

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

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



# Definition of BU of Dredged Material

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**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.*

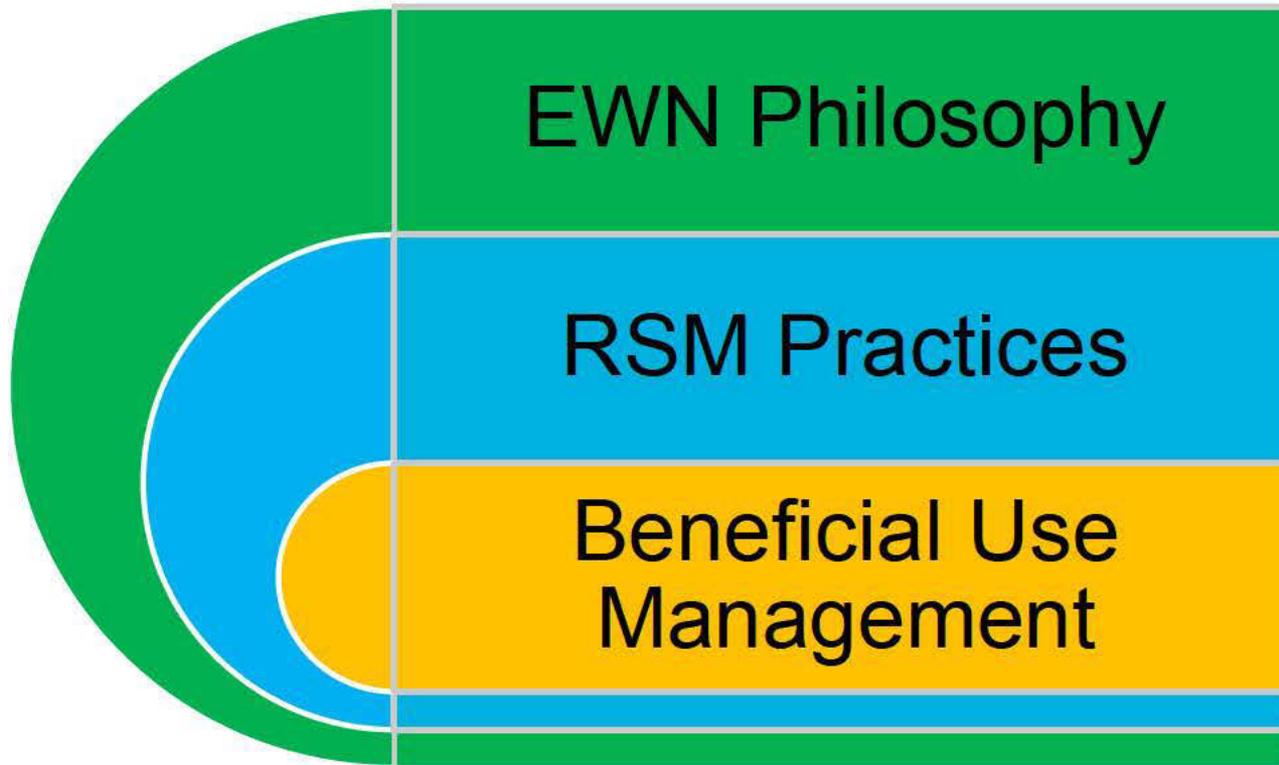
**National Dredging Team's Dredged Material Management: Action Agenda for the Next Decade (2003):** Much of the sediment dredged each could be used in a beneficial manner, such as habitat restoration and creation, beach nourishment, and industrial and commercial development; yet much of this dredged 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.*



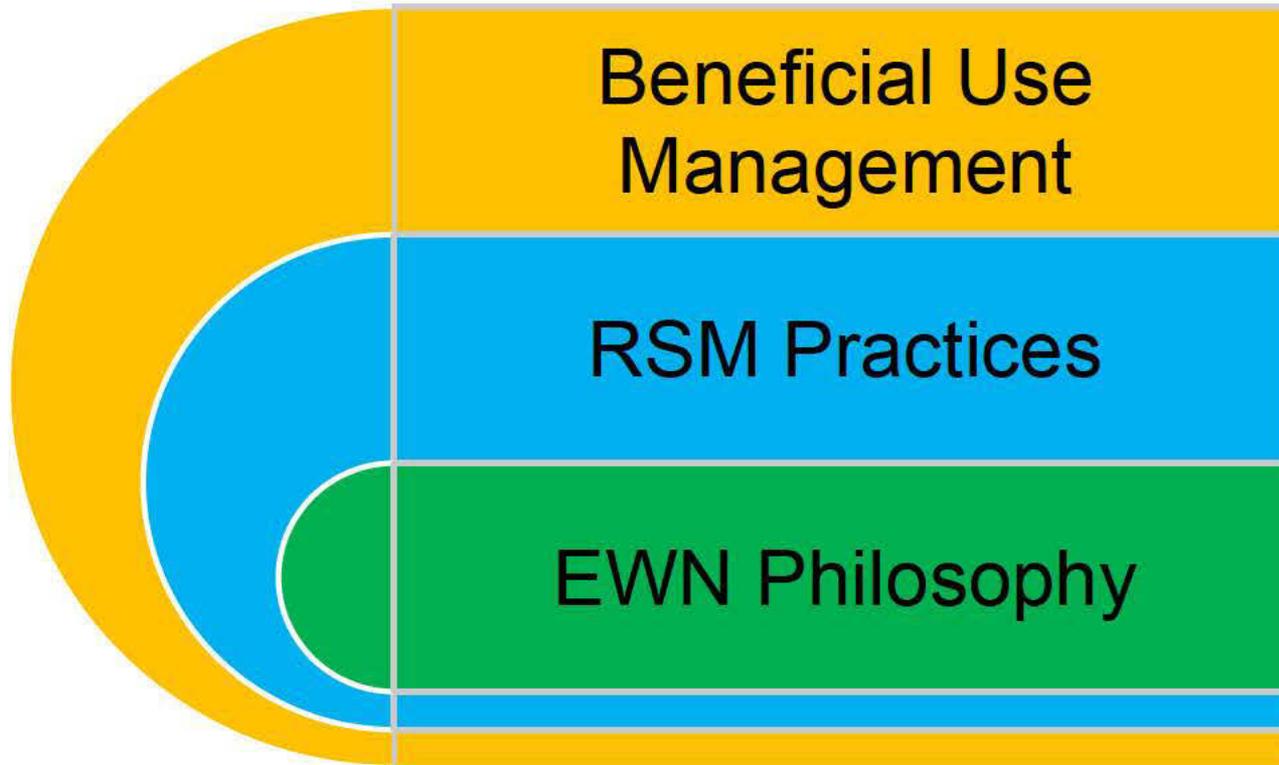
# Integration of RSM and EWN with BU

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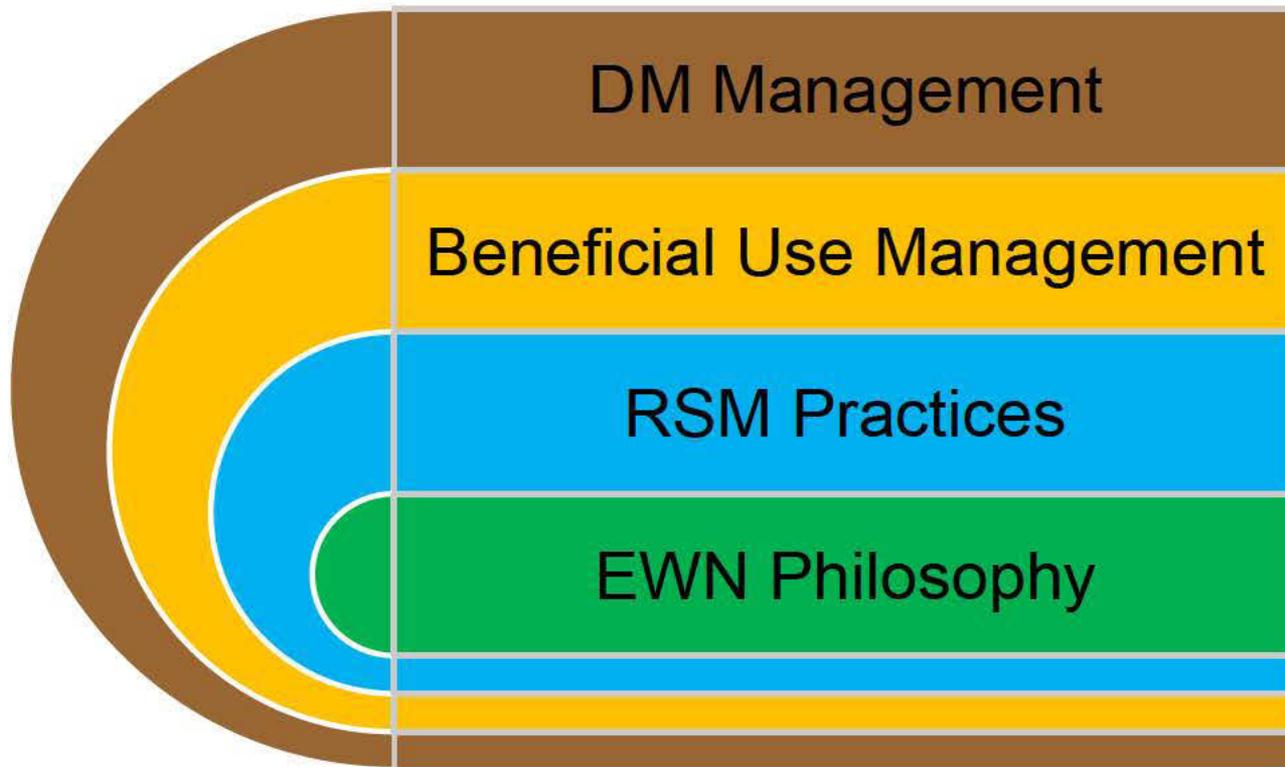
# Integration of RSM and EWN with BU

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# Integration of RSM and EWN with BU

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# Technical Guidance for Management of Dredged Material

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*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

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

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

*USACE 2003*  
Five Risk Pathways  
for CDFs  
Upland Testing  
Manual



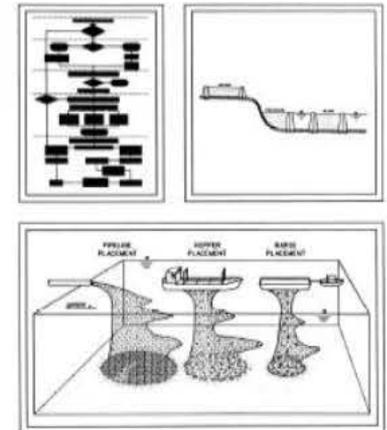
# Beneficial use of Dredged Material

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



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



# Beneficial Use Categories

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- ***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***



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Upland



Shoreline



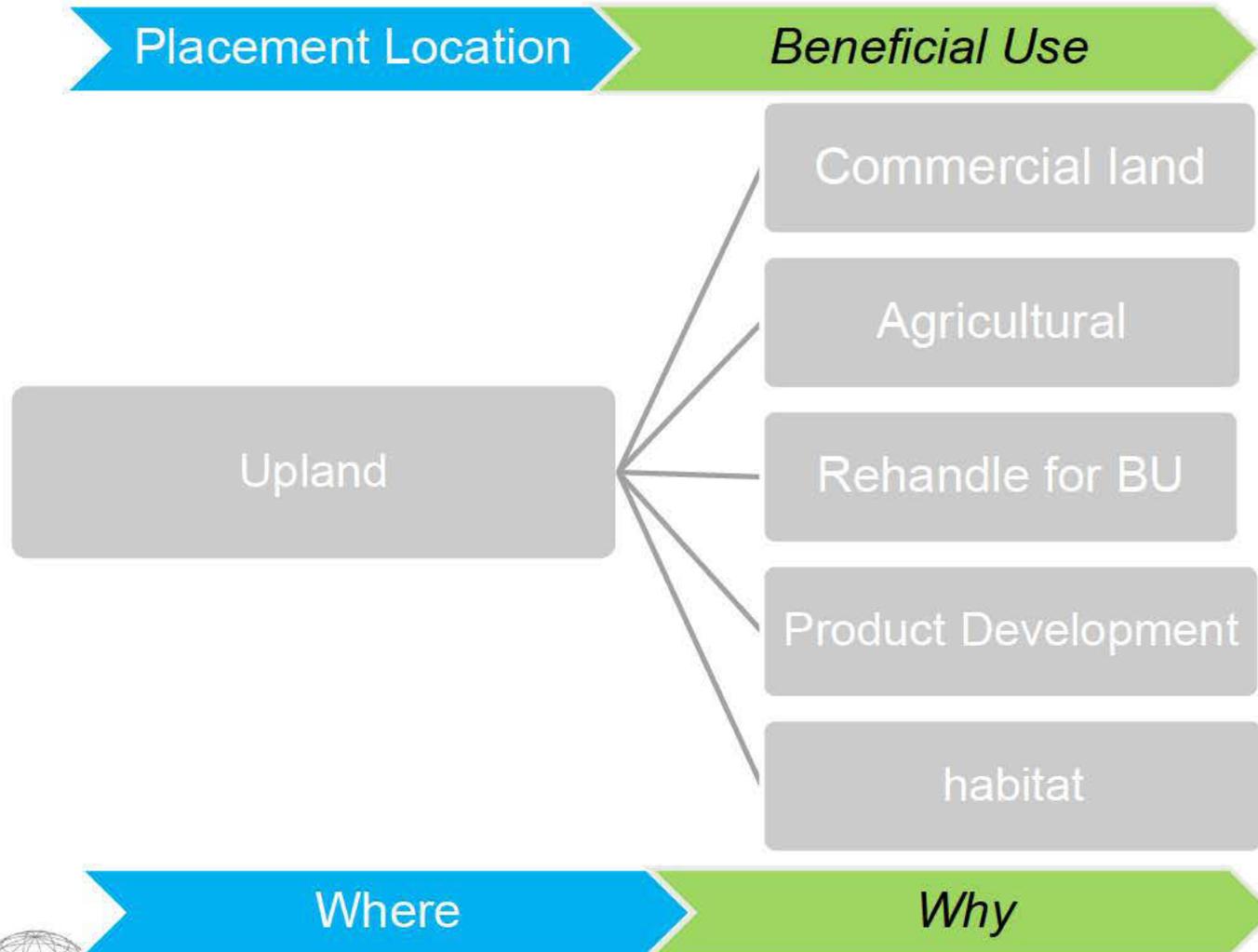
Shallow  
Water



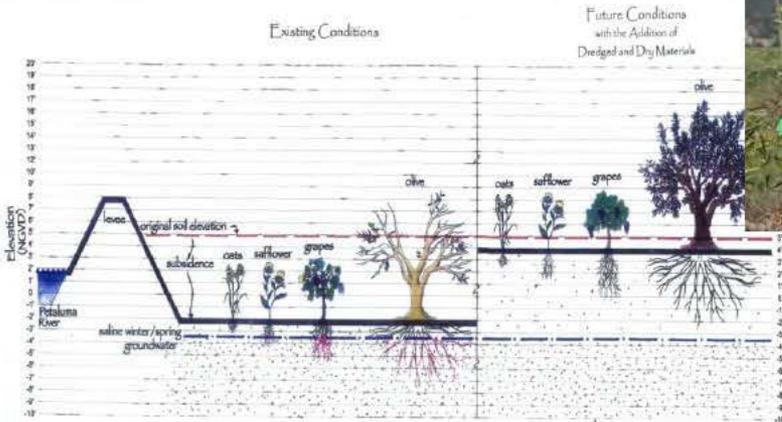
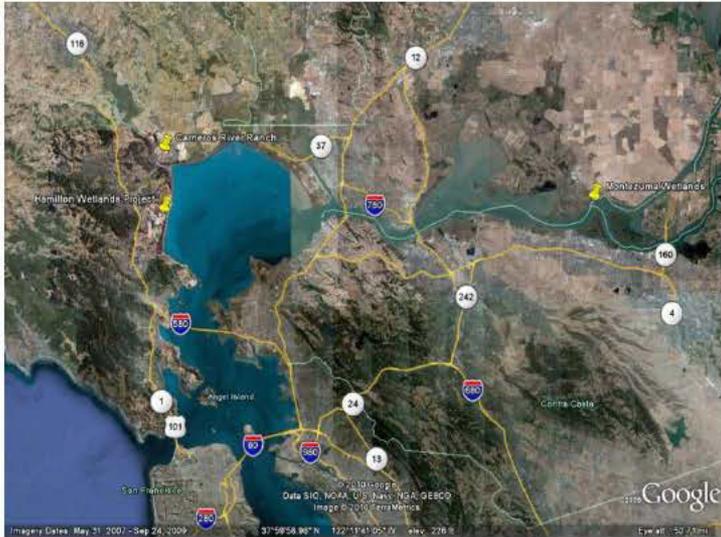
Deep  
Water



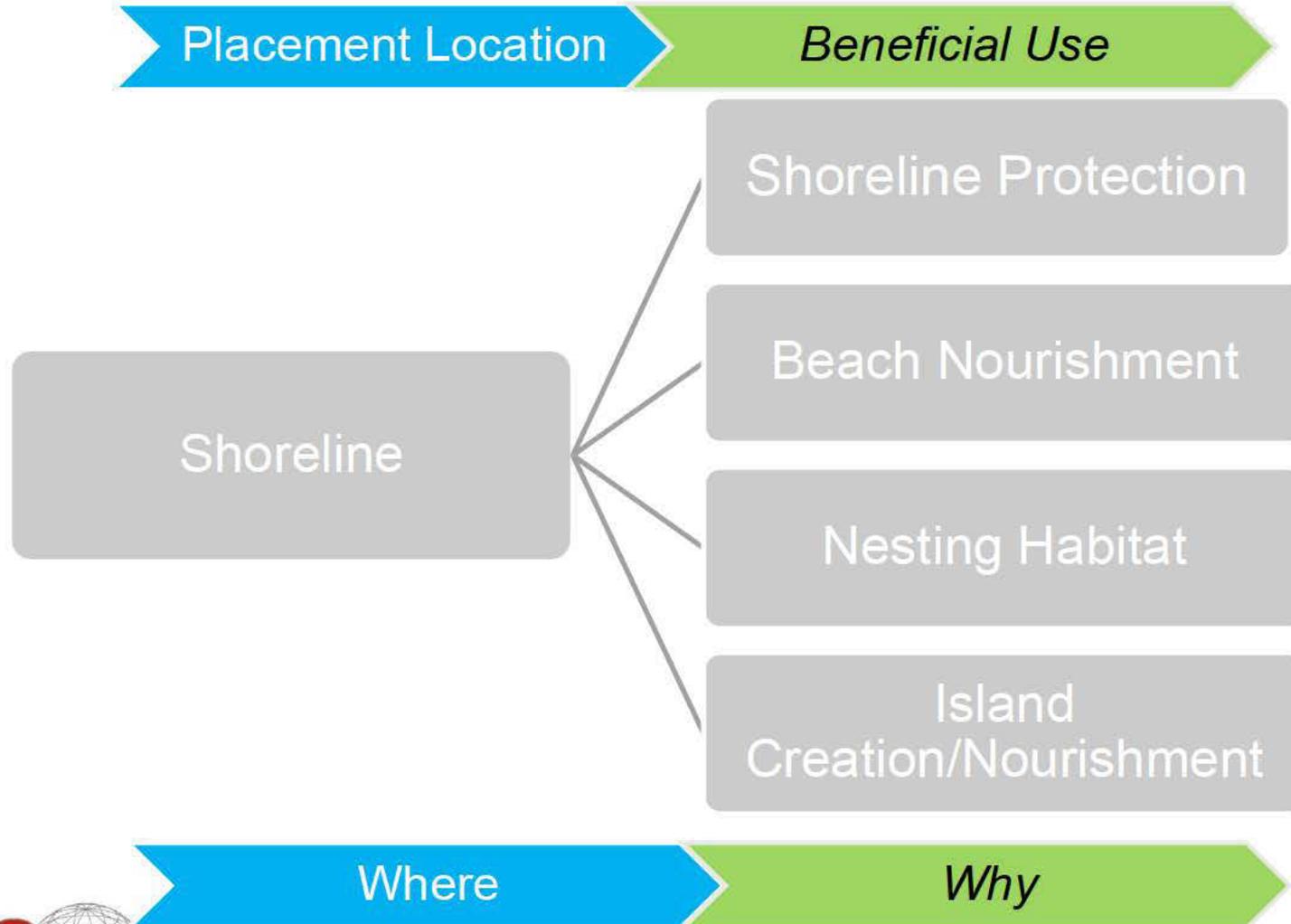
# Dredging Operations and Beneficial Use



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



# Dredging Operations and Beneficial Use



# Island Nourishment: Sand Island—SAM Beach Nourishment

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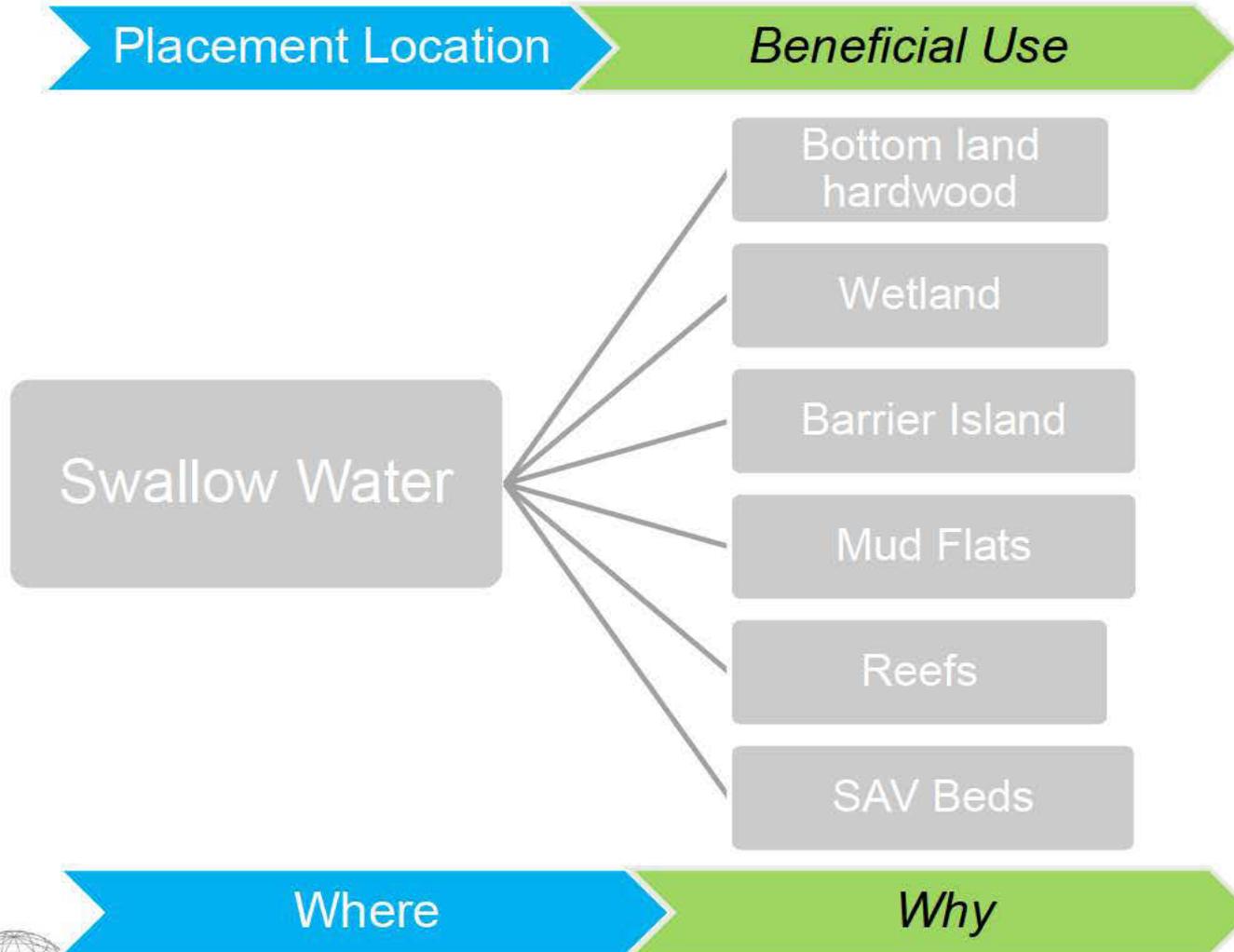


# Beach Nourishment

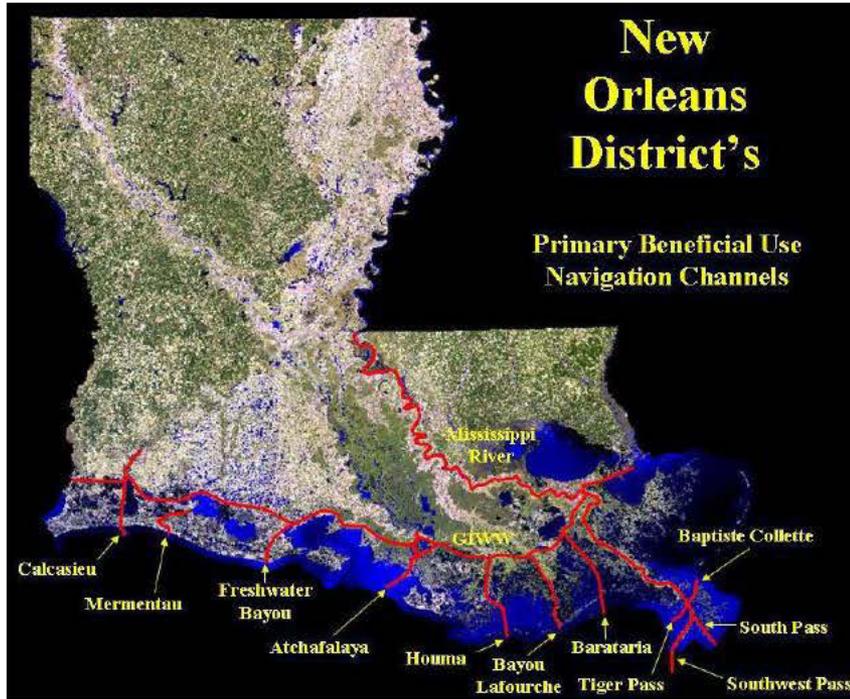
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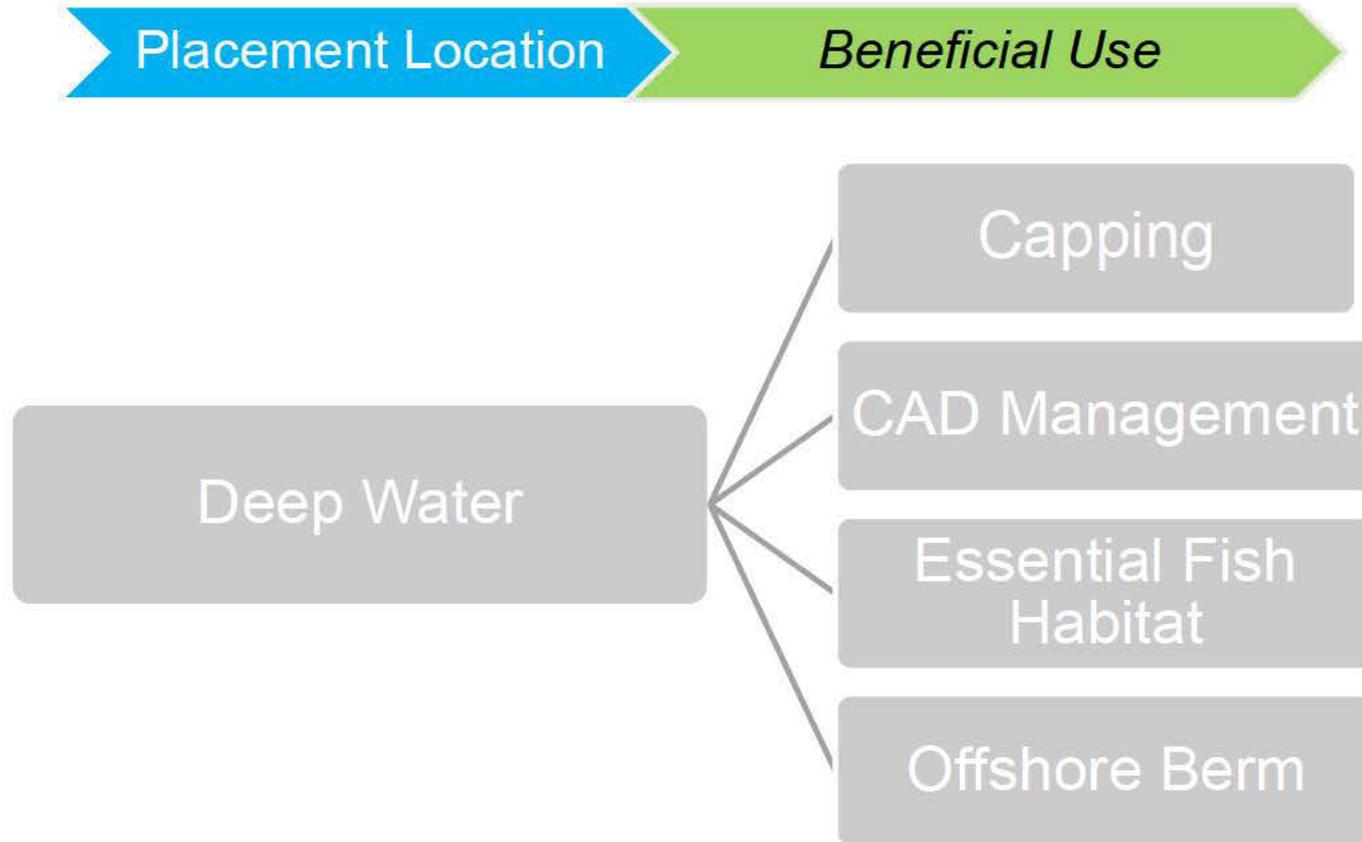
# Dredging Operations and Beneficial Use



# Wetland Nourishment



# Dredging Operations and Beneficial Use



# Berm and Flow lane Placement

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



# BU Alternative Considerations

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## Material Suitability

- Physical
- Chemical
- Biological
- Regulatory

## Site Selection

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

## Placement Logistics

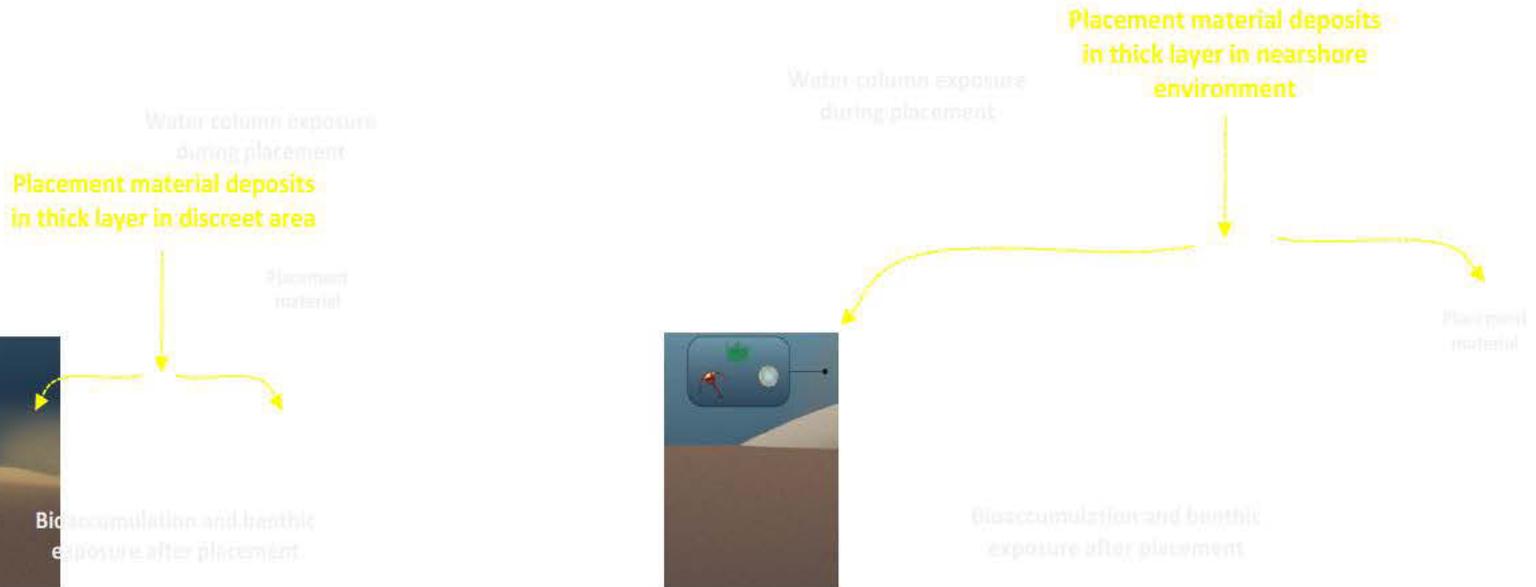
- Hydrodynamics
- Fine Sediment Processes
- Dredge compatibility
- Stability
- Engineering Tools

## Funding

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



# DM Management Conceptual Site Model



# Quantification of Benefits

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- 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

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- **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

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- **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

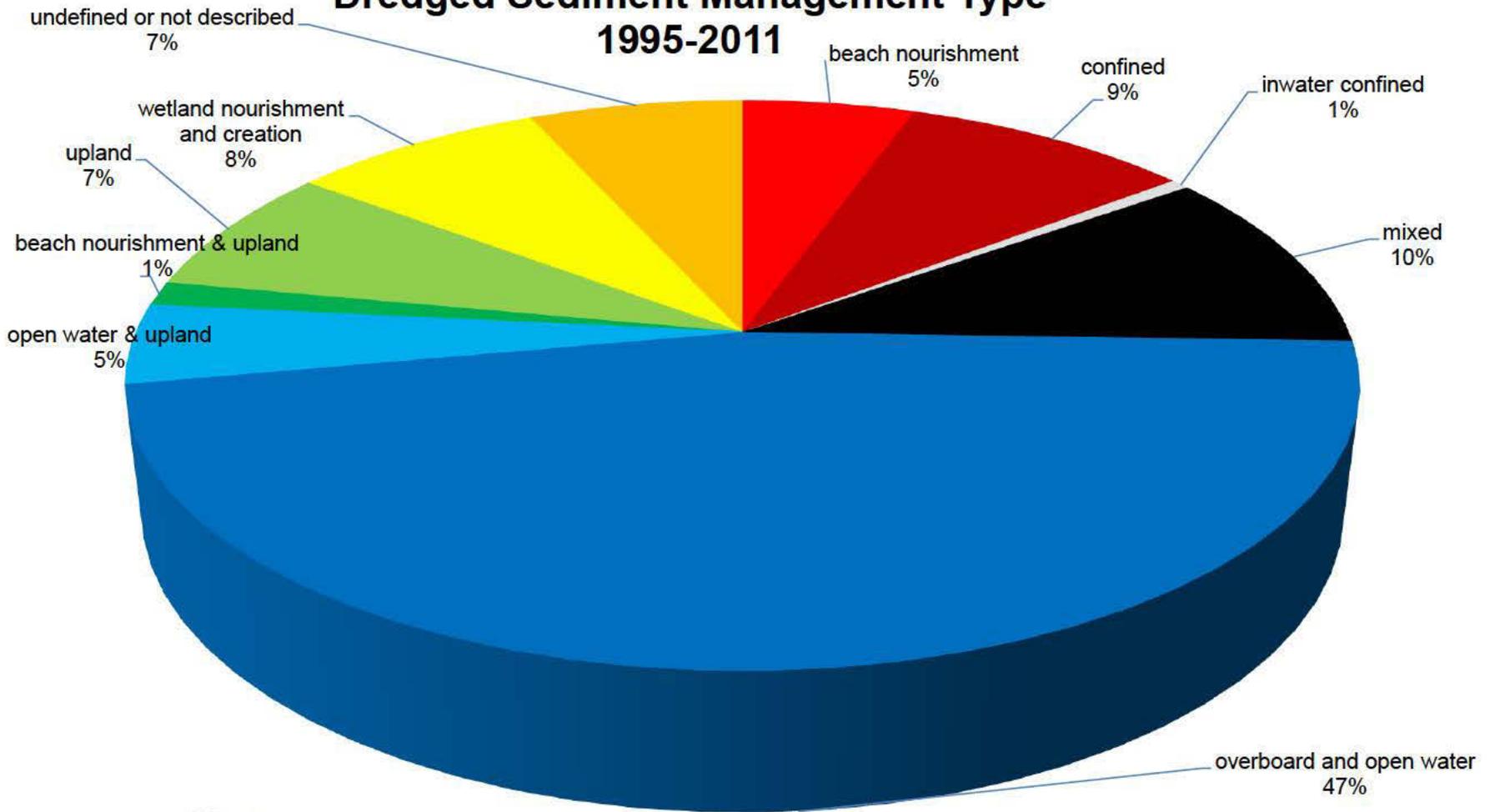
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- **B** beach nourishment
- **C** confined
- **D** underwater confined
- **M** mixed, more than one type
- **O** overboard and open water
- **S** open water and upland
- **T** beach nourishment and upland
- **U** upland
- **W** wetlands nourishment 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**

<b>Tracker (Disp_Type)</b>	<b>Material Management Category</b>	<b>Percentage of total Dredged Material Management from 1995 to 2011</b>	<b>Estimated Percent of Dredged Material Potentially used Beneficially</b>
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

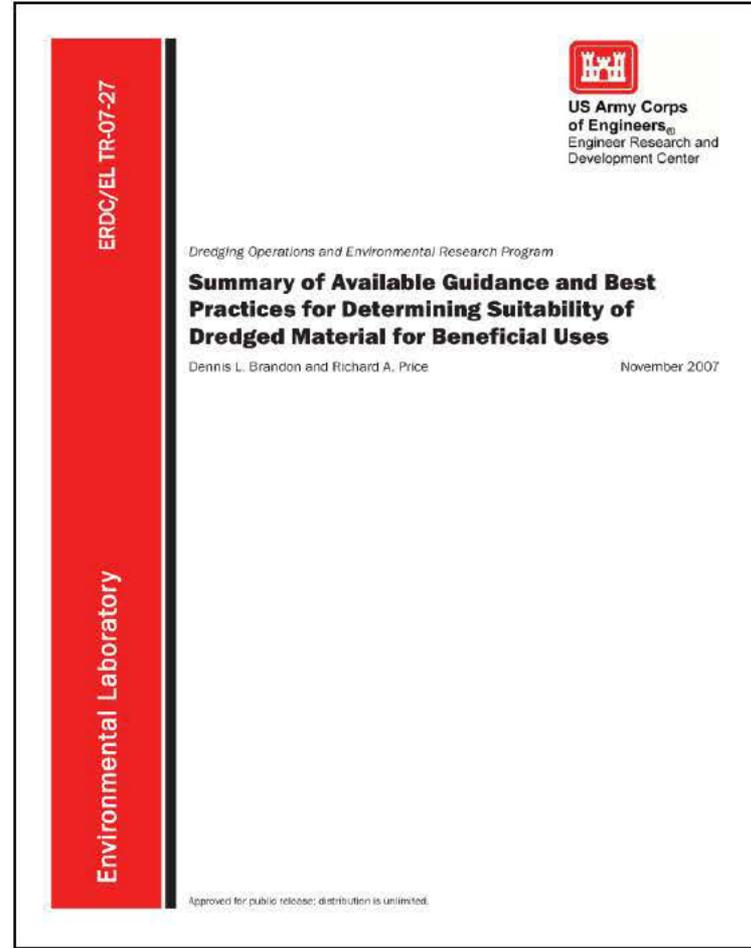
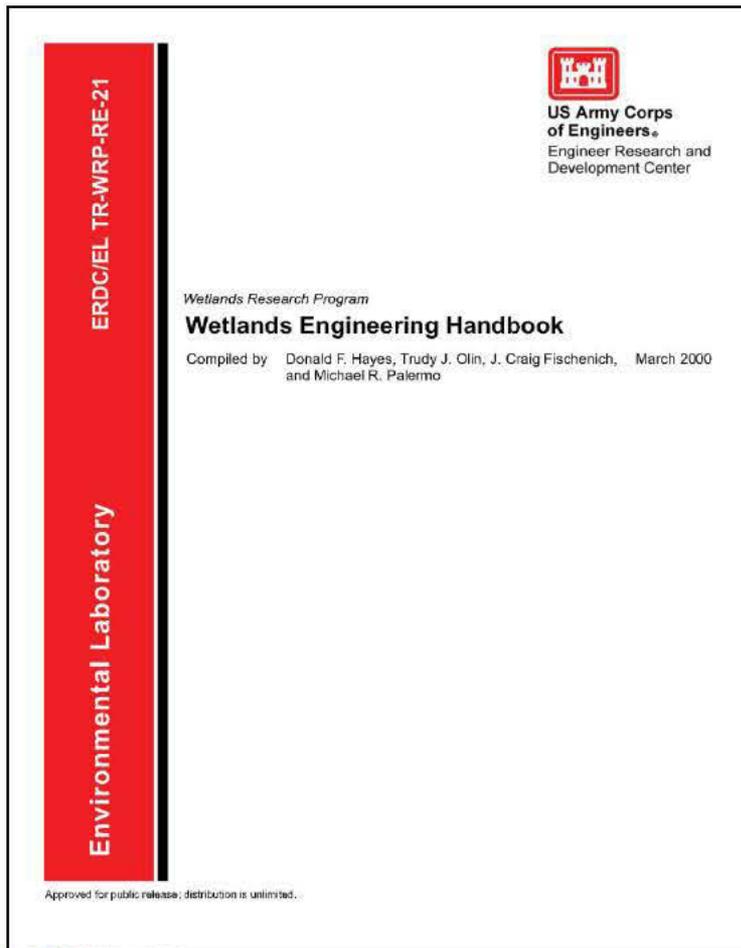


# Guidance on Planning/Funding/Authorities

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# Guidance on



# BU Website

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



# RSM and EWN

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