

Integration of RSM and EWN with the Beneficial Use of Dredged Sediments



John L. Childs Environmental Laboratory
john.l.childs@usace.army.mil

Regional Sediment Management and Engineering with Nature
Portland Oregon 28-30 August 2012



Definition of BU of Dredged Material

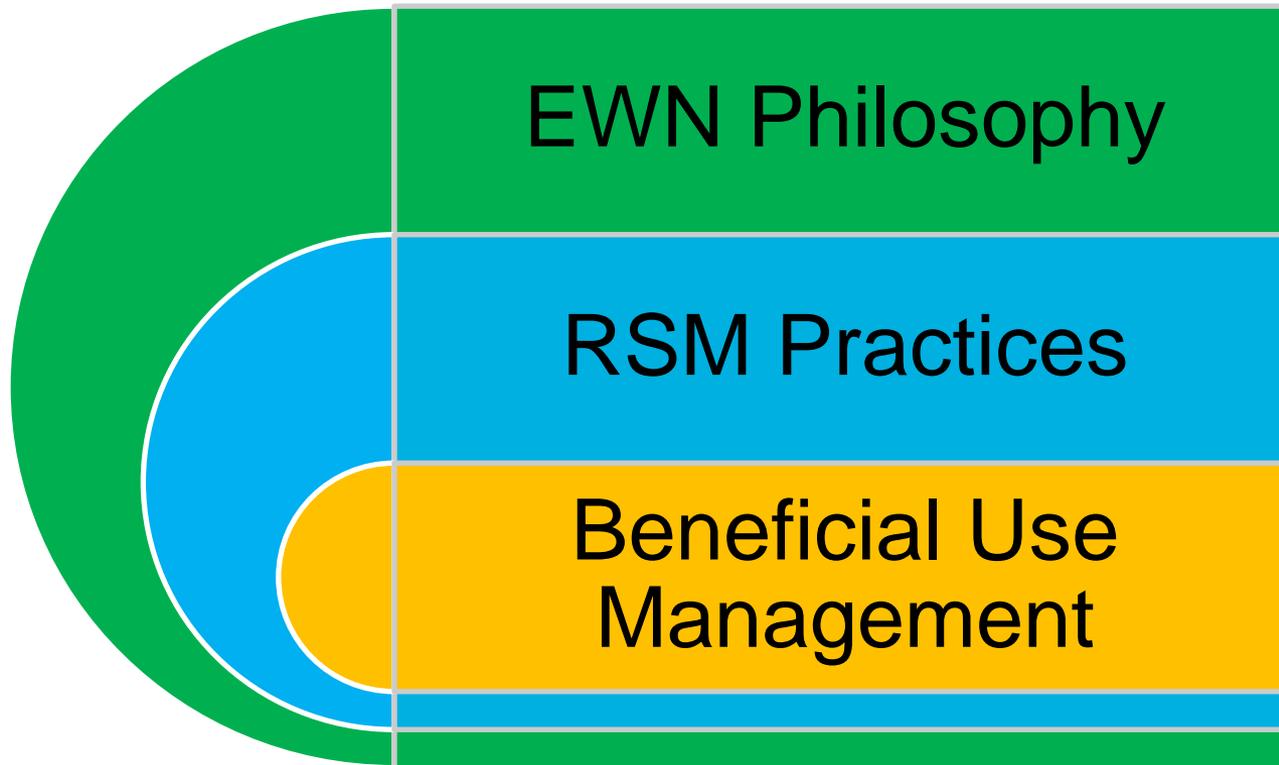
Corps 1987 EM 1110-2-5026: *Beneficial Use is utilizing dredged material as a resource in a productive way, which provide environmental, economic, and/or social benefits.*

National Dredging Team's Dredged Material Management: Action Agenda for the Next Decade (2003): Much of the sediment dredged each could be used in a beneficial manner, such as habitat restoration and creation, beach nourishment, and industrial and commercial development; yet much of this dredged material is disposed in open water, confined disposal facilities, and upland disposal facilities; Beneficial use must become a priority at all levels of management and there must be recognition that dredged material is a valuable resource (EPA 2003).

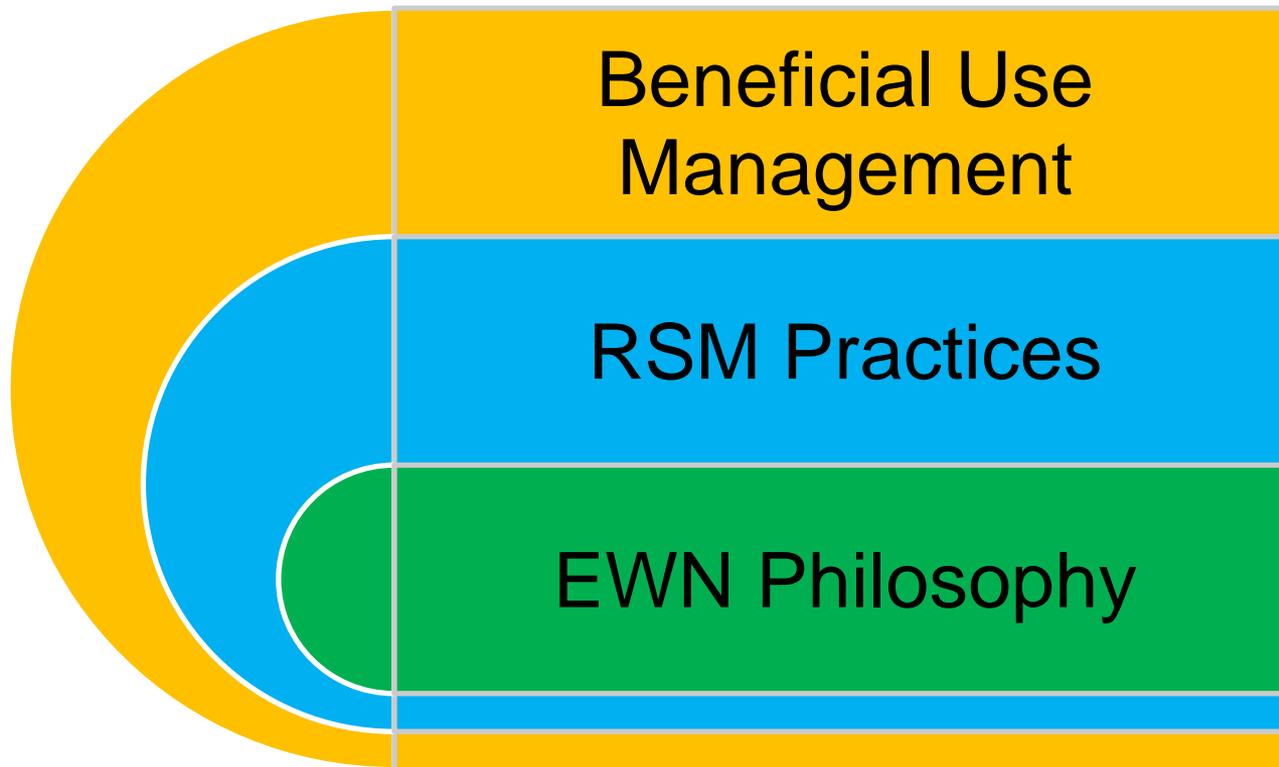
The Corps fully supports and strives to beneficially use dredged material in all circumstances where it is practical and cost-effective, and where those beneficial uses can be accomplished in compliance with all requirements of federal law.



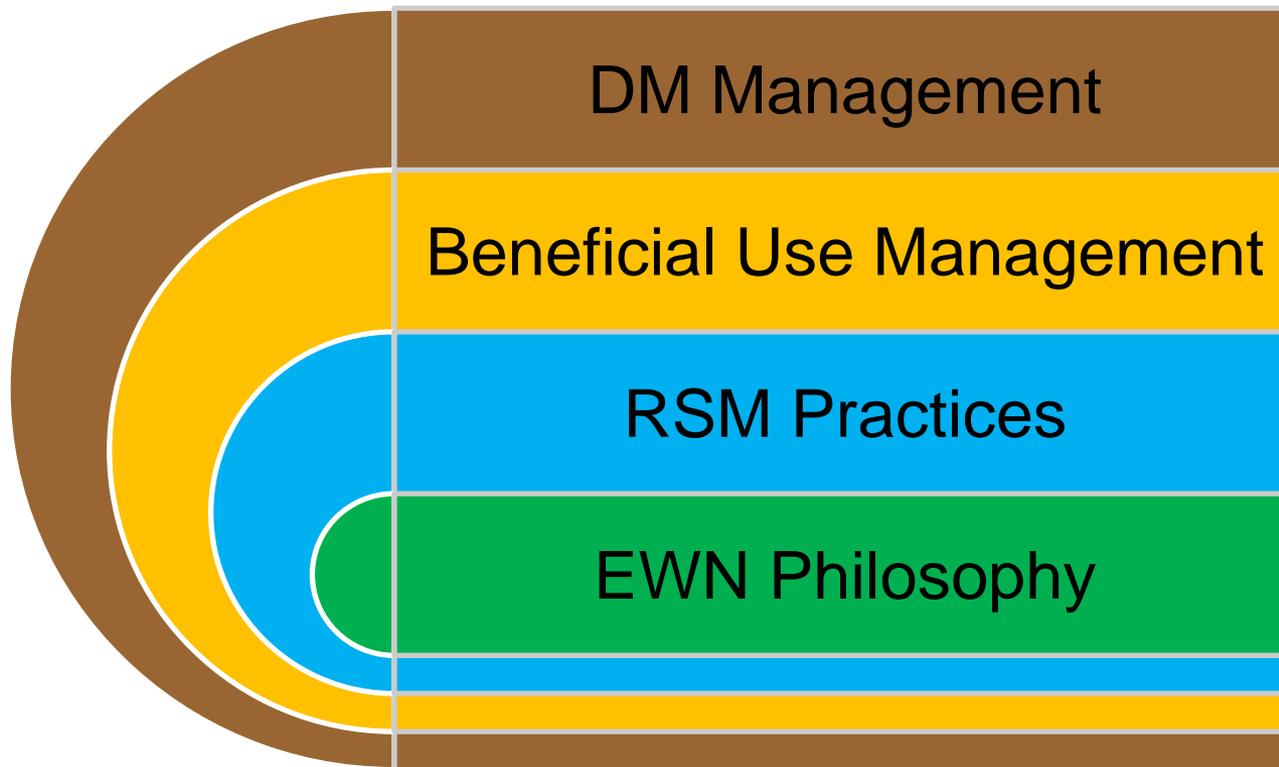
Integration of RSM and EWN with BU



Integration of RSM and EWN with BU



Integration of RSM and EWN with BU



Technical Guidance for Management of Dredged Material

USEPA and USACE 2004
Evaluating Environmental Effects of DM
Management Alternatives
(A Technical Framework)

USEPA/USACE 1991

**Marine Protection
Research and
Sanctuaries Act
Ocean Testing
Manual**

USEPA/USACE 1998

**Clean Water Act
Inland Testing
Manual**

USACE 2003

**Five Risk Pathways
for CDFs
Upland Testing
Manual**



Technical Guidance for Management of Dredged Material

USEPA and USACE 2004
Evaluating Environmental Effects of DM
Management Alternatives
(A Technical Framework)

USEPA and USACE 2013
Aquatic Placement of Dredged
Material: Testing, Evaluation,
Assessment, and Management
Manual (TEAMM)

USACE 2003
Five Risk Pathways
for CDFs
Upland Testing
Manual



Beneficial use of Dredged Material

USEPA and USACE 2004 Evaluating Environmental Effects of Dredged Material Management Alternatives (A Technical Framework)

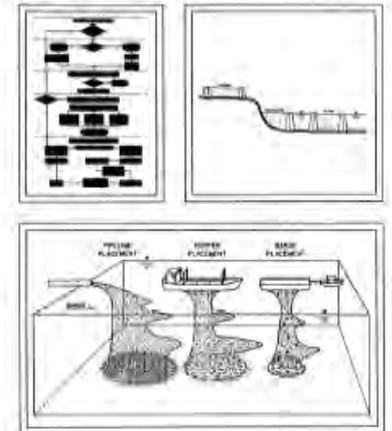
DM Management Options: Open Water Disposal; Confined Disposal; and Beneficial Use.

DM is a valuable Resource with beneficial uses of such importance that they should be incorporated into project plans.



United States Environmental Protection Agency
Department of the Army
U.S. Army Corps of Engineers
EP-600-0-02-006
Revised May 2004

Evaluating Environmental Effects of Dredged Material Management Alternatives—
A Technical Framework

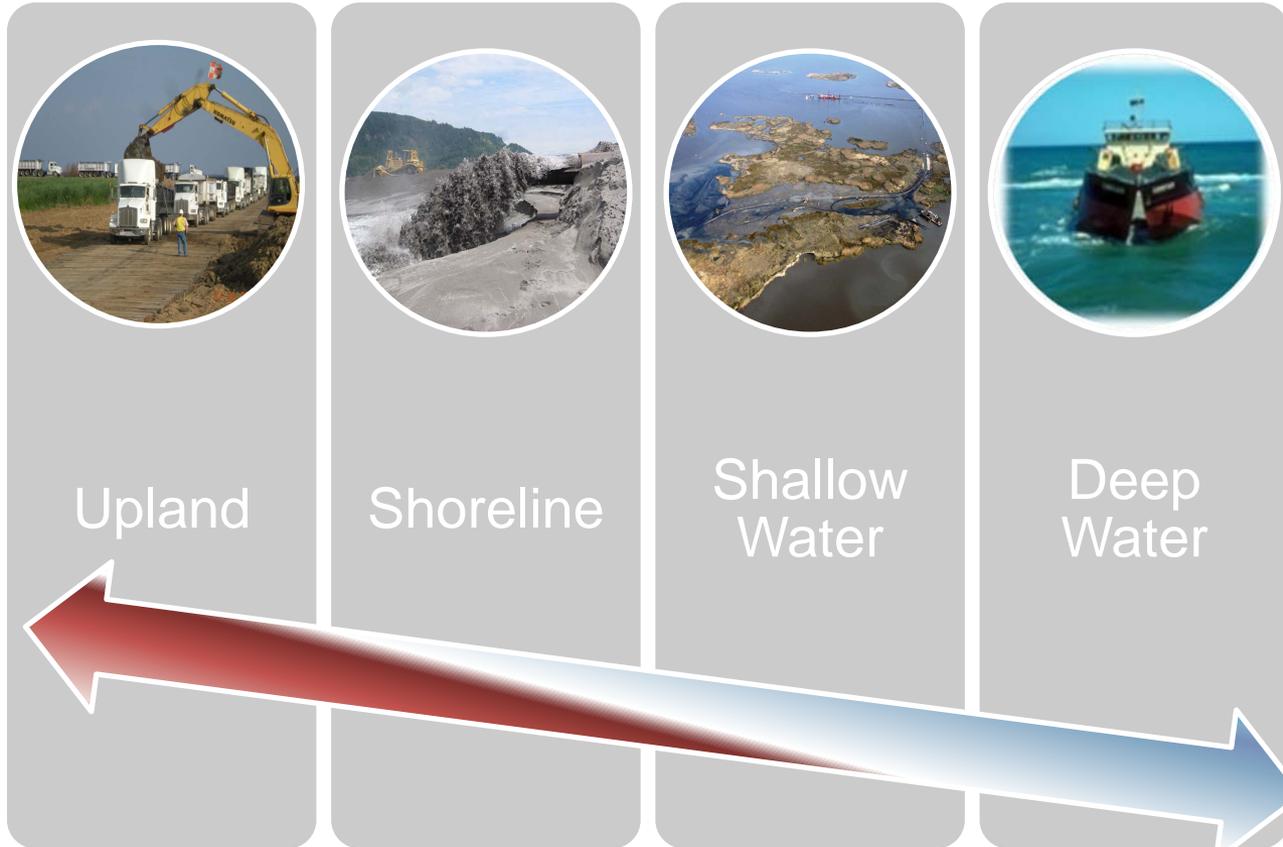


Beneficial Use Categories

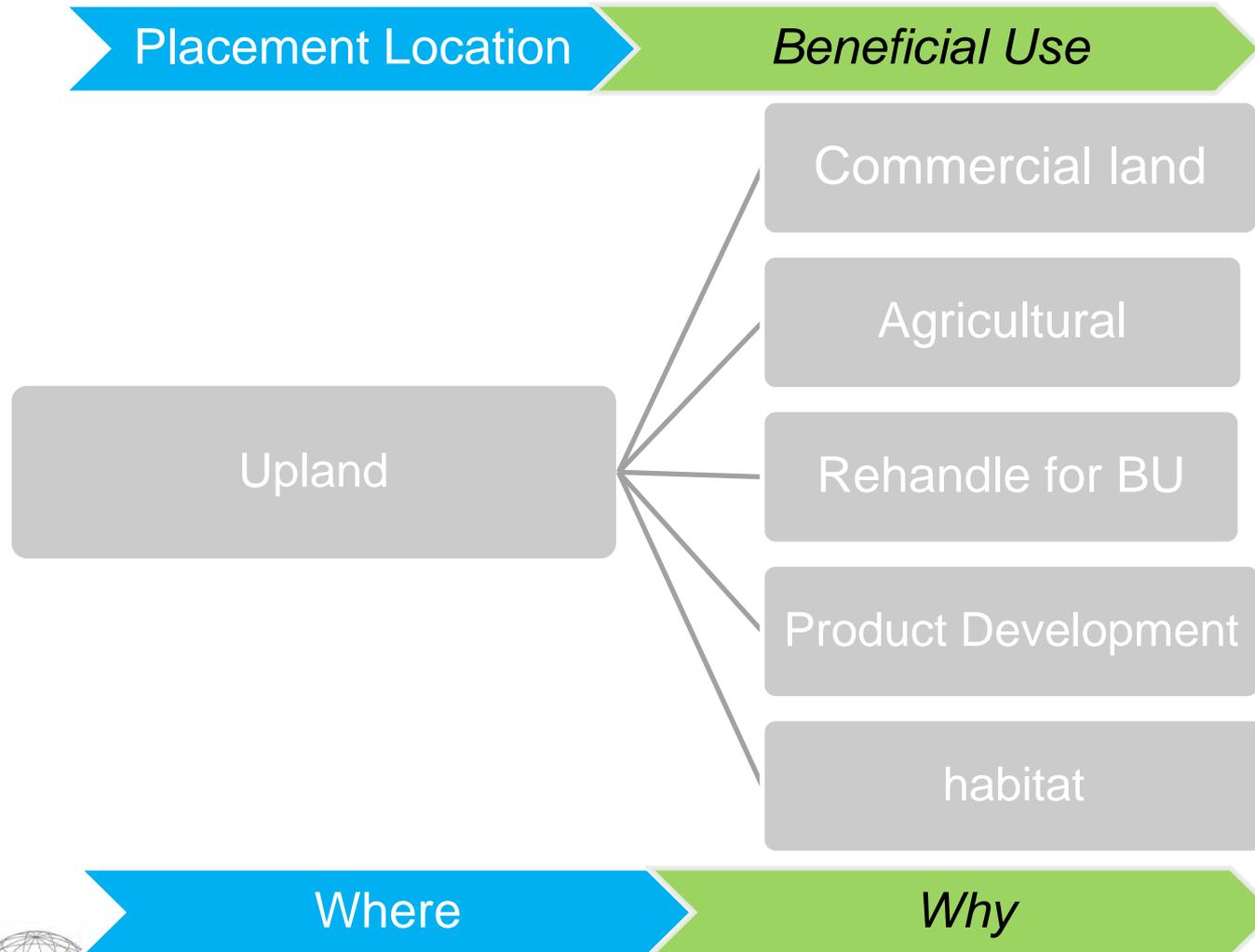
- *Habitat Restoration and Development*
- *Sustainable Relocation (RSM)*
- *Beach Nourishment*
- *Shoreline Stabilization and Protection*
- *Engineered Capping*
- *Aquaculture, Agriculture, Forestry, and Horticulture*
- *Recreational Development*
- *Commercial Land Development*
- *Commercial Product Development*



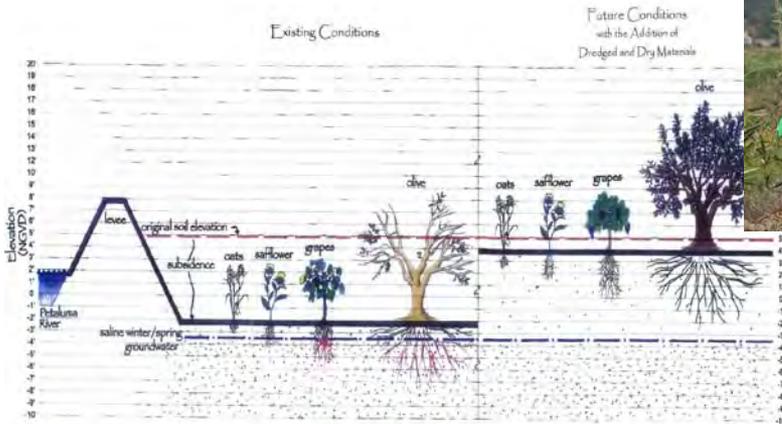
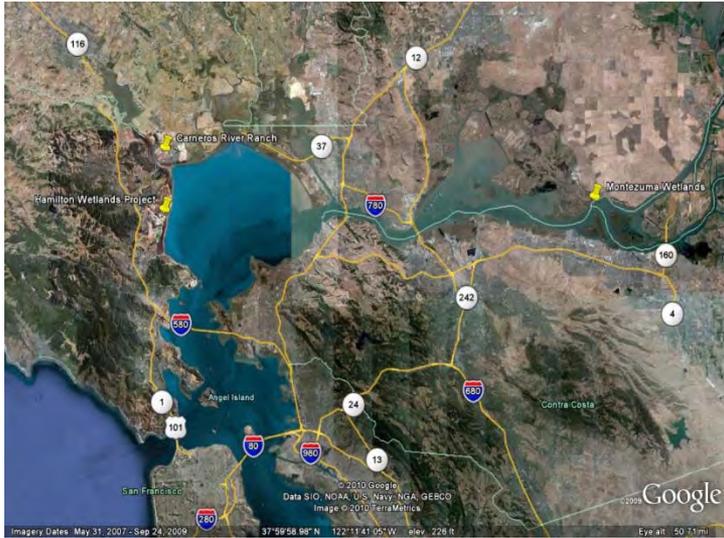
DM Placement Options



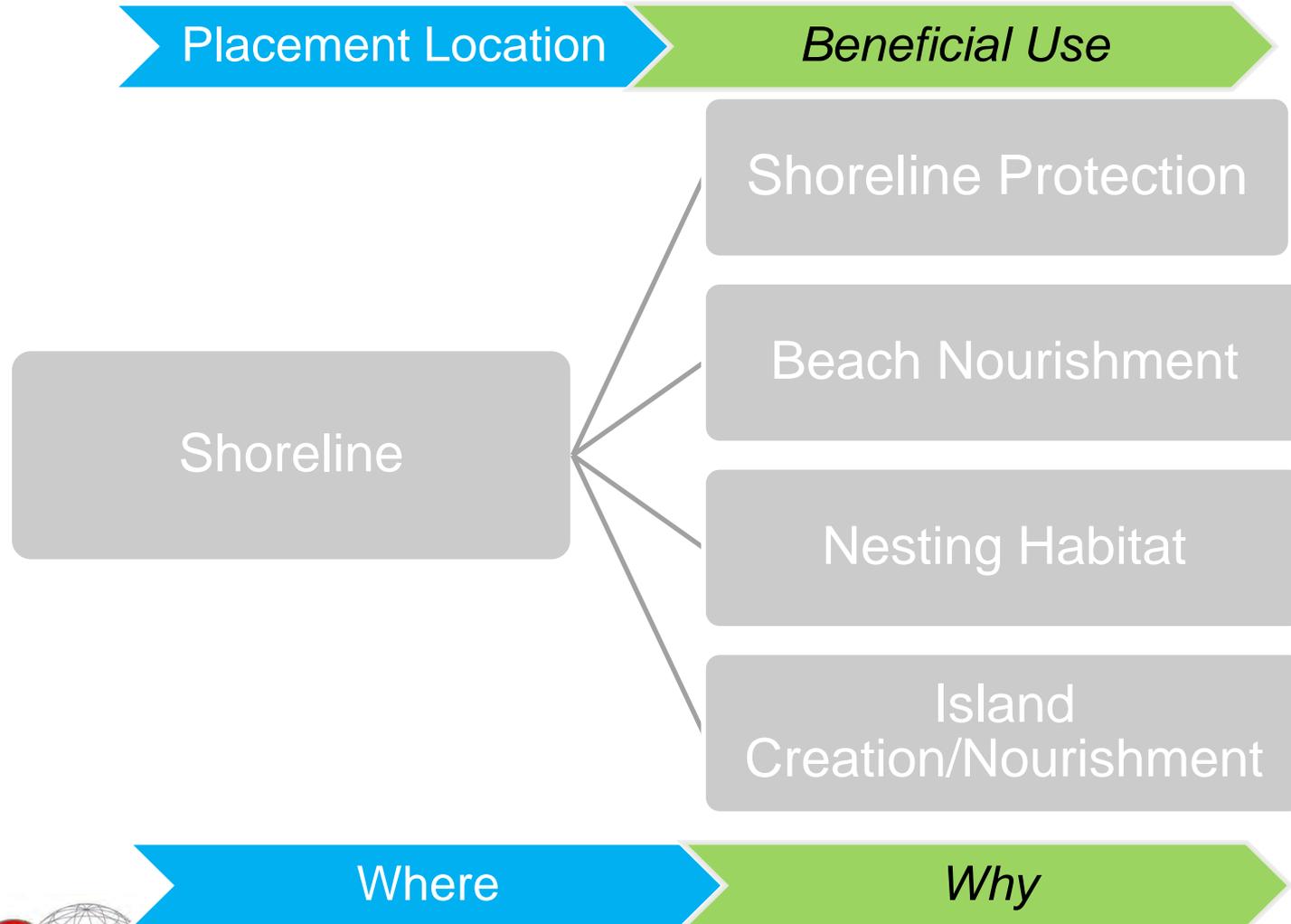
Dredging Operations and Beneficial Use



Upland Agriculture BU: Carneros River Ranch, Sonoma County, CA



Dredging Operations and Beneficial Use



Island Nourishment: Sand Island—SAM Beach Nourishment



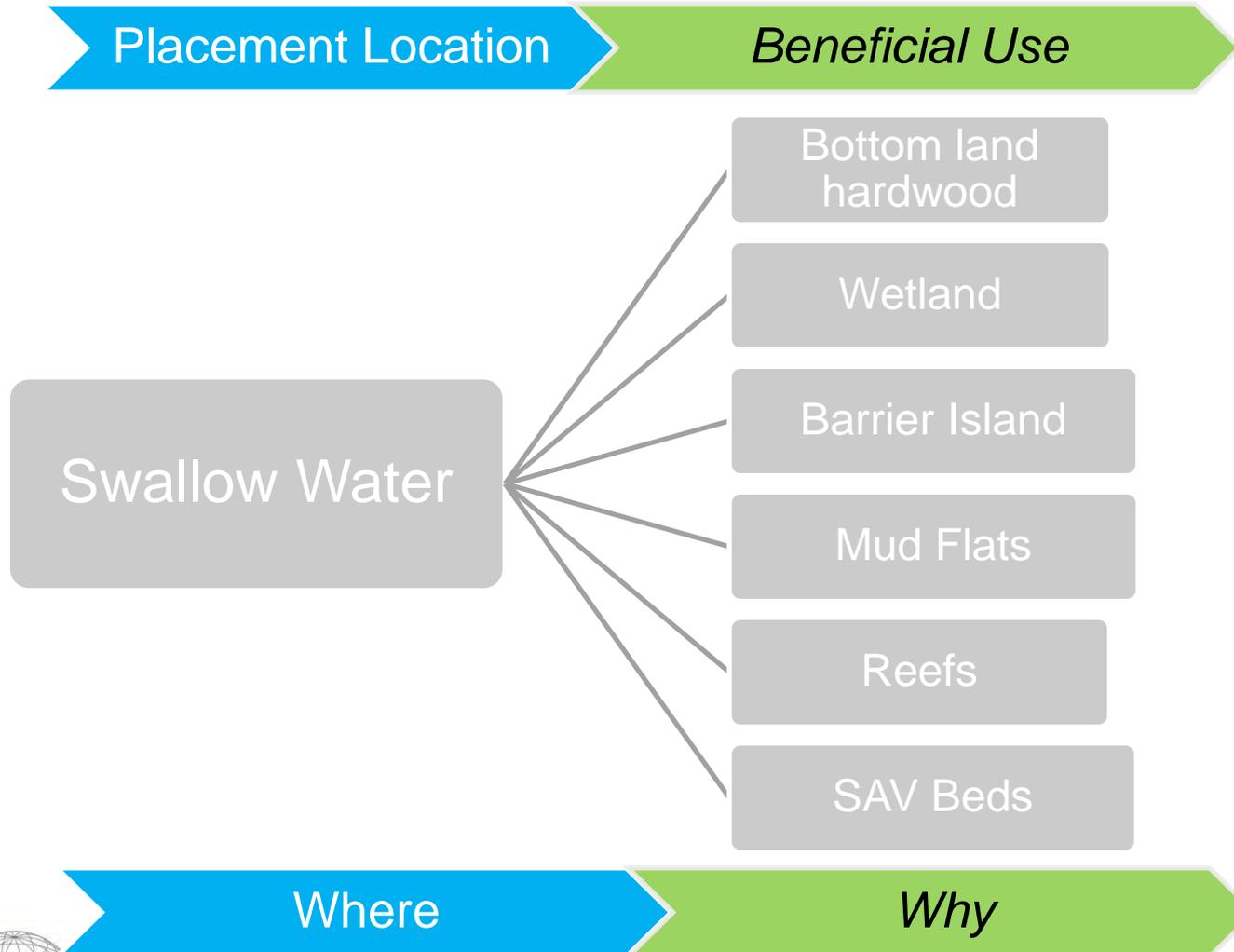
Regional Sediment Management and Engineering with Nature
Portland Oregon 28-30 August 2012



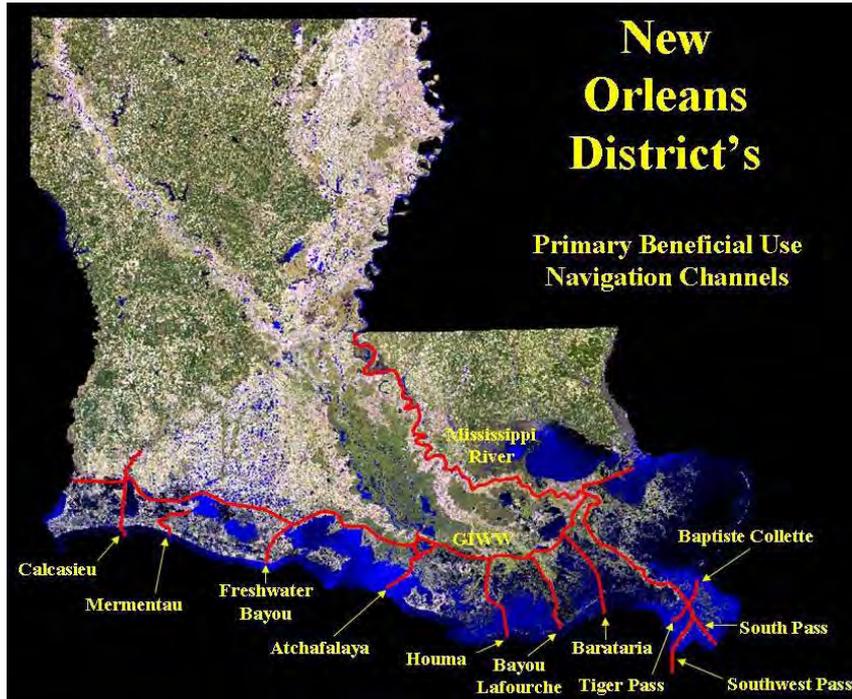
Beach Nourishment



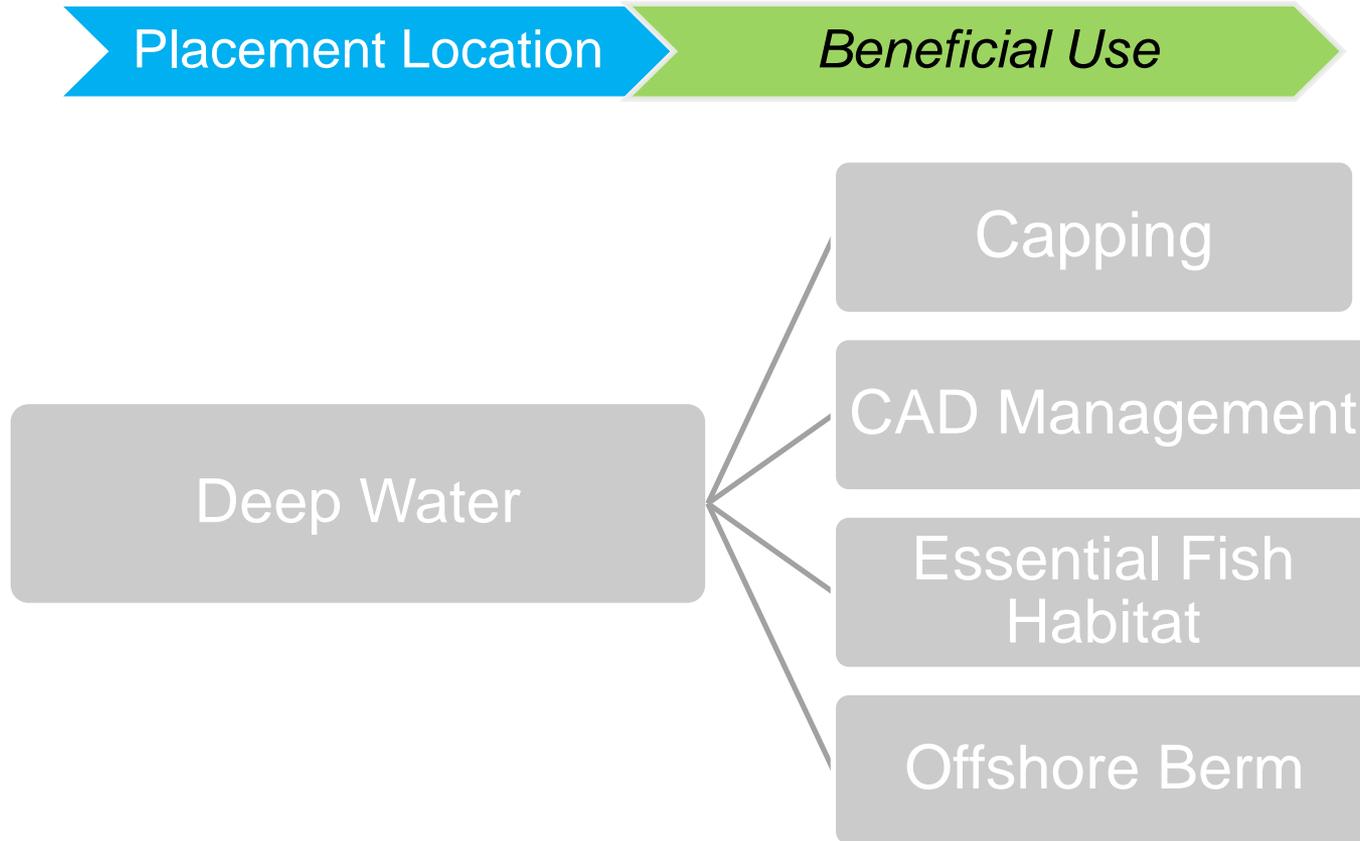
Dredging Operations and Beneficial Use



Wetland Nourishment



Dredging Operations and Beneficial Use



Berm and Flow lane Placement



Corps' Dredge Currituck after dumping a load of sand at an offshore berm at NJ inlet dredging project



BU Alternative Considerations

Material Suitability

- Physical
- Chemical
- Biological
- Regulatory

Site Selection

- Distance
- Slope
- Elevation
- Dredge compatibility
- Public support

Placement Logistics

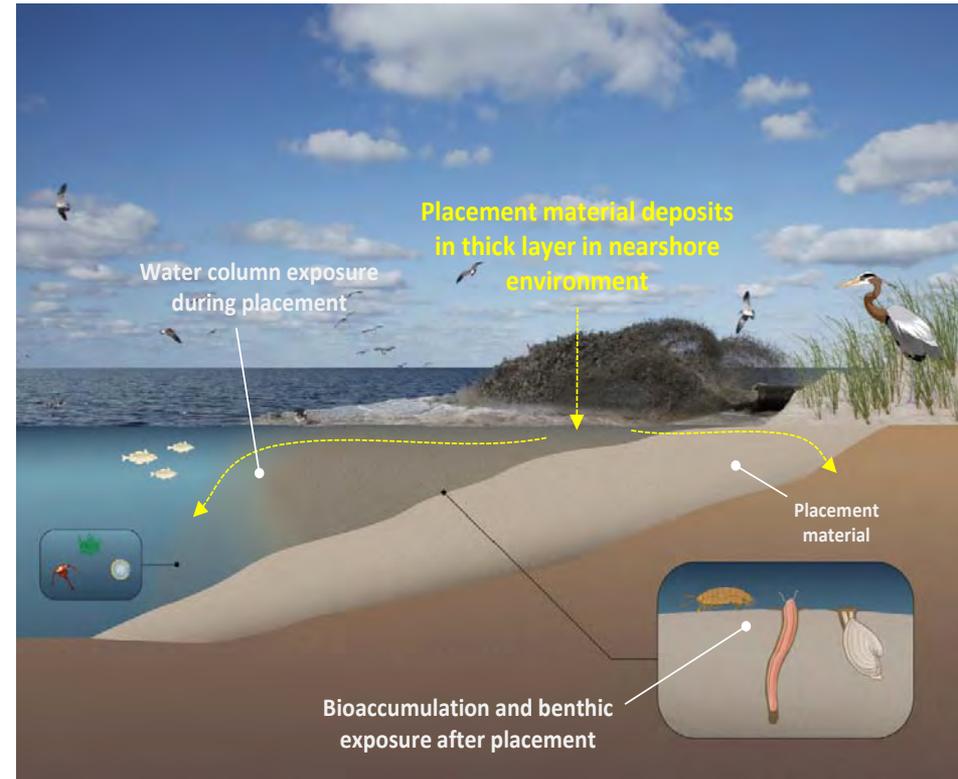
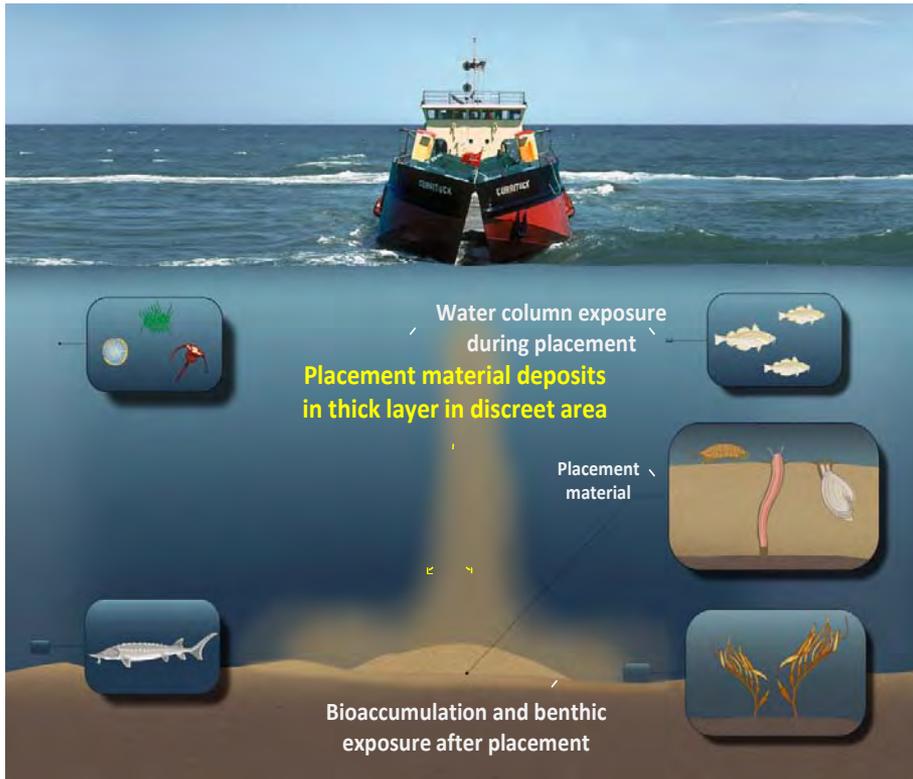
- Hydrodynamics
- Fine Sediment Processes
- Dredge compatibility
- Stability
- Engineering Tools

Funding

- Base Plan
- Sponsors
- Engineering Tools
- MCDA—D2M2



DM Management Conceptual Site Model



Quantification of Benefits

- What parameters should be considered when evaluating “benefits of BU”?
- What are the "environmental" and "human services”?
- Should both environmental and human services be considered?
- Should regional weighting factors be considered?
- Life cycle analysis—(current and future?)
- Valuation (monetary) vs Quantification (index)
- What are Corps Regulatory Limitations?
- What are Corps Opportunities (economic)?



Existing Quantification Methodologies

- **Value= significance + Quality + Quantity**
- **HEP-Habitat Evaluation Procedure**
- **EBI-Environmental Benefit Indicator**
- **HBU-Habitat Benefit Units**
- **EBU-Environmental Benefit Unit**
- **Ecosystem Services**
- **Economic Analysis of Ecosystem-Based Management**



Quantification General Approach

- **Define Categories**
- **Develop Conceptual Models for Categories**
- **List Features (BU) and Attributes (benefits)**
- **Identify various methods for quantification**
- **Determine weighting factor for each variable**
- **Develop algorithm to quantify cost to environmental benefit ratio**
- **Illustrate method with several case studies (past or current)**
- **Monitoring/Update CSM**



DIS Tracking

disp_type: type of material disposal

- **B** beach nourishment
- **C** confined
- **D** underwater confined
- **M** mixed, more than one type
- **O** overboard and open water
- **S** open water and upland
- **T** beach nourishment and upland
- **U** upland
- **W** wetlands nourishment or creation
- **x** undefined or not described



DIS Tracking of disp_type

Dredged Sediment Management Type 1995-2011

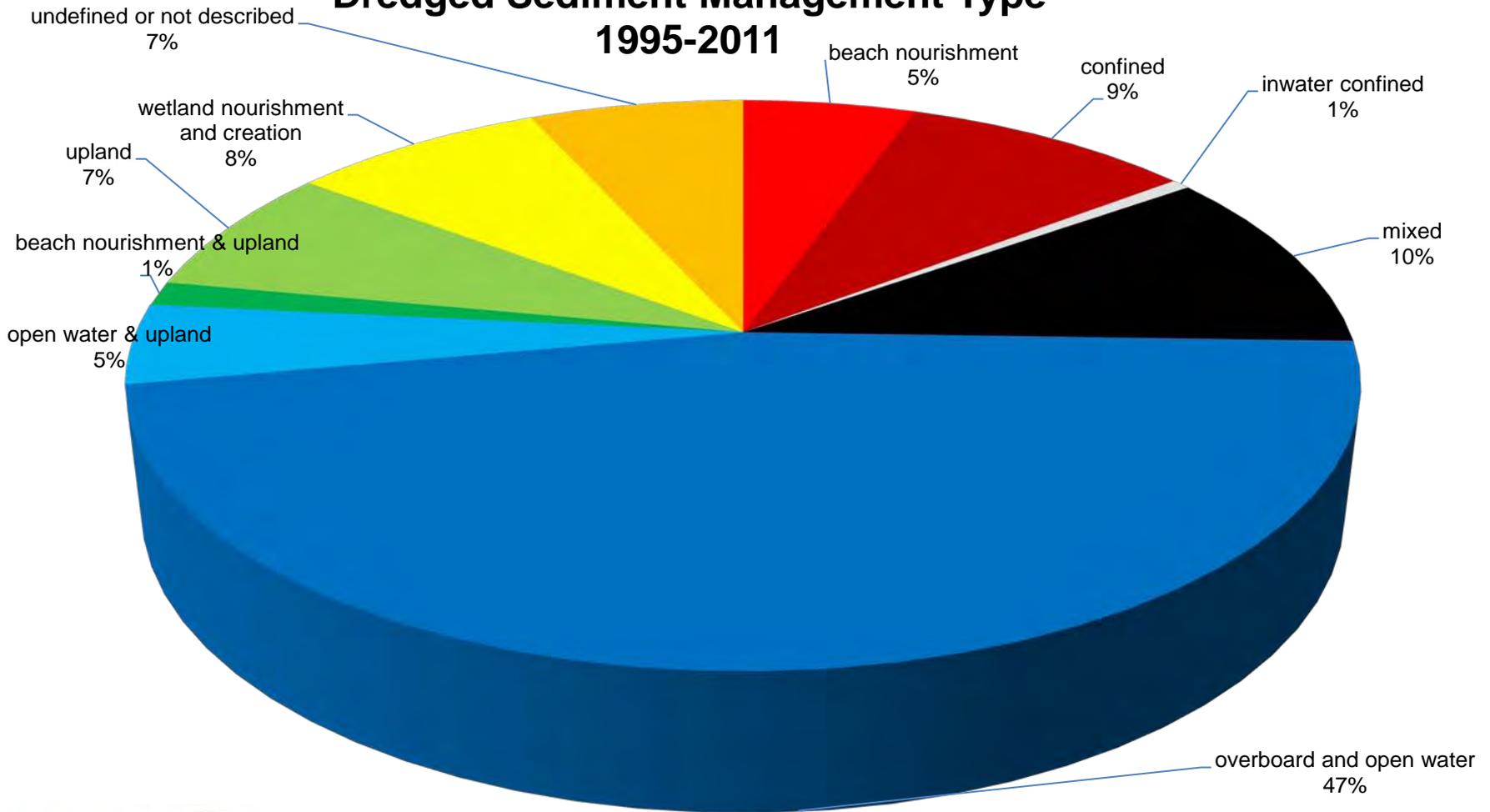


Table 3. Dredged Material Management Category as tracked by DIS (DIS database 29-Feb-2012), with estimates of Beneficial Use

Tracker (Disp_Type)	Material Management Category	Percentage of total Dredged Material Management from 1995 to 2011	Estimated Percent of Dredged Material Potentially used Beneficially
B	Beach Nourishment	5	5
C	Confined	9	1-5
D	Underwater Confined	1	0-1
M	Mixed, more than one type	10	4-8
O	Overboard and open water	47	10-30
S	Open water and upland	5	1-5
T	Beach nourishment and upland	1	1
U	Upland	7	1-5
W	Wetlands nourishment or creation	8	8
X	Undefined	7	2-5
Total		100	33-73



Guidance on Planning/Funding/Authorities

Identifying, Planning, and Financing Beneficial Use Projects Using Dredged Material

Beneficial Use Planning Manual



U.S. Environmental Protection Agency, Washington, DC
U.S. Army Corps of Engineers, Washington, DC

The Role of the Federal Standard in the Beneficial Use of Dredged Material from U.S. Army Corps of Engineers New and Maintenance Navigation Projects

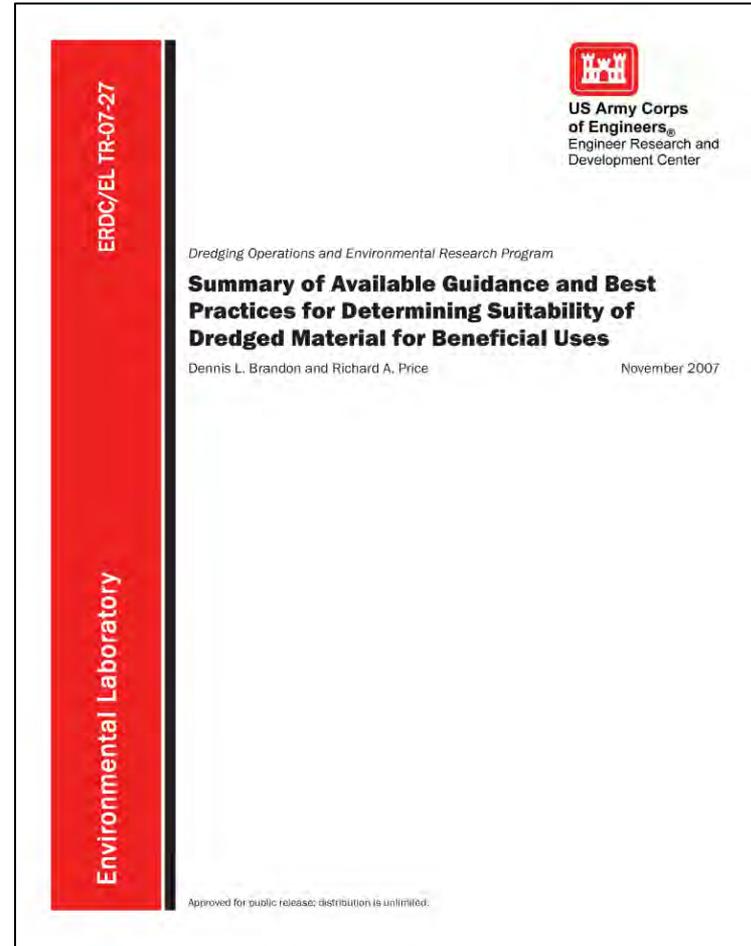
Beneficial Uses of Dredged Materials



U.S. Environmental Protection Agency, Washington, DC
U.S. Army Corps of Engineers, Washington, DC



Guidance on



BU Website

- <http://el.erdcl.usace.army.mil/dots/budm/budm.cfm>



RSM and EWN

