

FY21 RSM IPR



MVN/ERDC: Sediment Budget for the CSC Based on Numerical Modeling & Geochemical Fingerprinting

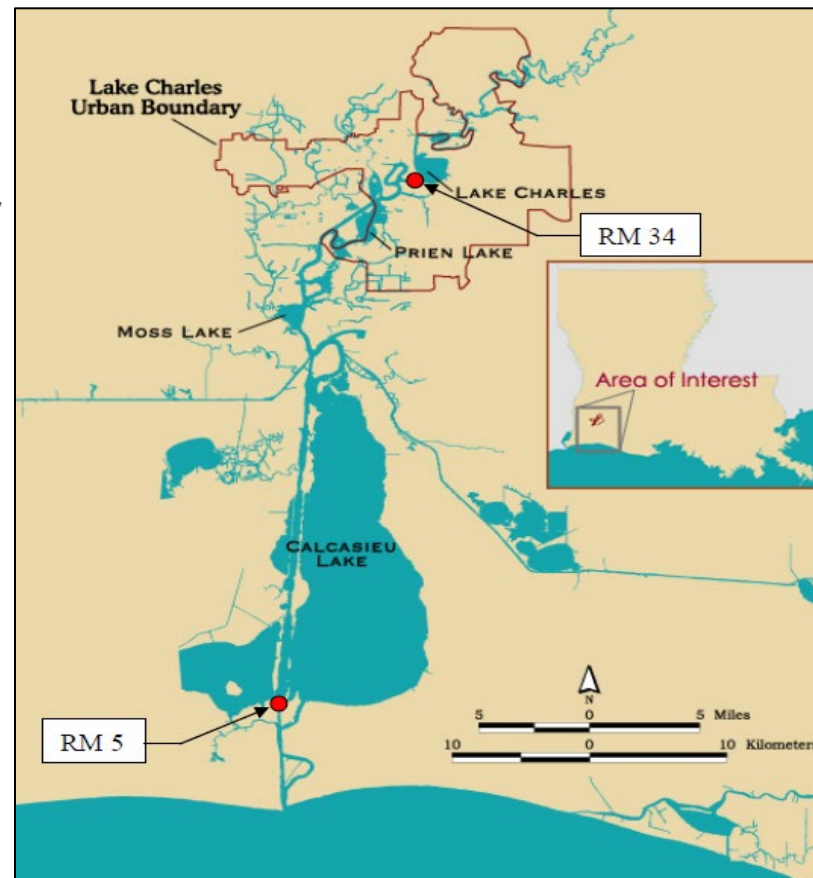
David Perkey, Anthony Priestas, Jeff Corbino

BLUF: Present the results and lessons learned from a multi-year study conducted to identify and characterize the primary sources of shoaling within the CSC.

Challenge/Objectives: Incorporate findings from individual investigations using different primary methods (AdH model, geochemical sediment data, C-SAT shoaling data) into one summary report.

Approach

- Finalize analysis of FY20 field data
- Pool FY19 & FY20 geochemical data
- Synthesize primary findings from each investigation into a summary TR



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District/Other USACE PDT Members

- Dave Perkey (ERDC-CHL)
- Anthony Priestas (ERDC-CHL)
- Gary Brown (ERDC-CHL)
- Michael Hartman (ERDC-CHL)
- Danielle Tarpley (ERDC-CHL)
- Jeff Corbino (MVN-OD)

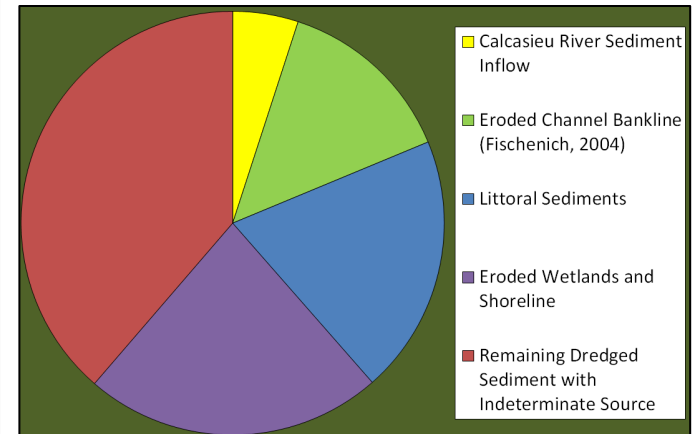
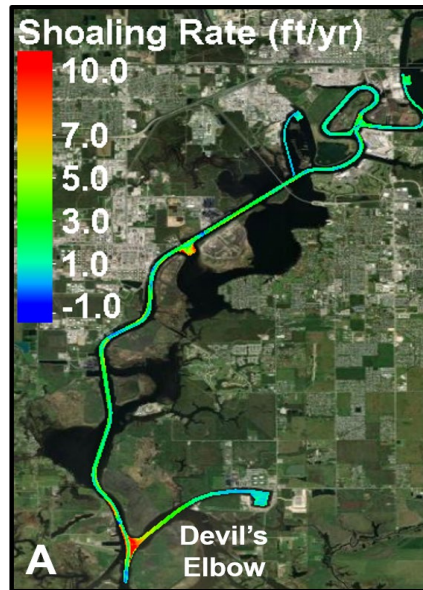


Stakeholders/Partners

Lake Charles Harbor & Terminal District

Leveraging/Collaborative Opportunities

- Compiling results from RSM & DOTS 2018-2020 CSC efforts
- Incorporates findings from WIG 2019 study



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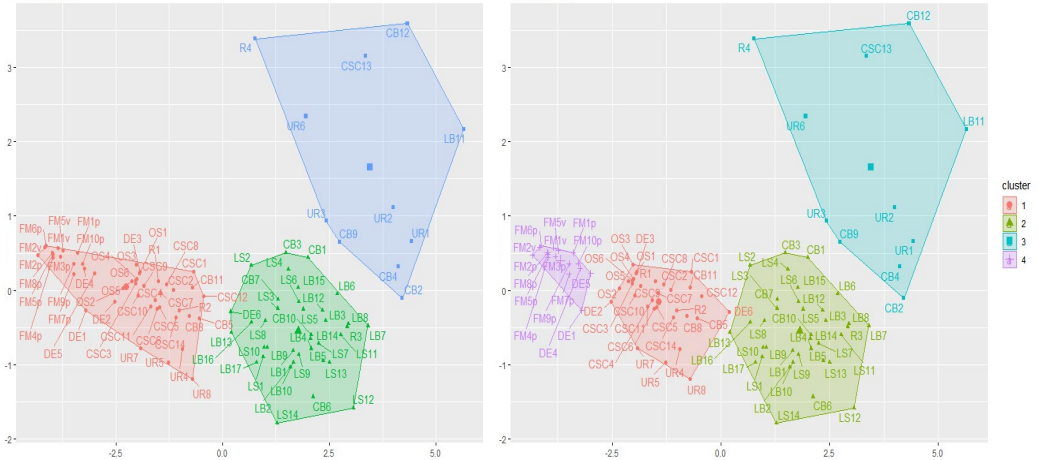
Accomplishments/Deliverables

Compiled all geochemical data and completed new “fingerprinting” analysis.

Presented findings for February 2021 RSM Bi-monthly call.

Prepared a synopsis TR for the entire CSC project.

Developed an ERDC “Storyboard” highlighting the goals and findings of the work.



US Army Corps of Engineers
Engineer Research and Development Center

Regional Sediment Management Program

Sediment Provenance Studies of the Calcasieu Ship Channel, Louisiana: A Synopsis Report

David W. Perkey, Anthony Priestas, Jeff Corbino, Gary L. Brown, Michael Hartman, Danielle R. N. Tarpey and Zhu V. Luong Month 2021

The storyboard includes a map of the Calcasieu Ship Channel with locations Sulphur, Cadeaux, West Hackberry Oil Field, and Cameron marked. It also features four photographs of sediment samples and a pie chart titled 'Calcasieu River Sediment Source' with a legend: Calcasieu River Sediment (red), Eroded Channel Bankline (green), Eroded or Sediments (blue), Eroded Wetlands and Shrubland (purple), and Remaining Eroded Sediment (yellow).



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End of the Day Results:

- Sediments from the upstream river and down stream Gulf of Mexico are geochemically indistinguishable from shoaling sediment in the CSC.
- Sediments from surrounding wetlands, lake, and banklines have a different geochemical signature than shoaling channel sediment.
- Geochemical and AdH results suggest primary sources of sediment are coming from both upstream (terrestrial) and downstream (marine) sources. Though stable isotope data showed the dominate sediment source likely varies annually with storm and weather/tide related conditions.
- WIG 2019 study came to similar conclusions using extensive field observations.
- Results contrast prevailing conceptual models that primary source of shoaling to CSC is erosion of area banklines, wetlands, and lake bottom.

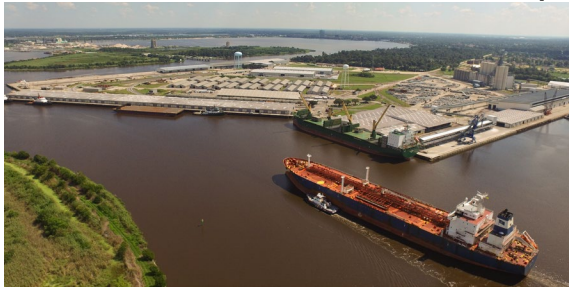
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Important navigation channel to the country:

- CSC Provides Access to 12th Largest National Port undergoing \$200B Expansion
- \$30M - \$40M Annual CSC O&M Requirement (all segments, 12 MCY / yr)



Engineering solutions are being sought to improve CSC reliability

- Dominant shoal material sources are the up-channel river & Gulf of Mexico with influx tied to flood & tidal events. Engineered control of floodwater & storm-tide introductions incompatible with the authorized project. In-system controls (i.e., investment in DMPFs & BU partnerships) required to maintain the channel.

