FCE Primary Production Work Group
ASM 2007

- **Progress**
- **FCE II plans**
- **Sub-group reports**
  - **-Periphyton (Gaiser)**
  - **-Marsh Vegetation (Childers)**
  - **-Mangroves (Monroy-Rivera)**
  - **-Seagrass (Fourqurean)**

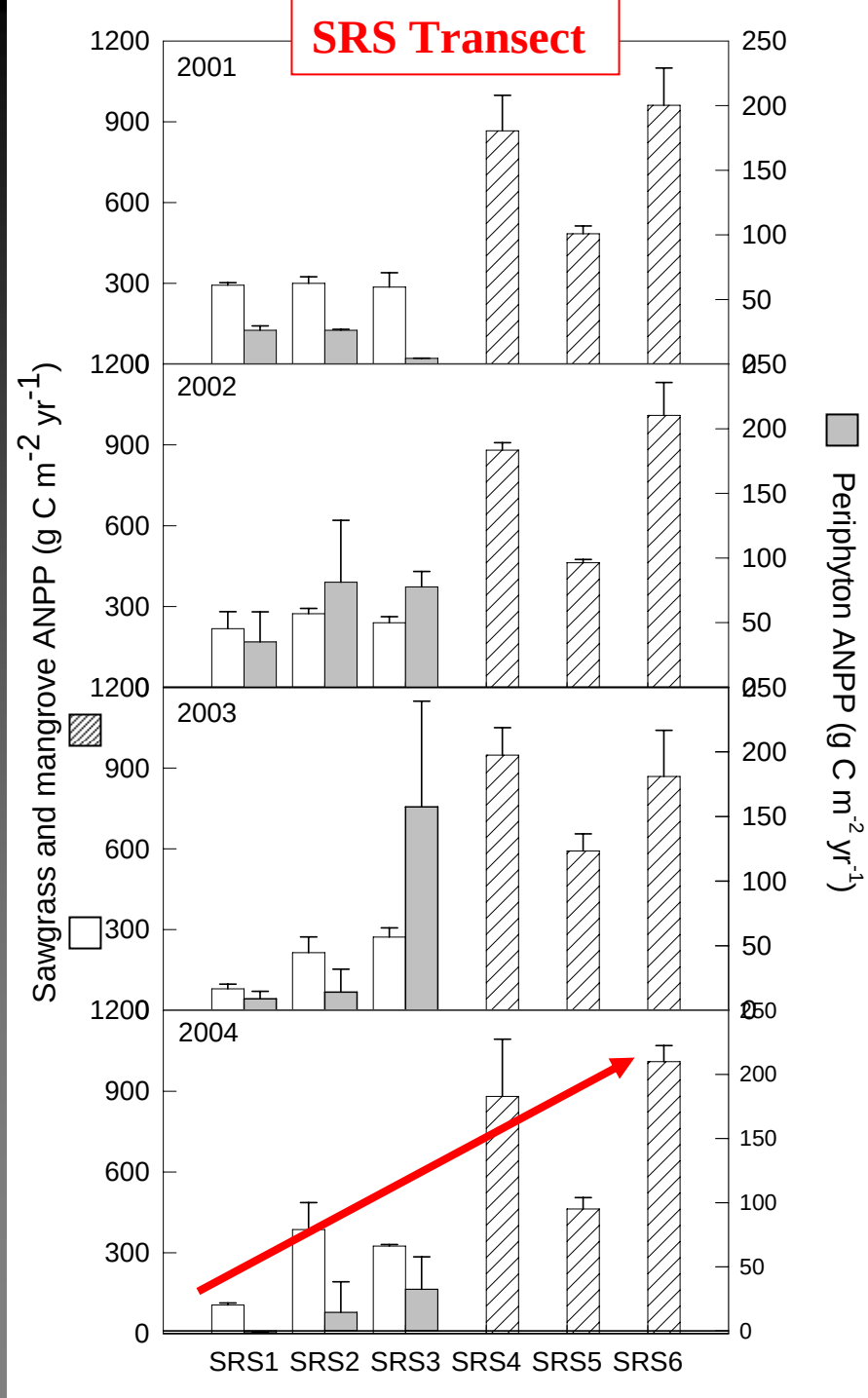
Progress and Integration

2006 pubs:

- Armentano et al., Hydrobiologia, 569(1): 293-309.
- Armitage et al., Hydrobiologia, 569(1): 423-435.
- Boyer et al., Hydrobiologia, 569(1): 71-85.
- Boyer et al., Hydrobiologia, 569(1): 167-177.
- Cardona-Olarte et al., Hydrobiologia, 569(1): 325-341.
- Childers et al., Limnology and Oceanography, 51(1): 602-616.
- Childers et al., Hydrobiologia, 569(1): 273-292.
- Cardona-Olarte et al., Hydrobiologia, 569(1): 325-341.
- Childers et al., Limnology and Oceanography, 51(1): 602-616.
- Childers et al., Hydrobiologia, 569(1): 273-292.
- Davis et al., Hydrobiologia, 569(1): 87-97.
- Dorn et al., Hydrobiologia, 569(1): 375-386.
- Ewe et al., Hydrobiologia, 569(1): 459-474.
- Frankovich et al., Hydrobiologia, 569(1): 259-271.
- Gaiser et al., Limnology and Oceanography, 51(1): 617-630.
- Gottlieb et al., Hydrobiologia, 569(1): 195-207.
- Iwaniec et al., Hydrobiologia, 569(1): 223-235.
- Krauss et al., Tree Physiology, 26: 959-968.
- Krauss et al., Hydrobiologia, 569(1): 311-324.
- Romigh et al., Hydrobiologia, 569(1): 505-516.
- Ross et al., Hydrobiologia, 569(1): 37-59.
- Saunders et al., Hydrobiologia, 569(1): 475-492.
- Thomas et al., Aquatic Botany, 84: 317-323.
- Thomas et al., Hydrobiologia, 569(1): 209-221.
- Tobias et al., Diatom Research, 21: 379-405.
- Troxler-Gann et al., Florida. Plant and Soil, 279(1-2): 271-286.
- Ward et al., Hydrobiologia, 569(1): 517-527.

Ewe, S.M.L., E.E. Gaiser, D.L. Childers, D. Iwaniec, V.H. Rivera-Monroy, and R.R. Twilley, 2006. Spatial and temporal patterns of aboveground net primary productivity (ANPP) along two freshwater-estuarine transects in the Florida Coastal Everglades. Hydrobiologia, 569(1): 459-474.

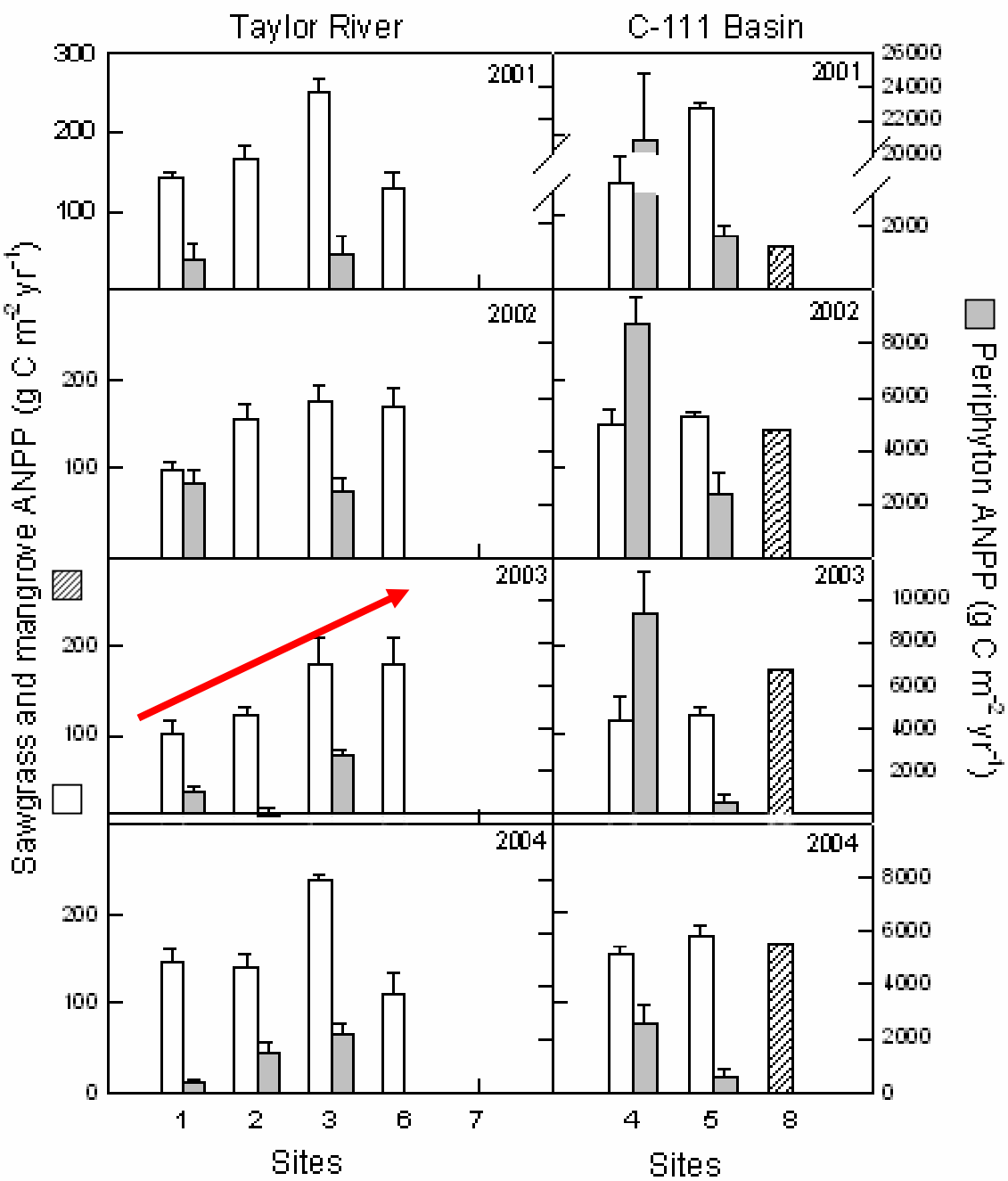
ANPP by producer and year

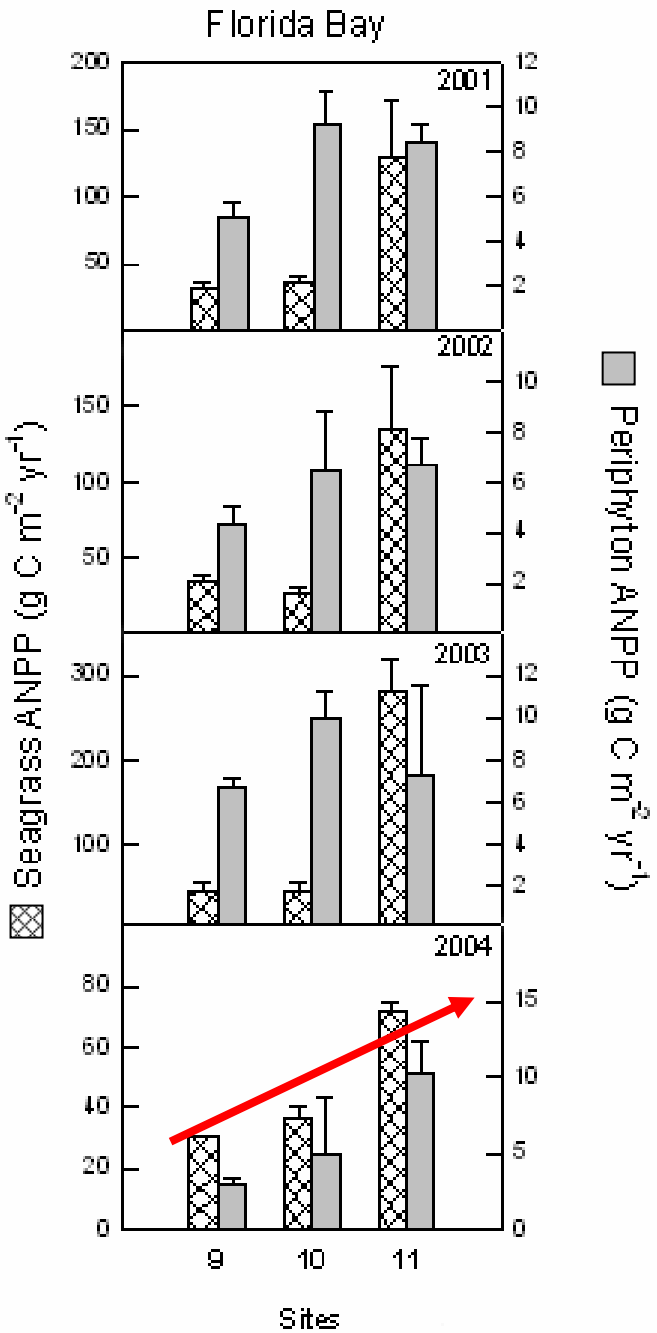


Ewe et al. (2006)

TS/Ph Transect

Ewe et al. (2006)





Plans for FCE II

- Continued integration
- A focus on the ecotone

  -Surface vs. subsurface P delivery on biomass allocation (above:below) in mangroves

  - Marsh plant and periphyton ANPP in ecotone; removal experiments in marsh and slough

Subgroups - Periphyton

Periphyton GPP

Everglades examples:

McCormick et al. 1998	6.62
Havens et al. 1999	8.25
McCormick et al. 2001	6.98
Browder et al. 1984	0.99
Swift 1989	0.98
Gaiser et al. 2005	3.81
FCE LTER	2.82
Rejmankova & Komarkova 2000	7.27

Mean ~ 5 g C m^{-2} d^{-1}

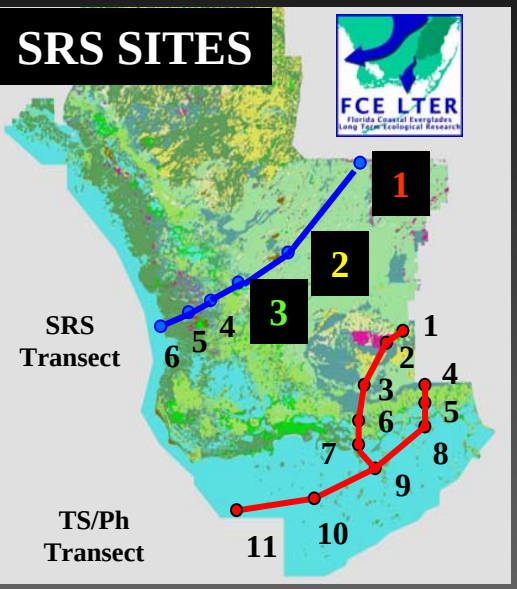
Other examples in literature:

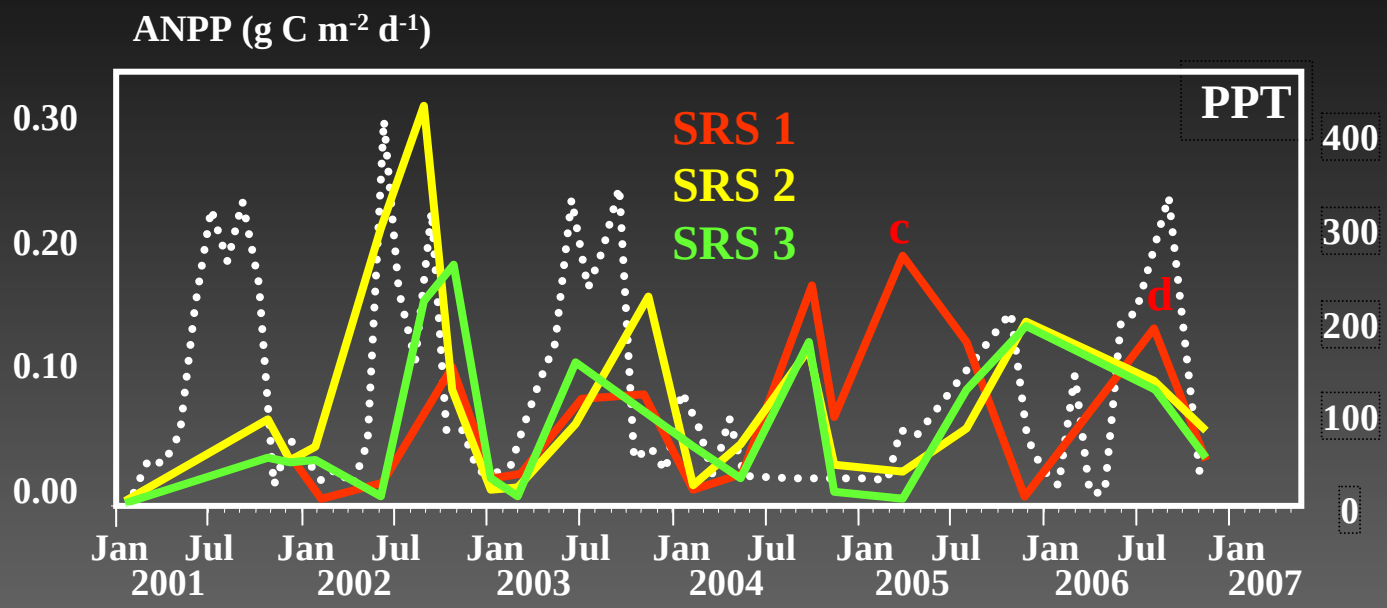
Stock & Ward 1989	0.23
Wetzel 1966	0.27
Rich & Wetzel 1978	2.00
Barko et al. 1977	0.09
Gruendling 1971	0.11
King and Ball 1966	0.28
Kevern et al. 1966	0.26
Hall et al., 1985	0.19
Pomeroy et al. 1981	0.41
Moncreiff 1983	1.10

Mean ~ 0.5 g C m^{-2} d^{-1}

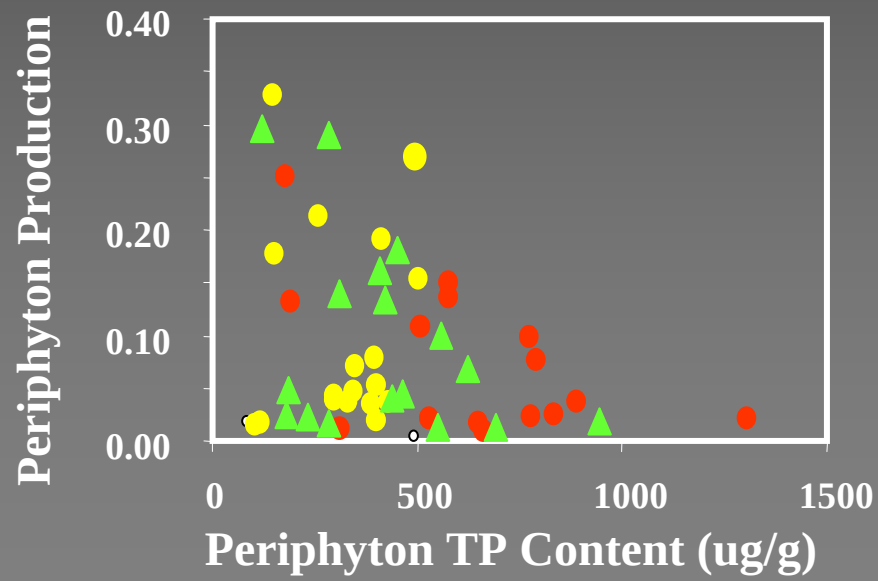
GPP of benthic algae in the Everglades is about ten times the mean reported in the literature

Periphyton Patterns – Shark Slough

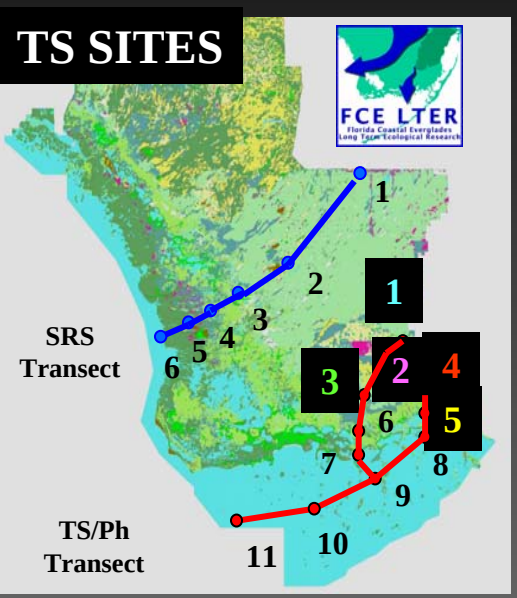


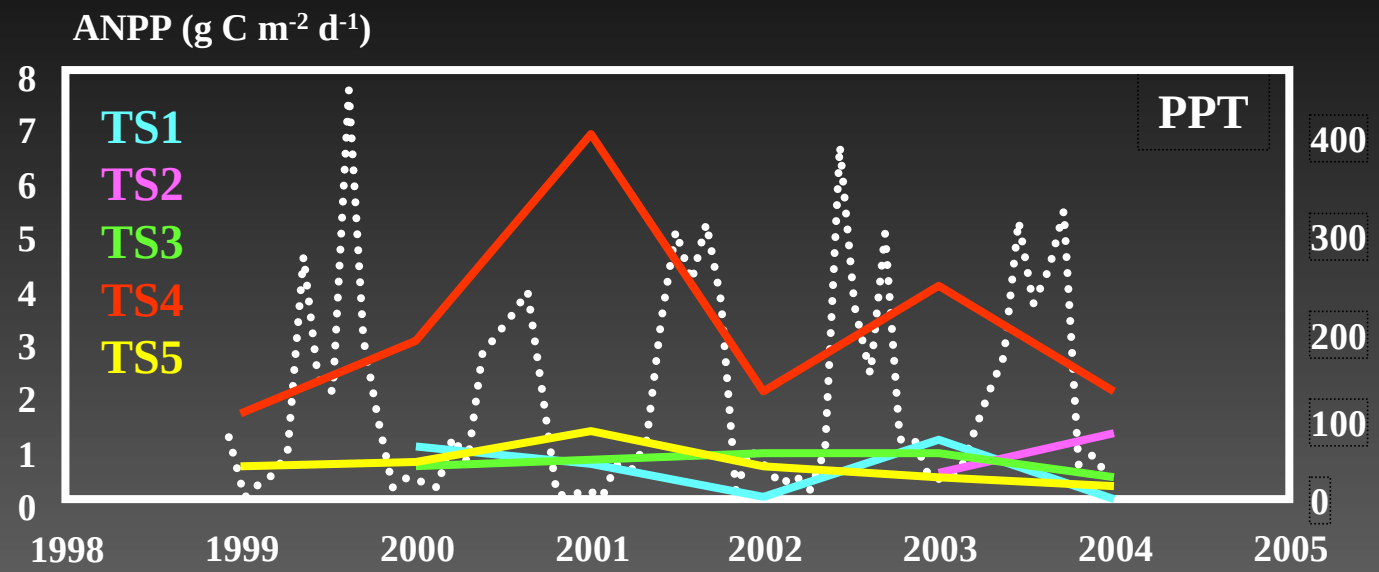


- Highest production during wet season
- High phosphorus concentrations in periphyton near SRS 1 signal enriched canal water
- Increased phosphorus leads to a decrease in periphyton production at this site

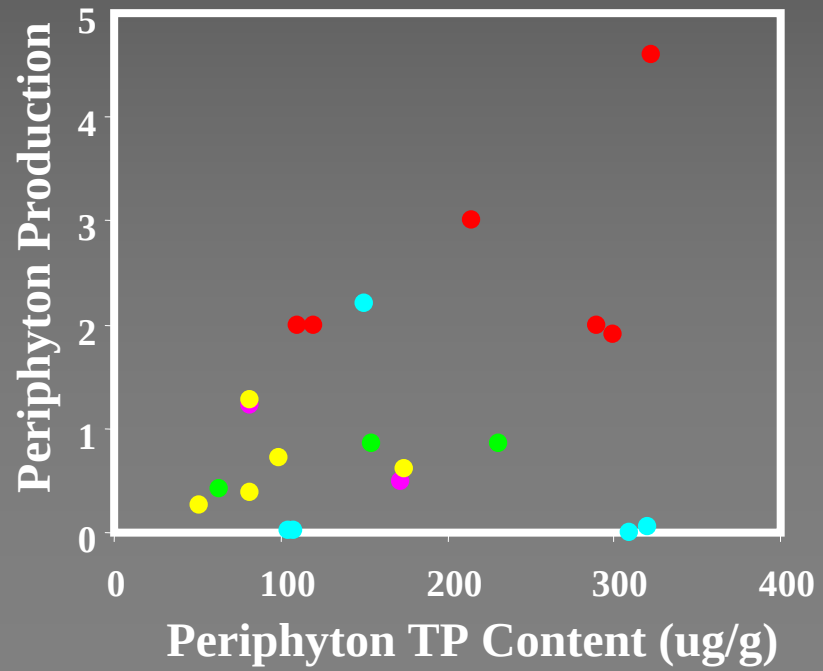


Periphyton Patterns – Taylor Slough

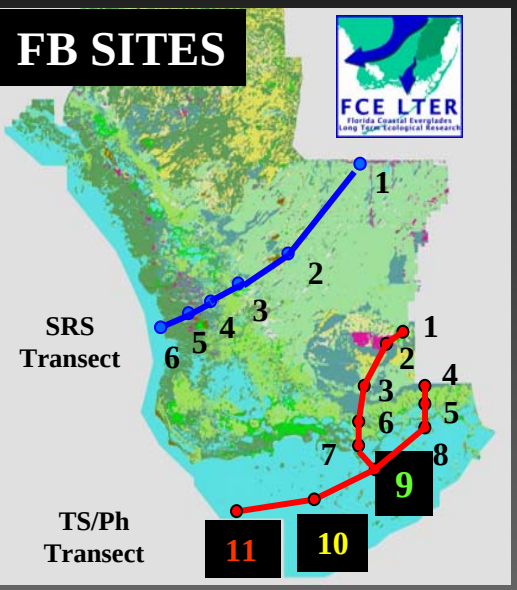


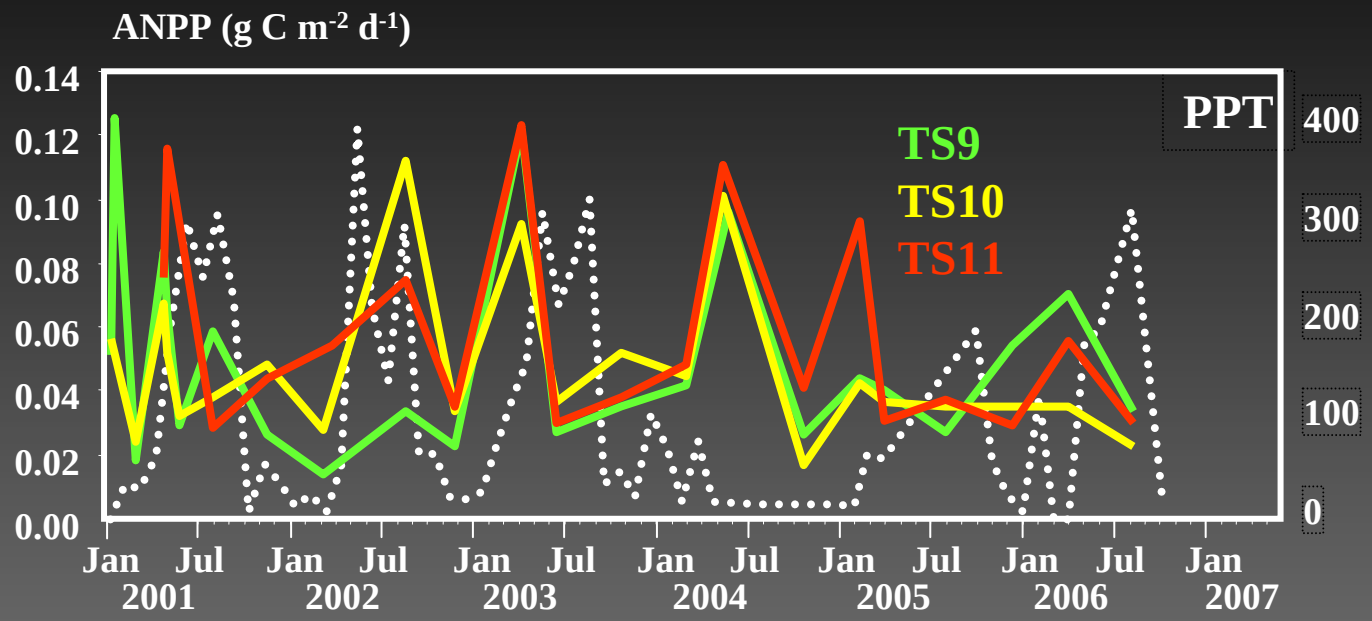


- Production peaks following rainfall events or canal discharge
- High phosphorus concentrations in periphyton near TS 4 signal enriched canal water
- Increased phosphorus leads to a increase in periphyton production at this site

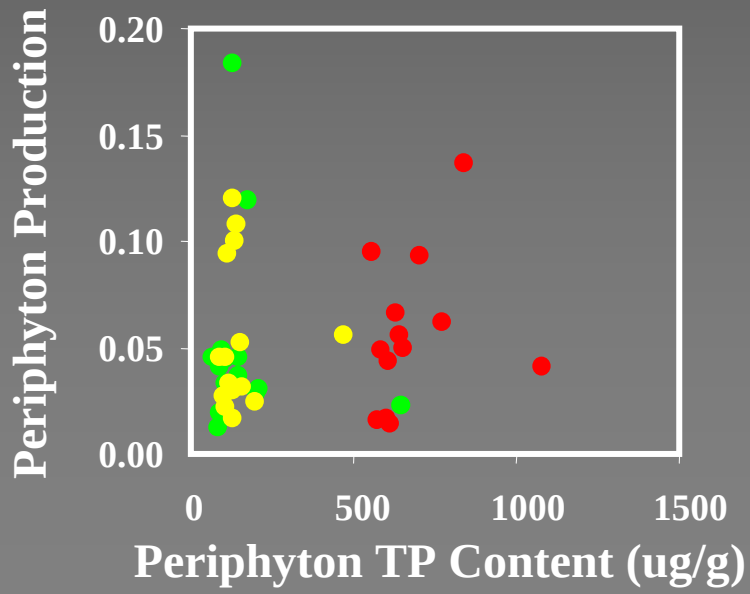


Periphyton Patterns – Florida Bay





- Production is highest in spring
- Highest epiphyton phosphorus concentrations are at the end of the gradient
- Increased phosphorus leads to a increase in epiphyton production at this site



Yucatan Comparative Food Web Study

	Everglades SRS, TS	Yucatan Sian Ka'an
Volume (ml m^{-2})	4800	6400
Dry Mass (g m^{-2})	210	290
AFDM (g m^{-2})	60	100
TP (µg g^{-1})	140	210

Periphyton in FCE II

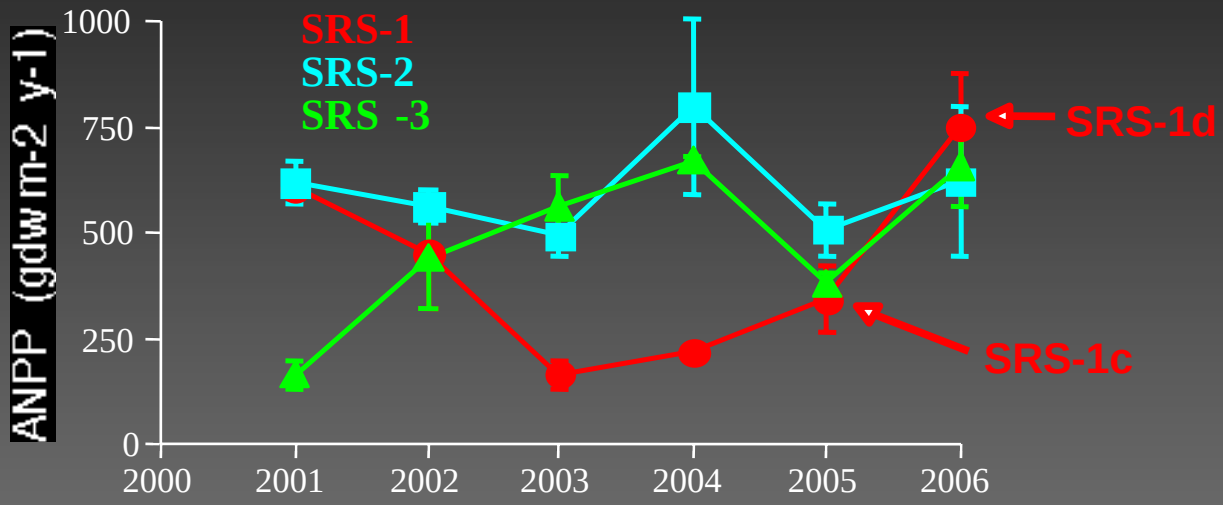
- **Focus on coordinating ANPP measures across marsh types, with a focus on the ecotone**

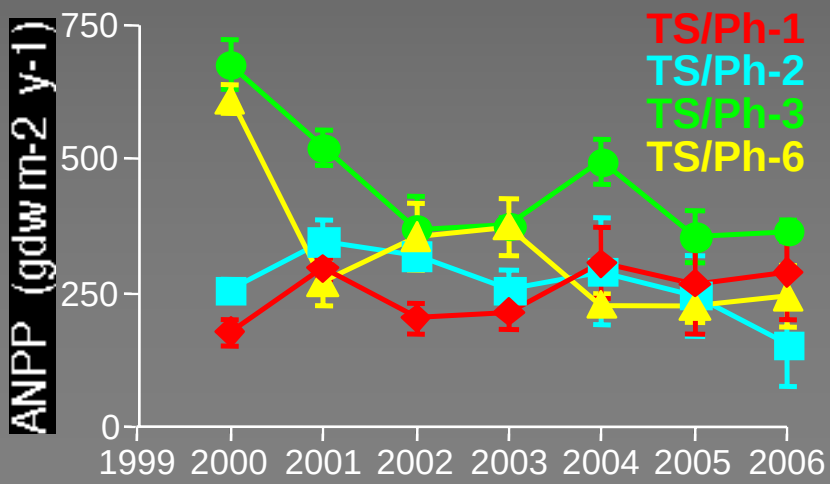
- **Eddy flux towers at TS/Ph 1 and SRS 2 (with Steve Oberbauer- new DOE Climate grant) including chamber experiments to determine relative contribution of plants, periphyton and abiotic ppt to C sequestration.**

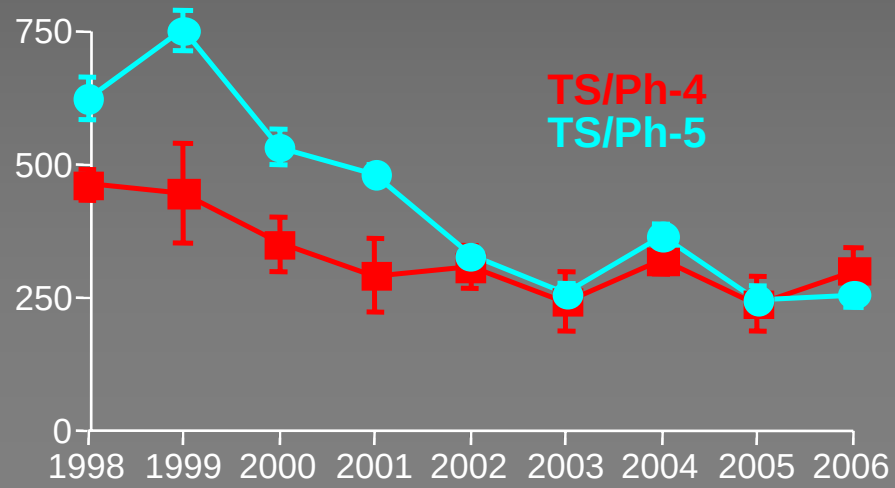
- **Continue cross system comparisons in Caribbean**

Subgroups – Marsh Macrophytes

Sawgrass ANPP data







Sawgrass ANPP observations

- **Decline in C-111 basin has stabilized in the last 4 years.**
- **Only trend in Taylor Slough is gradual decline in ecotone ANPP over 6 years.**
- **Increase in SRS ecotone ANPP but stable interior marsh ANPP.**
- **SRS-1 changed locations in 2005 and 2006**

- **Note that TS/Ph-4 and TS/Ph-5 sites were discontinued in January 2007 under FCE II transition.**