SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Zooplankton Monitoring in Lake Okeechobee's Pelagic Zone

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The Basics

- Plankton are the base of Lake Okeechobee's pelagic trophic web
- Zooplankton are filter feeders that transfer energy from primary producers to higher trophic levels
- This project investigates zooplankton community dynamics from both a temporal and spatial scale
- Data presented are from January of 2023 through December of 2024

The Big Questions

1. How do zooplankton vary spatially within Lake Okeechobee?
2. How do zooplankton in Lake Okeechobee change over time?
3. How do zooplankton fit into the pelagic trophic web of Lake Okeechobee?

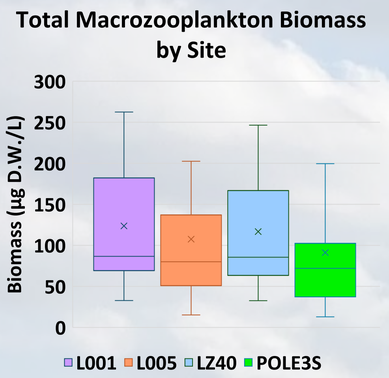
The Project

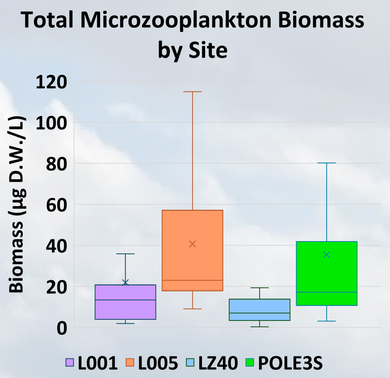
- Entire water column sampled
- Sites in four ecological zones
- Sampled monthly
- Parameters measured:
  - Microzooplankton
  - Macrozooplankton
  - Phytoplankton
  - Water Quality, including Chl-*a*, SRP, DIN, TSS, etc.

Question 1: How do zooplankton vary spatially within Lake Okeechobee?

Biomasses

- Significant difference between LZ40 and L005 microzooplankton biomasses
- No other significant differences in zooplankton biomasses

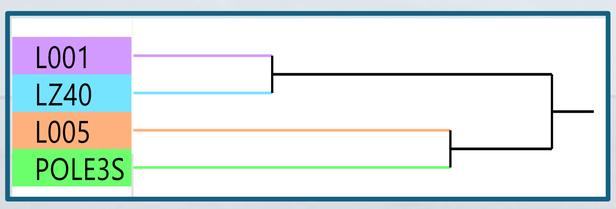




Communities

- Both microzooplankton and macrozooplankton communities exhibited similar relationships between sites

Microzooplankton

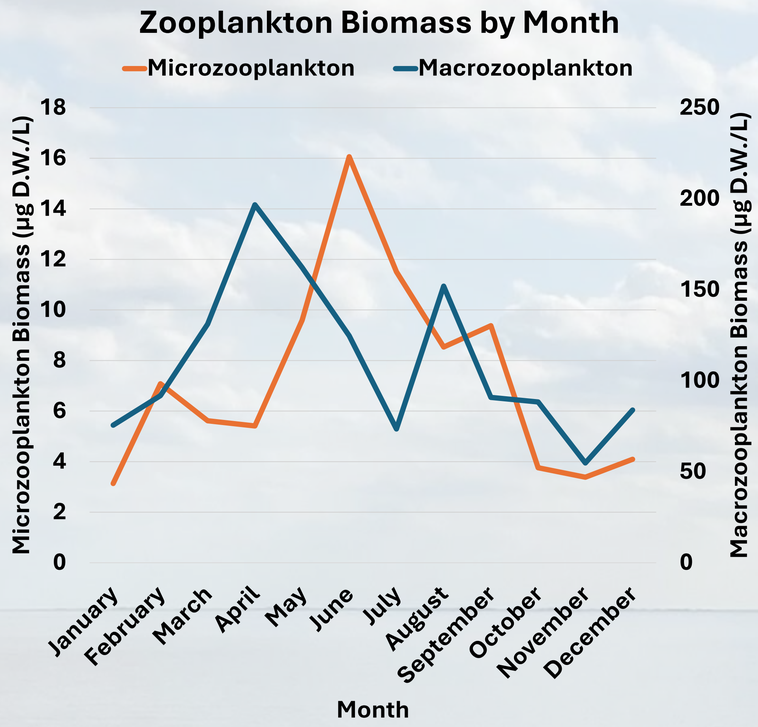


Macrozooplankton

Question 2: How do zooplankton in Lake Okeechobee change over time?

Microzooplankton

- Trends were variable, but biomass seemed to peak in early summer
- June biomasses were significantly higher than January, November, and December biomasses
- Community analyses identified summer months as having the most variable communities

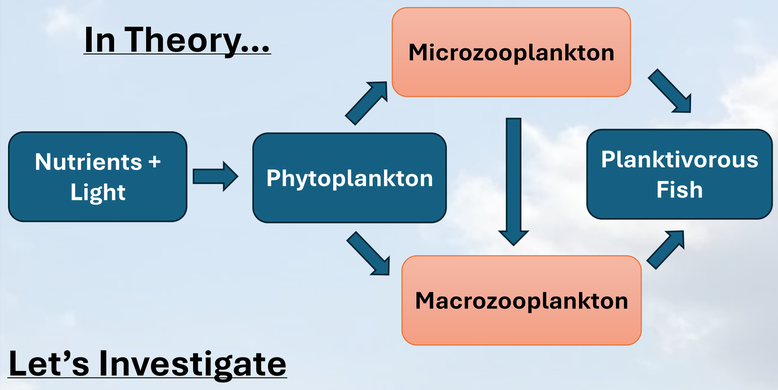


Macrozooplankton

- Biomasses peaked during spring and declined during summer
- April biomasses were significantly higher than January, July, and November biomasses
- Community analyses identified winter communities as most similar and late summer communities as most variable

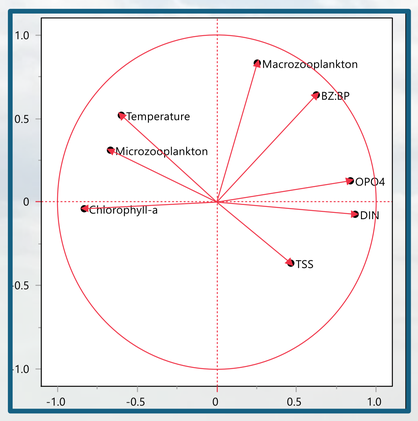
Question 3: How do zooplankton fit into the pelagic trophic web of Lake Okeechobee?

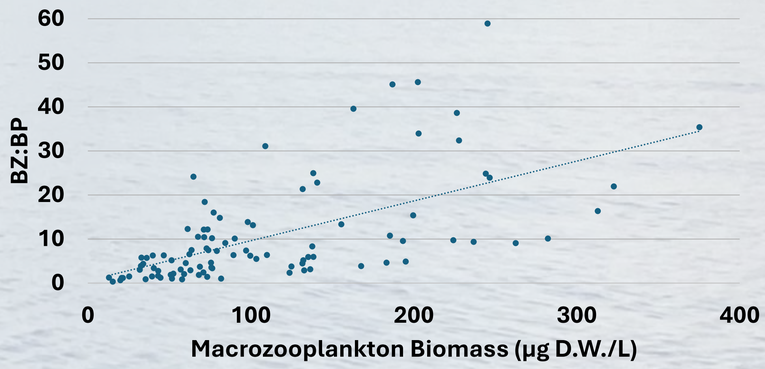
In Theory…



Let's Investigate

- Biomass of Zooplankton (BZ): Biomass of Phytoplankton (BP) ratio quantified the relationship between zooplankton and phytoplankton
- Chlorophyll-*a* was used as a proxy for phytoplankton biomass

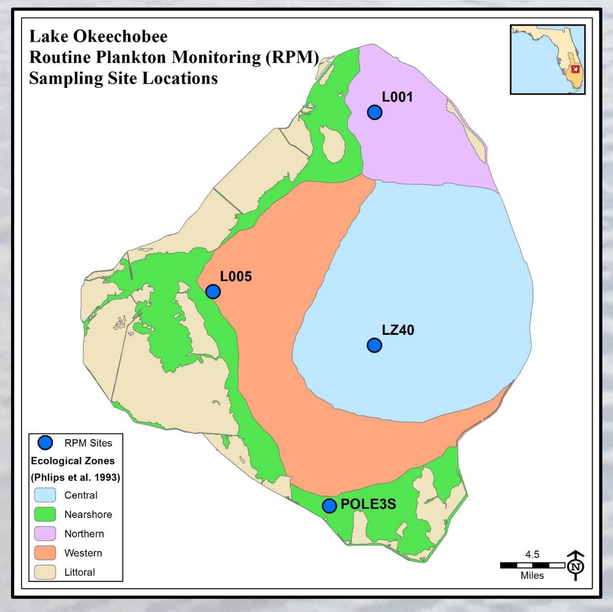




Question and Answer

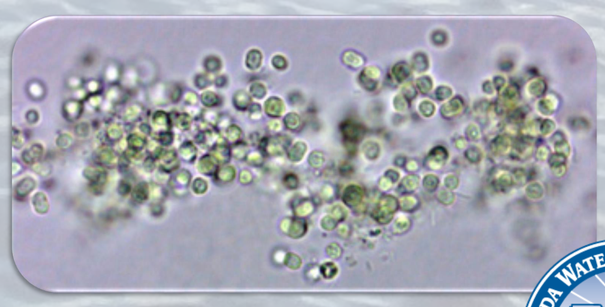
Q: How do zooplankton vary spatially within Lake Okeechobee?

A: While few biomass differences were observed, there was clear community variability, especially between deeper and shallower sites. These data point to species composition as the reason for community variability, as opposed to trophic forces.



Q: How do zooplankton fit into the pelagic trophic web of Lake Okeechobee?

A: In theory, zooplankton serve both as regulators of phytoplankton dynamics and as energy links between phytoplankton and planktivorous fish. These data suggest that macrozooplankton significantly influence the relationship between zooplankton and phytoplankton, but phytoplankton changes are likely more driven by changes in nutrients.



Q: How do zooplankton in Lake Okeechobee change over time?

A: It depends on the group. Generally, zooplankton increase in the spring, and late summer months host the most variable communities.