RESTORE Council Activity Description

## General Information

*Sponsor:*
Mississippi Department of Environmental Quality

*Title:*
Water Quality Improvement Program for Coastal Mississippi Waters

*Project Abstract:*
The RESTORE Council has approved $6.85M as FPL Category 1 planning activities in Council-Selected Restoration Component funding for the Water Quality Improvement Program for Coastal Mississippi Waters. This program is sponsored by Mississippi through the Mississippi Department of Environmental Quality (MDEQ). In addition, the Council is also identifying a separate $27.4M implementation component as an FPL Category 2 priority for potential funding. This program supports the primary RESTORE Comprehensive Plan goal to restore water quality and quantity in the Mississippi Gulf Coast Region through the identification and implementation of water quality improvement projects. Program activities include planning, engineering and design, septic-to-sewer conversion, implementation of new stormwater and wastewater systems, and repairing/upgrading existing stormwater and wastewater systems. This program will be coordinated with water quality improvement efforts under other funding streams to maximize outcomes.

Causes of water quality degradation in coastal systems include nutrient pollution and associated hypoxia and also bacteriological sources. Water quality degradation is often attributed to urban runoff, discharge, and overflow issues associated with aging or insufficient wastewater management. The conversion of septic-to-sewer and implementation of stormwater and wastewater improvement practices under the program is anticipated to reduce non-point source pollutant loads to downstream coastal receiving water bodies, resulting in an improvement in water quality of coastal waters and benefits to living coastal marine resources. Program duration is 10 years.

*FPL Category:* Cat1: Planning/ Cat2: Implementation

*Activity Type:* Program

*Program:* Water Quality Improvement Program for Coastal Mississippi Waters

*Co-sponsoring Agency(ies):* N/A

*Is this a construction project?:* Yes

*RESTORE Act Priority Criteria:*
(I) Projects that are projected to make the greatest contribution to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region, without regard to geographic location within the Gulf Coast region.
(II) Large-scale projects and programs that are projected to substantially contribute to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast ecosystem.

(III) Projects contained in existing Gulf Coast State comprehensive plans for the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.
(IV) Projects that restore long-term resiliency of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands most impacted by the Deepwater Horizon oil spill.

*Priority Criteria Justification:*
Coastal water quality issues are of great concern to the State and have been identified as a Gulf-wide priority. By addressing water quality degradation, this program will make the greatest contribution to restoring and protecting coastal resources. Given the interest across multiple states, it is a large-scale contribution to a pervasive Gulf-wide problem. Water Quality has been identified as a priority in multiple plans:

- The Mississippi Gulf Coast Ecosystem Restoration Plan identifies water resources as a priority program (MDEQ 2015).
- The Gulf Coast Ecosystem Restoration Task Force (GCERTF 2011) identified restoration of water quality as one of four main restoration goals, with reduction of pollutants and pathogens from storm water flows listed as a major action under that goal.
- The Ocean Conservancy (OC 2011) identified reduction of land-based pollutants as important to marine resources.
- The National Wildlife Federation (NWF 2014) discusses the importance of water quality near-shore for a host of habitats and species.
- Mississippi Comprehensive Wildlife Conservation Strategy (Knight and Barber, 2005) highlights stormwater runoff as a threat to habitats associated with developed areas that should be managed. By mitigating water quality degradation issues, the State is investing in a program that will contribute to the long-term resilience of the State's resources, specifically multiple living coastal marine resources. Reducing the likelihood of hypoxia and excessive nutrient loading, enhances the resilience of resources that are directly tied to MS and other Gulf state economies.

*Project Duration (in years):* 10

## Goals

*Primary Comprehensive Plan Goal:*
Restore Water Quality and Quantity

*Primary Comprehensive Plan Objective:*
Restore, Improve, and Protect Water Resources

*Secondary Comprehensive Plan Objectives:*
N/A

*Secondary Comprehensive Plan Goals:*
N/A

*PF Restoration Technique(s):*
Reduce excess nutrients and other pollutants to watersheds: Erosion and sediment control
Reduce excess nutrients and other pollutants to watersheds: Stormwater management
Reduce excess nutrients and other pollutants to watersheds: Wastewater system improvements

## Location

*Location:*
Coastal Zone of Mississippi, which impacts the coastal waters of the State of Mississippi including bays, estuaries, streams, and the Mississippi Sound.

*HUC8 Watershed(s):*
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Pascagoula)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Black)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Escatawpa)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Mississippi Coastal)
South Atlantic-Gulf Region(Pearl) - Pearl(Lower Pearl)

*State(s):*
Mississippi

*County/Parish(es):*
MS - Hancock
MS - Harrison
MS - Jackson

*Congressional District(s):*
MS - 4

## Narratives

*Introduction and Overview:*

General Description of Activity:

The Water Quality Improvement Program (WQIP) will support the restoration of water quality of Mississippi's coastal water resources through the identification and implementation of water quality improvement projects. Improvement projects may include, but are not limited to, the conversion from septic-to-sewer, the construction of new stormwater and wastewater systems, and the repairing and/or upgrading of existing stormwater and wastewater systems that would result in the improvement of water quality and the restoration and protection of natural resources. Implementation may also include, but is not limited to, engineering, design, and permitting, MDEQ and/or eligible sub-recipients (e.g., municipalities, counties, utility authorities) may implement components of individual projects within the program.

Primary Goal and Objective:

The Gulf Coast Ecosystem Restoration Council's (RESTORE Council) 2016 Comprehensive Plan Update outlines five goals to provide an overarching framework for integrated and coordinated restoration approach to region-wide Gulf Coast Restoration. The primary goal addressed by the WQIP is Restore Water Quality and Quantity. The Mississippi WQIP will improve water quality within Mississippi coastal waters, including priority bays and estuaries, coastal rivers and streams, along Mississippi coastal beachfronts, and within the Mississippi Sound. The activities of the WQIP are consistent with RESTORE Council's primary objective of Restore, Improve, and Protect Water Resources and targets projects that reduce and treat nutrient and pollutant loading.

Commitments in 2016 Comprehensive Plan Update:

The following describes how the WQIP addresses the commitments set forth in the 2016 Comprehensive Plan Update:

- Regional ecosystem-based approach to restoration: Water quality is a pervasive environmental concern across the Gulf Coast and is a priority goal for the RESTORE Council members. This regional approach is highlighted by the collaborative and connected multi-member interests in water quality improvement and commitment to addressing foundational issues causing water quality degradation. The State of Mississippi is addressing water quality improvement across the Mississippi Gulf Coast by identifying and implementing projects to mitigate downstream water quality degradation concerns. Addressing water quality provides resiliency to multiple living coastal marine resources within Mississippi and across the Gulf.
- Leveraging resources and partnerships: The State of Mississippi understands how leveraging is critical for effective coastal restoration. The State of Mississippi is investing in water quality improvement projects across the Deepwater Horizon (DWH) funding streams, including the following: Natural Resource Damage Assessment (NRDA) Nutrient Reduction projects in conjunction with USDA and EPA; habitat restoration efforts under National Fish and Wildlife Foundation Gulf Environmental Benefit Fund (NFWF-GEBF); and similar water quality improvement programs under the Direct and Oil Spill Impact Components of the RESTORE Act. The State of Mississippi has collaborated with other Gulf State Council members regarding their water quality goals to develop this region-wide water quality improvement program.
- Engagement, Inclusion, and Transparency: The State of Mississippi's prioritization of the WQIP is based on multiple public and stakeholder engagement activities, including the Annual Mississippi Restoration Summit, the Mississippi Coastal Restoration Plan (NFWF-GEBF) and the RESTORE Council's public engagement for the FPL3 Planning Framework. Throughout Mississippi's restoration public engagement and planning efforts, stakeholders have consistently identified the restoration and protection of water quality as a top priority.

- Science-based decision-making: Monitoring, source tracking, and other science-based decision tools will be utilized to determine the cause of water quality degradation, identify sources, and determine the effectiveness of implementation activities.
- Delivering results and measuring impacts: The WQIP will measure impacts of implementation through activities such as baseline monitoring, source tracking, and project and program specific monitoring. Monitoring activities for individual projects implemented will occur at the program level.

General Description of Environmental Benefits: Consistent with the RESTORE Council's water quality restoration goal, the State of Mississippi has prioritized the improvement of water quality for promoting ecosystem health and restoring and revitalizing Mississippi's economy. The conversion of septic-to sewer (Kelly, 2019) and the implementation of stormwater and wastewater system improvement practices (Reisinger, et al., 2018) is anticipated to reduce non-point source pollutant loads to downstream coastal receiving water bodies. This will result in an improvement in water quality of coastal waters and will provide in-situ benefits to living coastal marine resources, as well as the economy of the Mississippi Gulf Coast.

Environmental Stressors being addressed: Water quality impairment in coastal systems is a global phenomenon (Bennett et al., 2001; Vörösmarty et al., 2010) that is not only limited to nutrient pollution and associated hypoxia, but also tied with bacteriological impairment (Mallin et al., 2000). Stressors in coastal Mississippi are discussed here.

Pollutant Loading: Bacterial loading from pollutant sources results in beach advisories and oyster reef closures (with indirect consequences on coastal workforce and economies) (Feng et al., 2016). Nutrient loadings result in hypoxia development (Moshogianis et al., 2013) resulting in increased mortality of multiple living coastal and marine resources, both sedentary and mobile species. As a result of hypoxia, there is an additional possibility of harmful algal blooms occurring, posing both acute and chronic human health risks.

Freshwater Inputs: There are numerous freshwater inputs into Mississippi's bays, estuaries, and the Mississippi Sound, including inputs from urban systems, that result in alterations to water quality. This change in water quality is often associated with changes in water column conditions (i.e., hypoxia, eutrophication, and bacterial loads), and can also lead to the body of water not meeting its intended use (i.e., recreation or fishery) (Mallin et al., 2000; Pennington and Cech, 2010; Spellman, 2010).

Urban runoff: A significant amount of water quality impairment is attributed to urban runoff, discharge, and overflow issues associated with wastewater management (Dey and Truax, 2012). This is evidenced by direct contact advisories/closures, beach advisories/closures, as well as associations with storm events.

Additional Corollary Factors: Corollary factors that are likely contributors to the overall water quality dynamics on the coast that require consideration include source tracking of fecal coliform loads derivations, sediment load variability, and seasonal influences on bacterial levels.

Total Cost: $34,250,000

Timeline: 10 years

Partners: The State of Mississippi will coordinate with coastal municipalities, counties and utility authorities to implement projects under the WQIP.

Alignment with FPL3 Planning Framework: The WQIP aligns with the Planning Framework approach to reduce excess nutrients and other pollutants to watersheds and downstream receiving waters. Planning framework techniques that are anticipated to be utilized include storm-water management, erosion and sediment control, and wastewater system improvements.

*Methods:*

This WQIP will support the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast Region (GoCoast, 2013; GCERC, 2016). Program activities may run concurrently and include project planning and selection, engineering and design (E&D), permitting, conversion from septic to sewer in coastal communities, and implementation of new and/or repairing and upgrading existing stormwater and wastewater systems. Additionally, this program will be coordinated with other water quality improvement efforts under other Deepwater Horizon related funding streams, including water quality activities funded under the Direct and Oil Spill Components of the RESTORE Act.

The scope of work for this program can be generally classified into four components:

1. Program management and Oversight

Program management and oversight will cover general activities associated with this program and projects funded under this program. MDEQ personnel and its contractors will provide administrative programmatic functions and/or support during the life of the grant. MDEQ, with contractual support, will also manage the data associated with this program in accordance with the procedures outlined in the Observational Data Plan and the Data Management Plan.

2. Project Planning and Selection

This section provides context for how the State of Mississippi anticipates selecting projects to implement within the Council–Selected Restoration Component of the WQIP. Projects may be identified through existing data and analysis that demonstrate connectivity to water quality impairments, as well as, through the source tracking process where data gaps exist. Also, MDEQ may coordinate with local city and county entities to support identification of known wastewater/stormwater system failures contributing to water quality degradation. When needed, systematic source tracking may be utilized to identify sources and stressors of water quality degradation. Source tracking uses the identified water quality impairments (e.g., beach/advisory information, etc.) to establish hotspot specific water quality sampling regimes in order to systematically work upstream to identify the source of the degradation. Source tracking activities may include water quality sampling, tracking of pollutants, flow monitoring, stormwater and wastewater system testing, microbial source tracking, and could also include the sampling of marine nearshore sediments to provide an initial assessment of pollutant loading in the system. The source tracking process provides the analytical guidance and outlines the next steps for project identification, when needed. The source tracking process will determine hot spots for bacterial concentrations moving along an upstream gradient. Tributary contributions may be evaluated by examining the respective contributions, including potential concentrations and loads. Water sample analysis may be utilized to refine specific project and/or the source contamination project areas. Once an area or a specific project has been identified, additional due diligence (i.e., smoke testing, dye testing, and/or camera inspection), project scoping and coordination may be undertaken. Due diligence for individual projects will be unique and require varying degrees of additional work and may include cost benefit analyses, economic feasibility, preliminary engineering, environmental compliance and additional pre-construction activities.

3. Engineering and design, permitting, and implementation

Implementation may include, but is not limited to, engineering and design, permitting, small and large scale septic-to-sewer conversions, and any needed repairs, upgrades, or new construction of stormwater and wastewater management systems. MDEQ and/or eligible sub-recipients may implement components of individual projects within the program. Engineering, design, and permitting will be conducted in accordance with the applicable engineering and design guidelines and standards. For each project selected for implementation, specific workplans (including, but not limited to, budget and budget narrative, project narrative, milestones, environmental compliance, updates to the program ODP/DMP, and GIS files) will be provided to the RESTORE Council with updated project level information to facilitate the release of appropriate funds.

4. Post Implementation Monitoring

Monitoring will follow milestones as described in the individual project workplans, as well as additional monitoring measures within the Program. Monitoring may include as-built defined dimensions, lengths, surveys describing construction activities, as well as other construction related milestones. From a water quality monitoring perspective, all sampling collection, handling, transportation and analyses will occur according to state and federal QA/QC guidelines. Monitoring requirements will be unique for each project. Pre-implementation, baseline sampling, determination of pollutant of concern, and sampling design of post construction monitoring will be considered in developing a monitoring plan. While the project identification and evaluation process is linear, it is likely that there will be multiple processes occurring simultaneously across coastal Mississippi (e.g., one project in E&D phase, while another project is in post-construction monitoring phase). Water quality core parameter guidance will be project specific, but will reference any available RESTORE and NRDA related monitoring guidance.

### *Environmental Benefits:*

Elevated levels of potentially harmful bacteria are one of several water quality problems that exist on the Mississippi Gulf Coast (MDEQ online information). Bacterial impairment can come from a variety of nearshore and inland sources including storm-water runoff, boating waste, sewer overflows, septic system failures, wildlife, and other human activities. Nationwide, failure rates for septic systems vary, but the regional rate of septic failure is reported to range between 5% and 40%, with an average of about 10% (Swann 2008). Maryland and Virginia have reported failure rates of 5% for their septic systems (Fehr and Pae, 1997). Iverson (2019) documented statistically significantly higher nutrient exports from watersheds with high density of septic systems (approx. 1.8 systems / ha). Mass exports of total dissolved nitrogen and phosphate from high density watersheds were approximately 5 to 10 times higher than control and low density watersheds.

Septic systems by their very design are intended to leak sewage (Harrison et al., 2012). Converting septic to sewer is a major component of dealing with water pollution issues. Septic to sewer conversion in coastal watersheds are critical to avoid hydraulic and treatment failures as well as subsurface plumes that are typical of septic system failures. Multiple studies demonstrate hydraulic failures as well as subsurface plumes of dissolved nitrogen and phosphorus which have direct impacts to downstream water bodies (Gilliom and Patmont, 1983; Carodona, 1998). A study in Indiana suggested that one in three septic systems between 1950 and 2001 required repairs; however, since 1990 less than 3% of new septic systems required repairs, significantly fewer than in previous decades (Stout, 2003). However, in environments where soil wetness, high water tables, and frequent storm events are common occurrences, septic system failure, regardless of installation time frame, increases (Kohler et al., 2020).

Restoration and improvement of the quality of water as a natural resource will benefit the marine/coastal ecosystems, habitats, and fisheries, and provide economic benefits to the Mississippi Gulf Coast Region. Water quality degradation in coastal systems is a global phenomenon (Bennett et al., 2001; Vörösmarty et al., 2010; Lymer et al., 2018) and includes nutrient pollution and associated hypoxia (Diaz and Rosenberg, 2008) as well as enhanced bacteriological concentrations and loads (Mallin et al., 2000; O'Mullan et al., 2019). There are numerous freshwater inputs into Mississippi's bays, estuaries, and the Mississippi Sound, that result in alterations to water quality (Mickle et al., 2018). This change in water quality is often associated with changes in water column conditions (i.e., hypoxia, eutrophication, and bacterial loads) and can lead to the body of water not meeting its intended use classification (i.e., recreation or warm water fishery) (Mallin et al., 2000; Pennington and Cech, 2010; Spellman, 2010).

Wastewater management is often the most visible contributor to water quality degradation and is often associated with urban runoff, as well as discharge and sanitary sewer overflow (SSOs). The EPA estimates that there are at least 23,000 – 75,000 SSOs per year in the U.S. (EPA, N.D.), many of which are not specifically associated with impaired water listings, TMDLs, or other criteria. Urban wastewater connects directly to coastal marshes and the Mississippi Sound through canals and bayous. There are numerous studies and governmental reports that point to SSOs impacting and contributing to decreases in water quality, beach closures, shellfish bed closures, and other environmental problems (EPA, 2004; MDEQ, n.d., online).

The following objectives are set forth to improve water quality entering the Mississippi Sound and coastal waters:

- Systematic water quality evaluation and assessment to identify the source, dynamics, and most cost effective stormwater and wastewater improvement practices to improve water quality (Park et al., 1994; Sharpley et al., 2007; Spellman, 2008).
- Engineering, design, and permitting of the identified solutions (standard engineering practices, including certified and sealed plans). Conventional gravity sewers, force mains, pumping stations, treatment works, repair or construction, standard engineering principles or guidelines will vary depending on the system upgrade. Specific engineering guidelines will be informed by State agency policy decisions (MDEQ, n.d).
- Additional resources on new technologies tied to upgrades and improvements to wastewater collection systems (Sterling et al., 2010; FDEP, 2018) may be considered based on system circumstances, environmental and permitting regulations and restrictions.
- Implementation of designed stormwater and wastewater improvement practices. Implementation will follow standard construction and environmental practices, and any other applicable state and federal requirements (Walsh et al., 2005a, b; Hogan and Walbridge, 2007; Walsh et al., 2016).
- Monitoring of success of the respective practices (Kondolf and Micheli, 1995; Spellman, 2008; Lindenmayer and Likens, 2009a, 2009b; Reynolds et al., 2016). Specific wastewater discharges will be documented as project outcomes, as well as project-specific changes to downstream receiving waters (Fu et al., 2019; Tolouei et al., 2019).

*Metrics:*

Metric Title: HM001: Nutrient reduction - Lbs. N avoided or removed
Target: TBD
Narrative: Target is currently TBD. This will be used as a project or activity specific metric, as appropriate. The purpose of this metric is to verify that a reduction or avoidance of N loading

had been completed, and the performance measure will be the project or activity's ability to avoid or reduce lbs. of N. Once a project or activity is selected a target value will be established.

Metric Title: HM003: Nutrient reduction - Lbs. P avoided or removed
Target: TBD
Narrative: Target is currently TBD. This will be used as a project or activity specific metric, as appropriate. The purpose of this metric is to verify that a reduction or avoidance of P loading had been completed, and the performance measure will be the project or activity's ability to avoid or reduce lbs. of P. Once a project or activity is selected a target value will be established.

Metric Title: HM004: Sediment reduction - Lbs. sediment avoided or removed
Target: TBD
Narrative: Target is currently TBD. This will be used as a project or activity specific metric. The purpose of this metric is to verify that a reduction or avoidance of sediment loading had been completed, and the performance measure will be the project or activity's ability to avoid or reduce lbs. of sediment loading. Once a project or activity is selected a target value will be established.

Metric Title: RES002: Watershed management - # upgrades to stormwater and/or wastewater systems
Target: TBD
Narrative: This is a program specific metric. The number of upgrades to stormwater and/or wastewater systems for water quality implementation projects.

Metric Title: PRM011: Restoration planning/design/permitting - # E&D plans developed
Target: TBD
Narrative: This is a program specific metric. The number of E&D plans for water quality projects.

Metric Title: PRM013: Restoration planning/design/permitting - # environmental compliance documents completed
Target: TBD
Narrative: This is a program specific metric. The number of permits/compliance documents for water quality implementation projects.

*Risk and Uncertainties:*

Uncertainties may lie in inadequate planning to achieve desired water quality improvements as a result of the repair, upgrade, and/or construction that is implemented. Further uncertainty lies in the exact water quality improvement practice that needs to be implemented, the extent of the practice, as well as the utilization of multiple practices. This uncertainty results in a highly variable cost for implementation. By undertaking due diligence on source tracking and narrowing in, through water quality monitoring and beach advisory information to the area of concern, the risk associated with not seeing measurable improvements in water quality as a result of implementation are mitigated. Furthermore, through specific tasks and objectives for planning and evaluation, uncertainty in the scientific basis for implementation is reduced, as well as, the types of practices to be implemented and their respective costs. MDEQ has significant experience in implementing water quality improvement projects across the State of Mississippi, with a particular emphasis on the Mississippi Gulf Coast. MDEQ managed and provided oversight to the Community Development Block Grant (CDBG) program that invested over

$600 million in drinking water and wastewater improvement projects in the Mississippi coastal counties affected by Hurricane Katrina. An identified risk of implementation of best management practices for water quality improvement in riparian and in-stream areas is the effect on water flow, specifically causing flooding and drainage issues to upstream urban areas. Specific engineering and design of wastewater/stormwater improvement practices will evaluate the risk for said practices to influence and control water flow and ensure that design maximizes water quality mitigation. With diligent and effective planning prior to implementation, as well as post construction monitoring, uncertainties and risks of not improving water quality moving into the Mississippi Sound are significantly decreased. Sea level rise and storm surge are two risks and uncertainties to project implementation performance. Given the variability in sea level rise prediction as well as the anticipated immediate ecosystem service benefits of the implementation of sewer and wastewater infrastructure, it is unlikely that pipe infrastructure implementation will consider sea-level rise. Hummel et al. (2018) summarized a national assessment of coastal wastewater treatment facilities at risk for sea level rise. Mississippi was classified as low risk, with low exposure across a sea level rise gradient from 1ft to 6ft. However, with respect to storm surge, certain upgrades (i.e., pump stations, backflow valves, electrical connections etc.) could be based on storm surge predictions and to ensure lack of failure under those conditions.

### *Monitoring and Adaptive Management:*

Monitoring will follow milestones as described in the individual project workplans, as well as additional monitoring measures within the Program. Monitoring may include as-built defined dimensions, lengths, surveys describing construction activities, as well as other construction related milestones. From a water quality monitoring perspective, implemented projects will be monitored for their effectiveness in improving water quality in the respective identified water resource degradation, as applicable. For all impairments, trends over time may be compared to long-term advisory information to document changes. These trends could also be closely paired with environmental conditions of water flow and climate to highlight and provide reasoning for any documented changes. Additional monitoring and evaluation criteria could include: modeling estimates for changes in infiltration and inflow, pressure gauge and/or smoke testing, pollutant monthly and stormwater event sampling, and flow. Regardless of the criteria, pre/post implementation methodologies will inform the identification of project changes to water quality. Post implementation monitoring will identify project specific outcomes. If monitoring does not show progress towards those outcomes, additional vetting of project implementation success, and/or the identification of additional problem areas may occur to further improve water quality success criteria.

Water quality improvement projects implemented through this program may be operated and maintained by either MDEQ or eligible sub-recipient(s) both during and after the period of performance. Operation and maintenance activities necessary beyond the scope of work for this program are anticipated to be funded by local funding sources.

### *Data Management:*

MDEQ will store and manage an ISO-compliant relational database and geospatial database on a server that utilizes the Amazon Web Services cloud-based server environment. In addition to the network and server administration provided by Amazon Web Services, MDEQ manages the server, operating system, software and services. GIS information is backed up in three locations. The data is included in server snapshots performed by and stored at Amazon Web Services. Duplicate datasets are also located on a secure, cloud-based system. This system includes separate cloud backup and storage on two separate network attached storage arrays located in Gulfport and Jackson, MS. Finally, copies of the data are

stored on an internal server. All electronic data and metadata will be delivered to the RESTORE Council on a yearly basis for review and approval.

*Collaboration:*

The State of Mississippi, through Comprehensive Plan Commitment and Planning Support activities, has collaborated with Gulf state Council members to identify, develop and refine this region-wide water quality improvement request. To advance the program, MDEQ will collaborate with local municipalities, counties, utility authorities and other relevant agencies to identify and mitigate sources (e.g. infrastructure system failures) contributing to water quality impairments.

*Public Engagement, Outreach, and Education:*

The State of Mississippi's prioritization of the WQIP for Coastal Mississippi Waters is based on multiple public and stakeholder engagement activities. Throughout Mississippi's restoration public engagement and planning efforts, stakeholders have consistently identified the restoration and protection of water quality as a top priority. The following are examples of public engagement, outreach and education activities which were considered in the selection of this program:

Annual Mississippi Restoration Summit: MDEQ has hosted the Mississippi Restoration Summit annually for four consecutive years. The public is invited to learn about restoration projects and programs and to provide input on current and future priorities for restoration. The priority of water quality has been highlighted each year and MDEQ's ongoing water quality improvement program planning and implementation efforts were the central theme of the 2019 Summit. Based on the input received at the annual summits, investing in water quality restoration and protection continues to be a top priority of stakeholders.

Mississippi Coastal Restoration Plan (NFWF-GEBF): In 2014, MDEQ undertook a multi-year planning effort to develop a comprehensive plan to support NFWF-GEBF restoration program activities in Mississippi. Development of the Mississippi Coastal Restoration Plan included extensive engagement with the public, NGO's/subject matter experts and state and federal agencies. MDEQ's community engagement activities included community conversation and resource summits held in each of the three coastal counties. The community conversation meetings had more than 200 participants, representing 125 organizations, across the three coastal county locations. The importance of water quality restoration and enhancement was a top common value voiced across all three coastal counties.

RESTORE Act Mississippi State Expenditure Plan: Since 2016, MDEQ has solicited stakeholder input to support planning and development of the Mississippi State Expenditure Plan (MSEP). Engagement with a wide range of stakeholders, including private citizens, non-governmental organizations, business owners, elected officials, and other community leaders, has informed the priorities for restoration. During the 2019 MSEP planning and development, MDEQ received input from stakeholders that reaffirmed the priorities of water quality, restoring and revitalizing the economy, and community resilience.

*Leveraging:*

Funds: $5,000,000.00
Type: Bldg on Others

Status: Received
Source Type: Other Federal
Description: Coastal streams and watersheds have been impacted by urban development, hydrologic alterations, erosion, invasive species and other factors that have led to a decrease in water quality discharging into the Mississippi Sound. The purpose of the Strategic Stream Restoration Program is to implement coastal stream restoration strategies in the three Mississippi coastal counties to improve water quality entering the Mississippi Sound, as well as increase ecosystem function of the streams.

Funds: $11,000,000.00
Type: Bldg on Others
Status: Received
Source Type: Other Federal
Description: This Mississippi Gulf Coast Water Quality Improvement Program grant supports the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Mississippi Gulf Coast Region through the identification and implementation of water quality improvement projects. Improvement projects may include, but are not limited to, the construction of new or the repairing/upgrading of existing stormwater and wastewater systems, including conveyance and treatment, to mitigate water quality issues in a coastal water resource.

Funds: $49,000,000.00
Type: Bldg on Others
Status: Received
Source Type: Other Federal
Description: This Mississippi Gulf Coast Water Quality Improvement Program grant supports the restoration of water quality of Mississippi's coastal water resources by targeting stormwater sources, discharges, and/or wastewater improvements that will result in the improvement of water quality and the restoration and protection of natural resources. Efforts to achieve such improvements include enhancing the State's understanding of source water quality problems, implementing upgrades, repairs, and/or construction activities associated with stormwater and wastewater systems to restore water quality and promote ecosystem health.

Funds: $3,600,000.00
Type: Bldg on Others
Status: Received
Source Type: Other
Description: The Coastal Streams and Habitat Initiative was funded by NFWF-GEBF. The Coastal Stream and Habitat Restoration and Management Initiative created strategies and restoration designs to abate threats to priority coastal streams and restore associated habitat.

Funds: $500,000.00
Type: Bldg on Others
Status: Received
Source Type: Other
Description: The Design Challenge for Improvement of Water Quality from Beach Outfalls was funded by NFWF-GEBF to encourage individuals and teams to compete to create innovative "green" solutions to address the water quality impacts of beach outfalls. This project funded a

design competition to find innovative eco-solutions for water quality impairments associated with beach outfalls in Mississippi.

Funds: $4,000,000.00
Type: Bldg on Others
Status: Received
Source Type: Other
Description: The Upper Pascagoula River Water Quality Enhancement project includes development and implementation of conservation plans to reduce nutrient and sediment contributions in the watershed. The project includes an extensive outreach program to land owners. Conservation practices will be planned and implemented on property throughout the watershed with emphasis given to properties bordering rivers and streams.

*Environmental Compliance:*

The planning portion of this activity is covered by the Council's NEPA Categorical Exclusion for planning and related activities (Section 4(d)(3) of the Council's NEPA Procedures). Environmental compliance documentation will be updated for implementation activities in FPL Category 2. Similar to project specific implementation information, environmental compliance checklists and required environmental compliance information will be provided on individual projects as identified. All specific environmental compliance needs will be identified during project identification and development activities.

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## Budget

*Project Budget Narrative:*
A total of $34,250,000 has been approved from FPL 3b to fund activities associated with the Program. The funds are solely intended for the planning, implementation, and monitoring of water quality related infrastructure improvement. An estimated 20% will be used for FPL Category 1 activities such as project planning (e.g., project selection and development), program and project administration (e.g., administrative programmatic functions, coordination, and sub-recipient / contractual support for project implementation), engineering and design, permitting, monitoring, adaptive management and data management activities. An estimated 80% will be for FPL Category 2 implementation (i.e., construction) of stormwater and wastewater management systems (including upgrades and repairs), as well as possible septic to sewer conversions. The need for contingency costs will be considered as appropriate when developing individual project-specific budgets.

*Total FPL 3 Project/Program Budget:*
$ 34,250,000.00

*Estimated Percent Monitoring and Adaptive Management:* 5 %
*Estimated Percent Planning:* 13 %
*Estimated Percent Implementation:* 80 %
*Estimated Percent Project Management:* N/A
*Estimated Percent Data Management:* 2 %
*Estimated Percent Contingency:* N/A

## Environmental Compliance

| Environmental Requirement | Has the Requirement Been Addressed? | Compliance Notes (e.g., title and date of document, permit number, weblink etc.) |
|---|---|---|
| **National Environmental Policy Act** | Yes | In Category 1, this activity involves only planning actions. These planning actions are covered by the Council's NEPA Categorical Exclusion for planning, research or design activities (Section 4(d)(3) of the Council's NEPA Procedures). Additional NEPA compliance will be required for Category 2 efforts. |
| **Endangered Species Act** | N/A | |
| **National Historic Preservation Act** | N/A | |
| **Magnuson-Stevens Act** | N/A | |
| **Fish and Wildlife Conservation Act** | N/A | |
| **Coastal Zone Management Act** | N/A | |
| **Coastal Barrier Resources Act** | N/A | |
| **Farmland Protection Policy Act** | N/A | |
| **Clean Water Act (Section 404)** | N/A | |
| **River and Harbors Act (Section 10)** | N/A | |
| **Marine Protection, Research and Sanctuaries Act** | N/A | |
| **Marine Mammal Protection Act** | N/A | |
| **National Marine Sanctuaries Act** | N/A | |
| **Migratory Bird Treaty Act** | N/A | |
| **Bald and Golden Eagle Protection Act** | N/A | |
| **Clean Air Act** | N/A | |
| **Other Applicable Environmental Compliance Laws or Regulations** | N/A | |

## Maps, Charts, Figures


Figure 1: Map of Program Area