SUSTAINABLE SEDIMENT MANAGEMENT AND DREDGING SEMINAR
28-30 NOVEMBER 2018
GALVESTON, TX

Overview: Sediment Beneficial Use
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A Systems View

- We build and manage systems to achieve specific objectives
  - Navigation system:
    - Locks, dams, channels
  - Flood risk reduction system:
    - Structural, nonstructural, ecosystem features
  - Ecosystems supporting values and services
- Balancing objectives and optimizing
  - Law, regulation, dialogue and deliberation
U.S. Environmental Laws and Regulations

- National Environmental Policy Act of 1969
- Federal Water Pollution Control Act of 1972 (amended and renamed the Clean Water Act in 1977)
- Marine Protection, Research, and Sanctuaries Act of 1972 (commonly called the Ocean Dumping Act)
- Coastal Zone Management Act of 1972
- Endangered Species Act of 1973
- Resource Conservation and Recovery Act of 1976
- Magnuson-Stevens Act as reauthorized by the Sustainable Fisheries Act of 1996
- Etc.
The USACE Navigation Mission:

To provide safe, reliable, efficient, effective and environmentally sustainable waterborne transportation systems for movement of commerce, national security needs, and recreation

Observations

- The Corps’ navigation mission involves multiple objectives
- Managing the risks relevant to these objectives requires making tradeoffs
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
US Authorities

- Rivers and Harbors Act of 1899, and all subsequent WRDA’s
- Clean Water Act
  - Section 404
- Marine Protection, Research, and Sanctuaries Act
  - Section 103
International Authorities

- London Convention and Protocol
  - Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter
- OSPAR Convention
  - Convention for the Protection of the Marine Environment of the North-East Atlantic
- HELCOM
  - Baltic Marine Environment Protection Commission
- Barcelona Convention
  - Convention for the Protection of the Mediterranean Sea Against Pollution
Risk Analysis

- **Risk Assessment**: What are the risks?
- **Risk Management**: What actions should be taken?
- **Risk Communication**: How to exchange information?
Risk-Informed Decision Making

- **Risk Assessment**: an approach to developing an understanding of the processes shaping the scope and nature of risks and uncertainties that is sufficient to support decision making
  - What is the risk?
  - Why and how are the risks occurring?
  - What is the uncertainty associated with the risk estimate?
Risk-Informed Decision Making

- **Risk Management**: a process to evaluate, select, implement, monitor and modify actions to alter levels of risk
  - What are my decision alternatives?
  - How will I evaluate the performance of those decision alternatives?
  - How do the decision alternatives differ in terms of risks?
  - What are the tradeoffs in terms of costs, benefits, and risks among the alternatives?
Risk-Informed Decision Making

- **Risk Communication**: exchange of information about risks that supports deliberation and decision-making
  - Why are we communicating?
  - With whom are we communicating?
  - How will we communicate?
  - What are we communicating?
Risk Analysis Overview

RISK ASSESSMENT PARADIGM

- Exposure Assessment
- Problem Formulation
- Risk Characterization
- Effects Assessment
- Economic Analysis, Socio-Political, Engineering Feasibility
- Risk Management
Guidance Documents for Assessment and Management of Dredged Material

National Technical Guidance

- Technical Framework
- Inland Testing Manual
- Ocean Testing Manual
- Upland Testing Manual
- Beneficial Use Manual

Found at: https://dots.el.erdc.dren.mil/guidance.html
Inland Testing Manual

- Addresses Clean Water Act
- Interim guidance in 1976, updated in 1998
- Included:
  - Effects-based testing
  - Sequenced > Tiered

DM placement “will not cause “an unacceptable adverse impact”"
Ocean Testing Manual

- Addresses MPRSA
- Originally developed in 1977, updated in 1991
- Included:
  - Effects-based testing
  - Bioaccumulation
  - Sequenced > Tiered

DM placement in ocean will not
“unreasonably degrade or endanger: human health, welfare, or amenities, marine environment, ecological systems, or economic potentialities”
Upland Testing Manual

- Addresses evaluation of DM for upland placement
- Published in 2003
- Included:
  - Tiered approach to assess contaminant releases
  - Focused on contaminant pathways and use of a conceptual model
  - Goal is to determine need/extent of contaminant controls
USACE GALVESTON DISTRICT
BENEFICIAL USE AND IMPLEMENTATION
OF REGIONAL SEDIMENT MANAGEMENT

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US Army Corps of Engineers

U.S. Army
Texas is the number two state in the nation for waterborne commerce. Texas ports generate over $5 billion in local and state tax revenue, and over $9 billion in federal import tax revenue each year.
Monitor and maintain over 1,000 miles of navigation channels and waterways

Dredge 20-30 million cubic yards per year

10 Major Texas maritime Ports

Gulf Intracoastal Waterway connects Ports

3 Strategic Ports

Texas Ports and Waterways moved >600M tons of Commercial Cargo during 2017
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