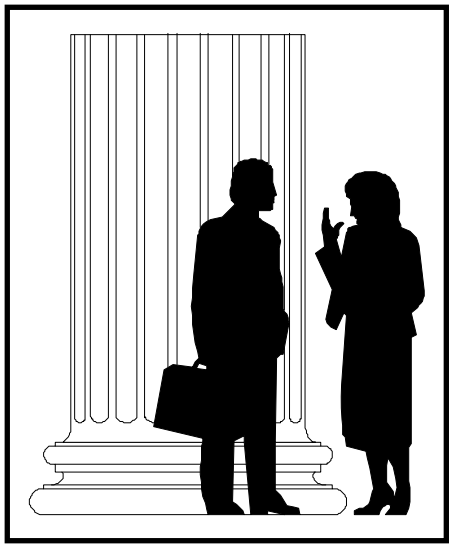
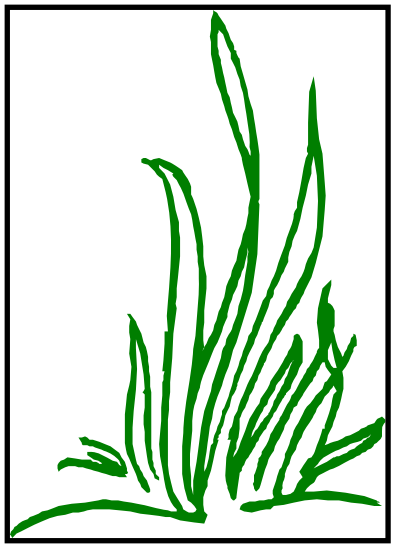
Marsh Building
Finding the Match





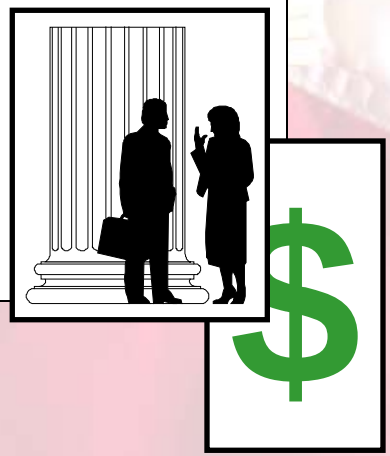
U.S. Army Corps of Engineers, NY District

Megan Jadrosich, Project Manager

October 29, 2008

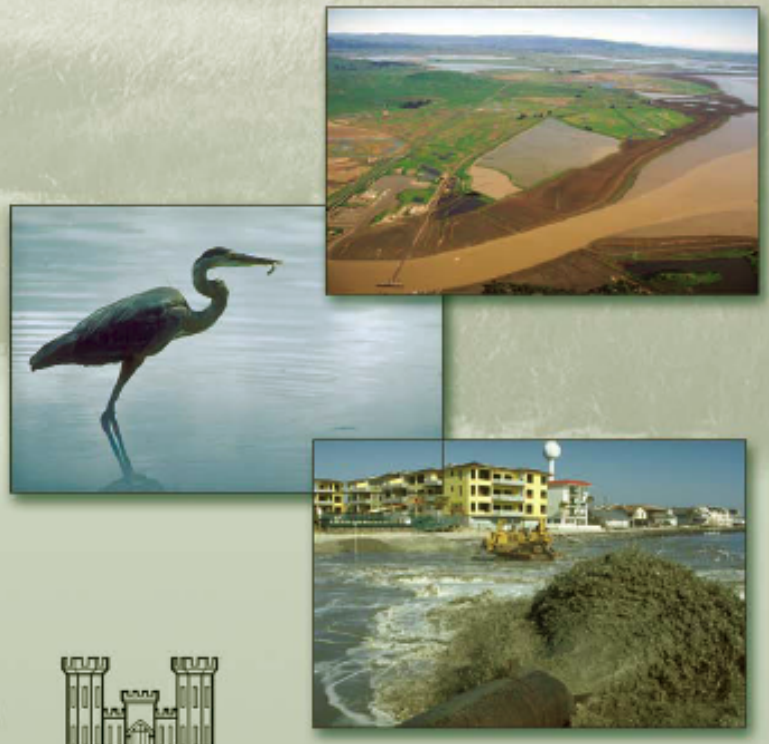
USACE Programs

- **Section 204/207 Beneficial Use of Dredged Material – Regional Sediment Management** – *65% Fed 35% NFed*
- **Section 206/1135 Aquatic Ecosystem Restoration**
- **Betterment** – *100% NFed*
- **Support for Others** – *100% NFed*
- **General Investigations**



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, Wash

U.S. Army Corps of Engineers, Washington, D

JAMAICA BAY MARSH ISLANDS, JAMAICA BAY, NEW YORK

INTEGRATED ECOSYSTEM RESTORATION REPORT
ENVIRONMENTAL ASSESSMENT
AND
FINDING OF NO SIGNIFICANT IMPACT

US Army Corps of Engineers New York District

December 2005

Jamaica Bay Project Support

USACE Marsh Island Restoration Interagency Team:

The Port Authority of New York & New Jersey

New York State Department of Environmental Conservation

New York City Department of Environmental Protection

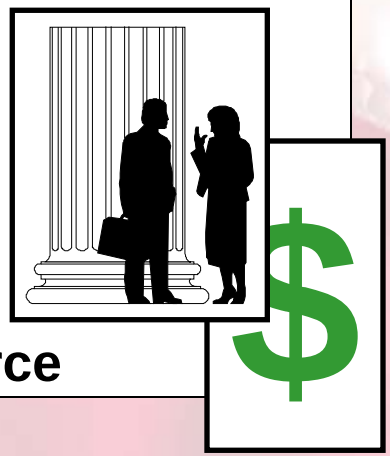
National Park Service

Native Plant Material:

USDA-Natural Resources Conservation Service

Other Agency Support

Environmental Organizations – Jamaica Bay Task Force



Partnerships

- **Other Funding Sources**
- **Partnership Framework**
- **Local Initiative**

Planning – Construction - Monitoring

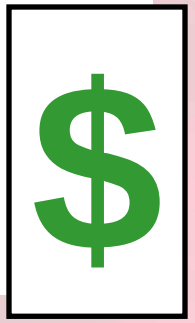
Explore Ideas:

The Corporate Wetlands Restoration Partnership
The Cooperative Institute for Coastal and Estuarine Environmental Technology
NOAA - Community-based Restoration Program
NRCS Wetland Reserve Program
Chesapeake Bay Program
Ducks Unlimited
Native Plant Nursery – Volunteer Plantings?

COST

COST per ACRE

COST per HABITAT UNIT



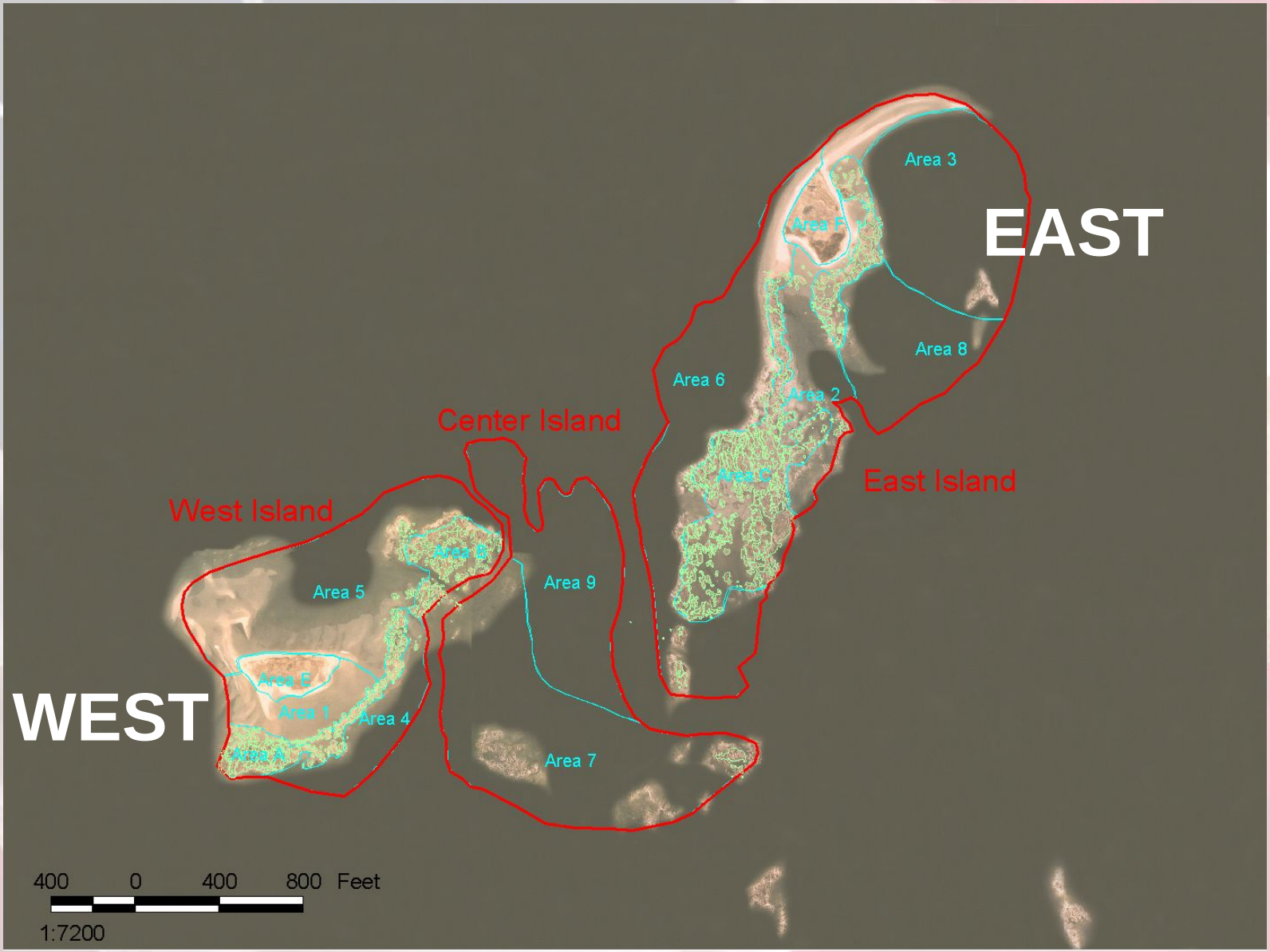
Overview of Ongoing Jamaica Bay Efforts

Jamaica Bay Ecosystem Restoration

CAP Projects (1135)

Marsh Island Sites

Elder's Point – Area Identification



Elders Point East Design

42.69 acres

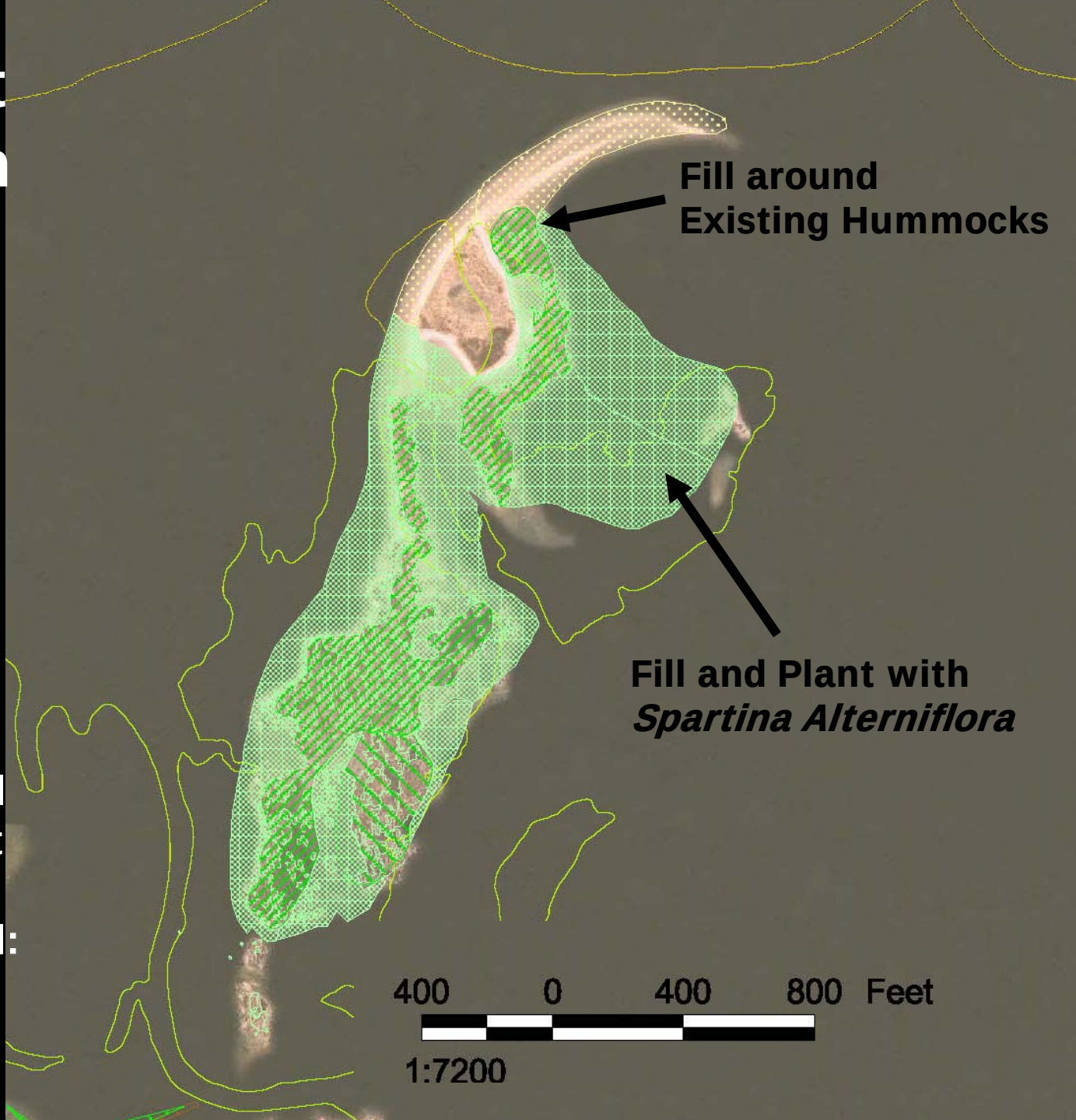
248,500 cy

750,000 plants

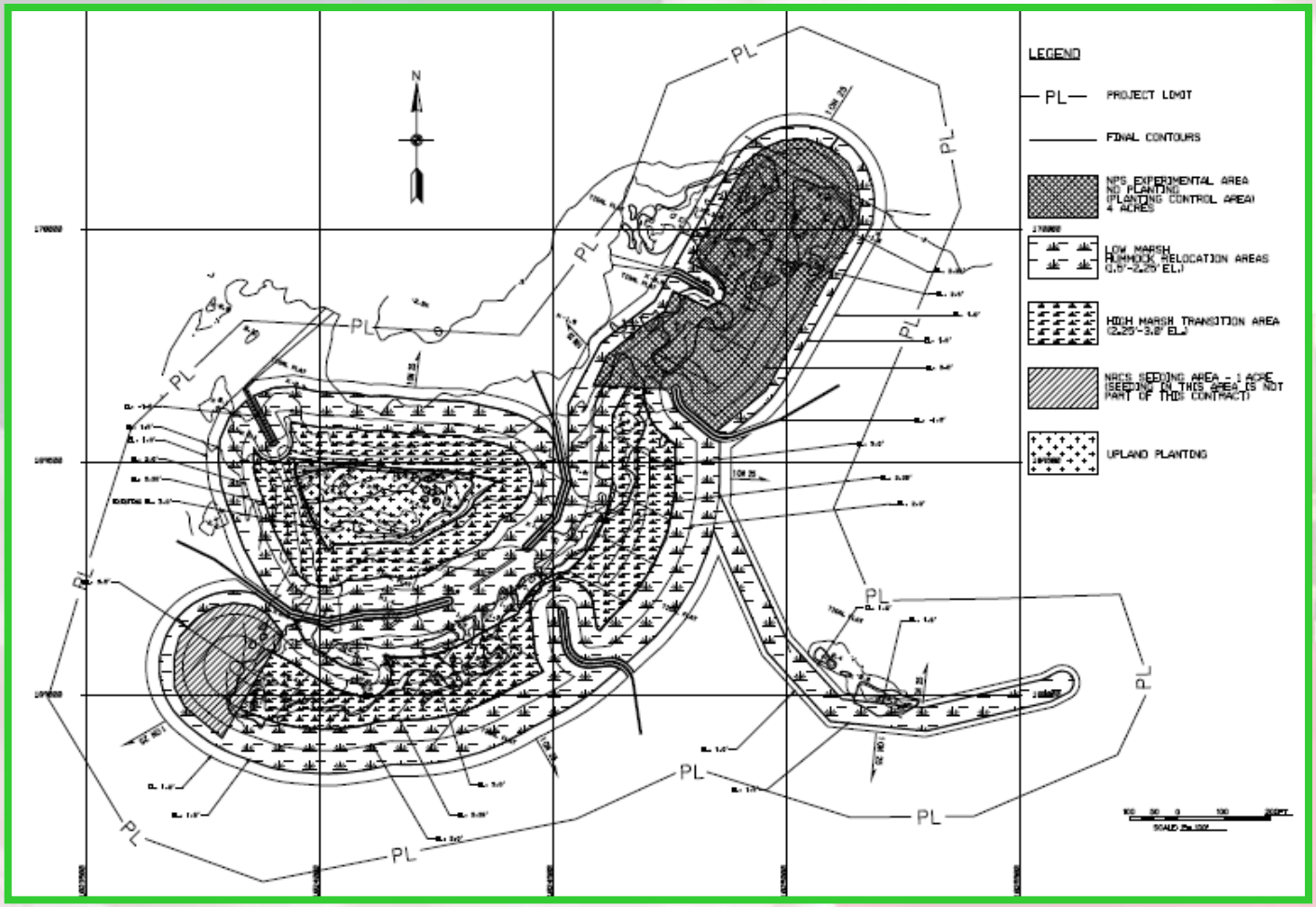
$16 million

Sand Sources:

1. Rockaway Inlet Maintenance
2. Ambrose Navigation Channel (NY/NJ Harbor 50 ft Deepening Project)
3. Ambrose Channel: Private Mining Co.



Elders Point West

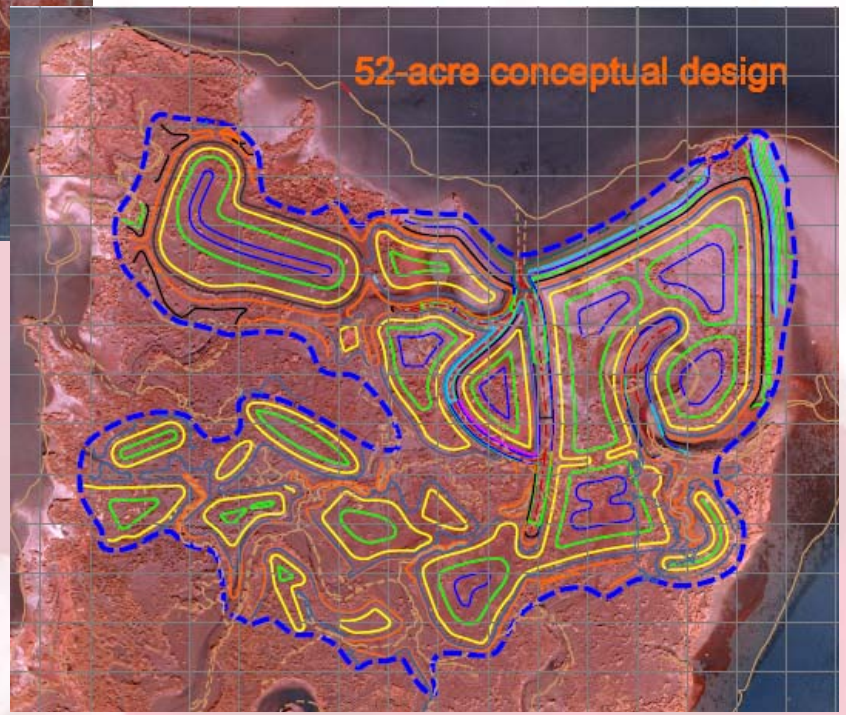


Yellow Bar Hassock

EXISTING CONDITIONS

Photo courtesy of NPS

Yellow Bar Preliminary Designs



Material Source

NY-NJ Harbor Deepening Project

Inlet or Harbor Maintenance

Upland Borrow Site

Offshore Borrow Area?

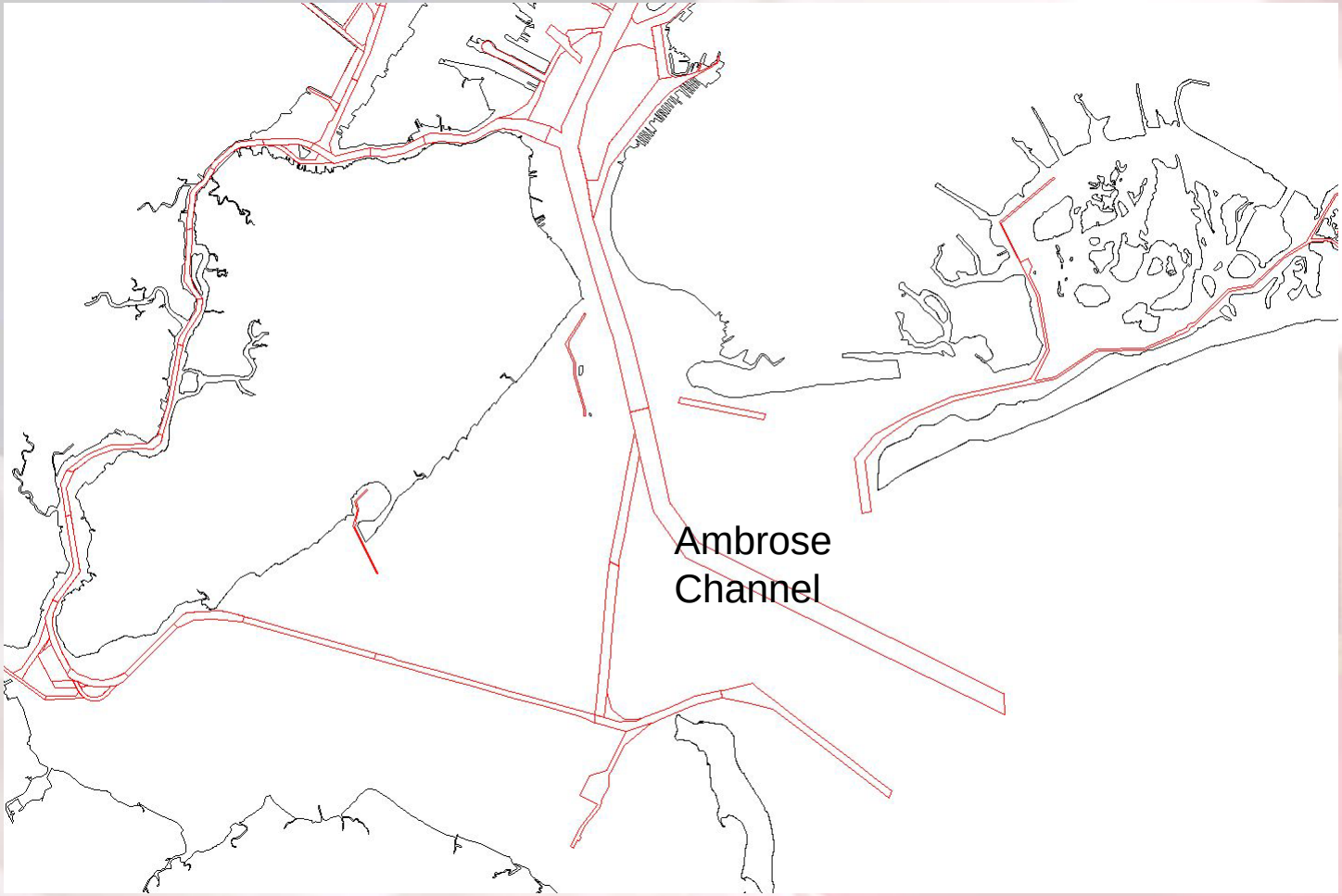
~~Bay Channels?~~

$

50 Foot Deepening Project

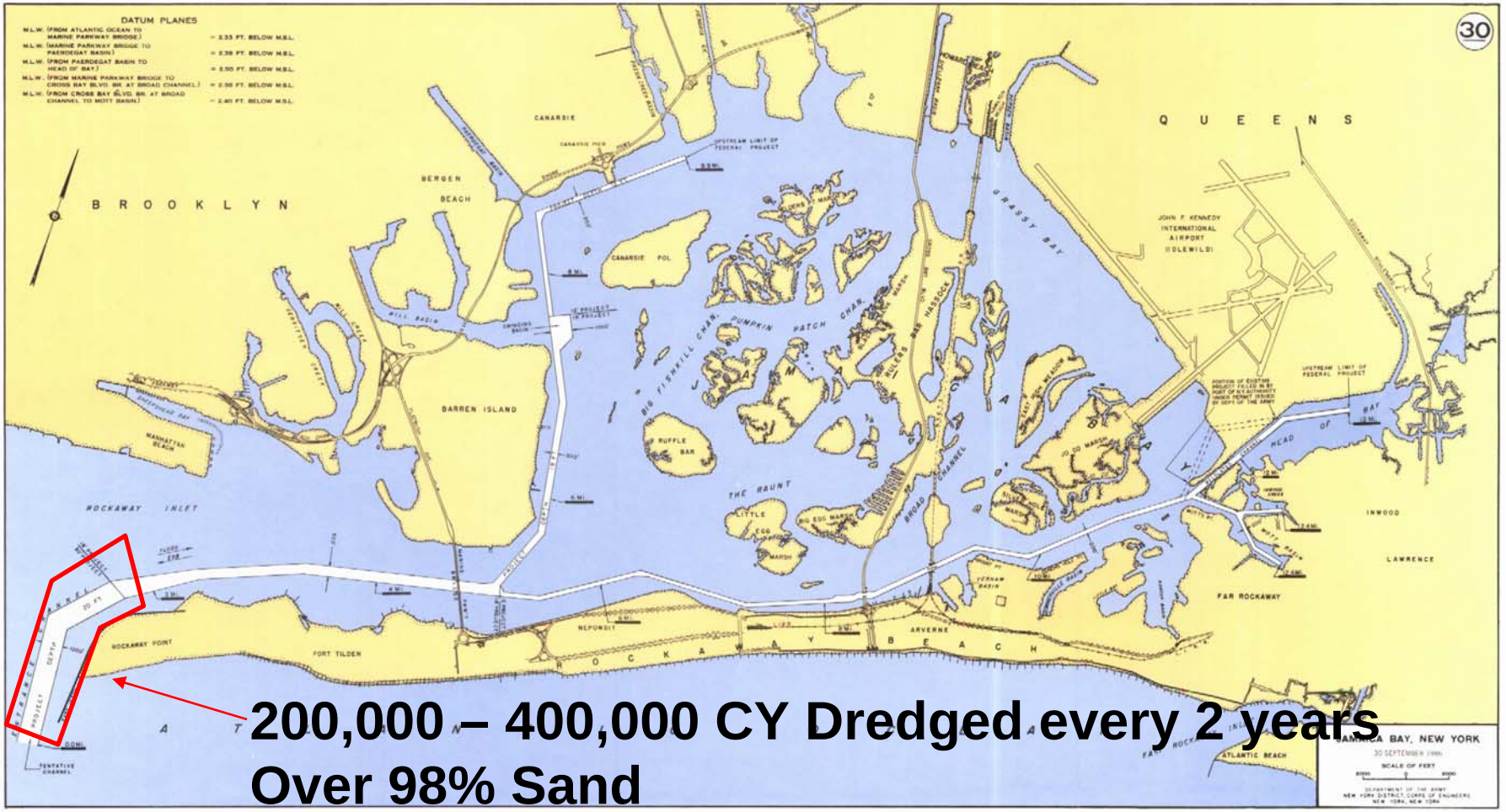
SEDIMENT SOURCE

Ambrose Channel Dredging



SEDIMENT SOURCE

Rockaway Inlet Dredging



200,000 – 400,000 CY Dredged every 2 years

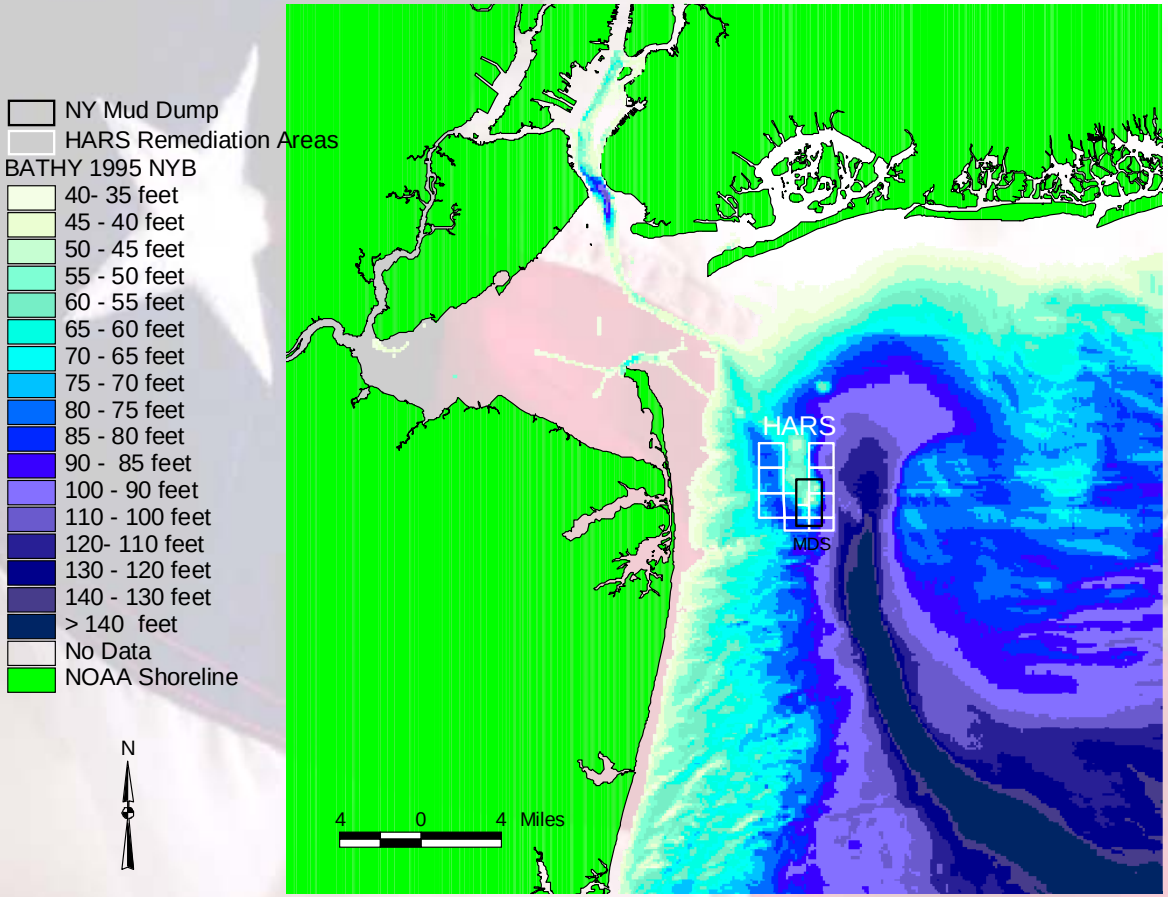
Over 98% Sand

Dredging scheduled for Sep – Mar 2008/2009

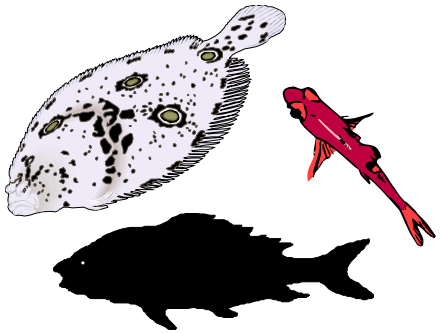
Navigation Channel Survey

Historic Area Remediation Site

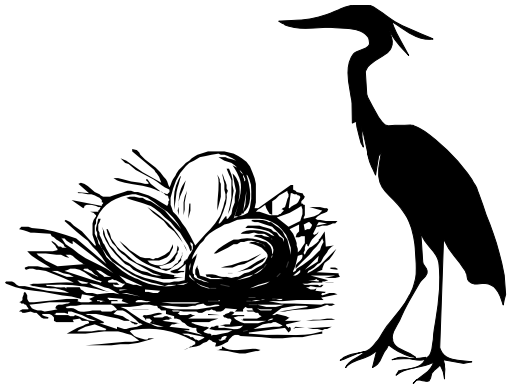
BASE PLAN



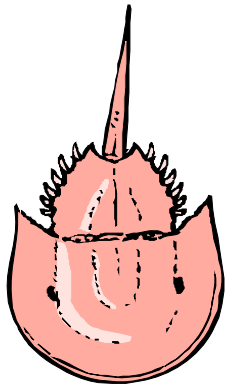
Environmental Windows



February/April - mid-September



May - July



May & June

When can material be dredged & placed?

Sep-14 through January*

**** Depends on dredged material source***

Dredged Material Costs

Approximate Costs for Discussion

HARS Placement	**$8 - $15/cy**
Offshore Borrow Area	**>$12/cy**
Anchorage/Ambrose & Elders W. Placement	**$26 - $41/cy**
Pumped from Off-Site Stockpile + (placement of stockpile)	**$35/cy* + ($9 - $22 CY)**
Upland Sand Source (trucking only – add above costs)	**>$35+ /cy +**

INCREMENTAL COST

$26 - $8 (BASE HARS) = $18 cy

Above costs do not include mob/demob

Material Placement

Off-Site Stockpile

Direct Pump-out

On-Site Stockpile(s)

Alternative Pump-out Staging Locations

Alternative Pump-Out Unconfined vs. Confined (aquabag, coir logs, berm)

Floyd Bennett Field Staging

Getting Sand to the Island
Method 1: Stockpile, Re-Slurry and Pump Across Bay

Direct Pump From Hopper Dredge

Direct Pump-out from Hopper Dredge to Island was Much More Efficient

Sand Discharge

Any flexibility regarding unconfined pumpout?

October 2006 Aerial

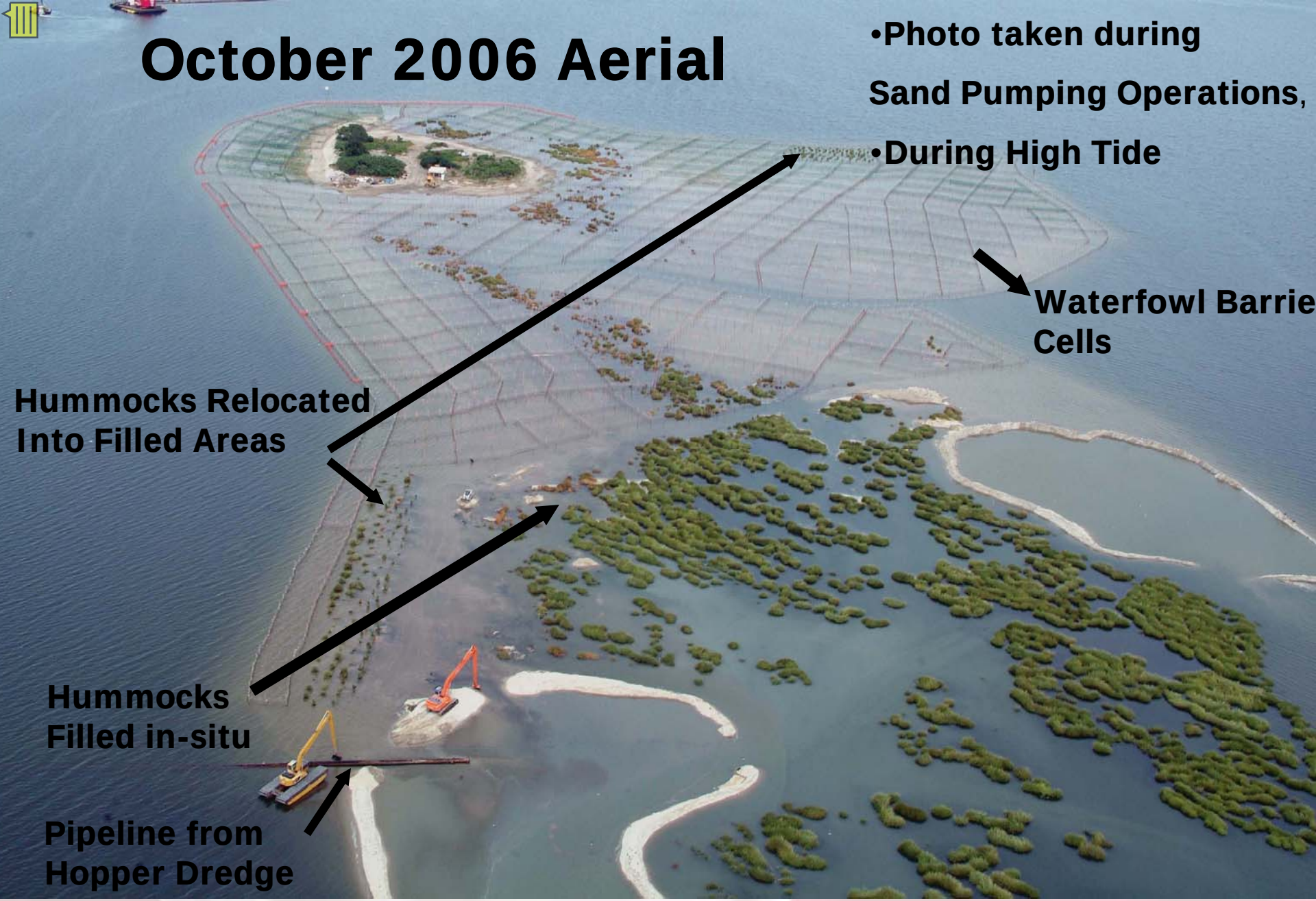
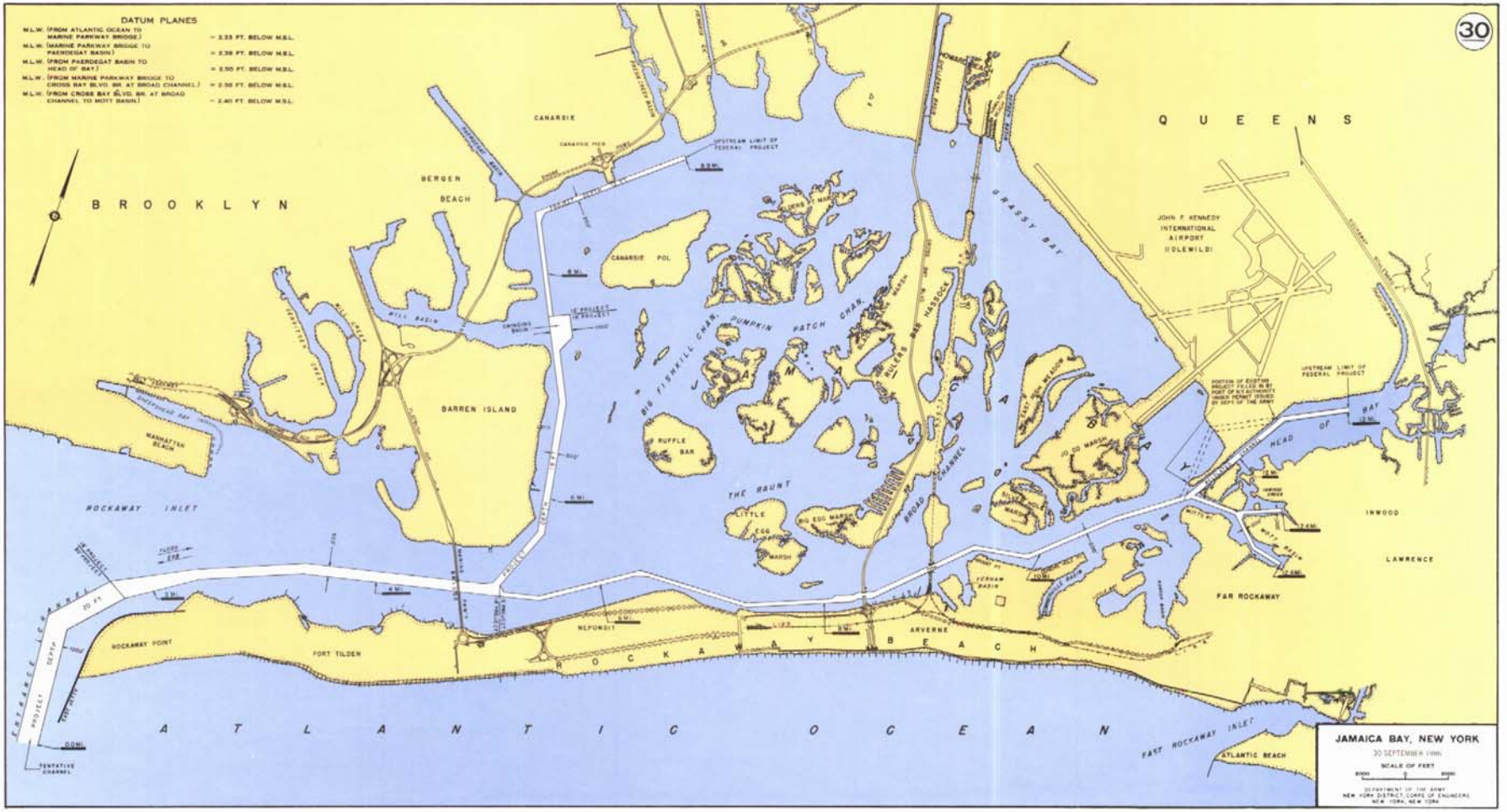


Photo courtesy of Galvin Brothers, Inc.

Alternative Pump Out Locations



Site Grading & Drainage

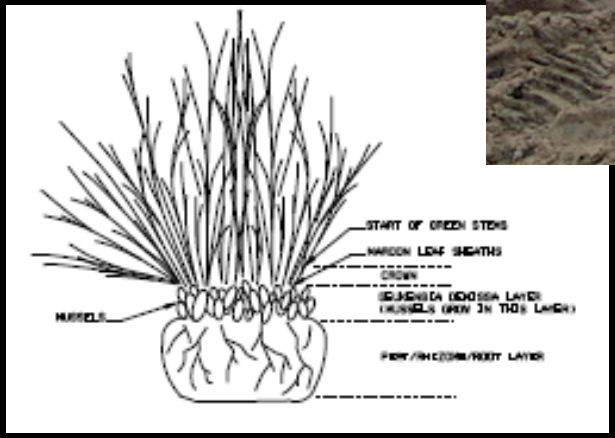
Stockpiled Material?

Grading by Whom/When: Dredging Contract or Wetland Contract

Settlement Period

***Spartina* Hummock Relocation**

4’

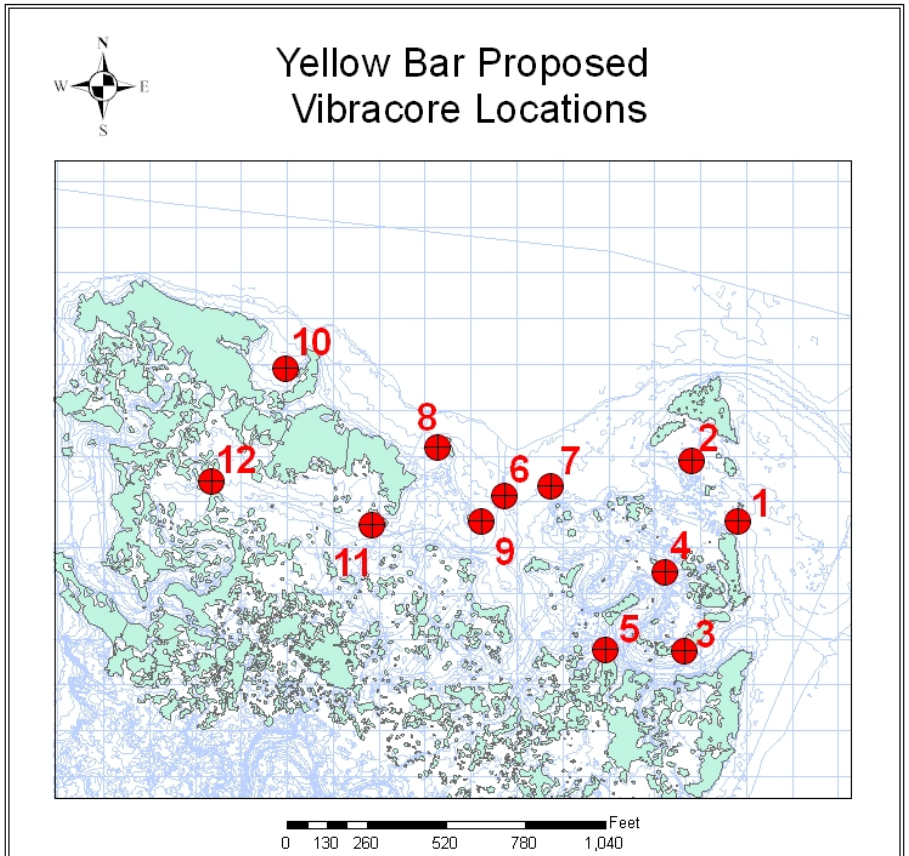


Spartina Hummock

Do not underestimate vertical settlement!

Obtaining geotechnical borings on these marsh islands are often logistically challenging. If no consolidation information is available, contingency for fill volume should reflect that. 40% more fill was needed for the 38 acres of created marsh

Yellow Bar Geotechnical



ID	POINT_X	POINT_Y
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2	-73.83838856400	40.61240304130
3	-73.83847734190	40.61068815670
4	-73.83870568460	40.61140411120
5	-73.83939957330	40.61070280250
6	-73.84059255260	40.61209384860
7	-73.84004551940	40.61217312880
8	-73.84136949820	40.61252196150
9	-73.84086210510	40.61185600810
10	-73.84316122990	40.61323548300
11	-73.84214644380	40.61182429610
12	-73.84404123980	40.61222862490

Legend
- Vibracore locations - 2/13/08
- Existing vegetation in project area
- Existing topography

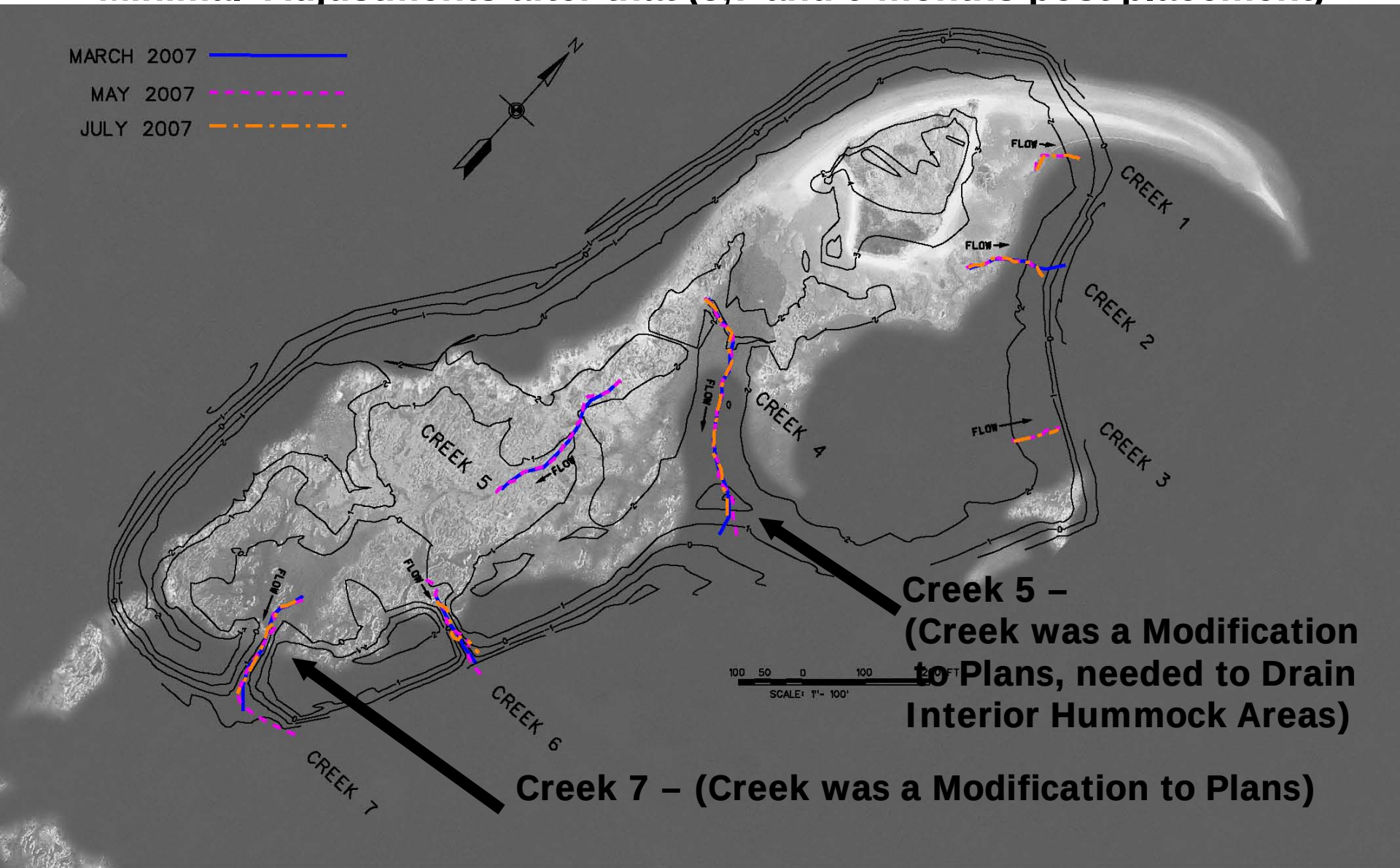
Map created by GSW, 02/11/08
Data source: NPS existing vegetation

2.5 ft fill

Site Grading

Tidal Creek Plan Form Morphology:

- Self-Adjustments of Creeks Happened 1-3 Month After Placement
- Minimal Adjustments after that (5,7 and 9 months post placement)

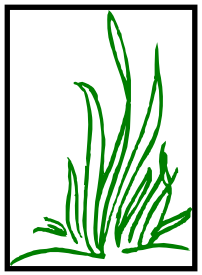


Creek 5 – (Creek was a Modification to Plans, needed to Drain Interior Hummock Areas)

Creek 7 – (Creek was a Modification to Plans)

Planting Alternatives

- No planting (natural recruitment)
- Seeding
- Plugs (native source?)
- Pots (native source?)
- Hummocks – Fill around
- Hummocks - Transplant



Instant Marsh or Time for Recruitment?
Capabilities for Monitoring & Adaptive Management

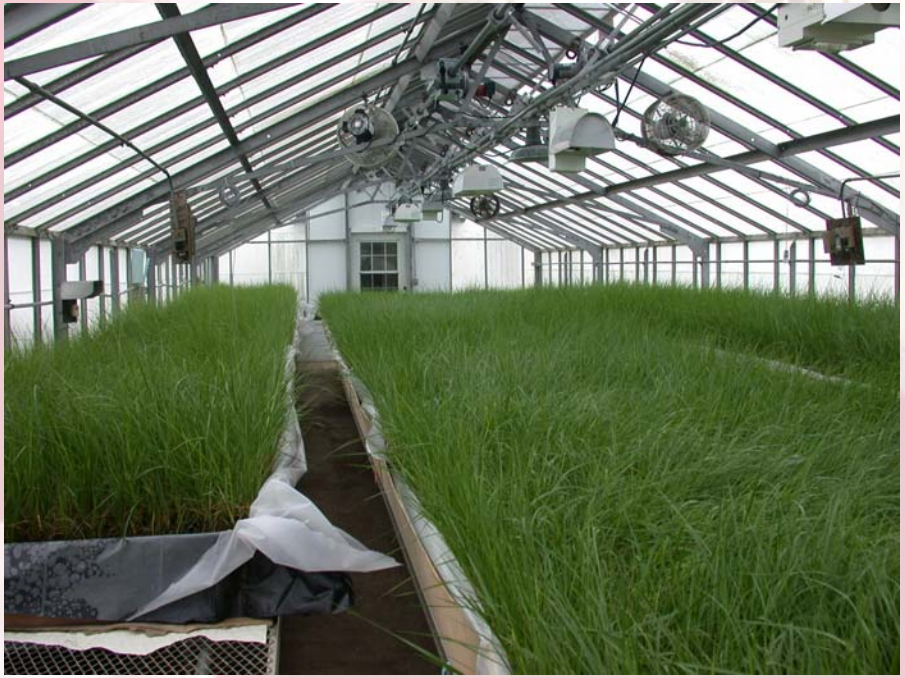
Recruitment & Seeding

No planting (natural recruitment)
Seeding

- Monitoring & Adaptive Management ---- Duration?
- Annual output – habitat unit benefits
- Seeding – questionable success for wave/wind intense areas.
- Seeding - Agricultural approach; Sexual Reproduction vs. Vegetative Propagation
- Below ground-Above ground biomass

Native Plant Propagation

What is native?



Planting Plugs

Minimal Equipment – Low Cost

Restoration Success

Spring Planting Window

Consider wider spacing

Hummocks Left in Place and Filled are Still Struggling (still to wet)

Being Filled Sept 2006

April 2007

June 2007

Hummock Transplant

Sequencing

Need More Flexibility with Planting Requirments

Wider Planting Spacing

Filling areas to low marsh grades and Transplanting Hummocks is More Effective than filling around Existing Hummocks

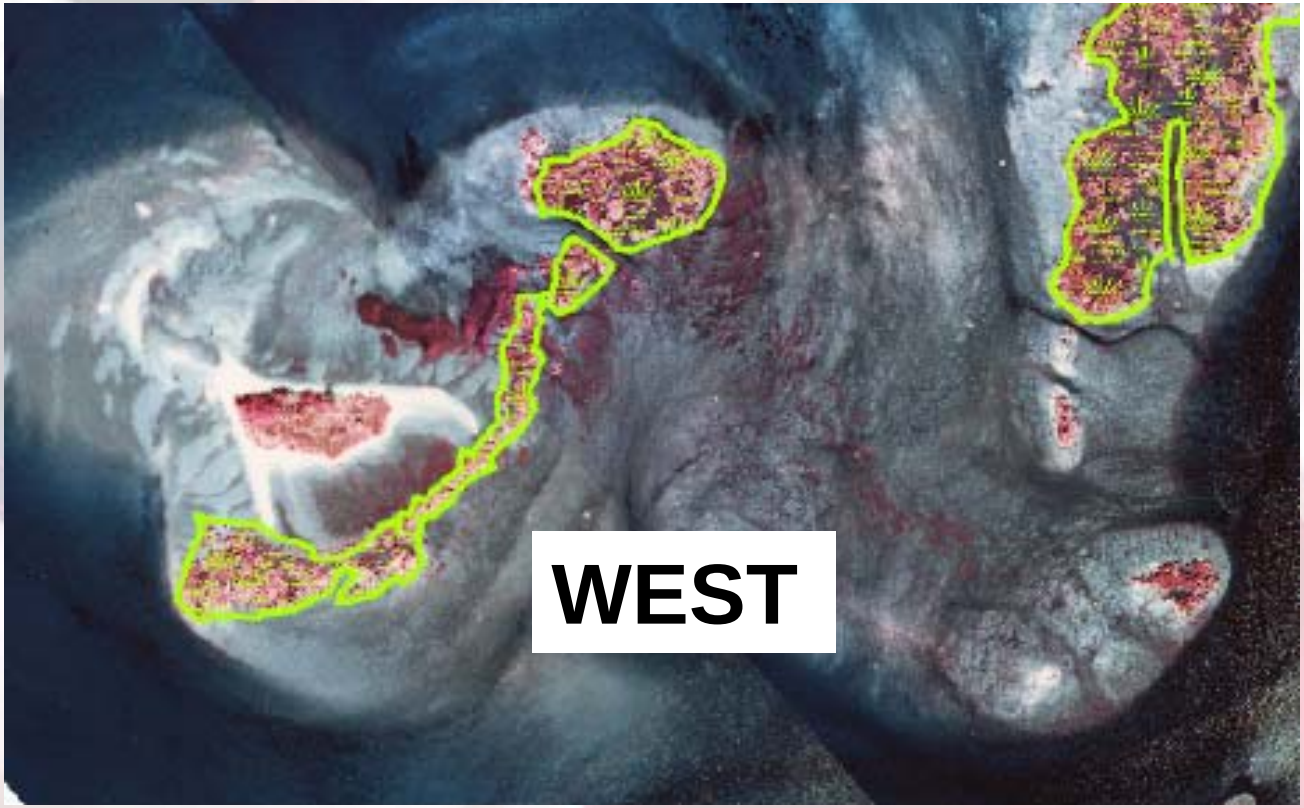
Transplanted: Sept 06

March 2007

Sept 2007

Existing Hummocks

YELLOW BAR



Monitoring & Adaptive Management

- **USACE Guidelines:**
  - **1 % Monitoring**
  - **3% Adaptive Mgmt.**
  - **5 Years**
- **Non-Federal Funding of Monitoring Studies**
- **Responsibility of Adaptive Management**
- **Improve Cost-Efficiency & Output of Survey Efforts**

Contracting Strategies

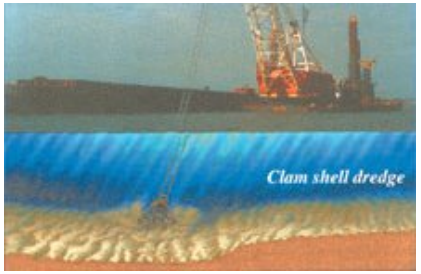
- One Contract
- Separate Dredging Contract & Small Business Contract for Wetland Build-Out
- Cost Reimbursable
- Design Build
- Turnover for Planting by Others

Baltimore District – Poplar Island

- Port of Baltimore
- Poplar Island – Chesapeake Bay
- $340 million
- 40 million cy over 16 years of dredging
- 35,000 ft Containment Dikes
- 1,140 acres
- 570 acres marsh, 570 acres upland habitats
- Success with marsh plugs
- Clamshell Dredge & Pipe from Scow

San Francisco - Hamilton Wetlands

- Port of Oakland
- 950 acres of wetland habitat
- $62 million
- > 21 million cy
- Supplemental EIS – Evaluating Cost-Effective Technologies for Dredged Material Transport to Restoration Area
- Web page is *www.Hamiltonwetlands.org*



Louisiana

Shallow water “terraces”

Finding the Match

Value Engineering – February 2008

Industry Meeting – November 2008

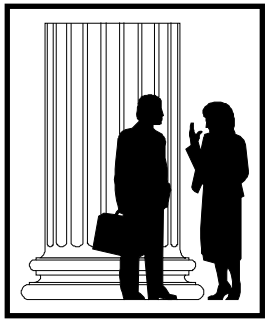
Outreach – Marsh Projects Nationwide

Symposium – Monitoring Results

Creative Thinking

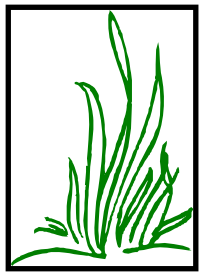
Funding Sources

Partnerships



Alternative Methods

Alternative Approach to Costly Marsh Building?



Thanks to District Team (present & past) & Our Project Partners

Melissa Alvarez - Senior Project Biologist

Bill Slezak, Chief of Harbor Programs Branch

Len Houston, Chief of Environmental Analysis Branch

Gail Woolley, Sheila Rice-McDonnell, & Anthony Schiano – Engineering

Matthew Voisine & Jeff Cusano – Project Biologist & GIS

Jamal Sulayman & Steve Weinberg – Engineering Dredging Team

Shewen Bian & Mark Kucera – Construction Team

Karen Ashton & Steve Couch – Planning

Peter Weppler – Team Leader, Environmental Branch

Presentation also made possible by past USACE Restoration Engineers:

Bethany Bearmore & Kerry Anne Donohue

Visit the District's Project Web Page at:

http://www.nan.usace.army.mil/project/newyork/factsh/jamaica/index.htm

Contact Project Manager
Megan.B.Grubb@usace.army.mil

BUILDING STRONG!