

Notes on the Water-Related Sections of the Mid-Barataria Sediment Diversion Draft Environmental Impact Statement¹

May 13, 2021

Introduction

This document presents a summary of sections of the Mid-Barataria Sediment Diversion Draft Environmental Impact Statement. The Louisiana Coastal Protection and Restoration Authority (“CPRA”) applied for a permit from the U.S. Army Corps of Engineers (“USACE” or “the Corps”) for the Project, which is a key part of its coastal restoration plan. Pursuant to the National Environmental Policy Act (“NEPA”) of 1969, USACE prepared a Draft Environment Impact Statement (“DEIS”), with cooperation from several federal agencies.² The Draft EIS serves to compile and inform the public on the decisions of those federal agencies, CPRA, and the Louisiana Trustee Implementation Group (“LA TIG”) regarding environmental impacts associated with the Project and natural resource restoration. The Administrative Procedure Act and NEPA also require federal agencies to allow a comment period for interested parties to voice their concerns about potential federal action. The Corps has recently extended the deadline for comments on the Mid-Barataria Sediment Diversion DEIS to June 3, 2021. The Tulane Institute on Water Resources Law & Policy hopes that this summary will assist the community to better understand the impacts of this project, as well as equip them with some of the information needed should they wish to file a comment. The summary is limited to Chapter 4 of the Draft EIS, pertaining to Environmental Consequences³, and Appendix R: Mitigation & Monitoring and Adaptive Management Plans, which details the proposed mitigation plan associated with those environmental consequences.

Draft Environmental Impact Statement (DEIS) Summary

Mid-Barataria Sediment Diversion Project Purpose

Due to sea-level rise and subsidence, southern Louisiana is quickly losing coastal land and faces the daunting task of curbing that land loss before it is too late. In its natural state, the

¹ Principal Authors: Thuy Le, Senior Research Fellow, and Portia Mastin, Senior Research Fellow. Special acknowledgements are due to Mark Davis, Christopher Dalbom, and James Nieset.

² These agencies were: the National Oceanic Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (USFWS), U.S. Department of the Interior (USDOI), and U.S. Department of Agriculture (USDA).

³ This notes summary document does not contain Sections 4.2, Geology and Soils; 4.7, Air Quality; 4.8, Noise; 4.12, Threatened and Endangered Species; 4.16, Recreation and Tourism; 4.19, Aesthetic and Visual Resources; 4.21, Navigation; 4.22, Land-Based Navigation; and 4.24, Cultural Resources.

Mississippi River deposits sediment as it flowed through Louisiana, creating wetlands at the river's delta and Barataria Basin. However, this stream of sediment to the basin was cut off when levees were erected along the river with the goal of flood protection and promoting easier navigation. Since then, the state has been losing coastland—about 4800 square kilometers in less than 100 years, and almost a quarter of that was in Barataria Bay.⁴ The erosion and subsidence caused by the reduction in sediment deposits were compounded by Hurricane Katrina's landfall in Southeast Louisiana and the explosion of British Petroleum's ("BP") Deepwater Horizon oil platform. Injuries resultant from the Deepwater Horizon ("DWH") oil spill severely damaged wetlands and further exacerbated the need for a wide-scale project to address the issue of Louisiana's receding coast. CPRA proposed sediment diversions as the most viable solution to the problem. The Army Corps of Engineers is the federal regulator of the Project, and it will be funded by the Louisiana Trustee Implementation Group.⁵ The idea of diversion as a method of restoring Louisiana's coast is not a fledgling one; actually, the concept has been explored since the 1990s by multiple organizations that conducted various studies on the possibility of diversion as a viable solution—all resulting in the culmination of the CPRA-proposed plan. The Mid-Barataria Sediment Diversion project would redirect sediment, freshwater, and nutrients from the Mississippi River into the Barataria Basin to build back coastal land. It is intended to mimic natural processes which would occur from natural crevasses or without the levee systems along the lower Mississippi River. When operational, the Project could discharge up to 75,000 cubic feet per second ("cfs") of freshwater, sediment, and nutrients into the Mid-Barataria Basin when the River flows are greater than a specified level and 5,000 cfs as a constant, maintenance feature.⁶ The Project encompasses approximately 949.1 acres, requires up to five years of construction, and costs \$2 billion—all with the hopes that it will serve to help restore the habitats and ecosystems that were damaged from the DWH oil spill and to build back coastal land in Southeastern Louisiana. Predictions as to how much new land the diversion could create range from 54-121 square kilometers over 50 years, a large range caused by uncertainty regarding sea-level rise and sediment deposition.⁷ Should the project be approved for a permit, it is expected to begin some time in 2023.

DEIS Chapter 4: Environmental Consequences

I. Groundwater Resources (Section 4.3, beginning on page 4-54)

This Section specifically details how the Project would impact groundwater quality and use in shallow/surficial aquifers and deep-water aquifers (deeper than 200 feet).

⁴ Warren Cornwall, *Rerouting the Mississippi River could build new land—and save a retreating coast*, Science, (April, 22, 2021), <https://www.sciencemag.org/news/2021/04/rerouting-mississippi-river-could-build-new-land-and-save-retreating-coast>

⁵ LA TIG manages the settlement funds paid by BP after the DWH oil spill.

⁶ The flow measurement that triggers the diversion is 450,000 cfs measured at Belle Chasse. Otherwise, the Project would maintain a flow of 5,000 cfs. U.S. Army Corps of Engineers, Mid-Barataria Sediment Diversion Draft Environmental Impact Statement, Executive Summary, ES-3.

⁷ Converted to acres, that is 13,343-29,900 acres. While CPRA expects the Project to produce 121 sq. km, USACE states that higher projections for sea level rise reduces the expected land production. Also factoring into the large range is uncertainty as to how much sediment the river will deliver.

- Beneficial Impacts
 - None Applicable
- Adverse Impacts
 - Construction activities for the Project could affect groundwater quality, depending on the severity of potential spills and leaks of hazardous materials. *(pg. 4-56)*
 - Project operation will have permanent, minor, adverse impacts on shallow groundwater elevations of flow direction in surficial aquifers from the placement by project structures and modifications to existing drainage channels. There will be negligible impacts on deeper aquifers, however, such as the Mississippi River Alluvial Aquifer. *(pg. 4-57-58)*
- Impacts that Could be Beneficial or Adverse
 - The Project will have short-term and long-term impacts on shallow groundwater quality because of the introduction of freshwater. These impacts will be minor and could be beneficial or adverse depending on the chemical changes and potential introduction of contaminants. The Project may cause higher nitrogen, phosphorous, chloride, and sulfide levels in shallow groundwater. The Project will also cause salinity reduction and oxidized nutrient increases during higher diversion flows. *(pg. 4-58)*

II. **Surface Water and Coastal Processes (Section 4.4, beginning on page 4-61)**

This Section discusses the Project’s potential impacts on bed elevations⁸, water levels, and tidal values in the Project area. Tidal values include tide, flow, and currents.

- Beneficial Impacts
 - Throughout the Barataria Basin, the Project will cause permanent, beneficial impacts from raised bed elevations, due to the increased land creation from the introduction of sediment from the project, which is the project purpose. *(pg. 4-69)*
 - In the Mississippi River, the Project will cause intermittent beneficial impacts due to a decrease in water levels from diversion operation both upriver and downriver of the structure. *(pg. 4-90)*
- Adverse Impacts
 - Construction of the Project will involve short term, moderate, adverse impacts to bed elevations, but negligible adverse impacts on water levels, tides, currents, flow, and sediment transport in the Barataria Basin. In the Mississippi River, construction will cause confined river flows, which could increase water velocity and change sediment movement; however, in general, the existing level of drainage would be maintained in the Mississippi River. *(pg. 4-64-65)*
 - Once operational, the Project will permanently cause increased erosion in the Mississippi River immediately upstream of the diversion due to increased water surface slope, and increased deposition immediately downstream due to the

⁸ For the purposes of the EIS, “bed elevations” is defined as “increases in the elevation of the bottom of Barataria Basin.”

reduced flow and slower water velocity from the diversion's rerouting. Project operation will also permanently impact tides, current, and flow from creation of cross-stream velocity in the River near the diversion. (pg. 4-73)

- In the Barataria Basin, the Project will cause higher water levels primarily occurring when the diversion is flowing. (pg. 4-79-80)
- Project operations will also permanently affect the birdfoot delta of the Mississippi River, because sediment that would be deposited there without the Project will instead be deposited into the Barataria Basin. This will cause reduced sediment load, and indirect impacts of that would include changes in wetlands habitats and flooding impacts at that delta. (pg. 4-73)

III. Surface Water and Sediment Quality (Section 4.5, beginning on page 4-126)

This Section describes the Project's potential impacts on salinity, water temperature, fecal coliform, nutrients, sulfate, dissolved oxygen, and total suspended solids.

- Beneficial Impacts
 - The Project will permanently decrease sulfate concentrations in the Barataria Basin, which would overall be beneficial to water quality throughout the Basin. (pg. 4-197-198)
- Adverse Impacts
 - The Project will permanently increase total suspended solids throughout the Barataria Basin which may result in adverse impacts on turbidity in some areas of the Basin. (pg. 4-190-191)
 - Increases in fecal coliform in the Barataria Basin resulting from the Project will have adverse impacts on oyster harvesting for human use. It is worth noting that while this affects oysters for human consumption, it has no impact on the overall health of oyster populations. (pg. 4-200-201)
- Impacts that Could be Beneficial or Adverse
 - The Project will permanently reduce salinity levels in the Barataria Basin and will permanently increase salinity levels in the birdfoot delta. (pg. 4-138)
 - The Project will permanently increase nitrogen and phosphorous levels through the introduction of nutrients from Mississippi River water, and dissolved oxygen levels, all of which would vary throughout the Barataria Basin. (pg. 4-165-166, 4-175-176, 4-182-183)

IV. Wetland Resources and Waters of the United States (Section 4.6, beginning on page 4-209)

A primary purpose of the Project is wetland and marsh creation. This Section details that process and what other impacts on wetlands the Project could have.

- Beneficial Impacts

- Construction of the Project will cause minor, permanent, localized impacts to the area because of invasive species mortality during construction activities. *(pg. 4-211-212)*
- Once in operation, wetlands will be created and sustained from the Project throughout the Barataria Basin, which is a primary project purpose. Sediment accretion would raise land elevation and allow for greater vegetation growth. The Project's changes in salinity will allow for freshwater species to survive and possibly expand in areas that have been negatively impacted by saltwater intrusion and sea-level rise. Overall, it will have major, permanent, beneficial impacts to wetlands in the Barataria Basin. *(pg. 4-223-224)*
- Adverse Impacts
 - Construction of the Project will cause minor to moderate adverse impacts due to dredging and filling wetlands in the area, and minor, temporary, adverse impacts on wetlands adjacent to construction area from sedimentation and contaminant runoff. Construction could also potentially cause minor to moderate, long-term, adverse impacts if construction activities result in the spread of invasive species. *(pg. 4-211-212)*
 - In the birdfoot delta, wetlands will be lost due to sediment reduction. *(pg. 4-224)*
 - In the Barataria Basin, there will be loss of some emergent wetlands from erosion near the immediate outfall area; however, this will be offset over 50 years. There will be minor to moderate, permanent, adverse impacts due to spread of invasive species in the Basin.
- Impacts that Could be Beneficial or Adverse
 - Freshwater from the diversion will provide significant nutrient input into marshes in the Basin, which could stimulate plant production and vegetation growth; however, there is also the possibility of increased decomposition of organic matter due to nutrient loading, which would adversely reduce marsh elevation. But, increased vegetation and plant production aboveground from increased nutrients could also counteract those marsh elevation reductions. Overall, the impacts of increased nutrients would vary across the project area and could adversely or beneficially impact marsh resilience. *(pg. 4-226-227)*
- Mitigation (Appendix R-3: Mitigation & Monitoring and Adaptive Management Plans)
 - The agency will utilize best management practices (BMPs), such as environmental inspections and temporary erosion control.
 - Through the Avoidance and Minimization Mitigation Plan, there will be rehabilitation of jurisdictional waters during construction, monitoring in the outfall area to assess the project's effects on bathymetry, adjustment of operations and maintenance dredging as needed to reduce aggradation in the Barataria waterway, management of the outfall area to limit the loss of sediments in the Barataria waterway, and operational management and maintenance dredging as needed to reduce aggradation in Wilkinson Canal.
 - Through the Minimization and Adaptive Management Plan, there will be freshwater and estuarine monitoring, upland and soils monitoring, and land and

water extent monitoring. There will also be maintenance dredging of the canals to address impacts from the Project, adjustments to the extent that the project structure is opened, and adjustment of the timing of project operation. Lastly, there will be potential adaptive management actions taken for erosion, increased inundation, absence of sediment dispersal, loss of wetlands, shifts in vegetation, and increased algal blooms.

V. Terrestrial Wildlife and Habitat (Section 4.9, beginning on page 4-274)

This Section discusses how the Project will impact vegetation and wildlife species native and invasive to the Project area. This section discusses species and vegetation that live in wetlands and marsh land, as well as agricultural land and forested land in the area.

- Beneficial Impacts
 - Because the Project will increase wetlands, there will be probable beneficial impacts to upland vegetation in the outfall area because of greater storm protection. Additionally, creation of wetlands in the Barataria Basin will be permanently beneficial to wildlife using wetland habitats. (pg. 4-286-289)
 - The Project will reduce saltwater intrusion in the Barataria Basin, which will be beneficial to reptiles and amphibians that live in the area.
- Adverse Impacts
 - The Project could have minor adverse impacts throughout the Basin due to the spread of invasive plant species, and there will be adverse impacts on wildlife habitat from the potential spread of invasive animals, specifically nutria. (pg. 4-293-294)
 - Operational lighting and noise could impact species migration and movement. (pg. 4-287)
 - Wetland loss in the birdfoot delta resulting from Project operation will be harmful to wildlife using wetland habitat in that area. (pg. 4-288)
 - The Project will cause permanent, minor, adverse impacts on species that use agricultural land. (4-287-288)
 - Due to lower salinity levels in the Basin resulting from the Project, species that require higher salinity marsh land for habitat will be permanently adversely impacted. (pg. 4-293)
- Mitigation (Appendix R-3: Mitigation & Monitoring and Adaptive Management Plans)
 - Through implementation of the Minimization and Adaptive Management Plan, there will be upland and soils monitoring, maintenance dredging of the canals to address impacts from the project, adjustments to the extent that the project structure is opened, and adjustment of the timing of project operation.

VI. Aquatic Resources (Section 4.10, beginning on page 4-298)

Aquatic resources, for the purposes of this Section, include benthic resources, submerged aquatic vegetation, and Essential Fish Habitat. This Section describes the Project's potential

impacts on those resources through changes in the aquatic atmosphere, such as nutrient, salinity, and temperature.

- Beneficial Impacts
 - Due to salinity decreases throughout the Basin associated with the Project, there will be major, permanent, beneficial impacts to submerged aquatic vegetation from increased biomass once salinity stabilizes after initial project operation. (pg. 4-318)
 - Marsh creation from operation of the Project will permanently benefit benthic resources in the Barataria Basin.
 - Overall, aquatic fauna in the Barataria Basin will likely be benefitted by the changes in habitat from the Project's wetland creation. (p. ES-11)
 - The Project area contains Essential Fish Habitat⁹ for seven managed species, and for eight highly migratory species. Overall, the project will permanently benefit those Essential Fish Habitat species due to change from soft-bottom habitat types to higher value habitat types in the Barataria Basin. (pg. 4-326-327)
- Adverse Impacts
 - Construction activities will cause minor, temporary to permanent, adverse impacts on submerged aquatic vegetation and benthic resources, and fauna/habitat from structure placement, dredging, and turbidity during construction. (pg. 4-300, 4-303-304, 4-307-308)
 - Increased turbidity from project operation may cause decreased submerged aquatic vegetation growth near the diversion outfall. (pg. 4-318)
 - Increased sedimentation from the Project will cause minor to moderate, permanent, adverse impacts to benthic resources. (pg. 4-323)
 - Due to marsh loss in the birdfoot delta, there will be moderate, permanent, adverse impacts to Essential Fish Habitat in that area. (pg. 4-328)
 - Increased sedimentation in the Project area will permanently and adversely impact hard substrates, which will in turn adversely impact oyster habitats. (pg. 4-325-326, 4-338)
 - The potential for decreased dissolved oxygen resulting from the Project could cause mortality events for all key species, which include: brown shrimp, white shrimp, blue crab, bay anchovy, Gulf menhaden, red drum, spotted seatrout, Atlantic croaker, southern flounder, largemouth bass, eastern oyster, and freshwater fishes. However, impacts of the Project overall vary by species and depend on how much dissolved oxygen decreases.
 - Operation of the Project will change aquatic conditions in the Barataria Basin, which could allow for introduction and expansion of invasive aquatic species throughout.
- Impacts that Could be Beneficial or Adverse
 - Algal blooms caused by nutrient loading can be beneficial in an estuarine environment due to increases in productivity and food sources; however, depending

⁹ As designated by the National Oceanic and Atmospheric Administration through the Magnuson-Stevens Fishery Conservation and Management Act.

on their size and frequency, they can also have adverse impacts on the environment due to decreased dissolved oxygen. Therefore, impacts on aquatic fauna from increased nutrients could be minor to moderate, permanent, and beneficial or minor to moderate, temporary, and adverse. (pg. 4-322, 4-340-344)

- The introduction of Mississippi River freshwater into the Barataria Basin will cause water with lower temperatures and lower salinity, which often results in higher dissolved oxygen levels; however, as stated above, nutrient input from the project causing higher production could also result in lower dissolved oxygen. Therefore, operation of the Project may cause some sporadic, limited areas of low dissolved oxygen in the Basin, but the Project is not projected to cause any large or prolonged low dissolved oxygen events because the Basin is already considered a “well-mixed estuary.” (pg. 4-322, 4-340-344)
- Mitigation (Appendix R-3: Mitigation & Monitoring and Adaptive Management Plans)
 - The agency will utilize best management practices (BMPs), such as environmental inspections.
 - Through the Avoidance and Minimization Mitigation Plan, there will be rehabilitation of jurisdictional waters during construction, monitoring in the outfall area to assess the project’s effects on bathymetry, adjustment of operations and maintenance dredging as needed to reduce aggradation in the Barataria waterway, management of the outfall area to limit the loss of sediments in the Barataria waterway, and operational management and maintenance dredging as needed to reduce aggradation in Wilkinson Canal.
 - Through the Minimization and Adaptive Management Plan, there will be freshwater and estuarine monitoring, upland and soils monitoring, and land and water extent monitoring. There will also be maintenance dredging of the canals to address impacts from the Project, adjustments to the extent that the project structure is opened, and adjustment of the timing of project operation. Lastly, there will be potential adaptive management actions taken for erosion, increased inundation, absence of sediment dispersal, loss of wetlands, shifts in vegetation, and increased algal blooms.
 - Adverse impacts to aquatic resources will also likely be mitigated by the fishery impacts and oyster mitigation plans, which are discussed below in the commercial fisheries section.

VII. Marine Mammals (Section 4.11, beginning on page 4-423)

This Section details the Project’s impacts on the bottlenose dolphin, because it is the primary marine mammal species found in the project area, specifically in the Barataria Basin.

- Beneficial Impacts
 - Increased marsh land from operation of the Project will likely have permanently benefit prey species of bottlenose dolphins, which could be beneficial to them. (pgs. 4-451, 4-454-455)
- Adverse Impacts

- Noise from construction of the Project will likely cause temporary, negligible to minor, adverse effects to bottlenose dolphins in the Barataria Basin. (pgs. 4-431-432)
- Lower salinity and temperature in the Barataria Basin from the Project's introduction of Mississippi River water through the diversion will permanently adversely affect bottlenose dolphins. The initial opening's immediate salinity decrease will be especially harmful to dolphin reproduction, health, and survival, especially because the timing for project operations coincides with peak calving. Due to these impacts, there will likely be substantial population decline of bottlenose dolphins in the Barataria Basin. (pg. 4-446-449)
- The addition of Mississippi River contaminants from project operation could result in higher concentrations of those contaminants in apex predators, like bottlenose dolphins. Further, the addition of nutrients could also be detrimental to bottlenose dolphins. The primary area of impact from increased nutrients that could cause harmful algal blooms is close to the outfall area. There is currently not enough information to determine whether the addition of nutrients will trigger harmful algal blooms, but if it does, there will be minor to moderate, temporary, adverse impacts on fauna, which would be felt up the food chain to bottlenose dolphins. Therefore, if harmful algal blooms occur, it will adversely impact dolphins due to toxicity from inhalation or from ingestion of contaminated prey, which could result in death or sub-lethal impacts to the dolphins. (pgs. 4-454-455, 4-451-453)
- Mitigation (Appendix R-3: Mitigation & Monitoring and Adaptive Management Plans)
 - The Mitigation Plan calls for operational minimization measures, statewide stranding program funding, human interaction stressor reduction, and contingency funds for Unusual Mortality Events. There will also be freshwater, estuarine and land and water extent monitoring. Lastly, there will be potential adaptative management actions taken for erosion, increased inundation, absence of sediment dispersal, loss of wetlands, shifts in vegetation, and increased algal blooms.

VIII. Socioeconomics (Section 4.13, beginning on page 4-525)

Socioeconomic impacts include the Project's impact on the economy, population, housing and property values, tax revenue, public services and utilities, community cohesion, and the protection of children. (pg. 4-525) The Summary Table for this Section can be found on page 4-567.)

- Beneficial Impacts
 - Construction of the Project would lead to job creation and a boost to the economy of Plaquemines Parish and nearby parishes, with the potential to employ about 29% of the Plaquemine's Parish workforce.
 - The Project is expected to reduce land loss and flooding that otherwise would occur over time as climate impacts increase. This would decrease pressure on residents to migrate away from coastal communities and have a beneficial impact on businesses and property values.

- The reduction in storm hazards will also slow the decline in housing and property value caused by flooding and subsidence. The New Orleans area north of the diversion project is expected to experience a minor, permanent, beneficial impact as a result of the land gained and increased storm protection.
- Adverse Impacts
 - Communities near the immediate outfall area (10 miles north and 10 miles south) and outside of the flood protection system would experience adverse impacts on housing and property values due to increased flood risks.
 - Construction would increase road traffic, noise, and dust.
 - In Jefferson and Plaquemines Parishes, 848.7 acres of land would be altered, resulting in a less than 1% loss of farmland in Plaquemines Parish. CPRA would compensate landowners for any lost land.
 - Areas outside the flood protection area are expected to experience increases in tidal flooding from the project, which would lead to a decline in tax revenue and public services.
- Mitigation
 - CPRA plans to monitor and adaptively manage operation to address flooding impacts. It is also looking into property rights acquisition (Appendix R-3: Mitigation & Monitoring and Adaptive Management Plans)
 - Depending on the degree of flood impact, CPRA may acquire easements on affected properties and compensate owners for property value loss.
 - Other methods may include structural mitigation and infrastructure improvements, such as assistance with home elevation, utility upgrades, elevating public roadways, etc., to offset additional inundation.

IX. Commercial Fisheries - (Section 4.14, beginning on page 4-570)

This Section focuses on the Project’s impact on commercial fisheries located in the Project area: the Barataria Basin, a portion of the Mississippi River Basin, and 13 commercial fisheries sub-basins located therein. Parishes affected include: Ascension, Assumption, Lafourche, Jefferson, Orleans, Plaquemines, St. Charles, St. John the Baptist, St. James, and St. Bernard. The Project is expected to create and maintain marsh habitat, submerged aquatic vegetation habitat, decrease salinity, supply nutrients, and increase shallow water habitat—all of which will affect the abundance of some commercially important species.

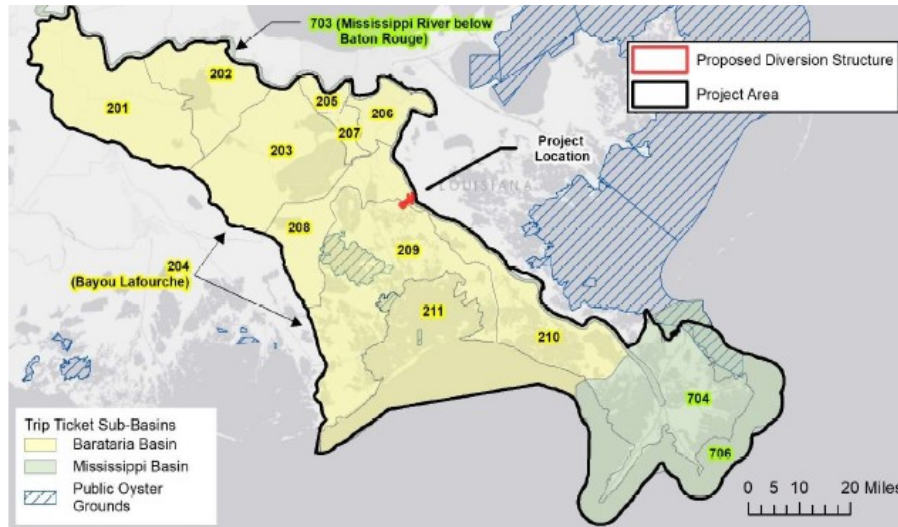


Figure 3.14-1. Trip Ticket Sub-basins and Public Oyster Seed Grounds in and near the Project Area.

- **Beneficial Impacts**
 - Some fisheries will benefit from the Project, including white shrimp, blue crab, Gulf menhaden, bay anchovy, and freshwater finfish. (pgs. 4-599-600) This is due to the maintenance of marsh habitat and decrease in salinity because of the Project.
 - Commercial alligator hunting and farming is expected to experience minor, permanent, beneficial impacts due to the retention of suitable habitat near the outfall area. (pg. 4-601)
- **Adverse Impacts**
 - There will be some road closures and minor water-based traffic during the construction period of the Project, which may impact access for those engaging in commercial fishing activities but are not anticipated to have a measurable effect. (pgs. 4-572-573)
 - Increased tidal flooding of launch sites, sediment accretion, or the expansion of thick mats of aquatic invasive plant species could require fishers to travel longer distances to certain water sites. There is also a possibility that some of those sites might have to be closed. (pg. 4-589)
 - While smaller vessels might have an easier time navigating through the navigation channels affected by sedimentation, larger vessels will have a difficult time due to the decreased channel depths.
 - The Project is expected to have a major, permanent, adverse impacts on brown shrimp and eastern oysters.
 - The reduction of abundance of brown shrimp would substantially reduce spring harvest, while fall harvest (which consists most of white shrimp) is expected to remain the same.
 - Sub-basin 211 would not be affected due to its distance from the project area.

- Substitution of a different target species may lessen the adverse impacts but will not be enough to fully offset the environmental changes. (pg. 4-594)
 - While there will be major, permanent, adverse impacts on the eastern oyster fishery, areas near the barrier islands could possibly be used as seed grounds and growing areas for adults when salinities are too low. (pg. 4-596)
 - Changes in the marsh habitat and increased sedimentation in the channels is expected to increase difficulty for fishermen to access fishing sites. The Project risks the introduction and expansion of invasive species in the Barataria Basin, which would clog canals and create difficulty for some fishing vessels. (pg. 4-591) Many will need to invest in new gear, seek out new locations, and incur traveling costs.
 - The accelerated decrease in the abundance of certain species may similarly accelerate the decline of the fishing industry due to increased risk and uncertainty related to general economic factors. (pg. 4-595)
- Mitigation
 - If no mitigation efforts are taken to maintain channel depths, commercial fishing vessels would experience permanent, moderate, adverse impacts.
 - CPRA is investigating mitigation measures to address adverse impacts on commercial oyster and brown shrimp fishing. (pg. 4-968)
 - To mitigate economic damage resulting from adverse impacts to oyster beds, CPRA may implement several mitigation and stewardship measures, including Alternative Oyster Aquaculture (AOC) programs, as well as marketing to support the oyster industry. (Appendix R-3: Mitigation & Monitoring and Adaptive Management Plans)
 - To mitigate impacts on the shrimp and fishing industry, mitigation plan measures include: grant programs to equip fishing vessels with refrigeration and other gear change/improvements; marketing to support the finfish and Louisiana shrimp industry; and workforce training for commercial fishers. (Appendix R-3: Mitigation & Monitoring and Adaptive Management Plans)
- *Note: The DEIS conclusions were drafted with the expectation that the fishing industry would respond to environmental changes by moving to other fishing areas. If this is an incorrect assumption, impacts will likely be greater. (4.14.2: Pg. 4-572)*

Expected Trends in Project Area Fish Abundance Comparison		
Aquatic Species	Trend Over Modeled 50 Years	
	No Action Alternative	Preferred Alternative (75,000 cfs)
Brown Shrimp	Gradual but major decrease over time; largest decrease after 2050	Major, permanent, adverse; Decline in abundance accelerated
White Shrimp	Gradual but major decrease over time; largest decrease after 2050	Minor, permanent, beneficial; Slight increase in abundance

Blue Crab	Gradual decrease over time; largest decrease after 2050	Minor, permanent; beneficial; Slight increase in abundance
Bay Anchovy	Negligible or no change over time	Minor, permanent, beneficial
Gulf Menhaden	Negligible or no change over time	Moderate, permanent, beneficial;
Spotted Seatrout	Slight decrease over time	Minor, permanent, adverse;
Atlantic Croaker	Slight decrease over time	Negligible
Southern Flounder	Negligible or no change	Minor, permanent, adverse
Largemouth Bass	Gradual but major decrease over time	Moderate, permanent, beneficial
Eastern Oyster	Gradual but major decrease over time; largest decrease after 2050	Major, permanent, adverse; Decline in abundance accelerated

X. Environmental Justice (Section 4.15, beginning on page 4-607)

Federal agencies are required to consider environmental justice when identifying and addressing impacts of programs, policies, and activities. Environmental justice, according to the EPA, is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies. This part of the EIS analyses how Project impacts will affect low-income and/or minority communities—including those that live and work within a half-mile radius of the Project construction footprint and areas most likely experience adverse impacts (southern Plaquemines and Jefferson Parishes) (pgs. 4-607-609)

- Beneficial Impacts
 - Communities may experience temporary beneficial impacts from additional construction jobs and increase demand for goods and services in the area near the Project footprint.
 - Populations located in areas north of the diversion and inside of federal flood protections should experience some beneficial impacts from the additional storm protection. (pg. 4-617)
- Adverse Impacts
 - During construction, there are expected to be minor to moderate, temporary adverse impacts. Pile driving will create noise and cause delays in traffic due to reduced roadway capacity. Residents may experience increases in respiratory illness or episodes of asthma due to dust.
 - Tidal flooding could increase in Lafitte area and other communities near the immediate outfall area and outside the federal levee system. It is higher than it would be under the No Action Alternative.
 - Areas affected include Lafitte, Myrtle Grove, Hermitage, Grand Bayou, and Happy Jack (pg. 4-620)
 - There are expected to be minor to major, long-term, adverse impacts on communities not protected by federal levees and major, permanent, adverse impacts

on commercial fisheries. These impacts will be disproportionately high in some low-income and minority populations in the Project area, as they may lack resources to respond to impacts. (pg. 4-616)

- For those within the levee protection system, the impacts are expected to be negligible.
- *Note: The DEIS assumes that many residents may refuse to migrate or do not have the resources to relocate.*
- The reduction in brown shrimp abundance will likely affect low-income and minority communities in the Project area, but the extent is unknown. Communities that depend on shrimp and oysters from the Barataria Basin will experience more on an impact due to their higher dependence on subsistence fishing. (pgs. 4-625-627)
 - The decreased abundance may result in dietary deficiencies, reduced access to fresh and healthy foods, and a weakening of social ties.
- Ironton is expected to experience most of the adverse impacts from construction and operation of the project, including effects from noise and air pollution and adverse impacts on their commercial fishing and other subsistence activities. (pg. 4-618) A town with a population of 120, ninety-seven percent of whom are minorities, its citizens may experience a disproportionately high impact from the Project compared to other communities.
- Mitigation
 - CPRA is currently evaluating mitigation measures related to the potential acquisition of easements on properties ~20 miles south of the diversion in areas outside of levee protection, which are expected to suffer increased tidal flooding and storm hazards as a result of the project. (pg. 4-968)
 - There are also plans to improve public access for recreational and subsistence fishing, as well as some additional measures that may be developed based on outreach to low-income and minority populations. (*Appendix R-3: Mitigation & Monitoring and Adaptive Management Plans, Section 5.0*)

XI. Public Lands (Section 4.17, beginning on page 6-653)

This Section focuses on the changes to public lands and access to them as a result of the Project. During construction, direct impacts would occur within a half mile of the Project construction footprint, while indirect impacts would occur on LA 23 in the form of traffic delays. During operations potential impacted areas include designated public lands located throughout Barataria Basin and the birdfoot delta. (pg. 653)

- Beneficial Impacts
 - Without the Project, 80% of wetlands in the Barataria Basin and 89% of wetlands in the birdfoot delta would be lost over the next 50 years. Sea-level rise and subsidence would also increase flooding and make some public lands less accessible. The Project is expected to have a beneficial impact by creating and

sustaining wetlands, decreasing the amounts lost over the 50-year period. (pg. 4-656)

- However, it should be noted that the loss of wetlands would result in a possible expansion of public lands as more areas shift to navigable waters. This also potentially has the added impact of reducing the taxable property base for Plaquemines Parish.
- While the Project is expected to create wetlands, it is predicted that any Project-induced wetland benefits on public lands in the Barataria Basin could be lost by 2070, resulting in 0 acres gain/loss compared to the 298,235 acres that would be lost otherwise. (pgs. 4-656-659)
- Adverse Impacts
 - While there are no public lands located within half a mile from the diversion complex, mobilization of crews and equipment during construction may cause traffic congestion that can indirectly hinder access to public lands.
 - *Note: Construction is NOT expected to result in road closures.*
 - There is expected to be increased tidal flooding on public lands or roads leading to those lands. (pg. 659)
 - Due to reduced downriver sediment deposit, there will be some decreases in wetlands in the birdfoot delta, specifically 929 acres in the Delta NWR and 37 acres in the Pass A Loutre WMA.

XII. Land Use and Land Cover (Section 4.18, beginning on page 4-662)

This section analyses impacts of the Project on land use and land cover. Construction impacts are expected to occur primarily within half a mile of the construction footprint and operation impacts are expected to extend throughout the Barataria Basin and the birdfoot delta.

- Beneficial Impacts
 - The Project is expected to slow wetland loss over the next 50 years and help the State achieve its coastline restoration objectives, which could encourage investment in the Project area. (pg. 4-668)
 - The Project's creation of wetlands is expected to be beneficial for activities such as hunting waterfowls. Land gains in the Barataria Basin would also support fishing, wildlife viewing, and other tourism activities. (pg. 4-668)
- Adverse Impacts
 - Construction of the Project will have a direct, moderate, permanent adverse impact on 949.2 acres of land in Jefferson and Plaquemines Parishes due to movement of construction personnel and equipment, vegetation clearing, ground disturbance, and some noise and dust disturbance, as well as the conversion of agricultural, open, and forested land to developed land.
 - There would be an adverse impact on activities where more open water is desired.
- Impacts that May be Beneficial or Adverse
 - There would be 45% more land loss in the birdfoot delta. (pg. 4-668) However, whether this land loss is beneficial or adverse depends on the activities intended by

the user. (pg. 669) Regardless, there will be some displacement of activities such as fishing, recreation, and tourism from the basin to the delta, or vice versa.

XIII. Public Health and Safety (Section 4.20, beginning on page 4-680)

The Section addresses issues of public health that could *hypothetically* occur due to construction and operation.

- Beneficial Impacts
 - The Project would result in increases in elevation within the delta and reduce storm surge elevation, limiting the height of waves in areas north of the immediate outfall area.
 - There would be minor, permanent beneficial impacts on decreasing levee overtopping north of the immediate outfall area.
- Adverse Impacts
 - Risks associated with construction activities may create potential dangers.
 - Inadvertent contaminant releases could affect public health and safety, depending on the nature of the release. Large releases that make it into the water could impact water quality.
 - Unsecured large equipment may pose dangers during storms if not secured properly.
 - Communities in the Project Area outside of the federal levee system would experience land and waterbed changes as sediment flowing into the basin settles. These communities would be susceptible to adverse, long-term, minor to major indirect public health and safety impacts, as rising water levels due to diversion operations cause an increased risk to the public health and safety of communities outside of the federal levee system.
 - The Project would result in an increase in surge elevation gulfward of the immediate outfall area. Wave heights are expected to decrease as distance from the diversion increase.
 - There would be minor, permanent, adverse impacts on increase levee overtopping south of the immediate outfall area.

XIV. Hazardous, Toxic, and Radioactive Waste Assessment (Section 4.23, beginning on page 4-786)

This Section addresses the risk of possible contaminants resulting from Project construction and operation. This section of the DEIS limits its analysis to the area within half a mile of the construction footprint and areas where spills could impact soils, surface water, and groundwater during operation. Impacts on airborne contaminants are addressed in Section 4.7 Air Quality of the DEIS.

- Beneficial Impacts
 - None Available
- Adverse Impacts

- Construction of the Project may result in temporary, minor to moderate, adverse impacts due to potential unexpected discovery of an exposure to contaminated sites. That being said, there are no indications of an adverse environmental condition at the site.
 - There may be minor to major, permanent, adverse impacts over time, regardless, as there may be future commercial or residential developments on the site.
- There could be short to long-term minor to major adverse impacts from the transport and use of potentially harmful chemicals and fuels needed for equipment maintenance and operation. However, CPRA would be required to report large-quantity spills and develop a contingency plan.

Conclusion

There are several major impacts the Mid-Barataria Sediment Diversion will have on coastal Louisiana's environment and its communities.

First, it will decrease land loss in the Barataria Basin, but increase land loss in the birdfoot delta. Compared to the No Action Alternative, which would lead to continued land loss in the Barataria Basin and birdfoot delta, the MBSD will create and sustain approximately 17,300 acres of wetland in Barataria Basin by 2050, which will decrease to 13,400 acres of land—12,700 acres of which are wetlands—by 2070 as a result of sea-level rise and subsidence, thus reducing the wetland loss by 17.4 percent. That being said, there are a number of uncertainties, such as sea-level rise, subsidence, and plant growth that affect how much land will actually be created. Furthermore, the birdfoot delta is expected to lose 3,000 acres of land as a result of the project.

Second, it will significantly impact commercial fisheries. The influx of freshwater from the Mississippi River will adversely impact brown shrimp and oyster abundance as well as some finfish, while white shrimp, blue crab, and other finfish fisheries will benefit. However, it is important to note that commercial shrimp fisheries and the commercial oyster industry are predicted to experience adverse impacts and abundance decreases due to reduced marsh habitat and salinity shifts, even without the MBSD.

Third, it will have major, adverse impacts on the Barataria Bay Estuarine System (BBES) bottlenose dolphins and their habitat. The decrease in salinity levels in the BBES caused by operation of the Project would adversely affect their health, survival, and reproduction. While the dolphin population is expected to experience gradually increasing adverse impacts under the No Action Alternative, influx of freshwater from the diversion will likely lead to a substantial reduction in population.

Lastly, it is currently unknown how nutrients from the river will affect the basin. The Mississippi River is overloaded with nutrients, like nitrogen and phosphorous, that can cause harmful algal blooms. Furthermore, there are concerns that excess nutrients from the river may

accelerate marsh plant growth so much that vegetation does not have enough time to develop root systems strong enough to hold down the newly-deposited sediment.¹⁰ The DEIS does not significantly analyze this potential impact and lacks a conclusive finding on whether it will negatively or positively impact the basin.

The MBSD will be crucial to building back coastal land in Southeastern Louisiana, but the Draft EIS highlights some issues with the project, which will require more comprehensive mitigation measures and/or separate efforts by the state to address those issues. The Project should be paired with comprehensive basin-wide nutrient management to lower the chance of harmful effects in the Barataria Basin. The potential for harmful algal blooms and low dissolved oxygen from the introduction of Mississippi River freshwater into the Barataria Basin would have negative impacts on wildlife, fisheries, flora and fauna, and wetland creation. Additionally, to reduce harmful impacts to the fishing community, specifically for oyster fisheries, the Project should be accompanied by encouragement of innovative, off-bottom oysterculture at the state level. While Appendix R of the Draft EIS speaks briefly about plans to mitigate impacts to oysters via such programs, those efforts will require further development and additional environmental reviews. Finally, the impacts to communities outside of flood control systems in the Barataria Basin highlights the need for some action at the state or federal level to protect those communities. The Project is necessary for reducing the impacts of sea level rise and subsidence to coastal Louisiana, but these added measures should be taken to lessen the Project's potential for harmful impacts in the area.

Changes in the Louisiana coast have already presented significant challenges to the fishing and oyster interests, to the natural habitat, and to the communities along the coast. The coastline has generally moved inland, marshes have disappeared, and areas that were once freshwater are now saltwater. Without intervention, this will continue and probably accelerate. The use of "permanent" throughout the DEIS is without a doubt a legal fiction. Nothing is permanent, especially in this setting. The only permanence in coastal Louisiana is impermanence.

The Mid-Barataria Sediment Diversion Project is an immense project that was years in the making and carries with it the lofty goal of restoring Louisiana's coastline; it aims to restore some of the lost coastal land and marshes needed to maintain and redevelop fisheries, oyster reefs, other natural habitats, and reinforce coastal storm protection. Such a significant undertaking is bound to result in some disruption; but this disruption is necessary to ensure an existing coast in the future. The DEIS addresses the areas in which such disruption should be expected, and we have tried to highlight areas which should be of particular importance to those interested in commenting on the process. With that said, the DEIS is limited in scope (despite its massive length) and acknowledges but cannot fully consider certain relevant issues to the extent many may like. The purpose of the comment period is to allow the community to bring more attention to these issues and improve Project plans and further mitigate adverse impacts. Despite its shortcomings, it presents a plan Louisiana can use to tackle the problem of our receding coast.

¹⁰ Cornwall, *supra* note 4.