Mississippi's Nonpoint Source Management Program

Chickasawhay River
David Watts
Mississippi Department of
Wildlife, Fisheries and Parks

2006 Annual Report

MISSISSIPPI DEPARTMENT OF
ENVIRONMENTAL QUALITY

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Mississippi's 2006 Nonpoint Source Program Annual Report

South Independent Streams Basin
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Executive Summary

Nonpoint Source (NPS) Pollution, also known as polluted runoff, has an adverse impact on the state's water resources. Unlike pollutants from point sources that enter the environment from well-defined discharge points, pollutants from nonpoint sources find their way to surface and ground waters via rainwater runoff or percolation. The polluted runoff can contain sediment, nutrients, bacteria, or toxic materials. Runoff from the following seven major land use categories potentially impacts the State's water bodies: agriculture, forestry, mining, construction activities, urban runoff, hydrologic modifications, and land disposal activities. Polluted runoff is a significant cause of water quality problems in Mississippi. The NPS Pollution Control Program seeks to reduce or eliminate polluted runoff that degrades water bodies in Mississippi.

The state's NPS Management Plan incorporates a strategy for the management and abatement of NPS pollution and relies on statewide and targeted watershed approaches. These approaches are implemented through both regulatory and non-regulatory programs on the federal, state, and local levels. Some of the activities regulated by the State include: construction, stormwater, mining, and hydrologic modifications. The strategy for the management of these activities is to continue to develop and implement educational programs and to continue to issue permits and maintain compliance and enforcement activities. The implementation of program activities for land use categories that are not regulated will rely primarily on the voluntary cooperation of stakeholders and will be supported financially through federal assistance programs such as Section 319 and other state resources. The strategy for addressing NPS pollution on a statewide level includes education/outreach, assessment and monitoring, Best Management Practices (BMPs) demonstrations, BMP compliance, technology transfer, consensus building, and partnering.

The NPS Management Program also implements a strategy that targets priority watersheds. Prioritization of these watersheds is done by multi-agency teams in the Basin Management Approach (BMA). Within priority watersheds, activities will be implemented to address parameters of concern that appear on the State's 303(d) list. The state's NPS Program also incorporates the Coastal NPS Program strategy, the Basinwide Approach strategy, and the State's strategy for the development and implementation of NPS Total Maximum Daily Loads (TMDLs).

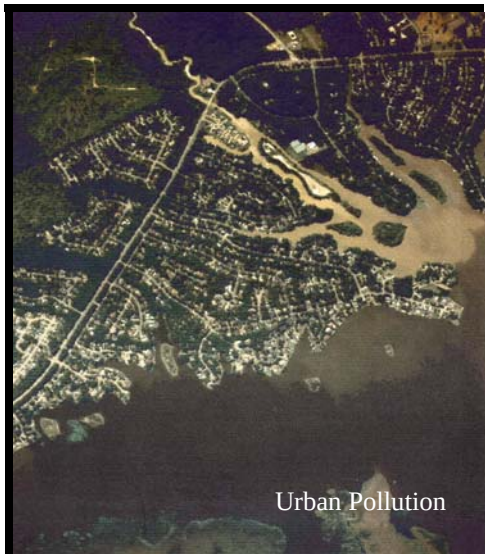
The NPS Program continues to be implemented in cooperation with several agencies, organizations, and groups at all levels of government and in the private sector. A great focus is given to activities that promote consensus building and partnering to increase the overall effectiveness of the State's NPS Program. The program strategy will be implemented to meet the long-term goals of the program. The long-term goals will, in turn, be achieved by implementing five-year action plans. These plans will be modified as more data and new issues are identified under the BMA.

This report relates several accomplishments during calendar year 2006 that directly relate to and support the long-term and short-term action strategies identified in the State's NPS Management Program. Recently, MDEQ entered into an agreement with the United States Geological Service (USGS) to provide assessment/monitoring support to priority watersheds. The USGS, along with a number of watershed teams, will coordinate the development and implementation of monitoring plans to document water quality improvements. Other major accomplishments include: the development of 151 TMDLs; the continuing effort to develop nutrient, water quality criteria standards; and the continued success of the musical puppet play called "Watershed Harmony" that shows grade-school students the importance of controlling NPS pollution. Other important accomplishments include the further development of the

Mississippi Watershed Characterization and Ranking Tool (MWCRT). This tool can be used to assess the environmental parameters within the river basins of Mississippi. Eighty-three BMPs were installed and demonstrated in the Old Fort Bayou/Tuxachanie Creek demonstration project resulting in an estimated 7,635 tons of soil saved per year. Within weeks of the development of the Bee Lake Watershed Implementation plan, engineers began survey and design of structures to address erosion, sedimentation, lake level, and organic enrichment. The Mississippi Soil & Water Conservation Commission (MSWCC) has submitted a watershed implementation plan for the Hickahala Creek Watershed Restoration Project and has already completed the installation of twenty-three grade stabilization structures, four sediment control ponds, and one stream crossing. The Nature Conservancy was awarded a Section 319 grant to prepare a conservation plan for the Buttahatchee River and to build a watershed alliance, which includes the state of Alabama, to restore and protect the river. Since March, 2006, several landowners in the Fannegusha Creek area have agreed to implement BMPs and, more than 225 acres have been involved in nutrient management practices, over 200 acres of pasture and hay land have been planted, areas of permanent vegetation and grassed waterways have been established, and more than 110,000 feet of terraces have been built. The Mill Creek watershed restoration project's intent is to place sedimentation\detention basins throughout the watershed at strategic locations and includes monitoring at various locations along the creek to measure the success of the project. Finally, four watershed restoration projects were recently funded in the Pascagoula River and Yazoo River Basins. In the Pascagoula River Basin, the Oakahay Creek, Red Creek, and Chunky River/Okatibbee Creek restoration projects were funded. In the Yazoo River Basin, the Steele Bayou Water Quality Improvement Project was also funded.

What is Nonpoint Source Pollution?

Nonpoint source (NPS) pollution, also known as polluted runoff, has an adverse impact on the State's water resources (see www.epa.gov/owow/nps/whatis.html). Unlike pollutants from point sources that enter the environment from well-defined discharge points, pollutants from nonpoint sources find their way to surface and ground waters via rainwater runoff or percolation. The polluted runoff can contain sediment, nutrients, bacteria, or toxic materials. This runoff comes from seven major land use categories and can potentially impact the State's water bodies. These seven categories are: agriculture, forestry, mining, construction activities, urban runoff, hydrologic modifications, and land disposal activities. Polluted runoff is a significant cause of water quality problems in Mississippi. The Nonpoint Source Pollution Control Program seeks to reduce or eliminate polluted runoff that degrades water bodies in Mississippi.


Urban Pollution

Mississippians enjoy a rich heritage of natural resources. From headwater streams to the Gulf of Mexico, Mississippi's land has been blessed. The charge given to the Mississippi Department of Environmental Quality (MDEQ) is to conserve the environment while allowing economic development in concert with good environmental practices.

The Mission of the NPS Pollution Control Program in Mississippi is to conserve and improve state waters for man's use and the sustainment and propagation of wildlife and aquatic life, through focused research, responsible regulation, widespread education, and cooperation with other agencies and the public."


Forestry Pollution


Agricultural Pollution

History of NPS Program

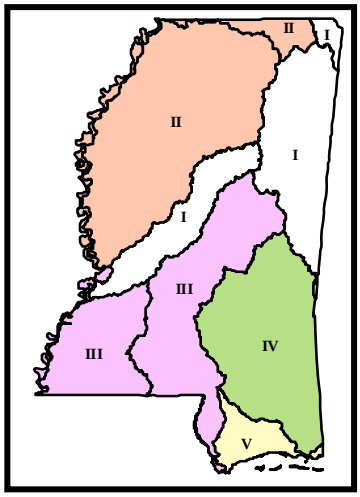
First Ten Years…

The 1987 Amendments to the Clean Water Act (CWA) established a national policy that programs be developed to control nonpoint sources of pollution. Congress inserted Section 319 in order to establish a national program to address nonpoint source pollution. It authorized the EPA to issue grants to states and, in order for the states to receive these grants, required the states to assess NPS pollution problems and causes within the state, and to implement a management program to control NPS pollution. Every few years the states must document their efforts and results in assessing pollution problems and implementing their management programs. A NPS assessment document and a management plan was developed and approved by the Environmental Protection Agency and Mississippi's NPS Management Program began in August, 1989. To date, MDEQ has successfully secured 17 annual grants (totaling approximately $45 million dollars) from the EPA to run its NPS program and implement 138 NPS pollution control projects.

The NPS Program was originally established to provide education and outreach, demonstrate the effectiveness of Best Management Practices (BMPs), investigate the ability of new practices and technologies to reduce NPS pollution, and to assess NPS sources and impacts to waters of the state. In 1999, the NPS Program began to change its focus as the Total Maximum Daily Load (TMDL) issue gained national attention. Questions were raised at both the state and the federal level as to how to address any NPS pollution reductions that might be required in a TMDL. MDEQ answered the question by developing the BMA.

Moving into the future…

Mississippi's BMA is a process that promotes coordination and collaboration among state and federal agencies and local stakeholders to restore and protect the quality of the state's water resources. The process focuses on the creation of opportunities where state and federal organizations can work together with local stakeholders to target their resources to address water quality concerns in priority watersheds.



Core activities in this process include: identifying water quality concerns; monitoring, assessing, and prioritizing these concerns; and then planning and implementing effective management strategies that address the water quality priorities. The approach facilitates comprehensive water quality planning while fostering environmentally-sound economic development.

Within MDEQ, the NPS Management Program has shifted its emphasis from the funding of individual demonstration projects to the support of collaborative watershed restoration and protection efforts. These efforts are described in Watershed Implementation Plans (WIPs) developed in collaboration with local watershed teams through the BMA. Additionally, the NPS Management Program provides technical, educational, and funding support on a statewide basis. During 2004, MDEQ organized the NPS Program and the Basin Management Approach process into a single organizational unit, MDEQ's Watershed Management Branch. Subsequently basins teams were organized to address five river basins within the State.

The Group 1 Basin Team (Big Black-Tombigbee-Tennessee Rivers) selected 15 priority watersheds for restoration/protection or further study efforts in 2006. In the Tennessee River Basin, portions of the Pickwick Lake Watershed (Yellow Creek Embayment and Bear Creek) were identified for restoration/protection activities. In the Tombigbee River Basin, the watersheds selected for restoration/protection included Town Creek, Mill/Bull Mountain Creeks, and Donivan Creek. In the Big Black River Basin, the Lindsey/Bakers Creek and Fourteen Mile watersheds are slated for restoration/protection efforts. Ten other watersheds were identified for further study and monitoring because of insufficient monitoring data. In the Big Black Basin this included the Straight Fence Creek watershed. In the Tennessee Basin: Mud Branch/Bear Creek and Sandy Creek/Yellow Creek watersheds were included. In the Tombigbee Basin, the following watersheds were identified as requiring additional monitoring: Edmond Branch/Sucamochie River, Talking Warrior/Chinchahoma, Talking Warrior Creek, Carmichael Creek/Town Creek, Yonaba Creek/Town Creek, Queen Lake/Tombigbee River, and Mud Creek/Tombigbee River. In areas slated for restoration/protection activities, Watershed Implementation Teams (WITs) will be developing WIPs that will address management strategies and educational activities over the next three years.

The Group 2 Basin Team selected 15 priority watersheds in which to focus restoration efforts. These watersheds include: Bee Lake, Bear Creek, Hickahala and Senatobia Creeks, Tchula Lake–Abiaca Creek, Deer Creek, Coldwater River, Quiver River, Indian Bayou, Moon Lake, Lake Washington, Dump Lake, Pinchback Lake, Big Sunflower River, and Steele Bayou. NPS grants were awarded for restoration activities in the Bee Lake, Bear Creek, Hickahala and Senatobia Creeks, and Tchula Lake–Abiaca Creek watersheds. Watershed Implementation Teams are being formed in a number of the priority watersheds, and WIP development is underway. Beginning in January, 2007, Group 2 Basin Team will review selected priority watersheds identified in the first five-year cycle, and consider new watersheds of interest for the second five-year cycle.

The Group 3 Basin Team selected eight priority watersheds to be targeted for implementation activities. These watersheds include: Fannegusha Creek, Mill Creek, Pelahatchie Creek, Barnett Reservoir, Magee's Creek, Strong River, Mike's River, Homochitto River, and Fifteen Mile Creek. Contracts were let for projects in Fannegusha Creek, Mill Creek, Strong River, and Magee's Creek. All projects are well underway, with WITs meeting to formulate plans, implement BMPs and educate stakeholders.

The Group 4 Basin Team identified nine priority watersheds for restoration. These include: Oakahay Creek, Pascagoula and Escatawpa Rivers, Red Creek, Skiffer Creek, Black Creek, Chunky River, Okatibbee Creek/Lake and Okatoma Creek. Project contracts that have been let by MDEQ include: Oakahay Creek, Chunky River/Okatibbee Creek, Red Creek and Lower Pascagoula watersheds. Watershed implementation Teams are formulating WIPs in these areas.

In Group 5 Basin, the Coastal Streams, Hurricane Katrina dealt a heavy blow. All levels of the coastal infrastructure (economic, environmental, and residential) were affected either by severe damage or total devastation. Although greatly impacted, the water resources of the Coastal Steams Basin can and will be restored to a higher quality, but will require a great deal of effort. Currently, 29 government and stakeholder entities are working together with local communities to develop and implement plans for restoring and protecting the water resources important to the coastal communities.

Several WITs have or are being organized in the Group 5 basin including: Turkey Creek, Tchoutacabouffa/Tuxachanie, and Jourdan River. Over the next several years, these teams will be developing and implementing WIPs that will restore and protect water quality in the basin. This effort is being spearheaded by the Land Trust for the Mississippi Coastal Plain with assistance from EPA, MDEQ, and other water resource organizations.

More information on Mississippi's Basin Management Approach and the NPS Program can be found on MDEQ's website: www.deq.state.ms.us. Information on the long term goals of the NPS Program can be found in the quick-links section of the NPS home page on the MDEQ website (See NPS Related Links).

Highlights of the Year

Assessment & Monitoring/ TMDL Activity

Total Maximum Daily Loads

Total Maximum Daily Loads (TMDLs) are a requirement of the Federal CWA passed in the early 1970's 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 storm water runoff from urban areas or agriculture.

The CWA requires TMDLs for every impaired water body in the state. Every two years, MDEQ creates a list of these impaired waters called the Section 303(d) List of Impaired Waters. EPA approved MDEQ's 2004 Section 303(d) List in May of 2005. The 2006 list was submitted for approval in July of 2006.

A federal consent decree requires EPA to complete the 2,700 TMDLs shown on the 1996 Section 303(d) Impaired Waters List by 2009. MDEQ is taking the lead in addressing these TMDL requirements. MDEQ continues identifying the stressors associated with the biological monitoring effort prior to completing the TMDLs. MDEQ completed 54 stressor indentfication reports in the Big Black and Tombigbee Basins in 2006. MDEQ sampled the biological community in over 1000 streams since 2001 to provide an indicator of long-term, water-body health. By utilizing the biological sampling effort and completion of TMDL reports (151 in FY 2006), MDEQ has addressed approximately 2,200 of the TMDLs on the 1996 list. Less than 500 TMDLs are remaining from the consent decree.

MDEQ has completed the consent decree requirements in several basins, including the Pascagoula River Basin, the North Independent Streams Basin, and the Tennessee River Basin. MDEQ was working on the TMDLs due in the Coastal Streams Basin last year, but due to the disruption caused by Hurricane Katrina, the plaintiff agreed to allow the remaining coastal TMDLs an extra year for development to ensure adequate public involvement in the TMDL process.

Stressor Identification Project

Beginning in 2001, MDEQ conducted statewide biological monitoring using benthic macroinvertebrates as an indicator to develop a regionally-calibrated Index of Biological Integrity (IBI) for wadeable streams. The primary intent of this effort was to develop a credible and scientifically defensible, biological assessment tool for assessing Mississippi's large number of evaluated 303(d) streams and rivers. This IBI, known as the Mississippi Benthic Index of Stream Quality (M-BISQ), was then used to assess the State's wadeable streams and rivers.

As required by §303(d), total maximum daily load (TMDL) development is to be undertaken for applicable pollutants identified through the 303(d) listing process. However, TMDLs cannot be computed on §303(d) listings identified as biological impairment because the actual stressors causing the impairment were not known. The purpose of the Stressor Identification Project was to identify stressors contributing to biological impairment for these Mississippi streams. During this reporting period, 85 stressor identification analyses were completed, including water bodies in the Pascagoula, North Independent/Tennessee Basins and Big Black/Tombigbee River Basins in Mississippi.

The Stressor Identification Project supports activities to identify potential causes and sources of biological impairment as identified through the MDEQ M-BISQ project for impaired water bodies across the state so that appropriate restoration measures may be taken. This project directly supported MDEQ's ability and commitment to develop TMDLs according to strict timelines to meet applicable deadlines. Resulting data will also be used in subsequent §305(b) assessment efforts for reporting causes and sources of impairment Based on the stressor identification analysis, TMDLs will be developed for applicable pollutants with management and implementation strategies recommended for the segment with regard to existing and potential loadings of point and nonpoint pollution.

Nutrient Criteria Development Program

In previous years, water quality monitoring was undertaken by MDEQ to support nutrient criteria development and to identify nitrogen-sensitive, coastal water bodies. During this reporting period, MDEQ began the data analysis phase for these data. Analyses were initiated on water quality monitoring data collected in selected Mississippi coastal and estuary water bodies. Although the major thrust of these analyses is to develop nutrient criteria recommendations, the analyses will serve to identify nitrogen-sensitive, coastal water bodies along the Mississippi Gulf Coast.

Monitoring included the collection of data on total phosphorus (TP) and total nitrogen (TN) as primary causal variables of eutrophication and measures of algal biomass (chlorophyll a) and a measure of water clarity (turbidity) as response variables. Dissolved oxygen data were collected as a primary response variable. The results of these analyses will support the identification of nutrient-sensitive, coastal water bodies and the development and implementation of best management practices for reducing the nutrient contributions from nonpoint sources. This effort supports the EPA initiative to develop nutrient criteria for the Nation's water bodies including nitrogen-sensitive, coastal and estuarine water bodies. Criteria will be developed to support initiatives for better control of nitrogen input to nitrogen-sensitive coastal waters from nonpoint sources. Also, this monitoring supports Mississippi's efforts to comply with the coastal NPS program conditions required by EPA under the Coastal Zone Amendments Reauthorization Act (CZARA).

Mississippi's Beach Monitoring Program

Monitoring under the Beach Monitoring Program is conducted to protect the health of recreational users of the beaches through a systematic water quality sampling and analysis program. Water samples are collected weekly and tested for enterococci bacteria along with several chemical parameters from the beach sites throughout the year. If bacteria levels reach unsafe levels, advisories are placed on the beach to advise against water contact at the beach. The advisories remain until the water quality samples indicate that bacteria levels have returned to the EPA acceptable level.

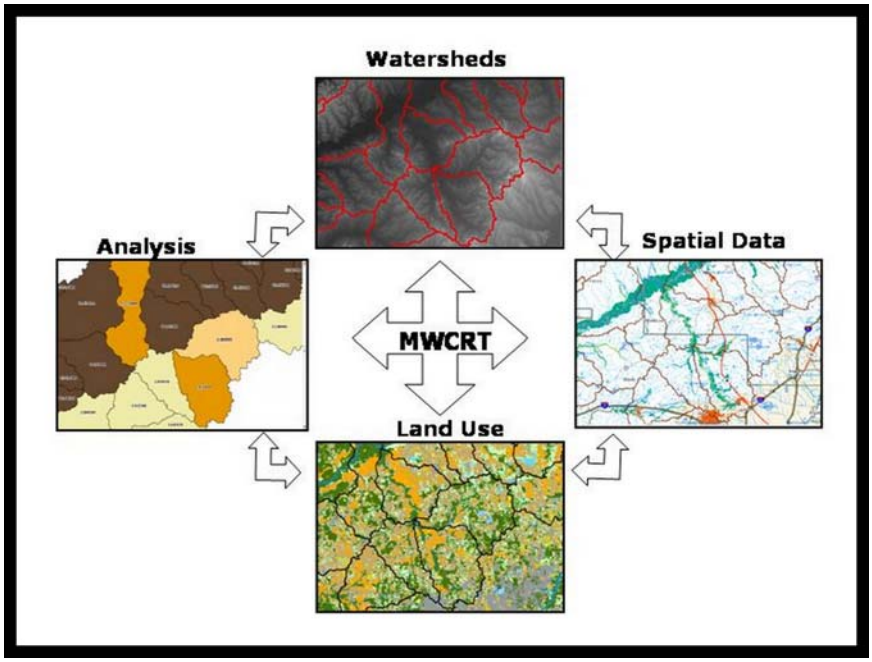
During this reporting period, MDEQ continued monitoring water quality at 22 beach sites along the Mississippi Gulf Coast under Mississippi's Beach Monitoring Program. Current funding is provided by the BEACH Act of 2000. Although beach water quality monitoring continued at the beach sites during this reporting period, water contact was limited as a result of debris left in the waters by Hurricane Katrina. Post Katrina monitoring indicated that bacteria levels rapidly returned to levels that are safe for human water-contact activities. However, the danger to swimmers from debris in the water resulted in the posting of advisories against water contact at most of the Mississippi beaches during this reporting period.

Information on the beach monitoring activities can be found by going to the MDEQ website homepage at www.deq.state.ms.us, then clicking on Environmental Data and then on Beach Monitoring. Also, EPA has linked the Mississippi Beach Monitoring Website to their Beach Watch site. The Beach Monitoring Website contains near real-time data from all the monitoring locations, current beach closure advisories, locations and pictures of all the beach monitoring sites, and maps locating the sampling sites. Also, one can review the history of beach advisories/closures for all beach locations and obtain historical beach monitoring data.

Geographic Information Systems Mapping of NPS Projects

The use of Geographic Information Systems (GIS) continues to be a growing function for the NPS Program. Two major components of GIS are spatial data management using a Geo-database, and the assessment and monitoring of NPS projects. In the past 2 years, GIS has been used to analyze watershed projects on the Basin and watershed scale. GIS has also been used in conjunction with Global Positioning Systems (GPS) technology to maintain a BMP database and to monitor BMP locations throughout the state. Digital cartography represents a large portion of the GIS capabilities. GIS has been supporting NPS programs such as Project Monitoring, BMPs, Coastal Zone, Basin Management, and Educational Outreach.

Watershed characterization remains a major focus of GIS capabilities within the NPS Program. Use of the Mississippi Watershed Characterization and Ranking Tool (MWCRT) has improved the evaluation time for prioritizing watersheds. The MWCRT is a spatially based tool used to characterize the sub-watersheds within the major river basins of the state. This tool uses GIS to assess the environmental parameters within the river basins of Mississippi. The general parameters of the tool are to assess readily available statewide spatial data layers within the sub-basins or 12 digit hydrologic unit codes. The assessments are used to characterize the sub-watershed within each river basin. Each spatial layer is placed into a broad category to determine its resource value on the environment and human welfare and to assess the stressors placed on each sub-watershed. These characterizations are then used to calculate a score for each sub-watershed. The score of each sub-watershed is based on raw, spatial data in the form of points, lines, and polygons. The point, line, and polygonal data are calculated as observations, miles and acres of data. Raw data values are normalized and weighted by relative importance to create the ranking system. Each data layer can then be assessed individually or combined to produce a ranking of each sub-watershed. The MWCRT provides a scientific method that allows managers to identify watersheds of interest, make meaningful decisions, and prioritize watersheds for restoration and protection activities. Since Mississippi has over 1300 individual watersheds, utilizing the MWCRT has assisted MDEQ and its partners in shortening the evaluation time for identifying priority watersheds from 3 years to 1 year.



Mississippi Agrichemical Groundwater Monitoring Program

The Mississippi Agricultural Chemical Groundwater Monitoring Program is an on-going program initiated in March 1989, for the purpose of determining if the use of agricultural chemicals is impacting groundwater quality in Mississippi. During the calendar year 2006, samples have been collected from 66 wells. Included in this total were three private drinking water wells sampled throughout the State and 63 high volume irrigation and fish culture wells located in the highly agriculturalized Mississippi Delta. Nineteen of these high volume wells were re-sampled to determine if water quality had changed during the year. In addition to these well samples, six samples were collected from surface water sources in support of groundwater activities. Analyses of these 91 samples did not detect any agricultural chemicals or other organic compounds exceeding Federal Primary Drinking Water Standards and/or State of Mississippi Groundwater Standards.

In addition to simply monitoring groundwater, the AgChem Program actively participates in other programs involved in protecting groundwater in Mississippi. One of these programs is the Mississippi Pesticide Container Recycle Program. During the calendar year 2006, a total of 14 days have been spent out of the

office in field activities related to this program. Although complete amounts are not yet available, it is estimated that a total of over 725,000 pounds of plastic pesticide containers will be recycled during this calendar year.

Lower Pearl River Partnership

In 2003, MDEQ, The Nature Conservancy (TNC), and the Louisiana Department of Environmental Quality (LDEQ) formed the Lower Pearl River Partnership to address the major stresses to the Pearl River Basin. The goal of this effort is to focus conservation at the community level and work with partners to restore, preserve, and protect ecologically significant areas of the Pearl River and its tributaries. Two major accomplishments were made toward the project's overall goals. These included: 1) reduction in nonpoint source pollution to the Pearl River floodplain and tributaries that affect wildlife habitat and aquatic fauna; and 2) the development of a Conservation Area Plan for the Pearl River watershed via cooperative endeavors with partners and stakeholders from local, state and federal agencies, the academic community, and local conservation groups. The results produced from this project grant will be useful in the development of Total Maximum Daily Loads (TMDLs) for 57 impaired waterbody segments in the Pearl River watershed.

Hurricane Katrina Monitoring Efforts

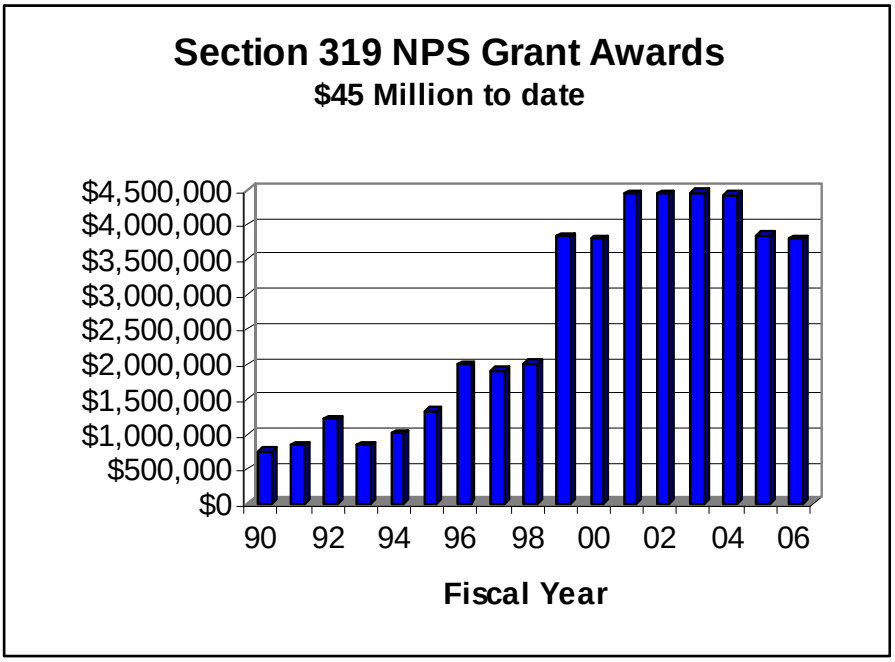
MDEQ Field Services Division, with tremendous support from its state and federal partners, coordinated an aggressive monitoring effort to evaluate Hurricane Katrina's impacts on human health and the environment. Following the storm, there was concern about the bacteria concentrations in coastal waters since many wastewater plants were damaged or without power. The MDEQ partnered with the United States Geological Survey (USGS) and the Gulf Coast Research Laboratory (GCRL) to conduct bacterial sampling in the bays, bayous, and beaches along the Gulf Coast. Sampling of these waters was concluded in June 2006 as the water quality conditions stabilized. The results indicated localized, episodic spikes in bacteria concentrations. Fortunately, widespread severe contamination was not found. The results were used to help identify problems with wastewater infrastructure as part of the ongoing effort to improve water quality on the Gulf Coast.

The USEPA Region 4 Science and Ecosystem Support Division (SESD), in conjunction with MDEQ staff, selected eight facilities along the Coast for sampling soils and sediments. The purpose of the sampling was to monitor for contaminants that may have been released as a result of the storm. The results of this sampling showed no contamination attributable to Hurricane Katrina around these facilities.

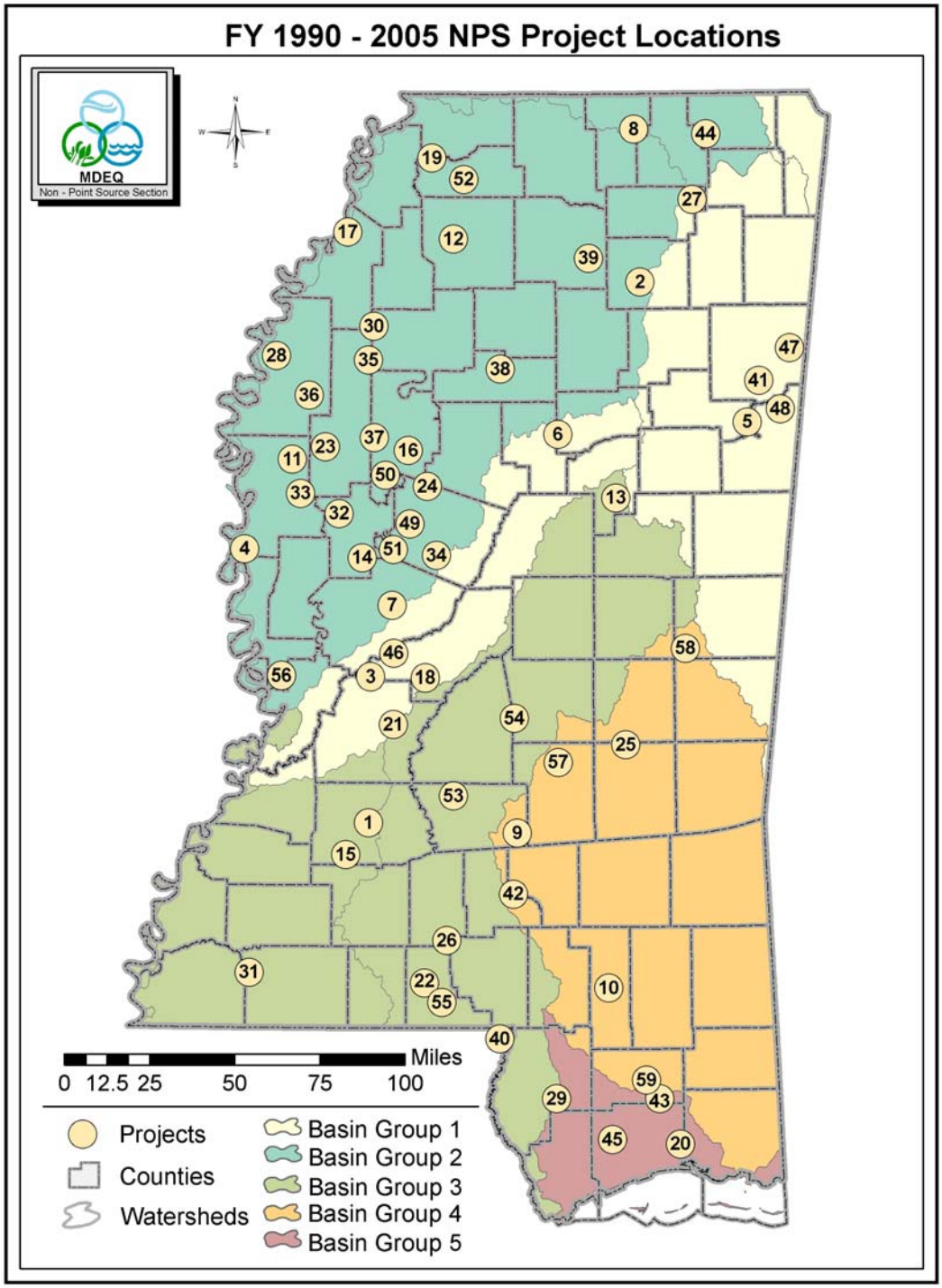
Section 319 Watershed Projects

Before and after shots were taken in August and December of 2006 at one location of the Bee Lake Restoration (Holmes County) Project. A rock lined apron was used to prevent scour and erosion at this location.

Since the inception of the 319 Program in 1990, several different kinds of projects have been funded including: demonstration projects of BMPs in watersheds; agricultural/chemical waste disposal; ways of converting dairy cow wastes into electrical power and preventing possible stream pollution from those wastes; industrial plant demonstration projects that focus on preventing NPS pollution in industrial watersheds; coastal streams basins restoration; a conservation easements program that encourages and assists farmers to place lands into riparian buffer strips or the like. These are just a few examples.



This graph illustrates how the 319 program has grown over the years with a total funding of $45 million to date.



This graphic shows the location of watershed projects in Mississippi since the program's inception. The next page is an index of all the numbered locations shown.

Watershed Projects	Project Name
1	1990 Lake Hazle
2	1990 Swine Production Waste Manangement
3	1992 Bogue Chitto Watershed
4	1992 Lake Washington
5	1993 Luxipalila Watershed
6	1993 NPS Demo Farm
7	1993 NPS Demo Farm
8	1994 Muddy Creek Demo
9	1994 Okatoma Creek Demo
10	1995 Catfish Pond Nutrient Removal
11	1995 Irrigation Return Flow Water Quality Demo
12	1995 McIvor Creek Watershed
13	1995 Surface Water/Groundwater Interaction
14	1995 Wolf lake NPS Demo
15	1996 Copiah-Lincoln Golfcourse BMP Demo
16	Impact of Flooding on Nitrogen Discharge (Roebuck Lake)
17	1996 Moon Lake Demo
18	1996 Urban Resource Conservation Plan, Madison
19	1997 Cane Musscacunna Creeks
20	1997 Land Acquisition
21	1997 Model Stormwater BMP Demo - Lefluer's Bluff
22	1997 Pushepatapa Watershed
23	1998 MSEA (Beasley Lake) Project
24	1998 MSEA (Deep Hollow Lake) Project
25	1998 Souinlovey Creek
26	1998 Ten Mile Creek Demo
27	1998 Ten Mile/Donivan Creek
28	1998 Upper Bogue Phalia Watershed
29	1999 Coastal Streams
30	1999 Delta F.A.R.M. Project
31	1999 East Fork Amite River Watershed
32	1999 MSEA (Thighman Lake) Project
33	2000 Alternative BMPs in Bogue Phalia
34	2000 Big Cypress Creek
35	2000 Bogue Phalia/ Coldwater River Watershed
36	2000 Mound Bayou
37	2000 MSVU Water Quality Demo
38	2000 Riverdale Creek
39	2001 Cane - Duncans Watershed Demo
40	2001 Lower Pearl River Watershed Demo
41	2001 Luxapalila/Yellow Creek Watershed Demo
42	2001 Middle/West Bowie Creek Watershed Demo
43	2001 Old Fort Bayou
44	2001 Tuscumbia River Watershed Demo
45	2001Beauvoir's Oyster Bayou Restoration Project
46	2002 Bogue Chitto Creek Watershed
47	2002 Buttahatchee River Watershed
48	2002 Luxipalila Watershed
49	2003 Abiaca Creek/ Tchula Lake
50	2003 Bear Creek
51	2003 Bee Lake
52	2003 Hickahala Creek
53	2004 Fannegusha Creek Watershed NPS Project
54	2004 Magees Creek Watershed NPS Project
55	2004 Strong River NPS Project
56	2005 Steele Bayou
57	2005 Oakahay Creek
58	2005 Chunky-Okatibbee
59	2005 Red Creek

Highlighted Section 319 Watershed Projects

MDEQ had six active grants in 2006 totaling $25.46 million in federal funds. During 2006, 18 projects/activities totaling $2.58 million were completed with 23 projects/activities still ongoing. Those that are ongoing may take from one to four years to complete. The following is a highlight of some of the completed, ongoing, and recently funded projects.

Old Fort Bayou/Tuxachanie Creek Demonstration Project

This was a project aimed at reducing nonpoint source pollution from agriculture in western and southwestern portions of Jackson County. The drainage area of the Old Fort Bayou/Tuxachanie Creek watershed is comprised of 1% cropland, 10% pastureland, 65% timberland and 24% urban lands. The soils in the watershed are very erosive. Eighty-three BMPs were installed and demonstrated in this project. These practices included: establishment of permanent vegetation, fencing, heavy use area protection, nutrient management, pasture and hay land planting, pond installation, establishment of a stream crossing, streambank and shoreline protection, installation of water and sediment control basins, installation of feeding troughs/tanks, and chiseling. In all, 1,523 acres were treated resulting in reduced loads of pesticides, nutrients, and sediment in adjacent waterways. The reduction of soil erosion is resulting in an estimated 7,635 tons of soil saved per year.

Bee Lake Watershed Restoration Project

The Bee Lake Watershed consists of 12,000 acres of prime farmland in Holmes County. The 1400-acre oxbow is the focal point of the watershed, providing excellent public fishing as well as water supply for agricultural irrigation purposes. Despite the wonderful aesthetics found within and around the lake, many environmental issues lay hidden from the layman's eyes.

In 2005, a Bee Lake Watershed Implementation Team consisting of over 40 professional resource agency staff, landowners, and other stakeholders, convened to develop the Bee Lake Watershed Implementation Plan. After nearly a year of revisions and continued consensus building, the team released the final draft in June of 2006.

The plan identified and prioritized issues including sediment, lake level, noxious aquatic weeds, organic enrichment, future development, fisheries management, and public access for immediate action. Within weeks of the plan's release, engineers began survey and design of structures to address erosion, sedimentation, lake level, and organic enrichment. State fisheries biologists began to develop a new fisheries management plan, a noxious

aquatic weed control plan, and initiated a feasibility study for funding a new boat ramp on the lake. In addition, the landowners began discussing the establishment of a homeowners association around the lake to control future development.

Implementation of structural BMPs to reduce sedimentation and organic enrichment began in September. By the end of November, more than 60 structures had been installed. More than 30 additional structural BMPs will be added in 2007. Vegetative BMPs and weir construction will also begin in early 2007. Other actions planned for 2007 include continued noxious aquatic weed control, boat ramp construction (if feasible), implementation of the educational outreach plan identified in the plan, expansion of water quality monitoring efforts by USGS and MDEQ, and the establishment of new creel and slot limits for fish harvest. It is expected that all concerns identified by the plan will be fully addressed by the end of 2007.

Hickahala Creek Watershed Restoration Project

In January 2005, the MSWCC began working on a sub-grant to improve water quality in the Hickahala and Senatobia Creek Watershed by implementing a comprehensive watershed plan to reduce nonpoint sources of pollution. In May 2005, the first public meeting was held in order to gauge public interest and provide information about the project. Approximately 70 people attended the meeting. In August, the first meeting of the WIT occurred in Senatobia. MSWCC has almost finished the process of formulating the Watershed Plan. It has been submitted to MDEQ for final approval. To date MSWCC has completed the installation of 23 grade stabilization structures, four sediment control ponds, and one stream crossing.

Buttahatchee River Restoration and Protection Project

The Buttahatchee River watershed, shared by Mississippi and Alabama, presented exceptional challenges to protection and restoration efforts. The Buttahatchee River starts in northwest Alabama and flows through northeast Mississippi before emptying into the Tennessee – Tombigbee Waterway. This river is one of the region's most scenic rivers and contains a diversity of freshwater mussel and fish species. However, monitoring by MDEQ in the mid-90's showed a pathogen problem and led to the river being listed as impaired with a TMDL being written in 1999. The Buttahatchee is also stressed by sedimentation and invasive, non-native species.

Basin Team 1 selected the Buttahatchee as a priority waterbody. Efforts to protect and restore the Buttahatchee were shared by TNC, the MSWCC, and the US Department of Agriculture's National Sedimentation Laboratory (NSL). The Nature Conservancy was awarded a Section 319 grant to prepare a conservation plan and build a watershed alliance that includes Alabama to restore and protect the river. The MSWCC recently concluded working with the local conservation districts in Lowndes and Monroe counties to identify critical problem areas on agricultural lands and assist landowners with installing BMPs to correct those problems. The Mississippi Department of Health completed a survey to determine the condition of onsite wastewater systems in Mississippi's portion of the watershed. In addition, the NSL completed a study of the channel stability of the Buttahatchee.

Fannegusha Creek

The primary objective of this project is to implement selected BMPs on targeted areas in the Fannegusha Creek Watershed. These practices will result in reduced sediment loadings from agricultural nonpoint sources. The current land use in the watershed includes 21,700 acres of agricultural lands (the majority of which is crop land), 16,854 acres of timber land, and 8,389 acres of wetlands. Of primary concern is loss of sediment from crop and pasture lands. Soils in the watershed are very erosive with sheet and gully erosion occurring on sloping agricultural lands. Erosion is occurring in the project area at the rate of 8 tons per acre per year. Sediment contained in the runoff is entering Fannegusha, Red Cane, and Hurricane Creeks causing degradation of the resource base. During 2006, several landowners in the area agreed to implement BMPs and since March 2006, more than 225 acres have been involved in nutrient management practices, over 200 acres of pasture and hay land have been planted, areas of permanent vegetation and grassed waterways have been established, and more than 110,000 feet of terraces have been built.

Mill Creek Watershed Restoration Project

This project, located in Rankin County, involves the development of a multi component strategic plan for improving water quality in Mill Creek. The plan calls for the stabilization of the channel and banks along Mill Creek, the reduction of NPS pollutants throughout the entire Mill Creek watershed, the development of water quality educational programs for citizens within the watershed, and the development of ordinances designed to promote low impact development. It is believed that sediment is the major nonpoint source pollutant entering Mill Creek. Therefore, the project has the specific intent of reducing the solids (sediment) content entering Mill Creek by placement of sedimentation\detention basins throughout the watershed at strategic locations. The plan calls for monitoring at various locations along the creek to measure the success of the project.

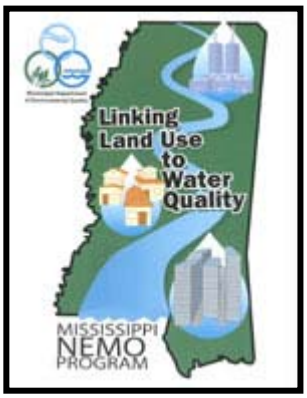
Recently Funded Projects

Three watershed restoration projects were recently funded in the Pascagoula River Basin. The projects included Oakahay Creek, Red Creek and Chunky-Okatibbee watersheds. The Oakahay Creek project, located in Smith County will improve water quality through the use of various agricultural BMPs applied to pasture land and cropland and by informing and educating the public about BMPs. The Red Creek project, located in the counties of Lamar, Stone, George, and Jackson, will include restoration activities on 40 acres of streamside property, development and installation of watershed signage, improvement of recreational access sites, and development of voluntary conservation agreements with streamside landowners. The Chunky–Okatibbee River project, located in Newton, Lauderdale, and Clarke Counties, will identify sources of water quality pollution, identify and install BMPs and monitoring locations, develop and initiate education and outreach programs, and work with landowners along the Chunky River to agree to conservation easements or other conservation elements. In the Yazoo River Basin, the Steele Bayou Water Quality Improvement Project is located in Washington, Issequena, Sharkey, and Warren Counties. Steele Bayou was identified in Mississippi's 1996 Section 303(d) List of Impaired Waterbodies. A sediment TMDL for Steele Bayou was finalized on June 30, 2003. The primary purpose of this project is to reduce sediment loadings in Steele Bayou. The goal is to improve water quality and fisheries in the watershed by installing permanent structural and vegetative measures in critical areas.

Watershed Harmony
Musical Puppet Play

MDEQ and Bayou Town Productions completed the Watershed Harmony Musical Puppet theater in October 2003. Since that time, the performance has reached more than 25,500 students, teachers, and others. During the 2006 tour, approximately 5,500 people enjoyed the show. The play focuses on the prevention of polluted runoff by promoting the use of best management practices and individual stewardship to improve water quality. The Watershed Harmony puppet musical conforms to the 4th and 5th grade Mississippi Framework Curriculum and the National Science Standards. The performance is frequently used as a school presentation and as part of environmental field-day student events. In addition to students, the show is enjoyed and seen by all ages and many groups, including civic clubs, special event groups, summer reading programs, scout troops, and summer camps. The play is 30 minutes in length and is performed on a multi-level, 12'x12'stage with seven songs and dialog that convey a water quality stewardship theme. Additional time may be included for extra activities.

Growth Readiness Program



In 2004, "NEMO" (Nonpoint Education for Municipal Officials) became the "Community Growth Readiness Program" to show that this program was applicable for counties as well. The program continues to educate public employees and consultant engineers in storm water phase II communities about the link between land use, development, water quality, and water quanity. It also provides educational tools and presentation materials for workshop participants to use in their communities for achieving the public education requirements of their "Storm Water Phase II Permit". With new development statewide many public employees and plan reviewers have become more aware of water quality and cumulative impacts of new development. These personnel have begun to insist on more on-site stormwater management

Another component of the Growth Readiness Program is providing training for contractors and inspectors on erosion and sediment control at construction sites. With the new requirements of the "Phase II Stormwater Permit" for local enforcement of erosion and sediment control on construction sites, there is an urgent need for training of local inspectors. In 2006, presentations were made to landscape architects, coastal officials, city workers, contractors, building inspectors, and realtors.

Project Earth Teacher Workshops

Over 200 educators participated in 11 Continuing Education Units (CEU) -approved teacher workshops during 2006. These workshops were offered throughout Mississippi and included sessions on water quality; NPS pollution prevention; land use; water chemistry; macroinvertebrates; and hands-on water-related activities that teachers can use in their classroom to train students in natural resource concepts and stewardship. MDEQ also provides environmental education products and lesson plan books for these workshops.

Mississippi Network Radio Public Service Announcements

Each month, the Mississippi Network Radio stations run messages that contribute to reducing NPS pollution throughout Mississippi. Adopt-A-Stream Workshops, teacher workshops, storm drain marking and other events are advertised. New Public Service Anouncements (PSAs) during 2006 included two messages about the benefits of urban forestry and a dialog about pollution prevention using the characters *Bobby Bass* and *Molly Mockingbird* from Mississippi's Watershed Harmony Musical Puppet Theater.

Environmental Student Training Events/Envirothon Competition

Environmental Education Events

MDEQ staff reached over 4,500 students, teachers, and the general public with water pollution prevention and water quality presentations. The water models are frequently used with most of these educational activities. Over 80 water models (the Enviroscape and the groundwater aquifer sand tank model) have been distributed statewide to Mississippi State University (MSU) Extension Service Offices, district Department of Health Offices, Soil and Water Conservation Districts, Environmental Learning Centers, the Choctaw Tribe Reservation, and other organizations.

Ecology Day Camps

MDEQ partnered with the University of Mississippi Wetland and Water Resources Institute to conduct three Ecology Day-Camp sessions with over 35 students from grades 2 – 12 in attendance during the summer of 2006.

Envirothon Competition

Envirothon is a competitive learning event for high school students. The competition tests the student's knowledge of environmental resources including soils, forestry, wildlife, and current environmental issues. There were 285 high school students active in the 2006 Mississippi Envirothon competitions. DEQ assists with the Envirothon training, steering committee, and statewide competition.

Adopt-A-Stream

Adopt-A-Stream (AAS) is a program that promotes environmental stewardship by training citizens about stream ecology, aquatic life, and water chemistry. Volunteers attend a water-education workshop to learn how to monitor a stream, conduct a stream cleanup or mark storm drains. Transition and updating of the (AAS) program are underway with the selection of a new coordinator and project director this year. The Mississippi Wildlife Federation will be the primary partner with MDEQ to continue the program in Mississippi. The traditional 2-day workshop format will remain in use and a new 1-day workshop format will be introduced to embrace the Watershed Characterization Tool (a Geographic Information Systems Tool). Topics covered at the 2-day workshop include, watershed mapping and delineation, water chemistry, macroinvertebrates as biological indicators of water quality, and effects of point and nonpoint source pollution on water quality. Field work at a stream is also part of the workshop.

During 2006, complimentary test kits for World Water Monitoring Day were distributed to interested individuals during several environmental education events in Mississippi. The distribution of these simple, inexpensive, but accurate test kits will allow more widespread monitoring activities and increase public awareness about stream stewardship.

Storm Drain Marking Program

MDEQ assisted local resource people in conducting storm drain marking projects in which discs with the message “Dump No Waste, Drains to River” were attached to storm drains. High-school students and scouts glued the markers to 1,500 storm drains and distributed door hangers in six Jackson-Metro area neighborhoods and in two other cities in north and south Mississippi during 2006. When possible, the students and scouts talked with residents about stormwater runoff and the need to prevent pollutants from entering storm drains.

Publications and Literature

Sustainable Urban Forestry Publications

The completion of a "Sustainable Urban Forestry" project created several excellent products which are now available to community leaders, land managers, and the public. *The Community Forestry Booklet* is a 14-page booklet which includes information about realizing benefits from your community forest to mitigate nonpoint source pollution and to manage stormwater. *Preserving Trees in Construction Sites* (12 pages) describes ways to protect trees during construction and after construction that will prevent tree decline and/or tree loss. A poster entitled *Best Management Practices for Water Quality* depicts porous pavement, rock and gravel tree root infiltration in parking areas, water absorption by trees and plants and other practices for urban areas. A 191 page technical/information manual entitled *Urban Forestry, Mississippi Urban and Community Forestry Management Manual* is available as well as *An Introduction to Urban Community Forestry* booklet. To order, contact the Mississippi Forestry Commission, phone 601-359-1386; ask for the "urban forester".

Erosion and Sediment Control Publications

The Field Manual for Erosion and Sediment Control on Construction Sites in Mississippi (2nd edition) is a pocket-sized field manual on waterproof paper which may be ordered from MDEQ. The field manual is designed to be a companion field volume to *The Planning and Design Manual for the Control of Erosion, Sediment and Stormwater* (over 100 pages with color photos of best management practices). The combination of the two manuals bridges the gap between design requirements, and installation and maintenance of structural and vegetative practices in the field. To order either manual, "print and complete an order form" by visiting MDEQ's web site at: www.deq.state.ms.us/MDEQ.nsf/page/NPS_Publications_Literature?OpenDocument (scroll to document title order form)

Watershed Exhibit & Brochure

A new 8'X8' watershed exhibit entitled *Why Are Watersheds Important to You* and an updated brochure were used throughout the year to emphasize the important link between land uses, individual stewardship and water quality in rivers, lakes and oceans. New literature on "Rain Gardens" was ordered and distributed this year. Table-top Nonpoint Source Pollution exhibits were displayed at several events including Earth Day and Arbor Day.

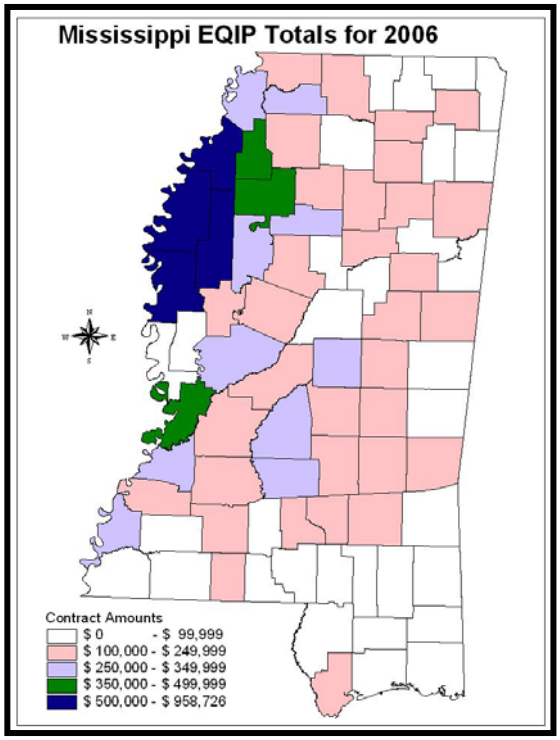
Citizen's Guide to Water Quality in the Yazoo River Basin 2006

This booklet was completed in 2006 and includes 31 pages of maps and citizen's information on becoming involved with water quality protection and conservation. The booklet also provides water quality information on several watersheds within the basin that have been targeted for restoration and protection activities.

NPS - Related Programs

Agricultural NPS Advances in Mississippi

The Farm Security and Rural Investment Act of 2002 is landmark legislation for conservation funding and for focusing on environmental issues. The conservation provisions assist farmers and ranchers in meeting environmental challenges on their land. This legislation simplifies existing programs and creates new programs to address high priority environmental and production goals. The 2002 Farm Bill enhances the long-term quality of our environment and conservation of our natural resources. Under the Farm Bill, a number of programs were introduced and implemented in Mississippi. Under one such program, the Environmental Quality Incentives Program (EQIP), 103,047 acres were enrolled for a total funding of $15 million. The Wildlife Habitat Incentive Program (WHIP) awarded $679,318 for the enlistment of 12,444 acres. The Wetlands Reserve Program implemented 11,655 acres for $11 million.



The Mississippi 319 Waste Pesticide Disposal Program

Mississippi farmers continue to take advantage of economical ways to address waste pesticide disposal problems and improve water quality in their watersheds at the same time. Through a 319 grant from MDEQ, waste pesticide disposal collection events were planned and held in 2005 and 2006. The events were coordinated by the MSU Extension Service, with assistance from the Bureau of Plant Industry, a division of the Mississippi Department of Agriculture and Commerce.

Four separate collection programs were held in Batesville, Hamilton, Brooksville, and Pittsboro. In these combined events, a total of 74,000

pounds of waste pesticide products were brought to the collection sites by farmers where the products were collected and properly disposed of by a licensed hazardous waste contractor. A total of 67 farmers from 26 counties participated in the four collection events. These results reflect a positive collaboration of farmers, farm-support groups, educational institutions, and environmental agencies.

These programs and prior ones funded by 319 grants have had a positive impact on reducing environmental risks and improving water quality in rural Mississippi while providing farmers an economical way to dispose of waste pesticide products. Since the inception of the program, over 315,000 pounds of waste pesticides have been collected from 189 farmers in 65 counties. In addition to reducing potential environmental risks associated with these waste products, the events collectively saved farmers more than $330,000 in disposal costs. Additional programs through 319 funding in future years will be welcomed to further reduce environmental, water quality, and health-related risks in agricultural areas of the State.

Water Pollution Control Revolving Loan Fund

The Water Pollution Control Revolving Loan Fund program provides low-interest loans to public entities in the state for the construction, repair, or replacement of wastewater, storm water, and nonpoint source pollution- control projects. Funding from these projects comes from federal grants, state match repayments, and interest on deposits. During 2006, MDEQ funded nine new projects for a total of $18,573,743 from the Water Pollution Control Revolving Loan Fund Program. MDEQ also processed eight loan increase requests for a total of $22,229,858.

Through this program nonpoint source needs for the state were estimated in the 2004 Clean Water Needs Survey. MDEQ contracted with FTN Associates to estimate BMP needs and costs for waterbodies with a TMDL. FTN also did this for waterbodies listed on the Section 303(d) report as impaired, but where a TMDL had not yet been written. The strategy used was to identify the pollutant causing the impairment, identify or determine the recommended load reduction, conduct a GIS analysis of the watershed to estimate the number and type of BMPs needed, and used NRCS cost figures to calculate total costs. Sanitary surveys from the Department of Health were also reviewed to estimate needs and repair costs for areas with high rates of failing onsite treatment systems. The resulting assessed needs and costs were:

- Cropland $ 61,140,000
- Livestock $ 212,149,000
- Silviculture $ 13,141,000
- Streambank Restoration $1,197,971,000
- Onsite Wastewater $ 79,499,000

Source Water Assessment Program

The Federal Safe Drinking Water Act (SDWA), reauthorized by Congress in 1996, added provisions for the states to develop Source Water Assessment Programs (SWAPs). The clear intent of Congress was to compel states to devise and adopt measures to enhance the protection of all public water systems from potential contaminant sources. The Source Water Protection Strategy for the four public surface water system intakes used in the State involves integrating drinking water protection into Mississippi's Basin Management Approach that was designed to protect and restore the quality of the state's water resources. This strategy has been completed and integration efforts are underway with the Basin Management Teams. Mississippi has accepted EPA Region IV's offer to assist with these projects. TVA offered assistance and is now participating in these projects as well.

Meetings with the three public surface water systems operating in the state have been completed; additional meetings are anticipated. The state also is participating in the national pilot project addressing integration of the SDWA and the CWA. As of 2006, SWAPs have been completed for community water systems in all 82 counties. MDEQ has provided the public water-supply operators in the State with their SWAP reports. Since July 1, 2005, preliminary assessment reports have been required for all new water well permits. This pre-SWAP report is used to critique proposed well sites to avoid the drilling of new wells into known plumes of contamination or too close to identified Potential Contaminant Sources (PCSs). The Tennessee Valley Authority (TVA) has completed SWAPs for three surface water/source water systems in the state.

A data tracking system has been designed to comply with EPA's Source Water Program Activities Measures. This GIS application allows MDEQ to track which systems have implemented source water protection strategies.

Storm Water Program

Implementation of Mississippi's Storm Water General Permits and regulations continues in 2006. The Environmental Permits Division of MDEQ issued coverage for 528 large construction projects (5 acres or greater) and 118 regulated industrial facilities. Small construction projects (1 acre to less than 5 acres) continued in 2006. The Storm Water Management Plan for Mississippi's 37 Municipal Separate Storm Sewer Systems (MS4s) (consisting of 24 cities, nine counties, two military bases, one university and the Mississippi Department of Transportation (MDOT) continues into the 4th year of a 5-year implementation schedule. The Hydrostatic Test General Permit, which has a storm water construction component, was reissued for a second 5-year period and approximately 20 facilities were recovered under the reissued permit. The "Wet Deck Log Spray with Recirculation General Permit" was issued on January 3, 2006 with a storm water component. Approximately 19 facilities were issued coverage in 2006. The "Mining Storm Water General Permit" began the reissuance process in 2006.

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