

I CONVEGNO ISTITUTO DI SCIENZE POLARI

# Ecosystem indicators from cumulative biomass curves in the Barents Sea – AT5

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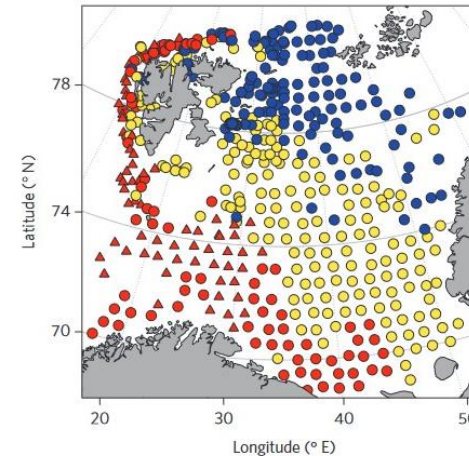


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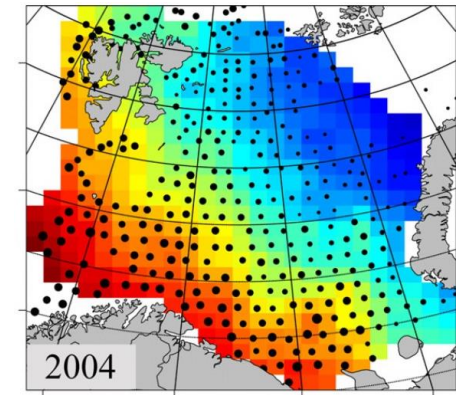
# Introduction

- Climate change-driven shift in communities (a; Fossheim et al., 2015)
- Differences in assemblage life history (b; Wiedmann et al., 2014a)
- Influence on functional diversity (e.g. trends in functional distinctiveness; Wiedmann et al., 2014b)
- Implication for the food-web structure, whose metrics display systematic spatial variation along environmental gradients, separating distinct biogeographic regions (c-d; Korstch et al., 2015; 2019)

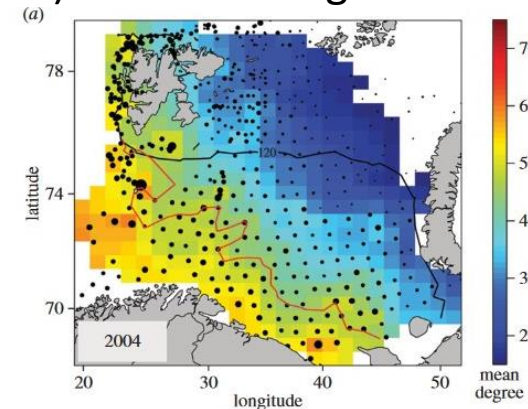
a) Assemblage type



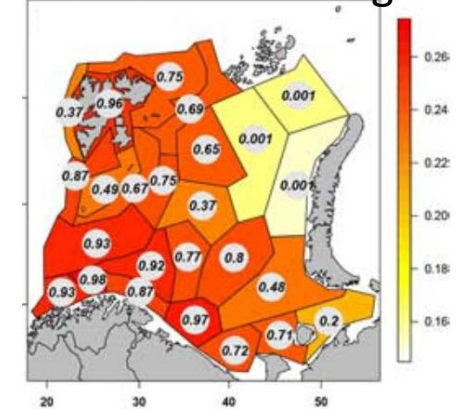
b) ranking of life history speed



c) no. of feeding links

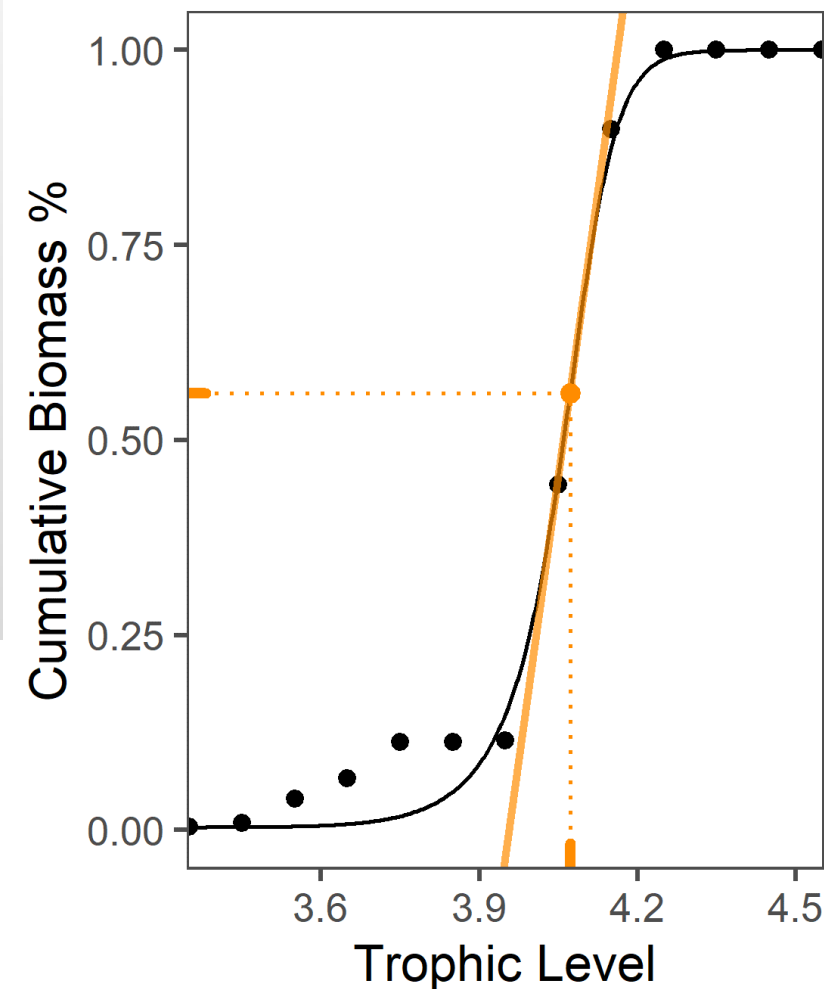
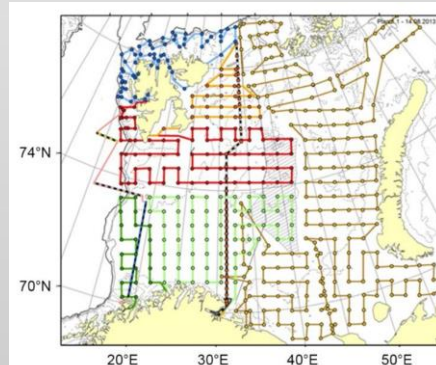


d) Food-web clustering



# Trophodynamic indicators

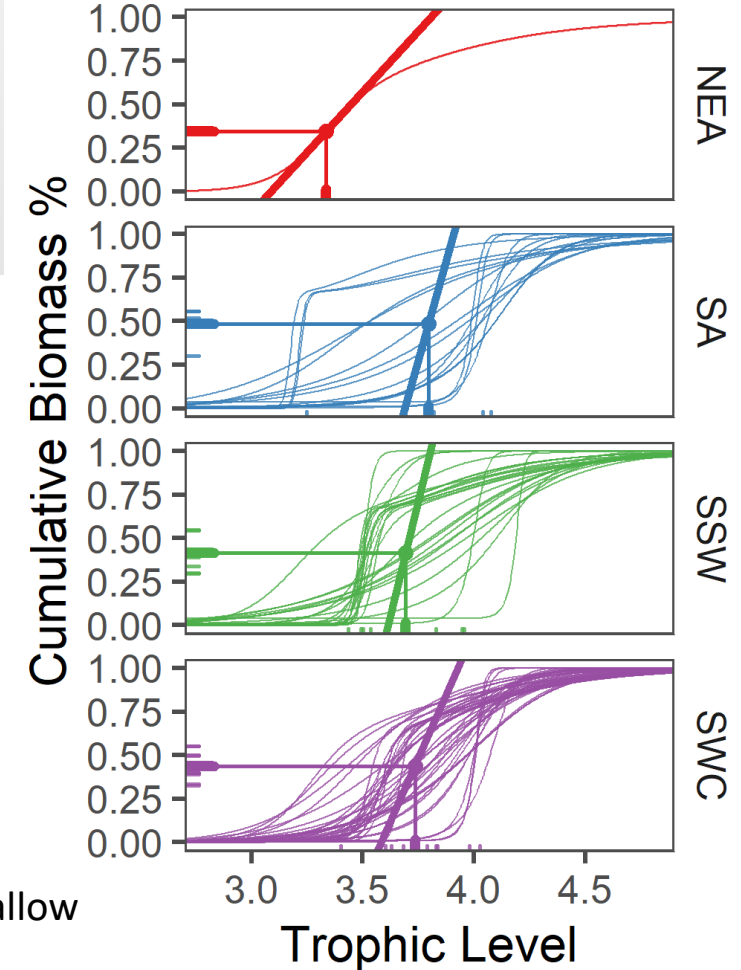
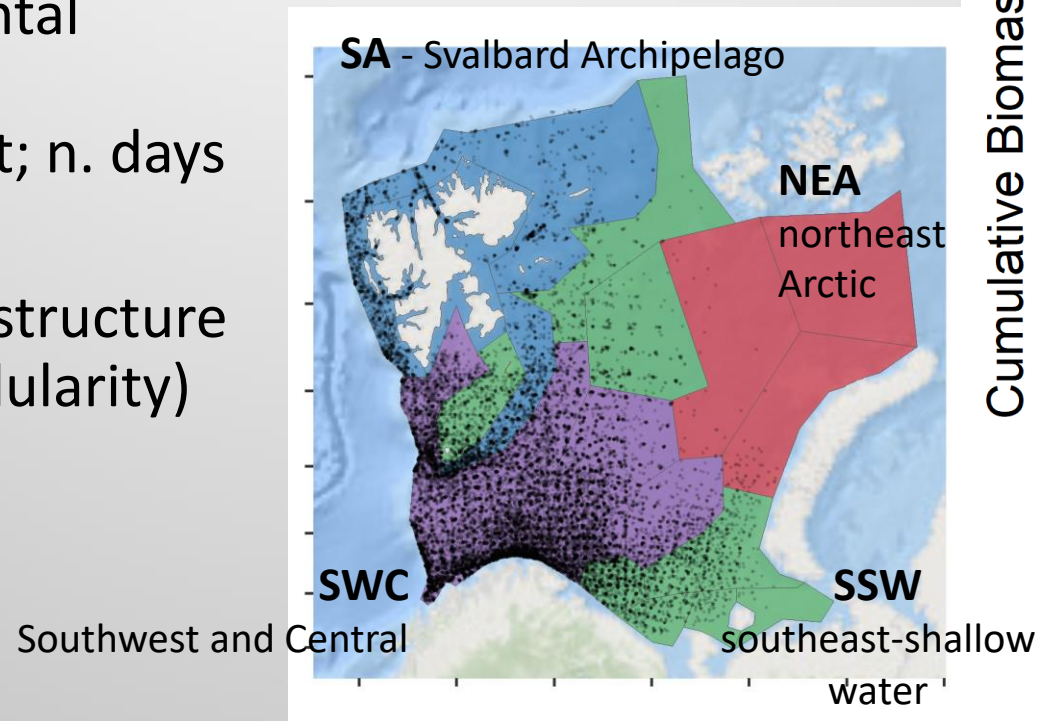
- Theoretical background: biomass accumulation that is (log-) normally distributed across TLs and transfer efficiency limited up in the food chain (Link et al., 2015; Pranovi et al., 2020)
- S-shaped curves describe this emergent pattern at ecosystem level and derived indicators respond to anthropogenic pressures
- The aim of this work is to explore the application of this approach to the Barents Sea using data from the bottom trawl surveys carried out by the Norwegian Institute of Marine Research (IMR; Djupevåg et al., 2018)





# Trophodynamic indicators in the Barents Sea

- S-shaped curves: consistency with theory
- Differences among regions
- Correlation with environmental conditions (water temperature/inflection point; n. days ice/ steepness variability)
- Correlations with food-web structure (e.g. decrease in slope modularity)



# Future developments

- Describe spatio-temporal dynamics (1984-present IMR data)
- Explore the role of key species
- Link with functional diversity and food web topology
- Influences of environmental characteristics
- Test the responsiveness to anthropogenic pressures