

MISSISSIPPI DEPARTMENT OF
ENVIRONMENTAL
QUALITY
2012
ANNUAL REPORT



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STATE OF MISSISSIPPI
PHIL BRYANT, GOVERNOR
MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
TRUDY D. FISHER, EXECUTIVE DIRECTOR

December 31, 2012

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, 2012, and additional information about the agency for calendar year 2012.

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 in spite of the state's revenue challenges. We are proud to be the steward 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 cursive script, reading "Trudy D. Fisher".

Trudy D. Fisher
Executive Director

TDF:jb

cc: Lieutenant Governor Tate Reeves

cc: Members of the Mississippi Legislature

Trudy D. Fisher was reappointed as the Executive Director of the Mississippi Department of Environmental Quality by Governor Phil Bryant in January 2012. Ms. Fisher was first appointed by former Governor Haley Barbour in January 2007, and is the first woman to serve as the agency's director. Prior to returning to MDEQ, she was in private practice where she led an environmental law practice. She had previously served as MDEQ's General Counsel.

As MDEQ Executive Director, she 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. After Hurricane Katrina devastated south Mississippi, under Fisher's leadership, the agency implemented a \$640 million wastewater and water infrastructure program for the Mississippi Gulf Coast region.

In addition to her duties as Executive Director, Fisher serves as Mississippi's Trustee for natural resources under the Oil Pollution Act and is tasked with leading Mississippi's recovery from the Deepwater Horizon oil spill. She is also the State Co-Chair of the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force, Co-Chair of the Governor's Commission on Gulf Coast Restoration, and the former Co-Chair of the Gulf of Mexico Alliance.

Fisher has been repeatedly recognized by her peers as one of the Best Lawyers in America, and the Mississippi Business Journal selected her as one of Mississippi's 50 Leading Business Women for her environmental legal services accomplishments. She is Past President of the Mississippi Bar Section on Natural Resources, Energy and Environmental Law, Past President of the Board of Directors of the Boys and Girls Clubs of Central Mississippi, and is active in other civic and charitable endeavors.

Fisher earned a bachelor of science degree from the Mississippi University for Women and her juris doctor degree from the University of Mississippi School of Law, where she served as editor-in-chief of the Mississippi Law Journal.



Trudy D. Fisher, Executive Director of the Mississippi Department of Environmental Quality

Commission on Environmental Quality

Chair: Martha Dalrymple - 2nd District - Term Ends 6-30-2015

Vice Chair: Chat Phillips - At Large - Terms Ends 6-30-2013

R. B. (Dick) Flowers - 1st District
Term Ends 6-30-2012

W. J. (Billy) VanDevender - At Large
Term Ends 6-30-2012

Jack Winstead - 3rd District - Term Ends 6-30-2016

Kay Kell - 5th District - Term Ends 6-30-2018

Charles Dunagin - 4th District - Term Ends 6-30-2017



Flowers, VanDevender, Dalrymple, Winstead, Kell, Phillips, Dunagin

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.

Values

- ◆ 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 member 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.

AIR QUALITY

Air Quality Standards and Planning

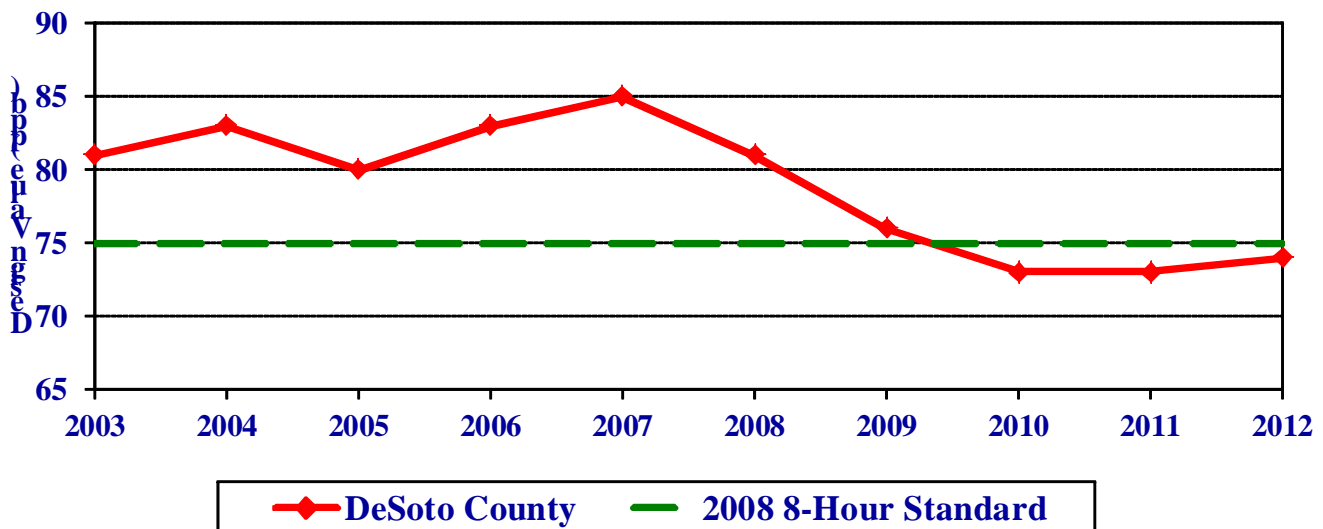
Mississippi has historically met all federal ambient air quality standards. However, new, more stringent federal standards for ground-level ozone, nitrogen dioxide, sulfur dioxide, lead, and visibility recently promulgated by the U.S. Environmental Protection Agency (EPA) are jeopardizing the track record. Increased planning and monitoring efforts will continue for several years because of these changes.

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 84 parts per billion (ppb) in 2004. In 2008, EPA issued a new ozone standard of 75 ppb. Final designations of the standard were made in 2012. All Mississippi counties were again designated as attainment 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. MDEQ submitted a Petition of Reconsideration to EPA and a Petition of Review to the U.S. District Court of Appeals for the District of Columbia in order to attempt to change the DeSoto County designation.

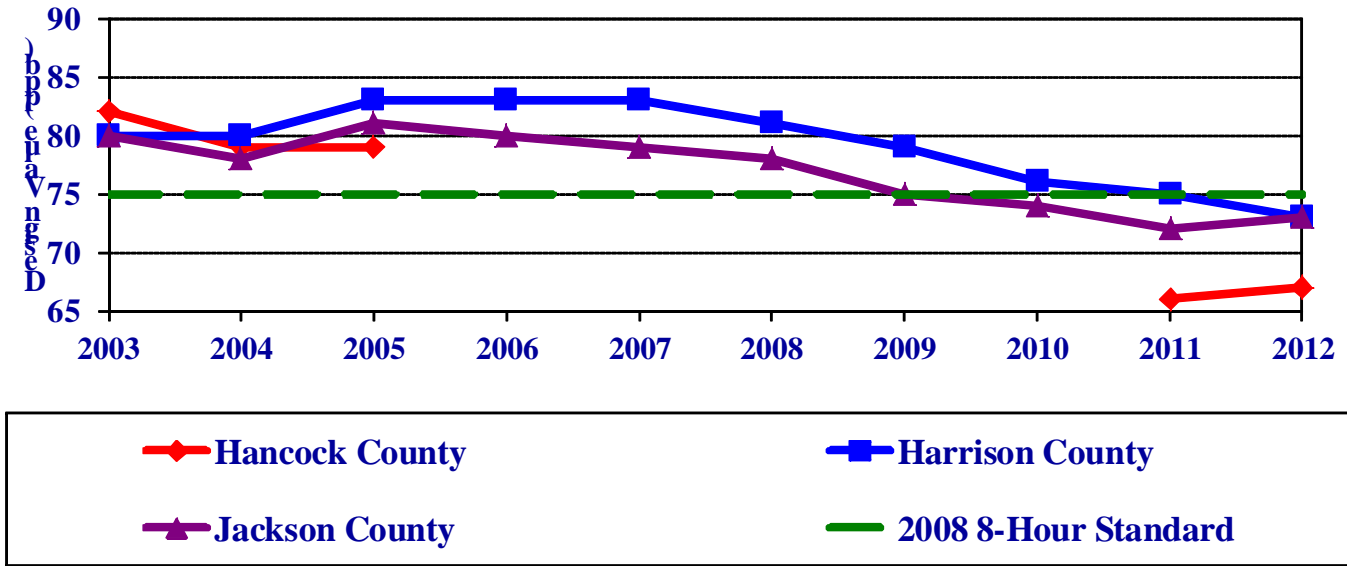
MDEQ is continuing a voluntary ozone precursor air pollution control program in partnership with governmental and business leaders on the Coast and in DeSoto County in efforts to prevent or mitigate future nonattainment.

In 2008, EPA issued new lead standards that required MDEQ to monitor for lead starting in December 2011 to determine if the state will meet the new standards. In addition, EPA has issued new standards for nitrogen dioxide and sulfur dioxide. In 2012, EPA designated all Mississippi counties as attainment with the nitrogen dioxide standards. Sulfur dioxide designations were due by June 2012, but haven't been issued yet. EPA retained the current standards for carbon monoxide. Mississippi is meeting those standards. Mississippi is also meeting the particulate matter standards. Proposed standards for particulate matter will be made in December 2012.

**DeSoto County
Ozone Design Values
2003-2012**



Mississippi Gulf Coast Ozone Design Values 2003-2012



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 as well as the MDEQ web site. 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.



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 several MDEQ staff members are part of, 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. In 2012, the modeling effort has been continuing and preliminary results are expected to be available in 2013.

Air Support Branch

Emission Inventories

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 completed and submitted the 2010 inventory prior to the December 31, 2011 submittal date. Work is currently being done on the calendar year 2011 inventory which is a larger (complete inventory) submittal than most years, and is due December 31, 2012.

The Mississippi Diesel Emissions Reduction Project

The Air Division began the Mississippi School Bus Retrofit Project in the spring of 2009. Utilizing Diesel Emission Reduction (DERA) State Grant funds from EPA's Clean Diesel Campaign and Supplemental Environmental Projects, MDEQ initially planned to retrofit approximately 225 public school buses. With an additional \$1.7 million from the American Recovery and Reinvestment Act (ARRA), MDEQ expanded the project to over 1,900 buses across Mississippi. MDEQ paid for the installation of diesel oxidation catalysts (DOC) on public school buses built from 1998 to 2003. DOCs are an EPA verified technology, built into a new muffler, which use a chemical process to break down pollutants in the exhaust stream into less harmful components. The addition of DOCs can remove up to 40 percent of the PM, 70 percent of the VOC, and 40 percent of the CO from the tailpipe emissions. Installation of the DOCs began in July of 2009. This project was completed in the spring of 2012 and 1,931 buses were successfully retrofitted in 107 school districts. MDEQ was commended by EPA for operating one of the most successful school bus retrofit programs in the nation.



Mississippi Diesel Emissions Reduction Project State Grants

MDEQ used Diesel Emission Reduction (DERA) State Grant funds in 2011 and 2012 to fund competitive sub-grant programs in which entities applied for funding by submitting an application following a request for proposals. Entities proposed diesel emission reduction strategies and were encouraged to provide matching funds for their projects. Eligible projects included engine repowers, engine upgrades, engine replacement, retrofitting of equipment, cleaner fuels, or idle reduction technologies. Eligible entities for this project included universities, private organizations, non-profit organizations, businesses, and any county, city, and other local governments. In 2012, MDEQ received 28 applications requesting nearly one million dollars in funding. MDEQ awarded eight grants for approximately \$200,000. Due to the success of this grant program, MDEQ expects to continue this program with a new DERA State Grant from EPA.

Air Monitoring

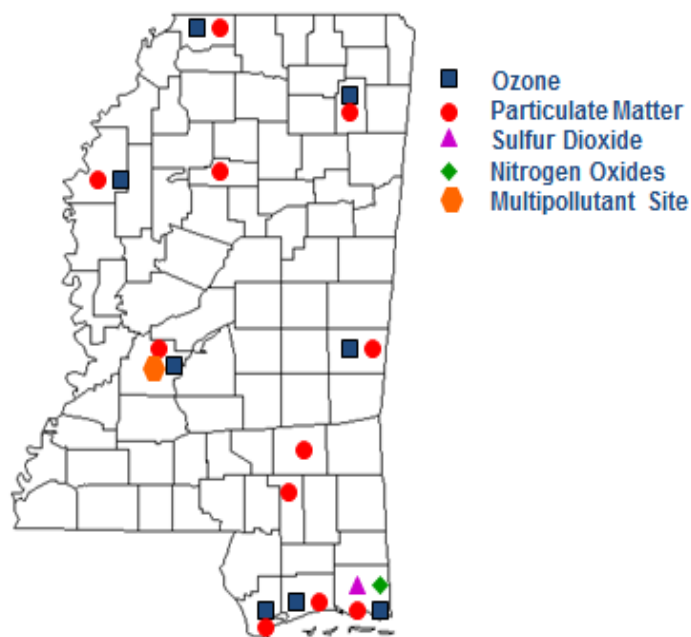
During FY2012, MDEQ operated a network of automated continuous air analyzers and 24-hour manual samplers for the purpose of measuring ambient air levels of ozone, particulate matter, sulfur dioxide, nitrogen dioxide, and carbon monoxide.

This monitoring network serves many purposes including:

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



2012 Mississippi Ambient Air Quality Monitoring Sites



Asbestos

MDEQ implements regulations to protect against the harmful hazardous air pollutant asbestos, which is a known human carcinogen. The regulations apply to most non-residential building demolition and renovation operations and require work practices designed to prevent air emissions of asbestos. Implementation activities primarily involve communicating the requirements of the regulations, educating home owners for safe activity, and inspection of building demolition and renovation projects to assure safe and regulation compliant operations.

Agency regulations also require accredited training of individuals who perform asbestos abatement activities. Individuals must document their qualifications in an application to MDEQ and receive a certificate to perform asbestos abatement activity. MDEQ also works to protect children and employees in schools from unsafe asbestos conditions by performing inspections to ensure that school asbestos management plans and operations conform to the requirements of federal regulations.

During 2012, MDEQ inspected 401 building demolition and renovation projects and investigated 46 complaints. There were also 1358 applicants who received certification to perform asbestos abatement activity and asbestos management plan inspections were performed in 36 school districts.

Air Toxics

Many facilities are regulated for air emissions that may cause acute or chronic health conditions. These hazardous air pollutant (HAP) emissions are primarily controlled or reduced under what is known as maximum achievable control technology (MACT) standards. Facilities typically must install additional control equipment and/or change process equipment or materials in order to reduce HAP emissions and comply with the standards. There are approximately 100 such standards affecting facilities in one of 174 source categories of major sources. Also, for the smaller HAP emission rate facilities, there are another 48 area source standards affecting operations at facilities in one of 70 source categories. MDEQ implements these regulations to approximately 200 major sources and thousands of area sources. The types of affected facilities range from large chemical plants and petroleum refineries to small dry cleaners, gasoline stations, and auto body shops.

Air toxic activities also include the implementation of accidental release prevention regulations. Certain chemicals used by facilities in communities across Mississippi could become very dangerous should there be an uncontrolled release. The regulated facilities are evaluated for appropriate measures to prevent releases and also for their preparedness to minimize the consequences of a release should one accidentally occur. These facilities are required

to have an active risk management program and must submit a summary of that program called a risk management plan (RMP) for MDEQ review. Inspections are also performed to review and monitor facility compliance with the regulations. During 2012, there were 152 active regulated facilities and 34 facility RMP inspections performed.

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 Environmental Permits Division, while all compliance certifications and demonstrations are handled by the Environmental Compliance and Enforcement Division.

The Air Division meets regularly with the 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.

Lead-Based Paint Program

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

- Lead is a heavy metal which is believed to have been a serious public health problem for centuries.
- Dust and debris from activities that disturb lead-based paint can be dangerous if not managed properly.
- 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 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.

In addition to certifying persons and firms engaged in lead-based paint activities, program staff performs audits of training courses and performs inspections of job sites to ensure compliance with the regulations. During the FY 2012, the MDEQ Lead-Based Paint Section performed 13 training course audits, 13 site inspections and certified 546 individuals and firms involved in lead-based activities.



WATER RESOURCES

Total Maximum Daily Load and Modeling Section

The Total Maximum Daily Load (TMDL) is a calculation of the greatest amount of any single pollutant that can assimilate in surface waters while continuing to meet water quality standards. The TMDL also determines how much of the pollutant come from point sources, such as industry and communities, or nonpoint sources, such as storm-water runoff from urban areas or agriculture.

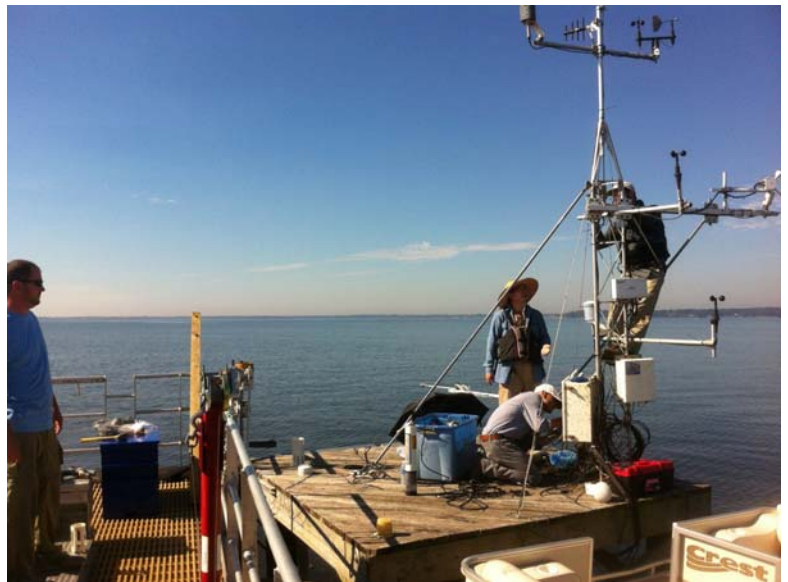
Water bodies that do not meet water-quality standards are identified as "impaired" for the particular pollutants of concern. Under Section 303(d) of the Clean Water Act (CWA), states are required to develop a list of impaired waters needing TMDLs. MDEQ, biennially, creates this 303(d) List of Impaired Waters. MDEQ's 2012 list was adopted by the Mississippi Commission on Environmental Quality on June 28, 2012. In addition, MDEQ completed 16 TMDLs between July 2011 and June 2012.

Partnerships

MDEQ TMDL Staff joined in joint partnerships with other governmental and private entities for improving and maintaining water quality in the State of Mississippi. One partnership involved Georgia Pacific, EPA Region 4, and the LDEQ to develop water quality models of the Pearl River. In June, 2006, EPA Region 4 and MDEQ jointly monitored the Pearl River at several stations in Jackson, Mississippi, downstream of the Ross Barnett Reservoir to gather stream data to create a water quality model for determining the waste load allocation (WLA) for Jackson's Savannah Street POTW. This effort was successful in generating a complete data set for model development in this segment. The WLA as well as two TMDLs were created based on this dataset.

This successful monitoring effort and computer model development generated the idea to build a series of models that link the segments of the Pearl River from the Ross Barnett Reservoir to the water diversion control structure at Walkaih Bluff in south Mississippi. MDEQ, in cooperation with EPA, Georgia Pacific, and LDEQ is creating a series of linked water quality models of the Pearl River Watershed. This summer the Copiah County Segment was monitored by MDEQ and EPA. LDEQ monitored the Pearl River County segment. Georgia Pacific monitored the segment in Lawrence County in 2011. Over the next two to three years, these monitoring efforts will be used to generate the information needed for a comprehensive computer model of the Pearl River.

Another joint partnership that the TMDL staff are involved in is with Jackson State University's Earth Sciences program and Pearl River Valley Water Management District (PRVWMD) to operate a meteorology and water quality monitoring station on the Ross Barnett Reservoir as part of the ongoing work that the Surface Water Division is performing at the Reservoir. JSU and the PRVWMD initially installed the weather station platform as part of a NOAA grant to study the weather impact on the shoreline. MDEQ staff recently installed a long term water quality monitoring instrument which will work with the other monitoring equipment already present to provide information on water quality such as pH levels, chlorophyll, dissolved oxygen concentrations, and temperature. These measurements as well as the weather information from the platform will provide detailed information for future water related models of the reservoir and the Pearl River. This partnership with JSU and PRVWMD leverages the combined resources of all three partners.



Modeling Permit Limits

The TMDL section is working with NPDES Permitted facilities to help with upcoming nutrient criteria, existing nutrient TMDLs, and new oxygen permit limits. These "life changing" limits potentially strain the existing capacity for treatment at many small towns in Mississippi. The TMDL section is working with all of these communities to improve the existing computer models through new survey methods and more intensive monitoring and research, ensuring accuracy in the development of water quality based limits for these facilities.

Fish Tissue Monitoring Program

MDEQ's 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.

Fish tissue monitoring conducted in 2011 determined a decrease in DDT and toxaphene levels in fish tissue in several Mississippi Delta water bodies. As a result of this monitoring, consumption advisories were lifted for Steele Bayou, Bee Lake, Charlie Capps Lake, and Recon Lake in 2012. An advisory for no consumption of buffalo (*Ictiobus* species) on Lake Roebuck was modified to a limited consumption advisory in 2012.



Specific monitoring efforts in 2012 focused on the continued monitoring of state waters for DDT and toxaphene as well as mercury and selenium in fish tissue. Additional sites were monitored for a suite of pesticides and heavy metals of concern. With additional monitoring in the future, the data collected in 2012 will be used to make decisions concerning fish tissue consumption advisories for the water bodies of the State.

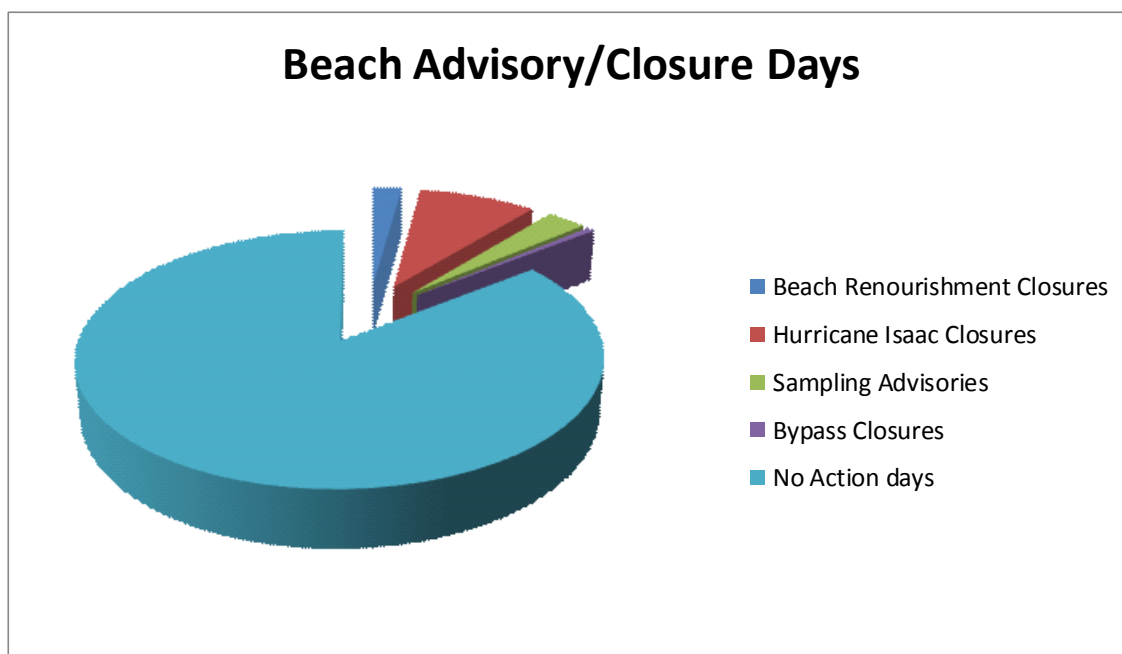
Coastal Beach Monitoring Network

MDEQ's Coastal Beach Monitoring Program, operated in conjunction with the University of Southern Mississippi's Gulf Coast Research Laboratory (GCRL), conducts routine bacteria and water chemistry sampling at 22 beach stations located along Mississippi's Gulf Coast. MDEQ is a partner within the multi-agency Beach Monitoring Task Force composed of the EPA Gulf of Mexico Program, the Mississippi Department of Marine Resources, GCRL, Mississippi Secretary of State Office, and the Mississippi State Department of Health. 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 developed by GCRL that can be accessed on the MDEQ homepage. Information is also available via Facebook, Twitter, or by advisory email notification.

During 2012, a total of 39 advisories were issued for elevated bacteria detected through routine sampling. The average length of advisory was six days. Hancock County beach re-nourishment projects resulted in two sections of beach being closed for an extended period (78 and 98 days). Following Hurricane Isaac, all 22 beaches were closed until debris clean-up was completed and subsequent water quality testing indicated safe swimming conditions. Closures ranged from 15 to 49 days. Sewer leaks/bypasses were the source of six more closures which lasted an average of seven days.

In total, 39 advisories and 31 closures were issued in 2012. The 70 bacteria advisories/closures covered 1,148 beach days or 14.3 percent of the 8,030 beach days available in the year. The MC252 oil spill had no impact on beach advisories during the reporting period.



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. In 2012, MDEQ collected biological data at 80 sites. To date MDEQ has completed twelve phases of M-BISQ monitoring for a total 1,498 biological samples at 1,362 sampling locations. Results from the M-BISQ effort are being used to assess the health of wadeable streams and to steer future biological monitoring and assessment activities. Much of the basis for Mississippi's §305(b) water quality assessment is from data collected and analyzed from the M-BISQ monitoring project. Approximately 100 sites have been scheduled for M-BISQ monitoring in 2013.

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 will be used to develop an index of biological integrity for the Mississippi Delta. In addition, the data collected are 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, a total of 96 sites 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 provided to MDEQ and currently in the review process. The final report should be available in 2013. The effort to develop an index of biological integrity for the Mississippi Alluvial Plain is an ongoing effort with the U.S. Geological Survey.

Ambient Bridge Network

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 three regional offices. Each office is responsible for the stations in its region.

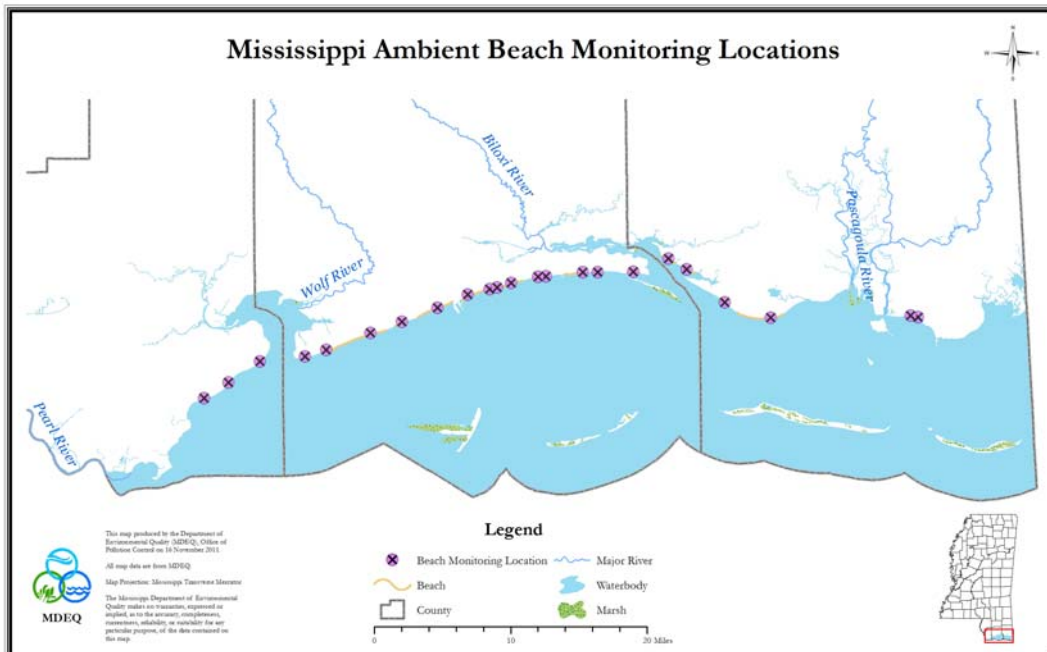
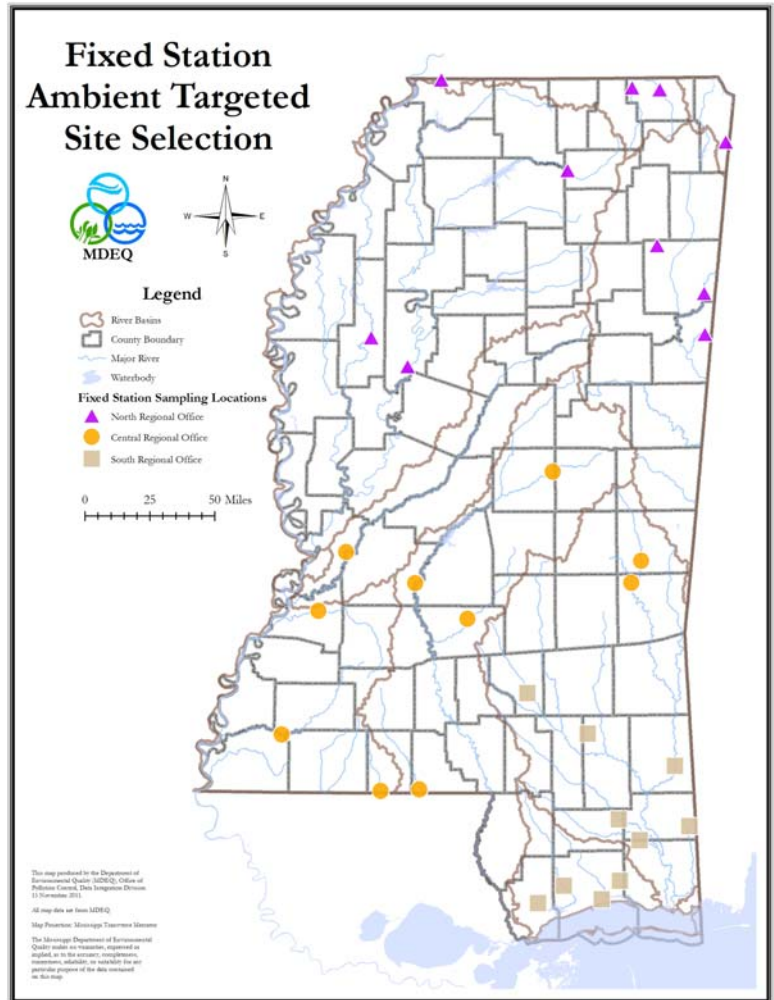
There are currently 10 stations in the north and central regions and 11 in the southern region for a total of 31 stations statewide. In 2012, 31 stations were sampled every month. Laboratory analyses for the samples are carried out by MDEQ's laboratory located in Pearl. Several stations in the sampling network are historical stations that have monitoring dating back to the 1970's.

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 in order 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 2012, 46 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.

Coastal Monitoring

MDEQ participated in the EPA National Coastal Assessment 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, termed 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.

Triennial Review of Water Quality Standards

The Clean Water Act requires all states to develop, review, revise, and adopt water quality standards. States are required to review their water quality standards every three years in a process known as the triennial review. Efforts have been underway to review and revise Mississippi's water quality standards as part of this triennial review process. In 2012, the Mississippi Commission on Environmental Quality adopted the proposed revisions to the Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters. MDEQ is currently working to complete the triennial review package that will be EPA Region 4 for their review.



Mississippi's Numeric Nutrient Criteria Development Activities

In 2012, MDEQ continued development of 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 within 2012 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. The Mississippi Nutrient Technical Advisory Group (TAG) held three meetings in 2012. The 2012 TAG meetings focused on providing continued technical input on developing nutrient criteria for Mississippi's wadeable and non-wadeable streams, lakes and reservoirs, coastal and estuarine waters, and Mississippi Delta waters. MDEQ continues data analyses efforts based on recommendations from the TAG. The Mississippi TAG will continue to meet quarterly throughout the criteria development process to help MDEQ meet the timeline and schedule within Mississippi's Nutrient Criteria Development Plan.
- In 2012, MDEQ held the first Nutrient Criteria Update Session for Mississippi stakeholders. The objectives of the update session were to both provide stakeholders with an update regarding the work MDEQ is performing to develop the criteria as well as 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.
- Mississippi's Nutrient Criteria Development Plan outlines the process and timeline the state intends to follow to numeric nutrient criteria. This plan was mutually agreed upon by the state and EPA in October 2010. Nutrient criteria are being developed based on water body type and are divided into the categories of (1) wadeable streams, (2) non-wadeable streams, (3) Delta waters, (4) lakes and reservoirs, and (5) coastal and estuarine waters. The timeline is mutually agreed upon by EPA and was revised to incorporate results from ongoing efforts within our state. The public comment period will begin by June 30, 2013, for lakes and reservoirs, wadeable streams, non-wadeable streams, and coastal and estuarine waters. The public comment period will begin on November 30, 2014, for Delta waters. MDEQ is currently on track with the timelines in this plan and continues to make progress successfully implementing the plan. All milestones within the Nutrient Criteria Development Plan for 2012 were met.
- MDEQ continues to collect data and conduct studies to support nutrient criteria development. Ongoing activities include development of a benthic index for coastal waters, a benthic index for Delta waters, as well as data collection efforts across the state. MDEQ also continues to implement monitoring and modeling efforts within St. Louis Bay through grant funding awarded to MDEQ by the EPA Gulf of Mexico Program Office. The intensive monitoring portion of this grant was completed in 2011. Data analyses and modeling efforts will be completed for this study in 2013.



The Gulf of Mexico Alliance Nutrients Priority Issue Team: Reducing Nutrients and Nutrient Impacts

Mississippi continues to lead the Nutrients Priority Issue Team (PIT) of the Gulf of Mexico Alliance. The Gulf Alliance is a partnership among the states of Alabama, Florida, Louisiana, Mississippi, and Texas working to address the priority issues related to the ecological health of the Gulf of Mexico. The Nutrients PIT is providing a collaborative approach to building and evaluating tools needed to reduce excess nutrients and restore coastal waters that have been negatively impacted by excess nutrients. The four focus areas for the Nutrients PIT include (1) characterizing nutrients and nutrient impacts, (2) supporting state efforts to develop numeric nutrient criteria, (3) reducing hypoxia, and (4) reducing nutrient inputs to the Gulf of Mexico.



Developing and Implementing Conjunctive Water Management Strategies for the Mississippi Delta through the Delta Sustainable Water Resources Task Force

The future of the Mississippi Delta's economic and environmental viability depends on abundant, accessible water of sufficient quality. Water needs in this region are broad and include personal consumption, irrigation, aquaculture, fisheries and aquatic habitat, wetland function, wildlife, and waste water assimilation. Over 17,000 permitted irrigation wells screened in the shallow Mississippi River Valley Alluvial Aquifer (MRVA) are used for irrigation and aquaculture and pump approximately 1.5 billion gallons of groundwater each day. However, this pumpage demand has exceeded the recharge to the MRVA resulting in continuing overbalances of groundwater withdrawals versus aquifer recharge, notable water-level declines in the aquifer, and development of a regional cone of depression in the central portion of the Delta. Collateral impacts include continued lowering of dry-season stream flows and more incidents of drought-induced dry stream beds. Because of increased yields and profitabilities that irrigation provides over dryland farming, the level of water withdrawal permit applications continues to increase which further complicates this issue.

Fortunately, these challenges are in a region that experiences historically around 53 to 55 inches of rainfall each year, is adjacent to the 1 to 1.5 MM cubic feet/second flow of the Mississippi River, and is downstream from four adjacent major flood control reservoirs. So, although the challenges are significant, opportunities exist for the development of conjunctive water management options and alternative surface water supplies.

Conjunctive water management is the foundation for sustainable Delta water resources. In its simplest context, conjunctive water management is managing the coordinated use of surface and groundwater to satisfy desired water needs such that the total benefits exceed the sum of the benefits that would result from independent management of each water resource.

During December 2011, MDEQ formed the executive level, multi-agency and organization Delta Sustainable Water Resources Task Force. The Task Force's mission is to develop and implement approaches that will result in water resources for agriculture, fisheries, and wildlife in the Mississippi Delta. Office of Land and Water Resources (OLWR) staff lead a multi-agency Task Force work group designed to develop and implement conjunctive water management strategies in the Delta. Core strategies include identification and evaluation of alternative surface water supplies; advancement of irrigation efficiency and conservation practices; understanding historical trends, current status, water use, and water budgets as a management tool; modeling future scenarios for planning and implementation purposes; monitoring and assessing water resources information; and identifying and developing economic incentives and funding sources. Other supporting strategies are also being developed. OLWR staff also lead a Task Force work group that is addressing how to implement a program for producers to measure water used for irrigation and waterfowl management to foster conservation at the farm level. This activity will also provide needed water use information for regional modeling and management uses. OLWR staff also support a third Task Force work group led by a Delta stakeholder organization that is addressing stakeholder awareness, outreach, education, and training needs.

Two projects are currently being planned by OLWR staff to develop information regarding recharge to the MRVA. The goal of one project is to obtain more accurate data concerning the thickness, spatial, and property variabilities of the surficial layer, or topstratum, of the alluvium which is typically comprised of clay and has a profound influence upon recharge to the alluvial aquifer from precipitation. This layer also seems to inhibit the migration of contaminants from the surface of the land into the aquifer. A second project has the goal of collecting water samples from various depths in the topstratum and utilizing tritium or some other isotope in the water as a tracer to calculate the time that the water has been out of contact with the atmosphere, thereby providing estimates of the rate of recharge from the surface at various locations throughout the Delta.

Assessment and Study of Water Resources

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

During 2010 and 2011, water levels were measured in 430 wells that are screened in seven aquifers that are primary sources of water supplies in 21 counties of northeastern and northern Mississippi in an area that extends from Kemper County to the Tennessee border. The information collected in this study was utilized to prepare a potentiometric surface map for each of these aquifers to assist in assessing groundwater availability. These maps were made available to the public in 2012 in electronic format on the MDEQ website.

In 2012, work continued on a project to evaluate the availability of groundwater resources in Lafayette County. Water levels were measured in 51 wells in or near Lafayette County and collection of an additional set of water level measurements is scheduled for 2013. The study of the subsurface hydrogeology of the county began in 2012 utilizing currently available borehole geophysical logs. This effort will continue in 2013, hopefully with additional subsurface information from private sources. The goal of this project is to develop a more complete understanding of the water resources available to the citizens of Lafayette County.

In the spring of 2010, OLWR staff completed work on the development of a numerical groundwater flow model of the Mississippi River Valley Alluvial Aquifer (MRVA) of the Mississippi Delta. The model is used to better understand the groundwater flow system, the potential effects of variations in pumping patterns, and to evaluate various water resources management scenarios. The model will incorporate information developed through the MRVA topstratum and infiltration studies to improve its use as a management tool. Additionally, OLWR staff is expanding its information base on the Tertiary aquifers that also provide recharge to the MRVA. During 2012, significant effort and resources have also gone into enhancing the design and capabilities of the Delta Groundwater Model to support implementation of the Delta Conjunctive Water Management Strategies. A more comprehensive network of observation wells screened in the Cockfield and Sparta aquifers just below the alluvial aquifer is needed. OLWR staff are assessing which existing wells can be incorporated into a network for this purpose and determining the areas in which new monitoring wells should be constructed.

In the southern third of Mississippi, sand beds of the Catahoula, Hattiesburg, Pascagoula, and Graham Ferry Formations form the main aquifers that are primary sources of water supplies. These formations contain numerous interbedded layers of sand and clay. The complexity of these sediments has made it difficult to map the surface geology and delineate the aquifers in the subsurface. The MDEQ Office of Geology and OLWR continued their work in this area to map the surficial geology and construct geologic cross-sections across the area. The objectives of this 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.

In anticipation of an increase in demand for water resources due to recent exploration activities by oil and gas companies, OLWR initiated a study to evaluate ground water resources in Wilkinson and Amite Counties. The purpose of this study is to determine the availability of ground water for use in an oil and gas well completion method known as hydraulic fracturing, and to assess the susceptibility of the fresh water sands to contamination. This work was performed in conjunction with the above-mentioned study of the aquifers of southern Mississippi which provided the foundation for the present work. Maps of the structural elevation of the tops of the Glendon and Moody's Branch Formations and geohydrologic cross-sections detailing the fresh water section in the subsurface have been completed. A map depicting the elevation of the base of fresh water relative to Mean Sea Level is being prepared.



Water Management Associated with Hydraulic Fracturing

In addition to the water resources study in Wilkinson and Amite Counties described in the preceding section, additional OLWR staff has been working to support development of the Tuscaloosa Marine Shale in Southwest Mississippi using hydraulic fracturing technology. Because of the significant volumes of water required for this procedure, the agency worked closely with petroleum companies to meet their water supply needs. Balancing the vast economic potential of the shale play with the effective management and protection of the local water resources is a priority of the agency. A long-term water management strategy for the region is under development that will include the use of alternative water supplies.

Source Water Protection

The OLWR staff continued its efforts to protect the drinking water supplies of the 1,200 public water systems operating in the state as part of activities related to the Source Water Assessment/Protection Program. This program focuses on the proper siting of new wells and addressing potential sources of contamination identified in the vicinity of drinking water supplies. Staff worked closely with the Mississippi State Department of Health's (MSDH) Water Supply Division to assist in the implementation of the EPA's new Groundwater Rule. Staff is also working to identify abandoned public water supply 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 September 2012, 31 wells in 18 counties have been properly plugged and abandoned at a total cost of \$419,794. This coordinated plugging effort is being funded by the MSDH.

OLWR staff built and launched a new educational exhibit at the 2012 Mississippi Gem and Mineral Society show, an event in the Trade Mart attended by thousands of people. The exhibit is called "Meet Your Aquifer" and allows "hands-on" contact with actual samples of the sands, gravel, and rocks that form aquifers in Mississippi from which most people obtain their drinking water.

Mississippi Agricultural Chemical Groundwater Monitoring Program

The Mississippi Agricultural Chemical Groundwater Monitoring (AgChem) Program was initiated in March, 1989, for the purpose of determining if the use of agricultural chemicals is impacting groundwater quality in Mississippi. Thus far, the sampling of over 1,800 wells throughout the state does not indicate any significant impacts directly attributable to agricultural practices.

During the calendar year 2012, 74 samples have been collected from a total of 66 source locations. Included in this total were 51 drinking water samples, and 22 irrigation, fish culture or wild-life management samples and one surface water sample. The program remains committed to testing wells statewide as well as those located in the highly agriculturalized Mississippi Delta. Three samples of the 74 analyzed detected organic compounds in excess of Federal Primary Drinking Water Standards. However, the subsequent resampling of these three wells found no detects of the original organic compounds. Analyses of the other 74 samples performed by the Ag-Chem program did not detect any agricultural chemicals or other organic compounds exceeding Federal Primary Drinking Water Standards and/or State of Mississippi Groundwater Standards. One public supply well reported 5.0 mg/L for Nitrate-Nitrite-Nitrogen. Though below the Federal Primary Drinking Water Standard of 10.0 mg/L, this well may require periodic checking due to the combination of local surface geology and surrounding poultry industry.



In addition to monitoring groundwater for harmful compounds, the AgChem Program actively participates in other programs involved in protecting groundwater in Mississippi. One of these programs is the Mississippi Pesticide Container Recycle Program. During the calendar year 2012, a total of three days have been spent out of the office for field activities related to this program. Although complete amounts are not yet available, it is estimated that a total of over 637,000 pounds of plastic pesticide containers will be recycled during this calendar year.

Another area in which the AgChem Program participates is the Mississippi Waste Pesticide Disposal Program. During the calendar year 2012, two days were spent in field activities related to this program through which a cumulative total of more than 43,662 pounds of waste pesticides were collected.

Dam Safety

The number of High Hazard dams in the state inventory currently stands at 264, while the number of Significant Hazard dams currently stands at 65. The number of Low Hazard dams on state inventory is currently 3,502. Mississippi is fifth in the nation for number of dams on inventory.

During 2011, 201 dams were inspected across the state by the Dam Safety Division. The information produced by these inspections resulted in dam owners initiating repairs or rehabilitation on five dams. The Dam Safety Division also reviews designs for repairs or modifications to existing dams, inspects dams during critical stages of construction and performs critical engineering analyses on dams. In 2012, six High Hazard dam and one Low Hazard dam were authorized for repairs and fourteen new Low Hazard dams were approved for construction. There are now 202 emergency action plans (EAPs) approved and on file, which is an increase of 24 since 2011.

The Dam Safety Division's goal is to have the owners of all High Hazard dams submit EAPs for review and approval. Compliance with this goal presently stands at approximately 77 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.

Staff members responded to five dam emergencies in 2012 (two during Hurricane Issac) and were able to handle each emergency successfully. The Dam Safety Division provides on-site response and technical assistance to the county emergency manager and to the dam owner.

Drillers Licensing

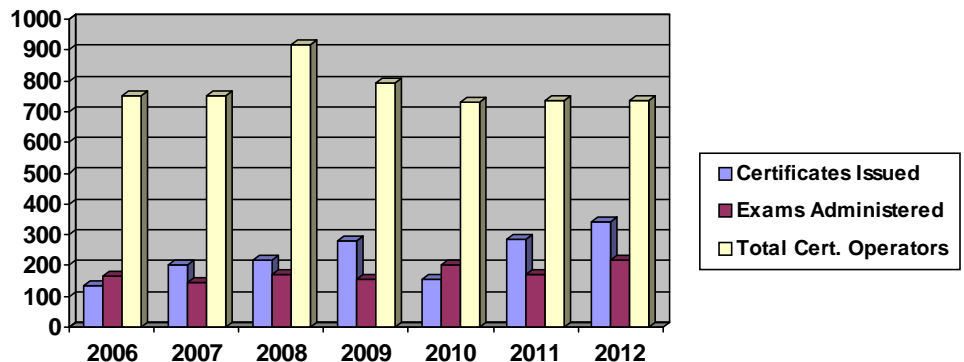
During 2012 the Drillers Licensing Program implemented the oversight of the continuing education program. The Drillers Licensing Program has reviewed and approved six education providers for the continuing education program. All licensed drillers now have to obtain four hours of continuing education per year as a part of maintaining their license. The program has renewed or issued 233 licenses and investigated several complaints.

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 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 2012 training calendar included 42 days of Agency sponsored training classes. Of these training days, 29 were the Agency continuing its relationship by co-sponsoring and participating in training activities with the three wastewater related associations in the state (Mississippi Water and Pollution Control Operator's Association, Mississippi Water Environment Association and Mississippi Rural Water Association). Attendance at agency sponsored sessions totaled 965 operators, utility managers and engineers. Certification exams were administered to 219 prospective operators with a total number of 340 new and renewal certificates issued. There are currently 738 certified pollution control operators in the state.

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 2012, the staff conducted 70 technical assistance and outreach visits.



Basin Management Approach

The mission of the Basin Management Approach is to foster stewardship of Mississippi's water resources through collaborative watershed planning, education, protection and restoration initiatives. To accomplish this, ten of Mississippi's major river basins have been organized into four basin groups (see map insert). Each basin group has a basin team of state and federal agencies, non-governmental organizations, and other stakeholders.

1. Nutrient Reduction Strategies

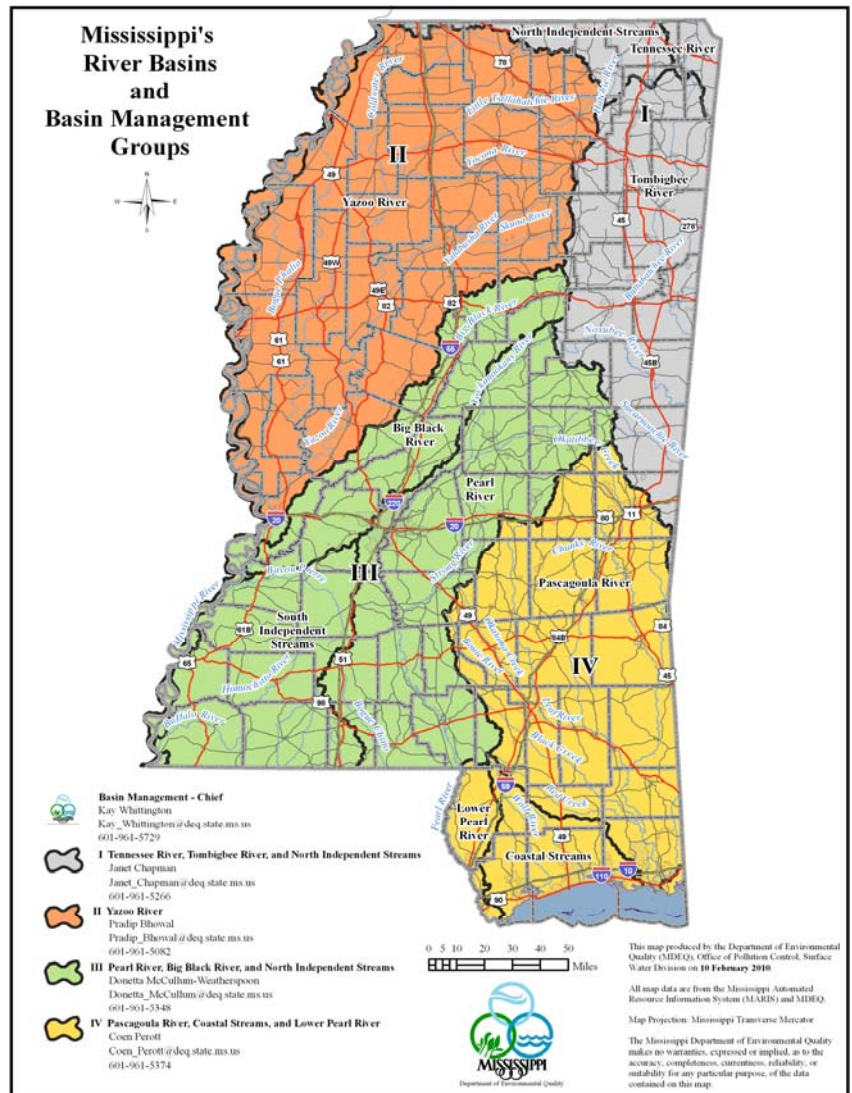
Mississippi's collaborative, leveraged approach to reduce excessive nutrients and their impacts focuses on the development and implementation of appropriate nutrient reduction strategies. During 2009, strategies were developed to reduce excessive nutrient loadings for the Mississippi Delta, the primary region of row-crop agriculture and aquaculture in the state. This effort was co-led by MDEQ and Delta F.A.R.M. (Farmers Advocating Resource Management). During late 2009, MDEQ, working through the Gulf of Mexico Alliance's Nutrients Team, facilitated the development of a common template for Gulf of Mexico States to encourage a consistent, aligned approach to reduce excessive nutrients regionally. This template is now being implemented in Mississippi and Louisiana as both states use it to guide them in developing state-specific nutrient reduction strategies for their coastal watersheds. In Mississippi, this effort is co-led by MDEQ and the Mississippi Department of Marine Resources (MDMR). During September 2010, MDEQ, working through the Hypoxia Task Force, facilitated the development of a common framework for states within the Mississippi/Atchafalaya River Basin to reduce excessive nutrients and mitigate Gulf hypoxia. Additionally, in a similar effort Mississippi also developed nutrient reduction strategies for the upland areas of the state.

In 2012 the Delta, coastal, and uplands strategies were consolidated to establish a comprehensive, state-level, approach to reduce nutrient loadings from nonpoint and point sources, whether in a predominately agricultural environment, areas of higher municipal and industrial uses, or more natural coastal environments.

2. Implementing Nutrient Reduction Strategies and TMDLs in the Mississippi Delta

Seven watersheds have been identified for implementation of the strategies in the Mississippi Delta, which is in Basin Group II. These include three new projects in the Harris Bayou, Porters Bayou, and Coldwater River watersheds, and the expansion of four existing sediment reduction projects in the Bee Lake, Wolf/Broad Lake, Lake Washington, and Steele Bayou watersheds.

Porter Bayou, a tributary of the Big Sunflower River, flows through portions of Bolivar and Sunflower counties. The Porter Bayou project is comprised of: North Project Area (1,000 acres) and South Project Area (2,500 acres). Installation of nutrient reduction BMPs in the north project area was completed in 2011. Installation of BMPs in the south project area was completed during 2012. Installed BMPs include two acre tail-water recovery system, eight acre on-farm storage reservoir; 100 acres land formed; five low grade weirs; 88 water control structures; and 24,156 feet two-stage ditch. Collection of nutrient data for this project is currently ongoing.



Harris Bayou, also a tributary of the Big Sunflower River, flows through portions of Bolivar and Coahoma counties. The Harris Bayou project is comprised of two project areas: Treatment Area (1,700 acres) and Control Area (1,300 acres). Installation of nutrient reduction BMPs in the treatment area was completed during 2012. Installed BMPs include five acre tail-water recovery system, 16.75 acre on-farm storage reservoir; 210 acres land formed; six low grade weirs; 14 water control structures; 10,000 feet two-stage ditch; and 600 feet grass waterway. No BMPs are installed in the control area in order to maintain it as an area for comparison. Also, collection of nutrient data for this project is currently ongoing.

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 the northwestern Mississippi. The Coldwater River project is comprised of three sites. Several nutrient reduction BMPs were installed in these sites during 2012. Installed BMPs include two on-farm storage reservoirs/ tail-water recovery systems; 240 acres land formed; three low grade weirs; 11 water control structures; and 3,000 feet two-stage ditch. Also, collection of nutrient data for this project will begin soon.

Bee Lake is a 1400-acre oxbow lake located in Holmes County. Primary inflow to Bee Lake is through Tchula Lake (a nearby oxbow lake) during high water periods in the spring, and outflow is back through Tchula Lake to the Yazoo River. The Bee Lake phase II project is comprised of one project area (740 acres). Several nutrient reduction BMPs were installed in the project area during 2012. The installed BMPs include three low grade weirs; eight water control structures; and 3,000 feet of two-stage ditch. Also, collection of nutrient data for this project is currently ongoing.

3. Steele Bayou as Success Story for Hypoxia Task Force

In the *Moving Forward on Gulf Hypoxia Annual Report 2011* the Hypoxia Task Force showcases the Steele Bayou watershed project as one of the success stories that documents a reduction in the load of nutrients entering the Mississippi River and the Gulf of Mexico. Steele Bayou was originally impaired by sediment, low dissolved oxygen, organic enrichment, nutrients and legacy pesticides. In the 1990s U.S. Army Corps of Engineers established pre-project conditions from the monitoring stations. In 2005, USACE initiated routine monthly post-project water quality data collection from multiple monitoring stations. Initial post-project monitoring results indicated a large reduction of in-stream total suspended solids that led to continued emphasis on BMP installation and monitoring.

Subsequently, MDEQ implemented a Section 319 restoration project to complement the USACE project. The project addressed major head-cuts, bank stabilization and other major BMPs while the MDEQ project focused on smaller drainages and installing supplemental BMPs to help reduce non-point source pollution from adjacent croplands. To further document water quality improvements in Steele Bayou, the MDEQ, USACE, and USGS implemented a monitoring project. Funded by the USACE and MDEQ, the study documented water quality improvements and the effectiveness of specific BMPs.

Analysis of the post-project monitoring in the Steele Bayou watershed reveals a 42 percent -60 percent reduction in Total Suspended Solids concentrations over the past 15 years and an 8 percent -35 percent reduction in Total Phosphorous concentrations – a significant complementary result of this flood control and sediment reduction project. In addition, this watershed restoration project contributed to removing the Steele Bayou from the Delta Regional Fish Advisory in July 2011. Multiple natural resource agencies, farmers in the Delta, and other partners have worked together with residents to balance the needs of agriculture with protection of our natural resources in the Steele Bayou watershed.

4. Implementing Nutrient Reduction Strategies and TMDLs in the Mississippi Uplands

The Upland Nutrient Reduction Strategy Implementation in the North Independent Streams Basin has been progressing according to schedule. Two watersheds have been selected for installation of BMPs that will reduce nutrient pollution: the Bell-Muddy Creek Watershed in Tippah County and Tarebreeches Creek Watershed in Alcorn County. Installed in the Bell-Muddy watershed are 1,265 feet of stream bank and shoreline protection, three water and sediment control basins, 4 grade stabilization structures, 1,132 feet fencing, 14.5 acres critical area planting, 11 acres of pasture and hayland planting. Tarebreeches Creek watershed has 309 acres pasture and hayland planting two heavy use area protections, and 1 tank/trough installed. More BMP implementation will be accomplished throughout the project period.

USGS has monitoring sites in both of these watersheds to capture the change in runoff due to the installation of these and the remaining BMPs that will be implemented over the course of this project. Monitoring began in February 2012, on both watersheds with sampling for nutrients, sediment, and biological integrity. Sampling is conducted every four weeks at five sites in the Bell-Muddy Creek watershed and four sites in the Tarebreeches watershed.

5. Implementing Nutrient Reduction Strategies and TMDLs on the Mississippi Coast

The Rotten Bayou Watershed Project was developed to implement the 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 Strategy was developed through local workshops with coastal stakeholder input. Livestock, forestry, urban stormwater, and atmospheric deposition were included in the Coastal Nutrient Reduction Strategy.

As part of efforts to recover from the Deepwater Horizon oil spill, USDA's Natural Resources Conservation Service (NRCS) announced the start of an innovative water and wildlife conservation effort along the Gulf Coast, called the Gulf of Mexico Initiative (GoMI). NRCS developed GoMI 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 help 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 Rotten Bayou, NRCS targeted the Rotten Bayou Watershed for their GoMI Project. The Soil and Water Conservation Commission, the Soil and Water Conservation District, and NRCS, have been working with local landowners in the Rotten Bayou Watershed to install agricultural Best Management Practices (BMPs). Some of the available BMPs to landowners in the watershed are Pasture and Hay Planting, Nutrient Management, Tank/ Troughs, Tree and Shrub Establishment, Forest Harvest Trails and Landings, and Vegetative Barriers.

As part of the Rotten Bayou Watershed Project, the Land Trust for the Mississippi Coastal Plain is working with local residents in the watershed to form a watershed team, a technical team, and an education team, to develop a Watershed Implementation Plan.

Also as part of the Rotten Bayou Watershed Project, the Department of Landscape Architecture, at Mississippi State University, is working with the City of Diamondhead to develop Low Impact Development Urban Best Management Practices involving stormwater.

6. Ross Barnett Reservoir

The Ross Barnett Reservoir in Basin Group III is a vital 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. The Environmental Protection Agency has designated this area as a Priority Watershed. The Reservoir welcomes in excess of 2.5 million visitors annually and many consider it the premier recreational water body in Mississippi. Since its development almost 50 years ago, it has provided immeasurable benefits to the local economy. Local communities are continuing to benefit from increased residential and commercial growth, largely attributable to the reservoir.

MDEQ and Pearl River Valley Water Supply District (PRVWSD), along with other partners, have finalized plans to restore and protect water quality within the Reservoir. This initiative, which is known as Rezonate focuses on six priority issues in the watershed: 1) Erosion and sedimentation, 2) Pathogens, 3) Litter/trash in the reservoir and around the shoreline, 4) Nutrients/organic enrichment, 5) Invasive species, and 6) Pesticides.

As part of the Rezonate initiative, a comprehensive watershed protection and restoration plan, a water quality monitoring plan, a source water protection plan (SWPP), a comprehensive education and outreach plan, and a pathogen source assessment and wastewater management plan for the reservoir have been completed.



The watershed protection and restoration plan uses EPA's Nine Key Elements of Watershed Protection to identify potential pollutant sources in the watershed. The plan also recommends a set of conservation measures to address the priority pollutant issues and ensure that these measures are implemented. MDEQ and PRVWSD facilitated the development of these plans through workgroups that utilized technical expertise from various state agencies, local agencies, and local stakeholders.

Recently, through the National Water Quality Initiative (NWQI), Natural Resource Conservation Service (NRCS) along with MDEQ, identified mutually agreed upon watersheds, which were high priority for the installation of targeted BMPs. Three watersheds were selected in Mississippi, one of which was Pelahatchie Creek-Ashlog Creek, a tributary located in the Pearl River/ Reservoir Watershed, and one of the four targeted priority watersheds selected for restoration through the Rezonate comprehensive plans developed for the Reservoir. The other two locations were Porter Bayou (Big Sunflower Watershed) and North Tippah Creek (Tippah River Watershed). These watersheds are considered impaired, and funding through this initiative will reduce the runoff of nutrients and sediments into them. NRCS will continue to coordinate with local and state agencies, conservation districts, nongovernmental organizations and others to implement this initiative. This strategic approach will leverage funds and provide streamlined assistance to help individual agricultural producers take needed actions to reduce the flow of sediment, nutrients and other runoff into impaired waterways.

The Pearl River Valley Water Supply District and the Barnett Reservoir Foundation, a newly formed non-profit 501(c) 3 established to promote the reservoir and surrounding businesses, hosted the first annual Independence Day Celebration on the Ross Barnett Reservoir simultaneously at Old Trace and Lakeshore Parks in Madison and Rankin Counties. Event activities included kid zones, live music, food vendors and static military displays. Patrons of both parks viewed the 1st annual lighted boat parade, and a grand fireworks display which finished the evening. An estimated 5,000 people attended the event.

An Education Outreach Implementation Plan has been developed to meet the educational needs of six specific target audiences that live, work, and recreate in the Ross Barnett Reservoir Watershed. Identification of target audiences will allow MDEQ and co-lead PRVWSD to tailor messages and education materials. Specific goals and objectives for each targeted audience have been designed to reflect each group's interests, and provide opportunities for each audience to take actions to improve water quality. The targeted audiences included in the Education Outreach Plan are:

1. General Public
2. Educators and Students in Area Schools
3. Homeowners Associations
4. Area Civic and Recreational Organizations
5. Decision Makers
6. Land Development Professionals

The goal of implementation of awareness activities through the end of this campaign is to move a percentage of the target audiences through awareness and retention to acceptance. The implementation of behavior change plans, which targets a smaller audience and requires outreach on a more personal level, will focus on attitude change (desire) and behavior change (action). Activities will be selected as funding allows to implement a three year consecutive campaign. The aim of the three year campaign period is to reach the target audiences on a consistent basis to increase awareness.

In 2012 MDEQ entered into a three year Memorandum of Agreement (MOA) with the Pearl River Valley Water Supply District. The purpose of this MOA is to demonstrate techniques to stabilize eroding stream banks, reduce sedimentation and non-point source (NPS) pollution that drains into the Ross Barnett Reservoir Watershed. Due to NPS pollution from sediment and nutrients, primarily as a result of urbanization and recreation, various BMPs that can reduce sediment and peak storm water flow loadings need to be implemented.

This project is funded partly through a U.S. Environmental Protection Agency FY2011 Nonpoint Source Grant which supplies 60 percent of total program funds with the remaining 40 percent of expenditures to be supplied as a state/local match. The funding for this contract shall support BMPs and other work activities agreed upon by the Pearl River Valley Water Supply District and MDEQ.

7. Magees Creek

The Magees Creek watershed project covered approximately 143,000 acres in Walthall, Marion and Lawrence counties. Magees Creek failed to meet water quality standards for its primary contact recreation designated use and was placed on the 303(d) list of impaired waters for pathogens. In addition to pathogens, Magees Creek was also experiencing sediment problems due to soil loss on pasture lands.

In 2003, MDEQ developed a fecal coliform bacteria total maximum daily load (TMDL) for Magees Creek. According for the TMDL to meet the fecal coliform bacteria water quality standard, fecal bacteria loadings to Magees Creek would have to be reduced by 45 percent.

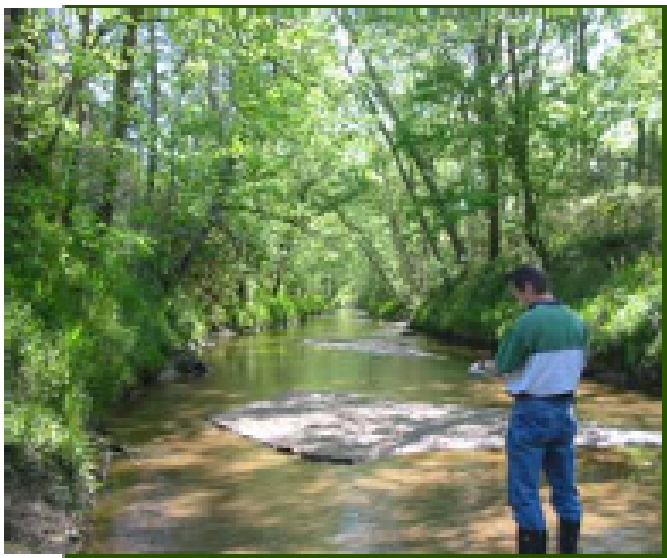
Over the course of the project (2005-2009, the Mississippi Soil and Water Conservation Commission (MSWCC) worked with local landowners to implement approximately 114 BMPs on more than 3,355 acres in the Magees Creek watershed. The agricultural BMPs included implementing nutrient management practices on approximately 2,800 acres of land, planting pasture and hayland on 350 acres, planting trees on approximately 177 acres, and installing approximately 52,000 feet of fencing to exclude livestock from land adjacent to the creek. Landowners also installed sediment control basins, grade stabilization structures, animal waste control facilities and livestock troughs. These efforts helped control fecal coliform bacteria sources in the watershed and reduced sediment loads in the creek by 7,841 tons per year.

The project also provided pollution prevention education and outreach to local stakeholders to increase understanding of restoration efforts to improve water quality in the Magees Creek watershed. MSWCC and its partners wrote articles for the local newspaper, conducted field tours to demonstrate BMPs, installed roadside signs to identify water quality improvement projects, and scheduled regular meetings with community members to educate them about restoration efforts in the watershed. This project was completed in 2009 with the intent of improving water quality by addressing the impairments of fecal coliform bacteria arising from runoff from agricultural areas, wildlife and other nonpoint sources.

Water quality has improved in Magees Creek as a result of BMP installations, and has been removed from the state's list of impaired waters in 2012. It has also been listed by the EPA as a success story.

8. North Tippah Creek

Implementation of this project is currently ongoing (1) to inform/educate the public about the watershed and the things they can do to improve water quality; and (2) to monitor water quality to determine if there is a need for BMPs implementation to reduce nutrients and sediment. North Tippah Creek, a tributary of the Tippah River, flows 220 miles through portions of Coahoma, Desoto, Marshall, Quitman, Tate and Tunica counties in the Northwestern Mississippi. Collection of nutrient data for this project will begin soon.



LAND

Office of Geology

Surface Mining and Reclamation of Surface-Mined 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.

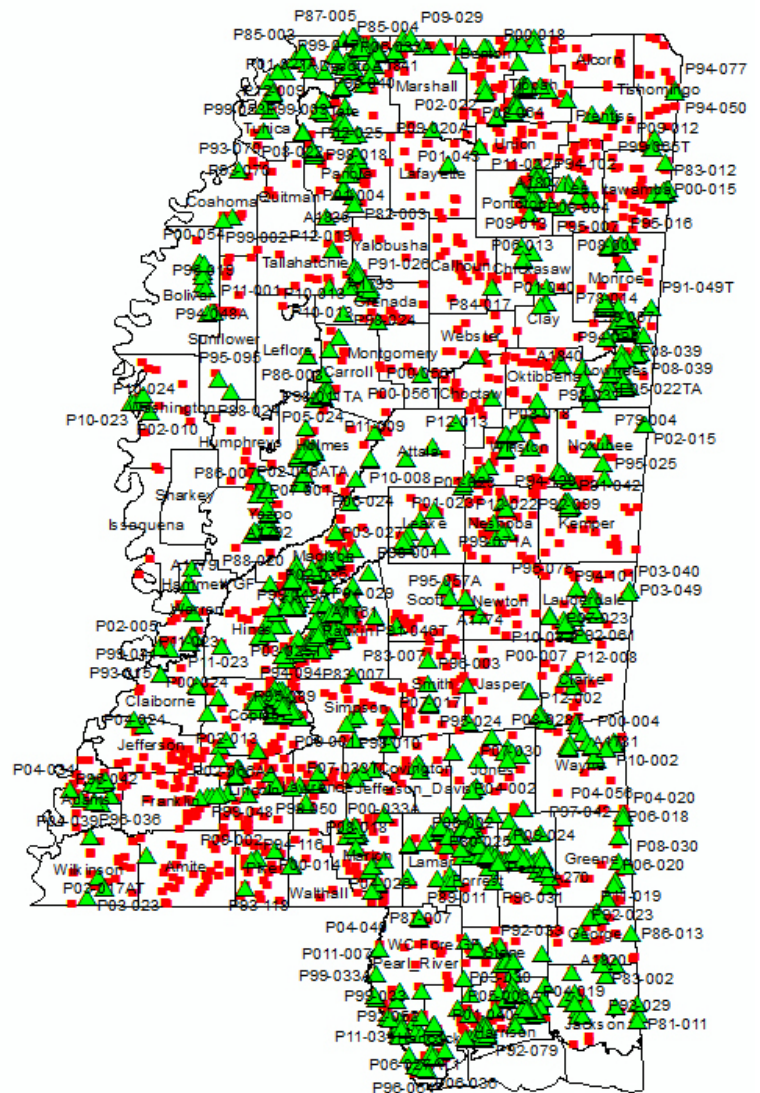
During FY2012, some 812 inspections were performed, 32 permits were issued, and 63 Notices of Exempt Operations (operations less than four acres in size) were issued. A total of 1,682 exempts are on file, covering approximately 6,728 acres, and 1,470 acres were completely reclaimed as a result of the Mining and Reclamation Division's efforts to oversee reclamation. The state currently has 706 permits covering 32,975 acres.

The Mining and Reclamation Division continued to update the mining database to provide data to the MDEM program. This database provides valuable mining information in a GIS format so that mining sites can be located and viewed by anyone on the internet. More work will be done during the coming fiscal year to add new data to the database.

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 FY2012, division staff provided training to 201 miners and 46 contractors working in the mining industry.

Mississippi joined the ranks of the coal-producing states in 2002. The Coal Mining Division was established during FY2007 to focus on the complexities of coal mine regulation. The Mississippi Lignite Mining Company is mining lignite, a low-grade coal, at their Choctaw County Red Hills Mine to supply fuel for an adjacent 440 MW mine-mouth power plant. The mine produces over 3.5 million tons of lignite per year and has permitted 5,904 acres. This permit was initially issued in 1998, and was renewed in February 2008 for its third five-year term. The planned life of the permit is 30 years.

The Liberty Fuels, LLC permit for Mississippi's second lignite mine, which is in southwestern Kemper County, was issued in December 2011. The initial permit is 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 4.1 million tons per year for the planned forty-year life of mine. The life of mine area is planned to be approximately 18,200 acres, in Kemper and Lauderdale counties. The under construction, first-of-its-kind, adjacent power plant is designed to produce 550 MW of electricity and be fueled by gas produced on-site from the lignite.



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 (OSM).

Mississippi's Abandoned Mine Land Program was approved by the OSM in September 2007, with the initial triennial grant approved in October 2007. Work under this program to identify and locate abandoned historic coal mines in Mississippi has been completed. All parts of the state were included in the search for abandoned historic coal mines. Four sites were found, 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 all reclamation work done. These two sites have been determined to be a physical threat to public safety and well-being; none has been determined to have any acid mine drainage or to be an environmental hazard.



Geological Data Collection Activities

The department's geologic mapping program for FY2012 was funded in part by a federal STATEMAP 2011 grant of \$88,372 and an NCRDS grant of \$15,000. Deliverables for the STATEMAP grant include Deemer, House, Union East and Post 7.5-minute geologic quadrangle maps in Neshoba, Kemper, Newton, and Lauderdale counties in east-central Mississippi and the Lanham, Strengthford, Overt, and Rhodes 7.5-minute quadrangles in Jones, Wayne, Forrest, and Greene counties in southeastern Mississippi. These maps were published in color at a scale of 1:24,000 as Open-File Reports OF 248-255. The 2011 STATEMAP deliverables were due at the end of July 2012. Geologic units mapped in east-central Mississippi in FY2011 and 2012 include the Tusahoma, Hatchetigbee, Tallahatta, Winona, Zilpha, and Kosciusko formations of Eocene age, Pleistocene loess and Prairie Formation, and Holocene alluvium and alluvial fan deposits. Geologic units mapped in southeastern Mississippi in FY2011 and 2012 included the Vicksburg Group of Early Oligocene age and the Catahoula and Hattiesburg formations of Miocene age, and Holocene alluvium. Geologic mapping in FY2013 will be funded by the STATEMAP 2012 grant, which was awarded funding of \$85,041. Additional assistance for mapping will come from a federal NCRDS grant of \$15,000. Mapping work for FY2013 will include the Duffee, Collinsville, Chunky, and Meehan 7.5-minute geologic quadrangle maps in Newton and Lauderdale counties in east-central Mississippi and the Terry, Whites, Crystal Springs, and Hopewell 7.5-minute quadrangles in Hinds, Rankin, Copiah, and Simpson counties in south-central Mississippi.



Six test holes were drilled in FY2012, including the (1) #1 Plum Creek Thousand Butterflies in Jones County to a TD of 450 feet, (2) #1 Plum Creek Monarch Road in Jones County to a TD of 460 feet, (3) #1 Plum Creek John Thompson Road in Perry County to a TD of 440 feet, (4) #1 PCL McDonald in Neshoba County to a TD of 500 feet, (5) #1 PCL Crisco Road in Simpson County to a TD of 330 feet, and (6) #1 Plum Creek East Tiger Creek in Wayne County to a TD of 450 feet. Twenty-two papers were published, including 14 articles in *Environmental News*, one article in *Journal of Paleontology*, 3 abstracts in the *Journal of the Mississippi Academy of Sciences*, *Just Geology 2010-2011*, and two abstracts in the 2011 *American Society of Mining and Reclamation, 29th Annual Meeting*.

Proposed work for the STATEMAP 2013 grant includes six geologic quadrangle maps. These are the Meridian South, Vimville, and Whynot quadrangles in Lauderdale County in east-central Mississippi and the Star, Harrisville, and Mendenhall East quadrangles in Rankin and Simpson counties in south central Mississippi.

The Environmental Geology Division gathers, studies, and archives subsurface geological and geophysical data for ongoing 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. In some cases, quality of groundwater is critical and this information is often available through data searches. These requests come from water well contractors, engineering firms, consultants, and private individuals.

MDEQ staff continue to be involved in the eight CUSEC states work in disaster planning regarding the New Madrid Earthquake Zone (NMEZ). Northwest 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.

The Environmental Geology Division's geologist and technicians worked on numerous drilling and sampling programs in the state. Drilling, sampling, and monitor well construction activities were performed for the Surface Geology Division's STATEMAP program and the Office of Land and Water Resources groundwater project in the Mississippi Delta. During FY2012 the division's drill crew drilled a total of six test holes in support of the STATEMAP grant. Two of these holes were drilled in Jones County, and one each in Neshoba, Perry, Simpson, and Wayne counties. Total footage drilled and sampled amounted to 2,660 feet. These cuttings and samples were preserved and archived in the Office's core and sample library. Two test holes and two monitor wells were drilled and completed for the Office of Land and Water Resources for their geologists studying groundwater withdrawal from the Mississippi River Alluvium.

Environmental Geology's geologist and technicians wireline logged a total of 52 test holes in 31 counties throughout the state. Total footage logged was 33,346 feet or approximately 6.32 miles of geophysical wireline data. Stakeholders included 12 water well contractors, one engineering firm, and two state agencies. The shallowest test hole wireline logged during FY2012 was secured in a hole drilled by Garner Houston Well Company to a total depth of 175 feet. This test hole was completed as a high yield (approximately 1800 gallons per minute) irrigation well in DeSoto County. Conversely, the deepest test hole wireline logged was secured in a 2,050 foot hole drilled by Donald Smith Well Company, Inc., (Richland, Mississippi) for the North Hinds Water Association in Hinds County. The vast majority of the wells and test holes wireline logged during FY2012 were for utility systems, industrial applications, and poultry wells. Twelve wells were for private individuals.

The Environmental Geology Division's technicians pulled, shipped and re-filed samples and cores for 23 scientists in other state agencies and oil and gas explorationists. A total of 338 boxes of cores and samples from 159 wells were examined during FY2012. Sample splits were done on 48 wells totaling 20,756 feet of samples. These splits were shipped to consultants and scientists for testing and observation. Staff re-boxed 725 boxes of samples and cores on 53 wells. The division also shipped 45 boxes of cores and samples for observation and testing.

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). This program develops and updates digital flood insurance rate maps (DFIRMs) for the 82 counties under funding by the Federal Emergency Management Agency (FEMA). These resulting DFIRMs and supporting digital data will be available online.



The division is involved in collecting statewide subsurface geothermal information. With funding provided by the U.S. Department of Energy, the division is collecting bottom hole temperatures from oil and gas wells drilled throughout the state. This data will be organized by the Association of American State Geologists (AASG). This project will bring data from all 50 states into the National Geothermal Data System (NGDS).

The division acts as staff for the Mississippi Coordinating Council for Remote Sensing and Geographic Information Systems. The Council exists to set policies and standards that will 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 on the Web: (1) geodetic control, (2) elevation and bathymetry, (3) orthoimagery, (4) hydrography, (5) transportation, (6) government boundaries, (7) cadastral, and (8) the Gazetteer. The division 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.

In FY2012 the Geospatial Resources Division dealt with the FEMA flood mapping, the GIS Council, MDEM, other GIS data development, and collection of oil and gas well bottom hole temperature data.

Working with FEMA and MEMA, the division continued work on completing the updating of flood map (DFIRM) projects. As of June 2012, 75 of the new countywide DFIRMs had become effective for NFIP flood insurance purposes. In 2012, the division delivered 8 county preliminary DFIRM update mapping projects funded by FEMA in FY2009.

In FY2012, the division hosted one GIS Council meeting and supported the Council's work in developing an updated strategic / business plan. The division continued work with the Mississippi Department of Information Technology Services (ITS), supporting the updating and development of the Mississippi GIS Clearinghouse / Portal Project. The Portal houses and distributes all digital MDEM data for the state. The division will continue this work activity into the foreseeable future.

During 2012, the division continued monitoring and managing contractors completing work on different 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. During FY2013, the division will continue working on projects that include development of MDEM data, including attributed road centerlines and large-scale hydrography for several HUC 8 river sub-basins in northwest and central Mississippi, and Lidar development over two areas of the state.

The division maintains three web sites. For an information-rich site for oil and gas related information: www.library.geology.deq.state.ms.us. Another has a wealth of coastal data as a result of our twelve years of active research: www.geology.deq.state.ms.us/coastal. The division continues to maintain a web site for the Mississippi Flood Map Modernization Initiative (MFMMI): 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.

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 Environmental Quality Permit Board for issuance. The Permit Board issues, reissues, modifies, denies, transfers, and revokes Mississippi 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's Environmental Permits Division's (EPD) 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 15,000 sites in the permitting universe. Many of these sites have permits that by state and federal regulation expire every five years and have to be re-issued. As new companies come into the state and existing companies have changes or modifications, these activities also require permitting actions. The Environmental Permits Division works closely with Mississippi Development Authority in helping site these 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 the 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. Other MDEQ offices that work with permitting matters are the Office of Geology and the Office of Land and Water Resources. 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**
- **Performance Improvements**

EPD put in place even more new procedures to ensure that permit writers coordinate closely with MDEQ's Office of Community Engagement (OCE). The procedures allow for early communication and the presenting of permitting information to environmental justice communities. During this past year EPD continued to partner with OCE to mature and streamline community engagement efforts in providing information to the public on the permitting process, educating stakeholders about the specifics of permitting projects, and soliciting input to strengthen the permit process.

EPD continued to partner with the Data Integration Division of MDEQ in the development of new functionality for the agency's enterprise-wide data management system – enSite. enSite has become the agencies 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. MDEQ continues to look for opportunities to make more environmental data available to stakeholders.

Improving Environmental Information Management

MDEQ began implementation of a new Regulatory Services Portal (RSP) for electronic submittals. MDEQ is currently working on the development and implementation of RSP services for processing minor air permit modifications (502b10) and terminating Baseline Storm Water coverage. These services should be up and running in 2013. MDEQ, in partnership with other states began a modernization effort on their enSite system in 2012. MDEQ is completing the testing of the new modernized enSite (web based) system, Tempo 360, in the fourth quarter of 2012.

Storm Water Regulations

Implementation of Mississippi's Storm Water General Permits and regulations continued in Fiscal Year 2012.

- The Environmental Permits Division (EPD) issued general permit coverage for 183 large construction projects (five acres or greater). In addition, 43 construction projects were recovered under the current general permit and 42 projects issued modifications.
- EPD issued general permit coverage for 55 regulated industrial facilities under the Baseline Storm Water General Permit for Industrial Activities.
- EPD received and processed 71 "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.
- EPD reissued the Mining Storm Water, Dewatering, and No Discharge General Permit on September 7, 2012. EPD has issued recoverage certificates to 70 projects to date. These are projects that have ongoing mining activities when the previous permit expired and therefore must be covered under the current general permit. In addition, EPD issued new general permit coverage for 67 surface mining operations (clay, gravel, sand, etc.).
- EPD reissued the City of Jackson's Storm Water Permit on August 29, 2012.

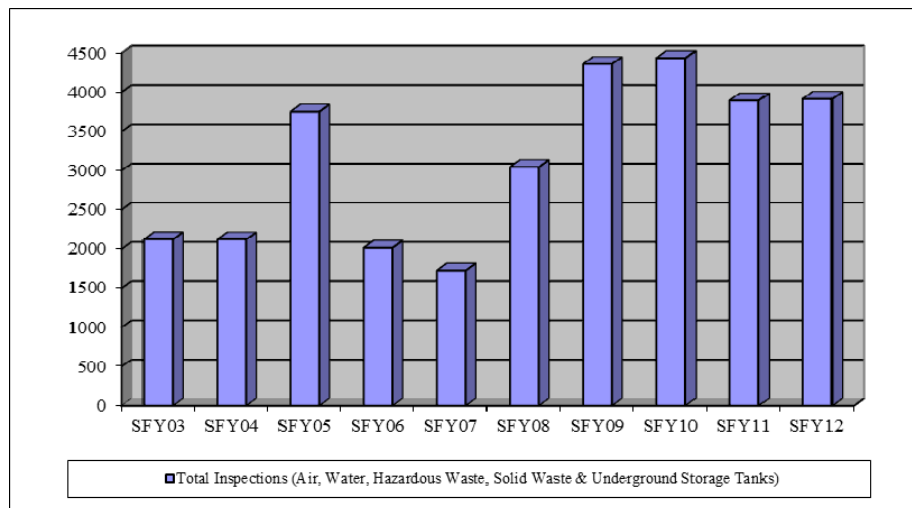


Compliance And Enforcement

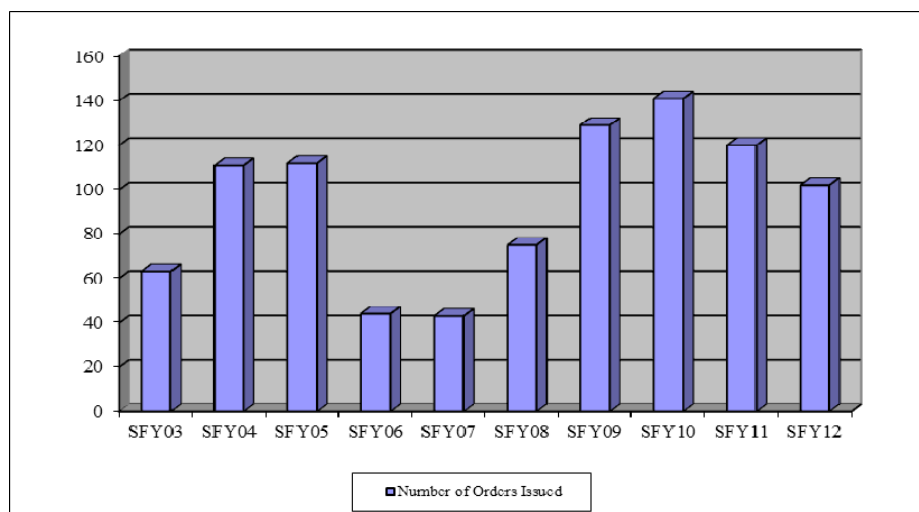
The Environmental Compliance and Enforcement Division (ECED) implements and oversees the majority of the compliance and enforcement programs for MDEQ. ECED is responsible for the regulation of sites for compliance with applicable air, water, hazardous waste, and non-hazardous waste permits and regulations. 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

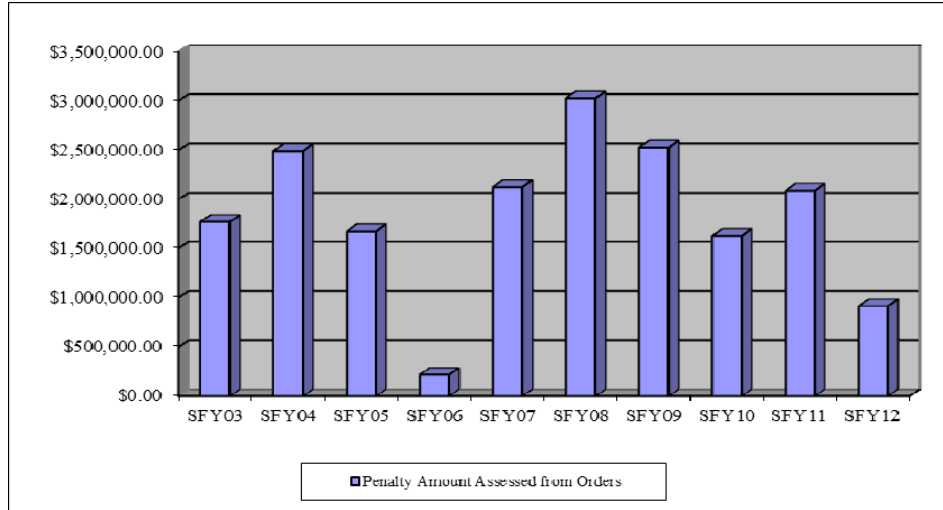
During Fiscal Year 2012, the following numbers of on-site inspections were performed by ECED and the Field Services Division:

- 219 for compliance with air pollution regulations/permits.
- 1,719 for compliance with water pollution regulations/permits.
- 80 for compliance with hazardous waste regulations/permits.
- 734 for compliance with solid waste regulations/permits.
- 1,162 for compliance with underground storage tank regulations/permits.

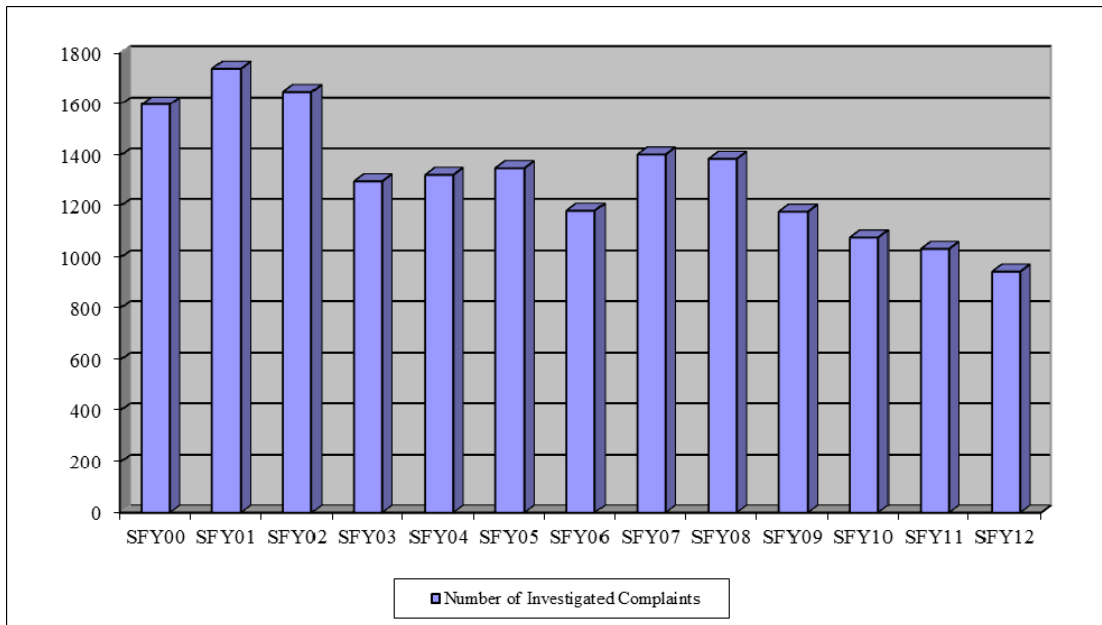


During Fiscal Year 2012, ECED actions resulted in 102 Orders being issued for non-compliance with air, water, solid waste, and/or hazardous waste regulations/permits. Eighty-seven of these Orders contained provisions for a penalty with a total assessed penalty amount of \$916,652.00. When appropriate, MDEQ allows the use of Supplemental Environmental Projects (SEP), projects that go beyond what is required to comply, 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. During Fiscal Year 2012, the Office of Pollution Control (OPC) received 946 complaints related to air, water, solid waste, and/or 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 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 endeavor to investigate every citizen complaint.



Clean Up Of Contamination

Accidents, spills, leaks and past improper disposal and handling of hazardous materials and waste have resulted in a number of sites that have contaminated land, water, and air. Through five programs, the Brownfields Program, the Uncontrolled Sites Program, the Voluntary Evaluation Program, the CERCLA Program, and the Underground Storage Tanks Program, the staff of the Groundwater Assessment and Remediation Division is responsible for the protection of human health and the environment by overseeing the assessment and remediation of contaminated sites in Mississippi.

Brownfields

Two Brownfield Agreement were reached in 2012. The Commission and the City of Ridgeland reached a Brownfield Agreement regarding the remediation of brownfield property located at the former Madison Materials and Jackson Ready Mix Sites in Ridgeland. The city agreed to remove and dispose of an Underground Storage Tank (UST) and associated piping and plans to redevelop the brownfield property into City Center, with a new city hall, performing arts facility, green space, and commercial/retail developments.

On September 27, 2012, the Commission on Environmental Quality reached a Brownfield Agreement with Colle Towing Company. The remediation of a portion of former Colle Towing Company facility lays the foundation for Signet Maritime Corporation to expand its Shipbuilding and Repair Division. Signet Maritime will match \$3.6M from the Katrina Supplemental Community Block Grant Program for a \$7.2M investment in the Pascagoula facility. Signet Maritime will increase the current workforce in the Mississippi Division by 50 people over the next 3 years. Signet has already started the hiring process for 32 of the 50 people in preparation of the construction of a 60 Metric Ton Bollard Pull tractor tug to be named *SIGNET MAGIC*. The *SIGNET MAGIC* will increase the Signet Pascagoula Harbor Tug Fleet and lower the average age of the Fleet to 3.2 years. The current construction schedule calls for steel cutting to commence begin immediately to meet the delivery date of July 2013. In addition, the grant funding will provide new berthing, drainage and support buildings to support the Pascagoula repair and construction facility and will aid the growth of Jackson County and the Jackson County Port Authority.



Underground Storage Tanks

The goal of the Underground Storage Tanks Program (UST) is to protect groundwater from leaking underground storage tanks. To meet this goal there is a two-pronged approach. First, 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 8,345 tanks at 3,158 facilities have the appropriately maintained equipment in order to protect the groundwater. Secondly, in the event of a release, there is a fund available for eligible tank owners to help in the assessment and cleanup resulting from leaking USTs. The Mississippi Groundwater Protection fund began in 1987 and has committed \$150 million to eligible tank owners for the assessment and cleanup of sites contaminated from leaking underground storage tanks. The average fund commitment per site has been \$152,505. At the end of 2012, the Mississippi Groundwater Protection Trust Fund had assessed 1,044 sites, completed assessment and/or remediation of 844 sites, and had 200 active sites. This past fiscal year \$6.91 million were reimbursed to eligible tank owners. Also, this year 35 new sites were assessed and 33 sites were closed.

Uncontrolled Sites

Over the past 12 months, GARD actively oversaw 174 sites. During that same timeframe, the number of sites brought to GARD's attention was 34, bringing the total number of sites in MDEQ's public record to 1,818 sites. Also, MDEQ issued "State No Further Action" (SNFA) letters for seven of these sites that were evaluated and remediated to levels protective of human health and the environment. In addition, MDEQ issued Restrictive Use Agreed Orders for three sites, thereby allowing the sites to be reused with certain activity and use limitations. 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.

Voluntary Evaluation Program

The Voluntary Evaluation Program (VEP) offers participants an opportunity to receive an expedited review of site characterization and remediation plans and reports for uncontrolled sites that they have an interest in. The VEP is funded entirely by these participants who pay for MDEQ's oversight costs. Typically, individuals involved in property transfers find the VEP attractive because of the expedited review process. There were seven new VEP sites that joined the program this fiscal year. MDEQ issued one "State No Further Action" (SNFA) letter.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Oversight of the site assessment and restoration of hazardous waste sites at federal facilities continues to be a large portion of the CERCLA Program. Oversight is conducted at seven Department of Defense Sites, a Department of Energy Site (Salmon Test Site), a NASA facility (Stennis Space Center), and several formerly used defense sites. MDEQ is funded for this oversight work through agreements with the Department of Defense, Department of Energy, and NASA.

Through the grants from the Environmental Protection Agency, CERCLA staff performed preliminary assessments, site investigations and site inspections at hazardous waste sites for National Priority List (NPL) consideration, coordinated with EPA on emergency/removal projects at the Copiah County Manufacturing Co.

Hazlehurst and the Southeastern Wood Preserving site, Canton, and assisted the Environmental Protection Agency with the oversight of the assessment and future remediation of four Superfund Sites in the state—Sonford Products, Flowood; Davis Timber, Hattiesburg; American Creosote, Louisville; and Wood Treating, Picayune. At the present time it is estimated that the remediation costs for these four sites is approximately \$76 million. The state will ultimately have to pay 10 percent of these remediation costs or \$7.6 Million. In addition, Red Panther Chemical, Clarksdale; Kerr-McGee (Tronox), Columbus; and Southeastern Wood, Canton, have been listed as NPL sites, however, there has been no estimation of remedial costs to date. 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 and further legal proceedings. The initial bankruptcy proceeding resulted in a Trust being set up that will provide some money toward the further assessment and remediation of the site and if ongoing legal proceedings by the U.S. Environmental Protection Agency, U.S. Department of Justice, and many states is successful then a responsible party will pay for all the assessment and remediation of this site and many other sites previously owned by Kerr-McGee in Mississippi and other states. The Southeastern Wood, Canton site does not have a potentially responsible party and will require a 10% state match for the remediation costs.

Emergency Response

During Fiscal Year 2012, the Emergency Services Branch continued to respond to emergencies all across the state. Expenditures for response actions exceeded \$550,000 and were reimbursed approximately \$60,000 while the response staff dealt with approximately 930 calls for assistance or to reported emergency releases.

Emergency Services staff also provided Hazardous Materials Awareness Training with The Law Enforcement Training Academy at Mississippi Delta Community College and with the State Fire Academy as well as participating in numerous exercises and drills with state, federal and local counterparts and companies such as pipelines and refineries that operate in the state.

During Fiscal Year 2012 MDEQ staff responded to the counties affected by Hurricane Isaac and the possible dam breach at Percy Quinn State Park. Approximately \$900,000 in expenses were incurred from the Percy Quinn State Park response.



MDEQ provided cleanup and disposal of Household Hazardous Waste with a cost of approximately \$360,000. Assistance was also provided for meth lab cleanups with approximately \$250,000 in expense.

Homeland Security remains a top priority for training and planning. The Emergency Services staff continues to work with numerous agencies including fire, police and emergency management at the local level, other state agencies, EPA, U.S. Coast Guard, F.B.I., and other federal agencies to conduct well coordinated responses, in order to protect Mississippi's citizens and the environment.

MDEQ's Emergency Response Team is on-call statewide 24 hours a day, seven days a week. MDEQ and the Mississippi Emergency Management Agency (MEMA) work together to provide effective around-the-clock spill response.



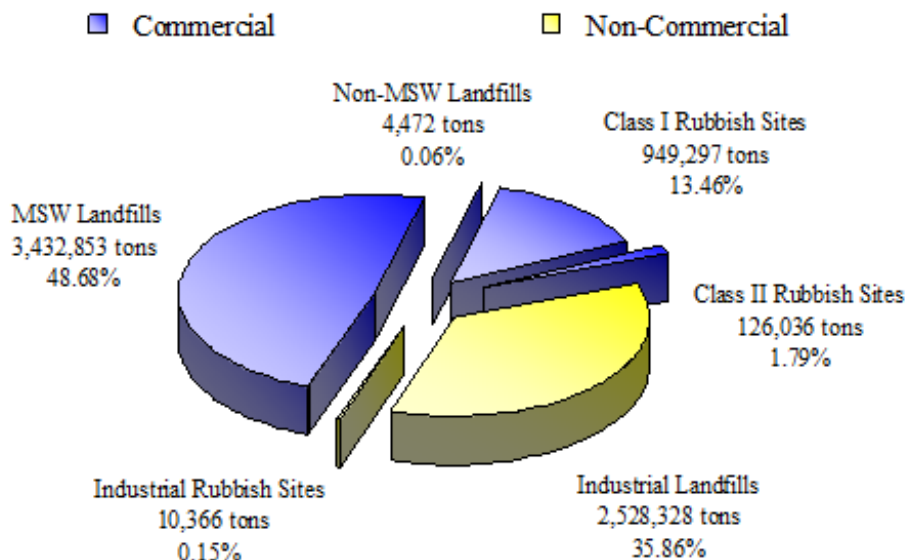
Solid Waste Management and Recycling

The Solid Waste Management and Recycling Programs at MDEQ worked on issues, projects and programs throughout 2012 to ensure the proper management of solid wastes, to promote the reduction and recycling of solid wastes, and to plan for the future solid wastes management needs of the state. The following information represents a summary of the work conducted as well as the solid waste management conditions in the State of Mississippi over the past year.

Solid Waste Annual Report

Each year, MDEQ collects an annual report from the owners of permitted solid waste management facilities on solid waste management activities for 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, and composting facilities.

In 2012, MDEQ developed a report on solid waste disposal activities conducted during Calendar Year 2011. This report indicated that more than 7.0 million tons of wastes were disposed at permitted landfills and rubbish sites in Mississippi. Approximately 3.4 million tons (48.75 percent) of the total waste was disposed at commercial landfills, 2.5 million tons (35.86 percent) at non-commercial landfills, 1 million tons (15.25 percent) at commercial rubbish sites, and 10,000 tons (0.15 percent) at non-commercial rubbish sites.



About 4.5 million tons of solid wastes were disposed at commercial disposal facilities and the remaining 2.5 million tons of wastes were disposed at noncommercial disposal facilities. Mississippi received more than 700,000 tons of solid waste from out-of-state sources representing approximately 10.5 percent of the total solid waste that was disposed during 2011.

In addition, a total of approximately 29,000 dry tons of wastes were applied at the permitted land application sites and about 5,000 tons of material was received for management at solid waste composting facilities.

Recycling and Waste Reduction

MDEQ also works to promote and grow recycling in the State of Mississippi. It is the policy of the State of Mississippi to reduce waste at its source, to re-use material rather than discard them, and to recycle wastes whenever possible. Current indications are that just over half of the state's population has access to local government sponsored recycling programs for residential recyclables. In addition, just over half of those that have access to recycling have curbside recycling services and the remaining communities have drop-off recycling services. These numbers are continuing to grow as more communities add recycling programs and as communities upgrade and grow existing programs in the state.

In order to grow recycling access in the state, MDEQ is developing a grants program called the Regional Recycling Cooperative Grants program to promote cooperative regional recycling efforts among the states rural communities. MDEQ is focusing its initial efforts to promote regional recycling with a number of rural and underserved communities in various areas of the state. In 2012, the agency met with cities and counties from various areas of Mississippi to discuss how

communities could work together to cooperate in collecting and marketing their recyclables. MDEQ expects to release a Funding Opportunity Announcement for these Recycling Cooperative grant funds to assist local governments in building these cooperative efforts in underserved and rural areas of the state.

In April, MDEQ participated in the Mississippi Recycling Coalition's (MRC) first State Legislative Awareness Day for the Recycling Industry in the state. The MRC provided a breakfast for State Legislators and staff along with information on the economic benefits of recycling. The Southeast Recycling Development Council sent representatives to the event to assist in helping provide support and information on the jobs and income benefits offered by the recycling industry. MRC, MDEQ and SERDC were able to engage State Legislators on the continued importance of building this important industry in Mississippi.

In October, MDEQ joined the Southeast Recycling Development Council and the Mississippi Recycling Coalition in the Fall Recycling Summit in Point Clear, Alabama. This regional recycling meeting which was conducted jointly with the Mississippi and Alabama Recycling Coalitions was attended by over 150 participants and exhibitors. The Summit included sessions on boosting public participation in recycling programs, increasing container recycling, promotion of the economic benefits of recycling, public education programs, rural recycling initiatives, electronics recycling, recycling infrastructure growth considerations and extended producer responsibility.

In November 2012, MDEQ hosted its first ever America Recycles Day event in Smith Park in downtown Jackson in conjunction with the annual Keep America Beautiful national event. MDEQ was joined by approximately 30 exhibitors promoting the benefits of recycling and waste reduction. In addition, MDEQ sponsored several social projects as part of the event, collecting gently used ladies shoes for the Dress For Success organizations, used cell phones for Cell Phones for Soldiers and canned goods for Stewpot Community Services.



"America Recycles Day"

Recycling Education

In addition to those efforts, MDEQ provides education and outreach on the importance of growing recycling in the state. Throughout 2012, MDEQ spoke to numerous groups and at various events including the Mississippi Municipal League, the Keep Mississippi Beautiful/Keep Alabama Beautiful Joint conference, the MDEQ enHance Program Conference, the Mississippi Air and Waste Management Association, State SWANA Chapter, and various cities, counties regional solid waste authorities and other organizations. The agency also continued its strong support of the Mississippi Recycling Coalition and assists that organization with membership, web site development and maintenance and conferences and workshops.

Additionally, the Recycling and Solid Waste Reduction Program at MDEQ works with local and state governments, school districts, private sector organizations, non-profit organizations, and the general public to increase recycling and solid waste reduction activities across the state. The program provides both educational and technical assistance to all groups in the state to increase the awareness and the importance of recycling and solid waste reduction measures.

The program partners with numerous organizations in the state including the Mississippi Recycling Coalition, Keep Mississippi Beautiful and its local affiliates, and the Mississippi Beverage Association. In FY 2011 the Recycling and Solid Waste Reduction Program conducted site assistance visits, gave presentations to organizations and schools across the state, and provided recycling and solid waste information via exhibits at various events.

- Four K-12 schools were visited.
- Four college and university programs were visited.
- Four state agency programs were visited.
- Seven presentations or exhibits were conducted for government organizations.

- Eight presentations or exhibits were conducted for community groups.
- Five presentations were conducted for industry group and associations.
- Ten commercial recyclers were inspected.
- Five recycling programs for businesses other than recycling were inspected.

The program also utilized a recycling education display that was made available to libraries and other organizations across the state for exhibition to the general public.



Solid Waste and Waste Tire Grants Programs

The Solid Waste Programs also continued the management and dispersal of various grant program funds. Through the Solid Waste Policy, Planning and Grants Branch, MDEQ awarded over \$3.27 million in Fiscal Year 2012 for solid waste management and recycling projects, solid waste planning projects and waste tire projects across the state. Of that total, over \$2.14 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 were awarded through two different categories of grants: Non-competitive (or allocated) grants to counties and 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 \$99,400 to communities that have maintained successful local illegal dumping prevention and enforcement programs.

Solid Waste Assistance Grants – Fiscal Year 2012

\$947,751 - Total Non-Competitive Grants
 67 Counties Received Non Competitive Grants
 \$1,197,396 Total Competitive Grants
 39 Municipalities and Counties Received Competitive Grants

The MDEQ Solid Waste Programs also provide planning grants to local governments to assist in the development of long-range plans and goals for solid waste management and recycling in the state. Five planning grants totaling \$154,776 were awarded to Adams, Tallahatchie and Scott Counties and the Golden Triangle and Pine Belt Solid Waste Management Authorities in Fiscal Year 2012 to develop and update comprehensive solid waste management plans for their communities.

In addition, the Solid Waste Policy, Planning and Grants Branch continued in 2012 to develop and implement the state's strategy to achieve statewide recycling of waste tires. During Fiscal Year 2012 the recycling rate for waste tires processed in the state was over 94 percent of the tires collected. In addition, 26 new waste tire grants totaling \$974,514 were awarded to local governments to fund local waste tire collection and clean-up programs during FY 2012. These new waste tire program grants along those tire grants previously awarded assisted local governments across the state in the proper collection and disposal of over 740,000 passenger tire equivalents in calendar year 2011.

Waste Tire Grants – Fiscal Year 2012

740,000 - Waste Tires Collected through local government programs

Counties receiving waste tire grants during FY12 included: Amite, Bolivar, Calhoun, Claiborne, George, Greene, Grenada, Hancock, Harrison, Hinds, Kemper, Madison, Neshoba, Panola, Pike, Quitman, Sharkey, Stone, Tate, Tishomingo, Walthall, and Wayne Counties and the City of Canton, the Golden Triangle, Pine Belt and Three Rivers Solid Waste Management Authorities.

In addition, the MDEQ successfully completed the conservation grants to local governments from funds made available through the Department of Energy to the State of Mississippi through the American Recovery and Reinvestment Act. The Energy Efficiency and Conservation Block Grant funds in the amount of \$470,637 assisted several local governments to fund certain costs to start new recycling programs or to expand existing recycling programs.

Also, MDEQ distributed or expended other assistance funds in Fiscal Year 2012 in corrective action funding programs. In the waste tire abatement program, MDEQ cleaned up two illegal tire dump sites in expending \$47,066 to remove and properly dispose of over 24,000 tires. In addition, MDEQ provided funding assistance to the City of Philadelphia in FY 2012 totaling \$58,951 to correct problems at one of the city's closed sanitary landfills.

Solid Waste Planning

The MDEQ Solid Waste and Recycling Programs work with local governments around the state to develop and implement long range solid waste planning efforts. Each local government in Mississippi is required by state law to develop and implement a comprehensive local, solid waste management plan for a 20 year period. In 2012, MDEQ worked with numerous communities to complete the development of updated and amended local solid waste plans.

The MDEQ worked with the City of Wiggins to finalize an updated comprehensive 20 year solid waste management plan for the city. In addition to the completion of that plan, the development of comprehensive, updated solid waste management plans continued for the City of Jackson, City of Canton, Hancock County, Harrison County, Jefferson County, Kemper County, Lauderdale County, Tallahatchie County, and Warren County. In addition, start-up efforts to write new plans began for Adams County, Holmes County, Simpson County and Scott County.

In addition to the development of comprehensive updated plans, MDEQ also worked on the review and finalization of certain amendments to existing plans to assure adequate disposal services and capacity for various jurisdictions throughout the state. 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 2012 include: Lawrence County (addition of GP Monticello industrial landfill), Pine Belt Regional Authority (addition of Southeastern Environmental Services solid waste processing facility), Rankin County (addition of Terra Waste Services medical waste processing facility), Scott County (expansion of City of Forest class II rubbish site), Simpson County (addition of Terra Renewal Services land application sites), and Jackson County (addition of SEB Mines class II rubbish site). These planning amendments were important to assist local governments with providing needed disposal capacity and services for management of solid wastes.

Waste Tire Management Program

The MDEQ Waste Tire Management Program has experienced continued success in achieving significant recycling of waste tires. This success is reflected in the most recent annual program information collected from Calendar Year 2011 indicating that the overall waste tire recycling rate was close to 95 percent and the recycling rate for tires generated in Mississippi was close to 89 percent. It is anticipated that the state's waste tire recycling and reuse rates for waste tires will continue to approach or exceed the current national average of approximately 90 percent. Overall, waste tire processors in the state managed approximately 6.5 million waste tire equivalents in 2011 with approximately 50 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 managed the permitting and reporting activities of approximately 120 registered waste tire haulers in 2012. Also about 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 throughout the State of Mississippi. Through the abatement program, MDEQ has cleaned up approximately 2.5 million waste tires that had been illegally dumped over the past several years since the

program was started. In 2012, approximately 17,000 passenger tire equivalents were removed and recycled through the MDEQ waste tire abatement program. 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. 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 and the development of electronic reporting and record keeping for waste tire processing and collection facilities.

Electronic Waste Management

Electronic waste or “e-waste” is one of the fastest growing waste streams nationally and continues to present management and disposal problems for Mississippians. In 2012, MDEQ continued its work to help communities, businesses and private citizens understand and know proper methods for recycling and disposing of electronic wastes. MDEQ has developed and maintains comprehensive web resources for all interested parties seeking to recycle used electronics. This past year has seen several new companies added to MDEQ’s electronics recycling directory and a reorganization of the directory to make it easier to locate vendors that are in Mississippi and neighboring states.

MDEQ continues to promote the use of certified recycling companies for the management of electronics wastes in the state. In particular, MDEQ promotes certification programs managed by two organizations, R2 Solutions and the Basel Action Network. These two organizations continued to provide certification of those recycling businesses that collect and recycling electronics materials in a safe and responsible manner. Mississippi saw the first in-state facility to become certified when Magnolia Data Solutions of Jackson received their R2 certification in April 2012. MDEQ has encouraged the state’s recycling businesses and the state’s communities, businesses and local and state government agencies to consider these certification programs when advertising for electronics recycling services and/or selecting an electronics recycling vendor.



e-waste event in Jackson

MDEQ also continued providing assistance in 2012 to sponsor various e-waste collection and recycling events and programs around the state for residents and small businesses. MDEQ awarded solid waste assistance grants to fund ongoing e-waste collection programs in the City of Jackson and in various other communities. In addition, the agency continued its support for a computer refurbishment program at Jackson State University (through a grant arrangement with Hinds County). 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 April and October of 2012. These two events collected more than 36,400 pounds of electronics for recycling. Electronics collected at these events included used computers, televisions, cell phones, printers, fax machines and various other e-wastes. These events were serviced by Advantage E-Cycling of Pearl (April) and Magnolia Data Solutions (October) who each worked with the Chamber and MDEQ in collecting and recycling of the electronics.

Other outreach efforts to advance the proper management of electronics have included promoting MDEQ’s resources to the regulated community. In October 2012, MDEQ staff presented best management practices for the storage of electronics and selection of an electronics recycler at the Fall Conference of the Mississippi Chapter of the Solid Waste Association of North America. In early 2012, MDEQ assisted the Product Stewardship Institute (PSI) in promoting and encouraging the use of product stewardship based recycling programs for end of life electronics (manufacturer mail back programs), rechargeable batteries (Call2Recycle), and mercury thermostats (Thermostat Recycling Corporation). This is an ongoing PSI outreach effort and additional details on the number of participants and amounts collected should be available in 2013. MDEQ is continuing efforts into 2013 to assist local and state government and the state’s business and industry sectors on the proper management of discarded electronics.

Medical Waste Management

MDEQ's solid waste management programs are responsible for regulating the commercial management of medical wastes in the state. This responsibility includes medical wastes collected and transported from health care facilities, veterinary care facilities, medical wastes generated in home health care, medical wastes generated by emergency and trauma response, medical wastes generated by business and institutional clinics and medical wastes generated in private residences.

In 2012, MDEQ has continued work on the development of web-based resources that better communicate proper management conditions for various types of medical wastes, particularly those 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 in the state in 2012.

In addition, MDEQ continued its work on the household medical sharps collection program. MDEQ has developed and implemented a statewide educational program to inform the public on 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. In addition, MDEQ has worked to create and expand its collection network of community drop-off locations at pharmacies, fire stations, and other facilities. MDEQ has continued to use services of three of the state's medical waste service providers for collection of the sharps. In April, MDEQ's Household Sharps collection program was honored by the Keep Mississippi Beautiful organization with the second place Outstanding Program Award in the State Government category.



The number of people participating in the program and the number of sharps collected monthly continued to increase in 2012, and in October, a milestone was reached with the surpassing of one million used syringes collected since the inception of the program just three years earlier. MDEQ also conducted a number of educational and outreach activities related to promotion of the household sharps program including revising and reprinting of an educational pamphlet, and speaking and exhibiting at numerous stakeholder meetings across the state and the development of an informational web site.

MDEQ is also working to address one of the growing areas of environmental concern in the country and that is the management of pharmaceutical wastes and household personal care products. MDEQ is developing resources to encourage the proper management of pharmaceutical wastes

and is discouraging flushing or washing medications down the toilet or sink. MDEQ worked with the Mississippi Office of the Federal Drug Enforcement Agency to promote collection events for obsolete pharmaceutical wastes in April and October of 2012 sponsored by various law enforcement agencies throughout the state of Mississippi and the country. The primary goal of these programs is to prevent the illegal distribution or improper use of prescription and over the counter drugs. In addition, the collection efforts help to avoid discharge of these materials into the environment through wastewater systems around the state.

Organics Wastes

In 2012, MDEQ continued efforts to promote organics waste reduction and recycling in the State of Mississippi. In late 2011, MDEQ announced its Pilot Composting Program in which the agency provides approval to small start-up composting operations allowing these start-up businesses and community composting operations to begin under a less formal form of authorization. This pilot composting program will allow these operations to develop and build sustainable operations. At the same time these efforts are ongoing, MDEQ has initiated efforts to streamline the state composting regulations. Currently, composting facilities follow the same permitting process that municipal landfills follow. MDEQ believes that this permitting process can be improved and streamlined for composting operations and businesses to increase and expand composting in the state. In 2012, MDEQ authorized five new composting facilities (four business operations, one community program) under the Pilot Composting Program.



Thus far, the feedback from program participants has been overwhelmingly positive, and MDEQ frequently receives inquiries about the program and new requests for authorization from interested parties.

In addition, MDEQ is working with other organizations in a sustainability planning effort in Mississippi's three Gulf Coast counties. These efforts originated from a planning grant from U.S. Dept. of Housing and Urban Development to the Gulf Coast Regional Planning Commission. MDEQ has helped develop recommendations for supporting sustainable food systems on the Gulf Coast. In particular, the agency has helped develop goals and recommendations for reducing the amount of food wastes going to landfills and towards increasing the amount of food that is donated and the amount of food wastes that are composted or converted into other usable products. The planning phase of the sustainable food systems plan has been completed; and in 2012 MDEQ took a more pronounced leadership role in this organization which recently adopted the name Mississippi Gulf Coast Food Waste Task Force. The goal of this organization continues to be increasing food waste reduction and recycling. Plans for achieving this goal in 2012 include promotion of food donation and home composting at public events held in the coastal counties, collection of food waste at these events, including composting education in developing school sustainability curriculums, and stressing the importance of food donation and food waste collection to local food businesses. These efforts help to minimize the cost of managing food waste, help to maximize food donations and use and help to create valuable compost products from Mississippi composting businesses.

MDEQ has also increased public outreach and education efforts to promote organics waste reduction and recycling in 2012. MDEQ created a new composting web page to provide important information concerning home composting, MDEQ's Pilot Composting Program for business and government operations, composting activities for kids, and much more. The web page also provides information on the benefits of composting and why this form of recycling organic materials is important for the state. In addition, MDEQ participated in several public events in 2012 including the Southern Regional Master Gardener Conference held in Natchez in May; the Greening of Fondren held in Jackson in August; and the Real Food Radish Festival held in Long Beach in November, and the America Recycles Day event held in Jackson in November. MDEQ's involvement in these events was focused on efforts to increase and promote the growth of organics waste reduction and recycling in the state. Additionally, MDEQ made efforts to educate children on the benefits of composting by participating in the City of Jackson's Environmental Camp in July. MDEQ staff conducted an activity with the kids called "Edible Compost" in which food items were used to represent compostable materials. This exercise taught the children how to compost in a fun and interactive manner.



MDEQ staff member hands out ingredients for "Edible Compost".

Landfill Methane Outreach Program (LMOP)

MDEQ continued its partnership with the EPA to promote the use of landfill gas as an alternative energy source through the Landfill Methane Outreach Program (LMOP). In January of 2012, the Golden Triangle Regional Solid Waste Management Authority (GTRSWMA) was honored by the EPA with a national award recognizing the power generation project at the Golden Triangle Municipal Solid Waste Landfill. The project received one of three national Landfill Methane Outreach Program Projects of the Year Awards for 2011 selected from landfill gas energy projects from across the country. The award was presented at the 15th Annual LMOP Conference and Project Expo held in Baltimore, Maryland. In addition, the GTRSWMA was honored by the Solid Waste Association of North America with the 2012 Gold Excellence Award for Landfill Gas Utilization. This ceremony was held in August of 2012 at SWANA's WasteCon conference in National Harbor, Maryland.

In addition, the state also saw the completion and implementation in 2012 of two new landfill gas to electricity projects completed at Three Rivers Regional Landfill near Pontotoc and at Waste Management's Prairie Bluff Landfill near Houston. These projects are in addition to the current landfill gas to electricity project at the Golden Triangle Regional Solid Waste Landfill near West Point, the landfill gas project at the Waste Management Pecan Grove Landfill located near Pass Christian, and an on-site gas to energy use at the Prairie Bluff Landfill.

In these two new landfill gas to electricity projects at Three Rivers Landfill and Prairie Bluff Landfill, gas from the landfill is rerouted through a system of underground piping to an internal combustion engine driven generator set. As with the Golden Triangle Landfill project which became operational in 2011, the power generated from these two new projects was purchased and placed on the local power grid by Tennessee Valley Authority as part of their Generation Partners Program. The significant environmental benefits of these landfill gas-to-electricity projects are equivalent to the following:



Mississippi's first landfill gas to electricity generating facility at the Golden Triangle Landfill

- Over 8,200 passenger vehicles or
- Carbon sequestered by approximately 9,000 acres of pine or fir forest or
- CO2 emissions from over 4,700,000 gallons of gasoline consumed or
- CO2 emissions from burning approximately 230 railcars worth of coal.

Electricity produced from each project provides enough power for over 800 to 1000 homes in each area.

Through the LMOP program, MDEQ has also identified numerous other landfills in the state that appear to be candidates for future energy project development. In 2012, the agency updated the list of Landfill Methane Outreach Program (LMOP) Candidate Landfills and is now available to potential landfill gas to energy developers and end users. MDEQ will continue to maintain and update this list and conduct similar activities to connect landfill operators with project developers and end users as the agency works to promote projects at these landfills which can provide both economic and environmental benefits to landfill host communities.

Byproduct Beneficial Use Program

The Solid Waste Programs at MDEQ continued efforts in 2012 to promote the beneficial use of nonhazardous by-product materials that would otherwise be disposed in landfills. The state's beneficial use regulations allow for industries to request that their nonhazardous industrial by-product materials be evaluated for use in the place of products or raw materials. If the MDEQ evaluation 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 and will not be regulated as a solid waste. In early 2012, MDEQ collected information on the volume of materials distributed for use in the State of Mississippi in Calendar Year 2011. These reports indicated that BUD holders distributed approximately one million tons of by-product materials. Approximately 94 percent of the by-products distributed were used for construction purposes while the remaining percentage was used in soil amendment applications.

In addition, during 2012 the MDEQ approved eight new BUDs for new materials and uses. MDEQ continues to work with the suppliers throughout the region who provide by-products and other material for construction uses and land application uses. One way that MDEQ does this is through demonstration projects. A demonstration project 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. Through the demonstration project the material and use are evaluated for both environmental and physical performance. The results of each demonstration project are submitted to MDEQ for further review and consideration and assist the agency in making determinations about the impacts of the long term use of the by-product material.

Solid Waste Training and Certification Programs

The MDEQ Solid Waste Programs administers training and certification programs for solid waste professionals in the State of Mississippi. 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 in the state. MDEQ worked with SWANA to help sponsor training opportunities at state SWANA conferences in May and October. In 2012, there were 34 certified commercial landfill operators in the state. In 2012, MDEQ issued one new certification and seven renewal certifications for operators.

In addition, MDEQ hosted two training workshops and examination sessions for Class I rubbish operators in 2012 in January and November. There are currently 135 certified Class I rubbish site operators in the state. In 2012, MDEQ issued certificates from those training and testing events for 15 new Class I rubbish site operators in the state and issued eight renewals for existing Class I rubbish site operators. MDEQ also worked with the state SWANA chapter to provide Continuing Education Units training opportunities through the SWANA organization's spring and fall conferences.



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/partner with both states and the federal government (e.g. DOD) and non-governmental entities to promote effective pollution prevention practices.

During FY 2012, the MDEQ Pollution Prevention Program accomplished the following program elements:

- Twelve P2 enHance site visits
- Reviewed and monitored 198 annual waste minimization certified reports and eight P2 plans were approved
- Met all conditions of the 2011 to 2012 EPA/Mississippi Pollution Prevention (P2G) Grant
- One recycling site visit, three workshops and eight presentations were conducted on environmental issues
- Permitting and reporting compliance assistance activities were provided to two facilities in two different SIC Codes

Key Pollution Prevention Activities

The Pollution Prevention Program (P3) coordinates multiple activities focusing on the reduction of waste streams that can impact the environment. Efforts include leading P3/E3 programs for the furniture industry, and energy and water efficiency in state government buildings. Efforts were designed to support E3 — an initiative designed to focus on sustainability and the triple bottom line of energy, environment and the economy. Central to the program is the concept of continuous improvement.

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.



GRANTS AND LOANS PROGRAMS

Section 319 Nonpoint Source (NPS) Pollution Control Grants

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 our 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, two federal laws with NPS pollution control provisions.

The MDEQ currently has five active grants, one of which (Grant Year 2008) will be closed out in 2012. During 2012, 45 projects/activities totaling \$3.64 million were completed with 23 projects still ongoing. 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 demonstration projects; agricultural/chemical waste disposal; and watershed protection and restoration projects.

In FY2012, MDEQ received over \$3 million in Section 319 Grant funds. Of this amount, two percent is allocated for administrative work, thirteen percent for assessment and monitoring, twenty-eight percent for program operation and statewide education and public outreach projects, and fifty-eight percent for priority watershed restoration and protection projects. The latter projects focus primarily on nutrient reduction.

Water Pollution Control Revolving Fund

The Water Pollution Control Revolving Loan Fund (WPCRLF) program provides low interest loans to public entities in the state for construction, repair, or replacement of wastewater, storm water, and non-point 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/Low Income Community" WPCRLF projects. During 2012 MDEQ funded 18 new WPCRLF projects totaling \$40.5 million, which included approximately \$7.8 million of Green or Small/Low Income Community subsidies.



Pontotoc Wastewater Treatment Plant



Water Pollution Control Emergency Loan Fund

The Water Pollution Control Emergency Loan Fund (WPCELFL) program provides loans to communities for the emergency construction, repair, or replacement of wastewater collection and treatment facilities. The WPCELFL has approximately \$3,108,000 available for such emergency projects.

ENVIRONMENTAL RESPONSE

Disaster Debris Management

MDEQ's solid waste programs worked with federal, state and local agencies and organizations regarding the management of disaster related debris. The agency continued to work with communities on recovery and clean-up efforts from the severe disaster events of 2011. Record natural disasters in 2011 left many communities hurting and in need of assistance. Hit particularly hard was the Town of Smithville where 16 people were killed and the town was virtually leveled by an F-5 tornado.

On that day, the National Oceanic and Atmospheric Administration confirmed the presence of 63 tornadoes in Mississippi leaving behind tremendous property damage. MDEQ immediately began providing guidance and assistance to local governments faced with cleanup. It was estimated that approximately 40,000 dump truck loads of debris would need to be managed. Over the next few months, MDEQ authorized a total of 42 emergency debris sites to help cities and counties manage the huge volumes of debris. In addition to the tornado events of April 2011, the State also experienced tremendous flooding along the Mississippi River with numerous homes and businesses being flooded.

After assessing the tremendous damage and clean-up costs encountered by local governments, MDEQ offered grant funds to these local governments to assist in recovery. These grant funds were sufficient to reimburse the affected local government's entire 12.5 percent share of FEMA-eligible expenses and 50 percent of their expenses where FEMA had declared costs ineligible due to an association with roadways receiving Federal Highway Administration funds. MDEQ was able to provide disaster debris grant support to 59 local governments (23 cities, 33 counties, 3 others), with a total over \$.1.3 million. The largest award went to one of the counties that was hit hard, Webster County, which received \$303,673. Seven other local governments received financial assistance from MDEQ in excess of \$50,000.

In addition to the continued recovery from the 2011 disaster events, the state did experience damage along the Gulf Coast and in South Mississippi in August of 2012 from Hurricane Isaac. MDEQ activated the agency's Disaster Debris Ready Room to provide information and resources to impacted communities and worked with various local governments to deal with disaster-related debris. MDEQ approved 16 disaster debris management sites primarily for the management of downed trees and other vegetative debris. MDEQ also provided assistance in the three coastal counties and in Pearl River County with Household Hazardous Waste collection in the flooded areas of those Counties and also assisted with the clean-up and collection of thousands of nutria carcasses.



Gov. Phil Bryant speaks to the crowd gathered for the Smithville Memorial 2012.

In May, MDEQ also conducted additional assessments and inspections at the historic Hurricane Katrina debris sites to determine the conditions of these debris disposal sites. MDEQ has also planned additional groundwater monitoring activities at these sites on the Gulf Coast that received much of the mixed building and structural debris for disposal from Hurricane Katrina.

Deepwater Horizon [MC-252] Oil Spill

The Mississippi Department of Environmental Quality (MDEQ) and the Mississippi Department of Marine Resources (MDMR) led the state response to protect the vital natural resources of Mississippi's Gulf Coast from the Deepwater Horizon [MC- 252] incident.

Exhaustive sampling efforts by state and federal agencies began in May 2010 and continue today through a joint effort with MDEQ and MDMR to ensure seafood safety. Results from hundreds of state samples and thousands of federal samples continue to indicate that seafood is safe for human consumption. This sampling is scheduled to continue for an additional two years through a Memorandum of Understanding between the state and BP.

MDEQ continues to send staff to Gulf Coast Incident Management Team in New Orleans and to the Coast for emergency response efforts, albeit at a reduced level.

On November 2, 2011, the Shoreline Cleanup Completion Plan (SCCP) signed by the Federal On-Scene Coordinator (FOSC) for the Deepwater Horizon (DWH) Oil Spill Response. The SCCP was collaboratively written by the U.S. Coast Guard (USCG), the Gulf States, NOAA, the Department of the Interior (DOI), and BP – collectively known as the Gulf Coast Incident Management Team (located at Unified Command in New Orleans). The purpose of this Plan was to define a process to deem that removal actions are complete on each shoreline segment, within the response, in a manner consistent with and documented by the Shoreline Clean-up and Assessment Technique process. The shoreline clean-up processes, as identified within the plan, were developed to ensure that appropriate shoreline clean-up activities have been conducted. The plan provides the mechanisms for ceasing active clean-up operations where Unified Command agrees that segments have been cleaned to the point where removal actions have been completed. The plan provides the processes to deem that removal actions are complete for all segments that were never impacted by MC-252 oil, or where the Federal On-Scene Coordinator determines current conditions are no longer a threat to the environment or where further removal actions may cause more harm than good. Response efforts continued in 2012 utilizing the SCCP, under the direction of the FOSC.

All shoreline segments that are actively being cleaned will remain in the response until cleanup criteria are met and officially taken out of the response by the FOSC and the State On-Scene Coordinator. Currently, cleanup activities continue on shoreline segments along the Mississippi Gulf Coast and the Mississippi Barrier Islands.

More than 90 percent of the surveyed shoreline (represents more than 4,300 shoreline miles surveyed for cleanup activities) is currently Operationally Inactive and is being managed through the process defined in the SCCP in order to deem that removal actions have been completed.

Approximately six percent of the surveyed shoreline is still under active Patrol and Maintenance (P&M) activities, which continue across approximately 290 miles in the four states. As P&M activities in these shoreline segments are completed, each segment will follow the survey/inspection/monitoring/approval process defined in the SCCP to determine that removal actions are complete.



GCIMT is currently in the process of developing the Final GCIMT Phase III Removal Activities Completion Plan. The purpose of this Phase III Plan is to outline the activities required before the Federal On Scene Coordinator (FOSC) may determine that removal efforts are complete under 40 C.F.R. 300.320(b) for the Deepwater Horizon (DWH) MC-252 Emergency Oil Spill Response.

The FOSC, in consultation with the State On-Scene Coordinators (SOSCs), Federal Trustees, and the Responsible Party (RP), will execute remaining Phase III (containment, cleanup, recovery & disposal) activities and processes in accordance with the Shoreline Clean-Up Completion Plan (SCCP) .

This plan serves to support the current objectives of the Gulf Coast Incident Management Team (GCIMT) as Phase III (containment, cleanup, recovery & disposal) activities are completed and the GCIMT Unified Command functions are discontinued. The Deepwater Horizon Phase IV (Documentation and Cost Recovery) and traditional United States Coast Guard (USCG) response activities will continue under the FOSC authority. On going Phase IV activities and traditional state and federal response activities in accordance with the National Contingency Plan (NCP) and applicable Area Contingency Plans (ACPs) are beyond the scope of the Phase III Plan. The plan provides guidance for the GCIMT as the organization de-centralizes and active response on impacted shoreline segments is minimized. As shoreline segments meet SCCP endpoints and operational requirements decrease, the GCIMT will continue to optimize staffing, as determined appropriate by the Unified Command.

Continuing into 2012, MDEQ staff will continue to be actively involved in regard to the Deepwater Horizon (DWH) Oil Spill Response Activities until all of Mississippi's shoreline segments have been deemed removal actions complete, by the FOSC, in consultation with the State.



GoCoast 2020



GoCoast 2020 was established in August by Gov. Phil Bryant through Executive Order to serve as the official advisory body for allocation of monies received by the State of Mississippi under the RESTORE Act.

MDEQ Executive Director Trudy Fisher was designated by the Governor to direct the efforts of the Commission. In addition, she serves as Mississippi's representative on the Gulf Coast Ecosystem Restoration Council.



RESTORE is a federal act stipulating that 80 percent of certain penalties assessed as a result of the Deep Water Horizon oil spill be directed to the five Gulf states impacted by the spill. GoCoast 2020 is comprised of more than 100 business and community leaders and elected officials from across the Mississippi Gulf Coast. The group worked to develop a bold, comprehensive vision for a vibrant Mississippi Gulf Coast, relying on public input to help integrate existing plans and resources into restoration efforts.

GoCoast 2020 worked on recommendations about initiatives and projects related to the following eight key areas of focus:

- **Eco-restoration**
- **Economic development**
- **Small business**
- **Seafood**
- **Tourism**
- **Research and Education**
- **Infrastructure**
- **Workforce development**



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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. The Deepwater Horizon NRDA, given its geographic size, three-dimensional nature and ecological complexity, may continue for years. With potential natural resource injury spanning five states and their waters, as well as federal waters, this is the largest damage assessment ever undertaken.

Federal law requires the designation of federal and state officials to serve as trustees in protecting public interest in natural resources and the services they provide. Mississippi's Deepwater Horizon NRDA trustee is Mississippi Department of Environmental Quality (MDEQ) Executive Director Trudy D. Fisher. Working with trustees from the U.S. Department of Commerce (NOAA), the U.S. Department of the Interior (DOI), U.S. Environmental Protection Agency (EPA), U.S. Department of Agriculture (USDA) 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.

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 are collecting data related to a wide range of natural resources. Here in Mississippi, using a team of scientists and other subject experts, MDEQ is conducting a comprehensive, data-driven assessment of the type and extent of damage to our ecosystem resources and habitats. This information is used to assess potential impacts to natural resources. Lost human uses of these resources and habitats such as recreational fishing, boating, hunting, and beach activities also are being assessed.

Typically in a NRDA, the natural resource trustee(s) develops a restoration plan or plans to compensate for the impacts following a damage assessment. Establishing a comprehensive restoration plan involves analyzing data to determine injuries. A draft restoration plan will be developed and offered for public review and comment. Upon approval of the plan, a claim will be made for funds from the responsible parties. These funds will be used to implement projects designed to both restore and compensate for the injured natural resources as well as the human use losses associated with public lands.

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 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.

Eight Early Restoration projects have been funded to date, two of which are in Mississippi. The first was awarded at a cost of \$11 million. It will enhance existing oyster beds, thus compensating for losses of natural resources within the Mississippi Sound exposed to oil, dispersant, and/or response activities following the Deepwater Horizon Oil Spill. Other benefits include providing additional oyster production in the western Mississippi Sound, increasing oyster harvesting opportunities, and enhancing existing Mississippi oyster management efforts.

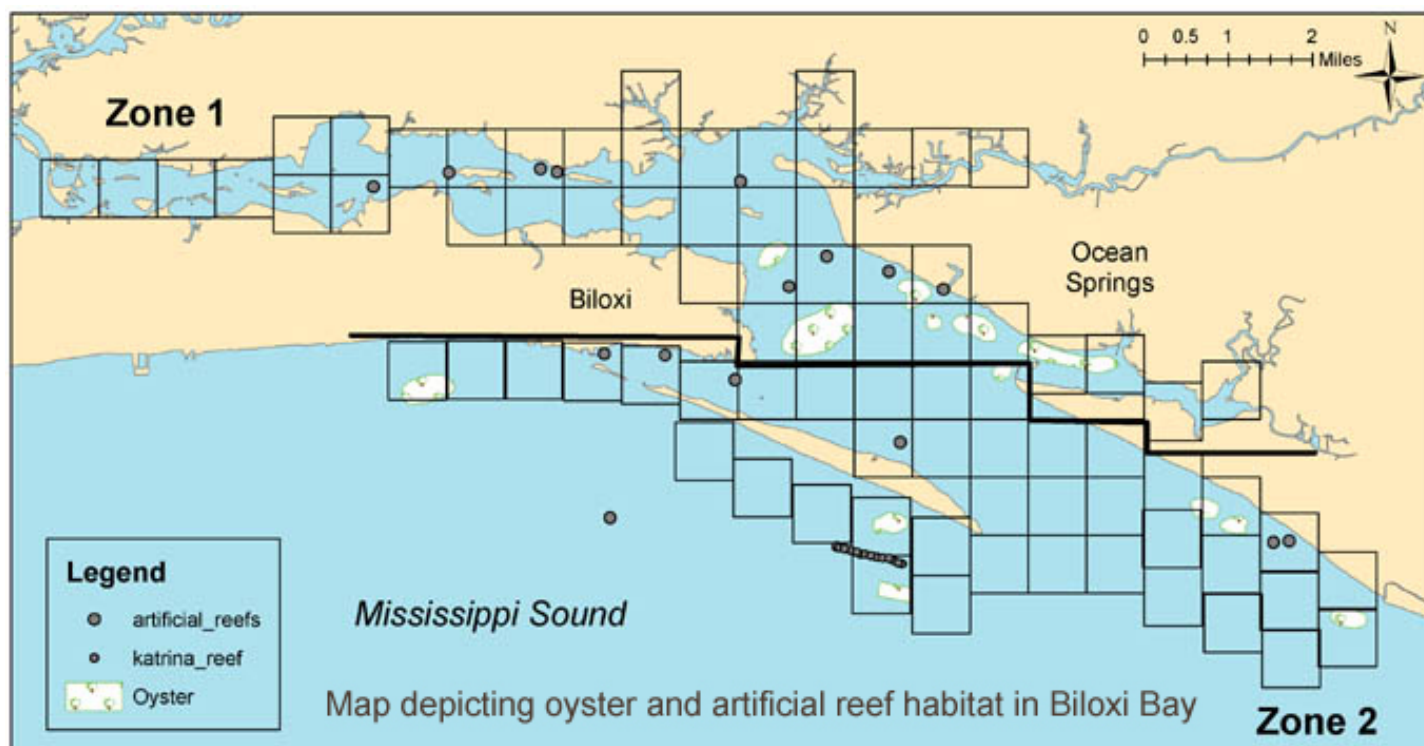
Under this project, approximately 1,430 acres of oyster beds within marine waters of Hancock, Harrison, and Jackson counties will be enhanced through the deployment of cultch material (domestic limestone gravel) onto existing oyster beds. The cultch provides a hard surface where oyster larvae can attach and grow.

The first \$3 million phase of the project was completed in October, 2012, with the deployment of 20,372 cubic yards of approved cultch material, which covered approximately 203 acres. Deployment of the remaining 1,227 acres of cultch will take place in the Spring 2013, and if needed, Fall 2013. This schedule is timed to coincide with the Spring and Fall oyster larvae (spat) season

The second Mississippi Early Restoration project is the Mississippi Artificial Reef Habitat Restoration Project and provides for the deployment of material to enhance up to 67 existing artificial reef areas in the coastal waters of Mississippi. Each reef is approximately three acres in size. Valued at \$2.6 million, it addresses injuries to natural resources and creates new near shore reefs. This enhancement will support the recovery and production of Gulf marine resources by helping increase the overall productivity of the reefs, which is the base of the food web.

The Artificial Reef Project is scheduled to begin November 2012 and it will extend into 2013 with the deployment of 100 acres of crushed, clean domestic limestone cultch material (28,301 cubic yards, total of limestone gravel). The limestone cultch will be placed one to two inches in thickness and the reefs will not exceed a total height of six inches. It will provide valuable hard bottom habitat with foraging and sheltering sites for smaller encrusting organisms. Similar to the oyster cultch restoration project, this project will increase the productivity of reefs by restoring critical resources in the Mississippi Sound.

The Deepwater Horizon natural trustees are currently considering the next round of early restoration, with two new projects proposed for public review. These projects, which are estimated to cost about \$9 million, focus on improving nesting habitat for birds and sea turtles.



Hurricane Katrina Response

Treatment of municipal wastewater is a vital element in the reconstruction of the Coast and in protection of the environment. While most local communities have completed their Katrina related infrastructure projects, two communities continue the work to repair and upgrade their wastewater treatment systems.

The City of Pass Christian is continuing water, wastewater and storm water infrastructure replacement projects. Three of five projects are complete with the two remaining areas due to be finalized by the end of 2012. One of these projects includes redirecting storm water flows from the beach to Bayou Portage north of town.

The City of Biloxi has 36 areas of construction planned under 13 separate construction contracts. One contract/area was completed in 2012 with four more contracts/areas at 10 to 50 percent complete. Three additional areas (two contracts) are planned to be advertised by the end of 2012. Five contracts covering 27 areas of construction are expected to be advertised in early 2013 with the final contract/area planned for 2014. These projects include replacement of sewer lines, rebuilding of pump stations, mitigation projects such as raising control panels and converting some force mains to gravity sewers.



Texas Flat Waste Water Treatment Facility
in Hancock County

Mississippi Gulf Region Water And Wastewater Plan

During 2006, the Mississippi Department of Environmental Quality developed the Mississippi Gulf Region Water and Wastewater Plan in response to Hurricane Katrina. This plan recommended over \$600 million to fund water and wastewater projects in Pearl River, Stone, Jackson, Harrison and Hancock Counties to (1) support existing and future growth patterns, particularly as realized through new housing construction; (2) promote economic development; and (3) emphasize the regional concept for infrastructure management. The funding is provided by the U.S. Department of Housing and Urban Development (HUD) through the Disaster Recovery Community Development Block Grants (CDBG-DR).

Final engineering designs and all clearances for the Environmental Review Records have been completed for all original projects. More than 87 percent of the nearly 4,000 individual parcels, easements, and right of entries required for the projects have been acquired.

Environmental permits necessary for construction have been issued, including: National Pollutant Discharge Elimination System (NPDES), State of Mississippi Water Pollution Control Operating, MDEQ stormwater, the Corps of Engineers' Section 404 wetlands, Section 401 water quality certifications and MDEQ groundwater withdrawal permits.

All original projects have been advertised, received construction bids and commenced construction. To date, the subrecipients (county utility authorities) have submitted closeout packages for 21 projects. An additional 30 projects have reached or are expected to reach substantial completion by 2012 year's end. The remaining projects are expected to finish during calendar year 2013.

The projects being constructed include 17 wastewater treatment facilities, 32 water wells, 32 elevated storage tanks, 68 sewage pumping stations and more than 600 miles of water and sewer mains.

MDEQ has paid out in excess of \$570 million in program-related expenses through the end of 2012. The County Utility Authorities (CUAs) averaged incurring approximately \$7 million per month on construction related expenditures during 2012.

The coming year, 2013, should see a vast majority of the projects and grants closed out, assuming the outstanding rights-of-way and property acquisitions can be obtained in a timely manner. The CUAs are hard at work on start-up activities, as well as continuing to ensure the viability of their facilities, including the construction of ancillary projects that will connect to the CDBG-DR funded facilities. MDEQ anticipates that this program will have a very positive and lasting impact on the lives of coastal residents.

MDEQ And MDWFP Release Fish To Re-Populate Pearl River

Staff from the Mississippi Department of Environmental Quality (MDEQ) and the Mississippi Department of Wildlife, Fisheries, and Parks (MDWFP) completed three fish releases in 2012.

May 26, 2012 – 2,500 Large Mouth bass fingerlings released at Highway 26 near Poplarville.

June 15, 2012 – 14,000 lbs of Large Blue Catfish at Walkiah Bluff near Picayune.

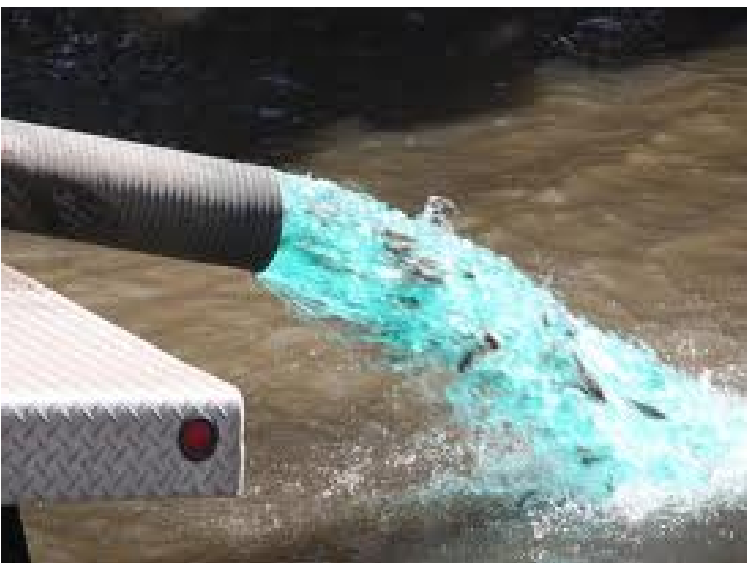
October 25, 2012 – 35,000 White Perch with half released at Walkiah Bluff near Picayune and half released at Napoleon Landing South of Stennis Space Center.

The releases are part of an ongoing stocking program to re-populate the Pearl River after an August 2011 discharge of black liquor from the Temple-Inland paper mill in Bogalusa, Louisiana, resulted in a massive fish kill.

The fish kill stretched through approximately 80 miles of the river, including approximately 40 miles bordering Mississippi. MDEQ, with assistance from MDWFP, estimated that approximately 219,000 fish and mussels were killed in the Mississippi portion of the river.

MDEQ settled with Temple-Inland alleged violations of state laws prohibiting pollution of state waters and improper disposal of waste material. The company has paid a \$100,000 penalty, approximately \$220,000 for fish stocking, and about \$45,000 to reimburse the agency for response and recovery costs. In addition to the three releases that have already occurred, the agencies plan to conduct at least two more releases in the Spring of 2013.

In addition, a continuous water quality monitoring station has been established downstream of the mill in cooperation with the U.S. Geological Survey (USGS). The station provides for real time, on-line monitoring of water quality parameters which can be used to detect future releases.



OUTREACH

Community Engagement

The Mississippi Department of Environmental Quality (MDEQ), Office of Community Engagement (OCE) provides oversight and resources to ensure “transparency” and “meaningful involvement” is incorporated throughout the business process of the agency.

From February 2012 through November 2012, OCE participated in a total of 269 documented outreach activities. This number does not reflect the many one-on-one meetings, conference calls and discussions OCE has been a part of during 2012 both internally and externally on the topics of environmental justice and community engagement.

MDEQ reaffirms strong commitment to engaging with the community, as part of its decision making. MDEQ recognizes that inclusion and engagement, particularly at the early and formative stages of projects and proposals, are vital to building and maintaining community trust.



Nonpoint Source (NPS) Pollution Education Programs

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. The primary objective of the NPS Educational Program is to increase public awareness of NPS pollution and to induce behavior changes that will reduce NPS pollution impacts, both from individuals and watersheds. The following is a descriptive list of the state’s NPS educational and outreach accomplishments.

1. Watershed Harmony Musical Puppet Theater

Watershed Harmony is a 30-minute musical production theater with seven songs, a multi-level stage, and 10 puppet characters. It is performed throughout Mississippi to teach audiences about responsible environmental stewardship of state waters and how Best Management Practices (BMPs) can reduce the impacts of polluted runoff.



2. Mississippi and Yazoo River Boat Tours for Students



A NPS project to educate students about the Mississippi and Yazoo River watersheds began in the fall of 2008. During 2012, a total of 356 students and teachers toured the rivers on a river boat. They viewed land uses on the shore, water uses in the two rivers, and the industrial harbor that might impact water quality in the two watersheds. Pre-test/Post-test scores indicate an increased knowledge and awareness as a result of the tours. Students also gained a new perspective about water quality in their communities.

3. Storm Drain Marking

This program promotes 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." During 2012, volunteers glued the markers to 252 storm drains and distributed door hangers to homes. Students and scouts also talked with residents about stormwater runoff and the need to prevent pollutants from entering storm drains.



4. Adopt-A-Stream Program

Adopt-A-Stream is a program that promotes environmental stewardship by training volunteer citizens about stream ecology, aquatic life, and water chemistry. Volunteers attend a one- or two-day, water-education workshop to learn how to monitor a stream, conduct a stream cleanup, or mark storm drains. In 2012, twenty-four people attended the traditional two day workshop and 149 attended nine one day workshops. Over 8,250 people were reached with the AAS Program statewide through ten large-venue environmental events.



5. Enviroscape and Groundwater Models

During 2012, MDEQ staff reached over 5,000 students, teachers, and the general public using presentations associated with water quality. Over 110 water models have been distributed throughout Mississippi to county MSU Extension Service Offices, Department of Health offices, Soil and Water Conservation Districts, Environmental Learning Centers, the Choctaw Indian Reservation, and other organizations.



6. Environmental Teacher Workshops and Student Environmental Camps



A total of 1,328 teachers and 3,525 students were reached during 2012 at MDEQ-sponsored training venues. Included in the statewide training were 47 approved workshops where teachers could obtain Certified Education Units. Two curricula were used in the training that included *Watershed and Me A-Z* and *Longleaf Pine*.

The *Watershed and Me A-Z* curriculum is new and was released in September 2012.

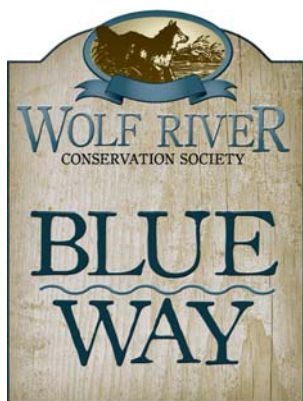
Six student Environmental Day-Camp sessions were conducted at two universities with over 104 students in attendance.

7. Envirothon Competition for High School Students

This competition tests student knowledge about water, soils, forestry, wildlife, and current environmental issues. In 2012, there were 359 high school students (56 teams) and their advisors from 31 Mississippi counties who participated in four area competitions. A total of 115 students (23 teams) participated at the state level competition. Oxford High School, the winning team, traveled to Selinsgrove, Pennsylvania, to compete in the North American Canon Envirothon Competition held in July. Oxford High School placed 16th out of 54 teams in the international competition and had the highest score in the area of soils. MDEQ assists with sponsorship, Envirothon training, the steering committee, and the statewide competition.



8. Water Events/Festivals/Exhibits/Other



- **Blueways**

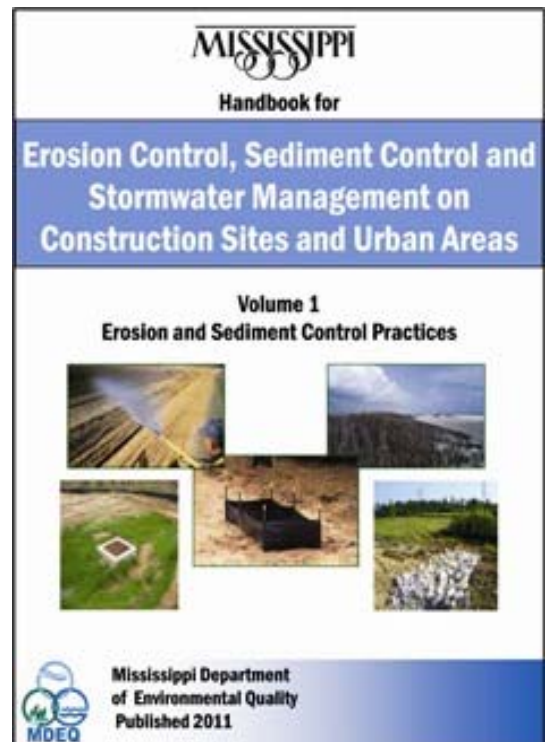
A project sponsored by a NPS grant introduced the concept of recreational paddling trails called *Blueways* to Mississippi citizens. The first recreational activity to begin in Mississippi is called *The Battle on the Bayou*. Over 200 participants throughout the United States traveled to Ocean Springs in order to participate in this *Blueway* event. Continuing the effort of providing recreational paddling trails in Mississippi, other *Blueways* have been added. *The Pascagoula River Blueway* took place at Lighthouse Park in Pascagoula, and *The Jourdan River Blueway* took place at McLeod State Park in Kiln. *The Red Creek Watershed Project* created a beautiful scenic *Blueway* in Stone County thanks to a partnership with the local watershed group.

- *The Wolf River Watershed Project* also added a *Blueway* component in order to engage local stakeholders and to improve the recreational use of the Wolf River. *Blueway* designations provide for additional opportunities for eco-tourism while fostering stream stewardship.
- The ***Make-A-Splash*** Event is a one-day educational event held in September each year where students are transported to the Mississippi Museum of Natural Science in Jackson and each class rotates through about 20 different interactive, water-and water-quality education booths. Eleven schools attended the event in 2012 which consisted of five schools from the Pearl River Watershed, five from the Yazoo River Watershed of the Mississippi Delta region, and one school from the Bayou Pierre Basin. A total of 766 students and teachers attended this event.

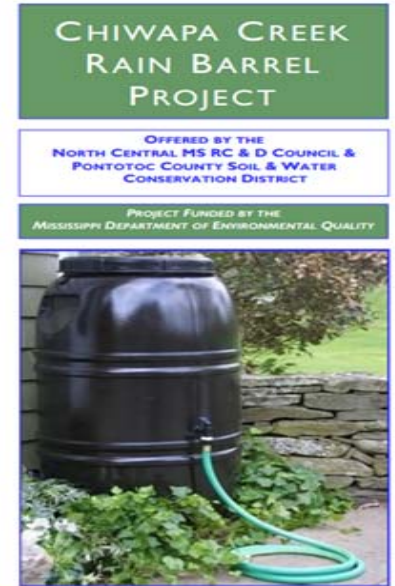
- **The Ross Barnett Reservoir *WaterFest 2012*** The event highlighted the need to protect and improve water quality within the Ross Barnett watershed. The event featured fun, educational/interactive activities, exhibits, food, music, demonstration areas, and more. Attendance for 2012 was over 1,900 people. During *WaterFest*, a kayak race was held through a partnership with the Reservoir Gator Bait Paddler's Association which included nearly 50 kayakers. A new addition to the festival this year was *Project Rezway*, a fashion runway contest for children under the age of 18 to construct apparel and accessories out of 75 percent recycled material.



- ***Updated Handbook for Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas*** – Stormwater management at construction sites in urban areas and commercial developments often requires innovative application of art and science to help insure that people are held safe, property is protected, and the environment is not adversely affected. To help with this management task, MDEQ collaboratively developed a document entitled *Planning & Design Manual for the Control of Erosion, Sediment and Stormwater*. MDEQ recently elected to initiate a process of review and improvement of the current manual, with significant input from Mississippi Department Of Transportation and U.S. Department of Agriculture. In 2012, the manual has been presented at four, statewide conference- events that included audience members of private contractors and engineering professionals, as well as state and federal agency personnel.

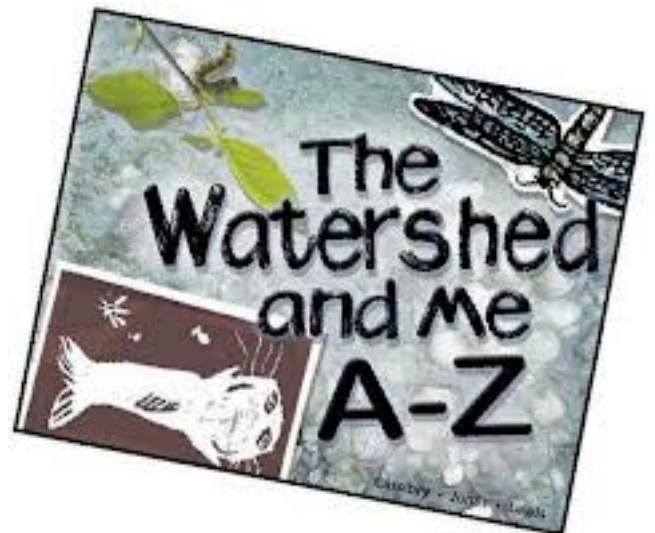


- **Nutrient Management Guidelines for Agronomic Crops Grown in Mississippi** – MDEQ, through its NPS grant, funded the Department of Plant and Soil Sciences at Mississippi State University, for a nutrient management planning manual to be primarily used by farmers. The publication was completed in March of this year and it brings together many years of science regarding the economic and environmentally responsible use of plant nutrients in Mississippi. This manual was selected as the national winner of the bound book category in the Communications Awards program of the National Association of Country Agricultural Agents.



- **Rain Barrel Demonstration Project** – A rain barrel connected to a household gutter collects and stores rain water from a rooftop for later use in watering or irrigation. A demonstration project was held to educate the public about the ease of constructing and using a rain barrel to reduce runoff into storm drains, rivers and streams. The project educated and assisted 262 people in building 275 rain barrels as well as producing informational brochures.

- **The Watershed and Me A-Z Book** – MDEQ, through its Section 319 NPS grant, provided funding for the Mississippi Gulf Coast Community College to produce this book containing images of plants and animals that are located in the Longleaf Pine Ecological System of Mississippi. This ecosystem extends from the Meridian area of central Mississippi in the upper Pascagoula River Basin to south of Jackson and southward all the way to the Gulf Coast. The book was released in September 2012 and is focused on the educational concept of “community-based education” or “place-based education,”



enHance Recognition Program



In its fourth year, enHance currently has 32 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 reductions of over 12,900 tons of solid waste, 23,800 tons of air emissions, 630 million kBtu of energy use, and 14 million gallons of wastewater. This has been done through changes in operating procedures, redesign of products/packaging, beneficial reuse of materials, installation of more efficient equipment, recycling, and other similar alternatives. The annual training workshop and luncheon was held in April to recognize new members and provide environmental training and networking opportunities. This year's workshop was "Solutions for Waste." Presentations included information on beneficial use

opportunities for solid waste, innovative applications for reducing industrial energy use, savings opportunities with the E3 (Economy, Energy and the Environment) program, and an industrial best practices case study on waste reduction.

Energy Efficiency and Energy Star

As outlined by the Energy Star program of EPA, "Energy efficiency is the fastest, cheapest, and largest untapped solution for saving energy, saving money, and preventing greenhouse gas emissions." Energy Star outlines a seven step continuous improvement process to improve the energy performance of buildings. The Pollution Prevention program has been working 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 30 percent in less than three years, saving thousands of dollars. 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.

The agency is planning for expansion of energy reduction efforts to greening efforts of all office operations. Consequently, our Energy Committee is expanding to a Green Team that extends its scope to address solid waste, fleet management, water usage, and procurement, in addition to energy conservation initiatives underway. The Green Team vision is to make meaningful changes happen, then generate periodic reports and share success stories and lessons learned intended to be shared inside and outside state government.

Environmental Resource Center

The Mississippi Department of Environmental Quality is dedicated to providing statewide focused, collaborative, and coordinated environmental assistance, as a priority, to increase environmental awareness and compliance, and to protect the environment for all Mississippians. MDEQ's assistance vision and ethic incorporates and implements the theme "Environmental Assistance – A Priority." Assistance in the form of workshops, seminars, training sessions, and on-site technical assistance is provided through the Environmental Resource Center (ERC). MDEQ assistance activities are developed and implemented in an agency-wide perspective incorporating input from all MDEQ offices, divisions, programs, and across environmental media.

Topics and issues: solid waste planning, solid waste enforcement officer training, surface mining laws and regulations, high hazard dam regulations, dam safety, solid and hazardous waste recycling, small business technical assistance, dry cleaner assistance, toxic release inventory training, storm water regulations, pollution prevention, paint spray operations, compliance assistance, coating operations, city and county seminars and conferences, wastewater compliance, basin management, watershed implementation, and water quality.

The ERC continues to provide one-on-one assistance activities to a variety of Small and Less than Large Businesses. ERC serves as the central point for receiving citizen complaints and Public Information Requests.

During the month of October the Environmental Resource Center recognized and promoted Children’s Environmental Health. The MDEQ ERC partnered with the Mississippi Children’s Museum, the Mississippi Museum of Natural Science, the Mississippi Department of Wildlife Fisheries and Parks, the Mississippi Public Broadcasting and Metro Jackson Attractions Associations to disseminate information to assist parents and other children’s organizations in providing healthier environments for our children. Over 1,400 people attended the event.



The MDEQ Environmental Resource Center also presented an Energy Efficiency Workshop for churches. The workshop was well attended by Jackson area churches. The workshop involved representatives from the MDEQ’s Environmental Resource Center, Mississippi Development Authority’s Energy Division, Entergy, and MDEQ’s Energy Efficiency Committee.

Solid Waste and Recycling Education and Outreach Programs

An important part of work of the Solid Waste and Recycling programs are the outreach efforts provided to the public and to stakeholders in the state on proper solid waste management and recycling and waste reduction. These outreach efforts are conducted by MDEQ through partnerships with various organizations in the state and region on a variety of solid waste management and recycling issues. Throughout the year, MDEQ’s solid waste programs helped to organize and host conferences and meetings for the Mississippi Recycling Coalition and the Mississippi Chapter of the Solid Waste Association of North America. In addition, the Solid Waste programs participated in conferences, conventions and training sessions of various organizations including the Southeast Recycling Development Council, the Mississippi Municipal League, the MDEQ Enhance Program, the Mississippi Association of Supervisors, the Mississippi Manufacturer’s Association, the Mississippi Chapter of the Air and Waste Management Association, Keep Mississippi Beautiful and various other state and local organizations and agencies.

Geology Outreach and Education

1. The Fossil Road Show, Mississippi Museum of Natural Science

The Fossil Road Show was held at the Mississippi Museum of Natural Science. MDEQ staff who helped with this event were David Dockery and James Starnes of the Office of Geology.



2. The Fossil Road Show, Union County Heritage Museum

James Starnes identified fossils at the Union County Heritage Museum Fossil Road Show.

3. Office of Geology Rocks the Show

Staff from the Office of Geology were present at the Mississippi Rock, Gem, Mineral, and Fossil Show in Jackson. They answered questions from the public and presented the multifaceted work of the Office of Geology.



4. Teacher Workshops

David Dockery presented the geology sections for the Hinds County and the Yazoo County Soil Conservation Service teacher workshops. Teachers were trained in using Office of Geology circulars 6 and 7 to teach geology in their classrooms.

5. The Jackson Public Library Summer Reading Program

James Starnes of the Office of Geology presented a rock and fossil program at the Eudora Welty Library.

6. French Elementary School Career Day

James Starnes presented geology as a career at the French Elementary School Career Day.

7. St. Richards Elementary School Community Helpers Program

James Starnes gave a geology talk at St. Richards Elementary School's Community Helpers Program.

8. Jackson Area Cub Scouts Jamboree

James Starnes did a program and activities of the Geology Merit Badge at the Jackson Area Cub Scouts Jamboree.

