

Mid-Breton Sediment Diversion Project Overview and Purpose (POSTER SESSION)

Brad Barth, Operations Assist Administrator, Coastal Protection and Restoration Authority, Baton Rouge, Louisiana, bradley.barth@la.gov

Matthew Hoy, Senior Principal, Stantec, St. Louis, Missouri, matthew.hoy@stantec.com

Scott Peyton, Vice President, Stantec, Cincinnati, Ohio, scott.peyton@stantec.com

Adam Witt, Senior Water Resources Engineer, Stantec, Sacramento, California, adam.witt@stantec.com

Qimiao Lu, Associate Principal, W.F Baird and Associates, Oakville, Ontario, qlu@baird.com

Rob Nairn, Principal, Ibid, rnairn@baird.com

Rebecca Quan, Coastal Engineer, Ibid, rquan@baird.com

Abstract

The Mid-Breton Sediment Diversion Project (MBrSD or Project) is being proposed to address the problem of large-scale land loss in coastal Louisiana. The Project design connects the left descending (east) bank of the Mississippi River near River Mile 68 above Head of Passes to the Breton Sound Basin by modifying the existing Mississippi River Levee to include four primary components: an intake channel, a gate structure, a conveyance channel, and an outfall channel. The Project is currently in the 60% Design Phase, with design completion scheduled for early 2024, and a Final EIS and permitting decision to follow in late 2024. Construction is expected to begin in early 2025.

Introduction

Louisiana continues to experience coastal land loss as a result of both human and natural forces. Levees and flood control structures on the Mississippi River have successfully provided flood control and other benefits to the region. These features have fixed much of the channel and its banks, depriving the broader coastal ecosystem of the freshwater, sediment and nutrients that previously flowed to these areas and limited large scale land loss. Land loss reduces shorelines, marshes and swamps that are a vital barrier against storm surge and flooding. If nothing is done, 2,250 square miles of land could be lost in the next 50 years as shown in Figure 1.

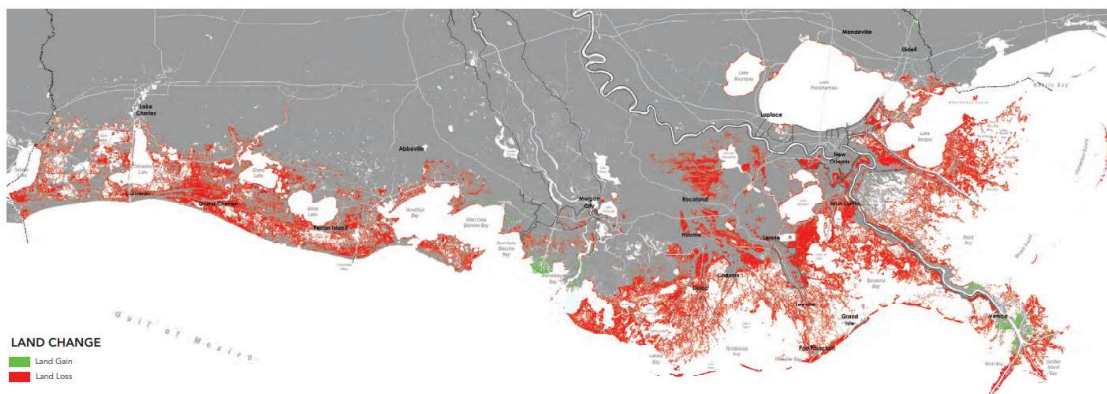


Figure 1. Projected land change along Louisiana coast under medium environmental scenario (from 2017 Coastal Master Plan, CPRA)

The Master Plan

Recognizing the need for an innovative approach to restore and sustain land, the State of Louisiana's Coastal Master Plan has proposed a comprehensive plan that includes over 124 projects to build or maintain more than 800 square miles of land and reduce expected damages by \$8.3 billion annually by year 50.

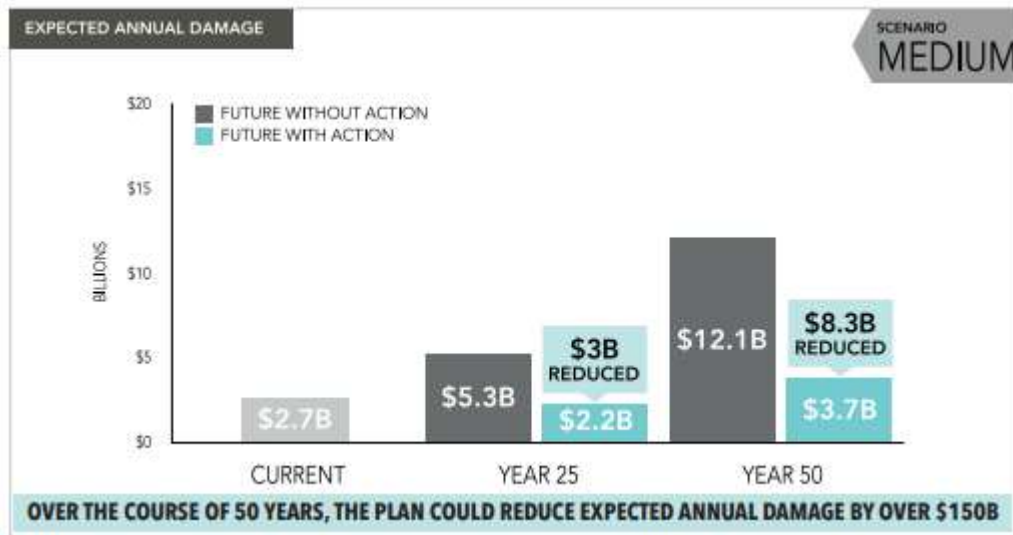


Figure 2. Expected Annual Damage Reduction (from 2017 Coastal Master Plan, CPRA)

The projects include restoration projects to build or maintain land, structural protection such as levees that reduce flood risk by acting as physical barriers to coastal surge, and non-structural risk reduction projects such as elevation and floodproofing of buildings.

The Master Plan includes multiple sediment diversions along the Mississippi River as cornerstone projects essential to creating and sustaining coastal land. Controlled sediment diversions offer a unique opportunity to strategically re-establish hydrologic flows, carry land-building sediment, nourish marshes, and sustain land. Because large-scale sediment diversions are relatively new not just to Louisiana but to coastal residents worldwide, CPRA and USACE worked closely to develop cutting edge technical models to better understand and estimate the effects of using river resources for large-scale restoration projects. CPRA conducted detailed analyses of multiple potential diversion locations in order to determine which projects should be prioritized for design and construction. Each project was modeled to estimate effects on multiple variables, such as land building, sediment transport, nutrients and water levels.

CPRA decided in fall 2015 to recommend that the Mid-Breton and Mid-Barataria diversions move forward to preliminary engineering and design. Design and construction is being funded through a settlement from the 2010 BP Oil Spill, administered through the National Fish and Wildlife Foundation (NFWF). The discussion in this poster session will focus on the Mid-Breton diversion.

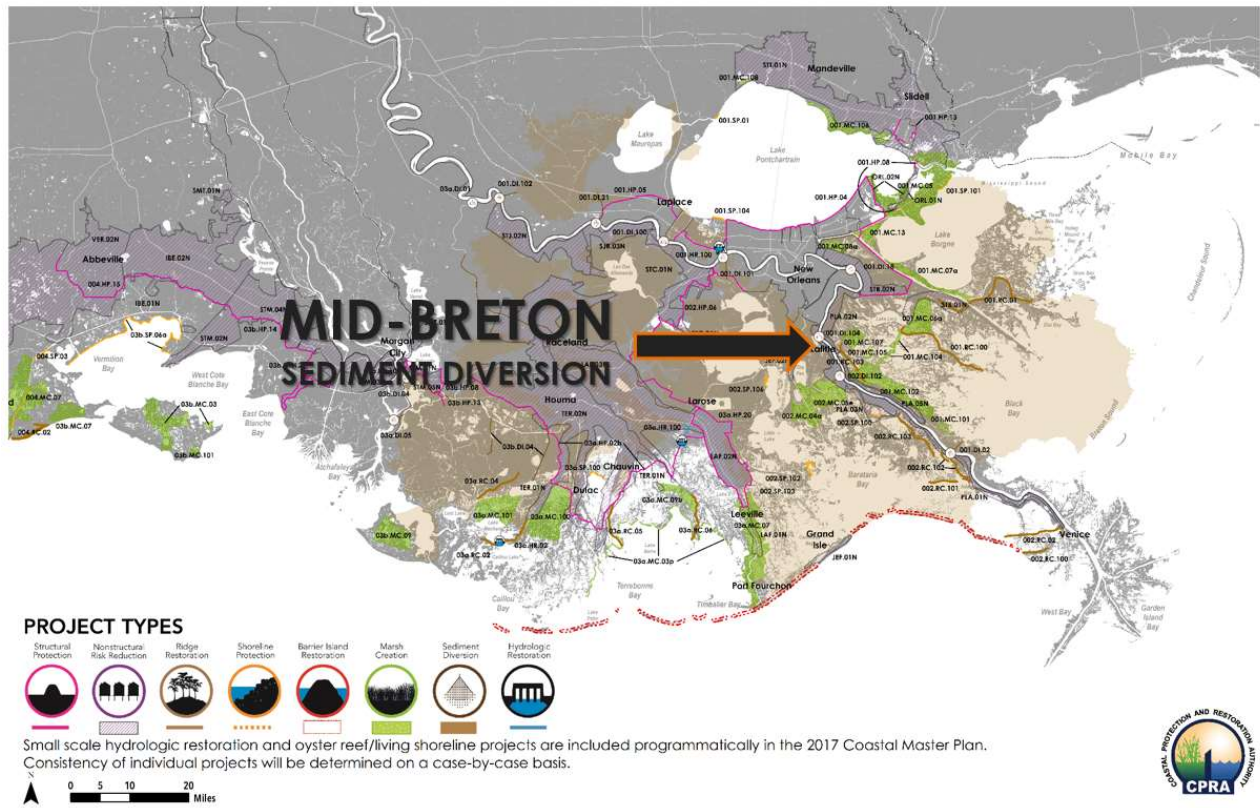


Figure 3. CPRA Master Plan Projects (from 2017 Coastal Master Plan, CPRA)

The Project

The Mid-Breton project will be located at River Mile 68.0 AHP on the left descending bank of the river near the community of Wills Point. It is being designed for a peak flow of approximately 1,415 cms (50,000 cfs) when the river is flowing at 28,316 cms (1,000,000 cfs). The main project features are as follows:

1. **Intake.** The project includes a curved intake to transition water and sediment from the Mississippi River to the Breton Sound.
2. **Diversion Structure.** Consists of a structure with three lift gates operated by a gantry crane and a conveyance channel to move water and sediment from the river to the basin.
3. **Conveyance Channel.** The conveyance channel will have an invert elevation of -6.1 m (-20 ft) NAVD 88, a bottom width of 48.8 m (160 ft), side slopes of 3.5H:1V, and will be approximately 0.8 km (0.5 mile) long. The channel and side slopes will be lined with riprap armoring.
4. **Outfall Transition.** A flared outfall channel will allow transition of flows in the conveyance channel into the Breton Sound.

Design and construction will be necessary to accommodate and/or modify the Mississippi River levee, a state highway, domestic utilities, and a hurricane levee and associated drainage.

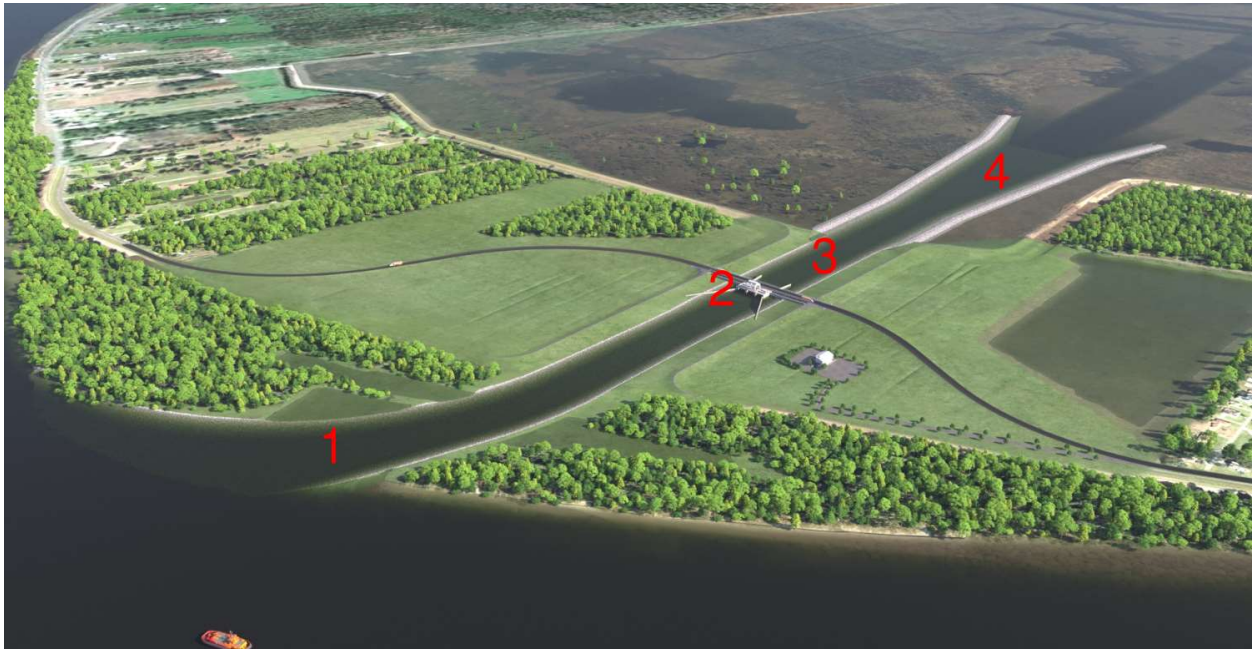


Figure 4. Rendering of Mid-Breton Diversion Conceptual Design (Stantec)

References

Coastal Protection and Restoration Authority of Louisiana, 2017. "Louisiana's Comprehensive Master Plan for a Sustainable Coast". Effective June 2, 2017.