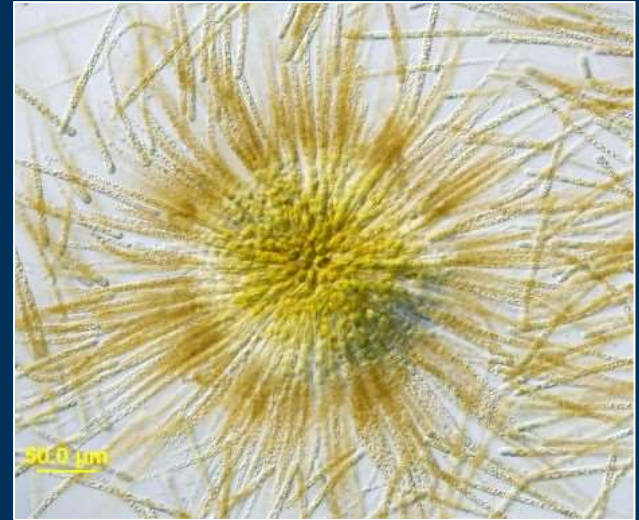


AWRI Tasks

Task 6: Identify Nutrient Controlling Algal Blooms (spring/summer 2013)

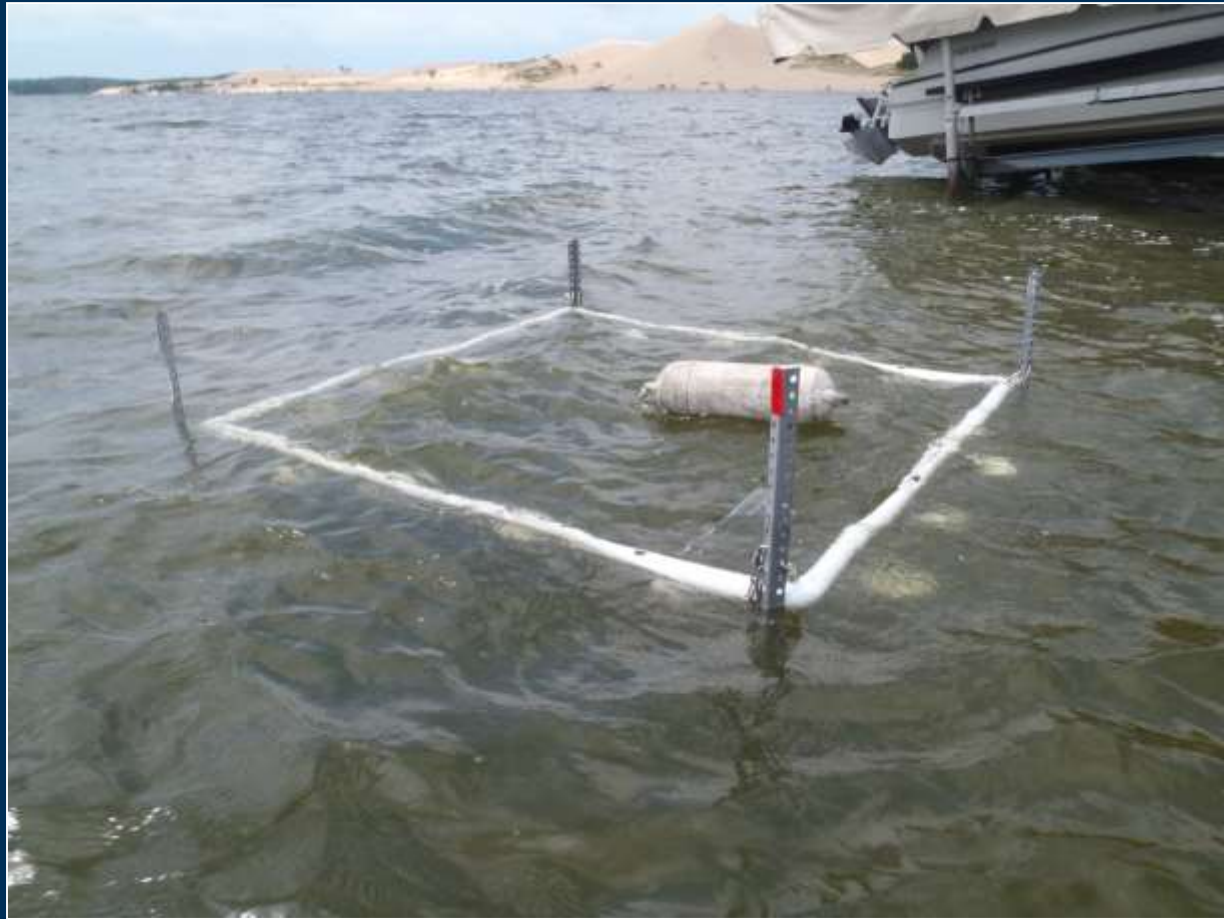
Task 7: Internal Phosphorus Loading Estimates (2013/2014)

Task 6: Identify Nutrient Controlling Algal Blooms (N or P)



Task 6: Identify Nutrient Controlling Algal Blooms

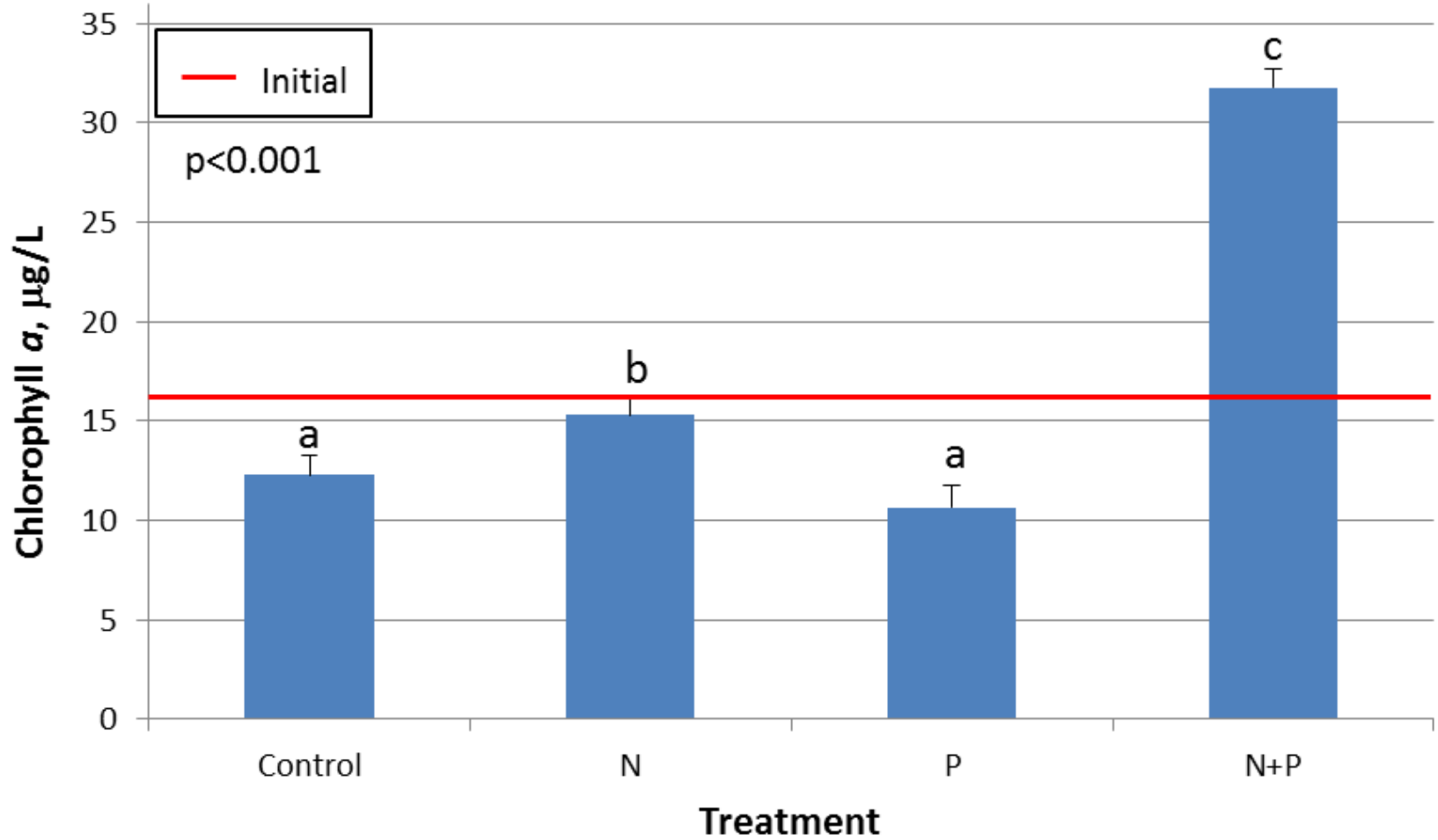
- Nutrient Bioassay
- Algal ID
- Cyano-toxins



Thank you, Ed DeJong!

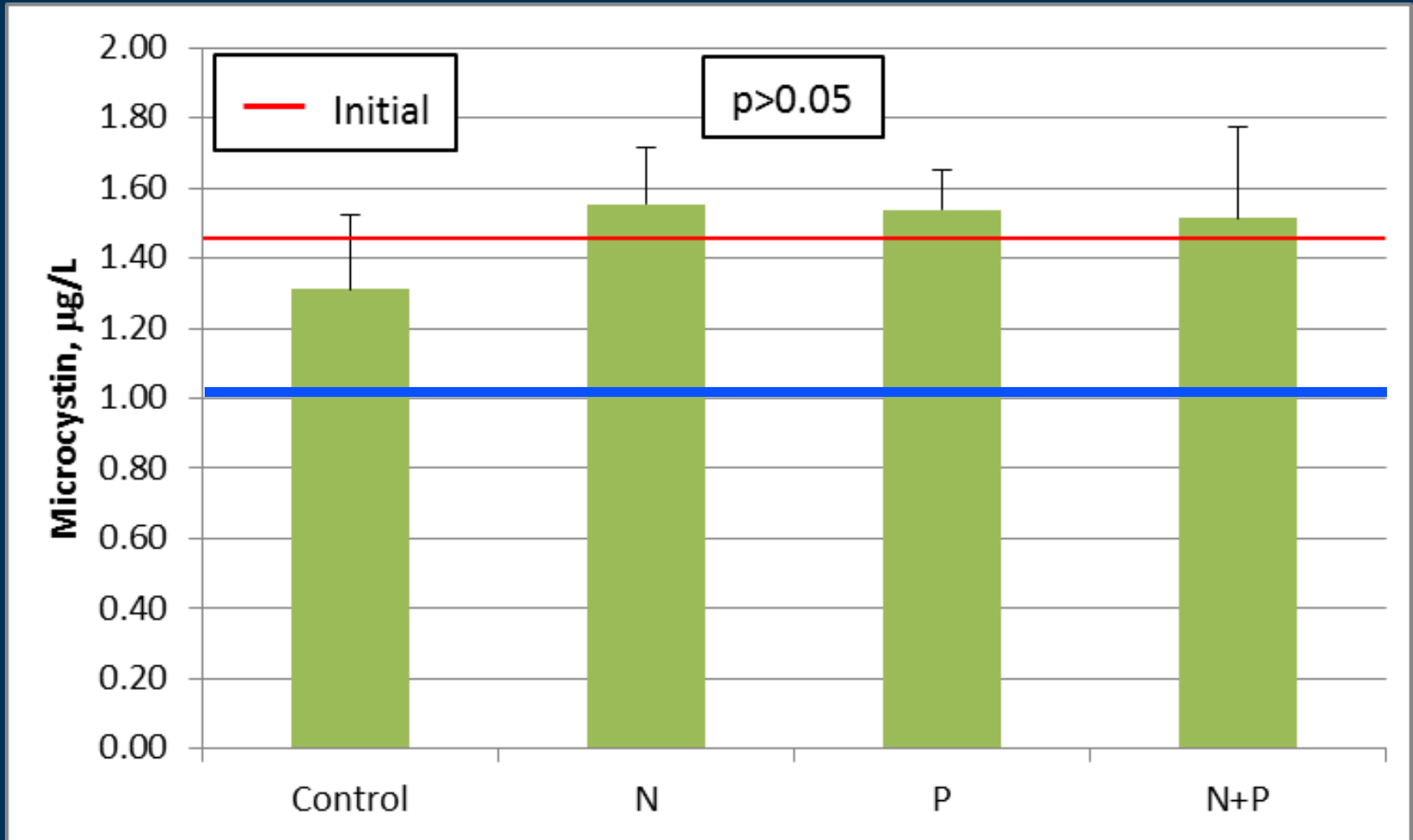
Nutrient Bioassay: July 2013

Chlorophyll *a*



Nutrient Bioassay: July 2013

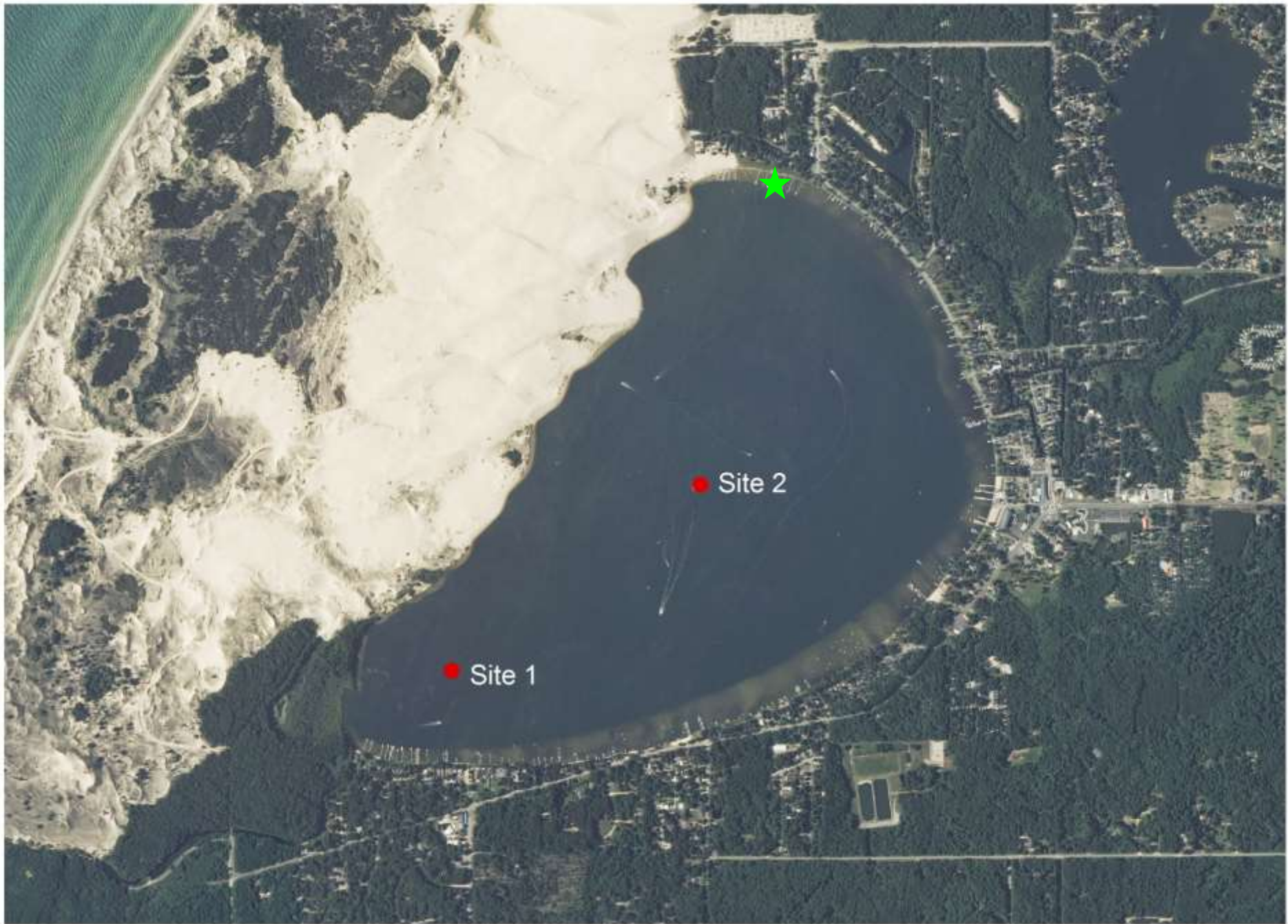
Total Microcystin



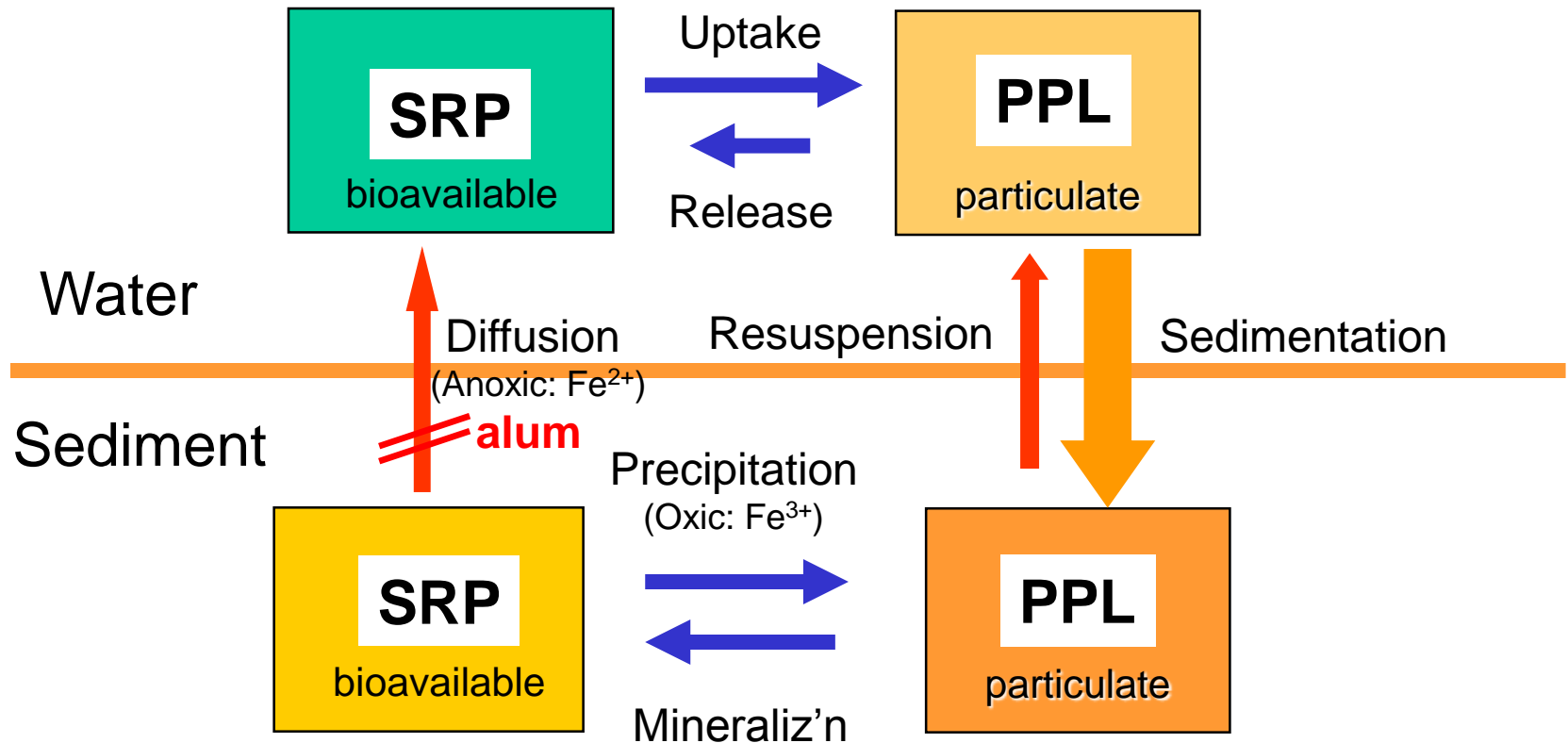
Task 7: Internal Phosphorus Loading Estimates

- Determine flux of P & N from sediments
 - 2 sites
 - Early summer & late summer; 2013 and 2014
 - Oxidic and anoxic treatments
- Measure diel dissolved oxygen
 - 2 sites
 - 4 events during summer





Internal Phosphorus Loading



(Modified from Reddy)

Diel Dissolved Oxygen: August 2013



Diel Dissolved Oxygen: August 2013

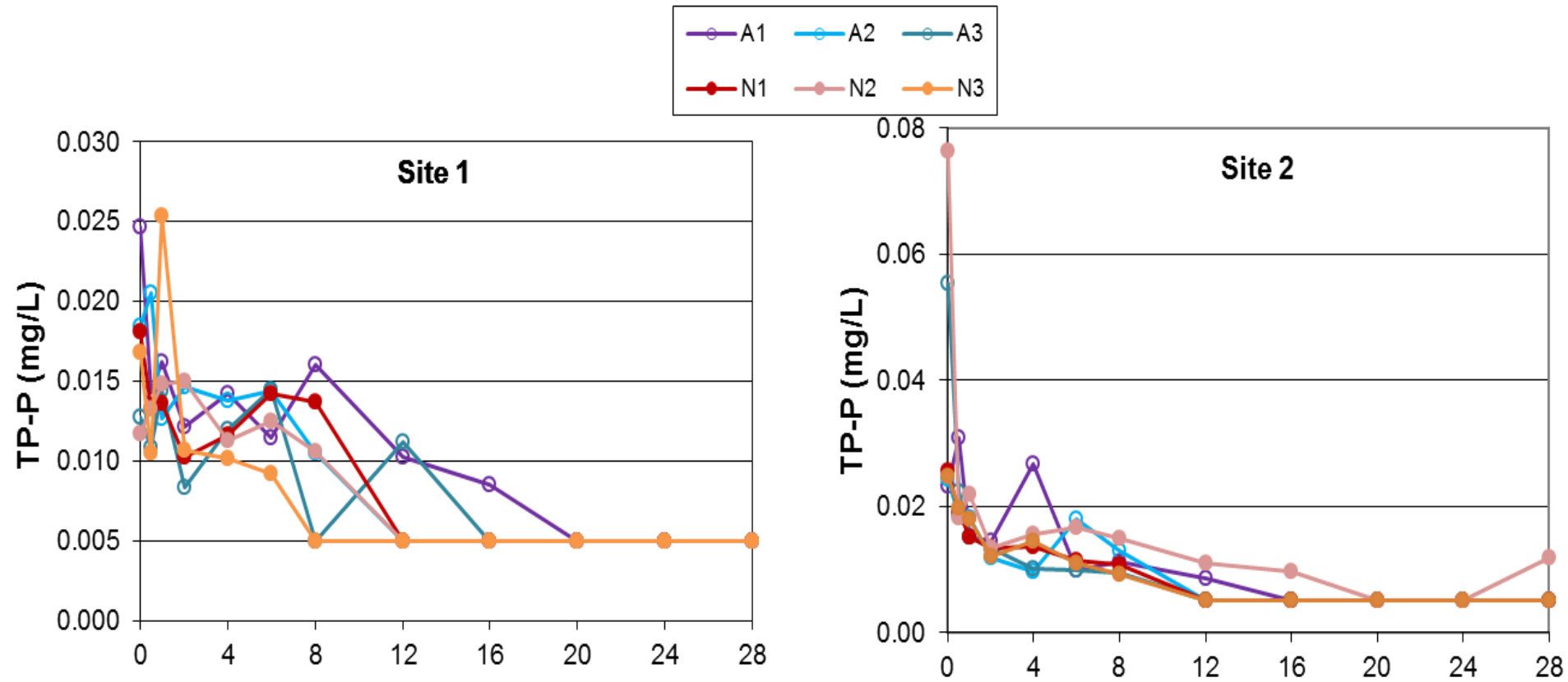




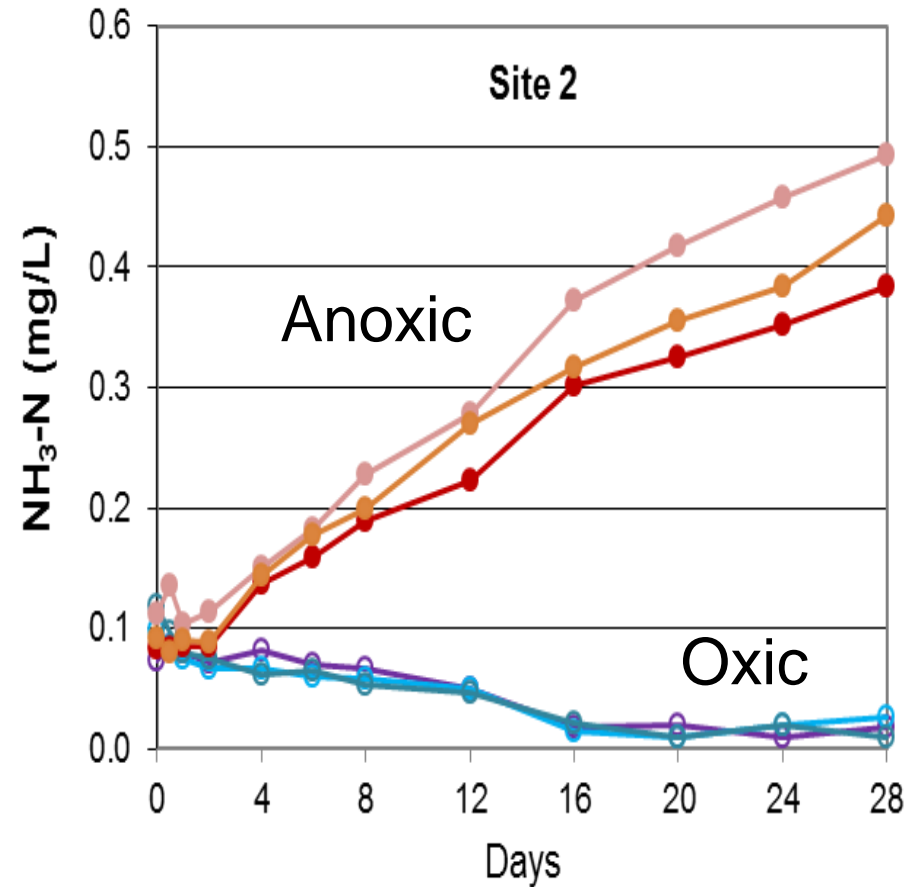
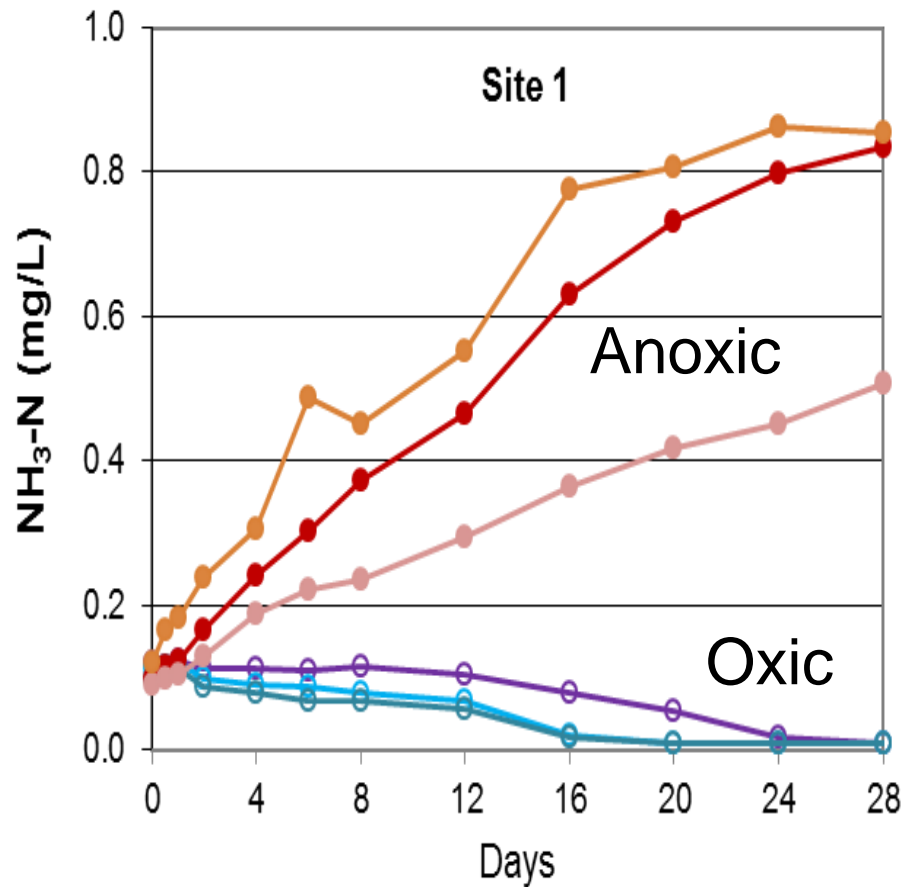




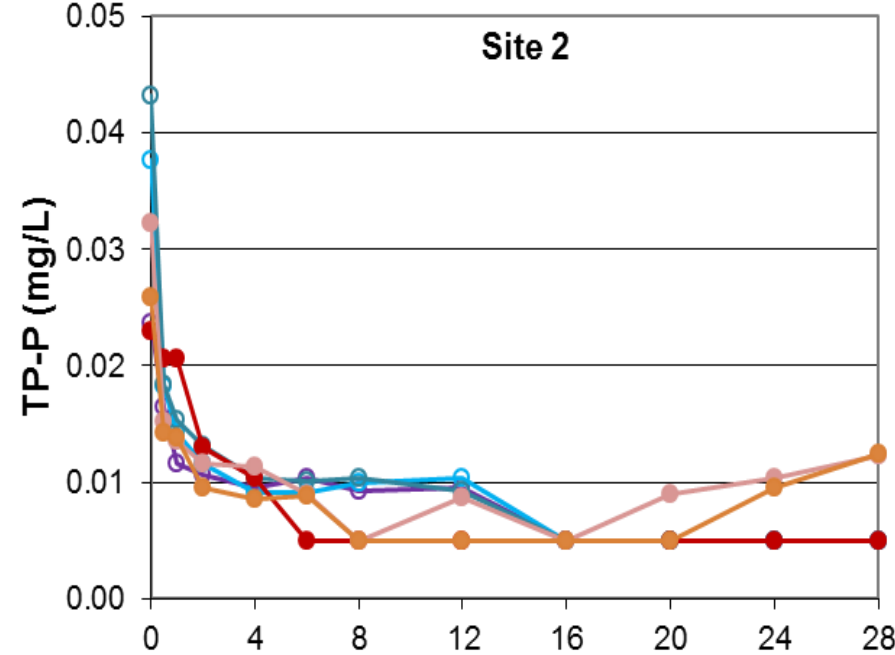
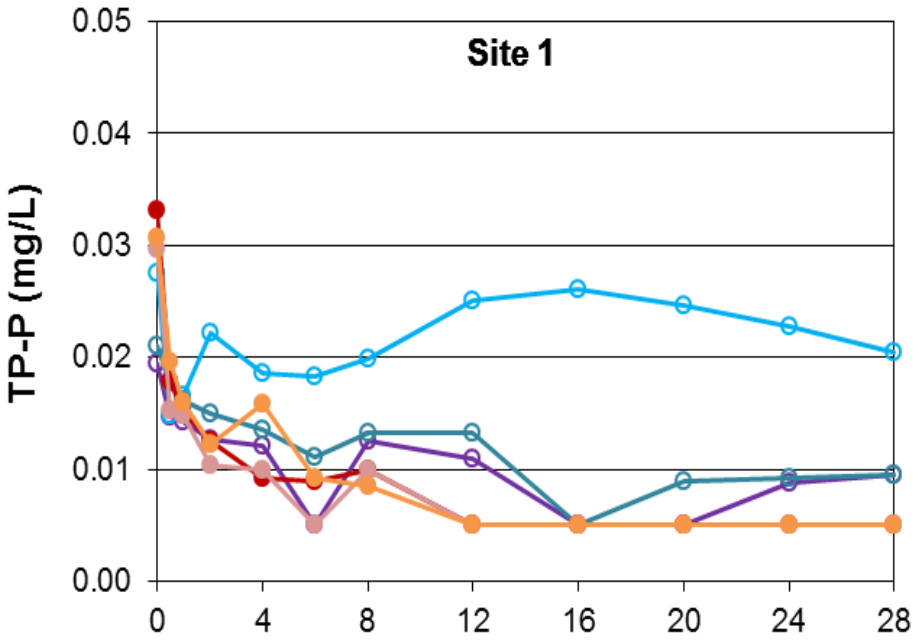
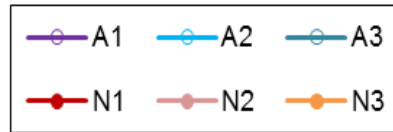
Phosphorus Flux: May 2013



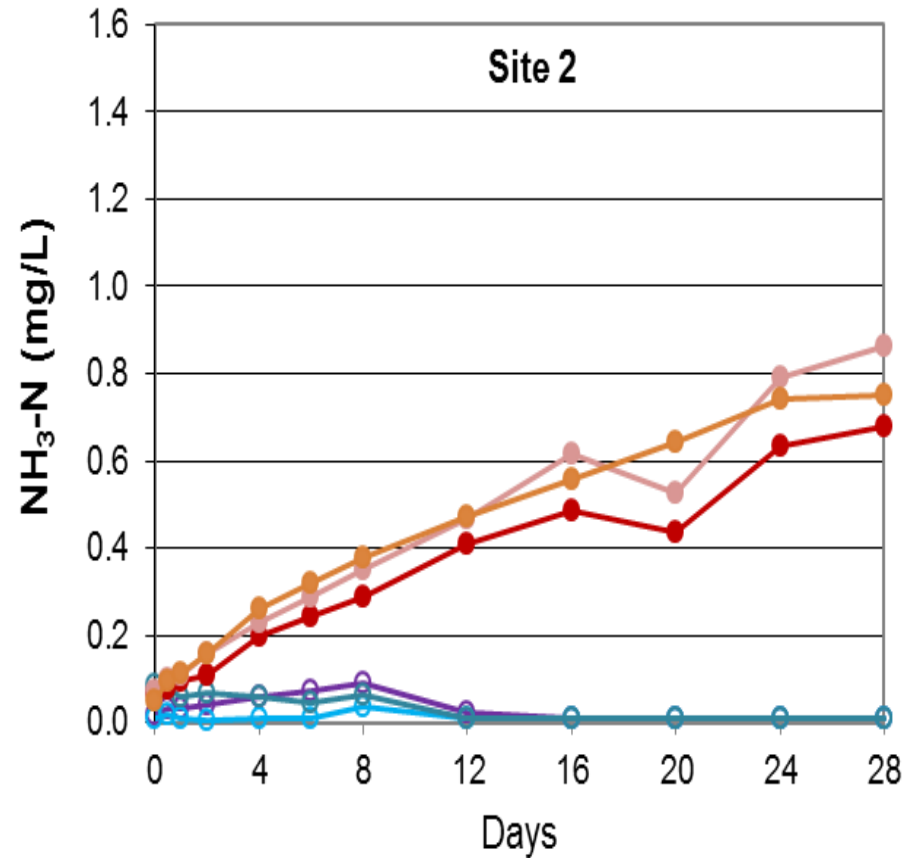
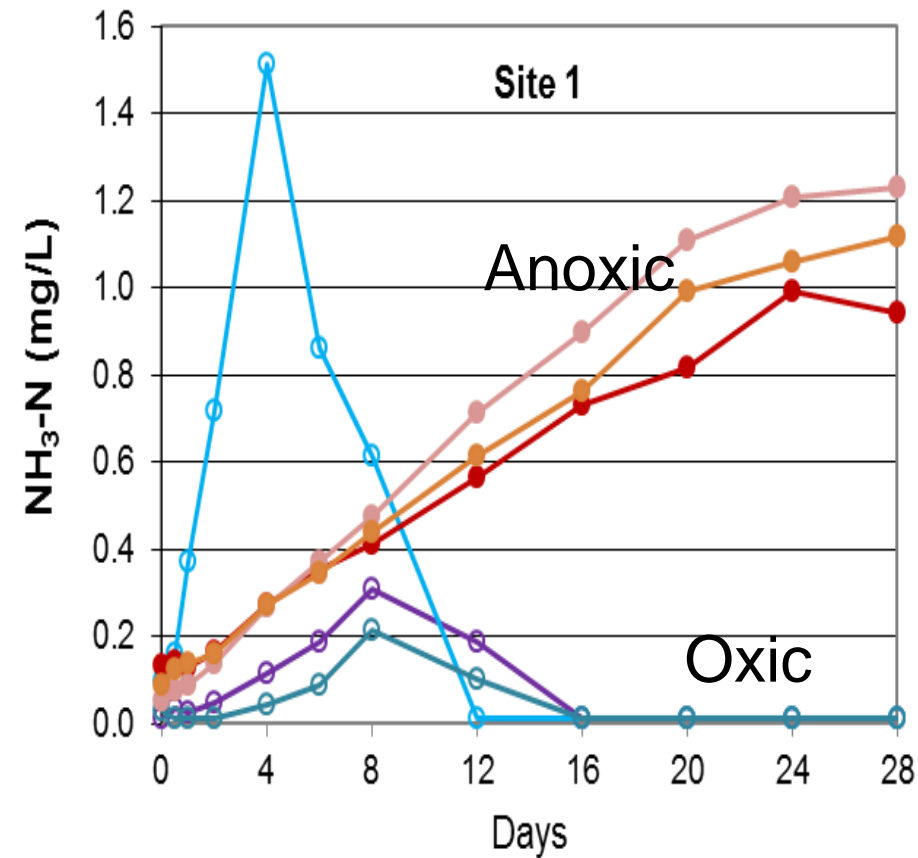
Ammonia Flux: May 2013



Phosphorus Flux: August



Ammonia Flux: August 2013



Nutrient Flux Summary: 2013

(mg/m²/day)

	Mean TP Flux	
	Anoxic	Oxic
May '13	-0.16 ± 0.06	-0.16 ± 0.12
August '13	-0.07 ± 0	-0.05 ± 0.03

Harmful Algal Blooms (HABS)

Microcystin is the most common cyanotoxin produced by HABS → hepatotoxin and tumor promotor.

WHO standards:

- drinking water: 1 $\mu\text{g/L}$
- recreational: 20 $\mu\text{g/L}$

Harmful Algal Blooms (HABs)



Microcystin Concentrations		
Location	Date	Concentration ($\mu\text{g/L}$)
Mona Lake (bloom)	July, 2007	~350
Lake Erie (bloom)	October, 2011	~4,200

Microcystin Concentration

Silver Lake

Site	Date	Concentration ($\mu\text{g/L}$)
1 (surface)	4/17/14	<0.05
2 (surface)		<0.05
1 (surface)	5/2/14	<0.10
2 (surface)		<0.05

Preliminary Conclusions

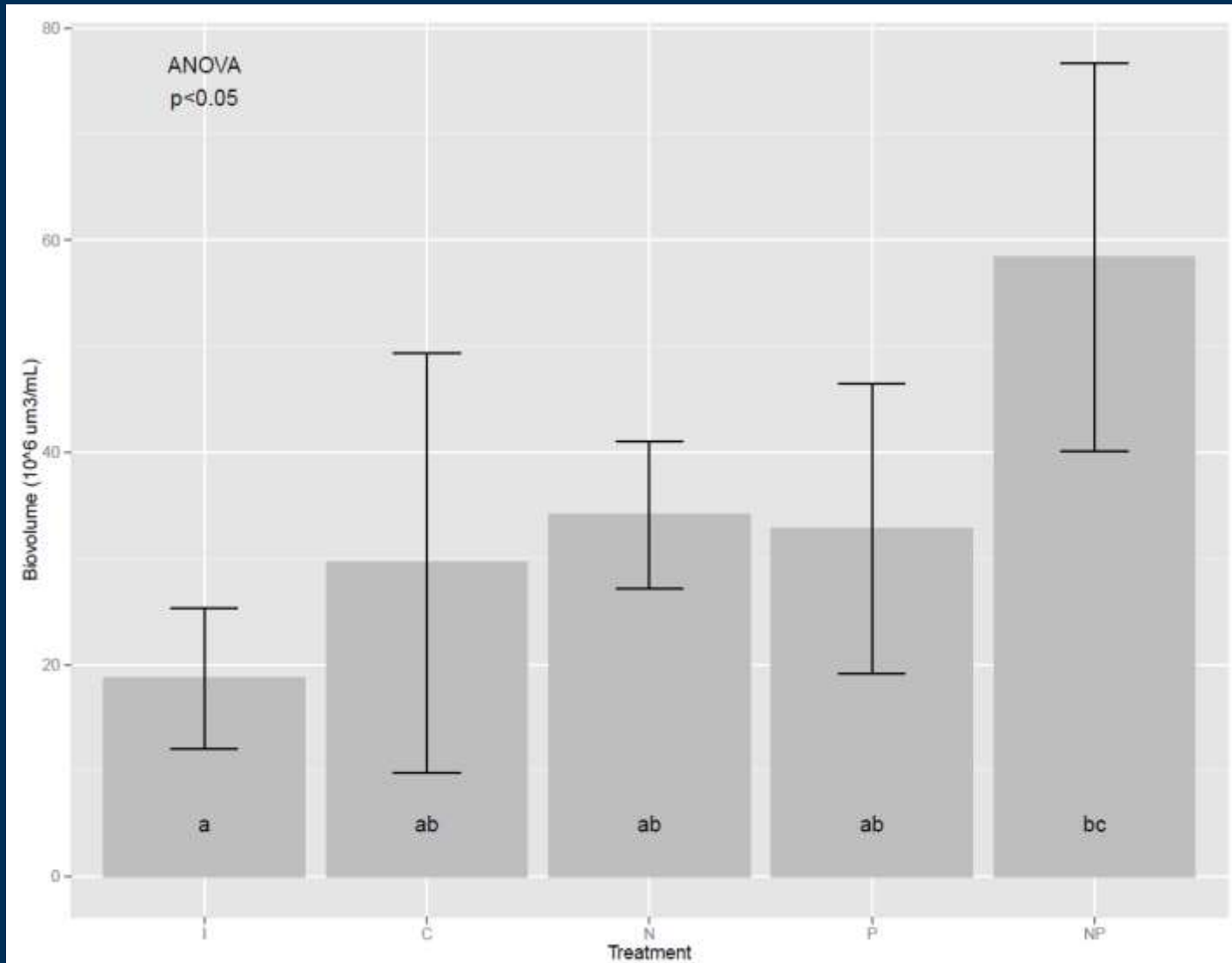
- Internal loading not a major source of phosphorus to Silver Lake
- Algal growth appears to be co-limited by P and N
- Cyanotoxin levels not an issue to date

Next Steps: 2014

- Continue internal loading studies and conduct two more nutrient bioassays
- Conduct biweekly plankton sampling to ID algae and measure toxins
- AWRI graduate student starting thesis on *Gloeotrichia* toxicity

Nutrient Bioassay: July 2013

Phytoplankton Biovolume



Nutrient Bioassay: July 2013

Total Microcystin per unit Chlorophyll

