

A DECADE AFTER DISASTER

Recommendations for a more resilient Mississippi River Delta
following the 2010 Gulf oil spill



MississippiRiverDelta.org/DecadeAfterDisaster

RESTORE
THE MISSISSIPPI RIVER DELTA



The leaking Macondo oil well was just 40 miles off of Louisiana's coastline.

Oil was observed on more than **800 miles of Louisiana shoreline**, including nearly 200 miles of beach shoreline and 650 miles of wetland shoreline.¹

The 2010 Gulf oil spill was an unprecedented ecological and human tragedy in the United States.

When the *Deepwater Horizon* oil rig exploded — killing 11 men and dumping more than 134 million gallons of oil into the Gulf of Mexico over 87 days — many questions lingered about the long-term health of the Gulf's ecosystems and economies. Millions of birds, fish and other wildlife were impacted by heavy oiling, both inshore and in the deep waters of the Gulf. Multi-billion dollar industries ranging from commercial and recreational fishing to tourism suffered serious blows. Hundreds of miles of shoreline (mostly around the Mississippi River Delta in coastal Louisiana) bore signs of oil for years after the well was capped and the spill was declared “over” by the parties at fault.

From this tragedy came an opportunity for the future, as the legal settlements that followed provided roughly \$16 billion for over 15 years of restoration of Gulf ecosystems. This investment in ecological restoration of unparalleled size and scope has allowed Louisiana, in particular, to make significant progress on critical restoration projects designed not only to restore natural resources harmed in the oil spill, but also to enhance the long-term resilience of the coast. This investment is critical to Louisiana, which is experiencing a dire land loss crisis and is suffering from some of the highest rates of sea level rise and subsidence in North America.

The Mississippi River Delta and coastal Louisiana lose a football field of land every 100 minutes, and the oil spill added insult to injury.

Heavily oiled coastline and wetlands along coastal Louisiana were unable to be truly “cleaned,” and faced significant and accelerated erosion in the months and years following the spill.

64%

of the **documented oiled shoreline** in the Gulf of Mexico was found in Louisiana.¹

Louisiana's restoration effort is guided by the state's Coastal Master Plan: a 50-year, \$50 billion comprehensive strategy for reducing risk and addressing the land loss crisis facing America's great delta. Updated every six years, this plan has been unanimously supported by Louisiana's State Legislature and overwhelmingly supported by in-state voters. Most importantly, the plan uses the best available science, cutting-edge models and feedback from the public to prioritize projects for implementation. The plan guides investments in projects that will give the maximum benefits to ecosystems and communities over the long term in a dynamic, rapidly changing coastal system.

There is no time to lose for the communities on the front lines of a land loss crisis exacerbated by the oil spill. Billions of dollars of infrastructure and industries, unparalleled fish and wildlife habitats and communities of more than two million people rely on a healthy, working coast. Even with the unprecedented amount of funds from the oil spill settlement, the needs of the Mississippi River Delta (and the larger Gulf ecosystem) far exceed the resources available, and there is much work still to do.

We should continue to be strategic with existing resources to make the most of near-term restoration opportunities and to develop a long-term plan for a sustainable coast in a changing future.

1. Nixon et al. 2016.

As we look ahead to these critical next few years for Louisiana’s coast, **Restore the Mississippi River Delta recommends nine strategies** for maintaining momentum on advancing critical ecosystem restoration in the delta, maximizing the investment opportunities of the oil spill settlement and engaging local communities in the restoration and resilience process.

ENSURING A STRATEGIC AND SUSTAINABLE RESTORATION EFFORT

1. Stakeholders and decision-makers across the Gulf states should coordinate on restoration spending strategies for different funding streams during the near and long term.
2. The state of Louisiana should identify sustainable funding beyond the term of the oil spill settlement.
3. Louisiana should continue to lead on restoration plans and policies that connect the long-term health of the Mississippi River Delta with the rest of the Gulf region.

UTILIZING SCIENCE AND PERFORMING RESTORATION THE RIGHT WAY

4. In 2020 and beyond, state and federal agencies should efficiently advance projects that offer maximum benefits based on the best available science, and stay on track to meet specific milestones.
5. Science programs across the Gulf should connect available research dollars to restoration processes already underway, to ensure that science funds help to inform and improve outcomes of Gulf ecosystem restoration.
6. As projects move forward and generate monitoring and performance data, the information should be standardized and centrally stored to promote efficiency and coordination.

ENGAGING COMMUNITIES FOR A MORE RESILIENT FUTURE

7. From restoration planning to project implementation, state and federal agencies should improve the stakeholder engagement process.
8. Workforce development, procurement strategies and coastal restoration should play an integral role in benefitting local and regional economies.
9. State and federal agencies should innovate fisheries management so fishers can adapt to a wider range of environmental conditions, such as the likelihood that an increasing amount and frequency of Mississippi River water will flow through the Bonnet Carre Spillway.

Restore the Mississippi River Delta opposes rollbacks of regulations that were aimed at making drilling in the Gulf safer in the aftermath of the Gulf oil spill, but that is not the focus of this report. The collective work of our coalition is focused on making sure that settlement dollars are spent wisely in moving ecosystem restoration and community resilience forward and ensuring the recovery of people, wildlife and jobs in the Mississippi River Delta. That focus is reflected in these recommendations.

ENSURING A STRATEGIC AND SUSTAINABLE RESTORATION EFFORT

The oil spill settlement provided an infusion of dollars for restoration that has enabled Louisiana to make significant progress on key Coastal Master Plan projects that have been planned for decades. Despite the jumpstart that these dollars have provided, the settlement dollars will not be enough, calling for a strategic and thoughtful approach to remaining investment, and a longer-term strategy for additional funding for the Louisiana Coastal Master Plan. This long term funding is a significant challenge; fortunately, the state and its residents have demonstrated a steadfast commitment to coastal restoration efforts, providing a strong foundation for future progress.

1 Stakeholders and decision-makers across the Gulf states should coordinate on restoration spending strategies for different funding streams during the near and long term.

- With roughly \$12.8 billion remaining of the \$16.67 billion total available for restoration across the Gulf, there is much work left to do.
- Decision-makers across funding streams should come together to assess collective progress to date, and to develop a comprehensive strategy and long-term vision for Gulf health, in order to guide wise spending of remaining funds.

2 The state of Louisiana should identify sustainable funding beyond the term of the oil spill settlement.

- In addition to \$6 billion in oil spill settlement funds, Louisiana has dedicated state resources and its share of offshore oil revenues to implement the Coastal Master Plan. However, these funds together will not be enough to complete the projects laid out in the Coastal Master Plan in entirety. To see the greatest benefits from the efforts already made, we should complete additional Master Plan projects, designed to work together to optimize land building and protection.
- To continue this important work, and sustain a delta that feeds and fuels the nation, the state of Louisiana should identify sustainable funding beyond the term of the settlement to complete as many synergistic, beneficial land-building and sustaining projects as possible.

3 Louisiana should continue to lead on restoration plans and policies that connect the long-term health of the Mississippi River Delta with the rest of the Gulf region.

- The Coastal Master Plan was developed prior to the spill (and updated appropriately since), but the oil spill has helped to guide and simplify Louisiana's decision-making with funds. Led by world-class scientists and technical experts, with input from stakeholder groups spanning sectors and geographies, the plan is a visionary blueprint that prioritizes a suite of project types working together for maximum benefits. Louisiana should share lessons learned from its restoration and oil spill recovery efforts with other states around the nation.



The Mississippi River is the largest source of fresh water, nutrients and sediment in the northern Gulf of Mexico.

Nutrients from the river fuel the base of the food web and, in turn, the abundance of food supports commercial and recreational fisheries throughout this area.



70 percent of the commercial fish landings in the Gulf of Mexico were caught and/or brought to dock in Louisiana.



Coastal Louisiana provides critical habitat for 100 million migratory, nesting and wintering birds annually.

Louisiana's coast is at the end of both the North American Central and Mississippi flyways, where nearly **70 percent of ducks migrate** in the winter.

UTILIZING SCIENCE AND PERFORMING RESTORATION THE RIGHT WAY

Restoration to address oil spill injuries and create a healthy, more sustainable future for the Gulf requires planning and investment in a suite of restoration projects that work together to create large-scale and long-term benefits. Since Louisiana was at the heart of the oil spill (and restoration in Louisiana is key to restoring long-term health to the Gulf), it is critical that restoration projects in the Mississippi River Delta are implemented efficiently and without delay so that their benefits can be realized.

There is clearly an opportunity to make investments in restoration that will provide coastal protection benefits over the long term. Those completed investments will also help Louisiana's degraded habitats and the wildlife that depend on those habitats to recover from the oil spill, and make them healthier and more resilient in the face of future storms and rising sea levels.

4 In 2020 and beyond, state and federal agencies should efficiently advance projects that offer maximum benefits based on the best available science, and stay on track to meet specific milestones.

RIVER REINTRODUCTION INTO MAUREPAS SWAMP PROJECT:

This restoration project would divert fresh water and some sediment into the Maurepas Swamp to increase the long-term health and resilience of one of the largest remaining forested wetlands on the Gulf Coast. While this area was not directly impacted by the oil spill, this restoration project would contribute to overall Gulf ecosystem health by helping to sustain approximately 45,000 acres of productive wetlands. This project is currently in engineering and design phases and will receive most of the money for construction from oil spill funds; however, additional funding will be needed to fully construct the project. There is currently an opportunity to close that funding gap by using the Maurepas project to mitigate wetland impacts from a risk reduction project in the same area: the West Shore Lake Pontchartrain project.

MID-BRETON SEDIMENT DIVERSION:

This large-scale restoration project will divert sediment-laden river water from the Mississippi River east into Breton Sound to build new land and sustain 16,000 acres of wetlands over 50 years. The project is currently in engineering and design phases. Scoping for the Environmental Impact Statement is expected to begin in 2020.

BARATARIA BASIN HABITAT RESTORATION PLAN:

This strategy outlines three projects that are being considered for oil spill fund allocation: the Mid-Barataria Sediment Diversion, the Large-Scale Barataria Marsh Creation Project and the Spanish Pass Ridge Restoration. If constructed, these projects will work together to provide long-term, ecosystem-level benefits to the Barataria Basin, one of the most heavily oiled coastal areas during the spill. Spanish Pass Restoration is expected to begin construction this year. The Mid-Barataria Sediment Diversion is currently in engineering and design phases, and the environmental impact statement is expected to be released this year for public comment. A plan on the Large-Scale Barataria Marsh Creation is expected to be released for public comment in 2020.

Note: Restore the Mississippi River Delta has identified 17 projects in Louisiana's 2017 Coastal Master Plan that, if prioritized and implemented quickly, will help restore and maintain as much of Louisiana's coast as possible to achieve a resilient future for the people, wildlife and industries of this nationally-significant region.

We are highlighting these three projects as major opportunity areas using oil spill funds, making specific recommendations to move these forward and advance overall restoration goals.

MississippiRiverDelta.org/PriorityProjects

In recent polls of likely voters in Louisiana:

98%

say officials should work to **maintain as much of Louisiana's coast as possible**, even if it's not possible to restore the original footprint.

97%

want their elected officials to **prioritize tackling coastal land loss** when in office.



5 Science programs across the Gulf should connect available research dollars to restoration processes already underway, to ensure that science funds help to inform and improve outcomes of Gulf ecosystem restoration.

- The NOAA RESTORE Science Program, the Centers of Excellence, the NAS Gulf Research Program, the NRDA dollars set aside for adaptive management and monitoring and other science/research programs across the Gulf should communicate and coordinate to best leverage all available research dollars, to inform restoration and to measure restoration success.
- We have an opportunity now to set up thorough and robust monitoring, and adaptive management programs and protocols, that can serve as models for future restoration programs. Improvements in sensors and the quantity of monitoring across the coast can allow ongoing (and in some cases, real time) understanding of the system as a result of project progress, including how different projects are interacting.
- Robust monitoring and adaptive management programs can be vital for the operation of ecosystem-scale, keystone restoration projects such as sediment diversion projects, which would be operated differently throughout the year to take advantage of river and basin conditions to maximize land-building.

6 As projects move forward and generate monitoring and performance data, the information should be standardized and centrally stored to promote efficiency and coordination.

- Through the Natural Resources Damage Assessment process, oil spill-related science programs and subsequent restoration efforts, an enormous amount of new data and science is being generated in the Gulf of Mexico region that can inform restoration needs and drive scientific inquiry in the region for years to come.
- Robust monitoring that uses standard protocols and accessible, transparent data management is crucial in order to allow operational decision-making to be continually fine-tuned based on current data. This data should be shared so that the public, scientists and others are all seeing the same information that is being used for decision-making.

In recent polls of likely voters in Louisiana:

- 92%** support an approach that **balances restoration of coastal wetlands with protection efforts**, such as levees.
- 82%** support **sediment diversions**, large-scale coastal restoration projects that would deliver sediment from the Mississippi River to build and sustain wetlands over time.

In the ten years since the oil spill considerable progress has been made on project planning and implementation. **There are currently 24 restoration projects** that have been completed, are in construction or are currently moving towards implementation.

SUCCESS HIGHLIGHTS:



Louisiana Outer Coast Restoration Project

has restored beach, dune and back-barrier marsh habitat on three barrier islands in Louisiana using funds from the oil spill that are dedicated to restoring wetlands, coastal and nearshore habitats and birds. Many of Louisiana's barrier islands received extensive oiling during the spill and were damaged during clean-up activities. This restoration project is building off of the considerable investment through various funding sources to restore Louisiana's barrier island chain. Restoration of the barrier islands will provide important habitats for birds and other wildlife, and will provide a critical line of defense against storm surge for nearby coastal communities and wetlands. The Caillou Lake Headlands, Chenier Ronquille and Shell Island restoration projects have been completed, using 19 million cubic yards of sediment to restore more than 2,000 acres of habitat. The final island slated to be restored in this project is North Breton Island, an initiative currently being planned and that, once completed, would restore 200 acres of beach, dune and marsh habitat.



Caminada Headland Restoration Project

has restored 489 acres of beach and dune habitat along seven miles of beach using 5.4 million cubic yards of sediment. This project works in conjunction with another completed project which restored 303 acres of beach and dune habitat along six miles on the Caminada Headland. Together, these two projects restored 13 miles of barrier island that provide foraging and nesting habitat for birds and other wildlife, that provide storm surge protection for nearby communities and vital infrastructure and that protect interior wetlands from storm surge and waves.



Lake Hermitage Marsh Creation Project

leveraged oil spill funds to restore 100 acres of marsh in the Barataria Basin using sediment dredged from the Mississippi River. This project was designed to build off of a 600 acre marsh restoration project funded through a different source. Together, these two projects provide habitat to fish, birds and other wildlife and help protect nearby marsh from increased wave action.

ENGAGING COMMUNITIES FOR A MORE RESILIENT FUTURE

From oil spills to hurricanes, Louisiana's coastal communities have been at the forefront of disasters that have caused flooding, economic disruption, resource constraints, employment insecurity and population shifts. At the same time, these disasters have increased communities' risks and vulnerability to impacts from climate change like sea level rise, hurricanes and extreme weather.

In many ways, Louisiana is leading the nation in adaptation to climate impacts and recovery from disasters. Recent trends with climate change indicate that we will experience more varied and extreme weather patterns and events in the future. This means that coastal communities — especially those who are dependent on the resources provided by the coast, such as commercial fisheries — should prepare for disturbances that are unprecedented.

To meet these challenges, we should go beyond the status quo and seek innovative solutions. Polling indicates that issues like climate change, adaptation and advancing resilience are at the forefront of the minds of Louisiana voters. Ahead of the national curve in other areas, the state of Louisiana has already deployed awareness and engagement strategies that go beyond the typical public

71%

of voters believe in climate change with half of respondents indicating that climate change is affecting them today and 72 percent saying it will impact future generations.

57%

of respondents across the state believe Louisiana's land loss crisis will have a direct impact on them this year with that number jumping to 77 percent in the next ten years.

comment processes, cultivating a more informed and active public. However, the future holds many more important opportunities to build on that community engagement work to ensure the long-term success of restoration and adaptation programs.

Ten years after the oil spill, ongoing environmental challenges present many opportunities to build resilience and community leadership, and to evolve and enhance local economies and jobs.



7 From restoration planning to project implementation, state and federal agencies should improve the stakeholder engagement process.

- Having well-informed communities and accessible engagement processes is a fundamental step in successful restoration and resilience initiatives. Raising awareness and growing leadership cannot be relegated to regulatory-required public comment processes. Sustained outreach that is often done on the terms of community stakeholders is critical to growing widespread support for the massive job of restoring our coasts and building resilient communities.
- Public-private partnerships for outreach efforts are a tried and true way to expand the reach of programs, and to enhance participation. The State of Louisiana in particular is pioneering new, more effective approaches that more directly engage citizens and make democracy more meaningful in the context of coastal restoration. To the right are three examples.



Getting stakeholders into the field — either by plane or boat — to have a firsthand look at the coast is a powerful way to build support and educate about coastal land loss and solutions that can help. Attending standing meetings in local communities, as opposed to hosting a standalone event, is another great way to reach stakeholders. Likewise, combining resources and working in partnership with community-based organizations is an effective approach for raising awareness and building support.



Louisiana's Coastal Protection and Restoration Authority (CPRA) Coastal Connections effort places project managers and engineers on some of Louisiana's keystone diversion projects in the very coastal communities that will be impacted by their projects. CPRA spends time in bait shops, civic centers and libraries hosting "office hours" to engage one-on-one with stakeholders. They've conducted over 100 meetings on diversion projects in the last four years. This type of dialogue is in no way mandated, but it is critical to ensuring project understanding and restoration program success.

The Coastal Protection and Restoration Authority's Community Conversations series aimed to raise awareness and participation in the 2017 Coastal Master Plan process. This innovative series of six free community dinners were held across the coast in partnership with 13 community groups, including interfaith organizations, Native American tribes, sportsmen groups, a historically black university and other under-engaged partners, in order to ensure breadth of outreach in each area. The effort engaged and garnered in-depth feedback from over 400 residents.



LA SAFE (Louisiana's Strategic Adaptations for Future Environments) is an initiative to address the changing coastline and increased flood risk through a community-driven planning process. LA SAFE, partnered with the State's Office of Community Development and the Foundation for Louisiana, brought together partners and stakeholders from across six coastal parishes for a rigorous and interactive planning process to look at climate change adaptation from the community level. It included 71 individual public events across the six-parish region and engaged nearly 3,000 individual residents. The result was a group of projects that included a wide range of adaptation strategies, and that directly responded to community needs in the face of increasing flood risk across the coast.

8 Workforce development, procurement strategies and coastal restoration should play an integral role in benefitting local and regional economies.

- Guaranteed annual investments in coastal restoration in Louisiana over the next decade can truly benefit local and regional economies, but foundational work is needed to ensure those consistent investments provide maximum benefits. Through workforce development, residents of local communities can be prepared with the skills necessary to compete for restoration jobs and to support a meaningful and equity based “restoration economy.” Certainly area businesses will benefit from indirect sales of goods and services needed to support the restoration work, but these jobs can only directly and equitably benefit Louisiana’s economy if targeted workforce training and procurement strategies are designed to support equity, local training and local hiring. A recent study by economist Dr. Loren C. Scott found that construction of the Mid-Barataria Sediment Diversion alone would increase regional sales by \$3 billion and support nearly 4,000 jobs over seven years. The consistent investment flows over the next decade will provide a unique opportunity to not only build essential restoration and protection projects, but to lift the local economy as a whole, building equity along the way.
- Local community colleges and universities are already offering restoration training programs at a variety of skill levels and the jobs that flow from this work are becoming more clearly defined.
- State and local officials and agencies and nonprofits should coordinate to tie together procurement strategies and local training initiatives for workforce needs, equity and small business and Disadvantaged Business Enterprises to ensure that the restoration economy truly lifts the coastal communities.



The **University of New Orleans** now offers a Graduate Certificate in Coastal Engineering, in which students complete coursework teaching them how to understand coastal sediment transport, spillways, drop structures, stilling basins, sector gates and outfall structures, levee design, principles of sediment transport and principles of coastal morphodynamics to predict delta evolution, shoreline change and marsh edge erosion.

Nunez Community College, in partnership with St. Bernard Parish Government’s Coastal Division, announced the addition of Coastal Studies and GIS Technology to its program offerings. The Coastal Studies and GIS Technology program prepares students for coastal careers with a focus on GIS technology skills and instruction in coastal and environmental science.

At **Delgado Community College**, the Civil and Construction Applied Engineering Technology Program provides students with the knowledge and competencies in building, bridge, tunnel, dam, harbor, airport, waterway, railway and highway construction. Students have the opportunity to learn about water power, irrigation, drainage, water supply systems, sewerage and waste disposal and environmental health systems construction.

Economic Opportunities of Coastal Restoration

A recent report showcased how local and state businesses, governments and residents are expected to benefit economically during the combined seven-year period between 2021 and 2027 when the Mid-Barataria and Mid-Breton sediment diversions are being built.

The analysis indicated that the construction of these projects, totaling \$1.85 billion over seven years, will have significant economic benefits within Plaquemines Parish and the region.

In Plaquemines Parish specifically, business sales are expected to increase by \$2.3 billion, and \$7.2 million will be added to the local treasury. Constructing these projects will support an annual average of 391 jobs per year with 687 created in 2023 — the year of greatest expenditures. Over the seven-year period, parish residents will experience a \$157.6 million increase in household earnings.

Furthermore, regional business sales will increase by \$3.1 billion and local

government treasuries will receive an increase of \$36.7 million. On average, 2,255 jobs will be supported during the seven-year period with a peak of 3,962 jobs in 2023. Across the four parishes, household earnings will increase by \$809.2 million.

The State of Louisiana will also benefit with \$56.6 million in state revenues being added during the period of building — an amount slightly greater than the costs of funding the Office of the Lieutenant Governor during a similar time frame.



9 State and federal agencies should innovate fisheries management so fishers can adapt to a wider range of environmental conditions, such as the likelihood that an increasing amount and frequency of Mississippi River water will flow through the Bonnet Carre Spillway.

- The opening of the spillway is just one of the many challenges that fishers will likely encounter in the years ahead. Continued land loss, seafood prices and coastal restoration and flood protection projects all have potential consequences for members of the seafood industry.
- Recently, the Louisiana Seafood Future (LSF) effort was led in partnership by CPRA, Louisiana Department of Wildlife and Fisheries and Louisiana Sea Grant, in order to gain a better understanding of the challenges that fishers are facing and to document how industry members may keep their businesses profitable and sustainable in spite of those challenges.
- The adaptation strategies highlighted in the LSF effort require analysis to determine applicability and viability so that strategies may be shelf-ready when and if the anticipated challenges present themselves, and should funding be made available.

CONCLUSION

Ten years after the most devastating ecological tragedy to hit the Gulf of Mexico happened, restoring the Mississippi River Delta and its surrounding coastline isn't just about recovering the wildlife and habitats harmed from the 2010 oil spill; it is ultimately about the opportunity to envision a more sustainable and resilient delta for future generations. The people of coastal Louisiana should be central to developing that vision, working together with the state, agencies and the NGO and science communities to ensure that the right projects are selected to move forward; that billions of settlement dollars are spent in ways that maximize restoration potential; and that the economies and ecosystems of the coast continue to thrive in decades to come.

About Restore the Mississippi River Delta

Restore the Mississippi River Delta is working to protect people, wildlife and jobs by reconnecting the river with its wetlands. As our region faces the crisis of threatening land loss, we offer science-based solutions through a comprehensive approach to restoration. Composed of conservation, policy, science and outreach experts from Environmental Defense Fund, National Audubon Society, the National Wildlife Federation, Coalition to Restore Coastal Louisiana and Lake Pontchartrain Basin Foundation, we are located in New Orleans and Baton Rouge, Louisiana; Washington, D.C.; and around the United States. Learn more at MississippiRiverDelta.org and connect with us on Facebook and Twitter.

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