



Assessing the Impact of Sudden Wetland Dieback on Tidal Wetland Condition

Sudden Wetland Dieback



Detected by State Wetland Monitoring Program in 2006

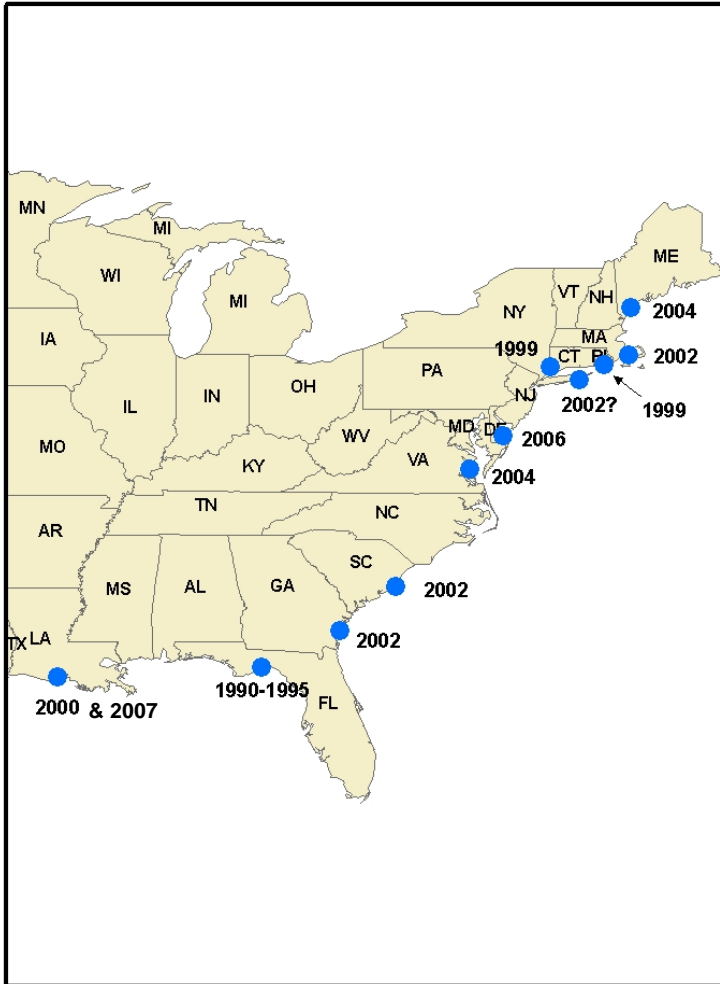
2006



Piney Neck
Brown Marsh
Sept. 06



Sudden Wetland Dieback on Atlantic & Gulf Coasts



- Widespread, sudden vegetation death
- Mostly *Spartina alterniflora* (low marsh)
- 1st noted in '68 in Louisiana
- Recent occurrences unprecedented
- Rate of recovery variable

Questions

- What percentage of the '06 dieback marshes showed effects in '07?
- What is the distribution of detectable dieback effects in Summer 2007?
- How are specific marshes coping with the effects of dieback?



Aerial Survey Methods and Analysis: September '07

- 2 photographers, 1 Cessna (and 1 pilot), +1000 photos
- Absence of plant death required change in methods from '06
 - First compared to reference marshes
 - 3 categories: *not to slightly affected*, *affected*, *severe*
 - Sensitivity given to angle of photo
- Removed Intertidal flats to focus on vegetated estuarine wetlands

Compounding Factors

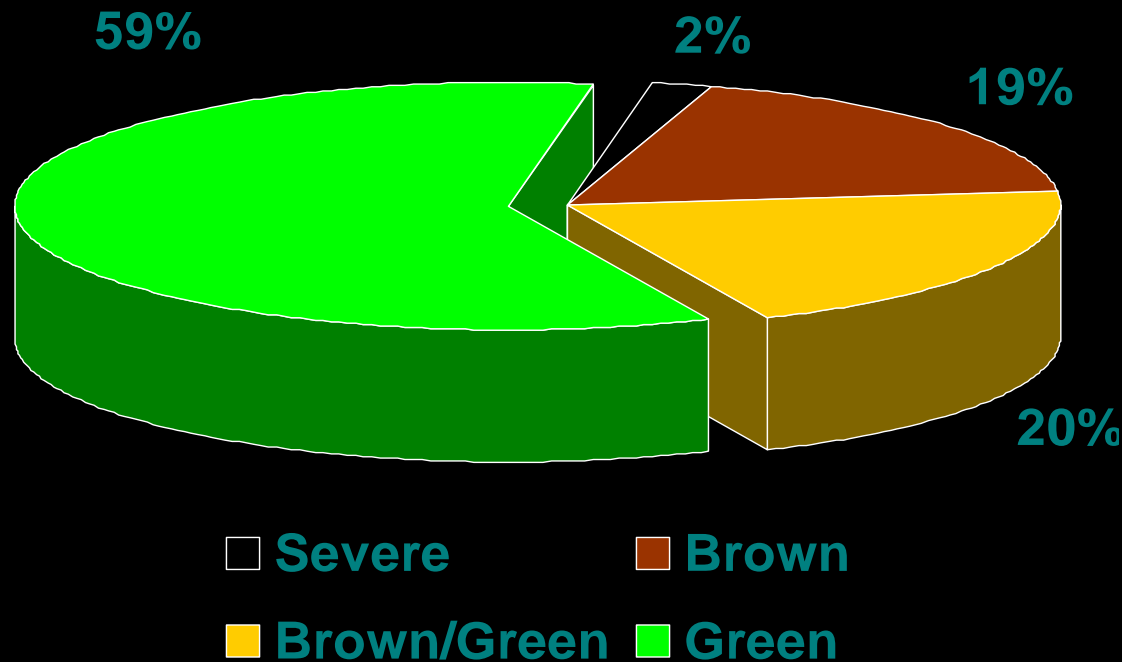
- Submerging marshes
- *Phragmites* Control
- Snow Geese Impacts



↑ *Phragmites* control area at Lingo Point, North side of Indian River Bay. Sprayed in Fall of 05 & 06.

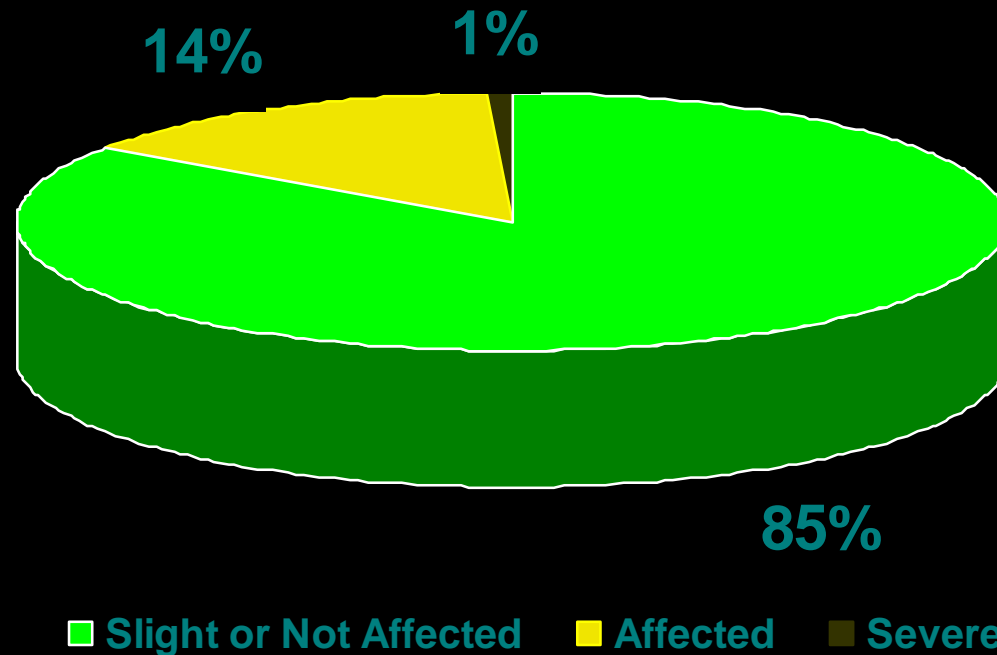
← Snow Geese herbivory from Winter 2006/2007 at back barrier marsh, Little Assawoman Bay

Frequency of Dieback by Tidal Wetland Polygon Sept '06



22% of polygons sufficiently observed

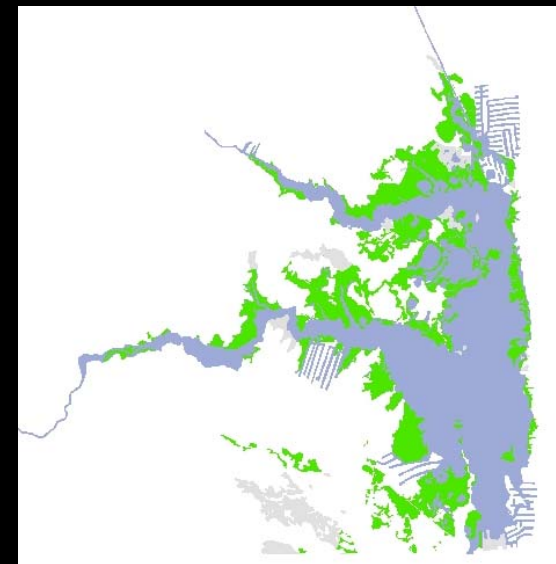
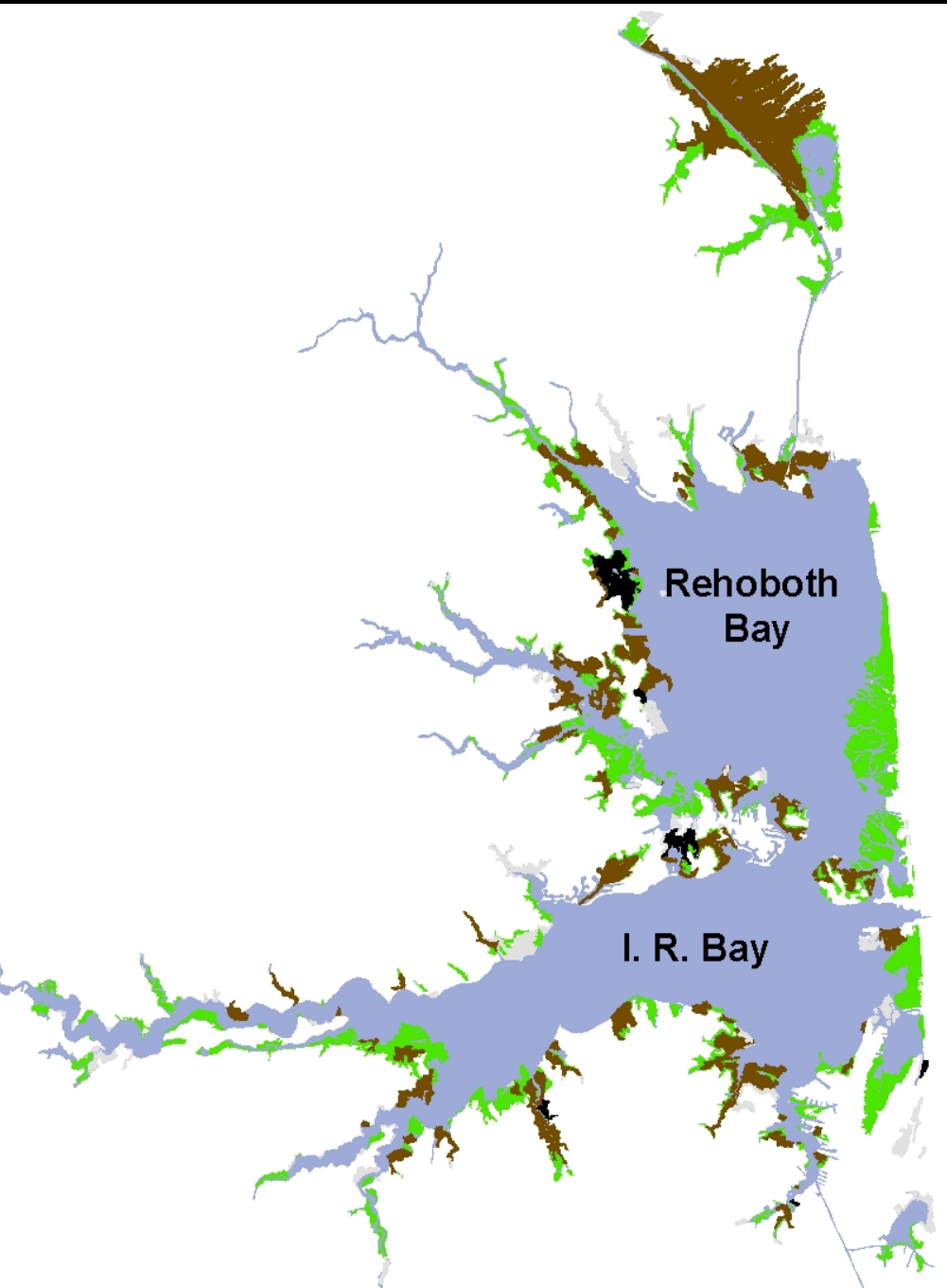
Frequency of Dieback by Tidal Wetland Polygon September '07



76% of polygons sufficiently observed

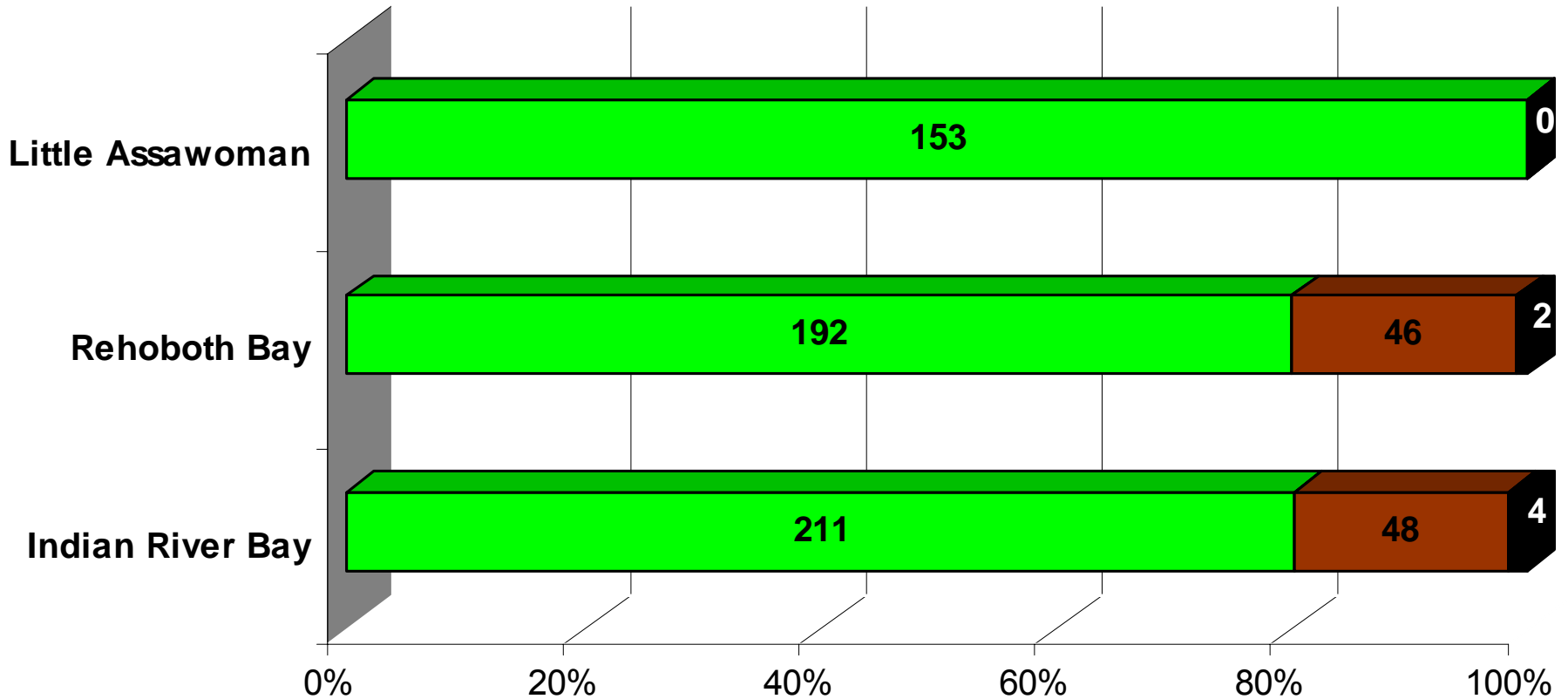
52% of '06 dieback sites showed effects in June '07

SWD Distribution September 07



LAB not to scale

Dieback Effects by Bay Sept. 07



■ Not to Slightly Affected ■ Affected ■ Severe



Sept. '06 Classified "Brown"



June '07 Classified "Affected"



Sept. '07 Classified "Affected"



Sept. '06. Classified "Brown"

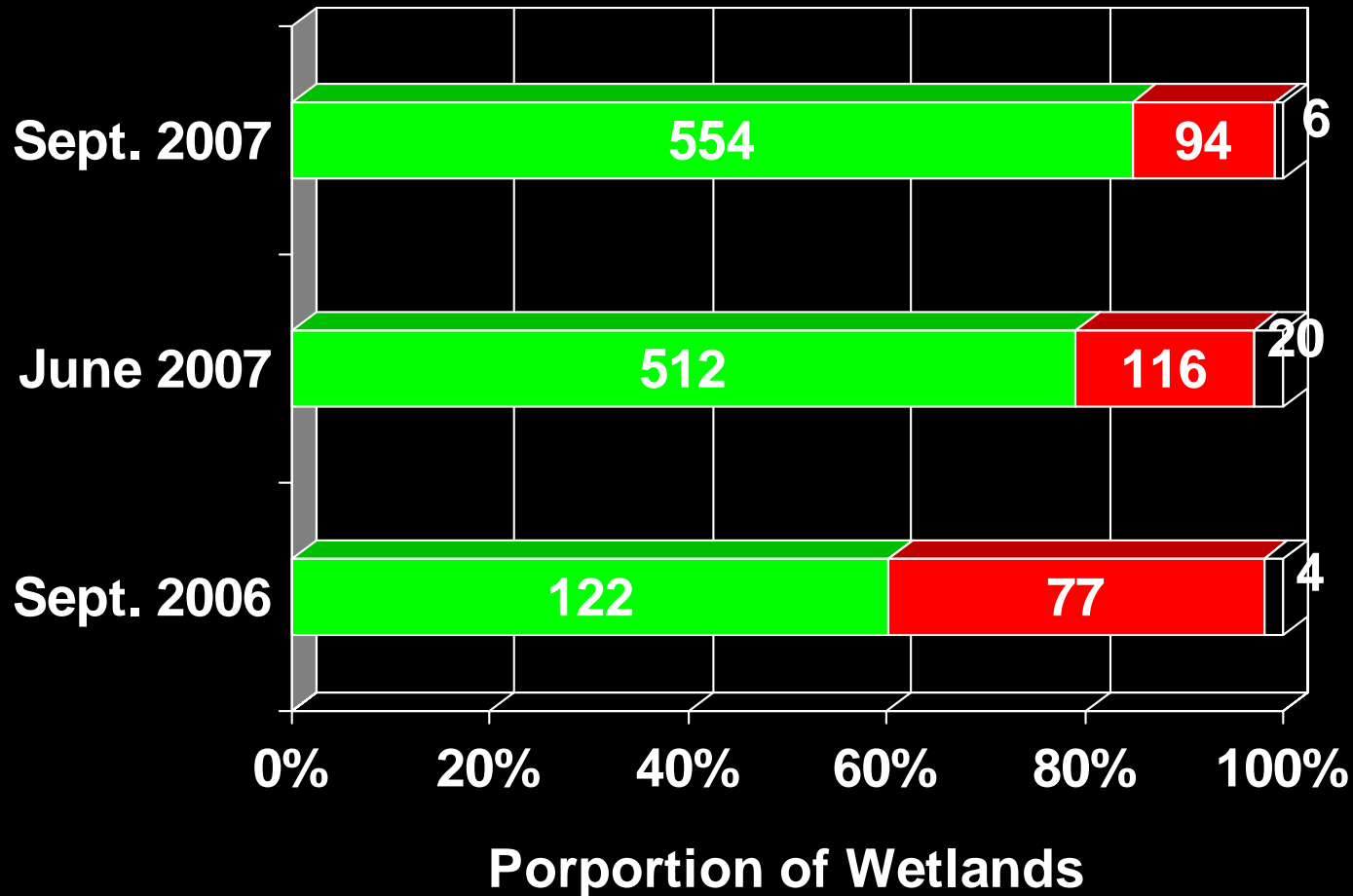


June '07. Classified "Severe"



Sept. '07. Classified "Severe"

Inland Bay Wetlands by Dieback Category

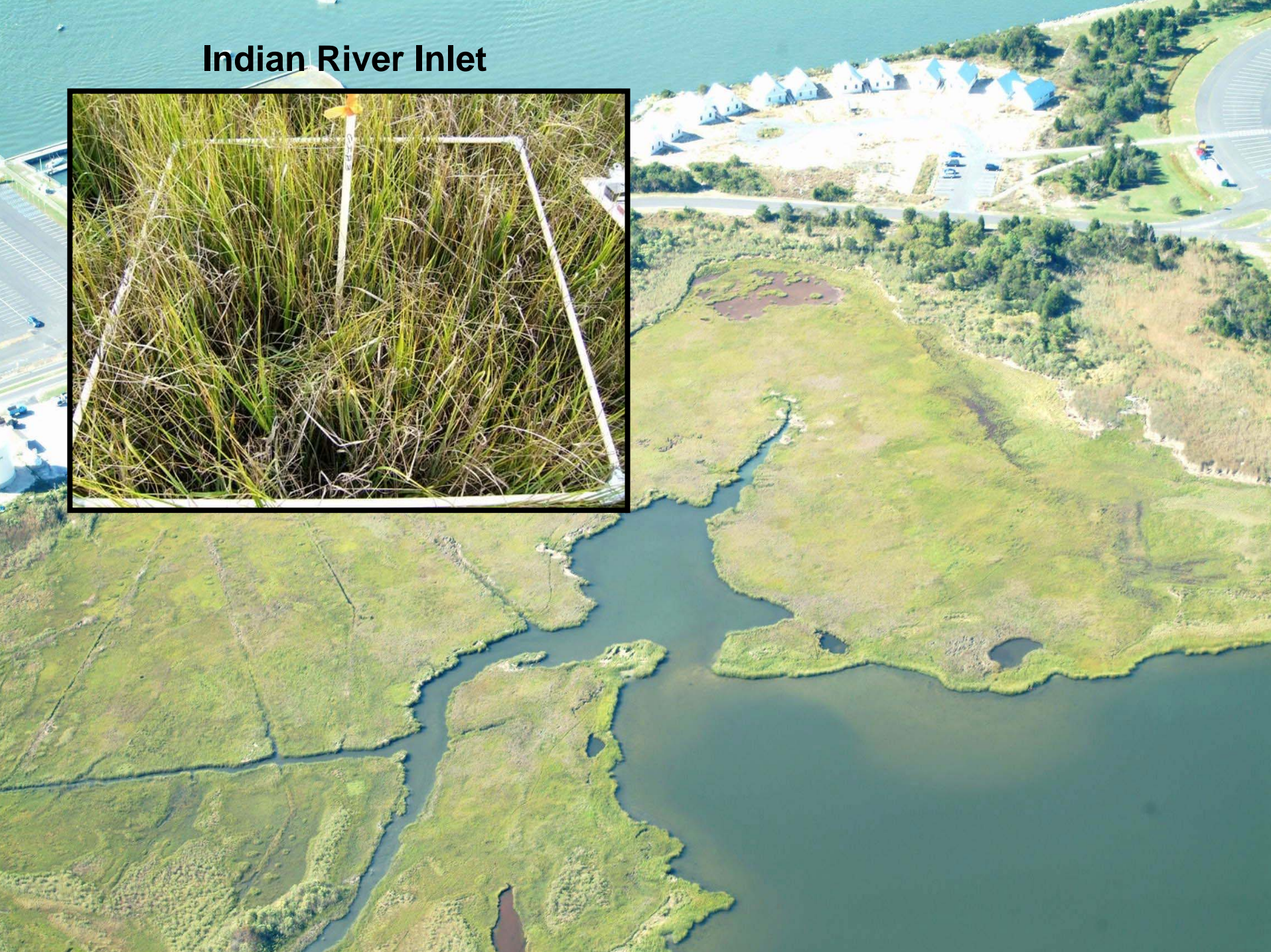


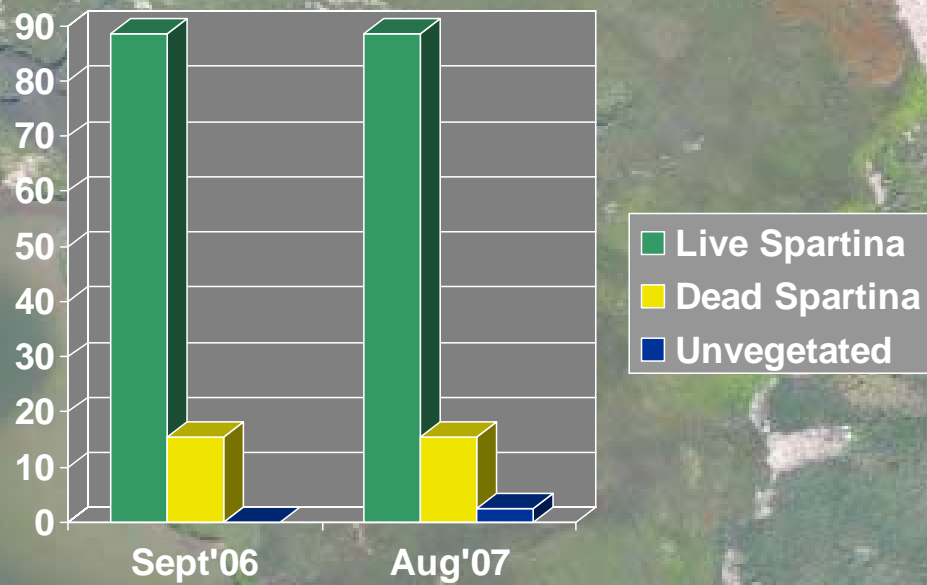
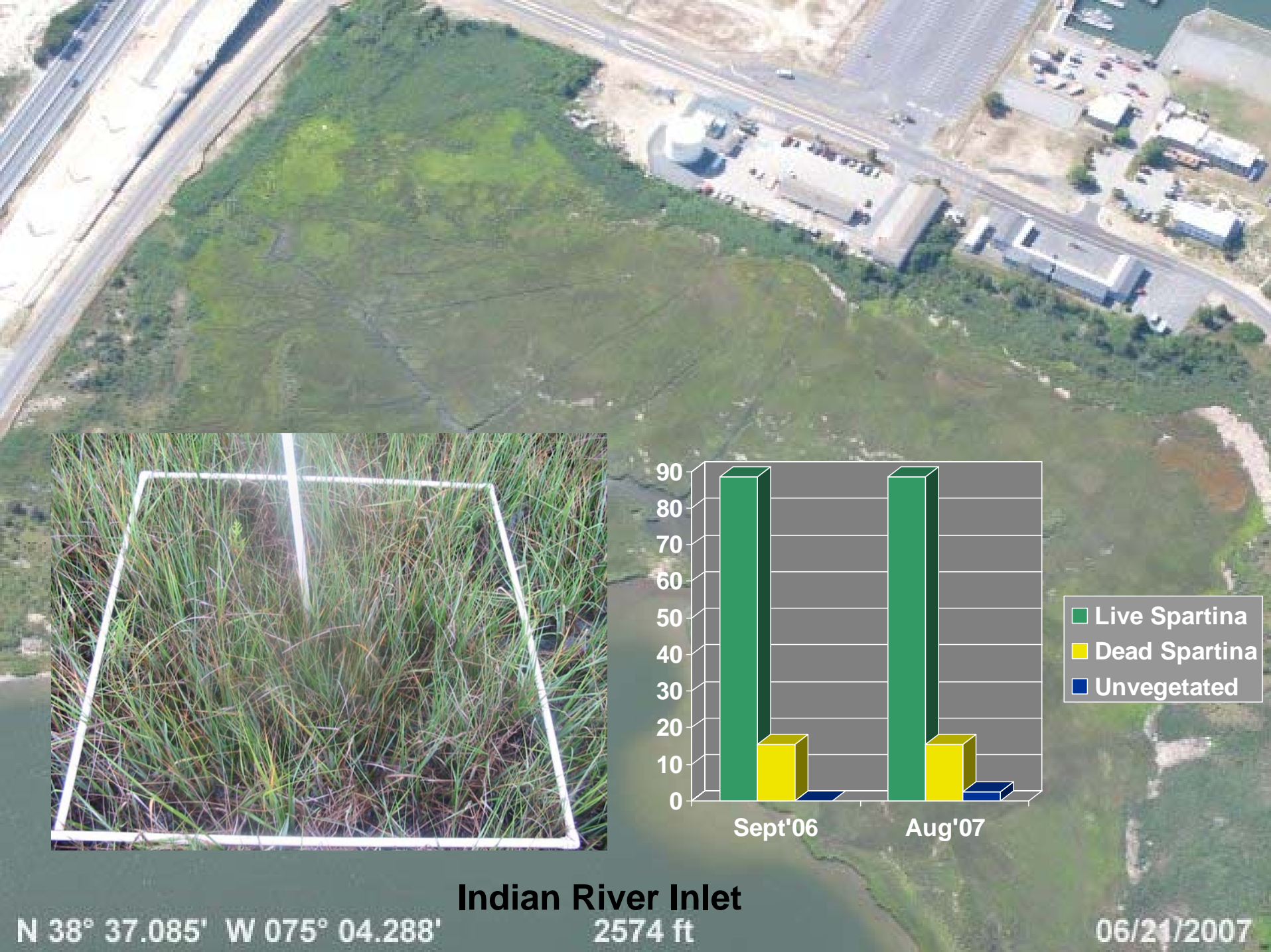
■ Slight or Not Affected/ Green
■ Affected/Brown/BrownGreen
■ Severe/Brown

Permanent Plot Sampling



Indian River Inlet





Indian River Inlet

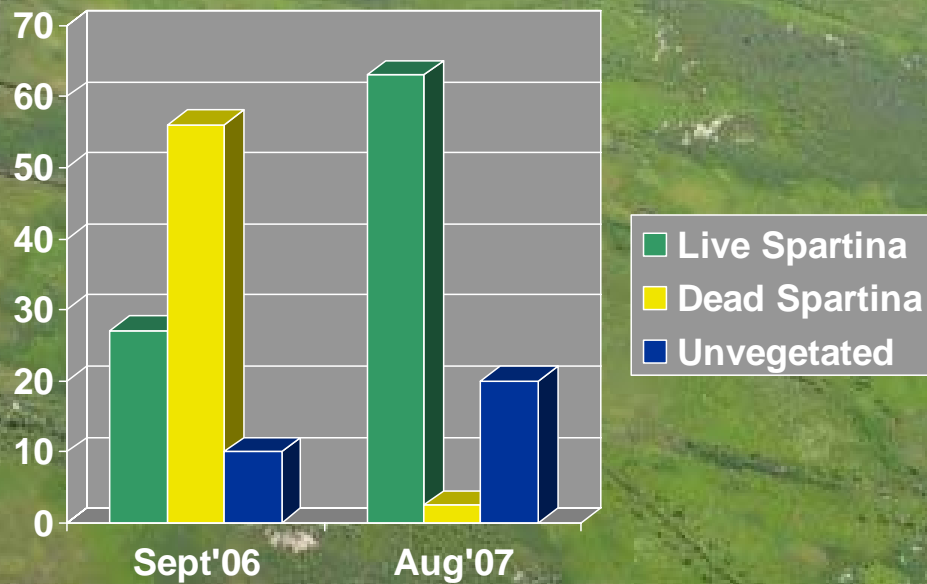
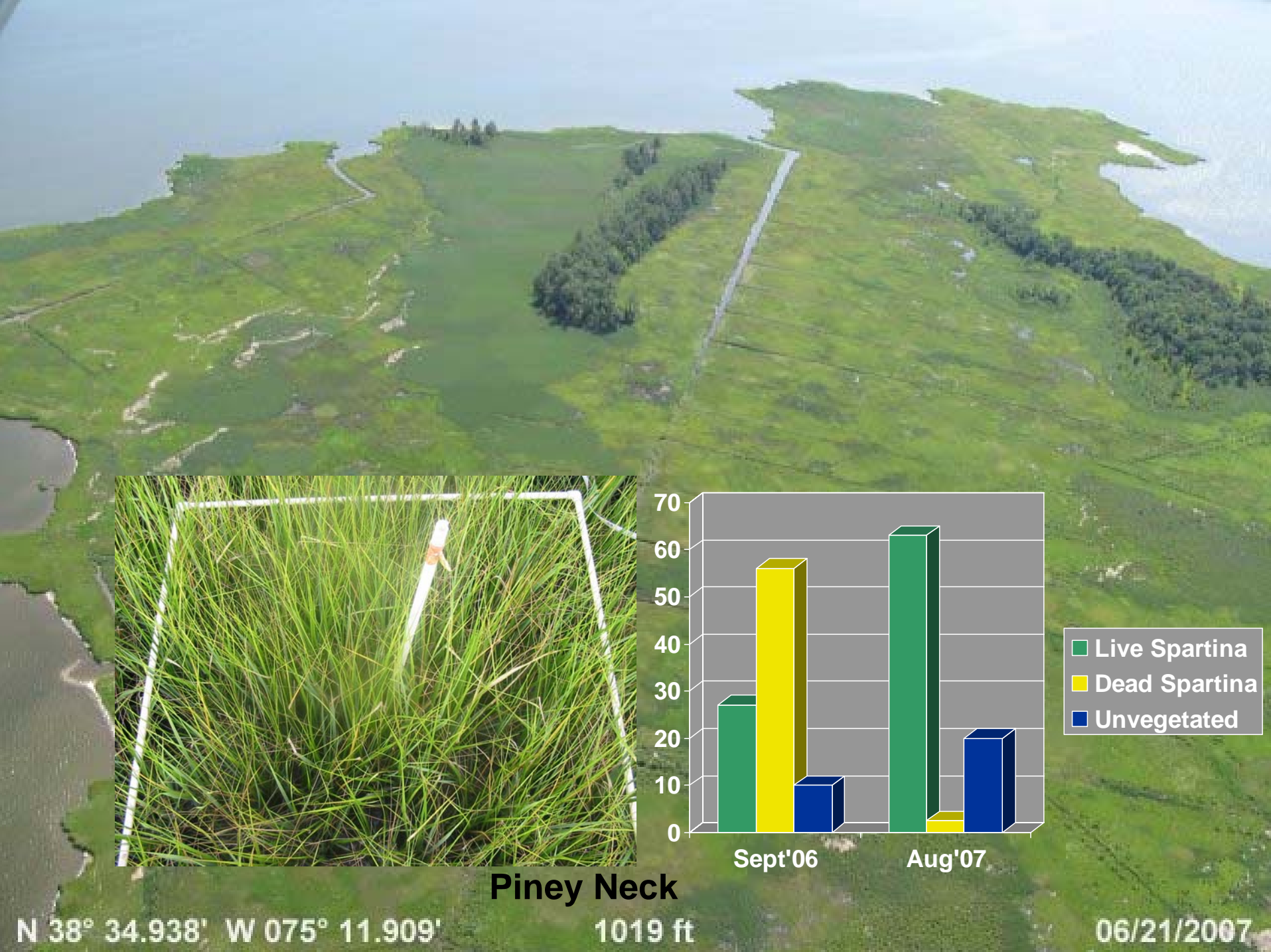
N 38° 37.085' W 075° 04.288'

2574 ft

06/24/2007

Piney Neck





Piney Neck

N 38° 34.938' W 075° 11.909'

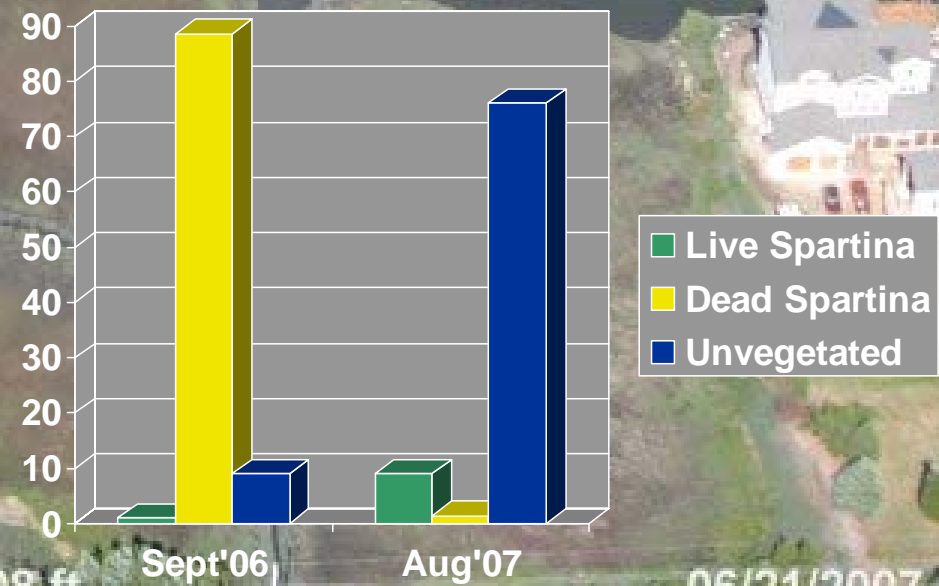
1019 ft

06/21/2007

Cotton Patch Hills 2006



Cotton Patch Hills

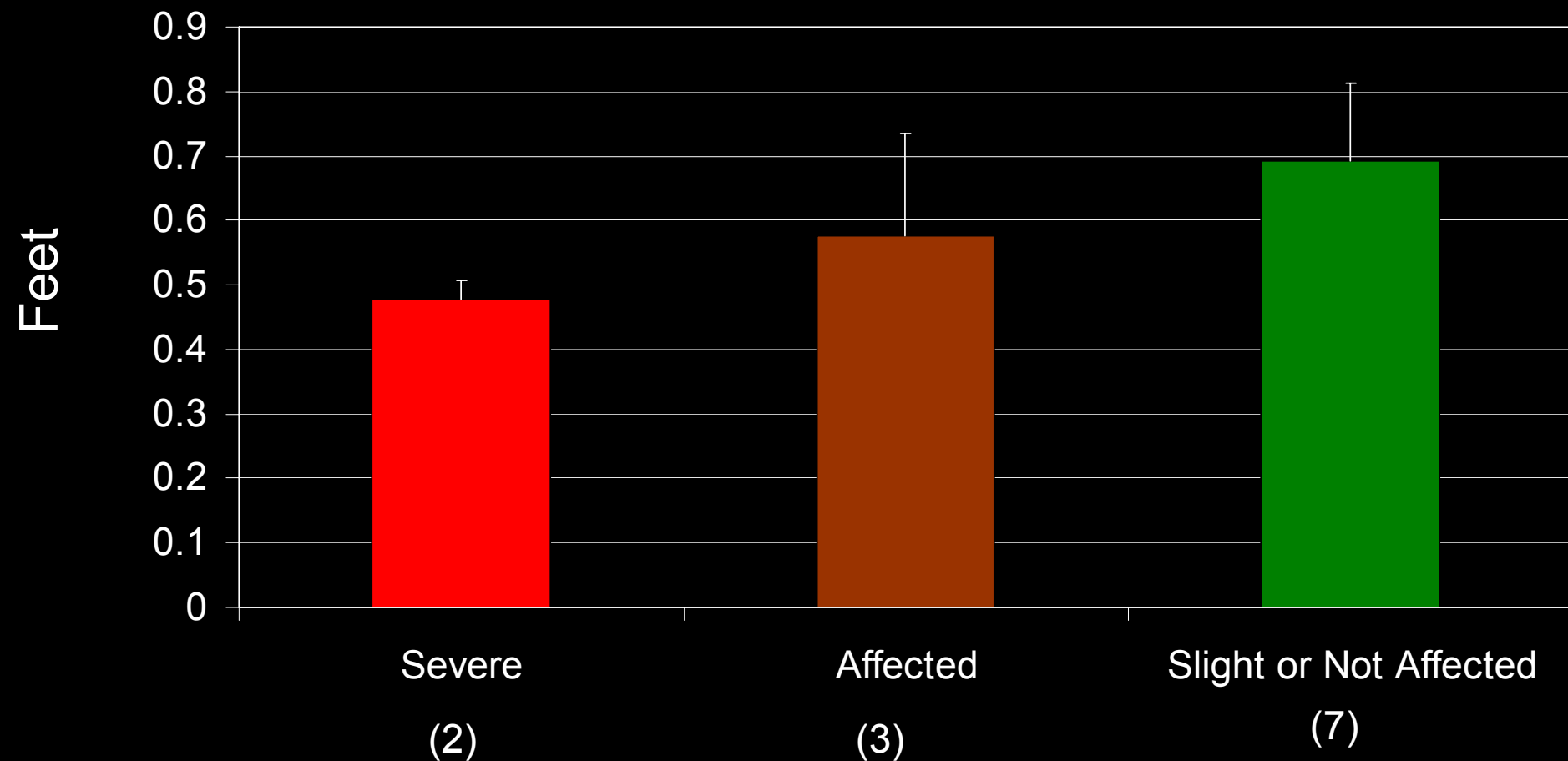


N 35° 34.820' W 75° 03.511'

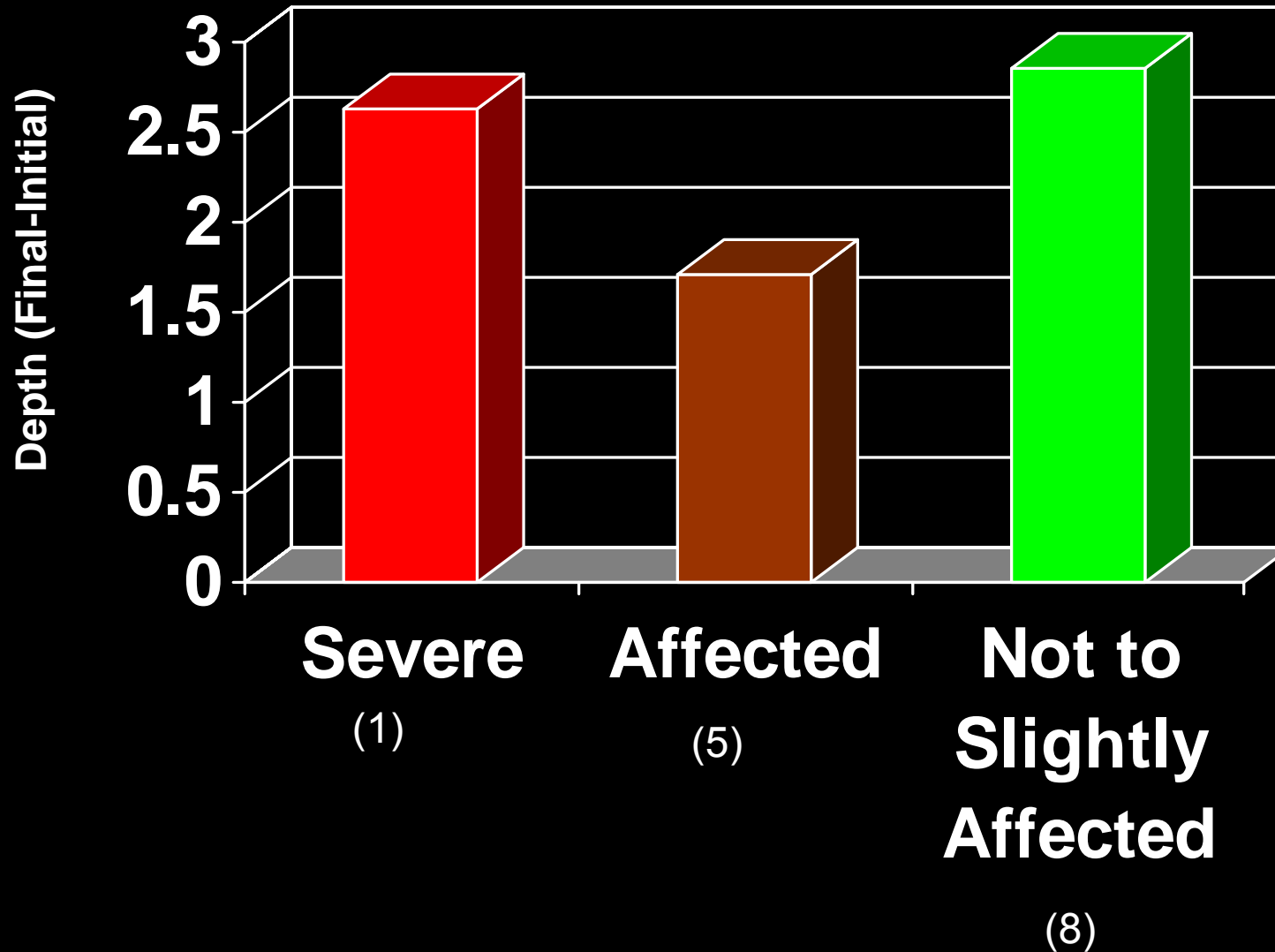
1008 ft

06/21/2007

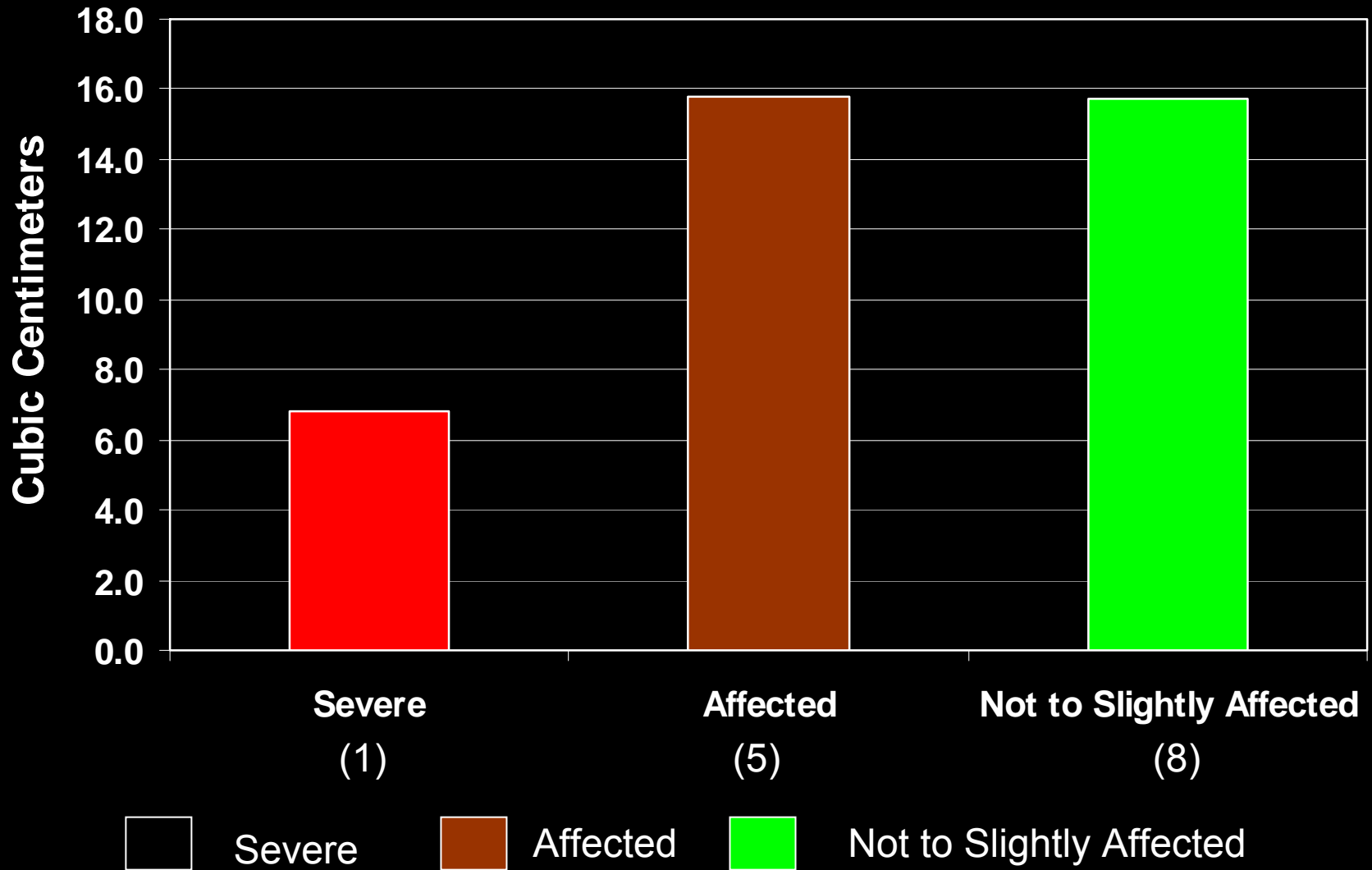
Elevation of Wetlands by 2007 Dieback Severity



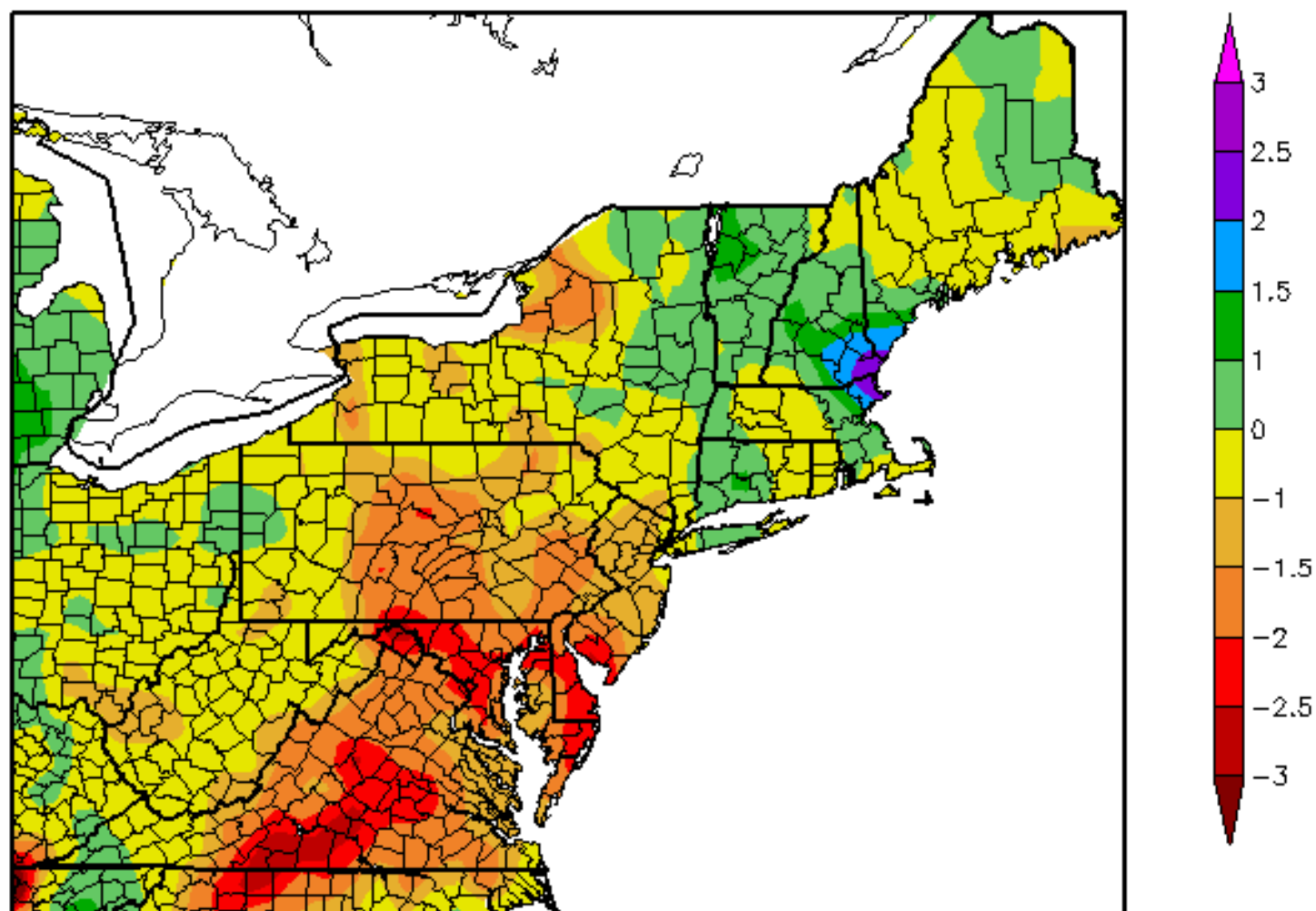
Soil Resistance



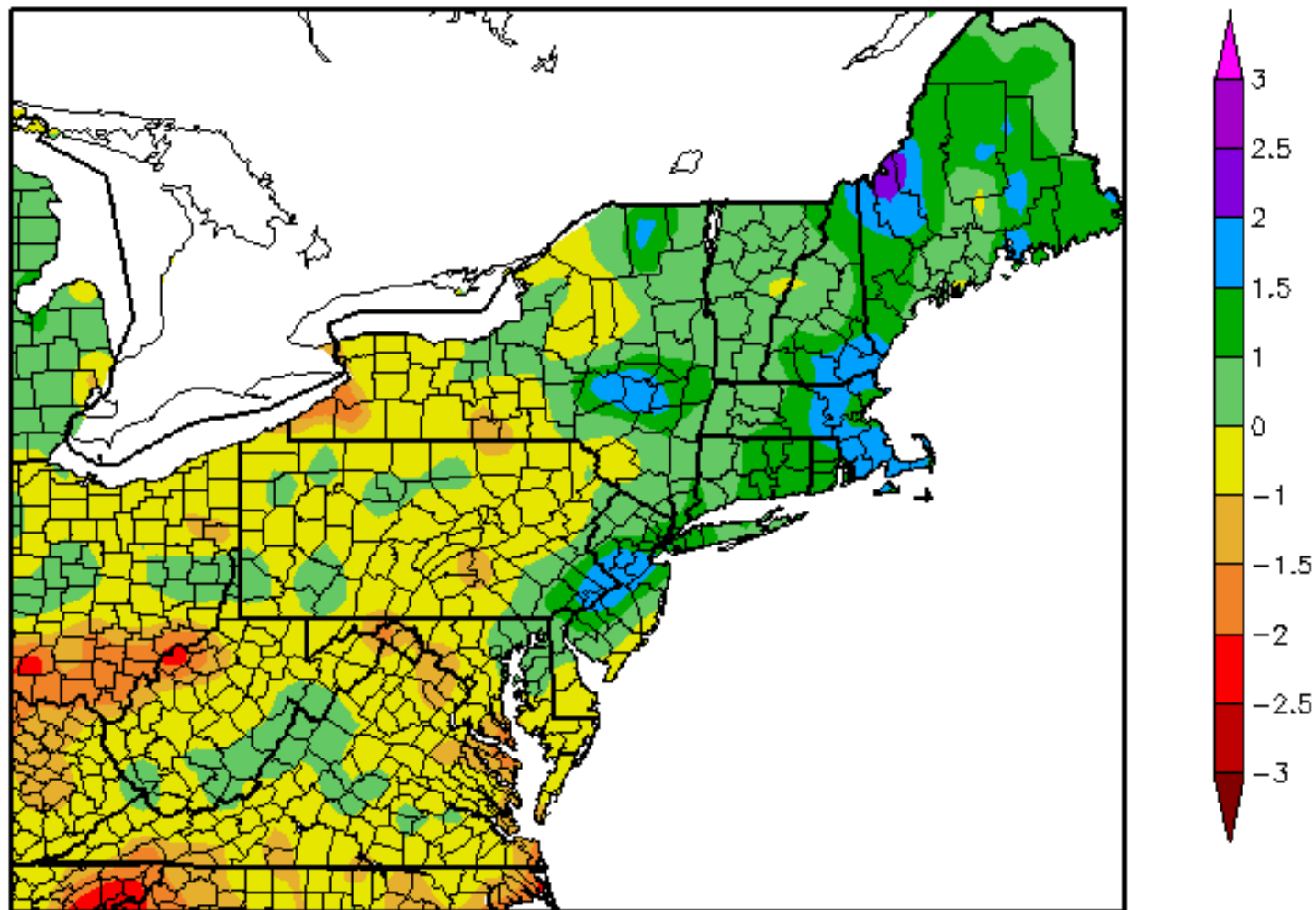
Plant Fragments 2-4cm (cc)



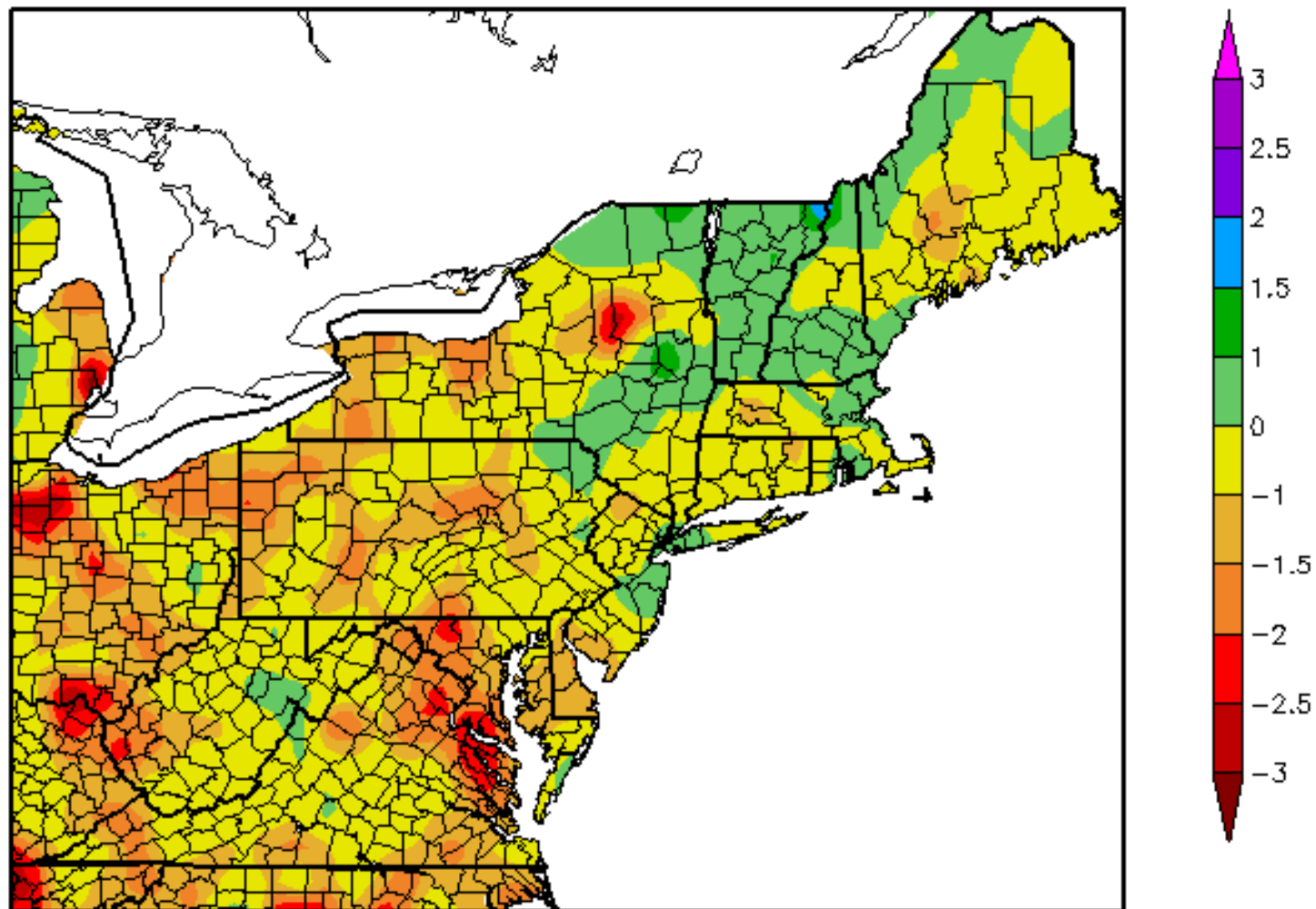
3-Month SPI
3/1/2006 – 5/31/2006



3-Month SPI
3/1/2007 - 5/31/2007



3-Month SPI
5/1/2007 – 7/31/2007



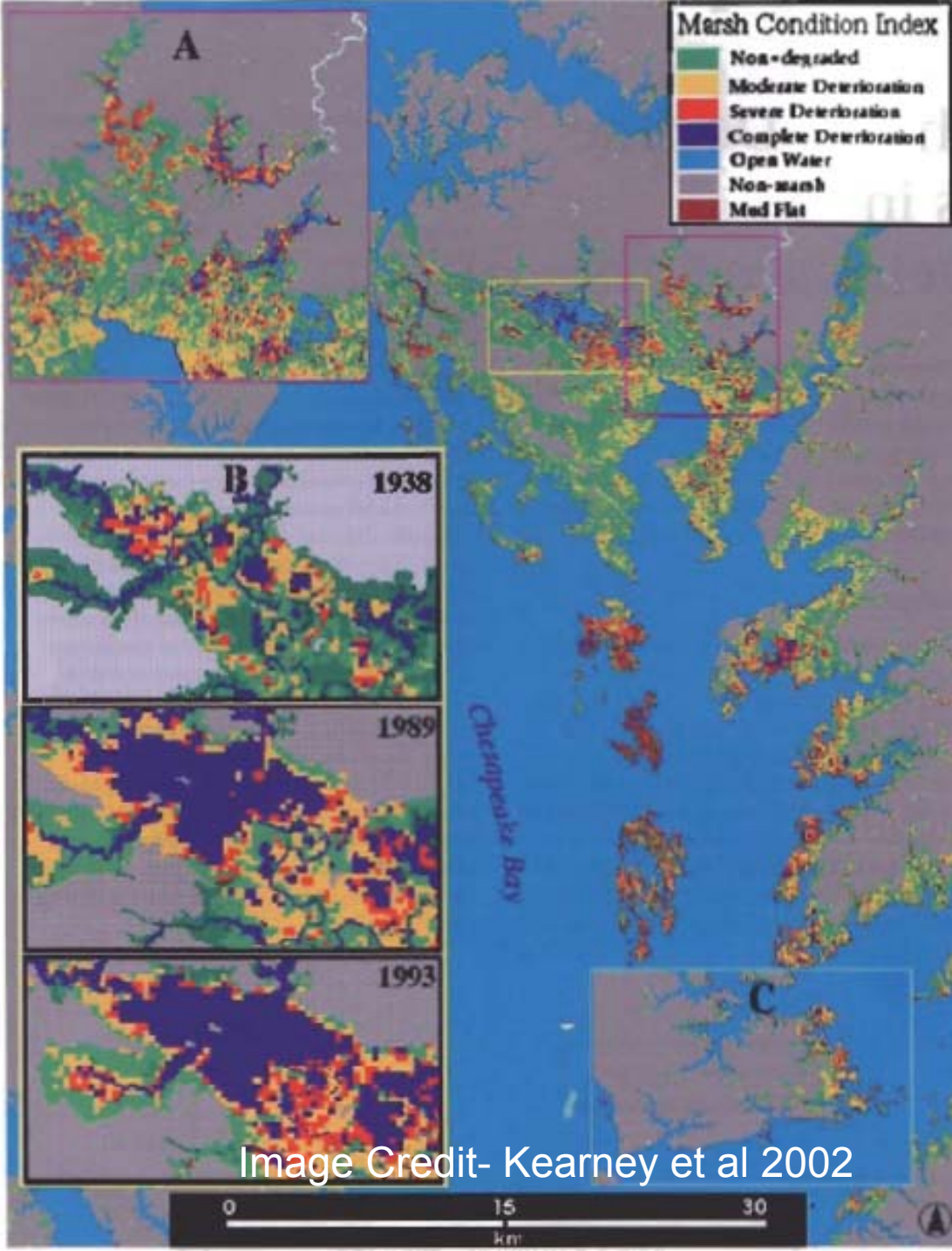


Image Credit- Kearney et al 2002

- Marsh Condition Index
Dr. Kearney
University of Maryland College Park
- Documents marsh loss and condition
- Previous Work- 1984-1993
- Contracted for 1993-2006
- With an extra emphasis on years 2003-2006
- SWD may have tipped the scale

Continue Monitoring




Image Credit- lacoast.gov

- Surface Elevation Tables
- pH loggers
- Water level loggers
- Water & Soil Chemistry
- Vegetation

Management Response

- Reduce Stressors
 - Remove Hydrologic Alterations
 - Protect and Restore Buffers
 - Reduce Snow Geese Population
- Healthy Marshes

An aerial photograph of a vast wetland area. A prominent, light-colored, winding river or canal cuts through the green landscape, starting from the top left and meandering towards the bottom center. The terrain is covered in dense, low-lying vegetation, likely marsh grasses, with some areas appearing slightly more brownish or reddish, possibly indicating different plant species or water levels. On the right side, there is a denser, darker green area that looks like a forest or a thicket of trees. The overall scene is a natural, undisturbed landscape.

Special thanks to the dedicated field crews
and funding and support provided
by EPA REMAP, EPA WPD, CIB, and DNREC