

Long term regulative effects of Atlantic climatic factors on Archipelago Sea zooplankton biomass

– a comparison with terrestrial arctic butterflies by Heta Rousi, Julia Fält-Nardmann, Pekka Niemelä & Jari Hänninen (Univ. of Turku)

Project goals and methods

1st Year

Applying of Generalized linear mixed models (GLIMMIX) to investigate the impacts of climatic control (e. g. Winter NAO index, n:o of Ice days, Baltic Regime shifts) on Archipelago Sea zooplankton biomass time series in 1966-2019.

2nd Year

Conducting of comparative research with an identical study of arctic terrestrial butterfly biomasses during the same time frame → **Synthesis** of parallel regulation mechanisms.



Figure 1. *Acartia* spp. and *Bosmina longispina maritima* individuals under inverted microscope.

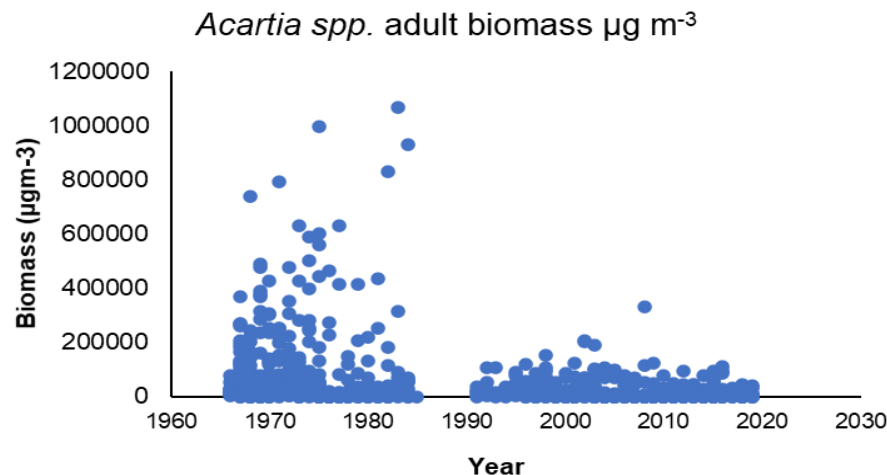


Figure 2. Biomass development of *Acartia* spp. adults in the Archipelago Sea, SW Finland during 1966-2019.

Preliminary results and questions

- Overall zooplankton biomass has decreased markedly in the Baltic Sea during the last 50 years.
- Especially species of marine origin such as *Centropages hamatus*, *Temora longicornis*, *Acartia* spp. and *Evadne nordmanni* have decreased in biomass.
- Other species of brackish or limnic origin such as *Eurytemora affinis* or *Limnocalanus macrurus*, have increased in biomass.
- Based on earlier studies we know that temperature and salinity strongly affect the zooplankton species in the Baltic Sea.
- We are interested, besides of further biomass changes of aquatic zooplankton, to find out whether the Atlantic climatic factors regulate terrestrial arctic butterfly species in similar ways.

Reference: Hänninen, J. 2022. The Baltic Sea Ecosystem Regulation Mechanism. Environmental Analysis & Ecology Studies 9(5). doi: 10.31031/EAES.2022.09.000721.



Figure 3. The field station of Archipelago Research Institute / Turku University on the island of Seili, SW Finland.