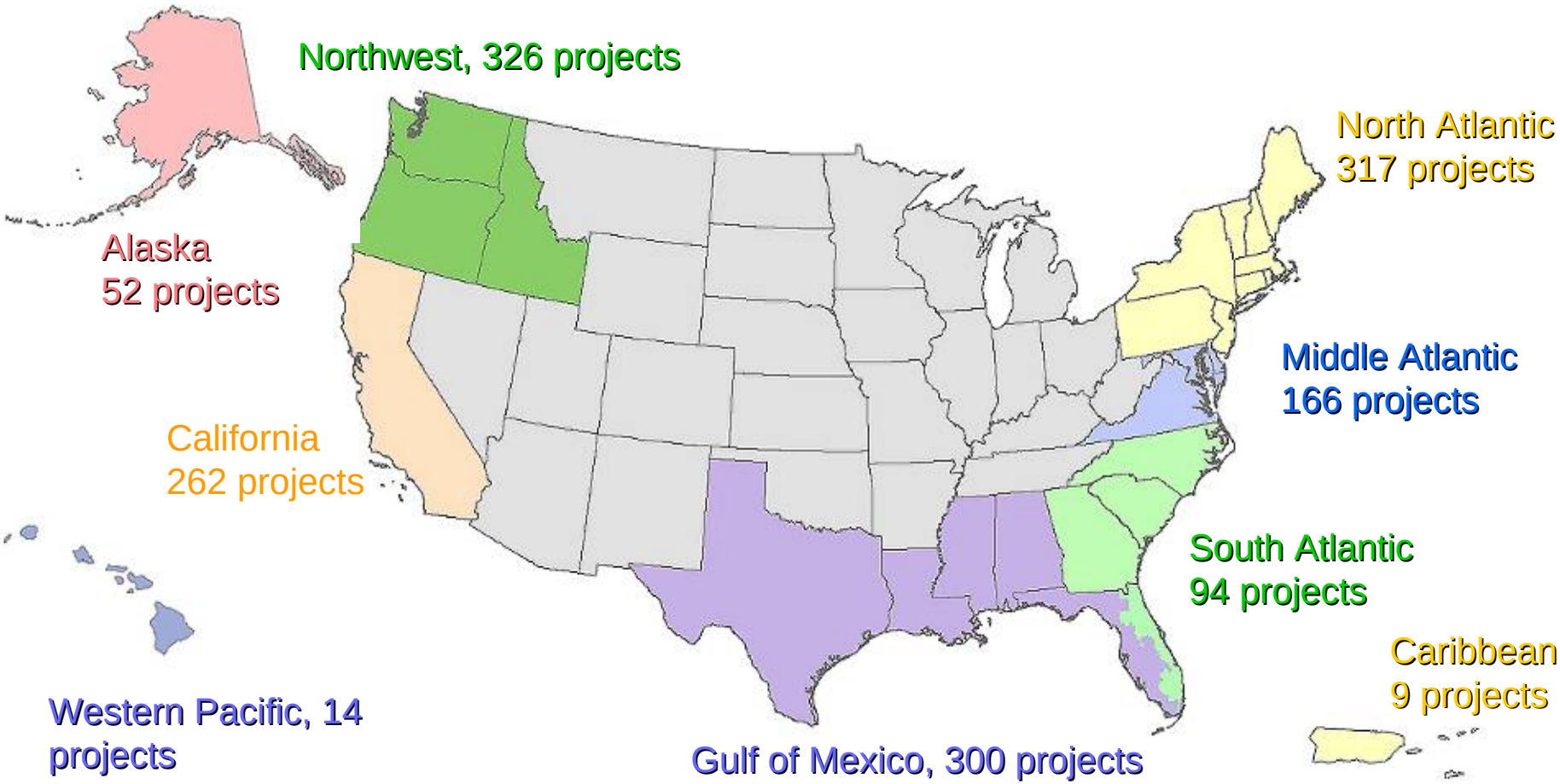
National Oceanic and Atmospheric Administration
NOAA Restoration Center

Wetland/EstuaryTrends in the Northeast Region

Jamaica Bay Symposium

Sandy Hook Field Office
Highlands, New Jersey
October 28, 2008

Projects Nationwide



Project Types

Types of Restoration:

- Riverine
  - Fish passage
    - Dam removal
    - Fish Ladders
  - Non fish passage
    - Stream channel complexity
    - Riparian stabilization and planting
    - In-stream Habitat
- Wetlands
  - Salt Marsh
  - Freshwater Tidal Marsh
  - Restoring tidal flow
  - Living Shorelines
- Shellfish
- Debris removal
- SAV
- Agricultural Lands
- Upland
- Grasslands

Abstract

Wetland Trends in the Northeast Region:

- Tidal wetlands provide critical functions for wildlife and juvenile fish nursery. The services sustain human food resources.
- The role of wetlands is understood and valued. Federal and state regulatory programs provide protection of wetlands and increasingly restoration. Despite recent legislative protections, wetlands continue to decline.
- Among the negative effects; smothering by marine debris, injury by oil spills, invasive species in salt marsh plant community and high energy impacts to toe of bank are readily apparent.
- Salt marsh die-back is not well understood but is likely to be the result of water logging, oxygen deficiency and increased sulfides in soil, which in turn may be the result of sea-level rise caused by global climate change (with both natural and anthropogenic causes).

Abstract

Wetland Trends in the Northeast Region:

- Salt marshes rely on sediment deposition to “stay ahead” of sea-level rise. Coastal geologists refer to “sediment budget”, the amount of available sediment, as a necessary component of marsh building.
- Stabilization of land masses, navigational inlets and channels, have altered the flow of sediments and are a contributing factor, along with storm and sanitary discharge, to the changing character of suspended solids, and thus sediment budget, in the water column.
- Marsh loss is a worldwide phenomena however marsh loss does not occur uniformly. Local geological forces result in uplifting or subsidence of terrestrial formations and offers explanation for why some locals are building marsh and others are experiencing loss. Land and marine alterations that accelerate marsh loss in one local may also account for increases in nearby locations.
- Regions vary in land use and topography and the long-term prognosis for coastal marshes will also vary. The effect of “coastal squeeze” -defined as marshlands having nowhere to go to make a vertical and well as horizontal adjustment, as exampled by bulk heading , land reclamation and occurrences of naturally steep topography, will have the greatest long term effect on coastal marshes.

Abstract

Case evidence within the area of the four mid-Atlantic National Estuary Programs demonstrates a wide array of physiological effects, terrestrial and marine uses, coastal management decision making, and selection of restoration alternatives for both “fringing” marshes and large marsh complexes.

- Delaware Estuary Program – John Heinz NWR, Lardner's Pt., Army Creek, Lang Impoundment

- Delaware Inland Bays Estuary Program – Burton Island

- Barnegat Bay Estuary Program – Brigantine Station Forsythe NWR, Mordecai Island

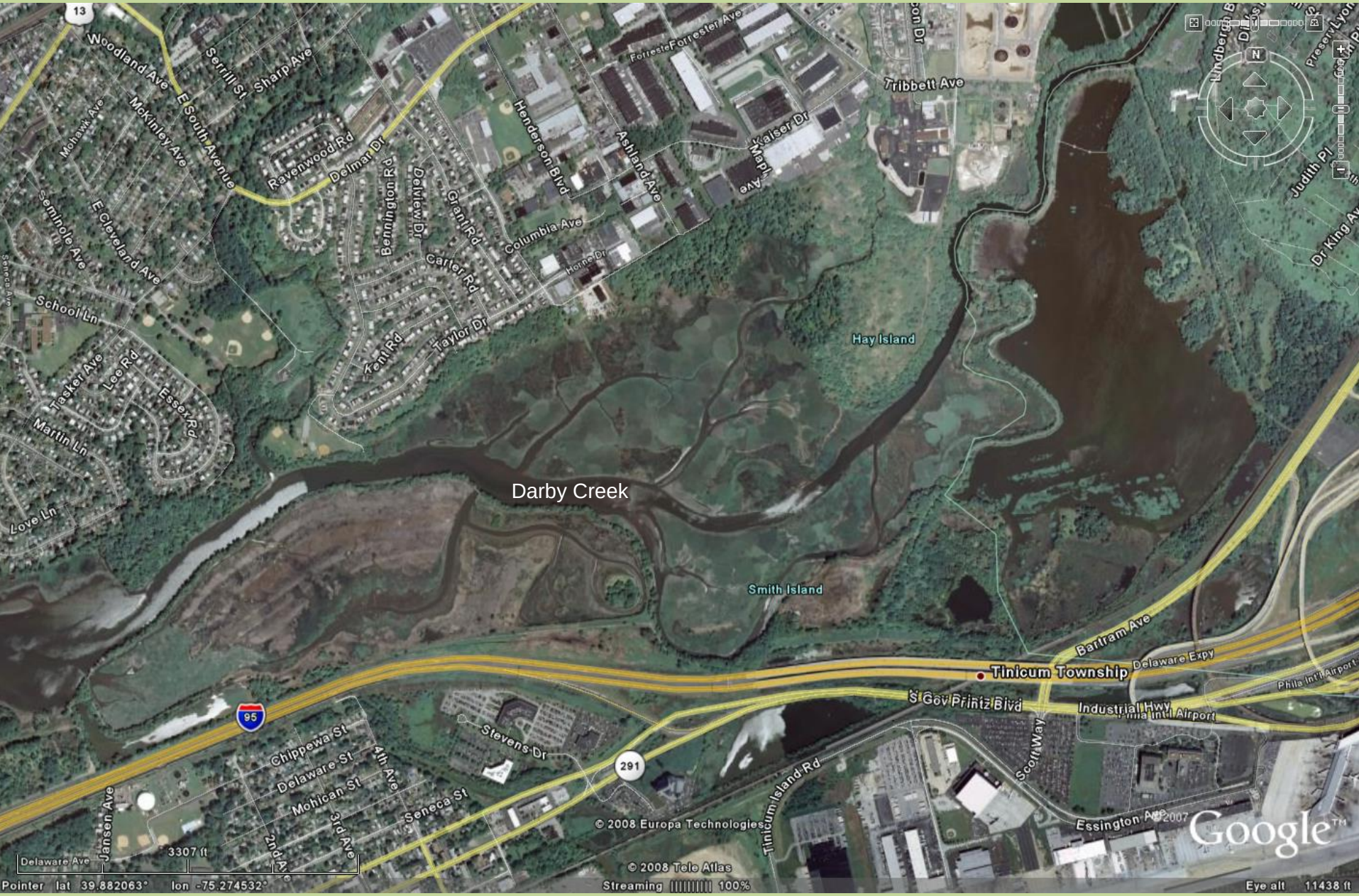
- New York/New Jersey Harbor Estuary Program – Fresh Kills Landfill, Woodbridge Creek, Goethals Pond, Arthur Kill Marshes,

Marsh Physiology

- Accreting Marshes
- Subsiding Marshes
- Fringing Marshes

Accreting Marshes

John Heinz Nat'l Wildlife Refuge, Philadelphia PA



Existing condition 2007

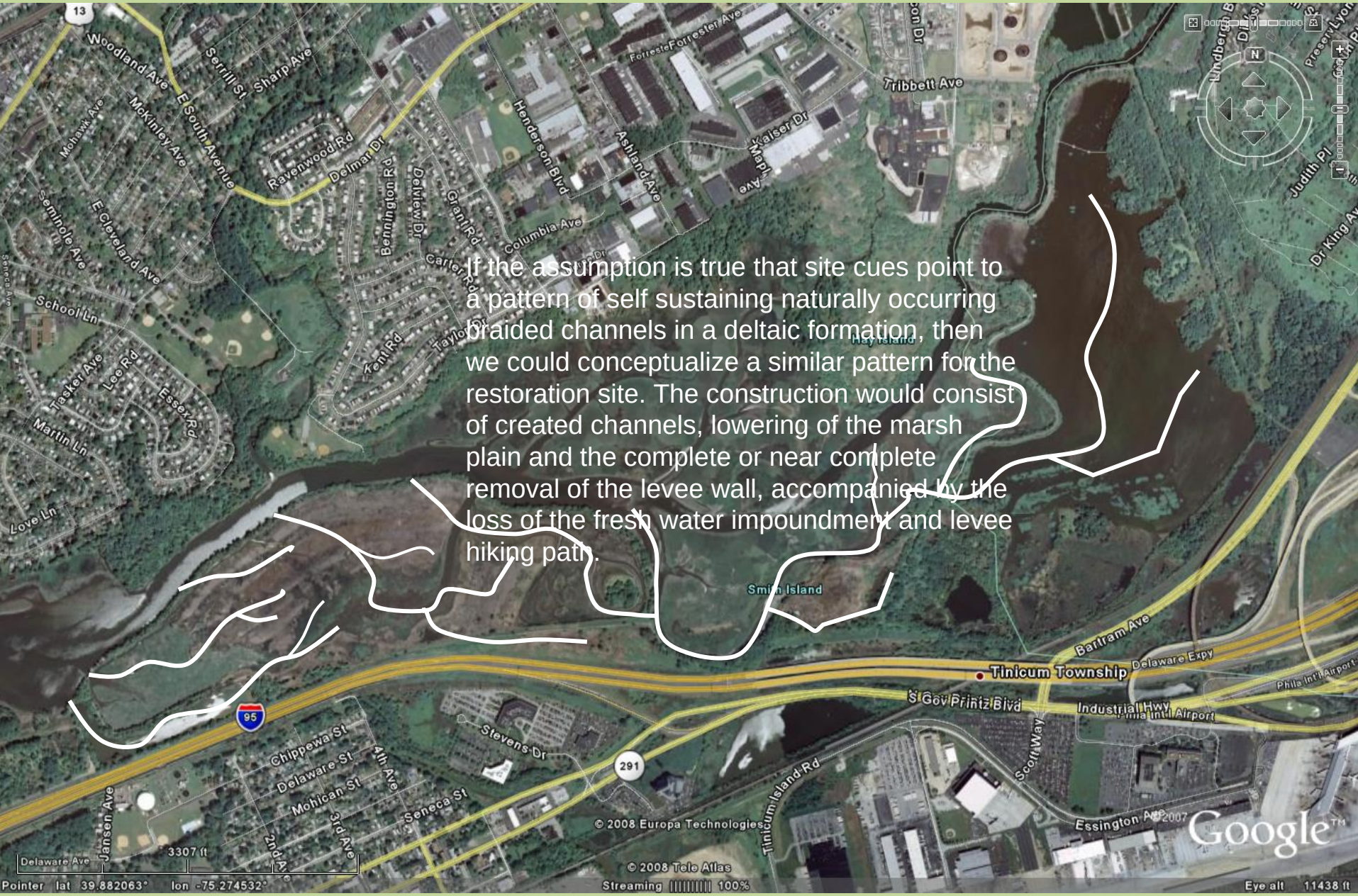
John Heinz Nat'l Wildlife Refuge, Philadelphia PA

Site Selection

John Heinz Nat'l Wildlife Refuge, Philadelphia PA

Site Indicators

John Heinz Nat'l Wildlife Refuge, Philadelphia PA



Conceptual

Mad Horse Wildlife Management Area, Salem County NJ

Existing Condition

Mad Horse Wildlife Management Area, Salem County NJ

Draft Conceptual Restoration Plan March 09, 2008

rmy Creek, New Castle County DE

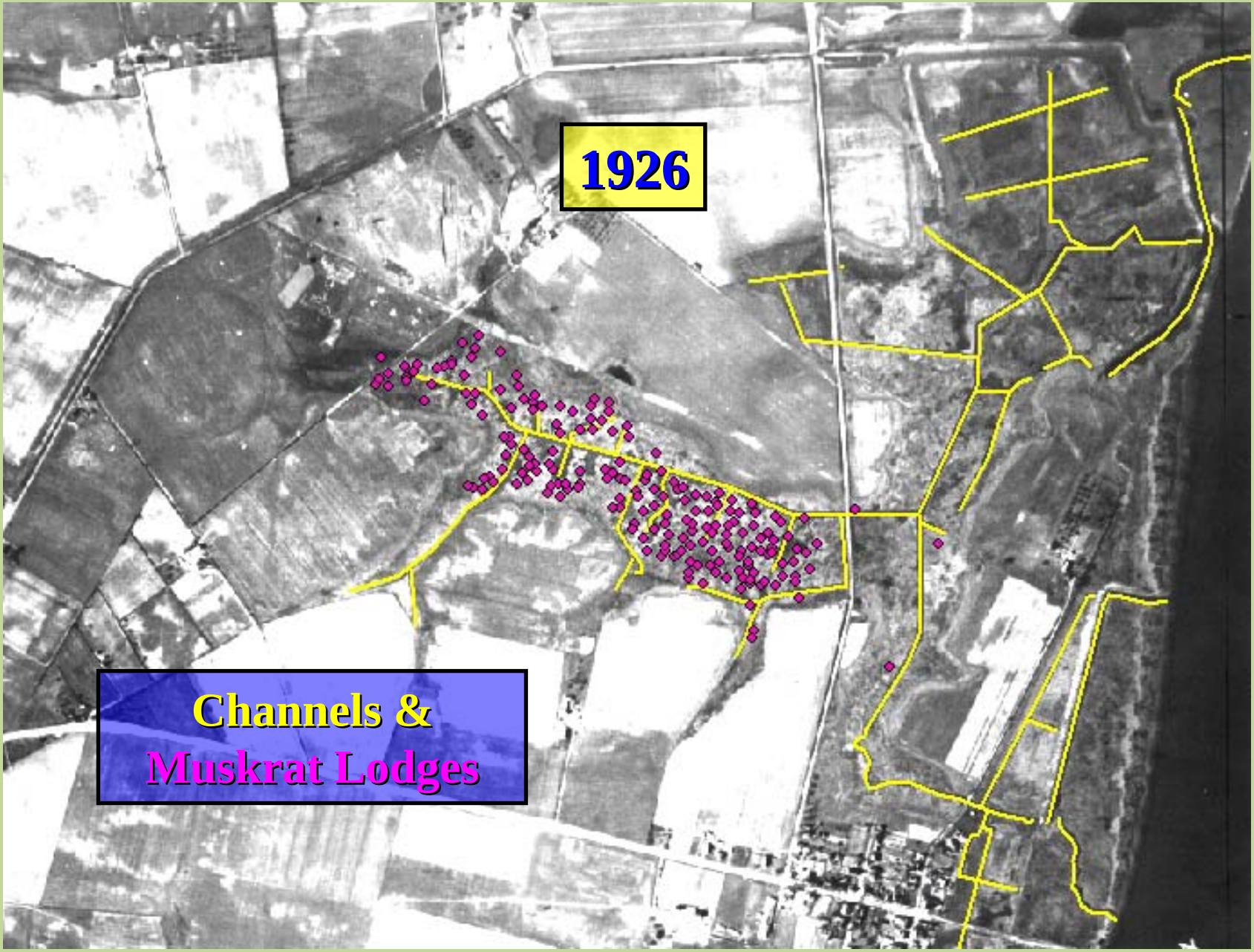
Existing Condition

Army Creek, New Castle County DE

Conceptual Channel Design
10/16/08.

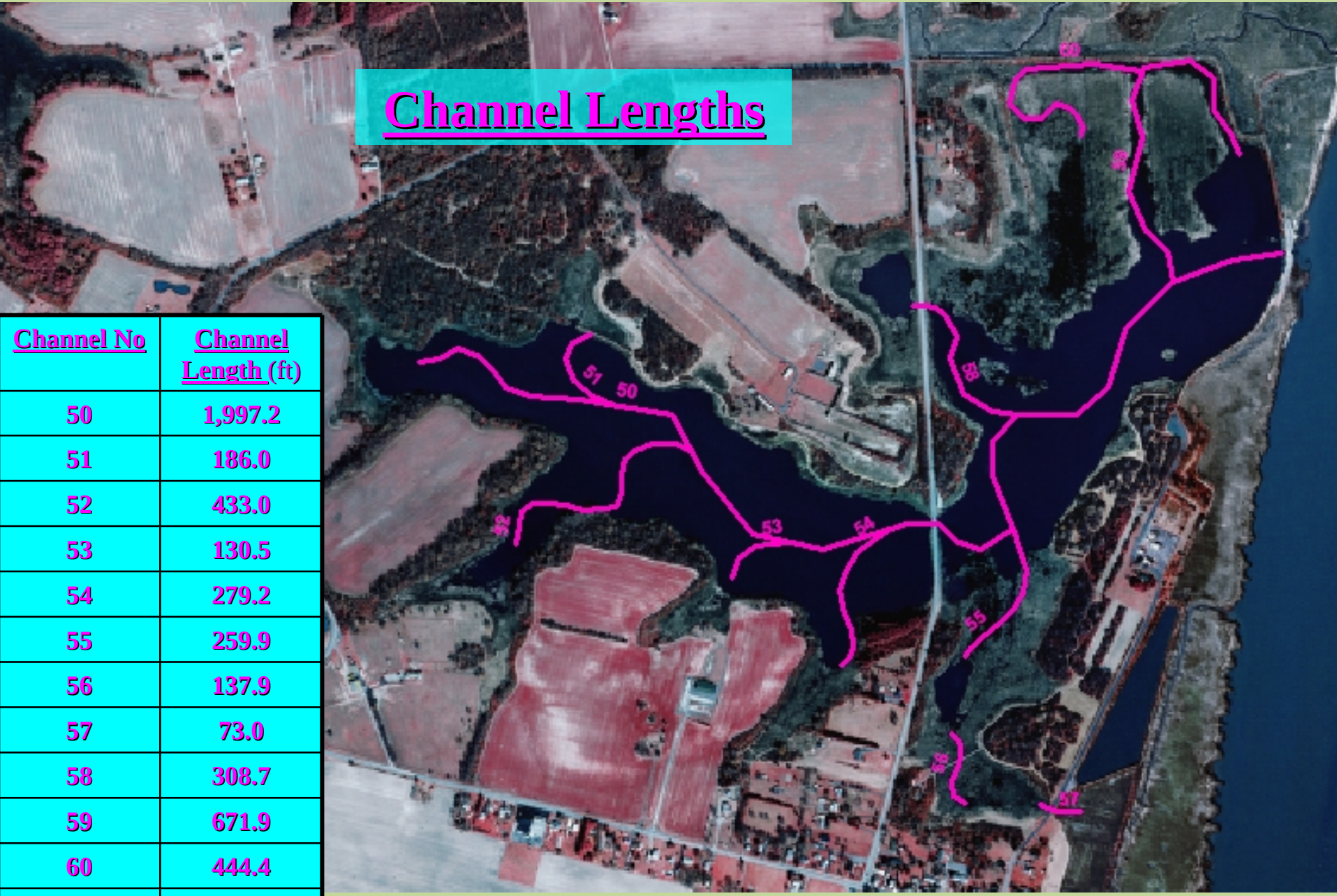
Salt Marsh Dieback – Subsiding Marshes

Lang Impoundment, Augustine Wildlife Management Area, Port Penn DE



Historic Condition

Channel Lengths

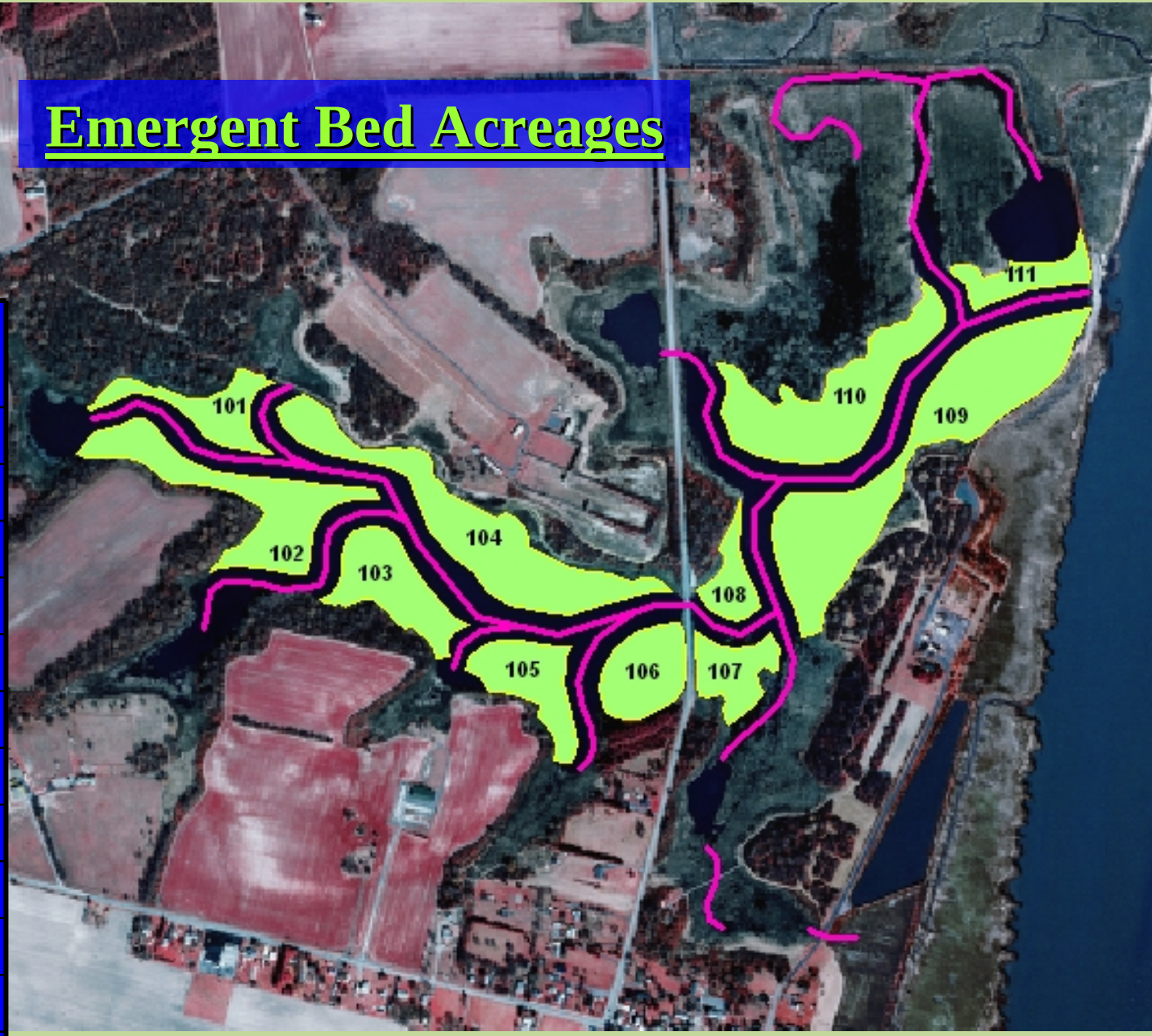


Channel No	Channel Length (ft)
50	1,997.2
51	186.0
52	433.0
53	130.5
54	279.2
55	259.9
56	137.9
57	73.0
58	308.7
59	671.9
60	444.4
Total:	**4,921.7**

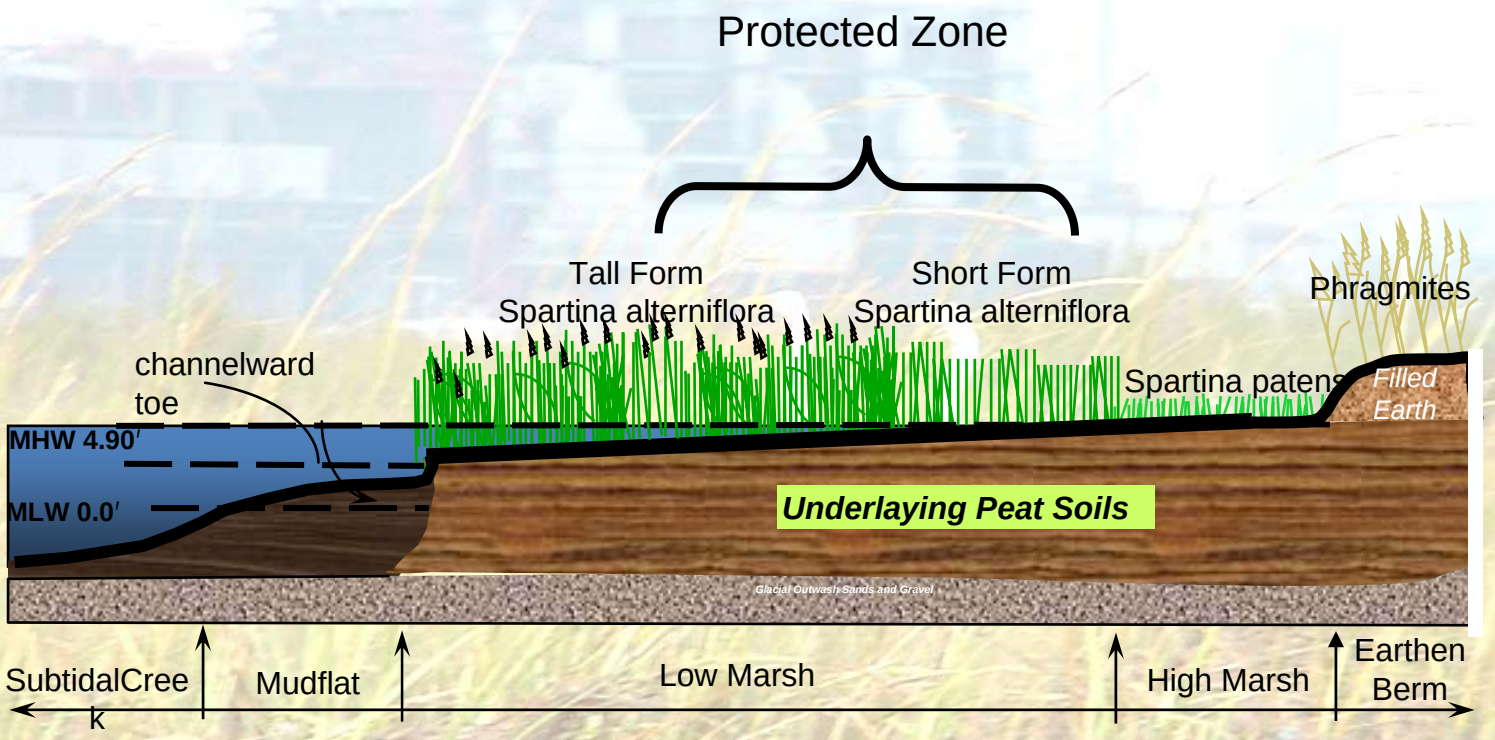
Lang Impoundment, Augustine Wildlife Management Area, Port Penn DE

Emergent Bed Acreages

Emergent Bed No.	Acreage
101	2.7
102	6.5
103	4.2
104	9.1
105	3.4
106	2.4
107	2.4
108	1.6
109	13.0
110	7.9
111	2.0
Total:	55.2



Fringing



The Intertidal Zone

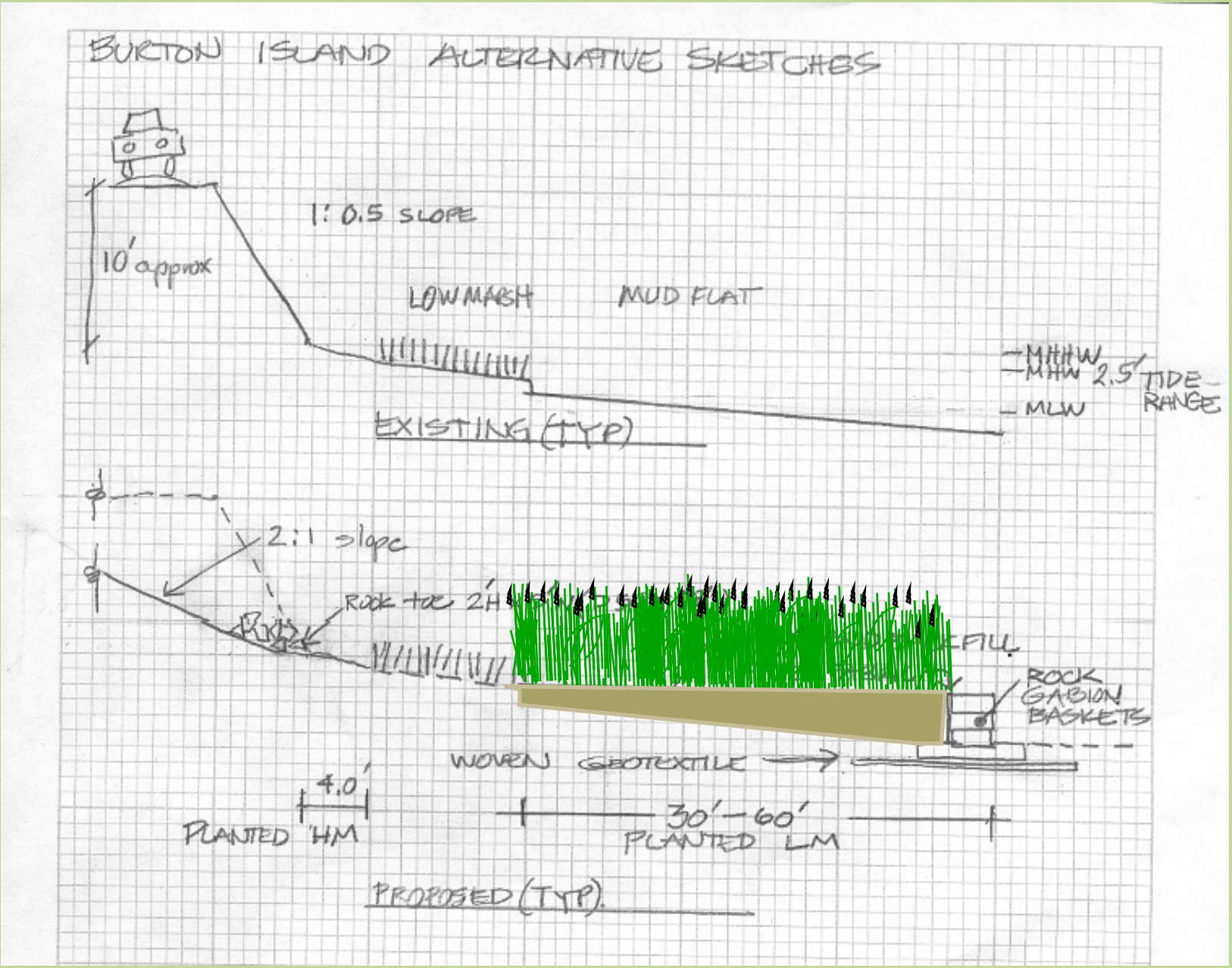
Burton Island Landfill, Millsboro DE

Existing Condition

Burton Island Landfill, Millsboro DE

Conceptual Plan

Burton Island Landfill, Millsboro DE

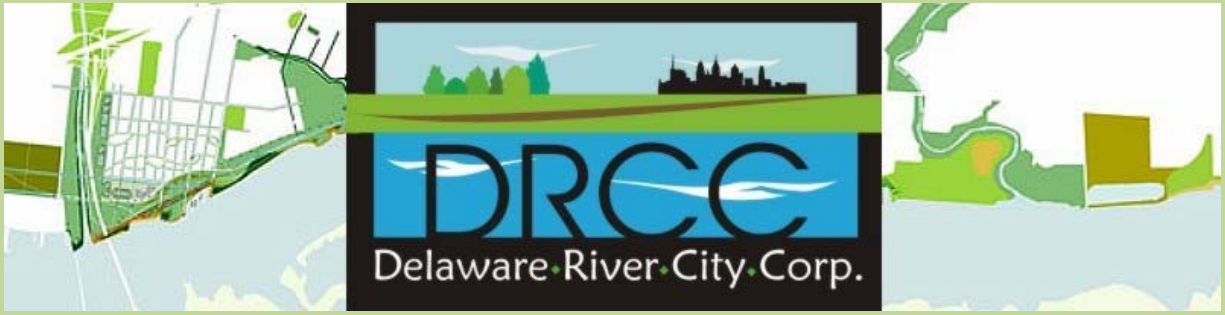


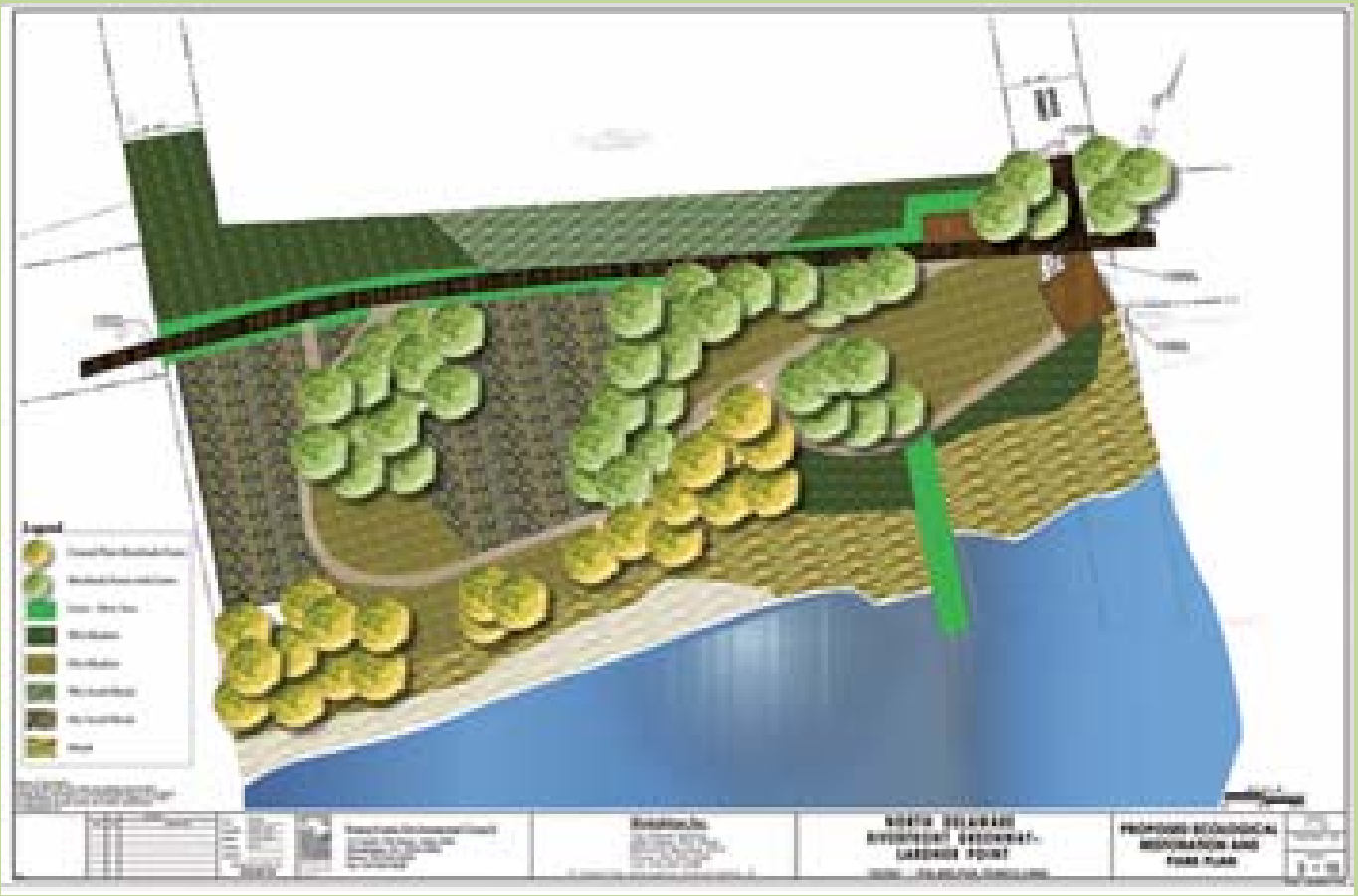
Conceptual Cross Secti

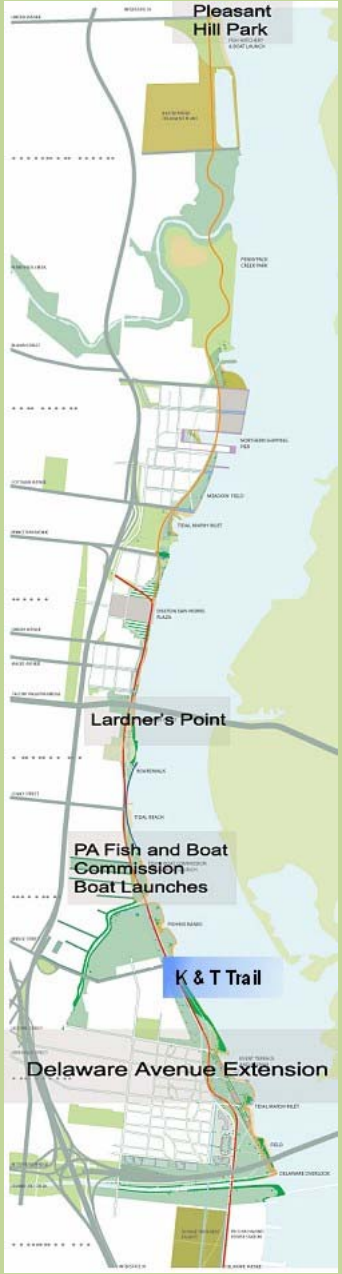
Lardner's Point, Philadelphia PA

Redevelopment Plan

Lardner's Point, Philadelphia PA

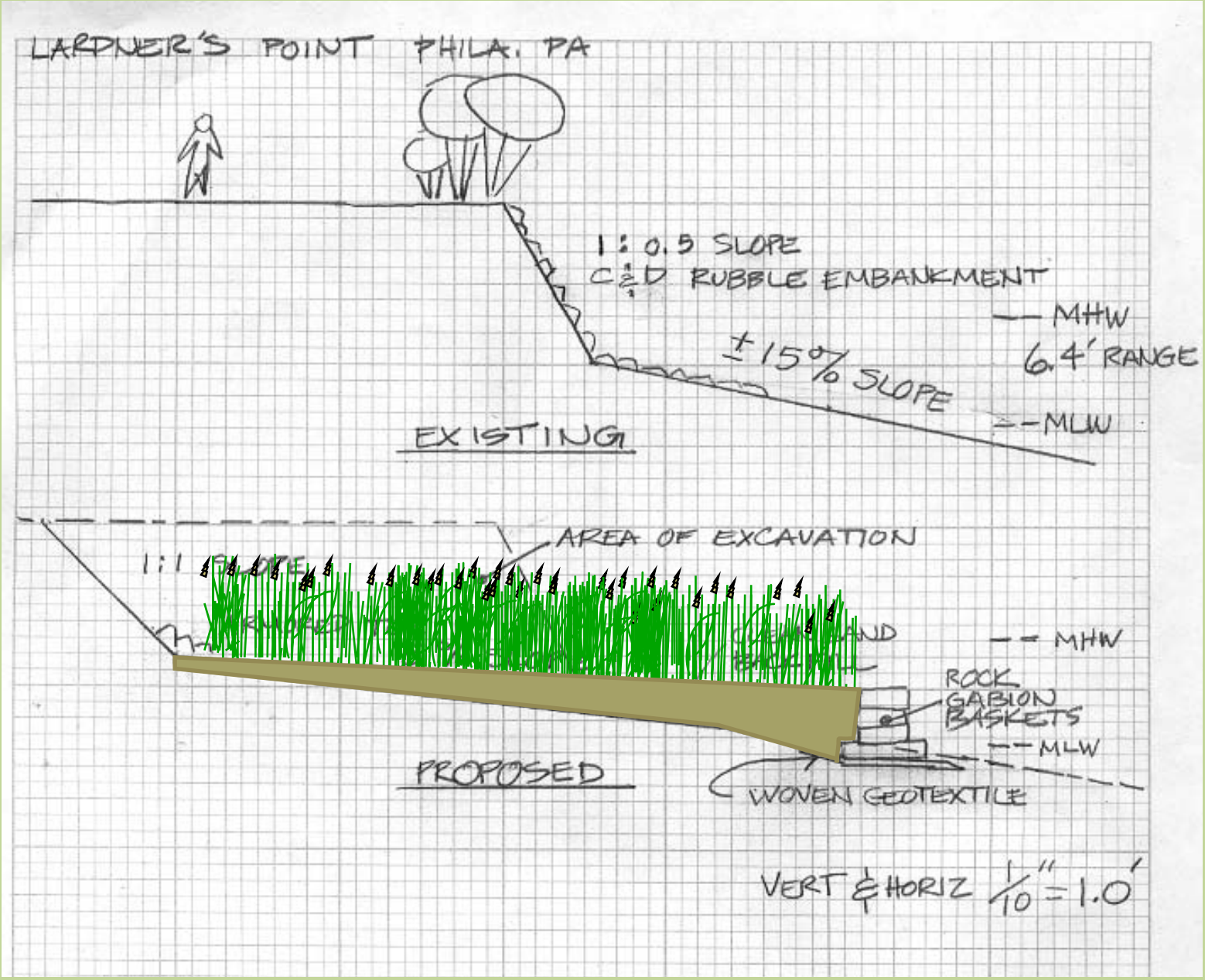






Conceptual

Lardner's Point, Philadelphia PA



Conceptual Cross Sectio

Mordecai Island, Beach Haven NJ

Existing Condition

Mordecai Island, Beach Haven NJ

Existing Condition

Mordecai Island, Beach Haven NJ

Interim Protection Plan

March 7, 2005 Barge opposite Mordecai Island taking borings to obtain data necessary to engineer the offshore breakwater as part of the Army Corps project.

Edwin Forsythe National Wildlife Refuge ,
Brigantine NJ

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Existing Conditio

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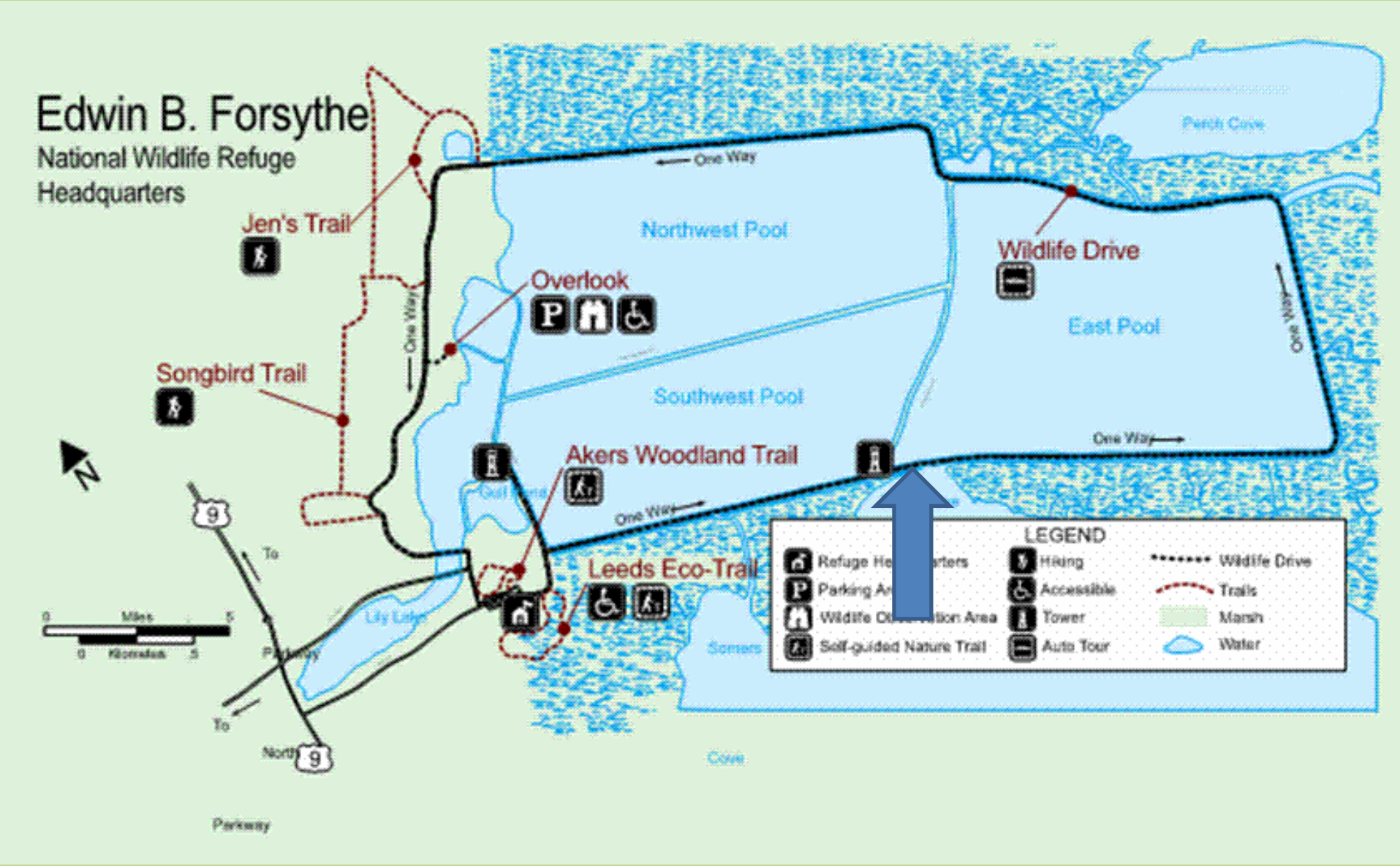
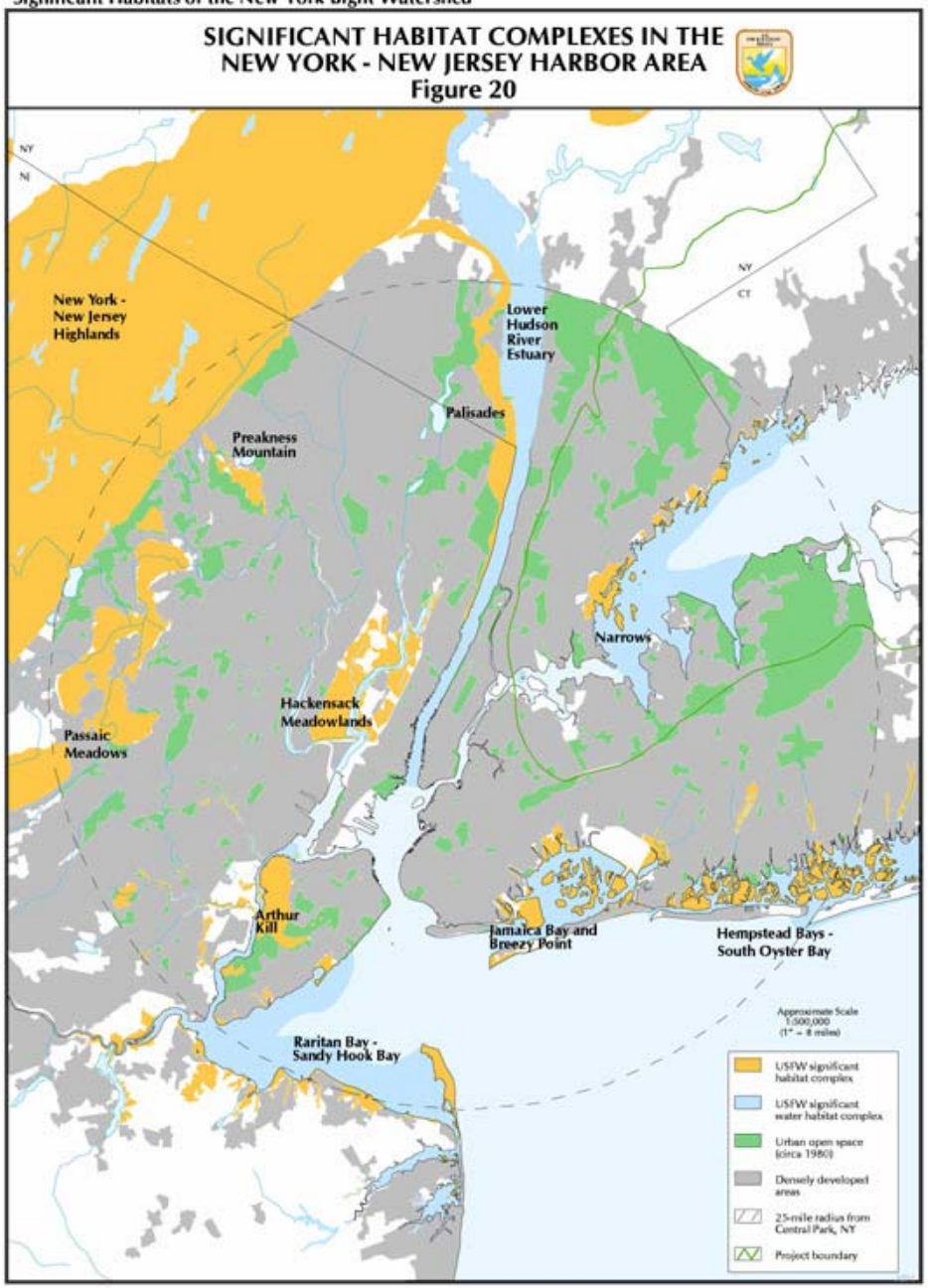
Existing Condition

Edwin Forsythe National Wildlife Refuge, Brigantine NJ



New York
New Jersey
Harbor Estuary Program

Significant Habitats of the New York Bight Watershed



Fresh Kills Landfill, Staten Island NY

Existing Conditions

Fresh Kills Landfill, Staten Island NY

Fresh Kills Landfill, Staten Island NY

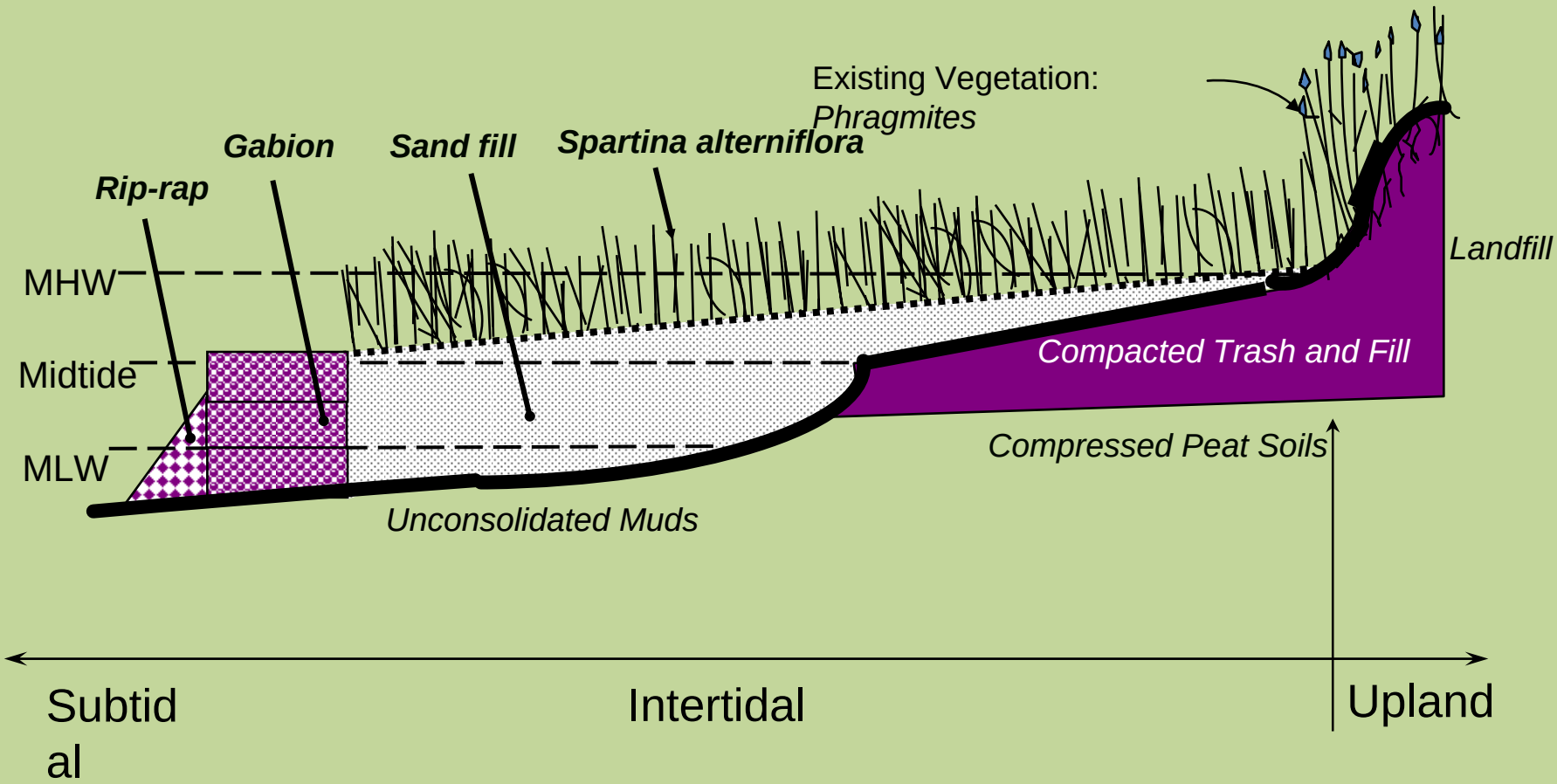


Fig. Final Design Solution at Fresh Kills Landfill Hill 6/7 Salt Marsh Restoration (mitigation for loss of marsh). Existing intertidal zone is a steeply sloped, narrow, unvegetated fringe at edge of hill. Sediments are mixed with compacted waste. Existing slopes >10%. The Constructed slopes are 1-5% and supported by a gabion wall. This solution provided an adequate medium for plant growth, at the desired slope. The solution doubles the width of the intertidal low marsh zone.

NYC Parks & Recreation
Natural Resources Group
Graphics: CWA

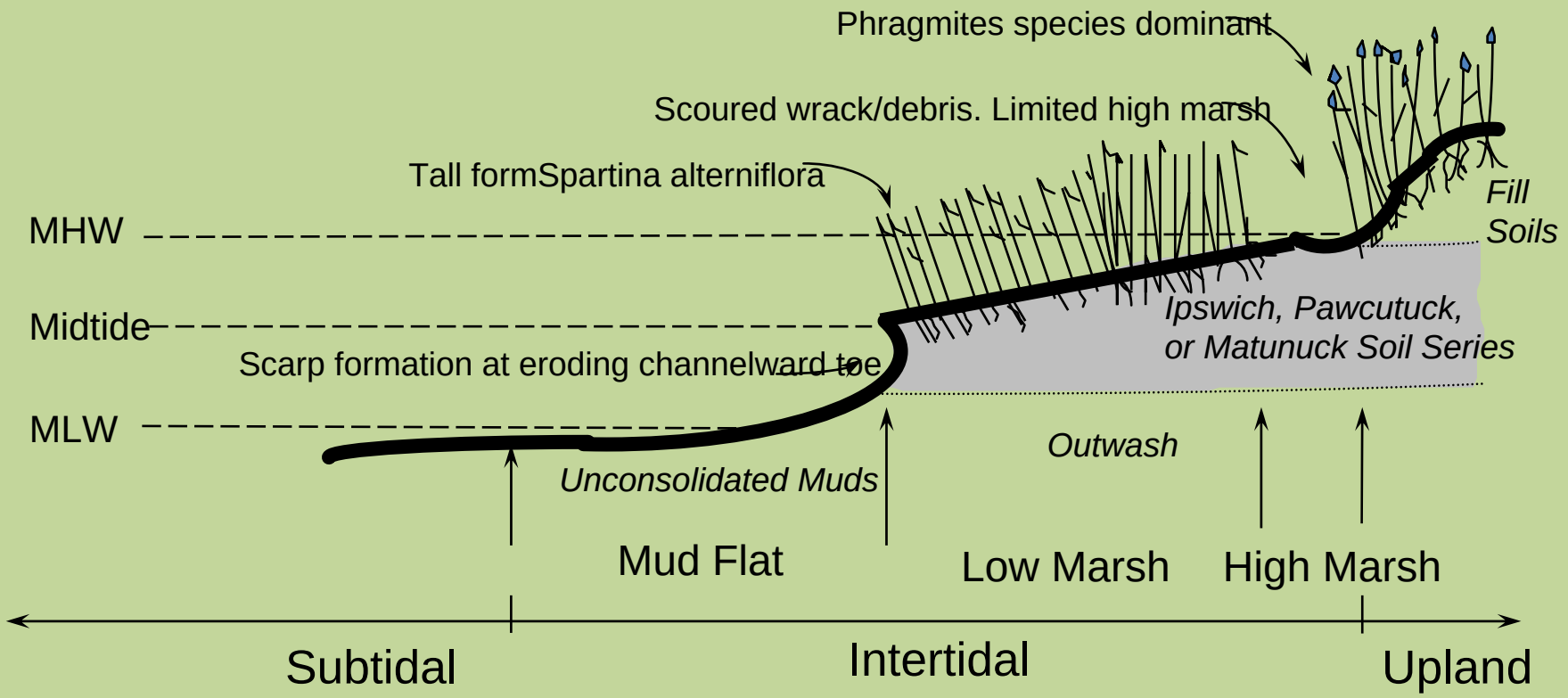


Fig. 2 The Intertidal Zone between Mean Low Water (MLW) and Mean High Water (MHW) in a protected marine environment. Typical shoreline profile at a fringing marsh in Jamiaca Bay, NY showing the observed effects of filled land on a marsh profile. Toe formation typ. in close proximity to boat traffic or open fetch.

From GNRA Soils Report
Graphics: CWA

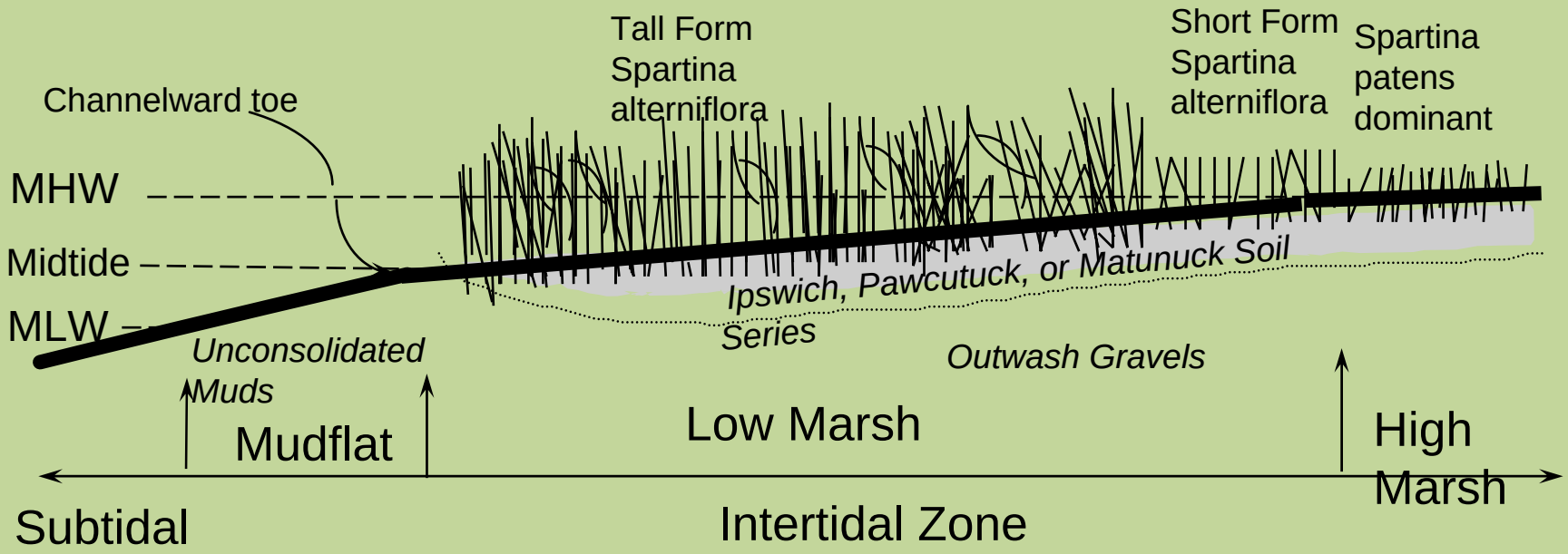
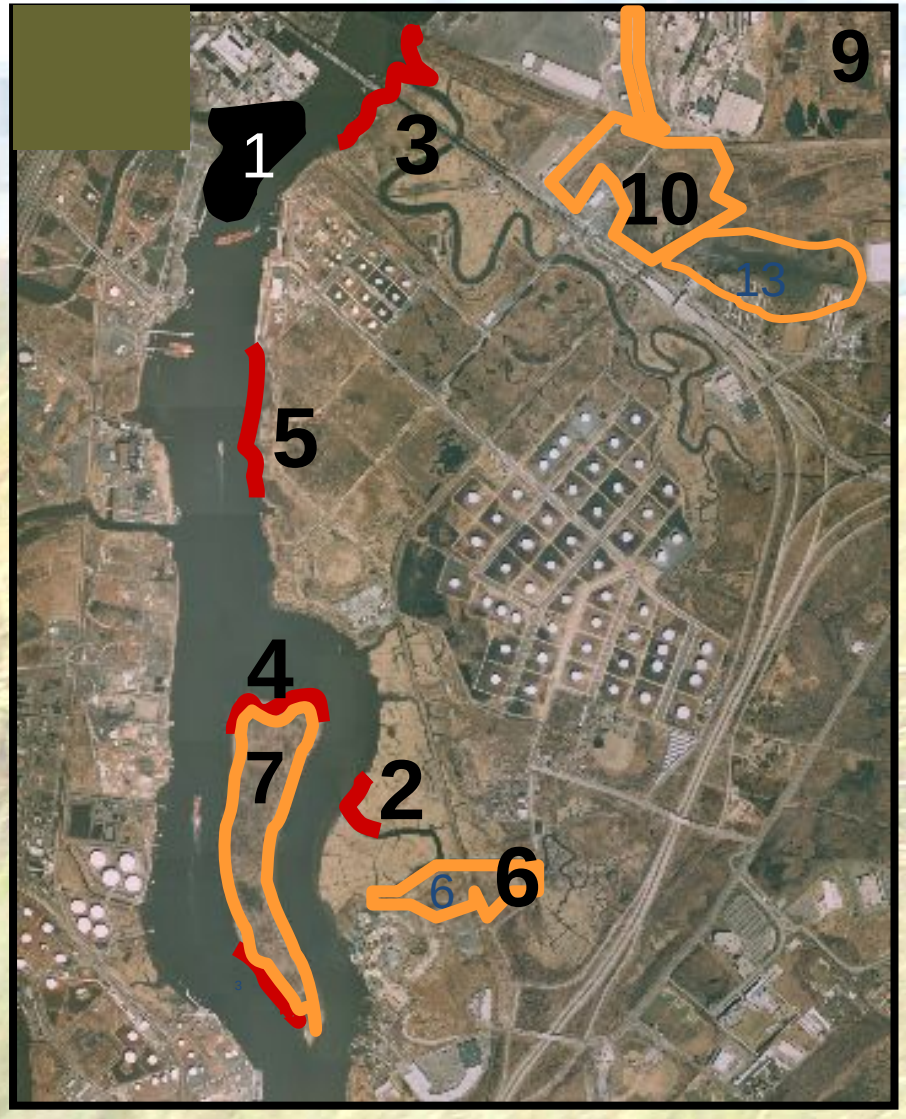


Fig. 1. The Intertidal Zone between Mean Low Water (MLW) and Mean High Water (MHW) in a protected
Jamaica Bay environment. Salt marsh with minimal disturbance impacts. Subject to moderate current energy and wave action. Topography is marked by gradual slopes and large expanses of salt marsh vegetation.

From GNRA Soils Report
Graphics: CWA

LOCATION MAP: Area of the Arthur Kill Watershed at Linden NJ and Staten Island NY. New York/New Jersey Harbor Estuary.



1. Origin of Oil Spill ●

Primary Restoration

2. Saw Mill Creek Marsh. 1992.
3. Old Place Creek Marsh 1994.
4. Pralls Island. 1994.
5. Gulfport Reach. 1995.

6 acres of primary impacts restored

Compensatory Restoration

6. Dike Removal 1998 & 2004
7. Pralls Is. Heron Nesting Habitat. 2001..
8. Gravesend Bay Salt Marsh (not shown)1998 & 2004.
9. Monument Pond 2001.
10. Bridge Creek Marsh. 2006
11. Woodbridge Creek 2007.

43 acres constructed

12. Lincoln Park 2005-ongoing.
13. Goethals Pond Study 2006-ongoing.

95 acres in planning

Acquisitions with trustees funds NY/NJ (not shown)

Acquisitions and Land Transfers to NYC Parks and NYSDEC in Northwestern Staten Island resulted in an additional 2755 acres of public preserve or parkland (1985-2006)

148.52 acres acquired

Bridge Creek Marsh, Staten Island NY

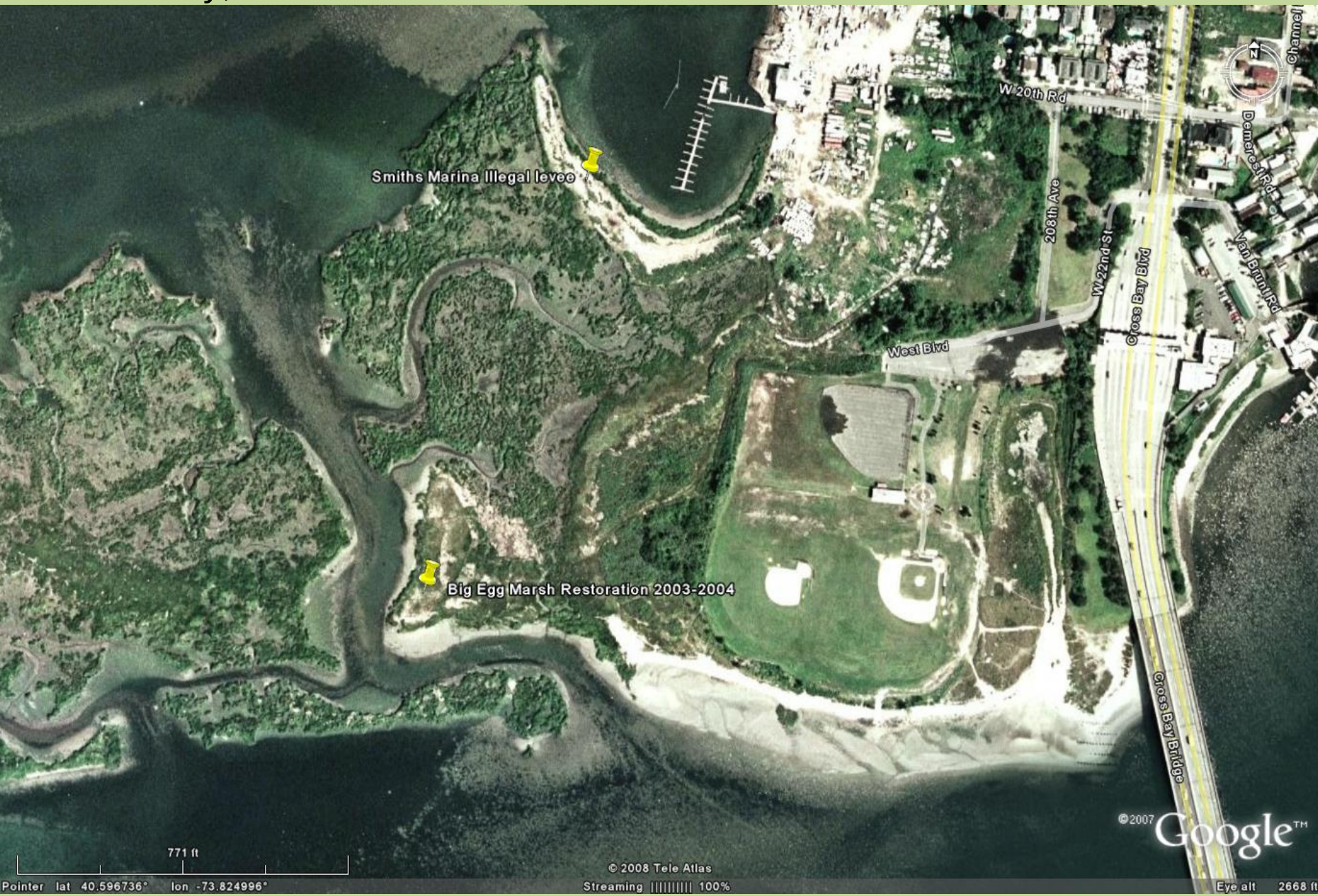
Completed Construction

Woodbridge Creek Marsh, Woodbridge NJ

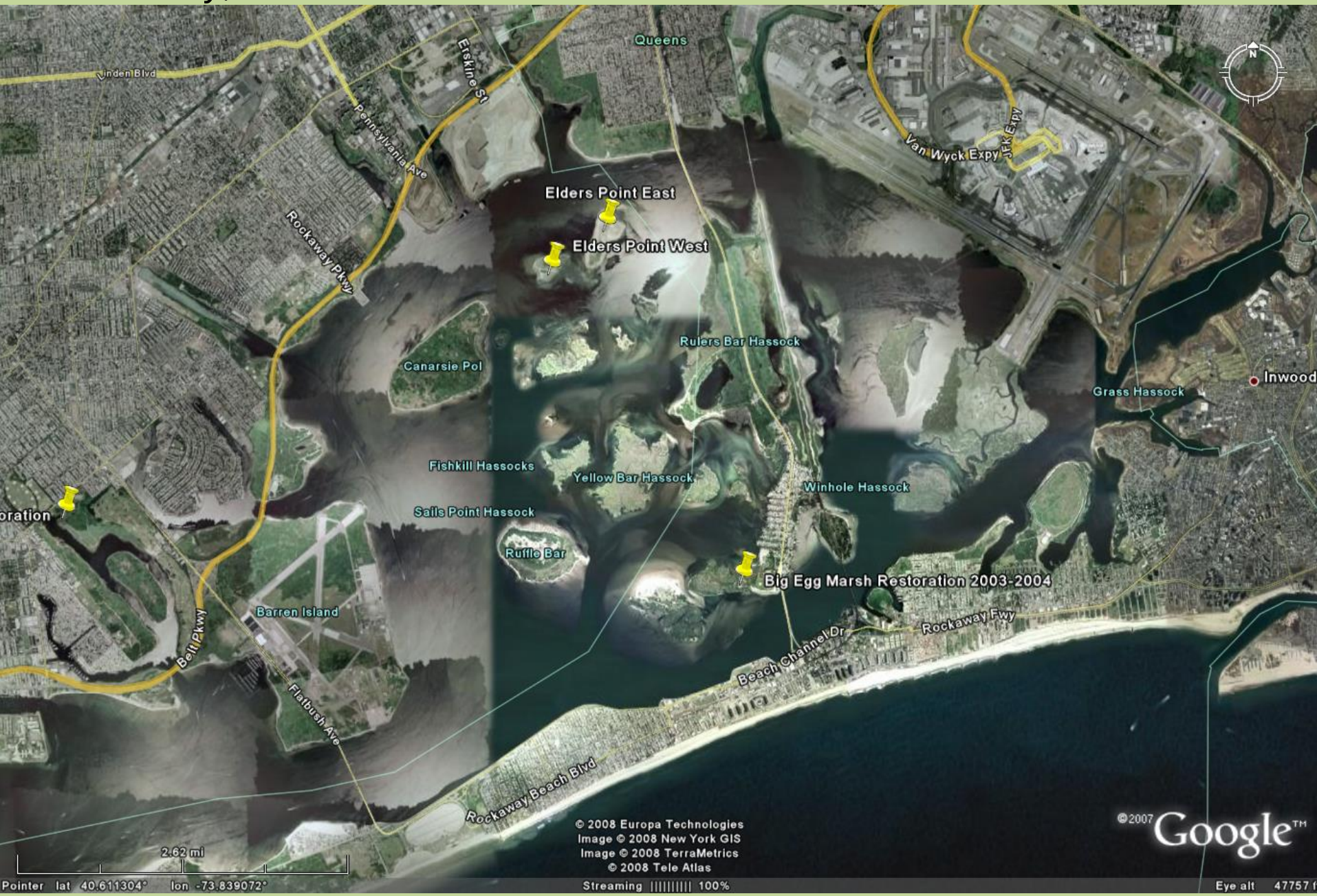
Woodbridge Creek Marsh, Woodbridge NJ

Goethals Bridge Pond, Staten Island NY

Jamaica Bay, NY



Jamaica Bay, NY



Conclusion

Case evidence within the area of the four mid-Atlantic National Estuary Programs demonstrates a wide array of:

- Physiological effects
- Associated terrestrial and marine uses
- Coastal management decision making
- Selection of restoration alternatives for both "fringing" marshes and large marsh complexes