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Sea level trends for all sections of the Baltic Sea coastline

Kristine S. Madsen (1), Jacob L. Høyer (1), Ülo Suursaar (2), Per Knudsen (3), and Jun She (1)

(1) Danish Meteorological Institute, Copenhagen, Denmark (kma@dmi.dk), (2) Estonian Marine Institute, University of Tartu, Tartu, Estonia, (3) DTU Space, Danish Technical University, Lyngby, Denmark

To better understand influence of sea level rise on societal vulnerability and coastal erosion processes, it is important to know the sea level trend. The coastline of the Baltic Sea is not uniformly exposed, and therefore we will determine the sea level trend of the last 10, 50 and 100 years for all sections of the coastline.

The observational record of sea level in the Baltic Sea is quite unique with several records of more than 100 years of data. However, the information is confined to the tide gauge locations. Here, we utilize a statistical method based on least squares regression and originally developed for short term sea level variability (Madsen et al. 2015, JGR, doi:10.1002/2015JC011070) to spread out the sea level information from selected tide gauges to all sections of the Baltic Sea coast.

Monthly mean tide gauge observations are retrieved from PSMSL and supplemented with Estonian observations. The spatial distribution of the sea level is obtained from model reanalysis from the Copernicus Marine Service and satellite altimetry observations and land rise information is taken into account. Results are validated against independent tide gauges, providing a consistent record of 20th century sea level trends and variability, including uncertainties, for the entire Baltic Sea coastline.

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