ADVANCING BENEFICIAL USE OF DREDGE MATERIAL DURING PORT DEEPENING AND O&M DREDGING EVENTS

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AGENDA

BRIEF INTRODUCTION TO SEDIMENT MANAGEMENT AND BU
(5 min)

BUDM DURING O&M
(10min)

BUDM DURING HARBOR DEEPENINGS
(15min)

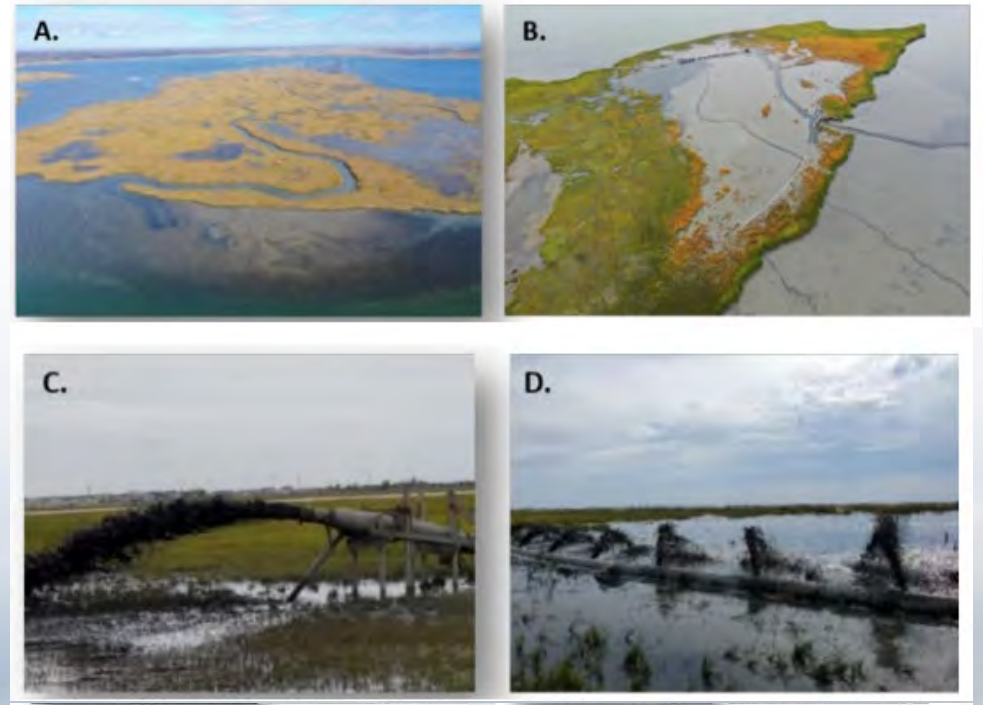
DREDGE MANAGEMENT STRATEGIES AND RISK DRIVERS FROM INDUSTRY PERSPECTIVE
(20 min)

CLOSE OUT
(5 min)

BUDM Definition: productive and positive uses of dredged material, which cover broad use categories ranging from fish and wildlife habitat development, to human recreation, to industrial/commercial uses" (USACE Beneficial Uses of Dredged Material, Engineer Manual 1110-2-5026).

BUDM PROGRAM GOALS

- Meet USACE navigation mission
- Execute cost-effective projects
- Save Dredged Material Management Area (DMMA)/CDF capacity
- Maintain sediment in the natural system
- Optimize habitat creation/restoration (Natural/Nature-based Features - NNBF)
- Implement Coastal and Sea Level Rise (SLR) Resilience Solutions
- Protect community infrastructure
- Supplement coastal storm risk management (CSRM) mission
- Supplement ecosystem mission



Placement at (A) Gull and (B) Sturgeon Island. (C) Dredged slurry being pumped on southern Gull Island. (D) Innovative sediment distribution pipe being utilized as part oft the Sturgeon Island placement.

RECENT LEGISLATION ON BENEFICIAL USE

WRDA 2020 Section 125

This section renews the Congressional commitment to beneficial use (BU) of dredged material by:

(a) establishing a national policy to maximize the beneficial use of material obtained from Corps projects; requiring the Corps to calculate the economic and environmental benefits of the beneficial use of dredged material when calculating the Federal Standard,

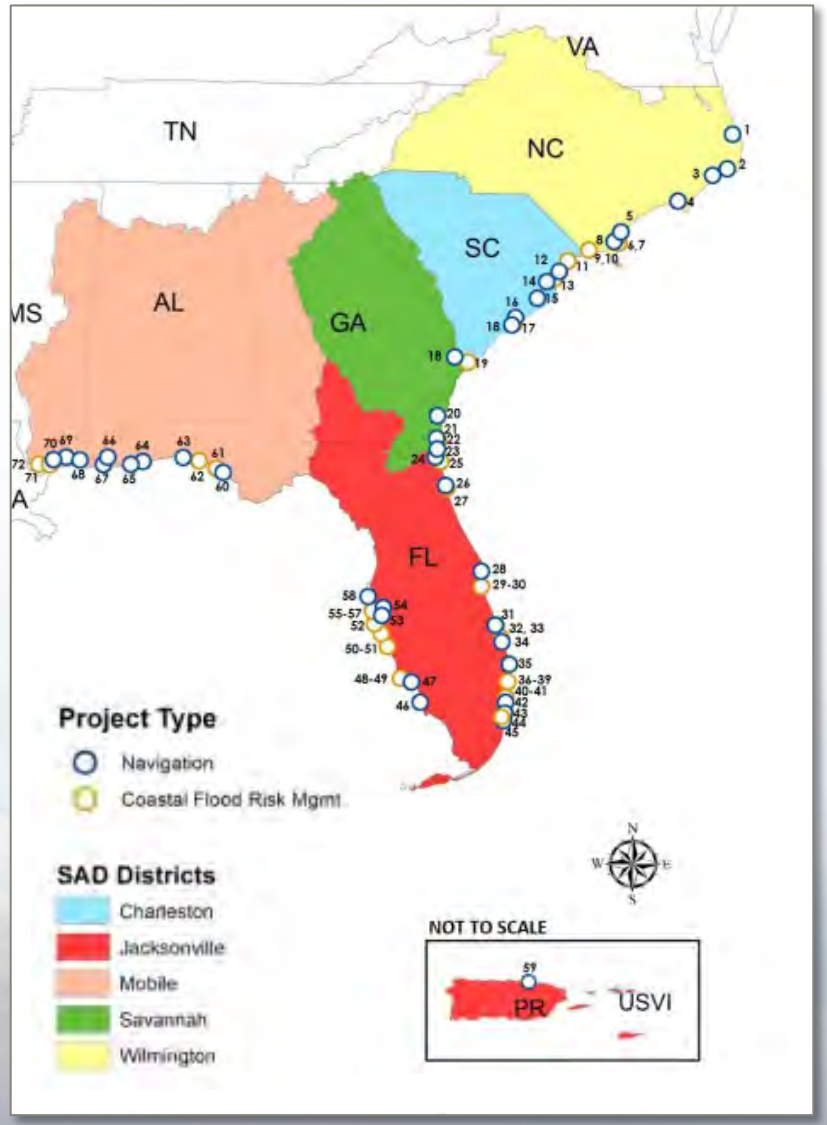
(b) amending section 204(d) of WRDA 1992 to direct that other-than-least-cost placements of dredged material for certain purposes be funded using appropriations available for construction or operation and maintenance of the water resources development project producing the dredged material

(c) increasing the number of beneficial use of dredged material demonstration projects to 35 projects, **WRDA 2016 Section 1122**

(d) directing the Corps to develop five-year regional dredged material management plans, and

(e) emphasizing greater coordination across the Corps' dredging contracts.

SAD REGIONAL SEDIMENT MANAGEMENT

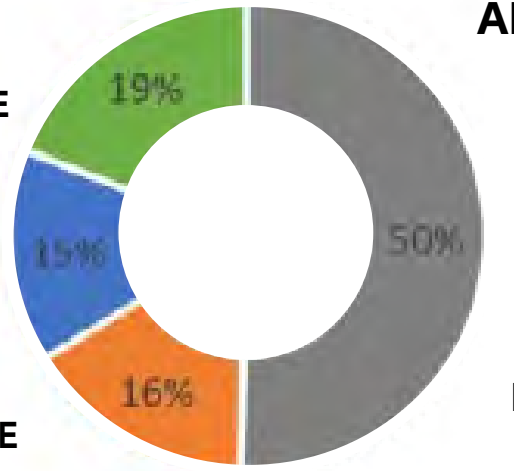


A full SAD portfolio review of 72 navigation (NAV) and Flood Risk Management (FRM) projects, identified

- **50% BUDM across the region with >$100M in annual value and >$20M in opportunity**
- **What will it take to get to 70% or even 100% BUDM?**

PLACEMENT

- UPLAND/OFFSHORE
- BEACH
- NEARSHORE
- ESTUARINE/RIVERINE



ANNUAL RSM VALUE

NAV: $68.8 M
FRM: $19.4 M
OTHER: $16.0 M

TOTAL: $104.2 M

BENEFICIAL USE OF DREDGED MATERIAL: 50%

SOUTH ATLANTIC DIVISION (SAD) PLACEMENT AND BUDM OPPORTUNITIES

(RSM 2020 Optimization Update Results for % of Dredge Material by Placement)

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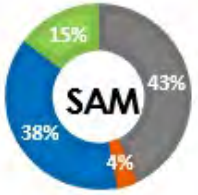
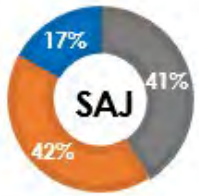
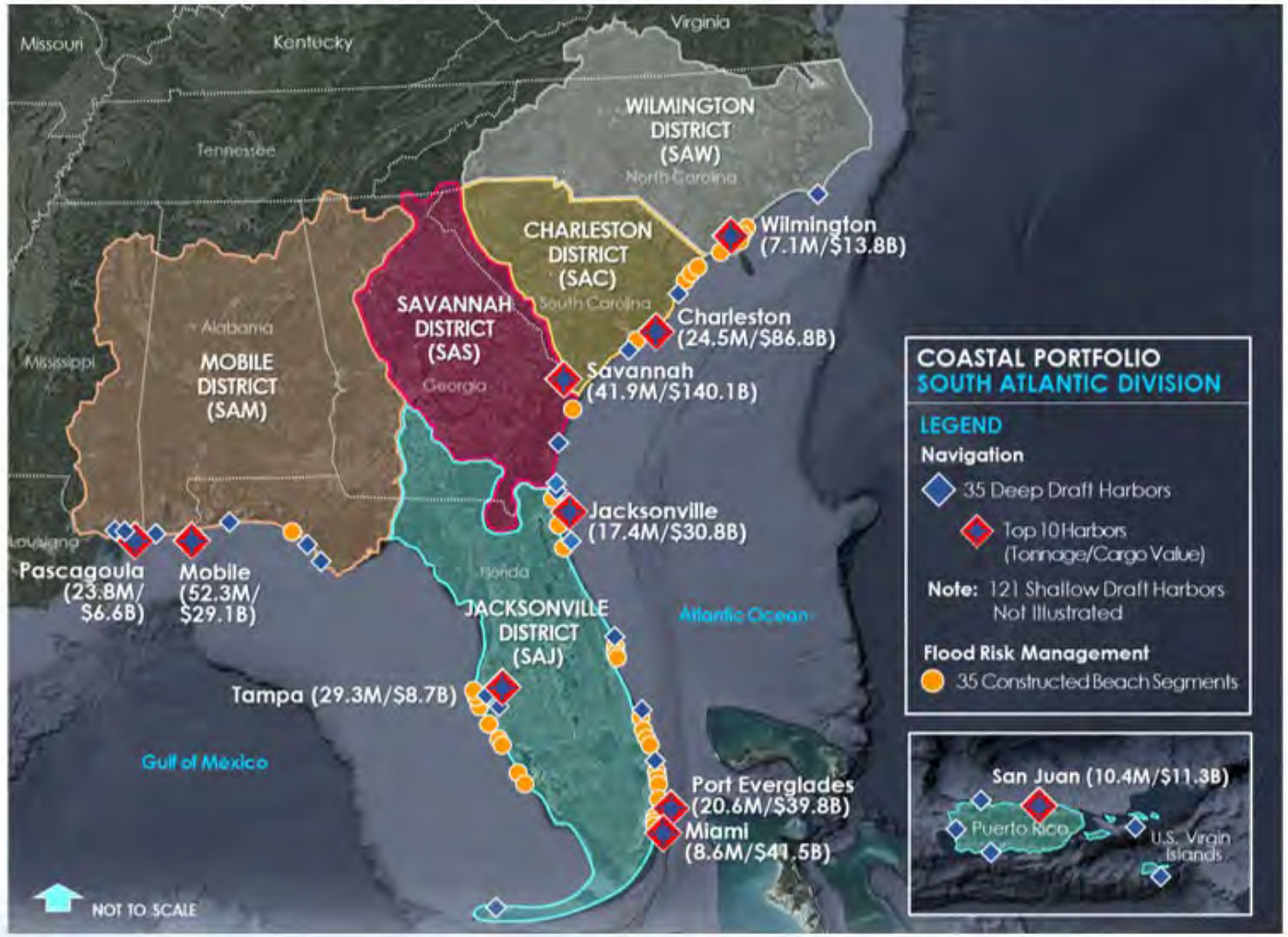




RSM OPPORTUNITY: $20M IDENTIFIED IN NEARSHORE PLACEMENT, ESTUARINE/RIVERINE PLACEMENT, AND REUSE OF UPLAND MATERIAL



PERCEIVED CHALLENGES TO IMPLEMENTATION ……WHAT ELSE?

USACE

- Understanding and availability of data specific to characteristics of a particular site (e.g., tidal range, wave exposure, geomorphological regime)
- Funding and time for monitoring pre to post project
- Contracting strategy
- Funding
- Plans and Specifications
- Bid line item structure
- Quantifying the benefit of the BUDM
- Design of containment methods and other BMPs.

STAKEHOLDERS/AGENCIES

- Trust
- Permitting standards variable by state, by agency.
- Environmental windows
- Monitoring Requirements
- Multi-agency differing regulatory success criterium
- Completion of sampling plan with collaborative input
- Qualifying natural environmental variability
- Performance requirements and acceptable return to “baseline” conditions following construction.

INDUSTRY

- Placement accuracy and temporal aspects of performance/acceptance requirements
- Defining/constraining cost
- Constructability and safety
- Flexibility, communication and data collection plan to perform adaptive management during construction
- Techniques for optimizing retention
- Equipment sizing appropriate for dredge and placement
- Data collection techniques in shallow water environments and marshes.

O&M CASE STUDY FROM NJ DOT

BENEFICIAL USE OF DREDGED MATERIAL FOR MARSH, DUNE AND BEACH ENHANCEMENT IN A COASTAL NEW JERSEY WILDLIFE REFUGE (Demonstration Project) by Scott Douglass et. al., NJDOT, WEDA Journal of Dredging, Vol. 19, No. 2

THE GOOD

-BUDM from navigation channel to increase marsh elevation, protective dune and beach replenishment.

- adaptive management during construction ensured target elevations controlled.

- target elevations were determined based on field observations.

-post con monitoring was done through NFWF and USEPA grants and showed system recovery and improvement.

- grain size of dredged sediment (although more sandier than marsh control) expected to integrate over time.

THE HARD

- Dredge volumes needs were relatively small @ 83.1kcy but only 45% was extracted from channel to be used beneficially due to placement capacity.

-CDFs have become extremely difficulty to obtain, permit and construct new ones in the NJ region.

- marsh tidal range required containment devices in place to minimize sediment dispersal into adj tidal creeks.

- construction impact to marsh is significant and return to baseline conditions is not realistic.

THE LESSONS LEARNED

-Marsh placement site capacity led to dredging depths being limited in the channel to avoid overfilling. Identify multiple placement options and backup capacity.

-Marsh containment required 20,000 ft of Filtrexx tubes and took 4 wks to install, costing $600k. Minimize containment to what is essential and minimize the use of machinery on the marsh.

-12 in cutterhead dredge required two passes to dredge entire channel width. Evaluate the current condition and needs of potential placement areas and establish control sites and define success criteria prior to the start of the project.

- project only required 41 dredging days but cost $140/cy (true cost).

DEEPENING CASE STUDY

Charleston Harbor Post 45

Crab Bank bird Sanctuary Restoration

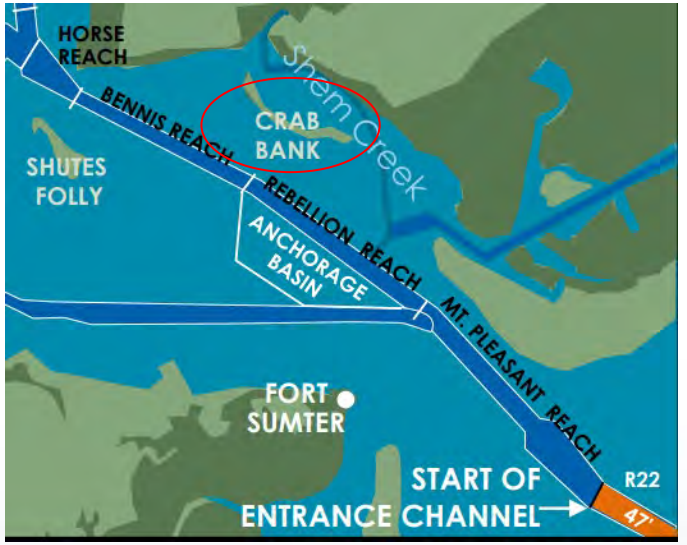
- 660kcy of new work material
- Cost $4M vs. $400k
- Hydraulic cutterhead with pipeline

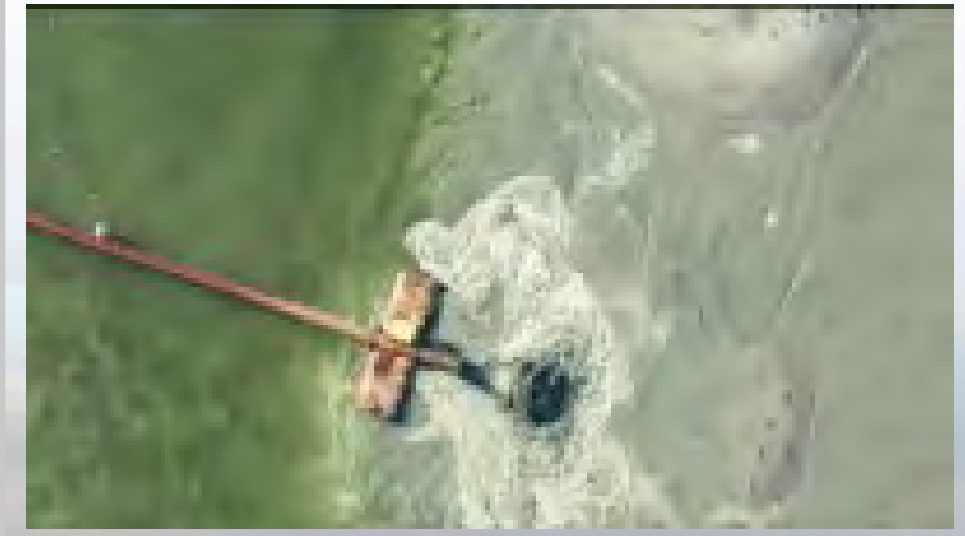
Artificial Reef Creation

- Six; 33 acre sites
- Mechanical Dredge

Lessons/Opportunities

- SCDNR established critical habitat with agency and Local support
- No containment needed
- More material to work with during deepenings.
- More time to develop and design.





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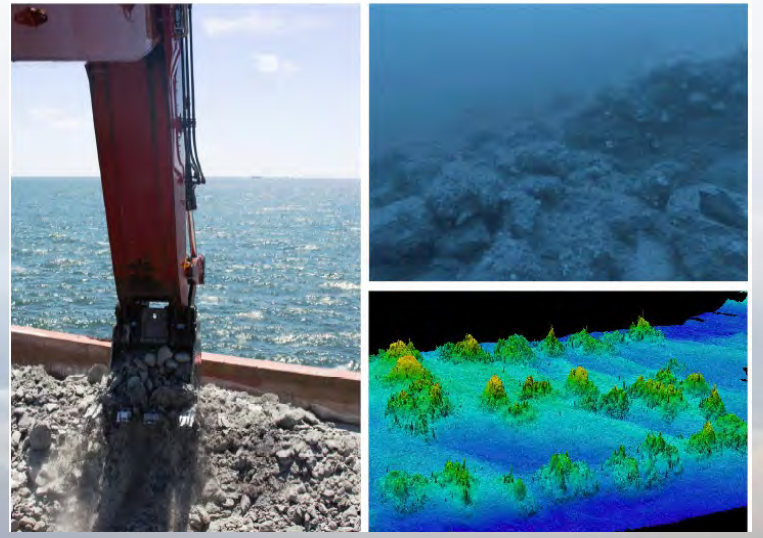


Artificial Reef Creation

DEEPENING CASE STUDIES

Jacksonville Harbor

- Mile Point Training Wall Reconfiguration and Great Marsh Island BUDM
- 53 acres of salt marsh created
- Cost $40M

Lessons/Opportunities

- Justified the habitat loss over time using aerials and NOAA charts for restoration
- Agency and Local support
- Helped overall hydrodynamics of site reconfiguration

DEEPENING STUDY OPPORTUNITIES FOR BUDM

Lessons/Opportunities

- Important to identify local stakeholders/agencies that have BUDM ideas or locations of interest early in the scoping process.

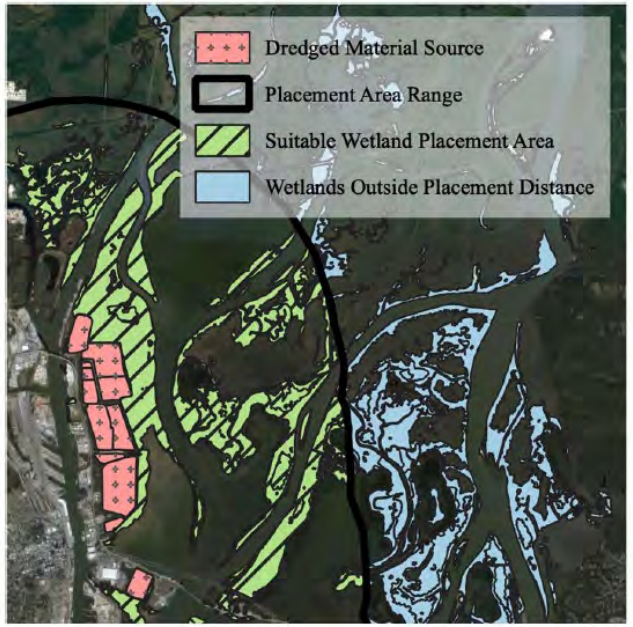
- Identifying BUDM benefits and capturing this in the feasibility study Benefit to Cost Ratio

- Industry engagement during feasibility study phase.

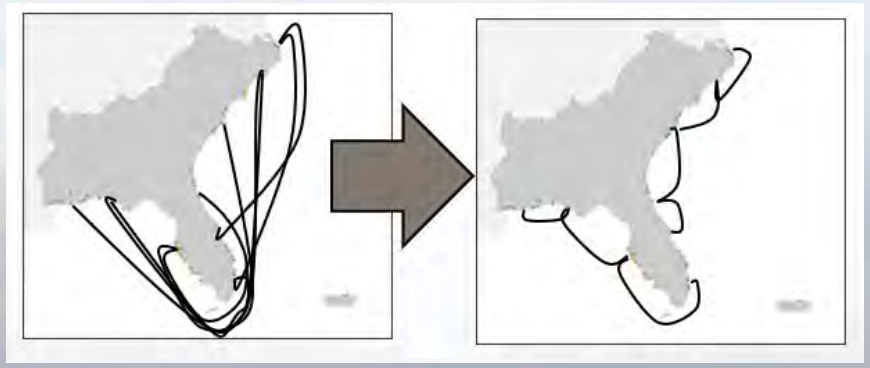
- 10 years of study vs. 3x3x3.

COST AND RISK DRIVERS TO BUDM – INDUSTRY PERSPECTIVE

- Transport or pumping distances for dredged material
- Dredging period of performance and flexibility
- Equipment needed for multiple placement types (nearshore vs. ODMDS)
- Risk of take of species dictating timing or equipment type
- USCG ocean certified requirements
- Operational flexibility
- Schedule flexibility
- Regionalization of contracts
- Bidding schedule across the region
- Pump ashore or scows that can get closer to shore equipment availability
- Equipment innovation to minimize double handling
- Hydraulic sorting specs (coarse grained falls out faster)
- District Cost estimators – Industry day engagement



16K ft distance used as radius for finding placement sites (EM 1110-2-5025) Runion et. al., 2021



STRATEGIES FOR IMPROVEMENT

- **<u>Future engagements coming soon! This is one of many.</u>**
- Top Challenges – together brainstorming strategies for improvement.
- Partnering with Industry on means and methods- understanding the technical challenges. Timeframe for engagement, and meaningful engagement.
- Adjusting performance specs, timing, flexibilities, etc. – lets change what we can control and plan for adaptive management techniques.
- Better communication and collaboration.
- THANK YOU!