

# FY21 RSM IPR

## NAO, James River Federal Navigation Channel, Lackey, Roberts



**BLUF:** NAO requested ERDC develop a regional operational model for sediment transport to improve sediment management in the James River initiative.

### Challenge/Objectives

- Reduce O&M costs
- Reduce exposure/risk of critical environmental receptors
- Determine migration of sediment from placement sites back into channels
- Optimize lifecycle management of placement sites
- Understand influence of aggregate transport on sediment management.



## James River Study Area

### Approach

- Field Data collection effort (sediment characterization)
- Pipeline placement (CDFATE)
- Farfield Fate (PTM)
- Bed Morphology, mound migration, regional transport (GSMB)



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## NAO, James River Sediment Transport Study

### District/Other USACE

### PDT Members

- Victor Roberts, NAO
- Chris Turner, NAO
- Robert Pruhs, NAO
- Tahirih Lackey, ERDC - CHL
- Joseph Gailani, ERDC - CHL
- Sung-Chan Kim, ERDC - CHL
- Earl Hayter, ERDC - EL
- Susan Bailey, ERDC – EL
- Jarrell Smith , ERDC - CHL
- Dave Perkey, ERDC – CHL
- Nathan Mays, ERDC - CHL

### Leveraging/Collaborative Opportunities

DOER and VIMS

### Stakeholders/Partners

James River Partnership



Velocity and sediment samples were collected at City Point Shoal for model validation and sediment characterization. Sediment will be analyzed for PCB levels and grainsize distribution.



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### Accomplishments/Deliverables

#### Presentations:

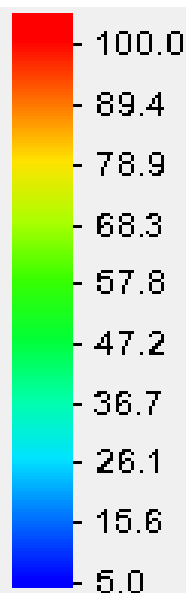
- Ocean Sciences in Feb, 2020 (San Diego, CA)
- VIMS physical sciences seminar - April 2020
- James River Partnership Meeting Presentation

#### Publications:

- TR – James River : Sediment transport Study - Dancing Point to Swann Point Channel
- JA - Impacts of Muddy Bed Aggregates on Sediment Transport and Management in the tidal James River, VA
- TR - James River: Field Data Analysis
- TR - Physical Factors that Influence Muddy Bed Aggregate Production, Size, and Durability
- LR – James River: Sediment transport Study - Goose Hill
- LR – James River: Lifecycle of Placement sites
- LR – James River: Sediment Transport Study – Tribell Shoals
- LR – James River: Sediment Transport Study – Jordan Point
- LR – James River: Sediment Transport Study – City Point Shoals
- TN – James River: Sediment Transport Study – Lesson's Learned



SSC mg/l



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**Increased dredging costs over recent years along with Operations and Maintenance budget cuts have decreased the amount of dredging that can be accomplished to meet navigation needs and the goal of unrestricted navigation on the James River.**

- Modeling of the fate of sediments dredged from the channel and overall regional sediment analysis will assist in understanding this complex sediment system.
- This project provides essential data for dredged material management, potentially helping to optimize the placement of the dredged material (ex: Tribell Shoals) and evaluate sources of shoaling. This can lead to significant decrease of costs.
- The field data collection effort is perhaps the most extensive and detailed sediment characterization data collection for this area, providing knowledge for future projects and efforts.
- Cost increases introduced by environmental windows can be mitigated through information obtained by predictive sediment transport modeling.