

Lake Trafford Restoration Limnological Assessment Program

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Inland Ecology Research Group



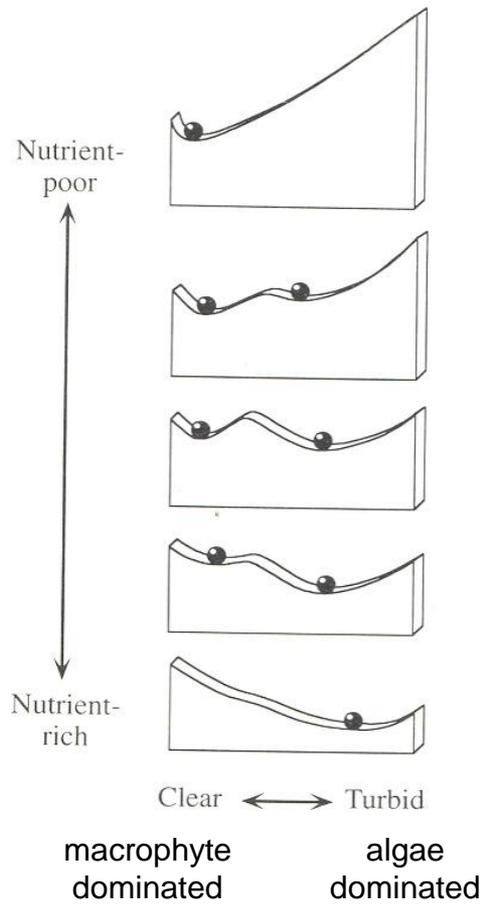
L. Trafford May 18, 1979

- **Macrophyte Dominated Lake**
- **Clear Water**
- **Nutrient Inputs = more plant growth**

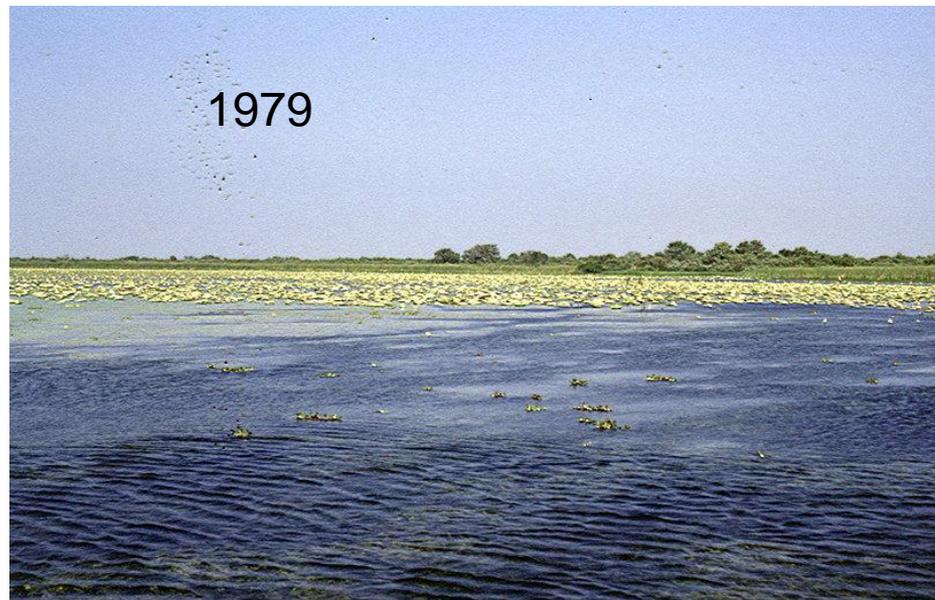


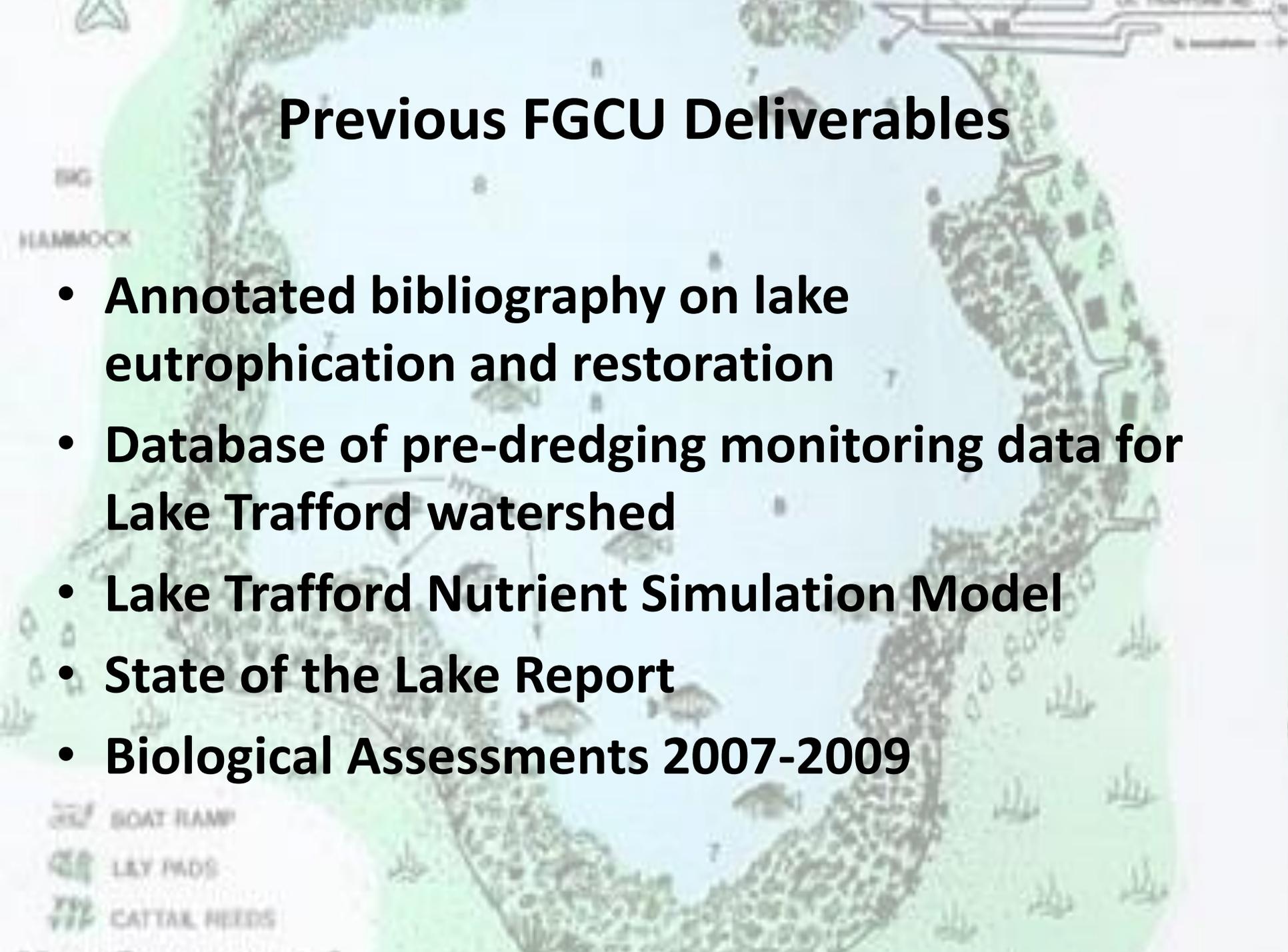
Invasive Hydrilla (and Hyacinths) begins to take over choking out native species and stunting sport fish growth.





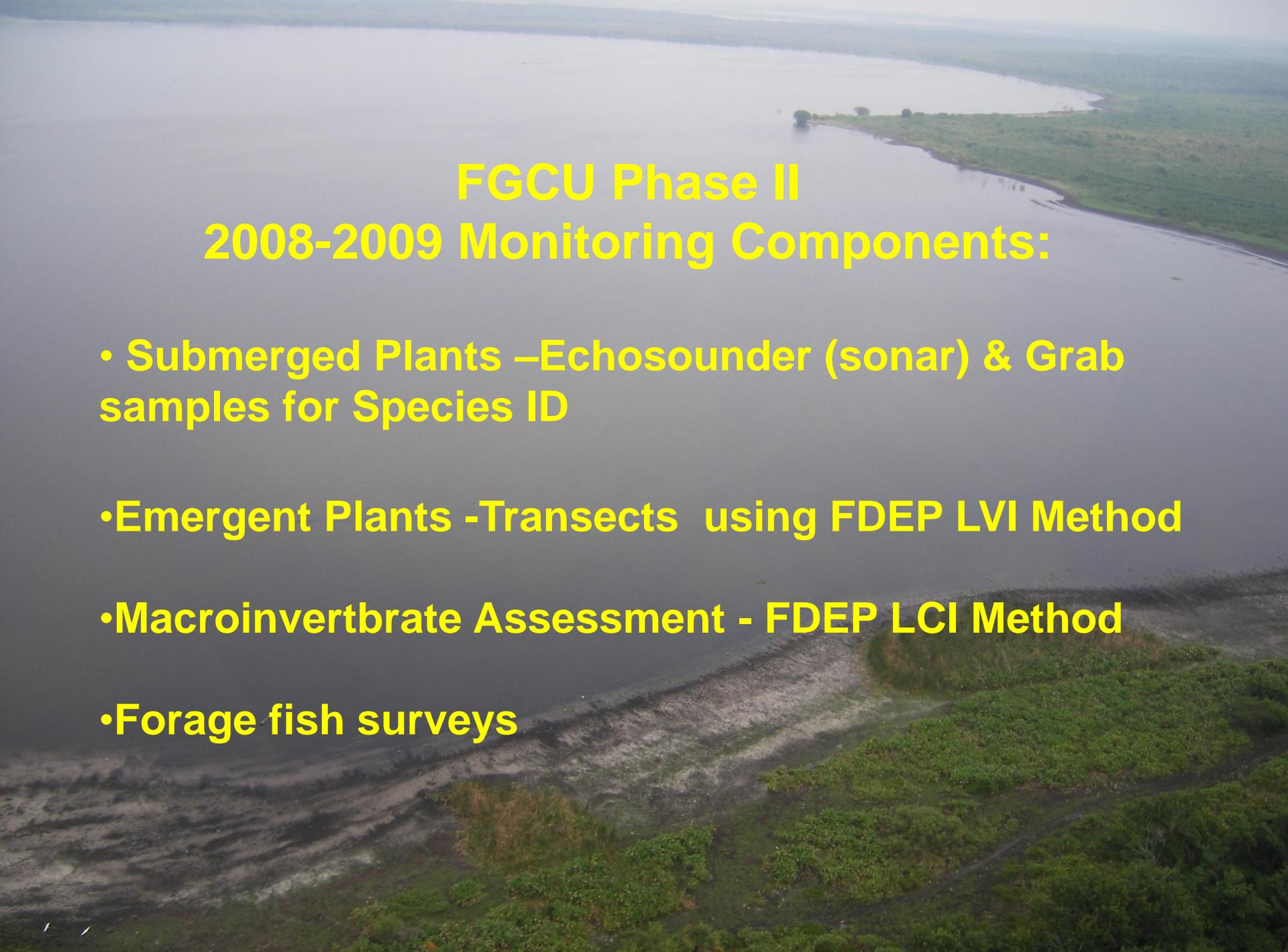
(after Scheffer 1990)



A map of the Lake Trafford watershed, showing the lake and surrounding land. The map includes labels for 'BOAT RAMP', 'LAY PADS', and 'CATTAL FEEDS'. The text 'HAMMOCK' is visible on the left side of the map. The map is overlaid with a semi-transparent text box containing the title and a list of deliverables.

Previous FGCU Deliverables

- **Annotated bibliography on lake eutrophication and restoration**
- **Database of pre-dredging monitoring data for Lake Trafford watershed**
- **Lake Trafford Nutrient Simulation Model**
- **State of the Lake Report**
- **Biological Assessments 2007-2009**

An aerial photograph of a wide river or lake. The water is a dark, muted blue-grey color. The right side of the image shows a grassy, green shoreline that curves along the water's edge. In the distance, the water continues towards a hazy horizon. The overall scene is overcast and somewhat desaturated.

FGCU Phase II 2008-2009 Monitoring Components:

- Submerged Plants –Echosounder (sonar) & Grab samples for Species ID**
- Emergent Plants -Transects using FDEP LVI Method**
- Macroinvertbrate Assessment - FDEP LCI Method**
- Forage fish surveys**



**Florida Lake Condition Index (LCI)
using benthic macroinvertebrates**

2008 Extreme Low Water Period Resulted in recovery of faunal restoration indicators



Previous Recommendations

- **Nutrient inputs from the landscape need to be controlled**
- **Sustainable lake management may require removing future accumulation of nutrients (harvesting exotic plants, spot dredging, filtration marsh)**
- **A post-dredging monitoring plan to characterize recovery of flora & fauna**
- **Monitor algal communities and lake trophic state.**
- **Replant native plants and restock fish.**
- **Develop management criteria for invasive exotics.**
- **Establish a Management Team to coordinate activities among the various agencies.**

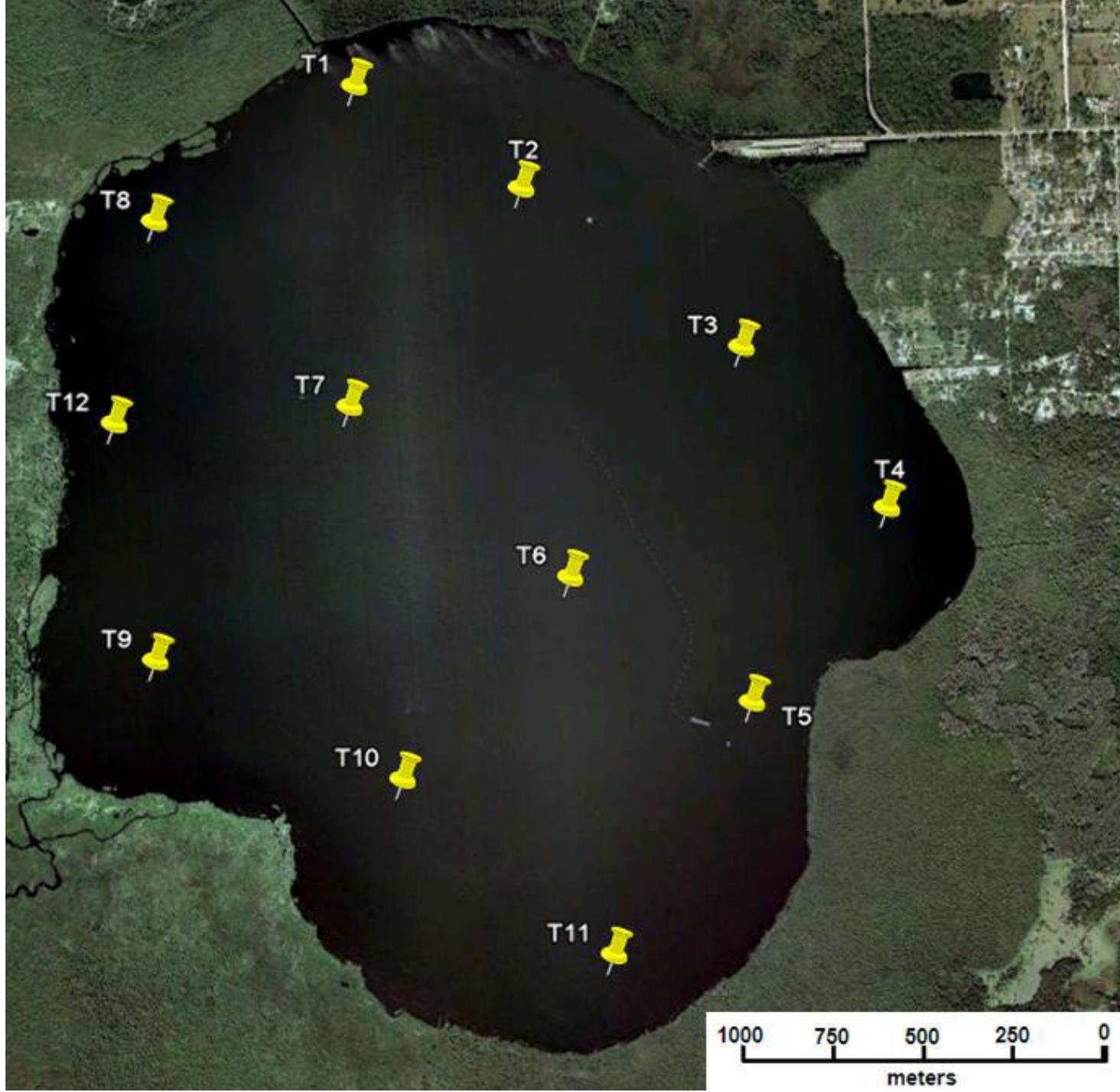


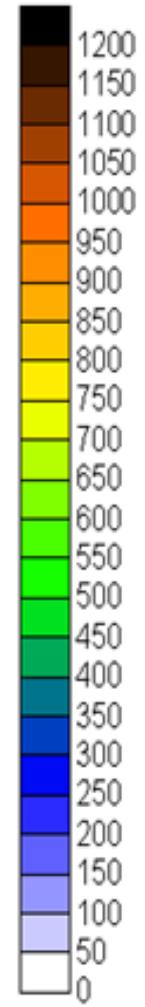
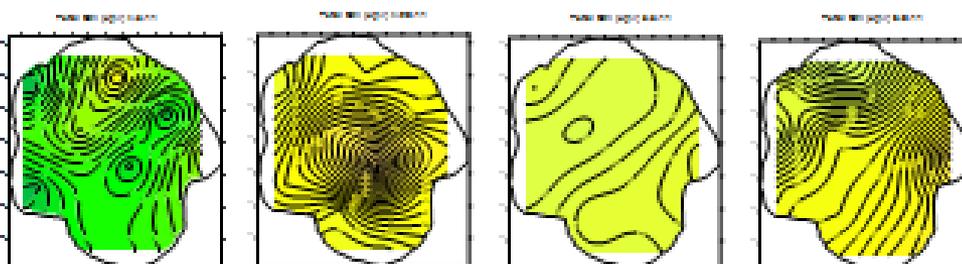
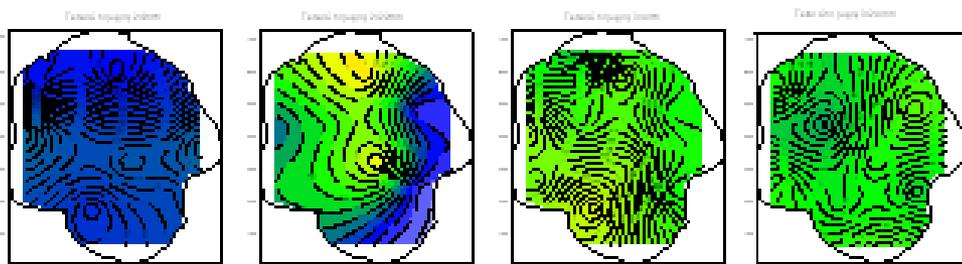
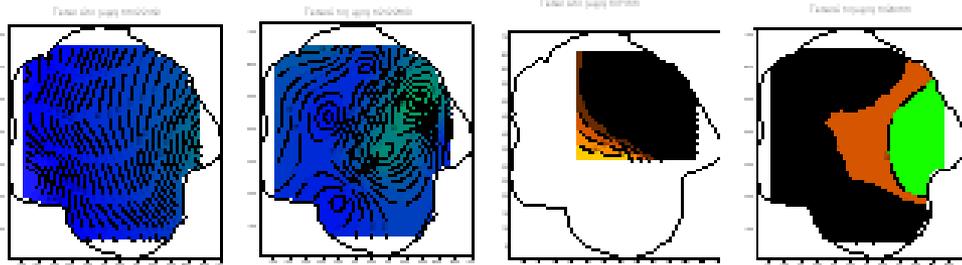
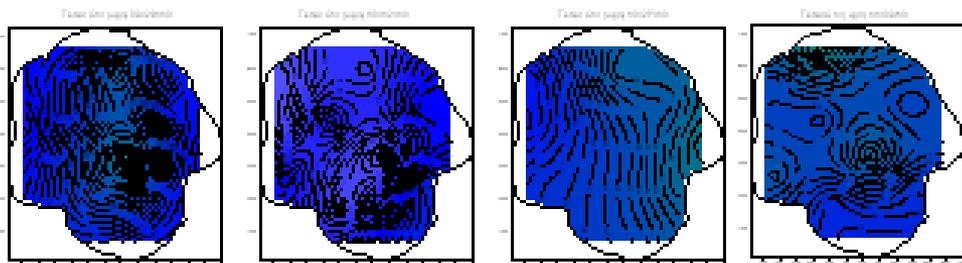
**Native *Vallisneria americana* (tape grass)
Pilot Study to “jump-start” Lake Recovery**



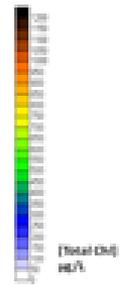
2010-2011 Lake Monitoring & Assessment Program

- Phytoplankton Assessments Twice Monthly
- Zooplankton Surveys Twice Monthly
- Water Quality (DO, Temp, Conductance, pH, Secchi, LiCor)
- Submerged Aquatic Vegetation Annually
- Benthic Macroinvertebrates LCI Annually

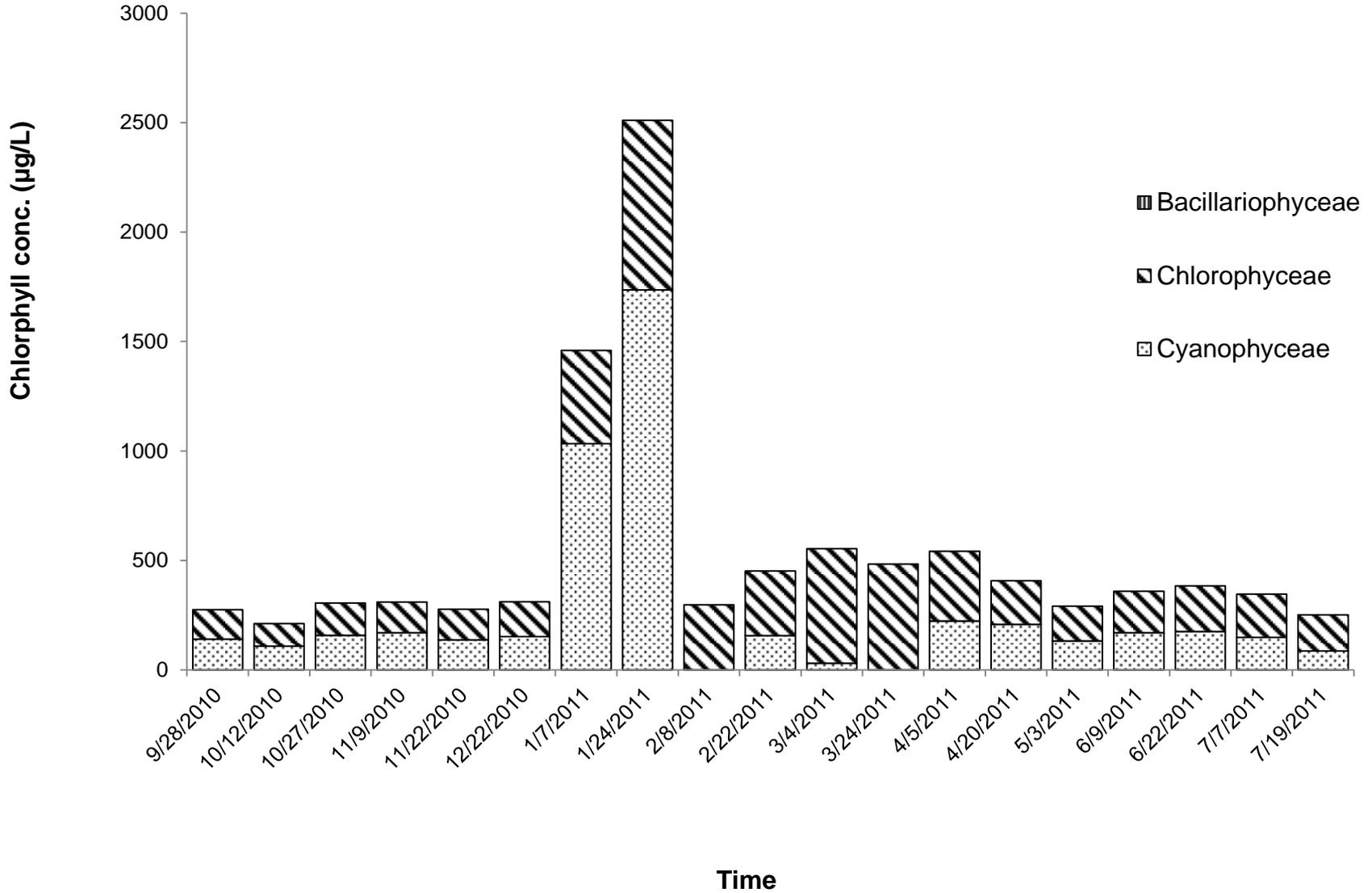


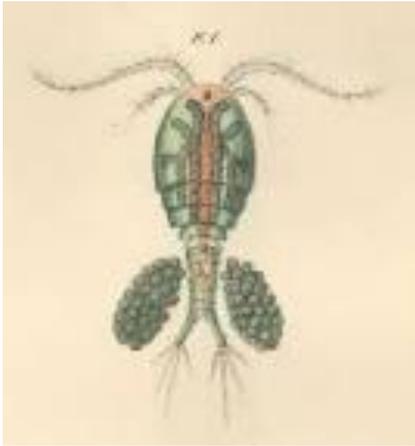


[Total Chl]
 $\mu\text{g/L}$

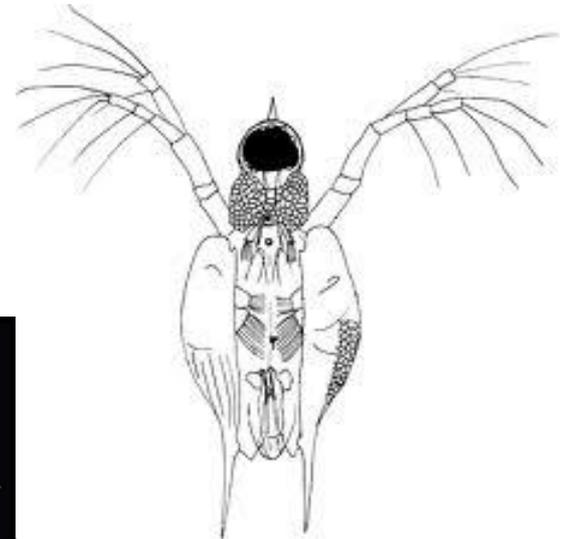
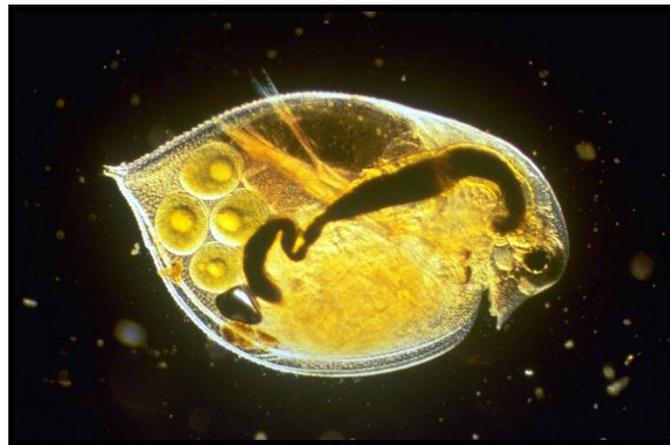
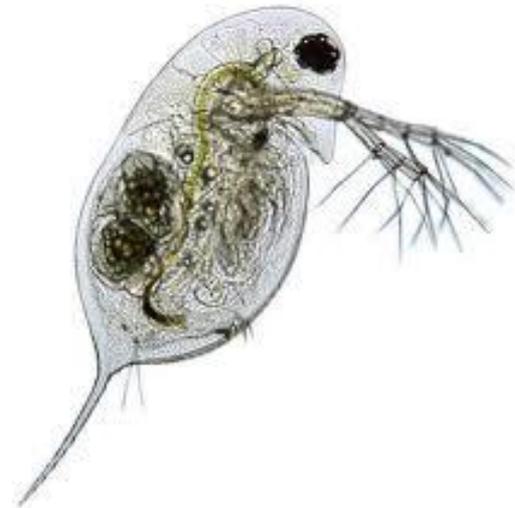


Proportional algal contribution to total chlorophyll ($\mu\text{g/l}$)

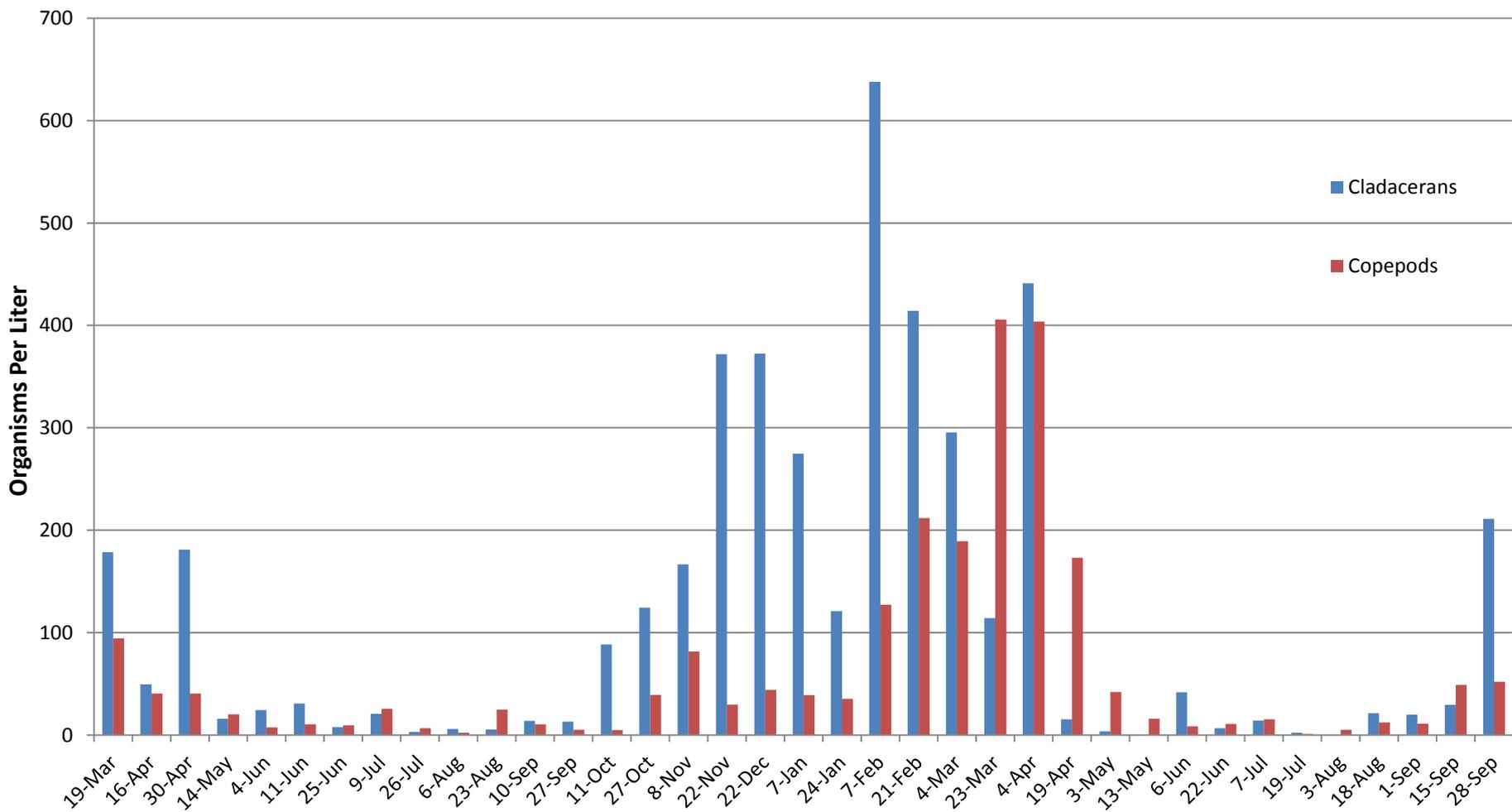




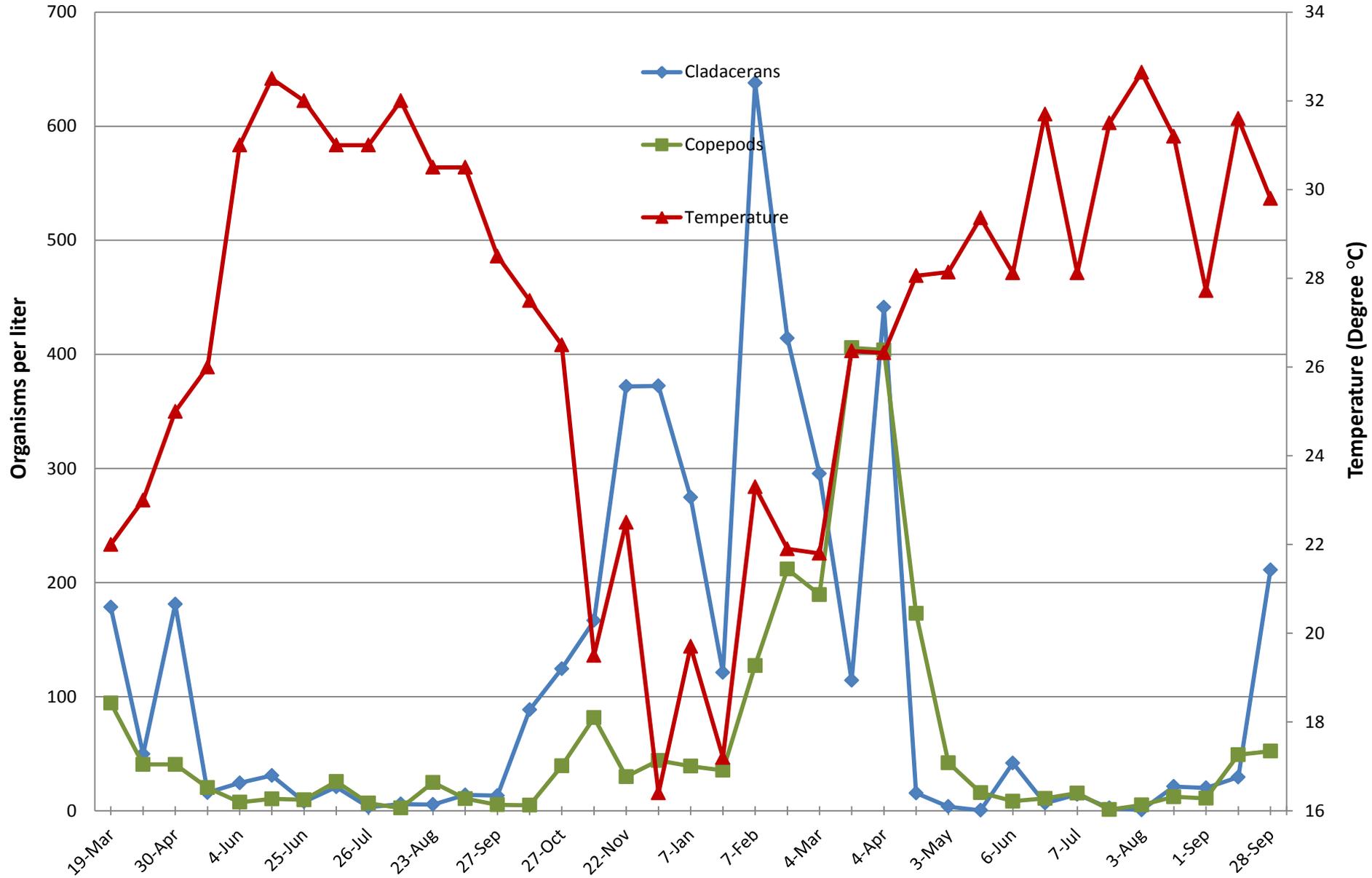
**Zooplankton
(larval fish food)**



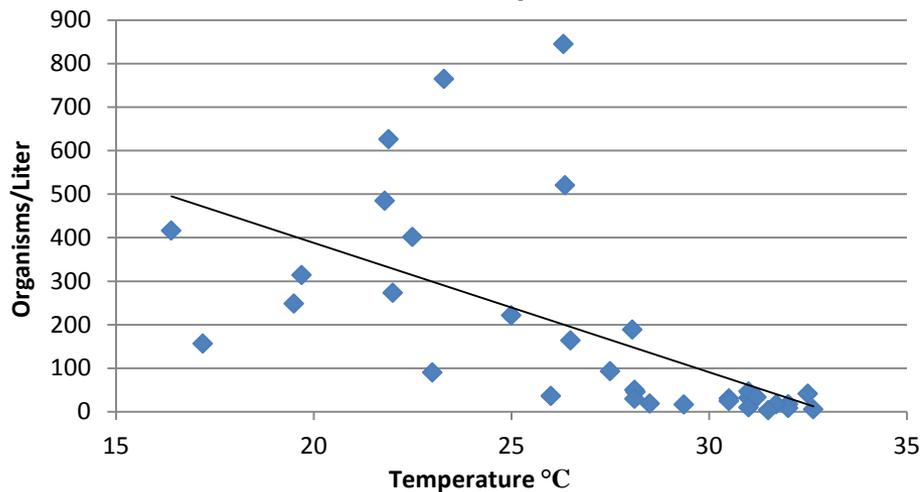
2010-2011 Average Zooplankton Densities in #Organisms/liter



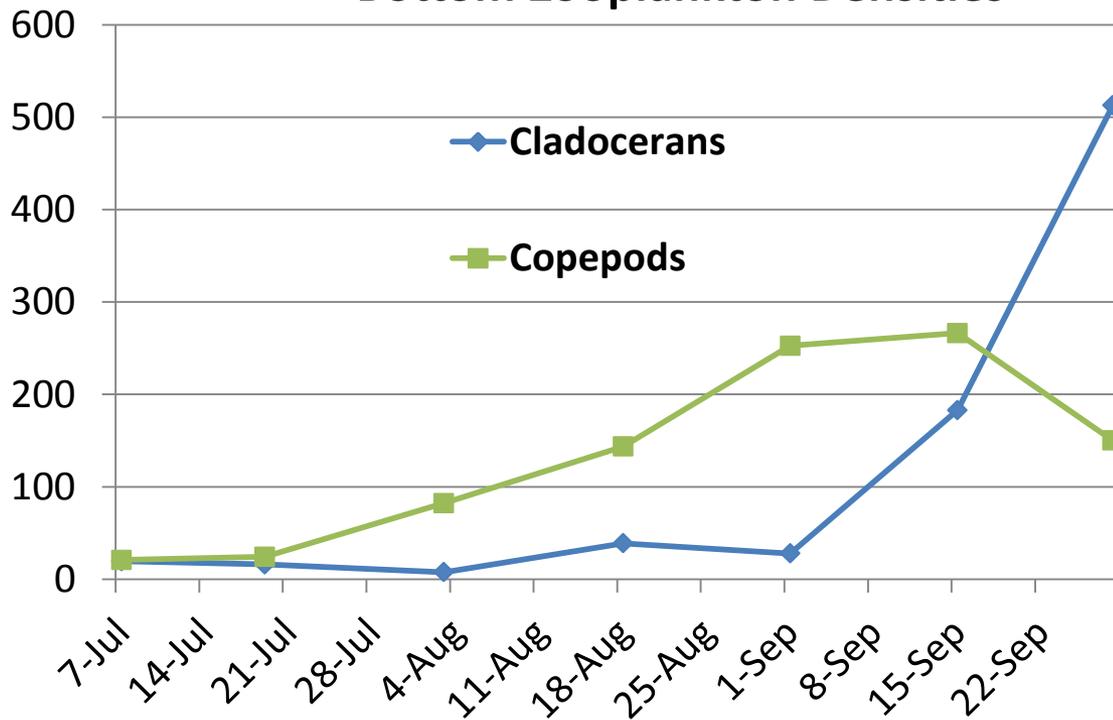
Average Zooplankton Densities and Temperature



Total Zooplankton

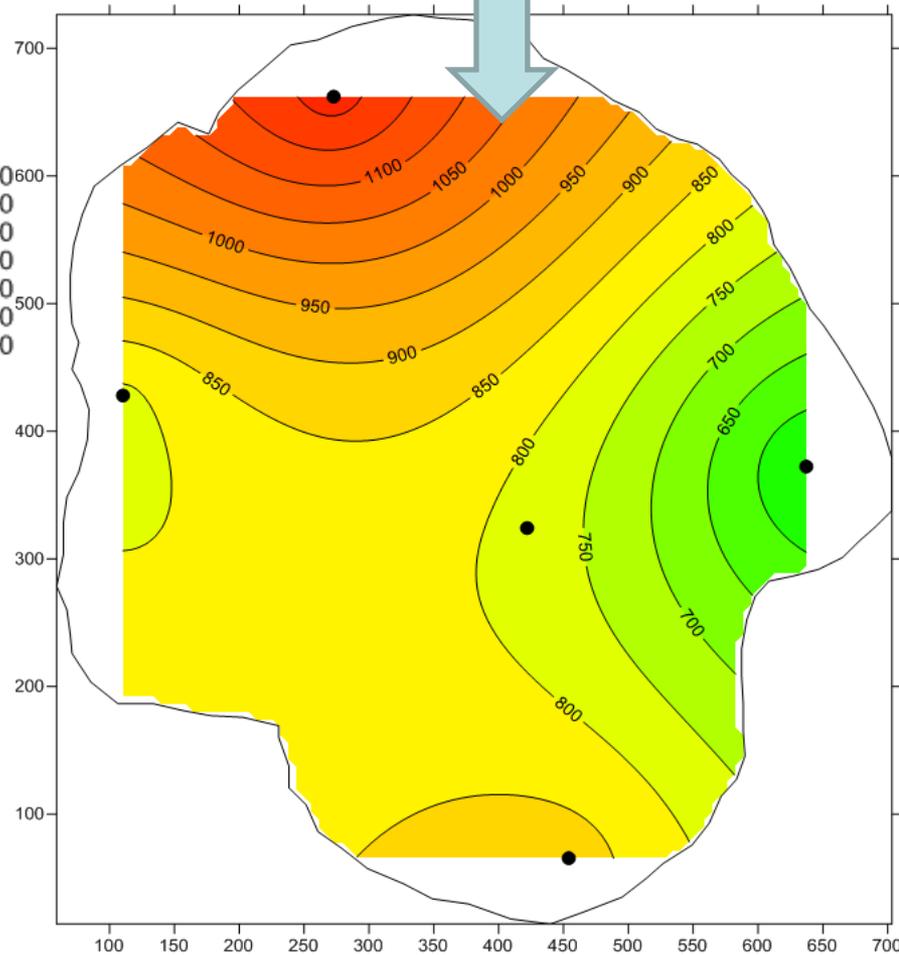
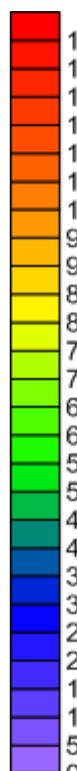
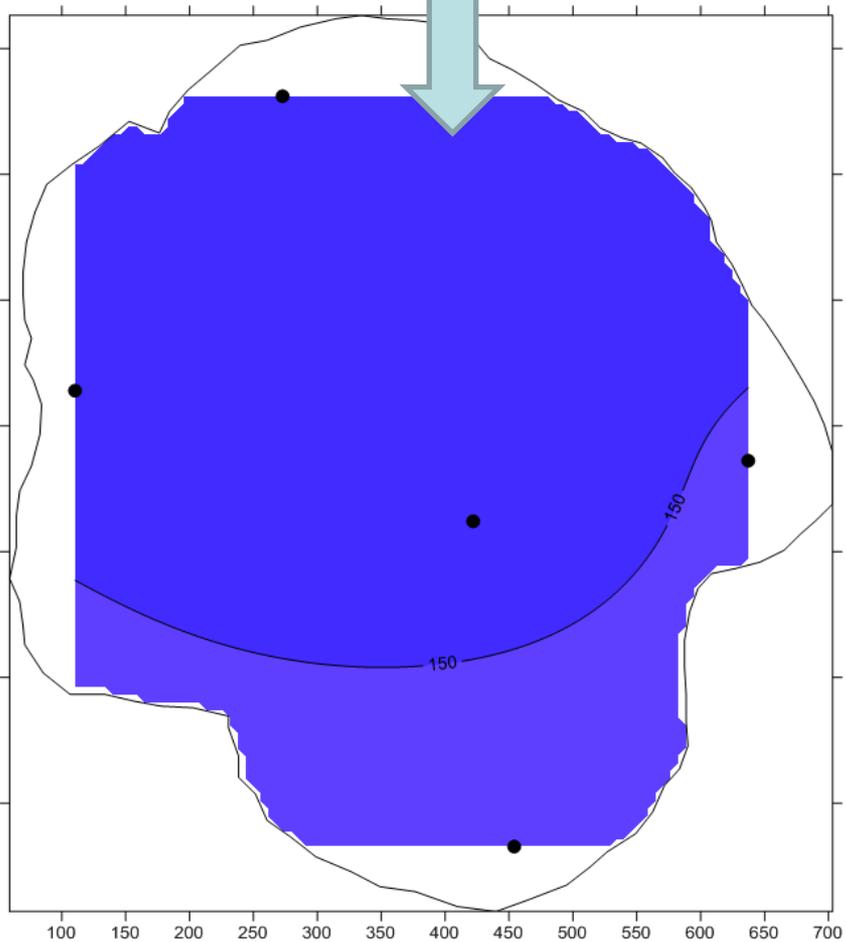


Bottom Zooplankton Densities



1/24/11 during blue green bloom

4/4/11 during green algae



Zooplankton Densities

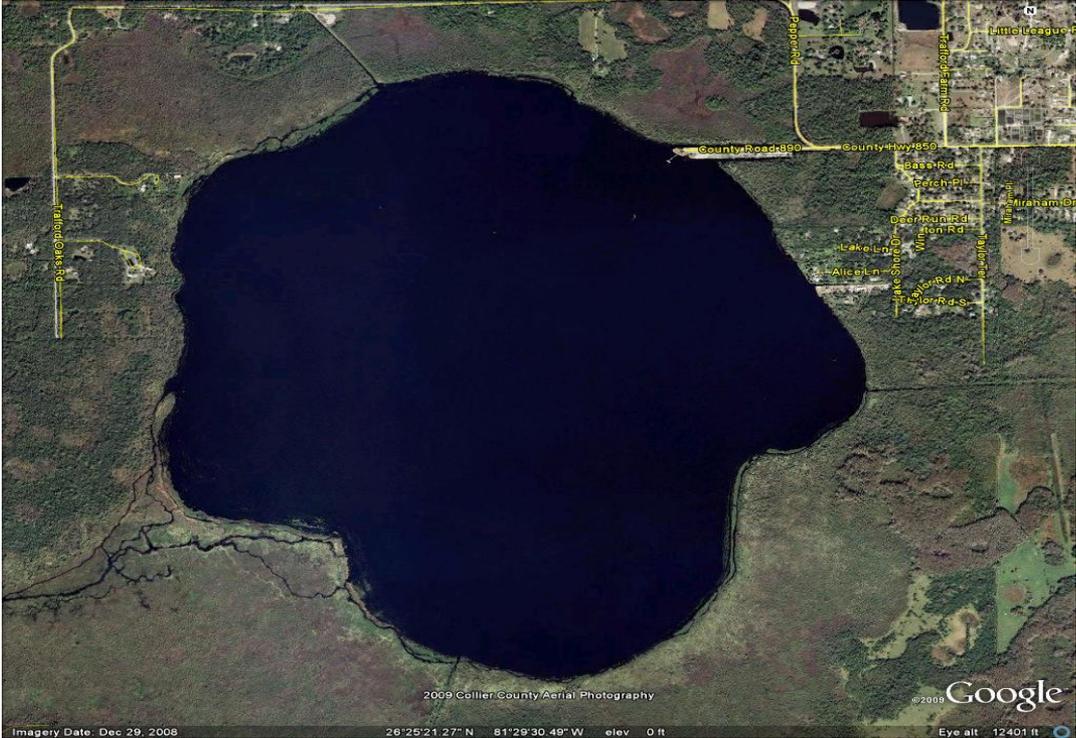
Lake Trafford Management Team, Started in March 2011

1. Coordinate Agency Activities & Obtain Expert Advice:
 - Fisheries
 - Water Quality
 - Exotic Plant Control
 - Habitat Restoration Priorities and Methods
2. Develop a Lake Management Plan for long-term success

Lake Trafford Management Team

- **Florida Fish & Wildlife Conservation Commission: Fisheries Habitat Restoration and Stocking, Invasive Plant Monitoring**
- **Collier County Pollution Control Lab: Nutrients and Water Quality Monitoring**
- **Florida Gulf Coast University: Biological Monitoring, Restoration Planting and Mapping, Coordination & Lake Mgmt. Plan, Grant Writing**
- **Florida Dept. of Environmental Protection: Impaired Waters, TMDLs, Basin Management Action Plans**
- **South Florida Water Management District: Project Management and Invasive Plant Control (contracted out)**
- **US Fish and Wildlife Service: CERP and Listed Species Issues**

LAKE TRAFFORD AQUATIC PLANT MANAGEMENT PLAN



TARGET PLANT(S): _____

TREATMENT DATE(S): _____

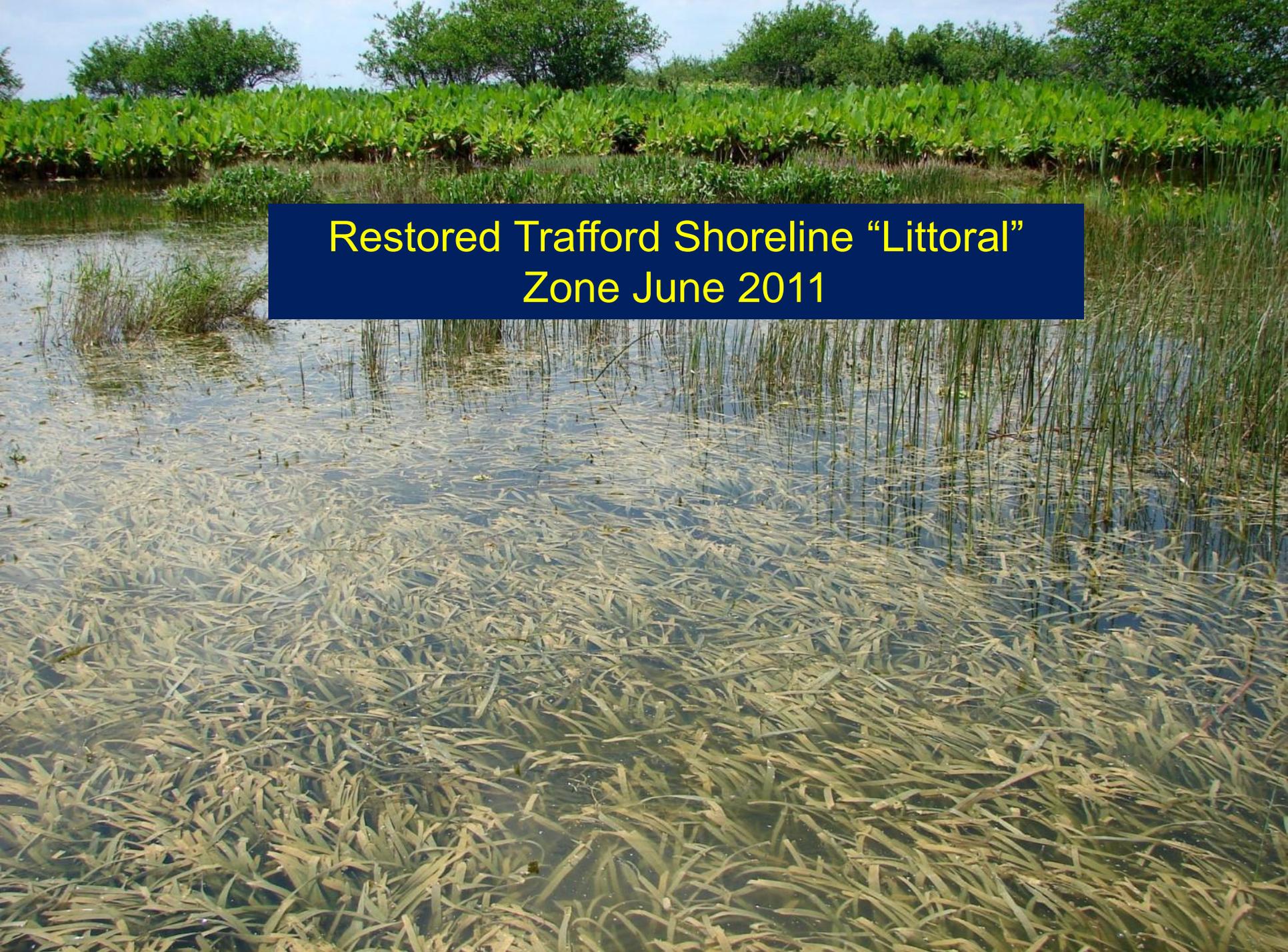
LOCATION(S): _____

METHOD: _____

WATER USE RESTRICTIONS: _____

CONTACTS: DENNIS GIARDINA, FWC: 239-229-5403

MIKE BODLE, SFWMD: 800-432-2045, X 6132



Restored Trafford Shoreline "Littoral"
Zone June 2011

FGCU Future Work: 2012-2014

- **Start on grant from USFWS Coastal Program (\$30,000/year for three years)**
- **Continue Development of Lake Mgmt. Work Plan (draft final plan due in Sept. 2012)**
- **Continue with limnological monitoring to assess restoration success and action plans (BMAP)**
- **Coordinate activities between agency partners**
- **Proposal pending to work with BlueWater Satellite and Collier County Lab to calibrate Lake WQ Model**

Acknowledgements:

SFWMD Big Cypress Basin, staff at FWC, FDEP, Collier County, Ski Oleski and Airboats & Alligators, USFWS Coastal Program,

