

Phytoplankton and zooplankton distribution along the Western Antarctic Peninsula: Implications for food web dynamics

BACKGROUND

- Montes-Hugo *et al.* (2009) and Mendes *et al.* (2013) found recent shifts in phytoplankton distribution associated with climatic variables; the former mapped abundance via satellite-derived chlorophyll concentrations
- Atkinson *et al.* (2004) noted increasing salp and decreasing krill stocks on a decadal scale

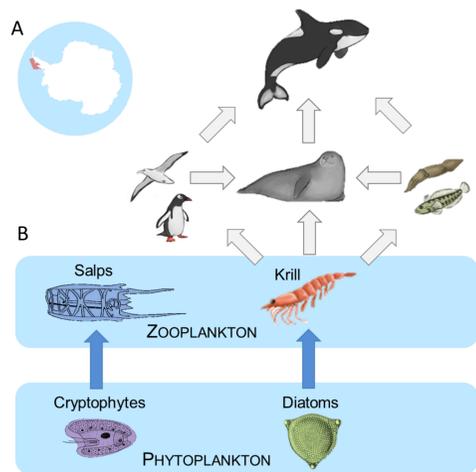


Figure: (A) Inset map depicting the Western Antarctic Peninsula study area in pink. (B) Representative Antarctic food web highlighting the lower trophic levels. The foundation are phytoplankton; large diatoms are consumed by krill, and smaller cryptophytes are consumed by salps. Salps are a dead end in the web while krill offer nutrition for higher trophic levels. Shifting abundances and distributions at the lower levels have consequences for the entire food web.

QUESTIONS

Horizontal comparisons: populations at the same level

Phytoplankton: Do cryptophytes and diatoms co-exclude each other?

Zooplankton: Do salps and krill co-exclude each other?

Vertical comparisons: populations through the food web

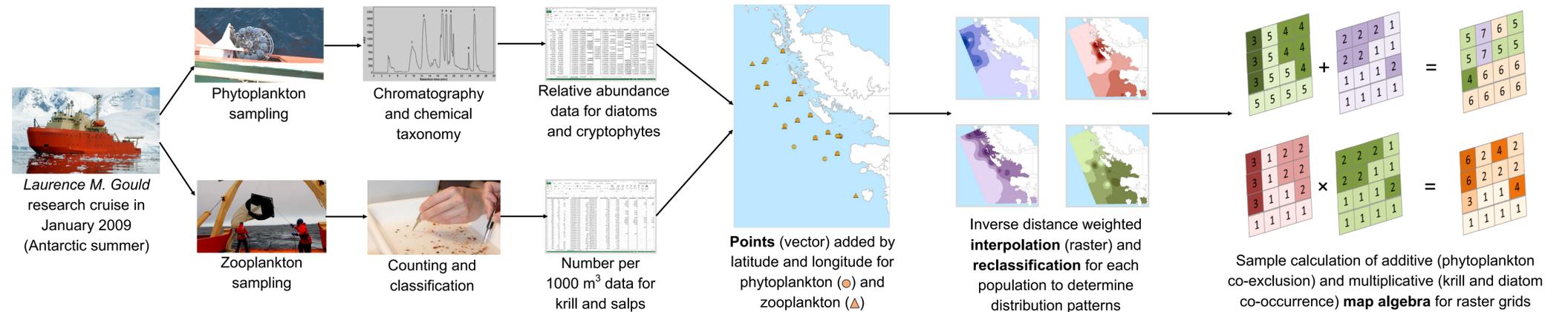
Do diatoms and krill co-occur?

Do cryptophytes and salps co-occur?

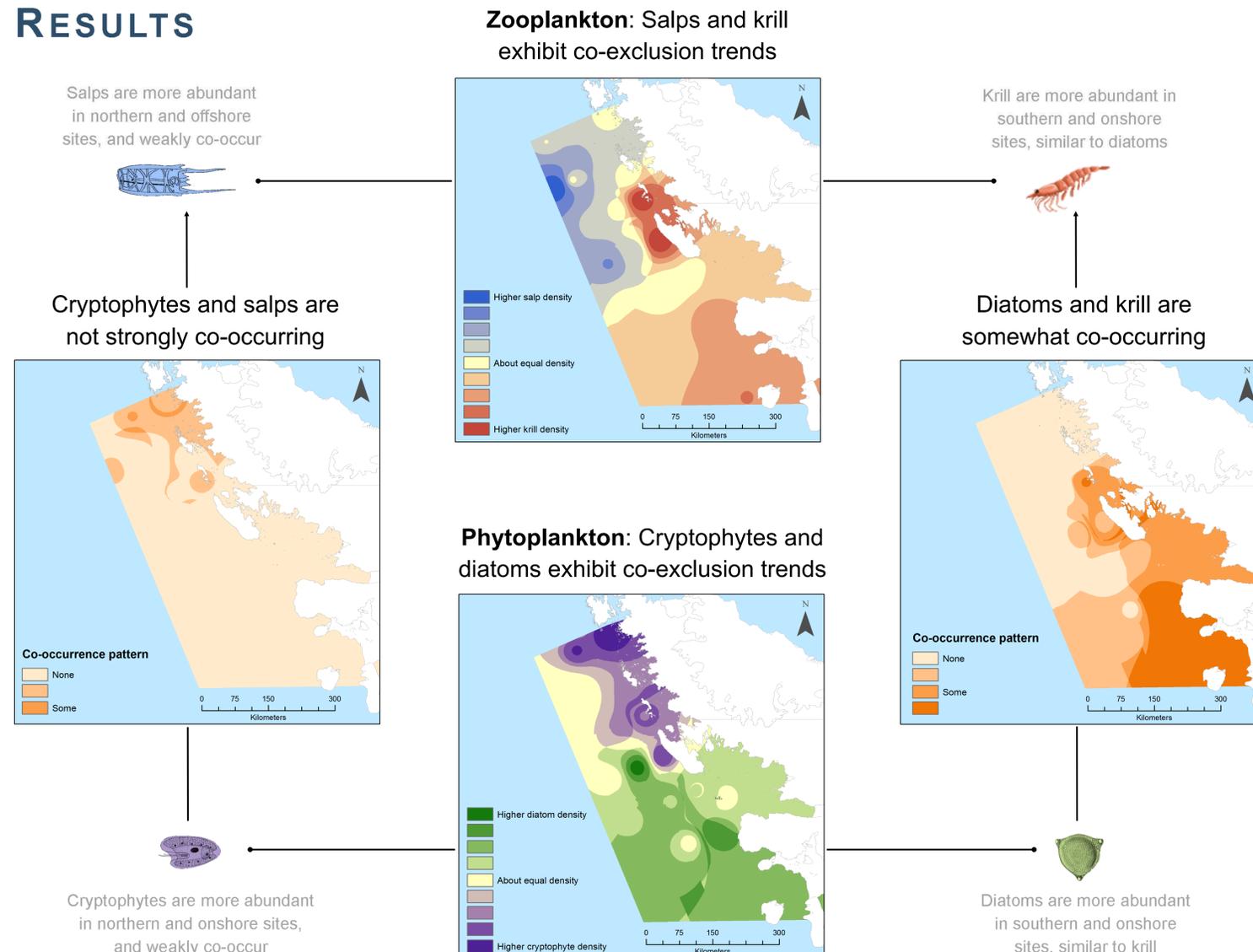
Hypothesis

Horizontal comparisons will show segregation into areas of higher abundance and vertical comparisons will show areas with correlation between predator and prey

METHODS



RESULTS



CONCLUSIONS

- This project established distribution patterns and correlations for populations whose abundance is important to higher levels in the Antarctic food web
- Future work can investigate temporal changes, correlations with seabirds and mammals, and potential driving of distribution by sea ice, temperature, salinity, or depth

REFERENCES

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