Management of Contaminated Sediments: Sustainable Alternatives

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Current Dredged Material Management Challenges

- Not enough sediment where we want it (e.g., ecosystems, beaches, wetlands, etc.)
- Too much sediment where we don’t want it (e.g., harbors, ports, marinas, etc.)
- 250 M-yd3 of sediment dredged annually to support US navigation program ($$)
- Uncoordinated regulatory programs
- Insufficient science and engineering to develop better management strategies and technologies
Sustainable Sediment Management

Comprehensive approach for addressing the long-term management and conservation of sediments within a watershed to maintain current and future beneficial uses while addressing regional environmental, economic, and social objectives.

Sediment is a resource not a waste!?
Integrated Sustainable Sediment Management

- Reforestation
- Agriculture
- Vegetated Buffer
- Retention Pond
- Flood Relief
- Reintroduction of Sediments from Behind the Dam
- Constructed Wetland
- Municipal Sewer
- Treatment
- Green Roof
- Parks
- Porous Pavement
- Creation of Additional Tidal Wetlands
- Sluice Extension
- Current
- CDF Discharge
- NPDES Discharge
- Treatment Facility
- Factory
- Side-cast Dredging of Channel
- Sand Bypass
- Beach Nourishment
- Capping
- Golf Course
- CDF (Confinement Only)
- Weston Solutions
**Comprehensive Management Program**

**Design requirements:**

- Watershed level focus, long-term goals
- Use of Regional Sediment Management principles
- Source controls!!!!!!!
- Commitment to beneficial use, conservation, and reclamation
- “Green Remediation” - reducing carbon footprint/impacts considered during management (e.g., GHG emissions, water usage, material consumption, waste generation and energy usage)
- Creative solutions for management of contaminated materials
  - Removal of contaminated materials may not be the best option
- Integrated, cross-programmatic coordination and cooperation
- Ecosystem services and sensitive habitat complexities in remedy selection and implementation
Beneficial Uses of Contaminated Dredged Material

- Habitat Restoration/Enhancement (wetland, upland, island, and aquatic)
- Aquaculture
- Parks and Recreation (commercial and non-commercial)
- Agriculture/Horticulture/Forestry
- Mine and Quarry Reclamation
- Landfill Cover for Solid Waste Management
- Beach Nourishment/Shoreline Stabilization
- Industrial and Commercial Use
- Material Transfer (fill, dikes, roads, etc.)
- Construction Material
- Multipurpose/Sequential/Innovative Land-use Concepts
Considerations in Remedy Selection

- Extent & Magnitude of Contamination
- Identification/isolation of source
- Stability of the Site
- Proximity of sensitive receptors
- Engineering Feasibility
- Cost
- Societal/ Cultural concerns
- Risk/Uncertainty
- Permanence
- Fate chemistry
- Weather
- Hydrology, tides, water temperature
- Geomorphology
- Equipment availability & mobilization
- Residuals
- Post-treatment of water and air
- Available onsite footprint
- Disposal options and availability
- Monitoring requirements
- Contaminated media
- Neighbors/work restrictions
- Construct a 5,000-ft commuter runway at the abandoned Enterprise Avenue Landfill site, a former Superfund site.
- Constructed to allow aircraft to clear structures at the nearby Navy Yard.
- WESTON saved the City ~ $5 million by using 1-M yd$^3$ of sediment dredged from the Delaware River to construct the runway to the proper height.
- Completed on time and within budget.
Questions??