Influence of the temperature and wind on Baltic Sea level in the instrumental period

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Sea-level time series from the Permanent Service for Mean Sea Level in the last century have been statistically analysed jointly with meteorological data. The sea-level time series show a clear downward trend in the Northern Baltic Sea and a weaker, but discernible, upward trend in the Southern Baltic Sea. The behaviour of sea-level shows, however, clear differences between the summertime and wintertime (Fig. 1).This points to an influence of long-term climate factors that cannot be ignored. For instance, the downward trend in wintertime at the northern stations disappears from the year 1960 onwards, in some of them (e.g. Helsinki), this trend is reversed. Additionally, large decadal deviations from the long-term trend are clearly discernible.

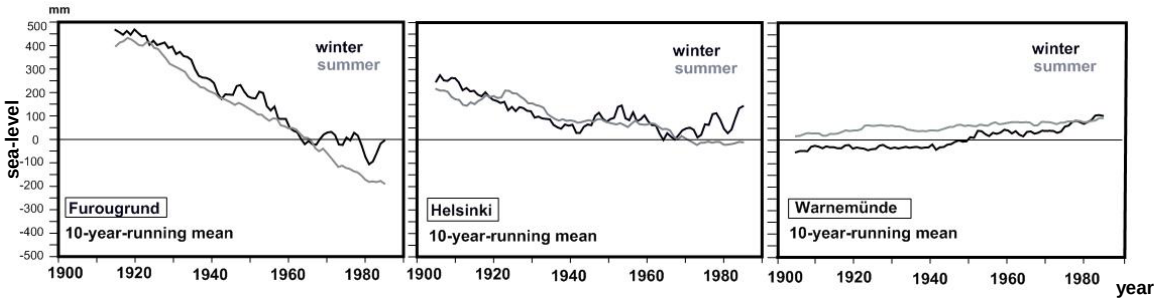

Fig. 1 Sea-level time series 1900-1990

Our present work is aimed at trying to explain these deviations from a linear, long-term trend, through the influence of climatic factors. An empirical regression model between sea-level and sea-level-pressure can explain most of these deviations, although not completely. The influence of the atmospheric circulation is most important in wintertime and in the Northern Baltic Sea, and weaker but non-negligible in summertime and in the Southern Baltic Sea. In the former case, the influence of the atmospheric circulation is even comparable in magnitude to the geological land uplift. The mechanisms through which this influence occurs (precipitation-runoff or wind stress) is now being investigated.

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