



The role of fish in shaping  
pond communities at Hanley  
Biological Field Preserve

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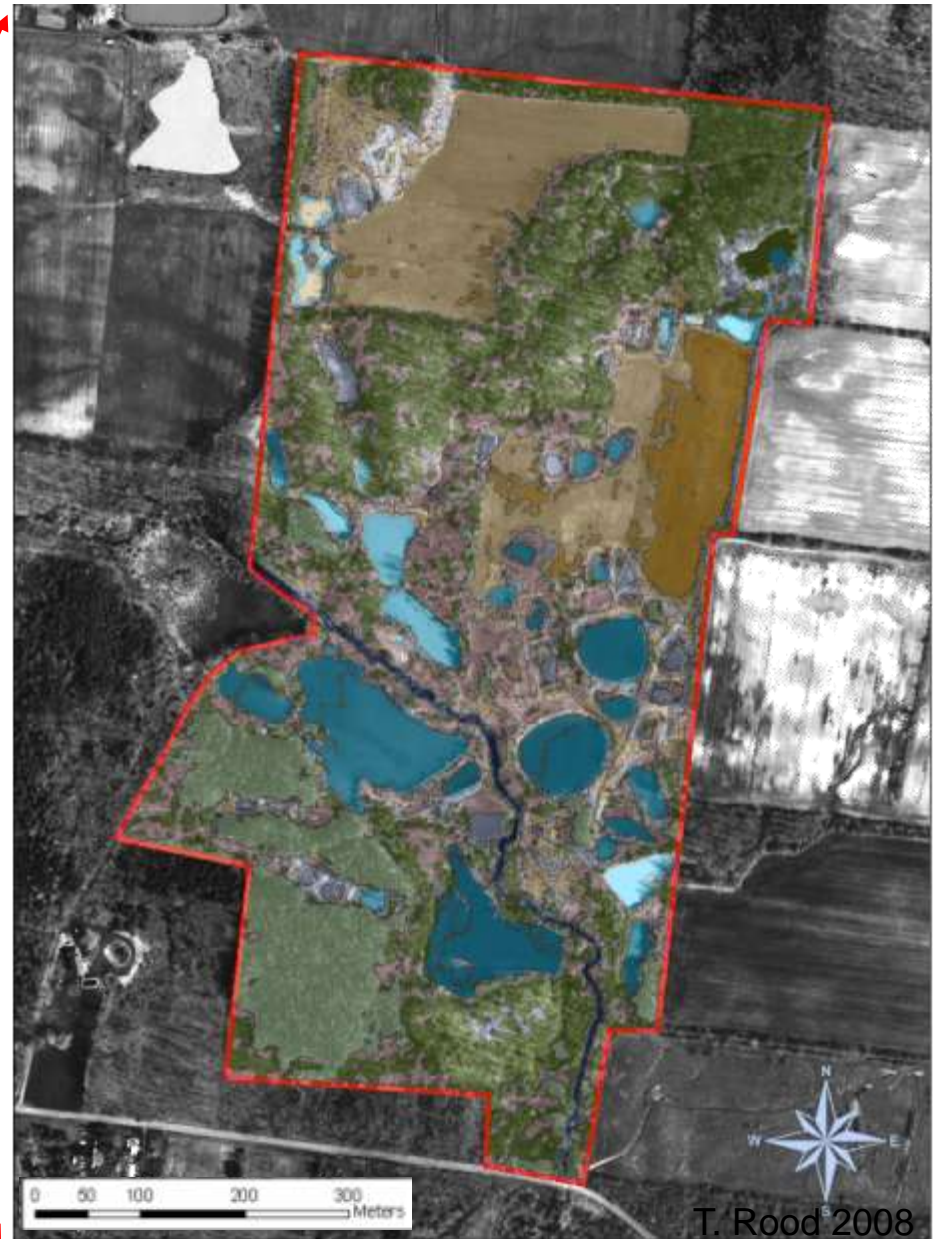
# With special thanks to—

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# Henry Hanley Biological Field Preserve





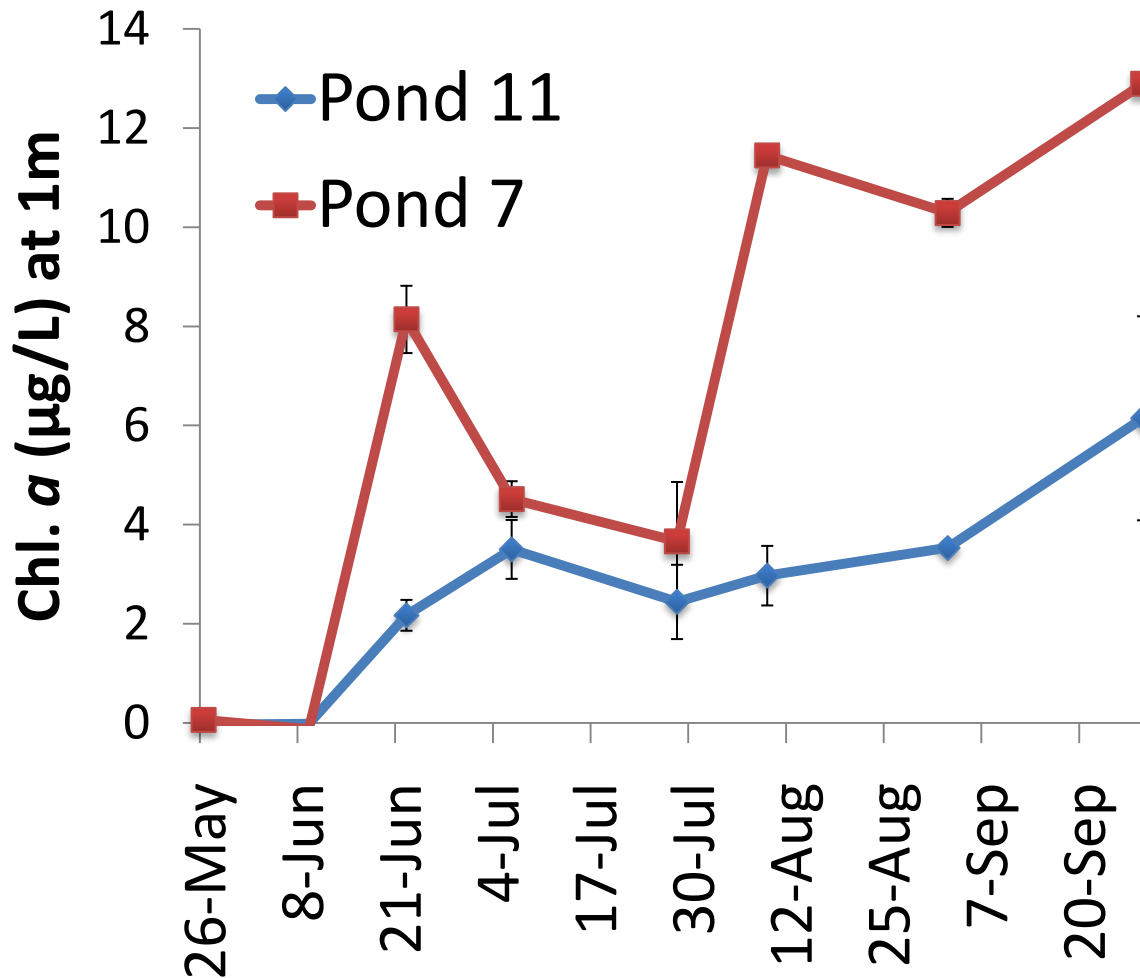
# POND 7



# POND 11



# Pond 7 has a greater concentration of Chlorophyll *a* than Pond 11



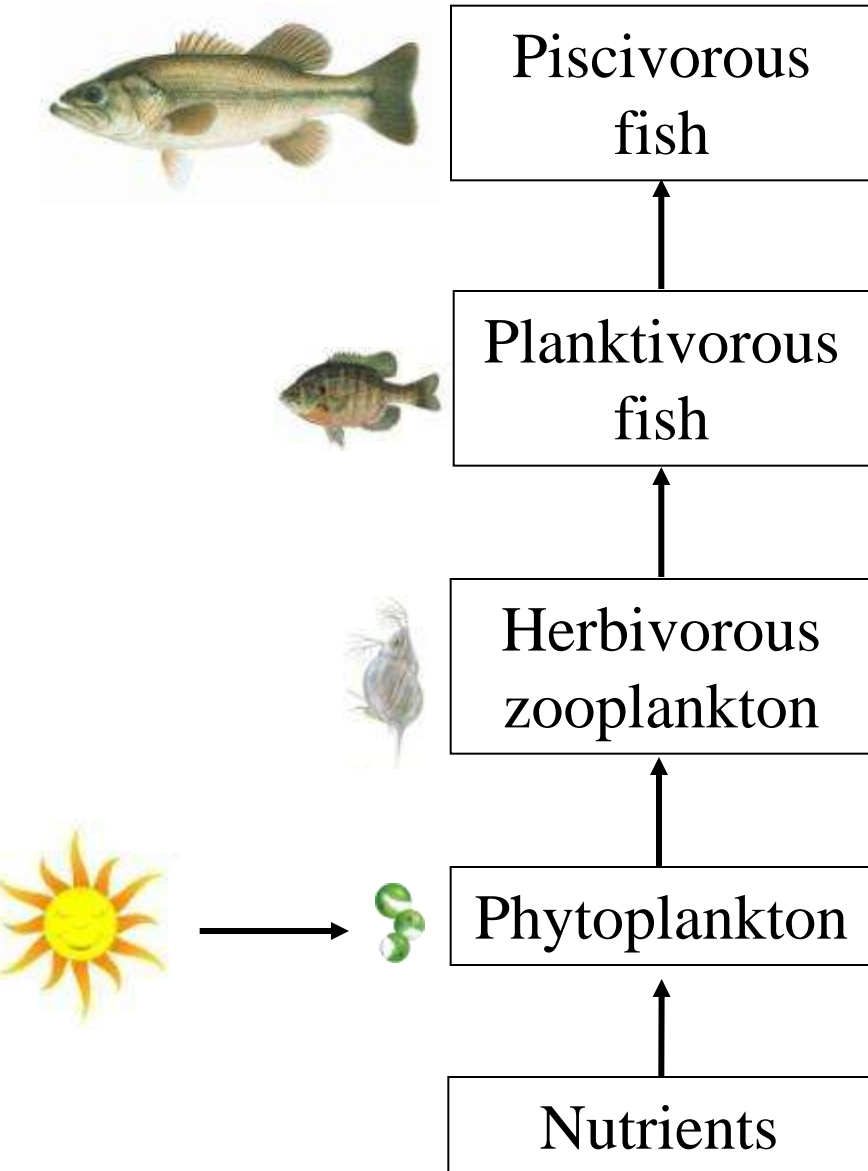
# Hypothesis 1:

The primary productivity of Ponds 7 and 11 differ due to

(a) dissimilar nutrient availability.

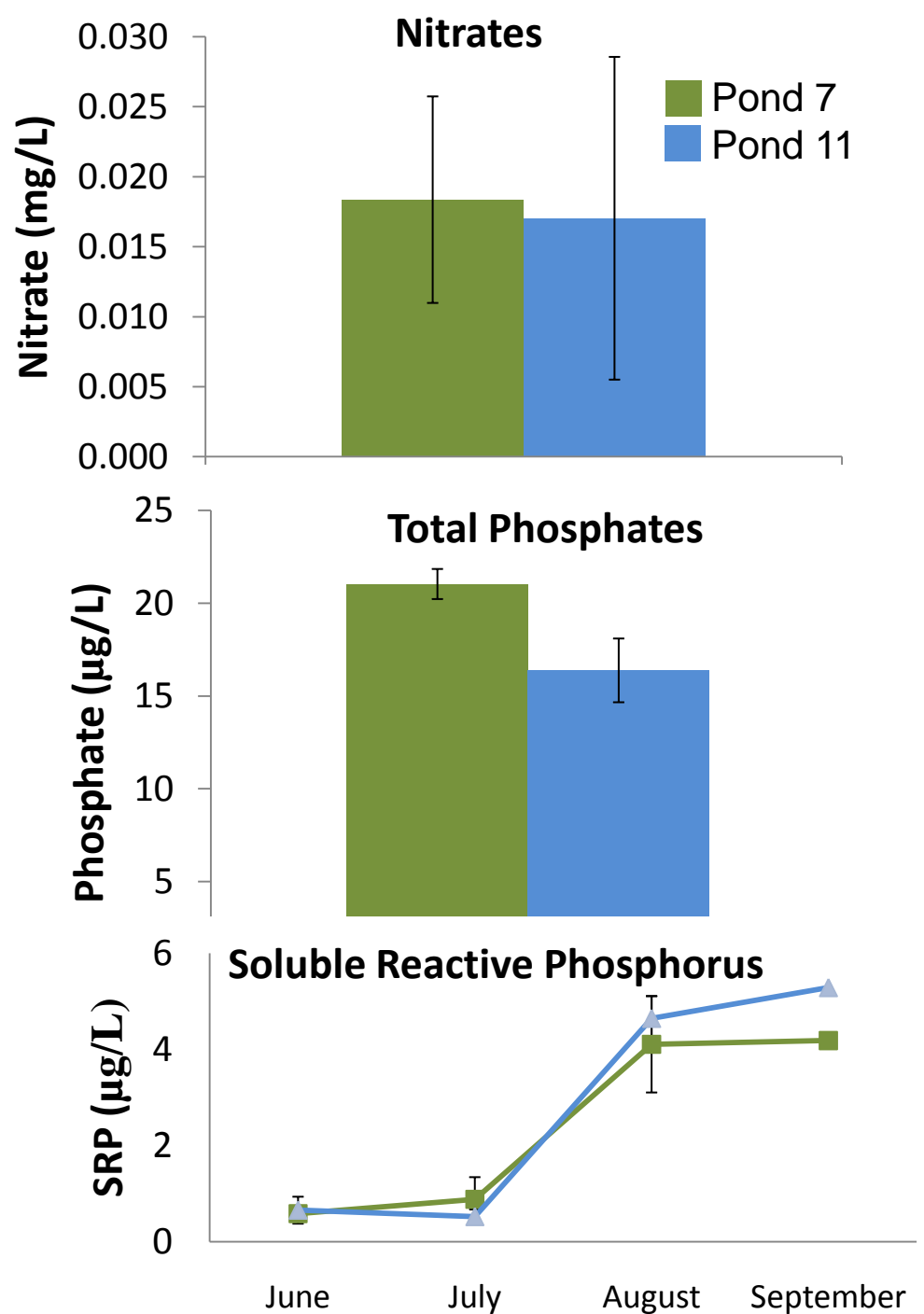
(b) dissimilar fish communities.

# Bottom-up / Top-down





Nutrient concentrations are similar between the two ponds.

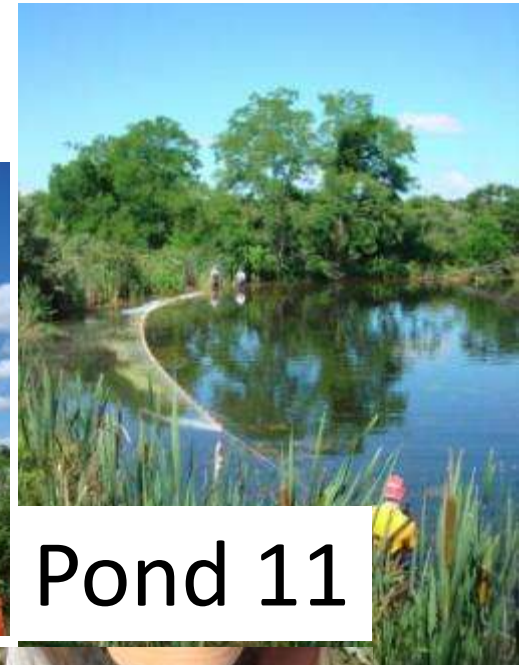




# The fish assemblages of Ponds 7 and 11 are different



Pond 7



Pond 11



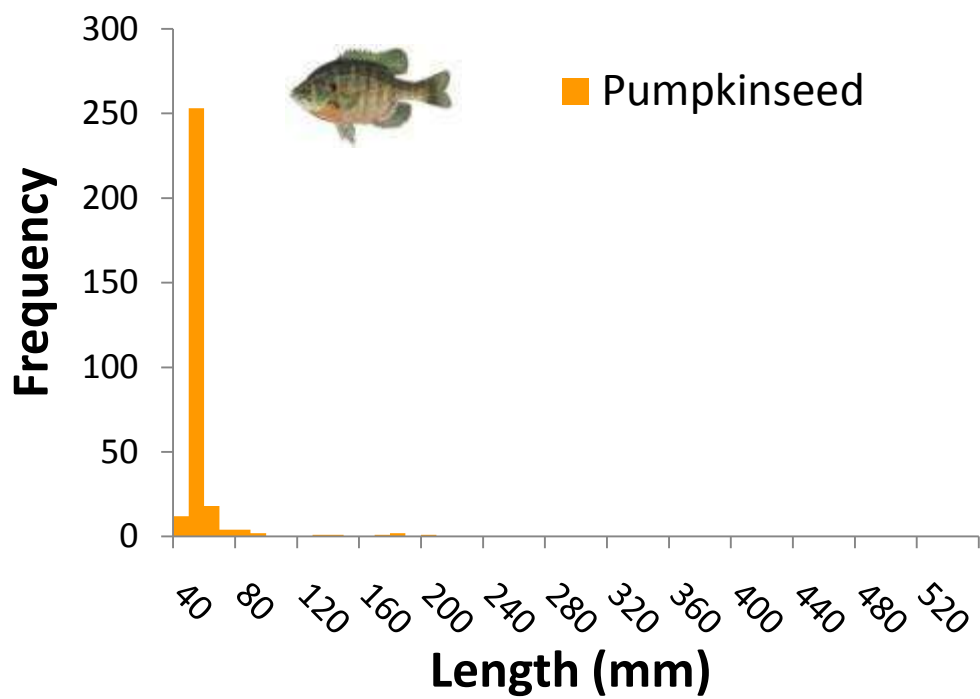
## Hypothesis 2:

The presence of piscivorous fish in pond 11 results in a trophic cascade that

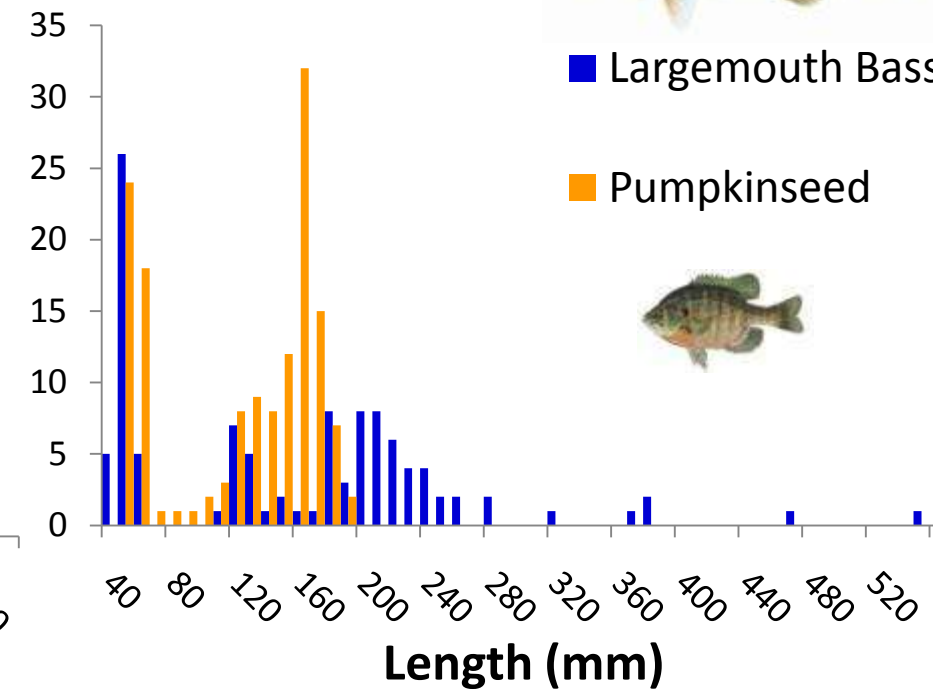
- a. Decreases the abundance and size of planktivorous fish
- b. Increases the abundance and size of herbivorous zooplankton
- c. Decreases the abundance of phytoplankton, but not the rate of production



# POND 7



# POND 11

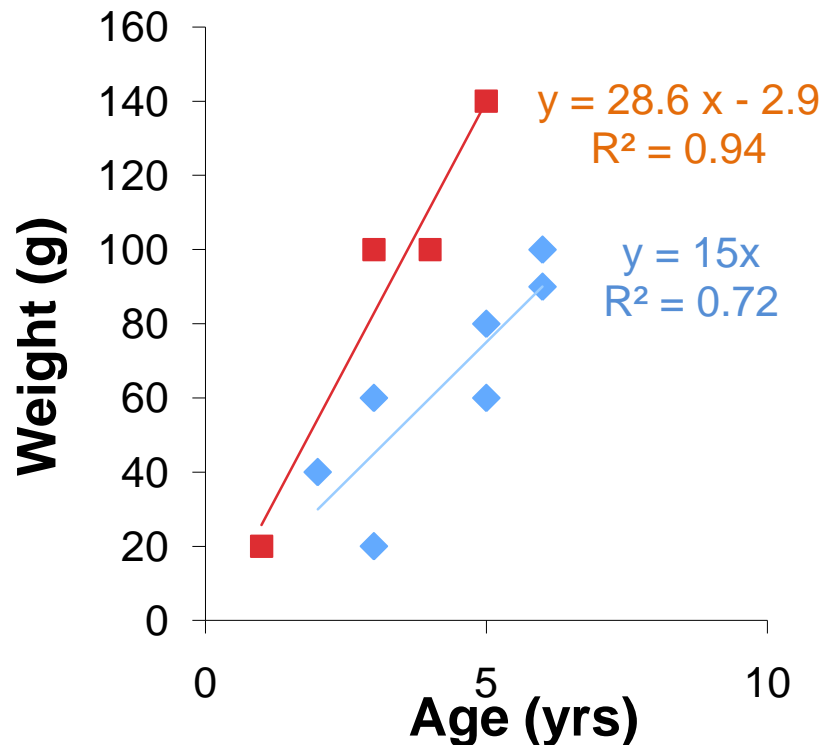
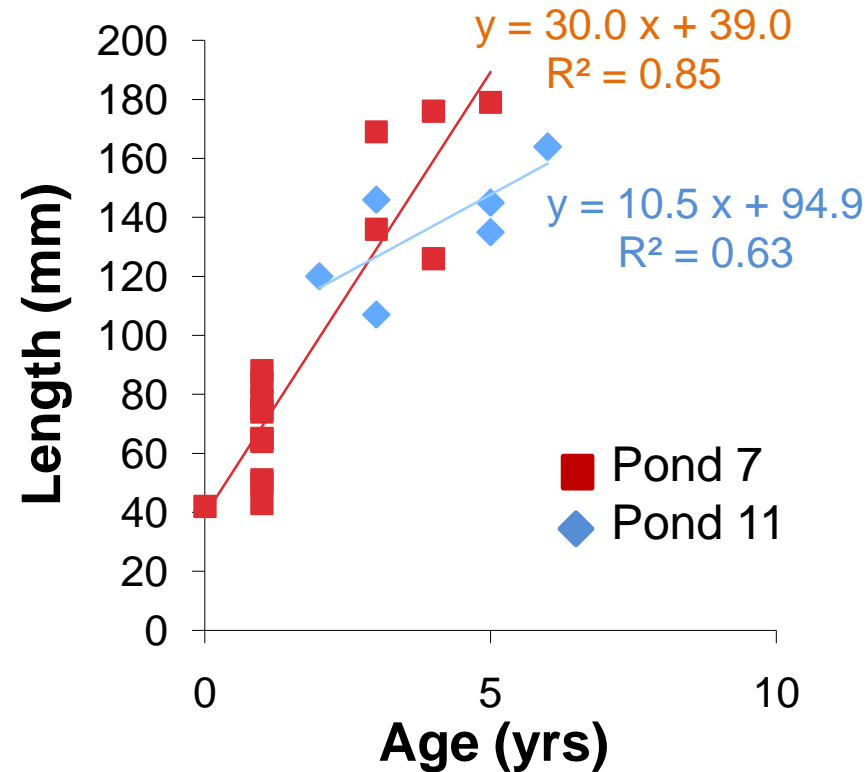


	PKS	LGM
<b>Mean Length (mm)</b>	48 ± 1.0	.
<b>Mean Weight (kg)</b>	0.10 ± 0.020	.
<b>Total Biomass</b>	16.5	.

	PKS	LGM
<b>Mean Length (mm)</b>	117 ± 4.0	151 ± 9.7
<b>Mean Weight (kg)</b>	0.08 ± 0.008	0.19 ± 0.044
<b>Total Biomass</b>	7.6	13.6



# Pumpkinseed sunfish in Pond 7 are generally longer and heavier than in Pond 11



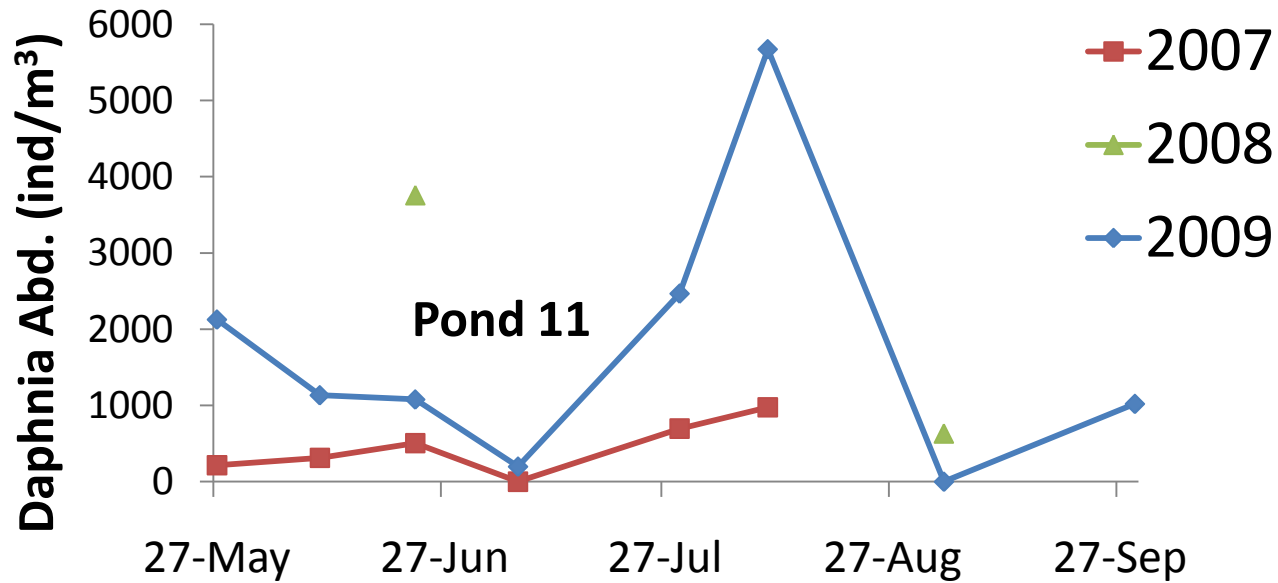
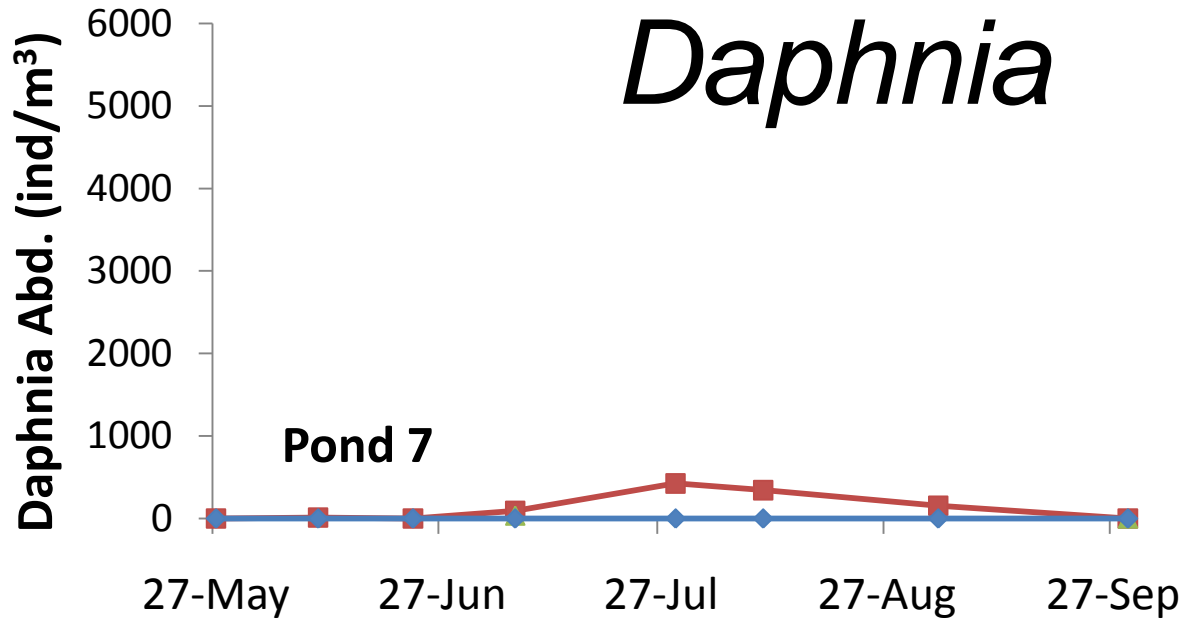
Relationship between (A) length and age and (B) weight and age of pumpkinseed sunfish in Pond 7 (n = 17) & 11 (n = 7) .

# Zooplankton are less abundant in Pond 7 than 11.

	Mean abundance (#/m <sup>3</sup> )	Standard Deviation
Pond 7	4,195	12,676
Pond 11	17,465	64,459

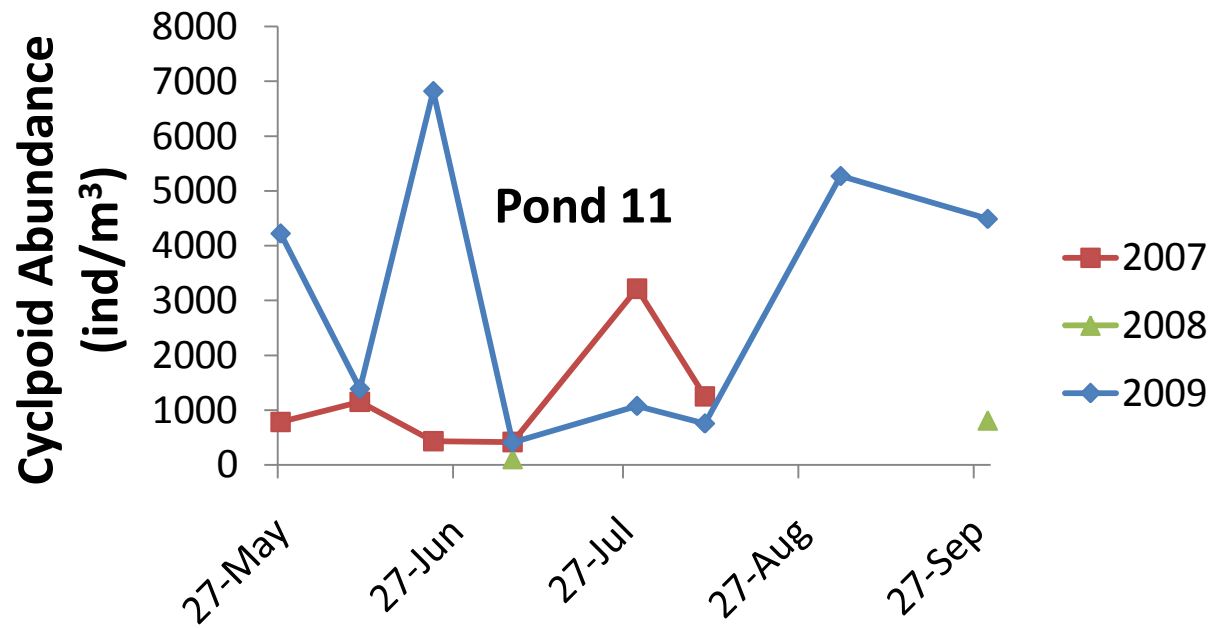
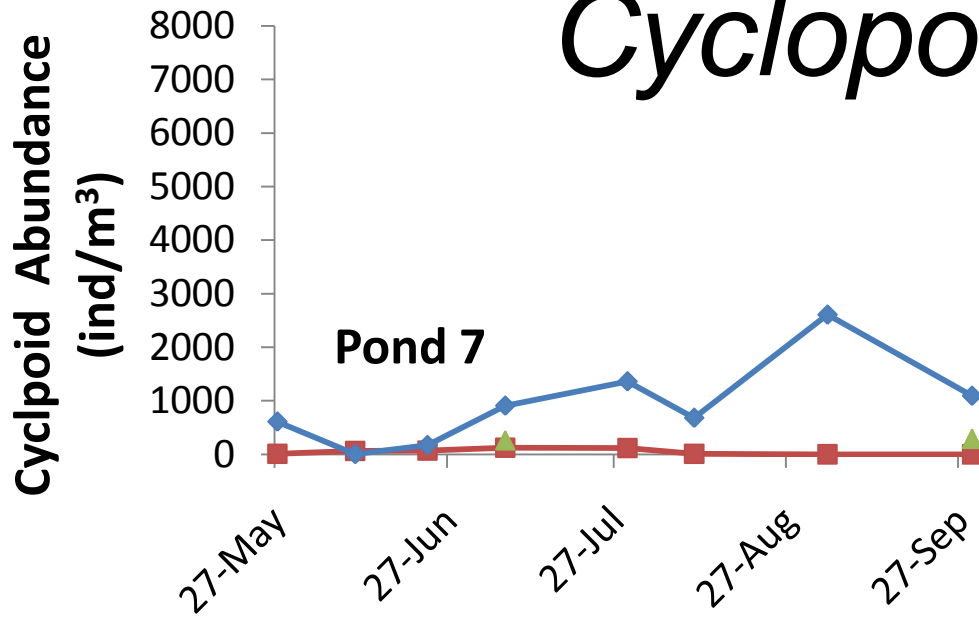
Mean abundance of zooplankton per collection with standard deviations. Mean was calculated by adding all taxa abundances (all dates and years) and dividing the total by the number of samples.

# *Daphnia*

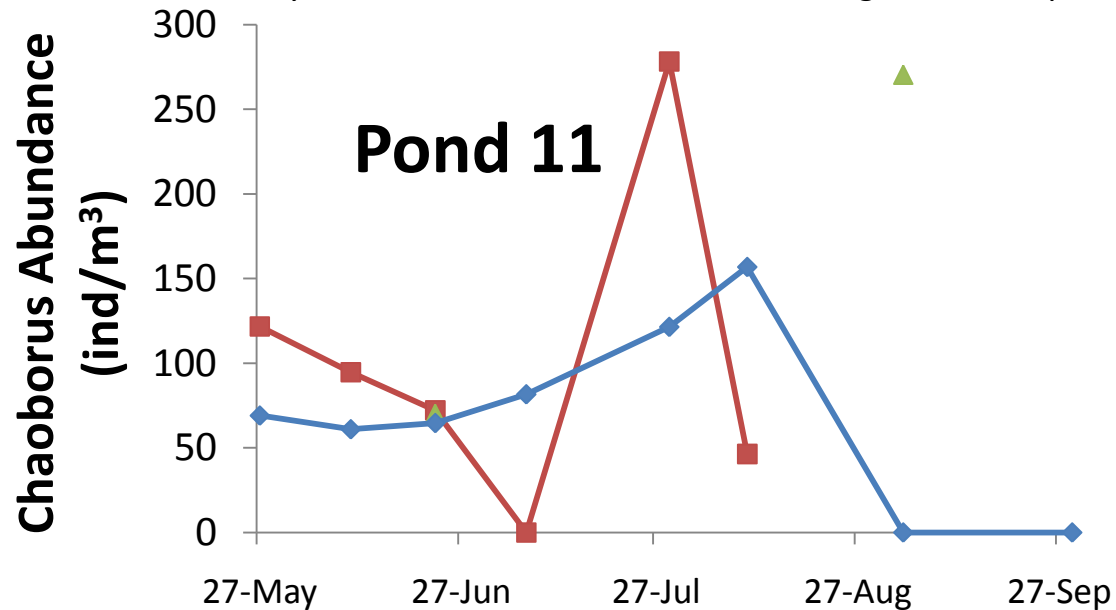
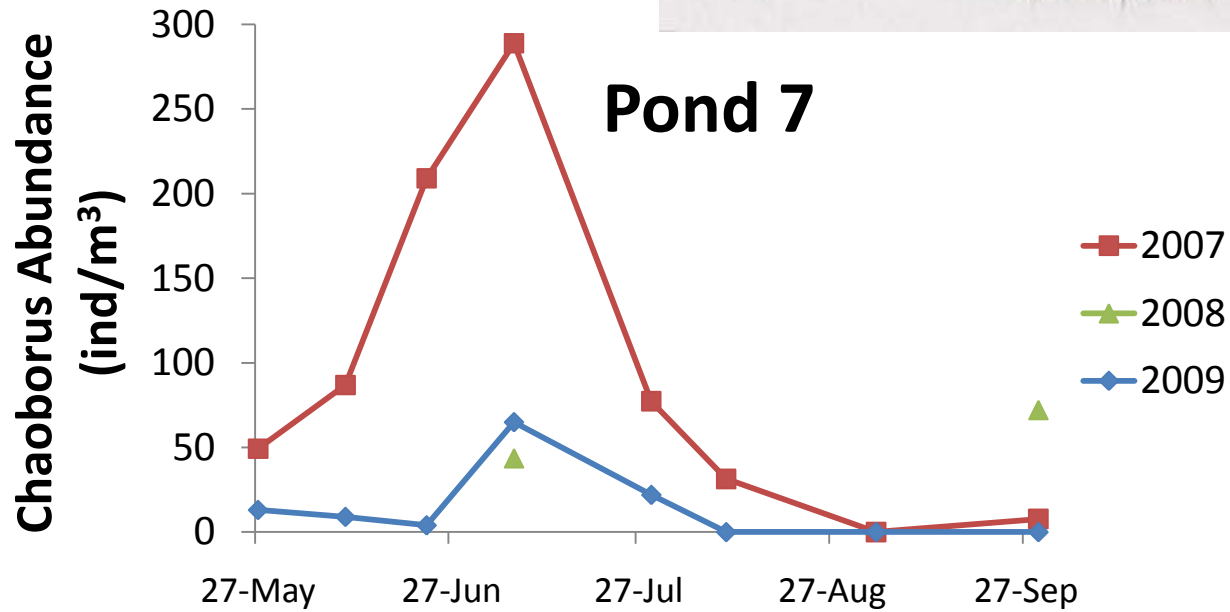
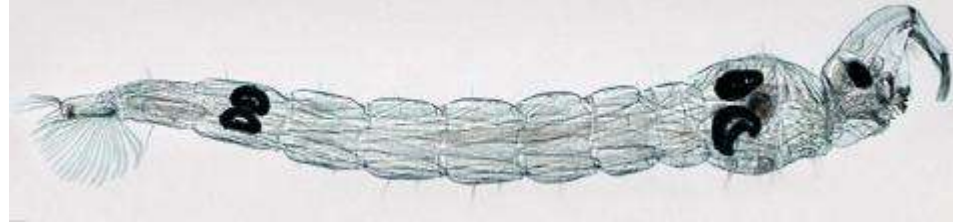




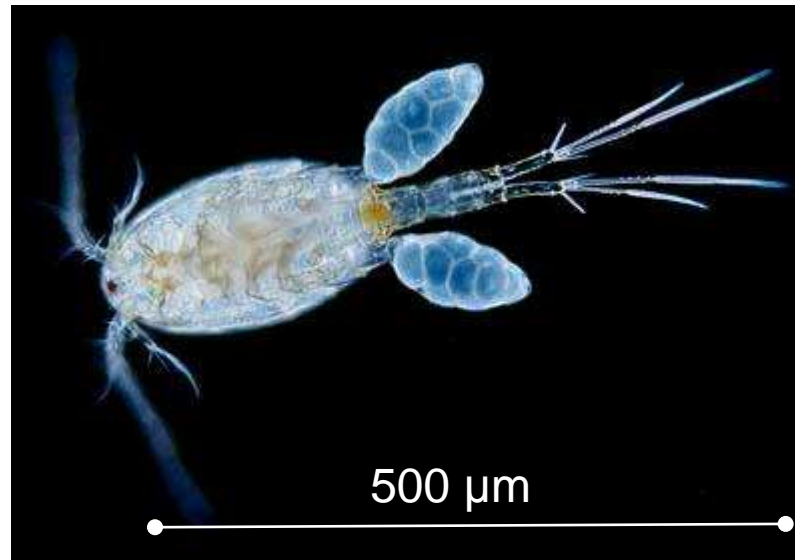
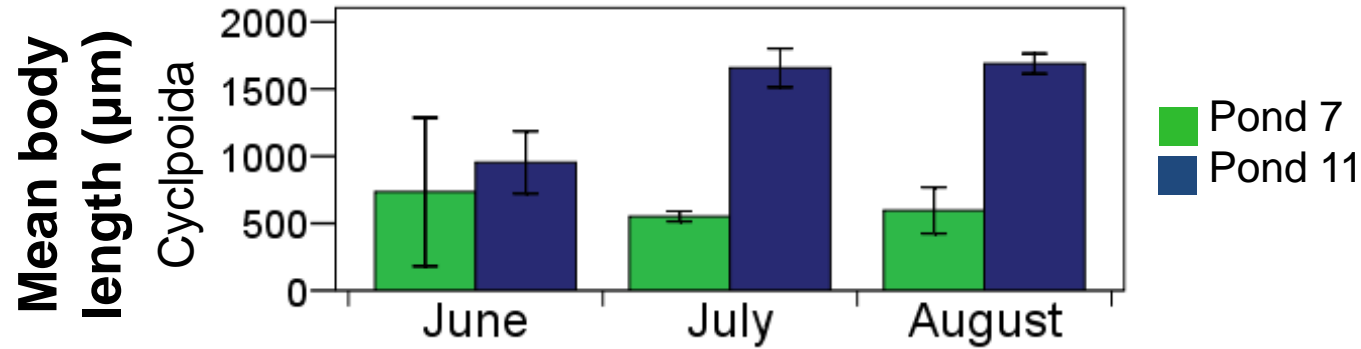
# Cyclopoid



# Chaoborus



# Zooplankton in pond 7 are smaller than pond 11.

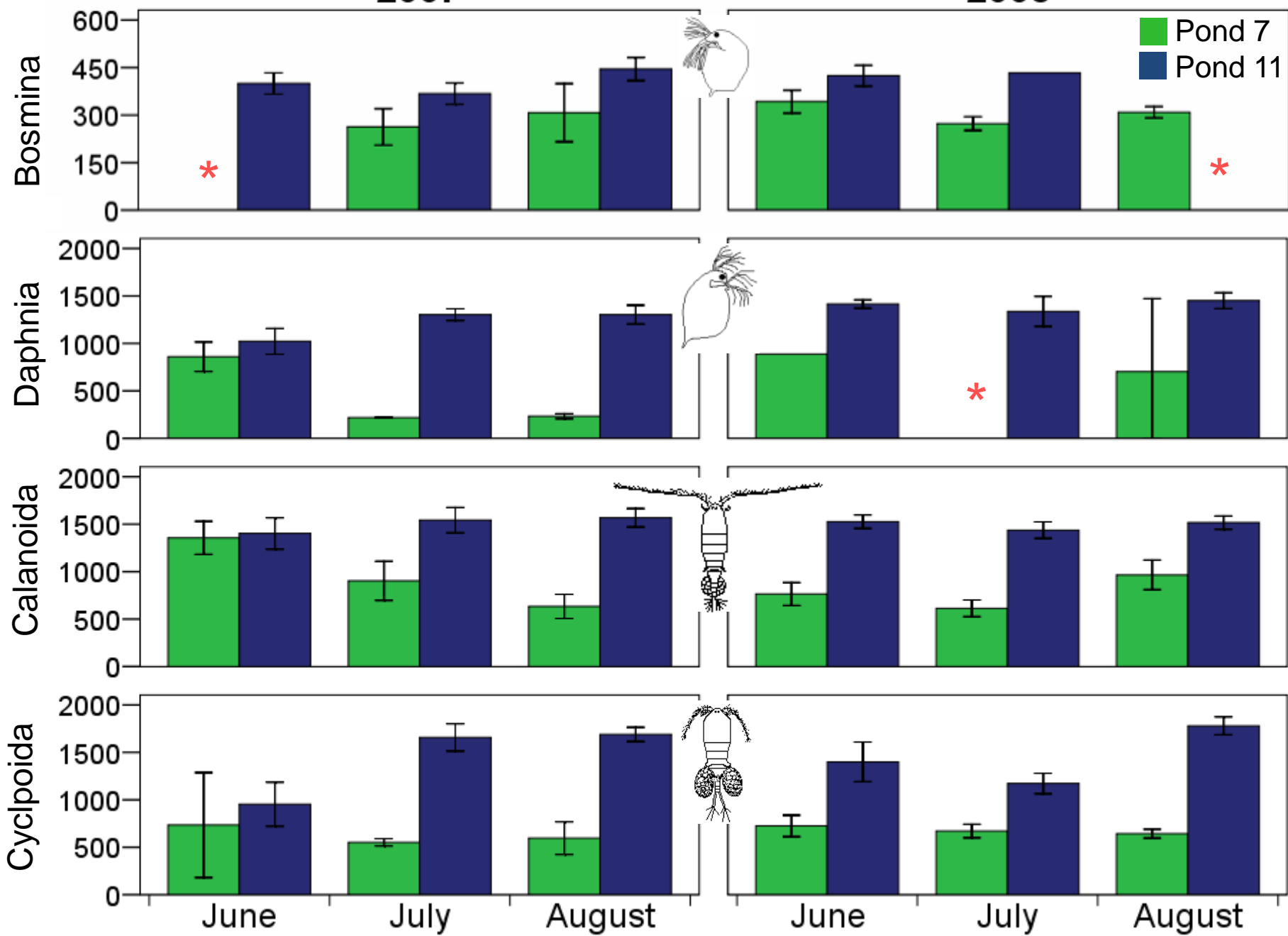




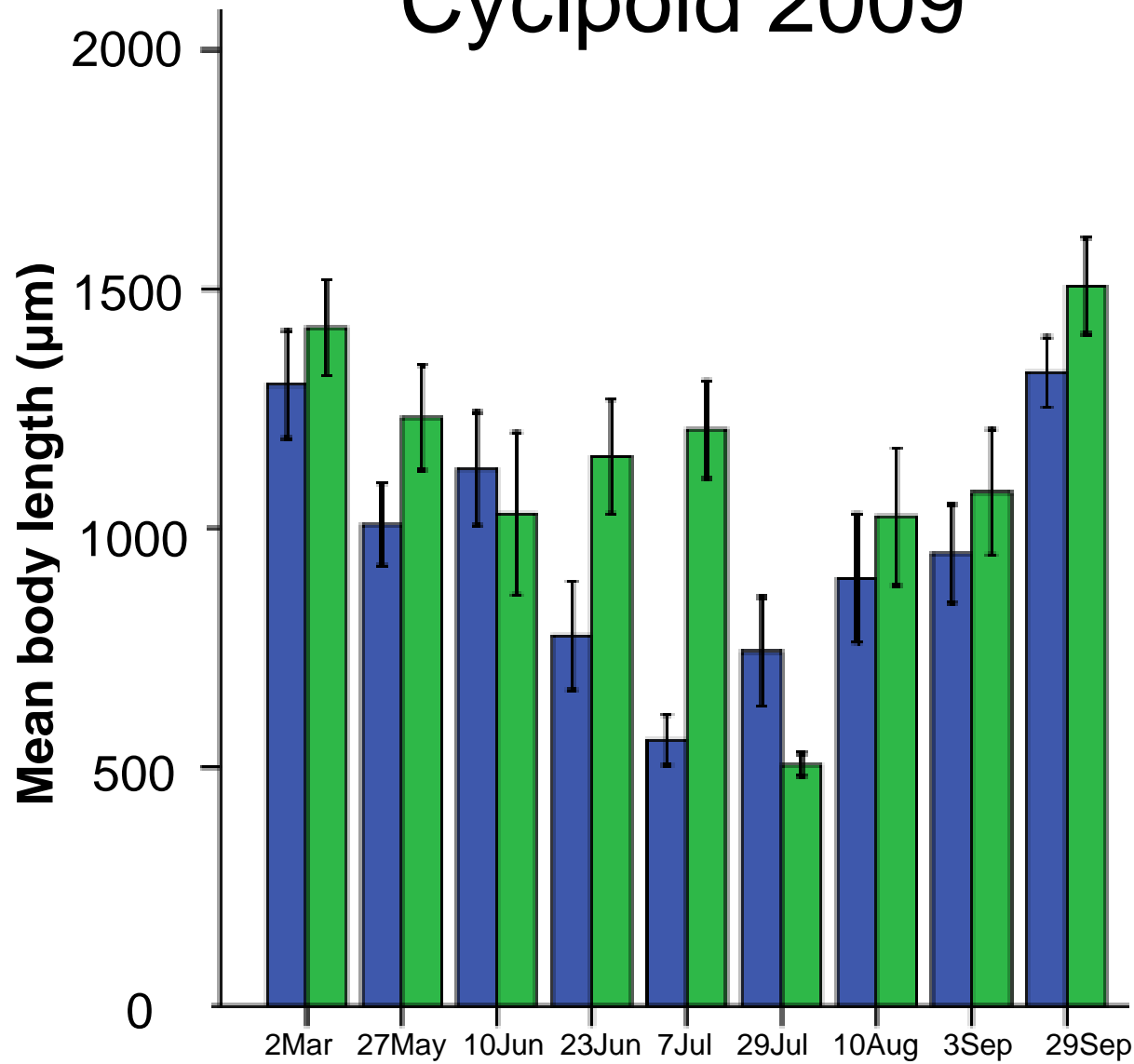
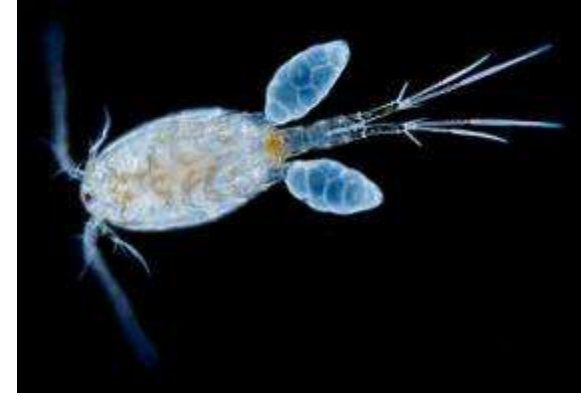
Mean body length ( $\mu\text{m}$ )

2007

2008

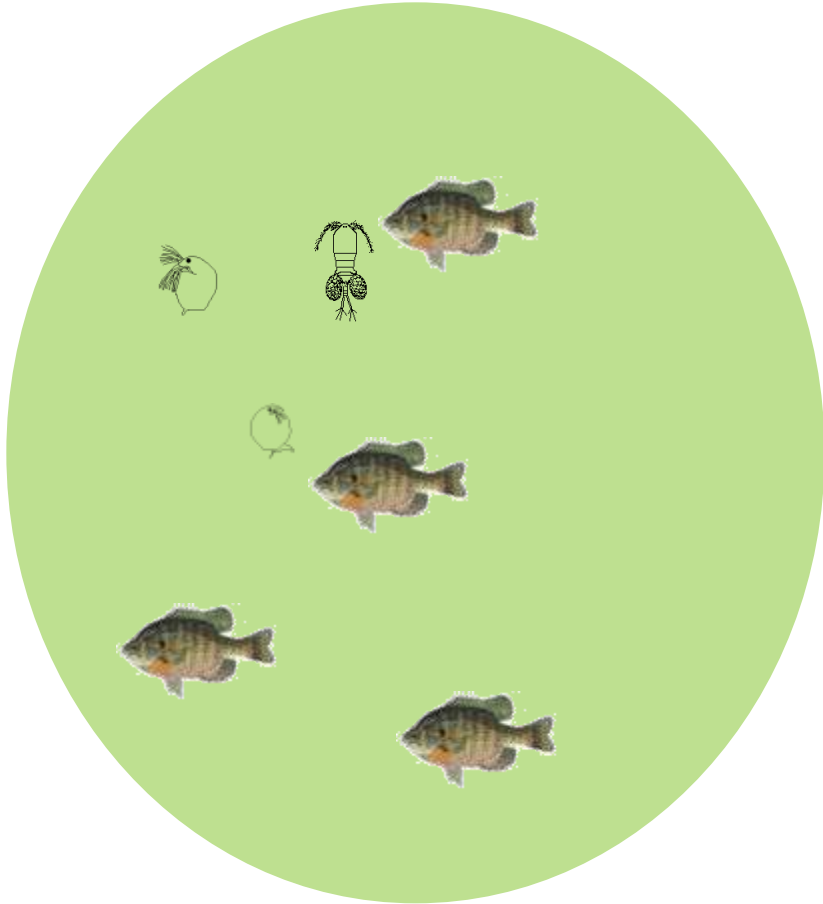


# Cyclopoid 2009

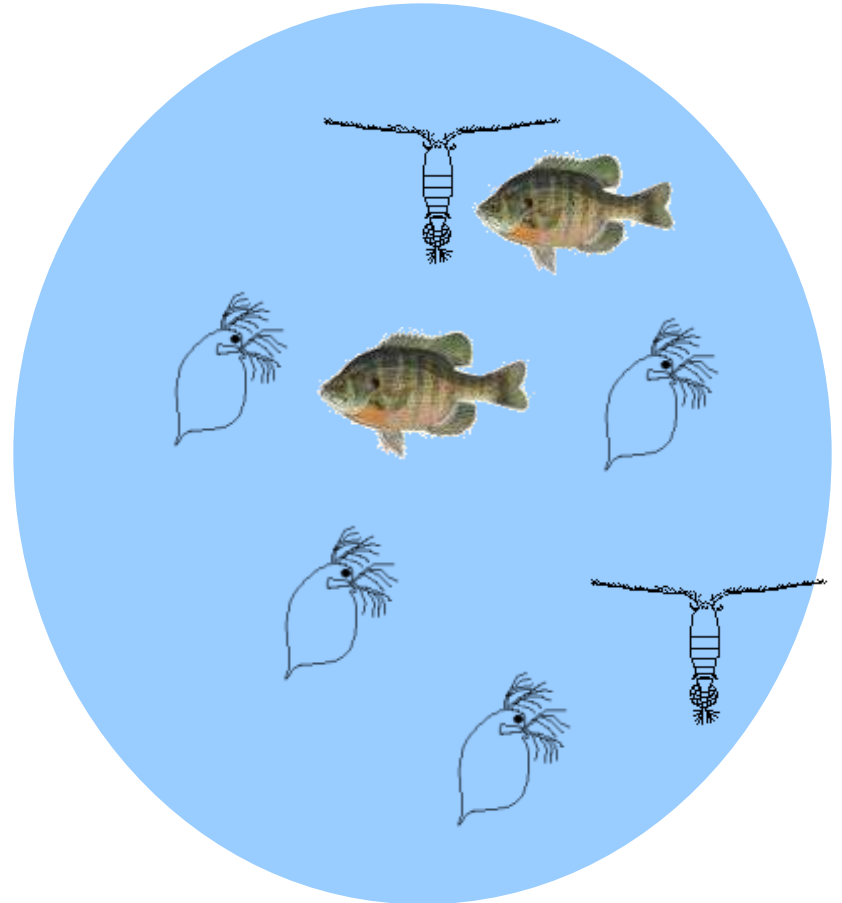


Pond 7  
Pond 11

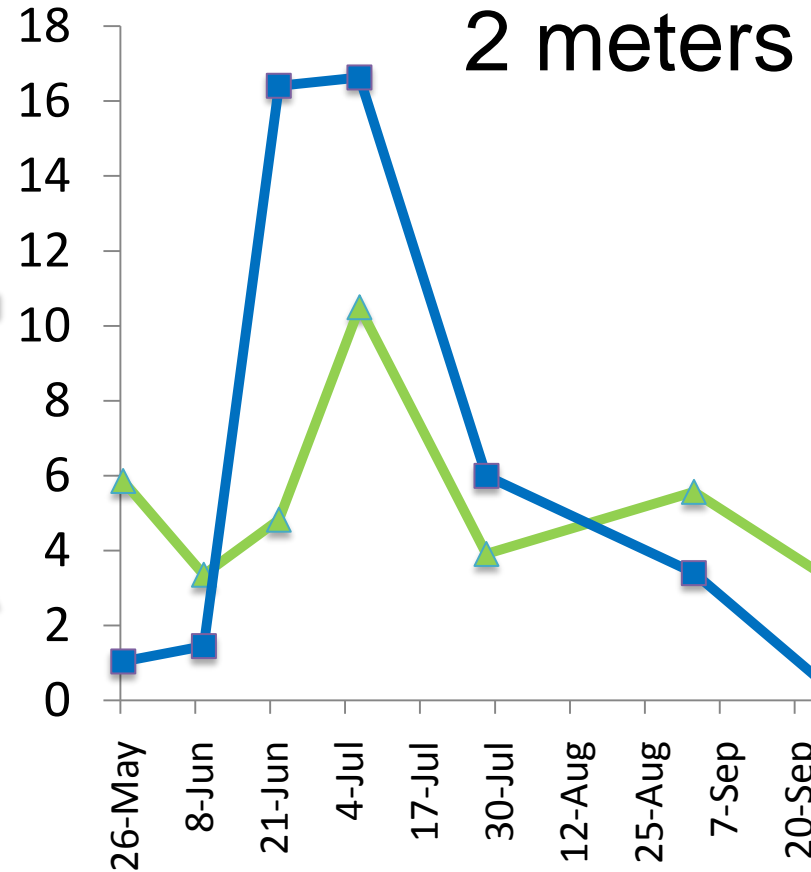
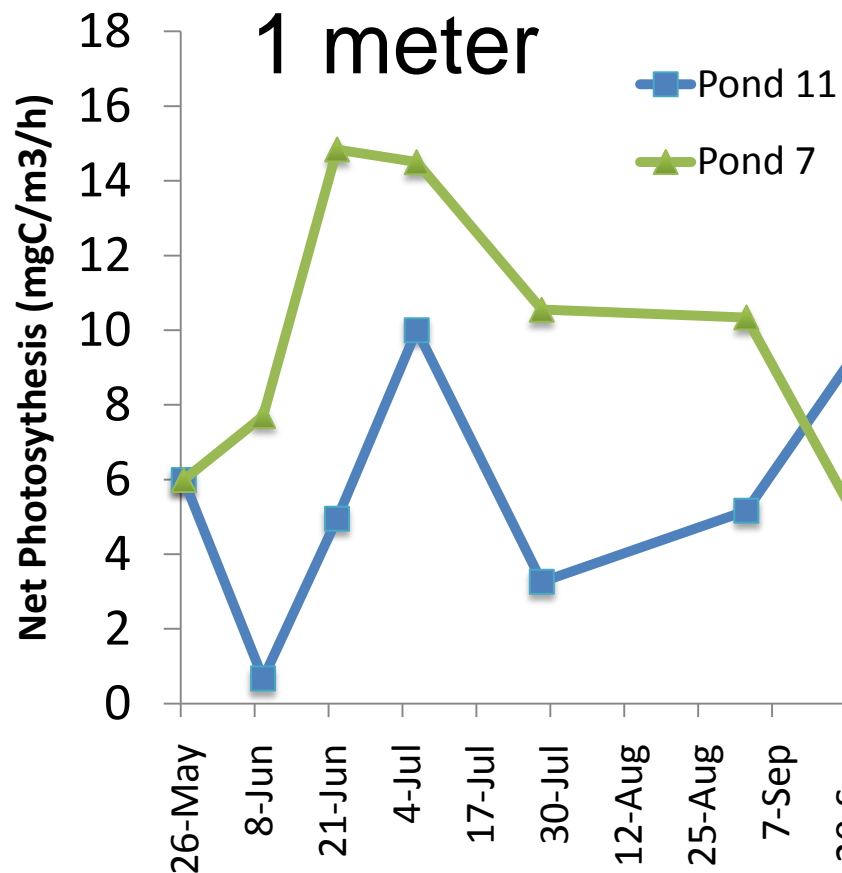
# POND 7



# POND 11



Pond 7 and 11 have similar rates of primary production.





# In conclusion—

Piscivores are absent in Pond 7  
and present in Pond 11.



Piscivorous  
fish

The zooplankton community in Pond 7 is

- dominated by small taxa  
know to avoid visually predation
- comprised of smaller individuals for  
those species that are common  
between Pond 7 and 11



Planktivorous  
fish



Herbivorous  
zooplankton

Chl. *a* concentrations in Pond 7 is great than  
in Pond 11.



Phytoplankton

Nutrient concentrations are similar.

Nutrients

