



Assessment of New York City Tidal Marsh Conditions and Vulnerability

Jamaica Bay Symposium

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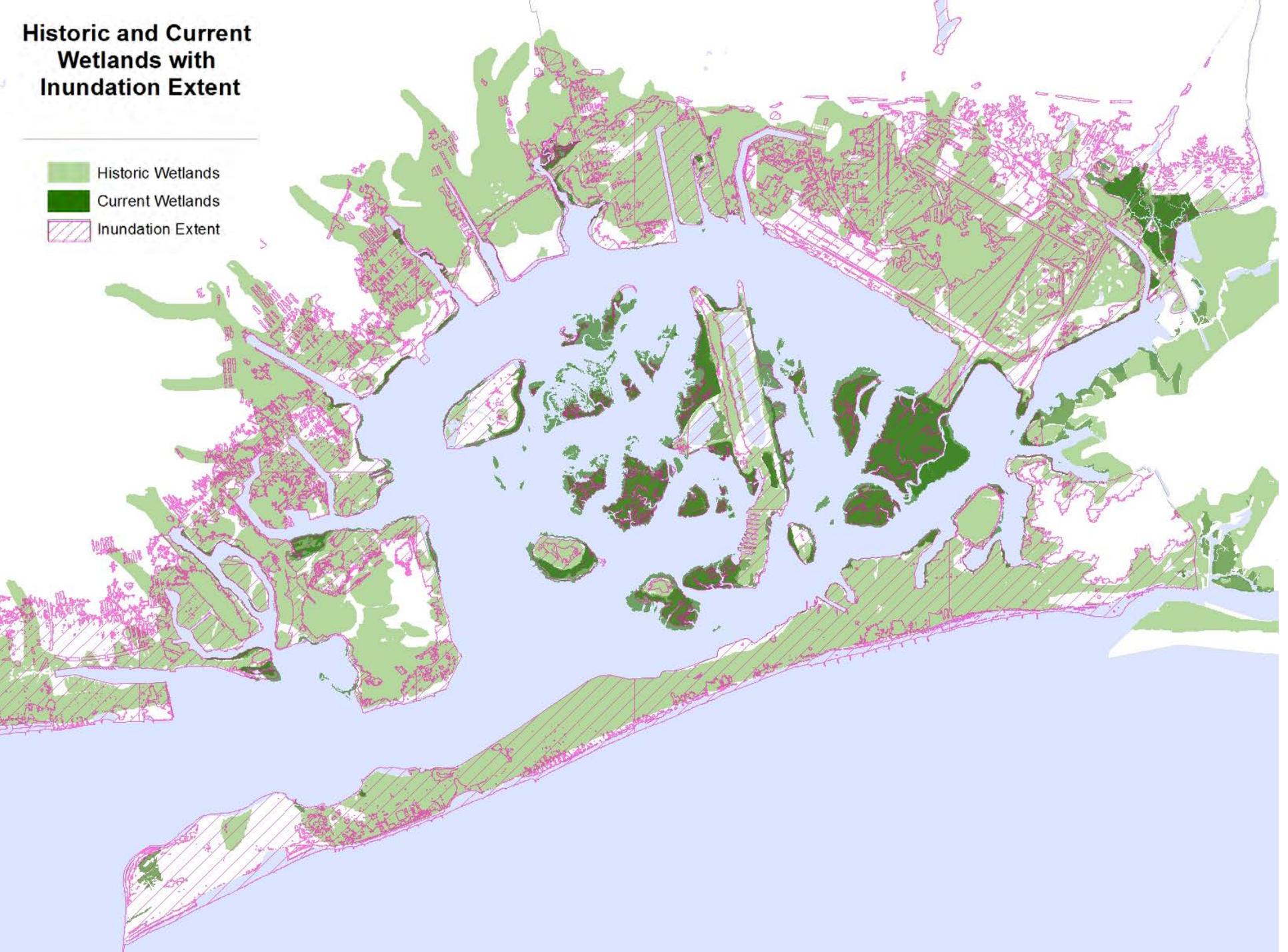
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Parks

Historic and Current Wetlands with Inundation Extent

- Historic Wetlands
- Current Wetlands
- Inundation Extent





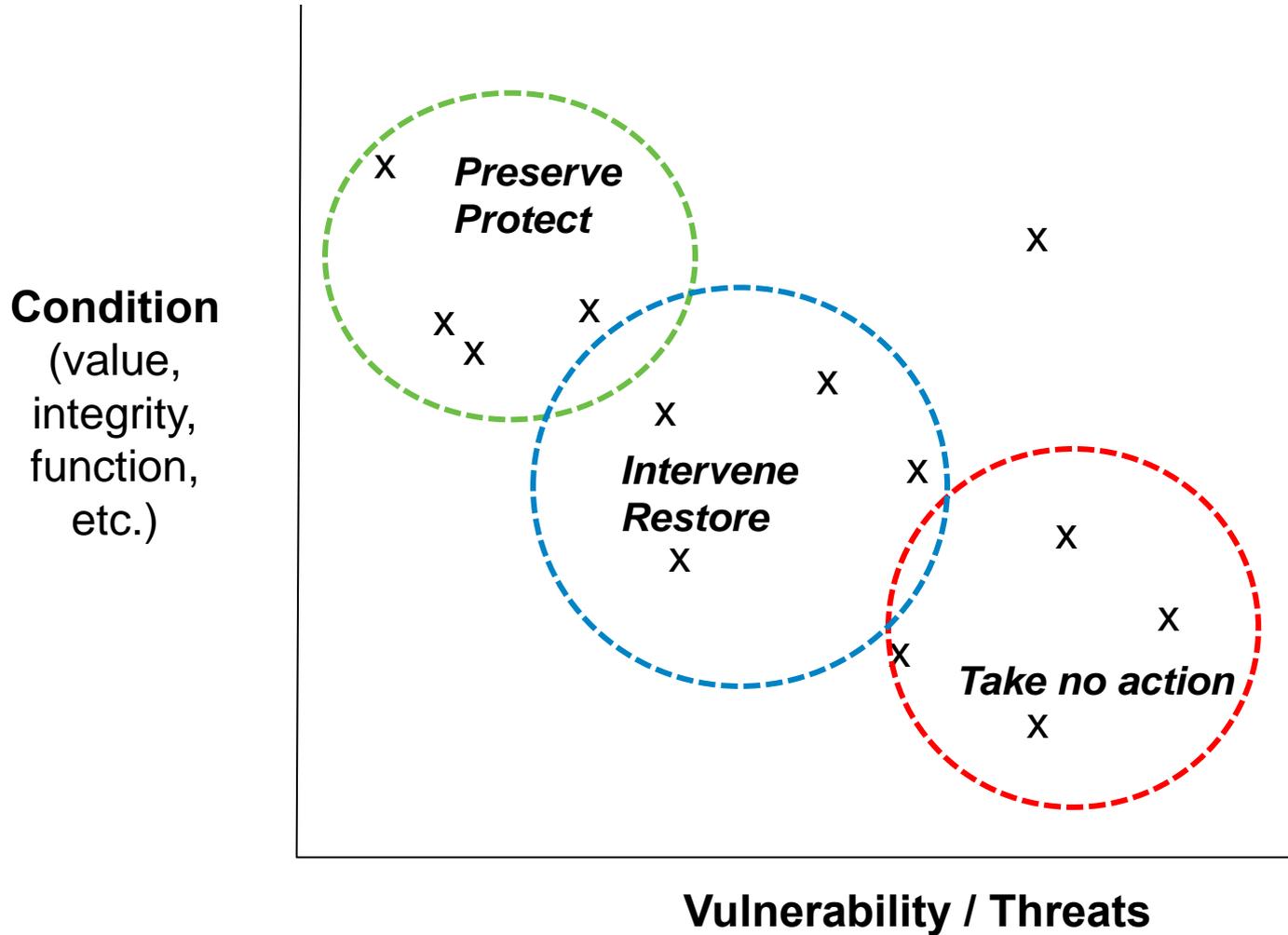
Our Questions:

1. What are the conditions of NYC marshes
2. Where are the most vulnerable marshes?
3. What are the marsh migration opportunities and constraints?



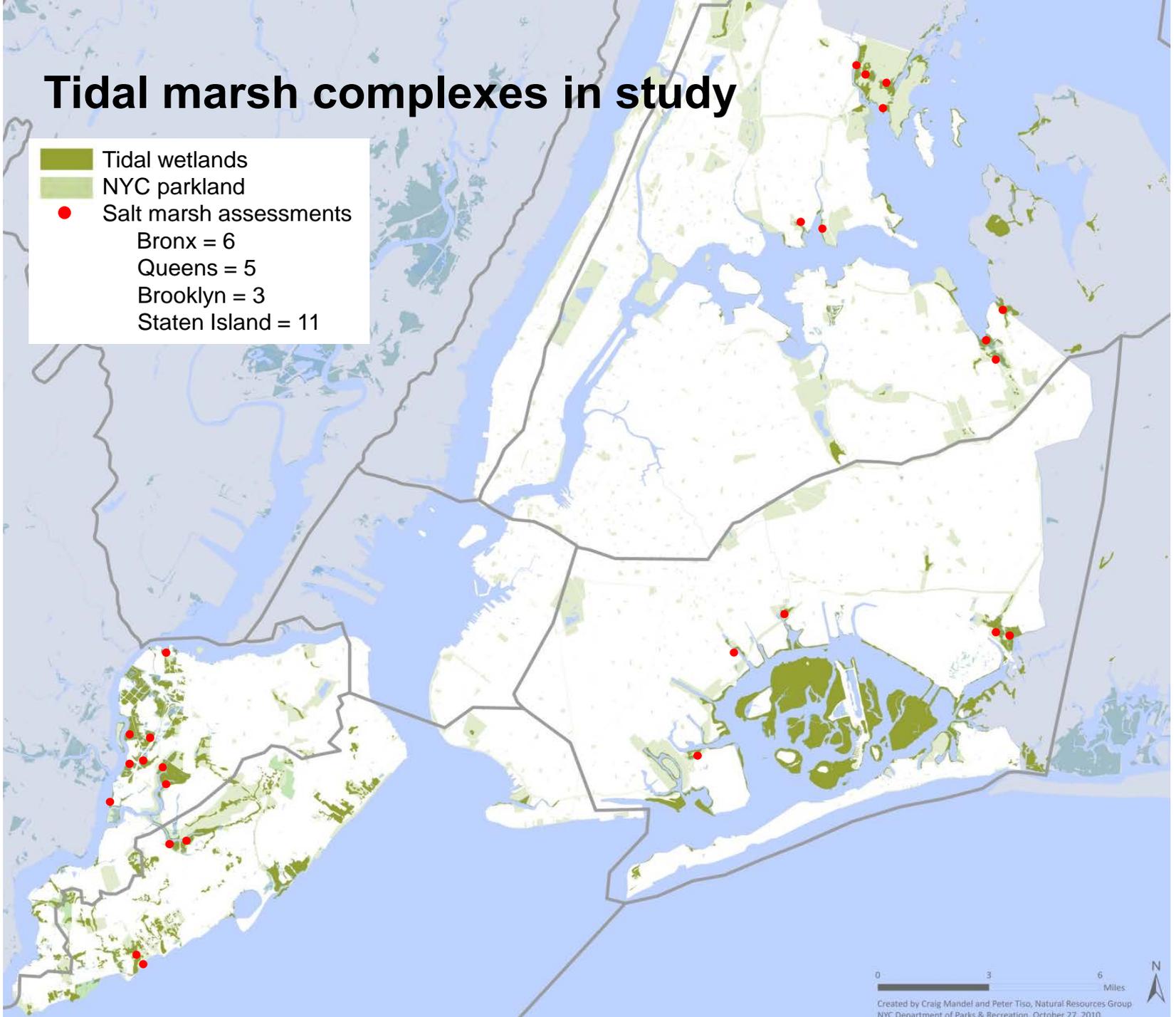
Priorities for restoration and protection

Conceptual Model for Prioritizing Management Actions



Tidal marsh complexes in study

-  Tidal wetlands
-  NYC parkland
-  Salt marsh assessments
 - Bronx = 6
 - Queens = 5
 - Brooklyn = 3
 - Staten Island = 11



1. What are existing conditions?

**Overall NYC marsh condition:
MidTRAM (Mid-Atlantic Tidal
Rapid Assessment Method)**



Field & desktop
assessment of
hydrology

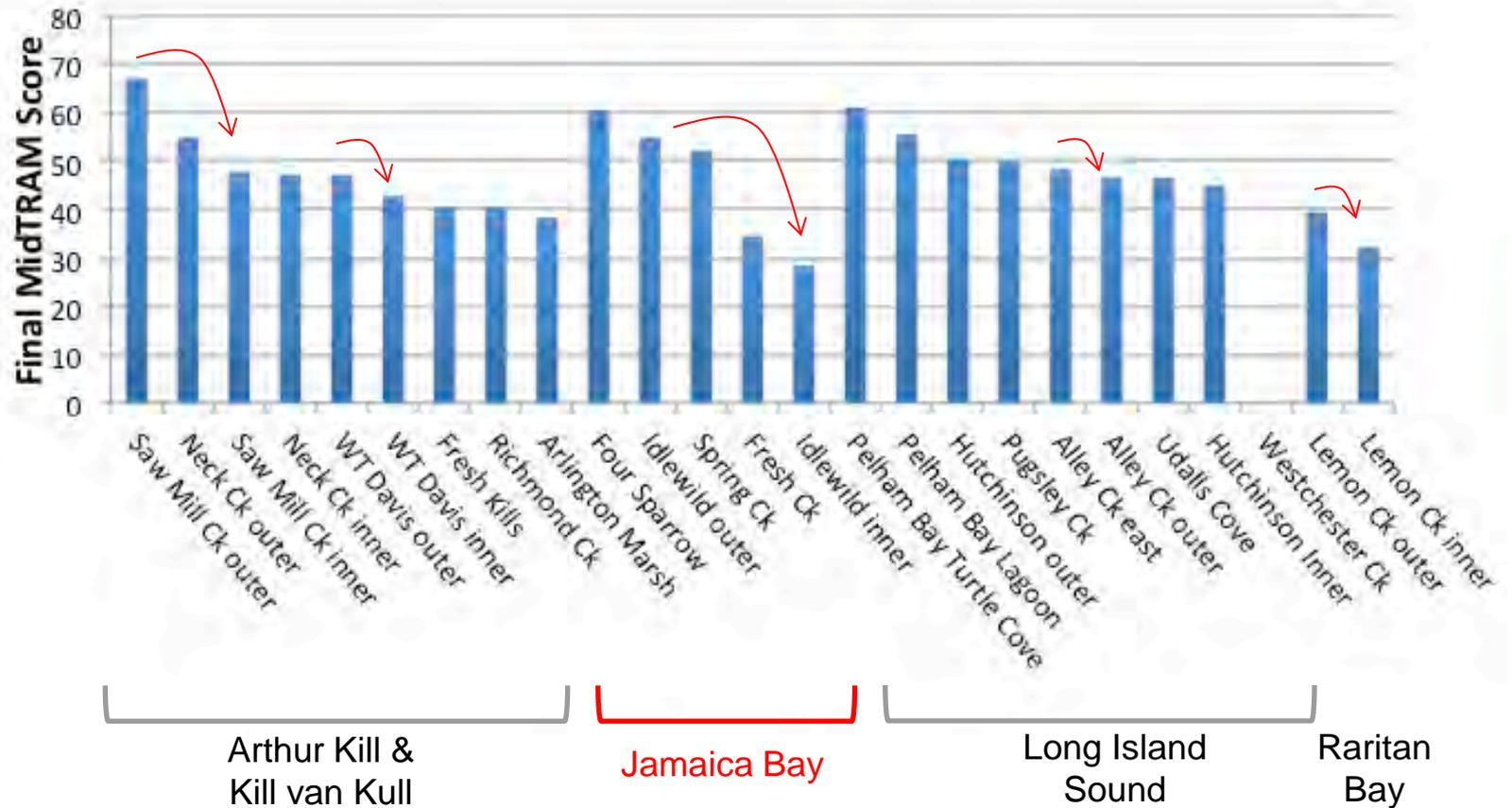


Desktop
assessment
of **buffer**



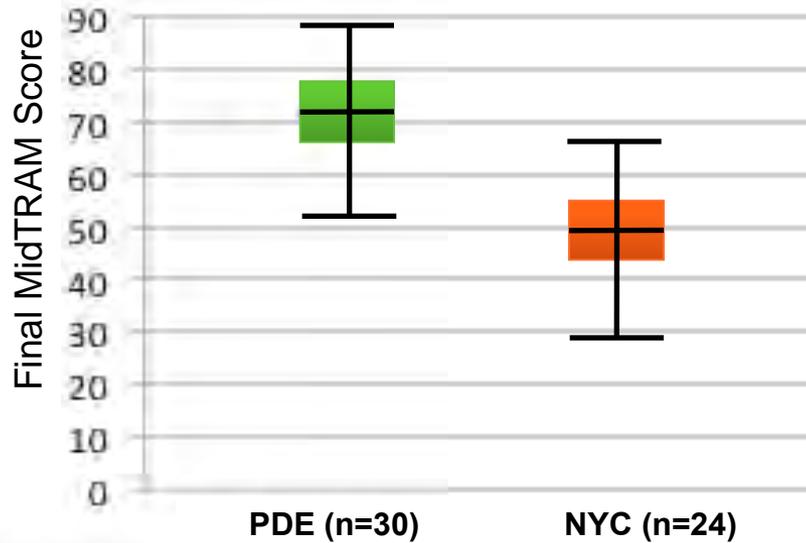
Field
assessment of
habitat

Salt marsh condition assessment scores across NYC (MidTRAM)

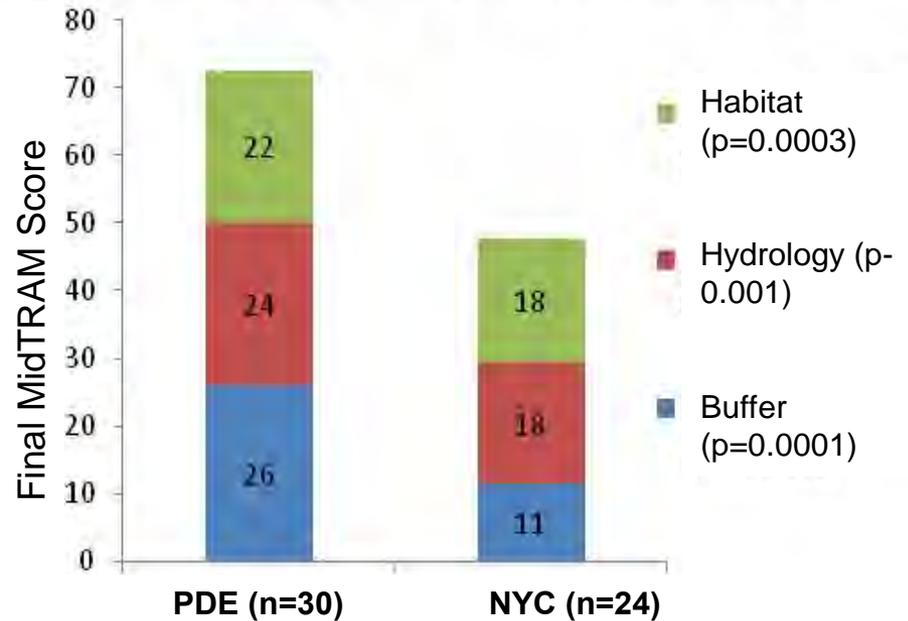


Salt marsh condition scores in Delaware Estuary and NYC (MidTRAM)

Distribution of Scores



Comparison of Metric



2. Which marshes are most vulnerable?

Ecological assessment within NYC Marshes

- Vegetation cover
- Root shear strength
- Species diversity
- Invasive species
- Non-vegetative cover

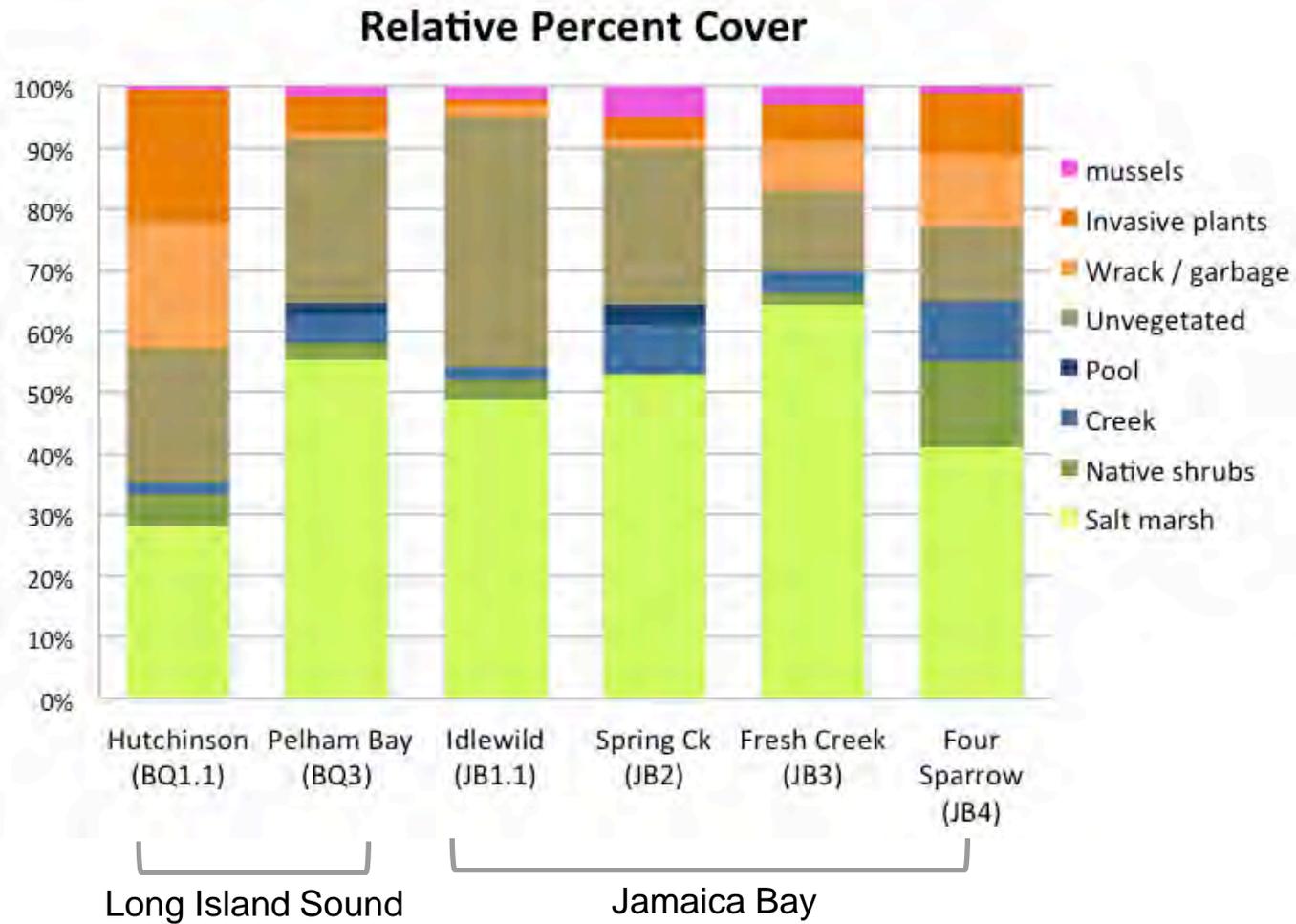


Spartina at
Spring Creek



Wrack at Four
Sparrow
marsh

Ecological assessment – preliminary findings



Ecological assessment – preliminary findings

Significant differences between marshes in:

- *Spartina alterniflora* and *Spartina patens* cover
- Bare ground, garbage, wrack cover
- Invasive species cover
- Root shear strength



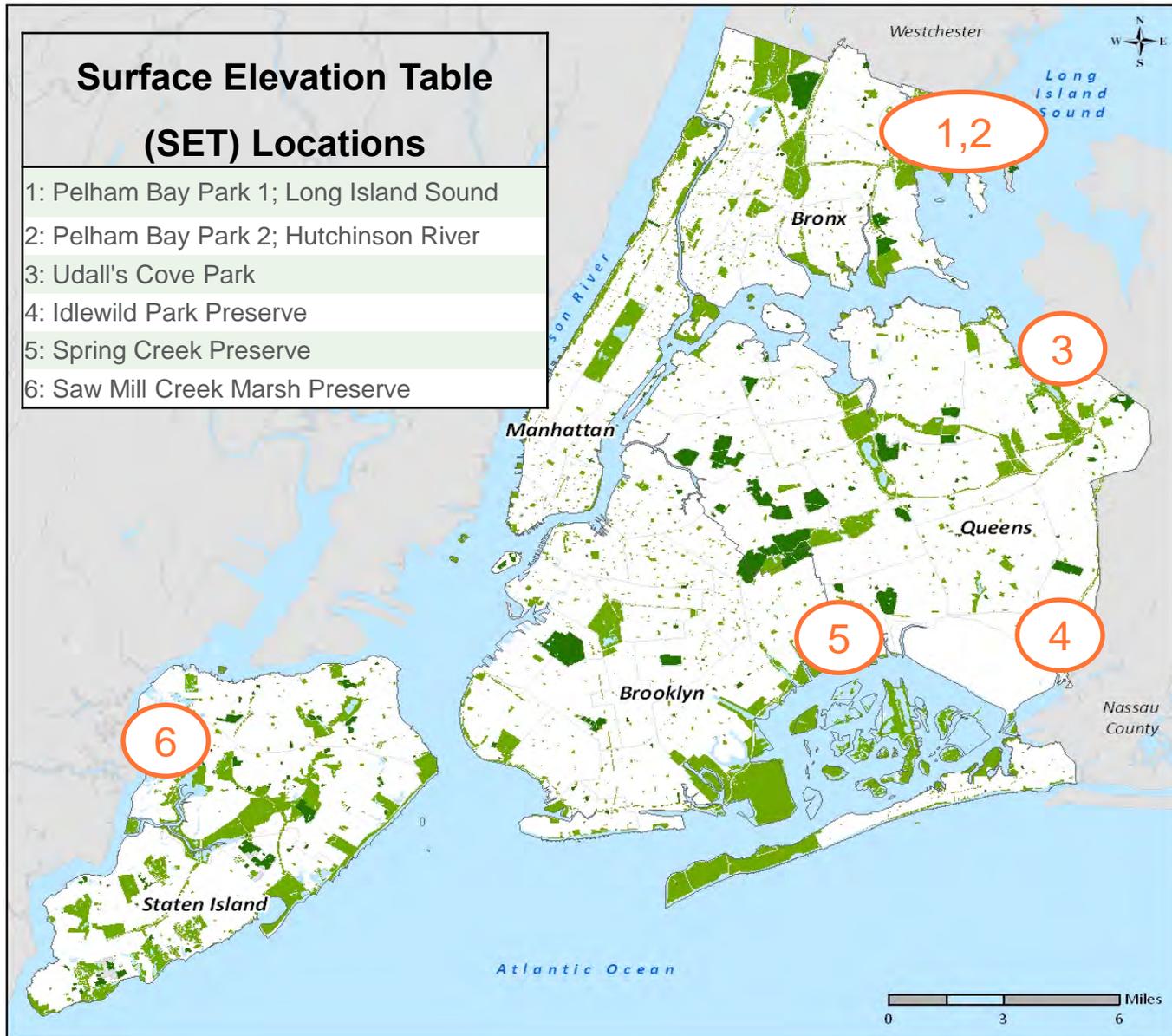
Marsh loss between 1974-2010 – preliminary findings

- Dozens of acres lost in tributary salt marshes in NYC
- Loss rates are ~0.3-1% of marsh area per year
- Loss varies over time and place and mechanism – less loss in some places in recent decades.



Idlewild marsh

Salt marsh accretion compared to Sea Level Rise (SLR)



Marsh elevation change (preliminary findings)				
	Pelham Bay A 1	Pelham Bay B 2	Udall' s Cove 3	Spring Creek 5
Years of data	3	2	2.5	1.5
Elevation (mm/yr)	1.7	2.8	3.1	5.0
Accretion (mm/yr)	3.6	5.0	2.4	3.6
Subsidence (mm/yr)	1.9	2.2	0.6	-1.4



3. What are the marsh migration opportunities and constraints?

Future inundated land and potential wetland extent: Sea Level Affecting Marshes Model (SLAMM)

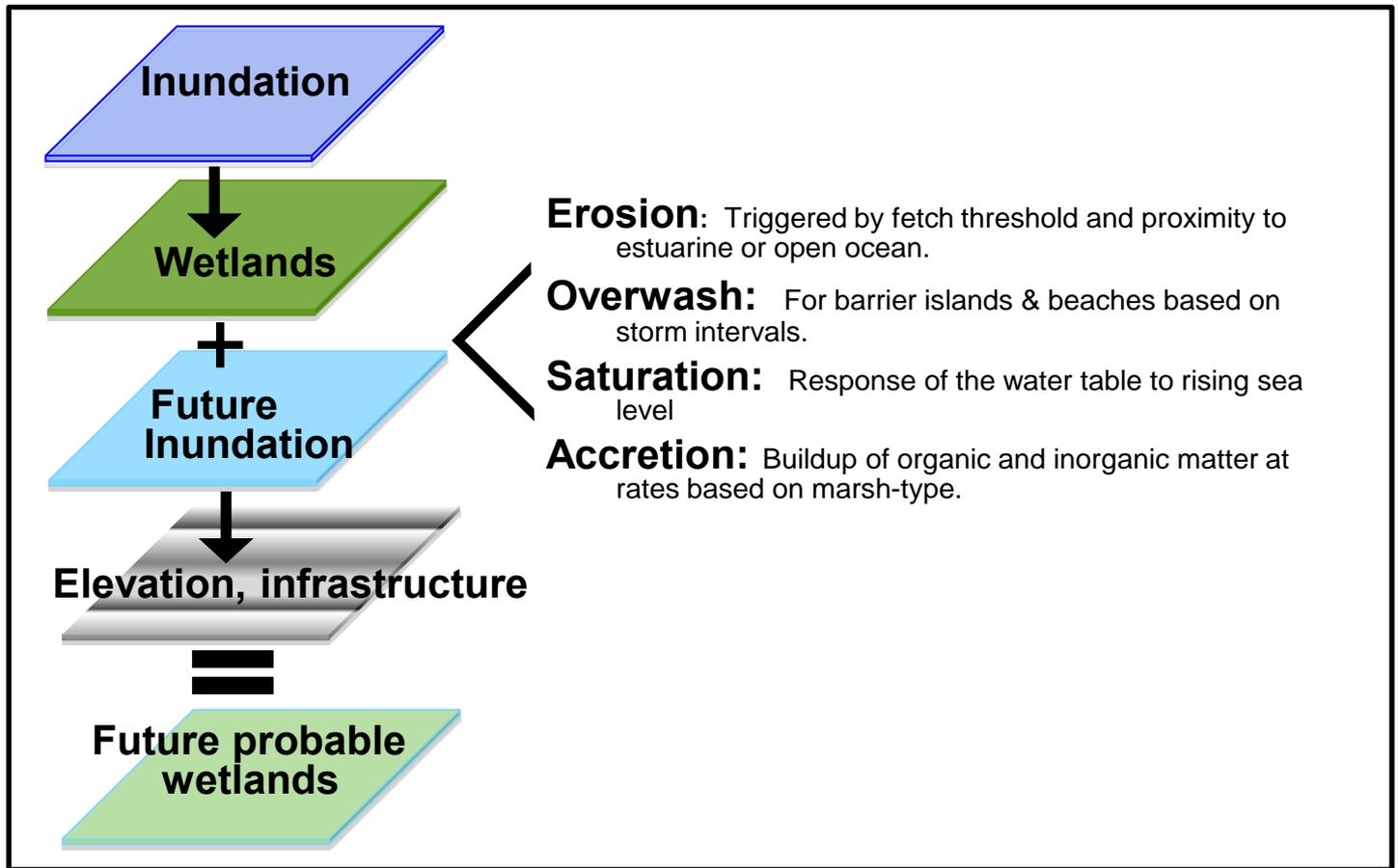


Idlewild marsh

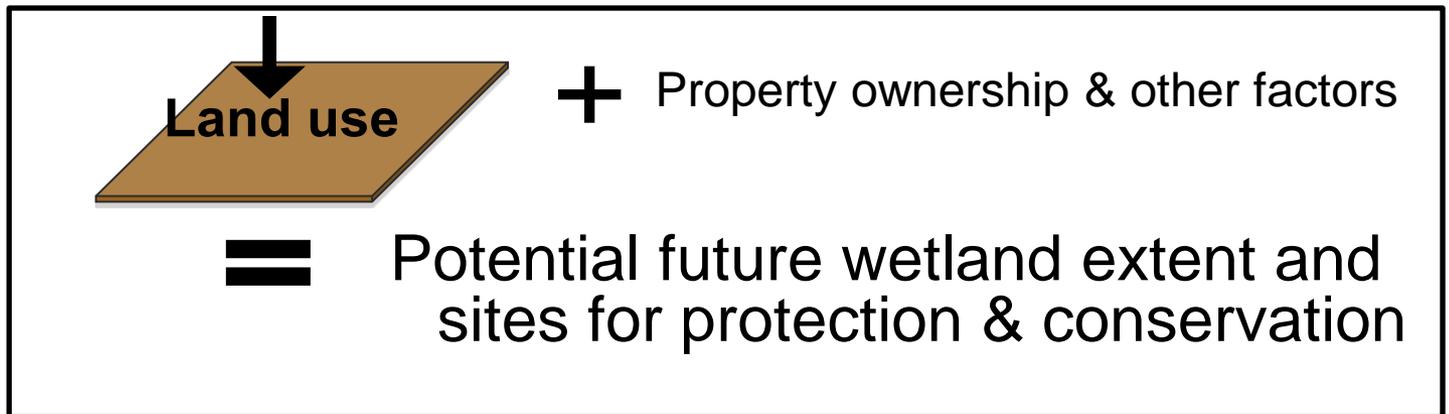


Fresh Creek

SLAMM



Parks & TNC



What next? Priorities for restoration and protection



Protect



Remove fill, wrack, debris and replant



Manage invasive plants

Priorities for restoration and protection



Build out eroded shoreline



Plan for salt marsh migration opportunities and constraints

Partners

U.S. EPA

NYS DEC

Brooklyn College

The Nature Conservancy

USGS

National Park Service

NYC DEP



NYC Parks

