

**Session 1 – Introduction to Dredging Equipment and Operations
(Duration 1.5 hrs)**

Draft Outline

Learning Objectives:

1. Understanding of what “dredging” is, and the main reasons why it’s being performed
2. Basic knowledge of typical dredging equipment and operations including ancillary equipment
3. Understand the role of transportation in project execution
4. Broad recognition of placement alternatives
5. Appreciation of beneficial use opportunities and challenges

Presentation Outline

1. Why do we dredge? (4-6 slides)
 - a. Navigation
 - b. Beach Restoration
 - c. Coastal Restoration
 - d. Wetland Restoration
 - e. Environmental Cleanup
 - f. Hydraulics/Flood Control
2. What is being dredged? Distinguish between sand, silt, and contaminated sediments. (1-2 slides)
3. Dredging equipment, basic operations, and produced sediment characteristics (10-12 slides)
 - a. Overview
 - b. Scales of equipment, and shore/water-based (gold-panning, land-based backhoe, to ocean-going hopper)
 - c. Details about hydraulic platform dredges
 - d. Details about bucket/clamshell dredges
 - e. Details about hopper dredges
 - f. A few other types (diver assisted, robotic)
 - g. Ancillary equipment/operations
4. Sediment Transportation Options (4-5 slides)
 - a. Pumping systems
 - b. Hauling systems
 - c. Unloading systems
5. Dredged sediment placement options (10-12 slides)
 - a. Open water placement
 - i. Ocean/Deep water disposal
 - ii. Sidecasting
 - b. Confined placement
 - i. Upland
 - ii. Nearshore
 - iii. Islands
 - c. Unconfined placement
 - i. Upland
 - ii. Nearshore
 - iii. Islands
 - d. Beneficial uses (start with this one? Then a., then c. then b. -?; “It’s a resource until proven otherwise”.....)
 - i. Definition
 - ii. Examples of successful projects

- iii. Barriers/Obstacles
- 6. Monitoring and Surveying: needs, media, methodologies/technologies, challenges (4-5 slides)
 - a. e.g. need to check your work and impacts, but can't see underwater plus everything is dynamic and constantly changes there...)
 - b. How to check depths, accurate location, production, impacts, etc. on the water, underwater, while in motion, etc.)
 - c. Mention GPS, hydro-surveys, water-quality probes, etc.

Session 2 – Environmental Aspects of Dredging Projects and Operations

(Duration 1.5 hrs)

Draft Outline

Learning Objectives:

1. Distinction between navigation and environmental dredging (and also to lesser degree mining and flood control driven dredging needs/projects)
2. Importance and relevance of sediment types/properties
3. General understanding of environmental issues associated with dredging, transportation, and placement.
4. Monitoring Objectives and Challenges
5. Value of beneficial use of sediments

Presentation Outline

1. Purposes and characteristics of mining dredging (1 slide)
2. Purposes and characteristics of flood-control dredging (1 slide)
3. Purposes and characteristics of navigation dredging (1 slide)
4. Purposes and characteristics of environmental dredging. (1 slide)
5. Regulatory Considerations, Permits, and Permitting Requirements (5-7 slides)
 - a. Basic Steps
 - i. Characterize the dredged material, physical, chemical, and toxicity
 - ii. Does it meet environmental standards?
 - iii. Where to dispose or place the material?
 - iv. Obtain Permits
 - v. Monitor
 - b. Permitting Process for Navigation Dredging
 - i. USACE
 - ii. USEPA
 - iii. NMFS/USFWS – endangers or threatened species, critical habitat
 - iv. State – 401 WQ certification, coastal zone consistency
 - c. Regulatory Framework for Environmental Dredging
 - d. Morphology/habitat concerns
 - i. Typical issues/relevant situations
 - ii. Mitigation measures
6. Sediment types/properties (2 slides)
 - a. Physical Characteristics
 - b. Chemical Characteristics
 - c. Toxicity Characteristics

7. Monitoring: needs, media, methodologies/technologies, challenges (4-5 slides)
8. Water quality concerns (15 slides)
 - a. Sources and typical impacts
 - i. Hydraulic Dredges
 - ii. Mechanical Dredges
 - iii. Hopper Dredges
 - iv. Barge overflow
 - v. Spillage and other losses
 - vi. Ancillary equipment
 - vii. Placement Area Discharges
 - b. Mitigation measures
 - i. Silt Curtains This item should be in the first session after Survey.
 - ii. Operational strategies
 1. Silt Curtains
 2. Best Management Practices
 3. Cofferdams?
9. Air quality concerns (2 slides)
 - a. Primary sources
 - b. Typical levels
 - c. Mitigation measures
 - d. Permitting?
10. Noise concerns (2 slides)
 - a. Primary sources
 - b. Typical levels
 - c. Mitigation measures
 - d. Permitting?
11. Residual sediments (2 slides)
 - a. Primary sources
 - b. Typical levels
 - c. Mitigation measures
12. Concerns related to placement alternatives
 - a. Open Water placement (2 slides)
 - b. Beneficial Uses (3 slides)