### FY18 RSM IPR @etroit District, Source to Sink Lag Time Study Jim Selegean, Heidi Wadman, Jesse McNinch, et al.

**BLUF:** Quantify the lag time between sediment delivered to a river and its appearance at our federal navigation channels

#### Challenge/Objectives

- Considerable funding is spent through USDA programs to encourage more sustainable agricultural land use practices
- One benefit of this program is a reduction in the amount of sediment delivered to streams that ultimately lead to federal navigation channels
- However, there has not been a reduction in dredging need at the downstream end of these watersheds

#### Approach

Collect sediment cores to build an understanding of lag time in fluvial systems









### **District/Other USACE PDT Members**

- Jim Selegean Detroit District
- Megan Royal Detroit District
- Rachel Malburg Detroit District
- Josh Friend Detroit District
- Justin Gresell Detroit District
- Heidi Wadman ERDC-FRF
- Jesse McNinch ERDC-FRF
- WHOI lab
- ERDC EL
- Wayne State University lab

### Leveraging/Collaborative Opportunities

 Tributary Modeling Program funded first year of study (\$100k)

### Stakeholders/Partners

- Users of our 92 federal harbors on Lakes Michigan, Huron and Superior.
- Environmental damage while in transport





#### Flash Freeze Cores in the Field









**Extracted Cores** 







Sub-Sample Cores



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#### Analyze Cores

- Grain size
- Particle shape indices
  - ImageJ software
- Magnetic fly ash
- Organic carbon
  - Fine and coarse grained black carbon
- Radio-isotope analysis













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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?

- N/A No construction associated with this study.
- Large field campaign to organize (equipment and people)
- Very large effort to process samples (prep and analysis)
- Greatest challenge was resistance to proposing this study

# FY18 RSM IPR



**Detroit District, Sediment Source to Sink Lag Time** 

How is this project benefiting the USACE and Nation?

- Managing expectations by producers, agencies and navigation industry
- Creating a fundamental understanding of how sediment fluxes through a low-gradient system
- Can allow us to anticipate the consequences of sediment-producing activities that the Corps is involved in (dam removal, dredging, et c.)