

Long-term Sea Level Variability in the Nordic Seas

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Project summary

Many forces in the atmosphere and ocean influence the sea level. Thus the sea level integrates a great number of physical processes in the environment and therefore can be a representative parameter for monitoring of climatic changes. There are more than 30 tide-gauge stations in the Barents, Norwegian and Greenland Seas. Most of these stations show significant changes of the sea level in last two decades. These changes could be a manifestation of global warming in the Arctic together with the increase of the NAO, a decrease of sea ice extent, air temperature rise, warming of Atlantic waters and reorganisation of the thermohaline circulation. In assessing total influences climate change, it is essential to consider each of the various factors, influencing sea level, individually, and to combine their separate contribution to provide estimates of future conditions. It is important to note that comprehensive investigation of sea level change in the Nordic Seas has not been done yet. This proposal, with a well-defined international collaborational component (Norway and Russia), aims to further our understanding of the Arctic climate system by (1) identifying links among atmospheric, cryospheric, and oceanic processes, (2) quantifying the regional and temporal variability of relevant processes in terms of sea level response, (3) determining the relative importance of each factor influencing sea level change under global warming conditions. Observational data analyses in combination with a numerical model results will provide a basis for this research. In the frame of proposed project we will prepare joint Russian-Norwegian sea level data set, give access to previously unavailable historical data from some important points and also new sea level records, restarted by Russia in the coastal zone of the Barents Sea during IPY. We are planning to support Russian PhD student research related to analysis of long-term variability of sea level in the Nordic Seas.