

# FY21 RSM IPR



## SAS/ERDC: Identification of Dredged Material Beneficial Uses from Geophysical Analysis of Sediment Borings

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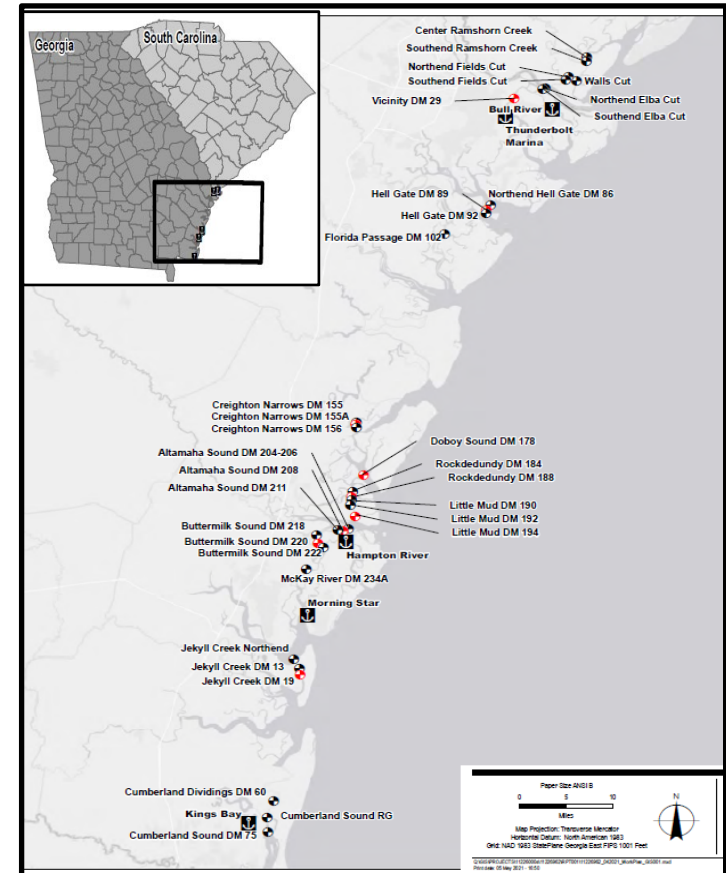
**BLUF:** This research aims to identify appropriate beneficial uses of dredged material (BUDM) along the Atlantic Intracoastal Waterway (AIWW) by examining geophysical properties of core borings and determining best potential applications.

### Challenge/Objectives

- >35% of the SAS-AIWW lacks capacity for disposal of dredged sediments over the next 20 years.
- Identify BUDM options based on physical & chemical testing of sediments from high shoaling regions
  - Beach placement, bird island construction, marsh restoration

### Approach

- 34 Core borings from area collected
- Property testing @ ERDC-CHL (GSD, density, plasticity, LOI)
- Subset of samples selected for erosion and mud aggregate testing



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### District/Other USACE PDT Members

David Perkey (ERDC-CHL)

Danielle Tarpley (ERDC-CHL)

Renée Styles (ERDC-CHL)

Erica Janocha (SAS)

Anna Wiliford (SAS)

### Stakeholders/Partners

Georgia Department of Natural Resources-  
Coastal Resources Division

### Leveraging/Collaborative Opportunities

- Past ERDC research has developed methods for assessing muddy aggregate production and durability (RSM & DOER)
- Current DOER RT seeks to evaluate potential applications for BUDM involving muddy sediments

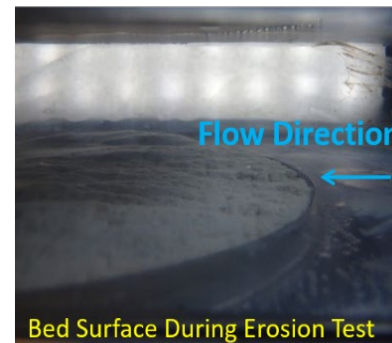




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### Accomplishments/Deliverables

- Storyboard for BUDM aspects of project
- Geophysical testing of 34 sediment samples
  - 14 Non-cohesive sediments
  - 20 cohesive sediments.
    - Erosion & aggregate testing on subset of 6 cohesive samples
    - Spanned spatially (N-S) & texturally (37-78% sand)
- Draft TR of results prepared. Ready for submittal to review system @ start of FY22.



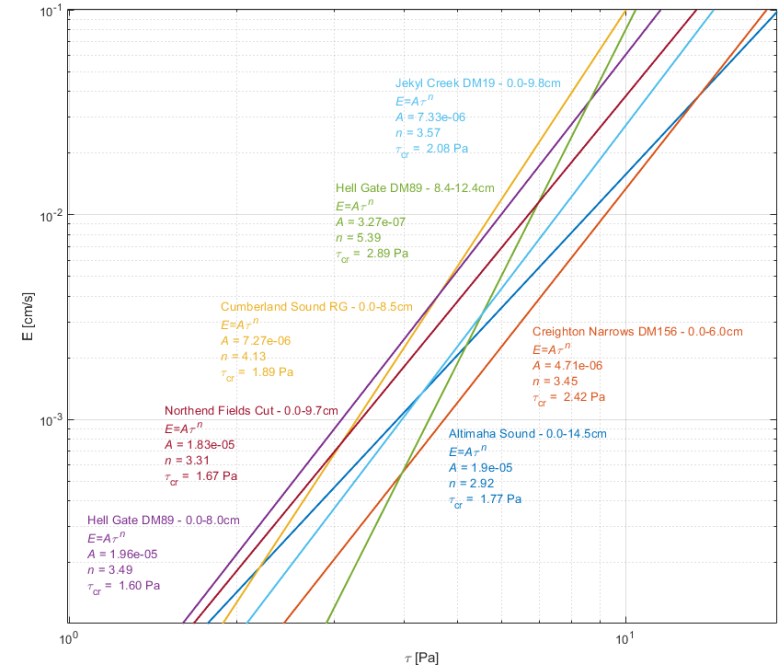


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**Challenge:** Delays in award of contract for core borings pushed schedule for analysis back.

### Lessons Learned:

- **Non-cohesive sediments:**
  - Potential BUDM applications for beach/nearshore placement or berm/island construction.
- **Cohesive sediments:**
  - Resistant to erosion following placement ( $\tau_{cr} = 1.6\text{-}2.9$  Pa), high probability of retention following consolidation
  - All produced robust (tumbled >100m) gravel sized aggregates, limited far-field distribution of fines during/following placement
  - Potential BUDM applications: island/berm construction, wetland/marsh restoration





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- **Creates dredging opportunities in areas that lack an environmentally preferred placement area.**
  - **SAS is building a 13 acre bird island in Altamaha Sound with material we tested. Erosion and physical data collected shows the material will create aggregates and stack well. We will be able to compare real world applications to this data and have greater confidence for future use.**
- **Provides information to engineers to improve decision making about applications of sediment for BUDM projects.**
  - **Better understanding of the physical state of the placed sediment & potentially expand the use of fine-grained sediment in BUDM (fate of fines)**
  - **Increasing BU opportunities to satisfy HQ goal of 70% BU by 2030**
- **Better informed management decisions to minimize economic and ecological implications.**
- **Developing better management plans to forecast and mitigate long-range impacts.**