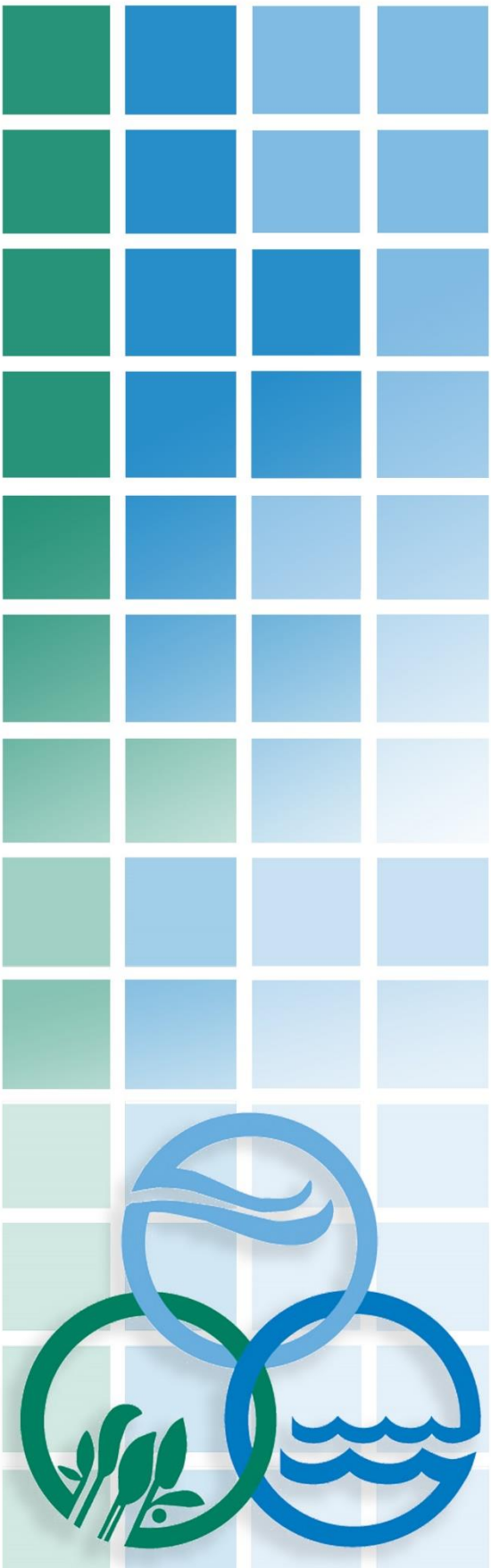


MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

2017 ANNUAL REPORT

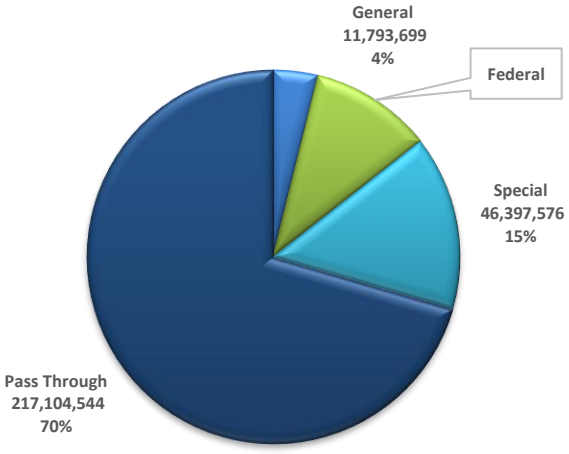
TABLE OF CONTENTS

STRATEGIC GOALS

Building a Better Mississippi: The Statewide Strategic Plan for Performance and Budgetary Success contains goals applicable to MDEQ and its mission. This annual report seeks to correlate the following goals of the agency's strategic plan with the results of its work in Fiscal Year 2017.

1. **Natural Resources** – To ensure that current and future generations have access to the state's abundant natural resources through restoration, protection, conservation, and wise development of those resources.
2. **Infrastructure** – To ensure that construction and maintenance of infrastructure are adequate to meet the needs of citizens and the business community and to foster economic growth.
3. **Health** – To protect Mississippians from risks to public health and to provide them with the health-related information and access to quality healthcare necessary to increase the length and quality of their lives.
4. **Economic Development** – To develop a robust state economy that provides the opportunity for productive employment for all Mississippians.
5. **Public Safety and Order** – To protect the public's safety, providing timely and appropriate responses to emergencies and disasters and to operate a fair and effective system of justice.
6. **Government and Citizens** – To create an efficient government and an informed citizenry that helps to address social problems.

FY16 APPROPRIATION



Message from the Executive Director

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

Gary Rikard
Executive Director
MDEQ

I. AIR QUALITY

A. Air Monitoring

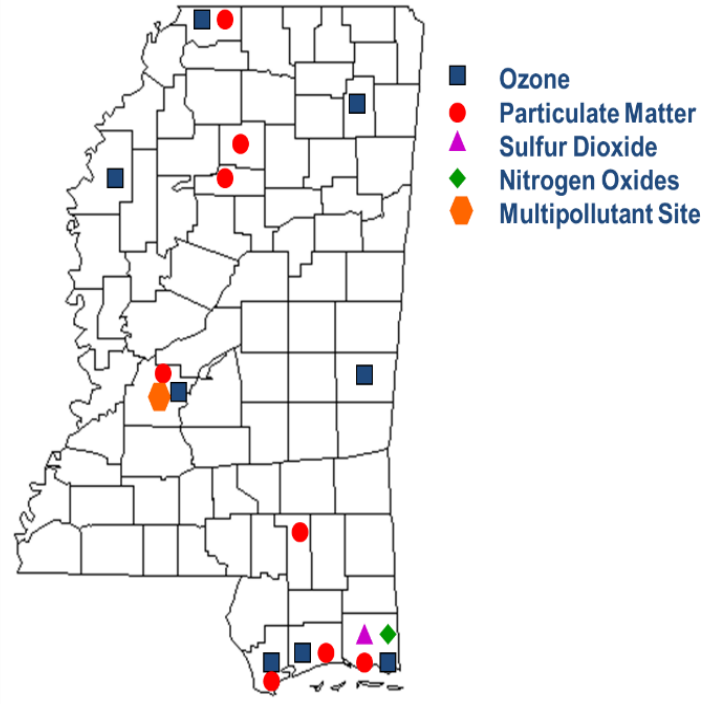
MDEQ operates a network of automated continuous air analyzers and 24-hour manual samplers for the purpose of measuring ambient air quality.

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

This monitoring network serves many purposes:

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

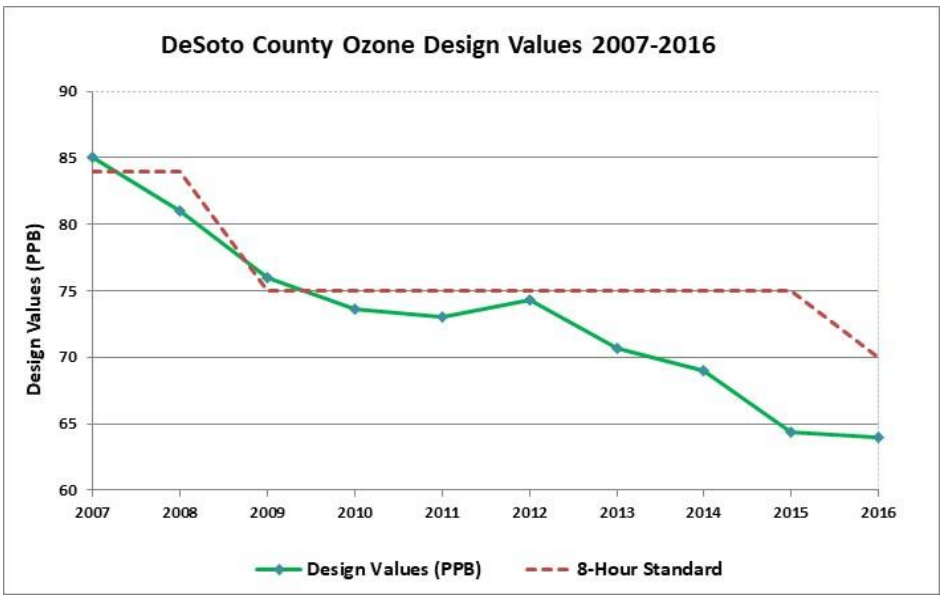
Mississippi Ambient Air Quality Monitoring Sites

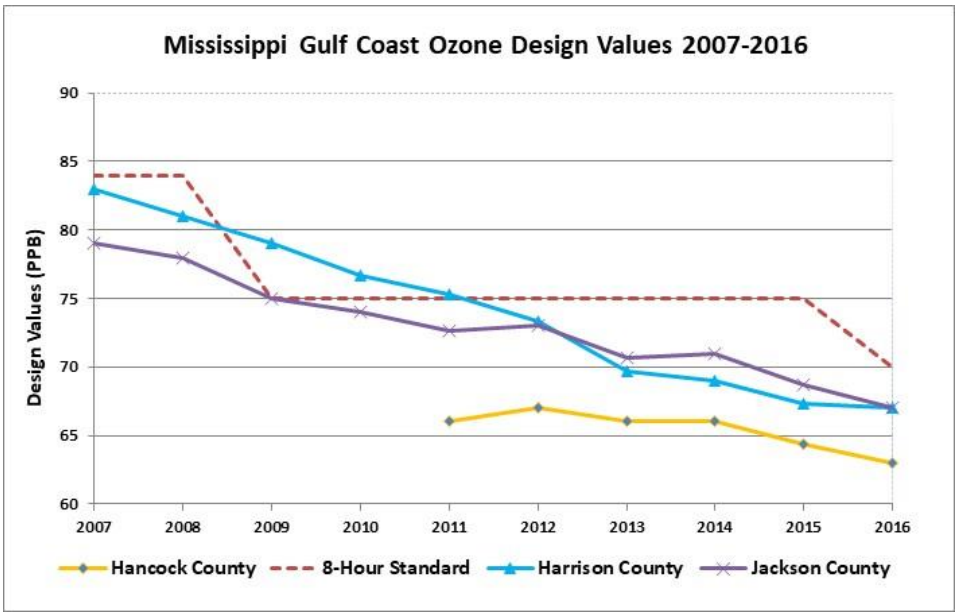


Air Quality Index Levels of Health Concern	Numerical Value	Meaning
Good	0 to 50	Air quality is considered satisfactory, and air pollution poses little or no risk
Moderate	51 to 100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of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

MDEQ issues daily air quality forecasts for the Mississippi Gulf Coast and the Jackson Metropolitan Area from April through October each year. Also, MDEQ, in association with the Memphis-Shelby County Health Department, issues air quality forecasts for DeSoto County.

These forecasts are made available through e-mail, the MDEQ website, and Twitter. The forecasts keep the public informed about the status of air quality, issue health advisories when needed, and notify the members of the respective ozone precursor reduction programs when they should implement their emissions reduction plans.





AIR QUALITY OBJECTIVE - Maintain Compliance with Federal Air Quality Standards

In 2012, the U.S. Environmental Protection Agency (EPA) designated all Mississippi counties as attainment for the nitrogen dioxide standards. EPA retained the current standards for carbon monoxide, and Mississippi is meeting those standards.

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

In August of 2017, EPA designated all counties in Mississippi as attainment/unclassifiable for the 2010 sulfur dioxide (SO_2) standard. MDEQ and the facilities worked cooperatively to meet the requirements needed to achieve this designation.

Emissions reductions in Mississippi and adjoining states, as well as favorable meteorological conditions, resulted in a recent downward trend in ground level ozone (O_3) concentrations. Although DeSoto County met the 2008 O_3 standard, most of the county was designated as part of the Memphis Nonattainment Area in 2013. In April 2016, EPA approved MDEQ's recommendation for all of DeSoto County to be in attainment. In 2015, EPA lowered the standard for O_3 to 70ppb. The Governor's recommendation for all counties in the state to be designated as attainment was submitted to EPA in August of 2016. Using the design values from 2014 to 2016 and 2015 to 2017, all monitors in Mississippi are meeting the 2015 O_3

standard. In November of 2017, EPA indicated that all of Mississippi would be designated as attaining the 70ppb O_3 standard. MDEQ is continuing a voluntary O_3 precursor air pollution control program in partnership with governmental and business leaders on the Coast and in DeSoto County in efforts to prevent or mitigate future nonattainment.

In 2008, EPA issued a new lead standard that required MDEQ to monitor for lead starting in December 2011, and the state is currently meeting that standard.

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

Mississippi is working with nine other southeastern states to address the many new air quality standards, that have or will come out, in a more efficient and effective way. The SEMAP group, which includes several MDEQ staff members, is addressing the new standards from a regional perspective. This is necessary because air emissions from Mississippi may impact air quality in other states, and other states can impact air quality in Mississippi. It is also more efficient and cost effective because the group can hire contractors to help develop inventories and perform air quality modeling and analysis for much less than each state trying to do the work on their own. The Southeastern States Air Resource Managers handle the administrative tasks for the group with the states providing technical expertise. The modeling effort has been continuing and results will be available to use for the new standards. Over the past year, the group has been working to develop better emissions inventories and plan for modeling to support requirements for EPA's Air Transport Rule and the Regional Haze Rule.

C. Air Emission Inventory Branch

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 MDEQ Air Division develops an inventory each year that quantifies the air emissions from larger 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 and submitting it to EPA in a prescribed format. The Emission Inventory Branch completed and submitted the 2015 major source inventory due January 2017. The request for the 2016 inventory was sent for review and will be processed and submitted to EPA in January 2018.

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

In Fiscal Year 2017, MDEQ utilized DERA grant funds for the replacement of older school buses with newer, cleaner, and more efficient ones. In 2016, after receiving applications from 14 school districts, MDEQ worked with 10 school districts to replace 11 school buses, with a total of $165,000 in sub-grant allocations. In 2017, after receiving applications from 14 school districts, MDEQ worked with nine school districts to replace 18 school buses, with a total of $267,972 in rebate allocations. Due to the success of this program, MDEQ expects to continue with a new DERA State Grant from EPA.

E. Asbestos

Asbestos is a potential danger when disturbed during the course of a building demolition or renovation operation. MDEQ regulations require affected facilities to inspect for asbestos before work begins. The regulations also specify work practices and procedures to prevent asbestos fiber emissions during building demolition and renovation activities. MDEQ assists project owners and operators in understanding the requirements of the regulations and performs demolition and renovation project inspections to ensure safe and compliant operations. Additionally, MDEQ aids homeowners by providing information in dealing with the hazards of asbestos for non-regulated activities they may perform.

EPA regulations require that schools inspect all buildings for asbestos materials, and monitor the condition of any asbestos material not previously removed. The regulation requirements and school activities must be addressed in an asbestos management plan required of each Mississippi school district. MDEQ performs asbestos management plan inspections to ensure that the requirements are being satisfied and that students, teachers, and other school employees are being protected from exposure to asbestos.

MDEQ also ensures, through its asbestos abatement activity certification program, that individuals who engage in asbestos abatement activities receive professional training and demonstrate they are competent to perform these services.

During Fiscal Year 2017, MDEQ inspected 275 building demolition and renovation projects and investigated 30 complaints. There were also 1,479 applicants who received certification to perform asbestos abatement activity and 36 school districts evaluated with asbestos management plan inspections.

F. Air Toxics

Air toxics refer to air pollutants that EPA has listed as Hazardous Air Pollutants (HAP). These air pollutants may cause acute or chronic health conditions and are primarily controlled or reduced through regulations called Maximum Achievable Control Technology (MACT) standards. Impacted facilities generally must install additional control equipment or change process equipment and materials in order to reduce HAP emissions to low levels. These standards and emission limitations are based upon the application of best demonstrated technology and very high emission control efficiency.

There are numerous MACT standards that affect 174 different source categories of major HAP

emission facilities and 70 source categories of smaller HAP emitting facilities, called area sources. There is a significant number of different, and often changing, HAP regulations to implement, and the universe of regulated facilities to assist and monitor for regulation compliance is quite large. The affected facilities range from large chemical and industrial facilities to small dry cleaning facilities, gasoline stations, and even backyard auto painting shops.

Air toxic activities also include the implementation of accidental release prevention regulations. These regulations apply to facilities with certain chemicals that could be very dangerous to public health and the environment in the event of a chemical accident or an uncontrolled release. Facilities that have or use these chemicals in amounts above the minimal levels must employ appropriate process safety measures or controls and must be prepared to mitigate the

consequences should a release of one of the listed chemicals actually occur. A regulated facility's actual planning, techniques, and procedures to prevent chemical accidents must be outlined and submitted in a Risk Management Plan for agency review. Activities also include monitoring the ever-changing regulated source population and completing compliance monitoring inspections of regulated facilities. During Fiscal Year 2017, there were 149 active regulated facilities and staff completed 37 inspections at regulated sources.

G. Title V Program

Mississippi received full approval from EPA in January 1995 to administer the Title V Operating Permit program. This program originated in the amendments to the Clean Air Act enacted in 1990. Each major source of air pollution is required to obtain a Title V Operating Permit which sets out all air requirements applicable to the source and specifies the methods by which the

source must demonstrate compliance. All aspects of Title V permitting are handled by the MDEQ Environmental Permits Division while all compliance certifications and demonstrations are handled by the MDEQ Environmental Compliance and Enforcement Division.

The Air Division meets regularly with the Title V Advisory Council (Council) to update them on the Title V workload and level of effort. The Air Division annually compiles data on actual program revenue and expenditures, along with projected expenditures, emission rates, and a work plan for the upcoming year, and submits this information to the Council. The Council uses this data to recommend an adequate Title V permit fee to the Commission on Environmental Quality (Commission) for the upcoming fee year. The program's revenue needs and the Council's fee recommendation are timely reported to the Commission so that they may adopt an appropriate fee rate prior to the September 1 annual permit fee due date. The Air Division also handles the collection of emissions information from fee-subject sources and provides fee-assessment information to the MDEQ Office of Administrative Services which handles fee billing and collection.

During Fiscal Year 2017, there were 65 Title V permits issued, including initial issuances, renewals, and all modifications. There were also five new Synthetic Minor Operating Permits issued to facilities that would have otherwise been required to obtain a Title V permit except that the owner or operator elected to take federally enforceable permit restrictions to limit allowable emissions below Title V major source thresholds. There were 122 Title V inspections conducted during this same time.

H. Greenhouse Gases

On December 7, 2009, the EPA Administrator signed the Endangerment Finding for greenhouse gases from mobile sources. EPA has used this finding as the basis to expand its regulatory efforts to regulate large stationary sources of greenhouse gas emissions. Initial regulatory efforts of greenhouse gases included regulations for the power sector, oil and natural gas industries, and landfills. The most significant of these regulations to date was the final release of the Clean Power Plan in August of 2015. However, in October of 2017, the current EPA Administrator proposed the repeal of the Clean Power Plan and continues to review other rules associated with greenhouse gases in accordance with Executive Order 13783 published in the Federal Register at 82 FR 16329 (April 4, 2017). MDEQ continues to monitor these efforts associated with the regulation of greenhouse gases and will participate in the regulatory process where necessary to support reasonable and effective regulation.

I. Lead-Based Paint Program

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

In addition to certifying persons and firms engaged in lead-based paint activities, MDEQ staff performs audits of training courses and performs inspections of job sites to ensure compliance with the regulations. During Fiscal Year 2017, the MDEQ Lead-based Paint Section performed 11 training course audits, nine paperwork review inspections, 39 site inspections (including investigations at three complaint sites), and certified 556 individuals and firms involved in lead-based paint activities.

II. WASTE MANAGEMENT

Waste Management Strategic Goal: Protect Mississippi's soil and water resources through proper nonhazardous solid waste and hazardous solid waste management.

Solid wastes include all types of garbage, refuse, debris, sludge, or other discarded materials from residential, commercial, industrial and institutional sources. The Mississippi Legislature has declared it to be the policy of the state that the generation of waste should be reduced or eliminated at the source, whenever feasible; waste that is generated should be recycled or reused whenever feasible; waste that cannot be reduced or recycled should be treated in an environmentally safe manner; and, disposal or other permitted release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner. MDEQ has been designated as the lead agency in implementing this policy to reduce wastes, reuse and recycle wastes and to safely dispose of wastes when necessary. To do so, MDEQ regulates the management of solid wastes from residences, businesses, industries, and institutions at storage sites, transfer stations, composting operations, recycling facilities, processing facilities, rubbish sites, landfills, and other types of solid waste facilities.

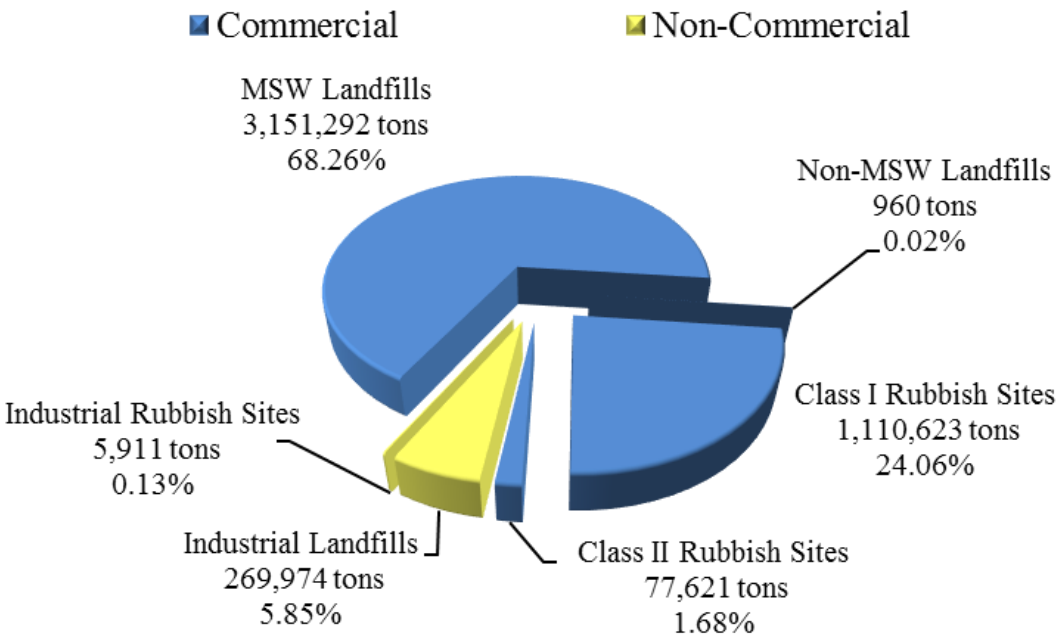
MDEQ also has delegation from EPA to regulate those solid wastes that are also "hazardous wastes." Hazardous wastes are those discarded materials that have characteristics that make the waste potentially more dangerous or harmful to human health or the environment if managed improperly.

A. Mississippi Solid Waste Management and Disposal

MDEQ's Non-hazardous Solid Waste programs direct the state's efforts to ensure the proper management of solid wastes, to promote the reduction and recycling of solid wastes, and to plan for the future solid waste management needs. To measure the success of these efforts, MDEQ collects an annual report from the owners or operators of permitted solid waste management facilities on activities conducted during the preceding calendar year.

In 2017, MDEQ developed a consolidated report on solid waste management activities conducted during Calendar Year 2016. This report indicated that just over 4.6 million tons of wastes were disposed at permitted landfills and rubbish sites in Mississippi. Approximately 3.1 million tons (68.28 percent) of the total waste was disposed at commercial landfills, 270,000

tons (5.85 percent) at non-commercial landfills, 1.19 million tons (25.74 percent) at commercial rubbish sites, and 6,000 tons (0.13 percent) at non-commercial rubbish sites. About 4.3 million tons of solid wastes were disposed at commercial disposal facilities and the remaining 280,000 tons of wastes were disposed at noncommercial disposal facilities. Mississippi received a little less than 640,000 tons of solid waste from out-of-state sources representing approximately 14 percent of the total.



In addition, a total of approximately 20,000 dry tons of wastes were applied at permitted land application sites, and about 26,000 tons of material was received at solid waste composting facilities. The annual reports also indicated that approximately 123,000 tons of material was received for management at solid waste processing facilities and 745,000 tons of wastes was managed by solid waste transfer stations.

B. Recycling and Waste Reduction

State law mandates the reduction of waste at its source, the re-use of waste materials rather than discarding them, the recycling of solid wastes whenever possible, and safe disposal of wastes as a last resort. Although MDEQ does not currently collect detailed recycling information from local governments or recycling businesses, the agency measures the access and availability of local recycling services to the state's residents. MDEQ's analysis indicates that close to 60 percent of the state's population has access to local government-sponsored recycling programs. This percentage represents continued growth; however, this rate still falls short of the national access rate of 94 percent. Approximately half of these Mississippi residents with recycling access are provided curbside recycling services with the remaining half having access to drop-off recycling services. The 40 percent of the state's population that does not

have access to community-based programs may still have access to other commercial recycling businesses or to non-profit recycling programs. The access to recycling for the state's population is slowly increasing as more communities add new recycling programs and as other communities upgrade and expand existing programs.

To grow recycling access, MDEQ emphasizes local government recycling programs and works to build cooperative efforts among local governments to collect, process, and market recyclables.

MDEQ's Waste Division also works with various partners to provide education and outreach on the importance of growing recycling in Mississippi and also provides training and technical resources to recycling professionals. MDEQ provides educational and technical assistance to increase the awareness and the importance of recycling and solid waste reduction measures. One of the key partners is the Mississippi Recycling Coalition (MRC), a non-profit consortium of local governments, state agencies, industries, institutions, businesses, trade organizations and non-profit groups working together to promote and grow recycling. MDEQ staff provide key assistance to MRC promoting and managing membership, hosting board meetings, managing the organization's website, developing and assisting with conferences, press releases, and programs involving student scholarships and school grants and awards. Other partners in the agency's recycling efforts include Keep Mississippi Beautiful and its local affiliates, the Mississippi Beverage Association, the Mississippi Municipal League, the Southeast Recycling Development Council, the Mississippi Manufacturers Association and various other local, state, regional and national organizations.

In addition, as a part of the agency's mission to promote recycling, MDEQ conducts outreach on the importance of recycling to various ages and groups around the state. This outreach includes presentations to organizations and schools, and exhibits on recycling and solid waste at various public events. In 2017, MDEQ was also been able to add to the recycling staff at MDEQ to better enable the agency to conduct its mission to promote recycling in the State.

C. Solid Waste and Waste Tire Grants Programs

The Waste Division also manages various solid waste assistance grant program funds. MDEQ awarded almost $2.9 million in Fiscal Year 2017 for solid waste management and recycling projects, solid waste planning projects, and waste tire projects. Of that total, over $1.7 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, provide household hazardous collection programs, conduct public information efforts on solid waste and recycling programs, and for other waste management activities at the local level. These funds are annually awarded through two different categories of grants: the non-competitive (or allocated) grants to county governments and the competitive grants available to municipalities, counties, solid waste authorities, solid waste districts and other local government organizations. These grant awards included supplemental solid waste enforcement officer grant funds awarded to communities that have maintained successful illegal dumping prevention and enforcement

programs.

Grant Awards for Fiscal Year 2017

- 57 counties were awarded at total of $637,045.00 in non-competitive, allocated grants.
- 34 municipalities, counties and solid waste authorities were awarded a total of $1,071,628 in competitive and supplemental grant funds.
- 24 municipalities, counties or solid waste authorities were awarded a total of $1,176,470 to fund local waste tire collection and clean-up programs.

Those local governments receiving waste tire grants included: Alcorn, Attala, Carroll, Clarke, Grenada, Harrison, Hinds, Jackson, Leflore, Madison, Marion, Marshall, Neshoba, Newton, Pike, Tallahatchie, Tate, Warren, and Wayne counties; Golden Triangle, Northeast Mississippi, Pine Belt, and Three Rivers Solid Waste Management Authorities; and, the City of Jackson.

MDEQ continues to work with the hub communities that received Regional Recycling Cooperative Grant awards in 2014. The grant award projects have been completed for three of the hub communities and the fourth community is evaluating the best means of using the remaining funds in their grant award after seeing some changes to local options for sorting recyclables. MDEQ has received approval to move forward with an additional round of regional recycling awards and is in the process of developing a new Funding Opportunity Announcement for these awards.

D. Solid Waste Planning

The MDEQ Solid Waste program works with local governments to develop and implement long-range solid waste planning efforts. Each local government is required by state law to develop and implement a comprehensive local, solid waste management plan for a 20-year period. The original local government solid waste plans in Mississippi were adopted in the early 1990s; consequently, many of these plans have reached the end-of-life and have been or are in the process of being updated.

Over the past year, comprehensive local solid waste plans have been granted final approval by the Commission for Kemper County and the City of DeKalb, Simpson County and the Cities of Magee, Mendenhall and Braxton and Washington County and the Cities of Arcola, Metcalfe, Hollandale, Greenville, and Leland. In addition, local solid waste plans are being finalized for Lauderdale County and the City of Meridian; the City of Canton; Rankin County and the Cities of Brandon, Florence, Flowood, Pearl, Pelahatchie, and Pearl; and Tallahatchie County and the Cities of Sumner, Tutwiler and Webb. Draft plans have also been completed for Hancock County, Tallahatchie County and Warren County. The development of comprehensive, updated solid waste management plans are in process for Holmes County and the Golden Triangle Solid Waste Authority. In addition, new efforts to comprehensively update solid waste plans were initiated in 2017 for Coahoma, Leflore, Neshoba, Smith counties and the Northeast Mississippi

Regional Solid Waste Authority (Benton, Prentiss, and Tippah counties).

Often local governments make decisions to significantly alter or amend their plans. MDEQ also reviews amendments to existing local plans to assure adequate disposal services and capacity and consistency with state law. These amendments are often conducted to add new disposal or recycling facilities locally or to make other changes to local solid waste plans regarding the manner that solid wastes are being managed. Communities that completed modifications in 2017 include: Golden Triangle Solid Waste Authority (expansion of landfill service area), Copiah County (addition of land application site), Hinds County (addition of land application sites, expansion of Class I rubbish sites), and Pine Belt Regional Solid Waste Authority (expansion of Class I rubbish site). Other plan amendments are under review by MDEQ for Three Rivers Regional Solid Waste Authority, Hancock County Solid Waste Authority, and Lauderdale County.

E. Waste Tire Management Program

The Waste Tire Management Program is tasked with developing, implementing, and promoting the state's strategy to achieve statewide recycling of waste tires. The program's success is reflected in the most recent annual program information collected at the end of 2016 indicating an overall waste tire recycling rate of 95 percent for tires collected and processed. The recycling rate for those waste tires generated in the state was just over 90 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 managed approximately 4.5 million waste tire equivalents with approximately 50 percent of the tires being imported from out-of-state.

The Waste Division reviews or otherwise handles the processing of various applications for waste tire management permits and authorizations for the collection, transportation, storage, processing, recycling, and disposal of waste tires. The state's network of waste tire transporters and waste tire management facilities consists of 122 licensed waste tire haulers, 149 local government waste tire collection sites (managing over 780,000 waste tires), and 10 commercial waste tire processing and collection facilities. Collectively, Mississippi waste tire facilities and transporters managed approximately 5.44 million passenger tire equivalents during calendar year 2016.

In addition to the infrastructure addressing the proper management of waste tires, MDEQ also initiates compliance and clean up actions involving facilities or persons and the unauthorized or improper management of waste tires. MDEQ manages the Waste Tire Abatement Program which provides assistance for the clean-up of unauthorized tire dumps and investigates

complaints. Since the program was started, MDEQ has cleaned up approximately 2.5 million waste tires from historic and random dumpsites. In early 2017, MDEQ completed a new contract solicitation process, and three contractors were selected to continue waste tire abatement activity.

MDEQ also worked with the Mississippi State University Extension Service to collect tires from farms and agricultural sources at an agricultural pesticide collection event held in Tunica County in February of 2017. The county used MDEQ grant funds to provide waste tire collection services in conjunction with the pesticide collection event. These cooperative efforts have been successful in past years and MDEQ hopes to continue this opportunity to assist the agricultural community.

F. Electronic Waste Management

Electronic waste, or e-waste, continues to be one of the fastest growing waste streams nationally, often presenting management and disposal problems for the state. MDEQ assists communities, businesses, and private citizens with the proper methods for recycling and disposing of e-waste. MDEQ maintains various web resources on e-waste including a directory of electronic recycling companies and other options for managing and recycling discarded electronics.

MDEQ also provides information and resources to support the implementation of the provisions of the state's Certified Electronics Recyclers Law which requires all state agencies to use a certified electronics recycler for the end of life management of electronic assets such as personal computers, computer components, audio players, videocassette players, facsimile machines, cellular telephones, wireless paging devices, or any electronic items containing an intact or broken cathode-ray tube. The Certified Electronics Recycler Law requires MDEQ to maintain a listing of certified electronics recyclers for the reference and use of state agencies on the agency's website.

State law also requires that MDEQ promote the certification of electronics recyclers. In particular, MDEQ promotes certification programs managed by two organizations, Sustainable Electronics Recycling International (SERI – formerly R2 Solutions) and the Basel Action Network. These two organizations provide certification of recycling businesses that collect and recycle used electronic products in a safe and responsible manner. MDEQ encourages the state's communities, businesses and local and state government agencies when making decisions on electronics recycling services to consider the benefits of using an electronics

recycling company certified under one of these programs. MDEQ also encourages any recycling business that collects and manages electronics to consider obtaining certification of its processes for managing and recycling the electronic products. At least two business organizations in the state, Magnolia Data Solutions of Jackson, and Logista Solutions of Columbus, are both certified to the R2-standard.

MDEQ also assists with and/or sponsors various community e-waste collection and recycling events and programs for residents and small businesses. MDEQ provides grants to communities to sponsor e-waste collection events for the public, often as part of a larger household hazardous waste collection event. MDEQ joins the Jackson Metro Chamber Partnership and various other partners to host two e-waste collection and recycling events for small businesses and residents in the Jackson Metropolitan area.

The agency also continued its support for the computer refurbishment program at Jackson State University (through a partnership agreement with Hinds County). MDEQ provides grant support to assist the program in collection and restoration of used computers. The program collects used computers from area businesses and residents and repairs them to be donated to low-income families, churches, summer programs, nonprofit organizations, day care centers. The program provides technical training to young adults on computer repair and restoration. In addition, the JSU program also sponsored an e-waste collection event in West Jackson for local residents and businesses.

G. Medical Waste Management

Medical Wastes

MDEQ shares regulatory authority with the Mississippi State Department of Health for medical waste management. The Department of Health sets minimum standards for management of medical wastes for licensed health care facilities in the state. MDEQ's responsibility includes the oversight of medical wastes collected and transported from health care facilities, veterinary care facilities, medical wastes generated by emergency and trauma response, medical wastes generated by business and institutional clinics, and medical wastes generated in private residences through home healthcare. In addition, MDEQ oversees commercial medical waste management facilities. Two existing commercial autoclave facilities are actively operating for the treatment of infectious medical wastes. A third autoclave facility has been permitted but is not currently operating. There is ongoing interest and activity in the state to site additional commercial autoclave systems.

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

Household Medical Sharps

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

The major focus in Fiscal Year 2017 for MDEQ was to expand the state's household sharps collection network including community drop-off locations at pharmacies, fire stations, and other business locations. This effort paid off with 79 new businesses recruited to join the network. This 29 percent increase brought the total number of collection stations at the end of the Fiscal Year to 355. The program grew to the point that a fourth medical waste service company was recruited to assist in picking up, transporting, and disposing of the sharps from the public collection stations. The volume of medical sharps collected in Fiscal Year was 7,538 pounds, and for the third consecutive year this volume represented more than one million medical sharps collected annually from Mississippi households.

Pharmaceutical Wastes

A growing area of environmental concern is the management of pharmaceutical wastes and household personal care products. MDEQ encourages the proper management of pharmaceutical wastes and discourages flushing or washing of household medications and other similar products down a toilet or sink. MDEQ promotes the biannual collection events sponsored by the U.S. Drug Enforcement Administration (DEA) and the Mississippi Department of Public Safety's medication collection efforts. The DEA works with numerous local law enforcement agencies throughout the country to host local one-day collection events for prescription drugs and other pharmaceuticals.

In addition to the national DEA sponsored events, MDEQ promotes the Department of Public Safety's medication collection program which provides drop-off collection sites for prescription drugs and expired pharmaceutical wastes at the agency's Driver's License offices. MDEQ has developed a brochure promoting the program, and the various drop-off locations are available on the MDEQ website and distributed at various health fairs and public events. In addition, a number of local law enforcement offices have developed ongoing medication collection programs.

H. Organic Wastes

Over the past year, MDEQ continued efforts to promote organic waste reduction and recycling. Organic wastes originate from plants or animals and are biodegradable. These wastes include items such as grass clippings, leaves, limbs and woody debris, food wastes, biosolids and other organic sludges, animal manure, and certain commercial and industrial woody or plant-based wastes. The re-use or recycling of organic wastes involves processes such as composting, mulching, anaerobic digestion, and land application.

Composting

MDEQ's Waste Division continued the agency's "Pilot Composting Program" through 2017. This program was launched to streamline and ease the approval process for start-up composting operations. The streamlined process helps businesses and community composting operations to begin under a less formal and less rigid form of authorization. This program has allowed new composting facilities to develop and build sustainable operations. The most recent information collected in early 2017 estimated that 19,569 tons of material was diverted to composting facilities. In conjunction with the pilot program, MDEQ has continued to work towards streamlining and simplifying the state's composting facility regulations and permitting process.

Mulching

MDEQ also promotes the mulching of woody debris for use as traditional mulch, boiler fuel, poultry litter, or other uses. A number of communities and businesses manage chipping and mulching operations for various types of woody debris. MDEQ offers a guidance document for start-up mulching operations (both public and private) that seek to create useful products from wood wastes and debris. This guidance includes the minimum operating criteria for mulch facilities with a similar streamlined approval process to that of composting sites. MDEQ also offers potential grant funding support through its Solid Waste Assistance Grant Program that communities are able to use to assist with the purchase of chipping equipment. A number of chipping operations in the state have struggled this past year to find final uses for the mulch. The low price of natural gas and other similar fuels has caused some companies that were using the chips as boiler fuel to transition away wood fired boiler systems. This transition has caused a decrease in the amount of wood chips used for boiler fuel.

Biosolids Land Application

MDEQ staff continues to utilize the statewide Biosolids Land Application General Permit to issue permit coverage for various projects in the state. MDEQ issued three certificates of coverage under this general permit in 2017 with a fourth coverage under review. All of the projects were approved for the purpose of assisting with the City of Jackson's Savannah Street Publicly Owned Treatment Works (POTW) storm cell cleanout project. MDEQ has also approved the soil amendment use of Exceptional Quality (EQ) Biosolids under the agency's Beneficial Use Program. Although a number of these have been approved in the past, MDEQ did not issue any new beneficial use determinations in 2017 for use of EQ biosolids.

Outreach
MDEQ has updated online resources to include a list of existing composting facilities, the latest in composting news, and current composting related events and activities. These resources also provide important information to the public on home composting, to businesses and government on the MDEQ's Interim Composting Program, and to schools and families on composting educational resources for students. MDEQ also works very closely with Mississippi Recycling Coalition (MRC) helping to provide information to the public on recycling through various programs and events, website, and social media outlets.

I. Landfill Methane Outreach Program

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

Through the LMOP program, MDEQ has also identified numerous other landfills as candidates for future energy project development. A new project is expected to come online by the end of 2017 conducted by Air Liquide in partnership with the Northeast Mississippi Regional Landfills. The company will be processing the landfill gas generated at the landfill and selling it for injection into a local interstate natural gas transmission pipeline. It is with these types of projects in mind that the agency updates and maintains an inventory listing of Landfill Methane Outreach Program (LMOP) Candidate Landfills on the agency's website and works to connect landfill operators with project developers and end users.

J. By-Product Beneficial Use Program

The MDEQ Waste Division promotes the beneficial use of non-hazardous by-product materials that would otherwise, be disposed of in landfills or managed under a solid waste management permit. The state's beneficial use regulations allow for industries and other waste generators to request that their non-hazardous industrial by-product materials be evaluated for use in the place of products or raw materials. If MDEQ's evaluation of a beneficial use request confirms that the material has suitable physical and chemical properties for the proposed use, then the agency issues a Beneficial Use Determination (BUD) that exempts the specific use of the material from solid waste management permitting requirements. In early 2017, annual report figures provided to MDEQ indicated that BUD holders distributed 1,055,034 tons of byproduct materials for beneficial uses in 2016. Almost 90 percent of the byproducts distributed were used for construction purposes while around nine percent of materials were used in soil amendment applications and a small fraction used in other types of beneficial uses.

MDEQ works with suppliers of these byproducts throughout the region who provide these

materials for construction uses and soil amendment uses. The agency also works with industries and waste generators to authorize beneficial use "demonstration projects." These projects allow an industry or company to conduct a short-term pilot project using the material to demonstrate the suitability of the material for longer term use. During 2017, MDEQ approved three new BUD's for new material uses in the state. Each of the new BUD's propose the beneficial use of by-product materials as soil amendments. MDEQ also extended a previous one-time beneficial use approval for the continued use of a non-hazardous adulterated pesticide product in conjunction with EPA and the Mississippi Department of Agriculture and Commerce.

MDEQ is currently in the process of evaluating additional requests for beneficial uses including proposals for the use of coal combustion fly ash as concrete additives, coal combustion bed ash for soil stabilization, and a mineral wool by-product for soil amendment uses. The agency is evaluating whether the proposed uses of these materials meet the state's minimum criteria for a beneficial use determination.

K. Solid Waste Training and Certification Programs

MDEQ's Waste Division offers two certification programs for commercial landfill and rubbish disposal site operators and provides training opportunities to other solid waste professionals. MDEQ partners with the state and national chapters of the Solid Waste Association of North America (SWANA) to provide training and certification to commercial solid waste landfill operators. In 2017, there were 31 active certified commercial landfill operators in the state. MDEQ has continued to work with the state SWANA chapter to help sponsor training opportunities at the organization's two state conferences.

MDEQ offers a state-designed training course for the commercial Class I rubbish site operators twice a year. In 2017, there were 139 active certified Class I rubbish site operators, and this past year, MDEQ issued certificates for 10 new operators and issued 40 renewals for existing operators. MDEQ also worked with the state SWANA chapter to provide continuing education opportunities through the chapter's spring and fall conferences for rubbish site operators as well.

MDEQ also offers periodic training events to support to local solid waste enforcement officers. Many local solid waste enforcement officers' salaries are partially funded through the Solid Waste Assistance Grant Program, and MDEQ ensures these officers have the knowledge needed to properly address solid waste issues in their local area. Training topics at this event include state solid waste laws and regulations, open burning laws, disaster debris management, public outreach and education, conducting clean-up events and electronics waste recycling.

L. Hazardous Waste Management Program

MDEQ's Hazardous Waste Management Program ensures hazardous waste is managed, treated, and disposed of in a manner which protects communities and the environment. MDEQ is authorized by EPA to manage and implement the Hazardous Waste Program, and EPA exercises oversight of the state's program to ensure it is implemented in accordance with

federal regulations--the 2018 Resource Conservation and Recovery Act (RCRA) Grant Work Plan and the 2015 Memorandum of Agreement for the RCRA Hazardous Waste Management Program. MDEQ's recent reorganization of the Office of Pollution Control helped consolidate the Hazardous Waste Management Program into the Waste Division with the other waste program efforts. This reorganization will assist MDEQ in rebuilding the technical expertise to support the agency's hazardous waste regulatory efforts.

Currently, there are five permitted operating facilities in the state which treat or store hazardous wastes. There are also 17 permitted facilities conducting remediation and post-closure activities for historic hazardous waste units. In addition to the oversight of the permitted facilities, MDEQ also provides compliance oversight, as well as outreach, for hazardous waste generators. Currently, approximately 185 large quantity generators and 280 small quantity generators are operating in Mississippi.

M. Underground Injection Control Program

MDEQ is the designated regulatory authority by EPA responsible for the protection of underground sources of drinking water through the regulation of Class I, III, IV, and V Underground Injection Control (UIC) wells. MDEQ also shares responsibility with the Mississippi State Oil and Gas Board in the administration of the Class VI UIC program. The UIC program was transferred into the Waste Division through the reorganization of the Office of Pollution Control in late 2016.

III. REMEDIATION

A. Brownfields

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

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

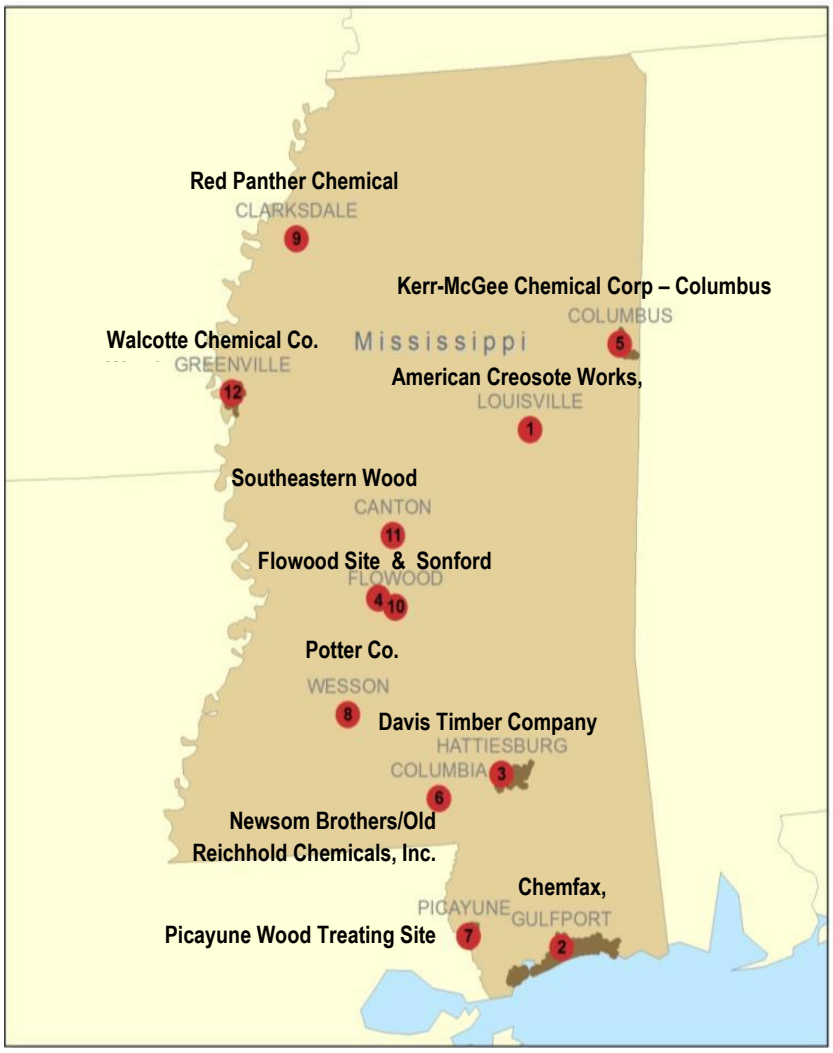
A "'brownfield site" is real property which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant that affects the expansion, redevelopment, or reuse of the property. MDEQ provided technical support to the Cities of Greenwood, Hernando, Vicksburg, and Yazoo City which received a combined total of over $1.5 million in federal grants in 2016 to conduct assessments and cleanups for site redevelopment for locations that have potential or perceived environmental issues. The agency is working with the recipients to help identify high priority locations for assessments and cleanups with the most potential for redevelopment and beautification of their community. MDEQ conducts grant writing workshops

to aid Mississippi communities in their efforts to receive these national competitive grants that provide the ability to advance property development opportunities.

B. Uncontrolled Sites and Voluntary Evaluation Program

During Fiscal Year 2017, Groundwater Assessment Remediation Division (GARD) staff actively oversaw 186 assessments and/or cleanups with the total number of sites at 2,033. Also, MDEQ issued “No Further Action” letters for 11 of these sites that were evaluated and remediated to levels protective of human health and the environment. MDEQ issued seven Restrictive Use Agreed Order/Environmental Covenants in Fiscal Year 2017, thereby allowing these sites to be reused with certain activity and use limitations. MDEQ staff continue to respond expeditiously to requests from the Mississippi Department of Transportation (MDOT) and other governmental agencies for the review of environmental assessments and remediation of contaminated sites and those sites with economic development potential. The Voluntary Evaluation Program (VEP) offers an opportunity to receive an expedited review of site characterization and remediation plans and reports for parties that are voluntarily cleaning up uncontrolled sites that they have an interest in. The VEP is funded entirely by these participants who pay for MDEQ’s oversight costs.

C. Superfund Cleanup and Redevelopment



Superfund Sites in Mississippi

Oversight of the site assessment and restoration of hazardous waste sites at federal Superfund facilities continues to be a large portion of the work involving the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Branch of MDEQ. 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 (FUDS). MDEQ is funded for this oversight work through agreements with the Department of Defense, Department of Energy, and NASA. Through the grants from EPA 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 American Wood Treating Site (Louisville), and assisted EPA with the oversight of the remediation of three Superfund sites—Sonford Products (Flowood), American Creosote (Louisville), and Wood Treating (Picayune). At the present time, it is estimated that the remediation costs for these three sites is approximately $75 million. The state will pay 10 percent of these remediation costs or $7.5 million. In addition, remedial investigations have begun at Red Panther Chemical (Clarksdale), Kerr-McGee (Tronox) (Columbus), and Southeastern Wood (Canton). Estimations of remedial costs for these sites will be developed after the remedial investigations have been completed by EPA.

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 was involved in bankruptcy and other legal proceedings.

The bankruptcy proceeding resulted in a trust being created that will provide as much as $68 million toward further assessment and remediation. The Southeastern Wood (Canton) site does not have a potentially responsible party and will require a 10 percent state match for the remediation costs.

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

D. Underground Storage Tanks

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

The compliance program inspects UST facilities and are responsible for ensuring approximately 8,200 tanks at nearly 3,015 facilities have the appropriately maintained equipment. In Fiscal

Year 2017, there were 1,036 inspections conducted. Quarterly compliance workshops are offered for additional compliance assistance.

A UST-certified contractor program ensures proper installation and maintenance of UST systems. This past year 146 licenses were issued through the MDEQ UST Certification Program, and there are currently 263 certified individuals that perform tank installations, alterations, testing, and/or permanent closures.

In the event of a release, the Mississippi Groundwater Protection fund is used by MDEQ to assess and clean up contamination resulting from leaking USTs. The fund began in 1987 and has paid $182 million dollars to reimburse eligible tank owners for the assessment and clean-up of sites contaminated from leaking USTs. The average fund commitment per site is nearly $161,000. At the end of this fiscal year, MDEQ was working on 519 sites that have had a confirmed or non-confirmed release and Trust Fund eligibility may or may not have been determined. During Fiscal Year 2017, $6.3 million was used to assess and remediate leaking underground storage tanks.

In September 2016, MDEQ hosted a two-day environmental consultant conference at the Mississippi Agricultural Museum to discuss advances in remediation and assessment technologies, to provide an open forum for discussions facing the environmental consulting industry and MDEQ regarding assessment and remediation activities, and to collaborate on clean-up efforts to restore Mississippi properties. This informative conference provided hands-on demonstrations and interactive projects for more than 50 environmental consultants working in Mississippi.

Revenue to operate the UST Program is derived from federal grants and fees imposed on tank owners. The UST Tank Fee has ranged from $40 per tank in 1988 to $80 per tank in 1994 and has remained unchanged at $100 per tank for the past 18 years.

IV. RECLAMATION

Surface Mining and Reclamation of Surface-Mined Lands

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

MDEQ regulates 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 complaints, overseeing the reclamation performed by operators, and enforcing the law as per the promulgated Rules and Regulations and Commission orders. Additionally, coal and lignite mines are regulated under the Mississippi Surface Coal Mining and Reclamation Law of 1979, with oversight of the

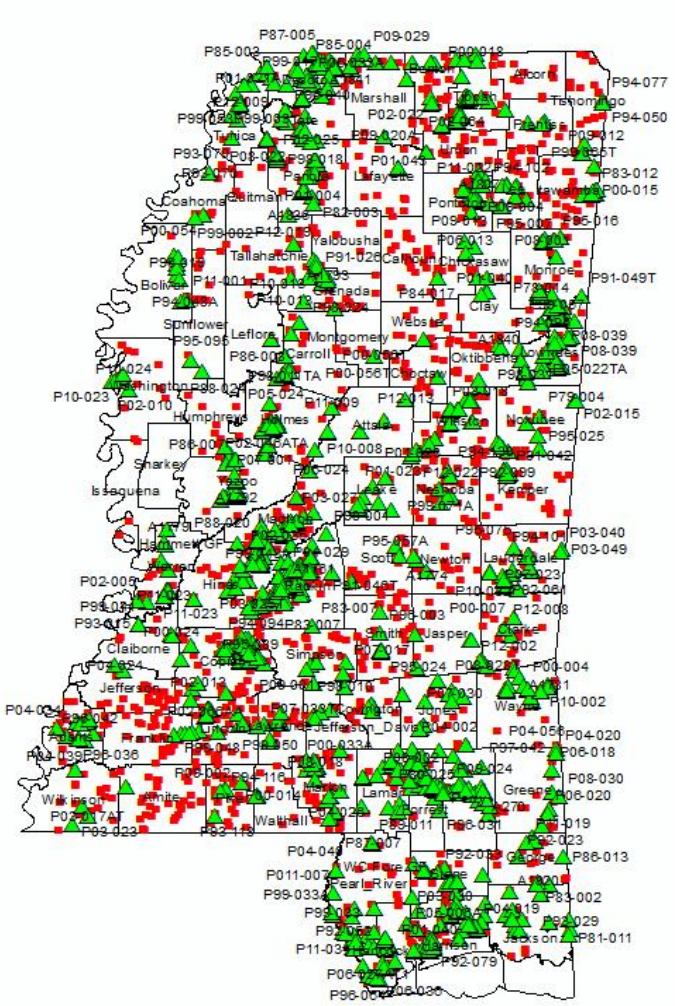
program by the federal Office of Surface Mining (OSM).

In Fiscal Year 2017, the Mining and Reclamation Division performed 806 inspections (of which 121 were bond release inspections), recommended to the Permit Board the issuance of 30 initial and 12 amended permits, and received 71 Notices of Exempt Operations (operations less than four acres in size). A total of 2,004 exempt operations are on file, covering approximately 8,016 acres. A total of 1,162 bonded acres were completely reclaimed as a result of the division's efforts to oversee reclamation. The state currently has 674 permits covering approximately 35,368 acres. The Office of Geology's Mining and Reclamation Division continues to update the mining database that provides valuable mining information in a GIS format so mining sites can be located and viewed by anyone using the online Mining Viewer.

The Mining and Reclamation Division provides 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 Fiscal Year 2017, staff provided training to 139 miners and 87 contractors working in the mining industry.

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

The Liberty Fuels, LLC mine permit in southwestern Kemper County was issued in December 2011 for 2,299 acres. This permit was renewed in 2016. The Liberty Mine was to produce an average of 2.2 million tons of lignite per year for the initial five-year term, and 4.5 million tons per year for the planned 40-year life of mine. In 2017, Mississippi Power Company discontinued the coal gasification process and elected to operate the power plant strictly on natural gas. The Liberty Mine has ceased all mining activities and has scheduled meetings with Mining Division staff to discuss permanent closure and reclamation of the mine.



Map of Surface Mining and Reclamation of Surface-Mined Lands

Staff inspections of both coal mines are conducted at least monthly. One or more joint inspections of each mine are conducted annually with OSM. Three permit revisions were finalized during Fiscal Year 2017. It is anticipated at least three applications for permit revisions will be submitted during Fiscal Year 2018. At least two bond release applications are anticipated during Fiscal Year 2018, and one permit renewal will be finalized in early 2018.

Work under Mississippi's Abandoned Mine Land Program to identify and locate abandoned historic coal mines has identified four sites--two in Choctaw County and one each in Winston and Lauderdale counties. All of these sites are believed to have been active sometime in the period from the mid to late 1800s to the late 1920s. Necessary reclamation work at the sites is progressing.

V. WATER QUANTITY

The Office of Land and Water Resources (OLWR) is responsible for the management of the water resources in Mississippi. Mississippi code requires that "…the water resources of the state be put to beneficial use to the fullest extent of which they are capable, that the waste or unreasonable use, or unreasonable method of use, of water be prevented, that the conservation of such water be exercised …" To achieve this requirement, OLWR pursues a conjunctive water management approach that coordinates the use of the ground and surface water resources of the state to satisfy desired water needs. OLWR ensures that the use, storage, allocation, and management of water resources be accomplished to the fullest extent possible, and that water pumped and impounded in Mississippi complies with applicable permit regulations. OLWR has numerous programs that support these requirements. These include the development and implementation of monitoring plans to facilitate the systematic collection, compilation, and management of data related to aquifers, streams, and lakes in the state; water use surveys and meter reporting tools; application of computer models to assist in making water management decisions; the review and processing of applications for issuance and modification; and, enforcement of ground and surface water use permits.

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

OLWR is also responsible for licensing and regulating water well contractors operating in Mississippi; regulating the design, construction, and modification of certain dams in accordance with regulatory criteria to ensure that lives and property downstream from dams and reservoirs are protected; and, assessing potential contamination threats to public, domestic and industrial water supplies.

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

In Fiscal Year 2017, the agency continued to engage large water use in industry, agriculture, public drinking suppliers, and the energy sector to seek balances between water use and economic development. In the Mississippi Delta, MDEQ staff is developing innovative approaches to studying and addressing water sustainability in the heavily utilized alluvial aquifer. Staff are also monitoring irrigation use outside of the Delta to mitigate competition with domestic and public supply drinking water resources. Likewise, OLWR continues to plan for, and work with the energy sector as it relates to hydraulic fracturing activities in the southwest portion of the state.

A. Water Resource Permitting and Management

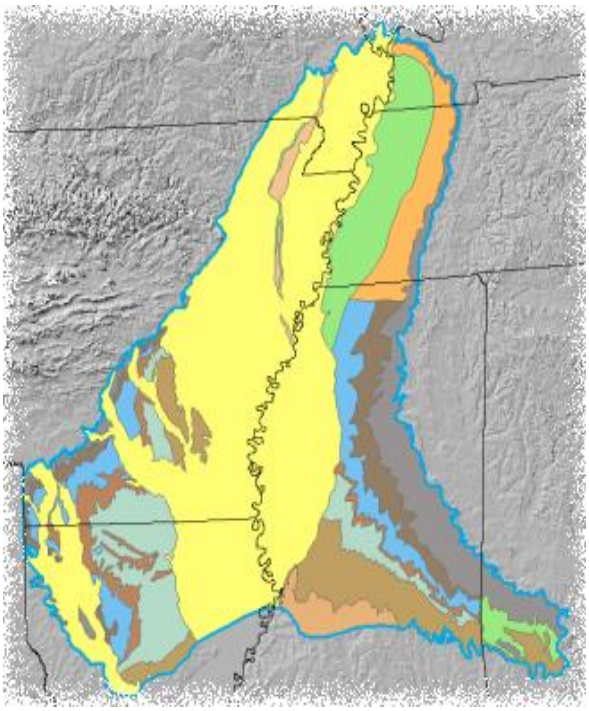
MDEQ researches and manages the water resources of the state to assure adequate supplies for the future. This is achieved by the coordinated interaction of the water withdrawal permitting process which includes the inventorying and assessment of the availability of water associated with fresh water aquifers and major fresh water streams in Mississippi. The agency is responsible for managing the water withdrawal permits of the state, and in Fiscal Year 2017 issued over 2,178 groundwater permits and 269 surface water diversion permits. Included in each permit is an established maximum withdrawal amount and any necessary special terms and conditions associated with a respective permit. For surface water permits, stream flows and lake levels are routinely monitored, and in the event that these fall below established standards, permittees are required to cease withdrawing water until flows rise above established minimums.

The Certification and Compliance Branch handles compliance and enforcement actions associated with water well driller's licensing, terms and conditions associated with groundwater and surface water withdrawal permits, and any other compliance issues. Branch staff work with industry, public suppliers, water well drillers, and other members of the regulated community to bring those entities into compliance with state laws and regulations. In Fiscal Year 2017, the branch began working with agricultural producers in the Mississippi Delta to verify compliance of the appropriate amount of conservation practices on farms as required by the terms and conditions of their groundwater withdrawal permits.

B. Assessment and Study of Water Resources

The abundant water supplies in Mississippi constitute one of the most important and valuable natural resources contributing directly to the quality of life and economic prosperity of the state. However, the water resources available in a given area of the state can vary significantly depending on various hydro-geologic conditions that may affect base flow 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. OLWR monitors surface water flows and groundwater levels of the state's major freshwater aquifer systems, and reports and potentiometric maps are created to document changes in water levels associated with these aquifer systems. Additionally, OLWR conducts in-depth regional hydrologic investigations to characterize Mississippi's surface water and groundwater resources to gain a better understanding of water supplies in regionally prioritized areas. The OLWR staff provides a wide range of information useful for planning economic development projects, groundwater modeling, and development of groundwater resources for public drinking water supplies.



Mississippi Embayment Regional Aquifer Study

In Fiscal Year 2017, a project in Oktibbeha County took water samples for baseline water quality information from public water supply wells utilized by the City of Starkville and other rural water associations. These samples were taken from each of the main aquifers in Oktibbeha County: the Gordo and the Coker. MDEQ staff completed a project to evaluate the water resources around Flowood with water levels taken at wells throughout the area. In addition, water quality samples were collected to determine raw water characteristics from wells screened in the Cockfield and Sparta. A project to characterize the water resources of the City of Clarksdale with water levels and samples taken from wells in the primary aquifers used in the area: the Mississippi River Valley Alluvial Aquifer (MRVA), the Sparta, and the Meridian-upper Wilcox. Cross-sections were completed to illustrate the location and depth of aquifer intervals available in the area.

Water-level data from wells in the MRVA is being collected and evaluated to monitor the effects of pumping and to assist in development of water management practices. OLWR is also working with the U.S. Geological Survey (USGS) to update, refine, and utilize the Mississippi Delta portion of an existing regional groundwater flow model developed by the USGS. This large-scale regional model covers the entire Mississippi embayment and extends through the primary drinking-water aquifers as part of the Mississippi Alluvial Plain (MAP) Study. This model will be used to better understand the groundwater flow system, the potential effects of variations in pumping patterns, and to evaluate various water resources management scenarios. New data continue to be collected for integration into the existing groundwater flow model.

Staff completed a project to evaluate the water resources in the McComb area in Fiscal Year 2017. Water levels were taken from the Citronelle aquifer and from the Grand Gulf aquifer system. Additionally, water samples were collected from many of the wells to determine baseline water quality. Cross-sections running through the area were developed to illustrate the subsurface geology.

In the coastal region of the state, an investigation of the fresh water aquifers in Jackson County is close to completion. Water level measurements and water samples were taken from public, private, and industrial water wells. Samples for baseline quality data were analyzed in the field for pH, temperature, and conductivity, with more comprehensive evaluation completed at the MDEQ laboratory. Due to the numerous layers of interbedded sand and clay comprising the water bearing formations in Jackson County, numerous cross-sections have been developed to better identify where these strata may be located. A surface geology map illustrating recharge areas has also been completed as part of the project.

MDEQ staff performed 106 flow measurements on streams throughout the state in support of the MDEQ Mississippi Benthic Indicator of Stream Quality project. In addition, USGS continuous stream gauging stations were monitored by OLWR to evaluate low flow conditions in streams, or reaches of streams, to ensure the water bodies did not fall below their respective statistical low flow averages. During such low flow events, on-site streamflow measurements were made where necessary to validate special terms and conditions related to surface water permit requirements. OLWR also worked in conjunction with MDEQ's Office of Pollution Control to ascertain discharge calculations at two locations as part of study on Middle Byway Creek and five locations as part of a study on Little Tallahatchie River.

C. Water Resources in the Mississippi Delta

The future of the Mississippi Delta's economic and environmental viability depends on abundant, accessible water of sufficient quality. Over 19,000 permitted irrigation wells screened in the shallow Mississippi River Valley Alluvial Aquifer (MRVA) are used for irrigation, aquaculture, and wildlife management purposes. Over time, pumpage demands have continued to exceeded recharge to the MRVA, leading to continued overbalances of groundwater withdrawals versus aquifer recharge, disconnected surface and ground water interaction, and notable water-level declines in the aquifer.

To address serious threats to the viability of the Mississippi Delta's MRVA aquifer and Delta-wide stream flows, MDEQ created an executive-level task force to address these water resource challenges in 2011. In 2014, Governor Phil Bryant issued an Executive Order formalizing the Governor's Delta Sustainable Water Resources Task Force. Under the Order, MDEQ is the lead to "…promote conservation measures, irrigation management practices, and plans for the implementation of new Delta surface water and groundwater supplies."

The Delta Sustainable Water Resources Task Force and its work groups consist of various state and federal agencies, stakeholder organizations, and academia all focused on the development and implementation of approaches and strategies to ensure sustainable ground and surface water resources for current and future generations in the Mississippi Delta. In Fiscal Year 2017, OLWR adopted a new general permit (MRVA-002), which updated conservation measures as a way to encourage continued adoption of water conservation practices via the permitting process. An online reporting portal developed by OLWR specifically designed to receive meter reading data from participants continues to yield valuable information that will be critical to improving total pumpage estimates and model accuracy.

D. Source Water Protection

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

The program also helps site the proper locations for new drinking water wells. The OLWR staff worked closely with Mississippi's 1,369 Public Water Systems consisting of approximately 2,750 groundwater wells, and five surface water intakes, to strengthen protection efforts of underground sources of public drinking water supply.

Potential sources of contamination are identified for each individual city or town in each water supply protection area to use as support for planning decisions. Information gathering in the assessment process is incorporated into recommendations for actions that can be taken at the local level to protect drinking water sources. The assessments help to focus protection efforts to minimize risks of individuals drinking contaminated water. These efforts may include developing source water protection plans, encouraging the use of Best Management Practices,

establishing local protection teams, and using other source protection measures.

E. Water Well Drillers Licensing

The testing and licensing of water well drillers are managed and maintained through OLWR. Applicants must meet basic requirements through testing in accordance with state law and state regulations to ensure that current license holders are in compliance with regulations. During Fiscal Year 2017, the Drillers Licensing Program issued or renewed 223 licenses for drillers or pump installers. In addition, data for all water wells drilled in the state were input to a database management system. MDEQ staff taught a continuing education course regarding Mississippi drilling laws and regulations at three drilling conferences in Mississippi and one in Tennessee.

F. Mississippi Agricultural Chemical Groundwater Monitoring Program

Over 90 percent of the population in Mississippi relies on groundwater for drinking water supply. Because of this dependence, there have been growing concerns that agricultural chemicals may be impacting and degrading the valuable groundwater resources in the state. The Agricultural Chemical Monitoring Program was established in 1986 to help determine what, if any, impact these practices may be having. For Fiscal Year 2017, OLWR staff sampled 58 water wells in a continuing effort to ascertain if agricultural practices in the state are affecting the quality of groundwater aquifer systems statewide. These data are recorded and reported to well owners who have concerns about their domestic drinking water. During Fiscal Year 2017, the program has sampled over 2,769 groundwater sources throughout the state. To date, results indicate that no significant impacts to groundwater quality are directly attributable to agricultural practices.

VI. WATER QUALITY

A. Ambient Recreational Monitoring Network

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

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

MDEQ maintains a monitoring network for fecal coliform for flowing waters in the state that are used for primary contact recreation. Monitoring is done at these locations to collect five samples within a 30-day period. This sample frequency allows for the calculation of a geometric mean for the fecal coliform data. In 2017, 445 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.

B. Ambient Lake Monitoring

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

C. State of Mississippi Water Quality Assessment 2016 Section 305(b) Report

MDEQ is responsible for generating the Water Quality Assessment Report under Section 305(b) of the Clean Water Act. The report comprehensively describes for EPA, Congress, and the public the status of the quality of the state's surface waters. Along with the water quality assessment information, the report also describes the state's assessment methodology and gives the causes, where known, for those waters identified as impaired.

D. 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, and for Fiscal Year 2017 MDEQ staff sampled 122 streams.

E. Mississippi Alluvial Plain Monitoring

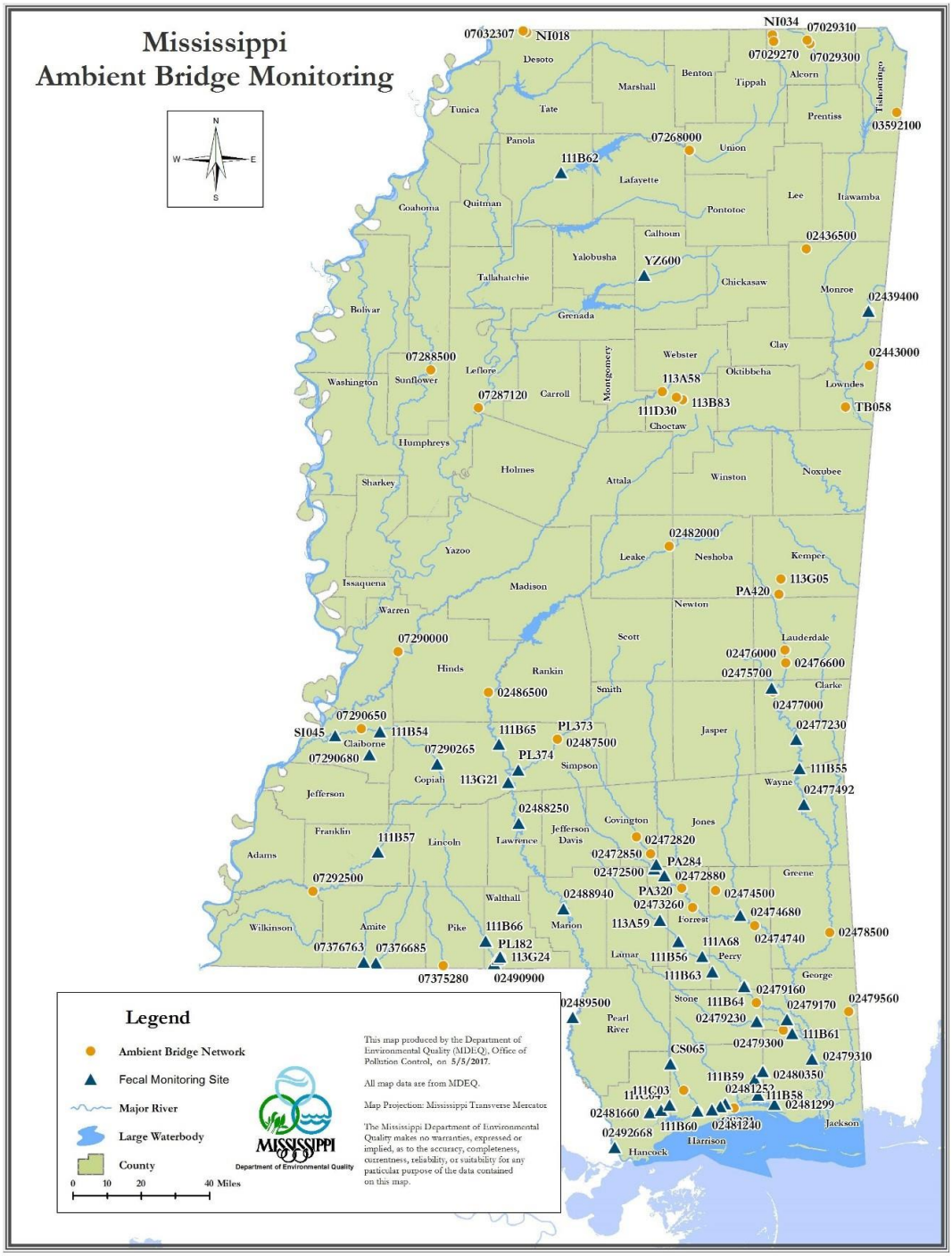
In 2002, MDEQ began collecting biological community, physical, chemical and habitat data on wadeable streams in the Mississippi Alluvial Plain, commonly referred to as the Mississippi Delta. These data, along with historical monitoring in the Mississippi Alluvial Plain, were used to develop an index of biological integrity for the Mississippi Delta. In addition, the data collected is also being used to evaluate the dissolved oxygen levels in the Delta as well as support nutrient criteria development. With each new set of data collected annually during September to October, the index will be refined and when finalized, biological monitoring in the Mississippi Delta will be incorporated into MDEQ's Ambient Monitoring Program. Since monitoring was initiated in 2002, approximately 120 sites have been monitored. In 2011, MDEQ 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. The effort to develop an index of biological integrity for the Mississippi Alluvial Plain is an ongoing effort with the USGS.

F. Fixed Station Ambient Monitoring

MDEQ's network of statewide ambient water quality monitoring stations provides systematic water quality sampling at regular intervals and uniform parametric coverage to monitor water quality status and trends over a long-term period. Sampling is carried out by MDEQ scientists

from each of the agency's three regional offices.

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



G. Fish Tissue Monitoring Program

The MDEQ Laboratory monitors fish tissue for contaminant levels that could be harmful to people that consume fish from the state's waters. When elevated levels of contaminants are found in fish tissue, the data is used by a multi-agency task force to determine if a fish tissue consumption warning or advisory is warranted. Presently, there are advisories for Mercury, DDT, Toxaphene, and PCBs on many state waters. Special fish tissue monitoring for Fiscal Year 2017 focused on sites where advisories for DDT and Toxaphene have been issued to collect additional data to further inform decisions on the advisory in the Mississippi Delta. These data are currently being evaluated for advisory updates. In addition, tissue was collected from fishing rodeos in the Mississippi Sound for Mercury and Selenium levels.

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

H. Triennial Review of Water Quality Standards

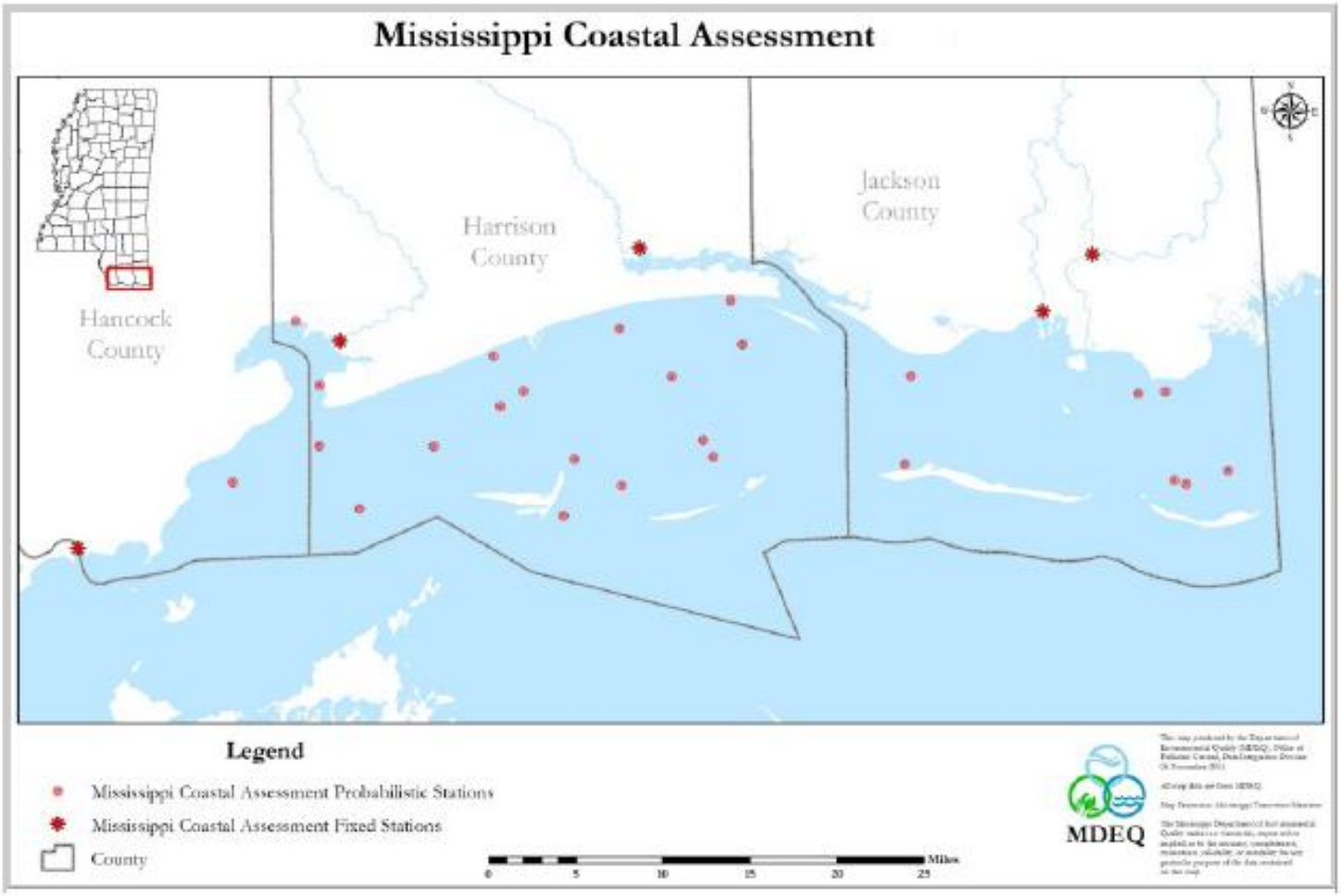
The Clean Water Act requires all states to develop, review, revise (as needed), and adopt water quality standards. States are required to review their water quality standards at least every three years through a process known as the triennial review. As part of the 2015 triennial review, MDEQ proposed the following revisions:

- The water quality criteria for recreational waters were updated based on EPA's most recent recommendations that were released in 2012. The bacterial indicator for freshwaters, fecal coliform, was replaced with the latest recommended bacterial indicator, E. coli.
- Based on the latest science and recommendations within EPA's 2012 guidance for Recreational Water Quality Criteria, seasonal criteria for bacteria are no longer recommended. Therefore, the seasonal bacteria option was removed from the following water body classifications: Fish and Wildlife Support and Public Water Supply.
- A statistical threshold value (STV) was added for enterococci within marine and estuarine coastal recreational waters. Enterococci samples examined during a 90-day period should not exceed 130 per 100 ml more than 10 percent of the time.

A public comment period and public hearing were held in 2015 to receive comments related to the proposed revisions to Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters. The final proposed revisions were adopted by the Commission on February 25, 2016, and were approved by EPA Region 4 on January 18, 2017.

I. **Coastal Monitoring**

MDEQ participated in the EPA National Coastal Assessment (NCA) Program from its inception in 2000 through 2006. When EPA suspended funding for the NCA program, MDEQ partnered with the Gulf Coast Research Laboratory and the Mississippi Department of Marine Resources to continue a very similar sampling program--the Mississippi Coastal Assessment Program (MCA). This monitoring evaluates 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 to September) and includes biological, chemical, and physical sampling. Sites are selected using a probabilistic site selection methodology, and 37 sites were sampled in Fiscal Year 2017. At the end of a five-year cycle, a total of 125 sites will be sampled for the coastal monitoring program.

J. Beach Monitoring Network

MDEQ conducts routine bacteria and water chemistry sampling at 21 beach stations located along Mississippi's Gulf Coast as part of the Mississippi Beach Monitoring Program. MDEQ is a partner within the multi-agency Beach Monitoring Task Force with the EPA Gulf of Mexico Program, the Mississippi Department of Marine Resources, the Mississippi Secretary of State's Office, the Mississippi State Department of Health, Hancock County, Harrison County, and Jackson County. This Task Force oversees the program and issues beach advisories when needed. MDEQ and the Task Force rely on data collected 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 website, Twitter, by public email and text notification, and press releases to local media.

During Fiscal Year 2017, a total of 125 advisories were issued for elevated bacteria detected through routine sampling. There were also two Non-Standard Segment (NSS) pre-emptive closures for Fiscal Year 2017--one in Long Beach for eight days and another in Ocean Springs for four days. Both were closed due to sewage leaks into the Mississippi Sound. NSS closures are not reported to EPA and therefore not included in the beach action days calculations below. Above average rainfall totals were the primary cause for the high number of advisories for the year. The 125 bacteria advisories covered 1,411 beach days or 18 percent of the 7,665 beach days available in the year.

K. Mississippi's Numeric Nutrient Criteria Development Activities

MDEQ develops scientifically defensible criteria that are appropriate and protective of Mississippi's waters. The criteria for each water body type will be coordinated with those for other water body types to ensure consistency across the state and protection from downstream impacts.

Highlights of MDEQ's numeric nutrient criteria development efforts in Fiscal Year 2017 include:

- MDEQ continued criteria development efforts across all water body types as described in the most recent version of Mississippi's Nutrient Criteria Development Plan.
- MDEQ continued to provide updates to stakeholders regarding the progress of nutrient criteria development. These updates promote open communication between staff and stakeholders. MDEQ will continue to update stakeholders throughout the numeric nutrient criteria derivation process.
- MDEQ continued to develop the plan for numeric nutrient criteria implementation. While developing the criteria values themselves, MDEQ also focused significant efforts into exploring concerns and questions raised by both MDEQ staff and stakeholders. The plan for how numeric nutrient criteria will be implemented must also be developed and understood by both. MDEQ will continue to work concurrently on both criteria development and implementation planning.
- MDEQ continued to collect data and conduct studies to support nutrient criteria development. Ongoing activities included development of a benthic index for Mississippi's coastal waters, a benthic index for Delta waters, and data collection efforts across the state.

L. Total Maximum Daily Load and Modeling

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

Water bodies that do not meet water-quality standards are identified as "impaired" for the particular pollutant of concern. Under Section 303(d) of the Clean Water Act, states are required to develop a list of waters that are not in compliance with water quality standards and establish a TMDL for each pollutant causing the impairment. MDEQ, biennially, creates a list of these impaired waters called the 303(d) List of Impaired Waters. MDEQ's 2016 list was adopted by the Mississippi Commission on Environmental Quality in June 2016. This list will be updated again in 2018 during the next review. MDEQ developed a TMDL for pH in the Big Black River and several TMDLs for sediment in water bodies located in the Big Black River Basin between October 2016 and September 2017. MDEQ also continues work on stressor identification (SI) analysis for water bodies that have been identified as biologicially impaired in the Big Black River Basin. The SI process identifies the stressors to water quality for individual water bodies

that have been identified as biologically impaired. Following the identification of the stressors, TMDLs will be completed for those water bodies.

Big Black River Nutrient Model Calibration Study

As part of MDEQs' Priority Framework, the Big Black River was targeted for model development. A water quality study on the Big Black River, located in central Mississippi, was performed in the fall of 2016. The project was a joint collaboration with EPA to evaluate physical and chemical parameters of the river and its segments. The primary objective of this study was to collect water quality samples for the evaluation and development of water quality model inputs to characterize the current conditions of the Big Black River. Study efforts included water quality sampling for an array of analytes including long-term biological oxygen demand, nutrients, solids, and algal analyses. The study area included seven locations that were selected to provide representative data on waters receiving pollutants from a wide range of agricultural and industrial sources. The water quality model will then be used to establish TMDLs for the Big Black River. Additionally, as part of MDEQ's nutrient criteria development efforts, this study helps generate data to estimate the total nutrient load allowable in the river and the nutrient input from the point source dischargers.

Modeling for NPDES Permit Limits

MDEQ's TMDL Program also establishes Waste Load Allocations (WLAs). In addition to the TMDLs and stressor identification efforts, TMDL staff members are actively involved in the ongoing issuance and reissuance of WLAs, which include the development of new and/or review of current NPDES permit limits. As a part of this process, the Modeling and TMDL Branch uses water quality models to replicate conditions of a stream and determine the appropriate loads that are allowed from dischargers as a result of those conditions. The Modeling and TMDL Branch completed approximately 108 WLAs from October 2016 to September 2017 to assist the permitting branch in meeting their permitting goals.

M. Development of the Priority Framework

MDEQ has developed a new collaborative framework for implementation of the Clean Water Act known as the Priority Framework. The new framework is designed to help coordinate and focus efforts to advance the effectiveness of the water program. Given resource constraints and competing program priorities, leveraging resources and coordinating efforts is crucial to effective program implementation. This framework does not change regulation, policy, or issue new mandates. It is intended to provide focus for MDEQ water programs to better manage the activities and promote collaboration to achieve water quality goals for the streams, rivers, lakes and estuaries of Mississippi.

In order to select the priority watersheds, MDEQ used landscape information to calculate metrics on the watershed scale that are used to characterize and rank watersheds by resource value and potential stressors. Resource value is determined using environmental and human welfare data layers. Environmental factors considered include erosion potential, impervious area, wetlands, impaired waters, and concentration and types of discharge permits. Human welfare factors include demographics, fishing advisories, water supply intakes, public water supplies, recreational water bodies, public waterways, national and state parks, and recreational

locations. Other factors considered were the presence of existing watershed plans, ongoing restoration and/or conservation work, and engaged stakeholders all of which greatly increase the chances of success.

Weights for each of these were adjusted based on professional judgment of the importance of each for characterizing watershed value. Once these factors were developed, standardized, and weighted, the tool produces a relative ranking of every watershed within the state. This ranking was used to screen watershed for activities that will address the water program goals. A total of 21 watersheds were chosen as targeted watersheds through this process.

MDEQ reviews the selection process and screening criteria annually to gauge success and evaluate potential candidate watersheds for the following ten-year period.. Flexibility will be retained to re-evaluate selections and amend watershed selection in the face of changing state priorities as well as changing EPA national and regional priorities. As part of this review, MDEQ identified an opportunity to leverage the work being done by several water programs. As a result, the Big Black River Basin will be evaluated as a priority area.

N. The Gulf of Mexico Alliance

The Gulf of Mexico Alliance (GOMA) is a partnership among the states of Alabama, Florida, Louisiana, Mississippi, and Texas whose goal is to address priority issues related to the ecological health of the Gulf of Mexico. During Fiscal Year 2017, MDEQ led the GOMA Water Resources Team encouraging a collaborative approach to address multiple focus areas related to water quality and quantity in the region as well as working to protect aquatic health, human health, and economic health in the Gulf of Mexico.

O. Mississippi River and Gulf of Mexico Watershed Nutrient Task Force

MDEQ continues to support the efforts of the Mississippi River and Gulf of Mexico Watershed Nutrient Task Force (Task Force). The Task Force was established in 1997 to understand the causes and effects of eutrophication in the Gulf of Mexico, coordinate activities to reduce the size, severity, and duration, and mitigate the effects of hypoxia. The Hypoxia Task Force is a partnership of 12 states, five federal agencies, and a representative for the tribes that work collaboratively to reduce nutrient pollution in the Mississippi/Atchafalaya River Basin. Activities of the Task Force include coordinating and supporting nutrient management activities from all sources, restoring habitats to trap and assimilate nutrients, and supporting other hypoxia related activities in the Mississippi River and Gulf of Mexico watersheds.

On behalf of the Task Force, EPA recently submitted the 2017 Report to Congress and the President providing an update on the actions and status of work undertaken by the Task Force. As a member of the Task Force, Mississippi hosted the fall Hypoxia Task Force meeting in Biloxi. The gathering was very productive and well attended with much discussion directed to upcoming Farm Bill initiatives, evolving research needs, better ways to track conservation practices, opportunities for cooperative federalism, and the critical role partnerships play in achieving success.

P. Nonpoint Source Pollution

Nonpoint Source (NPS) Pollution 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.

In 1987, amendments to the Clean Water Act established the Section 319 NPS Management Program. The state's program was approved in August 1989, and funded for implementation in August of 1990. Over the past 28 years, MDEQ, in cooperation with numerous federal, state, and local stakeholders has been successful in developing a comprehensive statewide program to help protect and restore valuable water resources.

In Fiscal Year 2017, MDEQ received approximately $3.08 million in Section 319 Grant funds. Of this amount, eight percent is allocated for administrative work, 25 percent for program operation and statewide education and public outreach projects, 16 percent for NPS watershed planning, 35 percent for NPS watershed project implementation, and 16 percent for support of priority watershed restoration and protection projects. Grants are awarded for a five-year period and progress is reported annually.

MDEQ currently has five active Section 319 grants covering the grant periods of 2013 to 2017. Section 319 grants are awarded annually to MDEQ by EPA, and MDEQ, in turn, utilizes sub-grant agreements to contract with eligible partners for work needed. Generally, these partners supply matching funds or in-kind services at a rate of 40 percent. During Fiscal Year 2017, the NPS Branch managed a total of 33 projects and activities totaling $2,032,600 in federal funds. These projects may take from one to four years to complete and include, but are not limited to, education and outreach projects, water-quality monitoring projects, projects that put Best Management Practices (BMPs) on the ground to demonstrate effectiveness of pollution reduction activities, agricultural and chemical waste disposal, and watershed protection and restoration projects.

Q. Stormwater Regulations to Improve Water Quality

MDEQ issues permits covering discharges resulting from rainfall events and the associated stormwater runoff from industrial or commercial sites. These permits focus on avoiding pollutants commingling with stormwater, averting excessive erosion, and preventing contaminated stormwater from entering waters of the state. The permits contain best management plans, monitoring conditions, and operational requirements to ensure stormwater discharges will not cause or contribute to violations of water quality standards or impair any beneficial uses of waters of the state.

In Fiscal Year 2017, MDEQ took the following stormwater permitting actions:

- The Environmental Permits Division (EPD) issued general permit coverages for 655 large construction projects (five acres or greater) under the Large Construction Stormwater General Permit.

- EPD issued general permit coverages for 98 regulated industrial facilities under the Baseline Stormwater General Permit.
- EPD received and processed 62 “No Exposure Certifications” from potentially regulated industrial facilities. Facilities that certify “No Exposure” of industrial activity to stormwater are not required to obtain storm water coverage under the Baseline General Permit.
- EPD issued general permit coverages for 150 regulated surface mining sites under the Mining Stormwater General Permit.
- EPD reissued the statewide Large Construction Stormwater General Permit (MSR10) on January 13, 2017. The Large Construction Storm Water General Permit authorizes the discharge of storm water run-off into waters of the state from construction sites. This general permit replaces the previous Large Construction Storm Water General Permit that expired December 31, 2015.

R. 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 Operators’ Association. Administration of the certification program was transferred to MDEQ in 1987 when the State Legislature mandated certification of all municipal and domestic wastewater operators. The certification regulations include a requirement for continuing education during each three-year certification period.

The training calendar included 43 days of agency-sponsored training classes. Of these training days, 35 were co-sponsored with the three wastewater related professional associations (Mississippi Water and Pollution Control Operators’ Association, Mississippi Water Environment Association, and Mississippi Rural Water Association). Attendance totaled 345 operators, utility managers, and engineers. Certification exams were administered to 193 prospective operators with a total number of 182 new and renewal certificates issued. There were 38 wastewater training request approved for wastewater continuing education credits in the classroom and online. There are currently 728 certified pollution control operators in the state.

The training program staff participated in energy conservation studies with EPA Region 4 and a wastewater expert professor in order to save energy costs for facilities while remaining in compliance with their National Pollutant Discharge Elimination System (NPDES) permit. The program looks forward to expanding this idea in the future to more facilities through specific training of operators.

The MDEQ Operators Training program staff have partnered with other agencies to speak at functions for the Mississippi Municipal League with the ultimate goal of increasing communication between operators and municipal officials. The training staff also provide onsite 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 Fiscal Year 2017, MDEQ Operators Training staff conducted 360 technical assistance and outreach activities through either onsite visits or remotely.

S. Water Pollution Control Revolving Fund

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

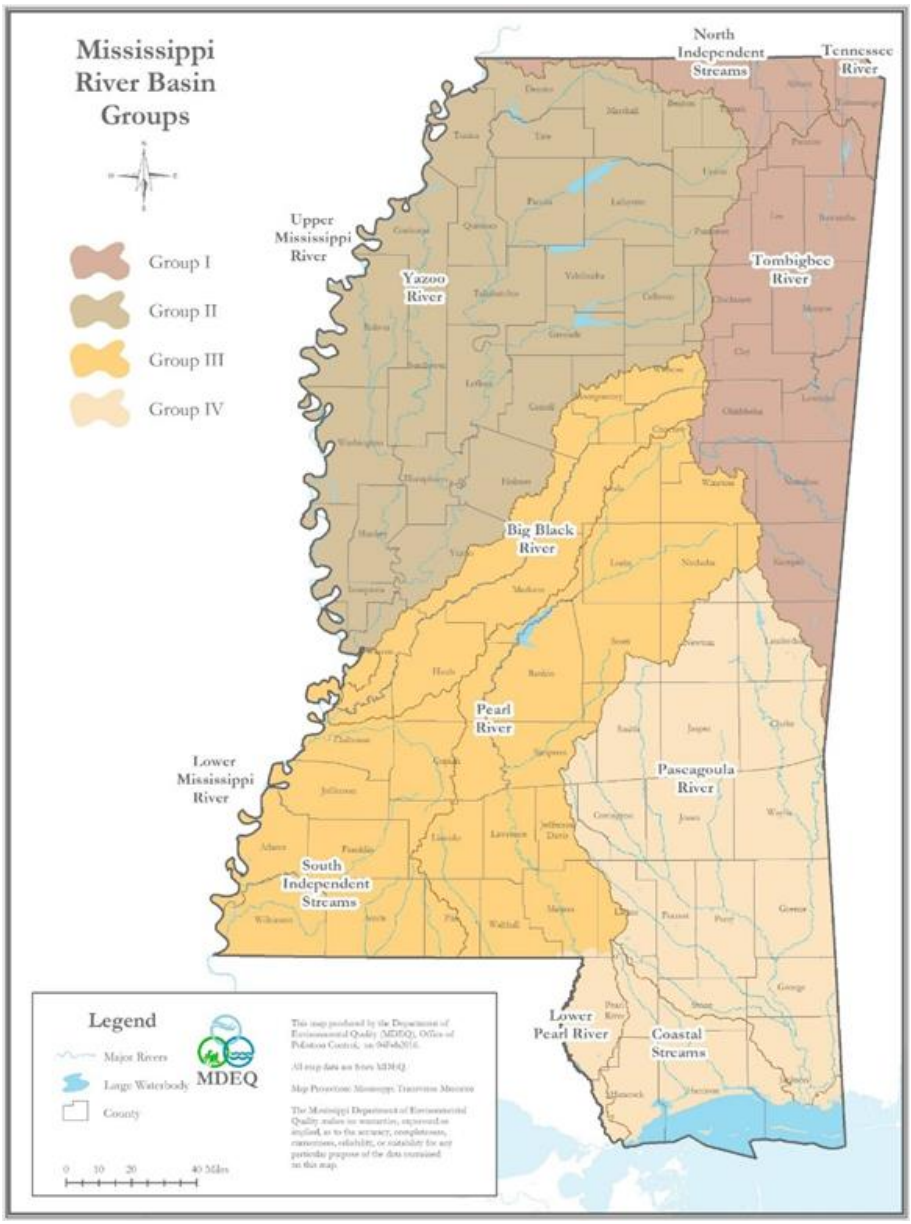
The Water Pollution Control Revolving Fund program (WPCRLF) provides low interest loans to public entities in the state for construction, repair, or replacement of wastewater, stormwater, and nonpoint source pollution projects. Funding for these projects comes from federal grants, state match, repayments, and interest on deposits. Since 2010, additional subsidy funding, provided through annual Congressional appropriations, has also been made available to "Green" and "Small and Low Income Community" WPCRLF projects. During Fiscal Year 2017, MDEQ funded four new WPCRLF projects totaling $18.1 million.

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

T. Water Pollution Control Emergency Loan Fund

The Water Pollution Control Emergency Loan Fund (WPCELF) program provides loans to communities for the emergency construction, repair, or replacement of wastewater collection and treatment facilities. The WPCELF has approximately $3.5 million available for such emergency projects. MDEQ encourages communities throughout the state to utilize this program whenever funds for emergency wastewater projects are needed. There were no new WPCELF loans awarded in Fiscal Year 2017.

U. Basin Management Approach



The goal of Mississippi's Basin Management Approach (BMA) is to restore and protect water resources of the state through collaborative development and implementation of effective management strategies that help improve water quality and quantity while fostering sound economic growth. In an effort to effectively carry out planning and implementation activities, the ten major river basins in Mississippi have been organized into four basin groups. Each basin group has a basin team comprised of the representatives from federal, state, and local government agencies, non-governmental organizations, and other stakeholders. This program implements strategies that target priority watersheds throughout the state. Prioritization of these watersheds is an evolving process identified in coordination with resource agency partners as part of the Basinwide Approach to Water Quality Management.

The Basin Management and NPS Programs are implemented in cooperation with several agencies, organizations, and groups at all levels of government and in the private sector. A great focus is given to activities that promote consensus building and partnering to increase the overall effectiveness. One key partnership to increase this overall effectiveness is with the USDA Natural Resources Conservation Service (NRCS). MDEQ and NRCS work collaboratively using Section 319 funds for assessment and monitoring of National Water Quality Initiative (NWQI) sites where the NRCS has or will implement various conservation practices such as cover crops, filter strips, and terraces. In addition, information from the

Mississippi Watershed Characterization and Ranking Tool (MWCRT) is used to help identify priority watersheds for targeted funding under the National Water Quality Initiative (NWQI) as well as other NRCS funding initiatives.

National Water Quality Initiative

The National Water Quality Initiative (NWQI) was introduced by the Natural Resources Conservation Service (NRCS) in 2012. This initiative is a collaborative effort of NRCS, EPA, and state water quality agencies including MDEQ. NWQI strives to reduce nonpoint sources of nutrients, sediment, and pathogens related to agriculture in small priority watersheds within each state. The watersheds within Mississippi that received funding for BMP implementation in Fiscal Year 2017 included North Tippah Creek (Basin Group II), Porter Bayou (Basin Group II), and Chase Bayou-Sammy Creek (Basin Group III). Porter Bayou is also an active section 319 project watershed. Mississippi also had two watersheds selected in a pilot program. As part of this NWQI pilot, watershed plans will be developed prior to BMP implementation which will follow the next year. Those watersheds are Hudson Creek-Clear Creek (Basin Group II) and Tilda Bogue-Bear Creek (Basin Group III).

Basin Group I

Catalpa Creek

Of major importance for Basin Group I is the formation of the Catalpa Creek Watershed team in the Tombigbee River Basin. Catalpa Creek has its headwaters on the Mississippi State University campus and the southeastern part of the City of Starkville. This grassroots team has done extensive preparation and planning to get this project underway building important partnerships and developing a water resources management plan for the Hydrologic Unit Code 12 Red Bud—Catalpa Creek watershed. The team has members from many departments, various centers, and institutes at Mississippi State University as well as members from the local agricultural community and the City of Starkville. They have written a watershed plan and proposals are going out to many agencies to leverage funding. MDEQ will provide funding for Phase I of the project by using a Section 319 grant.

Basin Group II

Delta Nutrient Reduction Strategy

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

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

Once nutrient load reductions are determined to be achievable, then quantitative reduction targets will be established and future progress will be evaluated in relation to achieving those targets.

MDEQ has helped fund many projects in Basin Group II watersheds:

Harris Bayou

Harris Bayou, a tributary of the Big Sunflower River, flows through portions of Bolivar and Coahoma counties. The current priority sub-watershed is Overcup Slough which is in the headwaters of the watershed and contains both catchments that have been the focus of the Delta Nutrient Reduction Strategy implementation efforts since 2010. BMPs installed in the Overcup Slough sub-watershed include: 36 water control structures, four low grade weirs, and approximately 9,100 feet of two-stage ditches. Also, 600 acres of cover crops were planted in Fiscal Year 2017.

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

Porter Bayou

Porter Bayou, also a tributary of the Big Sunflower River, flows through portions of Bolivar and Sunflower counties. The current priority sub-watersheds are Upper Porter Bayou and Middle Porter Bayou which contain the catchments that have been a focus of continued DNRS implementation efforts. BMPs installed in Upper Porter Bayou include: 23 water control structures, eight low grade weirs, approximately 19,695 feet of two-stage ditches, and 245 acres of land leveling activities. In Middle Porter Bayou, 17 water structures, three low grade weirs, and approximately 7,700 feet of two-stage ditches were installed along with 70 acres of land leveling activities. Along with the BMPs mentioned above, 350 acres of cover crops were planted in Fiscal Year 2017.

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

Mississippi River Basin Healthy Watershed Initiative (MRBI)

This initiative assists landowners and producers to voluntarily implement conservation and management practices that prevent, control, and trap nutrient runoff from agricultural land. MDEQ works collaboratively with NRCS to target watersheds to receive MRBI funding. In 2015, NRCS selected Brook Bayou, Christmas Lake Bayou, Long Lake, Stillwater Bayou, and Tommie Bayou watersheds located in portions of Bolivar, Sunflower and Washington counties. Burrell Bayou and Beaver Bayou-Mound Bayou (located in Bolivar and Sunflower counties) were added as new watersheds to receive funding this year through the MRBI initiative. All these watersheds combined received $5.473 million in funding in Fiscal Year 2017.

Jasper Creek

The Jasper Creek Watershed is located in Union and Tippah Counties in the Northeastern part of the Yazoo Basin. The land uses in this watershed are comprised primarily by agricultural lands. Jasper Creek Watershed was selected as a priority watershed because the partners felt a great impact on water quality could be made within this watershed. The watershed is listed on the 303 (d) list of impaired waters for biological impairment. The final draft of the watershed based plan under development and Best Management Practices are scheduled to begin installation the fall of 2017.

Little Topashaw Creek

This watershed is located in Webster and Chickasaw counties in North Mississippi. Cropland and pastureland are the primary land uses within the watershed. By implementing Best Management Practices (BMPs) within the watershed, it was determined by MDEQ and the partners that a significant impact could be made on the water quality within the watershed. A watershed based plan is in development for the watershed and is nearing completion. To date in the project, the following BMPS have been installed: six Grade Stabilization Structures, one Tank/Trough, and one Heavy Use Area Protection.

Basin Group III

Ross Barnett Reservoir

The Ross Barnett Reservoir has been an irreplaceable resource for Central Mississippi since its construction in the 1960s. It is the largest source of drinking water in the state supplying over 15 million gallons of water to local residents, businesses, and industries. As it has done for more than 50 years, this plentiful water resource also provides outstanding recreational opportunities, supports economic growth as well as scenic beauty and vital wildlife habitats.

Rezonate

In a continuing effort to leverage resources and to promote the message of protecting and restoring the Reservoir and the Pearl River Watershed, MDEQ, through the Ross Barnett Reservoir Initiative (known as *Rezonate*), has sponsored and helped facilitate several events in and around the Ross Barnett Reservoir.

Rezonate was a major sponsor for the sixth annual Project Rezway Recycle Fashion show that took place on April 27, 2017, at the Mississippi Craft Center in Ridgeland. The show featured apparel and accessories composed of at least 75 percent recycled materials. Keep the Rez Beautiful hosts this event annually with the aim of raising awareness of the importance of recycling and shows how commonly discarded items can be used again instead of littering the environment. Other major sponsors included Kathryn's Steakhouse, Waste Management, the Barnett Reservoir Foundation, MDOT, Keep Mississippi Beautiful, and the Pearl River Valley Water Supply District.

Keep Jackson Beautiful Eco Ambassadors Program is a hands-on, action-based environmental

stewardship program that fosters a new breed of environmental stewards for the future of our Planet while encouraging environmental careers. The program will strengthen and increase partnerships by providing youth and communities with the tools to implement and produce creative and innovative solutions that affects our natural and built environment.

During the 2017 project period the following projects were completed and/or ongoing:

- Use of composting toilets upriver at Flag Island to reduce the impact of potential bacteria and pathogens entering the Reservoir.
- Lakeshore Park Rain Garden rehab to reduce storm water runoff entering the Reservoir.
- Rezonate kiosks about watershed protection and restoration installed at Old Trace Park and Lakeshore Park.

Rezonate, through MDEQ, also partnered with the City of Ridgeland to increase awareness of project mission and goals by reaching more defined targeted audiences and to teach citizens about the importance of protecting drinking water sources especially in the Ross Barnett Reservoir watershed.

In 2017, MDEQ's Nonpoint Source Management Branch submitted a Success Story to EPA for Limekiln Creek as part of the program's annual grant requirements. The success story was approved and published on EPA's website, which can be found at the following link: https://www.epa.gov/nps/nonpoint-source-success-stories#ms

Basin Group IV

MDEQ continues to support watershed teams which have developed watershed implementation plans and have installed BMPs to mitigate pollution and protect and restore water quality. These watersheds continue to have active stakeholder groups.

Chunky River

MDEQ supports the East Mississippi Foothills Land Trust in an advisory role for the Chunky River watershed. Basin management staff worked with the East Mississippi Foothills Land Trust and other partners to develop a Chunky River Watershed Implementation Plan in 2009, and continues to meet routinely with the watershed team and support ongoing initiatives.

Turkey Creek

The Basin Management Branch works in partnership with other agencies and the Turkey Creek Steering Committee on improving water quality and community engagement in the Turkey Creek watershed. The Coastal Streams Basin Coordinator is a member of the Technical Committee, which was established to assist the Turkey Creek Watershed Implementation Steering Committee in an advisory role. The Turkey Creek Watershed Implementation Steering Committee was founded to address concerns of landowners and citizens in the Turkey Creek Community and help them to connect with local, state, and government officials and professionals to address environmental conditions in and around their community.

Rotten Bayou

MDEQ supports the Rotten Bayou Watershed Partnership in an advisory role. MDEQ Basin Management worked with the Rotten Bayou Watershed Partnership to develop the Rotten Bayou Watershed Implementation Plan in 2015, and continues to participate in watershed team initiatives.

Wolf River

MDEQ supports the Wolf River Conservation Society by attending meetings and offering advisory support. Basin Management worked with the Wolf River Conservation Society and other partners to develop a Watershed Implementation Plan for Wolf River in 2010.

Dry Creek

In 2017, a Nine Key Element Watershed Plan was developed for Dry Creek and submitted to EPA. Partners in the Dry Creek Watershed will be working to begin implementation of the watershed-based plan for Dry Creek, in the Pascagoula River Basin, in 2018.

WaterFest

In April 2017, MDEQ partnered with Celebrate the Gulf and Art in the Pass to bring WaterFest to the Mississippi Gulf Coast. At the event, staff from MDEQ presented water models and talked with participants about protecting the state's environmental resources and what they can do to help protect and restore the environment.

Piney Woods Chapter of the Land Trust for the Mississippi Coastal Plain

The Pascagoula, Coastal Streams, and Lower Pearl Basin Coordinator has been working with the Piney Woods Chapter of the Land Trust for the Mississippi Coastal Plain since 2015. Basin Management has an advisory role on the Piney Woods Committee, specifically regarding watershed implementation plans, Basin management approaches, and Section 319 grant initiatives. The Piney Woods Committee was founded in 2014 to protect the lands around the Lake Thoreau property, owned by the University of Southern Mississippi and has expanded since then to include the entire Leaf River Watershed.

VII. PERMITTING

MDEQ staff develop various types of environmental permits which are then presented to the Mississippi Environmental Quality Permit Board for issuance. The Permit Board issues, reissues, modifies, denies, transfers, and revokes permits and certifications administered under the Clean Water Act, the Clean Air Act, the Resource Conservation and Recovery Act, the Surface Mining Control and Reclamation Act, state mining laws, and state water resource control laws.

MDEQ's Office of Geology manages permitting activities under the Surface Mining Control and Reclamation Act. The Office of Land and Water Resources manages permitting activities under the water resources control laws. The Environmental Permits Division is responsible for Air Construction and Air Operating permits, Air Title V Operating permits, Wastewater - State No Discharge permits, Wastewater – NPDES permits, Wastewater – Pretreatment permits, Stormwater Construction and Operating permits, and Wetlands Impacts permits. In July 2016, the Waste Division was formed which is responsible for Solid Waste, Hazardous Waste, and Tire Program Permits.

Currently there are over 20,000 sites in the permitting database. Many of these sites have permits that, by state and federal regulation, expire every five or ten years and must be reissued. As new companies come into the state and existing companies have changes or modifications, these activities also require permitting actions.

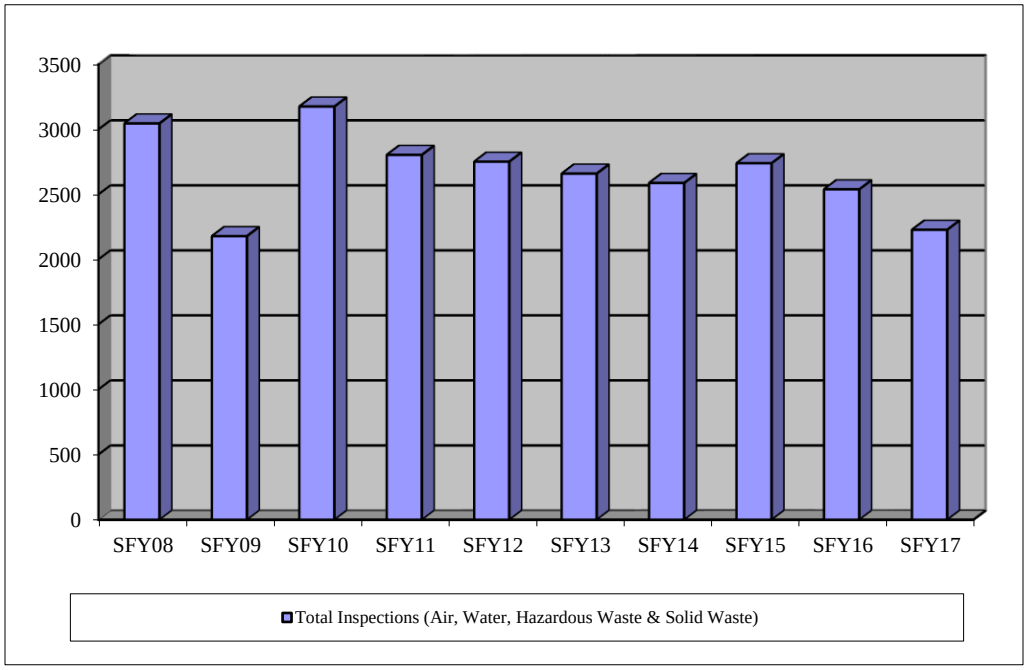
VIII. COMPLIANCE AND ENFORCEMENT

The Environmental Compliance and Enforcement Division (ECED) of the Office of Pollution Control implements and oversees the majority of MDEQ's compliance and enforcement activities and is responsible for the regulation of sites for compliance with applicable air, water, hazardous waste, and non-hazardous waste permits and regulations. The goal is for continuous compliance with all applicable environmental laws, regulations, and standards. Staff assists Mississippi businesses, industries, and farms with compliance. When a site fails to comply with

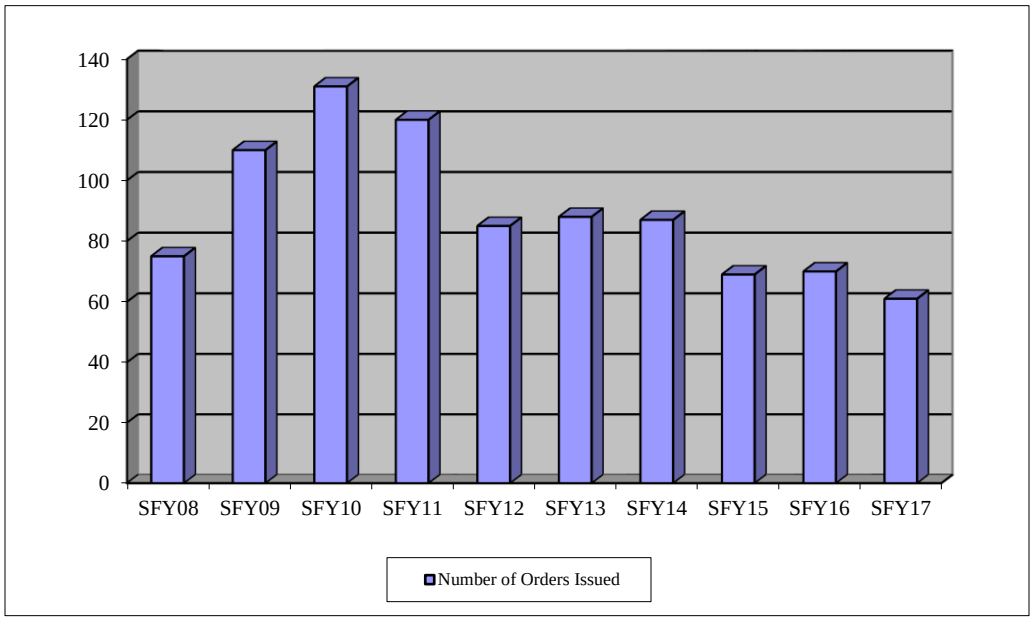
permit(s) or regulations, appropriate enforcement action is taken to promptly return the site to compliance.

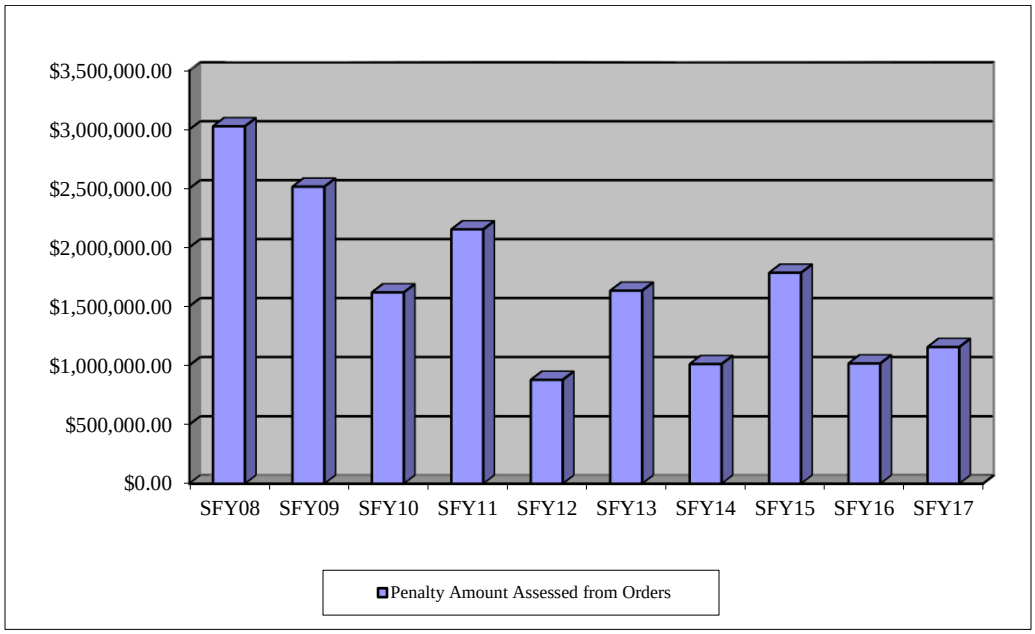
During Fiscal Year 2017, the following number of on-site inspections were performed by ECED and the Field Services Division:

- 187 for compliance with air pollution regulations/permits
- 1,209 for compliance with water pollution regulations/permits
- 59 for compliance with hazardous waste regulations/permits
- 773 for compliance with solid waste regulations/permits

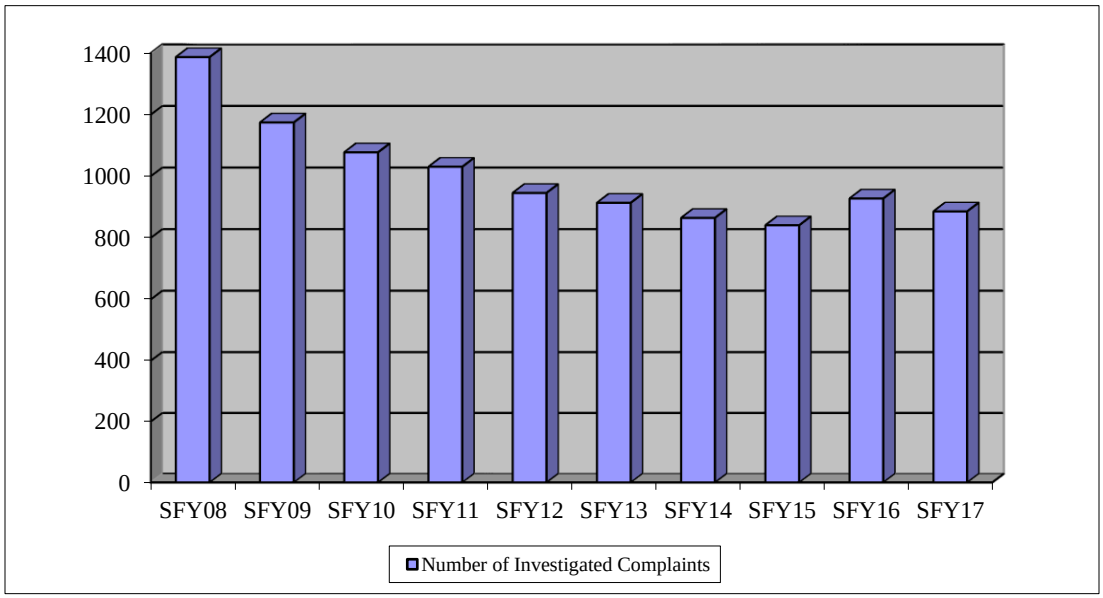


During Fiscal Year 2017, ECED actions resulted in 61 orders being issued for non-compliance with air, water, solid waste, and hazardous waste regulations and permits. Fifty-one of these orders contained provisions for a penalty with a total assessed penalty amount of $1.154 million dollars. When appropriate, MDEQ allows the use of Supplemental Environmental Projects (SEP), projects that go beyond what is required to comply, to offset a portion of a cash penalty. There were no orders utilizing a SEP during the Fiscal Year 2017.





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 2017, MDEQ received and addressed 886 complaints related to air, water, solid waste, and hazardous waste matters. When citizens report an environmental problem, they are asked to explain the nature of the problem and give the location of the problem, including directions to the site. A name is not required; however, if a name and contact information is provided, MDEQ either contacts the complainant during the investigation or provides the results of the investigation after the investigation is complete.



IX. EMERGENCY PREPAREDNESS AND RESPONSE

A. Emergency Response

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

The Emergency Response Division responds as needed to emergencies across the state involving hazardous materials, oil spills, or any pollutant that poses a threat to human health or the environment. Contractor expenditures for response actions were $759,824.09, and the agency was reimbursed approximately $648,773.72 from responsible parties. The Emergency Response staff handled approximately 910 calls for assistance in Fiscal Year 2017.

MDEQ's Emergency Response staff are on-call statewide 24 hours a day and seven days a week. MDEQ and the Mississippi Emergency Management Agency (MEMA) work together to provide effective around-the-clock spill response. MEMA is notified of emergencies, and they, in turn, contact MDEQ personnel who provide on-site response and technical assistance.

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

EMERGENCY OBJECTIVE – Maintain staff that is adequately trained and equipped to conduct an environmental emergency response.

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

B. Disaster Debris Management

Tornadoes

MDEQ's solid waste programs work with various federal, state, and local agencies and organizations regarding the management of disaster-related debris resulting from tornadoes.

Katrina Disposal Sites

MDEQ continued to monitor the Hurricane Katrina debris disposal sites used along the Gulf Coast to dispose of 24 million cubic yards of debris in the three coastal counties. In March of

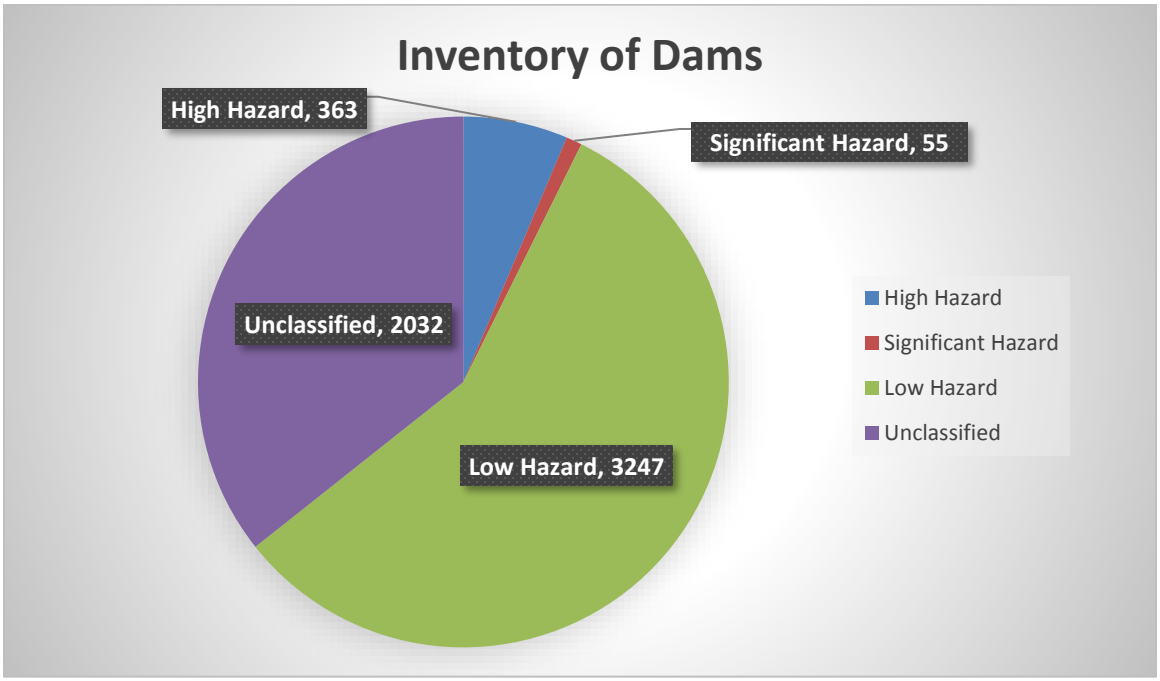
2016, an MDEQ sampling team collected groundwater monitoring samples at three of the Katrina debris disposal sites including the BOCA structural debris site in Hancock County, the Kyle Mallette site in Jackson County, and the Lamey site in Harrison County. These sampling results have been reviewed and catalogued and MDEQ will continue to monitor the results from the groundwater monitoring wells at these locations. In October 2016, the monitoring team sampled the groundwater wells at the Haas Structural Debris Disposal Site, the TCB Highway 53 Structural Debris Disposal site, and the deep well at Lamey Class II Rubbish Site. Upon obtaining the results, MDEQ will review and assess the analysis to determine if any potential groundwater impacts exist around the sites. The Blackmer Rubbish Facility in Harrison County also received Katrina debris, and its monitoring wells are sampled regularly.

C. Dam Safety

EMERGENCY OBJECTIVE – Protect downstream lives and property by ensuring that dams are properly classified, inspected, and maintained and include a current Emergency Action Plan (EAP) as required.

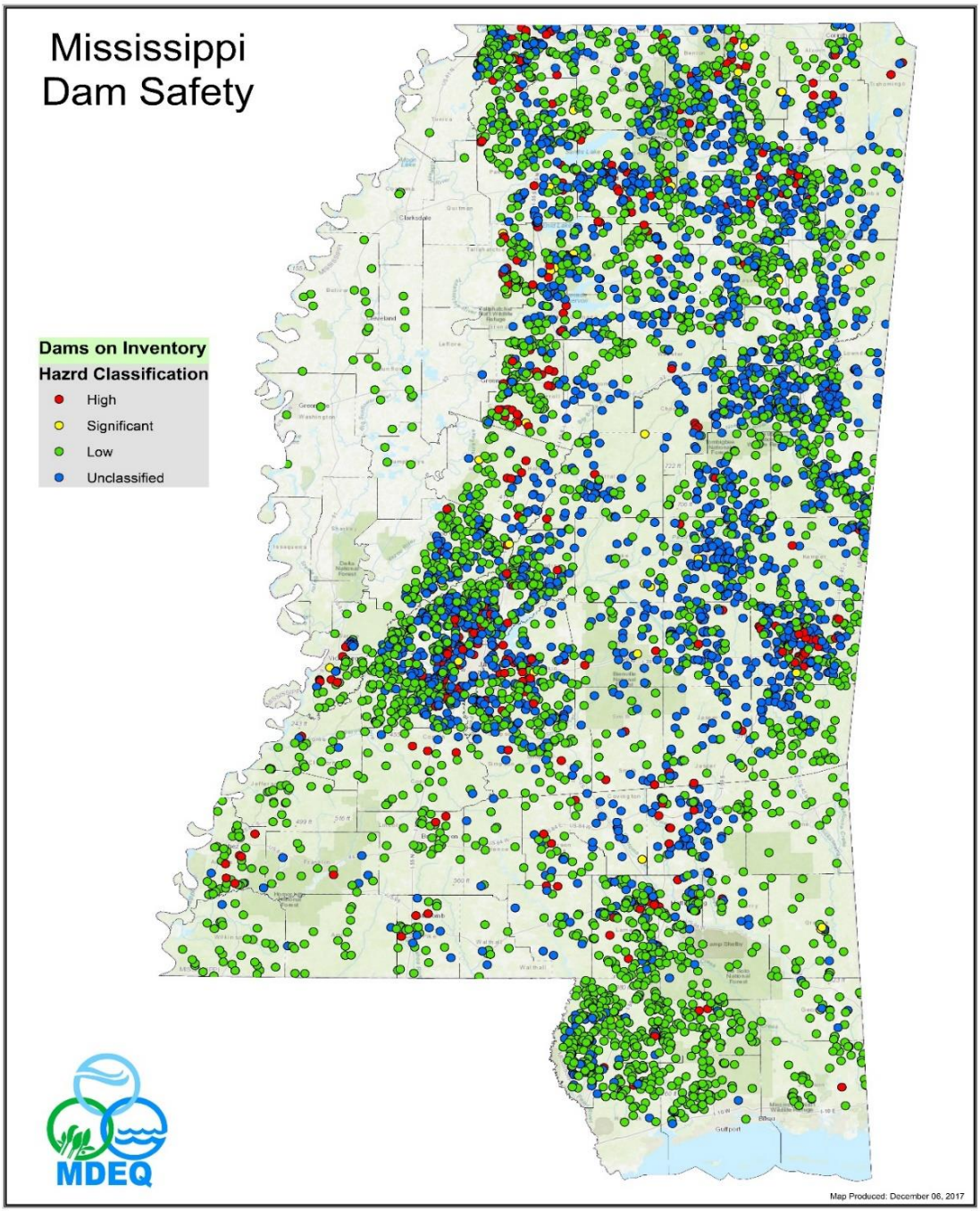
All dams in the state are identified, inventoried, and classified as either High Hazard, Significant Hazard, or Low Hazard in accordance with the state's Dam Safety Regulations. MDEQ requires that dam owners perform annual inspections of their High and Significant Hazard dams and also have periodic inspections performed by a registered professional engineer. Dam owners are required to address any deficiencies noted during inspections resulting in applications for modification and/or rehabilitation. MDEQ also performs random inspections to verify that the conditions of the dams are being accurately reported in the submitted inspection reports.

The Dam Safety Division reviews plans for repairs or modifications to existing dams, reviews plans for the construction of new dams, conducts and reviews dam inspections, performs engineering analyses of dams, and reviews and approves Emergency Action Plans (EAPs) for High Hazard dams in addition to other duties. There are currently 363 High Hazard dams, 55 Significant Hazard dams, 3,247 Low Hazard dams, and 2,032 unclassified dams on the state's inventory. Unclassified dams are dams upon which preliminary engineering analysis shows that the dam could potentially be either High or Significant Hazard but further analysis is needed for proper classification.



During Fiscal Year 2017, 204 dams were inspected and the information produced by these inspections resulted in dam owners initiating repairs or rehabilitation on nine High Hazard dams, in addition to the removal of two High Hazard dams. MDEQ staff also reviewed and approved applications to construct 15 new Low Hazard dams, one Significant Hazard dam, and one new High Hazard dam.

There are currently 255 EAPs on file for High Hazard dams. All owners of High Hazard dams are required to submit EAPs for review and approval. Compliance with this requirement presently stands at approximately 70 percent due a number of dams being recently reclassified to High Hazard. 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.



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

One of the other major duties of MDEQ is to respond to dam incidents and failures. Staff members responded to nine dam incidents or failures in Fiscal Year 2017 and were able to mitigate each emergency successfully. During emergencies, the Dam Safety Division provides on-site response and technical assistance to the county emergency managers and dam owners.

X. RESTORATION

Governor Phil Bryant announces restoration projects at the Mississippi Restoration Summit.

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

Office of Restoration

MDEQ's Office of Restoration oversees and manages the implementation of the state's restoration efforts stemming from the *Deepwater Horizon* oil spill. The office manages all aspects of restoration including programs and projects resulting from the NRDA process, the RESTORE Act, and the criminal plea agreement which established the NFWF GEBF. Using a team of scientists, engineers and other subject matter experts, MDEQ works with state and federal agencies, local governments, non-governmental organizations (NGO's), residents, industries, and business owners.

MDEQ engages the public throughout the restoration process. Mississippi's citizens have the opportunity to submit restoration project ideas into the state's project idea portal at its website. Since its inception in October 2013, the project idea portal has received over 1,000 submissions across the coastal landscape ranging from ecological projects, to economic development, to

infrastructure projects. Additionally, MDEQ and Executive Director Rikard disseminate information about the agency's upcoming projects, public meetings, and other information concerning restoration work using a direct texting service, email, the website, and Twitter, among other outreach methods, including the annual Mississippi Restoration Summit.

Mississippi Restoration Funds

As a result of the *Deepwater Horizon* oil spill, and settlement of claims arising from the oil spill, Mississippi will receive in excess of $2.174 billion to support the state's recovery and restoration efforts. These funds are allocated to Mississippi from civil and criminal penalties levied against the responsible parties under the Clean Water Act, penalties levied against the responsible parties under the Oil Pollution Act, and from the state's economic losses claim. Mississippi's restoration funds come from three primary funding sources:

- RESTORE Act - $688 million
  - Bucket 1 – $364 million
  - Bucket 2 – TBD[1]
  - Bucket 3 – $297 million
  - Bucket 5 – $26 million

- NFWF Gulf Environmental Benefit Fund - $356 million

- Natural Resource Damage Assessment - $297 million

Mississippi also received approximately $100 million in NRDA early restoration funding. Additionally, Mississippi will receive $750 million as settlement for the state's economic damages claim, which will be managed by the Mississippi Legislature.

[1] *Under the RESTORE Act, approximately $1.594 billion will be administered under Bucket 2 (Comprehensive Plan Component). Each member of the RESTORE Council is eligible to receive funding for projects under Bucket 2. There is a competitive process whereby members of the RESTORE Council may receive funds for restoration projects.*

GoCoast 2020

In 2012, Governor Phil Bryant created GoCoast 2020 to serve as the official advisory body for the allocation of civil penalties received by the State of Mississippi under the RESTORE Act. GoCoast 2020 was established to set a foundation and road map of priorities for Mississippi so the state will be better prepared as the final federal guidelines and regulations are set forth under RESTORE.

The GoCoast Committee Chairs were reconvened in July of 2016 and April 2017, to review projects previously recommended and new portal project submissions to formulate a list of priority projects for amounts available in the next round of funding.

The RESTORE Act

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

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

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

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

The Council is comprised of governors from the five affected Gulf States, the Secretaries from the U.S. Departments of Interior, Commerce, Agriculture, and Homeland Security as well as the Secretary of the Army and the Administrator of the EPA. The Gulf States selected and President

Obama appointed, the Secretary of Commerce as the Council's Chair. MDEQ's Executive Director Gary Rikard serves for Governor Phil Bryant on the Council.

RESTORE Act in Mississippi

Direct Component (Bucket 1)

In July 2017, the U.S. Department of the Treasury accepted Amendment No. 1 to Mississippi's Multiyear Implementation Plan (MIP). The MIP Amendment No. 1 describes the projects, programs, and activities, announced by Governor Bryant in November 2016 at the first annual Mississippi Restoration Summit, for which Mississippi will spend "Bucket 1" funds available to the state. Mississippi's MIP Amendment No. 1 included the following seven projects totaling approximately $27.3 million:

- Mississippi Gulf Coast Water Quality Improvement Program
- University of Southern Mississippi Oyster Hatchery and Research Center
- North Rail Connector – Planning Assistance
- National Oceans and Applications Research Center (NOARC) – Planning Assistance
- Salvation Army Center of Hope
- Mississippi Coast Coliseum and Convention Center
- Planning Assistance – MIP Amendment Development

Council Selected Component (Bucket 2)

In December 2015, the RESTORE Council approved the Funded Priorities List (FPL) totaling approximately $156.6 million in restoration activities across the Gulf. Mississippi has four projects on the approved FPL. The projects are:

- **Strategic Land Protection, Conservation, and Enhancement of Priority Gulf Coast Landscapes** - A coordinated multi-state strategy for land protection, conservation and enhancement of priority lands across the Gulf ($15.5 Million).
- **SeaGrant Education and Outreach** – A project to undertake education and outreach activities to describe the values of land protection for habitat, water quality improvement and for securing the future of the Gulf of Mexico ($750,000).
- **The Mississippi Sound Estuarine Program** ($2.27 million) – A project to establish the Mississippi Sound Estuarine Program to bridge critical upland/terrestrial habitats to open blue water, connect research priorities with restoration goals, and engage the community of the Mississippi Sound to tailor Mississippi's conservation needs with community benefits.
- **Enhancing Opportunities for Beneficial Use of Dredge Sediment** ($2.18 Million) – A project toprovide funding for beneficial use (BU) planning, design, engineering, feasibility, and permitting to get sites construction ready so that a significant amount of habitat can be created when additional funds become available.

As of the date of this Annual Report, no new projects have been added to the Council-approved FPL for the State of Mississippi.

Spill Impact Component (Bucket 3)
In April 2017, Daniel J. Jiron, as Acting Chair of the RESTORE Council, approved Mississippi's State Expenditure Plan (SEP). The SEP describes the project, programs and activities for which Mississippi will spend "Bucket 3" funds available to the state. The SEP includes three projects totaling approximately $49.8 million:

- **Mississippi Gulf Coast Water Quality Improvement Program** ($45 million) – This program will support the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast Region through the implementation of water quality improvement projects.
- **Pascagoula Oyster Reef Complex Relay and Enhancement** ($3.5 million) – This project will support the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats in the Gulf Coast Region by relaying oysters from the currently non-harvestable Pascagoula Oyster Reef Complex (ORC) to harvestable reefs and enhancing the ORC.
- **Compatibility, Coordination and Restoration Planning** ($1.3 million) – This project will provide planning assistance to support MDEQ's coordinated restoration planning effort to maximize the effectiveness of coordination of restoration in the Gulf Coast Region and the development of new and/or amended State Expenditure Plans.

Centers of Excellence Component (Bucket 5)
Mississippi's Center of Excellence was selected in July 2015. The Mississippi Based Restore Act Center of Excellence (MBRACE), a partnership among Jackson State University, Mississippi State University, University of Mississippi, and University of Southern Mississippi, will serve as the state's Center of Excellence focusing on science, technology, and monitoring in the Gulf Coast Region. In May 2017, MDEQ executed a sub-award agreement with The University of Southern Mississippi, as the lead university for the MBRACE consortium, for implementation of the Centers of Excellence program.

National Fish and Wildlife Foundation

Mississippi will receive $356 million for restoration as a result of the criminal settlements resulting from the *Deepwater Horizon* oil spill. The National Fish and Wildlife Foundation (NFWF) administers these funds through the Gulf Environmental Benefit Fund (GEBF), and Mississippi has been awarded grants for fourteen projects thus far under this program. The projects announced during FY2017 include the following:

- **Coastal Bird Stewardship, Phase I** - This $6.3 million project expands, in both scope

and duration, an earlier GEBF-funded Mississippi Coastal Bird Stewardship project. This four-year initiative will continue to benefit beach nesting and wintering shorebirds and seabirds, and will expand by improving habitat for shorebirds and other migratory species, and by filling key information gaps to support marsh bird conservation. Monitoring efforts will also improve our understanding of coastal bird population responses to ongoing restoration actions. Posting, stewardship, and monitoring on beaches and barrier islands will benefit six focal species (American oystercatcher, black skimmer, least tern, Wilson's plover, piping plover, and snowy plover). Assessments of abundance and distribution of focal marsh bird species (least bittern, clapper rail, marsh wren, Nelson's sparrow, and seaside sparrow) will inform future habitat and marsh bird conservation efforts in the Gulf region. This effort will also support the conservation significant wetland habitat, benefitting shorebirds and other migratory species through leveraged investment by the USDA Natural Resources Conservation Service's Regional Conservation Partnership Program.

- **Marine Mammal and Sea Turtle Conservation, Recovery, and Monitoring Program, Phase I** - This five-year project, funded at $9.9 million, will engage state and federal agencies, academic institutions and conservation organizations to bolster the capacity of Mississippi's marine mammal and sea turtle stranding network. The overall goal is to improve response to injured or dead animals and develop a consistent scientific understanding of the causes of mortality to inform management actions in the state. Project components will seek to: 1) bolster state partnerships and enhance stranding network capacity, 2) perform health and mortality assessments, 3) rehabilitate and release injured sea turtles, where appropriate, 4) use satellite telemetry tagging to assess habitat utilization and validate rehabilitation success, 5) improve compliance with utilization of Turtle Excluder Devices, and 6) establish a fisheries observer program. This project seeks to address scientific gaps and improve the understanding of foundational causes of marine mammal and sea turtle strandings to increase populations in the Mississippi Sound. MDEQ's partners for this project are the Mississippi Department of Marine Resources, the University of Southern Mississippi, the College of Veterinary Medicine at Mississippi State University and the Institute for Marine Mammal Studies.

Previously awarded projects include:

Funding Cycle 2013 (SFY2014)

- **Coastal Streams Initiative with The Nature Conservancy**
  - A project to develop strategies and restoration designs for nine coastal streams ($2.6 million)
  - Current Status: In closeout

- **Coastal Bird Stewardship Program with the Audubon Society-Mississippi**
  - A project to support Audubon's Coastal Bird Stewardship program ($1.6 million)

- Current Status: In closeout.

- **Coastal Preserves Invasive Species Program with the Mississippi Department of Marine Resources**
  - A project to restore and improve management in the Coastal Preserves ($3.3 million)
  - Current Status: Implementation; initial assessment complete; first treatment complete; monitoring on-going

- **Mississippi Coastal Restoration Plan (SFY 2014; off-cycle)**
  - A project to fund critical coastwide restoration planning ($3.6 million)
  - Current status: Implementation; Version 1 of the Plan published in 2015; update to plan drafted in 2017; Restoration Endpoints developed in 2016 and 2017.

Funding Cycle 2014 (SFY2015)

- **Reef Fish Assessment**
  - A project to bolster the fishing industry ($4 million)
  - Current status: Implementation; first year of data collection and analysis complete; second year of data collection complete

- **Marsh Restoration and Creation**
  - A project to conduct vital marsh restoration through beneficial use of dredge material ($21 million)

  - Current status: Implementation; Mississippi Sound Sand Bern (at Round Island) constructed and filled with dredge materials from Port of Pascagoula; design work for Wolf River and Beardslee Lake sites initiated

- **State Lands Invasive Species Management**
  - A project to enhance habitat value of state coastal lands through management of invasive species ($2.6 million)
  - Current status: Implementation; Mississippi Departments of Marine Resources and Wildlife, Fisheries and Parks assessing sites and formulating management strategies

Funding Cycle 2015 (SFY2016)

- **Habitat Restoration on Federal Lands Program – Phase I**
  - A project to enhance and restore habitat on federal coastal lands through invasive species management ($9.9 million)
  - Current status: Implementation; MDEQ sub-grant awards to federal partners in process
- **Habitat Restoration and Conservation in Turkey Creek – Phase I**
  - A project to conserve important habitat and enhance water quality in the Turkey Creek watershed ($7.5 million)
  - Current status: Implementation; MDEQ subawards to project partners and contracting of services necessary for project components in process
- **Oyster Restoration and Management – Phase I**
  - A project to conduct studies to help scientifically inform efforts to improve oyster populations and sustainability ($11.7 million)
  - Current status: Implementation; benthic mapping nearing completion; modeling of Western Mississippi Sound and Lower Pearl River in process; oyster gardening on-going; sampling and analysis of contaminated oyster cultch on-going
- **Design Challenge for Improvement of Water Quality from Beach Outfalls**
  - A project which funded a competition among individuals and teams to create innovative solutions to address water quality impacts from beach storm water outfalls ($544,000)
  - Current status: Competition complete; design challenge winners chosen; project in closeout

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 NRDA Settlement for Mississippi is $297,557,000 which funds the following restoration initiatives and project types:

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

Early Restoration

Under NRDA, plans for the implementation of early restoration projects prior to the final quantification of injury were developed to achieve restoration faster. In 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 received $100 million dollars to implement early restoration projects. The remaining $300 million was allocated by NOAA and DOI for early restoration projects proposed by state trustees.

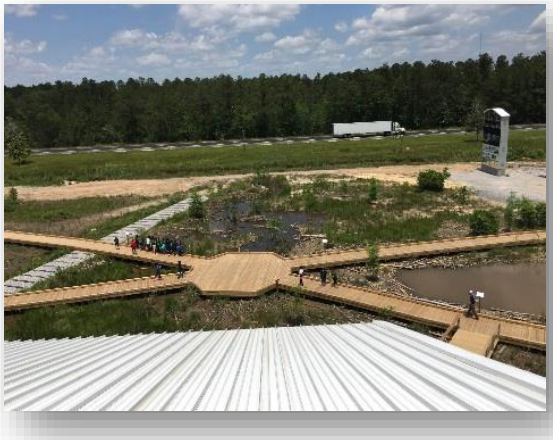
- **Phase I**
  - Mississippi's projects from Phase I included the laying of the largest oyster cultch in the history of the Mississippi Sound totaling $11 million, and $2.6 million on a near shore artificial reef(s) enhancement project. Construction activities for both projects are complete and monitoring activities are ongoing. Completed projects brought jobs to the Mississippi Gulf Coast as local contractors were hired to perform this work.

- **Phase II**: There was no Phase II project for Mississippi in Fiscal Year 2016.

- **Phase III: Mississippi has four Phase III projects totaling $68.957 million.**

  - **Hancock County Marsh Living Shoreline**

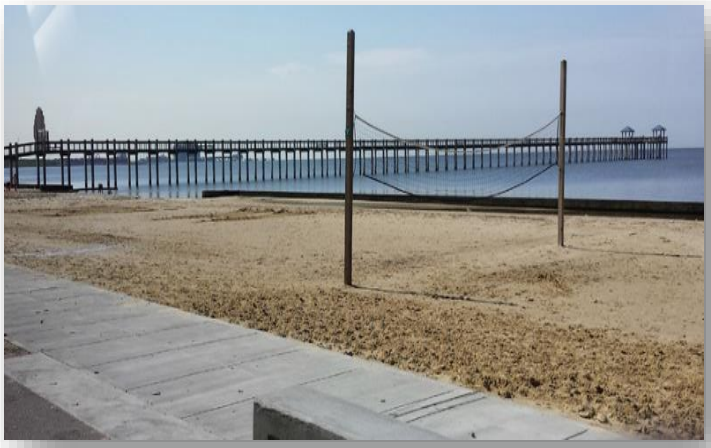
This project, which is on-going and under construction, provides for up to six miles of living shoreline. Benefits include reduction of erosion, re-establishment of oyster habitat, and enhanced fisheries resources and marsh habitat. Approximately 46 acres of marsh will constructed to protect and enhance the existing shoreline near Heron Bay. In addition, 46 acres of sub-tidal oyster reef were created in Heron Bay to protect the shallow bay and increase oyster production in the area. The estimated cost of this project is approximately $50 million of which NOAA is funding a portion. Construction activities began in mid-2016 and will continue through 2018.



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

INFINITY is a state-of-the-art interactive science research, education, and interpretive center located in Hancock County. Early restoration funds are being used to develop state of the art interactive exhibits at the INFINITY Science Center. These enhancements will replace lost recreational opportunities through enhanced visitors' access to coastal natural resources. The estimated cost of this project is approximately $10.4 million. Completed enhancements to date include the approximate three mile portion of the Possum Walk Heritage Trail, the Biome Boardwalk showcasing natural habitats of native landscaping. Construction commenced on a 3-D Theater and 6 new interior science exhibits used for learning about our environment.

- **Popp's Ferry Causeway Park**
  This project in Harrison County provides for construction of an interpretive center, trails, boardwalks, and other recreational enhancements. This project will replace lost recreational opportunities by enhancing existing amenities allowing visitors to fish, crab, and observe nature. The estimated cost of this project is approximately $4.7 million. Construction began in April 2017 and will be completed in 2018.
- **Pascagoula Beachfront Promenade**
  Early restoration funds for this project are being used to help complete a two-mile, ten foot wide lighted concrete pathway complete with amenities. The purpose is to restore the loss of recreational opportunities by enhancing access to the Mississippi Sound and its natural resources. The estimated cost of this project is approximately $3.8 million. Construction activities are underway.



- **Phase IV Project**
  - Restoring Living Shorelines and Reefs in Mississippi Estuaries – This Phase IV Early Restoration project includes restoration of intertidal and subtidal reefs and the use of living shoreline techniques including breakwaters. Projects will be implemented at locations in Grand Bay and Graveline Bay (Jackson County), Back Bay of Biloxi and vicinity (Harrison County), and St. Louis Bay (Hancock County). The project builds on recent collaborative projects implemented by MDMR, the National Oceanic and Atmospheric Administration, and The Nature Conservancy. When completed at all locations, the project will provide for construction of breakwaters, intertidal and subtidal reef habitat across the Mississippi Gulf Coast. Over time, the breakwaters, intertidal and subtidal restoration areas will develop into living reefs that support benthic secondary productivity, including, but not limited to oysters/bivalve mollusks, annelid worms, shrimp, and crabs. Breakwaters will reduce shoreline erosion as well as marsh loss. Currently engineering and design activities are being coordinated by MDEQ in collaboration with MDMR.

Long Term Restoration

In early 2016, Mississippi and the other NRDA trustees completed the Final Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement. It includes an assessment of the injury to natural resources caused by the oil spill and the types of restoration needed to compensate the public. The plan includes $183 million for projects in the following categories:

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

The Mississippi Trustee Implementation Group (MS TIG) is responsible for ensuring these funds are used to restore the natural resources and services in Mississippi that were injured by the *Deepwater* Horizon oil spill. The MS TIG is comprised of MDEQ and the following four federal trustee agencies:

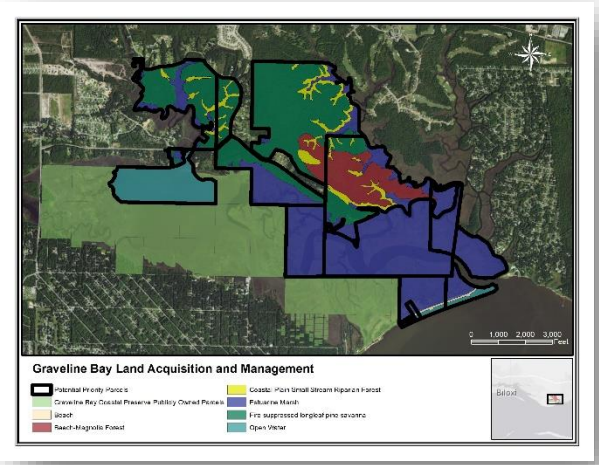
- the United States Department of Commerce, represented by NOAA;
- the U.S. Department of the Interior (DOI), represented by the United States Fish and Wildlife Service (USFWS), the National Park Service (NPS), and the Bureau of Land Management (BLM);
- the United States Department of Agricutlure (USDA) and;
- EPA.

The MS TIG develops plans for, chooses, and implements specific restoration actions that are consistent with the Final Programmatic Damage Assessment and Restoration Plan (PDARP)

and Final Programmatic Environmental Impact Statement (PEIS). Each plan will be integrated with the appropriate analysis of tiered environmental impacts. TIG decisions will be made by consensus and documented through a public Administrative Record. The Trustees will ensure that the public is involved through public notice of proposed restoration plans, opportunities for public comment, and consideration of all comments received.

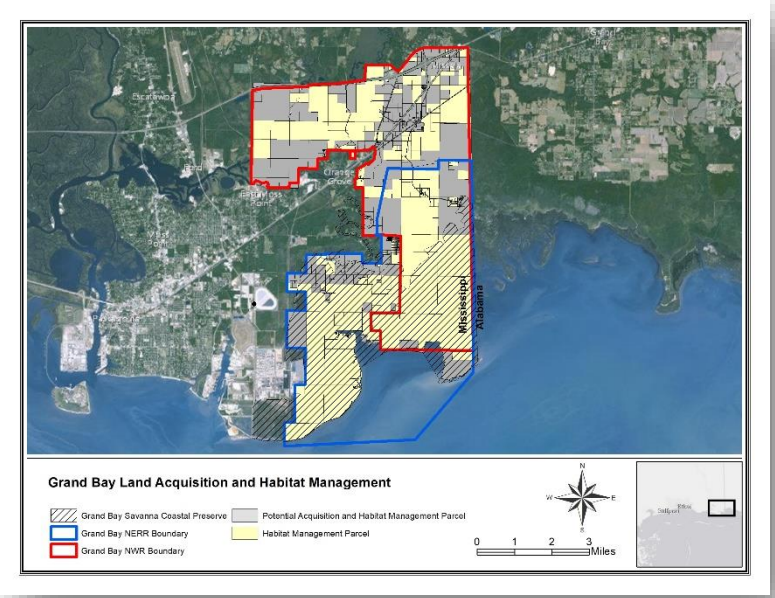
The first plan developed by the MS TIG was released in June 2017, and fulfils the restoration plan requirement under the Oil Pollution Act and the implementing regulations, and the environmental assessment requirement for compliance with the National Environmental Policy Act. The plan includes two projects designed to meet the following PDARP/PEIS Restoration Goals: Restore and Conserve Habitat (Wetlands, Coastal and Nearshore Habitats), and Replenish and Protect Living Coastal and Marine Resources (Birds):

- **Graveline Bay Land Acquisition and Management Project ($11,500,000)**
  - The Graveline Bay Land Acquisition and Management project will include acquisition, preservation, and habitat management on parcels on publicly-owned lands in the Graveline Bay Coastal Preserve, Jackson County. Implementing Trustees for the project will be MDEQ (lead) working with the Department of the Interior. The Mississippi Department of Marine Resources will be a project partner. The project will preserve and enhance up to 1,410 acres of habitat. Acquisition and preservation will include the purchase of land from willing sellers and preservation in perpetuity in order to protect natural habitats. Habitat management will include a combination of mechanical, chemical, and prescribed fire treatments as well as debris removal and/or road repair and/or removal and culvert replacement to help restore habitats. Target habitat will include estuarine marsh, shoreline (beach), and other coastal riparian habitats which provide foraging, loafing, and nesting for bird species that were injured in the spill. Restoration measures will serve to decrease habitat fragmentation and increase habitat connectivity to other large conservation parcels in the area. They will also help restore injuries to coastal, wetland, and nearshore habitats in Mississippi, as well as provide benefits to wading birds and other bird species injured by the spill. Acquisition and



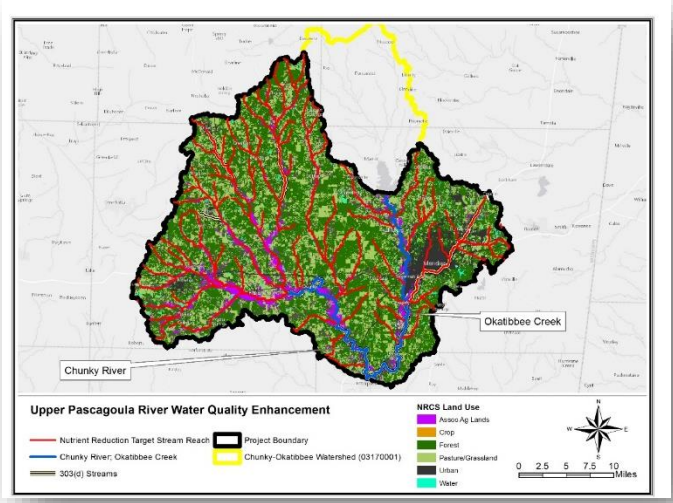
management will be implemented with available funding for up to 10 years. Project Implementation will commence in 4th Quarter 2017.

- **Grand Bay Land Acquisition and Habitat Management Project**
  - The Grand Bay Land Acquisition and Habitat Management project will result in a combination of acquisition and habitat management within the Grand Bay National Wildlife Refuge (NWR), Grand Bay National Estuarine Research Reserve (NERR), and Grand Bay Savanna Coastal Preserve boundaries in Jackson County, Mississippi. MDEQ and the Department of the Interior will be Implementing Trustees for the project. The Mississippi Department of Marine Resources and the U.S. Fish and Wildlife Service will be project partners. The project would include preservation of up to 8,500 acres and enhancement of up to 17,500 acres of habitat. Habitats within the project area include coastal marsh, beach, freshwater marsh, pine savannas and flatwoods, forested freshwater scrub-shrub, and open water including tidal creeks and bayous. Acquisition and preservation will include the purchase of land from willing sellers and preservation in perpetuity in order to protect natural habitats. Habitat management will include a combination of mechanical, chemical, and prescribed fire treatments to help restore habitats. These actions will help restore injuries to wetlands, coastal and nearshore habitats in Mississippi injured by the spill, as well as provide benefits to wading birds and other bird species injured by the spill. Acquisition and management will be implemented with available funding for up to 15 years. Project implementation will commence in 4th Quarter 2017.



A third project is designed to meet the Restore Water Quality Restoration Goal (Nutrient Reduction (Nonpoint Source):

- **Upper Pascagoula River Water Quality Enhancement Project**
  - The Upper Pascagoula River Water Quality Enhancement project will include development and implementation of conservation plans to reduce nutrient and sediment contributions in the watershed. The USDA (lead), EPA, and MDEQ will be Implementing Trustees for the project. The Natural Resources Conservation Service will be a project partner. The project includes an extensive outreach program to land owners. Conservation practices will be planned and implemented on property throughout the watershed with emphasis given to properties bordering rivers and streams. Conservation actions for the project will include: natural resource inventories; soil, water and nutrient conservation measures; habitat restoration; and, erosion control. Project Implementation will commence in the third quarter of 2017.



XI. OUTREACH, RESEARCH, AND EDUCATION

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

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

A. Key Pollution Prevention Activities

The Pollution Prevention (P2) Program coordinates multiple activities focusing on the reduction of waste streams that can impact the environment.

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

The purpose of MDEQ's Pollution Prevention Program is to:

- Provide 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.
- Support Economy, Energy, and Environment (E3) programs—an initiative designed to focus on sustainability and the triple bottom line of energy, environment, and the economy.
- Review, manage, and monitor the waste minimization plans, annual waste minimization certified reports, and the EPA/Mississippi Pollution Prevention Grant (P2G).
- Coordinate and partner with both state and the federal government and non-governmental entities to promote effective pollution prevention practices.

B. enHance Recognition Program

Since 2009, the enHance program has grown to 43 members representing top environmental performers throughout the state. The objective of this program is to recognize those business, industrial, manufacturing, and governmental facilities that go beyond compliance and to promote energy efficiency efforts, provide networking and training resources for pollution prevention, and encourage the use of environmental management systems and continuous improvement.

Members have implemented projects resulting in the reduction of one ton of hazardous waste and over 700 tons of solid waste diverted from landfills. More than six million gallons of wastewater are now being reduced, reused and recycled each year. Energy conservation efforts have resulted in reduced air pollution as well as significant economic savings of over $1 million. This has been done through changes in operating procedures, redesign of products or packaging, beneficial reuse of materials, and installation of more efficient equipment, recycling, and other similar alternatives. The enHance program promotes these best management practices to encourage more widespread implementation through training sessions, mentoring, and participation in the program.

C. Energy Efficiency and Energy Star

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

Energy use in the MDEQ main office buildings has been reduced by 50 percent in five years, saving hundreds of thousands of dollars in annual utility cost. MDEQ's efforts have been recognized by the Mississippi Development Authority and the Mississippi Department of Finance and Administration.

Starting in 2012, MDEQ began implementing energy efficiency measures such as employee education, de-lamping, and temperature control to be better stewards of public funds. MDEQ has developed Energy Management Plans for its main building as well as regional offices. Since MDEQ energy program's inception, the agency's Amite Street building has reduced its energy use by 31.5 percent. The energy cost index has been reduced from $2.17/sqft/yr to $1.70/sqft/yr. MDEQ's State Street building, has had impressive gains as well, reducing its energy usage by 19.7 percent and its energy use index from $1.98/sqft/yr to $1.77/sqft/yr. This effort has saved over $235,000 since 2012.

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.

D. Office of Community Engagement

The Office of Community Engagement continues to support existing partnerships and engage new partners in conserving and improving the environment. In 2014, the merger of the Office of Community Engagement (OCE) and the Small Business Environmental Assistance Program served to sustain and strengthen MDEQ's relationship with communities, elected officials, industry, small businesses, government agencies, and civic and community groups.

The OCE Environmental Justice Program has the responsibility of incorporating community engagement and environmental justice principles into agency processes and programs. This program focuses on two key areas: 1) working with agency management and staff to develop approaches to address environmental justice issues, completing identified environmental justice projects, and further developing practices and guidelines to sustain gains. 2) engaging directly with vulnerable communities to learn about environmental issues around them and bring their issues of concern back to the agency.

Working with Partners:

- **Pascagoula Community Collaboration**
  Comprised of industry representatives, community residents, local government officials, and state agencies, the Pascagoula Community Collaboration has continued to address the concerns of residents living in close proximity to the Bayou Cassotte Industrial Park. In 2016, MDEQ developed and implemented an investigative air sampling plan for the Cherokee neighborhood.

- **Other Activities**
  In addition to hosting and assisting in numerous face-to-face meetings, conference calls and public availability meetings, the Office of Community Engagement participated in multiple national and state conferences, workshops and on various federal workgroups including:
  - National Environmental Justice Advisory Council (NEJAC) Work Group

- Southern Section Air & Waste Management Association (A&WMA) Annual Conference
- MDEQ's Class 1 Rubbish Disposal Site Operator Training
- Environmental Benefits Mapping and Analysis Program - Community Edition Training
- Community Rating System
- Delta Communities: Identifying Challenges and Opportunities through Data and Dialogue
- Public Health Emergency Preparedness Senior Advisory Committee
- Discovering Steps to Safeguard our People and the Places They live: A Climate Adaptation Training for Coastal Communities
- Evacuation Re-Entry Planning
- Mississippi Development Authority – Small Biz Incubators
- Education, Economics, Environmental, Climate & Health Organization Roundtable
- Federal Reserve – Community Development
- Lead Inspector Training
- C-FERST (Community-Focused Exposure and Risk Screening Tool)
- Gulf of Mexico Alliance - Education and Engagement Priority Issue Team
- Mississippi Municipal League 2016 Small Town Conference in Natchez

National Environmental Justice Advisory Council Workgroup
(Photo source: WLOX)

Small Business Environmental Assistance Program

Mississippi's Small Business Environmental Assistance Program (SBEAP) provides education and assistance to small businesses and municipalities to ensure understanding and compliance with environmental laws and regulations.

Authorized through Section 507 of the 1990 Clean Air Act Amendments, SBEAP provides education and assistance to small businesses and municipalities to ensure understanding and compliance with environmental laws and regulations. It has three components: a small business compliance assistance program, a small business ombudsman (SBO), and a compliance advisory panel. These components work together and are monitored by the EPA Asbestos and Small Business Ombudsman.

SBEAP activities include the following:

• General Assistance Calls	1,722
• Complaint Calls Entered into CTS	346
• Technical Assistance Requests	9
• Onsite Technical Assistance Visits	5
• Meetings/Conferences Attended	17
• Webinars	12
• Conference/Outreach Calls	72
• SBEAP Outreach Publications	32
• SBEAP Regulatory Assistance Documents	6
• Compliance Assistance Tools	5
• SBEAP Mailings	638
• Environmental Workshops Hosted/Attended	4

E.Geology Outreach and Education

MDEQ's Office of Geology staff regularly meet with the public and student groups to discuss Mississippi's unique geology and identify fossils, rocks, gems, and minerals.

Mississippi Ground Water Association Summer Conference

In June, Andrew Newcomb of the Environmental Geology Division gave a presentation at the Beau Rivage to the Mississippi Ground Water Association, which is the former Mississippi Water Well Contractor's Association. The presentation demonstrated and detailed the availability of geophysical logs on the Environmental Geology Division's new web page.

Southwest Community College Drilling School

Paul Parrish and Andrew Newcomb of the Environmental Geology Division logged wells in the spring and fall semesters for the drilling school students. In addition, Andrew Newcomb gave a short instructional session on reading and understanding geophysical log data. Southwest Community College has the only drilling school in the State of Mississippi.

Madison Avenue Elementary Presentation

Paul Parrish gave three presentations on the Jackson Volcano and fossils to the Madison Avenue Elementary second grade in February.

Boyd Elementary School

In February, Paul Parrish gave a Jackson Volcano and fossils presentation to Jackson's Boyd Elementary fifth graders.

American Heritage Girls

In March, Paul Parrish provided a Jackson Volcano and fossils presentation to the American Heritage Girls at Pear Orchard Presbyterian Church in Ridgeland.

Arkansas Geological Survey (AGS) and Central United States Earthquake Consortium (CUSEC)

Paul Parrish participated in an earthquake features recognition workshop. The March workshop was held by AGS in conjunction with CUSEC to bring together states that would be affected by New Madrid Seismic Zone events.

The Mississippi Gem and Mineral Society Annual Rock Show

The Mississippi Gem and Mineral Society Annual Rock Show was held in February at the Mississippi Trade Mart in Jackson. The Office of Geology operated a booth showing the office's geologic work and answered questions from the public.

The Office of Geology also had a display of the Mississippi precious opal at the Gulf Coast Gem and Mineral Society's annual rock show in November.

Mississippi Museum of Natural Science Sr. Naturalist Camp

James Starnes of the Surface Geology Division helped lead a fossil collecting field trip with staff of the Mississippi Museum of Natural Science for Mississippi high school students at the Smith County Lime Pit site.

Mississippi Museum of Natural Science (MMNS) Annual Fossil Road Show and the Chickasaw County Heritage Museum Fossil Road Show

The Annual Fossil Road Show was held in March at the MMNS in Jackson. Office of Geology staff identified fossils for the public.

The Chickasaw County Heritage Museum held its first Fossil Road Show in May hosting James Starnes and paleontologists from the MMNS and Mississippi State University to identify fossil for the public and lead a Cretaceous fossil collecting trip at the Prairie Bluff Environmental Landfill.

Paleontological Excavation of a Skeleton of the State Fossil, *Zygorhiza kochii*

A largely complete fossil skeleton of an approximately 40 million-year-old whale was excavated for scientific study this past summer by Office of Geology and Office of land and Water Resources staff. The findings will be presented at the Mississippi Academy of Sciences Geology and Geography Division's Annual Meeting in Hattiesburg. Curation of the specimen is being performed by the MMNS.

Mississippi Geology Talk at the Mississippi Archaeological Association Meeting

James Starnes presented a two-hour lecture in February on the geology of Mississippi and how it relates to our state's rich archaeological resources and its preservation.

Filming of MPB's *Mississippi Roads* Television Episode

James Starnes and Tyler Berry of the Office of Geology's Surface Geology Division joined paleontologists from MMNS and the University of Southern Mississippi in July to film a MPB television special on a twenty-seven mile geological journey down the Chickasawhay River.

Online Outreach

Staff of the Office of Geology's Surface Geology and Environmental Geology Divisions daily respond to questions, identify rocks and fossils, and share maps and literature to citizens across the state through social media such as Facebook, Twitter, and Instagram.

Universities Outreach

Office of Geology's James Starnes, Paul Parrish, and Andrew Newcomb lead a fossil collecting trip for paleontology students from the University of Southern Mississippi.

Starnes and Paleontology staff at the MMNS collected rare Lower Oligocene age paleobotanical specimens from the Forest Hill Formation in Smith County for scientific study by University of South Alabama paleontologists before the site was inundated with water and lost.

James Starnes and Tyler Berry led a paleontological collecting trip for Millsaps College geology students and professors at the construction site of the Brandon Amphitheater in May where fossil-rich Lower Oligocene age limestone of the Vicksburg group were being exposed by site preparation.

F. Waste Division Outreach Efforts

The Waste Division's Waste and Recycling Programs conducted a variety of outreach efforts throughout 2017 on various aspects of proper solid waste management and waste reduction and recycling. These outreach efforts included:

- Waste Division staff participated in the EPA Region 4 Solid Waste and Recycling State Manager's meeting in Chattanooga focusing on various regional and national issues related to solid waste management. This meeting, while not an actual outreach event, is a key meeting for ideas and information from other states and EPA, and uses the

information to help in the development of outreach goals.

- Waste Division staff participated with the Southeast Recycling Development Council's annual Board retreat in January to plan the work of the organization to promote recycling throughout the southeast region.

- MDEQ joined the Mississippi Recycling Coalition (MRC) and Keep Mississippi Beautiful for a Recycling Awareness Day and Litter Prevention Day to the state's elected leadership at the State Capitol. MRC recognized the "Recyclers of the Year" in categories for local governments, educational institutions, business and industry, non-profits, and state and federal agencies.

- Staff conducted presentations to the fifth grade participants of the Neshoba County Soil and Water Conservation District "Conservation Carnival" in Philadelphia on the benefits of composting and recycling organic wastes.

- MDEQ's Waste Division was presented with Second Place in the State Government category for the agency's Regional Recycling Cooperative Program at the Keep Mississippi Beautiful Annual Awards Luncheon held in Jackson and also was recognized for its ongoing partnership with KMB.

- MDEQ staff participated in and supported the Keep the Reservoir Beautiful Recycling Fashion Show where participants modeled outfits made from recycled materials.

- The Recycling Program staff in the Waste Division participated in the Earth Day Fair at the University of Southern Mississippi to promote the benefits of recycling and composting.

- Waste Division staff assisted in hosting the state Solid Waste Association of North America (SWANA) Spring Conference in Biloxi in May. MDEQ conducted presentations on updated solid waste and recycling regulatory and assistance programs and addressed the conference with an update on electronics waste management issues.

- MDEQ staff participated in the Keep Mississippi Beautiful Great American Clean-Up kick-off event in Flora in May.

- Waste Division staff addressed the SONREEL Spring Meeting of the State's Oil and Gas attorneys in May to discuss MDEQ's regulatory responsibilities governing the management of Oil and Gas Wastes in partnership with the Mississippi State Oil and Gas Board's responsibilities.

- Waste Division staff participated in the "Breakfast with the Regulators" event sponsored by the State Air and Waste Management Association Chapter. The event included presentations on the re-organizational efforts of the Office of Pollution Control, as well as

a regulatory briefing and a question and answer session with industry attendees.

- Staff from the Policy and Planning Branch participated in the Madison County Soil and Water Conservation District's Conservation Day and the Great Delta Bear Affair in September providing presentations and exhibits to help educate students on the importance of recycling in their community.

- Waste Division Staff addressed the Southeast Regional Conference of the Air and Waste Management Association in Nashville in July providing an update on the agency's reorganization of the solid and hazardous waste programs as well as a regulatory update on various state waste management issues.

- Waste Tire Program staff spoke to the Mississippi Code Enforcement Officers Association in October focused on the management of scrap tires at business locations in the state in September.

- MDEQ Waste Division staff assisted in planning and sponsoring the Mississippi Recycling Coalition's (MRC) State Recycling Conference held at Holmes Community College in Ridgeland in October 2017. The conference included sessions on initiatives being conducted in the state, region, and nation to support recycling; better options for recycling infrastructure allowing for more efficient and cost effective collection and transportation of materials, the importance of measuring recycling rates, and how MDEQ is working to incorporate measurement in Mississippi. In addition, the MRC celebrated the organization's 20-year anniversary at the conference.

- MDEQ Recycling program staff hosted a meeting with The Recycling Partnership and Jackson metropolitan area local government recycling program and public works coordinators to discuss opportunities to increase recycling efforts in the metro area and opportunities to work cooperatively.

- Solid Waste staff also helped to sponsor the State SWANA Fall Conference in Natchez in October. This conference provides required Continuing Education Units for landfill and rubbish site operators to meet their re-certification requirements.

- Waste Division staff attended the Joint Hazardous Waste & Materials Management Training Conference hosted by the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) in Oklahoma City. This national solid waste organization conference addressed issues relevant to both hazardous waste and materials management programs.

- Solid Waste staff conducted Rubbish Site Operator Training Classes in April and November. This training provides an opportunity for new operators to receive certification and current operators to receive Continuing Education Units to meet recertification requirements.

- Waste Division staff helped sponsor and staff e-waste collection events with the Greater Jackson Chamber Partnership, Keep Mississippi Beautiful, Keep Jackson Beautiful, Magnolia Data Solutions and others. Staff participated in each event held in April and November at the Mississippi Farmer's Market in Jackson.

- MDEQ Recycling program staff participated in the "Everyday Tech" program on Mississippi Public Broadcasting (MPB) Radio to promote recycling and the fall E-Waste Collection event.

In addition to these efforts, MDEQ also partners with various organizations to provide outreach and education on a variety of solid waste management issues. Some of these outreach efforts are through grants to local governments who conduct outreach with local schools, community groups, and residents. Throughout the year, MDEQ's solid waste programs also 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 Mississippi Municipal League, the Mississippi Manufacturers Association, Keep Mississippi Beautiful, Mississippi State University Extension Service, the Jackson Metro Chamber Partnership, the Southeast Recycling Development Council, and various other state and local organizations and agencies.

G. Nonpoint Source Education and Outreach

The Nonpoint Source (NPS) Educational Program increases public awareness of NPS pollution and encourages behavior changes that will reduce NPS pollution impacts.

The outreach efforts for the program include:

Environmental Teacher Workshops

Teacher workshops are a major environmental education component of MDEQ's NPS education program each year. During Fiscal Year 2017, 42 teacher workshops were held in all regions of Mississippi with approximately 800 educators participating. The teacher workshops included interactive classroom activities and field trips instructing the classroom teachers and environmental educators. About half of this work was carried out through the *Project Learning Tree (PLT)* curriculum with the help of a program coordinator and facilitators. PLT work included 25 workshops for 456 educators with most of the workshops being held at Mississippi universities and community colleges. Other workshops were held at various venues in counties throughout the state. These workshops included sessions on water quality, NPS pollution prevention, green

infrastructure, low-impact development, water chemistry, macro-invertebrates, and hands-on, water-related activities.

Train-the-Trainer and Teacher Training Workshops

Eight educator workshops that included new teaching modules were held for 242 educators statewide in Fiscal Year 2017. Six of these workshops were held for teachers in each of the coastal counties and the three counties to their north (Jackson, Harrison, Hancock, Stone, George, and Pearl River counties). In addition, workshops were held at William Carey University in Hattiesburg and at the statewide Mississippi Environmental Education Alliance workshop in Jackson. These teaching modules included interactive environmental lesson plans for teachers and students and consisted of written lesson plans, a video on how to conduct the lessons, as well as supplies and equipment to carry out the lessons. Project coordinators presented the teaching-modules to decision makers, county Soil and Water Conservation District Clerks, Earth Team volunteers, and others so they could use the teaching materials with their constituents for classroom presentations, in-service teacher training, and conservation field days.

Adopt-A-Stream

Adopt-A-Stream is an environmental education training program for adults and students that focuses on aquatic ecosystems and the effects of NPS pollution on water quality. During Fiscal Year 2017, the program trained at 97 different venues and reached 9,600 people with water quality and NPS information, hands-on activities, workshops, and events. One two-day workshop and nine one-day workshops were conducted. A total of 185 adults were taught water-quality subjects. The coordinator for Adopt-A-Stream, through a sub-grant with the Mississippi Wildlife Federation (MWF), provided other water-quality training in Fiscal Year 2017. This training included: 1) educating citizens about water-quality issues and solutions in their own local watersheds; 2) conducting Envirothon team training on aquatic subjects in 28 high schools; 3) presenting 12 aquatic-ecology programs in classrooms; 4) leading three stream clean-ups and eight storm drain marking projects; and, 5) reaching over 9,000 people through large-venue events, teacher-workshop training sessions, summer environmental camps, and setting up displays at conferences and similar events.

Envirothon Competition

The Envirothon High School Competition tests students' knowledge about water, soils, forestry, wildlife, and current environmental issues each year. The focus in 2016 was "Invasive Species." The competition measures success by oral presentations made to a panel of judges where each team applies their knowledge and field experiences to a real-life environmental problem as well as by written and field tests. The Mississippi competition is sponsored by MDEQ's NPS Program and the Mississippi Association of Conservation Districts and is coordinated by the Mississippi Soil and Water Conservation Commission. In Fiscal Year 2016, 265 high-school students (53 teams) and their advisors participated in four area competitions. A total of about 100 students (20 teams) participated at the state competition which was held at Roosevelt State Park on May 6, 2016. The Oxford High School Envirothon Team won the state's competition and traveled to Peterborough, Ontario, Canada to compete in the National Conservation Foundation Envirothon.

Make-A-Splash

Make-A-Splash**,** a water education event, is held each September at the Mississippi Museum of Natural Science in Jackson where students visit up to 14 water-related interactive booths and guided museum exhibits to learn about polluted runoff, wildlife, water use, groundwater, surface water, and macro-invertebrates.

Student Environmental Day Camps

In 2016, the NPS program sponsored five one-week summer camp sessions at the University of Mississippi Demonstration Technology Transfer Building where 84 students were trained. These camps train students on environmental topics such as water quality, land use, forestry, wildlife, and NPS pollution.

Enviroscape and Groundwater Models

The Enviroscape and Groundwater Models continue to enhance NPS educational activities and are widely used by organizations all over the state due to their widespread distribution by MDEQ. Hundreds of presentations are made each year by various environmental organizations, natural-resource agencies, and non-profit organizations that use these models at conservation carnivals, schools, civic clubs, workshops, summer camps, and Earth Day events.

Storm Drain Marking

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

Field Days

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

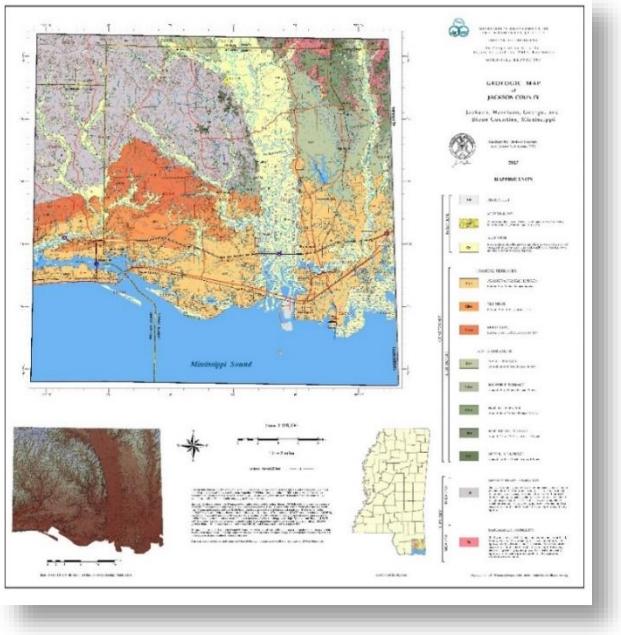
H. Geological Data Collection Activities

Geologic Mapping

Geologic maps of Mississippi created by Office of Geology staff are fundamental to characterizing the environment and have applications in water resources, pollution prevention, mineral resources, and protecting property from geologic hazards such as landslides, swelling clays, and floods.

The geologic mapping program for Fiscal Year 2017 was funded in part by a USGS State Geologic Survey Mapping (STATEMAP) grant of $61,327 in 2016. The primary objective of the STATEMAP component is to establish the geologic framework of areas that are vital to the welfare of individual states. Each State Geologist determines the state's mapping priorities in consultation with a State Mapping Advisory Committee. These priorities are based on state requirements for geologic map information in areas of multiple-issue needs or compelling single-issue needs and in areas where mapping is required to solve critical earth science problems.

Deliverables for the STATEMAP grant include the Pascagoula North, Three Rivers, and Harleston 7.5-minute quadrangles in southeastern Mississippi published in color at a scale of 1:24,000. A "quadrangle" refers to a USGS 7.5-minute quadrangle map, which are typically named after a local physiographic feature. Geologic units mapped and correlated in the subsurface on the maps associated cross sections, include the Miocene age Pascagoula Formation, the Pliocene-age Graham Ferry Formation, Pleistocene-age coastal terraces, and Holocene age alluvium.

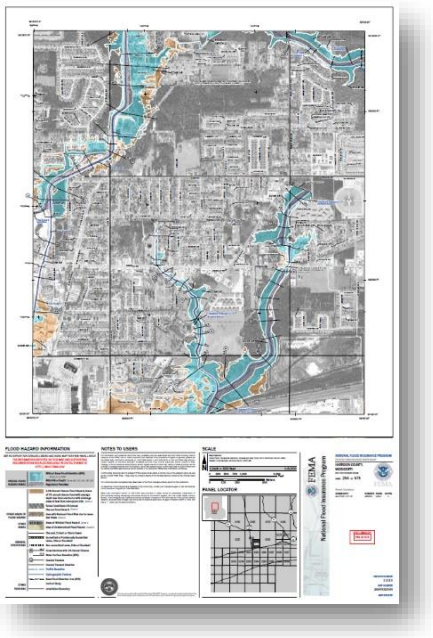


A composite geologic map of Jackson County including portions of George, Stone, and Harrison counties was published in 2017, compiling the last three years of STATEMAP grant work in Southeast Mississippi, in cooperation with MDEQ's Office of Land and Water Resources.

Flood Mapping

The mission of the Geospatial Resources Division is focused on remote sensing and geographic information systems activities for the State of Mississippi. The division manages the Mississippi Flood Map Modernization Initiative (MFMMI) and the Mississippi Risk Mapping, Assessment and Planning (Risk MAP) Program.

The Federal Emergency Management Agency (FEMA) began its new Risk MAP program in 2010. The Risk Map program develops and updates digital flood insurance rate maps (DFIRMs) for the 82 counties under funding by FEMA. The program has shifted to Hydrologic Unit Code 8 (HUC_8) sub-basin flood studies, while adding flood risk assessment, flood hazard mitigation, and planning activities and products. As of mid-2017, there are ten HUC_8 Risk MAP projects and one LAMP (Levee Analysis and Mapping Procedure) project on the Tennessee-Tombigbee Waterway in northeastern Mississippi. Preliminary mapping for Monroe and Itawamba Counties were released to the local communities in December of 2016 and are expected to become effective in early 2018. This project is one of 25 pilot LAMP projects for mapping de-accredited levee systems chosen by FEMA from across the nation.



A website for the MFMMI is available for the public and local government officials to learn the status of each county's DFIRM mapping project. In addition, 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.

Subsurface Geological and Geophysical Data

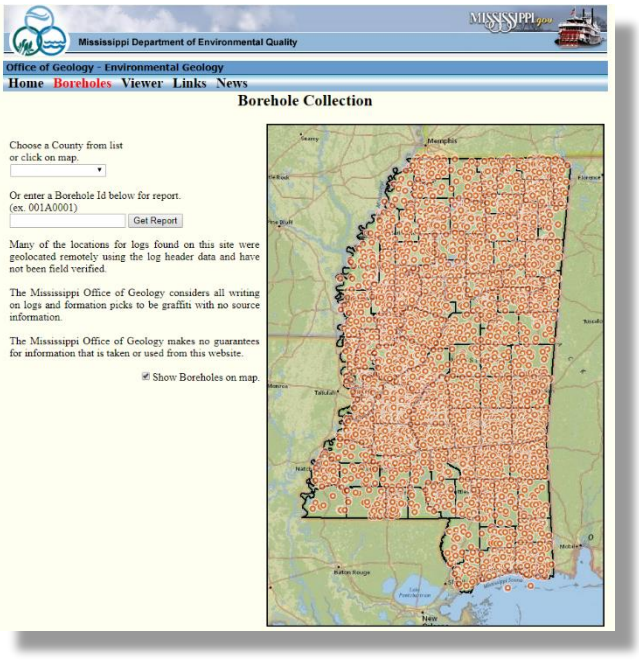
The Office of Geology gathers, studies, and archives subsurface geological and geophysical data for ongoing projects and other studies within MDEQ. Focused research is being performed with regard to groundwater and other environmental issues. The Office of Geology also provides support to other state agencies and academia. Geologists respond to requests for information on stratigraphy, groundwater availability, depth of wells, and potential yield of wells from water well contractors, engineering firms, consultants, and private individuals.

Central U.S. Earthquake Consortium

Staff from the Office of Geology continue to be involved in the Central U.S. Earthquake Consortium, which is comprised of eight states working on disaster planning concerning the New Madrid Earthquake Zone. Northwestern Mississippi is at risk of significant damage to roads, bridges, utility systems, power grids, and other infrastructure along this active fault zone. Geologists are in contact with and involved in meetings regarding future projects and studies over the next few years.

Environmental Geology

Since the 1950s, the Office of Geology has been collecting subsurface geological information by sending scientific instruments down test holes and water wells to record data on the rocks and groundwater (i.e. wireline logging). In Fiscal Year 2017, geologists from the Environmental Geology Division have wireline logged a total of 51 test holes and water wells in 26 Mississippi counties (total footage logged of 23,089 feet). Thirteen water well contractors, two state agencies, one water management district, and one federal agency have taken advantage of this essential program. The shallowest test hole wireline logged (total depth of 98 feet below ground surface) was drilled in coordination with the Office of Geology's Surface Geology Division for mapping activities through their USGS STATEMAP grant. The deepest test hole wireline logged was drilled to a total depth of 1,433 feet for Pickering Engineering. Private wells comprised almost half of those wire line logged, followed by wells for industrial and commercial entities. The log files produced by these wireline logging activities are an essential data reference for investigations of geology, water resources, potential for contamination, and mineral resources.



The new Environmental Geology Division webpage debuted in July 2017. The webpage highlights the division's resources and provides contact information for all of the operations of the Environmental Geology Division. The most beneficial feature of the page is the portion dedicated to boreholes. There is a web tool and a viewer that allow staff, industry, researchers, and the public to access the historic collection of geophysical logs. Currently, over 10,000 logs are available online by picking borehole locations off the map tool. E-logs, driller's logs, chemical tests, and other beneficial subsurface data are available in this feature. It has long been a desire of the Environmental Geology Division for this information to be readily available. The new website has been well received by scientists in industry, researchers, and other agency staff, garnering over 7,000 page views from July 6, 2017-September 6, 2017.

This year, the Environmental Geology Division's drilling program assisted two MDEQ offices, a federal agency, and a local water management district in attaining subsurface geological and hydrological data. Ten test holes were drilled by the Division's drilling crew in support of

mapping activities for Surface Geology Division's USGS STATEMAP grant in Jackson, George, Stone counties. The 10 test holes were drilled to a cumulative depth of 3,020 feet and were all logged by the Division's wireline logging program. The drilling program also drilled and installed a 100-foot monitoring well in Bolivar County to aid the Office of Land and Water Resources' and the Yazoo Joint Water Management District's investigations into Mississippi Delta water resources.

The Environmental Geology Division's analysts pulled, shipped and refiled samples for 18 geoscientists during Fiscal Year 2017. These visitors to the Core and Sample Library included one out-of-state and three in-state universities, as well as, members of the oil and gas industry. These researchers looked at approximately 256 boxes of cores and cuttings that comprised of 66 different boreholes totaling 68,565 of samples. Staff for the Division re-boxed 575 boxes of cores samples, received and archived 245 boxes of new core samples, and received and archived 251 boxes of samples and cuttings. In addition, sample splits were provided to researchers amounting to approximately 5,630 feet.

Mississippi Digital Earth Model

MDEQ is involved with the Mississippi Coordinating Council for Remote Sensing and Geographic Information Systems (Council) that sets policies and standards that promote the sharing of information, as well as facilitate the cost-sharing potential. The Council is also charged with oversight of the development of the Mississippi Digital Earth Model (MDEM).

The Office of Geology is responsible for MDEM's development, and the Geospatial Resources Division handles the assignment. MDEM consists of developing digital geographic information that will serve as the state base map. MDEM consists of eight layers of digital information that will be available online: (1) geodetic control, (2) elevation and bathymetry, (3) orthoimagery, (4) hydrography, (5) transportation, (6) government boundaries, (7) cadastral, and (8) the Gazetteer. MDEQ is responsible for the management and monitoring of MDEM data development contracts and the Quality Assurance of the MDEM mapping products that result from this work. Products from this work may be used by state and local governments, engineering firms, and construction companies involved in planning, development, construction, or regulatory work throughout the state. During Fiscal Year 2017, MDEQ continued monitoring and managing contractors completing work on MDEM data sets. These data included hydrography, elevation / topography LiDAR data, and high-resolution orthoimagery covering different areas of the state. In Fiscal 2017, the Geospatial Resources Division took delivery of new high-resolution

orthoimagery for 19 counties and approximately 7,151 square miles of new LiDAR elevation data covering all or portions of 22 different counties. All data developed are of MDEM quality and will be made available for distribution through the Mississippi Geospatial Clearinghouse website. (Figure above: Bare-earth hill-shade surface LiDAR image of Liberty Fuels Mine and Kemper County Energy Facility)

Publications

Twenty-four geologic papers and books were published by MDEQ's Office of Geology staff in Fiscal Year 2017. These include six articles in *Environmental News*, nine articles in the *Mississippi Geological Society Bulletin*, three abstracts in the *Journal of the Mississippi Academy of Sciences*, a paper in the *Alabama Museum of Natural History Bulletin*, a paper in the *Society of Vertebrate Paleontology* 76th Annual Meeting—Program and Abstract, a paper in the Mississippi Gem and Mineral Society's newsletter *Rocky Echoes*, and three geologic quadrangle maps as Open-File Reports OF 279-281.

Charitable Giving

$18,524

Prostate Cancer Foundation
Curing Together.

$9,396

MAKING STRIDES Against Breast Cancer
American Cancer Society

$4,400

THE SALVATION ARMY
Angel Tree

45 Angels Received Gifts

AMERICAN LUNG ASSOCIATION
2017 FIGHT FOR AIR CLIMB

$2,868

United Way

$1,860

XII. Commission on Environmental Quality

The Commission on Environmental Quality is comprised of seven members appointed by the Governor for each of the "old" five congressional districts and two "at-large" districts. The appointments are made with the advice and consent of the Mississippi State Senate. The commissioners serve seven-year staggered terms. The Commission meets on the fourth Thursday of each month.

Chair: Jack Winstead (Third District)
Vice Chair: John Dane III (Fifth District)
R. B. (Dick) Flowers (First District)
Brenda Lathan (Second District)
Jamie P. Martin (Fourth District)
Chat Phillips (At-Large)
W. J. (Billy) Van Devender (At-Large)

XIII. Mississippi Environmental Quality Permit Board

The Mississippi Environmental Quality Permit Board takes action on permits administered through MDEQ. Seven members serve by virtue of the state office they hold. Two additional members are appointed by the Governor for a term concurrent with the term of the Governor. These two members must be a retired professional engineer and a retired water well contractor, and they may only vote on matters related to water supply/withdrawal permits. The Permit Board meets the second Tuesday of every month.

Chair: Dennis Riecke (Mississippi Department of Wildlife, Fisheries, & Parks)
Vice Chair: James Hoffmann (MDEQ Office of Land and Water Resources)

David Dockery (MDEQ Office of Geology)

Howard Leach (Mississippi State Oil and Gas Board)

Chris McDonald (Mississippi Department of Agriculture and Commerce)

Leslie Royals (Mississippi State Department of Health)

Jennifer Wittmann (Mississippi Department of Marine Resources)