



FY18 RSM IPR

MVN, Investigation of Sources of Sediment Associated with Deposition in the Calcasieu Ship Channel (CSC)

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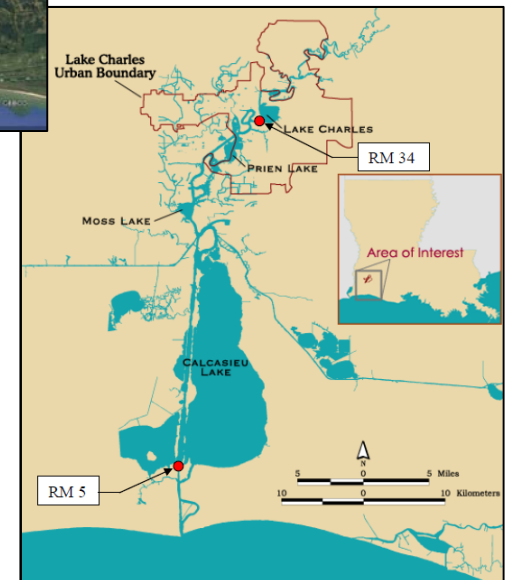
BLUF: Study is designed to identify and quantify the source or sources of that portion (~79%) of the sediment that is deposited in the CSC, with as yet unattributed provenance

Challenge/Objectives

- Sediment sources and pathways are complex, and uncertainties must be accounted for in the analysis
- Therefore, goals of this effort are limited – this effort can be used to inform future more detailed investigations

Approach

Utilize existing literature to investigate potential sources of sediment, and model simulations using existing AdH/SEDLIB model (adapted for this study) to investigate potential transport pathways for various sources



Study Area: Southwest Louisiana

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District/Other USACE PDT Members

MVN and the ERDC Coastal and Hydraulics Laboratory

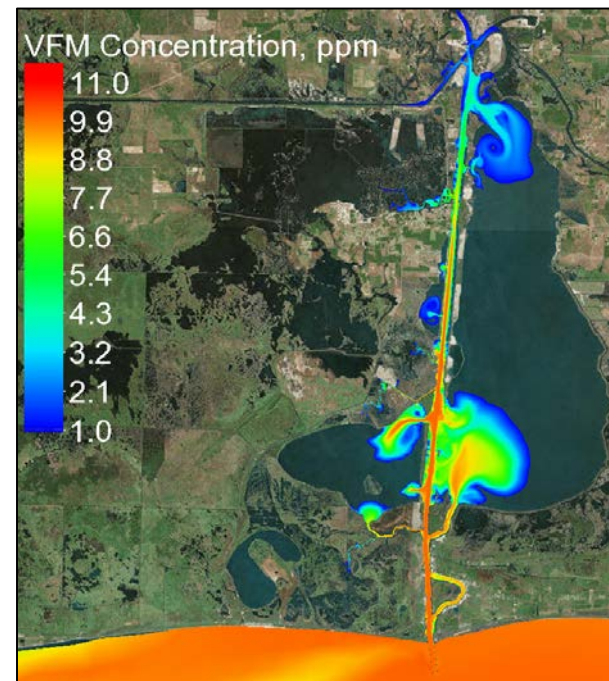
Stakeholders/Partners

Lake Charles Harbor and Terminal District
Calcasieu Water Safety Committee

Leveraging/Collaborative Opportunities

Leverages existing AdH model of Calcasieu Locks (CHL) and existing ERDC study of sediment sources (Fischenich, 2004)

Collaborative opportunities exist with other Louisiana Universities and research entities to utilize the results of this study for further research



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Accomplishments/Deliverables

Study was able to determine that the most likely sources of the additional sediment deposited in the Calcasieu Ship channel are:

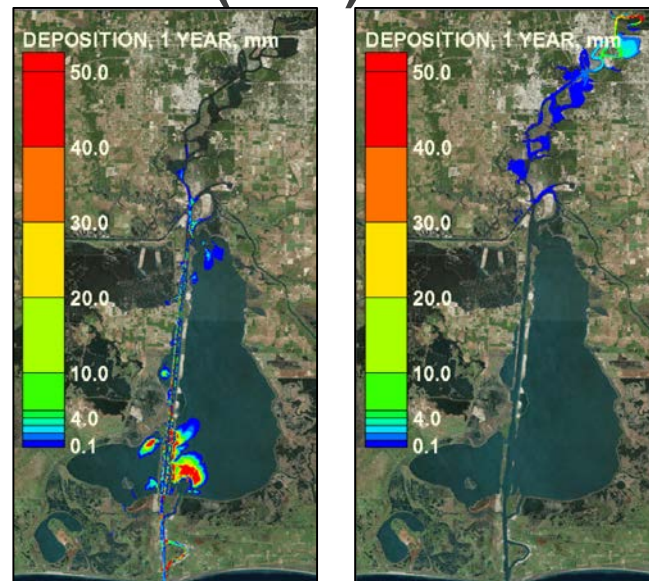
- Coastal sediments (originating from Mississippi/Atchafalaya Rivers and coastal erosion)
- Wetland and Shoreline erosion in the Calcasieu Lake and adjacent wetlands

Transport pathways involve deposition and resuspension of sediments by wind waves/ship wakes, until final settlement in the Ship Channel

Complexities in transport pathways that can be informed by future studies include

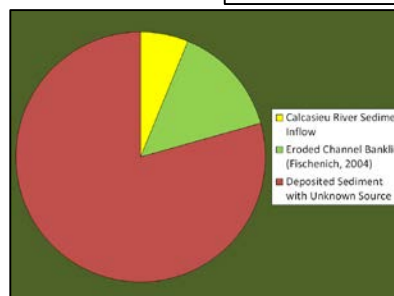
- Vessel effects
- Stratification effects
- Fluid mud
- Provenance studies

This study can be used to guide those studies

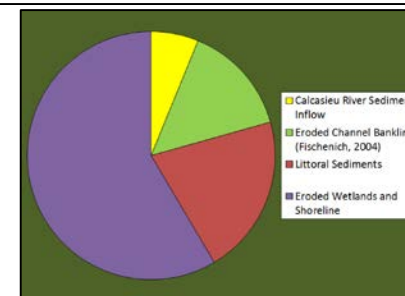


Coastal Source

River Source



Initial sediment budget



Revised sediment budget

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The most significant lesson learned here is that much can be accomplished if the goals are not overly ambitious.

The literature review and model study were able to indicate likely sources of sediment and potential transport pathways. But the observed quantities and locations of sediment deposition in the channel are influenced by processes that were not explicitly implemented in this model study (e.g. salt stratification, vessel effects, fluid mud). These would have been onerous and expensive for this effort, and would have required extensive data collection to parameterize and verify the model. But if these effects are implemented in future efforts, the results of this study can be used to inform their implementation.



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How is this project benefiting the USACE and Nation?

The ability to understand and quantify the sources of sediment in the CSC, and the transport pathways for that sediment, can lead to more efficient and targeted means of mitigating sediment deposition in the CSC. The annual dredging requirements for the CSC are currently ~4.6 mcy/yr. Any ability to mitigate that dredging requirement would be of great benefit to the Nation.

Also, it would help ameliorate sediment disposal concerns.