



## **Reconstructing atmospheric surface data of the 20th century to force of a coupled sea ice- ocean model of the Baltic Sea**

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A statistical model is developed to reconstruct atmospheric surface data for the period 1902-1998 to force a coupled sea ice-ocean model of the Baltic Sea. As the response time scale of the Baltic Sea on freshwater inflow is of the order of 30-40 years, climate relevant model studies should cover at least century long simulations. Such an observational atmospheric dataset is not available yet. We devised a statistical model using a Redundancy Analysis to reconstruct daily sea level pressure (SLP) and monthly surface air temperature (SAT), dew-point temperature, precipitation, and cloud cover of the Baltic. The predictor fields are daily SLP at 19 stations and monthly coarse gridded SAT and precipitation available for the period 1902 to 1998. The second input is a gridded atmospheric data set, with high resolution in space and time, based on synoptic stations, which is available for the period 1970-2001. Spatial patterns are selected by maximizing predictand variance during the “learning” period 1980-1998. The remainder period 1970-1979 is used for validation. We found the highest skill of the statistical model for SLP and the lowest skill for cloud cover.

The talk focuses on the reconstruction of the atmospheric surface data but also some selected results of hindcast simulations with a 3D coupled ice-ocean model for the Baltic Sea will be presented.