Long-Term Approach for the Sustainability of CDFs

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Motivation

- Declining disposal capacity
- Emergence of sustainability initiatives
- Maturing of regional sediment management and beneficial use opportunities
The Goal of Sustainability

...as it applies to CDFs, is to manage dredged material disposal in such a manner that:

1) disposal capacity is optimized and dredging operations are not limited by disposal capacity;
2) operations are economically feasible now as well as in the future; and
3) adverse environmental impact is minimized and benefits maximized.
Objectives

• Assess the scope of the problem
  ➢ Dredged volume going to CDFs
  ➢ Storage critical timeline
  ➢ Regional complexion?

• Develop a management strategy
  ➢ Policy changes
  ➢ Management practices
  ➢ Needed research
Approach

- **Survey**
- **Inventory**
- **Identify available tools**
  - State of the practice vs. state of the art
  - Dredging/disposal minimization
  - CDF management
  - Beneficial use
  - Cost optimization
- **Identify obstacles**
- **Develop a strategy**
Inventory

• USACE Districts, DMMPs, webpages
  ➢ Projects
  ➢ Annual and projected dredging volumes (trends)
  ➢ Confined Disposal Facilities
  ➢ Remaining capacity/Projected life
  ➢ CDF management practices

Disposal Method as Percent of Total Volume Nationally

![Graph showing disposal methods as a percent of total volume from 2000 to 2005. The graph includes lines for Upland & Dry, In-Water, and Undetermined or Mixed disposal methods, with volume in MGY (million cubic yards).]
Inventory

Disposal Method as Percent of Annual Dredging Volume for Detroit District

Division 5-yr Average Dredging Volumes
Survey

- Questions pertained to
  - CDF usage
  - storage capacity shortages
  - beneficial use of dredged material
  - obstacles that hamper CDF usage and beneficial use
  - regional sediment management

- 24 Districts responded

- Limitations
  - Single viewpoint (subjective)
  - Nonspecific as to scope of response

How critical is issue of CDF storage capacity?

- 9 % Unlimited
- 73 % Shortage in ?? yrs
- 18 % Out of capacity
To what extent are CDFs used for dredged material disposal?

- Never: 11%
- Occasionally: 30%
- Mostly: 52%
- Exclusively: 7%
CDF Use for DM Disposal – Percent of District Responding

- 4.3M yd$^3$ (2.6%)
- 147.0M yd$^3$ (91.5%)
- 9.2M yd$^3$ (5.8%)
- 0.2M yd$^3$ (0.1%)

5 Yr Avg Annual Dredging Volume & Percent of Total for All Districts Responding

Legend:
- Never
- Mostly
- Occasionally
- Exclusively

Dredged Material Assessment and Management Seminar
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Problems that Hamper Effective Usage of CDFs

(based on informal survey response)
Mass Balance Approach

\[ \text{Capacity} = \text{CDF size} - \text{Space Occupied} - \text{Material Added} + \text{Material Removed} \]
Approaches to Sustainability

• Minimize the volume of dredged material placed into CDFs
  ➢ Reduce dredging needs
  ➢ Improve dredging efficiency
  ➢ Alternative placement areas

• Manage CDFs to maximize capacity
  ➢ Maximize storage volume
  ➢ Minimize sediment volume (dewater)
  ➢ Facilitate removal

• Recover capacity through beneficial use
Dredging/Disposal Minimization

- Reduce dredging needs
  - Erosion control
  - Structures to minimize shoaling
- Precision/alternative dredging methods
- Alternative placement
  - Open water
  - Beach nourishment
Management

- **Maximize CDF capacity**
  - Sound construction and expansion
  - Ideal placement

- **Minimize occupied volume (trenching, dewatering)**

- **Management to facilitate beneficial use**
  - Processing or staging areas
  - Active or passive separation
  - Compartmentalization
  - Blending
  - Provide access

- **Obstacles**
  - Inconsistent funding
  - Limited dredging budget
Beneficial Use

• Obstacles
  - Cost (rehandling, transport)
  - Policy (Federal Standard)
  - Cost sharing
    - Unwieldy mechanisms (Section 204)
    - Funding limitations – public and private
  - Limited advance planning
  - Criteria

• Recommendations
Obstacles to Beneficial Use of Dredged Material

- Corps policies: 22%
- Inadequate market: 11%
- Cost: 8%
- Inability to meet State standards: 13%
- CDF materials not easy to access: 11%
- Uncertainty in characterization: 11%
- Time/effort to wade thru regs/deviate from current procedures: 9%
- Other: 4%

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Cost Optimization

• Present value comparisons
  - Staged construction
  - Life cycle analysis

• Economies of scale
Findings

- Capacity shortage – clearly an issue
- Multifaceted approach
  - BU has most potential
- Need BU policy roadmap
- Integrate planning and operations
- Agency coordination
Strategy

• Implementation
  - Collaboration
    - Workshops, National BU Team?
    - “How to” tech notes
    - Website
  - Innovative dredging contracts
  - Improve BU marketing
  - Sediment source reduction plan
  - CDF Inventory
  - Tools for cost/life cycle assessment of alternatives

• Research needs
Identified Research Needs

- Establishment of Risk-Based Criteria
- Testing Protocols for Beneficial Use
- CDF Characterization
- Benefits Analysis Tool for DMMP
- Dredged Material Processing for Reuse
- Retro-Fitting for Sustainability
- CDF Construction
- Implementation of Sustainability Strategies
Implementation Plan

- Step 1 – Real capacity recovery potential
- Step 2 – Assess site specific issues
- Step 3 – Develop a comprehensive, long term plan for sustainability
- Step 4 – Implementation, funding recruitment, permitting, formal agreements in place
QUESTIONS?

• Look for a Tech Report out later this FY

http://el.erdc.usace.army.mil/dots/doer/doer.html