

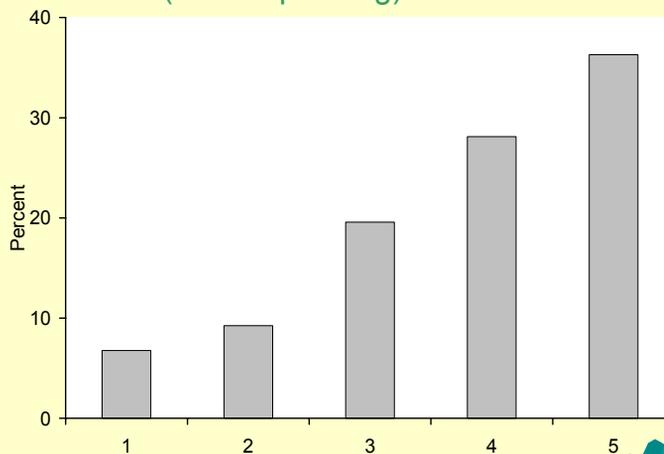
# Survey Results and Ford Lake Algal Blooms, 2005

Prof John T. Lehman

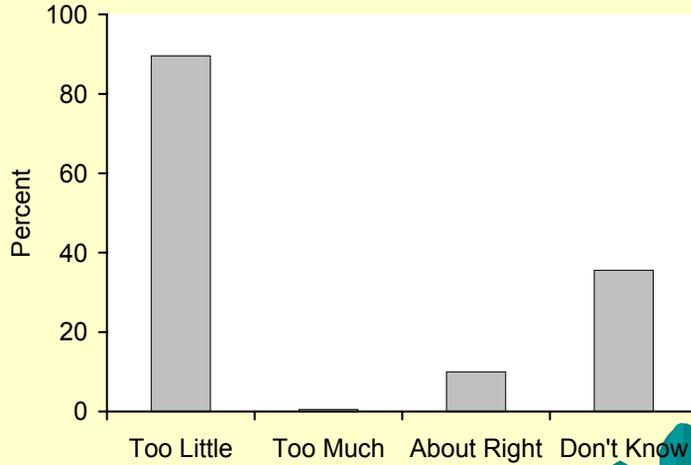
Presentation to the Middle  
Huron Partners  
6 October 2005

## What are citizens saying?

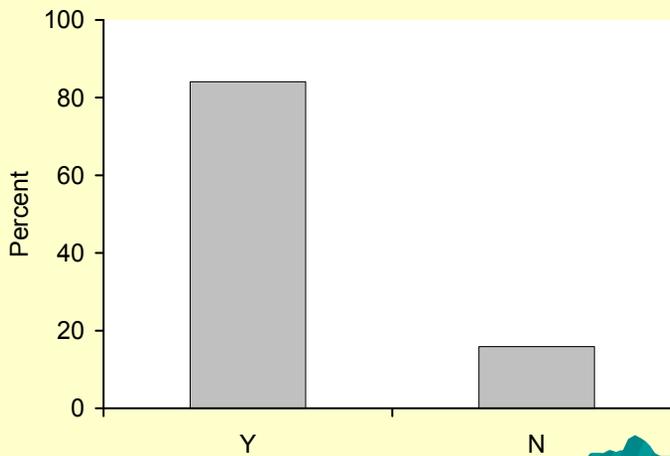
On a scale of 1-5 (with 5 being a major problem) how  
would you rank the algae nuisance problem in your area?  
(282 responding)



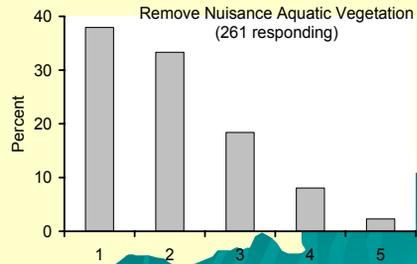
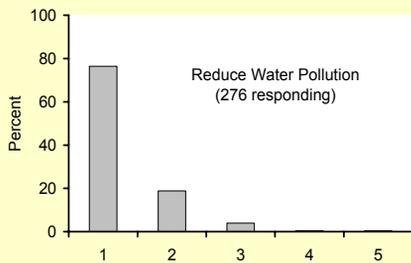
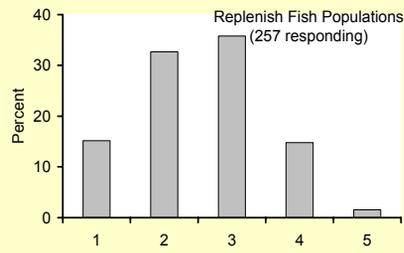
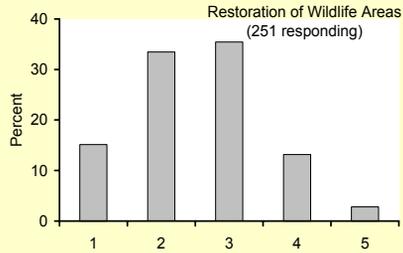
**Do you think that the current efforts to improve the water quality of the Huron River, Ford Lake and Belleville are “too little”, “too much”, or “about right”? (286 responding)**

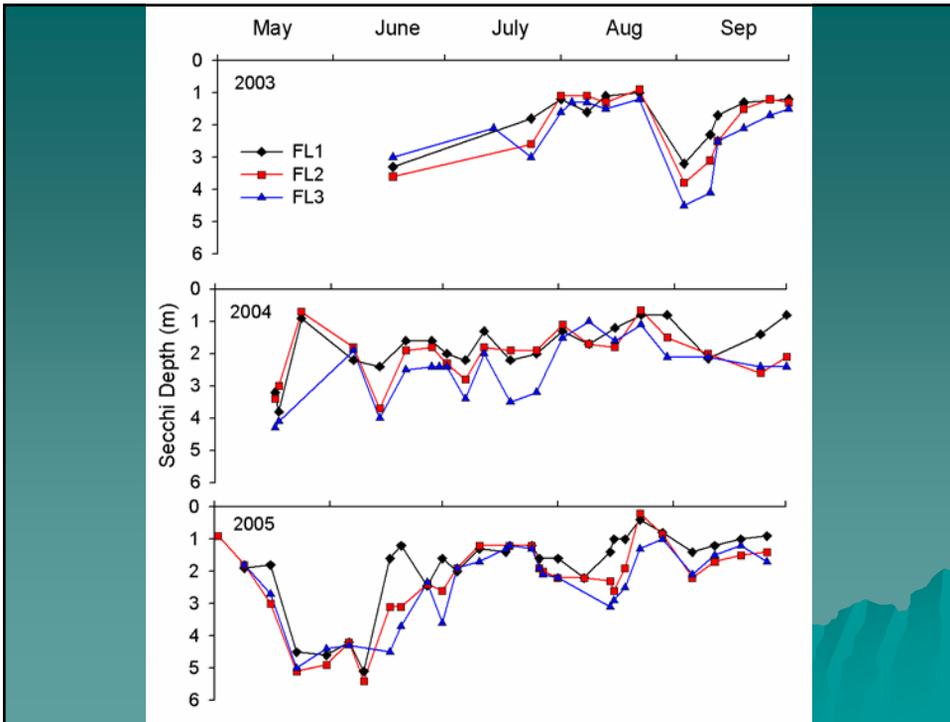


**Would you favor increasing efforts to improve water quality in Huron River, Ford or Belleville Lake, even if it resulted in an increase of municipal taxes? (283 responding)**



**On a scale of 1-5 (with 1 being of highest priority), where should money be allocated to repair damage?**



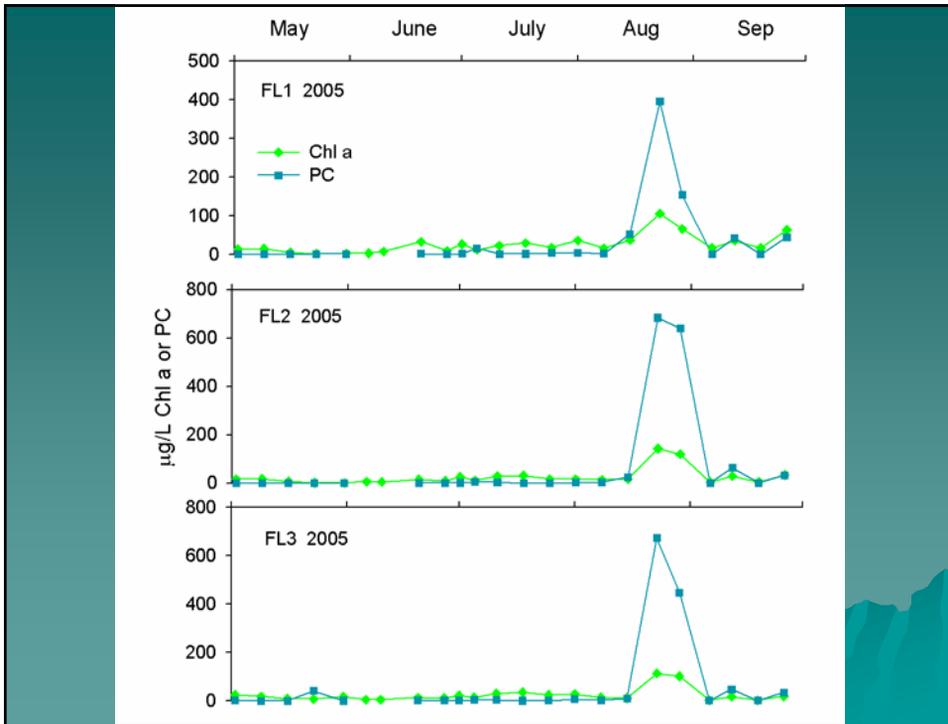


Nuisance problems in Ford Lake are caused by floating surface blooms of bluegreens.



## Factors that favor cyanobacteria

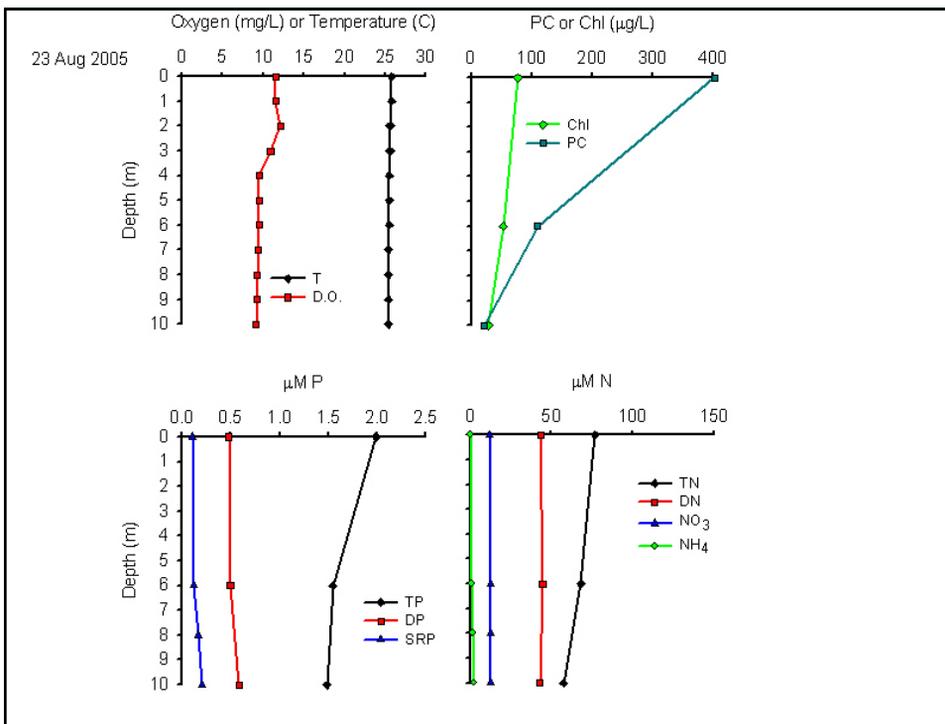
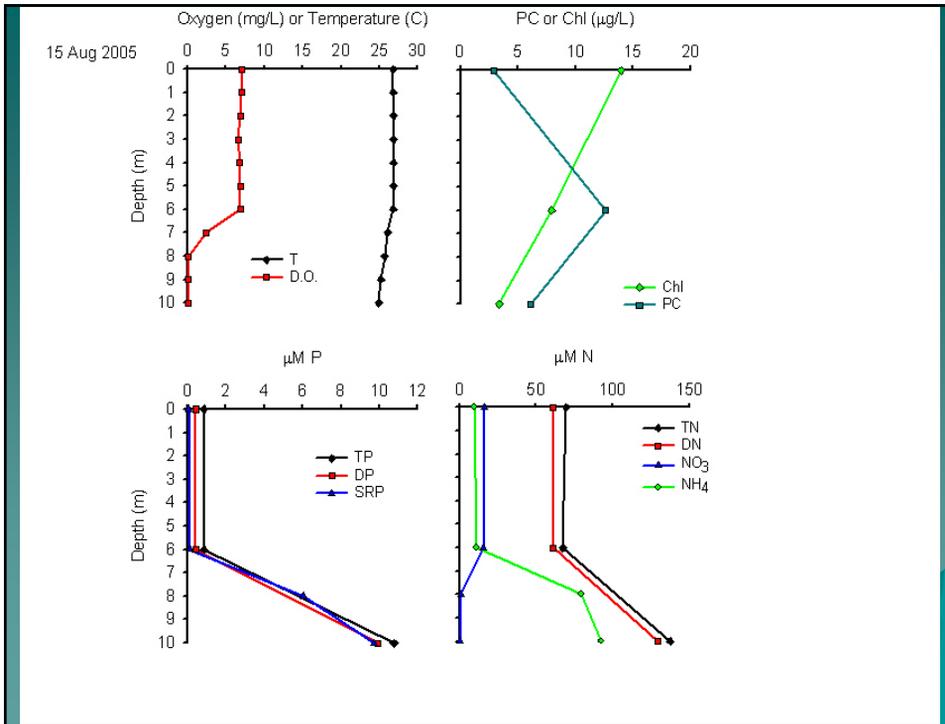
- ◆ High temperatures and low wind
- ◆ Large supply of phosphate
- ◆ Low ratio of nitrogen to phosphorus
- ◆ Ammonium as a nitrogen source



Usual assumption-- algae nuisance in Ford Lake is caused by phosphate in the Huron River, particularly by phosphate discharged from the Ann Arbor wastewater treatment facility.

This is not so.

The specific triggers for nuisance algal blooms in Ford Lake have an internal cause, and they can potentially be managed.



Management options differ depending on lake or reservoir nutrient sources

- ◆ If point sources dominate:
  1. Nutrient diversion
  2. Dilution
  3. Chemical treatment before input
  4. Removal by macrophytes or wetlands

Management options differ depending on lake/reservoir nutrient sources

- ◆ If non-point sources dominate:
  1. Sediment oxidation
  2. Sediment removal
  3. Sediment capping
  4. Chemical additives (algaecides)
  5. Artificial circulation
  6. Selective depth withdrawal
  7. Biomanipulation

Is Ford Lake dominated by point source or non-point source nutrients during the nuisance season?

Phosphorus is the nutrient element that most limits the growth of algae in Ford Lake.

June to August, 2003 to 2005, each day:

Huron River delivered **562** moles of phosphate  
964 moles of phosphorus in all dissolved and colloidal forms

Only about 40% of this phosphorus comes from the Ann Arbor Wastewater Treatment Facility (point source)

Ford Lake mud released no less than **1228** moles of phosphate each day on average.

In Ford Lake, **non-point sources** dominate.

## Proposed Management Options

### **Selective Depth Withdrawal**

#### **Bio-manipulation**

Apply two techniques simultaneously in summer 2006 for maximum effect. Discharge about 100,000 cubic meters per day from the bottom of the dam. This will prevent anoxia from developing and will probably cause complete mixing. At the same time, stock aggressively with pike and walleye to reduce the numbers of small zooplanktivorous fish.

## Evaluate Management Options

### **Practical Reality**

Ypsilanti Charter Township will likely need a financial partnership to defray the expense of lost hydropower revenue in June, July and August, plus the cost of stocking fish in the lake.

One possible grant source has been identified:

<http://www.nfwf.org/programs/greatlakes/index.cfm>