Zooplankton biomass size spectra off Rio de Janeiro (Brazil) estimated by LOPC and ZooScan observations

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Introduction

Fundamental biological rates vary systematically with organism **size** (Baird & Suthers, 2007).

Trophic functions are maintained in the ecosystems along succession leading to characteristic and **stable profiles** of the organisms' **biomass size spectra** (Kerr & Dickie, 2001).

Introduction

Biomass Size Spectra (BSS)

Important Index (Kerr & Dickie, 2001)

Population dynamics

Production

Laser Optical Plankton Counter (LOPC)

ZooScan

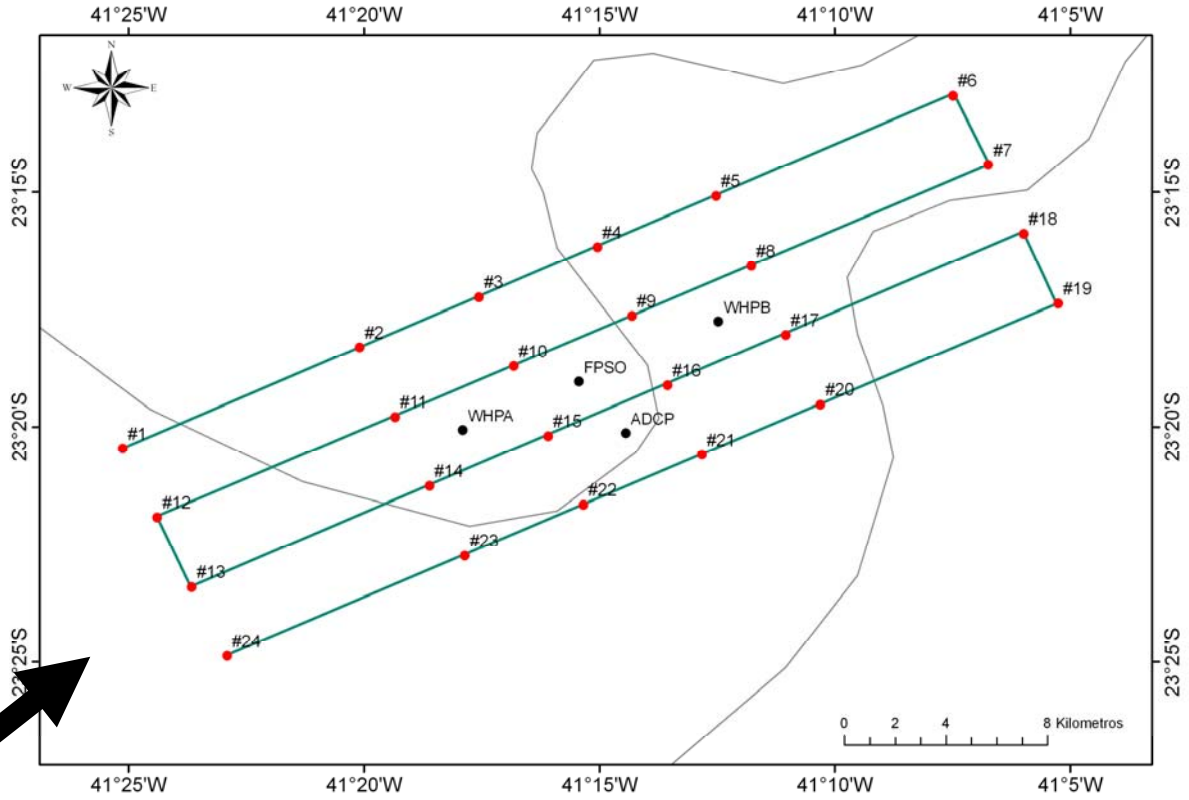
Treating organisms as particles…?

The integration between particles size and taxonomic data is not well done yet! Petchey & Belgrano, 2010.

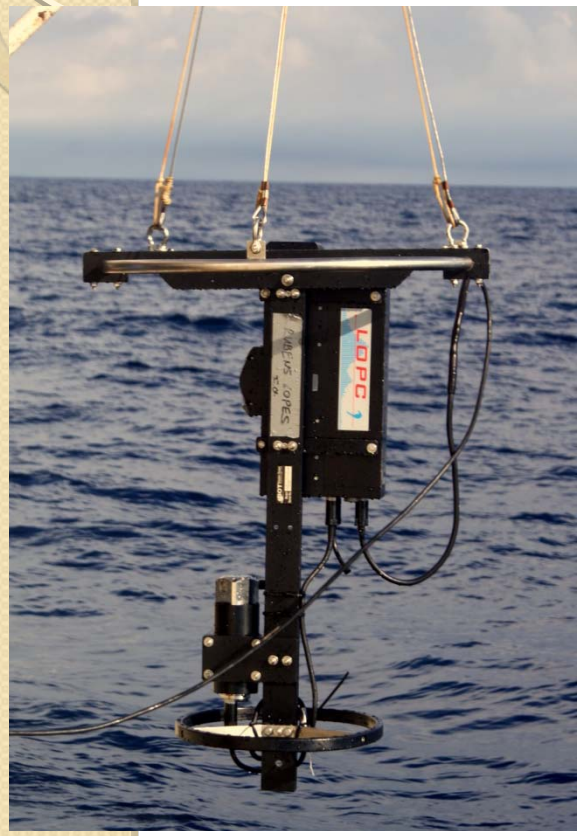
Introduction

- Objectives:
  - The aim of this study was to evaluate zooplankton abundance and biomass off Rio de Janeiro, Brazil using a LOPC and a ZooScan.

Material & Methods



Material & Methods



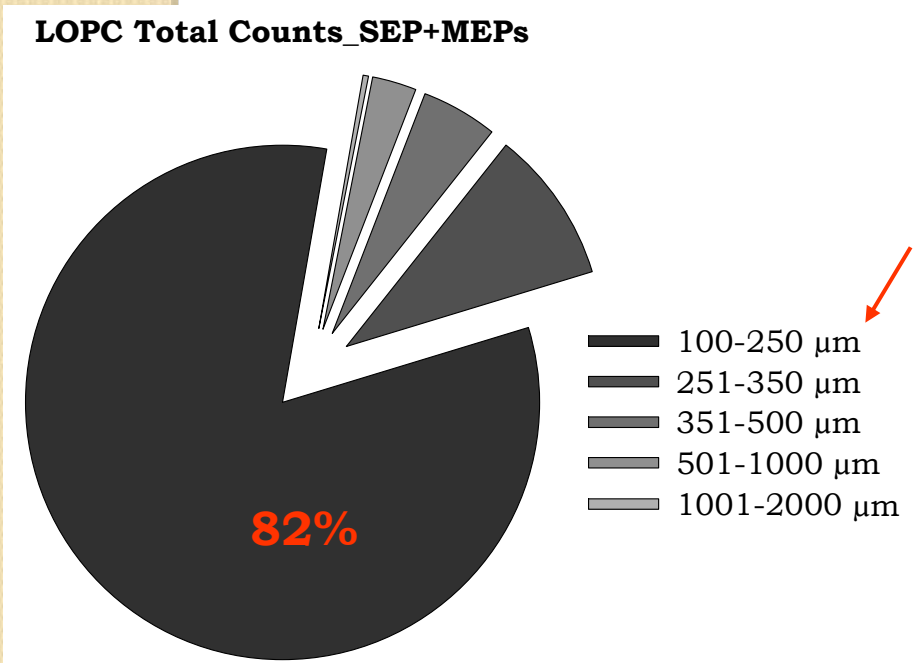
LOPC

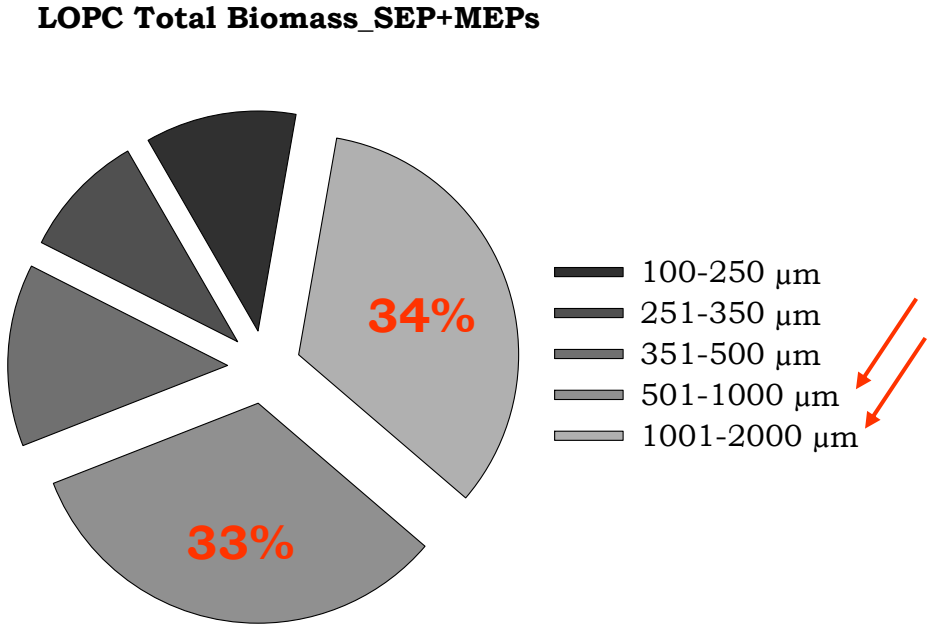
Conical nets
(200 µm)

ZooScan

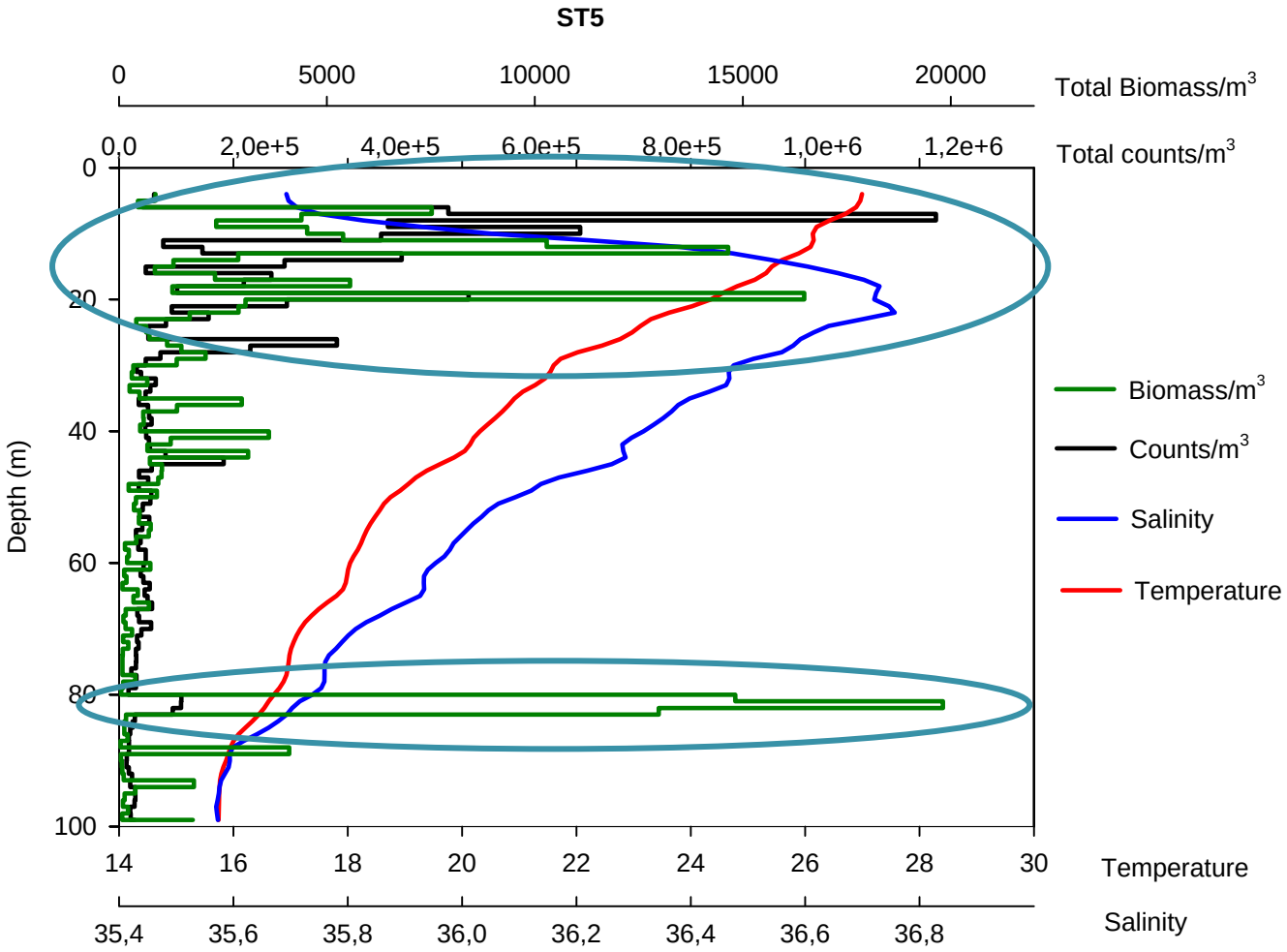
Results

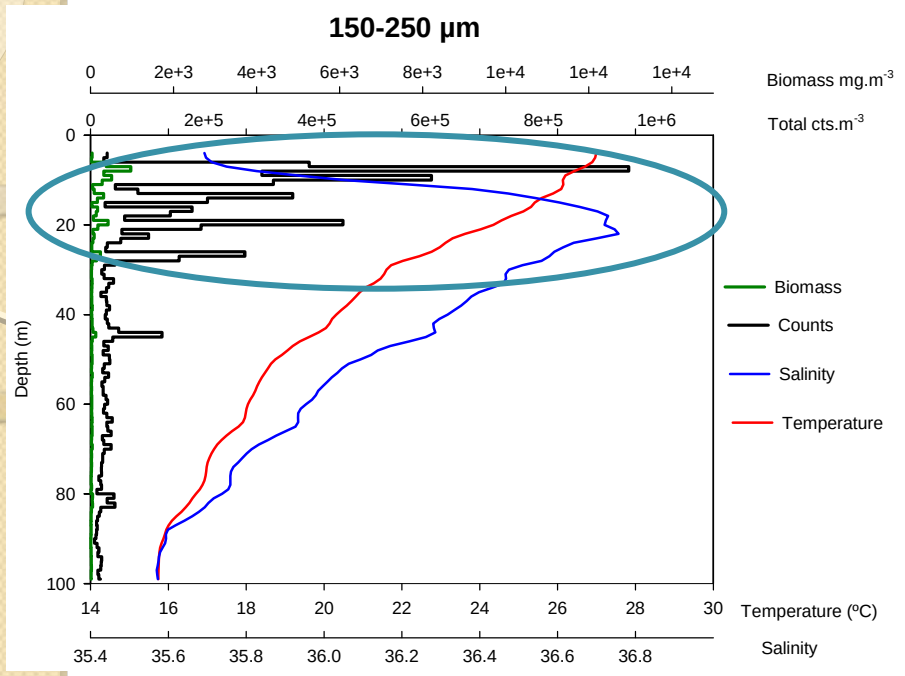
- LOPC: Abundance and Biomass x Particle Size.

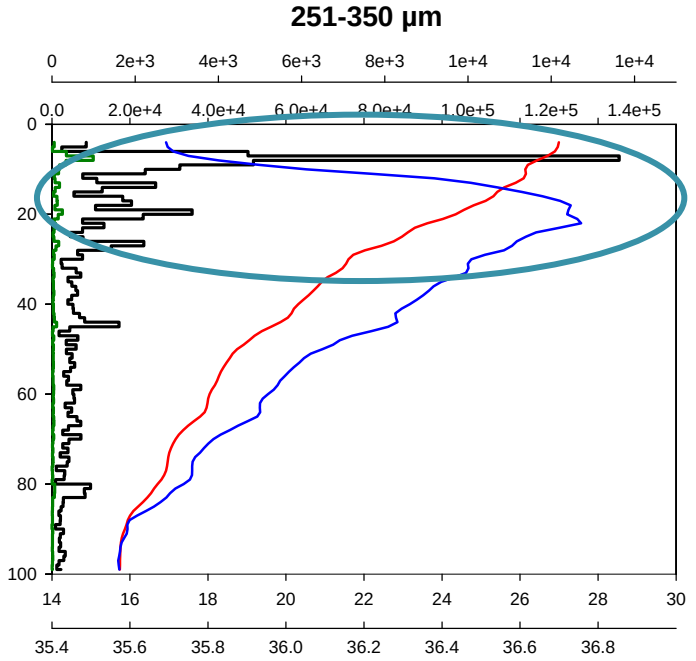


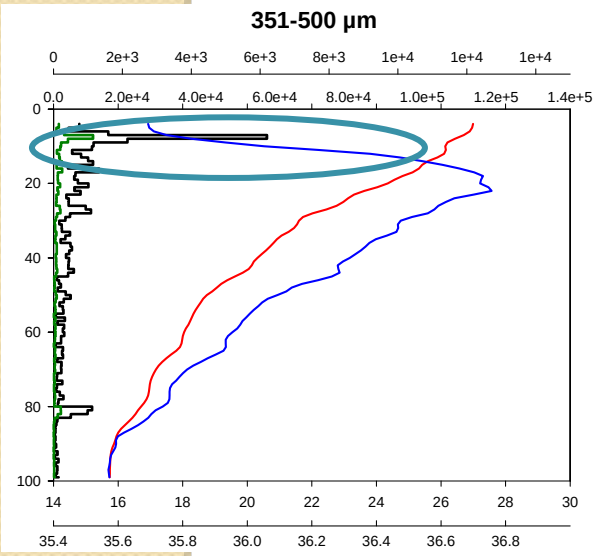


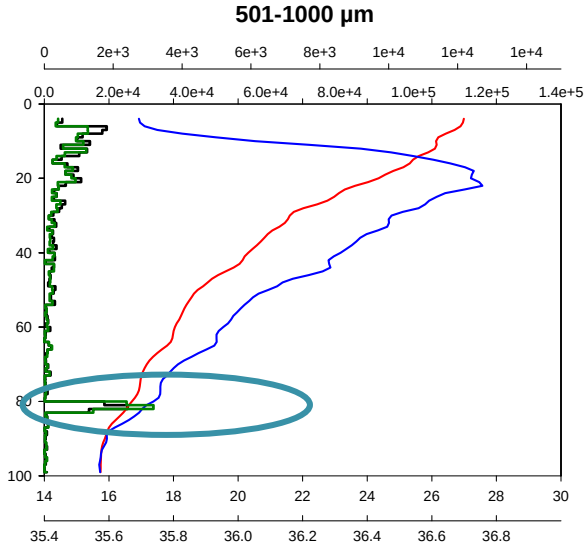
Particles vertical profile

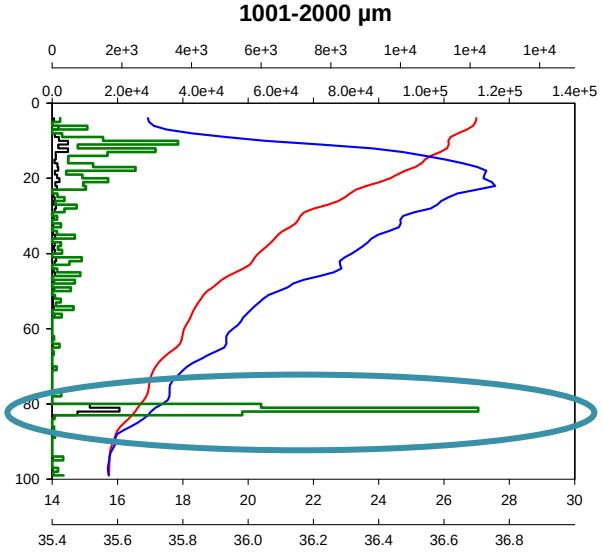



150-250 µm
Biomass mg.m-3
Total cts.m-3
Depth (m)
Biomass
Counts
Salinity
Temperature
Temperature (ºC)
Salinity


251-350 µm


351-500 µm

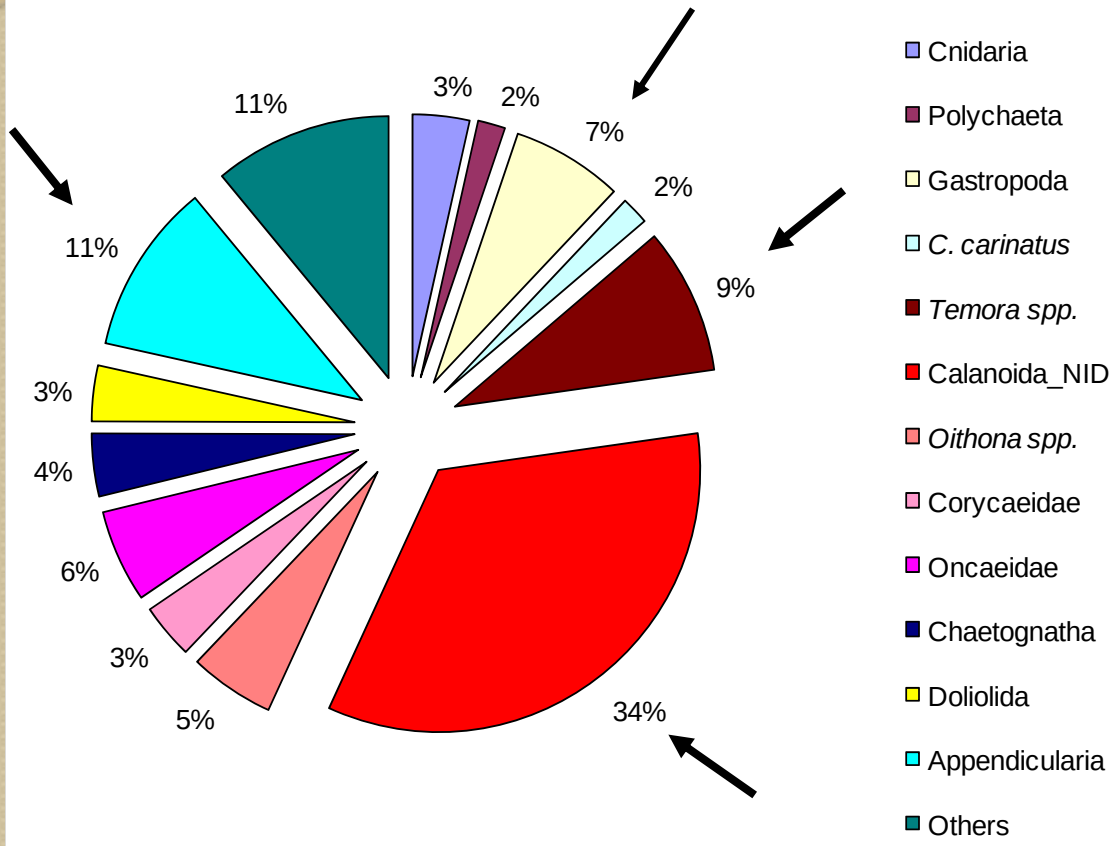

501-1000 µm


1001-2000 µm

Results

350 - 1000 µm (700 µm)

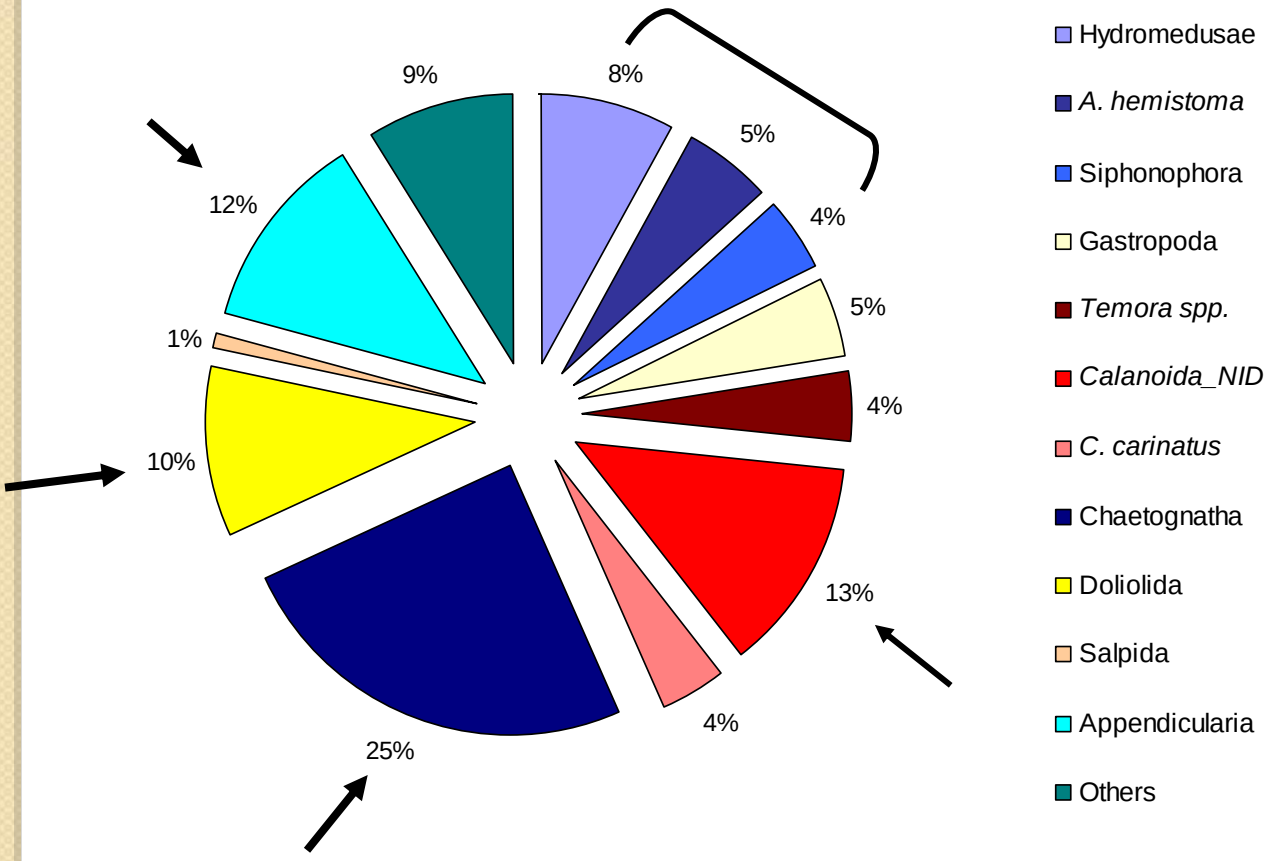
- ZooScan: Relative abundance



Results

350 - 11000 µm (~1500 µm)

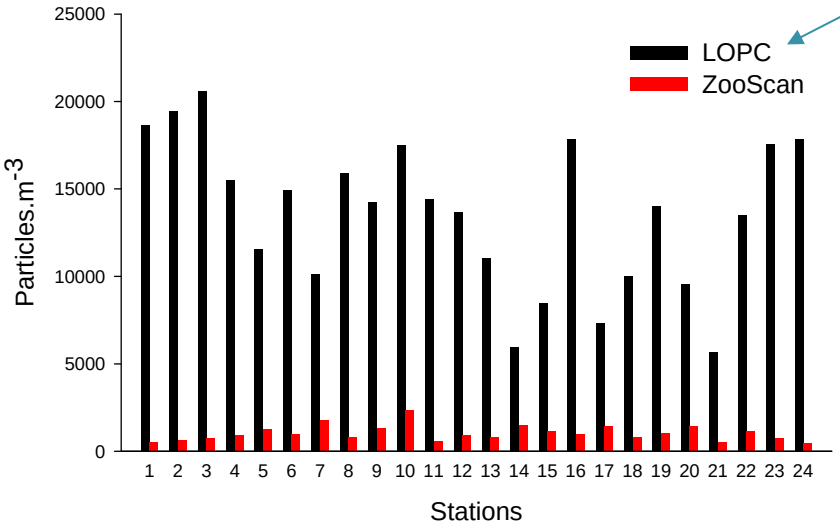
- ZooScan: Relative biomass



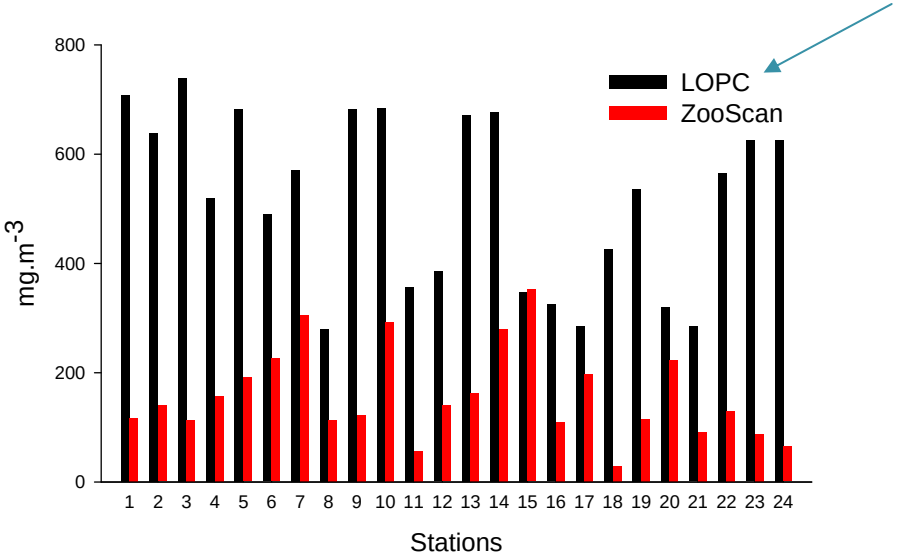
LOPC x ZooScan: Total density and total biomass.

Only particles >250 µm

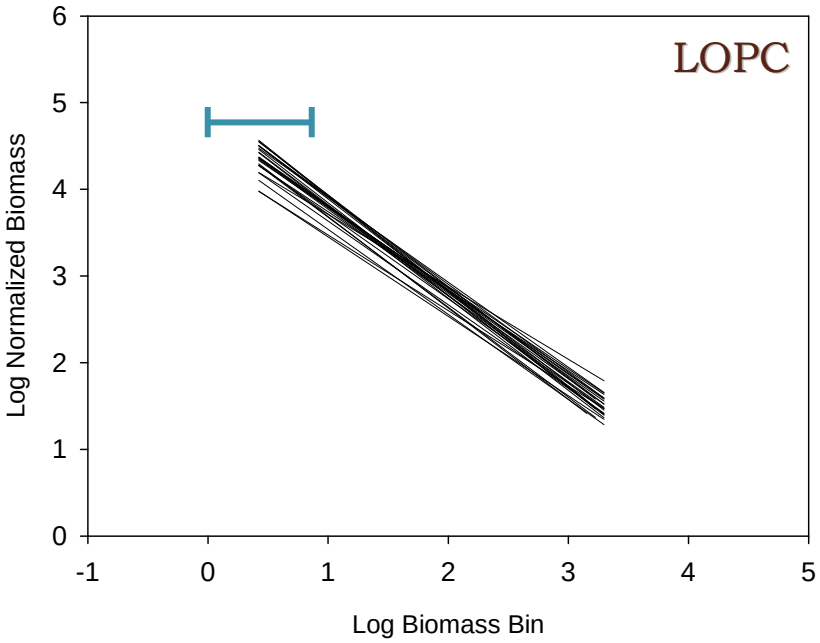
Total Density

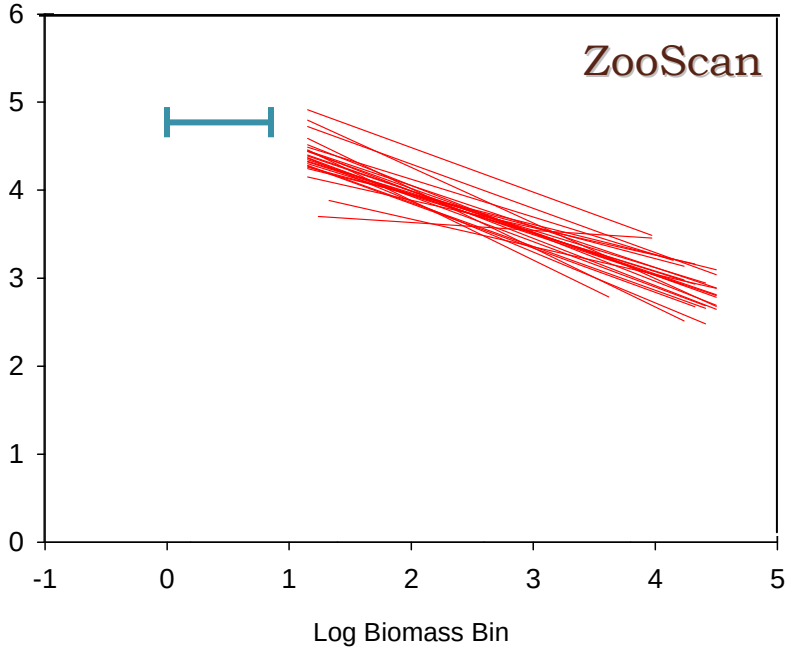


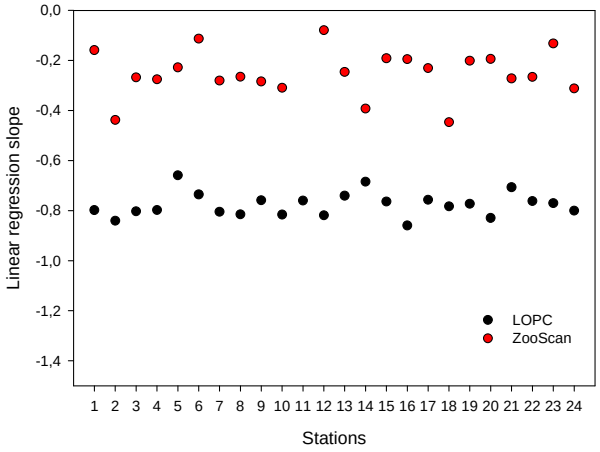
Total Biomass



NBSS



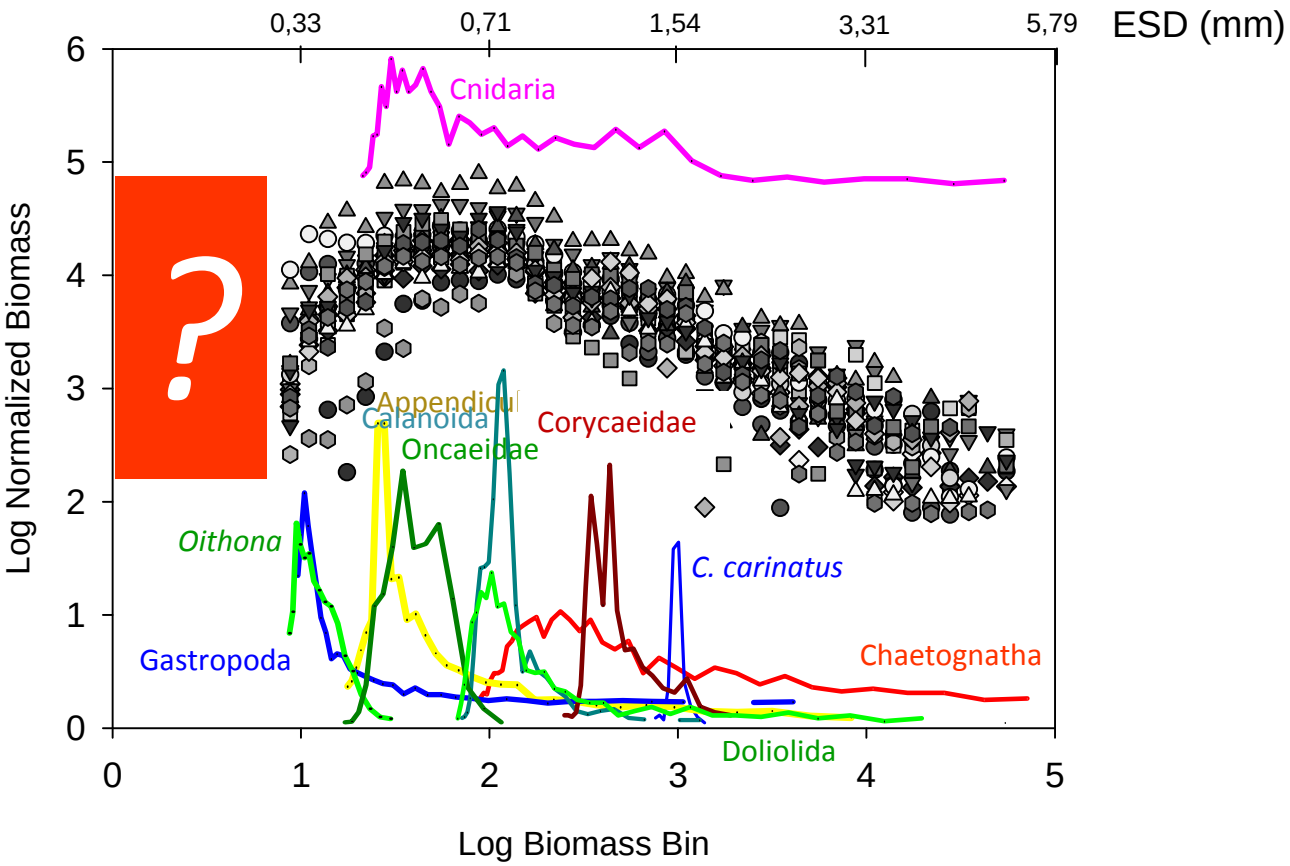




SLOPES

- LOPC: -0.92 to -0.70 (-0.83)
- ZooScan: -0.67 to -0.09 (-0.46)

Dominant groups in the spectra



Next Step…

- Include FlowCam analyzes from 50 µm net samples – who is 150-300 µm.

- To estimate which organism is where in the water column through the combination of these two data sets.

Conclusions

- Although size detection is not entirely coincident in these instruments, both the LOPC and the Zooscan provided useful and rapid results on the zooplankton vertical distribution in the study area.

- The combination of LOPC and ZooScan data has the potential to integrate taxonomy and size-based data in a quickly basis.