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Identifying Degraded Salt Marshes for Beneficial Use of Dredged Material Projects in New Jersey – Avalon Case Study

Goal: Trial the Beneficial Use of Dredged Material to Restore Salt Marshes

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Original plan: thin-layer placement of dredged material over salt marshes that were threatened by sea level rise.

Evolving plan: dredged material was used to mitigate a variety of sources of degradation, including sea level rise.

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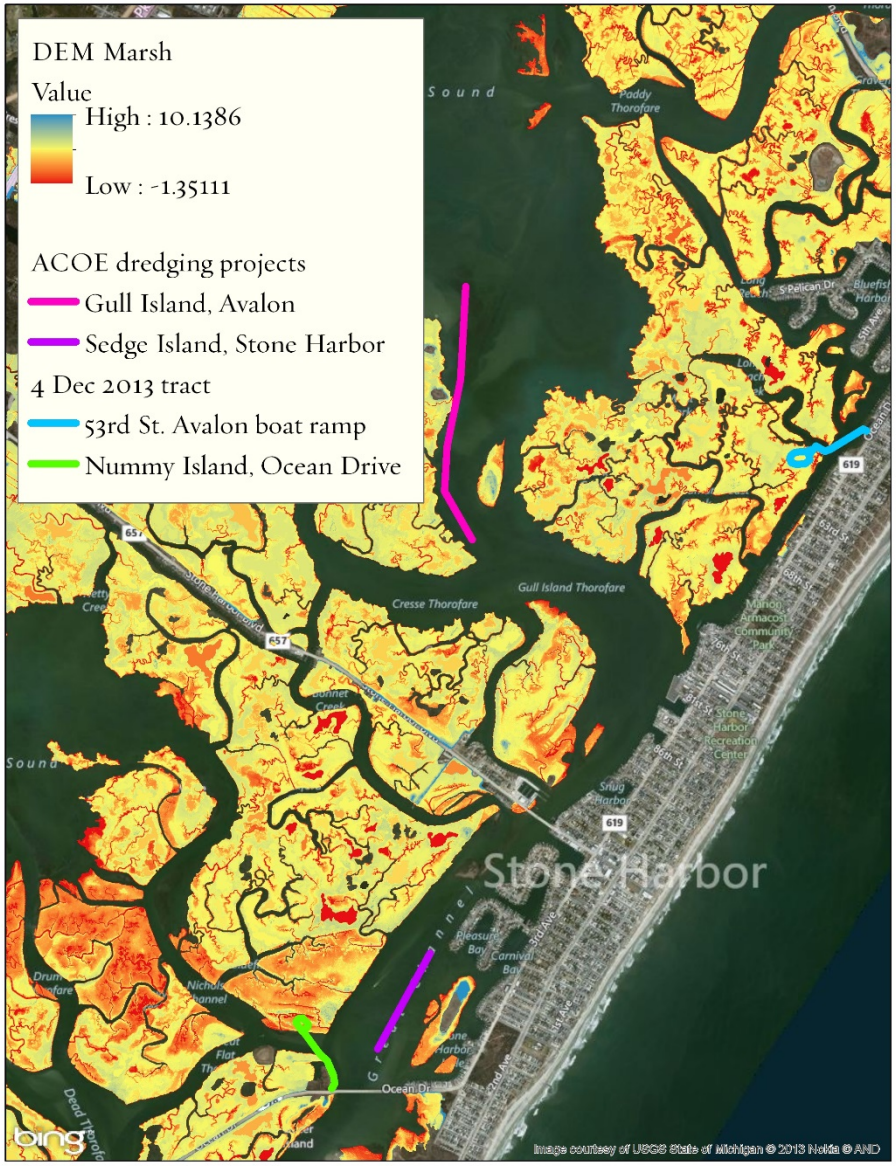
Regional Site Identification



Steps:

1. Where was dredging happening?
2. How far could sediment be pumped?
3. Look for low lying sections of marsh within range of pumping
4. Consider landownership and proximity to communities

Site Assessment

The site assessment process followed 3 steps:

1. High-level desktop analysis
2. Rapid on-the-ground assessment
3. Detailed site characterization

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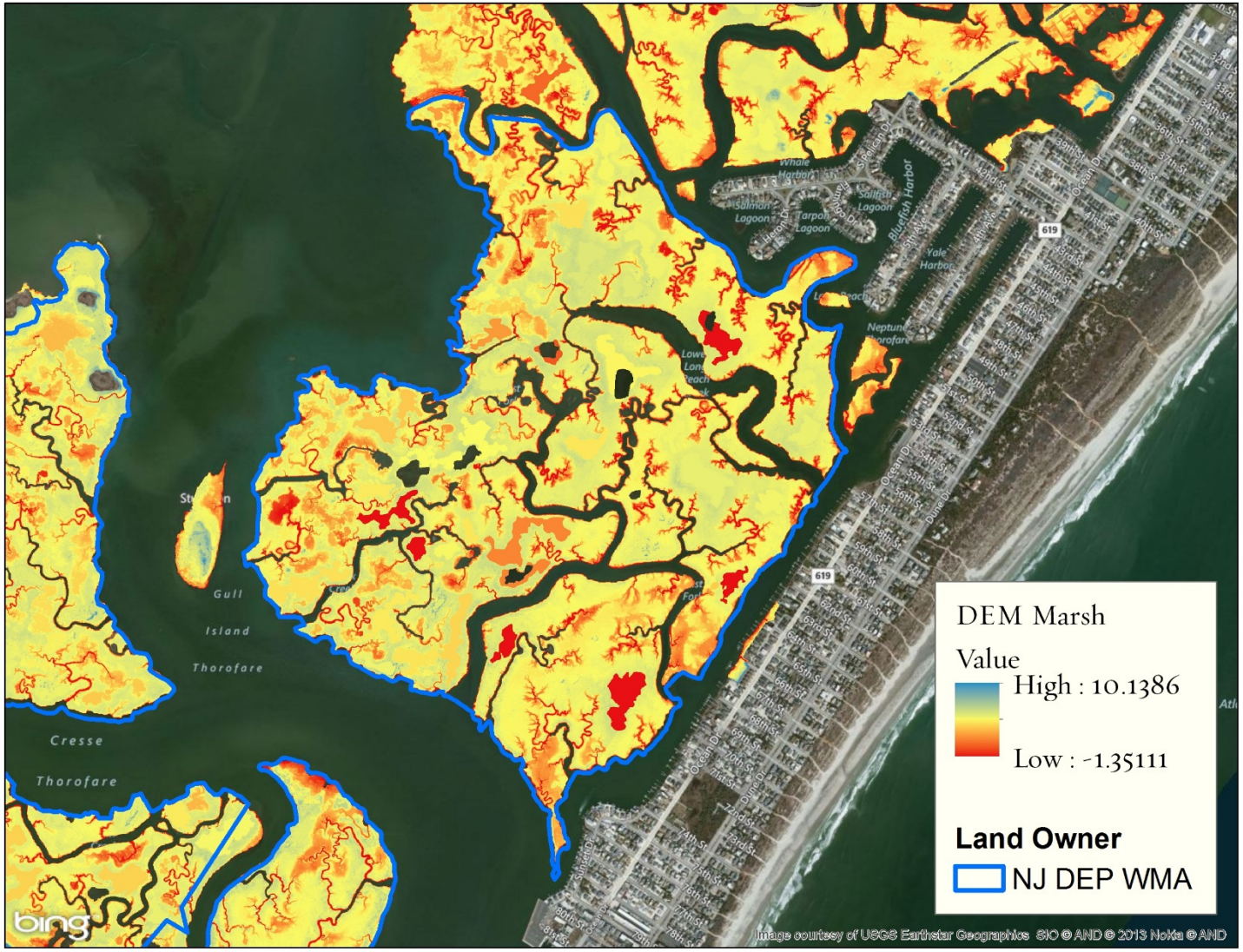
Desktop analysis: Close Look at DEM



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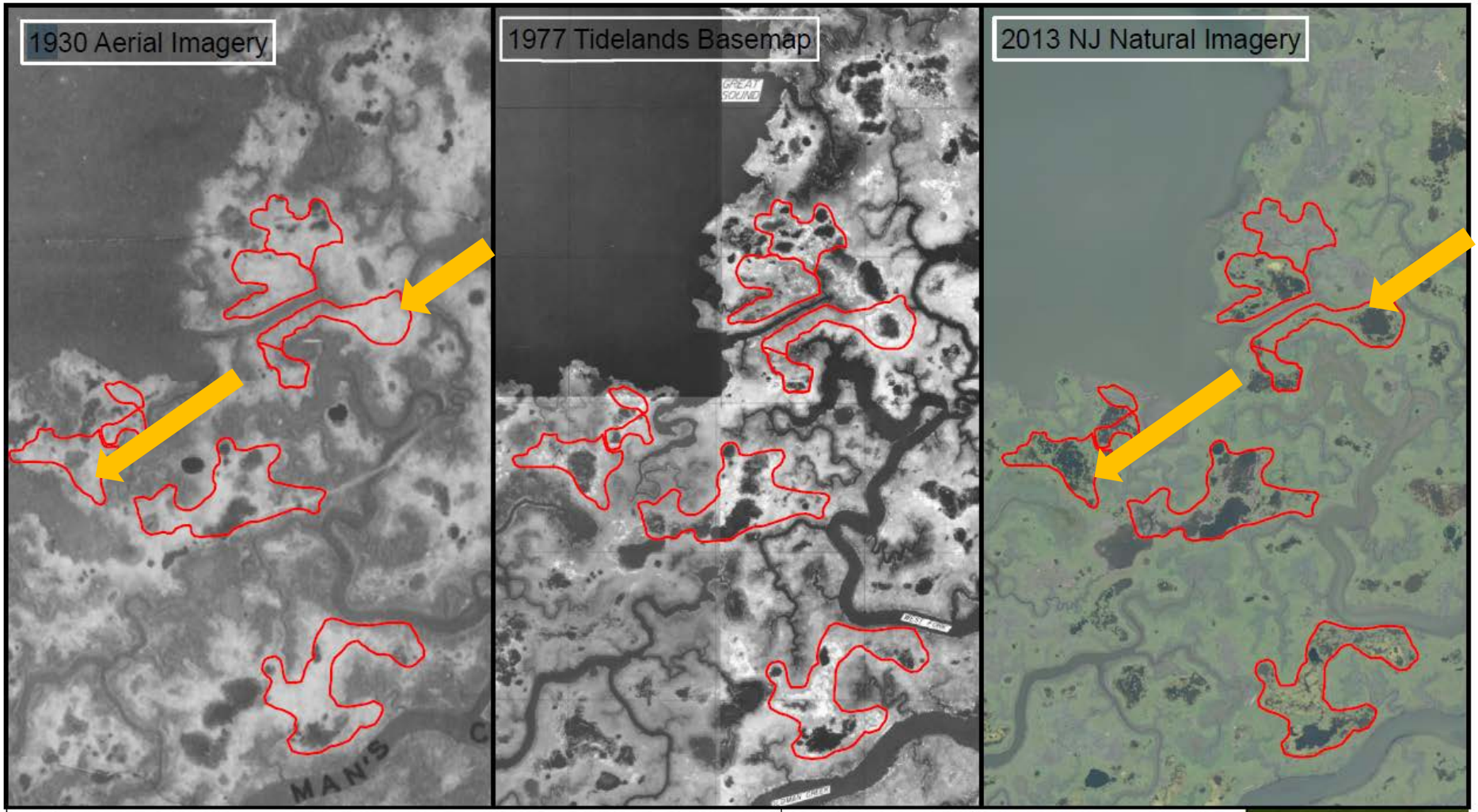
Desktop analysis: Historic Aerial Images



N
W E
S
Feet
0 250 500 750 1,000

Res

68.7%

Avalon Marsh Restoration
ial Images
Wetlands WMA
Block 84 Lot 1
Avalon Borough, Cape May County, New Jersey

GreenVest
One Step Ahead
MARYLAND
210 Najoles Road, Suite 202
Millersville, MD 21108
410.987.5800 (p)
NEW JERSEY
91 Fieldcrest Ave.
Raritan Plaza II, A-1
Edison, NJ 08837
732.902.6644 (p)
NORTH CAROLINA
4405 Dawson Court
Raleigh, NC 27612
919.787.5629 (p)
1 inch = 600 ft @11 x 17
Date: 9/22/2015

Desktop analysis: ERDC – Drainage Analysis

Drainage analysis image: Candice Piercy

Drainage analysis to look at non-draining and poorly draining pools (outlined in orange)

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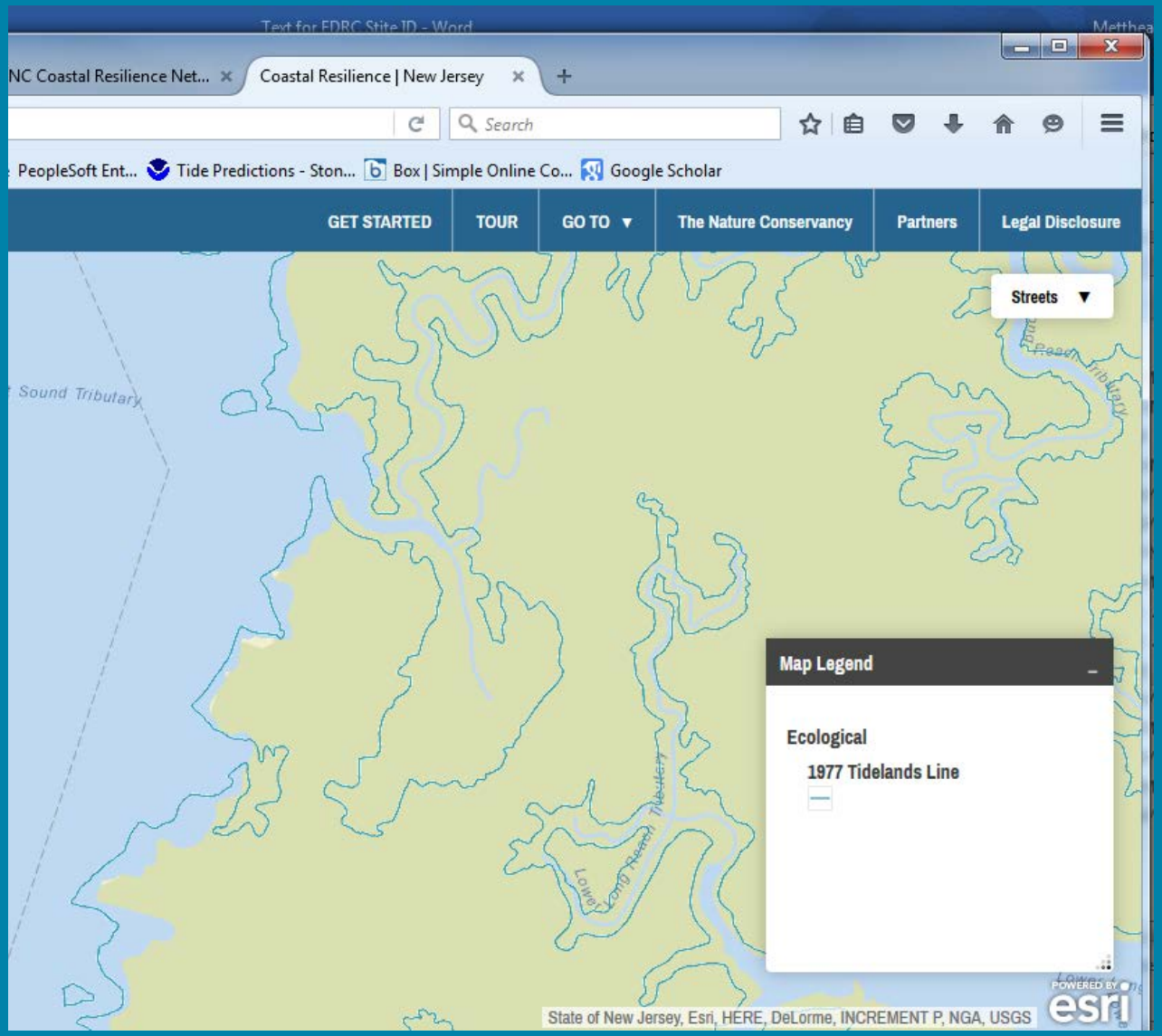
Desktop analysis: Erosion Rates



Map from coastalresilience.org

Site Visits: Rapid On-the-ground Assessment

We were looking for areas that were degraded and where the degradation could be mitigated by the addition of sediment:

- Rapidly eroding and undercutting edges of the marsh
- Explaining and unhealthy pools
- Sparse and stunted vegetation
- Low lying areas/ extensive flooding
- Areas of marsh that have a high ratio of water and mudflat to vegetated area
- Unstable marsh platform
- Low faunal usage

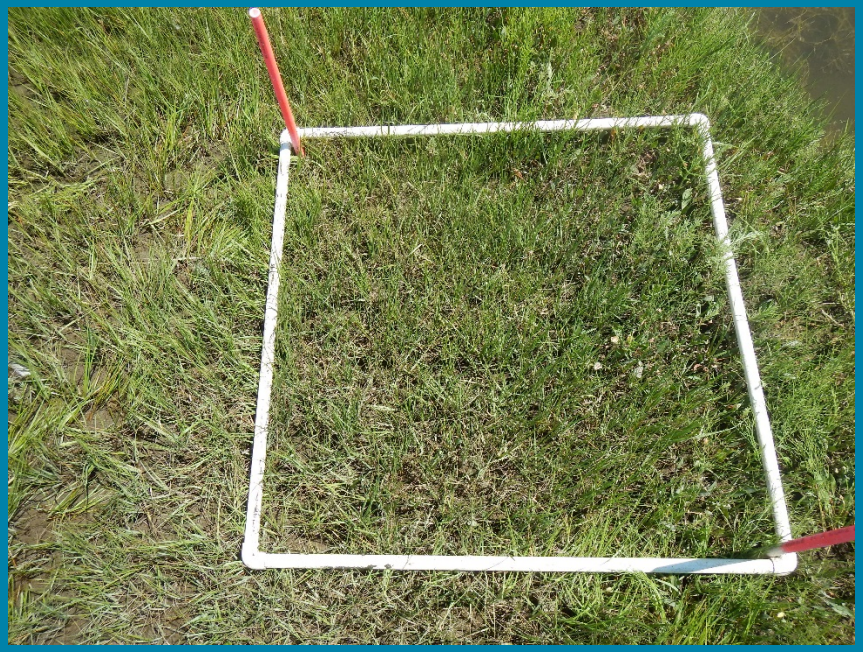
High tide over the marsh plain

Extreme edge erosion

Expanding pools next to eroding marsh edge = blowouts

Expanding Pools and Unstable Platform

Vegetation: Stunted and sparse *Spartina alterniflora*



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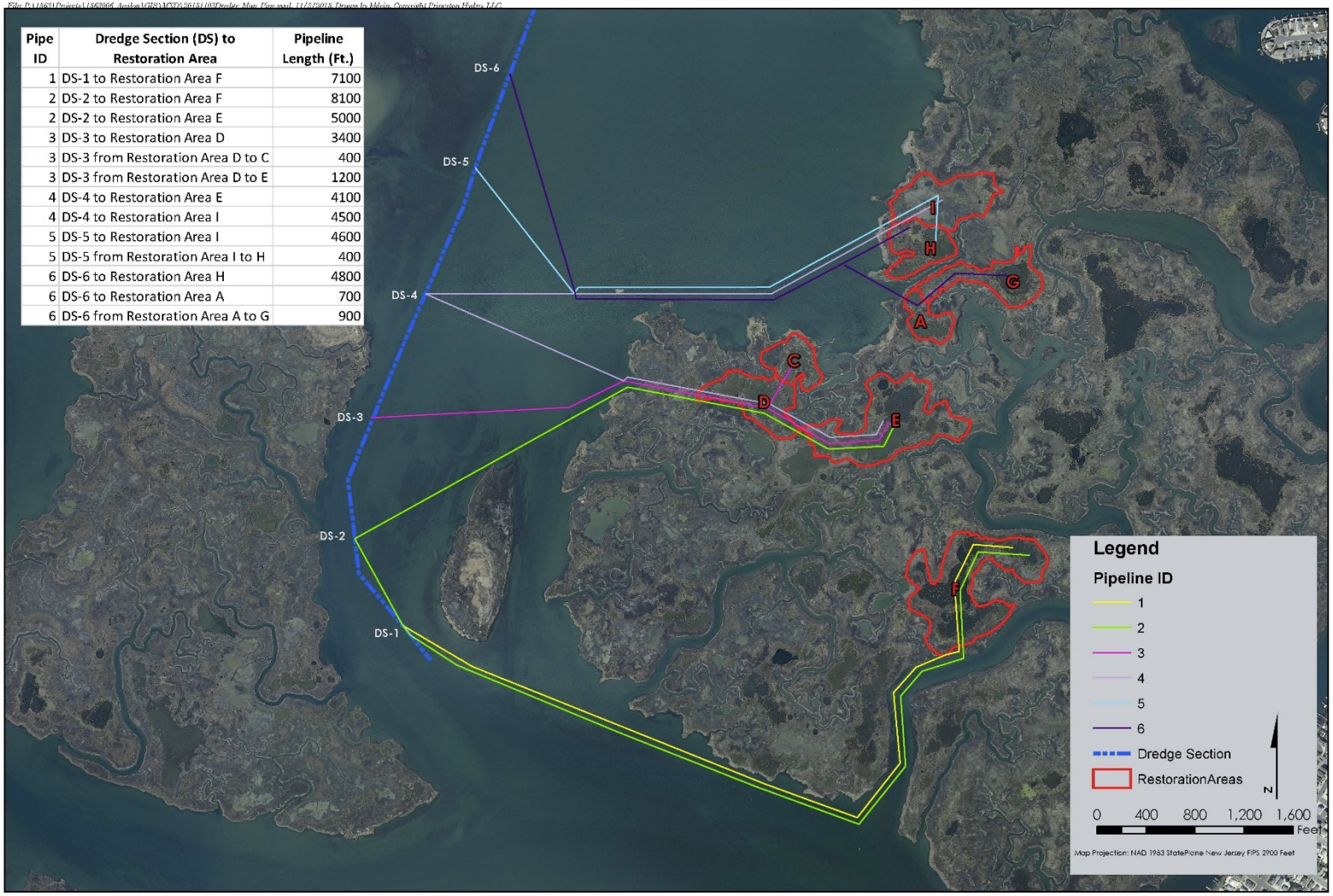
Final Areas Selected for Placement

Pipe ID	Dredge Section (DS) to Restoration Area	Pipeline Length (Ft.)
1	DS-1 to Restoration Area F	7100
2	DS-2 to Restoration Area F	8100
2	DS-2 to Restoration Area E	5000
3	DS-3 to Restoration Area D	3400
3	DS-3 from Restoration Area D to C	400
3	DS-3 from Restoration Area D to E	1200
4	DS-4 to Restoration Area E	4100
4	DS-4 to Restoration Area I	4500
5	DS-5 to Restoration Area I	4600
5	DS-5 from Restoration Area I to H	400
6	DS-6 to Restoration Area H	4800
6	DS-6 to Restoration Area A	700
6	DS-6 from Restoration Area A to G	900



THIN LAYER DREDGE
PIPE LAYOUT CONFIGURATION
Avalon, New Jersey

PRINCETON HYDRO, LLC.
1108 OLD YORK ROAD
P.O. BOX 720
RINGOES, NJ 08551
*with offices in NJ, PA and CT

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Detailed site characterization/ baseline monitoring

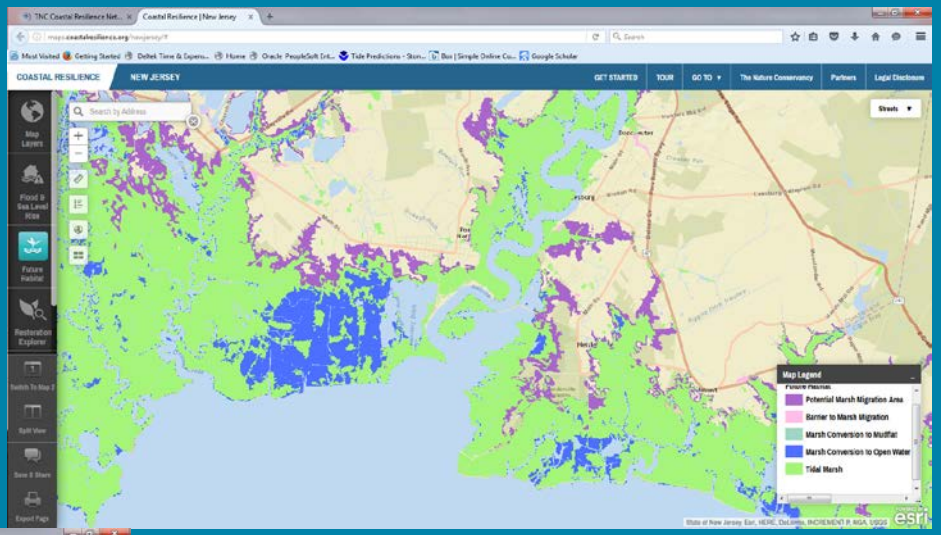
- Vegetation surveys
- Hydrology
- Topographic surveys
- Avifauna
- Infauna
- Epifaunal macroinvertebrates
- Nekton
- Soil/sediment properties of marsh and dredged sediments

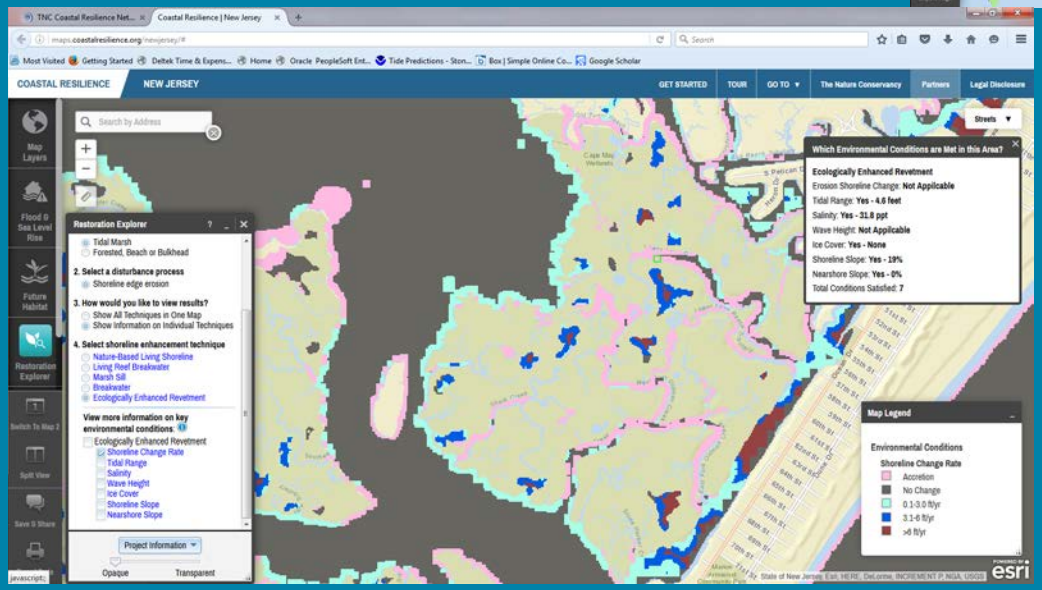
Data Collection and Modeling to Help Inform Future Projects

Restoration Explorer and Future Habitat App

http://maps.coastalresilience.org/virginia/#

http://maps.coastalresilience.org/network/





Regional field data collection efforts:

1. SMI
2. MACWA

Questions?

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