

# SEDIMENT CHARACTERISTICS OF NEW JERSEY'S COASTAL WATERWAYS

Phase I: Atlantic/Burlington, Cape May, Monmouth, &  
Ocean Counties

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# Overview

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Purpose: Regional-scale framework and baseline study of New Jersey's coastal waterways.

- **Location**
- **Project 1: Site Selection, Classification, & Sediment Analysis**
- **Project 2: Bayfloor Sediment Distribution & Shoaling Analysis**
- **Results:**
  - **Priority Sites**
- **Findings for Cape May County**
  - **Priority Areas**
  - **Recommended Channel Dredging**

# Regional-Scale Review

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# Project 1: Tasks

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- **Compile database of dredged material disposal sites including: location, ownership, condition, and capacity;**
- **Classify sites to assist in establishing priorities;**
- **Define sediment texture;**
- **Calculate the total volume of sediments; and**
- **Prioritize relative importance of each site with respect to maintaining navigability along the NJIWW, Shark River, and the Navesink and Shrewsbury estuaries.**



# Classification of Identified Sites

**Confined Disposal Facilities (CDF) - those with current multiple uses**



**Confined Disposal Sites (CDS) - those without current use, but with confining walls**



**Unconfined Disposal Sites (UDS) - those without confinement walls and no recent use**



**Uplands Island (UI) – natural feature**



**Other - those sites that were determined to originate from other than placing dredge material on the salt marshes**

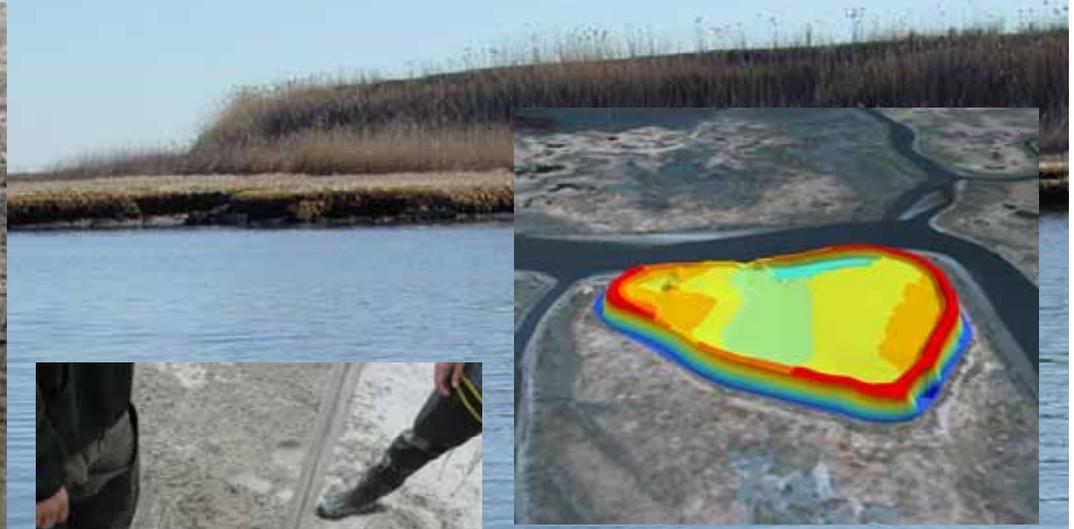


# Field Mapping, Sediment Composition, & Volume Calculations

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**Site Investigation -  
2 cm vertical accuracy**



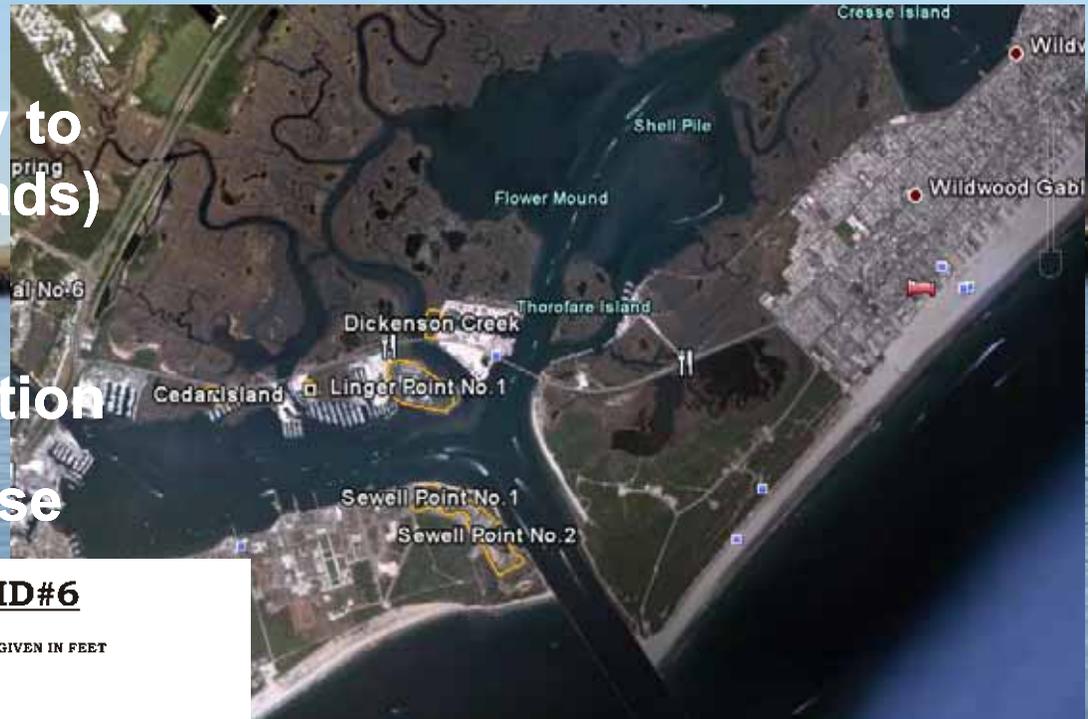
**Volume –  
Above compressed  
salt marsh surface**



**Sediments –  
% sand, silt, mud**

# Priority Sites

- Location (proximity to waterways and/or roads)
- Size/Capacity
- Sediment Composition
- Past and Current Use



## LINGER POINT 1 ID#6

### SITE #3

NOTE: MEASUREMENTS GIVEN IN FEET

DATE = 2/6/08

PENETRATING DEPTH = 9.5ft

CORE (RECOVERY) = Auger = 6.0ft Piston = 3.5ft

3 samples taken with auger and 1 piston core

#### STRATIGRAPHY NOTES:

OVERALL RESULTS: PERCENT SILT/CLAY = 9.9%

PERCENT SAND = 90.1%

Tan Sand Avg. = 2.25phi

Auger NOTE: NOT TO SCALE

<b>T</b>	2.4ft Medium Sand w/Shell Fragments (Grey)	3.6ft Fine Sand (Grey)	<b>B</b>
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Piston NOTE: NOT TO SCALE

<b>T</b>	0.2ft Fine Muddy Sand (Grey)	1.5ft Fine Sand (Tan/Grey)	0.2ft Interlocked Sand and Mud (Grey)	0.4ft Fine Sand (Tan/Brown)	0.6ft Interlocked Sand and Mud (Grey)	<b>B</b>
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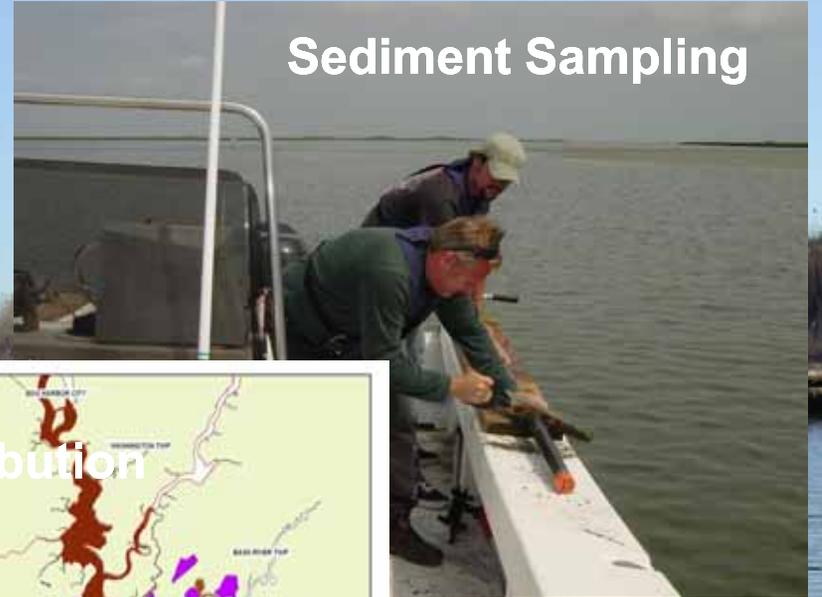
# Project 2: Tasks

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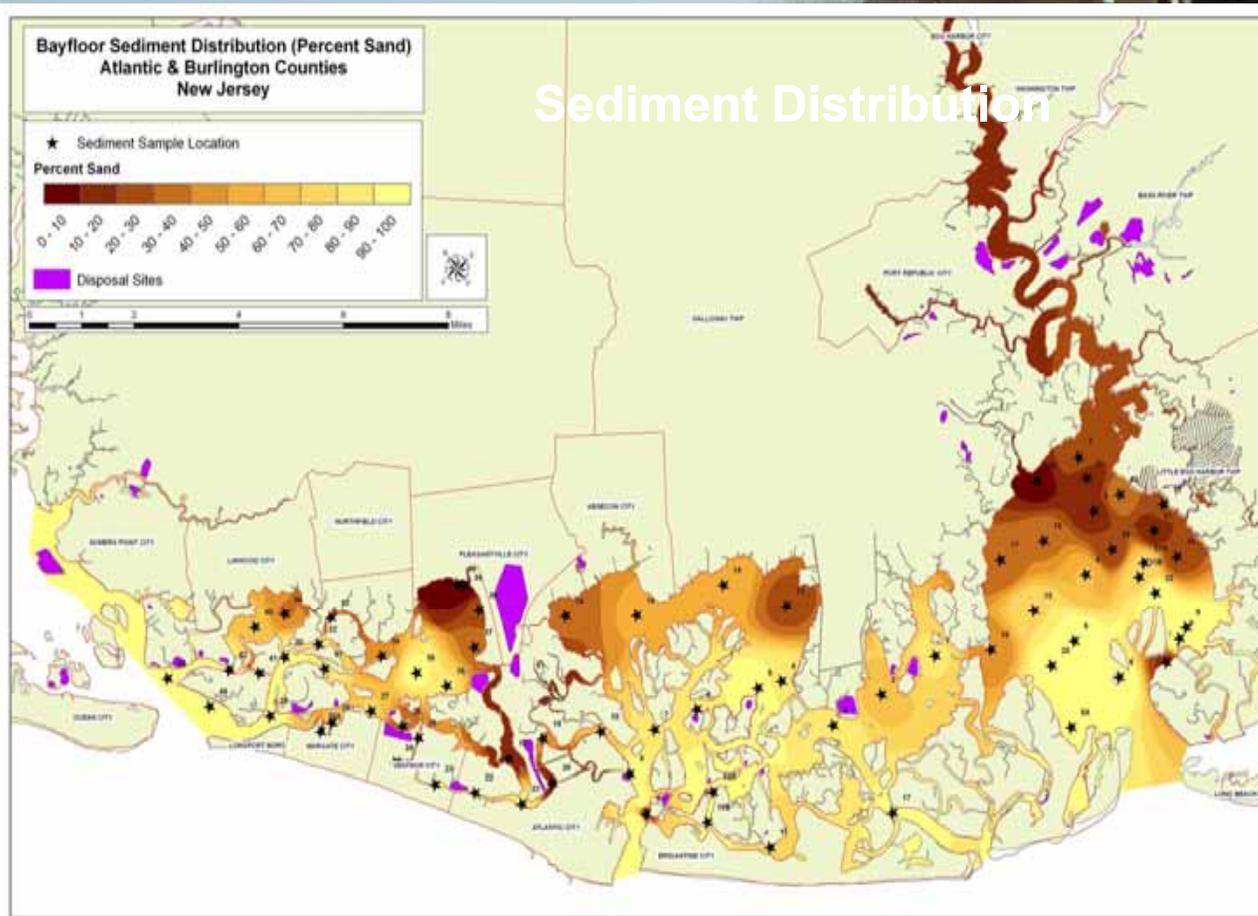
- Define bayfloor character through sediment sampling;
- Map existing sediment distribution;
- Examine previous dredging data;
- Conduct shoaling analyses to identify and prioritize areas in need of maintenance dredging; and
- Use spatial data analysis and modeling to determine sites suitable for potential dredged material processing centers & to prioritize maintenance dredging activities

# Bayfloor Characterization

Sediment Sampling



Sediment Distribution



Project 2: Bayfloor

# Bay Sediments

*More Sandy and Layered with Mud*

**PURE SAND**

**MIXED LAYERS**

**OCCASIONAL  
SAND LAYERS**

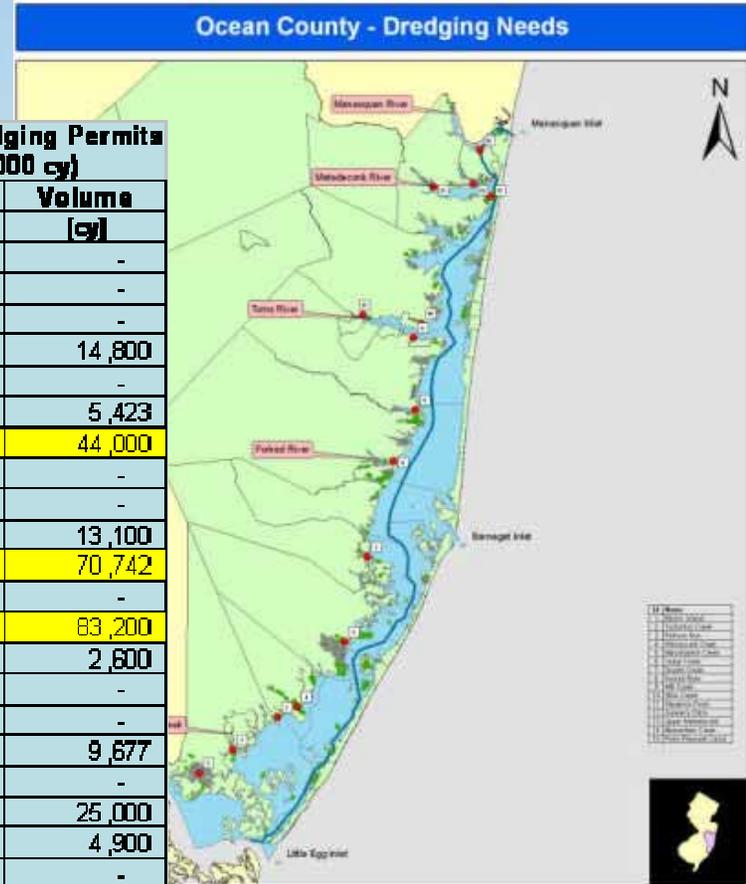


**Closer to Inlets...**

**...Further from Inlets**

# Maintenance Dredging

Municipality	Open Water Area [ac]	All Dredging Permits		Large Dredging Permits (+1,000 cy)	
		Permits	Volume [cy]	Permits	Volume [cy]
Barnegat Light Borough	306	-	-	-	-
Barnegat Township	3,896	4	400	-	-
Bay Head Borough	84	-	-	-	-
Beach Haven Borough	880	3	14,863	2	14,800
Beachwood Borough	7	-	-	-	-
Berkeley Township	7,187	10	7,492	2	5,423
Brick Township	4,367	29	46,812	7	44,000
Eagleswood Township	1,761	2	565	-	-
Harvey Cedars Borough	517	1	400	-	-
Island Heights Borough	184	5	13,565	3	13,100
Lacey Township	10,050	35	72,931	9	70,742
Lavallette Borough	130	3	451	-	-
Little Egg Harbor Township	16,529	54	88,936	3	83,200
Long Beach Township	11,691	6	3,455	1	2,600
Mantoloking Borough	142	-	-	-	-
Ocean Gate Borough	66	2	2,000	-	-
Ocean Township	6,686	8	10,587	3	9,677
Pine Beach Borough	8	1	190	-	-
Point Pleasant Beach Borough	224	1	25,000	1	25,000
Point Pleasant Borough	451	5	6,014	1	4,900
Seaside Heights Borough	73	-	-	-	-
Seaside Park Borough	258	1	650	-	-
Ship Bottom Borough	182	1	2,000	1	2,000
South Toms River Borough	60	-	-	-	-
Stafford Township	5,215	2	142	-	-
Surf City Borough	372	-	-	-	-
Toms River Township (Dover)	7,584	20	11,619	3	8,100
Tuckerton Borough	178	10	13,182	2	12,400
<b>Total</b>	<b>79,087</b>	<b>203</b>	<b>321,254</b>	<b>38</b>	<b>295,942</b>



Project 2: Shoaling Analysis

# Regional Results

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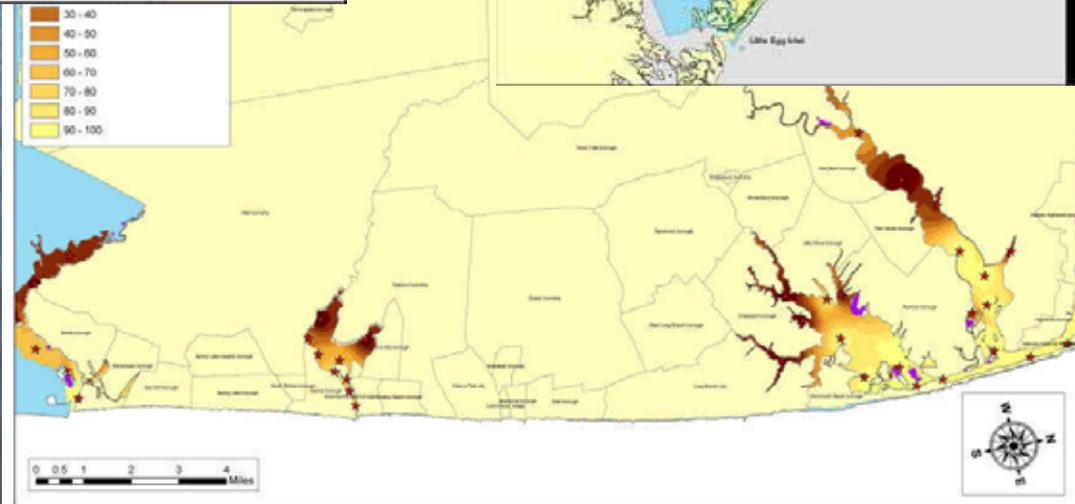
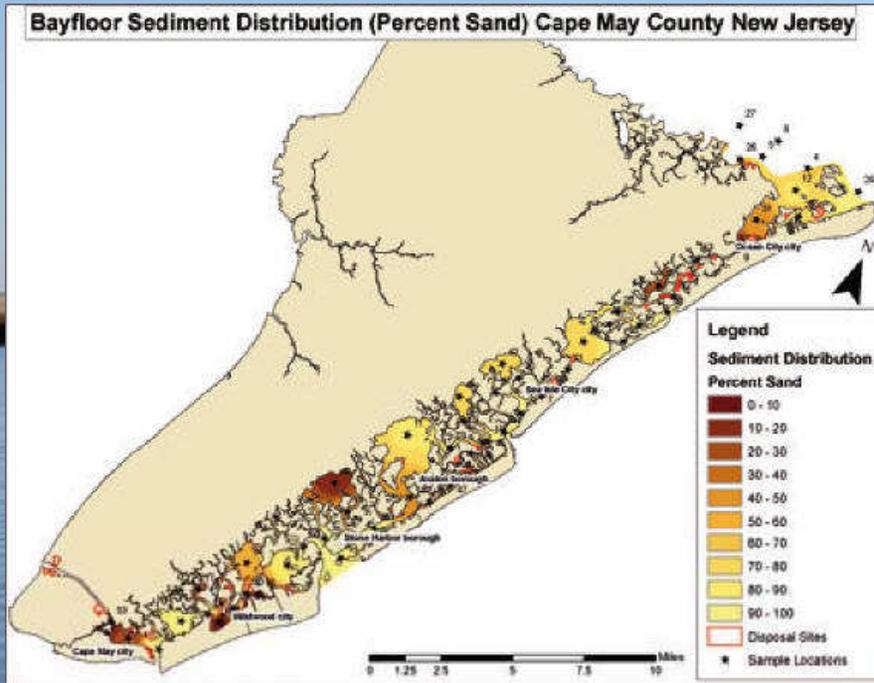
**Total Sites Identified = 236**

**Auger/Piston Cores = 139**

**Priority Sites = 25**

County	CDF	CDS	UDS	UI/Other	Priority
Atlantic/Burlington	6		56	1	6
Cape May	26	14	24	7	11
Monmouth (bay waters)	1	2	7		2
Ocean	7	11	74		6

# Regional Results

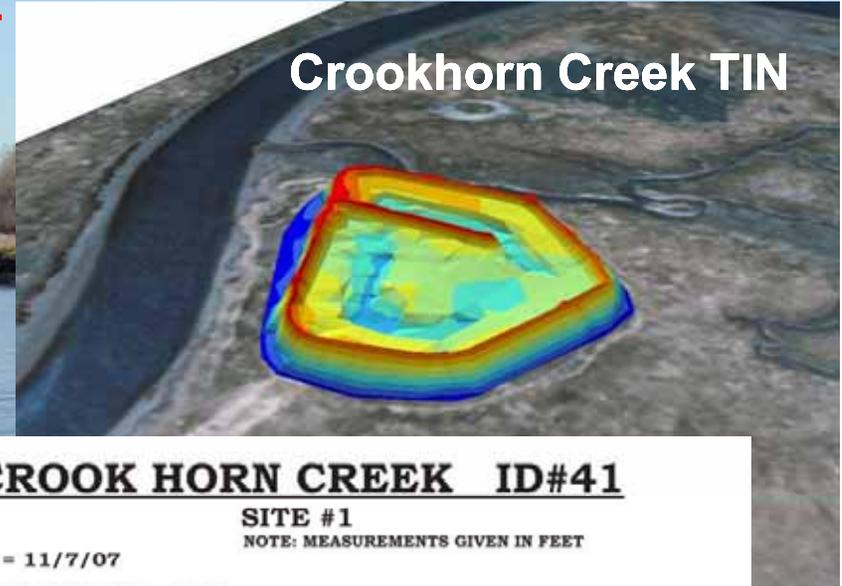


Sediment Distribution

# Cape May County

## Priority Sites

- Linger Point (1 & 2)
- Shaw Island
- Gravens Thorofare (1)
- Ludlam Thorofare (1 & 2)
- Devils Island
- Crook Horn Creek
- Clubhouse Lagoon (1)
- Sanctuary Island



Crookhorn Creek TIN

### CROOK HORN CREEK ID#41

#### SITE #1

NOTE: MEASUREMENTS GIVEN IN FEET

DATE = 11/7/07

PENETRATING DEPTH = 11.0ft

CORE (RECOVERY) = Auger 3.0ft = Piston = 13.7ft

2 surface samples taken with auger and 3 piston cores

STRATIGRAPHY NOTES: Salt Marsh contact at 9.6ft. Some Recored Material.

OVERALL RESULTS: PERCENT SILT/CLAY = 12.4%

PERCENT SAND = 87.6%

Grey Sand Avg. = 3.00phi

NOTE: NOT TO SCALE

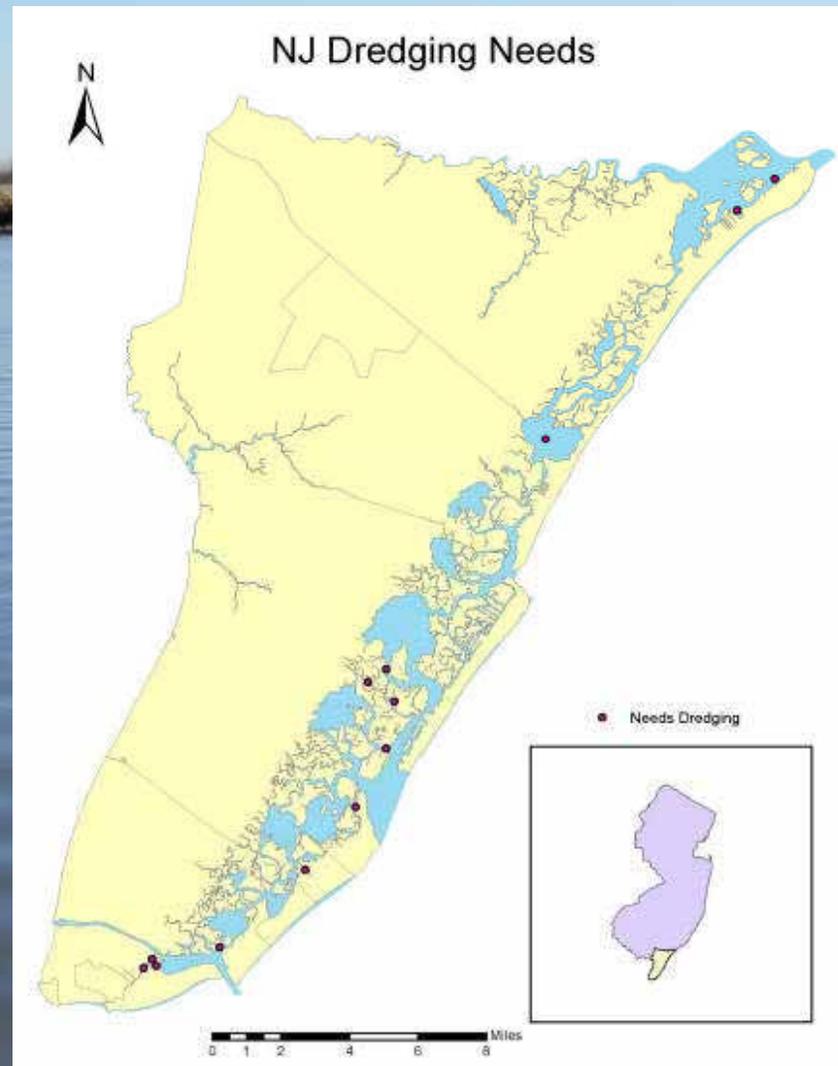
Core #1	0.3ft	0.4ft	0.6ft	0.1ft	1.7ft	0.1ft	0.2ft	0.1ft	0.5ft	0.6ft	
<b>T</b>	Muddy Fine Sand	Sandy Mud	Dark Mud	Trains to sand	Fine Sand (Grey)	Coarse Sand w/Shell Frag.	Muddy Fine Sand	Dark Mud w/Roots	Muddy Fine Sand	Fine Sand (Grey)	<b>B</b>
Core #2	1.9ft Slightly Mucky Fine Sand w/Roots (Grey)					1.5ft Fine Sand (Grey)					<b>B</b>
	RECORE										
Core #3	2.4ft	0.1ft	0.3ft	0.2ft	0.7ft	0.1ft	0.3ft	0.1ft	0.5ft	0.7ft	<b>B</b>
<b>T</b>	Fine Sand (Grey)	Sandy Mud	Fine Sand (Grey)	Sandy Mud w/Shell Frag.	Fine Sand (Grey)	Sandy Mud	Fine Sand (Grey)	Sandy Mud	Fine Sand (Grey)	Salt Marsh	

# Cape May County

## Priority Dredging Areas

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Cape May Harbor  
Ludlam Bay  
Crook Horn Creek  
Devils Reach  
Schellenger Creek  
Spicers Creek  
Middle Thorofare  
Ottens Harbor  
Beach Creek  
Great Flat Thorofare  
Stone Harbor Canal  
Scotch Bonnet  
Cressee Thorofare  
Venetian Bayou  
Beach Thorofare  
Ludlam Thorofare



# Questions?



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BOAT  
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