



## **Reconstructing the annual maximal ice cover extent in the Baltic Sea (MIB) during the 16<sup>th</sup> and 17<sup>th</sup> century**

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This study reconstructs the ice seasons in the Baltic Sea area for the period 1500-1719. The reconstruction is based on a time series of maximum annual ice cover extent in the Baltic Sea (MIB) covering the period 1720-1995. To extend the MIB series back in time a gridded Northern Europe sea level pressure (SLP) data set covering the period 1500-1995 was used. From the gridded data set indices that describe the geostrophic velocity field and the rotational components of the atmosphere were calculated. Decomposition like this provides information about the entire SLP-field. A simple statistical model, based on multiple regression methods, was then employed to develop a statistical relationship between the MIB series and changes in atmospheric circulation. The statistical model was calibrated and validated during the period 1720-1995 with good results. The statistical relationships developed by the model were assumed stationary which allows the circulation data to extend the MIB series back in time. A wavelet analysis of the reconstruction showed that the variability on all scales is comparable to the original time series. The result was subsequently found to be in good agreement with documentary data regarding winter severity in Northern Europe.