



2020 - 2024

MISSISSIPPI NONPOINT SOURCE POLLUTION MANAGEMENT PLAN

Prepared by:
Mississippi Department of Environmental Quality
Basin Management and Nonpoint Source Management Branch



January 14, 2020

MISSISSIPPI

Nonpoint Source Management Plan

FFY 2020 Plan Update

Prepared by the Mississippi Department of Environmental Quality
Surface Water Division
Basin Management and Nonpoint Source Branch
P.O. Box 2261
Jackson, MS 39225
January 2020



For Further Information Contact:
State Nonpoint Source Coordinator
Office of Pollution Control

MISSISSIPPI

Nonpoint Source Pollution Water Management

PROGRAM OVERVIEW



Figure 1: Examples of Point and Nonpoint sources of Pollution in a Watershed.

What is Nonpoint Source Water Pollution?

When most people think about sources of water pollution, what comes to mind is a pipe releasing wastewater into a stream from a treatment plant. Wastewater treatment plants – municipal or industrial – represent a type of finite, individual water pollution referred to as a point source of pollution. Point sources of pollution are governed by water quality rules and regulations set at the state and national levels.

However, when pollution comes from a dispersed, variety of sources (abandoned mines, forestry, urban streets, highways, cropland, pasture) and is carried into waterbodies by rainfall moving over and through the ground (Figure 1), it is called a nonpoint source of pollution (NPS). As stormwater runoff moves, it picks up and carries natural and human-made pollutants to lakes, reservoirs, rivers, streams, wetlands, and coastal waters. NPS pollution can also be transported into groundwater as runoff percolates through the soil. While point source discharges can occur continuously, in Mississippi NPS pollution is primarily driven by periods of rainfall.

Why is a NPS Pollution Management Program Needed?

Point sources are federally regulated under the Clean Water Act which means that nearly all municipal and industrial point sources are controlled to minimize their impact on water quality. Yet, issues such as fish kills, harmful algal blooms, and high levels of bacteria still occur and impact the safety and health of people and wildlife. To conserve and improve water quality for present and future generations of Mississippians, while sustaining the wildlife and aquatic animals who depend on Mississippi's water resources, MDEQ's Nonpoint Source Pollution Management Program was developed.

The NPS Management Program maintains a statewide focus on activities to reduce the impacts from NPS pollution. To do so, however, the agency must first understand the extent to which the waterbodies are impacted. As such, every two years MDEQ evaluates and reports on the water quality of Mississippi waterbodies – streams, rivers, lakes, reservoirs, estuaries, and coastal waters. This statewide assessment can be found on MDEQ's website here: [Mississippi's Section 305\(b\) Water Quality Assessment Report](#). When the specific beneficial uses ("designated uses") outlined in the federal and Mississippi water quality standards are not met, the waterbody's water quality is characterized as impaired.

What Happens When a Waterbody is Impaired?

When water bodies are impaired, those waters are compiled into a list as required by Section 303(d) of the Clean Water Act. This list represents waters that are deemed impaired for one or more designated use(s) and as a result, a total maximum daily load (TMDL) for the pollutant causing the impairment must be developed. The biennial Section 303(d) List of Impaired Water Bodies can be found on MDEQ's website here: [Mississippi's Section 303\(d\) List of Impaired Water Bodies](#). The TMDL is representative of a stream budget where allowable loads for specific pollutants are developed to ensure the water body can meet appropriate water quality criteria and designated uses.

Currently, Mississippi has 191 water bodies with TMDLs for nutrient impairments (i.e. total nitrogen and/or total phosphorus), and 307 water bodies with TMDLs for sediment. In Mississippi, nutrient loading and sediment are the two largest contributors to NPS pollution management concerns.

What Does the Nonpoint Source Program Do?

NPS water pollution, unlike point sources, is managed primarily through the voluntary actions of individual people that are instigated after they become aware of the multiple economic, social, and environmental benefits that can be



Award-Winning Program: Environmental Education & Outreach Mobile Classroom

realized if they participate in management effort. The Mississippi NPS Pollution Management Program achieves this through two primary approaches. First, it emphasizes awareness, education and outreach about the effects of NPS pollution, the costs associated with NPS pollution, and solutions to manage NPS pollution. Awareness addresses the first critical step of answering "So What?" and motivates people to change their behavior by making them aware of what is in the best interest of an individual and the public at large. Education builds



Cover crops reduce erosion, add organic matter, retain nutrients, and improve irrigation effectiveness

individuals' abilities to perform the new behavior and must begin at an early age (pictured above). Outreach moves education-based activities to the communities most in need by providing the knowledge and skills through field days, training, workshops, YouTube videos, and other interactive platforms.

Second, the Mississippi NPS Pollution Management Program uses outreach and funding assistance to encourage

landowners to use cover crops, rain gardens, and similar practices that reduce NPS pollution while providing other benefits. Management practices implemented in communities throughout the state are proof that the awareness and education approaches are changing beliefs and behaviors about NPS pollution. These NPS pollution management practices are supported by effective outreach efforts. Outreach starts with neighbor to neighbor exchanges and proceeds through agency and institutional programs, including financial assistance. Ultimately, NPS management implements practices throughout a watershed to reduce NPS pollution and improve water quality for everyone. Specifically, the NPS Program uses the Basin Management Approach (BMA) to achieve its targeted, watershed-based goals. The key strategy of this approach is to leverage collaboration among agencies, organizations, institutions, and stakeholders. The mission of the BMA is to foster stewardship of Mississippi's water resources through place-based, collaborative water resources planning, education, protection, and restoration initiatives. The BMA catalyzes collaborative identification and responses to a variety of water resources concerns. The building blocks of the BMA are smaller sub-divisions of teams such as Basin Teams and Watershed Implementation Teams.

Is the Program Making a Difference in Reducing NPS Pollution?

The greatest measure of success for the Mississippi NPS Pollution Management Program is restoring impaired

•
The Mississippi
NPS Management
Program has been
restoring water body
uses impaired by
NPS pollution for
over 30 years. That's
success!
•

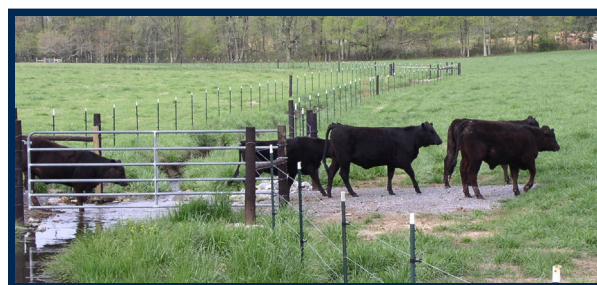
water bodies to full use. Using this metric, the Mississippi NPS Pollution Management Program is, and has been, a success for over 30 years. Each year, the Program, with its partners, initiates between 2-4 projects to improve water quality and restore water body uses across the state. Three examples include:

Lake Hazel – Lake Hazel was not attaining its aquatic life use due to stormwater runoff from commercial and residential development carrying sediment, nutrients, and oil and grease into the lake. Through partnerships with

Mississippi Soil and Water Conservation Commission (MSWCC), the City of Hazlehurst, participating landowners, and other interested stakeholders, stormwater runoff was addressed by implementing various management practices. These practices included water and sediment control basins, restoration of vegetation in heavily eroded areas, and grade stabilization of earthen structures, to reduce loads of sediment, nutrients, and other pollutants entering the lake. Local newspaper articles, field tours of management practices, and educational materials created awareness of the success of these practices for landowners and the public. This project started in 1990 and the lake was removed from the Mississippi list of impaired waterbodies in 2004.

Caney Creek – Caney Creek, in Tishomingo County, was not attaining its aquatic life use because of sediment loading from silviculture and agricultural sources, organic enrichment from agricultural sources, and habitat alternations. Partnerships of MSWCC, USDA Natural Resources Conservation Service (NRCS), Conservation Districts, and local landowners resulted in implementation of nutrient management practices, grade stabilization structures, prescribed grazing, tree and shrub planting, and animal watering facilities. This project started in 2007 and in 2014 Caney Creek was removed from the Mississippi list of impaired waterbodies.

Limekiln Creek – Limekiln Creek, in central Mississippi, was not attaining its aquatic life use because of low dissolved oxygen/organic enrichment, low pH, and excess nutrients from agricultural activity. Through partnerships of MSWCC, NRCS, Conservation Districts,



Controlled stream crossing access for cattle

and local landowners, a NPS project began in 2005. Over 75 management practices, including grade stabilization structures, water and sediment control basins, pasture planting, fencing, heavy use area protection, stream crossing areas (pictured above), and permanent vegetation were implemented in the watershed. These practices significantly reduced sediment, nitrogen and phosphorus loading to Limekiln Creek. In 2014, Limekiln Creek was removed from

the Mississippi list of impaired waterbodies.

The Mississippi NPS Pollution Management Program, through its awareness, education, and outreach programs, including its watershed management partnerships, is making a difference in reducing NPS pollution in Mississippi. However, as shown in each of the examples above, it takes time. Success is not immediate, but, through continual effort, success is, and can be, attained.

How Does the Nonpoint Source Program Help Mississippians?

An added value of the Mississippi NPS Pollution Management Program are the federal dollars being injected into the state and local economies to achieve these environmental benefits. Over the last five years (2015-2019), the Mississippi NPS Pollution Management Program has received approximately \$15 million in federal grant funding

from the EPA Section 319 Grant Program. Over \$9 million of these dollars were awarded to local projects focused on the management and reduction of NPS pollution in Mississippi. These funds not only directly benefited local communities in our state, but were leveraged by other agencies and organizations via funds matching to provide additional funds. These partnerships also support other management practices in the same watersheds.

Who Do I Contact About the MS NPS Management Program?

MDEQ welcomes and encourages your participation in, and comments on, the Mississippi NPS Pollution Management Program. If you are interested in NPS pollution management in Mississippi, please contact the Basin Management and NPS Branch of the Surface Water Division of the MDEQ's Office of Pollution Control at PO Box 2261, Jackson, MS 39225, or by phone at 601-961-5171.

Take Back Our Waters Mississippi! Find a Local Watershed Team or Group. Engage with Your Local Governments on Water Quality Issues. Get Involved. Have a Voice. YOU Can Help Protect and Restore Our Waters!

It takes everyone's efforts to manage NPS pollution in our streams, rivers, reservoirs, lakes, wetlands, and estuaries. From those of us that live in more urban environments in Mississippi's cities and towns to those of us living in the more rural areas of the state, we can all take action to improve our environment. Together, through actions both small and large, we can make a difference. Below is a list of the top 10 things you can do to reduce NPS pollution:

1. Water your lawn only when it is necessary. Conserve water used in the house as well.
2. Limit the use of pesticides and fertilizers. Be sure to follow the instructions on the labels.
3. Plant hardy vegetation. Cover the bare spots in your yard to reduce run off.
4. Put litter in its place; not on the ground.
5. Compost or mulch yard waste. Don't leave it in the street or sweep it into storm drains.
6. Inspect and service your septic system at least every 2 years.
7. Wash your car at a commercial car wash or on the lawn.
8. Recycle used oil and antifreeze and dispose of household chemicals properly. MDEQ sponsors household waste disposal days.
9. Dispose of deer carcasses properly. Place in garbage bag and discard with the trash; or bury correctly (see MS Bureau of Animal Health regulations.)
10. Pick up after your pet. Scoop your poop please! This prevents bacteria from running off into our streams, river, reservoirs, lakes, and estuaries.

Table of Contents

Overview: Mississippi Nonpoint Source Water Pollution Management Program.....	i
List of Tables.....	vii
List of Figures.....	vii
List of Acronyms	vii
Acknowledgements	ix
Chapter 1: Introduction	1
Mississippi's Water Landscape	3
What is NPS Pollution?	3
Why Do We Have a Mississippi NPS Pollution Management Program Plan?.....	6
Nonpoint Source Pollution Management in Mississippi.....	8
About this Plan	8
Who Can I Contact About the Mississippi NPS Management Program?	9
Chapter 2: Mississippi NPS Pollution Management Program Overview	10
Introduction.....	11
Mississippi NPS Program Vision and Goals.....	11
Unpacking Long-term Goals 1 and 2	12
Unpacking Long-term Goal 3	12
Overview of the Approach for Implementing the Mississippi NPS Program.....	13
Summary of Changes in the Mississippi NPS Program Since the 2014 Plan.....	13
MDEQ Organization	13
Use of Tracking and Reporting Categories.....	13
Planning Tools.....	13
Awareness, Education, and Outreach Programs	14
Ecosystem Services	14
Overdetermining Success	17
Chapter 3: Mississippi Section 319 Grant Process	20
Throughout the Year.....	21
How Projects and Other NPS Activities Get Funded	22
Prioritizing Watersheds for Project Implementation	24
Developing a Section 319 Grant Workplan	27
Day to Day: Managing the Work.....	28
Project Management.....	29
Planning.....	29
Outreach	29
Chapter 4: Partnerships, Collaboration, and Leveraging	31
Partners in the Mississippi NPS Program	32
Partnerships with MDEQ Water Programs	35
Partnerships with Federal Programs.....	36
Partnerships with State Agencies.....	36
Partnerships with Organizations and Institutions.....	37
Working Collaborations	37

Partnerships and Planning	39
Awareness, Education, and Outreach	39
Summary.....	40
Chapter 5: Water Management Process.....	41
Water Quality Standards.....	43
Water Quality Monitoring	44
Water Quality Assessment	46
Index of Biological Integrity.....	46
Stressor Identification.....	47
Water Quality Modeling.....	47
Watershed Plans and Implementation	48
Summary.....	48
Chapter 6: Core Elements of Mississippi’s NPS Management Program	49
Element 1: Program Administration.....	51
Who Administers the Mississippi NPS Program?.....	51
Oversight of the Mississippi NPS Program.....	51
Mississippi NPS Program Budget	51
Annual Report for Mississippi NPS Program	52
Five-year Review of Mississippi NPS Program	52
Consistency of Federal Programs	52
Element 2: Program Implementation	53
Developing and Managing Sub-grants	53
Tracking and Reporting Progress.....	53
Grant Reporting and Tracking System Reporting.....	54
MDEQ Reporting and Tracking Tools.....	54
Awareness, Education, and Outreach	54
Strategies, Tools, and Knowledge Transfer.....	56
Nutrient Reduction Strategies.....	57
Decision Management Tools.....	57
Mississippi Watershed Characterization and Ranking Tool.	57
Basin Management Planning Application.	58
Knowledge Transfer.....	58
Element 3: Planning	58
The Basin Management Approach	59
Mississippi’s Basin Groups	59
Basin Teams.....	60
Watershed Implementation Teams.....	60
Benefits of Mississippi’s Basin Management Approach.	60
Basin Management Approach and Mississippi’s NPS Program.....	61
Contact Information for Basin Coordinators	61
Watershed Prioritization	61
Watershed Based Plans.....	62
Element 4: Project Implementation.....	63
Role of WITs in Project Implementation	64
Funding Projects	64

Workplans and Sub-grants.....	65
Project Reporting.....	65
Element 5: Project Implementation Support.....	66
Works Cited.....	67
Appendix A: Short-term Goals, Objectives, and Milestones for Mississippi’s NPS Management Program FY20-24.....	A-1
Appendix B: FY20-24 Priority Watersheds.....	B-1
Appendix C: NPS Pollution Management Practice Sources of Influence for Overdetermining Success	C-1

List of Tables

Table 1: Comparison of Point vs Nonpoint Sources.	4
Table 2: Major Categories and Subcategories of Nonpoint Sources of Water Pollution in Mississippi.....	5
Table 3: Key Elements of an Effective State NPS Pollution Management Program	7
Table 4: Designated uses in federal and Mississippi water quality standards	12
Table 5: Monetary valuation methods for market and non-market goods and services.....	16
Table 6: Six Sources of Influence.....	17
Table 7: Mississippi NPS Program Partners	34
Table 8: Categories of NPS Pollution Regulated by MDEQ.....	35
Table 9: Mississippi NPS Program Collaborations.....	38
Table 10: Unique Resources and Water Concerns in the Basin Groups.....	59

List of Figures

Figure 1: Examples of Point Sources	3
Figure 2: Sources of NPS Pollution in a Watershed.....	4
Figure 3: Walt Kelly 1972 Earth Day Cartoon - Pogo	8
Figure 4: Categories of ecosystem services and types of benefits provided “free” for use.....	15
Figure 5: Important Dates and Deadlines for Mississippi NPS Program	22
Figure 6: EPA 9 Key Elements for Watershed Based Plans	23
Figure 7: MS River Basins and Basin Groups	24
Figure 8: MS Watershed Characterization & Ranking Tool.....	25
Figure 9: Basin Planning Application	26
Figure 10: Water Management Process	42
Figure 11: MS’s Surface Water Monitoring Design	45
Figure 12: Surface Water Division Organizational Chart.....	51
Figure 13: Office of Pollution Control Organizational Chart.....	51

List of Acronyms

AAS.....	Mississippi Adopt-A-Stream Program
BCWI.....	Bear Creek Watershed Initiative
BMA.....	Basin Management Approach
BMPs.....	Best Management Practices
CALM.....	Consolidated Assessment and Listing Methodology
CSP	USDA Conservation Stewardship Program
CWA.....	Clean Water Act

CZARA.....	Coastal Zone Reauthorization Act
Delta F.A.R.M.....	Delta Farmers Advocating Resource Management
EMFLT	East Mississippi Foothills Land Trust
EPA	US Environmental Protection Agency
EQIP	Environmental Quality Incentive Program
FFRs	Federal Financial Reports
GIS.....	Geographical Information System
GMP	US EPA Gulf of Mexico Program
GOMA.....	Gulf of Mexico Alliance
GRTS	Grants Reporting and Tracking System
HUC.....	Hydrologic Unit Code
IBI	Index of Biotic Integrity
KRB	Keep the Reservoir Beautiful
LTMCP.....	Land Trust for the Mississippi Coastal Plain
MBISQ.....	Mississippi Benthic Index of Stream Quality
MDEQ.....	Mississippi Department of Environmental Quality
MDMR.....	Mississippi Department of Marine Resources
MEA.....	Millennium Ecosystem Assessment
MEEA	Mississippi Environmental Education Alliance
MFC	Mississippi Forestry Commission
MRBI.....	USDA Mississippi River Basin Initiative
MSHD.....	Mississippi Department of Health
MSU	Mississippi State University
MSWCC.....	Mississippi Soil and Water Conservation Commission
MUFC	Mississippi Urban Forestry Council
MWCRT	Mississippi Watershed Characterization and Ranking Tool
MWF	Mississippi Wildlife Federation
NGO.....	Nongovernmental Organization
NPDES	National Pollutant Discharge Elimination System
NPS.....	Nonpoint Source
NRCS.....	US Department of Agriculture Natural Resources Conservation Service
NRDA.....	Natural Resource Damage Assessment
OAS.....	MDEQ Office of Administrative Services
OPC.....	MDEQ Office of Pollution Control
PPA	Performance Partnership Agreements
PPG.....	Performance Partnership Grants
PRVWSD.....	Pearl River Valley Water Supply District
QAPP	Quality Assurance Project Plans
RC&D	Mississippi Resource Conservation and Development Councils
RCPP	USDA Regional Conservation Partnership Program
SOP.....	Standard Operating Procedure
SWD	MDEQ Surface Water Division
SWMP	MDEQ Surface Water Monitoring Program Plan
TAG	Mississippi's Nutrient Technical Advisory Group
TMDL	Total Maximum Daily Load

USDA	United States Department of Agriculture
USGS	United States Geological Service
WBP.....	Watershed Based Plan
WIT	Watershed Implementation Team
WLA	Waste Load Allocation
WQS	Water Quality Standards
WRRI.....	Mississippi Water Resources Research Institute

Acknowledgements

The updated Mississippi Nonpoint Source Program Management Plan was compiled and drafted by the Nonpoint Source (NPS) and Basin Management Branch of the Mississippi Department of Environmental Quality (MDEQ), Surface Water Division (SWD) in the Office of Pollution Control (OPC). This plan describes NPS pollution control measures that will be used by MDEQ in coordination with activities conducted by other agencies and watershed groups at the federal, state, and local levels. The MDEQ Surface Water Division acknowledges and appreciates the information and input provided by many individuals and programs both within MDEQ as well as outside the agency that contributed to the update of the Plan. The MDEQ would also like to acknowledge the agencies, watershed groups, private landowners, and other citizens who continue to invest time, energy, and financial and technical resources to protect and restore Mississippi's water resources.

Writing, coordination, guidance, and review of report

The preparation of the Mississippi Nonpoint Source Program Management Plan was coordinated, led and primarily written by Natalie Segrest, the current Chief of the Basin Management and Nonpoint Source (NPS) Branch of the Mississippi Department of Environmental Quality (MDEQ), Surface Water Division (SWD). Other internal staff also contributed and worked together to transform an immense amount of data and information into a coherent and meaningful report. Support for the development of this document also included input from Dr. Kent Thornton with FTN Associates, Ltd. Mike Freiman, Division Chief of the Surface Water Division, guided this work, advised on methods, and supported the review process for both data and drafting. The thorough review of the document was completed by reviewers, which included Ajay Parshotam, Patrick Vowell, Melissa Wells, Coen Perrott, Christy Prouty, and Donetta McCullum-Weatherspoon.

Data review, compilation and analysis and map development

The data compilation of collected data and map development was done by Jimmy Alley, GIS Analyst at the Geospatial Group.

Project Management, design layout and finalization of report

Thank you to Donetta McCullum-Weatherspoon for project management of the 5yr management plan, and for undertaking the graphic design of the document by providing guidance and input to Joshua Creative Group to transform this report into a professional document. Additional thanks go to Natalie Segrest and Christy Pouty who provided major contributions to the report as language, formatting and technical editors who played an active role with bringing this document to finalization.

Special thanks

Funding for Mississippi's NPS Management Plan was provided by the United States Environmental Protection Agency under assistance agreement #C999486616, through the award of funds made available by Section 319 of the Clean Water Act to the Mississippi Department of Environmental Quality. The contents of this document do not necessarily reflect the views and policies of the Environmental Protection Agency, nor does the EPA endorse trade names or recommend the use of commercial products mentioned in this document.

Photo credit

The MDEQ would also like to extend sincere gratitude to our internal staff and other agency partners for providing beautiful Mississippi photos for this management plan.

1. Cover Photo- Acid Falls, Bolivar County, MS, Photo by Madison Dixon with Dixon Drone Photography
2. Ch. 1 Cover Photo- Bells Ferry Wolf River Coastal Preserve, Photo Provided by Mississippi Wildlife Federation
3. Ch. 1 (preceding page)- Wood Duck on Mississippi Lake, Photo by Deborah Logan with Creative Expressions Photography
4. Ch. 2 Cover Photo- Buttahatchie River, Photo Provided by Wildlife Mississippi
5. Ch. 2 (preceding page)- Brushy Creek, Gloster, MS, Provided by Mississippi Wildlife Federation
6. Ch. 3 Cover Photo - Confluence of Pascagoula and Escatawpa River, Jackson County, MS, Photo by James Starnes with Mississippi Department of Environmental Quality
7. Ch. 3 (preceding page)- Ross Barnett Reservoir Spillway and Pearl River, Flowood, MS, Photo by, Shawn Clark with Mississippi Department of Environmental Quality
8. Ch. 4. Cover Photo - Dead River Lake of the Pascagoula River, Jackson County, MS, Photo by Nancy Blue of Gautier, Mississippi
9. Ch. 4 (preceding page) – Price Creek, Warren County, MS Photo Provided by James Starnes with Mississippi Department of Environmental Quality
10. Ch. 5 Cover Photo - Ten-Tom near Columbus, MS, Photo by Robbie Wilbur with Mississippi Department of Environmental Quality
11. Ch. 5 (preceding page)- Pearl River, Photo Provided by Wildlife Mississippi
12. Ch. 6. Cover Photo - Confluence of Pascagoula and Escatawpa River, Jackson County, MS, Photo by James Starnes with Mississippi Department of Environmental Quality
13. Ch. 6 (preceding page)- Sea Shells at Bay St. Louis during Renew our Rivers Clean-up, Photo by Matthew Carr with Mississippi Department of Environmental Quality
14. (Page 9) Biloxi Beach, Harrison County, MS, Photo by Barbara Viscup with Mississippi Department of Environmental Quality
15. (Page 19) Barge Crossing, Vicksburg, MS, Warren County, Photo by Madison Dixon with Dixon Drone Photography
16. (Page 30) Paul B. Johnson State Park outside Hattiesburg, MS, Photo by Brittany Miller with Mississippi Department of Environmental Quality
17. (Page 44) Coles Creek in Jefferson County, MS, Photo by Paul Parrish with Mississippi Department of Environmental Quality
18. (Page 48) Rocky Creek, Photo by Danny Beasley with Mississippi Department of Environmental Quality
19. (Page 55) Environmental Education Water Quality Teacher Workshop at LeFleur’s Bluff State Park, Hinds County, MS Photo by Andrea Falcetto with MS Natural Science Museum
20. (Page 55) Mobile Classroom (Bayou Town Productions) Receive 2019 Gulf Guardian Award for Youth Environmental Education, Great Southern Club, Hancock Whitney Plaza, Harrison County, MS, Photo by Jeanne Allen, EPA Gulf of Mexico Program
21. (Page 56) MDMR and MDEQ Receive 2019 Gulf Guardian Award for Partnerships with Celebrate the Gulf/ Waterfest Education Festival, West Hancock Elementary, Hancock County, MS, Photo by Jeanne Allen, EPA Gulf of Mexico Program
22. (Page 66) Ship Island off MS Gulf Coast, Photo by Andrew Whitehurst with Healthy Gulf
23. Appendix A Cover Photo-Saucier Creek in Harrison County, MS, Photo by Madison Kymes with the Mississippi Department of Environmental Quality
24. Appendix B Cover Photo - Victoria Bend, near Gunnison, MS, Photo by Madison Dixon with Dixon Drone Photography
25. Appendix C Cover Photo - Lake Washington, Washington County, MS, Photo by Melody Chimahusky with the Mississippi Department of Environmental Quality
26. Back Cover - Chilly Morning at the Ross Barnett Reservoir in Madison County, MS, Photo by Robbie Wilbur with Mississippi Department of Environmental Quality

CHAPTER ONE

Introduction





This document is Mississippi's 2020 Nonpoint Source Pollution (NPS) Management Program Plan (hereafter referred to as the "Plan"). It is an update of Mississippi's 2014 NPS Pollution Management Program Plan, approved by the US Environmental Protection Agency (EPA). This 2020 Plan has been updated and revised to better reflect how NPS pollution is managed in Mississippi. The emphasis and purpose of Mississippi's NPS Pollution Management

•
**The focus of MS's
NPS Program is to
protect and
improve water
quality**
•

Program remains unchanged from the 2014 Plan. The focus of this program is on protecting and improving water quality for present and future generations of Mississippians, while sustaining the wildlife and aquatic animals who depend on Mississippi's water resources. The

Mississippi NPS Pollution Management Program involves focused research, widespread education, conservation activities, and cooperation with partners and the public.

The Mississippi Department of Environmental Quality (MDEQ) realizes that an updated, comprehensive NPS Pollution Management Program is critical to the State and the EPA. It allows EPA and the state to ensure that funding, technical support, and other resources are directed in an effective and efficient manner to support state efforts to address NPS pollution. This Plan is designed to

make implementation of the Mississippi NPS Pollution Management Program strategic, measurable, attainable, publicly accessible, transparent, and user-friendly. Furthermore, this Plan is meant to be dynamic in nature. It is designed to serve as a tool to evaluate the effectiveness and efficiency of program activities so that adjustments can be made to maximize program success.

Mississippi's NPS Pollution Management Program is a vehicle for protecting and restoring clean, healthy water in the state. An added value seen through implementation of the program is the ability to inject federal dollars into the state and local economies to achieve these environmental benefits. Over the last five years (2015-2019), the Mississippi NPS Pollution Management Program has received approximately \$15 million in federal grant funding from the Clean Water Act Section 319 Grant Program. Over \$9 million of these dollars were awarded to local projects focused on the management and abatement of NPS pollution in Mississippi. These funds directly benefited local economies in our state.

•
**Over the last 5 years,
MS has received
\$15M in §319
funds; over \$9M was
spent on projects
injecting money into
local economies.**
•

Mississippi's Water Landscape

Clean surface waters (rivers, streams, lakes, wetlands, estuaries) and groundwater in Mississippi are critical for a healthy and economically vibrant society. Drinking water use, recreation (fishing, hunting, swimming, boating), growing and harvesting healthy food, and producing other products that contribute to our economy are all affected by the quality of our waters. It is easier and cheaper to use clean water than treat polluted water.

Mississippi has a population in excess of 2,980,000 (US Census Bureau, 2017) and covers a surface area of 47,689 square miles. The state is divided into nine major river basins, drained by more than 82,000 miles of rivers and streams. Thirty-two percent of these rivers and streams are perennial, meaning they have flowing water throughout the year. Intermittent streams, which flow during rainy seasons but are dry during summer months, represent 65% of Mississippi's total stream mileage. There are also over 2,400 miles of man-made ditches and canals in the state. The Mississippi River (approximately 400 miles), and the Pearl River (approximately 80 miles) form Mississippi's border with Arkansas and Louisiana on the west side of the state. There are hundreds of publicly owned lakes, reservoirs and ponds in the state, covering a combined area of approximately 260,000 acres. According to land use information, wetlands cover an estimated 2,728,000 acres of Mississippi, with

tidal marsh comprising approximately 53,000 acres of this total. The approximately 84 miles of the southern edge of Mississippi's contiguous land mass borders the Mississippi Sound. The total area of estuarine waters in Mississippi is approximately 758 square miles. This area includes the St. Louis Bay, Back Bay of Biloxi, Pascagoula Bay, Mississippi Sound, and the portion of the Gulf of Mexico that extends three miles south of the Barrier Islands.

What is NPS Pollution?

When most people think about sources of water pollution, what comes to mind is a pipe or ditch discharging wastewater from an industrial plant to a stream (Figure 1). These types of water pollution sources are referred to as **point sources** of pollution. Point sources of pollution are governed by rules set forth in state and national water quality regulations.

Water pollution can also be caused by what are referred to as **nonpoint sources** of pollution. Nonpoint source pollution comes from a variety of sources and is typically transported by stormwater runoff (Figure 2). Nonpoint source pollution can also be transported by groundwater that moves through the soil into streams through a process called percolation. Nonpoint source pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries natural and human-made pollutants to lakes, reservoirs, rivers, streams, wetlands, coastal waters.

Exhibit 1-2 Common point source discharges of pollutants to waters of the United States

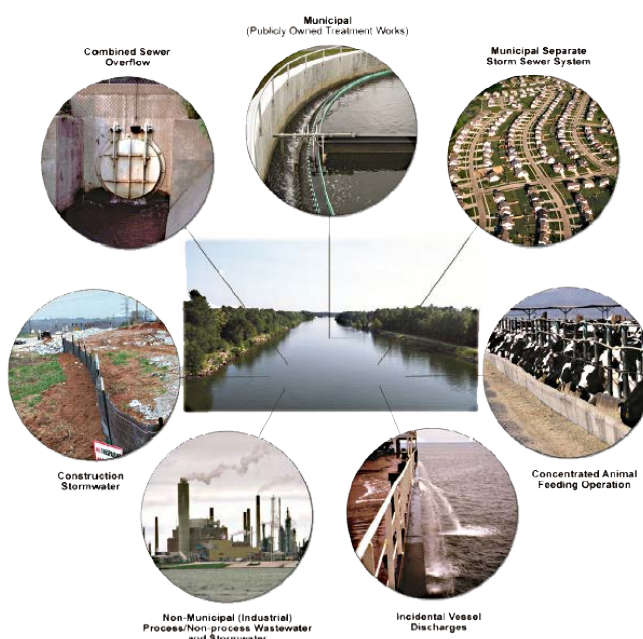


Figure 1: Examples of Point Sources

The effects of nonpoint source pollution on waters are diverse and, at times, hard to quantify. However, nonpoint source pollution ultimately harms drinking water supplies, recreation, fisheries, and wildlife.

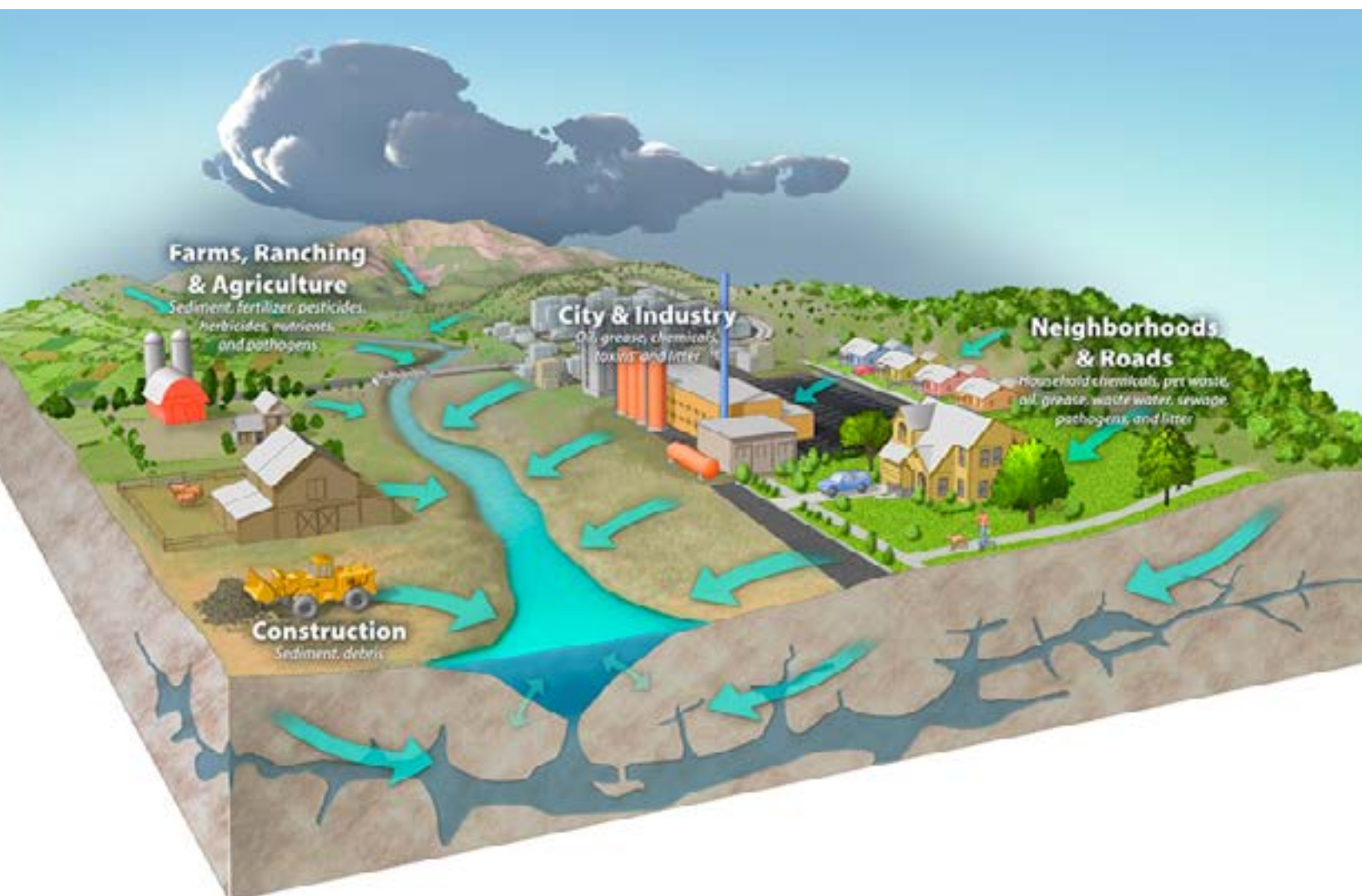


Figure 2: Sources of NPS Pollution in a Watershed

Table 1 shows some of the ways point source discharges and nonpoint sources of water pollution are different from each other.

Point Sources versus Non Point Sources	
Where does it Occur?	
Point sources come from a single discharge point (e.g. pipe).	Nonpoint source water pollution comes from multiple places distributed throughout the landscape, watershed, basin, etc.

How do you Control/Manage It?		
Point source A single, regulated source of water discharge, generally covered by a state or federal water quality discharge permit.	VS	Nonpoint source Multiple, unregulated sources of pollution, generally addressed through voluntary actions to control nonpoint source water pollution.
How Often Does it Happen? How Long Does it Last?		
Point source discharges typically occur all the time from one source, although there might be some daily or seasonal variability.	VS	Nonpoint source water pollution typically occurs only during, and immediately following, storm events when rainfall runs off the land carrying pollutants into the adjacent waterbody.
How Do You Prevent It?		
Point sources can be controlled by taking action through one entity (e.g. an industrial or domestic wastewater plant).	VS	Nonpoint source actions typically need to be taken by multiple entities (e.g., Individuals, landowners, local government) for multiple sources to control nonpoint source water.

Table 1: Comparison of Point vs. Nonpoint Sources.

The Mississippi Nonpoint Source Management Program addresses nonpoint sources of water pollution. Examples of nonpoint source water pollution identified in Mississippi that contribute to water quality issues are listed in Table 2. The most common nonpoint source pollutants in Mississippi are sediment (soil), nutrients (phosphorus and nitrogen), and bacteria (E. coli).

Agriculture Non-irrigated Crop Production Irrigated Crop Production Specialty Crop Production Pastureland Rangeland Aquaculture Animal Holding/Management Area Manure Lagoons	Urban Runoff Unpermitted Stormwater Runoff
Forestry Harvest Restoration Residue Management Forest Management Logging Roads Construction and Maintenance	Land disposal Onsite Wastewater Systems (Septic Tanks)
Construction Highway/Road/Bridge Construction Land Development	Mining Abandoned Mine Drainage
	Hydro-modification/Habitat Modification Flow Regulation/Modification Removal of Riparian Vegetation Streambank/Shoreline Modification/Erosion
	Other Atmospheric Deposition Highway Maintenance and Runoff Spills Contaminated Sediments Recreation Activities Upstream Impoundments Marinas/boating maintenance and fuel

Table 2: Major Categories and Subcategories of Nonpoint Sources of Water Pollution in Mississippi.

Why Do We Have a Mississippi NPS Pollution Management Program Plan?

Historically, people thought the vast resources of the United States would always be capable of supporting human society and did not need to be protected from human influences to remain useable. That turned out not to be true. By the 1960s, water resources in the United States were in bad shape. There was extensive pollution in the nation's waters that resulted in massive algae blooms and fish kills; and situations where sewage was discharged directly into streams and rivers. There was even an instance where a river caught fire.

In 1972, in recognition of the need to address water pollution concerns nationwide, the Clean Water Act was passed. One of the most successful programs established by this Act is the National Pollutant Discharge Elimination Program (NPDES). The NPDES is a system of regulations to control how much pollution is discharged to surface waters from point sources. As a result of the regulations implemented through the NPDES program, many of the direct point source issues affecting water quality were addressed.

As the pollution from point sources was reduced and water quality improvements were achieved, there were still pollution concerns

●
A Nonpoint Source
Management
Program is needed
to help manage
impacts to water
quality from causes
other than point
sources.
●

that needed to be addressed. There were still fish kills, and harmful algal blooms, and fecal coliform bacteria at beaches that made it unsafe to swim. Not all these problems could be traced back to point sources of water pollution. The conclusion was that nonpoint sources of pollution were also

impacting water quality. To have good quality water resources that are safe and healthy for people and wildlife, more needed to be done to control nonpoint sources of water pollution.

In 1987, Section 319 amendments were made to the Clean Water Act that established the national Nonpoint Source Pollution Management Program. Under Clean Water Act Section 319, states, territories, and tribes are required to develop programs to help abate nonpoint sources of pollution to surface and ground water. The Mississippi Nonpoint Source Pollution Management Program is thus required by federal law (Clean Water Act Section 319). Since the inception of the Program, Mississippi has been implementing a proactive approach that relies on collaborative efforts that focus on the development and implementation of strategies and tools to protect and restore our water resources. This involves focused research, widespread education, conservation implementation, and leveraged cooperation with partners and the public.

Clean Water Act Section 319 also authorizes the US Environmental Protection Agency to issue federal cost-share grant money to states, territories and tribes. This federal grant money can be used for a wide variety of activities that directly or indirectly control nonpoint source pollution. To remain eligible to receive this federal grant money, states are required to submit updated Plans to the US Environmental Protection Agency for approval at least every five years. This Plan, as an update of the 2014 Plan, fulfills this requirement. In 2013, EPA issued revised guidelines for Section 319 grant programs (USEPA, 2013). Within this guidance, EPA stated management plans should "...identify strategic priorities, develop goals and milestones, and work more effectively to address the evolving state of their (state) waters and engage partners to address statewide NPS priorities..." (USEPA, 2013). Furthermore, the updated guidance issued by EPA defined 8 key components that should be included in an effective NPS Pollution Management Program. Table 3 provides a list of these components and identifies where each of these components have been addressed in the MS NPS Management Plan.

EPA Element Number	NPS Pollution Management Program Key Program Element as Required per EPA Guidance	Location in Mississippi 2019 Plan
1	The state program contains explicit short- and long-term goals, objectives, and strategies to restore and protect surface water and ground water, as appropriate.	Chapter 2 (long-term goals) and Appendix A (short-term goals)
2	The state strengthens its working partnerships and linkages to appropriate state, interstate, tribal, regional, and local entities (including conservation districts), private sector groups, citizen groups, and federal agencies.	Chapter 4 and Chapter 6: Elements 2-4.
3	The state uses a combination of statewide programs and on-the-ground projects to achieve water quality benefits/ efforts are ell-integrated with other relevant state and federal programs.	Chapter 3, Chapter 4, Chapter 5, Chapter 6.
4	The state program describes how resources will be allocated between abating water quality impairments from NPS pollution and protecting high quality waters from significant threats caused by present and future NPS impacts.	Chapter 3, Chapter 5: Water Quality Standards, Chapter 6: Elements 2-4
5	The state program identifies priority waters impaired by NPS pollution for restoration as well as priority unimpaired waters for protection. The state establishes a process to assign priority and to progressively address identified watersheds by conducting more detailed watershed assessments, developing watershed-based plans, and implementing the plans.	Chapter 3, Chapter 5, Chapter 6: Elements 3-5.
6	The state implements all program components required by Section 319(b) of the Clean Water Act and establishes strategic and adaptive management approaches to achieve and maintain WQS as expeditiously as practicable. The state reviews and upgrades program components as appropriate. State program includes a mix of regulatory, non-regulatory, financial and technical assistance as needed.	Chapter 1: Table 2, Chapter 2, Chapter 3, Chapter 6
7	The state manages and implements its NPS management program efficiently and effectively, including necessary financial management.	Chapter 2, Chapter 3, Chapter 6: Element 1
8	The state reviews and evaluates its NPS management program using environmental and functional measures of success and revises its NPS management program at least every five years.	Appendix A

Table 3: Key Elements of an Effective State NPS Pollution Management Program

Nonpoint Source Pollution Management in Mississippi

NPS pollution management is fundamentally a social process, because human activities contribute to, and can control, NPS water pollution. NPS water pollution is managed primarily through the voluntary actions of people. The Mississippi NPS Pollution Management Program

- Strives to show how more success can be achieved through voluntary cooperation than regulation and
- Endeavors to show people the multiple economic, social, and environmental benefits they can realize from participating in managing NPS water pollution.

The legal and statutory authority and responsibility for the Mississippi NPS Pollution Management Program resides with MDEQ, but all Mississippi residents and visitors, purposely or unwittingly, are involved in NPS pollution management. NPS water pollution, unlike point sources, is managed primarily through the voluntary actions of people.

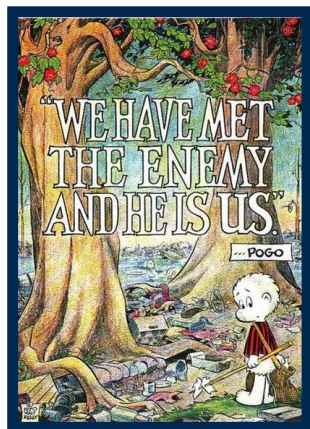


Figure 3: Walt Kelly 1972 Earth Day Cartoon - Pogo

is as true today as it was then, “We have met the enemy and (s)he is us.”

About this Plan

This 2019 Plan update is organized differently than the 2014 Plan. The revised organization better reflects MDEQ’s approach to addressing water quality impacts caused by nonpoint sources of pollution through the Mississippi Nonpoint Source Pollution Management Program. In implementing and managing the Mississippi Nonpoint Source Pollution Management Program, MDEQ considers

the program to consist of the following 5 core components: Element 1: Program Administration, Element 2: Program Implementation, Element 3: Planning, Element 4: Project Implementation, and Element 5: Project Implementation Support. In this 2019 Plan document, much of the discussion of the Mississippi Nonpoint Source Pollution Management Program is organized to address:

- How the program works through partnerships, collaboration and leveraging to mitigate NPS pollution and achieve the goals of MS’s NPS Pollution Management Program;
- How the program uses Mississippi’s Water Management Process as a foundation for watershed and water quality management decisions; and
- How the 5 core program elements are used in the management and implementation of Mississippi’s NPS Pollution Management Program.

As this 2019 Plan serves as an update to Mississippi’s approved 2014 NPS Management Program Plan (MDEQ, 2014), there is some information in the 2014 plan that remains accurate and did not need to be revised or updated as part of this effort. This information will be used to guide the Mississippi NPS Pollution Management Program over the next five years and will continue to inform how Mississippi guides the use of Clean Water Act Section 319 funds. The following sections of the 2014 Plan remain unchanged and are applicable to the Mississippi NPS Pollution Management Program:

- Chapter 1: Section 1.4: Legal Authority
- Chapter 2: Section 2.2.1: Climate and Topography
- Chapter 2: Section 2.3: Land Ownership
- Chapter 3: Section 3.4.5: Federal Consistency
- Chapter 5: Section 5.14: Source Water Protection
- Chapter 6: Nonpoint Source Enforceable Mechanisms and Policies
- Appendix B: Legal Opinions

If there are updates to these Sections and Appendices, those changes will be made during MDEQ’s annual review of its NPS Pollution Management Program, and noted in the Mississippi NPS Program Annual Report.

Who Can I Contact About the Mississippi NPS Management Program?

Chapters 49-2 and 49-17 of the Mississippi Code identify MDEQ as the lead agency in Mississippi for water quality management. The mission of MDEQ is to safeguard the health, safety and welfare of present and future generations of Mississippians by conserving and improving our environment and fostering wise economic growth through focused research and responsible regulation. The Office of Pollution Control within MDEQ is responsible for programs related to water quality, including the Nonpoint Source Pollution Management Program.

MDEQ welcomes and encourages your participation in, and comments on, the Mississippi Nonpoint Source Pollution Management Program. If you are interested in nonpoint source pollution management in Mississippi, please contact the Basin Management and Nonpoint Source Branch of the Surface Water Division of the MDEQ's Office of Pollution Control at P.O. Box 2261, Jackson, MS 39225, or by phone at 601-961-5171.



CHAPTER TWO

Mississippi NPS Pollution Management Program Overview





Introduction

In Mississippi, like elsewhere in the country, we are facing serious challenges to sustaining the quantity and quality of our groundwater and surface water resources for beneficial uses, such as drinking water supply, commercial and recreational fin and shellfish fishing, and swimming. Although Mississippi is blessed with an abundance of water resources, the demands of communities, agriculture, and industry on those water resources continues to increase. At the same time, water quality is being impacted in some areas by point source and nonpoint source (NPS) pollution from these same communities, industries, and agriculture. As a result, beneficial uses of some water resources are no longer supported. The Mississippi NPS Pollution Management Program (NPS Program) addresses challenges to sustaining beneficial uses of Mississippi water resources that are caused by NPS pollution.

Mississippi NPS Program Vision and Goals

As noted in Chapter 1, the Mission of MDEQ is to safeguard the health, safety and welfare of present and future generations of Mississippians by conserving and improving our environment and fostering wise economic growth through focused research and responsible regulation. The vision and long-term goals of the Mississippi NPS Program flow from this mission.

The **Vision** of the Mississippi NPS Program is to **ensure safe, clean, healthy, and sustainable water resources to meet the needs and uses of present and future generations of Mississippians.**

Three long-term goals help ensure this vision is achieved:

1. Protect and improve the quality of Mississippi water resources for human uses;
2. Achieve water quality improvements through mitigation of NPS pollution; and
3. Foster wise economic growth through focused research, responsible regulation, widespread education, and collaborative efforts through partnerships.

These long-term goals reflect a 20-year planning horizon. Managing NPS pollution requires a long-term perspective. In part, this is because improving water quality for human uses takes time. The time it takes to see measurable success following the implementation of NPS pollution management practices can range from years to decades (Meals, Dressing, & Davenport, 2009). However, simply because improvements aren't observed quickly doesn't mean they aren't occurring. NPS pollution is largely driven by rainfall, which is notoriously variable. As a result, it can take several years, to decades, to clearly see water quality improvement resulting from control of NPS pollution.

Unpacking Long-term Goals 1 and 2

Human uses of Mississippi water resources include not only drinking water, and water supply for agricultural and industrial uses, but also the support of finfish, shellfish, and wildlife; water-based recreation; and the aesthetic value of water resources. Specific beneficial uses of water resources are designated in the federal and Mississippi water quality standards (Table 4). These are the water resource uses that the Mississippi NPS Program supports and protects.

Mississippi Use Classification	Associated Federal Designated Use
Public Water Supply	Drinking Water Supply
Recreation	Primary Contact Recreation
Fish and Wildlife	Aquatic Life Use Fish Consumption Secondary Contact Recreation
Shellfish Harvesting	Shellfish Consumption
For more information see Mississippi water quality standards (MDEQ, 2019)	

Table 4: Designated uses in federal and Mississippi water quality standards.

For some waterbodies, NPS pollution impacts water quality so these desired uses are not supported and aren't being attained. The objective for those waterbodies is to reduce NPS pollution so these uses are supported. Where water quality is good enough to support desired uses, the objective is to protect these waterbodies from NPS pollution. In general, it is easier and less expensive to prevent good water quality from becoming worse, than it is to improve poor water quality.

Unpacking Long-term Goal 3

Economic growth is usually measured in dollars. Good quality water resources contribute to Mississippi's economic growth, but not always in ways that are easily measured in dollars. Over the past 15 to 20 years, economists have worked to develop approaches to estimate, in dollars, the economic value of more of the services water resources provide to human society. Wise economic growth means the full value of all the services water resources provide are considered when making decisions about development and economic growth that affect water resources.

Wise economic growth is fostered through responsible use of regulations. Effective management of Mississippi water resources requires management of both point and nonpoint sources of pollution, using both regulatory and voluntary

approaches. Responsible regulation means understanding that regulations are not the only tool for managing water quality, and that they are not always the most effective tool. NPS pollution management includes state and federal regulation of some nonpoint sources of pollution, but this occurs separate from the Mississippi NPS Program. The Mississippi NPS Program focuses on locally led, voluntary management of NPS pollution, as a complement to state and federal regulations. Local communities can pass local regulations, such as zoning laws, as a tool for local NPS pollution management.

The Mississippi NPS Program supports research on a variety of topics related to water resources and management of NPS pollution. Research improves our ability to manage water resources to ensure Mississippi will have the quality water it needs to support the current economy, and future economic growth. Research also provides information that can be used to educate Mississippi residents and visitors about NPS pollution and how to effectively control it.

Managing NPS pollution doesn't cost dollars, it saves dollars.

Because the Mississippi NPS Program focuses on voluntary management of NPS pollution, outreach and education are vital tools of the program. The Mississippi NPS Program

•
The Mississippi NPS program is based on locally led, voluntary activities.
•

uses education and outreach to make people aware of, and knowledgeable about, the value of Mississippi water resources, and how to improve and protect these resources. The intent is that this awareness and knowledge will foster and enable voluntary management of NPS pollution.

Collaboration is an integral part of the Mississippi NPS Program. There are multiple agencies, organizations, and institutions involved in water resources management in Mississippi along with MDEQ. As noted in Chapter 1, all Mississippi residents, businesses, communities, and visitors are involved in NPS pollution management, whether or not they are aware of it. Therefore, the most effective way for MDEQ to manage NPS pollution is by collaborating with other agencies, organizations, institutions, businesses, communities, and individuals.

Overview of the Approach for Implementing the Mississippi NPS Program

The Mississippi NPS Program is implemented to achieve its purpose and long-term goals using both statewide and targeted watershed approaches. These approaches are

•
A Stakeholder is a person (or community) who is affected by the work of the NPS Program, has influence over the work done in the program, and has a vested interest in the successful outcome of program implementation.
•

implemented through both regulatory and non-regulatory programs on the federal, state, and local levels. The implementation of most of the Mississippi NPS Program activities relies primarily on the voluntary cooperation of stakeholders and is supported financially through federal assistance programs (such as Section 319) and available state resources. The approach for addressing NPS pollution on a statewide level includes education and outreach, monitoring

and assessment, planning activities, consensus building, and partnering. At the watershed level, implementing the Mississippi NPS Program includes watershed-based plans, demonstrations of practices to control NPS pollution, inspection of NPS pollution control practices, and technology transfer, as well as local consensus building and partnering.

Summary of Changes in the Mississippi NPS Program Since the 2014 Plan

In the five years since the 2014 Plan was submitted to EPA, MDEQ has continued to refine and improve the procedures and tools of the Mississippi NPS Program. Below is a summary of the changes during that time period.

MDEQ Organization

There have been several changes in the organization of MDEQ since 2014. As an example, in 2016, the Basin Management Branch and NPS Branch of the MDEQ Surface Water Division were combined so that there is one manager over both programs. References in this 2019 Plan to Offices, Divisions, etc. within MDEQ reflect the agency organization as of October 2019.

Use of Tracking and Reporting Categories

In 2016, MDEQ began organizing administrative tracking and reporting of Mississippi NPS Program activities into the core program components noted in Chapter 1:

- Element 1: Program Administration,
- Element 2: Program Implementation,
- Element 3: Planning,
- Element 4: Project Implementation, and
- Element 5: Project Implementation Support.

Planning Tools

The geographic information system (GIS) based computer model used in ranking state watersheds (Mississippi Watershed Characterization and Reporting Tool {MWCRT}) has been updated to use more current data. It has also been revised to allow for scalability and regionalization. In addition, an online web enabled application has been developed to assist basin teams in the watershed prioritization process. This Basin Management Planning web application is used by our partners to review and provide feedback on priority watersheds.

Awareness, Education, and Outreach Programs

Awareness, education, and outreach are the cornerstones of NPS pollution management. They are critical tools for creating the voluntary changes in behavior necessary for reducing NPS pollution. The first critical step in managing NPS pollution is to make people aware of the issue, what they are losing through NPS pollution, and how their actions contribute to these losses. Awareness addresses the “So What” question for stakeholders and is key in motivating



Awareness, education,
and outreach are the
cornerstones of NPS
pollution management.

people to change their behavior by making them aware that change is in their best interest. Education is crucial for people to have the ability to change their behavior. Being motivated to change is the first step, but simply

leads to frustration if people don't know how they can change. Education provides the knowledge, skills, and ability for change to occur. Finally, implementing changes as part of NPS pollution management occurs through outreach – collaboration, partnerships, and cooperative efforts among people, whether through collaboration between agencies and institutions or interactions between neighbors. Awareness, outreach, and education are all essential for an effective NPS management program.

Some core awareness and education programs associated with the Mississippi NPS Program have changed over the last five years. These changes will be maintained over the next five years. For example:

- The Environmental Education and Outreach Mobile Classroom has been expanded by developing focused programs for grades K-2 and 3 that are in line with the Mississippi Department of Education Curriculum Standards. This allows for information to be presented in a more targeted fashion.
- The Mississippi NPS Program has expanded its support of water and NPS pollution education programs for teachers by participating in programs aimed at college students preparing to be teachers.
- The use of social media as a tool for awareness, education, and outreach related to NPS pollution is expanding.

Over the next five years, awareness, education, and outreach

efforts of the Mississippi NPS Program will continue to change. For example, as opportunities become available, MDEQ will partner with individual schools to make additional water and NPS pollution education programs available to children and youth. In addition, two areas are being emphasized in future efforts:

- Ecosystem services, and
- Overdetermining success.

Ecosystem Services

Benefits that humans receive from nature are called ecosystem services. Although this concept is not new (Marsh wrote about relationships between man and nature in 1864 (Marsh, 1865)), it became more firmly established through the 2005 Millennium Ecosystem Assessment (Millennium Ecosystem Assessment, 2005). The 2005 Millennium Ecosystem Assessment categorized ecosystem services as:

- Provisioning (food, fiber, other raw materials – in general, these are traded in the marketplace and have direct monetary value);
- Regulating (climate regulation, pollination, waste decomposition, detoxification, air purification, pest control);
- Supporting (nutrient cycling, soil formation, primary production, habitat); and
- Cultural (recreation, spiritual, aesthetic beauty, science, and education) (See Figure 4).

The provisioning services are goods, products, or services that have market value, such as timber, commercial fisheries, agricultural products, and biochemical extracts. Provisioning services of water resources include drinking water, and commercial fish and shellfish harvesting. For many economic growth and development analyses, only losses of provisioning services are considered for comparison with benefits that might be derived from converting natural areas to agriculture, housing developments, roads, or industrial sites.



Figure 4: Categories of ecosystem services and types of benefits provided “free” for use

Historically, the other services (regulating, cultural, supporting) of water resources and other ecosystems were difficult to value in monetary terms; yet, they are critical to our quality of life. In general, the benefits of these other categories of ecosystem services were:

1. completely unknown to many stakeholders and decision-makers;
2. assumed to be “free”, with no cost to the stakeholders if they were impaired or lost; or
3. not considered because they were assumed to have no monetary value for stakeholders.

While economists have had methods for valuing non-market services (e.g., regulating, or cultural ecosystem services) for several years, these methods have become better known since the 2005 Millennium Ecosystem Assessment. Some of these methods are listed in Table 5.

Market Place Method – value based on goods and services bought and sold in commercial markets	Productivity Method – value based on products or services that contribute to the production of commercially marketed goods
Hedonic Pricing Method – value based on services that directly affect market price of another good (e.g., streamside vs non streamside property)	Travel Cost Method – value associated with recreational, aesthetic, or spiritual activity or experience and the willingness of people to pay to travel to the site for that experience
Damage Cost Avoided/Replacement Cost Method – value based on cost of avoiding damages from lost services or cost of replacing services (e.g., drinking water treatment costs)	Contingent Valuation Method – value based on asking people their willingness to pay for specific goods or services based on scenario (most widely used method for estimating non-use values)
Contingent Choice Method – value based on asking people to make trade-offs among choices of services or characteristics. Does not ask for willingness to pay, but infers value from trade-offs	Benefit Transfer Method – value based on transferring existing benefit estimates to similar location, issue or use.

Table 5: Monetary valuation methods for market and non-market goods and services.

Numerous studies have been conducted over the past decade that quantify the value of various ecosystem services in monetary terms. In 2012, the Harte Institute at Texas A&M University-Corpus Christi developed GecoServ for the Gulf of Mexico Program and the Gulf of Mexico States, including Mississippi. GecoServ is a repository of studies that have estimated the monetary value of some of the services associated with Gulf Coast water resources (Plantier-Santos, Carollo, & Yoskowitz, 2012). GecoServ is one of several repositories that will provide information the Mississippi NPS Program will use in helping landowners and stakeholders understand the value of ecosystem services provided by Mississippi water resources. The US Environmental Protection Agency also has tools for assessing and valuing ecosystem services.

The adage, “If it doesn’t make money, it doesn’t make sense.” has a corollary: “You’re losing money if you’re not using ‘free’ ecosystem services.” The Mississippi NPS Program has started emphasizing the monetary losses experienced by landowners

and stakeholders when they don’t consider the value of ecosystem services in their management decisions (see **Cost of Soil Loss** text box). Several studies¹ have emphasized the need to identify loss rather than gain in encouraging people to change their beliefs and behaviors. People are naturally risk averse, and emphasizing loss is a much greater motivator for change than explaining what they may gain through making those changes. People see loss as occurring in the present and gains as occurring in the future. Losses can serve as an important motivator for change in programs that rely heavily on voluntary participation, like the Mississippi NPS Program. Understanding of losses associated with poor water quality can help nudge landowners and stakeholders toward implementing NPS pollution management practices. Thus, the Mississippi NPS Program will continue to emphasize loss to stakeholders in its NPS pollution management awareness, education, and outreach activities.

¹Ariely, D. 2008. Predictably Irrational: The Hidden Forces that Shape our Decisions. HarperCollins. New York.; Kahneman, D., and A. Tversky. (1979). Prospect theory: An analysis of decisions under risk. *Econometrica*, 47, 313-327.; Kahneman, D. 2012. Thinking Fast and Slow. Farrar, Straus and Giroux -Macmillian Publishers. New York.; Thaler, R. and C. Sunstein. 2008. Nudge: Improving Decisions About Health, Wealth, and Happiness. Penguin Books, New York.; Thaler, R. 2015. Misbehaving: The Making of Behavioral Economics. W.W. Norton & Company. New York.; and Tversky, A.,and D. Kahneman. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, 185, 1124-1131.

Table 6 lists six sources of influence that contribute to changing behavior (Grenny, Patterson, Maxfield, McMillan, & Switzler, 2013). These six sources can also be used in “overdetermining success” and they are as follows:

It is more likely voluntary change will occur when more of these sources of influence are used. To illustrate, the likelihood of success in reducing NPS pollution through voluntary change is increased significantly when people are:

- Aware of the personal benefits from implementing NPS pollution management practices;
- Educated so they have the personal ability and capacity to implement the practice or activity;
- Encouraged by their peers who have implemented the practices;
- Strengthened by the number of others who are also changing their management practices through outreach programs;
- Provided incentives through outreach programs – financial assistance, awards, and acknowledgments – for changing practices; and
- Placed in an environment where desired practices have been implemented.

Consider personal motivation. We know people can be motivated to change behavior when they are made aware of a direct personal benefit. NPS pollution awareness programs that emphasize the personal benefits of managing NPS pollution are using personal motivation to influence behavior. When using personal motivation, it is important to realize that, typically, people don't change until the pain of not changing becomes greater (on the order of two times greater) than the pain of changing. Another consideration of personal motivation is that we tend to overvalue what we have (endowment effect) and undervalue what we'll gain (loss aversion). One personal motivator is losing money. Making someone aware of the money they are losing as a result of how they currently manage NPS pollution, can help motivate a person to change how they manage NPS pollution.

However, if you don't have the ability to do something, personal motivation alone isn't enough to cause a change in behavior. Personal ability is a source of influence that complements personal motivation. NPS Pollution management educational programs can train people in the skills they need to implement management practices that reduce NPS pollution.

Peer pressure is considered to be the most powerful form of social motivation for changing behaviors. Innovators and opinion leaders can be powerful forces for change, because in many cases, the messenger is more important than the message. Community leaders who have implemented various management practices and have seen the benefits, are effective spokespeople in encouraging others to change

their practices. When people see leaders in the community using and benefiting from different management practices that control NPS pollution, change can occur more easily and quickly. People watch what other people are doing and follow when there is a clear benefit.

Fortunately, research has shown you only need between 15 and 16% of the population changing how they do things, such as manage NPS pollution, for the change to spread rapidly and become widely accepted (Rogers, 2003). This strength in numbers makes it easier for others to change. The more people are implementing NPS management practices, the more other people will also begin implementing these practices.

Structural forms of motivation include financial assistance, incentives, and awards. Cost-share programs have been widely used in NPS Programs and can be powerful motivators for implementing practices. Symbolic awards (e.g., Conservationist of the Year, Farm Family of the Year, Rotary Club Awards) can also be powerful motivators for changing behaviors with respect to NPS pollution management.

Finally, changing the physical environment through the adoption of NPS pollution management practices or



*Mississippi State University (MSU)
Extension Forage Field Day*

activities reinforces awareness of the practice and makes it visual. Outreach activities like field days at the site where NPS pollution management practices have been implemented can change the environment dramatically for individuals who aren't familiar with those practices. They now see it, feel it, and are in it; different environment.

Field days are especially effective for encouraging voluntary changes in behavior because they incorporate all six sources of influence in one activity. Farmers, producers, landowners, and other stakeholders are introduced to the personal benefits of implementing various management practices from someone who is doing it. They can ask questions to learn more about how these practices can be implemented (personal ability). People hear from an early adopter peer who is using the practice and they are surrounded by others

who are also interested (strength in numbers). They can learn about cost-share and other incentives that are available to those implementing the practice. Finally, they are in the environment where the management practice has been implemented so they can see exactly what was done. Follow-on awareness, education and outreach efforts can be used to reinforce the field day experience.

Awareness, education, and outreach are the cornerstones for overdetermining success in NPS pollution management by using multiple approaches simultaneously. These concepts and mechanisms are not new but put in this framework allows for a different way to measure program success. Making focused efforts to create goals, directed messaging, tools and incentives that allow the Mississippi NPS Program

target specific pollution sources and implementation measures will allow for multiple avenues to not only reach the public and stakeholders but also to test success rates of our tools. As the program moves forward, the feedback can be used to either deploy these tools on a broader scale or enhance them so they will be more useful in the future. Examples of influence matrices for selected NPS pollution management activities (e.g., integrated pasture management, urban stormwater management, unpaved roads management, etc.) in Mississippi are presented in Appendix C.



CHAPTER THREE

Mississippi Section 319 Grant Process





This chapter builds on the overview in Chapter 2 by describing how the Mississippi NPS Program works. Much of the work associated with the Mississippi NPS Program is related to management of Section 319 (hereafter referred to as “Section 319”) grant money. This chapter provides a summary of the process of obtaining, distributing, and tracking Section 319 grant funds through the Mississippi NPS Program. It is intended that this chapter will:

- Provide an overview of how the Mississippi NPS Program operates day to day,
- Highlight specific dates of importance to the Mississippi NPS Program and Section 319 grant process, and
- Help the public and MDEQ partners get a better understanding of how the Section 319 grant process works in Mississippi.

Throughout the Year

In any given year, the Mississippi NPS Program is actively managing multiple Section 319 grants. Within each of those grants, multiple projects and activities are funded as outlined in the respective grant workplan. Section 319 grant applications are due to EPA by September 30th of each year. When the grant application is submitted, the application must be accompanied by a narrative grant workplan. The grant workplan outlines how the grant funds will be spent. This workplan also provides references the Mississippi NPS Program 5 yr. Management Plan illustrating how the requested grant funds will be used to meet the

goals and milestones of the Mississippi NPS program. The timeframe to complete all activities described in the grant workplan is 5 years from the date of submittal of the grant application (September 30th). Typically, Section 319 grants are awarded 10-11 months after grant submission leaving approximately 4 years to complete the activities outlined in the grant workplans.

In any given year, the Basin Management and NPS Branch staff manage the work outlined in the five active Section 319 grant workplans. As part of this workload, time will be spent developing the documentation and reports needed to close out a grant that is at the end of its 5-year funding cycle. In addition, a new grant application (and work plan) is prepared and submitted every year. So, the annual workload also includes time and effort spent developing the information needed to generate the application and workplan for the upcoming grant cycle.

Section 319 grants and grant process are an integral part of the Mississippi NPS Program.

Figure 5 shows a timeline of the Mississippi NPS Program Section 319 activities that must be performed every year, with associated deadlines, to meet grant reporting commitments and deadlines. Because the §319 grant application and award process occurs within the timeframe of the federal fiscal year, October 1st – September 30th, the timeline presented below follows the federal fiscal year format. Information provided in the sections below will detail those activities that are ongoing in MS’s NPS Program and highlight specific

deadlines or reports that are of increased importance to the management and implementation of the program.

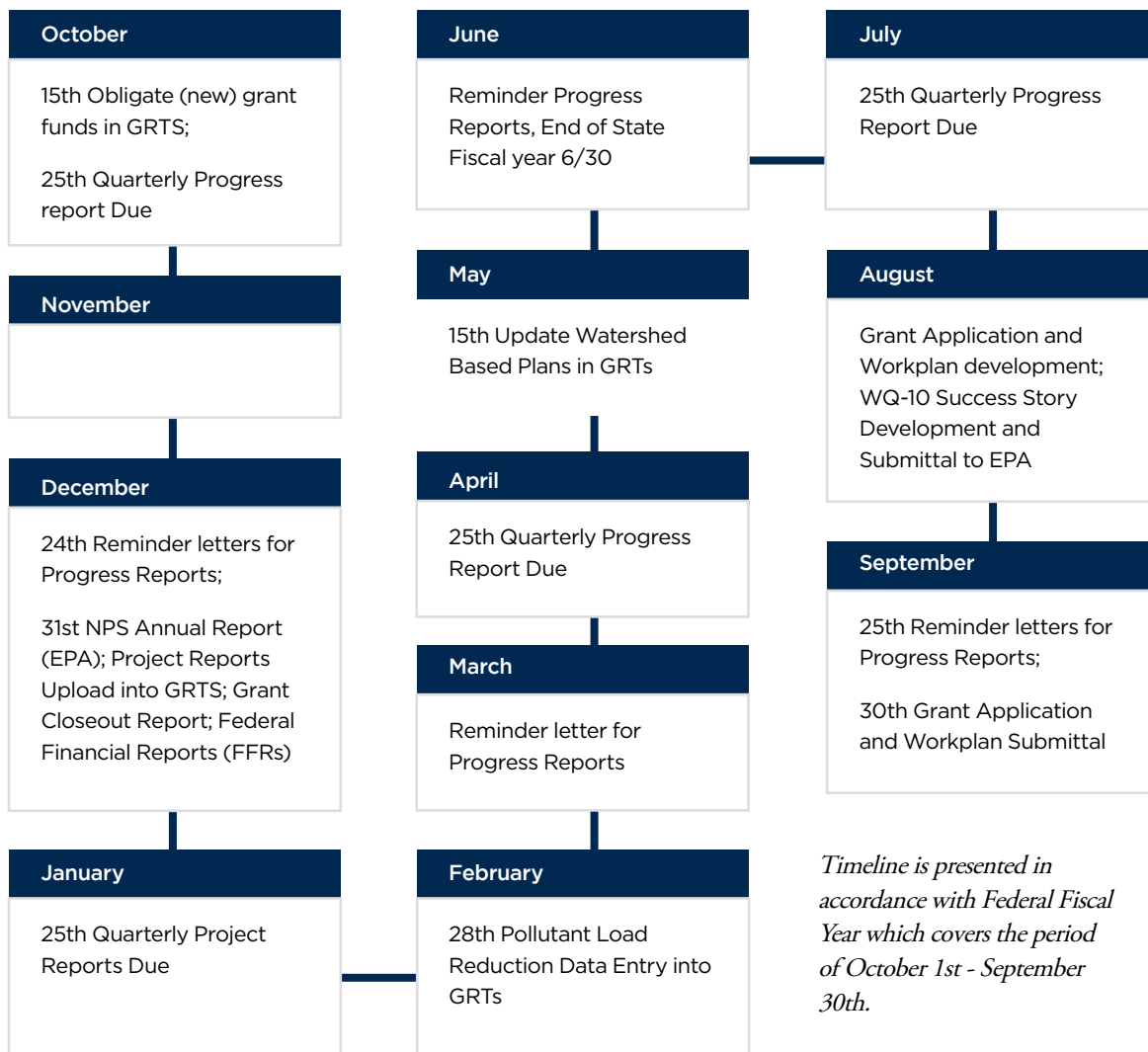


Figure 5: Important Dates and Deadlines for Mississippi NPS Program

How Projects and Other NPS Activities Get Funded

One of the most advantageous parts of working with Section 319 grant funds is the flexibility in which the funds can be used, as long as the outcome supports efforts to reduce NPS pollution. This allows funds to be used to pay for efforts that run the gamut from education projects targeting all different age groups and demographics; development of training manuals outlining best practices for mitigating and preventing categories of nonpoint source pollution; to on the ground implementation of NPS pollution control practices in watersheds to improve or protect water quality.

With all of the flexibility available under Section 319, there are a couple of requirements that must be met to use the funds:

1. While the grant is a federal award, it does require a 40% match. This means the grant award represents 60% of the total funding needed and the remaining 40% must be provided in the form of non-federal dollars, state funds, or in-kind services.
2. Section 319 funds can only be used to pay for activities or projects that are not required by federal regulation.

In 2013, EPA restructured how Section 319 grants could be managed and spent. Several key conditions were outlined by EPA for allocating Section 319 grant funds:

- Only 10% of the grant could be spent on program administration,
- Only 50% of the grant could be spent on implementing statewide program and planning activities (including administration),
- At least 50% of the grant funds are required to be spent implementing projects in watersheds,
- Grant funds can be spent on projects only in watersheds that;
 1. Have been identified as a priority watershed, and
 2. Have an accepted 9 Key Element watershed-based plan. The 9 Key Element Plan is designed to answer the 9 most important questions to address the water quality concerns watershed (see Figure 6).



Figure 6: EPA 9 Key Elements for Watershed Based Plans

At its core, the NPS Program is designed to be a non-regulatory mechanism to provide the opportunity to reduce NPS pollution through cooperation and partnerships. The Mississippi NPS Program is successful because of these partnerships. Without willing landowners, stakeholders, local partners, and cooperating state and federal organizations,

there would be no successes. In large part, it is through the efforts of cooperators that the Mississippi NPS Program implements the projects funded through Section 319 grants. Awareness, education, and outreach (utilizing concepts of ecosystem services and overdetermining success, discussed in Chapter 2) are vital for increasing the likelihood of success in NPS pollution management through cooperation and partnerships.

There are several ways to fund projects and NPS pollution management activities using MDEQ's Section 319 grant process. Many efforts, like the on-going work to support environmental education activities, are core components of the Mississippi NPS Program. Basin Management and NPS Branch staff work with NPS Program partners to develop annual workplans and budgets to support those activities.

Other activities or project ideas can be submitted to the Basin Management and NPS Branch for consideration for funding. Suggestions for NPS pollution management projects can be submitted to the Basin Management and NPS Branch at any time, but it is important to understand that, in order for a project to be funded, it must be included in the Mississippi NPS Program grant workplan that is submitted each year by September 30th. Basin Management and NPS Branch staff will work with partners to develop or refine project concepts, ideas, budgets and workplans. Proposals for NPS pollution management projects submitted to the Basin Management and NPS Branch should include the following:

- A description of the project,
- How the project will address NPS pollution,
- Project outcomes and milestones, and
- A proposed budget, along with a list of partners and available matching funds.

Most projects are submitted to the Mississippi NPS Program using contacts developed through the Basin Management Approach (BMA). In Mississippi, the Basin Management Approach is the process by which the NPS Program works with stakeholders, and partners to identify water quality concerns, prioritize implementation and restoration needs, and promote opportunities to leverage resources. The mission of the BMA is to foster stewardship of Mississippi's water resources through collaborative watershed planning, education, protection, and restoration initiatives. To accomplish this, nine of Mississippi's major river basins have been organized into four basin groups (Figure 7). Each basin group has a Basin Team comprised of representatives from state and federal agencies, non-governmental

organizations, Institutes of Higher Learning, and local organizations and stakeholders. Basin Teams provide the opportunity for multiple levels of government, non-profits, academic institutions, and local stakeholders to coordinate their efforts. Together, Basin Team members help identify water quality concerns, and prioritize watersheds for water quality restoration and protection activities. The BMA also encourages and provides the opportunity for Basin Team members to pool both technical and financial resources to address priority watersheds.

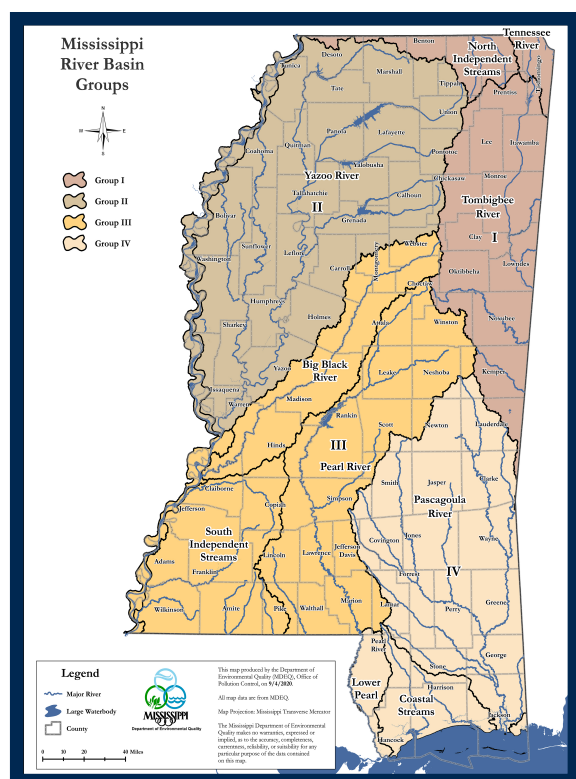


Figure 7: MS River Basins and Basin Groups

Much of the collaboration of Basin Team members occurs at regular Basin Team meetings. During Basin Team meetings, members work collaboratively on a number of very important activities. One of the most critical activities for the Mississippi NPS Program is the prioritization and selection of watersheds for development of watershed-based plans. Team meetings are also used as a forum to report out on:

- Project activities;
- Relevant basin scale work or research;
- Watershed working group assignments;
- Education and outreach activities;
- Opportunities to engage with project stakeholders;

- New project ideas; and
- New water resources priorities.

Project ideas are often a byproduct or outcome from the BMA. Project ideas can also result in other small group interactions where staff from the NPS Program participate. In selecting NPS pollution management projects, the Mississippi NPS Program uses a team focused approach to identify priorities.

Prioritizing Watersheds for Project Implementation

Mississippi's NPS Program works collaboratively with partners to target priority watersheds throughout the state. Prioritization of these watersheds involves coordination with Basin Team members, stakeholders, and resource agency partners as part of the BMA.

Over the years, the process used to prioritize and target watersheds for NPS pollution management has evolved. The focus of water resources management nationwide has moved to implementation and measuring success on smaller scales, mostly watersheds classified at the hydrologic unit code (HUC) 12 scale (i.e., 25,000 to 30,000 acres) or smaller. The Mississippi watershed prioritization process reflects this focus on a smaller scale planning framework. Instead of focusing on entire river basins or larger HUC 8 scales, prioritization and planning is now focused on these smaller HUC 12 watersheds.

In Mississippi there are 1,468 HUC 12 watersheds. To help manage the workload of selecting priority and targeted watersheds from 1,468 HUC 12 watersheds, the Mississippi NPS Program relies on partnerships established through the Basin Management Approach. Partners help first identify watersheds of interest for the state, and then work within our Basin Teams to recommend priority watersheds to target for NPS pollution management projects funded from Section 319 grant funds.

In order to fund watershed scale implementation projects using Section 319 dollars, the watershed must have been identified as a "priority" and listed in the Mississippi NPS Program Plan. Every 5 years, the Mississippi NPS Program works with state and federal resource agency partners, institutes of higher learning, non-profit governmental organizations, and local partners and stakeholders to develop a statewide list of watersheds of interest for water quality management. This list is reviewed annually and revised, based on partner interest, agency priorities, and leveraging opportunities, so it represents an inclusive list of watersheds that have priority status for implementation of NPS

What Is A Targeted Watershed

A Targeted Watershed is a drainage area (HUC 12) that has been identified as being a high priority for NPS pollution management activities to restore and/or protect water quality. Criteria for identifying Targeted Watersheds include the existence of: a NPS-related impairment (or identification of high priority waters that should be protected), local stakeholders who are interested in doing something to address the water quality concern, and the potential for partnerships with other local, state, and federal entities to implement projects.

pollution management projects. This final list is the starting point for all Basin Teams when the process of ranking watersheds begins. See Appendix B for a full list of priority watersheds identified by MS's NPS Program for FY20-24.

Each year, two to four priority watersheds are targeted for implementation activities in the Section 319 grant application workplan. Basin Teams assist with selection of these targeted watersheds. As a first step in the annual selection process for targeted watersheds, the list of priority watersheds is reviewed and revised, based on partner interest, agency priorities, and leveraging opportunities, so it represents an inclusive list of watersheds that are of interest for implementation of NPS pollution management projects for the next year. This updated list of priority watersheds is the starting point for the process of targeting priority watersheds.

The Mississippi NPS Program uses as much available information as possible when working with the Basin Teams and interested stakeholders to rank and prioritize watersheds for NPS pollution management projects. To help with program planning, and to inform the watershed prioritization process, Mississippi's NPS Program developed the Mississippi Watershed Characterization and Ranking Tool (MWCRT). This is a geographical information system (GIS) based tool populated with spatial data that can be displayed on an interactive map. This tool is used to support planning efforts and prioritize watersheds for restoration and protection activities (Figure 8). The MWCRT uses data sets that represent both environmental resources that should be protected (e.g. recreation, water supply, blue ways) and environmental stressors that represent or contribute to degraded water quality (e.g. impaired waters, erosion potential, impervious surfaces). Using the flexibility available within the tool, environmental resources and stressors can be weighted based on their importance in a given geographic region. This

means, in a very rural area, paved roads and other impervious surfaces could be given less weight as an environmental stressor as it is less likely these sources would be causing degraded water quality in rural areas. Conversely, in urban areas, roadways and impervious surfaces could be weighted higher as a potential stressor. The MWCRT ranks watersheds at the HUC 12 scale and can be used to rank watersheds statewide (e.g. 1-1,468), within a basin group, within a given river basin (e.g. Pascagoula River Basin), a HUC 8 drainage, or even within a HUC 10.

How MWCRT Works

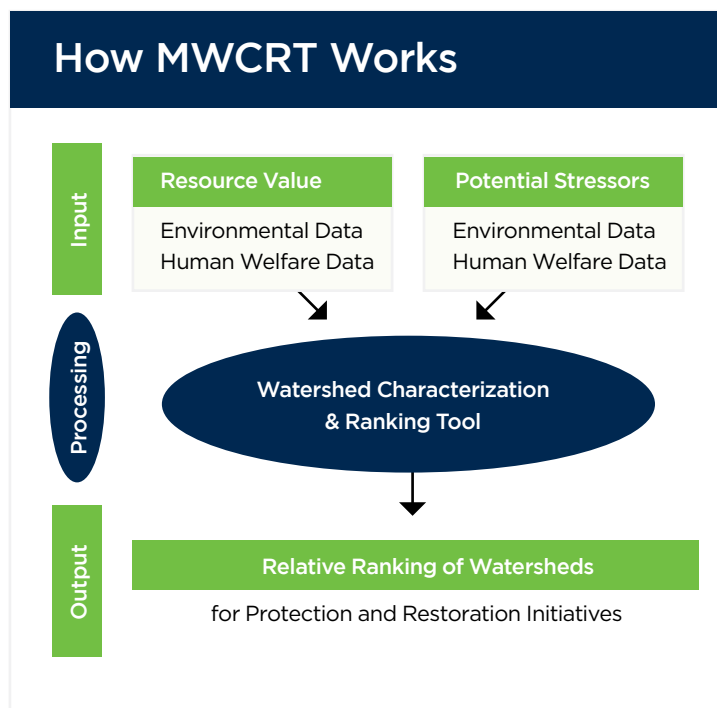


Figure 8: MS Watershed Characterization & Ranking Tool

To identify watersheds where Basin Teams would like to propose projects to be included in the workplan for a Section 319 grant, MWCRT is used to rank the priority watersheds within each basin according to highest potential restoration or protection need. The members of each Basin Team are then provided a list from MWCRT of the top 25

highest ranked priority watersheds in their basin group. The MWCRT ranks the priority watersheds that were identified statewide and any additions to the list that were included at the request of partners. This data set is then broken out by basin group and each priority watershed is ranked (against the others in the basin group) according to highest potential restoration (or protection) need.

In order to facilitate more active feedback and review, the results of the MWCRT ranking by basin group is then loaded into a web-enabled map application (Figure 9). Along with the ranked watersheds, the map application is loaded with additional data layers to help inform Basin Team members as they review the MWCRT ranks (e.g., impaired waters, locations of monitoring stations). The application also allows users to add supplemental data layers from their local computers/organizations to inform the selection process. This allows partners to use additional spatial data and information owned and managed by their respective organizations to determine which watersheds represent the highest priority from their organization's perspective for NPS project implementation. Another benefit of using the

web application is that it can be shared with multiple representatives from each partnering organization, ensuring that a broader audience has the opportunity to participate in targeting watersheds.

Once the information is provided to the Basin Team members and interested stakeholders, the Mississippi NPS Program requests each team member to identify 5 watersheds that represent their highest priority for NPS pollution management activities. Team members are given 3-4 weeks to review the information provided, consult with others in their organizations, and then respond to an online survey that is sent out to the Basin Team members where they are asked to identify their top 5 priority watersheds. The results of the survey are compiled and used to identify 3 priority watersheds in each basin group ranked highest for protection or restoration by Basin Team members for project implementation. From this list, each Basin Team selects one priority watershed within their basin group to recommend as a targeted watershed for NPS pollution projects. Watershed Implementation Teams are then formed, and 9 Key Element watershed-based plans prepared for those targeted watersheds.

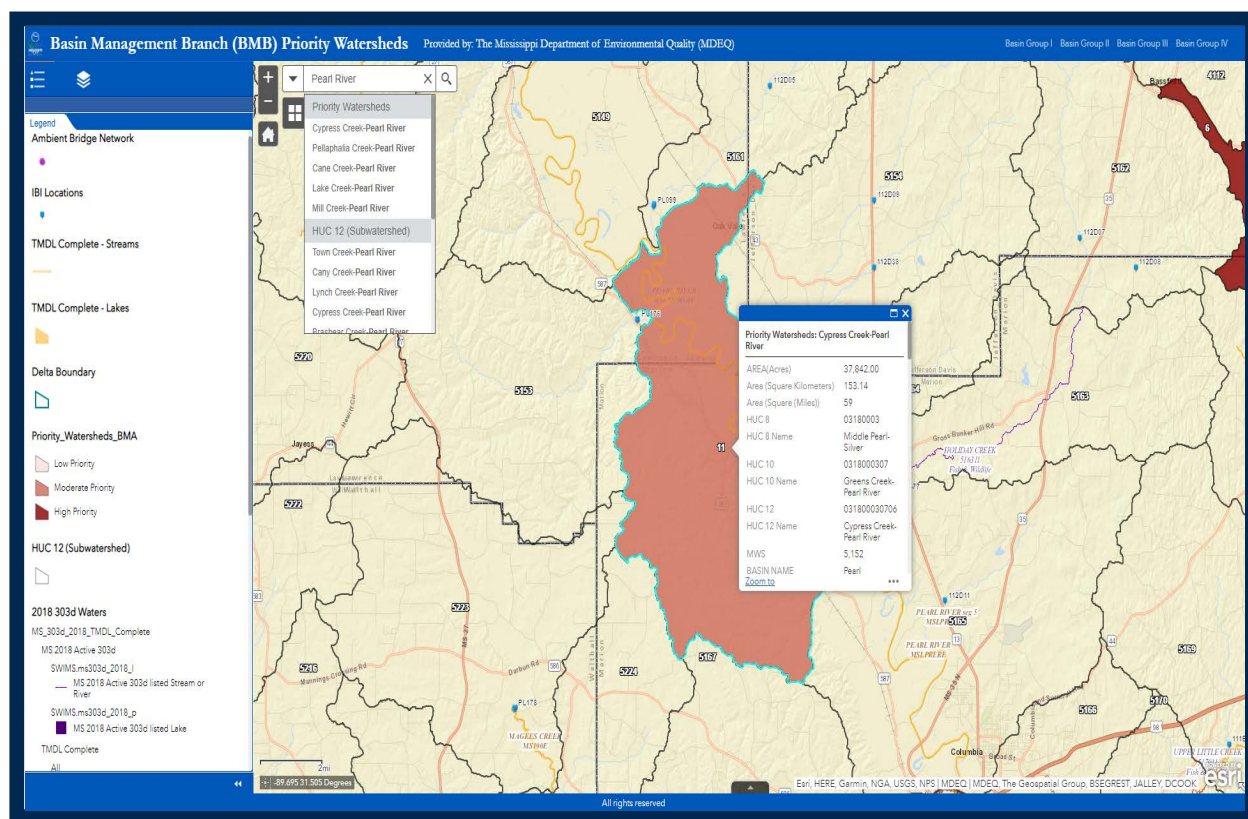


Figure 9: Basin Planning Application

Developing a Section 319 Grant Workplan

Each year, the state develops and submits a grant application to request funding from EPA to address nonpoint source pollution. The actual application is submitted to grants.gov using standardized forms required for all grants. In MS, the Section 319 grant is submitted as a standalone application and is not coupled with other Clean Water Act grant funding under “umbrella” grants, or performance partnership grants/agreements (PPGs/PPAs), as it is done in some states. With every grant application, a separate narrative workplan must be developed and submitted to EPA describing the work

The goal of every workplan is to reduce
NPS pollution and improve water quality

that will be completed using the grant funds. There are a few requirements the workplan must address in order to obtain approval from EPA and receive grant funds under Section 319 Including a description of:

- How the grant funds will be used;
- How the work proposed links back to the goals, milestones, and outcomes in the state’s NPS 5-year Management Plan;
- How (with sufficient details) funded activities address nonpoint source pollution;
- How the grant funding will be allocated to meet the requirements of 50% expenditures on program implementation and 50% on project implementation with only 10% of the grant being spent on overall administration.

In Mississippi, the NPS Program has organized grant workplans and funding breakdowns into 5 elements: (1) Program Administration, (2) Program Implementation, (3) Planning, (4) Project Implementation, and (5) Project Implementation Support. An overview of each element was provided in Chapter 2 and will be expanded in subsequent Chapters. The first 3 elements (Program Administration, Program Implementation, and Planning) in combination represent and fund what EPA guidance refers to as the “program implementation” activities of the grant. These work

elements and activities are:

- Larger in scope (not limited to a HUC 12 watershed),
- Often comprise statewide education and outreach activities,
- Support all program and watershed planning efforts,
- Fund staff time and program administration activities, and
- Provide for the development of nonpoint source related guidance, materials, handouts, etc.

The last two elements, Project Implementation and Project Implementation Support, represent (at minimum) 50% of the grant award and are focused on conservation practice demonstration projects at the watershed (HUC 12 or smaller) scale. Element 4, Project Implementation, is where funding is allocated for watershed project implementation. The funding needed to implement nonpoint source reduction practices, along with an education and outreach plan, is outlined in the approved 9 Key Element Plan for the watershed. The NPS Program works with resource agency partners like the Mississippi Soil and Water Conservation Commission (MSWCC) and Delta Farmers Advocating Resource Management (Delta F.A.R.M.) through sub-

MISSISSIPPI’S NONPOINT SOURCE POLLUTION CONTROL SECTION 319(h) GRANT PROGRAM WORK PLAN FOR GRANT YEAR 2020



grant agreements to implement the activities outlined in the watershed-based plans. These partners use the watershed-based plans to guide conservation practice implementation and education and outreach activities as projects are executed.

The majority of the funding set aside in element 5 (Project Implementation Support) is used for funding agreements

the NPS Program has with the USGS and NRCS for their support and technical assistance in watersheds with ongoing implementation projects. The NPS Program in Mississippi works closely with the USGS on shared research priorities. Many of these shared research priorities offer partnership opportunities to collect data in watersheds with ongoing implementation projects. Section 319 funds are used to support these efforts. The NPS Program also has an agreement in place with NRCS. This agreement promotes partnership and leveraging with NRCS national initiatives to implement Farm Bill conservation programs. It also ensures technical assistance is available from NRCS at the local level to support watershed implementation projects. Funds from

Implementing NPS pollution management practices and activities is the desired outcome.

element 5 help guarantee continued partnership and leveraging with NRCS while supporting the programs technical assistance needs for watershed implementation projects.

When developing the annual workplan, the NPS Program describes the activities that are proposed for funding upon receipt of the grant award. In order to receive funding for a project, the work must be part of the annual workplan and must be a covered activity (i.e. linked back to) under the approved NPS 5-yr management plan. For each watershed implementation project proposed for funding, a synopsis of the watershed and description of why it is proposed for funding is included in the workplan along with a total project budget. This project budget represents the amount of grant funding to be allocated to the project and is not inclusive of the matching funds (or in-kind) that is required under the grant. In Mississippi, the majority of the Section 319 funds flow through the program to partners in the form of sub-awards or sub-grant agreements. This allows the NPS Program to work with partners to complete the work outlined in the workplans. Included at the end of each workplan is a table that provides the total funding for each element including salary, personnel, travel, equipment, supplies, indirect, match, funds allocated as contractual dollars, and other. The other category is used to signify those funds earmarked for sub-awards to be used to develop agreements with partners to complete the work outlined in the workplan. The budget table is a summary of the funding information provided in the grant application. In order to facilitate the approval process by EPA, MS also includes

an up to date list and map of the priority watersheds as identified in the 5-yr Management Plan. This addition helps expedite the approval process by ensuring the watersheds included in element 4 have been identified as priorities as this is a requirement to receive funding.

Day to Day: Managing the Work

As mentioned earlier, managing the work of the NPS Program with five Section 319 grants ongoing continuously can be hectic. In order to improve efficiency and better align work tasks and personnel, NPS Program staff and Basin Management staff were merged into a single branch. This provided a more cohesive, team-based approach to managing the day to day workload of Mississippi's NPS Program. Within the Basin Management and Nonpoint Source Branch in MDEQ's Surface Water Division, the program and watershed planning functions are now merged under the same leadership, including:

- Education and outreach activities;
- Grant management, development, and oversight; and
- Implementation of projects funded using Section 319 grant awards.

In any given day, staff can spend time working with partners to:

- Develop budget and project workplans;
- Draft sub-grant agreements;
- Track invoices and processing payments for projects;
- Perform site visits and inspections in watersheds with ongoing projects;
- Track project progress;
- Meet with stakeholders and partners to collaborate on new or ongoing work;
- Participate in basin team meetings and watershed implementation team meetings;
- Develop project reports, annual reports, or watershed-based plans;
- Participate in education and outreach events;
- Work with partners on committees and working groups to address nonpoint source related issues; and
- Enter required data into EPA's Section 319 GRTS database.

These different functions can be grouped into 3 main categories: project management, planning, and outreach.

Project Management

All projects are assigned a primary and secondary project manager. This ensures appropriate staff resources are assigned to projects and optimizes opportunities for cross training among team members. Staff work in tandem to ensure project goals and milestones are completed within allowed timelines and budgets. This approach also ensures that partners can always contact a staff member who is knowledgeable and up to date on their project to address any issues that may arise. Project managers begin by working with partners to develop sub-grant agreements (or contracts) that define project goals, milestones, budget breakdowns, and any required matching funds. Once the agreements are in place, projects can begin. The project managers remain involved throughout the life of the project. Activities performed by project managers include:

- Site visits;
- Routine meetings with sub-grantees to ensure project remains on schedule and to provide any support needed from the program;
- Processing invoices for work completed;
- Working with partners to meet project reporting requirement;
- Maintaining up to date project budgets;
- Ensuring all costs and expenditures are fully documented and eligible expenses under the grant award; and
- Working with partners to complete project close out reports at the end of a project period.

Planning

Planning encompasses a broad set of activities under the grant. In the NPS Program, planning at the smallest spatial scale takes place in the form of developing 9 Key Element watershed-based plans to guide implementation activities at the HUC 12 watershed scale. Staff work within a watershed implementation team, or core group of watershed experts to answer the who, what, when, where, why, and how much questions associated with developing plans on how to address water quality concerns and restore (or protect) waters at a watershed scale. These watershed-based plans are required and must be approved before grant funds can be spent to implement NPS Program projects in targeted priority watersheds.

On a larger scale, planning efforts can span a wide range of activities; from devising plans on how to target watersheds to developing strategies to address different types of nonpoint



source pollution (e.g. Mississippi has developed both statewide and regional nutrient reduction strategies), to developing new approaches or assessment tools to measure success of conservation practice implementation. This 5-yr Management Plan Update represents another example of large-scale planning where goals and milestones are outlined for Mississippi's NPS Program in order to measure success and where new/updated statewide priority watersheds are identified. The flexibility allowed under planning is critical to the continued success of the NPS program in MS and others nationwide. It provides an opportunity to use funding to address those questions and needs that arise as the program evolves. New information on successful best management practice implementation approaches can be integrated into the Program seamlessly. This adaptive management approach is critical in keeping the NPS Program relevant into the future.

Outreach

Outreach activities are another core function staff dedicate time and resources to performing. Like planning, outreach activities also span a broad range of actions. Significant staff



resources are spent coordinating with other resource agency partners that have shared nonpoint source management goals and, in some cases, overlapping state or federal management authority to implement nonpoint source management programs. A key component to a successful NPS management program is coordination with other resource agencies and partners that have a shared goal to mitigate nonpoint source pollution. Where possible, this includes leveraging all available resources to achieve improvements to the environment by reducing the impacts from nonpoint sources of pollution. Staff from the Basin Management and Nonpoint Source Branch work tirelessly with partners at all levels, from locally led watershed teams to participation on national workgroups like the Gulf Hypoxia Task Force. Staff dedicate time and resources on the following:

- Building effective partnerships;
- Identifying shared priorities;
- Leveraging opportunities;
- Aligning implementation efforts;
- Supporting water management planning;
- Developing education and outreach campaigns and training; and
- Better telling the story of the benefits achieved through mitigating nonpoint source pollution.

Success can only be achieved through continuous and successful collaboration with partners from other state agencies, institutes of higher learning, non-profit organizations, federal resource agencies, and local stakeholders. By working collaboratively to identify shared goals in common areas (e.g. watersheds, target audiences, common environmental stressors (nutrients), etc.), and pooling resources (both technical and monetary), Mississippi will continue to see environmental improvements as a result of a successful NPS management program. Ensuring staff remain actively engaged in outreach activities with our partners reinforces Mississippi's commitment to success.



CHAPTER FOUR

Partnerships, Collaboration, and Leveraging





Mississippi's NPS Program is integral to the mission of protecting and restoring water quality in Mississippi. The success of this mission relies on an assortment of natural resource and water quality programs that act at all scales (regional, state, federal, interstate, tribal and local levels). These programs work together toward a common goal of environmental protection and improvement through an extensive network of partnerships. The Mississippi NPS Program and staff recognize that bringing people, priorities and resources together to address a common goal blends science and regulatory responsibilities with social and economic considerations. The Mississippi NPS Program utilizes a variety of partnerships to connect with diverse stakeholder groups to further its goals in Mississippi. Through collaboration, the Mississippi NPS Program

is integrated with other Clean Water Act (CWA) and natural resource programs. This reduces unnecessary duplication of effort and increases the opportunity for success of all of the programs involved. Given the resource limitations in Mississippi, and the nature of NPS pollution, MDEQ and its partners can accomplish more by leveraging resources through coordinated actions, than any one group can achieve going it alone. This is especially important as some sources of NPS water pollution are regulated by federal or state laws. These

regulations complement the work to promote voluntary management of NPS pollution through the Mississippi NPS Program. Some categories of NPS water pollution are regulated by MDEQ while others, like septic systems, are regulated by the Mississippi Department of Health. Through active and effective partnerships, the Mississippi NPS Program works collaboratively to manage NPS pollution. This is accomplished by leveraging the strengths and capabilities of all partners to achieve success.

Partners in the Mississippi NPS Program

As of December 2019, MDEQ has over 80 active partners working with the Mississippi NPS Program. This includes federal agencies, state agencies (Mississippi and

Alabama), non-governmental organizations, tribal partners, and institutions. Not included in this count are the many unaffiliated individuals who participate in the program. While some partners work with the Mississippi NPS Program long-term, and in multiple capacities, other partners come and go, or work with the program in a single capacity. A few partnerships have been formalized through written memorandum of agreements.

●

Effective NPS pollution management occurs through collaborative partnerships at all levels.

●

A complete list of agencies, non-governmental organizations, and institutions participating in the Mississippi NPS Program as of December 2019 is provided in the table below.

Partnerships with Federal Agencies	
• US Environmental Protection Agency • US Environmental Protection Agency Gulf of Mexico Program • US Geological Survey • US Department of Agriculture Natural Resources Conservation Service • US Department of Agriculture Agricultural Research Service • US Department of Agriculture Farm Service Agency • US Forest Service • National Park Service	• US Fish and Wildlife Service • US Army Corps of Engineers-Vicksburg, Mobile & Memphis Districts • US Army Corps of Engineers-Engineer Research and Development Center • Tennessee Valley Authority • Federal Emergency Management Agency • US Department of Transportation • National Oceanic and Oceanographic Administration • Federal Emergency Management Agency
Tribal Partners	
• Mississippi Band of Choctaw Indians	
Partnerships with State Agencies	
• MS Department of Health • MS Soil and Water Conservation Commission • MS Department of Transportation • MS Department of Agriculture and Commerce • MS Department of Wildlife, Fisheries, and Parks	• MS Department of Marine Resources • MS Emergency Management Agency • Mississippi Development Authority • Pearl River Valley Authority • MS Forestry Commission
Partnerships with Local Governments	
• County Supervisors • Mayors	• City Planners
Partnerships with National Level Nongovernmental Organizations and Institutions	
• National Audubon Society • Grand Bay National Estuarine Research Reserve • The Nature Conservancy	• Ducks Unlimited • Bass Unlimited • Keep America Beautiful

Partnerships with State Level Nongovernmental Organizations and Institutions	
• MS Farm Bureau Federation • Wildlife Mississippi • MS Rural Water Association • Strawberry Plains Audubon Center • MS Urban Forestry Council • Geological Survey of Alabama • MS Environmental Education Alliance • MS Wildlife Federation • Keep Mississippi Beautiful • Keep Jackson Beautiful	• Keep the Reservoir Beautiful • Pearl River Keeper • Mississippi Association of Conservation Districts • Pearl River Valley Water Supply District • Tombigbee River Valley Water Management District • Alabama/Tombigbee River Basin Clean Water Partnership • Alabama Department of Environmental Management
Partnerships with Local Nongovernmental Organizations and Institutions	
• Yazoo Mississippi Delta Joint Water Management District • Delta F.A.R.M. • Yazoo MS Delta Levee Board • MS Lower Delta Partnership • Delta Council	• Southern Agriculture • Resource Conservation and Development Councils • Land trusts • Watershed groups • Noxubee and Choctaw Wildlife Refuge
Partnerships with Regional Organizations and Interest Groups	
• Mississippi River/Gulf of Mexico Watershed Nutrient (Hypoxia) Task Force • Gulf of Mexico Alliance	• Gulf Coast Restoration Council
Partnerships with Academic Institutions	
• Mississippi State University • Cooperative Extension Service • Mississippi Water Resources Research Institute • University of Mississippi	• University of Southern Mississippi • Alcorn State University • Private and public schools
Partnerships with Museums	
• Mississippi Museum of Natural Science • Mississippi Children's Museum	• Mississippi Museum of Agriculture

Table 7: Mississippi NPS Program Partners

The Mississippi NPS Program is always looking for new partnership opportunities and new ways to work with existing partners. New partners are introduced to the program through different avenues but most often come about through outreach efforts of MDEQ and its current partners, participation in the Basin Management Approach, and participation of MDEQ staff on committees, task forces, and work groups that deal with subjects relevant to NPS pollution.

Partners contribute to the Mississippi NPS Program in a variety of ways. Some provide services, some provide funding, some provide information, and some contribute technical support in the form on knowledge transfer or implementation assistance. Partners contribute to all aspects of the Mississippi NPS Program, including administration of the program, knowledge transfer to and from the program, planning, implementation, and evaluation. Examples of active partnerships and collaborations with the Mississippi NPS Program are described below. As already mentioned, the program's partnerships are extensive. Because of that, examples were provided of some of the different partnerships between the program and collaborators (federal, state, institutions, and organizations). It is not possible to provide an exhaustive list in this Plan.

Partnerships with MDEQ Water Programs

Collaboration among programs internal to MDEQ, including the Mississippi NPS Program, is essential to accomplishing MDEQ's mission. To work efficiently and reduce redundancy, MDEQ is organized so that some services are grouped into a separate office or division that supports others in the agency. While the Mississippi NPS

Mission: To safeguard the health, safety, and welfare of present and future generations of Mississippians by conserving and improving our environment and fostering wise economic growth through focused research and responsible regulation.

Program works mostly with groups and landowners who want to participate in the program, much of the other work managed by MDEQ is regulatory in nature. There are areas where some sources of NPS pollution do fall within the regulatory authority of other programs managed by MDEQ and in some instances, by other agencies (e.g. septic systems are regulated by the Mississippi Department of Health). Some regulated nonpoint water pollution sources are readily apparent, such as runoff from mining tailings, and erosion from construction sites. Others may be less apparent. For example, air pollution regulations affect water pollution through atmospheric deposition (i.e., water pollutants either fall out of the air, or are dissolved in the rain that falls). Table 8 provides examples where established water programs within MDEQ have overlapping regulations that support the goals of the Mississippi NPS Program. Because of this, it is important the Mississippi NPS Program maintains communication and works collaboratively with these programs.

Regulated NPS of Water Pollution	MDEQ Division
Confined Animal Feeding Operations (CAFOs)	Environmental Permits
Stormwater runoff from developed areas and industrial sites	Environmental Permits
Mining	Environmental Permits
Landfills	Waste
Hazardous waste sites	Groundwater Assessment and Remediation
Underground storage tanks	Groundwater Assessment and Remediation
Atmospheric pollutants	Air

Table 8: Categories of NPS Pollution Regulated by MDEQ

Active collaboration within MDEQ makes it possible for the Mississippi NPS Program to have the services and resources necessary to efficiently meet its goals, while also contributing to achieving the goals of related MDEQ programs. In addition to the collaboration with the regulatory programs, the Mississippi NPS Program also depends on other divisions and groups within the agency that are set up to support MDEQ's mission. For example, the MDEQ Office of Administrative Services assists with grants management and financial reporting for the Mississippi NPS Program. Also, the Field Services Division provides monitoring, data analysis, and assessment support to the Mississippi NPS Program. Chapter 5 discusses other ways the water programs within MDEQ are used to implement the Mississippi NPS Program.

Partnerships with Federal Programs

The Mississippi NPS Program has a strong partnership with the USDA Natural Resources Conservation Service. Working with staff in the state NRCS office as well as those located in local county offices, NRCS provides input on watershed priorities, works with the program to implement USDA special initiatives, and uses Farm Bill funding to put conservation practices on the ground in Mississippi. Over the last 5 years, NRCS in Mississippi has been ranked number three in the nation for the amount of conservation dollars installed on the landscape. Not only does NRCS bring conservation funding to the table, they also have highly trained staff that support many needs of the program. These staff provide technical support to local offices, provide engineering designs to meet conservation needs, and work with local landowners to identify needs and help them understand how conservation can be a part of their working lands. The Mississippi NPS Program works actively with NRCS to leverage conservation dollars, technical support, and outreach to the agricultural community in Mississippi. Most often, the program works to coordinate conservation efforts that are implemented through the following USDA Programs: Environmental Quality Incentives Program (EQIP), Conservation Stewardship Program (CSP), National Water Quality Initiative (NWQI), and Mississippi River Basin Initiative (MRBI). By working together, concentrating activities in priority watersheds, and tracking changes in water resources, both the Mississippi NPS Program and NRCS are better able to show successes achieved from the conservation practices implemented.

Another successful collaboration the Mississippi NPS Program maintains is with the United States Geological Service (USGS). Through this partnership, the USGS and

the Mississippi NPS Program have identified shared research priorities. Working to address these shared priorities results in data collection and analysis in priority watersheds as well as expanding data analysis to cover a range of research questions. The USGS partnership helps the program to answer larger scale questions and look at the overall effectiveness of the program as a whole. These questions range in scope from how effective certain best management practices are to if there is a trend in water quality parameters that can show large scale improvements in NPS pollutants through time. Because the issues under investigation are shared priorities, both the Mississippi NPS Program and USGS leverage staff time and funding to investigate these priorities. As an additional benefit, the USGS uses the findings from the work and publishes the outcomes of the research. This provides a mechanism for the results to be accessed by a much larger audience and builds the repository of NPS related research available.

Partnerships with State Agencies

The Mississippi NPS Program is continually working with and through sister state agencies to broaden the scope of the program and reduce the impacts of NPS pollution. Some examples of our most effective partnerships are with the Mississippi Soil and Water Conservation Commission to implement best management practices in priority watersheds, the Mississippi Forestry Commission to implement the forestry water quality protection program, and the Department of Marine Resources to implement the management measures needed to meet the requirements of Section 6217 of the Coastal Zone Reauthorization Act.

The Mississippi Soil and Water Conservation Commission (MSWCC) represents one of the most productive partnerships within the Mississippi NPS Program. The MSWCC works with staff in county offices across the state to identify agricultural conservation needs, educate local landowners on the benefits of implementing best management practices on their lands, and develop watershed plans in priority watersheds. The MSWCC has a long-standing relationship with the agricultural community in Mississippi and through these established relationships, helps to identify priority watersheds and bring local stakeholders and land owners to the table to ensure projects are successful. The Mississippi NPS Program has routine meetings with the MSWCC and NRCS to facilitate continued communication, identify leveraging opportunities, and target coordinated implementation actions. Through these coordinated efforts, the agricultural community in Mississippi is working together to mitigate the impacts from NPS pollution.

Working with the Mississippi Forestry Commission (MFC), the Mississippi NPS Program leverages funding and staff time to implement a forestry water quality protection program. Through this program, the Mississippi Forestry Commission evaluates the implementation and use of voluntary Best Management Practices for forestry activities throughout the state and provides a report on those activities every 3 years. Tracking and reporting on the use of these voluntary practices on a continuous cycle is expected to increase use of the practices. In addition, the MFC works with other forestry-related groups in promoting water quality protection within the state by conducting educational workshops and distributing educational materials about forestry practices that protect water quality and how they reduce NPS pollution.

The Mississippi NPS Program works with the Mississippi Department of Marine Resources (MDMR) to address all of the NPS pollution management measures as required under Section 6217 of the Coastal Zone Reauthorization Act (CZARA). Under CZARA, MDEQ and MDMR work together to address coastal NPS pollution issues in the CZARA area. In Mississippi, that area is the majority of the 9 southern most counties. The water in these counties most directly impact coastal bays, bayous and estuaries. Currently, Mississippi's Coastal NPS Program, as defined under CZARA, is conditionally approved. Over the lifespan of this management plan, the Mississippi NPS Program will be working with MDMR to address the remaining management measures that must be approved by both the Environmental Protection Agency and the National Oceanic and Atmospheric Administration. These outstanding issues are: on-site disposal systems, construction stormwater (new construction and urban), and marinas.

Partnerships with Organizations and Institutions

All partnerships are vital to the success of the Mississippi NPS Program, but those partnerships that allow the program to gain access to local landowners and stakeholders who can implement conservation practices on their properties offer the best opportunities for success. Anytime the NPS program can work with an organization that has an established relationship with a stakeholder group and where the local community already trusts that organization; those are where the greatest impacts can be made. Some of the best examples of organizations that have built trust with their communities and members, and where the Mississippi NPS Program has seen tremendous success when working with them are: Delta Farmers Advocating Resource Management or Delta F.A.R.M, Land Trust for the Mississippi Coastal Plain

(LTMCP), and Mississippi State University (MSU).

Delta F.A.R.M. is an association whose membership is made up of agricultural producers and landowners in Northwest Mississippi who work to implement agricultural practices that will conserve, restore, and enhance the environment where they live. The Mississippi NPS program works with staff from Delta F.A.R.M. to identify priority watersheds, develop management strategies, address issues of concern to the agricultural community, and implement conservation measures that will reduce NPS pollution and improve water quality.

The Land Trust for the Mississippi Coastal Plain is an organization whose purpose is to “protect the six coastal counties’ natural lands, scenic areas, freshwater resources, and wildlife habitat.” Currently, the LTMCP is responsible for protecting over 8,800 acres on the Mississippi Gulf Coast and works to conserve, promote, and preserve the open spaces and green spaces in the coastal plain. The Mississippi NPS Program works with the LTMCP to implement conservation projects, build environmental stewardship, identify priority areas, and develop strategies and plans that work to address NPS pollution in coastal environments, especially in urban areas.

The Mississippi NPS Program works with Mississippi State University to implement the Mississippi Waste Pesticide Disposal Program. The primary goal of this program is to help Mississippi farmers and property owners minimize the environmental risks associated with the disposal of waste pesticide products by providing an option for disposing of such products in a safe and efficient manner. Waste pesticide collection and disposal events are targeted in areas with high concentration of agricultural production (Mississippi Delta region), and in priority watersheds.

Working Collaborations

NPS pollution affects, and is affected by, a wide range of environmental conditions, regulations, and policies. Research into a variety of subjects can improve management of NPS pollution. The MDEQ Surface Water Division Chief (SWD) and other SWD staff serve on a number of committees, task forces, and work groups that work to address water resource concerns at national, regional, and state levels. These groups deal with subjects relevant to the management of NPS pollution and maintaining an active presence on the committees, work groups, and task forces ensures effective collaboration between their work and the Mississippi NPS Program. Serving on these committees ensures input from MDEQ regarding NPS problems affecting state water resources and contributes to integration of the Mississippi NPS Program with relevant local, state, regional, and federal

programs. Participation in these committees, task forces, and work groups also allows for gathering and sharing information, approaches, and experiences that are relevant to the Mississippi NPS Program. Examples of these collaborations are listed in Table 9.

National Level Committees, Task Forces, and Work Groups	
• Association of Clean Water Administrators • American Council of Engineering Companies • Environmental Council of the States	• Environmental Law Institute • American Water Works Association • Coastal States Organization
Regional Level Committees, Task Forces, and Work Groups	
• Mississippi River/Gulf of Mexico Watershed Nutrient (Hypoxia) Task Force • Gulf of Mexico Alliance (GOMA)	• Natural Resource Damage Assessment (NRDA) • Gulf Coast Ecosystem Restoration Council
State Level Committees, Task Forces, and Work Groups	
• Mississippi Water Resources Research Institute (WRII) • Mississippi's Nutrient Technical Advisory Group (TAG) • Mississippi State University Biomass BMP Advisory Group • USDA Natural Resources Conservation Service (NRCS) Technical Committee • Mississippi Department of Health (MSDH) Drinking Water State Revolving Funds	• Mississippi Department of Health (MSDH) Wastewater Advisory Council • Mississippi Resource Conservation and Development (RC&D) Councils • Mississippi Urban Forestry Council (MUFC) • Mississippi Environmental Education Alliance (MEEA) • Mississippi Wildlife Federation (MWF) • Mississippi Adopt- A-Stream (AAS) Program • Mississippi Native Plant Society
Local Level Committees, Task Forces, and Work Groups	
• Mississippi Delta Sustainable Water Resources Task Force • Pascagoula River Basin Alliance • East Mississippi Foothills Land Trust (EMFLT) • Land Trust for the Mississippi Coastal Plain	• Wolf River Conservation Society • Keep the Reservoir Beautiful (KRB) • Barnett Reservoir Foundation • Bear Creek Watershed Initiative (BCWI)

Table 9: Mississippi NPS Program Collaborations

Partnerships and Planning

Collaborating with partners in planning improves implementation and overall effectiveness of the Mississippi NPS Program. Working with common goals in mind allows for planning that integrates complementary capabilities and resources from other programs. This approach helps cooperating programs and staff to work more effectively and efficiently to achieve NPS reduction goals. Planning together also supports coordination of activities from multiple programs to create synergy, resulting in a greater impact on the environment than could be achieved working separately.

Many planning activities of the Mississippi NPS program involve collaboration with program partners. Most opportunities for planning are facilitated through Mississippi's Basin Management Approach. The Basin Management Approach is the framework used by the Mississippi NPS Program to ensure that partners have a mechanism for communication and collaboration. This is also the mechanism by which partners help identify priority watersheds for the program. The Basin Management Approach is discussed in more detail in Chapter 6. Additional examples of collaboration in planning are described in Chapters 3 and 6, including:

- Collaboration of Basin Teams and other stakeholders in selecting NPS Program priority and targeted watersheds,
- Watershed Implementation Teams collaborating in the preparation of watershed-based plans for NPS Program targeted watersheds,
- Collaboration to develop strategies to address different categories of NPS pollution,
- Partners identifying NPS Program projects for the MDEQ Section 319 grant workplan, and

- MDEQ staff working with Mississippi NPS Program partners to develop NPS Program project concepts, ideas, and workplans.

Awareness, Education, and Outreach

Collaboration in NPS pollution awareness and education efforts makes it possible for the Mississippi NPS Program to reach a much wider audience than would be possible working alone. Many program partners have established relationships and interactions with segments of the Mississippi population. Working through these partners and their existing awareness, education, and outreach programs, the Mississippi NPS Program can efficiently promote NPS pollution management. Existing collaborations for NPS pollution awareness, education, and outreach involve MDEQ providing technical information or input, or using Section 319 subgrants to help support partner programs.

Collaboration among partners increases the breadth, depth, and effectiveness of NPS pollution awareness education and outreach efforts.

Project Highlight: Rezonate and the Pearl River Keeper

A showcase for successful collaboration and using effective education, outreach, and awareness campaigns can be found in the Ross Barnett Reservoir Watershed. The Ross Barnett Reservoir is the primary drinking water source for Mississippi's capital city Jackson. To protect this valuable resource, the Mississippi Department of Environmental Quality (MDEQ) and the Pearl River Valley Water Supply District (PRVWSD) worked together to develop the Ross Barnett Reservoir Initiative. Part of that was establishing community volunteer groups to improve and protect water quality in the Reservoir and its surrounding watershed. The education, outreach, and awareness campaign of this Initiative, is known as *Rezonate*!. The *Rezonate* campaign focuses on educating local stakeholders about the importance of good water quality in the Reservoir, its surrounding watershed, and what they can do to support clean and healthy water.

The *Rezonate* campaign has established goals and objectives for specific targeted audiences or citizen groups living and working within the Reservoir's drainage area and is a tool to educate the public about the six primary water quality

issues facing the Ross Barnett Reservoir: sediment, nutrients, pesticides, pathogens, invasive plant species and trash. To achieve the overall goals of the campaign, focus was placed on using coordinated efforts among interested stakeholders and groups who live in and around the Reservoir and use the water. These collaborative efforts promote positive relationships and offer opportunities to distribute information about *Rezonate* to broader audiences, and target water quality issues.

Through the *Rezonate* initiative, MDEQ partnered with and supported a unique citizen led action group known as the Pearl River Keeper (PRK). They are dedicated to improving the Reservoir and Pearl River Watershed through restoration, advocacy, and education. The PRK was established in 2017 and was the first of its kind in Mississippi. This group has conducted 4 annual Pearl River Clean Sweep volunteer cleanups deployed along the Pearl River Watershed from its headwaters in Nanih Waiya, Mississippi, downriver through the Ross Barnett Reservoir, along the border of Mississippi and Louisiana, all the way to Pearlinton on the Mississippi Gulf Coast. The Clean Sweep also includes locations on the Strong and Bogue Chitto River tributaries. As part of the 2017-19 Clean Sweep events, **more than 2,400 volunteers removed over 110,000 pounds of trash from the Pearl River and surrounding watershed!** Even amid the Covid-19 pandemic, the PRK was able to safely conduct a 2020 Clean Sweep event that produced 473 volunteers and removed 27,000 pounds of trash. **Since its inception, the PRK has had nearly 3,000 Clean Sweep volunteers, and removed a total of 137,000 pounds of trash from the Pearl River in just 4 years! These organized community clean-ups bring people together and provide an example of environmental stewardship that lead to significant improvements in water quality.**

The Pearl River Keeper has also introduced multiple volunteer programs to local citizens. These programs provide ways for local citizens to take active roles in watershed protection and also provide training and opportunities for volunteers to collect water quality data and information. The goals of these volunteer programs are to encourage tourism and recreational use of the Reservoir, along with educating the public about the Pearl River watershed and the effects of pollution on water quality. More information about *Rezonate* and the Pearl River Keeper can be found here: <https://rezonate-ms.org> and <https://www.pearlriverkeeper.com>.



Pelabatchie Creek



*Strong River: D'Lo Water Park, Georgetown Bridge
Merit Water Park (Chapel Bridge to Hwy 28)*



Ross Barnett Reservoir Spillway Dam

Summary

Partners are essential to the success of the Mississippi NPS Program. Through this program, MDEQ works with a wide variety of partners, using a variety of approaches for collaboration. There are currently over 80 partners working with the Mississippi NPS Program, but MDEQ actively searches for new partners, and new ways to collaborate with existing partners. By using input from our partners, it is MDEQ's desire to bring together a collaboration composed of many and varied relevant entities and resources working together to:

- Increase efficiency in meeting state water quality standards and water-use benefits;
- Prioritize and align NPS management processes;

- Identify priority watersheds;
- Use a watershed-based management approach where sensible, practical methods are used to restore and protect the state's water quality resources;
- Resolve difficult and complex issues through voluntary and regulatory approaches;
- Integrate resources and expertise to meet NPS programmatic goals, objectives, and milestones; and
- Achieve NPS pollutant load reductions (e.g. Nitrogen, Phosphorous, and sediment) in priority watersheds.

CHAPTER FIVE

Water Management Process





Mississippi's water management process is designed to be iterative and adaptive. Programs within MDEQ along with resource agency partners, both federal and state, non-profits, institutions, and local stakeholders work collectively during one or more of the steps outlined below to ensure Mississippi has healthy, productive waters now and into the future. To protect water, the first step is to understand what characteristics in the water enable it to support healthy communities and allow it to be used for its intended purposes. This is the reason water quality standards (WQS) are developed and why WQS serve as the starting point in the water management process. The water management process outlines how waters are managed by defining the pathway for establishing basic thresholds for healthy water through how waters are monitored, assessed, and then protected or restored. Many CWA programs within MDEQ, including the Mississippi NPS Program, rely on this process to provide the information needed to make informed management decisions for their programs and health and safety of waters in the state. These decisions are supported by activities of the MDEQ water quality management process (Figure 10), including:

- Development and revision of water quality criteria;
- Water quality monitoring;
- The biennial state water quality assessment/listing of impaired waters;
- Planning: Restore or Protect Water Quality; and
- Implementation.

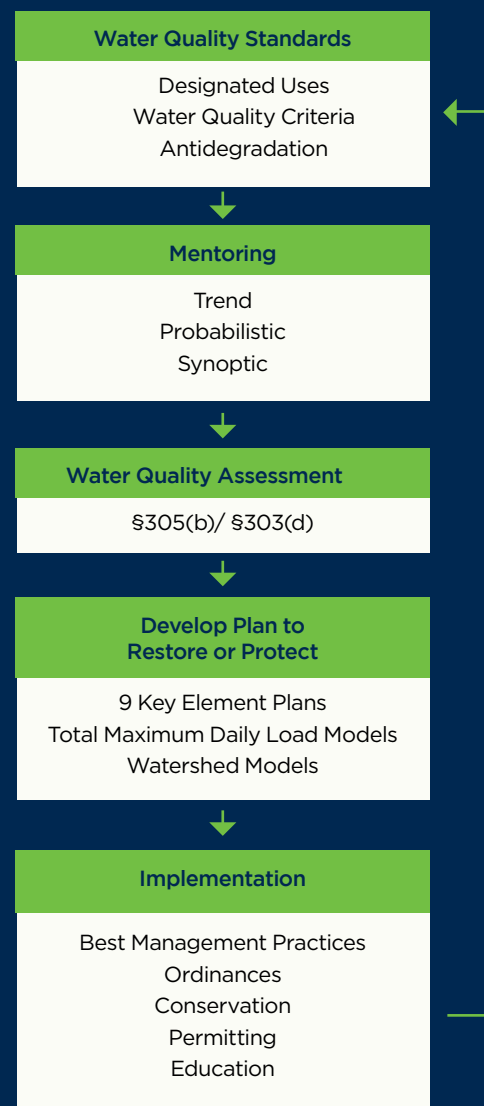
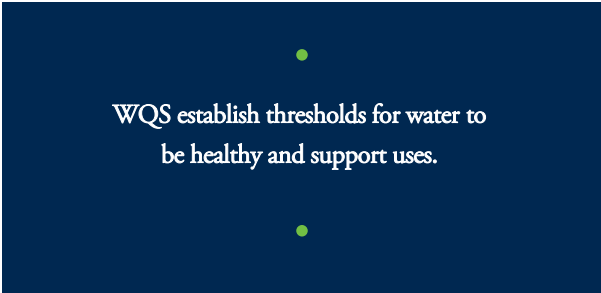


Figure 10: Water Management Process

Water Quality Standards

One of the tools used to evaluate the health and safety of Mississippi water resources is **water quality standards (MDEQ, 2019)**. Water quality standards outline numeric (or narrative) thresholds for individual water quality parameters used to measure water quality. The state identifies water quality standards that are necessary to support how the water is used, otherwise referred to as designated uses. These uses are defined in the state's water quality regulations and correspond to federally recognized designated uses. The *Clean Water Act* requires that each state review their water quality standards at least every three years in a process called the triennial review. Water quality standards must include three components: (1) the designated uses of the state's water bodies; (2) the water quality criteria (narrative or numeric) necessary to protect those uses; and (3) anti-degradation provisions to protect water quality. During the triennial review, that latest science and information available are considered, and when needed, criteria are updated to protect human health and aquatic life. NPS pollution management may be used to improve water quality in water bodies that do not meet water quality standards so these uses may be attained. Therefore, the Mississippi NPS Program supports development and revision of state water quality standards.

Excessive nutrient (phosphorus and nitrogen) loss from watersheds is frequently associated with degraded water quality in streams. To reduce this impact to surface waters, NPS sources originating from cropland farming practices and other watershed activities, are being evaluated for



WQS establish thresholds for water to be healthy and support uses.

implementation of control measures. Due to concerns about eutrophication in the nation's water bodies, EPA directed the states to develop and adopt numeric nutrient criteria for surface waters. Since it is thought that much of the nation's and Mississippi's nutrient impairments are a result of NPS runoff, work is needed to confirm this premise and to develop scientifically defensible numeric nutrient criteria that are appropriate for Mississippi's surface waters. MDEQ plans to establish numeric nutrient criteria following a sequenced approach for (1) lakes and reservoirs (outside the Mississippi Alluvial Plain), (2) coastal and estuarine waters, (3) streams and rivers (outside the Mississippi Alluvial Plain), and (4) Delta waters (Mississippi Alluvial Plain). MDEQ's mission is to

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

Water quality standards define the water quality goals of a water body or portion thereof, in part, by designating the use or uses to be made of the water. States adopt water quality standards to protect public health or welfare, enhance the quality of water, and serve the purposes of the Clean Water Act. "Serve the purposes of the Act" (as defined in sections 101(a)(2), and 303(c) of the Act) means that water quality standards should:

- provide, wherever attainable, water quality for the protection and propagation of fish, shellfish, and wildlife, and recreation in and on the water ("fishable/swimmable"), and
- consider the use and value of state waters for public water supplies, propagation of fish and wildlife, recreation, agriculture and industrial purposes, and navigation.

These sections of the CWA describe various uses of waters that are considered desirable and should be protected. States must take these uses into consideration when classifying state waters and are free to add use classifications. Consistent with the requirements of the CWA and WQS Regulation, states are free to develop and adopt any use classification system they see as appropriate, except that waste transport and assimilation is not an acceptable use in any case. Once states have their use classification system in place, they must have criteria in place to protect these uses.

A state can choose to adopt subcategories (and/or seasonal classifications) in its use classification system to further refine designated uses. Mississippi currently has a very basic use classification structure outlined in the water quality standards regulations. Initial work has been completed by MDEQ in a collaborative effort with EPA to explore the potential to refine the use classifications in Mississippi and develop preliminary concepts for this effort. Stakeholders in Mississippi were supportive of the concept and MDEQ is moving forward with developing a more refined system to appropriately classify our water bodies.

Transparency and stakeholder involvement are a priority of the MDEQ Water Quality Standards Program. Stakeholder update sessions, small group discussions, presentation opportunities at meetings and conferences across the state, the MDEQ website, and social media are all tools being utilized by MDEQ to support transparency of information and enhance stakeholder awareness and involvement. The efforts listed above are in addition to the mandatory public comment period and public hearing that are required for all revisions to the water quality criteria regulations.

Water Quality Monitoring

There is a saying, “measure what matters.” Since improving and/or protecting water quality is the focus of the Mississippi NPS Program, water quality monitoring is a necessary part of the program. The Mississippi NPS Program supports the water quality monitoring programs of MDEQ and its partners. Water quality monitoring supported by the Mississippi NPS Program includes:

- Collecting measurements of physical and chemical characteristics of water samples,
- Conducting surveys of aquatic communities, and
- Collecting information about water resources.

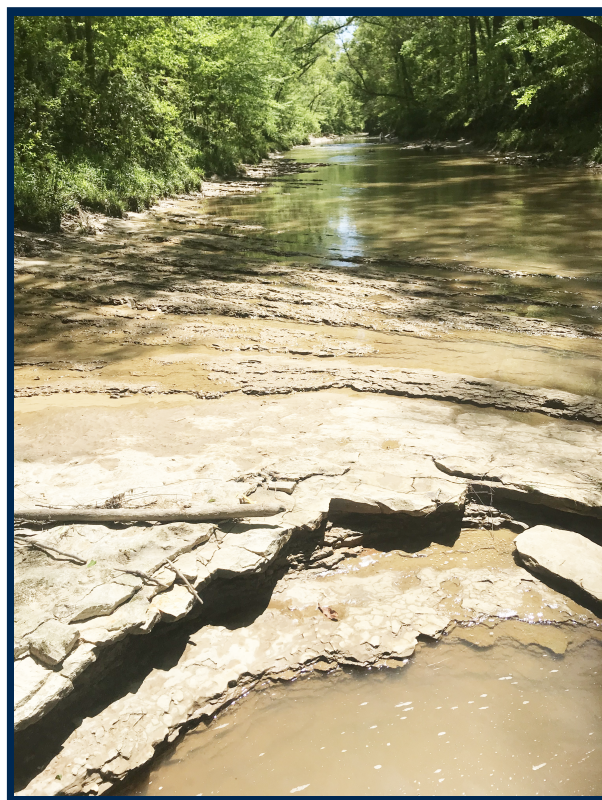
The Basin Management Approach (BMA) is used by MDEQ to coordinate water quality data collection activities with its partners to increase the extent of Mississippi waters that are monitored and focus monitoring in watersheds where conservation measures are implemented to show improvements. The Basin Management Approach is discussed in more detail in Chapter 6: Planning. In addition to the targeted, watershed monitoring coordinated through planning efforts by the BMA, MDEQ manages a statewide surface water monitoring program. Data from these water quality monitoring programs are used to:

- Track the health and safety of Mississippi water resources,
- Develop tools to evaluate the health and safety of Mississippi water resources,
- Understand how to improve and protect Mississippi water resources, and
- Plan activities to improve and protect Mississippi water resources.

The MDEQ water quality monitoring program is implemented by the MDEQ Field Services Division and is implemented following MDEQ’s Surface Water Monitoring Program (SWMP) Strategy. The SWMP is evaluated and updated every 3 years to address changes or enhancements to statewide monitoring programs. This monitoring strategy is intended to address the broad range of water quality management decisions that require surface water monitoring data for all types of waters in the state, including streams, rivers, lakes, reservoirs, estuaries, coastal areas, and to the extent possible, wetlands. The SWMP is also intended to support the implementation of water management programs as required under §§ 303, 305, 402, 314, and 319 of the CWA. Mississippi’s strategy for achieving comprehensive, statewide monitoring and assessment of its surface waters involves coordination of various levels of MDEQ surface water monitoring activities in the state’s rivers, streams, lakes, and coastal waters. In addition to MDEQ’s efforts, other state and federal government agencies and public/private groups also conduct surface water quality monitoring in state waters. MDEQ actively promotes data sharing

and coordination with these groups by soliciting their contributions of data and information to be used in comprehensive evaluation and assessment of Mississippi surface water quality.

Program objectives, or more specifically the questions that are to be answered, drive the conceptual monitoring design as it is multifaceted; incorporating several approaches for site selection, indicators, intensity of monitoring, magnitude and frequency of data collection, and monitoring schedules. To ensure that the design is clearly understood and represented in an organized fashion, the structure of the design is presented as a tiered model. The tiered model is structured in a manner to group monitoring activities that mutually address management needs and questions to be answered. A schematic of this tiered model is shown in Figure 11.



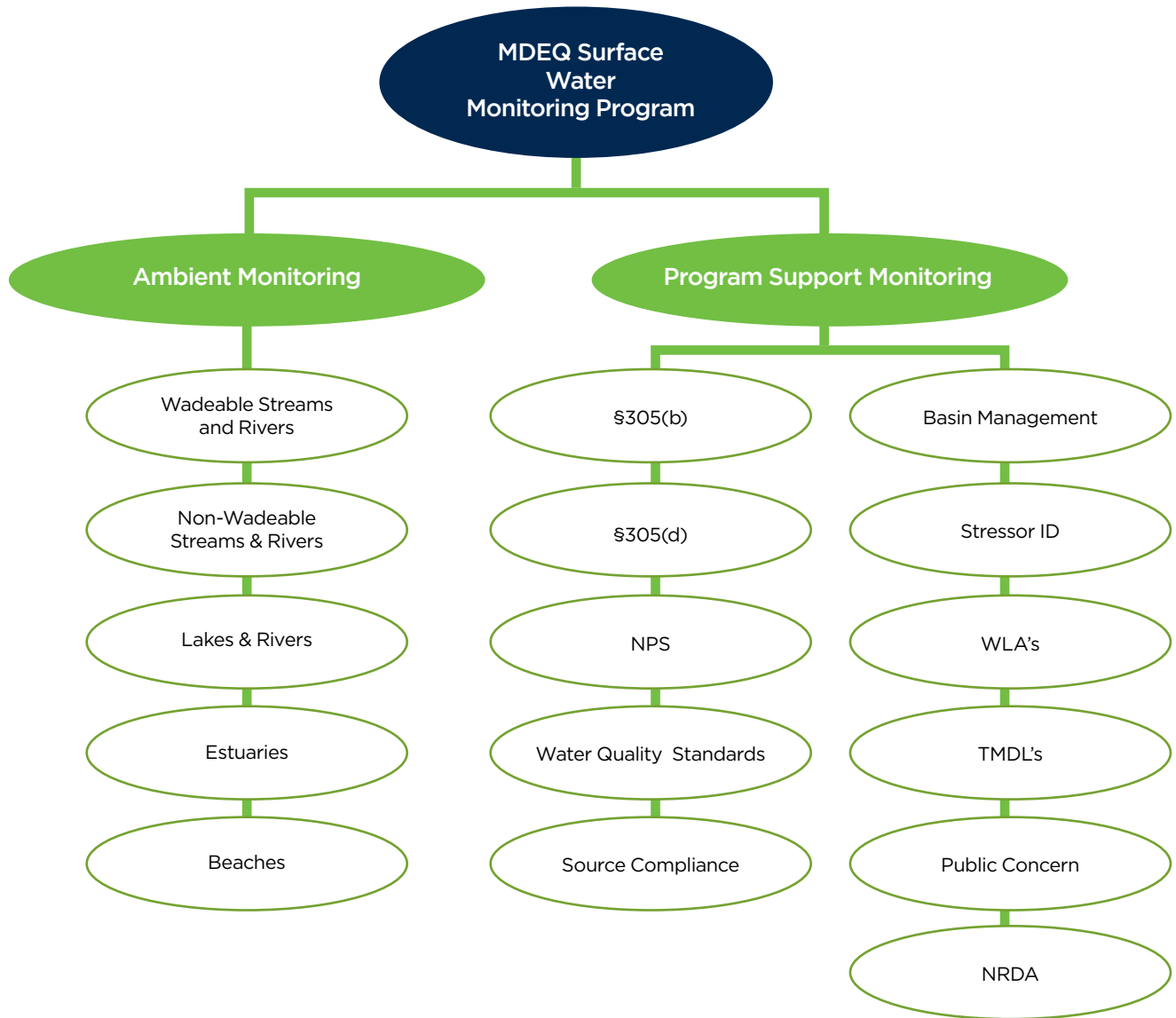
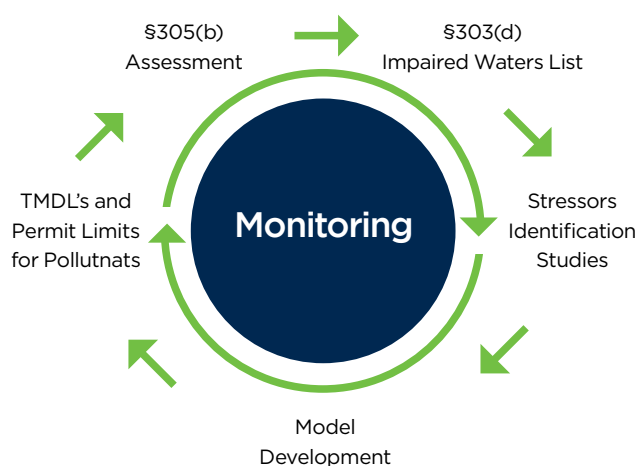


Figure 11: MS's Surface Water Monitoring Design

All MDEQ monitoring funded by EPA grants is carried out under Quality Assurance Project Plans (QAPPs) prepared using EPA QAPP Guidelines. Monitoring activities conducted by MDEQ for parameters addressed in the Mississippi Water Quality Standards are conducted in accordance with the Mississippi Consolidated Assessment and Listing Methodology (CALM) when possible. This ensures the data collected can be used to assess the quality of state waters and determine if they are meeting designated uses. Laboratory procedures and data management are covered under approved MDEQ SOPs. Data collected in conjunction with the USGS is entered into the USGS National Water Information System data system and is publicly available via their website. MDEQ has a proven record of successfully managing and implementing water quality monitoring and assessment projects. MDEQ works to ensure that activities are carried out as outlined in project work plans and carefully manages grant funds to make certain that cost effective measures are implemented. Information and data collected as part of the monitoring efforts of MDEQ's Surface Water Monitoring Program serve as the basis for the biennial Section 305(b) statewide water quality assessment.

Water Quality Assessment

Surface water quality data analyses and assessments are technical reviews of physical, chemical, bacteriological, and/or biological monitoring data, as well as other information to determine the quality of surface water resources. Analysis and assessment of surface water quality in Mississippi is



carried out through comparison of surface water monitoring data and information to established biological reference conditions and chemical, physical, and bacteriological water quality criteria established for Mississippi waters. According to the CWA, §305(b) requires each state to describe the quality of their water resources, in a report for the USEPA, Congress, and the public on a biennial basis. The [§305\(b\)](#)

water quality assessment process is designed to determine whether water quality conditions in water bodies are meeting their designated uses. In addition to the §305(b) Report, MDEQ provides a list of all impaired water bodies where TMDLs have not been completed pursuant to §303(d) of the CWA. The [§303\(d\) List of Impaired Waters](#) is a prioritized listing of water body use impairment along with the causes of the impairment. When a water body is placed on this list, a stressor(s) identification process is initiated. Based on identification results, a Total Maximum Daily Load (TMDL) may or may not be written for development to address the cause(s) of impairment, and strategies for restoring the water body back to fully supporting its designated use(s). When the TMDL has been completed or monitoring data show that the water body is no longer impaired, the water body is taken off of the §303(d) list.

Section 319 requires that states identify water bodies where NPS pollution causes impairment of water quality. This is done as part of the biennial assessment of the water quality of state water resources, conducted by the MDEQ Field Services Division. The biennial assessment of water quality of state water resources is required by Clean Water Action Section 305(b). This biennial water quality assessment has three purposes:

- Identify those waters where water quality does not support their designated uses,
- Identify the cause(s) of the poor water quality (i.e., pollutant), and
- Identify the pollutant source(s).

Detailed information on the process and procedures of the Mississippi biennial water quality assessment is available on the MDEQ website. Two tools used in the biennial assessment are supported through the Mississippi NPS Program; Index of Biological Integrity, and Stressor Identification Studies. These tools are discussed below.

Index of Biological Integrity

Due to the complexity of calculating improvement in water quality and determining the extent of non-point source pollution, MDEQ has focused resources on developing assessment tools to accurately evaluate the water quality status of Mississippi's water resources. The development and maintenance of robust assessment tools are integral to being able to accurately determine current water quality status, track improvement, and support management decisions. Restoring and maintaining biological integrity has always been part of the objective of the Clean Water Act. However, monitoring and assessment of biological integrity have only recently come to be included in state water quality programs. Biological integrity is assessed using an Index of Biotic Integrity (IBI).

The MDEQ relies heavily on the use of biological indicators to determine attainment status. The purpose of ambient biological monitoring is to assess the health or biological integrity of the aquatic community as a long-term indicator of stream water quality. The MDEQ Ambient Biological

Because biological indicators integrate the effects of multiple pollutants, they are effective in assessing water quality.

Monitoring Program collects benthic macroinvertebrate community surveys in wadeable freshwater streams. Using these data the [Mississippi Benthic Index of Stream Quality \(M-BISQ\)](#) (MDEQ, 2003) was developed. The MBISQ is used to assess status of wadeable streams and determine if they are meeting the Aquatic Life designated use. The MDEQ is working to develop similar assessment tools that can be used in other areas of the state. The development refinement of assessment tools similar to the M-BISQ can be used to determine program success.

As part of routine maintenance, and to ensure that the IBI is still sensitive and responsive to changes in water quality, MDEQ periodically [recalibrates the Mississippi IBIs](#) (MDEQ, 2016), generally every 5 years. Recalibration allows for the addition of newer data into the process to further refine the index, including but not limited to, providing reference conditions for determination of biological impairment. As part of the recalibration process, any existing data gaps are also identified. Then, resources are allocated to fill these gaps during future monitoring efforts. A well maintained and sensitive IBI allows MDEQ to make impairment decisions with confidence, as well as track the success of NPS pollution management watershed projects.

Stressor Identification

According to the *2018 Mississippi Section 303(d) List of Impaired Water Bodies* (MDEQ, 2018), eighty-seven percent (87%) of the impaired streams are classified as biologically impaired (i.e., M-BISQ indicates these waters are not attaining the Aquatic Life use), and will require stressor identification studies. When water quality of a stream is assessed using the M-BISQ and is classified as impaired, a Stressor Identification study is often needed to determine what is causing stress on the biological community. Once the cause of the stress is determined, then work can be done to identify and mitigate these source(s) of the stress. This work is critical to the Mississippi NPS Program as the results from the stressor identification studies and analysis provide

information that is critical to targeting best management practice and conservation implementation in order to mitigate NPS sources of pollution.

MDEQ has a strong team of scientists and engineers focused on evaluating water quality data and identifying stressors in water bodies that have been listed as being biologically impaired using benthic macroinvertebrate community data. When biological community data indicate that a water body segment is impaired, an investigative, stressor identification analysis using strength-of-evidence approach is conducted to determine the cause(s) of the impairment. Such causes may range from specific pollutants (e.g. Total Nitrogen) to other causes of pollution such as sedimentation, habitat loss or hydrologic alteration. In most cases, nonpoint sources contribute, or are the primary causes of impairment. MDEQ relies upon all available monitoring and assessment information and conducts additional monitoring to gather the necessary data to help determine both the causes and sources of impaired waters. The EPA's stressor identification guidance, *U.S. Environmental Protection Agency (EPA)*

Stressor identification studies identify which pollutant(s) is causing water quality impairment.

Stressor Identification Process and Stressor Identification Guidance Document (USEPA, 2000), is used to identify most probable stressors causing biological impairment. Once the cause of impairment is determined, a TMDL can be developed to address the pollutant of concern identified by the stressor identification

process. These TMDLs help guide the restoration process by establishing pollutant loads where, when met, will allow the stream to return to a healthy state and meet water quality standards. Stressor identification studies are part of the Mississippi NPS Program because they are part of determining if NPS pollution is causing impairment of water bodies.

Water Quality Modeling

Water quality models are used in a variety of ways to support the MS NPS Program and those CWA programs that work in conjunction with Mississippi's NPS Program to manage NPS pollution. Most modeling work is completed by MDEQ staff working within the Modeling and TMDL Branch of the Surface Water Division. The work carried out by this branch supports the development of waste load allocation (WLA) models that inform water quality permit limits implemented through MDEQ's Permitting Branch as well as developing TMDLs for waters identified as impaired on the state's Section 303(d) List of Impaired Water Bodies. The TMDL is representative of a stream budget where pollutant specific allowable loads are developed to ensure

Models can be used for different purposes.

the water body can meet appropriate water quality criteria and designated uses. As part of the TMDL process, load allocations are also assigned to NPS sources of pollution when needed. Load allocations

developed through TMDL models help guide restoration and conservation implementation efforts in watersheds. They are also key sources of information needed when developing watershed plans.

In addition to WLA and TMDL type models that tend to be very robust and require extensive data sets to generate model outputs, there are a variety of other computer models available to help in the management of NPS pollution. These models can be used to estimate pollution load reductions once best management practices and conservation measures are implemented. Some can even provide estimates of NPS pollutant loads in watersheds before conservation is implemented and then provide an estimate of how much of the pollutant can be removed (load reduction) once BMPs are implemented. These models are very helpful because they can provide estimates of pollutant loads before and after implementation and can be used to show how successful implementation of NPS conservation practices can be.

Watershed Plans and Implementation

Many organizations recognize the importance of watershed planning and over the past 10 years, more emphasis has been placed on planning at smaller scales. Most planning activities facilitated by the Mississippi NPS Program are performed

Watershed-based management plans are the “road map” for restoring waters impaired by NPS pollution.

on the hydrologic unit code (HUC) 12 scale. The average size of a HUC 12 in Mississippi is 25,000-30,000 acres and there are 1,468 12-digit HUCs in the state. Although planning can be effective at larger scales, most watershed plans in Mississippi are developed for HUC 12 watersheds. Planning for watersheds of this size fits in line with both

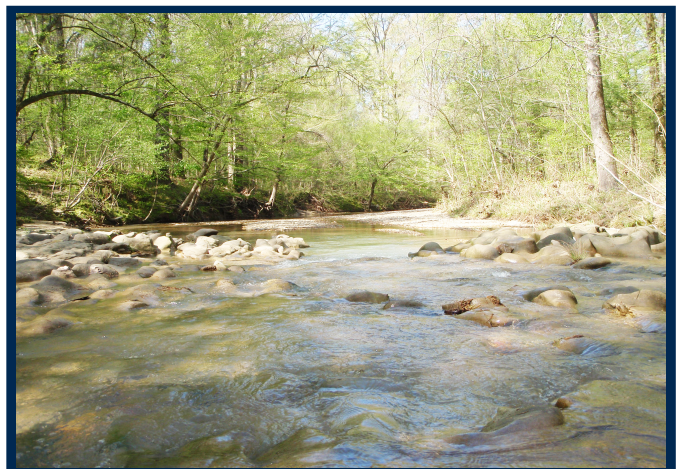
EPA and USDA NRCS planning recommendations. It also follows recommendations for best practices. Especially when one of the outcomes of the plan is to show success, or water quality improvements, from implementation of conservation practices to mitigate NPS pollution.

For Mississippi’s NPS Program, watershed plans are developed in conjunction with watershed teams. This process is discussed in more detail in Chapter 6 under Element 4: Planning. Watershed plans are developed for priority watersheds that were identified for either protection or restoration needs. As the watershed plans are developed, specific actions are identified to address the specific restoration (or protection) needs identified for that watershed. After the needs are identified, the team can then leverage resources, either technical or financial, to implement the actions identified in the plan. Actions can range from education/outreach campaigns, to NPS BMPs, to the development of stormwater management ordinances or working with MDEQ’s Permitting Division to address the needs of the permitted facilities in the watershed.

The purpose of developing a watershed plan is to identify all of the environmental stressors, all of the conservation needs, create an education plan, establish a budget, and work with the team to implement actions that will result in water quality improvements and positive behavior changes in stakeholders. Once a plan is developed, the actions identified in that plan can be implemented. More information about how the Mississippi NPS Program works through the Implementation process can be found in Chapter 6: Element 5: Implementation.

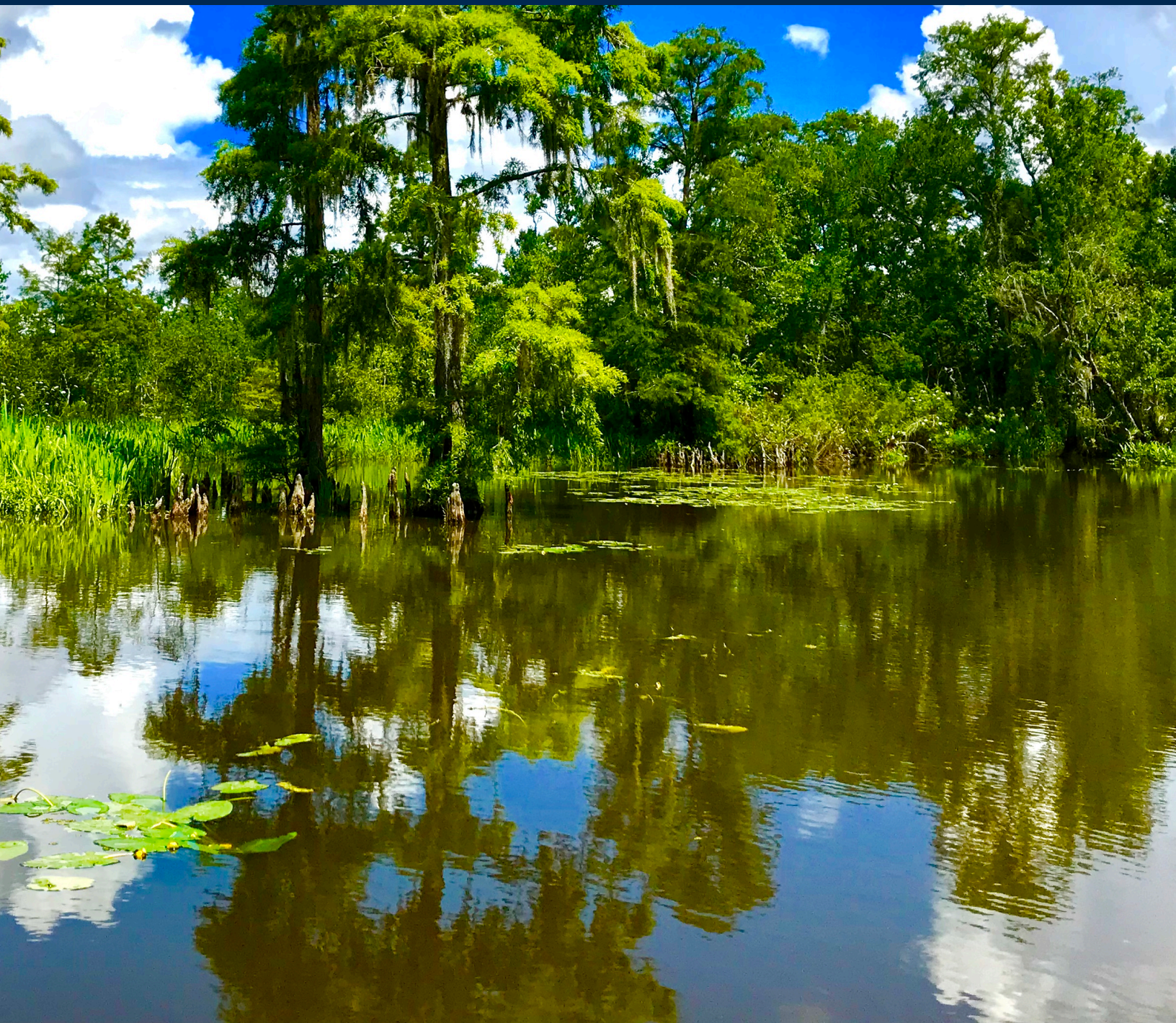
Summary

The Mississippi Water Quality Management Process addresses a number of MDEQ Clean Water Act programs. This process supports the Mississippi NPS Program. Therefore, Section 319 grant funds are used to support Water Quality Management activities relevant to the Mississippi NPS Program.



CHAPTER SIX

Core Elements of Mississippi's NPS Management Program





The Mississippi NPS Program is carried out to achieve its purpose and long-term goals using both statewide and targeted watershed approaches. These approaches are implemented through both regulatory and non-regulatory programs on the federal, state, and local levels. The approach for addressing NPS pollution on a statewide level includes education and outreach, monitoring and assessment, planning activities, consensus building, and partnering. At the watershed level, implementing the Mississippi NPS Program includes the development of watershed-based plans, implementation of practices to control NPS pollution, inspection of NPS pollution control practices, monitoring to detect changes in water quality, as well as local consensus building, partnering, and education and outreach efforts.

To improve transparency and consistency with both reporting and management of funds under the \$319 grant, all grant funded activities are grouped into five core functions or elements. This allows for more seamless, consistent reporting of both program level and project level activities as well as submittal of required financial reports. As such, all grant activities are organized under one of the following 5 functional elements of the Mississippi NPS Management Program: Program Administration, Program Implementation, Planning, Project Implementation, and Project Implementation Support. The sections below describe the work activities and/or projects funded in each of these core elements of the program.



Element 1: Program Administration

MDEQ strives to administer the Mississippi NPS Program efficiently and effectively. The administration element of the Mississippi NPS Program includes:

- Oversight of the program;
- Management of the program budget and associated \$319 grants; and
- Ensuring consistency of Federal programs and projects with the Mississippi NPS Program.

Specific Program Administration short-term goals, objectives, and milestones for the next 5 years are included in Appendix A.

Who Administers the Mississippi NPS Program?

Day-to-day administration of the Mississippi NPS Program is primarily the responsibility of the Chief of the MDEQ Basin Management and NPS Branch. However, MDEQ personnel outside of the Basin Management and NPS Branch also contribute to administration of the Mississippi NPS Program. The Basin Management and NPS Branch is part of the Surface Water Division within the MDEQ Office of Pollution Control (Figure 12). By having the MS NPS Program embedded within the Surface Water Division, it ensures open communication between the clean water state revolving fund, the water quality standards and water quality modeling programs and staff.

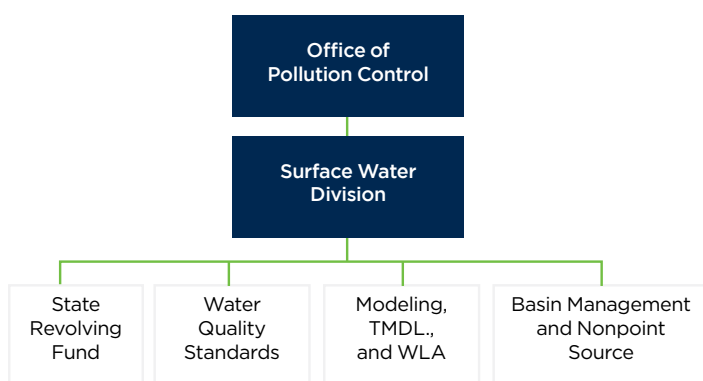


Figure 12: Surface Water Division Organizational Chart

This organizational structure also keeps the program included as an integral part of MDEQ's Clean Water Act (CWA) water management programs and allows for communication and integration of Mississippi's NPS Program goals with other CWA programs managed within Office of Pollution Control (Figure 13) and other programs at MDEQ. The Surface Water Division Chief facilitates and ensures this

communication among programs and provides oversight of the Mississippi NPS Program. In addition, the MDEQ Office of Administrative Services has staff that specialize in grant applications, federal financial reporting, and in performing financial risk assessments for sub-grantees. These staff ensure the financial reporting requirements under the grant are met.

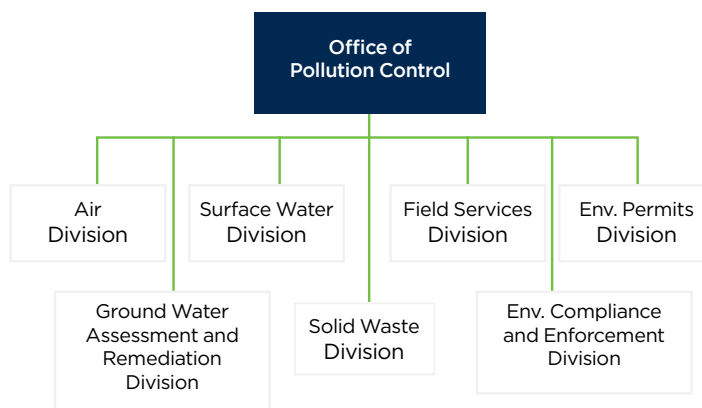


Figure 13: Office of Pollution Control Organizational Chart

Oversight of the Mississippi NPS Program

Oversight of the Mississippi NPS Program ensures the program achieves its vision and goals. This is accomplished through:

- Ensuring the Mississippi NPS Program remains engaged with other water programs managed by MDEQ as well as those within resource agency partner organizations that share NPS management goals and commitments;
- Preparing the Mississippi NPS Program annual report; and
- Reviewing and updating the Mississippi NPS Program goals, procedures, and documentation at least every 5 years.

Mississippi NPS Program Budget

The Mississippi NPS Program annual budget is typically between three and four million dollars; 60 percent of which is provided by \$319 grants and 40 percent by State funds or in-kind services (otherwise known as matching funds). As explained in Chapter 3, each grant is funded for a duration of five years. However, because it typically takes 10-11 months to receive the grant award, Mississippi generally has a little of 4 years to spend the grant funds. This results in MDEQ managing five active \$319 grants, at any given time, that are used to fund the Mississippi NPS Program.

In addition, the Mississippi NPS Program works with other state and federal funding programs, both within and outside of MDEQ, to leverage additional resources to implement Mississippi NPS Program activities.

Management of the Mississippi NPS Program budget is an important part of administering the program. Federal grant money provided to MDEQ under §319 makes up part of the Mississippi NPS Program budget. The federal government requires that the use of §319 grant money, and match, be tracked and reported to ensure it is being used appropriately. Reporting on use of §319 grant money, and other grant management activities, are part of managing the Mississippi NPS Program budget. Management of Mississippi NPS Program grants includes interaction between MDEQ and EPA in the form of:

- Overseeing grant preparation,
- Negotiating grant agreements,
- Receiving grant awards,
- Reporting on expenditures and deliverables, and
- Developing grant close-out reports.

The MDEQ Office of Administrative Services has staff that are responsible for grant applications and federal financial reporting. These staff work with Basin Management and NPS Branch staff to ensure the financial reporting requirements for the Mississippi Section 319 grants are met.

Annual Report for Mississippi NPS Program

Each year the Basin Management and NPS Branch prepares a report describing the activities completed by Mississippi NPS Program during the last year. This annual report is also a federal requirement for NPS Programs. The annual report is submitted to EPA in December and made available to the public on the MDEQ website. This annual report includes:

- A summary of activities over the past year in each of the Mississippi NPS Program elements,
- Explanation of how the activities over the past year contribute to achievement of NPS Program goals,
- A summary of the progress in achieving Mississippi NPS Program milestones, and
- An estimate of the status of expenditures for each of the five active §319 grants at the end of the year.

Five-year Review of Mississippi NPS Program

An updated, comprehensive Mississippi NPS Program is critical to the state and EPA in managing NPS pollution. Regular review and evaluation of the Mississippi NPS

Program provides an opportunity to adapt the program to changing conditions and knowledge. Therefore, the Mississippi NPS Program is reviewed and evaluated every five years. Using the results of this review, this Plan document is updated every five years.

After a Plan document is 4 years old, the update begins by reviewing and evaluating the success of that Plan, using both environmental and functional measures. This includes reviewing the purpose of the Mississippi NPS Program, its long-term goals, and procedures. Any changes to NPS Program are documented in the Plan update. In addition, the short-term (5-year) Mississippi NPS Program goals and associated actions and milestones are modified as appropriate to adapt the Mississippi NPS Program to changes in knowledge, partnerships, programs, and the environment over the previous five years. The Basin Management and NPS Branch Chief is responsible for initiating the Plan update and submitting the Plan update to EPA. The next Plan update is listed as a milestone in Appendix A with the 5-year goals, objectives, and milestones.

Consistency of Federal Programs

The Federal Consistency provisions in §319 requires each state to review federal activities for consistency with that state's NPS Program. MDEQ is responsible for conducting §319 consistency reviews and does so in accordance with the intergovernmental review process established by Executive Order 12372. MDEQ annually provides its list of the federal programs and projects that it will review to the State Clearinghouse. The State Clearinghouse then routes appropriate federal-project information to MDEQ for review.

Federal programs and projects MDEQ currently reviews for consistency with the Mississippi NPS Program include:

- USDA Farm Bill,
- Clean Water Act,
- Coastal NPS Pollution Control Program of the Coastal Zone Act Reauthorization Amendments of 1990,
- Safe Drinking Water Act,
- US Forest Service,
- National Park Service,
- US Army Corps of Engineers,
- Tennessee Valley Authority,
- US Fish and Wildlife Service,
- US Department of Transportation,
- US Federal Emergency Management Agency, and
- Mississippi/Gulf of Mexico Watershed Nutrient (Hypoxia) Task Force.

Element 2: Program Implementation

As with most water management programs, the Mississippi NPS Management Program is forced to function in both the technical environment of water quality management while also working to communicate goals and project outcomes with partners in both technical and non-technical fields. While technical information is important to the Mississippi NPS Program, understanding the social nature of differing stakeholder groups, how they best understand information presented to them, and how to encourage people to take an active role in managing NPS pollution in their watersheds is a critical component of program success. Ultimately, NPS pollution occurs as a result of human activities. Therefore, working with people is a critical part of implementing the Mississippi NPS Program. This includes collaboration, program transparency and awareness, education, and outreach.

Element 2 includes the activities that support the Mississippi NPS Program by implementing projects and activities that focus on work that is broader in scale than a HUC 12 watershed and is where most of the staff time is spent. Work done under this element ensures the NPS Program functions on a day to day basis, supports efficient management of grant funds, and helps to implement activities that support program objectives that are broader in scope but are instrumental to mitigating NPS pollution statewide. These activities include:

- Project management and the development of sub-grant agreements;
- Budget tracking, invoice review/approval, site inspections, and reporting;
- Coordination and collaboration between the Basin Management and NPS Branch and other offices and branches in MDEQ;
- Coordination and collaboration between the Mississippi NPS Program and related programs of other agencies, organizations, and institutions;
- Practices that provide transparency to the Mississippi NPS Program; and
- Education and outreach.

Several of these activities are described in more detail below. **Specific short-term goals, objectives, and milestones of the Program Implementation element for the next 5 years are included in Appendix A.**

Developing and Managing Sub-grants

The process of developing and management sub-grants is critical to maintaining an effective NPS management program in MS. Many activities of the Mississippi NPS

Program are implemented through sub-grants to other agencies, organizations, and institutions. When §319 grant funds are used to fund work by other agencies, organizations, and institutions, sub-grants or contracts are set up between MDEQ and the other partnering agencies/organizations. These agreements specify how the funds will be used and how the overall project will ultimately help address NPS pollution efforts in Mississippi. Basin Management and NPS Branch staff work with partners to develop workplans, budgets, and sub-grant agreements. Staff also are responsible for maintaining project budgets, monitoring expenditures, tracking matching funds, approving invoices, performing project audits, and maintain an active communication with project partners to ensure all goals and outcomes are met. A detailed explanation of the process of applying for and distributing §319 grants and sub-grants is provided in Chapter 3.

Tracking and Reporting Progress

MDEQ is committed to transparency in its programs and building efficient tracking and reporting mechanisms into the NPS Program provides needed transparency to EPA and the public. Tracking and regularly reporting on projects, initiatives, and results, are critical activities of the Mississippi's NPS Program. These actions provide information to stakeholders on the work the program is supporting, meet reporting requirements for EPA, and ensure that all funded activities remain on schedule and within budget. Transparency is integrated into the Mississippi NPS Program in several ways, including making program progress reports and other documents available online, and making Basin Team and Watershed Implementation Team meetings open to the public. Examples of information tracked and reported include:

- Personnel attendance at meetings,
- Nutrient and sediment load reductions resulting from the Mississippi NPS Program,
- Development of watershed-based plans,
- NPS Program success stories,
- Progress made in implementing §319 grant and sub-grant work plans, and
- Tracking and reporting on expenditures of §319 grant and sub-grant funds along with required matching funds or in-kind services.

Although most of the reports and plans developed by the Mississippi NPS Program are available to the public on MDEQ's website, EPA has developed a database that is used to store §319 grant related information for every entity that receives grant funds across the nation. This database is the Grants Reporting and Tracking System (GRTS).

Grant Reporting and Tracking System Reporting

The Section 319 GRTS online database is the official EPA reporting tool used by states to track and report on the use of §319 grant money. MDEQ uses GRTS to electronically report the progress made in implementing the projects and activities funded with §319 grants and sub-grants. Through GRTS, EPA ensures that financial and other reporting requirements related to §319 grants are complete. Upon receipt of a §319 grant, states and tribes receiving the funds must acknowledge receipt of the grant and then allocate/obligate the funds in the GRTS database. This obligation of funds provides a breakdown of how the funds will be spent in accordance with the workplan that was submitted with

•

Grant Recipients are required to enter reports, plans, and load reductions into EPA's GRTS Database.

•

the grant application. The GRTS database also has the ability to store project progress reports, track grant and project expenditures, follow watershed plans and success stories through the approval process, and can be used to store final reports for the projects funded under the grant. As an additional

reporting requirement, states enter estimates of the amount of nitrogen, phosphorus, and sediment prevented from entering surface waters as a result of the work funded from grant activities (see timeline in Chapter 3, Figure 5).

The GRTS data system provides a transparent way to demonstrate that §319 grant funds are allocated and used appropriately. This database is used by a number of federal and state agencies, organizations, and institutions. Thus, use of GRTS by MDEQ provides transparency to other agencies, organizations, and institutions, as well as the public. People outside of MDEQ can use GRTS to access information about Mississippi NPS Program activities, to enhance their understanding of Mississippi NPS projects and programs, to review the funds being awarded and leveraged through the Mississippi NPS Program, and to see what success the Mississippi NPS Program is achieving. Mississippi NPS Program information in GRTS can be accessed at <https://www.epa.gov/nps/grants-reporting-and-tracking-system-grts>.

MDEQ Reporting and Tracking Tools

Personnel within the Basin Management and NPS Branch with support from MDEQ grants management and budgeting staff track and report on grant expenditures using budgeting, tracking, and reporting software tools that have been developed to support MDEQ's needs. The Mississippi

NPS Program currently tracks and manages its budget day-to-day using Excel® spreadsheet tools. These spreadsheets are used, among other things, to track individual project budgets and matching funds, invoices and payments, and to ensure grant expenditures are in compliance with the overall grant budgets. This detailed project level data is reconciled into MDEQ's financial management database, BP2K, used by agency accounting staff to manage MDEQ program budgets. The grants management and accounting staff within MDEQ's Office of Administrative Services uses this financial information to generate the required Federal Financial Reports submitted to EPA each year (see Chapter 3, Figure 5). In the near future, the NPS Program will be working to develop a relational database that will track not only the required financial data and information but also the relevant project information related to the grant such as progress reports and documentation, sub-grant agreements, watershed plans, success stories, locations of conservation practices, and other data needed to meet federal reporting requirements.

Awareness, Education, and Outreach

Awareness, education, and outreach are critical for the success of voluntary management of NPS pollution through the Mississippi NPS Program. The critical first step in voluntary management of NPS pollution is to make people aware of what they are losing through NPS pollution, and how their actions contribute to these losses. Losses are typically strong motivators for changing people's behaviors (see Chapter 2 for more information). Being motivated to change is the first step, but nothing will happen if people don't know how to go about making the desired change. Education provides the knowledge and skills people need to be able to change. Finally, outreach is needed to develop collaborative and cooperative partnerships that support NPS pollution management. NPS pollution management requires partnerships at many different scales and levels to be successful. These partnerships must be strong among agencies, with institutions, and within neighbor to neighbor collaborations to achieve real change on the landscape. Awareness, education, and outreach are all essential for an effective NPS management program.

The Mississippi NPS Program implements a variety of environmental education activities and programs. MDEQ contributes funding and information to many programs to promote awareness and education of NPS pollution while also investing staff resources to facilitate training whenever possible. Environmental education programs sponsored by MDEQ target a wide range of audiences including: formal and informal educators, school aged children, the general public, elected officials and communities.

Awareness, Education, and Outreach for Educators

There are several programs that provide training in environmental awareness and water resources management for teachers. The focus of these routinely funded programs is primarily on teachers at the grade school through high school level; however, resources are also available to provide support for adult education/outreach efforts. Examples of some of the funded environmental education activities supported by Mississippi's NPS Program are: Project WET, Project Earth, Project Learning Tree, Project WILD, Project Aquatic WILD



Environmental Education Water Workshop for Teachers at LeFleur's Bluff State Park, Jackson, MS

and Private Eye. All of these programs provide training for educators along with curriculums that can be used in classrooms for students to learn environmental stewardship concepts. MDEQ is working with educators to promote train the trainer workshops. These efforts will expand the reach of Mississippi's NPS education and outreach program by providing a larger group of staff working in environmental and conservation jobs the knowledge and skill sets needed to either conduct environmental training activities themselves or provide training to other people in their fields. This larger group of trained professionals will then be available to the public and schools providing access to environmental education materials, curriculum, and/or demonstrations.

Awareness, Education, and Outreach for Students

The Mississippi NPS Program supports several education programs targeting school-aged children. Some of the programs are the: Environmental Education Mobile Classroom (an interactive program geared to specific grades (K-2 and 3-5)), summer ecology day camps for 1st -6th graders, Make a Splash (an annual event for children at the Mississippi Museum of Natural Science), and the annual Envirothon competition (a national competition open to high school teams). Working with our partners in education, the Mississippi NPS Program is continually looking for new opportunities to expand education and outreach for

our students. Under one such effort, the Mississippi NPS Program worked with partners to build and provide the books for regional traveling book barns. These book barns will move from school to school within the different regions of the state. Each book barn furnished with age appropriate books and learning material focused to teach school aged children about the concepts of environmental stewardship, water resource management, and pollution prevention.

In 2019, the one of a kind Mobile Classroom (see picture on right) received a Gulf Guardian Award from EPA's Gulf of Mexico Program. The Gulf Guardian awards were developed as a way to recognize businesses, communities, groups, individuals, and/or agencies who work to keep the Gulf of Mexico a healthy and productive estuary.



Mobile Classroom receiving the 2019 Gulf Guardian Award for Youth Environmental Education

Each year, EPA's Gulf of Mexico Program recognizes award winners in each of the following categories: Business/ Industry, Civic/Non-Profit Organization, Partnerships, Youth Environmental Education, and Individual. The Mobile Classroom received the first-place award under the category of Youth and Environmental Education.

Awareness, Education, and Outreach for the General Public

It is a priority of the Mississippi NPS Program to develop messaging tools and outreach materials that can be used to communicate across stakeholder groups. Because of this, resources are committed to provide education and outreach for the general public, adults and families. The



Demonstration of Enviroscope Model at Local Outreach Event

more exposure the program can bring to how NPS pollution is present in the environment and educate the public on what they can do to mitigate those sources, the more water resources benefits will be achieved. Some examples of successful education and outreach activities supported by the Mississippi NPS Program include: public service announcements on television and radio; presentations using the Enviroscope landscape model (see picture above) and aquifer tank model; promotion of the Adopt-A-Stream

more exposure the program can bring to how NPS pollution is present in the environment and educate the public on what they can do to mitigate those sources, the more water resources benefits will be achieved. Some

Program (in partnership with the Mississippi Wildlife Federation); participation in storm drain marking events; promotion of Blueways (system of recreational paddling trails); development and distribution of Citizen's Guides to Water Quality for Mississippi river basins; and use of MDEQ websites and social media accounts to promote awareness and provide information.



MDMR and MDEQ Receives 2019 Gulf Guardian Award for Partnerships with Celebrate the Gulf/Waterfest Education Festival

Another example of a very successful education, awareness, and outreach event that is supported by the Mississippi NPS Program is the sponsorship of Waterfest events. The Mississippi NPS Programs look for opportunities to partner with other groups or entities to foster environmental awareness and stewardship. In recent years, the program has seen success by co-hosting the NPS Waterfest event in conjunction with other events open to the public as an opportunity to achieve maximum exposure while minimizing the overall cost of hosting these programs. The Mississippi NPS Program successfully hosts Waterfest in conjunction with Celebrate the Gulf Marine Education Festival held on the Mississippi Gulf Coast. In 2019, the Celebrate the Gulf Marine Education Festival received a Gulf Guardian Award (picture above) under the category for Partnerships. This marine education festival is hosted by partnerships between state agencies, institutions, and a festival for local artists.

Awareness, Education, and Outreach for Communities and Landowners

Communities and municipalities often have exposure to and must work within the point source arena by managing city or county owned facilities. Even with this exposure to pollution management, there are still opportunities to promote awareness and provide education and outreach materials to elected officials and those working within our local communities. To help those working within counties and municipalities better understand how they can mitigate

NPS pollution, the Mississippi NPS Program supports the MDEQ Community Growth Readiness education program. This program educates cities and counties in an approach to development planning that incorporates natural resources concerns, including water quality and quantity. The NPS Program also works with partners to promote smart growth concepts, encourage adoption of green infrastructure and low impact development, and educate stakeholders on the benefits of urban and community forestry programs.

The term “landowners” can have different meanings and in Mississippi, a landowner can include both private citizens, and public entities, such as municipalities and counties. Many of the Mississippi NPS Program awareness, education, and outreach programs are collaborative efforts with other agencies, organizations and institutions, who work closely with these landowners to develop outreach tools needed to help address the NPS pollution concern(s) from the landowners perspective. For example, the Mississippi NPS Program works closely with the MSWCC, NRCS, and Delta F.A.R.M., a local group that works directly with producers, to enhance awareness, education, and outreach efforts targeted to agricultural landowners. Similarly, The Mississippi NPS Program also works with local municipalities and counties to support awareness, education, and outreach efforts through storm drain marking programs to build awareness of the impacts of stormwater runoff in urban environments.

Strategies, Tools, and Knowledge Transfer

As the landscape continually changes and evolves, so does our knowledge of how activities on the landscape affect water management. This constant state of change requires management programs to continually update their strategies for managing NPS impacts. Strategies can be developed to address types of pollutants like nutrients or they can be broader in scope to address entire categories of NPS pollution like the stormwater management in urban settings. By continuing to produce and update management strategies, it helps the NPS Management Program address water resource concerns in a consistent, transparent way while also allowing for results to be communicated back to stakeholders. The ability to develop strategies to address either the continuing impact of NPS pollution or emerging sources, helps the program adapt to a constantly changing and evolving future landscape.

As change is constant, the tools by which programs can communicate with partners and stakeholders are also advancing. NPS management programs need the ability to move with the rapidly evolving state of science and technological advances. While all of this change is occurring, programs are being enhanced, new approaches to manage NPS impacts are developed, and new ways to measure

change are established. Focus should also be spent on communicating these “lessons learned” to larger groups interested in NPS pollution management. The Mississippi NPS Management Program works to maintain relevant management strategies and decision support tools while committing to make a focused effort on knowledge and technology transfer.

Nutrient Reduction Strategies

In recent years, \$319 NPS funding has been used increasingly to support nutrient reductions in large watersheds. The strategy behind this approach is to use the committed \$319 resources to attract additional leveraging opportunities. Combining these funds together creates a greater potential to achieve quantifiable reductions in nutrient concentrations/loadings.

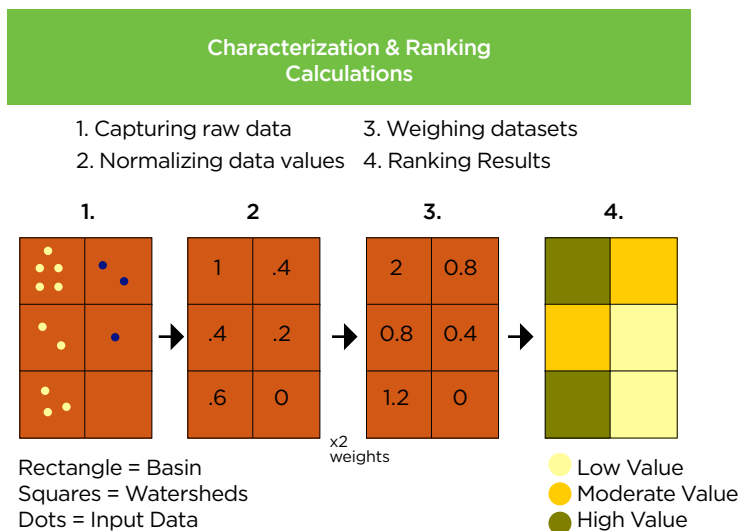
The Mississippi NPS Program incorporates the [Mississippi Coastal Nutrient Reduction Strategy](#), [Mississippi Delta Nutrient Reduction Strategy](#), the [Mississippi Uplands Nutrient Reduction Strategy](#), and the statewide strategy [Mississippi's Strategies to Reduce Nutrients and Associated Pollutants](#), in the development and implementation of NPS projects. The integration of these three regional strategies into the combined statewide strategy permits consistent, compatible, and coordinated watershed management plans to be developed and implemented statewide while addressing the distinct regional differences that exist for nutrient sources across the state. In implementing these strategies, Mississippi continues to work in conjunction with the Mississippi River Gulf of Mexico Watershed Nutrient Task Force to achieve nutrient reductions and work collaboratively to reduce the size of the hypoxic zone in gulf waters.

Decision Management Tools

The key to good management decisions is having a solid foundation upon which to make those decisions. Across the landscape of MDEQ, decision support tools are used to steer programs and make key water management decisions. These tools can take the form of water quality models, decision trees, biological indices, and assessment analysis support tools just to name a few. Within the Mississippi NPS Management Program, there are a couple of key decision support tools that are used to guide program decisions and prioritize watersheds for implementation projects. Not only does the program use these tools in-house to help inform where \$319 funds are directed, these tools have also been used by our partners to help inform management decisions for their respective organizations. The Mississippi Watershed Characterization and Ranking Tool (MWCRT) and the Basin Management Planning Application are fundamental components of Mississippi's NPS Management Program decision making process.

Mississippi Watershed Characterization and Ranking Tool

The Mississippi Watershed Characterization and Ranking Tool (MWCRT) uses existing geospatial data within a Geographic Information System (GIS) to characterize the watersheds of Mississippi within each river basin. Analysis of these characterizations is then used to produce a ranking designed to aid in the prioritization of watersheds based on areas of concern. This functionality allows these areas to be studied with greater detail to determine the feasibility of



project implementation. It even uses many of the same GIS layers as EPA's recovery potential screening tool therefore enabling the NPS program to address those concerns along with many others. The MWCRT is used as a steering tool and as an aid to help focus project implementation. The purpose of the MWCRT is to provide the MDEQ and its partners with a way to identify watersheds of interest. It is also used to make meaningful decisions about the policies and projects that affect those areas and the river basins as a whole. This tool is designed to help prioritize watersheds based on restoration and protection activities. The MWCRT is integral to the implementation of Mississippi's NPS Program and it serves to help prioritize and target watersheds for restoration and protection efforts. In recent years, the MWCRT has been enhanced to provide the ability to inform targeting and prioritization at different spatial scales. The continued use and refinement of the MWCRT allows Mississippi's NPS management program to refine prioritization and targeting scenarios as NPS pollution management actions evolve and our understanding of pollution pathways and recovery science advance.

Basin Management Planning Application

To facilitate a more interactive prioritization process, the Mississippi NPS Program developed a map enabled web application that aids in the visualization of different data sources at the watershed scale. This web application uses ArcGIS online functionality to display the outputs from the MWCRT along with additional data layers that can inform the ranking and prioritization process. To address NPS restoration concerns, specific metrics calculation within the MWCRT that most reflect the results of NPS impacts are used along with additional data layers that help to further refine the prioritization and planning process. Any data that can be displayed as a point, line, or polygon

MDEQ has a map app for partners to use to help prioritize watersheds.

feature can be used, but for the purposes of targeting watersheds for restoration, the following data sets are most commonly used: waters with completed TMDLs for a NPS pollutant, waters that are on the §303(d) impaired waters list, waters where there is existing monitoring

data to help inform decisions and measure change, and the locations of known point sources. If the focus is on prioritizing watersheds for protection, the metrics and data layers used for ranking would focus on watershed indicators like the presence of blueways, the location of bathing beaches and recreational waters, waters designated for water supply, source water protection areas, locations of protected species, or watersheds that include streams or rivers that are considered to be outstanding resources or reference sites. All of this information can be displayed geographically and used to inform the prioritization process. Additionally, the web application allows the user to add information available locally from their organization to aid in the prioritization process. This is especially useful when partners may have access to information that can help prioritize watersheds for restoration or protection purposes, but that information cannot be shared with the entire group.

The Basin Management and NPS program uses the Basin Management Planning Application each year to review those watersheds that were included as priorities in the 5 year management plan, make any additions to the list based on partner and stakeholder input, and prioritize watersheds for plan development and project implementation. Basin Team members are provided a link to the application where the outputs from the MWCRT and the additional data layers are pre-loaded. The team members are then asked to provide feedback to the Basin Coordinators on their top five priority watersheds for that year. From this input, the watersheds are then ranked based on overall priority for the

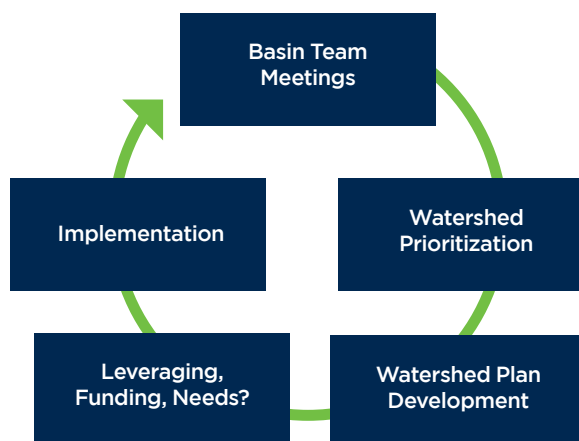
basin team as a whole. The top three priority watersheds will be the focus of watershed plan development for the next year with the highest-ranking watershed being targeted for implementation.

Knowledge Transfer

A large part of successfully managing NPS impacts to receiving waters is helping individuals understand what they can do to mitigate those impacts. In today's society, people often turn to the internet to research a problem before picking up a phone and trying to contact a person who may know the answer or who can, eventually, get them in contact with someone who knows the answer. This scenario is why knowledge transfer is critical to successful NPS management. Knowledge transfer can be realized in many forms: training courses, seminars, online tools and guidance documents/materials. It can also be realized through the use of social medial platforms like Twitter and Facebook and media campaigns. To be truly successful, all of these mechanisms should be utilized to provide the right information, in the right format, providing the needed amount of detail for the targeted audience. For these reasons, knowledge transfer remains a critical component of Mississippi's NPS management program.

Element 3: Planning

The Planning element of the Mississippi NPS Program is work area under which collaborative decisions are made about where in the state to focus NPS pollution management efforts, what those efforts will be, identify opportunities to leverage resources (either technical or financial), and prepare watershed plans for those priority watersheds where management efforts will be implemented. These decisions are facilitated by activities of the Basin Management Approach and are carried out through:



- Basin Team Meetings,
- Prioritization of Watersheds for Restoration or Protection Efforts,
- Development of Watershed Plans,
- Identification of Leveraging opportunities, funding and implementation needs, and
- Implementation.

Specific Planning element short-term goals, objectives, and milestones for the next 5 years are included in Appendix A. Implementation activities are discussed under Element 4.

The Basin Management Approach

The key strategy used in the Mississippi NPS Program for collaboration among agencies, organizations, institutions, and stakeholders, is the MDEQ Basin Management Approach (BMA). The mission of the BMA is to foster stewardship of Mississippi's water resources through place-based, collaborative water resources planning, education, protection, and restoration initiatives. The BMA provides a vehicle for bringing people together to collaborate on

identifying and addressing a variety of water resources concerns, including NPS pollution. The building blocks of the BMA are Basin Groups, Basin Teams, and Watershed Implementation Teams. Each of these elements is discussed below.

Mississippi's Basin Groups

As stated in the mission statement, the BMA fosters place-based collaboration. In order to break the regions of the state into smaller, more manageable areas; collaboration is organized around Basin Groups. As is common in watershed and water quality management frameworks, MDEQ has organized the BMA to work within the nine major river basins in Mississippi. Each Basin Group is made up of one or more of these river basin or drainage networks and each Basin Group has a dedicated staff member who is assigned to be the Basin Coordinator for that group. These Basin Groups, organized hydrologically by drainage basin, allow for collaboration around the different water resources, and water resources concerns, found in these different areas of the state (see Table 10).

Basin Group	Unique Water Resources	Unique Water Resources Concerns
1 - North Independent Streams, Tennessee, and Tombigbee River Basins	Tennessee-Tombigbee waterway	Hydrologic modification
2 - Yazoo River Basin	Canals, drainage ditches, wetlands, Mississippi River Alluvial aquifer, Mississippi River Oxbow Lakes	Dredging (canals & ditches) Groundwater depletion Run-off from row crop agriculture Fish consumption advisories for pesticides & mercury Hydrologic modification
3 - Pearl River, South Independent Streams and Big Black River Basin	Ross Barnett Reservoir, oxbow lakes	Fish consumption advisories for PCBs & mercury Run-off from row crop agriculture Urban Stormwater Urban Sprawl/water management
4 - Pascagoula River, Coastal Streams and Lower Pearl River Basins	Coastal waters, estuaries, beaches, barrier island habitat, shellfish beds, tidal marsh, coastal wetlands	Tidal Marsh depletion Urban Stormwater Sea Level Rise Beach/swimming safety HABs Shellfish and fin fish commercial fisheries Fish consumption advisories for mercury

Table 10: Unique Resources and Water Concerns in the Basin Groups.

Basin Teams

For each Basin Group, there is a Basin Team. Basin Teams provide the forum for collaboration on water resources management within the Basin Groups. The Basin Teams consist of an MDEQ Basin coordinator and [25-50]

Basin Teams focus on work for the larger Basin Group while Watershed Teams focus on working in smaller 12-digit watersheds.

representatives from resource agency partners (both federal and state), organizations, and institutions, as well as local stakeholders.

Basin Teams have in person meetings at least once a year, but also participate in smaller group discussions or meetings as needed.

These Basin Team meetings help establish

and support partnerships among Basin Team members and provide a forum to address water resource concerns. These groups also provide a communication pathway for partners to learn about the roles other organizations play in water management and how different partners may be able to help address different types of water management issues. During Basin Team meetings, team members work collaboratively on a variety of activities to address water resources concerns within their Basin Group including:

- Providing data for use in assessment of state water quality,
- Identifying water resources issues or areas of concern,
- Prioritizing watersheds for NPS pollution management activities,
- Reporting on water resources projects in the Basin Group,
- Learning about research relevant to the Basin Team,
- Coordinating education and outreach programs in the Basin Group,
- Identifying opportunities to engage with stakeholders within the Basin Group, and
- Identifying opportunities for leveraging technical and/or financial resources to address water resources concerns.

Watershed Implementation Teams

Watershed Implementation Teams (WIT) represent another mechanism for collaboration on water resources management within the Basin Management Approach. A Watershed Implementation Team is formed for each HUC 12 watershed that is prioritized by the Basin Teams and then targeted for NPS demonstration projects to be implemented within that watershed. Because of this, there can be many watershed

implementation teams established. The participants in the WITs may also be members of the larger Basin Team, but that is not always the case nor a requirement. Watershed implementation teams are intended to be more locally driven and provide a forum at the watershed level to promote public involvement in local water resources management. These teams include local stakeholders (e.g., landowners, residents, business owners, representatives of local government), as well as representatives from agencies, organizations, and institutions active in the priority watershed. The primary goal of the Watershed Implementation Teams is to protect and restore the quality of the water resources of target HUC 12 watersheds. Teams are also instrumental in the development and implementation of watershed plans. These plans are often used by WITs as their roadmaps to improve water resources within their watershed.

Benefits of Mississippi's Basin Management Approach

To fully address water resources concerns as a state, MDEQ recognizes it's going to require working through many pathways and approaches to both protect high quality waters and restore those waters that have been impacted over time. The Basin Management Approach was designed as a way to bring representatives from all water resource management programs, both regulatory and non-regulatory; federal partners, researchers, local governments, and the public together into a single forum where these representatives can work in tandem to prioritize and address Mississippi's water resources concerns. This approach allows these groups to work within their respective authorities on common issues to achieve common goals in the same places. By focusing time, attention, and resources (where possible) as a collective group, more actual improvement can be achieved, and these achievements benefit everyone. Working within the BMA provides the following benefits to managing water resources management concerns in Mississippi:

- Identifies and targets our water quality problems;
- Focuses efforts and funding on solving our water quality problems;
- Provides more opportunities for direct involvement of Mississippians in developing and implementing solutions to our water quality problems;
- Creates a more direct pathway for local stakeholders to access available technical assistance and funding resources;
- Provides opportunities for agencies, organizations, and groups with common water management goals to work in collaboration; and
- Increases the likelihood of water quality resources achieving designated uses for future generations.

Basin Management Approach and Mississippi's NPS Program

The BMA is integral to implementation of the Mississippi NPS Program. The BMA is the mechanism Mississippi's NPS Program uses to prioritize watersheds for implementation of NPS pollution management projects. Partners working within the BMA are integral for developing and implementing watershed-based plans, and associated NPS pollution management projects.

Contact Information for Basin Coordinators

The primary MDEQ contact for the BMA is the Basin Management and NPS Branch Chief. For information about a specific Basin Group or HUC 12 watershed, you can also contact the appropriate Basin Coordinator through the [MDEQ website](#).

Watershed Prioritization

The term “watershed” in the dictionary is defined as an area or ridge of land that separates waters flowing to different rivers, basins, or seas. In the watershed management context,

• A “watershed” is an area of land that separates waters flowing to different rivers, basins, or seas. In the context of this plan, a watershed is the drainage area represented at the HUC 12 scale.

•

most people use that term to specifically refer to a watershed as it is defined by the USGS hydrologic unit codes or HUC codes. In the framework of the Mississippi NPS Program, a watershed is a specific drainage area as it is defined at the HUC 12 scale. Some states have watersheds at a finer resolution, but that is not the case for Mississippi. In Mississippi, the finest resolution (e.g. smallest, or most detailed) HUC coverage available is the

at the watershed or HUC 12 scale. Watersheds at this scale are generally 25,000-30,000 acres and there are 1,468 HUC 12 watersheds in Mississippi.

In 2013, when EPA issued updated guidance for NPS programs and the use of §319 funds, they made some changes to help the programs better plan for how the grant funds would be used. Many of these changes were made in recognition that better planning would lead to better documented NPS pollution reductions. One of the major changes implemented was the mandate that any watershed designated to receive §319 grant funds to

implement conservation measures **must first have been designated by the program as a priority watershed**. As part of the NPS management plan, states and tribes must identify their priority watersheds. To address this requirement and to help manage the workload presented by having more than 1,400 HUC 12 watersheds, the Mississippi NPS Program developed a process to first identify watersheds that are priorities for either restoration or protection activities and then a process by which to prioritize, or target, watersheds from that list as places where NPS demonstration projects should be implemented.

The Basin Management Approach brings together different groups with shared goals of improving water resources while recognizing there are still limited financial resources available to implement conservation practices and other activities to improve water quality. Because of this challenge, a process was developed to help prioritize watersheds and target where resources and work efforts are implemented in order to obtain maximum benefits. As part of this management plan, every five years, Basin Coordinators request input from partners (i.e. MDEQ water programs, federal agencies, other state agencies, institutes of higher learning, NGOs, local organizations, and stakeholders) to develop a list of state watersheds they believe are a priority for water quality management activities. Water quality management can include water quantity management, water quality improvement of impaired waters, or protection of high resource value waters. This statewide list is included for reference as part of the NPS Program Management Plan and is reviewed annually by these same partners to ensure the list is complete and inclusive of watershed priorities as identified by MDEQ and resource agency partners. Additionally, this statewide list of identified watershed priorities is used as the starting point for watershed ranking and targeting that will ultimately lead to the identification of where grant funded restoration or protection projects should be implemented.

Working within the Basin Management Approach and the partners that participate on Basin Teams, members work collaboratively to prioritize watersheds and target the watersheds that represent the highest priority for either restoration or protection for watershed plan development and conservation practice implementation. The process begins by first reviewing and revising (if needed) the list of statewide priority watersheds. Next, this list is then used as a starting point for the prioritization and targeting process that is done for each basin group. A brief description of this process was provided in Chapter 3 but is described in more detail below:

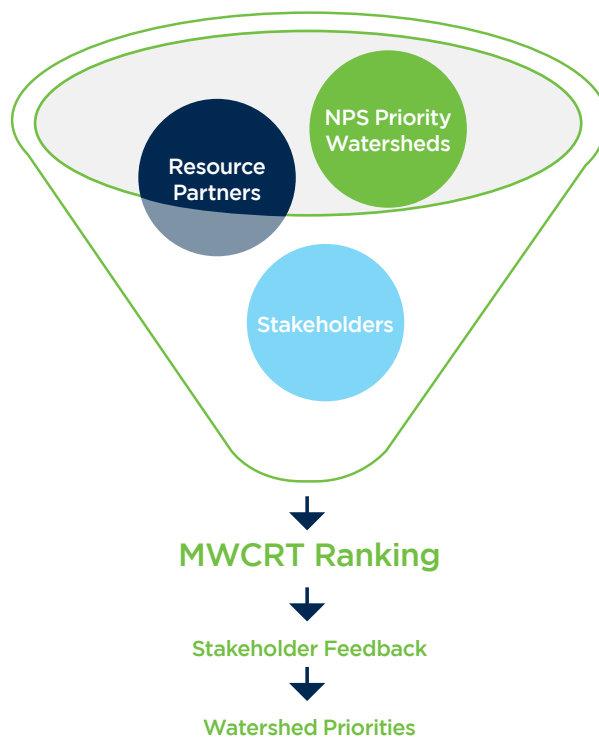
- Each year, Basin Teams review and update the statewide list to incorporate any changes in the priorities of the agencies and organizations they represent. This allows prioritization to adapt to the, sometimes rapid changes in state, federal, and local priorities. This also allows for priorities to evolve as changes occur in the environment

(e.g., disasters) or how the environment is managed (i.e. government regulations).

- The GIS based Mississippi Watershed Characterization and Ranking Tool (MWCRT) is used to rank those watersheds, by basin group. Using the results of the MWCRT output, the top 25 ranked priority watersheds in each Basin Group are identified.
- The list of top 25 ranked priority watersheds for each Basin Group generated from the process above is sent to the members of their associated Basin Teams. In order to allow for more efficient collaboration between the Mississippi NPS Program and Basin Team members, the output from MWCRT along with additional key information to support planning (e.g. location of monitoring stations, impaired waters, attaining waters, etc.) is loaded into an online web enabled mapping application and provided back to the basin team members for review.
- Each Basin Team member/organization nominates five watersheds (from the original 25) that best represents their highest priorities for funding/implementation and sends the list of their preferred five watersheds to their MDEQ Basin Team Coordinator.
- For each Basin Group, MDEQ compiles a list of the preferred watersheds from the Basin Team and ranks them using the feedback from the basin team members to generate a new list. This list represents the ranked priorities for that year or funding cycle.
- Using that information, the three watersheds with the highest ranks based on Basin Team preference are identified and work begins to develop watershed plans for those watersheds.
- Each Basin Team recommends one of the top three watersheds to be a Targeted Watershed.
- The Basin Management and NPS Branch selects Targeted Watersheds for the next MDEQ §319 grant proposal work plan. In addition to the results of the watershed prioritization, these decisions are based on availability of funds, available project partners in the watershed, distribution of §319 funds in watersheds throughout the State, and similar factors.

Watershed Based Plans

For each watershed identified as a priority for NPS pollution management through the Mississippi NPS Program, a Watershed Implementation Team (WIT) is formed. This team is generally composed of local stakeholders, resource agency partners, and any other interested party located within the watershed boundaries. The first responsibility of a WIT is to help gather the necessary information and write a Watershed-based Plan (WBP) for their watershed.



Information used in preparing WBPs includes the results of water quality assessments, stressor identification studies, water quality modeling, and TMDLs. This information guides WIT decisions on the types and location of restoration and protection activities to plan in a watershed. In watersheds that have TMDLs, they are used to provide water quality restoration objectives and pollutant load reduction goals for the WBP.



These WBPs are intended to be holistic in nature addressing the wide range of water management concerns unique to that watershed. The primary focus of these plans is water quality, and as a result, provides a roadmap for how conservation and education activities can be implemented in the watershed to achieve water quality improvement goals. To the extent possible, WBPs identify all sources of water pollution, both point source and NPS, regulated and unregulated. Thus, most WBPs address more than one category of NPS pollution. Along with identifying pollution sources, these plans also outline potential solutions to reduce and/or prevent NPS pollution and restore or protect designated uses in a watershed.

A holistic WBP facilitates not only simultaneously addressing multiple sources of water pollution, but also multiple objectives. This provides numerous opportunities for collaboration among partners, leveraging of resources (both financial and technical), and targeted awareness, education and outreach activities. Through the BMA, WITs can write WBPs that provide a roadmap for how natural resources programs with different missions can work together in a watershed to achieve common goals. Thus, WBPs can include elements and activities from a range of existing programs, including nutrient reduction, coastal zone management, public drinking water supply, source water protection, conjunctive water management, and programs funded as part of the Farm Bill. A holistic WBP is particularly important because NPS management is primarily voluntary and early successes can result in additional landowner participation.

Although many different types of information is useful and can be included in a watershed plan, EPA has identified nine key elements that are critical for achieving improvements in water quality. To be eligible for funding through §319 subgrant, NPS pollution management watershed projects must be associated with a WBP that includes the “nine key elements” identified by EPA (Figure 1). Thus, the Mississippi NPS Program requires that these key elements be included in all WBPs. To assist WITs in this effort, the MDEQ Basin Management and NPS Branch developed a guidance document entitled Mississippi Watershed Implementation Plan Guidance Compatible with Section 319 Grant Requirements to help develop plans that address all nine elements.

Once WBPs are completed, they are submitted to EPA for review and concurrence. After they have been accepted by EPA, NPS pollution management projects within the associated watershed are eligible to receive §319 subgrant funding. At least 50% of the §319 funds granted to the Mississippi NPS Program are allocated to watershed projects that implement WBPs. These WBPs are intended to be living documents. WITs commit to regularly reviewing and updating the WBP to document changes in knowledge about, and conditions in, the watershed.

9 Key Elements

1. Identify Causes & Sources
2. Load Reductions
3. Management Measures
4. Budget
5. Information & Education
6. Implementation Schedule
7. Milestones & Outcomes
8. Evaluation
9. Monitoring

Element 4: Project Implementation

This element of the Mississippi NPS Program encompasses those activities undertaken when watershed plans are implemented in targeted priority watersheds. As discussed above, WBPs identify recommended NPS pollution management activities needed to achieve the NPS pollution

Watershed Projects
can cover a range of
activities from BMP
implementation to Ed/
Outreach to
monitoring and
assessment

management goals for a targeted watershed. The NPS pollution management/conservation practices, local NPS pollution awareness and education, and water quality monitoring activities that are recommended in the WBPs are implemented through projects. These NPS pollution control projects are developed

and managed by agencies, organizations, or institutions active in the watershed. Through implementation of projects, NPS pollution sources are mitigated and water resources are improved and protected. While WBPs can, and often do, deal with multiple categories of NPS pollution in order to address all of the water resources concerns in the watershed; projects usually address a single NPS pollution category such as agriculture or urban stormwater. These projects, when implemented in concert following the

practices identified in the WBPs, are what ultimately work together to result in water quality improvements. Although projects may focus on one specific category, or landuse type, they can identify practices to reduce multiple pollutants. An example would be working in the agricultural portion of a watershed to mitigate the impacts from sediment, nitrogen, and phosphorus, while simultaneously working on a complementary project in the urban portion of the watershed to address those same nonpoint sources in urban stormwater. Because the actions were identified in the WBP and were implemented in conjunction with each other as complementary projects, it improves likelihood of reducing the overall water quality impact resulting from those sources. An added benefit of implementing watershed projects is the federal funds spent on these projects are injected into the local economies where the watersheds are located. These project funds are used to pay local businesses that in turn put NPS conservation practices on the ground in Mississippi thereby funding local economies while improving water quality.

All projects should include, as appropriate, NPS pollution management activities, water quality monitoring, and awareness and education activities. The WBPs developed for the targeted priority watersheds identify NPS pollution best management practices (BMPs) that control the NPS pollutant(s) of concern in the Targeted Watershed. Projects for demonstrating or implementing NPS pollution BMPs will usually focus on the practices identified in the WBP. However, NPS pollution BMPs not specifically named in the WBP can be included in projects funded by §319 subgrants, as long as they are appropriate for the conditions and NPS pollution sources in the Targeted Watershed, and will mitigate the pollutant(s) of concern.

In addition to implementing NPS pollution management in Targeted Watersheds, projects provide important information that is used to inform, evaluate, and improve the Mississippi NPS Program. For example, monitoring that is conducted in the watershed before practices are put on the ground and after implementation provide information on water quality improvements observed as a result of the projects as well as on the efficiency of management practices in reducing NPS pollution. Data generated from monitoring designed to show the effectiveness of NPS BMPs is critical to program success. Nonpoint pollution management programs need to show that the BMPs used to control NPS pollution do work and make a difference. Therefore, the standard protocol is to characterize water quality before putting NPS pollution management practices in place, and then monitor water quality after the practices are implemented. Water quality monitoring can be measurement of physical characteristics (e.g., temperature), measurement of chemical constituents (e.g., nitrogen), or survey and characterization of aquatic communities. All of these types of data and information are used in Mississippi's NPS Management Program.

Tracking watershed projects provides, in a cost-effective

manner, information on what improvements can be achieved from NPS pollution management activities and how much these activities cost to put in place. Having access to this type of information helps the program and water quality managers make better decisions which practices can achieve the best results for the most efficient cost. Project tracking information is also used to evaluate the success of the Mississippi NPS Program, identifying what is working and what changes are needed. Short-term goals, objectives, and milestones for the next 5 years specific to Project Implementation are included in Appendix A.

Role of WITs in Project Implementation

Once a WBP is written, and has been accepted by EPA, the role of the WIT is to facilitate implementation of that WBP through projects. In this role, WITs are a vehicle for getting NPS pollution management practices on the ground where they are needed in their Targeted Watersheds, while bringing natural resources work and federal money into local economies. The WITs provide coordination and collaboration avenues for implementation of NPS pollution management practices that were identified in the watershed plans. To this end, WITs build capacity by involving local governmental agencies, non-governmental organizations, and local citizens in the effort to implement projects. Members participating in WITs can work together to identify opportunities for pooling technical and financial resources in projects and facilitate formation of working groups within the team to focus on different aspects of WBP implementation. For example, it is not uncommon to have a separate working group within a watershed team that focuses on education and outreach while a different group of members focus on agricultural implementation needs or ordinance development for stormwater control. These working groups are formed based on the unique membership and needs of each watershed and watershed plan.

Funding Projects

Part of the watershed plan development process is determining how much it will cost to implement all of the activities identified in the watershed plan. In fact, budget information is one of EPA's 9 key elements that must be addressed in all WBPs before they can be approved, and implementation can take place. Part of the process also includes identifying any potential sources of funding that could be used for implementing the WBP (including and in addition to §319 grant funds). There are a variety of funding mechanisms for WBP projects, including federal and state agency grant programs, federal and state agency loan programs, private funding foundations, and funding assistance programs through non-government organizations

50% of the \$319 Grant must fund watershed projects.

and interest groups. Funding for projects brings money into local economies. Partnerships developed through the BMA can be important for identifying and obtaining funding for projects in Targeted Watersheds. Section

319 sub-grants are one way the Mississippi NPS Program funds projects in Targeted Watersheds.

Workplans and Sub-grants

Section 319 sub-grants can be used to fund a wide variety of activities, or projects, related to management of NPS pollution, and these sub-grants can be made with partnering agencies, organizations, local governments, or institutions. The work covered can include training programs, water quality studies, demonstration projects for a wide variety of practices that control NPS pollutants of interest, and cost share to individuals for implementing practices that control NPS pollution. Projects selected for \$319 sub-grant funding must be implemented in a targeted priority watershed. Projects must also include work that is consistent with the activities identified in the approved 9 key element watershed plan for that targeted priority watershed.

Partners wanting to implement projects develop workplans that cover the activities they plan to carry out in the watershed. Workplans identify the activities that will take place during the project, who will be responsible for initiating and managing each activity, a project schedule with milestones, and the project budget. When developing the budget, the workplan outlines how the matching funds for the project will be provided. Required match can be generated two ways: either by actual matching funds or by providing in-kind services that can be valued monetarily. Workplans are generally developed by the group or project team that will be overseeing the implementation of work and will be responsible for final reporting as well as all invoicing and requests for reimbursements for work completed. Assistance with preparing project workplans for \$319 sub-grant proposals is available from many sources including the WIT, Basin Team members, Basin Team Coordinator, and personnel of the Basin Management and NPS Branch. Tracking various projects implemented for the different targeted priority watersheds with approved 9 key element WBPs helps evaluate the success of the project individually, the overall watershed plan, and, ultimately, the Mississippi NPS Program.

Project Reporting

With every grant application that is submitted for \$319 funding, not only does the grant application have to identify how much of the grant funds will be spent on project implementation, but the narrative workplan must explain where and how these funds are going to be spent. Because of this requirement, the Mississippi NPS Program identifies the targeted priority watersheds where grant funds will be spent and provides the amount of funding that will be spent in each of those watersheds to implement activities identified in the WBPs. Once grant funding is received and sub-grants are in place to initiate work, project details are entered into EPA's GRTS data system. This process was described in more detail under Element 2, but the same requirements are followed for all projects receiving funding under the grant. The approved watershed plans are attached as supporting documentation into GRTS along with annual reporting of progress, expenditures, and load reductions. At the end of

the project, the final report is also uploaded into GRTS.

Project reports can be found in GRTS, on the web, and presented at Basin Team Meetings.

In addition to meeting all of the GRTS reporting requirements, all project partners submit detailed quarterly progress reports that provide updates on completed milestones and expenditures along with any pictures of

BMPs or results from any education or outreach events conducted. If anything happened that would result in a delay of the project, this is also reported on the quarterly progress reports ensuring that project managers and our partners can work together to develop solutions and ensure the project meets goals and is completed within grant timelines. Project summaries are often included as part of the NPS annual report and the NPS Program works with partners to use Basin Team Meetings, field days, and watershed team meetings as additional opportunities to provide presentations and project updates. At the conclusion of the project, final reports are developed to address each component of the work funded, load reductions are calculated where BMPs are implemented and, when possible, project summary scorecards are developed as an easy, 1-page, summary of the work completed in the watershed.

Element 5: Project Implementation Support

This element encompasses those activities of the Mississippi NPS Program that support implementation projects in targeted priority watersheds. The Mississippi NPS Program has established partnerships with multiple agencies, organizations, and institutions at the state or basin level as part of Program Implementation. Technical and financial support of the local, project-specific activities of these partners is considered part of Mississippi NPS Program Support for Project Implementation. Funding under this element can be used to support a range of activities as long as the outcomes ultimately address work needed to support project goals. Often, this funding ensures technical assistance is available at the local watershed level from partner agencies, organizations, and institutions. Some activities supported include partnership and support from local soil and water conservation district staff as well as NRCS technical assistance to design and implement NPS best management practices. These funds ensure these subject matter experts can participate in watershed implementation team meetings. This element also includes activities associated with monitoring to evaluate the effects of local projects on water quality.

Monitoring of water quality in Targeted Watersheds is necessary to show the results of the work of the Mississippi NPS Program. This data is used to determine if program and WBP goals are being achieved with regards to improvement or protection of the quality of water resources. All watershed-based plans have a monitoring component included as part of the planning process and funding under this element can be used to support those monitoring efforts. Because of how funding under §319 grants is structured, implementation projects in targeted priority watersheds have a maximum

Funding supports technical assistance, monitoring, assessment, data analysis, and research efforts in support of NPS project implementation efforts.

lifespan of four years before the grant ends. It is commonly recognized by researchers that it takes longer than five years for measurable improvements in water quality to occur after BMPs are implemented. Therefore, in order to demonstrate watershed improvements using water quality monitoring, the NPS Program is committed to funding monitoring in targeted watersheds after the initial projects are completed.

Work funded under this element ensures longer term monitoring in targeted priority watersheds can be conducted.

Funding is also used to support partnership agreements with the USGS to subsidize on-going monitoring in watersheds where NPS pollution demonstration projects are either on-going or where implementation is completed and follow-up monitoring is needed to measure water quality benefits achieved as a result of BMP implementation. The partnership between the Mississippi NPS Program and the USGS is unique in that the USGS leverages staff time to support monitoring as well as assessment and data analysis efforts that support shared water resource management goals with the NPS program. As part of these efforts, USGS staff participate in watershed monitoring and data analysis efforts that can be used to measure the success of NPS conservation practice implementation. This work can also be used to further the scientific understanding of different systems, determine new ways to establish monitoring protocols and load reductions, and collect data to refine individual BMP effectiveness/efficiency estimates for practices implemented on Mississippi soils, watersheds, and unique drainage systems like are found in the Mississippi River Alluvial Plain.

All water quality data collected using §319 funds is conducted in accordance with EPA-approved QAPPs and the results are uploaded into EPA national data systems as per the requirements of grant. Data collected in collaboration with the USGS are made available in the USGS's National Water Information System (NWIS). All data available in NWIS can also be obtained from the National Water Quality Monitoring Councils Water Quality Portal. This portal allows the public to access water quality data from both the EPA and USGS water quality data systems.

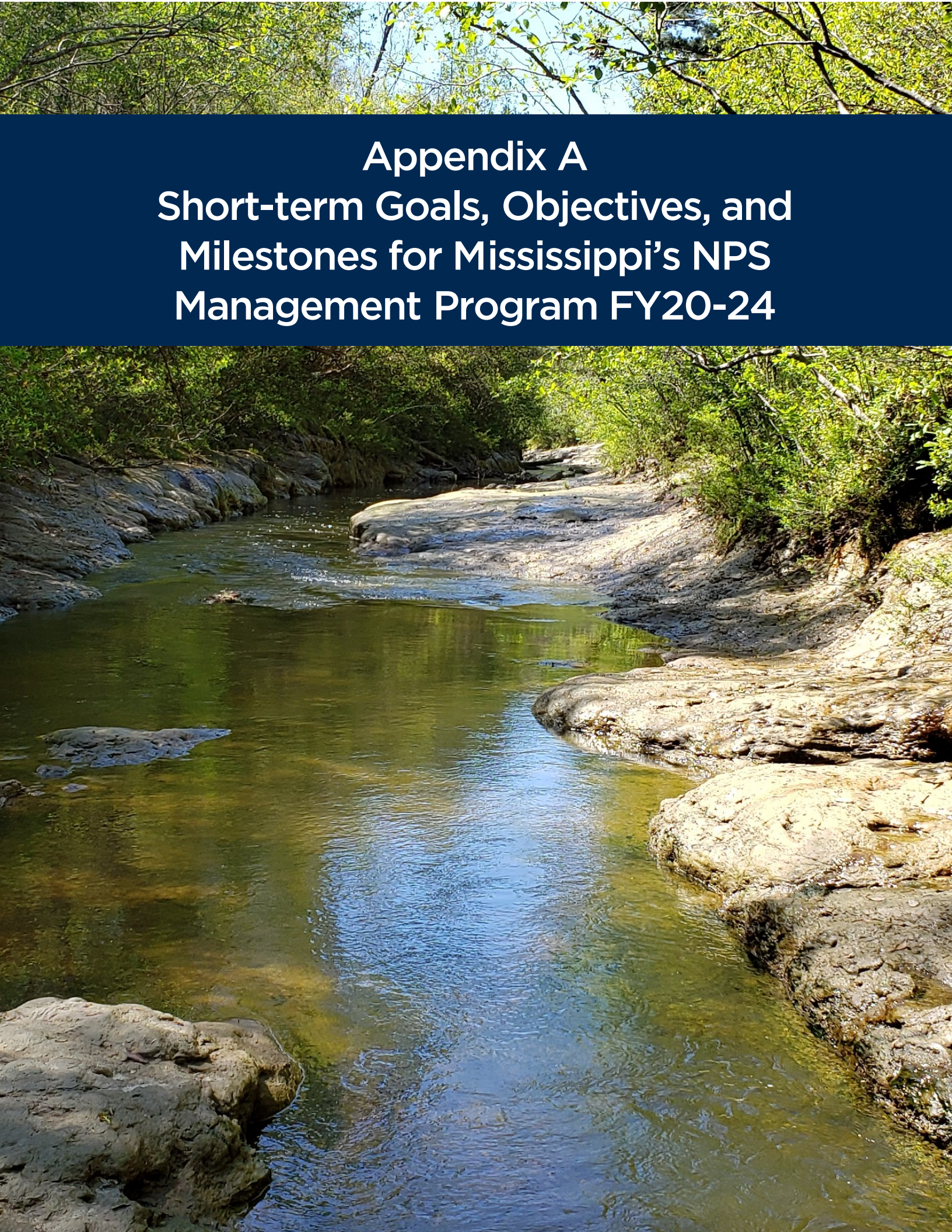
Short-term goals, objectives, and milestones for the next 5 years specific to Project Implementation Support are included in Appendix A.



Works Cited

- Ariely, D. (2008). *Predictably Irrational: The Hidden Forces That Shape Our Decisions*. New York, NY: HarperCollins Publishers.
- Duffy, M. (2012, August File A1-75). *Ag Decision Maker*. Retrieved from Iowa State University Extension and Outreach: <https://www.extension.iastate.edu/agdm/crops/html/a1-75.html>
- Grenny, J., Patterson, K., Maxfield, D., McMillan, R., & Switzler, A. (2013). *Influencer: The New Science of Leading Change 2nd Edition*. New York, NY: McGraw-Hill Education.
- Kahneman, D. (2012). *Thinking Fast and Slow*. New York, NY: Farrar, Straus, and Giroux-Macmillian Publishers.
- Kahneman, D., & Tversky, A. (1979). Prospect Theory: An Analysis of Decision Under Risk. *Econometrica*, Volume 47, Issue 2, pp. 263-292.
- Marsh, G. P. (1865). Man and Nature; or Physical Geography, As Modified By Human Action. *The New York Times*, 8vo. New-York: Charles Scriener.
- MDEQ. (2003). *Development and Application of the Mississippi Benthic Index of Stream Quality (M-BISQ)*. Jackson, MS: Mississippi Department of Environmental Quality (MDEQ).
- MDEQ. (2014). *Mississippi Nonpoint Source Program Management Plan 2014 Update*. Jackson, MS: MDEQ.
- MDEQ. (2016). *Evaluation and Recalibration of the Mississippi Benthic Index of Stream Quality (M-BISQ)*. 2016: Mississippi Department of Environmental Quality (MDEQ).
- MDEQ. (2018). *Mississippi 2018 Ssectio 303(d) List of Impaired Water Bodies*. Jackson, MS: MDEQ.
- MDEQ. (2018). *State of Mississippi Water Quality Assessment 2018 Section 305(b) Report*. Jackson, MS: MDEQ.
- MDEQ. (2019, December 26). *Wastewater Pollution Control Regulations*. Retrieved from Mississippi Department of Environmental Quality: https://www.mdeq.ms.gov/wp-content/uploads/2018/09/11-Miss.-Admin.-Code-Pt.-6-Ch.-2_Final_Approved-by-EPA-January-18-2017.pdf
- Meals, D., Dressing, S., & Davenport, T. (2009). Lag Time in Water Quality Response to Best Management Practices: A Review. *Journal of Environmental Quality*, 85-96.
- Millennium Ecosystem Assessment. (2005). *Ecosystems and Human Well-Being: Synthesis*. Washington, D.C.: Island Press.
- Plantier-Santos, C., Carollo, C., & Yoskowitz, D. (2012). Gulf of Mexico Ecosystem Service Valuation Database (GecoServ): Gathering ecosystem services valuation studies to promote their inclusion in the decision-making process. *Marine Policy*, Volume 36, Issue 1, 214-217.
- Rogers, E. M. (2003). *Diffusion of Innovation Fifth Edition*. New York, NY: The Free Press, Simon & Schuster.
- Thaler, R. H. (2015). *Misbehaving: The Making of Behavioral Economics*. New York, NY: W.W. Norton & Company.

- Thaler, R. H., & Sunstein, C. R. (2009). *Nudge: Improving Decisions About Health, Wealth, and Happiness*. New York, NY: Penguin Books.
- Tversky, A., & Kahneman, D. (1974). Judgement Under Uncertainty: Heuristics and Biases. *Science*, Volume 185, Issue 4157, pp 1124-1131.
- US Census Bureau. (2017). *American Community Survey (ACS) and Puerto Rico community Survey (PRCS), 5-Year Estimates*. US Census Bureau.
- USEPA. (2013). *Nonpoint Source Program and Grants Guidelines for States and Territories*. Washington D.C.: USEPA.

The image is a full-page background photograph of a river winding through a lush, green forest. Large, flat, light-colored rocks are visible along the riverbanks and in the water. The water is clear, reflecting the surrounding trees and sky. The top portion of the image is overlaid with a dark blue banner containing white text.

Appendix A

Short-term Goals, Objectives, and Milestones for Mississippi's NPS Management Program FY20-24

Mississippi NPS Program Goals, Objectives, and Milestones

Vision

The **Vision** of the Mississippi NPS Program is to **ensure safe, clean, healthy, and sustainable water resources to meet the needs and uses of present and future generations of Mississippians.**

Three long-term goals help ensure this vision is achieved:

1. Protect and improve the quality of Mississippi water resources for human uses;
2. Achieve water quality improvements through mitigation of NPS pollution; and
3. Foster wise economic growth through focused research, responsible regulation, widespread education, and collaborative efforts through partnerships.

These long-term goals reflect a 20-year planning horizon. Each of the five Mississippi NPS Program elements also have five-year short-term goals with associated objectives. Within the table format, there is space available to provide information on milestones accomplished each year to achieve the objectives and goals defined. This Appendix provides short-term goals, objectives, and milestones for each of the 5 key NPS Program Elements.

Program Administration – Element 1

Goal 1: Periodically review, assess, and report on progress toward achieving the NPS Program goals and milestones and revise as new information becomes available.

NPS Program Objectives	Milestones Reported Annually to Meet Program Objective and Goal				
	2020	2021	2022	2023	2024
a. Track and report on annual milestones to accomplish NPS Program goals and objectives.					
b. Update the NPS Management Plan every five years to reflect program changes and success toward meeting NPS Program goals.					5-yr NPS Program Plan Update

Goal 2: Manage the NPS Program budget and grants efficiently using appropriate technical and financial instruments.

a. Collaborate and coordinate with the MDEQ OPC Grants personnel to submit financial reports required in administrative conditions of Section 319 grant.					
b. Collaborate and coordinate with the MDEQ OPC Administrative staff to perform required financial risk assessment for sub-grantees awarded monies to complete work under the Section 319 grant.					
c. Allocate 50% of Section 319 grant funds to support project implementation.					
d. Expend grant funds by the grant end date and no later than 5 years from receipt of funds.					
e. Obligate Section 319 sub-awards within 1 year after the EPA grant award date.					
f. Dedicate an average of \$100,000 in Section 319 grant funds to the coastal zones as defined by Section 6217 of CZARA until full program approval is achieved.					
g. Prepare grant application and workplan for new Section 319 grant					
h. Prepare and submit grant close-out reports in compliance with administrative conditions of the Section 319 grant.					

Goal 3: Ensure consistency among the NPS Program and other federal and state water resource programs and projects.

- a. Coordinate with federal and state water management programs to maintain alignment of NPS priorities.
- b. Coordinate with programs managed by MDEQ to leverage resources and identify priorities.

Program Implementation – Element 2

Goal 1: Effectively implement the Mississippi NPS Management Program.

NPS Program Objectives	Milestones Reported Annually to Meet Program Objective and Goal				
	2020	2021	2022	2023	2024
a. Prepare annual Success Stories (WQ-10) of NPS restoration activities that have been effectively implemented.					
b. Maintain MOAs with federal and state agency partners and Mississippi educational institutions.					
c. Track and report on \$319 sub-grant funds and any match (or in-kind services) reported.					
d. Support implementation of nutrient reduction strategies.					
e. Utilize MWCRT and Watershed Planning App to assist partners with NPS planning and implementation activities.					
f. Provide reports and other documents online for public access.					
g. Develop centralized NPS database to assist with tracking and reporting \$319 grant activities.					
h. Provide all required information/data entry into EPA's GRTS data system for Section 319 funded projects.					

i. Georeference all best management practices installed through \$319 grant program.					
j. Conduct site visits to each project to ensure work is on track or completed.					
k. Develop standardized NPS pollutant reductions associated with implementing agricultural BMPs using the EPA Hypoxia Task Force measurement reduction framework to track NPS load reductions statewide.					

Goal 2: Implement a strategic Awareness, Outreach, and Education Program.

a. Conduct 4 Area and 1 State Envirothon Competition(s) annually.					
b. Conduct at least 4 stream stewardship outreach/ education workshops annually.					
c. Conduct at least 10 environmental education teacher workshops annually.					
d. Conduct at least 10 Project Learning Tree Workshops annually.					
e. Conduct at least 10 Environmental Education and Outreach Mobile Classroom events annually.					
f. Conduct outreach meetings and/or field days to promote awareness and educate local stakeholders about NPS pollution prevention.					
g. Fund Summer Ecology Day Camp for students.					
h. Support the annual Make-A-Splash Event and other environmental education programs in cooperation with local museums.					
i. At least annually, review print and electronic materials for updates and replenish as needed.					
j. Increase general public understanding of water resources, watershed management issues, and actions individuals can take to protect and restore water quality and aquatic habitats.					

Planning – Element 3

Goal 1: Use Partnerships to leverage resources for NPS management.

NPS Program Objectives	Milestones Reported Annually to Meet Program Objective and Goal				
	2020	2021	2022	2023	2024
a. Obtain approval of remaining conditions pursuant to CZARA Section 6217 in order to achieve fully approved Coastal NPS Management Program.					
b. Collaborate and contribute to NPS pollution management through participation on select Committees, Task Forces, and Work Groups.					
c. Continue to partner with MS-USDA-NRCS by meeting at least annually to support the decision-making process and next steps on the National Water Quality Initiative and the Mississippi River Basin Initiative as long as these initiatives remain a national priority.					
d. Encourage watershed planning activities in watersheds with high resource value waters.					
e. Provide technical assistance to local watershed groups by using Basin Coordinators and NPS Staff to support project development and implementation activities.					
f. Support technical events to exchange information between government partners, researchers, watershed groups, and/or citizens.					
g. Use the basin management approach and basin teams to prioritize watersheds for NPS pollution management on an annual basis.					
h. Select 3 Targeted Watersheds for implementation through the Section 319 grant annually based on available funds, statewide distribution, and available partners.					
i. Identify Watershed Implementation Teams in Targeted Watersheds in conjunction with local partners.					

j. Generate guidance for developing and/or updating watershed-based plans.					
k. Develop/update watershed-based plans for priority watersheds.	1	1	1	1	1
l. Number of 9 key Element Plans reviewed and accepted by EPA.	1	1	1	1	1

Goal 2: Support the MDEQ Water Quality Management process.

a. Support WQS Branch in developing criteria appropriate for assessing the effects of NPS pollution.					
b. Coordinate Section 319 program activities and leverage funding within MDEQ water programs to protect and restore surface and groundwater quality.					
c. Work with partners to solicit water quality data to support §305(b) statewide assessment.					
d. Develop statewide assessment for waterbodies to determine water quality status in compliance with Section 305(b) of the CWA.					
e. Identify waters not meeting one or more designated use and develop the impaired waters list in compliance with Section 303(d) of the CWA.					
f. Support Field Services Division water quality monitoring of NPS projects and NPS pollutant loadings.					

Project Implementation – Element 4

Goal 1: Promote Implementation of restoration (or protection) for priority watersheds.

NPS Program Objectives	Milestones Reported Annually to Meet Program Objective and Goal				
	2020	2021	2022	2023	2024
a. Award 319 sub-grants to implement management practices to reduce NPS pollution based on an accepted EPA watershed-based plan. b. Award Section 319 grant funds to implement projects in priority watersheds. c. Pursue full approval of the MS Coastal NPS program pursuant to Section 6217 of CZARA to restore and protect coastal waters.					

Goal 2: Implement applicable practices that control and reduce NPS pollution.

a. Require Operation and Maintenance agreements for BMP implementation projects to ensure continued performance and useful life of BMPs. b. Calculate estimated annual Total Nitrogen reductions achieved in priority watersheds. c. Calculate estimated annual Total Phosphorus reductions achieved in priority watersheds. d. Calculate estimated annual Sediment reductions achieved in priority watersheds.					
--	--	--	--	--	--

Project Implementation Support – Element 5

Goal 1: Collect and analyze data related to NPS pollution control and reduction.

NPS Program Objectives	Milestones Reported Annually to Meet Program Objective and Goal				
	2020	2021	2022	2023	2024
a. Use MDEQ monitoring resources to monitor waters in National Water Quality Initiative watershed. b. Use additional resources (e.g. staff, funds, and technical support) to monitor water quality in watersheds where NPS restoration activities have occurred.					

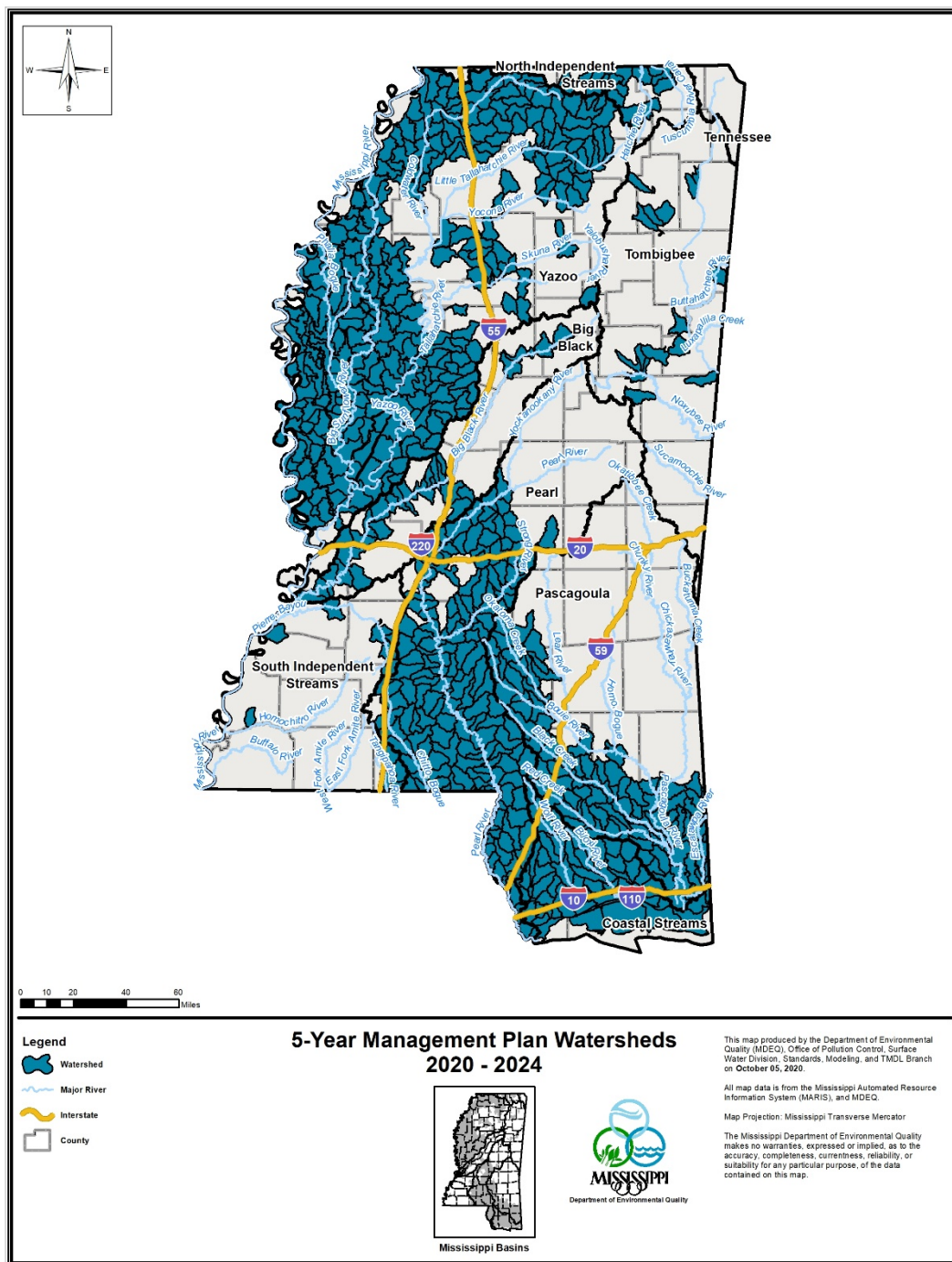
Goal 2: Collaborate with key partners to provide technical assistance in priority watersheds.

a. Work with respected members of the agricultural community (e.g. MSWCC, NRCS, Delta F.A.R.M., Farm Bureau, etc.) to educate stakeholders and design, fund, and/or implement conservation measures to mitigate NPS pollution. b. Work with respected members of the forestry community (e.g. MS Forestry Commission, Urban Forestry Council, MS Forestry Assoc., etc.) to educate stakeholders and design, fund, and/or implement conservation measures to mitigate NPS pollution. c. Work with trusted partners (e.g. land trusts, NGO's, IHL, etc.) in targeted priority watersheds to educate stakeholders and design, fund, and/or implement conservation measures to mitigate NPS pollution.					
---	--	--	--	--	--

Appendix B

FY20-24 Priority Watersheds





HUC 12	HUC 12 NAME
031601011002	Fulton-Tombigbee River
031601020104	Busfaloba Creek-Town Creek
031601020304	Reeds Branch-Chiwapa Creek
031601020403	Carmichael Creek-Town Creek
031601020405	Louisa Creek-Coonewah Creek
031601030602	Alsop Creek-Buttahatchee River

HUC 12	HUC 12 NAME
031601040603	Red Bud Creek-Catalpa Creek
031601040607	Spring Creek-Tibbee Creek
031601060101	Motley Slu-Gilmer Creek
031601060307	Broken Pumpkin Creek
031601080206	Skinner Creek-Hollis Creek
031601080207	Talking Warrior Creek-Chinchahoma Creek
031601080208	Bluff Lake-Noxubee River
031601080304	Little Yellow Creek-Yellow Creek
031700030404	Evans Creek-Chickasawhay River
031700040304	Cole Branch-Oakohay Creek
031700040305	Sullivans Hollow Creek-Oakohay Creek
031700040601	Skiffer Creek-Bouie Creek
031700040602	Williams Branch-Bouie Creek
031700040603	Dry Creek-Lone Star
031700040604	West Bouie Creek-Bouie Creek
031700040605	Town Creek-Terrible Creek
031700040606	Cooks Branch-Bouie Creek
031700040607	Clear Run-Bouie Creek
031700040608	Tick Creek-Bouie Creek
031700040701	Dry Creek-Okatoma Creek
031700040702	Goodwater Creek-Okatoma Creek
031700040703	Shelby Creek-Okatoma Creek
031700040704	Blakely Creek-Okatoma Creek
031700040705	Rogers Creek-Okatoma Creek
031700040707	Big Swamp Creek-Okatoma Creek
031700040801	Cross Creek-Big Creek
031700040901	Upper Oakey Woods Creek
031700040902	Oakey Woods Creek-Station Creek
031700050602	Reese Creek-Leaf River
031700050604	Gum Branch-Leaf River
031700050904	McMillan Creek-Leaf River
031700060101	Whiskey Creek
031700060102	Whiskey Creek-Pascagoula River
031700060103	Beaverdam Creek-Big Creek
031700060104	Plum Bluff Cutoff-White Creek
031700060105	Big Creek-Pascagoula River
031700060106	Little Cedar Creek
031700060107	Lyons Creek-Big Cedar Creek
031700060108	Indian Creek-Pascagoula River
031700060201	Wolf Branch-Bluff Creek

HUC 12	HUC 12 NAME
031700060202	Cowpen Creek-Bluff Creek
031700060203	Threemile Branch-Moungers Creek
031700060204	Little Bluff Creek-Bluff Creek
031700060301	Black Creek-Pascagoula River
031700060302	Upper West Pascagoula-Pascagoula Rivers
031700060303	Lower West Pascagoula-Pascagoula Rivers
031700070101	Monroe Creek-Black Creek
031700070102	Perkins Creek-Black Creek
031700070103	Sandy Run-Black Creek
031700070104	Black Tom Creek-Black Creek
031700070105	Boggy Hollow-Little Black Creek
031700070106	Little Beaver Creek-Little Black Creek
031700070107	Potato Creek-Big Creek
031700070108	Granny Creek-Black Creek
031700070201	Walls Creek
031700070202	Poplar Creek-Chaney Creek
031700070203	Pearces Creek
031700070204	Bowens Bay Creek-Beaverdam Creek
031700070205	Browns Creek-Beaverdam Creek
031700070206	Middle Creek-Black Creek
031700070301	Dry Branch-Red Creek
031700070302	Hickory Creek-Red Creek
031700070303	Double Branch
031700070304	Hurricane Creek-Red Creek
031700070305	Mill Creek-Kirby Creek
031700070306	Chaney Creek-Red Creek
031700070307	Bridge Creek-Flint Creek
031700070308	Tenmile Creek-Red Creek
031700070401	Old Creek-Red Creek
031700070402	Cypress Creek-Red Creek
031700070403	Clear Creek-Bluff Creek
031700070404	Cooper Hill Creek-Red Creek
031700070405	Little Red Creek
031700070406	Clay Creek-Red Creek
031700070501	Joes Creek-Cypress Creek
031700070502	Beaver Creek-Hickory Creek
031700070503	Cypress Creek-Black Creek
031700070504	Little Sweetwater Creek-Sweetwater Creek
031700070505	Long Branch-Black Creek
031700070506	Black Creek-Big Black Creek

HUC 12	HUC 12 NAME
031700080301	Long Branch-Brushy Creek
031700080302	Scarborough Creek-Brushy Creek
031700080303	Powell Creek-Escatawpa River
031700080401	Rocky Branch-Rocky Creek
031700080402	Red Creek-Escatawpa River
031700080403	Juniper Bay-Escatawpa River
031700080404	Flat Creek
031700080405	Spring Creek-Escatawpa River
031700080406	Cunningham Branch-Escatawpa River
031700080601	Pierce Creek-Big Creek
031700080603	Collins Creek-Big Creek
031700080701	Jackson Creek
031700080702	Franklin Creek
031700080703	Lyons Creek-Escatawpa River
031700080704	Black Creek Cooling Pond-Black Creek
031700080705	Beardslee Lake-Escatawpa River
031700090101	Bayou Heron-Grand Bay Swamp
031700090301	Bayou Casotte-Pt Aux Chenes Bay
031700090302	Singing River Island
031700090303	Pt Aux Chenes Bay-Mississippi Sound
031700090304	Petit Bois Island
031700090401	Hurricane Creek-Railroad Creek
031700090402	Bayou Costapia
031700090403	Bayou Billie-Tchoutacabouffa River
031700090404	Bigfoot Creek-Tuxachanie Creek
031700090405	Hester Creek-Tuxachanie Creek
031700090406	Hog Branch-Tuxachanie Creek
031700090407	Cypress Creek-Tchoutacabouffa River
031700090501	Horse Creek-Biloxi River
031700090502	Crow Creek-Biloxi River
031700090503	Saucier Creek
031700090504	Upper Little Biloxi River
031700090505	Lower Little Biloxi River
031700090506	Palmer Creek-Biloxi River
031700090507	Fritz Creek-Biloxi River
031700090601	Flat Branch-Bernard Bayou
031700090602	Bernard Bayou-Big Lake
031700090603	Turkey Creek Diversion Canals 1-3-Bayou Portage
031700090604	Old Fort Bayou
031700090605	Back Bay of Biloxi

HUC 12	HUC 12 NAME
031700090606	Davis Bayou-Biloxi Bay
031700090701	Graveline Bayou
031700090702	Biloxi Bay-Mississippi Sound
031700090703	Horn Island
031700090801	Beach Drainage
031700090802	Little Deer Island
031700090803	Deer Island
031700090804	Ship Island Pass-Mississippi Sound
031700090804	Ship Island Pass-Mississippi Sound
031700090805	East Ship Island
031700090806	West Ship Island
031700090807	Cat Island
031700090901	Upper Hickory Creek
031700090902	White Cypress Creek-Hickory Creek
031700090903	Blacksnake Creek-Mill Creek
031700090904	Dead Tiger Creek
031700090905	Catahoula Creek
031700091001	Devils Swamp-Bayou la Croix
031700091002	Lower Devils Swamp-Bayou Phillip
031700091003	Lower Bayou la Croix
031700091101	Boggy Branch-Wolf Creek
031700091102	Wolf Creek-Wolf River
031700091103	Murder Creek
031700091104	Alligator Creek-Wolf River
031700091105	Pen Branch-Wolf River
031700091201	Crane Creek
031700091202	Sandy Creek-Wolf River
031700091203	Big Creek-Wolf River
031700091301	Bayou Bacon
031700091302	Bayou La Terre
031700091303	Rotten Bayou
031700091304	Bayou Talla-Jourdan River
031700091305	Cutoff Bayou-Jourdan River
031700091306	Saint Louis Bay
031700091401	Campbell Bayou-Bayou Caddy
031800010904	Hontokalo Creek
031800020101	Sugar Bogue-Coffee Bogue
031800020102	Beach Creek-Coffee Bogue
031800020103	Lee Branch-Coffee Bogue
031800020201	Hurricane Creek-Fannegusha Creek

HUC 12	HUC 12 NAME
031800020202	Red Cane Creek-Fannegusha Creek
031800020203	Deer Creek-Fannegusha Creek
031800020301	Upper Pelahatchie Creek
031800020302	Ashlog Creek-Pelahatchie Creek
031800020303	Eutacutachee Creek
031800020304	Hollybush Creek-Clear Creek
031800020305	Snake Creek-Pelahatchie Creek
031800020306	Riley Creek-Pelahatchie Creek
031800020307	Mill Creek-Pelahatchie Creek
031800020401	Pellaphalia Creek-Pearl River
031800020402	Lake Creek-Pearl River
031800020403	Cane Creek-Pearl River
031800020404	Mill Creek-Pearl River
031800020504	Lower Richland Creek
031800020601	Brashear Creek-Pearl River
031800020602	Hanging Moss Creek
031800020603	Hog Creek-Pearl River
031800020604	Town Creek-Pearl River
031800020605	Neely Creek-Conway Slough
031800020606	Lynch Creek-Pearl River
031800020607	Cany Creek-Pearl River
031800020701	Robinson Creek
031800020702	Upper Strong River
031800020703	Barber Creek-Caney Creek
031800020704	Davis Creek-Strong River
031800020705	Raspberry Creek
031800020706	Purvis Creek
031800020707	White Oak Creek
031800020708	Jump Creek-Strong River
031800020801	Rocky Creek
031800020802	Brushy Creek-Clear Creek
031800020803	Campbell Creek
031800020804	Sellers Creek
031800020805	Crooked Creek-Strong River
031800020901	Thompson Creek-Dabbs Creek
031800020902	Lower Dabbs Creek
031800020903	Rials Creek
031800020904	Sanders Creek
031800020905	Allen Creek-Strong River
031800020906	Westville Creek

HUC 12	HUC 12 NAME
031800020907	Little Creek-Big Creek
031800020908	Harper Creek-Big Creek
031800020909	Banks Creek-Strong River
031800021006	Steen Creek-Pearl River
031800021007	Rocky Creek-Pearl River
031800021008	Weeks Mill Creek-Pearl River
031800021011	Reno Creek-Pearl River
031800030101	Russell Creek-Bahala Creek
031800030102	Little Beaverdam Creek-Bahala Creek
031800030103	Fords Creek-Little Bahala Creek
031800030104	Bird Branch-Bahala Creek
031800030201	Little Copiah Creek-Copiah Creek
031800030202	Lick Creek-Copiah Creek
031800030203	Indian Creek-Pearl River
031800030204	Vaughns Creek-Pearl River
031800030205	Mallard Creek-Pearl River
031800030301	Little Fair River-Fair River
031800030302	Perch Creek-Fair River
031800030303	Johnson Branch-Bear Creek
031800030304	Bear Creek-Fair River
031800030305	Saddlebags Creek-Pearl River
031800030306	Crooked Creek-Pretty Branch
031800030307	Monticello-Pearl River
031800030401	East Prong Silver Creek
031800030402	West Prong Silver Creek
031800030403	Silver Creek-Silver Creek
031800030404	Hooker Hollow Creek-Silver Creek
031800030501	Walker Branch-White Sand Creek
031800030502	Jaybird Creek
031800030503	Dry Creek-White Sand Creek
031800030601	Upper Holiday Creek
031800030602	Dry Creek-Pierce Creek
031800030603	Lower Holiday Creek
031800030701	Halls Creek
031800030702	Coopers Creek
031800030703	Mill Creek-Pearl River
031800030704	Tilton Creek-Pearl River
031800030705	Greens Creek
031800030706	Cypress Creek-Pearl River
031800040101	Harper Creek-Pearl River

HUC 12	HUC 12 NAME
031800040102	Richland Creek-Silver Creek
031800040103	Mays Creek-Pearl River
031800040201	Polk Creek-Upper Little Creek
031800040202	Hurricane Creek-Upper Little Creek
031800040203	Big Creek-Upper Little Creek
031800040301	Jacks Creek-Gully Creek
031800040302	Half Moon Creek-Lower Little Creek
031800040303	Little Prong Creek-Lower Little Creek
031800040401	Tenmile Creek
031800040402	Dillon Creek-Pearl River
031800040403	Sandy Hook-Hurricane Creek
031800040404	Sandy Hook-Sandy Hook Creek
031800040405	Middle Fork Creek
031800040406	Ball Mill Creek-Pearl River
031800040501	West Fork Pushepatapa Creek-Pushepatapa Creek
031800040502	East Fork Pushepatapa Creek
031800040503	Crains Creek-Pushepatapa Creek
031800040504	Muster Ground Creek-Pushepatapa Creek
031800040601	Mill Creek-Pearl River
031800040602	Mayfield Creek-Pearl River
031800040603	Baughman Creek-Big Creek
031800040604	Peters Cutoff-Pearl River
031800040607	Chinquapin Creek-Pearl River
031800040701	Lees Creek-Pearl River
031800040702	Pearl River Canal-Pearl River
031800040704	Wilson Slough-Pearl River
031800040705	West Pearl River-Pearl River
031800040801	Jumpoff Creek-East Hobolochitto Creek
031800040802	Moran Creek-East Hobolochitto Creek
031800040803	Bay Branch-East Hobolochitto Creek
031800040901	Little Hell Creek-West Hobolochitto Creek
031800040902	White Sand Creek-West Hobolochitto Creek
031800040903	Big Branch-West Hobolochitto Creek
031800040904	Kennedy Creek-West Hobolochitto Creek
031800040905	Long Branch-West Hobolochitto Creek
031800040906	Mill Creek-West Hobolochitto Creek
031800040907	Hobolochitto Creek
031800041001	Old Channel-Pearl River
031800041002	Second Alligator Branch-Pearl River
031800041003	Mikes River

HUC 12	HUC 12 NAME
031800041004	Middle River-Pearl River
031800041005	Pearlington-Pearl River
031800041006	Mulatto Bayou
031800041007	Rigolets-Pearl River
031800050101	West Bogue Chitto
031800050102	East Bogue Chitto
031800050104	Boone Creek-Bogue Chitto
031800050105	Myers Creek-Bogue Chitto
031800050201	East Topisaw Creek
031800050202	West Topisaw Creek
031800050203	Upper Topisaw Creek
031800050204	Carters Creek-Topisaw Creek
031800050301	Lazy Creek-Bogue Chitto
031800050302	Clear Creek-Bogue Chitto
031800050303	Leatherwood Creek-Bogue Chitto
031800050304	Love Creek-Bogue Chitto
031800050305	Silver Creek-Bogue Chitto
031800050401	Upper Magees Creek
031800050402	Varnell Creek-Magees Creek
031800050403	Union Creek-Magees Creek
031800050404	Kirklin Creek
031800050405	Collins Creek-Magees Creek
031800050501	Snell Branch-Silver Creek
031800050503	Mud Creek-Hays Creek
031800050504	Clifton, LA-Bogue Chitto
080102070101	Owl Creek-Little Hatchie River
080102070203	Clear Creek-Hatchie River
080102070502	McElroy Creek-Tuscumbia River Canal
080102070503	Tarebreeches Creek-Tuscumbia River Canal
080102070504	Coon Creek-Tuscumbia River Canal
080102070601	Bell Creek-West Prong Muddy Creek
080102070602	Turkey Creek-Muddy Creek
080102070603	North Branch Hurricane Creek-Hurricane Creek
080102070604	Big Creek-Muddy Creek
080102070801	Goose Pond Creek-Hatchie River
080102080201	Porters Creek
080102100201	Goose Creek-Wolf River
080102100202	Grogg Creek-Wolf River
080102100204	Blind Tiger Creek-Wolf River
080102100206	Indian Creek

HUC 12	HUC 12 NAME
080102100207	Grays Creek
080201000302	Lake Beulah-Mississippi River
080301000200	80301000200
080301000300	80301000300
080302010301	Duncans Creek-Cane Creek
080302010303	Lower Mud Creek
080302010404	Jasper Creek
080302010406	Middle Creek-Hell Creek
080302010407	Little Mud Creek-Little Tallahatchie River
080302010502	North Tippah Creek-Tippah River
080302010503	Caney Creek-Shelby Creek
080302010504	Campbell Creek-Yellow Rabbit Creek
080302010505	Rhoden Creek-Tippah River
080302010601	Little Snow Creek-Snow Creek
080302010602	Oaklimeter Creek
080302010603	Chewalla Creek
080302010604	Chilli Creek-Tippah River
080302010605	Potts Creek-Tippah River
080302010701	Cane Creek-Lockes Creek
080302010702	Mitchell Creek-Little Tallahatchie River
080302010703	East Cypress Creek-Cypress Creek
080302010704	Puskus Creek-Cypress Creek
080302010705	Cornersville Creek-Mill Creek
080302010706	Fice Creek-Little Tallahatchie River
080302010707	Bagley Creek-Little Tallahatchie River
080302010801	Upper Big Spring Creek
080302010802	Lower Big Spring Creek
080302010803	Little Spring Creek
080302010804	Graham Mill Creek
080302010806	Turner Creek-Little Tallahatchie River
080302010906	Hudson Creek-Clear Creek
080302020301	Simmons Creek
080302020302	South Fork Tillatoba Creek
080302020303	Upper Tillatoba Creek
080302020304	North Fork Tillatoba Creek
080302020306	Sherman Creek-Panola Quitman Floodway
080302030102	Toccopola Creek-Yocona River
080302030103	Kettle Creek-Yocona River
080302030105	Yellow Leaf Creek
080302030106	Pumpkin Creek-Yocona River

HUC 12	HUC 12 NAME
080302030303	Bynum Creek
080302030305	Long Branch-Yocona River
080302040101	Hudsonville-Coldwater River
080302040102	Dawson Creek-Coldwater River
080302040103	Red Banks-Coldwater River
080302040104	Little Coldwater Creek-Coldwater River
080302040105	Lee Creek-Coldwater River
080302040201	Nunnally Creek-Pigeon Roost Creek
080302040202	Cuffawa Creek
080302040203	Cuffawa Creek-Pigeon Roost Creek
080302040204	Red Banks Creek
080302040205	Byhalia Creek Canal
080302040206	Red Banks Creek Canal-Pigeon Roost Creek
080302040301	Lewisburg-Coldwater River
080302040302	Nolehoe Creek-Camp Creek
080302040303	Short Fork Creek-Coldwater River
080302040304	Little Beartail Creek-Beartail Creek
080302040305	Beartail Creek-Coldwater River
080302040401	Beards Creek-Hickahala Creek
080302040402	James Wolf Creek
080302040403	Basket Creek-Hickahala Creek
080302040404	Tolbert-Jones Creek-Senatobia Creek
080302040405	Nelson Creek-Mattic Creek
080302040406	Senatobia Creek-Hickahala Creek
080302040501	Cane Creek-Arkabutla Lake
080302040502	Mussacuna Creek-Arkabutla Lake
080302040503	Nesbit-Hurricane Creek
080302040504	Frees Corners-Hurricane Creek
080302040505	Wolf Creek-Hurricane Creek
080302040506	Arkabutla Lake-Coldwater River
080302040601	Upper Arkabutla Creek
080302040602	Butterbowl Creek-Arkabutla Creek
080302040603	Middle Arkabutla Creek
080302040604	Patent Creek-Strayhorn Creek
080302040605	Egypt Creek-Strayhorn Creek
080302040606	Lower Arkabutla Creek
080302040701	Buck Creek-Coldwater River
080302040702	Johnson Creek
080302040703	Upper Lake Cormorant Bayou
080302040704	Buck Island Bayou

HUC 12	HUC 12 NAME
080302040705	Lower Lake Cormorant Bayou-Coldwater River
080302040801	Little White Oak Bayou
080302040802	Seven Mile Bayou
080302040803	Flag Lake
080302040804	Brushy Bayou
080302040901	Beaverdam Lake
080302040902	Bear Lake
080302040903	Yazoo Pass
080302041001	McNeil Bayou
080302041002	Ark Bayou
080302041003	Brady Bayou
080302041004	Thomasson Bayou
080302041101	David Bayou
080302041102	Indian Creek
080302041103	Burrell Bayou
080302041104	Lower Coldwater River
080302050106	Little Topashaw Creek-Topashaw Creek Canal
080302050206	Cowpen Creek-Skuna River Canal
080302050308	Cypress Creek-Turkey Creek
080302050309	Organ Creek-Perry Creek
080302050310	Grenada Lake-Skuna River
080302050407	Butputter Creek-Yalobusha River
080302050504	Mouse Creek-Little Bogue
080302050505	Crowder Creek-Little Bogue
080302050601	Riverdale Creek
080302050602	McSwine Creek-Yalobusha River
080302050701	Platner Bayou-Tippo Bayou
080302050803	Beasley Creek-Big Sand Creek
080302050902	Kirby Branch-Potacocowa Creek
080302060101	Upper Pelucia Creek
080302060102	Gilmore Lake-Pelucia Creek
080302060103	Lower Pelucia Creek
080302060104	Roebuck Lake-Yazoo River
080302060105	Catfish Bayou-Alligator Bayou
080302060106	Abotcaputa Creek-Yazoo River
080302060201	Murdock Creek-Abiaca Creek
080302060202	Dry Creek-Abiaca Creek
080302060203	Merrill Branch-Coila Creek
080302060204	Coila Creek-Abiaca Creek
080302060205	Old River-Abiaca Creek

HUC 12	HUC 12 NAME
080302060301	Gayden Brake
080302060302	Eldrin Fondren Ponds Dam
080302060303	T.W. Aust Ponds
080302060304	Burns Slough
080302060305	Snake Creek-Wasp Lake
080302060306	Bear Creek-Wasp Lake
080302060307	Blue Hole
080302060401	Morgan Bayou-Morgan Brake
080302060402	Upper Millstone Bayou
080302060403	Chicopa Creek
080302060404	Lower Millstone Bayou
080302060405	Upper Tchula Lake
080302060406	Tchula Lake Cutoff-Tchula Lake
080302060407	Lower Tchula Lake-Yazoo River
080302060501	Upper Black Creek
080302060502	Shipp Creek-Black Creek
080302060503	Tarrey Creek
080302060504	Williams Creek
080302060505	Harland Creek
080302060506	Gourdvine Creek-Black Creek
080302060601	Little Fannegusha Creek-Fannegusha Creek
080302060602	Bophumpa Creek
080302060603	Long Creek-Fannegusha Creek
080302060604	Tipton Bayou
080302060605	Blissdale Swamp-Parker Bayou
080302060701	Upper Tesheva Creek
080302060702	Lower Tesheva Creek
080302060703	Old Creek-Yazoo River
080302060704	Upper Piney Creek
080302060705	Lower Piney Creek
080302060706	Jonestown Cut-Off-Yazoo River
080302060801	Short Creek
080302060802	Rocky Bayou-Yazoo River
080302060803	Thompson Creek
080302060804	O'Neil Creek
080302060805	Dump Lake-Yazoo River
080302060901	Big Kilby Lake
080302060902	Wade Bayou
080302060903	Whittington Auxiliary Channel- Will M. Whittington Auxiliary Channel
080302060904	Lake George

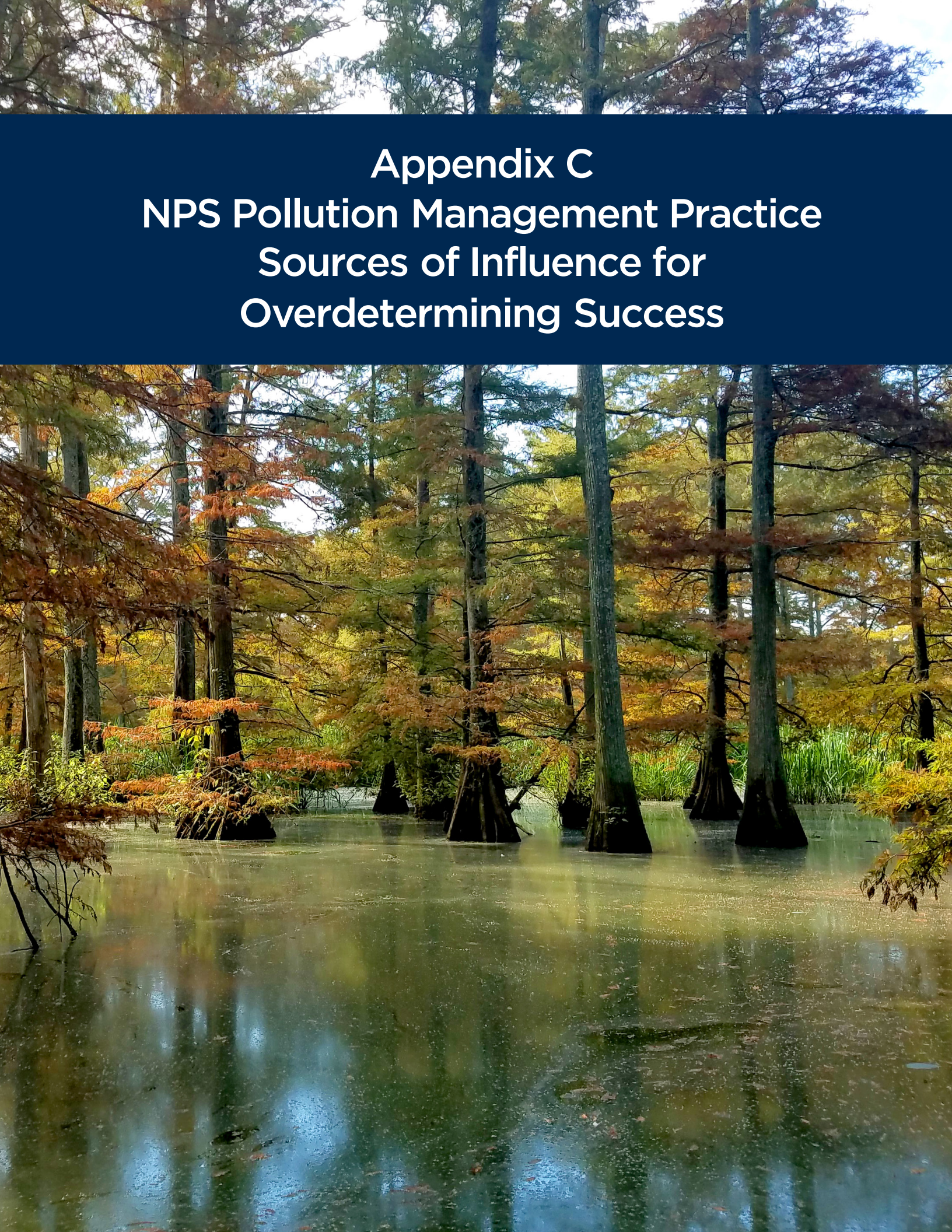
HUC 12	HUC 12 NAME
080302070101	Black Lake Bayou
080302070102	Little Sunflower River Headwaters
080302070103	Big Sunflower River Headwaters
080302070201	Yellow Bayou-Hushpuckena River
080302070202	Edward Bayou-Hushpuckena River
080302070203	Pecan Bayou-Hushpuckena River
080302070301	Overcup Slough-Harris Bayou
080302070302	Bobo Outlet-Harris Bayou
080302070303	Clark Bayou-Harris Bayou
080302070304	Hopson Bayou
080302070305	Dry Bayou-Harris Bayou
080302070306	Black Bayou
080302070401	Hyde Bayou
080302070402	Beaver Bayou-Mound Bayou
080302070403	Long Lake
080302070404	Burrell Bayou
080302070405	Lead Bayou
080302070406	Standing Stump Bayou
080302070501	Headwaters Jones Bayou
080302070502	Outlet Jones Bayou
080302070503	Upper Porter Bayou
080302070504	Middle Porter Bayou
080302070505	Lower Porter Bayou
080302070506	Gorman Lake
080302070601	Watson Bayou
080302070602	Lower Quiver Headwaters
080302070603	Parks Bayou-Parks Bayou
080302070604	Wild Bill Bayou
080302070701	Ruleville Lagoon
080302070702	Rattlesnake Bayou
080302070703	Fighting Bayou-Fighting Bayou
080302070704	Ashland Brake
080302070705	Pecan Bayou
080302070801	Little Jack Bayou
080302070802	Lake Henry
080302070803	Gin Bayou
080302070804	Moorhead Bayou
080302070805	Roundaway Bayou
080302070901	Deep Slough
080302070902	Bear Creek

HUC 12	HUC 12 NAME
080302071001	Indian Bayou-Indian Bayou
080302071002	Gravel Bayou
080302071101	Brook Bayou
080302071102	Conservatioin League Lake
080302071103	Tommie Bayou
080302071104	Dry Bayou
080302071105	Little Bradford Bayou
080302071106	Stokes Bayou
080302071201	Christmas Lake Bayou
080302071202	Stillwater Bayou
080302071301	West Bogue Hasty
080302071302	Pecan Bayou-Bogue Hasty
080302071303	Knox Bayou-Bogue Hasty
080302071304	Bee Bayou-Bogue Hasty
080302071305	Clark Bayou-Bogue Hasty
080302071401	Headwaters Bear Lake
080302071402	Jones Bayou
080302071501	Locust Bayou
080302071502	Beaver Dam Bayou-Dawson Bayou
080302071503	Short Bayou
080302071504	Beasley Bayou
080302071601	Tupper Bayou
080302071602	Beasley Bayou
080302071603	Little Atchafalaya Bayou
080302071604	Bucker Catfish Pond Dam
080302071605	Fourmile Bayou
080302071606	Mills Bayou
080302071607	Buck Bayou-Ditchlow Bayou
080302071608	Hard Cash Lake
080302071609	De Viney Bayou
080302071610	Turkeyfoot Bayou
080302071611	Fish Bayou
080302071701	Sunflower Lagoon Dam
080302071702	Big Widow Bayou
080302071703	Headwaters Big Widow Bayou
080302071704	Widow Bayou
080302071705	Silver Creek-Silver Creek
080302071706	Panther Creek
080302071707	American Churte
080302071801	Big Monocnoc Lake

HUC 12	HUC 12 NAME
080302071802	Straight Bayou
080302071803	Deer Creek-Rolling Fork Creek
080302071901	Fifteen Mile Island
080302071902	Howlett Bayou
080302071903	Coon Bayou
080302071904	Six Mile Bayou
080302071905	Little Sunflower Diversion Canal
080302080101	Collins Creek
080302080103	Skillikalia Creek-Yazoo River
080302090101	Headwaters Granicus Bayou
080302090102	Ditch Number Eighty Eight
080302090103	Swiftwater Bayou
080302090104	Granny Baker Bayou
080302090201	Horseshoe Bayou
080302090202	Rolling Bayou
080302090203	Aqua Farms Dam
080302090204	Arcola City
080302090205	Widow Bayou
080302090206	Moon Lake
080302090301	Ditch Number Fourteen
080302090302	North Lake Washington
080302090303	Swan Lake
080302090304	South Lake Washington
080302090305	Lafayette Lake
080302090401	Otter Bayou
080302090402	Flag Lake
080302090403	Gross Bayou
080302090404	Steele Bayou
080302090405	Steele Bayou Cutoff
080302090501	Mills Bayou
080302090502	Carlisle Lake
080302090503	Goose Lake
080302090601	Five Mile Lake
080302090602	Cypress Lake
080302090603	Eagle Lake
080302090604	Newman Road
080302090605	Deer Creek Mouth
080302090606	Cypress Bayou
080302090607	Steele Bayou Mouth
080601000301	Dowd Creek-Mammy Judy Bayou

HUC 12	HUC 12 NAME
080602010106	Salt Creek-Big Black River Canal
080602010306	Big Bywy Ditch-Big Black River Canal
080602010404	Flowers Creek-Big Black River
080602010501	Horse Creek-Big Black River
080602020302	Little Bear Creek-Bear Creek
080602020303	Tilda Bogue
080602020304	Tilda Bogue-Bear Creek
080602020404	Ellison Creek
080602020406	Pickett Creek
080602020407	Pepper Creek-Big Black River
080602020501	King Creek-Deer Creek
080602020504	Deer Creek-Big Black River
080602020507	Bluff Creek-Big Black River
080602020508	Mound Creek-Big Black River
080602020702	Poplar Creek-Big Black River
080602020703	Beaver Creek-Big Black River
080602020704	Porter Creek
080602020705	Halls Creek-Big Black River
080602020707	Summer Seat Creek-Big Black River
080602021001	Muddy Creek-Clear Creek
080602021002	Markham Creek-Big Black River
080602021003	Fivemile Creek
080602021005	Commissioners Creek-Big Black River
080602021101	Hamer Bayou-Big Black River
080602021102	Gunns Bayou-Big Black River
080602021104	Kennison Creek-Big Black River
080602030201	Wesson Lake-Dye Branch
080602030204	King Creek-Bayou Pierre
080602030205	Johnson Creek-Jones Creek
080602030207	Holcomb Creek-Bayou Pierre
080602030502	Booths Creek-Bayou Pierre
080602050703	Chase Bayou-Sammy Creek
080702050103	Little Tangipahoa River
080702050104	Osyka-Tangipahoa River
080702050105	Upper Bala Chitto Creek
080702050106	Lower Bala Chitto Creek
080702050108	Irving Branch-Tangipahoa River

This list include the HUC 12 priority watershed for the Mississippi NPS Program 2020-2024. If you need additional information about watersheds listed herein or would like to have a watershed considered as a priority for the Section 319 NPS Program, please contact your [Basin Coordinator](#).



Appendix C

NPS Pollution Management Practice Sources of Influence for Overdetermining Success



The concept of overdetermining success is to use multiple sources of influence simultaneously to encourage implementation of management practices to reduce nonpoint source pollution. These six sources of influence are addressed through the awareness, education, and outreach efforts and activities that are the cornerstones of nonpoint source pollution management. While time and resources might not permit all six sources of influence to be used simultaneously, as many sources as possible should be used. The following tables show examples of how awareness, education, and outreach approaches are combined to overdetermine success in encouraging adoption of selected nonpoint source pollution management practices. Additional tables can be developed as other nonpoint sources, management practices, and programs are identified.

Cover Crops and Residue Management Practices		
Domain	Motivation	Ability
Personal	• Increased profitability • Increased irrigation efficiency • Additional revenue stream (grazing) • Increased soil organic matter • Reduced fertilizer application • Reduced soil erosion	• Cover crop field days • YouTube/other videos • NRCS tech assistance • MS Cooperative Ext.
Social	• Leaders implementing practices • Farmer of the Year Award	• Delta F.A.R.M. seminars • Field days • Farmer to farmer exchanges • Conferences
Structural	• NRCS EQIP funding • NRCS RCPP funding • 319 funding	• Field days

Integrated Irrigation Water Management Practices ¹		
Domain	Motivation	Ability
Personal	- Increased profitability - Increased irrigation efficiency - Reduced fertilizer application	- Irrigation field days - YouTube/other videos - NRCS tech assistance - MS Cooperative Ext.
Social	- Leaders implementing practices - Farmer of the Year Award	- Delta F.A.R.M. seminars - Field days - Farmer to farmer exchanges - Conferences
Structural	- NRCS EQIP funding - NRCS RCPP funding 319 funding	- Field days - Surface water source for irrigation

¹Integrated Irrigation Water Management practices include land leveling, reservoir/tailwater recovery system, PHAUCET/Pipe Planner polypipe hole selection, surge valves, water meters, and irrigation scheduling.

Integrated Pasture Management Practices ¹		
Domain	Motivation	Ability
Personal	- Better pasture/forage quality - Increased rate of gain - Reduced hay feeding - Sustain water supply - Cost-share programs	- Grazing land conf. - Field days - YouTube/other videos - Grazing stick - NRCS tech assistance - MS Cooperative Ext.
Social	- Leaders implementing practices - Cattleman of the Year Award	- Grazing land coalition - Field days - Rancher to rancher exchanges - Conferences
Structural	- NRCS EQIP funding - NRCS RCPP funding 319 funding	- Grow grass, not algae campaign - Grazing stick - Promote 2 strand electric fence 4-5 forage paddocks - Stockpile paddock - Alternative water supply

¹Integrated Pasture Management practices include controlled stream access, alternative water supply, prescribed grazing, and heavy use protection areas.

Streambank Restoration and Stabilization Practices		
Domain	Motivation	Ability
Personal	• Reduced land loss • Gamebird hunting leases • Aesthetics • Reduced flood damage • Cost-share programs	• NRCS tech assistance • MS Cooperative Ext. • TNC tech assistance • Delta F.A.R.M. • Delta Wildlife
Social	• Leaders implementing practices • Conservationist of the Year Award	• Farmer to Farmer exchanges • Conferences • Field Days
Structural	• NRCS EQIP funding • NRCS RCPP funding • 319 funding • MWFP – Stream Teams	• Timber • Buffer strips/zones • Wildflowers

Homeowner Benefits from On-Site Wastewater Disposal System		
Domain	Motivation	Ability
Personal	• Increased property value • Reduced health risks • Increased resale value • Required for resale/loan approval	• YouTube videos • MSDH technical assistance • MSDH/MDEQ installation & maintenance training • MSDH Environmentalists • Field Days – Existing and new no-discharge systems
Social	• Public service announcements	• Property Owners Association • Sewage Summit in 4 Basins
Structural	• Increased property values • No resale w/o functioning on-site wastewater disposal system • Fines for nonfunctioning system	• Field days – Existing and new no-discharge systems

Homeowner Benefits from Stormwater Management Practices		
Domain	Motivation	Ability
Personal	- Increased property value - Decreased A/C cooling costs - Reduced costs for watering the lawn/garden - Beautiful landscapes - Green space and privacy	- YouTube videos - MSU Extension assistance - MDMR Green Infrastructure Tool Box - Master Gardener class - MFC Private Landowner - Services - MFC tree care advice - American Forest website - MS Arbor Day tree giveaway
Social	- Community leaders implementing Green Infrastructure - Yard of the month - POA/Neighborhood Association sponsored events focused on improving property value - public service announcements	- Neighbor helping neighbor - Master Gardener classes - Urban forests - MSU Extension urban field days - MDEQ Green Infrastructure training - Public service - Change regulations/zoning to make it easier to implement BMPs - Zoning - POA/Neighborhood Association by-laws that encourage (or don't penalize Green Infrastructure)
Structural	- Pursue Tax credits for stormwater management practices - Increased property values	- Strategic tree planting - Rain barrels - Gravel drive

¹National Tree Benefit Calculator <http://www.treebenefits.com/calculator>

Municipality/County Benefits from Stormwater Management Practices		
Domain	Motivation	Ability
Personal	- Increased property value/taxes - Reduced combined wastewater treatment costs and volume - Reduced water service costs - Reduced municipal A/C cooling costs - Reduced heat island effects - Reduced flooding - Reduced air pollution - Rain/stormwater reuse for public building toilets, cooling water, irrigation - Community gardens to increase infiltration, reduce runoff, provide fresh vegetables as value added. - Reduced health hazards (Zika, West Nile viruses) - Standardized tracking system for NPS load reduction from BMPs	- YouTube videos - MSU Extension LID/GI technical assistance - MDMR Green Infrastructure Tool Box - MDEQ Stormwater Runoff Management Manual - Master Gardner classes - American Forest website - MSU/APA integrated urban planning and design - MFC community planning - Community planning software for stormwater management - Community Growth Readiness training - Training on NPS load reduction tracking system - Public service announcements - Regulations/zoning to make Green Infrastructure easier
Social	- Public works directors - State/local Chamber of Commerce Director - Neighborhood Association Presidents - Mississippi Municipal League Ex. Director - Mississippi Association of Supervisors President	- MSU Extension - Mississippi Municipal League - Mississippi Association of Supervisors - Master Gardeners - Schools/community colleges/university activities and projects - Training for groundskeepers
Structural	- Increased property tax revenue - Stormwater fees for infrastructure development/maintenance - City/County ordinances - Unpaved roads program	- Green Space - Highway barriers - Rainwater harvesting - Community gardens - Bioswales - Retention/detention basins - Urban forests - Porous pavement - Park/recreation irrigation systems - Coastal wetlands/dunes infiltration

Public Awareness, Education & Outreach on Nonpoint Source Pollution

Domain	Motivation	Ability
Personal	- Increased property value/taxes - Reduced sewer bills - Reduced water service costs - Reduced A/C cooling costs - Reduced heat island effects - Reduced flooding - Reduced air pollution - Rain/stormwater reuse for lawn & garden watering. - Reduced health hazards (Zika, West Nile viruses) "Free" ecosystem service benefits - Student awareness programs - Teacher continuing education credits	- YouTube videos - MSU Extension LID/GI technical assistance - MDMR Green Infrastructure Tool Box - Master Gardner classes - American Forest website - Agricultural NPS Implementation Assistance program - Onsite Wastewater Disposal System Installation and Maintenance Education program - Educational partnerships with natural resource agencies, organizations, and institutions - Mississippi Statewide Forestry Water Quality Protection Program - Citizen's guides to water quality
Social	- Endorsements from: - Mayors - Public works directors - State/local Chamber of Commerce Director - Neighborhood Association Presidents - Mississippi Municipal League Ex. Director - Mississippi Association of Supervisors President - High School/Jr. High Principals - Farm Bureau President - Delta Council President - MS Association of Conservation Districts	- MSU Extension - Mississippi Municipal League - Mississippi Association of Supervisors - Master Gardeners - Schools/community colleges/university activities and projects - Training for groundskeepers - Watershed Implementation Teams - Adopt-a-stream program - Educator programs - Mississippi Waste Pesticide Disposal Program
Structural	- Section 319 subgrants 319 success stories - Mississippi Statewide Forestry Water Quality Protection Program - Teacher of the Year in Env. Education supporting NPS management - Farmer of the Year - Conservationist of the Year	- Green Space - Highway barriers - Rainwater harvesting - Community gardens - Retention/detention basins - Urban forests - Porous pavement - Park/recreation irrigation systems - Coastal wetlands/dunes infiltration - Storm drain markings - Blueways recreational paddling trails

