



Changes in extreme sea levels in the Baltic Sea

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A newly developed shallow water model for the Baltic Sea and North Sea is presented. The model is validated by means of a comparison with hindcast simulations with observational data sets. The aim of the development is to provide and apply a modelling tool to model extreme sea levels in the Baltic Sea, Kattegat and Skagerrak. The model approach will support the direct analysis of extreme sea level observations in the past and provide the possibility to extend the statistical data base by producing very long time series or very large ensembles of coastal sea levels. This effort is intended to contribute to an assessment of risks due to storm surges and coastal flooding in the 21st century along the coast of Sweden. By using different RCP climate scenarios downscaled with a regional, coupled climate model atmospheric forcing is available to project possible changes in extreme sea levels into the future. Projected sea level rise, changes in dynamical sea level in the North East Atlantic and tidal forcing in the northern North Sea are applied as boundary condition which allows to investigate their impact on the dynamics of regional sea level variability. Initial experiments focus on the impact of model resolution, resolution in the atmospheric forcing and the amount of details necessary in the bathymetry to faithfully model coastal sea level in the Baltic Sea and North Sea.