

# MOREHEAD CITY HARBOR, NC

## Dredged Material Management Plan (DMMP)

Public Meeting/Info Session

15 January 2014



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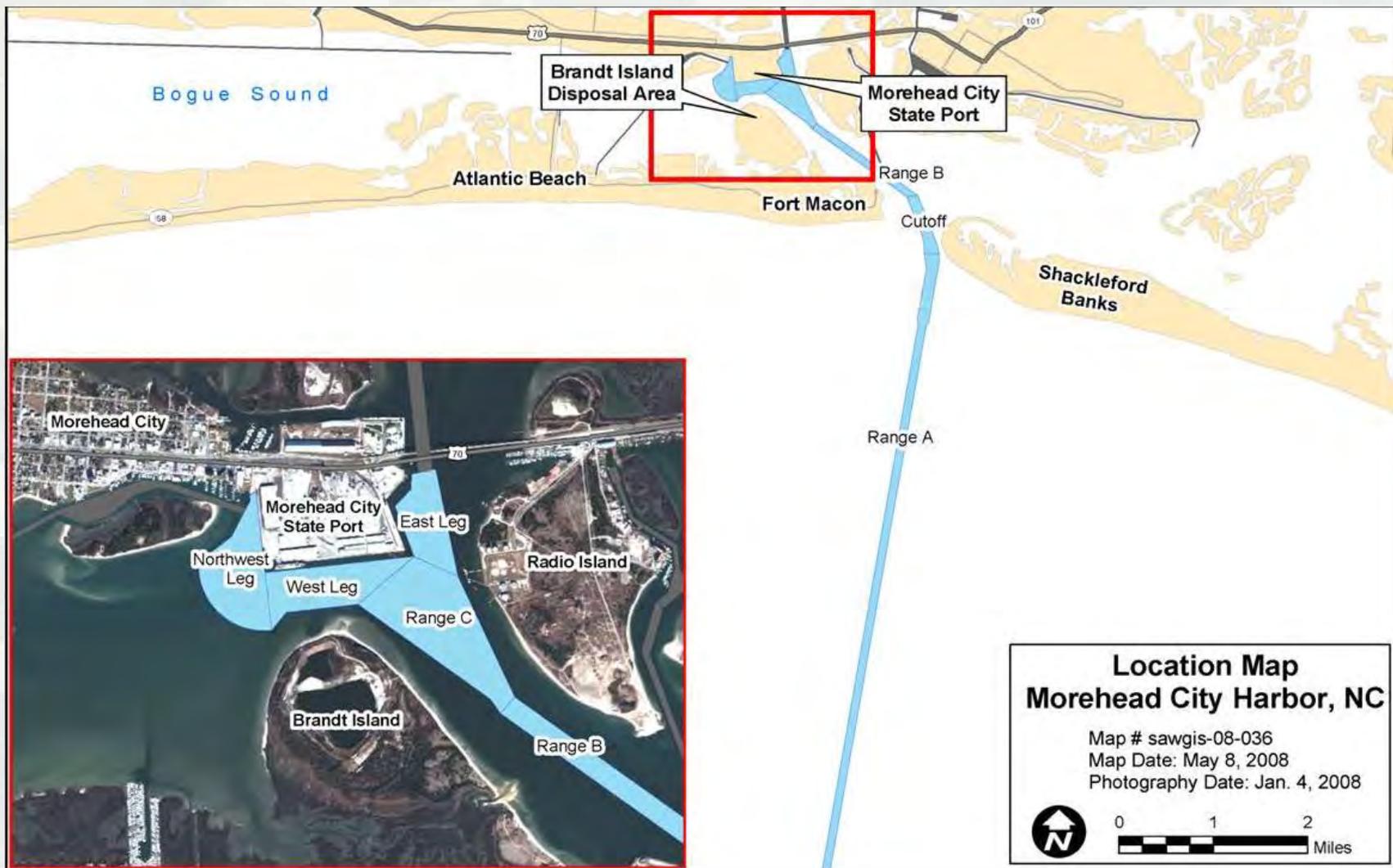
Wilmington  
District

# Morehead City Harbor DMMP Presentation Topics

- Morehead City Harbor Project Area
- DMMP/EIS Process
- Coastal & Sediment Analyses
- Alternatives Analysis
- Recommended Plan
- Environmental Considerations
- DMMP Costs
- DMMP Schedule



# MOREHEAD CITY HARBOR, NC



# DMMP Background

- DMMP is a 20-year disposal plan for dredged material removed during maintenance dredging of the existing authorized channel. It's not a renourishment plan.
- DMMPs cannot consider changes to the project, such as channel deepening, widening, or terminal groins.
- DMMP assumes that we'll have adequate funding to dredge the fully authorized channel dimensions each time we dredge.

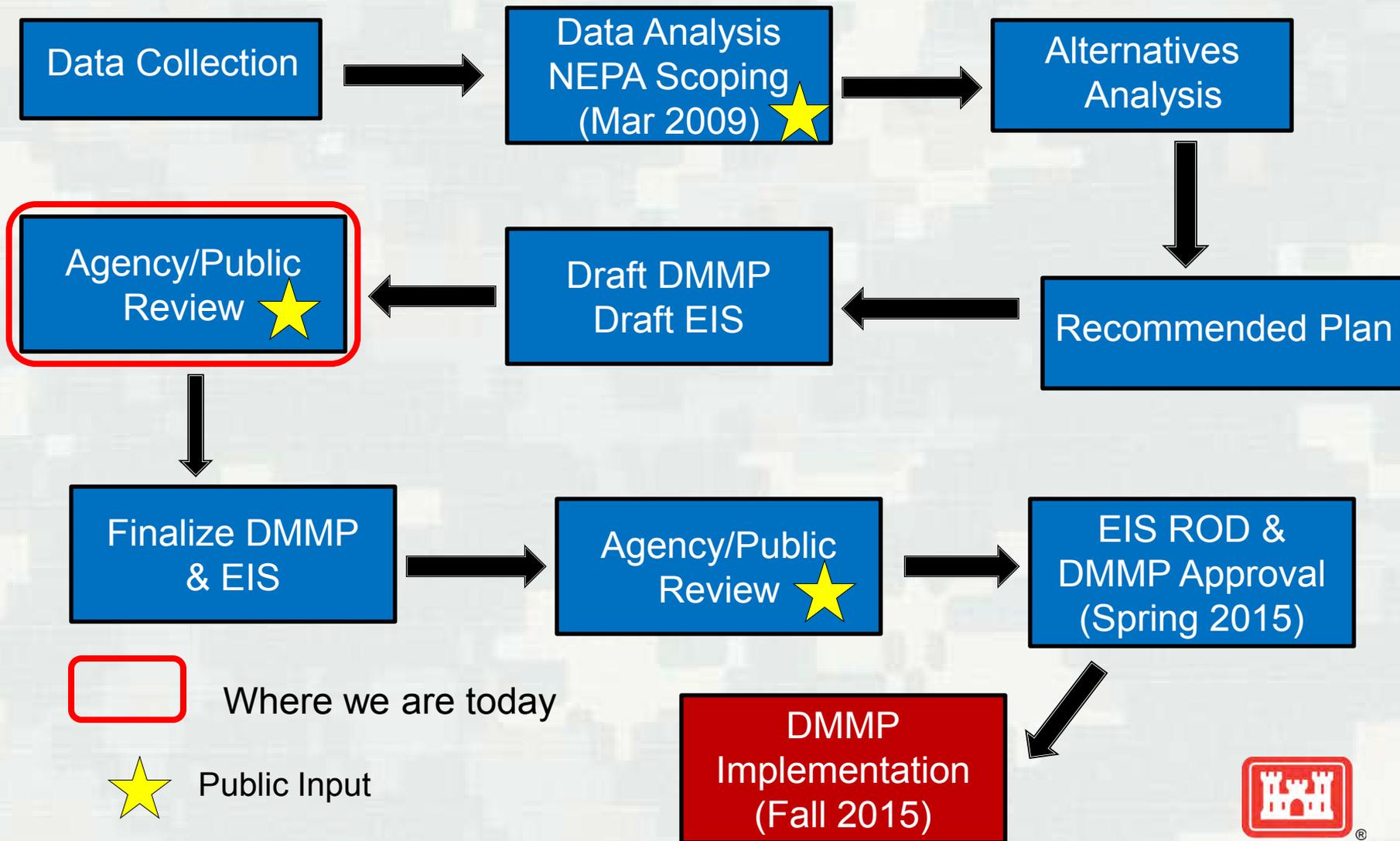
ER 1105-2-100- Federal navigation projects must demonstrate sufficient dredged material disposal capacity for at least 20 years.

ER 1105-2-100 & 33 C.F.R. § 335.7 (Federal Standard) – disposal of dredged material - least costly manner, consistent with sound engineering practices and meeting the environmental standards established by Section 404 of the Clean Water Act and meeting ocean dumping criteria.

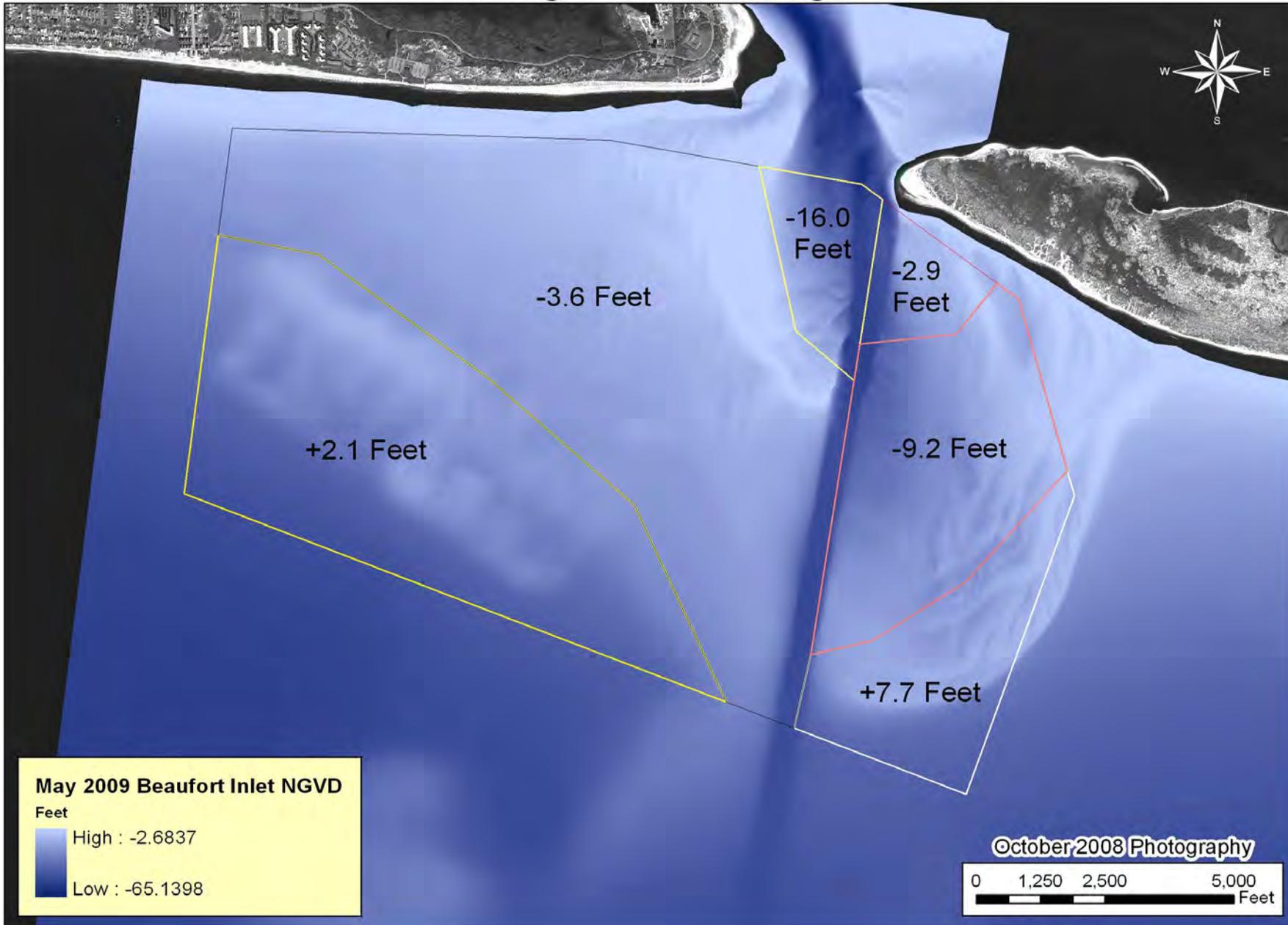
33 CFR 230 – procedures for implementing the National Environmental Policy Act (NEPA) for the Civil Works Program of the U. S. Army Corps of Engineers.



# THE DMMP/NEPA PROCESS

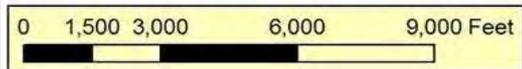


# Average Vertical Change





November 2008 Photography



-  Sand Content  $\Rightarrow$  90% - To be placed in nearshore or beach
-  Sand Content  $\Rightarrow$  80% - To be placed in Nearshore when practicable
-  Sand Content  $\Rightarrow$  80% - To be placed in Nearshore
-  Sand Content  $<$  80% - To be placed in the ODMDS
-  Sand Content  $<$  80% - To be placed in Brandt Island or ODMDS



<b>Morehead City Harbor DMMP Alternatives Investigated</b>			
<b>#</b>	<b>Description</b>	<b>Beneficial Use</b>	<b>Status</b>
1	<b>No Action (No DMMP)</b>	NA	eliminated
2	<b>Proposed DMMP (Measures Considered)</b>		
a	Brandt Island upland disposal site	No	in use
b	Place coarse-grained material ( $\geq 90\%$ sand) on Bogue Banks	Yes	in use
c	Morehead City Ocean Dredged Material Disposal Site (ODMDS)	No	in use
d	Expand nearshore (ebb tide delta) placement area west of Beaufort Inlet	Yes	proposed
e	Create nearshore (ebb tide delta) placement area east of Beaufort Inlet	Yes	proposed
f	Place Inner Harbor material $\geq 80\%$ sand in nearshore placement areas	Yes	possible future option
g	Expand and raise Brandt Island dike	No	possible future option
h	Raise existing Brandt Island dike (no expansion)	No	eliminated
i	Transfer Brandt Island material to ODMDS to regain capacity	No	eliminated
j	Recycle Material in Brandt Island through Hydrocyclone Density Separation	Yes	eliminated
k	Place coarse-grained material ( $\geq 90\%$ sand) on Shackleford Banks	Yes	proposed
l	Continue to use existing nearshore placement area (no expansion)	Yes	eliminated
m	Modify environmental windows	No	eliminated
n	Construct colonial waterbird islands	Yes	eliminated
o	Dispose of dredged material on Radio Island	No	eliminated
p	Dispose of dredged material on Marsh Island	No	eliminated
q	Use dredged material to create wetlands	Yes	eliminated
r	Construct new upland disposal site	No	eliminated
s	Brandt Island shoreline stabilization	Yes	eliminated
t	Construct jetties at Beaufort Inlet	No	eliminated
u	Modify existing groin on west side of Beaufort Inlet	No	eliminated
v	Realign channels to improve navigation and reduce dredging	No	eliminated



# DMMP Plan Formulation (Example)

Outer Harbor (OH) - South Range B , Cutoff, North Range A to sta. 110+00 - sediments ≥ 90% sand									
Measure ID#	Dredging Method	Disposal/Placement Area	Disposal or Placement Capacity (1-5)	Environmental Acceptability (1-5)	Operational Viability (1-5)	Beneficial Use (1-5)	Cost (1-5)	Excluded	Total Score
OH-12	18-inch Pipeline	Brandt Island	2	1	4	1		X	
OH-13	Bucket & Barge	ODMDS	5	4	2	1	4		16
OH-14	Hopper	ODMDS	5	4	5	1	5		20
OH-15	Bucket & Barge	Nearshore West-Existing	4	5	2	4	4	X	19
OH-15a	Bucket & Barge	Nearshore West-expanded	4	5	2	4	4	X	19
OH-15b	Bucket & Barge	Nearshore West-shallow	4	5	2	5	3	X	19
OH-16	hopper	Nearshore West (existing)	4	5	5	4	5		23
OH-16a	hopper	Nearshore West (expanded)	4	5	5	4	5		23
OH-16b	hopper	Nearshore West (expanded shallow)	4	5	4	5	5		23
OH-17	Bucket & Barge	Nearshore East-shallow	4	4	2	5	3	X	18
OH-17a	Bucket & Barge	Nearshore East	4	4	2	4	4	X	18
OH-18	Hopper	Nearshore East-shallow	4	4	4	5	5		22
OH-18a	Hopper	Nearshore East	4	5	5	4	5		23
OH-19	30-inch pipeline	Ft. Macon / Atlantic Beach	5	5	5	5	4		24
OH-19a	30-inch Pipeline	Nearshore West	4	4	5	4	2		19
OH-20	Hopper (pump-out)	Ft. Macon / Atlantic Beach	5	5	4	5	1		20
OH-21	30-inch Pipeline	Shackleford Banks Beach	5	4	5	5	4		23
OH-21a	30-inch Pipeline	Nearshore East	4	4	5	4	2		19
OH-22	Hopper (pump-out)	Shackleford Banks Beach	5	4	4	5	1		19
OH-A	30-inch pipeline	Brandt Island	2	5	4	1		X	
OH-B	30-inch pipeline	Marsh Island or Radio Island	1	5	2	1		X	
OH-C	varies	Modify Environmental Windows	NA	1	NA	NA		X	
OH-D	30-inch pipeline	Construct Waterbird Islands	1	3	4	3		X	
OH-E	30-inch pipeline	Create Wetlands	1	2	3	2		X	
OH-F	varies	Construct New Upland Disposal Site	1	4	4	1		X	
OH-G	varies	Brandt Island Shoreline Stabilization	NA	3	NA	2		X	
OH-H	varies	Reduce Channel Dimensions	NA	5	1	NA		X	

Measure	Reason(s) Measure Eliminated
OH-12, OH-13 and A	Removes coarse-grained sediments( ≥90% sand) from littoral system
OH-13, OH-15/ 15a/15b, OH-17/17b	Operationally not viable (mechanical dredge with scow in open ocean)
OH-14	Removes coarse-grained sediments( ≥90% sand) from littoral system
OH-C	Modifying environmental windows would not benefit long-term management
OH-B, OH-D, OH-E	Does not provide enough capacity for a single dredging event
OH-F	No undeveloped uplands exist in the project vicinity
OH-G	An analysis was performed to determine if stabilizing the north shoreline of Brandt Island would decrease shoaling within the Harbor. Due to the limited change observed during this analysis, a shoreline stabilization measure was not evaluated further.
OH-H	Current commercial navigation traffic requires the full channel dimensions



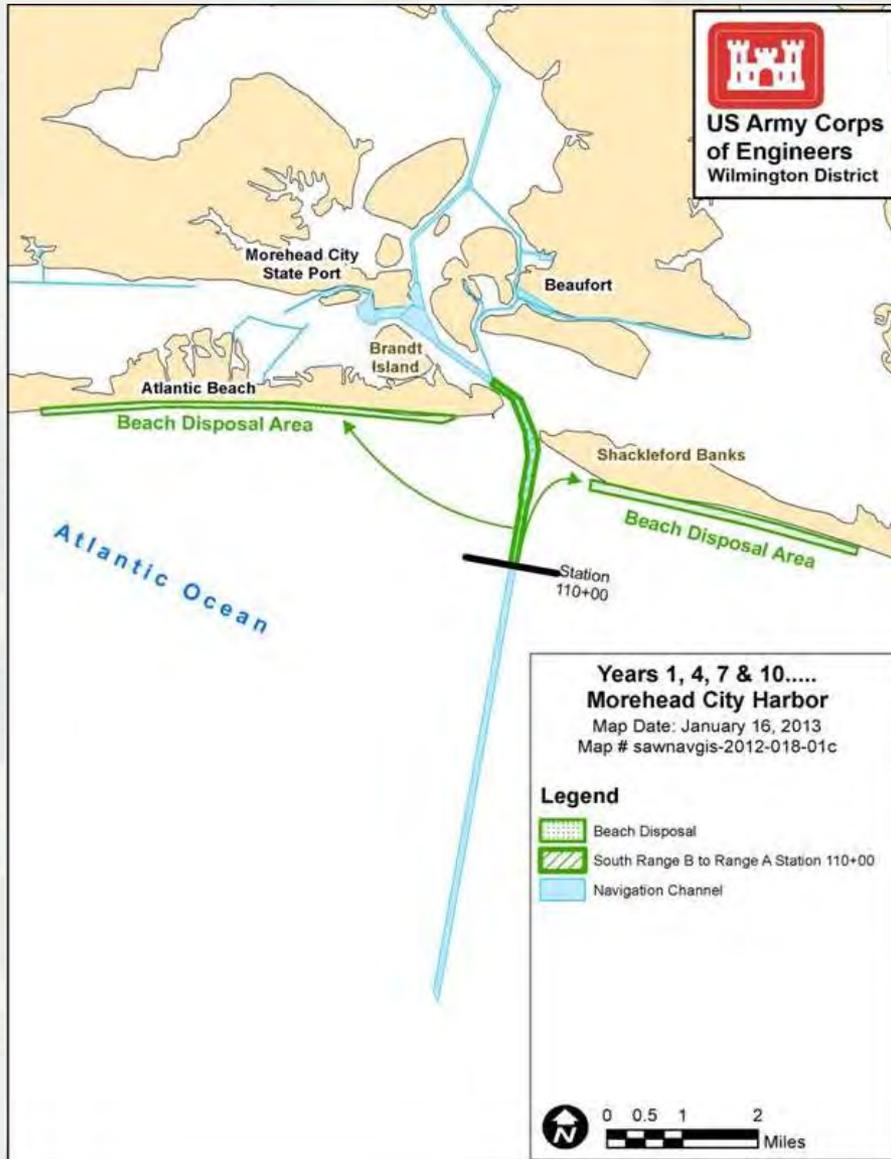
# Recommended Plan

DMMP Cycle	Harbor Section	Navigation Range Dredged	Dredge Plant	Proposed Disposal/Placement Location	Quantity Likely to be Dredged (cy)	Estimated Unit Cost	Estimated Cost (per dredging event) *
Years 1, 4, 7, 10...	Outer	S. Range B, Cutoff, N. Range A to Sta. 110+00	30-inch pipeline	Fort Macon State Park/Atlantic Beach & Shackleford Banks	1,200,000	\$7.82	\$16,791,300
Years 2, 5, 8, 11...	Outer	S. Range C-N. Range B	hopper	Nearshore West & East	346,000	\$4.25	\$6,457,900
	Outer	S. Range B, Cutoff, N. Range A to Sta. 117+00	hopper	Nearshore West & East	650,000	\$4.10	
Years 3, 6, 9, 12 ...	Inner	Northwest Leg, West Leg 1 & East Leg	18-inch pipeline	Brandt Island or ODMDS	362,000	\$4.35	\$10,175,600**
	Inner	West Leg 2 & N. Range C	18-inch pipeline	Brandt Island or ODMDS	152,000	\$4.30	
	Outer	S. Range B, Cutoff, N. Range A to Sta. 117+00	hopper	Nearshore West & East	810,000	\$4.10	
	Outer Entrance Channel	S. Range A, Sta. 110+00 out	hopper	ODMDS	344,000	\$3.50	

\* Costs include monitoring, mob/demob, planning, engineering and design, supervisory and administrative costs and 20% contingency  
 \*\* When Inner Harbor material is disposed of in the ODMDS (once Brandt Island reaches capacity), costs increase to \$12,083,500 per dredging event.



# Years 1,4,7,10....



- Puts the sand back where it came from
- Sand from Shackleford Banks goes back to Shackleford Banks (43%)
- Sand from Bogue Banks goes back to Bogue Banks (57%)



# 2006 - CALO Lighthouse



Before Placement

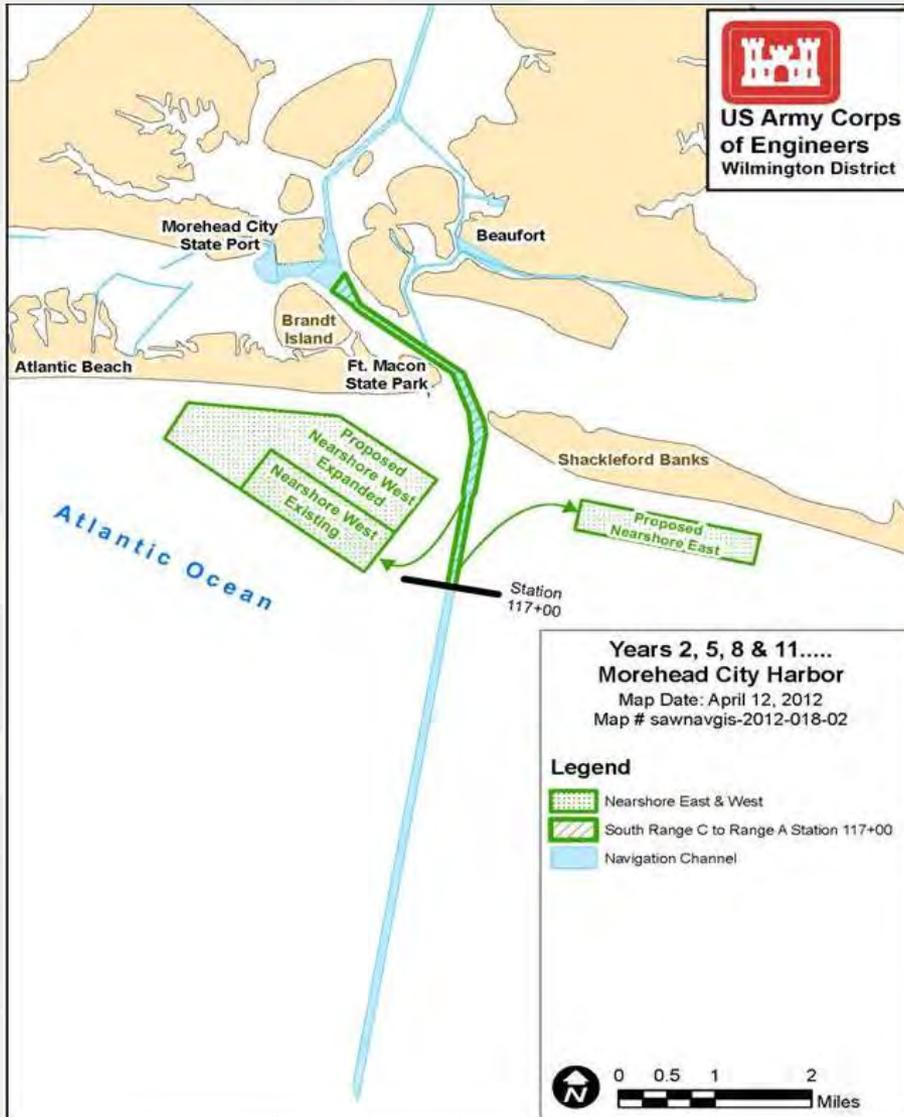


During Placement



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# Years 2,5,8,11.....



- Puts the sand back where it came from

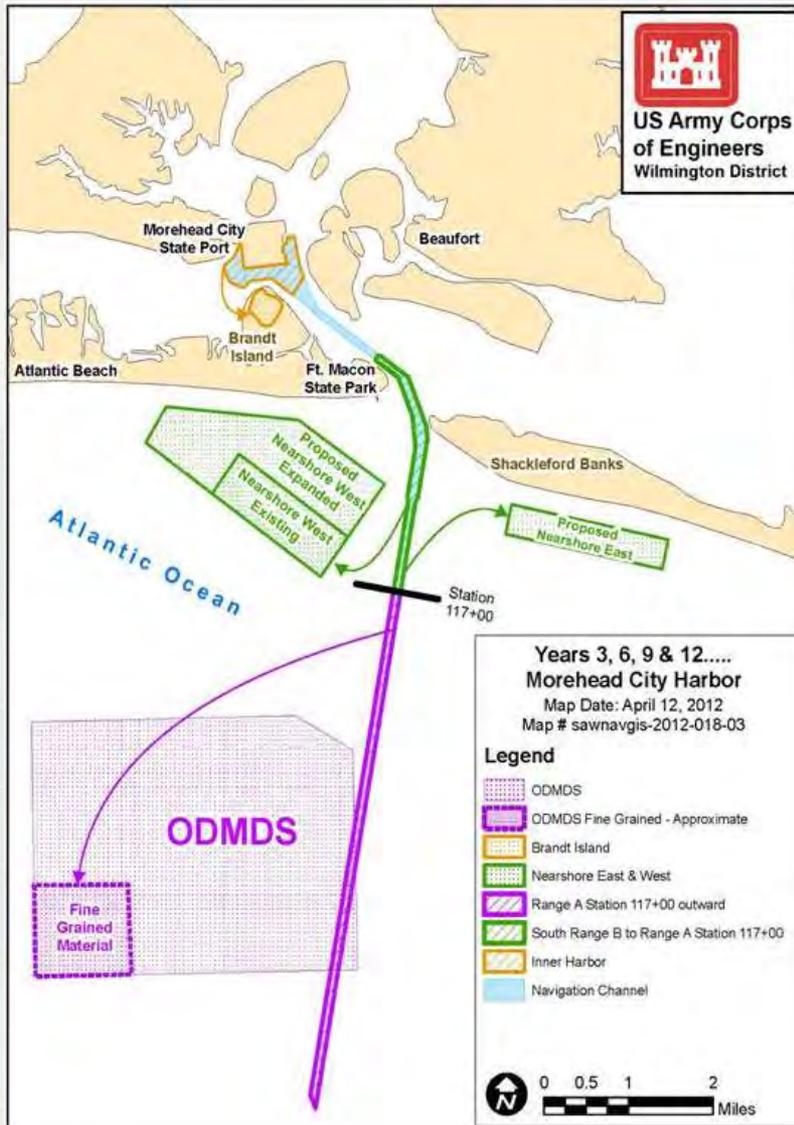
- Based on calculated losses, about 22% of the sand will be placed in the Nearshore East

- About 78% of sand will be placed in the Nearshore West

Proposed  
Nearshore East



# Years 3,6,9,12.....



- Sand placed in the nearshore areas based on losses
- Inner Harbor fine-grained material to Brandt Island
- Outer Entrance Channel material to the ODMDS



# Physical Monitoring Plan

- Biannual profile surveys of the eastern 53,000 feet of Bogue Banks
- Annual profile surveys of Shackleford Banks
- Pre- and Post placement surveys of the nearshore placement areas (minimum 1 annually)
- Directional wave measurements within the Beaufort Inlet complex
- Biennial bathymetric surveys of Beaufort Inlet
- Post placement sediment sampling to monitor evolution within the nearshore placement areas



# Key Environmental Considerations

## Based on Analysis of Coastal (Littoral Zone) Processes

- Ebb tide delta has historically lost volume due to removal of material from the system.
- DMMP plan to return dredged sediment back to its point of origin in order to reduce future erosion by retaining sand within the Beaufort Inlet complex.
- Since the 70's, Bogue Banks has received over 16 million cubic yards of sand from channel dredging, which has reduced potential shoreline impacts related to the navigation channel; Shackleford Banks has not and has significantly eroded.



# Key Environmental Considerations

- **Sediment Compatibility**

- The characteristics of the dredged material dictate where disposal of that material will be permitted.
- Only beach compatible sediment on beaches – beaches recover quickly so impacts are minor.

- **NPS Options**

- Dependent on NPS requirements and Special Use Permit (SUP).
- Disposal on Shackleford limited to the volumetric losses attributed to navigation dredging & NPS can opt out of receiving sand at any time.
- Impacts limited to beachfront only. Equipment (dozers, pipeline sections, etc.) must be walked during low tide along the beach strand to the disposal area.



# Economic Summary

- ❑ **DMMP Implementation = \$12.9 million/year**
- ❑ **Annual MHC budget = \$4-\$6 million/year**
- **DMMP demonstrates that we have capacity for at least the next 20 years for all the material in the channel.**
- **Current budget does not allow for dredging of all the shoaled material.**
- **DMMP must remain flexible to meet navigation needs**
- **DMMP is a plan, not a commitment**



# Morehead City Harbor DMMP Next Steps/Schedule

<u>Task</u>	<u>Completion Date</u>
Public Review of Draft DMMP/EIS	<b>3 Feb 2014</b>
Finalize DMMP/EIS	Summer 2014
Public Review of Final DMMP/EIS	Fall 2014
Final DMMP Approved by SAD	Spring 2015

**Submit comments tonight at info stations or  
by 3 Feb 2014 to:**

U.S. Army Corps of Engineers, Wilmington District  
ATTN: Mr. Hugh Heine (CESAW-TS-PE)  
69 Darlington Avenue  
Wilmington, North Carolina 28403  
Telephone: (910) 251-4070  
E-mail: [hugh.heine@usace.army .mil](mailto:hugh.heine@usace.army.mil).



**For questions or comments, please visit one of the Information Stations after the NPS presentation.**

**Draft DMMP Report:**

**<http://www.saw.usace.army.mil/Missions/Navigation/Dredging/MoreheadCityHarbor.aspx>**



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