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Baltic Sea mesozooplankton study

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Introduction

Coastal ecosystems, are some of the most biogeochemically active domains of the biosphere, receiving large nutrient inputs from both, land and sea, and supporting active microbial life and production. Dynamics and eutrophication of the coastal ecosystems, particularly over the last half of a century, have become of growing concern from the management and policy perspective, since complex interactions between the biological components of the coastal systems modify the response of individual systems to climate variability and change, increasing or decreasing nutrient loading and fishing and make these systems difficult to manage. Monitoring programs have been initiated worldwide to keep track of most important changes in the primary and secondary producers and fish yields, some of those programs running for > 4 decades now.

Monitoring programs

Major problem with any long-term monitoring programs is that these are very expensive to maintain, and require constant societal interest and support to warrant sufficient funding. When considering the high cost of collecting and processing the samples, optimization of the sampling program to maximize the informational value of the time series, is desired. Despite of that, not many guidelines exist for deciding on the spatiotemporal design of the monitoring of biological variables, mostly because of the lack of extensive scientific basis for deciding on the most optimal spatial and temporal frequency of data collection. To estimate the optimal sampling frequency, seasonally and spatially, for coastal zooplankton data, high number of data points with high spatial and temporal frequency would be required.

Scope of the study

Marine monitoring programs in the Baltic Sea have been running roughly since the 1960s, and large amount of data has already been processed and collected, although not yet compiled and harmonised, to be usable for more fundamental analyses. Compilation of raw zooplankton data has been initiated, and to date, > 16 000 profiles (>24 000 samples) of zooplankton communities have already been harmonised and merged into one master dataset, facilitating analysis of the spatiotemporal dependencies in the most common members of zooplankton community. From the spatiotemporal autocorrelation patterns of selected biological variables the suggestions of optimal sampling design over space and time for the long-term zooplankton monitoring will be derived. The data allow several other types of analysis and may thereby serve as a valuable source to investigate spatial ecology of zooplankton, top-down and bottom-up interactions with other trophic levels, or relation to regional/global drivers such as climate variability and change.

Invitation to participate

Anybody interested to participate in the Baltic zooplankton study, by contributing own data, helping to define further research questions and assist in results interpretations (and thereby becoming a co-author of research paper(s)), should contact Riina Klais (riina.klais@ut.ee). This activity is not directly financed neither from INSPIRE nor from BIO-C3, but having high relevance to both projects objectives, it is encouraged and supported by both consortia.

Table 1. Compiled zooplankton data

Provider	Region	Years	Number of profiles/number of samples
Estonian Marine Institute, University of Tartu (UT-EMI, Tallinn). Contact Riina Klais	Estonian coastal waters, Gulf of Riga, Gulf of Finland	1957-2011	8800/12314
Atlantic Research Institute of Fisheries and Oceanography (ATLANTNIRO, Kaliningrad). Contact Anna Semenova	Vistula and Curonian Lagoon, Southern Baltic Proper	1995-2013	1895/2029
National Marine Fisheries Research Institute (NMFRI, Gdynia). Contact Piotr Margonski	Southern Baltic Proper, Gulf of Gdansk	2002-2013	590/590
Finnish Environmental Institute (SYKE, Helsinki). Contact Maiju Lehtiniemi	Baltic Sea (all basins)	1979-2011	483/1345
Latvian Institute of Aquatic Ecology (LIAE, Riga). Contact Anda Ikaunieca	Gulf of Riga	1993-2005	128/128
Institute of Food Safety, Animal Health and Environment, (BIOR, Riga). Contact Gunta Rubene	Gulf of Riga, Baltic Proper	1958-2012	2668/6185
Swedish Meteorological and Hydrological Institute (SMHI)	Baltic Proper and Kattegat	1979-2012	1242/1501

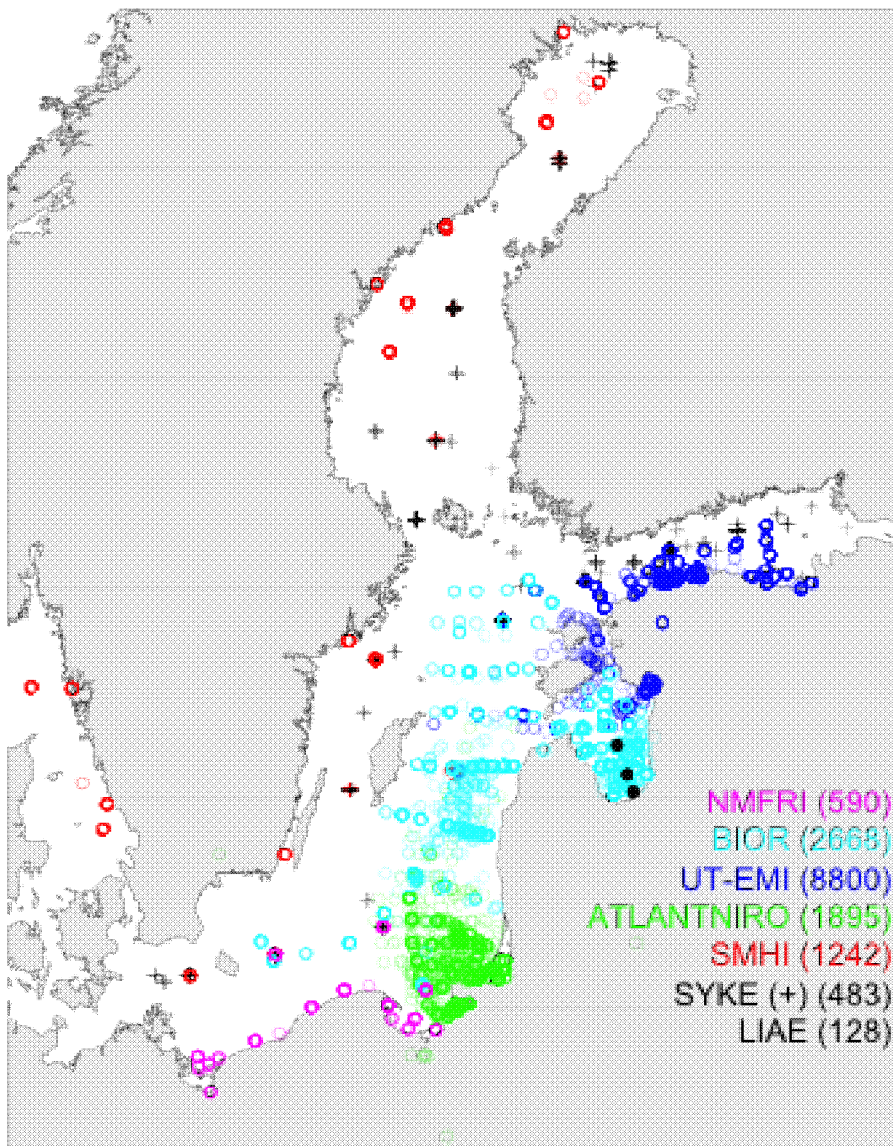


Figure 1. Spatial coverage of data by providers. Refer to Table 1 for abbreviations of data providers. In parentheses, number of profiles contributed by each provider is given.