Beneficial Use of Dredged Material: Successes and Challenges
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Beneficial Use Across USACE Mission Space

- **Navigation**
  - Strategic placement of dredged material supporting habitat development
  - Habitat integrated into structures
  - Enhanced Natural Recovery

- **Flood Risk Management**
  - Natural and Nature-Based Features to support coastal resilience
  - Levee setbacks

- **Ecosystem Restoration**
  - Ecosystem services supporting engineering function
  - “Natural” development of designed features

- **Water Operations**
  - Shoreline stabilization using native plants
  - Environmental flows and connectivity
Challenges

- Perceptions without scientific basis
- Lack of clear regulatory guidance
- Uncertainty dealing with contaminants
- Fear of product liability
- Emerging contaminants, e.g., microplastics, HABs, PFAS
- CDF capacity issues nationwide
- Re-use of dredged material in existing CDFs
What Risks are We Concerned About?

- Economic losses associated with reduced performance of a channel
- Environmental impacts associated with dredging
- Environmental impacts associated with DM placement, disposal, or beneficial use
- Navigation accidents
- Unnecessary costs for the dredging program
- Environmental impacts associated with contaminated sediments when dredging must be deferred
Principles for Beneficial Use Dredged Material Evaluations

- Consistent with USEPA risk assessment framework
- Recommends developing project goals for BU of dredged material
  - USEPA framing the risk assessment with management goals
- Uses conceptual site models to establish potentially complete exposure pathways
  - Generalized CSMs developed for aquatic, upland, and wetland placement scenarios
- Recommends the initial evaluation be documented and reported
- Suggests chemical, physical, and biological testing
  - Specific sampling and analysis requirements are not stipulated
- Recommends use of reference and control materials in the testing procedures
Beneficial Uses: Two Opportunities

- Beneficial use as part of the dredging and placement process
  - Regional Sediment Management
  - Engineering With Nature® and natural and nature based features

- Beneficial use as part of CDF operations and management process
  - Mining CDFs to maintain capacity
Beneficial Uses of Dredged Material and Engineering With Nature
BU Opportunities to Engineer With Nature

**Opportunities**

- Integrate Natural and Nature-Based Features (NNBF) with structural and non-structural measures to provide multiple lines of defense against storms and sea level rise.
- Generate full array of relevant economic, environmental and social ecosystem services.
Beneficial Uses Path Forward

- Many opportunities
- Focus energy to motivate and facilitate innovation in both technical and business processes
- Accelerate progress through co-development of solutions
- Important to elevate communication about advancing practice to enhance project value
Beneficial Use Case Studies
Beneficial Use Case Study #1 (NWW)

- Walla Walla Programmatic Sediment Evaluation results require a beneficial use of dredged material
“SURGICAL” DREDGING

Honolulu District
Thomas D. Smith, P.E.

Jacksonville District
Andrew J. Condon
HONOLULU DISTRICT
RSM Offshore Sand Sand Investigations

- Reeftop sand bodies are small and irregularly shaped.
- Not well suited for hopper dredges.
- Clam shell dredges are slow and expensive.
- Diver directed dredging was successful for small volume in West Maui, but susceptible to wave and current extremes.
9.5 mile segment featuring five erosion hotspots that require frequent renourishment

- Nearby offshore sand sources have been exhausted
- Typically contract small hotspot truck haul contracts utilizing upland mines
- Bakers Haulover Inlet complex provides required nourishment quantities for Bal Harbour
Lummus Park Backpassing

- Backpassing completed in 2012
  - 5,000 foot segment (R64 – R69)
  - The southern segment was filled with 19,000 cy of backpassed material, placed along 1,100 feet of beach between R60 and R61.1.
  - Then the pipeline was extended northward, more booster pumps added, and fill on the north segment began.
  - The total volume of fill placed along this 1,000-ft northern segment was 122,000 cy.
Alternatives

- Truck hauls are expensive and do not appear to economically viable in the long term
- Closest offshore sand sources are 100 miles away
- Are there more efficient backpassing methods (in terms of cost and disruption)?
- Along south jetty sand has accumulated in a thin veneer over hardbottom – Are there efficient extraction methods?
- Any permanent backpassing options given the heavily urban environment / limited and expensive real estate?
Discussion Points

- What are the key opportunities with respect to beneficial use of dredged material in the West Region?
- What are the main obstacles to realizing those opportunities?
- What are ways in which we can overcome those obstacles?
- How might the West Region achieve 100% beneficial use?