



US Army Corps
of Engineers.
Engineer Research and
Development Center

National Regional Sediment Management Program New Orleans District (MVN):



Evaluation of Structural and Operational Alternatives to Optimize the Distribution of Water and Sediment in the Passes of the Mississippi River

Description

Significant maintenance dredging is required each spring at the entrance of the Mississippi River navigation channel, where an average of 17 Million Cubic Yards of dredged material is removed each year from its first 30 miles. Throughout the life of the project, structural and operational modifications have been made in response to changes in river shoaling patterns and to reduce maintenance requirements. This proposal would use existing river models to evaluate new modifications near the river's Head of Passes to optimize the distribution of water and sediment towards the reduction of shoaling in the navigation channel.

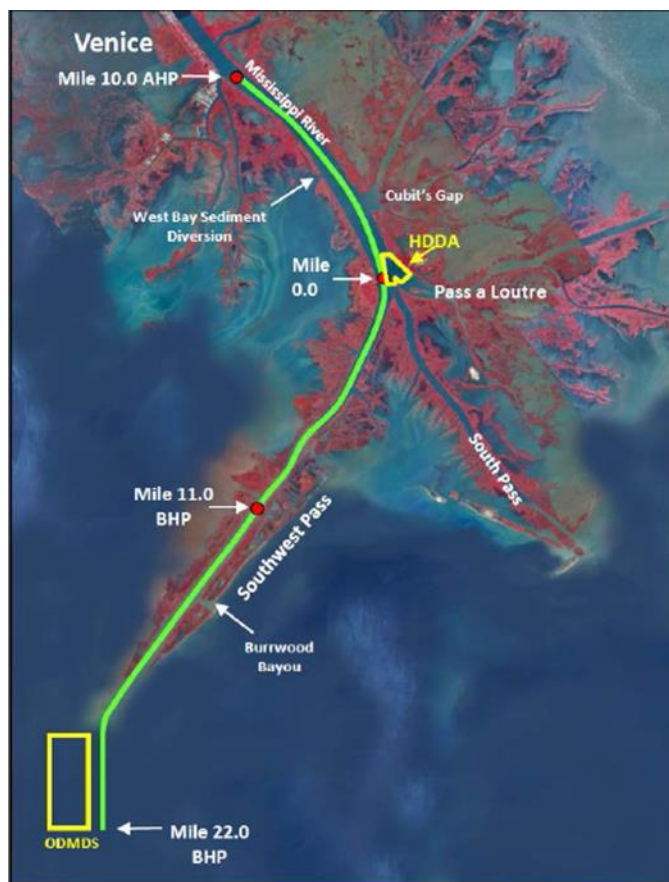


Figure 1. The lowermost segment of the Mississippi River navigation channel (in green) below Venice, LA, with notable landmarks and project features. Modifications to structures near Head of Passes (Mile 0) may improve the distribution of water and sediment amongst the river's passes.



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Issue/Challenge To Address

To reduce maintenance dredging requirements over the last 100+ years below Venice, LA, USACE has installed timber and stone dikes along the river's margins to constrict flows and installed other sills and deflection dikes at Head of Passes to force water through a preferred river pass. These structural and operational modifications were driven by river conditions and engineering goals at the time of installation, and their effectiveness and purpose have diminished through time with changes in river conditions or shifting maintenance strategies. This proposal would use the existing HEC-6T model of the Mississippi River to simulate the effect of a variety of structural and operational alternatives on long-term dredging requirements in the navigation channel below Venice.

Successes Lessons Learned

The HEC-6T model has previously been used to evaluate dredging alternatives at deep water crossings downstream from Baton Rouge, and with prior versions used to inform dredging alternatives in the Cubit's Gap and Head of Passes reaches under varying annual hydrographs. The results of these evaluations were used by the CEMVN to inform channel deepening studies and other proposed operational changes at Head of Passes.

Projected Benefits Cost Savings Value Added

This RSM effort has the potential to significantly reduce O&M costs for maintenance of the navigation channel. For example, a structural solution estimated through modeling to reduce the average annual maintenance requirement by 10% (or 1.7 Million Cubic Yards) would potentially reduce dredging costs by about \$42M (assuming \$2.50 per Cubic Yard). The costs associated with constructing and maintaining the structure could then be weighed against this cost savings.

Expected Products

Final report (including model set up, calibration, validation, and results) with proposed locations of structural / operational modifications and estimated changes to the distribution of water and sediment below Venice modeled for each feature.

Stakeholders/Users

Results from this effort can be shared with local, Federal and State agencies to assist in overall planning of restoration projects in the lower Mississippi River Delta. Investigation of the relationship between the HDDA, Pass a' Loutre, and South Pass has been specifically requested by state and Federal environmental agencies, and is a conditional requirement for continued maintenance of the navigation channel and use of the HDDA.

Leveraging Opportunities

This RSM effort will leverage data and models already developed for the Mississippi River Hydrodynamic Study and the Mississippi River Delta Management Study. This proposal complements and would help complete a key component of MVD's "Phase 2 – Southwest Pass Investigation".

Points of Contact

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Participating Partners

N/A