

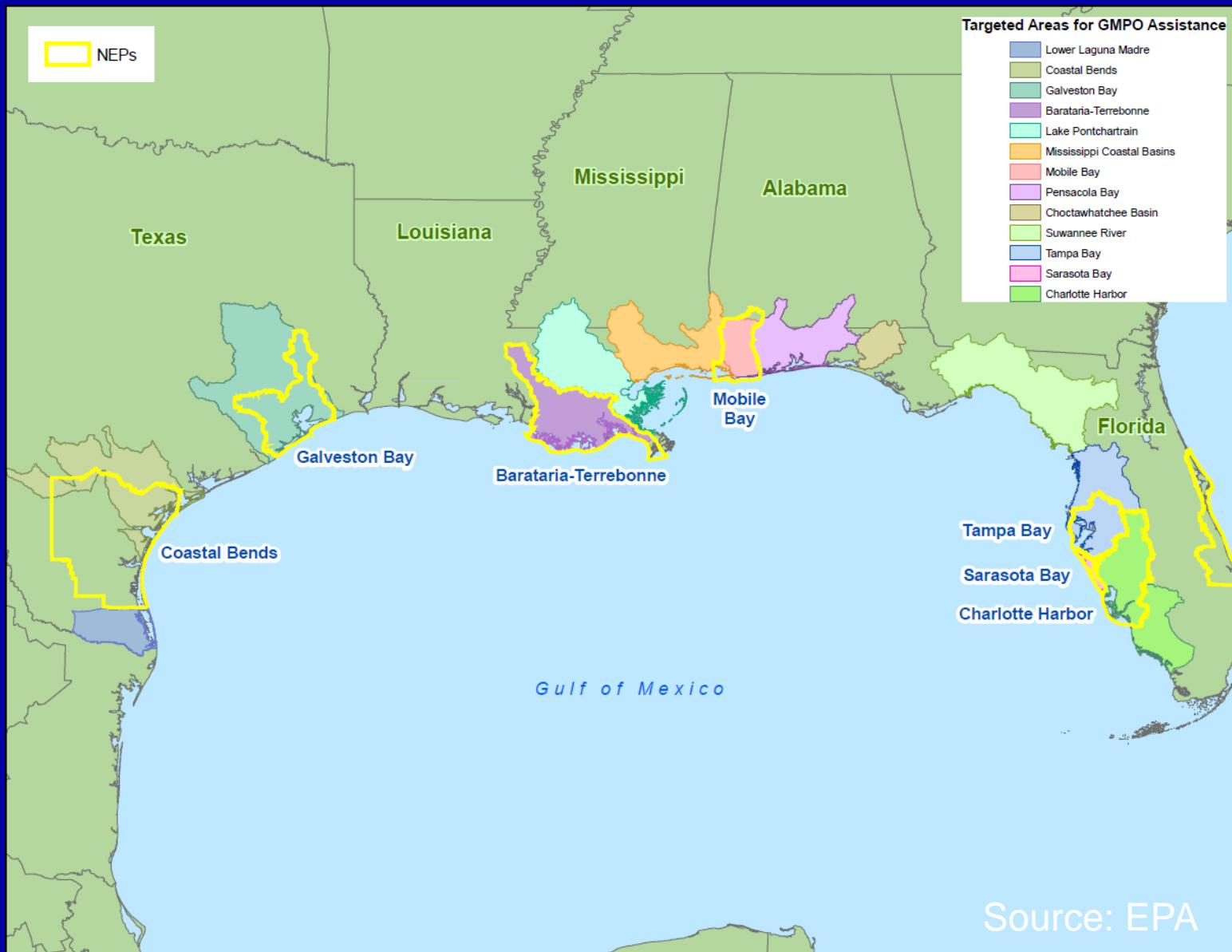
**Enhancing estuarine water quality
management through integrating earth
science research results:
A targeted project for Tampa Bay, Florida**

**Chuanmin Hu¹
Charles Kovach² and Christopher Anastasiou²**

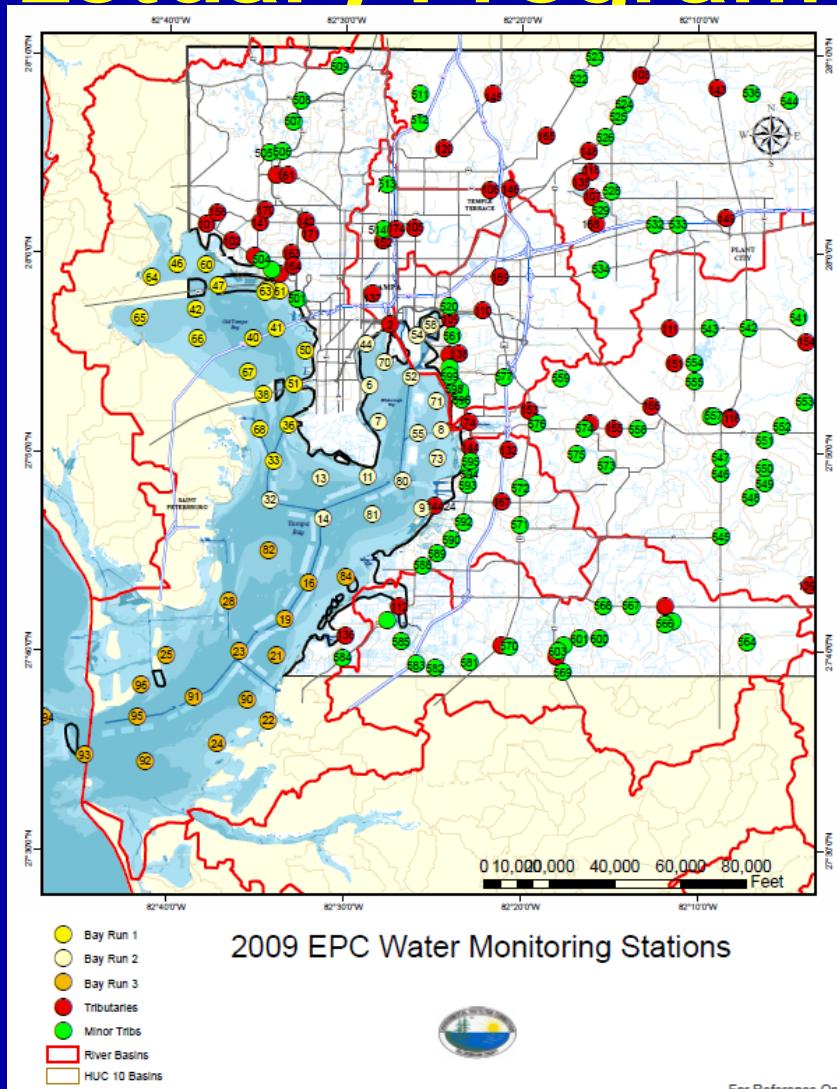
**¹University of South Florida
²Florida Department of Environmental Protection**



Gulf of Mexico NEPs



Tampa Bay Estuary Program



<http://www.epchc.org> Monthly sampling 1972 - present

Tampa Bay DSS

Water Quality Decision Matrix (WQDM)

CHLOROPHYLL		LIGHT ATTENUATION			
↓		Outcome 0	Outcome 1	Outcome 2	Outcome 3
Outcome 0	<i>GREEN</i>	<i>YELLOW</i>	<i>YELLOW</i>	<i>YELLOW</i>	<i>YELLOW</i>
Outcome 1	<i>YELLOW</i>	<i>YELLOW</i>	<i>YELLOW</i>	<i>RED</i>	<i>RED</i>
Outcome 2	<i>YELLOW</i>	<i>YELLOW</i>	<i>RED</i>	<i>RED</i>	<i>RED</i>
Outcome 3	<i>YELLOW</i>	<i>RED</i>	<i>RED</i>	<i>RED</i>	<i>RED</i>

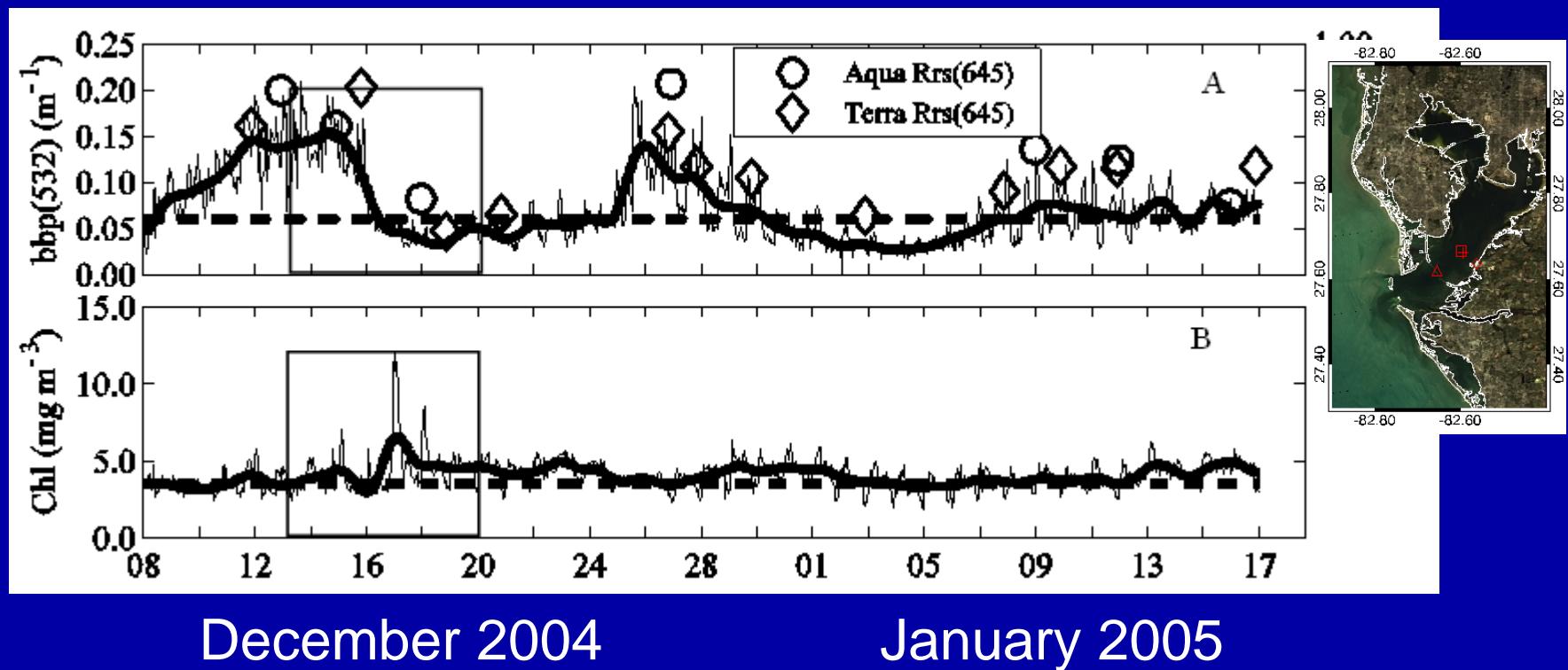
WQDM based DSS results => TMDL regulations by FDEP

Decision matrix results				
Year	Old Tampa Bay	Hillsborough Bay	Middle Tampa Bay	Lower Tampa Bay
1975	Red	Red	Red	Green
2004	Red	Green	Green	Yellow
2005	Green	Green	Yellow	Yellow

Source: Janicki et al., 2000; Poe et al., 2007

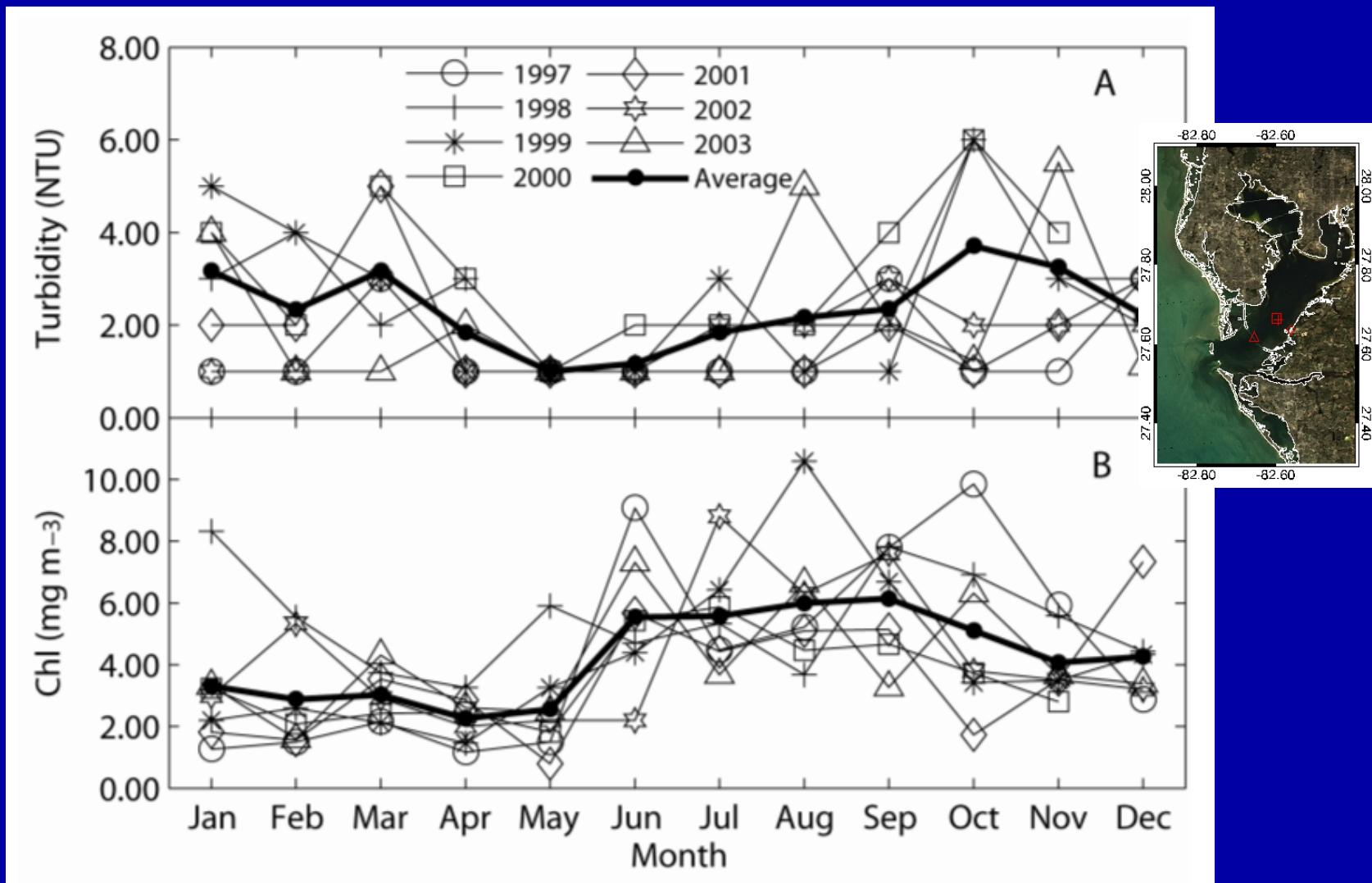
Potential Problem in Existing DSS

Lack of high-temporal resolution



Potential Problem in existing DSS

Lack of high-temporal resolution

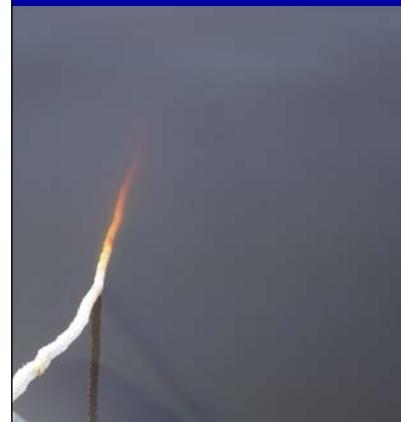
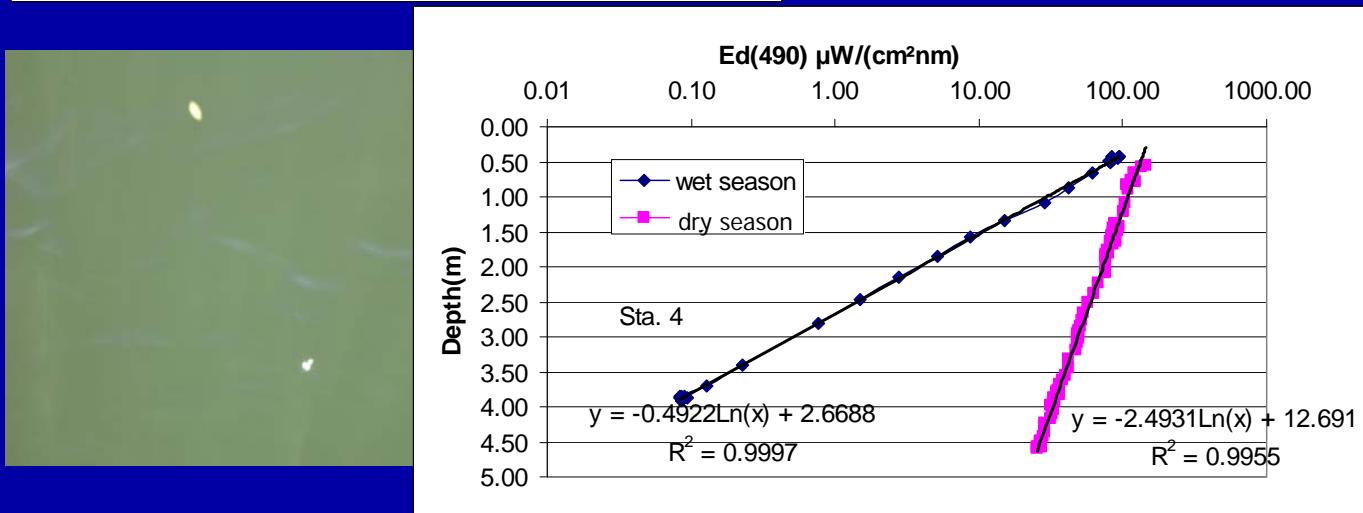
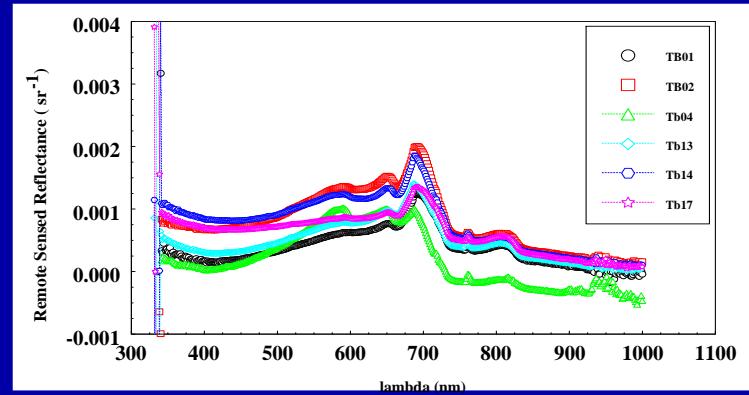
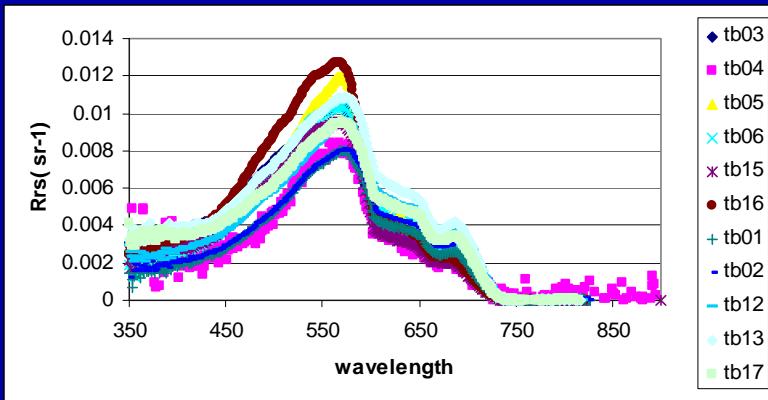


Data Source: EPCHC

Objectives

- Refine and use NASA ESP in DSS
- Expand to other estuaries

Approach: Incorporating RS

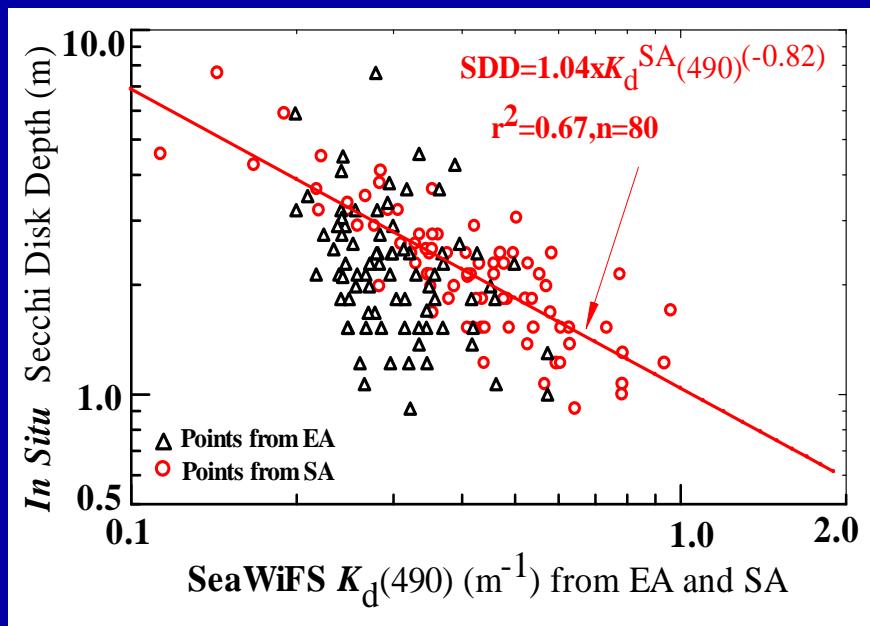
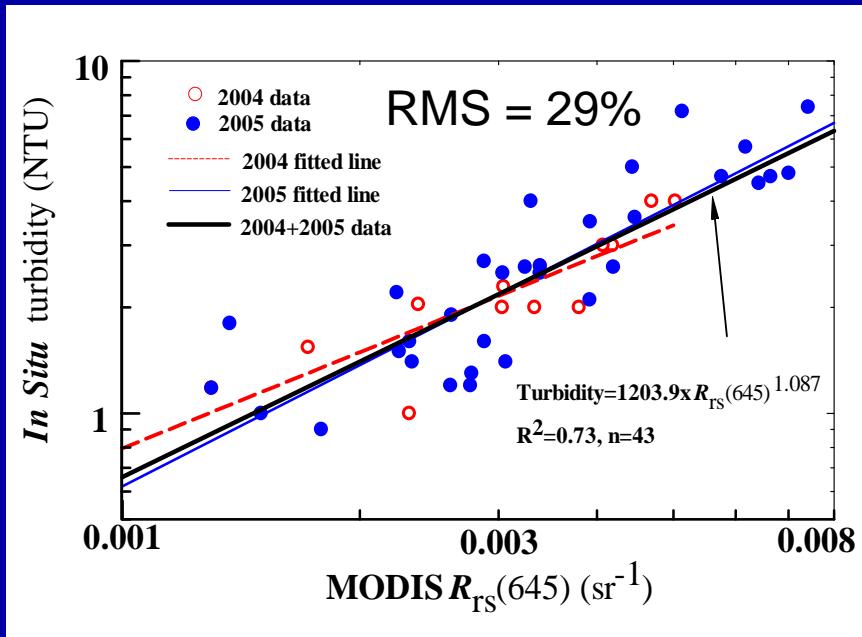


Dry season, Sta. 2, 3 July 2004

Wet season, Sta. 2, 4 Oct. 2004

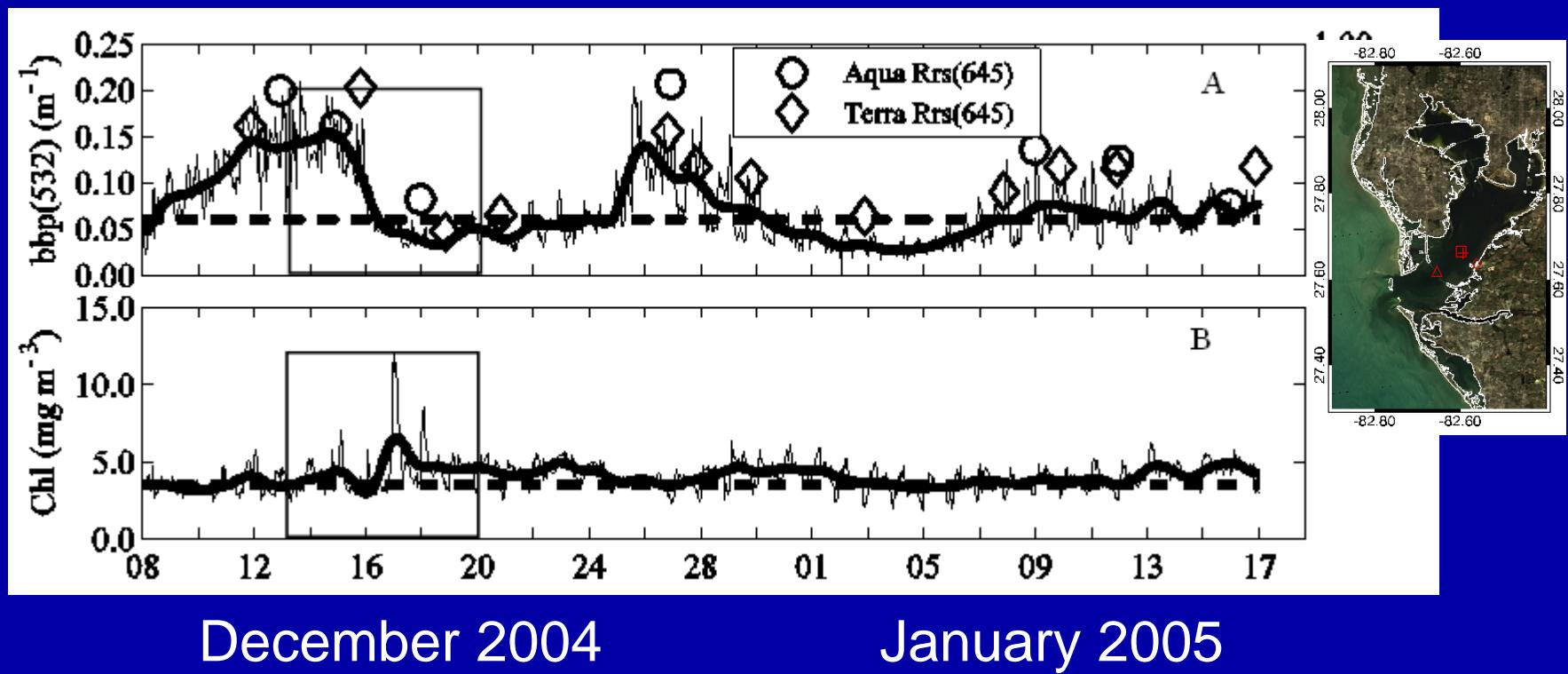
Approach: Incorporating RS

Turbidity and Clarity for Tampa Bay



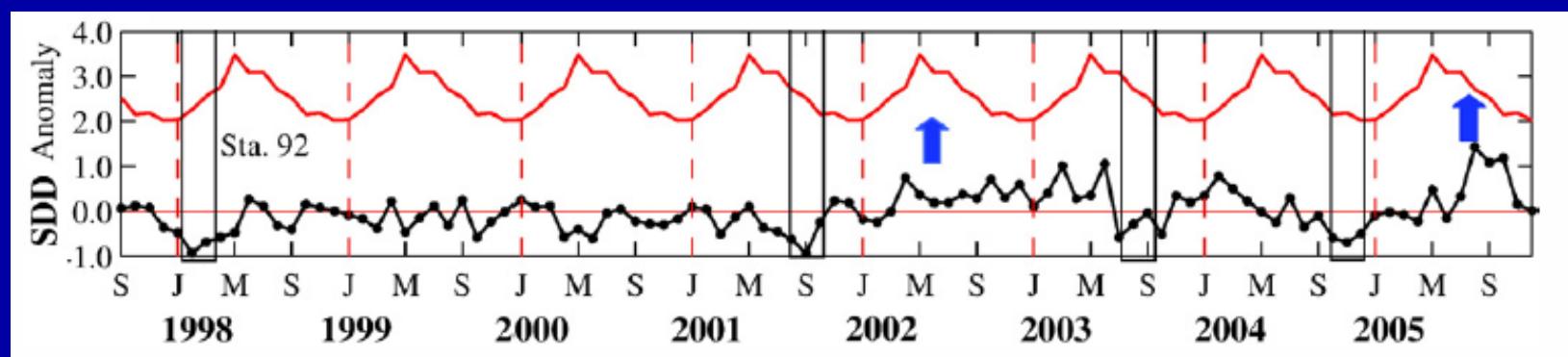
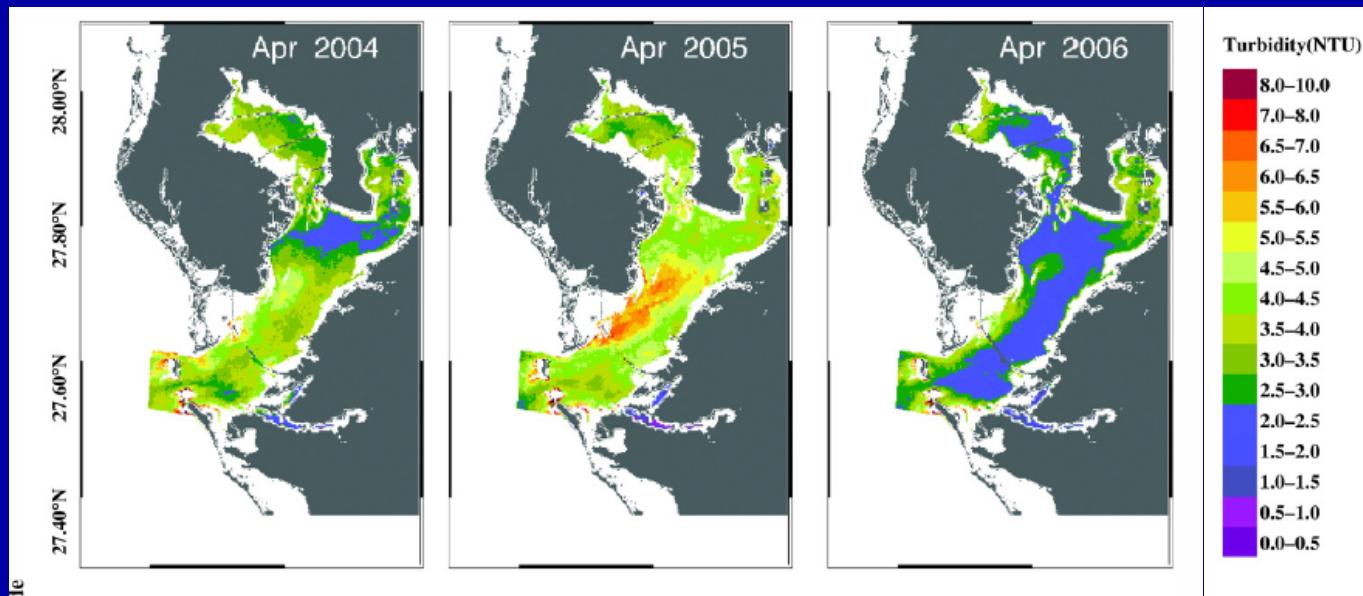
Approach: Incorporating RS

Increase temporal resolution



Approach: Incorporating RS

Turbidity and Clarity for Tampa Bay

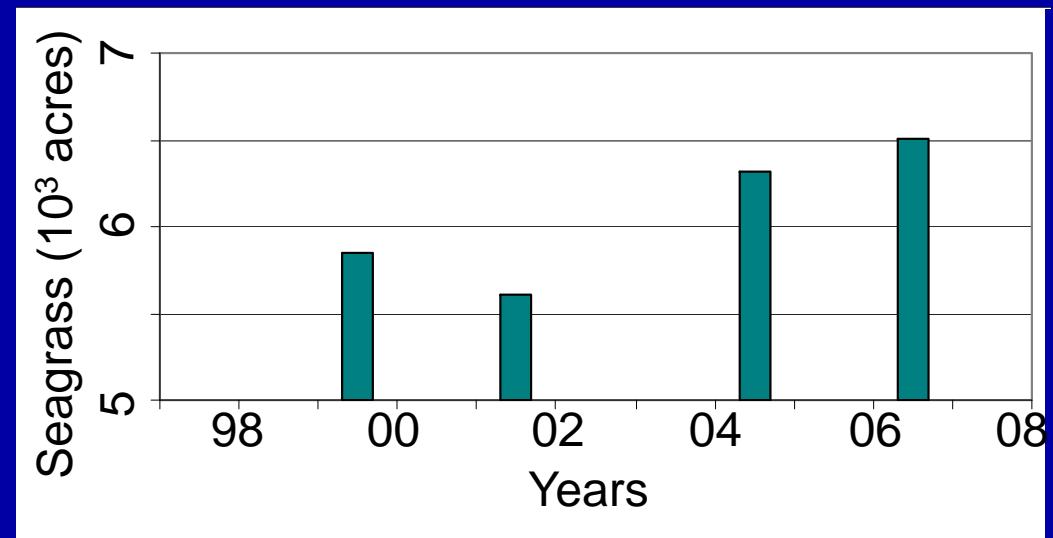
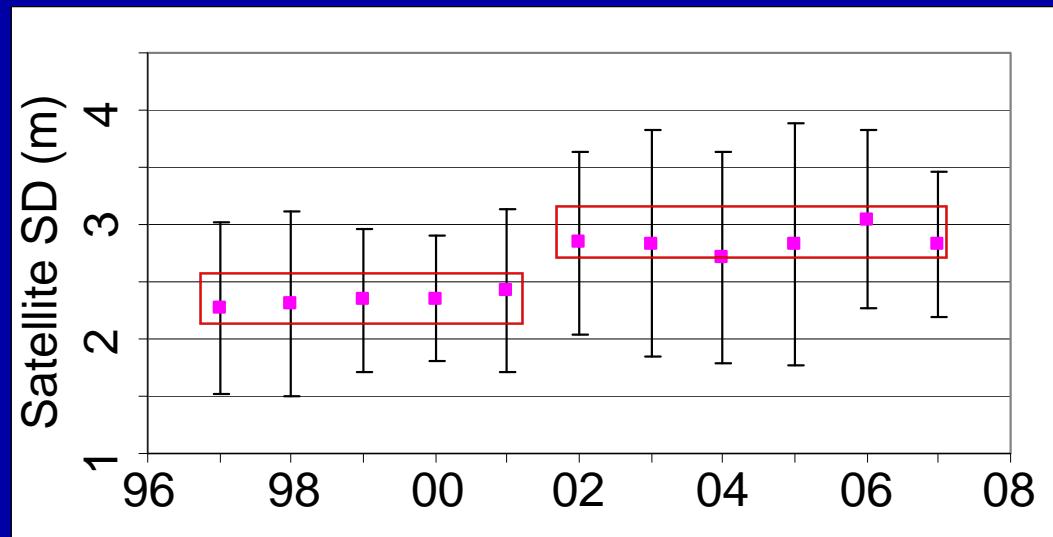


Water Clarity and Seagrass Coverage

Water Clarity from
Satellite



Seagrass
Coverage

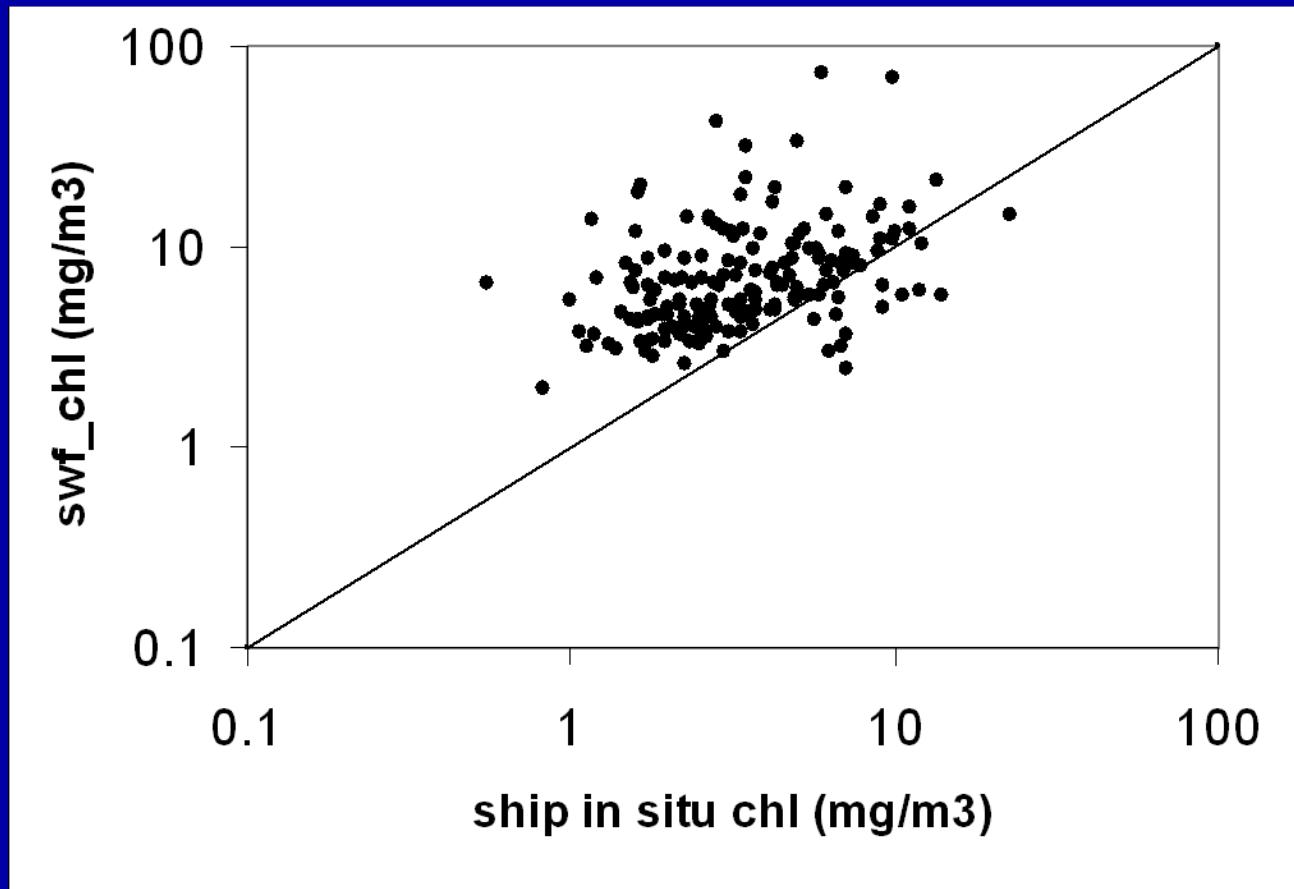


ESP Current Status

Data Product	Resolution	Revisit*	Sensors	Period	Quality
SST ($^{\circ}$ C)	1000 m	> 2/week	MODIS, AVHRR	1993 -	high
Turbidity (NTU)	250 m	> 1/week	MODIS	1999 -	high
Clarity (SDD, m)	1000 m	> 1/week	MODIS, SeaWiFS	1997 -	high
Chl (mg m^{-3})	1000 m	> 1/week	MODIS, SeaWiFS	1997 -	low
CDOM (m^{-1})	1000 m	> 1/week	MODIS, SeaWiFS	1997 -	low

Satellite Chl in Tampa Bay: Headache!

1998-2005 SeaWiFS and *in situ* data



Tasks

- Products online
- Algorithm refinement
- RS-based DSS
- Transition approach to FDEP and other NEPs

Participating Institutions

- University of South Florida
- Florida DEP

End-user Organizations

- Florida DEP
- Tampa Bay EP
- Charlotte Harbor NEP
- Mobile Bay NEP

Goal

- Maximize the use of NASA ESP in DSS

Sea Surface Temperature Anomaly

http://imars.usf.edu/merged_sst

