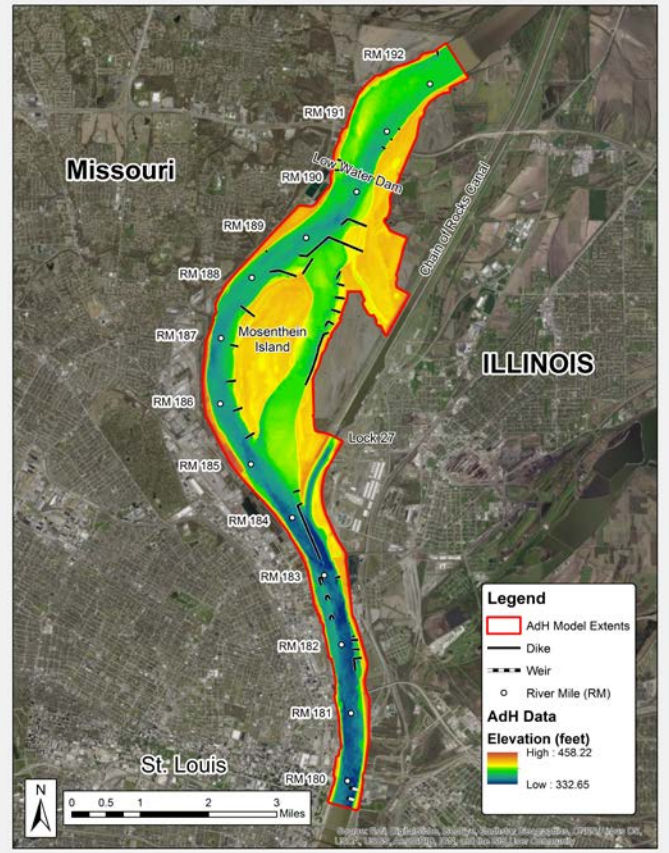
FY18 RSM IPR

St. Louis District – Sedimentation Impacts within the St. Louis Harbor

Brad Krischel

BLUF: The St. Louis Harbor reach, between River Mile 192.5 and 179.5 of the Middle Mississippi River (MMR), has experienced issues including sediment deposition leading to dredging, difficult flow and alignment through bridge spans, and shoaling problems at fleeting areas and facilities.



Challenge/Objectives

Since little is known about how the Old Channel hydraulically reacts under a range of conditions, engineers need to better understand the dynamic nature of the channel, such as the water surface slopes under various flow rates, the influx of sediment, the storage and release of sediment, the sediment sumps, the effect of Mosenthein Chute and the river training structures, and ultimately how all these factors influence sediment and flow conditions in the St. Louis Harbor.

Approach

The goal of this effort is to utilize an Adaptive Hydraulics (AdH) numerical sediment model to investigate the dynamic hydraulics of the Old Channel and how sediment is moving through the St. Louis harbor. Existing prototype data (bathymetry, flow, stage, sediment) will be used to evaluate how sediment load and bathymetry are changing over time.

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District/Other USACE PDT Members

- Mike Rodgers, P.E. – Project Manager, Regulating Works Project
- James Wallace, P.E. – Chief of the Hydraulic Design Section
- Eddie Brauer, P.E. – Hydraulic Engineer
- Brad Krischel, P.E. – Hydraulic Engineer
- Gary Brown, P.E. – ERDC's Coastal and Hydraulics Laboratory (CHL)

Leveraging/Collaborative Opportunities

The St. Louis District will rely on the expertise of The U.S. Army Engineer Research and Development Center's (ERDC) Coastal and Hydraulics Laboratory for technical issues relating to AdH/SEDLIB – specifically the sediment portion of the model.

Stakeholders/Partners

The study will be coordinated with environmental partners (Illinois Department of Natural Resources, Missouri Department of Conservation, U.S. Fish & Wildlife Service, etc) and navigation partners (River Industry Action Committee, barge companies, fleeting facilities, etc)

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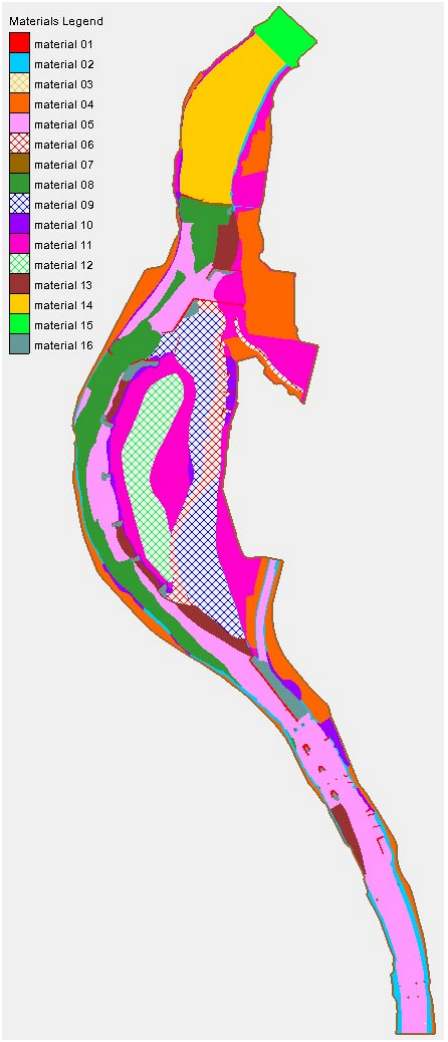
Accomplishments/Deliverables
Lessons Learned:

As a note, this RSM Project did not receive funding until the end of January, so there was a delay in beginning the study.

First accomplishment scheduled is AdH model calibration. Currently working with Gary Brown (ERDC) on calibration of the AdH model, which will be complete at the end of June.

Lessons learned will be compiled throughout the duration of the study.



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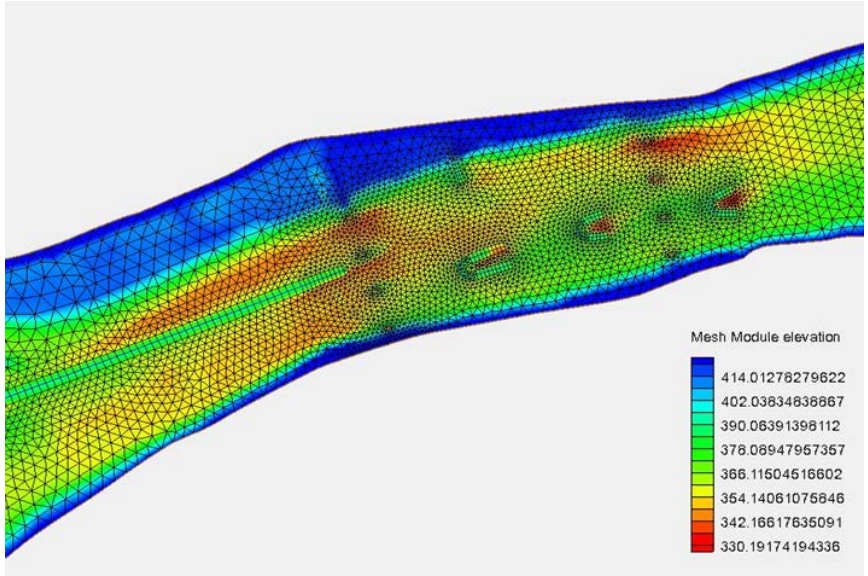
What challenges did you face to get your project to implementation and how did you move past them? If not yet implemented, what is your path forward to construction? (Give us your lessons learned that you think might benefit other Districts)

Largest foreseen challenge will be coordinating with partners regarding any new construction within the St. Louis Harbor due to large amounts of fleeting facilities.



Path forward will be to utilize the calibrated AdH model to simulate multiple prototype scenarios in order to better understand the sediment storage/release throughout the system.

After scenarios are run through the calibrated AdH model, the PDT will analyze the results to determine the best path forward for addressing the problem. Lessons learned will be compiled throughout the study.

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How is this project benefiting the USACE and Nation?
(efficiency, monetary, technical, relationship building, outreach, etc.)
(Volume of sediment to be managed, Acres created, etc)

In 2015, USACE ranked the port of St. Louis as the third largest inland port in the nation in terms of tonnage. The barges on the river near St. Louis move high annual volumes of fertilizer, steel, coal, petroleum products, agricultural commodities, and manufactured goods.

Understanding the hydraulics and sediment storage and transport through the reach is necessary to formulate a solution for managing sediment in the St. Louis Harbor and reducing costly channel closures and repetitive dredging leading to a more safe and dependable navigation channel.

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