



Long and Short Term Variability of the Main Physical Parameters in the Coastal Area of the SE Baltic Proper

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The memory of the ocean and seas of atmospheric forcing events contributes to the long-term climate change. Intensifying climate change processes in the North Atlantic region including Baltic Sea has drawn widespread interest, as a changing water temperature has ecological, economic and social impact in coastal areas of the Europe seas.

In this work we analyse long and short term variability of the main physical parameters in the coastal area of the South Eastern Baltic Sea Proper. The analysis of long term variability is based on monitoring data measured in the South Eastern Baltic Sea for the last 50 years. The main focus of the long term variability is changes of hydro meteorological parameters relevant to the observed changes in the climate. The water salinity variations in the Baltic Sea near the Lithuanian coast and in the Curonian Lagoon, a shallow and enclosed sub-basin of the Baltic Sea, were analysed along with the time series of some related hydroclimatic factors.

The short term water temperature and salinity variations were analysed with a strong focus on coastal upwelling events. Combining both remote sensing and in situ monitoring data physical parameters such as vertical salinity variations during upwelling events was analysed. The coastal upwelling in the SE Baltic Sea coast, depending on its scale and intensity, may lead to an intrusion of colder and saltier marine waters to the Curonian Lagoon resulting in hydrodynamic changes and pronounced temperature drop extending for 30-40 km further down the Lagoon.

The study results show that increasing trends of water level, air and water temperature, and decreasing ice cover duration are related to the changes in meso-scale atmospheric circulation, and more specifically, to the changes in regional and local wind regime climate. That is in a good agreement with the increasing trends in local higher intensity of westerly winds, and with the winter NAO index that indicates the change and variations of the atmospheric circulation in the North Atlantic region, including the Baltic Sea area.

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