Tampa Bay management priorities which need models: Water and Sediment

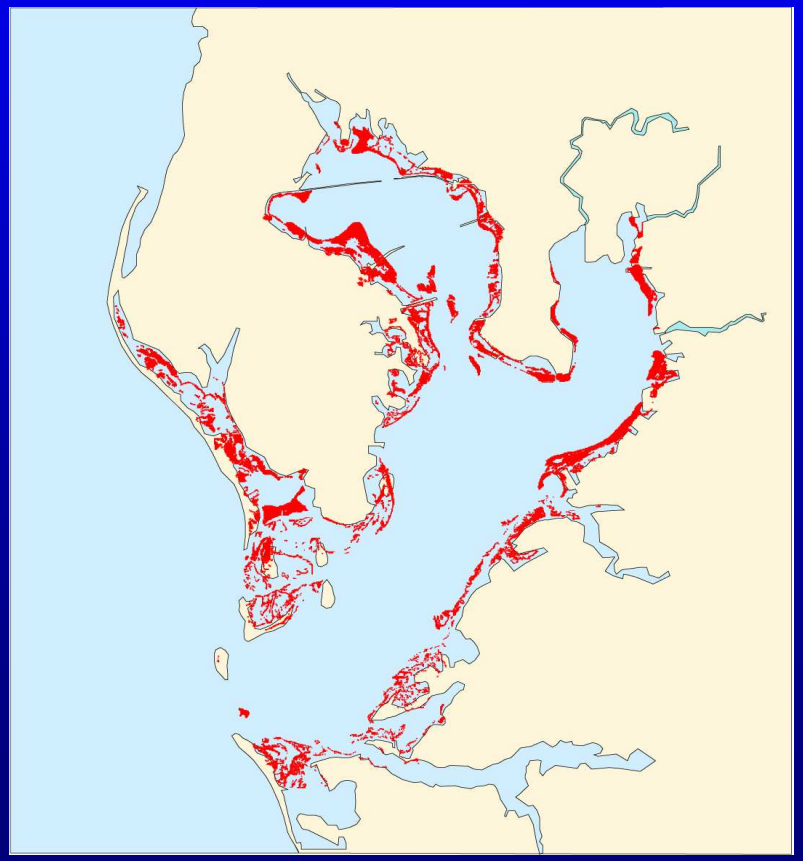
Management Priorities Workshop

April 27, 2007

H. Greening,

Tampa Bay Estuary Program

Tampa Bay
Seagrass Restoration Goal



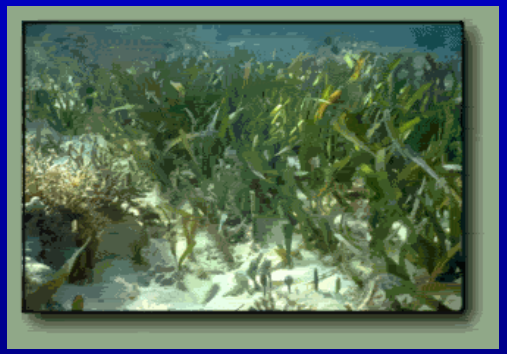
Difference Between 1950 and 1990 Seagrass Cover

Tampa Bay Nitrogen Management Strategy Paradigm

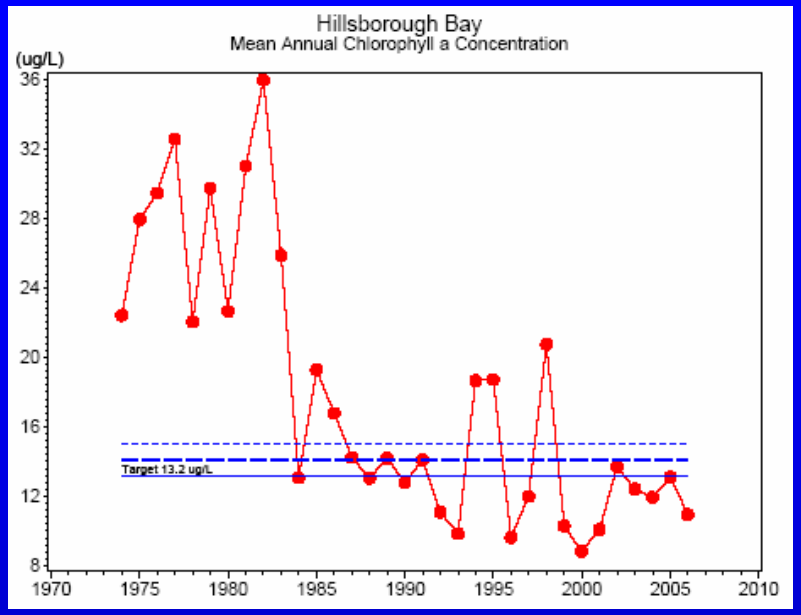
Models developed (1991-2003): empirical loading:response regression relationships; spreadsheet loading; mechanistic WQ response-- weight of evidence critical for management

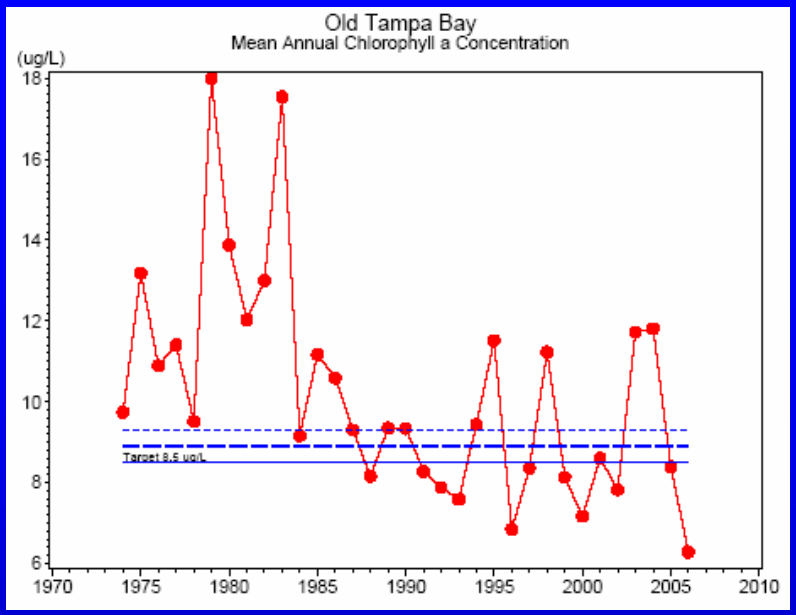
Numeric targets: seagrass acreage; light attenuation; chlorophyll *a*; TN loading

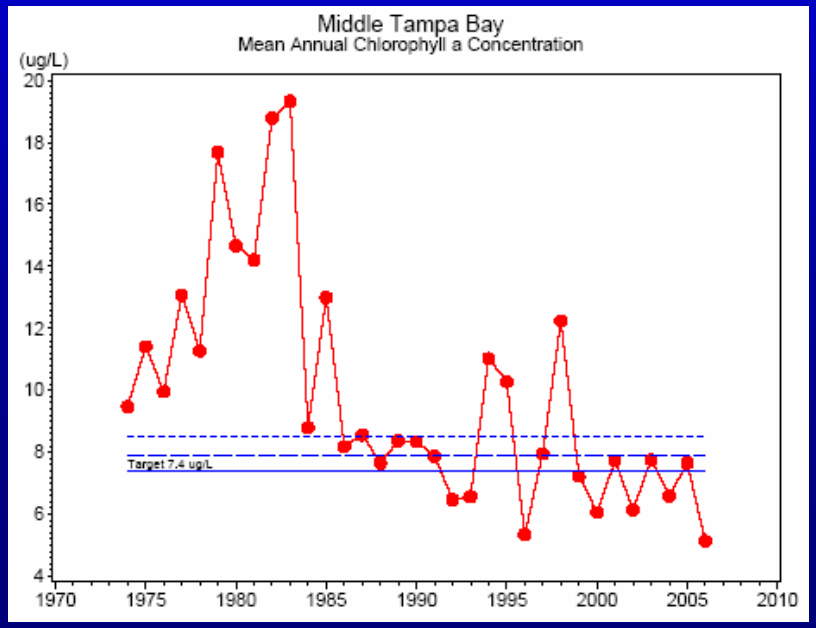
TN Load → Chlorophyll → Light Attenuation

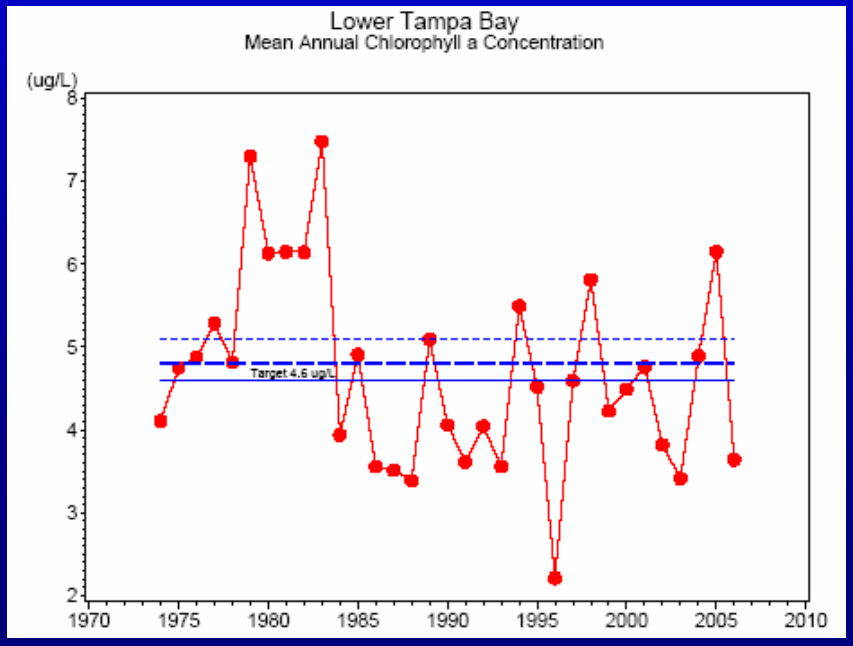


Seagrass Light Requirement → Seagrass Recovery to 1950 acreage









Data source: EPCHC; compiled by Janicki Env. 2007 (empirical regression model)

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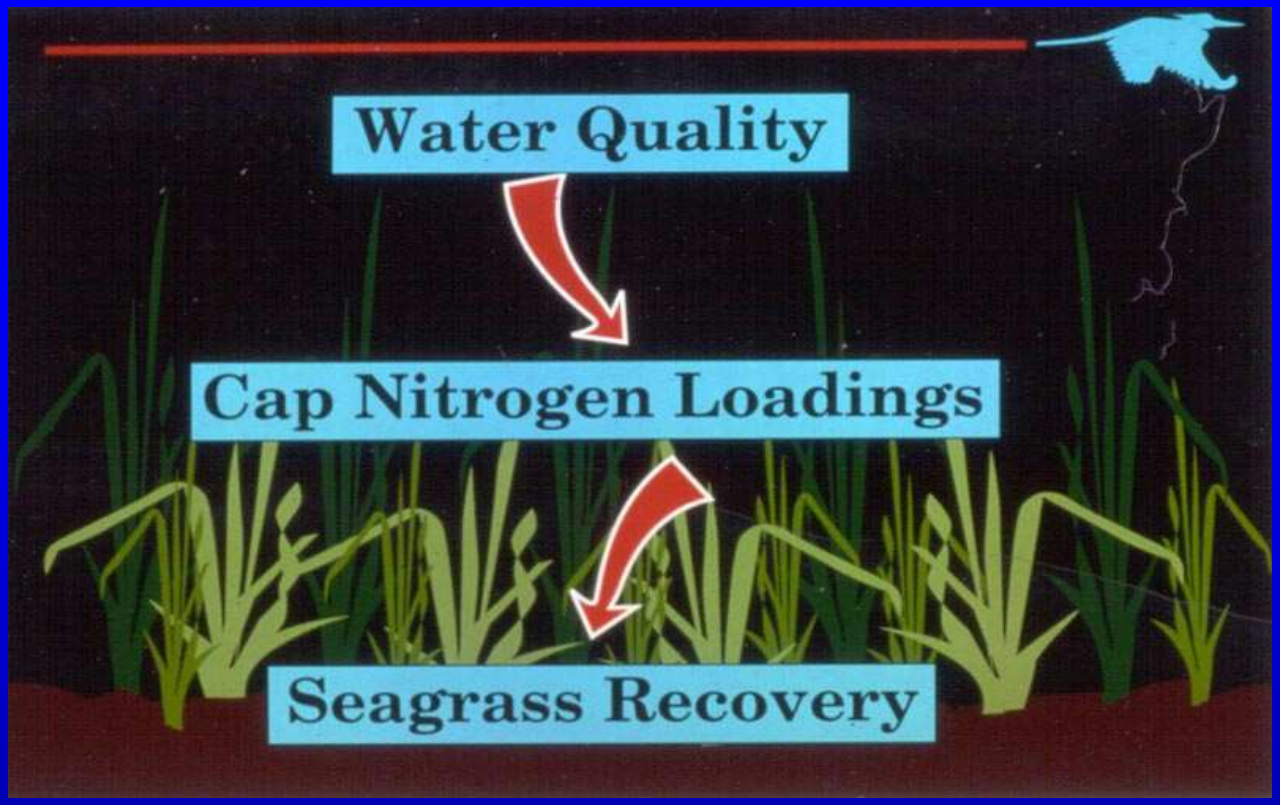
(empirical regression model)

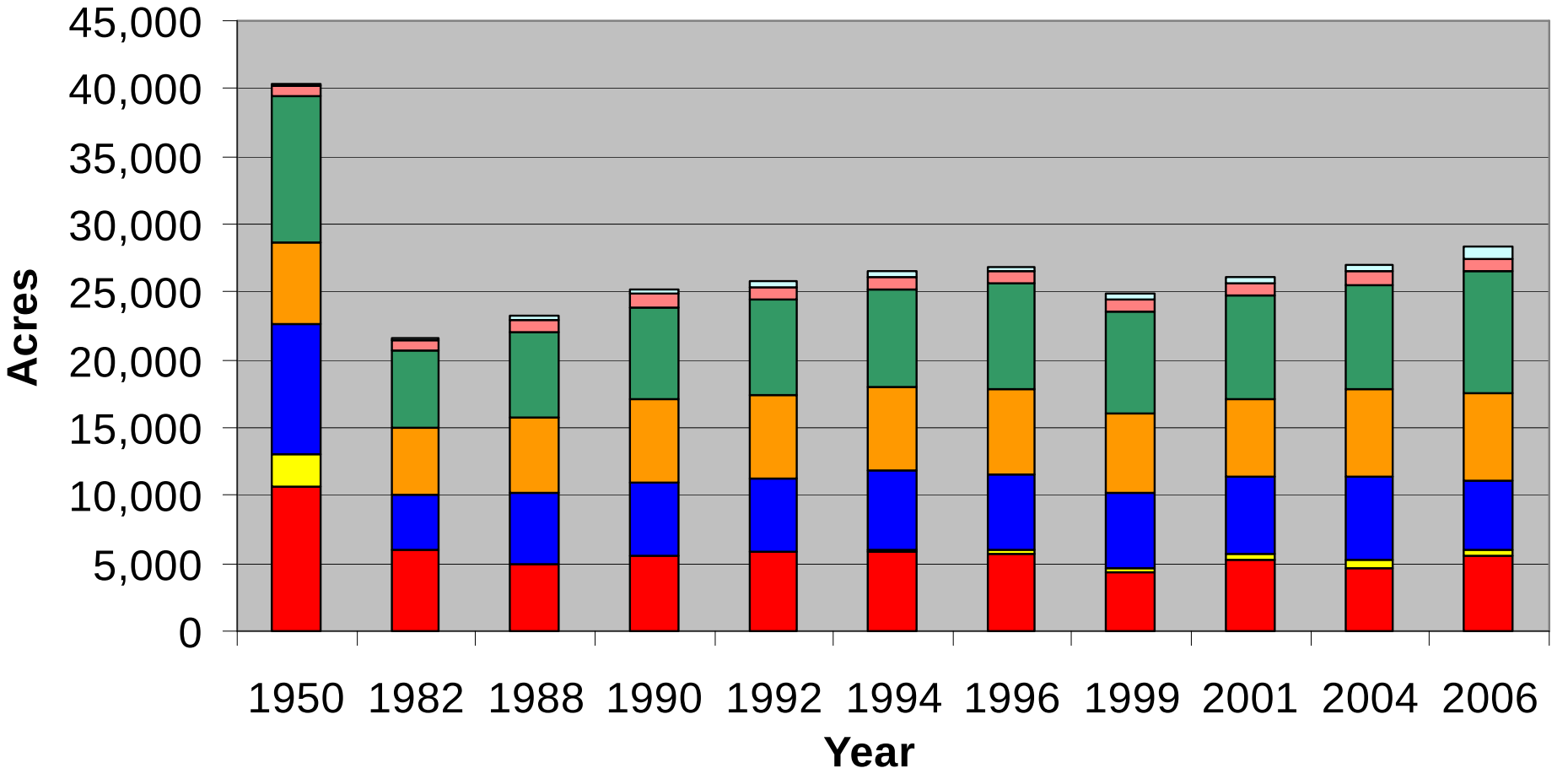
Decision matrix results				
Year	Old Tampa Bay	Hillsborough Bay	Middle Tampa Bay	Lower Tampa Bay
1975	Red	Red	Red	Green
1976	Red	Red	Red	Yellow
1977	Red	Red	Red	Red
1978	Red	Red	Red	Yellow
1979	Red	Red	Red	Red
1980	Red	Red	Red	Red
1981	Red	Red	Red	Red
1982	Red	Red	Red	Red
1983	Red	Yellow	Red	Red
1984	Red	Green	Red	Yellow
1985	Red	Red	Red	Yellow
1986	Red	Yellow	Red	Green
1987	Red	Yellow	Red	Green
1988	Yellow	Green	Yellow	Green
1989	Red	Yellow	Red	Yellow
1990	Red	Green	Red	Yellow
1991	Green	Yellow	Yellow	Yellow
1992	Yellow	Green	Yellow	Yellow
1993	Yellow	Green	Yellow	Yellow
1994	Yellow	Yellow	Red	Red
1995	Red	Yellow	Red	Yellow
1996	Yellow	Green	Yellow	Green
1997	Yellow	Green	Red	Yellow
1998	Red	Red	Red	Red
1999	Yellow	Green	Yellow	Yellow
2000	Green	Green	Yellow	Yellow
2001	Yellow	Green	Yellow	Yellow
2002	Yellow	Green	Green	Green
2003	Red	Yellow	Green	Yellow
2004	Red	Green	Green	Yellow
2005	Green	Green	Yellow	Yellow
2006	Green	Green	Green	Green

Seagrass Goal: Restore 11,000 acres over 2006 coverage, while preserving the existing 27,000 acres.



Nitrogen Management Goal: (empirical regression model) "Hold the line" on nitrogen loading at 1992-1994 average level. To compensate for expected increase in load with population growth, reduce or preclude an additional 17 tons per year (85 tons every 5 years). (watershed spreadsheet loading model)

DRAFT
Tampa Bay Seagrass Acreage Estimates



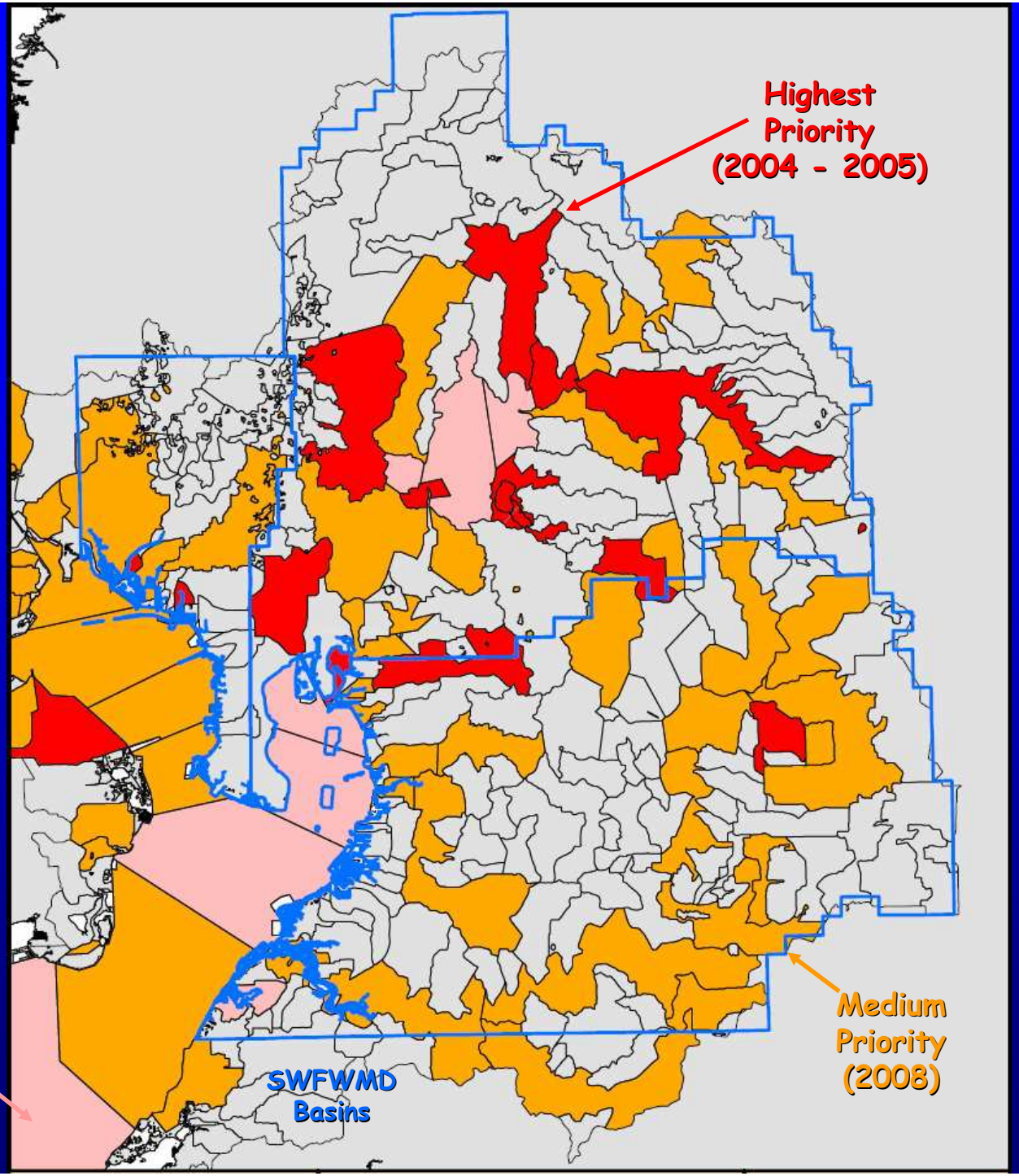
Data Source: SWFWMD SWIM February 2007

Management and Regulatory Implications

- EPA and FDEP have accepted the technical basis, model results and management strategy as meeting requirements for TMDLs for nitrogen in Tampa Bay.
- The Nitrogen Management Strategy appears to be adequately defined and supported with existing models for baywide spatial and temporal scales, with easily measurable targets and methods to track progress towards those targets. Accepted by bay managers and regulators.
- However, smaller spatial and temporal scale needs are not as well supported.

NEED:
Load/ response models to address smaller spatial scale TMDLs and impaired waters

~ 180 existing and anticipated TMDLs in Hillsborough County alone



Longshore Bar and seagrass, 1957

EED: Understanding of sediment
nsport dynamics and forcing
ctors to support restoration of
ngshore bars and associated
agrass in some areas of Tampa
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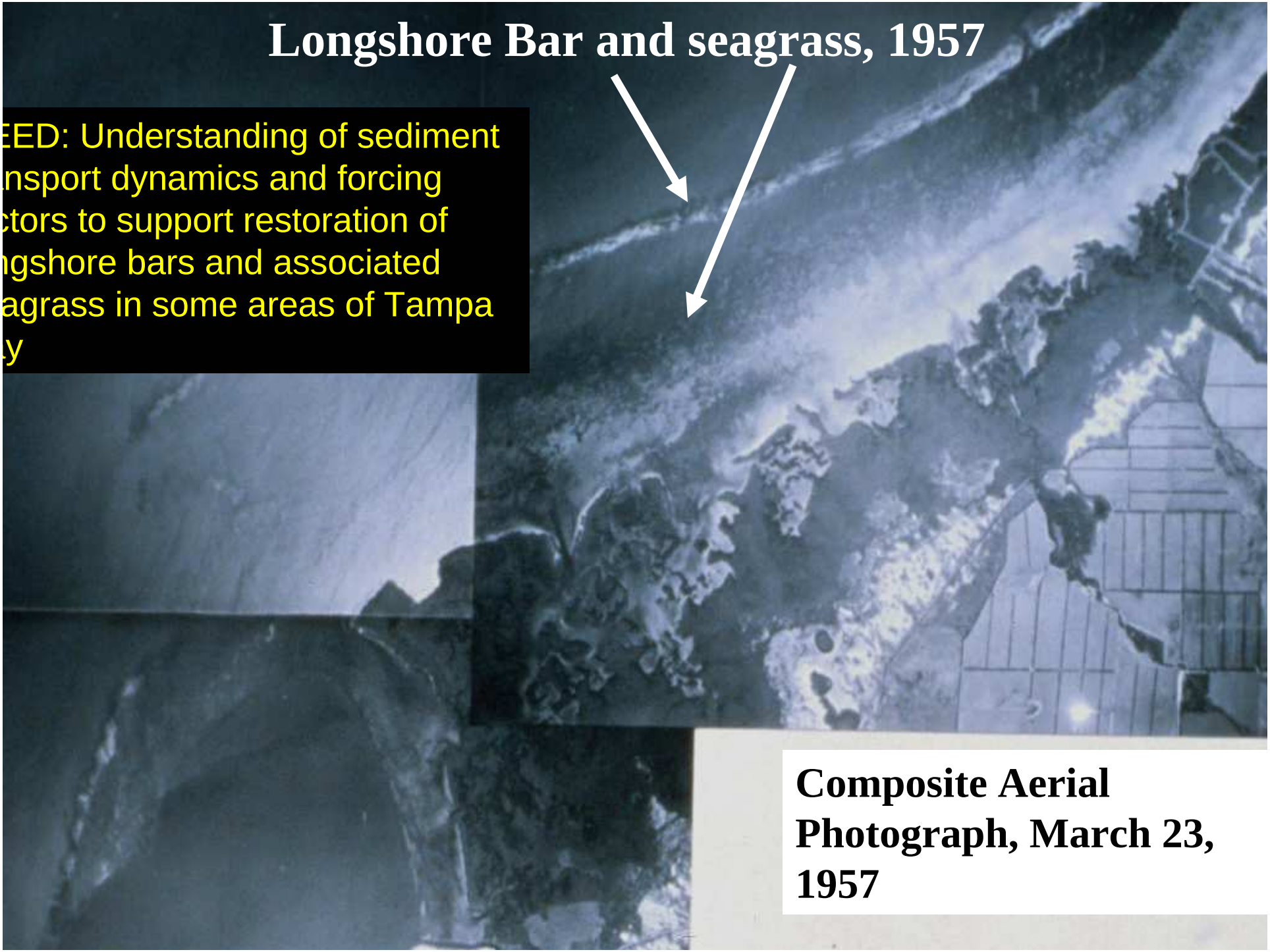
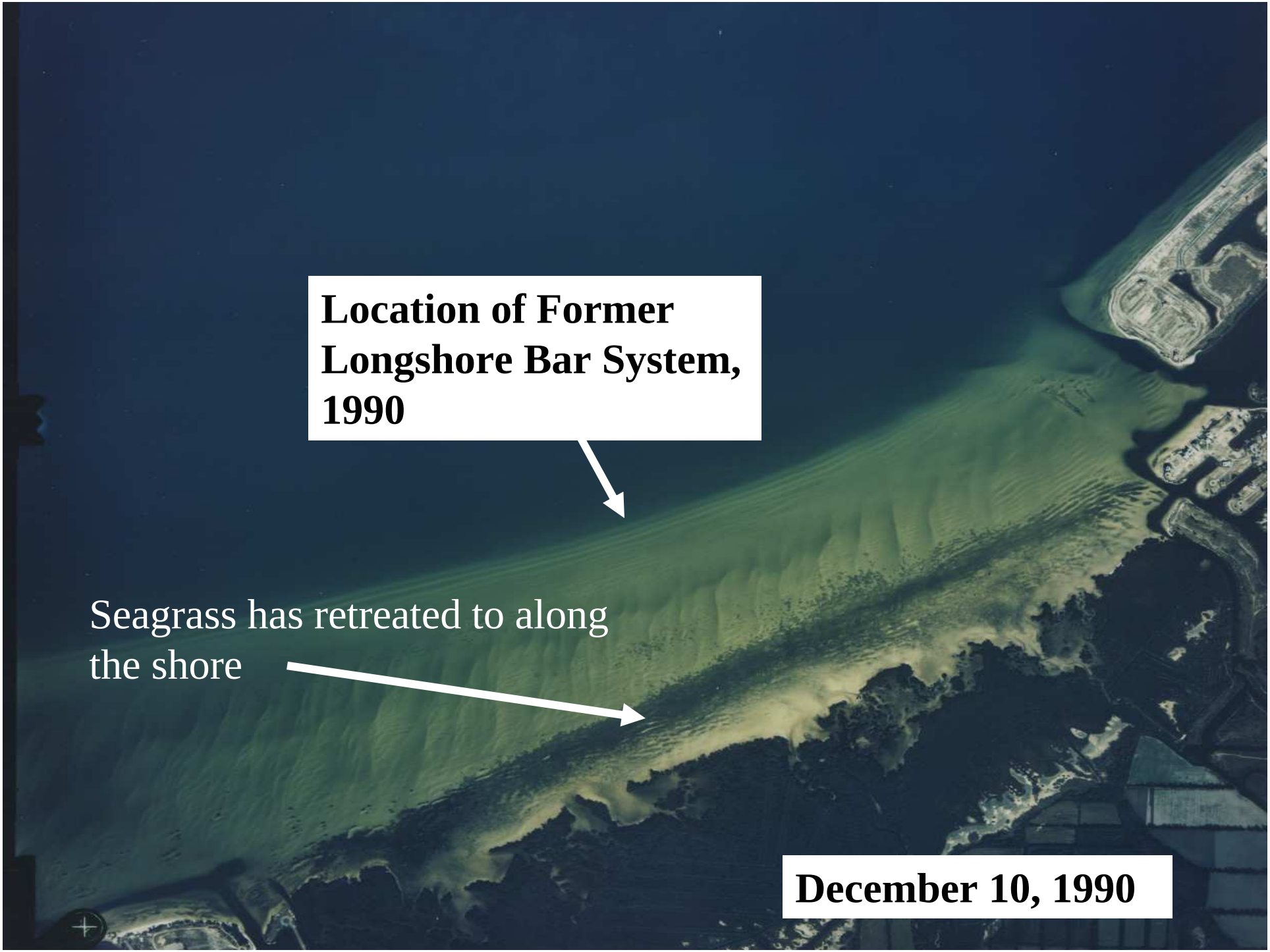
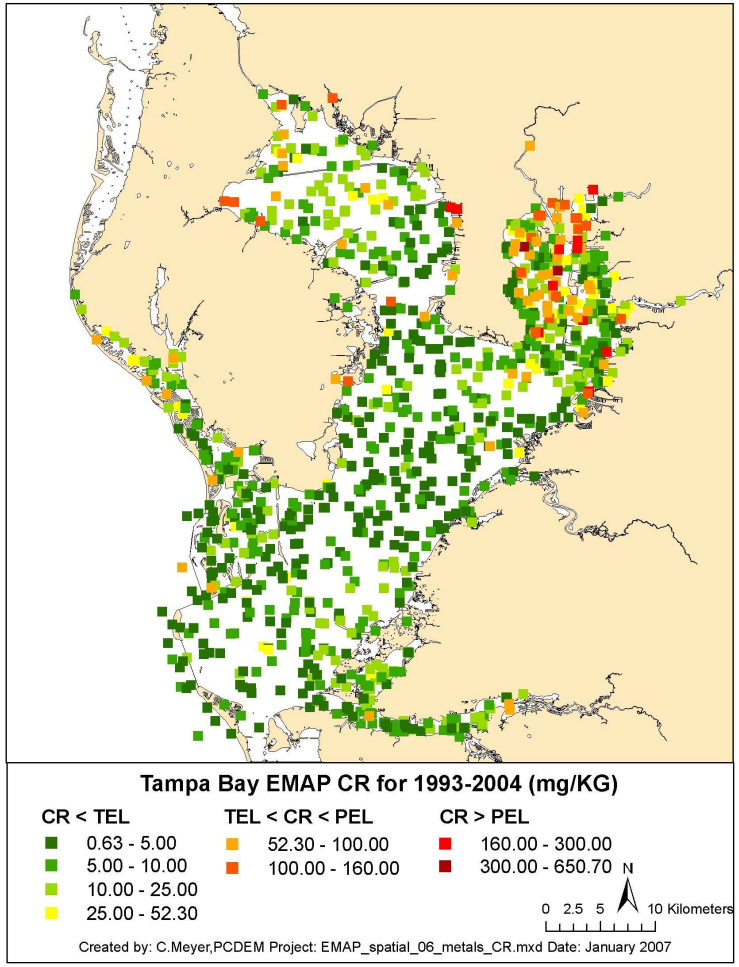


Composite Aerial Photograph, March 23, 1957


Location of Former Longshore Bar System, 1990
Seagrass has retreated to along the shore
December 10, 1990

Chromium

TEL = 52.3 mg/kg; PEL = 160 mg/kg



NEED:

Materials and sediment transport within the bay.

Most of the bay sediments are uncontaminated, but areas of contamination exist.

Transport from sources and within the bay is needed to develop management strategies for these limited areas.

Tampa Bay management priorities which need models: water and sediment quality

- Pollutant loading estimates at smaller temporal and spatial scales- within watershed and TB
- Response of waterbody to variable pollutant loads at smaller temporal/spatial scales- within watershed and TB
- Transport of materials- water, pollutants, sediments
- Special cases: oil/hazardous spills, response of waterbody to change in bay's hydraulics (dredging expansion), storms, response to changes in freshwater inflow, etc.