

The Beneficial Use of Dredged Material for Marsh Restoration

NJDEP Living Shorelines Summit
February 27, 2015

Joel A. Pecchioli

Research Scientist I

NJDEP Office of Dredging and Sediment Technology

Goal: Marsh Restoration

NOT Dredged Material Disposal

Beneficial Use of Dredged Material is
Strongly Encouraged

NJDEP in Learning Phase

Coastal Zone Regulatory Process

- General Permit 29 (within 1977 Tidelands line) **or**
- Individual Waterfront Development Permit &
- Tidelands License

- USACE Nationwide Permit 13 (Bank Stabilization) **or**
- USACE Nationwide Permit 27 (Habitat Restoration) **or**
- USACE CWA Section 404 Individual Permit
- CZM Consistency Determination
- Section 401 Water Quality Certificate

Important Project Design Parameters

Sediment Sampling & Testing

- Dredged material and marsh sediment should have similar **physical characteristics** and **contaminant concentrations**.
 - Sample sediment to be dredged
 - Bulk Sediment Chemistry - compare to SQGs
 - Elutriate - compare to Surface Water WQS
 - Sample surface sediment at marsh restoration site
 - Bulk Sediment Chemistry
- Sampling plans must be approved by NJDEP-ODST.

Important Project Design Parameters

Construction

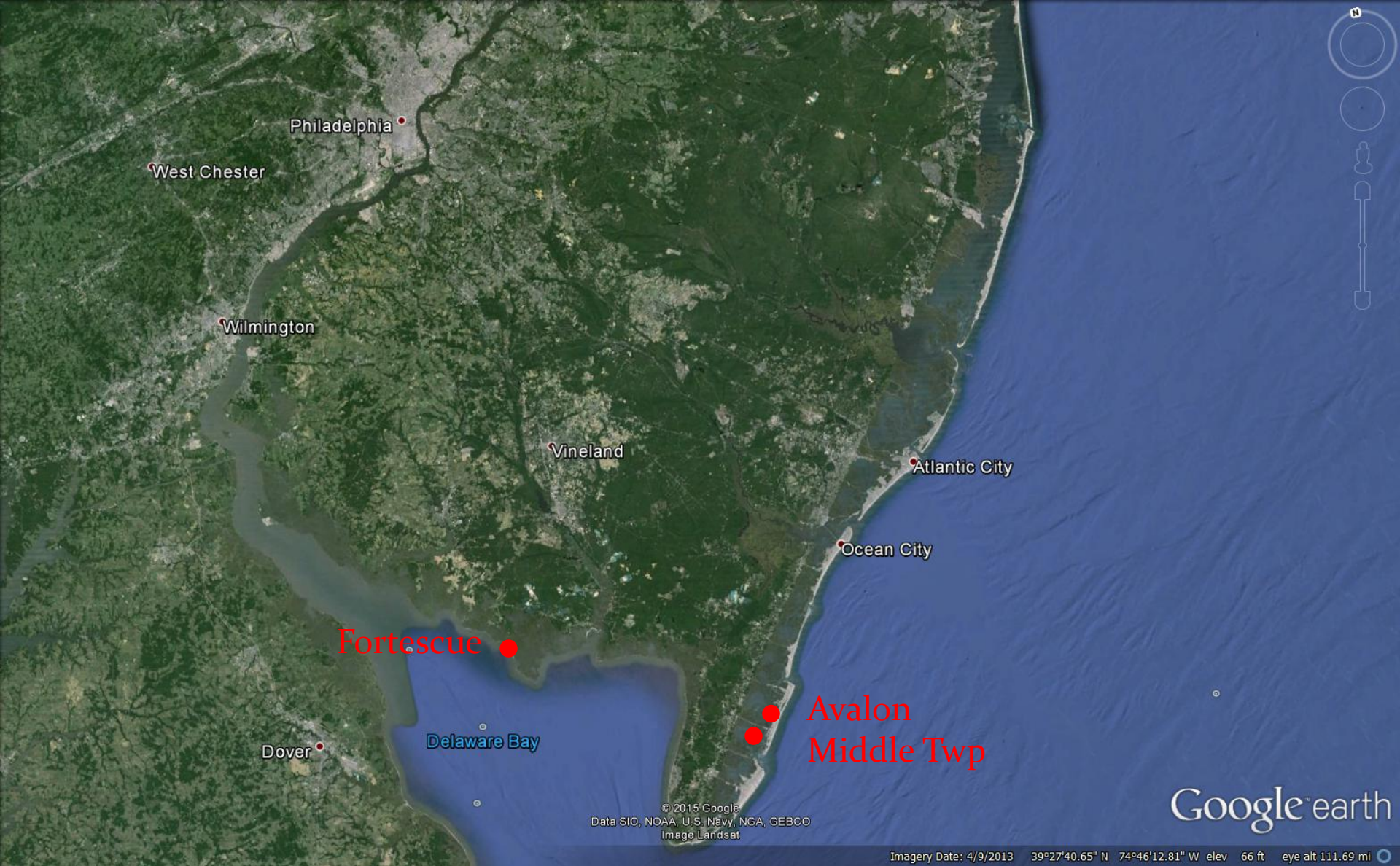
- Dredged material placement thickness?
 - Detailed site survey
 - Biological Benchmarks
 - Maximum 3-6 inches on marsh plain
 - Dredged material characteristics
- Placement method(s) – how & where?
- Dredged material slurry containment methods?
- Timing restrictions (T/E species, nesting birds, etc.)

NJDEP NFWF Projects

- \$3.42 million grant
- All work must be completed by August 2016
- Coordinated with USACE & NJDOT dredging projects
- Project Partners:
 - NJDEP – DFW, Land Use Regulation, Office of Science
 - The Nature Conservancy
 - Green Trust Alliance
 - The Wetlands Institute

NJDEP NFWF Project Objectives

- Evaluate the feasibility of using dredged material for marsh restoration
 - Thin-layer Placement
 - Marsh shoreline edge restoration
- Monitor and evaluate restoration projects to identify benefits and impacts
 - Storm damage buffering capacity
 - Erosion protection
 - Economic benefits



NFWF Grant Project Sites

Middle Township Site



Middle Township Black Skimmer Habitat

~ 0.5 acre site

Dredged Material - 96% fine sand



Middle Twp. Thin-Layer Placement Pilot Project

~ 2 Acre site Dredged Material - 96% fine sand

No sediment sampling







~150 feet

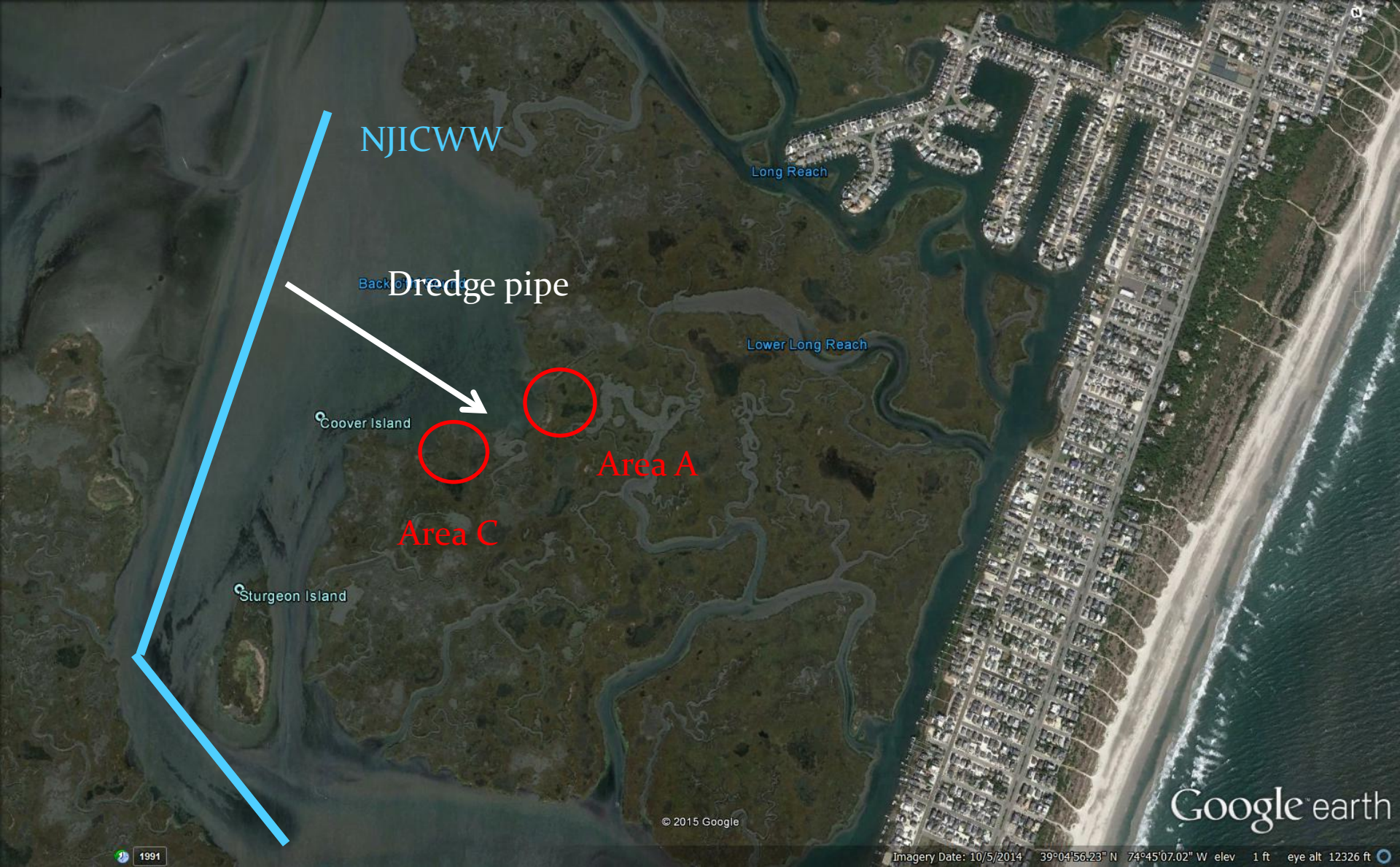


~50 feet





Avalon Thin Layer Placement Pilot Project



NJICWW

Dredge pipe

Coover Island

Area C

Area A

Sturgeon Island

Long Reach

Lower Long Reach

Google earth

© 2015 Google

Imagery Date: 10/5/2014 39°04'56.23" N 74°45'07.02" W elev 1 ft eye alt 12326 ft

1991

Avalon Thin Layer Placement Project

- Pilot Project: ~ 5,000 CY placed on ~ 5 acres
 - Dredged Material: 16% clay + 50% silt + 34% fine sand
 - TLP (< 6 in) on marsh plain
 - Fill pannes (~ 1 ft)
- Sediment sampling and testing (dioxins/furans)
- Full scale project: 40+ acres using ~ 70,000 CY
 - Shoreline edge restoration
 - Awaiting evaluation of dioxin/furan issue

Avalon Area C









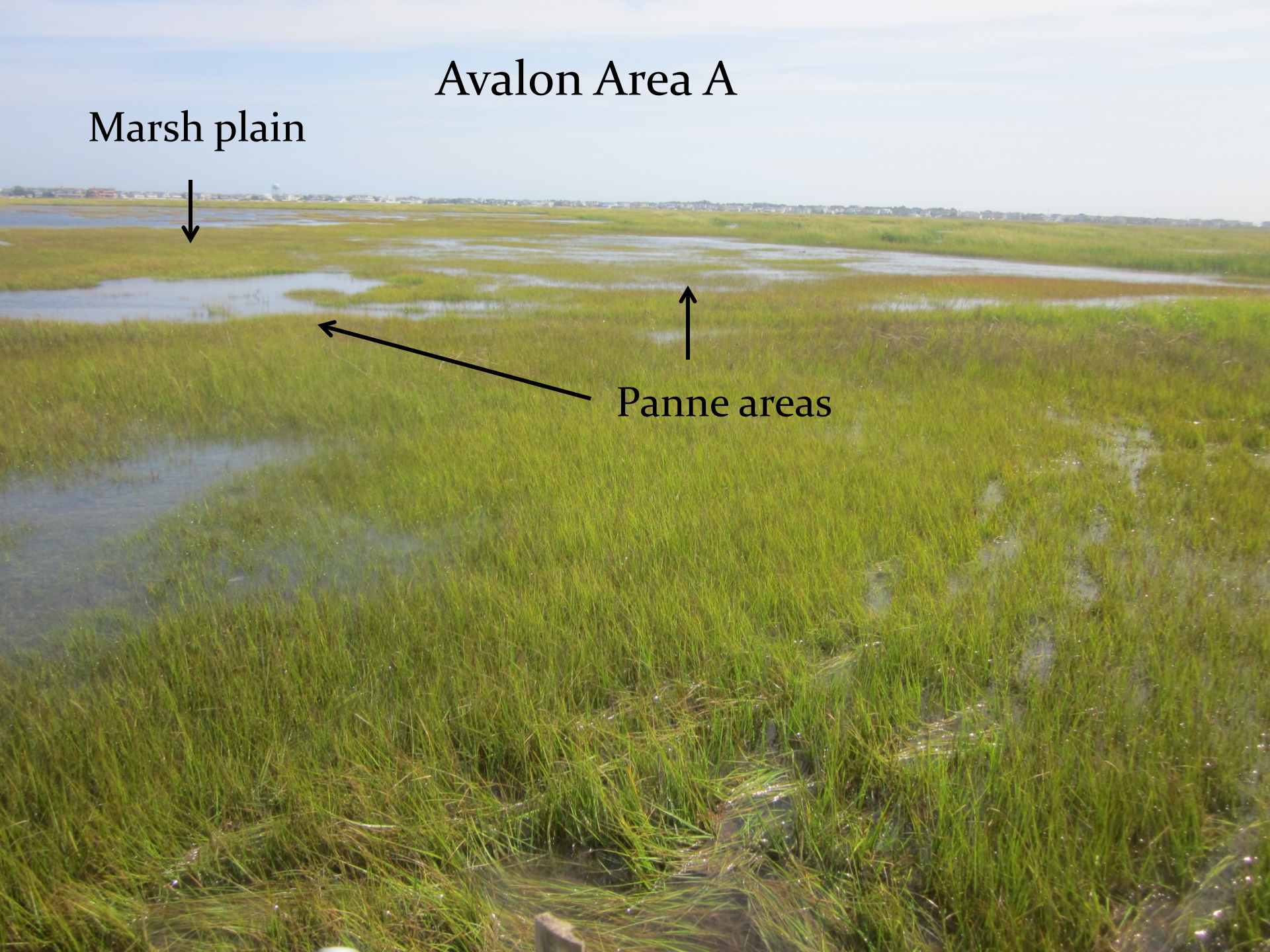


Avalon Area A

Marsh plain



Panne areas







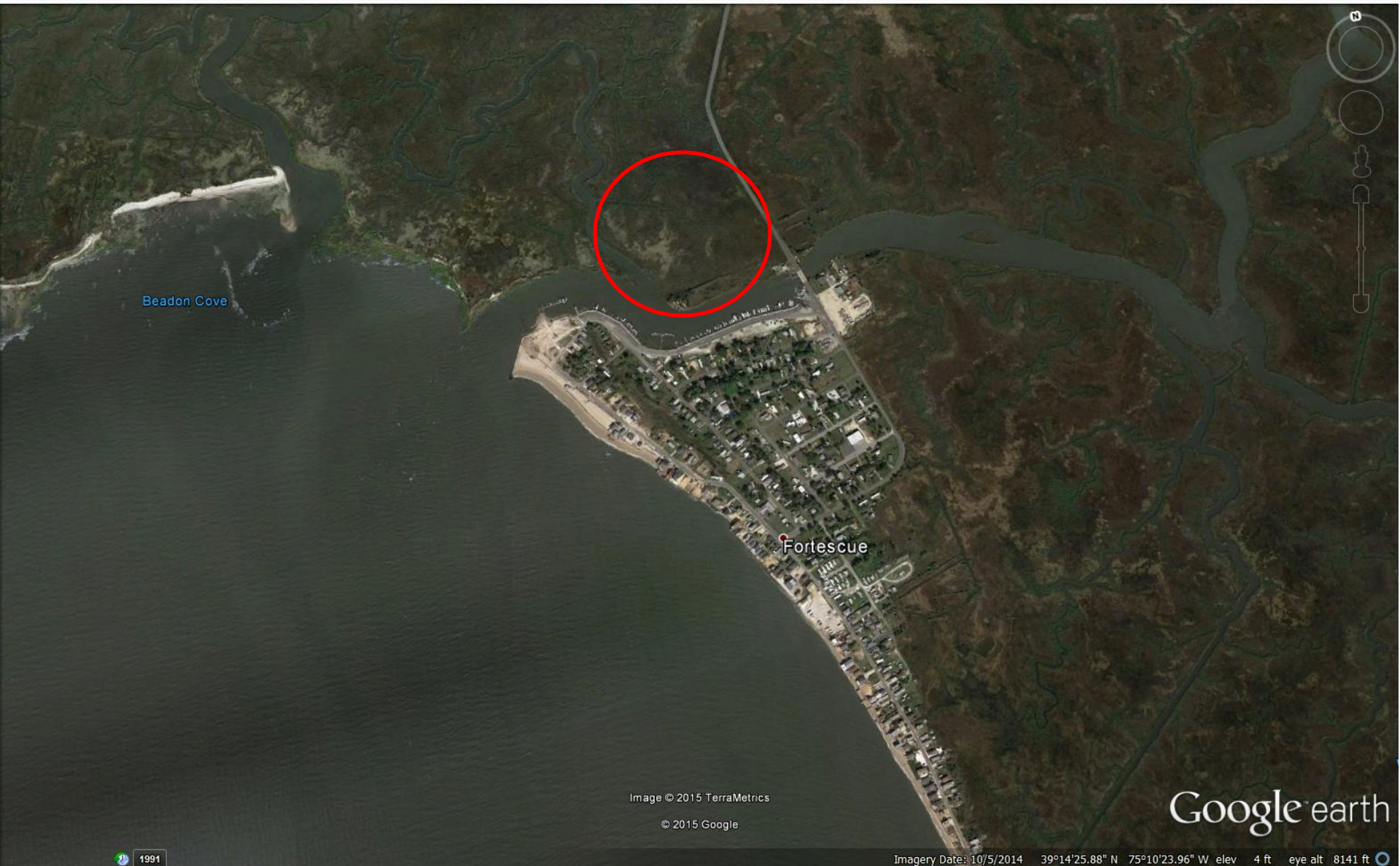


←
TLP Spray

↑
Coir logs



Fortescue Site



Beadon Cove

Fortescue

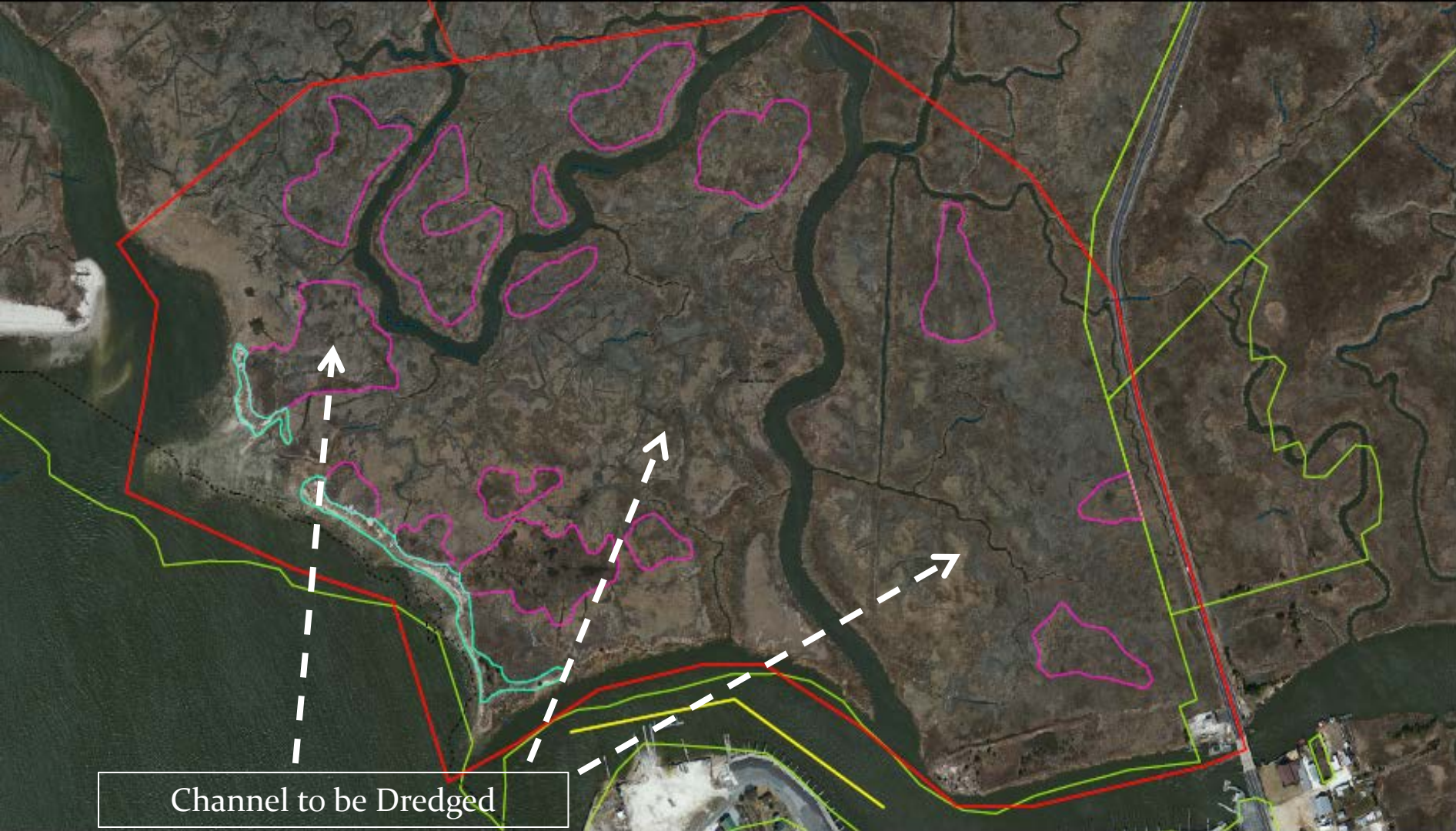
Image © 2015 TerraMetrics

© 2015 Google

Google earth

1991

Imagery Date: 10/5/2014 39°14'25.88" N 75°10'23.96" W elev 4 ft eye alt 8141 ft



Channel to be Dredged

Thin Layer Application Area A (~ 6 Inches of material)-18.98 Acres
 NJDFW Owned Property

Thin Layer Application Area B (~12 Inches of material)-1.48 Acres
 Municipal Limits

Dredging Area

Conceptual Restoration Plan

Figure 3

FORTESCUE AREA
Downe Township,
Cumberland County, New Jersey

GreenVest
One Step Ahead
www.greenvestus.com

MARYLAND 210 Hagers Road, Suite 202 Millersville, MD 21108 410.887.880 (o) 410.887.8801 (f)	NEW JERSEY 97 Parkwood Ave Raritan Place (L.R. 1) Raritan, NJ 08867 732.822.8844 (o) 732.822.8842 (f)	NORTH CAROLINA 4805 Owens Court Raleigh, NC 27612 919.787.5629 (o) 919.788.7429 (f)
--	---	--

1 inch = 139 feet
Date: 1/14/2014

Data Sources: NJ GIN, NJ DEP, GreenVest LLC

Fortescue Thin-Layer Placement – Fall 2015

Lessons Learned

- Need detailed site surveys
 - Design project
 - Establish target elevations: Bio-benchmarks
 - As-Built & Monitor Elevations
- Adaptive Management is Critical
 - Control flow of dredged material slurry
 - Personnel, equipment, and supplies on-site
 - Coordinate with dredging operations
- Monitoring Critical to evaluate project success/failure
 - Long-term (3-5 years)
 - Corrective actions? (eg. planting)

Any Questions?

