the Mississippi Museum of Natural Science. MDEQ’s Office of Geology staff identified fossils for the public.



- **Excavation and preservation of historic log canoe**

James Starnes worked with MDAH and MDWFP staff to excavate and preserve a log carved canoe found on the Pearl River at Monticello in August 27, 2014.



- **Richard Wright Library Children’s Summer Reading Program**  
James Starnes gave a rock and fossil presentation for the Richard Wright Library Children’s Summer Reading Program on June 11, 2015.



- **The Mississippi Gem and Mineral Society Annual Rock Show** The Mississippi Gem and Mineral Society Annual Rock Show was held on February 28 and March 1, 2015, at the Jackson Trade Mart. MDEQ's Office of Geology operated a booth showing the office's geologic work. Staff answered questions from the public.
- **Mississippi Gulf Coast Gem and Mineral Show**  
Staff provided an educational display for the Mississippi Gulf Coast Gem and Mineral Show on November 7 to 9, 2014.
- **St. Richard's Catholic School Third Grade Science Class**  
James Starnes gave a geology presentation to a Third Grade Science Class at St. Richard's Catholic School in Jackson on January 23, 2015.



