LONG ISLAND TIDAL WETLANDS TRENDS ANALYSIS PROJECT

a presentation to

The LIS Tidal Wetlands Loss Workshop

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prepared by

Cameron Engineering & Associates, LLP

In association with

Land Use Ecological Services, Inc.

LONG ISLAND TIDAL WETLANDS TRENDS ANALYSIS PROJECT

NEIWPCC
New England Interstate Water Pollution Control Commission

DEPARTMENT OF ENVIRONMENTAL CONSERVATION • NEW YORK STATE •

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

The Nature Conservancy
Protecting nature. Preserving life.™

Project Funding

New England Interstate Water Pollution Control Commission
US Environmental Protection Agency
New York State Department of Environmental Conservation
The Nature Conservancy

Project Partners

Peconic Estuary Program
Suffolk County Dept. of Economic Development and Planning
Town of East Hampton

Study Area

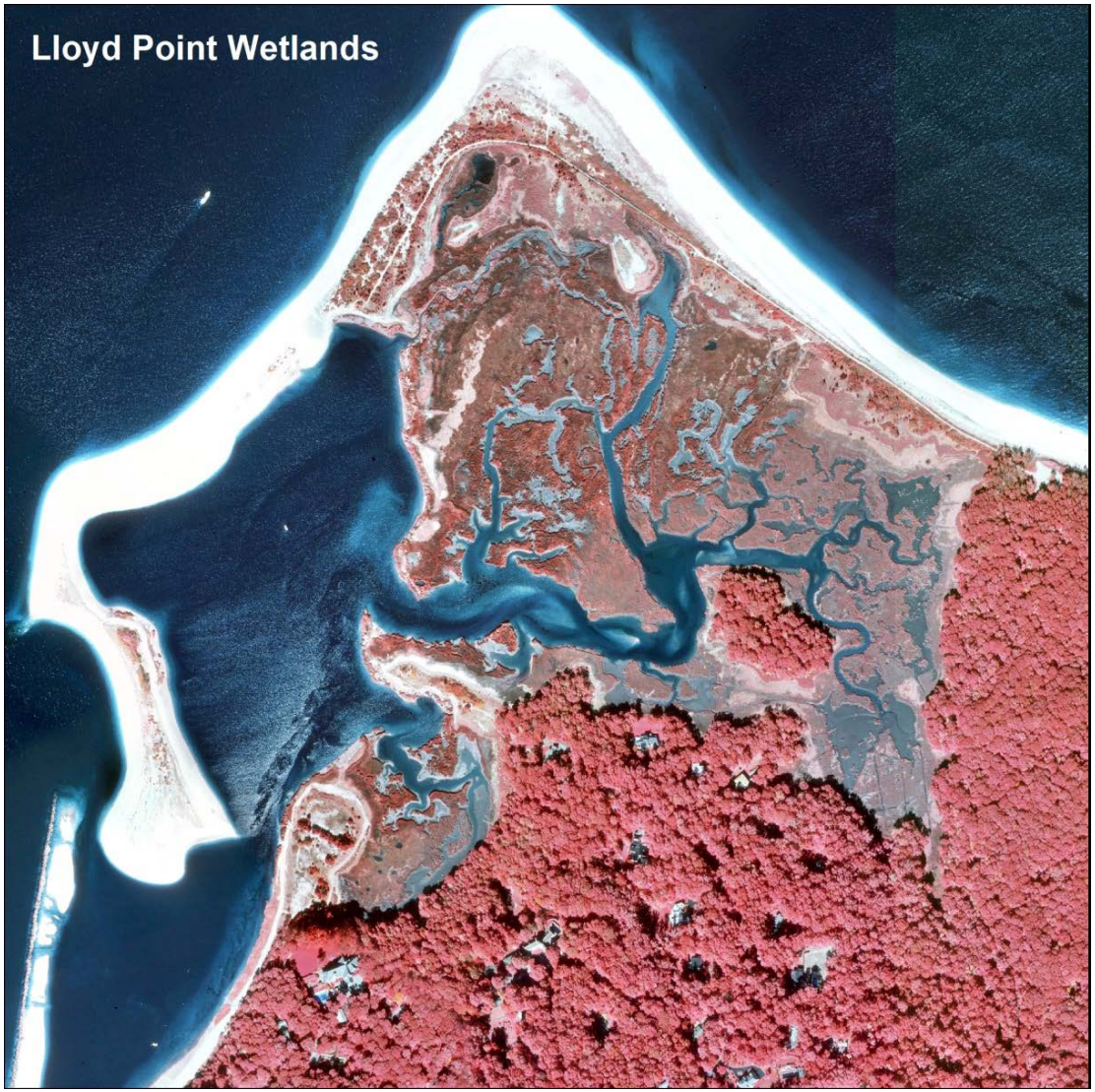
- Suffolk and Nassau Counties, Portions of Westchester, the Bronx, and Queens
- 527 Wetland Complexes (151 in LIS)
- Varying in area from 1 to 235 acres (LIS)
- Median Value = 5.5 Acres; Mean Value = 18 Acres (LIS)

Scope of Work

- Map 'Current' Tidal Wetlands
  - Long Island Sound & Peconics (Year 2005 imagery)
  - South Shore Estuary (Year 2008 imagery)
- Enhance 1974 Tidal Wetlands Mapping
  - Extract pannes and water features
  - Add Phragmites
- Compare Current Wetlands to 1974 Mapping
  - 527 Complexes
  - Towns and Counties

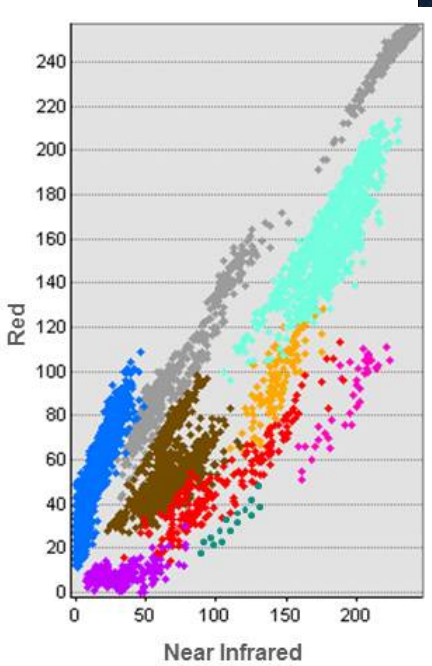
Map Current Tidal Wetlands

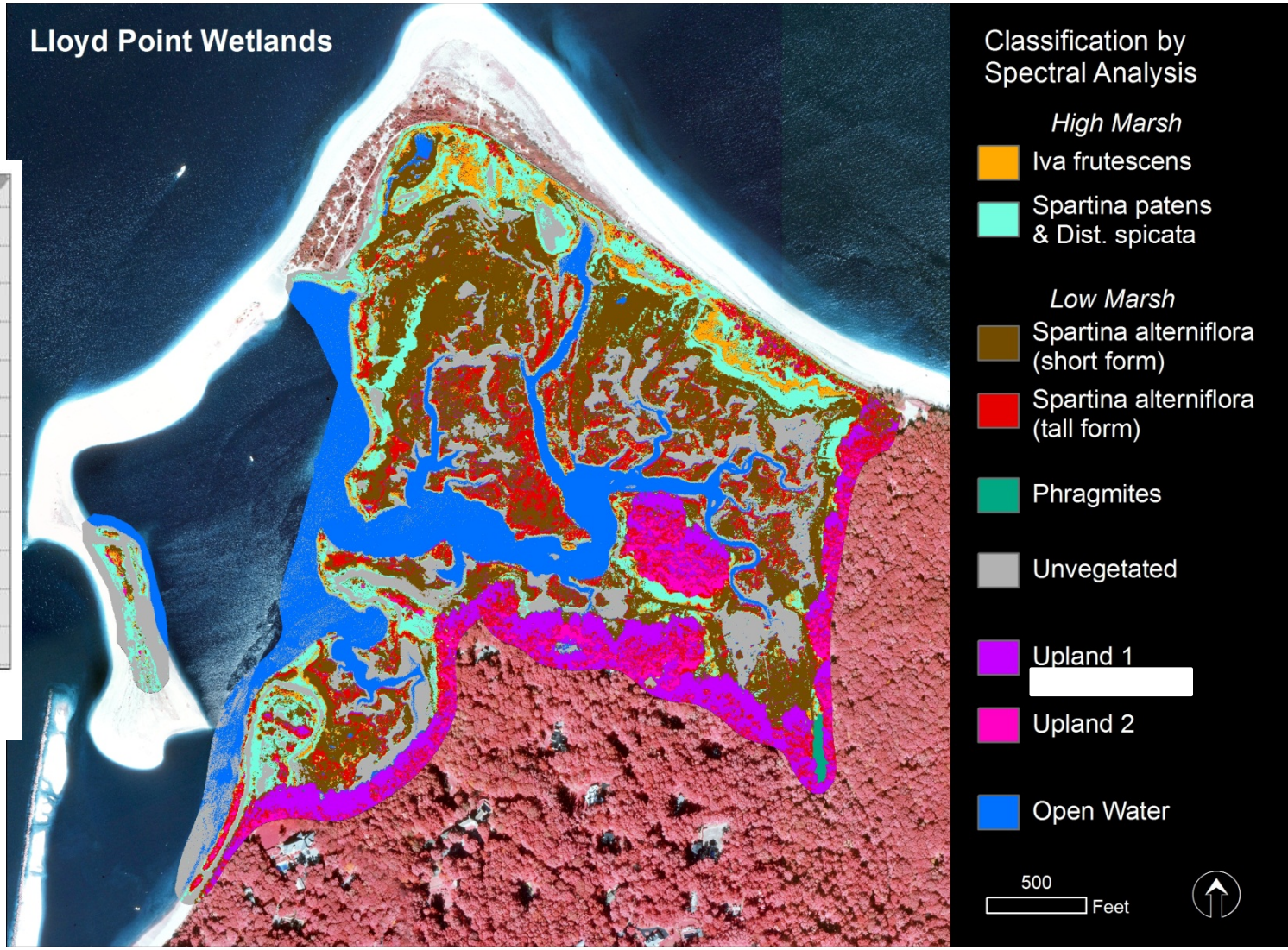
- Example Lloyd Point Wetlands (2005)



Map Current Tidal Wetlands

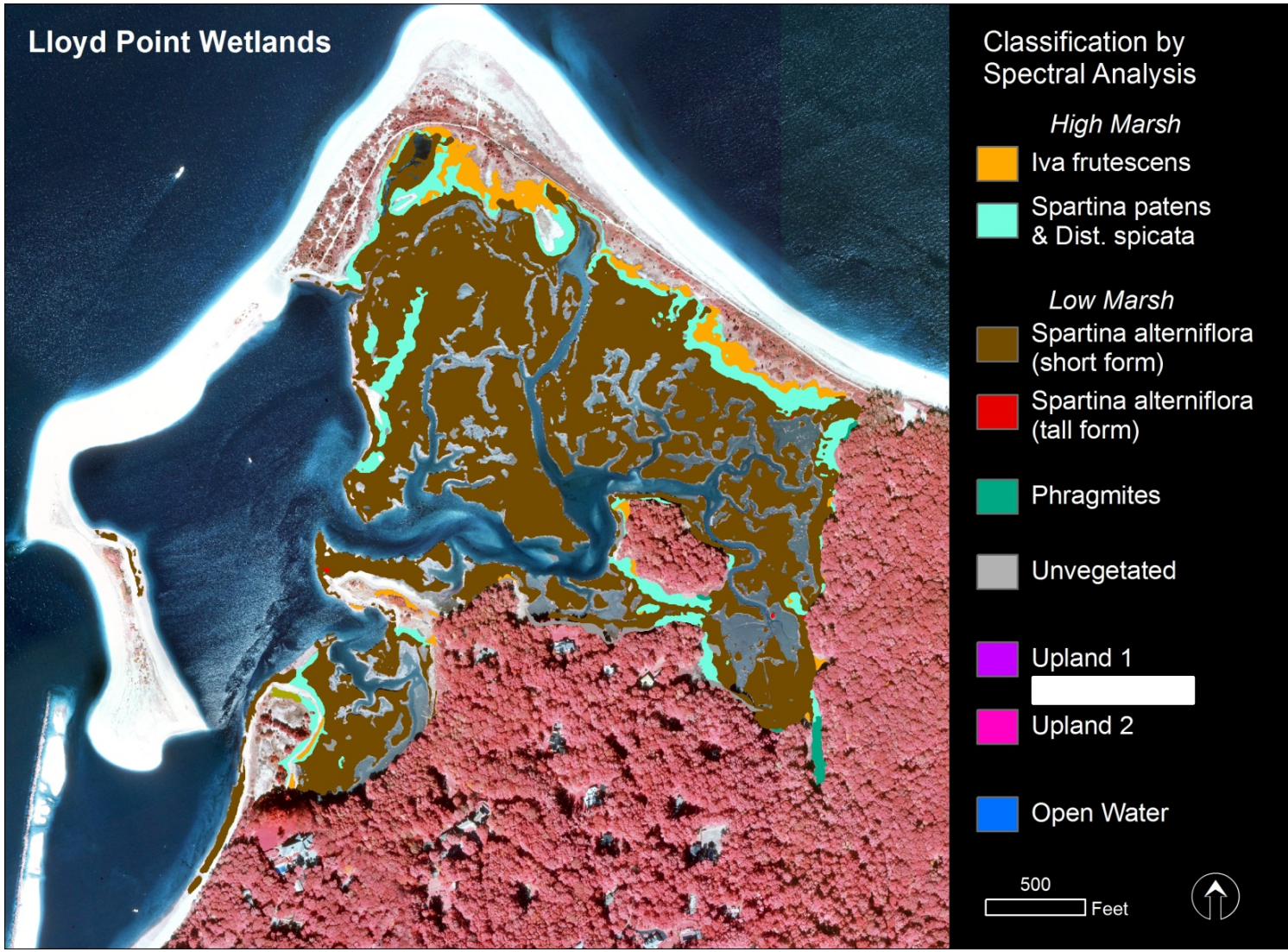
- Utilize spectral analysis/supervised classification to i.d. species





Map Current Tidal Wetlands

- Remove 'noise' and edit/refine boundaries

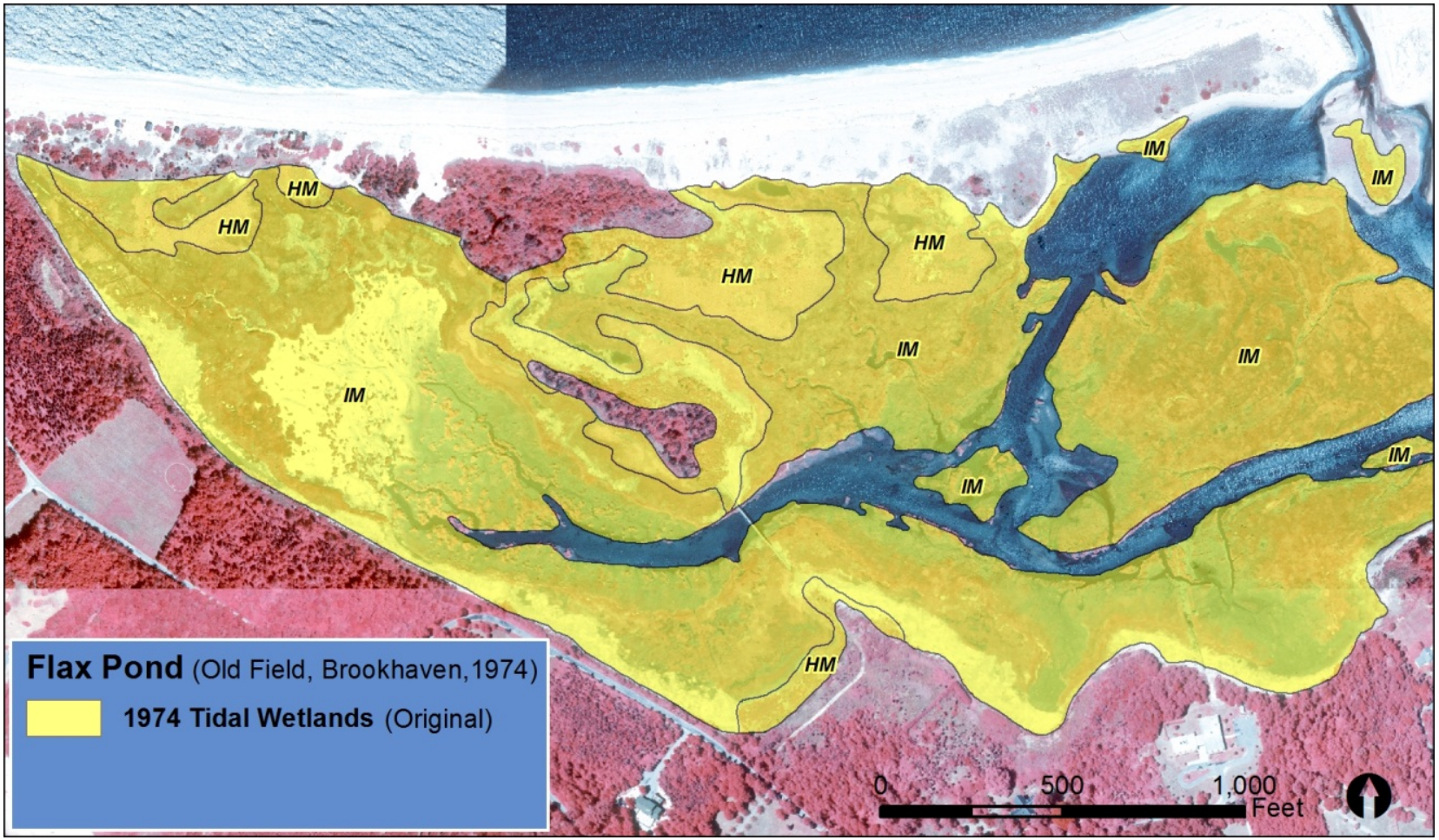


Enhance 1974 Tidal Wetlands

- Example: Flax Pond

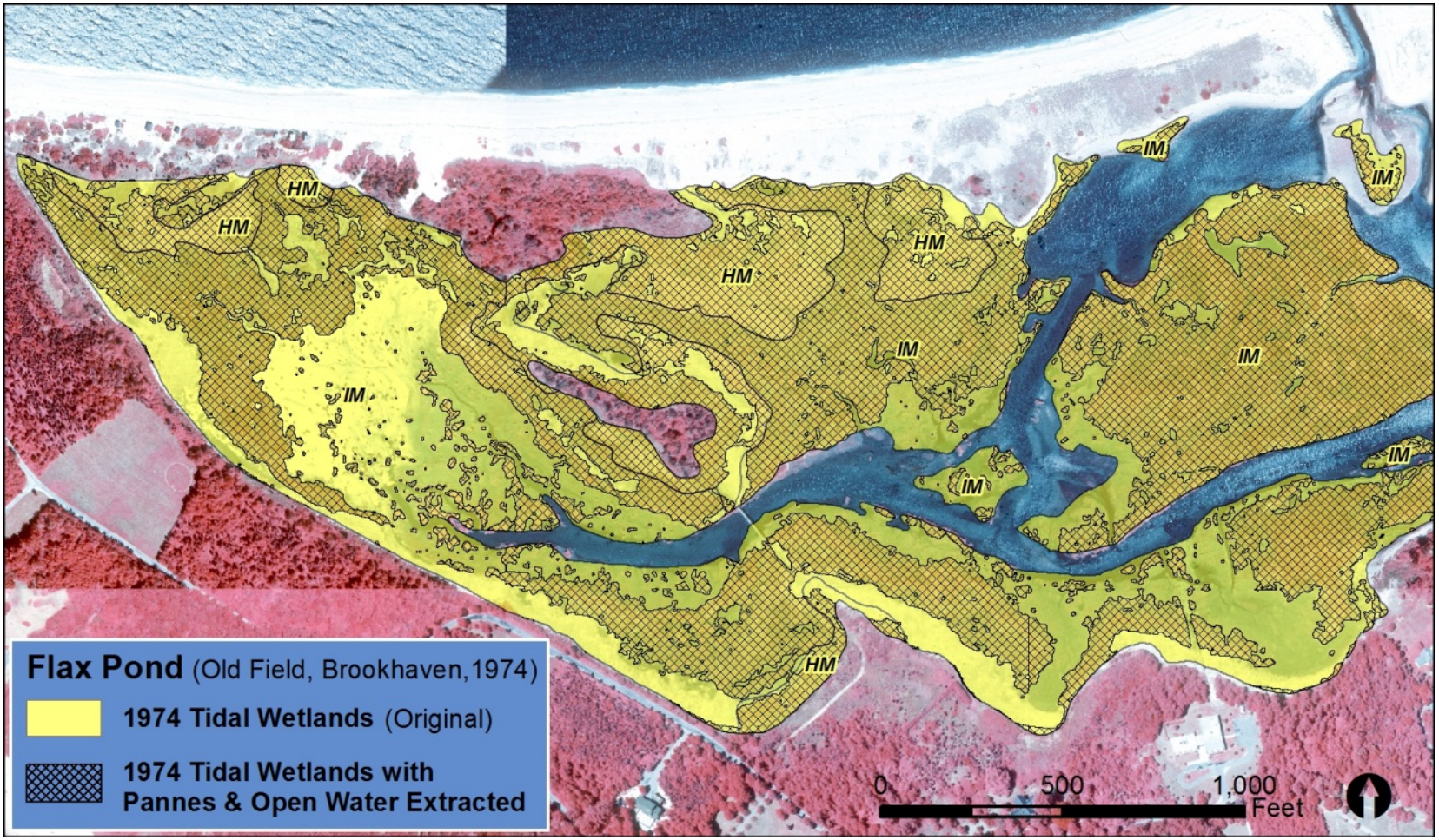
Enhance 1974 Tidal Wetlands

- Original mapping of marshes includes vegetated area plus pannes & open water



Enhance 1974 Tidal Wetlands

- Enhancement removes pannes & open water
- Vegetated areas only in enhanced mapping



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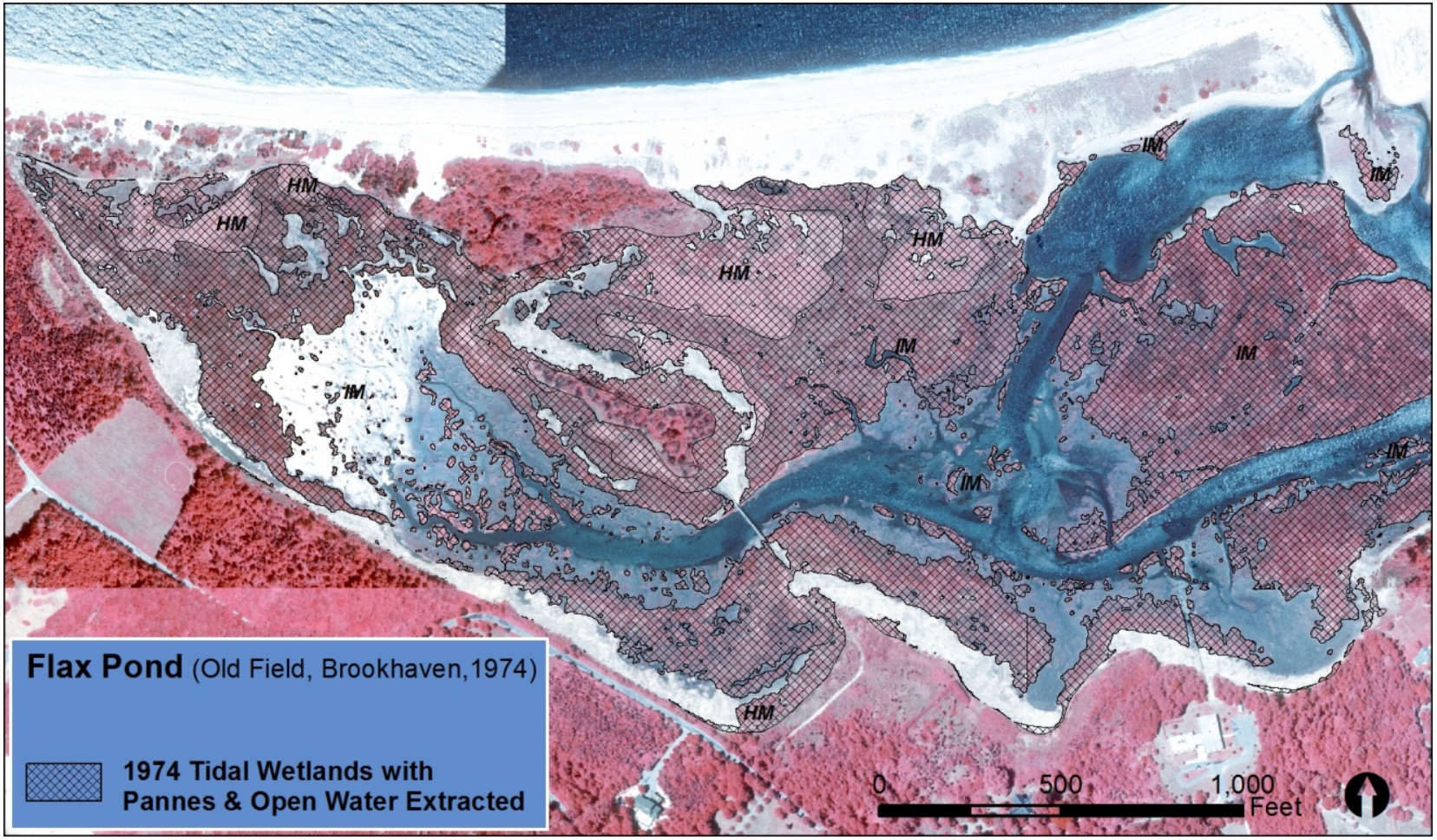

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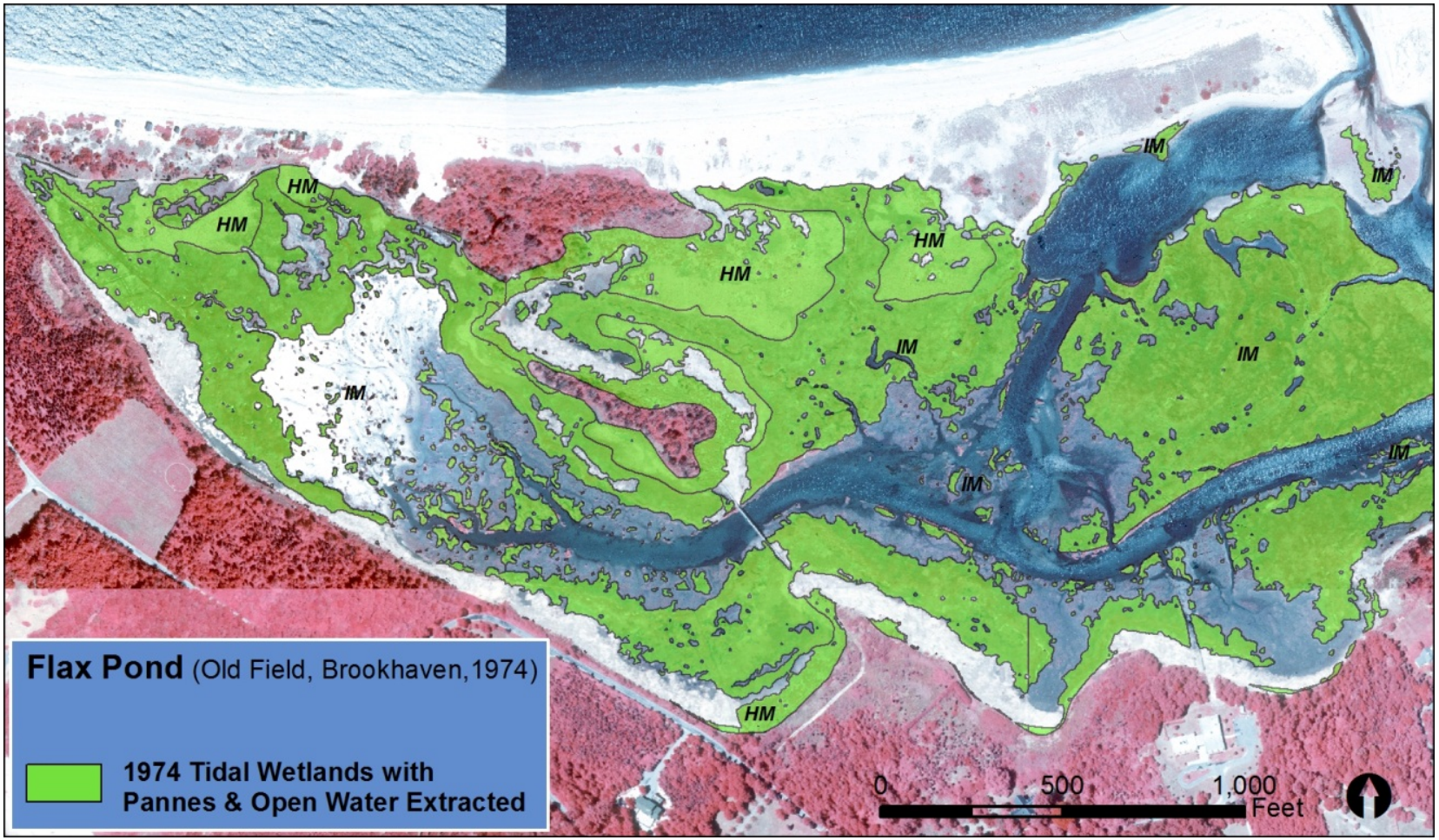

Rates of Tidal Wetlands Loss in Northeast

- Select Marshes on Long Island: 11-79%, 1974-2005
  - Mushacke (2007)
- Jamaica Bay: 50%, 1924-1998
  - Hartig et al (2002)
- Hempstead Bays: 50%, 1926-1983; Mean Retreat of Marsh Edge 18m
  - Ciappetta (2010); Browne (2011)
- Select Marshes in SW Connecticut: 31-86%, 1974-2004
  - Tiner et al (2006)
- Cape Cod: Up to 50-63%, 1952/1971-2005
  - Smith (2009)
- Select Marshes in Chesapeake Bay: 16-29%, 1850-1990
  - Wray et al (1995)

Tidal Wetlands Loss in Southern Long Island Sound

Wetland Type	1974 Wetland Area (acres)	2005 Wetland Area (acres)	Change (%)
Low Marsh	1,953.9	1,465.6	-25.0
High Marsh	1,005.6	789.4	-21.5
Phragmites	229.0	425.7	+85.9
Total	3,188.5	2,680.7	-15.9

Tidal Wetlands Loss in Southern Long Island Sound

Municipality	1974 IM + HM (acres)	2005 IM + HM (acres)	Δ IM + HM (acres)	Δ IM + HM (%)
Southold	81.2	86.2	+5.0	+6.2
Riverhead	162.7	129.0	-33.7	-20.7
Brookhaven	413.3	338.0	-75.5	-18.3
Smithtown	502.5	374.5	-128.0	-25.5
Huntington	702.4	527.9	-174.5	-24.8
Oyster Bay	378.0	313.0	-65.0	-17.2
North Hempstead	151.5	101.6	-49.9	-32.9
New Rochelle/ Larchmont/Mamaroneck	44.9	22.8	-22.1	-49.2
Rye	155.5	98.5	-57.0	-36.7
TOTAL	**2,959.6**	**2,255.4**	**-704.2**	**-23.8**

Tidal Wetlands Loss in Southern Long Island Sound

Complex (Town)	1974 IM + HM (acres)	2005 IM + HM (acres)	Δ IM + HM (acres)
Porpoise Channel Islands (Sm)	106.8	49.2	-57.6
Crab Meadow (H)	262.2	214.6	-47.6
Mount Sinai Harbor Islands (Bk)	69.1	38.0	-31.0
Marshland Conservancy & Blind Brook (Ry)	73.4	47.6	-25.7
Lloyd Point Wetlands (H)	98.4	76.2	-22.2
Inner Hempstead Harbor West (NH)	50.5	28.8	-21.7
Baiting Hollow Marsh (Ri)	19.9	0.0	-19.9
Stony Brook Harbor South (Sm)	55.9	37.7	-18.2
Mount Sinai Harbor South (Bk)	51.0	33.1	-17.9
Nissequogue East (Sm)	88.0	71.2	-16.8

***Marshes with largest areas of IM + HM lost (Suffolk, Nassau, Westchester Only)**

Tidal Wetlands Loss in Southern Long Island Sound

Complex (Town)	1974 IM + HM (acres)	2005 IM + HM (acres)	Δ IM + HM (%)
Baiting Hollow Marsh (Ri)	19.9	0	-100.0
Sheets Creek Channel (NH)	10.4	1.1	-89.3
LIS- Milton Point to Rye Beach (Ry)	18.0	3.4	-81.2
Northport Harbor- Bird Island (H)	17.0	3.5	-79.6
Northport Harbor (H)	21.8	5.4	-75.0
West Pond (OB)	20.6	8.6	-58.4
Cold Spring Harbor- East Shoreline (H)	10.8	4.7	-56.5
Huntington Harbor (H)	23.1	10.4	-54.9
Porpoise Channel Islands (Sm)	106.8	49.2	-53.9
Mitchell Creek (NH)	13.9	6.8	-51.5

***Marshes with >50% IM + HM loss and >10.0 acres of IM + HM in 1974 (Suffolk, Nassau, Westchester Only)**