



Gulf of Mexico Division

Protecting and Preserving
the Gulf of Mexico

2023 Annual Report



Our Mission

The EPA's Gulf of Mexico Division is focused on the health, productivity and restoration of the Gulf of Mexico and the communities that rely on this national resource.

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Message from the Director

I am pleased to present the FY 2023 Annual Report for the Gulf of Mexico Division (GMD), which highlights our work and accomplishments from October 1, 2022, to September 30, 2023.

During FY 2023, we continued our emphasis on working with underserved communities by conducting environmental justice virtual listening sessions along with in-person meetings with stakeholders. Staff used this information to develop our \$12.5 million Environmental Justice Request for Applications (RFA). The projects under this RFA will improve water quality and community resilience, restore habitats and provide education and outreach to underserved areas in the coastal zone.

GMD staff continued its outstanding efforts working with partners to protect and restore wetlands and coastal and ocean water resources by participating in the *Deepwater Horizon* (DWH) Natural Resource Damage Assessment (NRDA) Trustee Implementation Groups (TIGs) for Alabama, Florida, Louisiana, Mississippi and Region-wide. As the designee for the Federal Chair of the RESTORE Council, we worked to finalize the 2022 Comprehensive Plan Update in June. We reviewed for approval State Expenditure Plan Amendments for Alabama, Florida, Louisiana, Mississippi and Texas, along with a Funded Priorities List Amendments. We also reviewed RESTORE's 2022 Annual Report to Congress for approval.

This report is dedicated to our previous director, Ben Scaggs, who passed away on November 26, 2022. Ben started his work with the GMD in 2012 as director. Without Ben's hard work and dedication, the GMD would not be where it is today. When Ben left the GMD, he continued his passion for the Gulf and became the executive director of the RESTORE Council. The GMD's knowledgeable and skillful staff and myself are devoted to carrying on the effort and commitment made by Ben and the GMD's previous staff to protect and improve the Gulf of Mexico and its watershed.

Sincerely,



Marc Wyatt
Director, Gulf of Mexico Division

Who We Are

The Gulf of Mexico Division (GMD) is one of the EPA's Great Water Body Programs whose geographic focus is on the major environmental issues of the Gulf of Mexico region and its watershed.

The GMD is committed to voluntary, nonregulatory actions and solutions that are based on sound scientific and technical information as substantiated by our work with partners and the public.

Our program consists of two branches of experienced staff:



Science Integration and Analysis Branch

Promoting and implementing science to benefit the Gulf of Mexico and its communities, this branch assists Gulf of Mexico stakeholders by participating in activities such as collecting and testing water samples in the watersheds that flow into the Gulf to monitor water quality.



Partnerships Branch

Encouraging positive behavioral practices and promoting awareness of resources, technologies and environmental practices or initiatives, this branch works closely with Gulf partners to identify environmental concerns and provides up-to-date education on how shifts in behavior among Gulf stakeholders and tourists can effect change.

What We Do

The Gulf of Mexico is recognized worldwide as a vast and productive body of water with tremendous value in ecological, economic and social terms. The Gulf of Mexico Watershed is made up of 33 major rivers draining from 31 U.S. states and a large portion of Mexico. The U.S. Gulf of Mexico coastline is 1,630 miles long. Environmental challenges facing the Gulf of Mexico include excess nutrients that can cause hypoxic conditions, marine debris and degradation of natural features such as wetlands that provide vital ecosystems services.

The Science Integration and Analysis Branch and the Partnerships Branch work with Gulf of Mexico stakeholders to explore methods to:

- Support the assessment, development and implementation of programs, projects and tools that strengthen community resilience.
- Promote and support environmental education and outreach to inhabitants of the Gulf of Mexico Watershed.
- Protect, enhance and restore coastal and upland habitats within the Gulf of Mexico Watershed.
- Restore and/or improve water and habitat quality to meet water quality standards in watersheds throughout the five Gulf states and the Mississippi River Basin.



Active Investments

LOCATION	DOLLAR AMOUNT	AGREEMENTS
Mississippi	\$11,835,914	11 Grants, 8 Cooperatives
Louisiana	\$9,738,653	9 Grants, 9 Cooperatives
Iowa	\$9,525,149	2 Grants, 6 Cooperatives
Florida	\$9,184,992	11 Grants, 7 Cooperatives
Texas	\$6,629,581	11 Grants, 4 Cooperatives
Alabama	\$6,005,472	7 Grants, 5 Cooperatives
Virginia	\$5,499,680	3 Grants, 3 Cooperatives
Arkansas	\$4,150,000	2 Cooperatives
Wisconsin	\$4,025,124	4 Grants
District of Columbia	\$3,853,866	1 Grant, 1 Cooperative
Maryland	\$2,600,000	2 Interagency Agreements
Oklahoma	\$932,516	2 Grants
Tennessee	\$830,064	1 Grant, 1 Interagency Agreement
Kansas	\$750,000	1 Grant
Missouri	\$499,757	1 Grant
Georgia	\$300,000	1 Cooperative
Total	More than \$76 million	

4 Performance Measures

The GMD works with each of the five U.S. Gulf Coast states and other stakeholders in the Gulf of Mexico Watershed including the six Mexican Gulf Coast states on projects that support the following priority areas:



Water Quality

The GMD continuously works with Gulf Coast states to maximize efficiency and utility of water quality monitoring efforts for local managers. The GMD supports efforts to improve water and habitat quality to meet water quality standards throughout the five Gulf states and Mississippi River Basin.



Target: Improve 20 water quality health indicators



Results: Improved indicators in 98 water bodies



Environmental Education and Outreach

These efforts are cornerstones to environmental stewardship. The GMD's goal is to heighten citizens' appreciation of the Gulf, which leads to positive behavior practices. This can be accomplished by developing hands-on environmental initiatives and engaging residents in restoration programs/projects.



Target: Reach 20,000 individuals



Results: 62,199 individuals reached



Habitat Restoration

Through funding and partnerships, the GMD is restoring habitat in the Gulf states, especially related to wetlands, coastal prairies and stream banks corridors. This work helps provide for protection from storm damage; supports commercial and recreational fisheries; provides nesting and foraging habitat for birds and other wildlife; protects pollinators; and improves water quality for recreational use and aquatic life.



Target: Restore 1,000 acres



Results: 71,747 acres restored



Community Resilience

Resilience is the capability to anticipate, prepare for, respond to, and recover from significant multi-hazard threats with minimum damage to social well-being, the economy and the environment. The GMD supports community capacity building through vulnerability assessments and development of adaptive capacity or resilience plans to assist communities in preparing for potential changes in the environment or future, disruptive events.



Target: Reach 75 communities



Results: 171 communities reached



Nutrient Reduction

In 2023, the GMD awarded \$14.5 million through a Request for Applications (RFA) for 11 projects geared toward innovative approaches or strategies for the most effective and efficient ways to reduce nutrient loading.

These projects addressed demonstrations of innovative technologies and/or conservation projects that have the potential to reduce excess nutrient loads of the following areas:

- **Improving habitat to reduce nutrient pollution:** projects to enhance or restore riparian and near-coastal areas in rural, urban and suburban communities to reduce nutrients.
- **Managing urban runoff:** projects to capture, store, filter and treat runoff to reduce nutrient loads and improve water quality consistent with a broader strategy for watershed protection or restoration.
- **Farmer to Farmer:** projects to reduce nutrient loads while enhancing performance of working lands through conservation practices, and to advance the adoption of nutrient management through farmer-led outreach and education networks.



Addressing New Shore Pollution via In Situ Nutrient Sinks in Alabama

Recipient

Auburn University

Partners

- Mobile Bay Oyster Gardening Program
- Commercial oyster farmers

Summary

Auburn University will demonstrate the ability of a restored oyster reef to serve as a nutrient sink, thereby reducing wastewater pollution in Alabama's nearshore region. The goals of this project will be to reduce nutrient loads from urban stormwater runoffs via the generation of new, innovative technology and knowledge that can be implemented into existing and future green infrastructure. The results will provide relationships between geotextile elements (polymer type, pore structures, surface characteristics, synergistic effects of absorbent and surface treatment) and the removal of contaminants from nonpoint source runoff.

Anticipated Results



Habitat Restoration: Identify and develop best management practices for the most effective restoration elements to be applied in nearshore oyster reef restoration.

Building Soil Health and Resilient Conservation Champions with Collaboration and Data Sharing

Recipient

Sand County Foundation

Partners

- Federation of Southern Cooperatives
- University of Missouri Soil Health Assessment Center

Summary

Sand County Foundation will be helping farmers integrate soil sensors and collect soil health metrics to enable them to make in-season management decisions based on real-time soil moisture and temperature data. The data collected on each farmer's field will be used to demonstrate how soil health management influences infiltration, water holding capacity, aggregate stability and other soil properties critical to climate resiliency and water quality.

Anticipated Results



Habitat Restoration: Enhance **1,500 acres** of farmland through real-time monitoring.



Environmental Education: Directly work with **24 farmers** and help educate **over 200 farmers** on the benefits of different sustainable practices.



Choctawhatchee Coastal Habitat Improvement Project (CCHIP)

Recipient

Northwest Florida State College



Partners

- Florida Department of Environmental Protection Aquatic Preserve
- Choctawhatchee Basin Alliance
- Freeport High School
- Franklin's Promise

Summary

The Choctawhatchee Basin Alliance and its partners will improve water quality in the Choctawhatchee Bay Watershed by demonstrating an innovative approach to stormwater treatment. The Choctawhatchee Bay Watershed and Santa Rosa Sound systems are both impaired for nutrients, so this project will provide direct benefits to reducing nutrient loads in priority waters. The goals of this project are to improve coastal habitat, improve water quality, increase coastal resilience, train high school students on seagrass propagation and coastal restoration techniques, and establish an "Oyster Corps" team to provide opportunities for Opportunity Youth in the Choctawhatchee Bay Watershed to learn valuable life skills and support the coastal restoration efforts in the Choctawhatchee Bay Watershed.

Anticipated Results

-  Environmental Education: Employ underserved youth; train/educate high school students in environmental restoration.
-  Habitat Restoration: Remove invasive plant species; restore **8.1 acres** of seagrass habitat; achieve **30–60% reduction** in water column turbidity, **20–40% reduction** in total nitrogen from the water column and **20–40% reduction** in total phosphorus from the water column.

Demonstrating the Nutrient Removal in Agricultural Watershed Using Floating Macrophytes

Recipient

University of Houston



Partners

- Prairie View A&M University
- Old Dominion University

Summary

Using floating aquatic plants (FAP) to sequester nutrients such as nitrogen, phosphorus and heavy metals from stormwater in watersheds, researchers from three universities will develop a system to move a raft containing grasses and rice plants in pots to the center of the watershed and return to the shoreline when the raft is ready for harvest.

Anticipated Results

-  Water Quality: Reduce **50–60% of nutrients** using floating aquatic plants; improve **1 to 3 watersheds**.
-  Environmental Education: Reach **500 people**.

Introducing New Practices in Upper Bayou Lafourche, Louisiana

Recipient

Gulf of Mexico Alliance




Partners

- Farmers/landowners
- Morehouse Soil & Water Conservation District
- Louisiana Department of Agriculture and Forestry
- Louisiana Department of Environmental Quality
- USDA NRCS

Summary

The Gulf of Mexico Alliance will work with landowners and partners to demonstrate needed conservation practices on prioritized agricultural land in Bayou Lafourche, Upper Bayou Galion and Bayou Coulee. Pre- and post-demonstration monitoring will be conducted to determine the effectiveness of conservation practices to improve water quality and reduce downstream nutrient loading, ultimately aiming to restore the FWP (fish and wildlife propagation) designated use. Cost-sharing assistance will be provided to project participants. The educational programming includes demonstration practices of reducing nonpoint source pollution for the region and farmer engagement field days.

Anticipated Results

-  Water Quality: Improve **3 water bodies**.
-  Community Resilience: Engage **3 communities**.
-  Habitat Restoration: Enhance, protect or restore **18,000 acres**.



Modification of Disturbed Wetland for Nutrient Reduction of Urban Stormwater

Recipient

Louisiana State University
Agricultural Center


Partner

- LSU A&M Department of Civil & Environmental Engineering

Summary

This project will demonstrate how a modified abandoned borrow pit can serve as a detention basin to reduce sediment and nutrient loads by improving urban stormwater quality. In addition to demonstrating a two borrow pit system, this project will demonstrate how an innovative earthen weir (plant species specific) and wood chip bioreactor technology can be used to address water quality and habitat via reduction of urban stormwater nutrients, litter and coarse and fine sediments in Gulf of Mexico watersheds. The goals of this project will be to reduce nutrient loads, litter and coarse/fine sediments from urban stormwater runoffs via the utilization of three proof of concepts.

Anticipated Results

-  Water Quality: Reduce nitrogen by **40%** and phosphorus by **30%**.

Negate the Nutrients: A Regional Collaborative Using Bioremediation to Reduce Nutrient Pollution Throughout the Gulf of Mexico Region

Recipient

Groundworks New Orleans



Partners

- Water is Alive, Center for Watershed Protection, University of South Alabama
- Osprey Initiative

Summary

This project will demonstrate innovative bioremediation technologies that will reduce nonpoint nutrients in urban runoff, resulting in restored habitat in the region and improved water quality and resilience. Collaboration with underserved communities through education and outreach programs will help improve water quality and the health of aquatic ecosystems. Through volunteer-led science and training workshops, citizen scientists will be trained in sediment and water testing. Additionally, an educational series summarizing the results of the three-year study will be presented to each community. This project will help reduce and prevent sediment and nutrient runoff, thereby preventing pollutants from entering the Gulf of Mexico.

Anticipated Results

-  Water Quality: Reduce nitrogen and phosphorus loads in 3 different watersheds by **27,500 square miles**.
-  Environmental Education: Reach **1,000 individuals**.

Non-Woven Hybrid Geotextiles for Urban Stormwater Nutrient Management

Recipient

University of South Alabama


Partners

- Mobile Baykeepers
- Wake Forest University
- Auburn University
- North Carolina State University
- Karmanterra LLC

Summary

To reduce excess nutrient loading in Gulf of Mexico watersheds, this project will develop a novel geotextile, embedded with nutrient-absorbing agents, and evaluate its efficacy in removing nutrients from urban stormwater runoffs, as well as provide controlled phosphorus recovery for reuse, in Mobile and Auburn, Alabama.

Anticipated Results

-  Water Quality: Use new technology and knowledge for future green infrastructure for the reduction of nutrient loads from urban stormwater runoffs. Identify relationship between geotextile elements and the removal of contaminants from nonpoint source runoff.



Nutrient Reduction Through Innovative Technology

Recipient

B.F. Smith Foundation




Partners

- Delta F.A.R.M. member farmers/landowners
- Mississippi State University

Summary

B.F. Smith dba Delta F.A.R.M. (Farmers Advocating Resource Management) expects to directly reduce nutrient and sediment loss from lands in agricultural production through the demonstration of innovative agricultural conservation technologies and strategies while documenting agronomic, economic, social and environmental benefits. Delta F.A.R.M. will conduct on-farm demonstrations to evaluate these innovative technologies and strategies that can be integrated into farming systems to directly address nutrient and sediment loading into water bodies.

Anticipated Results

-  Water Quality: Improve **1 water quality indicator**.
-  Habitat Restoration: Restore or enhance **12,000 acres**.
-  Environmental Education: Reach **900 individuals**.

Precision Agriculture Accelerates Nutrient Reductions

Recipient

Mississippi State University



Partners

- National Black Growers Council
- Local farmers
- Partners in Florida, Texas and Mississippi

Summary

This project aims to leverage resources to identify and overcome barriers that restrain the adoption of precision and regenerative agricultural technologies, approaches and strategies that can reduce nutrient pollution. This goal will be attained by completing three objectives: 1) determine the socioeconomic and cultural factors influencing adoption of technologies, approaches and strategies; 2) evaluate on-farm how precision and regenerative agricultural technologies, approaches and strategies improve agronomic and economic viability; and 3) stimulate adoption of these techniques through traditional and innovative methods.

Anticipated Results

-  Environmental Education: Participate in **15 on-farm demonstration sites**.
-  Water Quality: Monitor surface waters at **6 sites** to measure nutrient loading.

Zombie to Living Community Ponds by Novel Bio-Infiltration

Recipient

University of South Florida


Partners

- University Area CDC
- Hillsborough County Engineering and Operations Department
- Oldcastle Infrastructure
- Sunshine Organics and Compost

Summary

This project will install novel bio-infiltration systems containing biochar-amended media around Aaran's Pond in Tampa's University Area Community to reduce nutrient discharge into the local river, thereby improving water quality. The project will also investigate whether collaborative participation in pond co-design and outreach activities changes residents' perceptions of the value of stormwater infrastructures in their community.

Anticipated Results

-  Habitat Restoration: Protect, enhance and restore **22 acres** of habitat.



Healthy and Resilient Gulf

Incentivizing and Empowering Communities to Reduce Litter

Recipient

Mississippi State University

Partners

- St. Martin High School
- Pass Christian High School
- Jackson County Parks
- Pass Christian Library
- Pascagoula River Audubon Center
- Osher Lifelong Learning Institute (OLLI)
- Ocean Springs High School
- Crosby Arboretum
- CREC Homeschool

Summary

Litter, especially plastic, is overwhelmingly present in our society. Many communities are eager to combat this “plastic pandemic” but are unsure or unaware of the readily available alternatives to replace their current single-use plastic items. This project aims to promote sustainable swaps and litter prevention education to coastal Mississippians through hands-on, bimonthly workshops targeting high school students, their invited families and members of the general public. Themed workshops will survey habit changes, instill prevention measures, promote sustainable materials, reduce litter at its source and provide participating schools with tools to reduce waste.



Cumulative Results

- Water Quality: **6 water bodies** improved.
- Environmental Education: **3,007 individuals** reached.
- Community Resilience: **5 communities** engaged.

Village De L’Est Environmental Resilience with Green Infrastructure



Recipient

Song Community Development Corporation

Partners

- VEGGI Farmers Cooperative
- Village De L’Est Neighborhood Improvement Association

Summary

Song CDC aims to expand and further develop its stormwater management, green infrastructure and environmental education programs. The project will incorporate developing green infrastructure—including riparian buffers, bioswales and floating wetlands—to mitigate nonpoint source pollution, with quantitative data collection and analysis, community member participation and input, education and demonstration, and community implementation.

Anticipated Results

- Habitat Restoration: Enhance, protect or restore **2 acres** of habitat through **3 green infrastructure projects**.
- Community Resilience: Engage in **5 community meetings**.
- Water Quality: Reduce nutrient runoff and other pollutants by **100,000 gallons** per year.



Improving Community Health Through Microbial Source Tracking

Recipient

University of South Florida

Partners

- City of Tampa
- Environmental Protection Commission of Hillsborough County
- Hillsborough County Stormwater
- St. Petersburg Water Resources

Summary

The University of South Florida (USF) is utilizing novel MST (microbial source tracking) approaches and high-throughput quantitative polymerase chain reaction (qPCR) to assess relationships among FIB (fecal indicator bacteria) and MST markers and pathogens, and to quantify human health risk. USF is developing an MST guide for government partners to improve decision-making on water quality issues throughout the Gulf of Mexico region and will hold a webinar to disseminate results of the project.

Cumulative Results

 Water Quality: **5 water bodies** improved.



Nora using the Van Dorn sampler to collect water at one of our Hamilton Creek sites.

Green Infrastructure for Texas High School Intern Program



Cohort 2 Green Star Wetland Farm field trip. Jeyry, Ahn, Cathlin, Kate and Christina are planting sprigs of *Ruppia maritima* into rockwool trays for a restoration project.

Recipient

Texas A&M AgriLife Extension Service





Partners

- Galveston Bay Foundation
- Clear Creek ISD middle and high school programs

Summary

Taking an innovative approach focused on student internships, Texas A&M University AgriLife Extension Service reduces and prevents water pollution through the development of green infrastructure (GI) projects. Interns will work with their mentors to create and implement their own GI projects in their communities or on their campuses as part of a capstone project. By the time the project concludes, anticipated results include 30–36 site scale stormwater GI projects, 3–5 high school campuses participating in GI work readiness programs, 30+ scholarship awards presented to students in the environmental science field, 36,000 native wetland plants propagated between two nursery locations, and 36 student presentations to raise awareness of GI projects and practices.

Anticipated Results

-  Environmental Education: Train **30 students** and implement GI projects.
-  Community Resilience: Engage in **13 local communities**.
-  Habitat Restoration: Create **10 acres** of enhanced habitat through raingardens, bioswales or plant-retrofitted stormwater detention areas.
-  Water Quality: Improve **9 subwatersheds** in the lower Galveston Bay Watershed.



Underserved Farmer to Farmer



Supporting Projects to Improve Water Quality, Habitat and Environmental Education Through Farmer-Led or Farm-Focused Organizations in the Gulf of Mexico Watershed

Summary

The NASDA Foundation was awarded \$3 million in cooperative agreement funding to collaborate with underserved farmers on projects within the Gulf of Mexico Watershed to support the Gulf of Mexico Farmer to Farmer objectives. The 14 partners listed are the selected subawardees that will provide technical assistance to underserved farmers to protect and improve water quality and habitat and to implement programs to prevent or reduce nonpoint source pollution, including nutrients and plastic pollution.

Anticipated Results



Habitat Restoration: Habitat improvement; protect sustainable forests.



Water Quality: Nutrient reduction; farmers or farming communities will adopt sustainability/resiliency practices and practices that lead to reduced nutrient losses and improved water quality.

Recipient

National Association of State Departments of Agriculture Research Foundation

Partners

- Cherokee Historical State Resort Park of Aurora (KY)
- Cowan Community Action Group (KY)
- Kentucky Agriculture Development Advocacy (KY)
- Simpson County Conservation District (KY)
- Pasa Sustainable Agriculture (PA/WV)
- Cumberland River Compact (TN)
- Sullivan County Soil and Water Conservation District (TN)
- University of Tennessee Institute of Agriculture (TN)
- Holston River Soil and Water Conservation District (VA)
- Appalachian Sustainable Development (VA)
- Clinch Valley Soil and Water Conservation District (VA)
- Evergreen Soil and Water Conservation District (VA)
- School of Animal Sciences, Virginia Tech (VA)
- West Virginia Conservation Agency (WV)



EPA/NACD Gulf of Mexico Historically Underserved Farmer to Farmer Grants Program

Recipient

National Association of Conservation Districts


Partners

- Local farmers
- Communities

Summary

NACD will work in underserved communities and with underserved farmers to reduce nutrients in the Gulf of Mexico and reduce flooding in historically underserved farm communities. NACD is awarding subgrantees and working in the region to reach more eligible entities.

Anticipated Results


 Habitat Restoration: Enhance, protect or restore at least **100,000 acres**.

Iowa's Underserved Missouri River Region Subaward Program

Summary

Nine subawardees have been selected with the potential to add three additional subawardees to help improve water quality. These projects will span at least nine watersheds, working directly with historically underserved farmers/communities. These subawardees will address nutrient loading and flood issues within the region.

Anticipated Results

 Water Quality: Attain **41% reduction** in nitrate loads and **29% reduction** in phosphorus loads. Subawardees should target practices and measures that treat water quality volume (WQv) of **1.25-inch rains** for individual practices and reduce subwatershed-wide runoff coefficients **below 50%** for "large" storms (6 inches over 24 hours) where possible.

Recipient

Iowa Department of Natural Resources

Partners

- IDALS
- Local farmers
- Communities

Strengthening the Support Ecosystem for Underserved Farmers

Recipient

Winrock International


Partners


- Dream of Wild Health
- Alliance of Sustainable Farms
- A Red Circle
- Potlikker Capital
- Lower Sioux Indian Community
- Hmong American Farmer Association
- Ho-Chunk Nation
- Song Community Development Corporation
- Milestone Cooperative Association
- Holmes County Food Hub


Summary

This project has selected 10 subawardees to complete phase two (the technical assistance phase), which is to build the capacity of these organizations. Subawardees who successfully complete phase two will move forward in collaborating with underserved farmers in the Upper and Lower Mississippi River basins on water quality, habitat resilience and forestry improvements, thus reducing phosphorus and nitrogen loss and reducing nutrient loads in Gulf of Mexico Watershed ecosystems.

Anticipated Results

 Environmental Education: Provide a competitive subaward program to directly support at least **10 organizations** and **100 farmers**.

 Habitat Restoration: Improve **7,500 acres** with a mix of agriculture, habitat and forestry management practices.

 Water Quality: Achieve **1,400 pounds** reduction in phosphorus loss or **19,000 pounds** reduction in nitrogen loss in the Mississippi River region.



Farmer to Farmer

Strengthening Farmer Networks to Improve Water Quality and Wildlife Habitat in the On-Demand World

Recipient

Practical Farmers of Iowa

Partners



- Iowa Department of Natural Resources
- Iowa Soybean Association
- Independent farmers

Summary

The Practical Farmers of Iowa will leverage the membership base in a Farmer to Farmer network and develop an educational outreach program in order to expand the number of acres on which cover cropping and/or small grain production are incorporated into crop rotation plans. The incorporation of cover crops and small grains will reduce surface runoff of nitrogen and phosphorus into rivers and streams within the Gulf of Mexico Watershed.



Anticipated Results

-  Habitat Restoration: Enhance, restore and protect **570,214 habitat acres**.
-  Environmental Education: Reach **10,231 individuals**.

Sensible Agronomics and Shrewd Conversations Support the Adoption of Environmentally Sustainable and Economically Sound Production Systems



Edge-of-field surface water quality monitoring equipment installed adjacent to a field in Bolivar County, Mississippi, planted with fall cover crops.

Recipient

Mississippi State University




Partners

- Local farmers
- Communities

Summary

This project established crop cover demonstrations at five field locations. Outreach events were conducted, with presentations made at multiple field days. Water samples were collected and analyzed.

Cumulative Results

-  Environmental Education: **56,708 individuals** reached.
-  Community Resilience: **1 community** reached.
-  Water Quality: **3 water bodies** improved.



Innovative Nutrient and Sediment Reduction Practices

Summary

This project's focus is exclusively on oxbow restorations, alternative tile intakes and nitrogen-removing wetlands/ponds. In addition to improving water quality, the selected practices provide flood storage, which watershed residents have identified as a high priority. To maximize the number of watershed residents who interact with the demonstration sites, we have chosen strategic rural locations near highways and paved county trails, and a 160-acre, peri-urban location on the outskirts of Iowa City, Iowa.

Cumulative Results

-  Habitat Restoration: **177 acres** enhanced, protected or restored.
-  Environmental Education: **455 individuals** reached.
-  Community Resilience: **5 communities** engaged.
-  Water Quality: **22 water bodies** improved.



Recipient

University of Iowa

Partners

- Local farmers
- Communities

Employing Agroforestry to Improve Water Quality in the Gulf of Mexico



Recipient

The Savanna Institute


Partners

- Wisconsin River Alliance
- Liberty Prairie Foundation
- Delta Institute
- Land Conservancy of McHenry County
- Independent farmers and private landowners

Summary

The Savanna Institute will develop a Farmer to Farmer education program to inform and train the participants in how to incorporate agroforestry into their respective nutrient management plans. The inclusion of agroforestry will result in a reduction in the quantities of nitrogen and phosphorus entering the Mississippi River Basin and the Gulf of Mexico Watershed.

Anticipated Results

-  Water Quality: Convert **3,747 acres** of cropland to agroforestry, resulting in the elimination of **60,686 pounds** of nitrogen and **4,950 pounds** of phosphorus from the Mississippi River Basin.





Trash-Free Waters

Plastics and Trash Pollution Reduction and Prevention



Recipient

American Bird Conservancy





Partner

- Gulf Coast Bird Observatory

Summary

The American Bird Conservancy (ABC) recently wrapped up its three-year effort to improve water quality on the upper Texas coastline by reducing trash accumulating on coastal beaches. ABC conducted an extensive education and outreach campaign that engaged local communities, stakeholders and natural resource managers impacted by trash and plastic pollution.

Cumulative Results

-  Habitat Restoration: **95 coastal cleanups**; **781 acres** improved.
-  Community Resilience: **5 new trash prevention plans** with **5 different municipalities** developed.
-  Environmental Education: **11,941 people** educated.
-  Trash Removal: **31,946 pounds** removed; **2,612 volunteers** assisted in cleanups.

Keep Lignumvitae Lovely: A Marine Debris Program

Recipient

Florida Department of Environmental Protection






Partners

- Local businesses
- NGOs
- Governmental agencies

Summary

Florida Department of Environmental Protection will perform weekly and monthly marine debris cleanups with volunteers, provide outreach to the community and visitors, work with the communication team on developing a marine debris-focused web page, and continue to develop partnerships with businesses and NGOs on marine debris education and reducing plastics.

Cumulative Results

-  Habitat Restoration: **2 habitats** restored.
-  Environmental Education: **1,081 individuals** reached.
-  Community Resilience: **2 communities** engaged.
-  Water Quality: **17 watersheds** improved.
-  Trash Removal: **14,245 pounds** of marine debris removed.





Geauxing Green: Sustainable Festival Planning

Summary

The French Quarter Festival in New Orleans, Louisiana, has over 825,000 attendees, 1,500 community volunteers, 1,700 local musicians and over 60 local restaurants participate yearly. The Rougarou Fest in Houma, Louisiana, is one of Louisiana's newest and fastest growing festivals. Located on the banks of Bayou Terrebonne, it currently has over 20,000 participants. The two festivals combined will reach close to 1 million attendees per year.

This project helps improve water quality through the reduction of waste by prevention and improving community resilience through education. These festivals were single-use-plastic free and provided reusable, recyclable or compostable products. The festivals' restaurants and vendors were required to use sustainable alternatives to plastic. Restaurants and vendors only served food on biodegradable and compostable materials.

The festivals prevented waste by supplying specialized reusable sorting stations. This ensured the waste was sorted correctly between recycling, composting and landfill destinations. Volunteers were present at each of the stations to educate festivalgoers and help prevent contamination.

Cumulative Results

 Trash Removal: Over **155,000 pounds** of waste diverted from landfills; over **9,000 pounds** of glass recycled.

100% compostable food packaging

100% recyclable or reusable beverage packaging



Recipient

Louisiana Universities Marine Consortium

Partners

- Barataria-Terrebonne National Estuary Program
- French Quarter Festivals, Inc.
- South Louisiana Wetlands Discovery Center

City of Mobile Environmental Litter Prevention Program



Recipient

City of Mobile


Partners


- Mobile Baykeeper
- Osprey Initiative
- Local schools and community groups

Summary

The city of Mobile is improving water quality through a three-pronged approach of prevention, removal and outreach/education to address the goal of achieving Trash-Free Waters in the Gulf of Mexico Watershed. The city worked with partners to install trash capture devices in the Three Mile Creek Watershed both in creeks and at storm drains. An electronic trash tracking system was developed that allows staff to upload and download maintenance data for the devices while utilizing the EPA's Escaped Trash Assessment Protocol (ETAP). The education and outreach campaign also includes public service announcements and working with area schools to encourage stewardship and prevent littering.

Cumulative Results

 Trash Removal: **3,960 pounds** of trash removed from the environment.

 Environmental Education: **1,145 individuals** reached.



Deepwater Horizon Natural Resource Damage Assessment and Restoration

The April 2010 explosion of the *Deepwater Horizon* (DWH) drilling rig resulted in the largest marine oil spill in U.S. history, causing the loss of 11 lives and extensive natural resource injuries. The oil spread from the deep ocean to the surface and nearshore environment from Texas to Florida, prompting an extensive response and Natural Resource Damage Assessment (NRDA). In 2016, the historic BP settlement required the company to pay up to \$8.8 billion over 15 years—the largest ever for natural resource injuries.

As a member of the DWH NRDA Trustee Council, the EPA supports eight Trustee Implementation Groups (TIGs). GMD staff serve as primary and alternate EPA Trustee representatives on the TIGs for Alabama, Florida and Mississippi, as well as the Region-wide TIG. Supporting the Office of Water lead for NRDA, GMD staff also provide technical expertise to the five Gulf states related to monitoring and adaptive management, and approaches to restore oysters and sturgeon injured by the oil spill. As a result of the NRDA restoration efforts, measurable results-oriented projects are being implemented to restore the Gulf of Mexico ecosystem and the natural resources injured by the DWH oil spill by restoring and conserving habitat, restoring water quality, replenishing and protecting injured coastal and marine species, and providing and enhancing recreational opportunities.



Examples of specific DWH NRDA work being supported by GMD staff

Florida TIG

In November 2022, the Florida TIG invited the public to submit water quality restoration project ideas for consideration in the TIG's third restoration plan and environmental assessment (RP/EA). The Florida TIG screened the restoration project ideas received and in August 2023 began writing the Draft RP/EA to further evaluate the projects under OPA and NEPA. The TIG expects to release the Draft RP/EA for public review and comment in early 2024.

Louisiana TIG

The Louisiana TIG approved seven Monitoring and Adaptive Management (MAM) activities in June 2023 to support assessment of overall program effectiveness. The selected activities would support the MAM Strategy developed in 2021, which outlined an approach to prioritize MAM activities in Louisiana for effective and efficient evaluation of the restoration of resources injured by the DWH oil spill.

Mississippi TIG

On August 31, 2023, the Mississippi TIG Trustees released for public review and comment the "Mississippi TIG Draft Restoration Plan 4/Environmental Assessment: Restoration of Wetlands, Coastal and Nearshore Habitats; Nutrient Reduction (Nonpoint Source); and Provide and Enhance Recreational Opportunities." The Mississippi TIG proposed seven long-term restoration projects valued at \$26.4 million. The comment period closed on October 13, 2023.

GMD staff continued a fifth year of water quality sampling for the Upper Pascagoula Water Quality Enhancement Project (nutrient reduction). This approved Mississippi TIG restoration project helps restore injuries to water quality by developing and implementing conservation plans and practices to reduce nutrient and sediment runoff into coastal waters from the Chunky-Okatibbee watersheds.



Gulf Coast Ecosystem Restoration Council



Installing gabion reef units along Sabine National Wildlife Refuge.
Credit: The Nature Conservancy

Following the catastrophic 2010 *Deepwater Horizon* oil spill, Congress passed the Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast Act of 2012 (RESTORE Act). The RESTORE Act established the Gulf Coast Ecosystem Restoration Council (the Council) and the Gulf Coast Restoration Trust Fund. The Council membership includes the governors of the states of Alabama, Florida, Louisiana, Mississippi and Texas, as well as the secretaries of the U.S. Departments of Agriculture, Army, Commerce, Homeland Security and the Interior, and the Administrator for the EPA. The EPA currently serves as the chair of the Council. If you are interested in reading more about the RESTORE Act or the Council, please visit: www.RestoreTheGulf.gov

During FY 2023, the EPA Chair approved the following significant actions, coordinated through GMD staff:

- Initial FPL Amendments: Money Bayou Wetlands Restoration and Bahia Grande Wetland System Restoration
- FPL3b Amendment: for City of Fairhope Sanitary Sewer Overflow Mitigation Project
- FPL3a Amendment: River Reintroduction into Maurepas Swamp Project
- 2022 Mississippi SEP
- Florida SEP Amendment 5



Conservation Enhancement Grant Program

Awarded \$2.5 million in 2021 with an additional \$1.8 million in required match

This project will enhance public-private partnerships that support land protection and conservation across the Gulf Coast region via funding for the following projects:

- **Atlanta Botanical Garden:** This project studies various vegetation removal and restoration techniques in coastal wetlands to determine impacts to ground layer vegetation, hydrology, amphibians, water quality and soil quality.
- **Galveston Bay Foundation:** This project funds management, restoration and enhancement activities on 800 acres of habitat within GBF-owned lands, due diligence projects for future conservation acquisitions and one economic benefits report.
- **Partnership for Gulf Coast Land Conservation:** This project funds due diligence for over 17 subawards for future permanent land acquisition with a goal of conserving over 20,000 acres. Two permanent acquisitions with over \$6 million in value are complete.
- **The Nature Conservancy:** This project funded restoration of over 2,100 linear feet of oyster reef habitat along rapidly eroding shorelines in Calcasieu Lake along Sabine National Wildlife Refuge, a priority landscape on the Gulf of Mexico. Monitoring of oyster reef sustainability is ongoing.
- **Woodlands Conservancy:** This project funds invasive species removal from 840 acres of forested wetlands within two properties, replanting of native vegetation, vegetation surveys via UAV, and bird banding and surveys.

Mobile Bay National Estuary Program (MBNEP)

Awarded \$1.65 million in 2020

This project:

- Restored approximately 1,800 linear feet of stream on the headwaters of Twelve Mile Creek, a tributary of Three Mile Creek.
- Implements an extensive Invasive Species Control Plan in priority areas identified in the Three Mile Creek Watershed.
- Addresses stressors affecting water quality and habitat in the Three Mile Creek Watershed.

Pensacola & Perdido Bays Estuary Program (PPBEP)

Awarded \$2 million in 2018

This project:

- Established the PPBEP Management Conference made up of the Policy Board, the Technical Advisory Committee, the Education and Outreach Committee and the Business Advisory Committee.
- Developed the Comprehensive Conservation Management Plan (CCMP), which was approved by its Policy Board in October 2022.
- Created five permanent positions that are filled.

Tampa Bay Estuary Program (TBEP)

Awarded \$1.46 million in 2018

The TBEP implemented five water quality and habitat improvement projects throughout the Tampa Bay watersheds:

- **Biosolids to Energy (City of St. Petersburg):** Commissioning and performance monitoring of the newly constructed Biogas Upgrade System.
- **Copeland Park Stormwater Enhancements (City of Tampa):** Enhancement of drainage and water quality by shoreline restoration and littoral shelf development at Copeland Park Pond and shoreline native revegetation.
- **Coastal Invasive Plant Removal/Cockroach Bay Aquatic Preserve (Hillsborough County):** Removal of high priority invasive plants to reduce spread throughout the Tampa Bay ecosystem, and native revegetation.
- **Robinson Preserve Water Quality and Habitat Restoration (Manatee County):** Establishment of 14.8 acres of high-quality coastal uplands habitat and vegetation monitoring.
- **Ft. De Soto Recirculation and Seagrass Recovery (Pinellas County):** Improvement to water quality by hydrologic flow restoration between backwater bays, native revegetation, establishment of 200 acres of seagrass beds, and creation of a hydrodynamic model of circulation, over a two-year period.



Research Program Participants

Oak Ridge Institute for Science and Education (ORISE) Participants

The Internship and Research Participation Programs at the EPA are managed by the Oak Ridge Institute for Science and Education (ORISE) under an interagency agreement between the EPA and the U.S. Department of Energy. The ORISE Internship and Research Participation Programs at the EPA are STEM-related educational and training programs designed to provide students, recent graduates and university faculty opportunities to participate in project-specific EPA research and developmental activities.

Amanda Free

Since starting her ORISE position with the EPA/GMD in February 2023, Amanda has collaborated with the Poarch Band of Creek Indians of Atmore, Alabama, processed water samples using qPCR analysis and helped with the EPA/USM STEM Summer Academic Cruise.

Amanda was invited to visit the Poarch Band of Creek Indian Reservation and assist with their monthly water sampling, and provide feedback on their collection process to increase efficiency and improve potential results. She processes samples by extracting DNA and running qPCR analyses. For now, she is focusing on the human HF183 marker but will soon start exploring other markers such as a ruminant and/or feral hog. These analyses will help the reservation better understand their watersheds and why some of their *E. coli* counts have been high. She keeps in contact with the reservation's environmental protection specialist to inform her of the sampling results.

Amanda also helped coordinate and attended the EPA/USM STEM Summer Academic Cruise. She assisted GMD staff in showcasing field and lab techniques in the marine biology field to a group of USM students.



Jenny Paul

This has been a productive year for Jenny with the GMD and the EPA ORD Gulf Ecosystem Measurement and Modeling Division. Although the transition from freshwater ecology to marine systems was a challenge, she met several professional goals and has positioned herself for success in this field.

Jenny was a co-author on an article in *Marine Pollution Bulletin* titled "Evaluating the effectiveness of M-AMBI with other biotic indexes in a temperate estuary" and was invited to present her work at the 2023 National Monitoring Conference in a special session focused on coastal waters. She has another first-authored paper in review, looking at the M-AMBI index, and was invited to present this work at the 2023 Coastal and Estuarine Research Federation meeting, with a third paper in preparation that will be presented at the Gulf of Mexico Alliance meeting in 2024. Cumulatively, this work provides important information regarding marine benthic indices in the northern Gulf of Mexico that will be used by the Pensacola & Perdido Bays Estuary Program and the Florida Department of Environmental Protection.

Additionally, Jenny has started two field projects related to rapid benthic assessment tools. The first is called sediment surface imaging (SSI), in collaboration with researchers at the EPA Atlantic Coastal Environmental Sciences Division. It uses GoPro cameras to take images of the sea floor,

which are then scored for habitat condition. The second project uses molecular taxonomy via eDNA and bulk tissue metabarcoding to identify organisms more quickly than traditional microscopic techniques and to aid in developing an index of biological integrity for use in the northern Gulf of Mexico. Both of these tools will be useful to monitoring programs at local and large scales.

However, for Jenny, the most impactful experience this year was serving as an instructor for two live-aboard marine science courses in collaboration with the GMD and the University of Mississippi during winter and summer breaks. In addition to the wealth of knowledge gained from the other instructors, she felt it validated her studies of marine ecosystems during her postdoc, as teaching others can be a test of one's own understanding, and it cemented her commitment to pursue a career in marine science.



GMD Spotlight

Gulf of Mexico Division Virtual Listening Sessions



The COVID-19 pandemic caused many changes to the way we live and work, shifting our way of life. Change can be unsettling, but it also can present opportunities—in the GMD’s case, a chance to reset some of our operations.

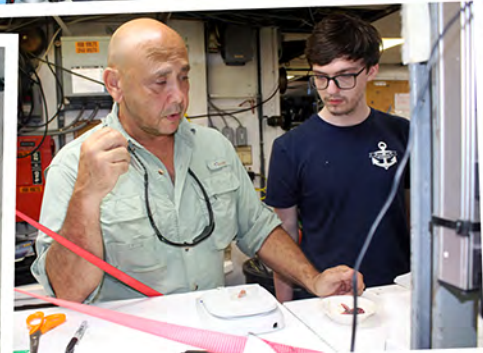
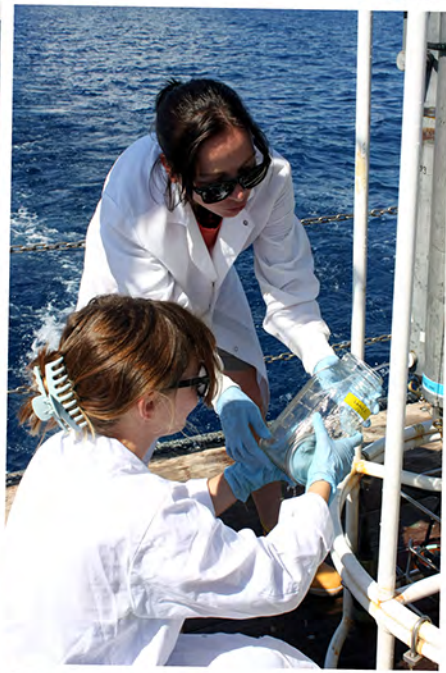
The GMD’s work is centered around engaging stakeholders and understanding their resonance with the environment. Our ability to have face-to-face conversations to better understand stakeholders’ concerns was deeply missed during the pandemic. We pondered how we could continue this engagement with stakeholders, ensure their input was heard and acted upon, and cultivate and maintain relationships. We found a solution with virtual listening sessions.

The GMD developed and hosted virtual listening sessions with the intent of gathering input on activities or programs aiding Gulf of Mexico preservation and strengthening environmental protection in communities. We found that a byproduct of these sessions was the ability to network—to build on existing relationships and cultivate new ones. The sessions also created a pathway for the GMD to learn new ways to support communities, and provided a platform for sharing updates on our operations and discussing the governing authority that guides our work plans and achievements.

The first session was held on July 28, 2022, and 93 partners attended. Topics ranged from understanding the essence of the GMD to conversations around creating green workforce development opportunities. The session was a success, showing that intentional engagement can happen in person or virtually. The key is the intentionality, creating space for synergy, frank dialogue and action.

Following each virtual listening session, the GMD analyzes stakeholder input and categorizes it by how effective certain ideas may be. Ideas from the sessions were directly integrated into recent RFAs such as the Environmental Justice RFA that focuses on community needs relative to the Clean Water Act. In addition, through stakeholder input, the GMD was able to enhance the upcoming Bipartisan Infrastructure Law RFA that will focus on habitat restoration, water quality, environmental education and outreach, and community resilience.

Attendees of the virtual listening sessions represent diverse backgrounds. To date, the GMD has hosted over 500 community stakeholders to gain input. It is our goal to continue building on and strengthening relationships with our partners by actively listening, collecting input and incorporating the feedback from stakeholders into future RFAs.



August USM/STEM Cruise

Date: August 6–11, 2023

Location: Gulf of Mexico

Ship: Point Sur



Protecting Human Health
and the Environment

Gulf of Mexico Division

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