



A coupled regional atmosphere-ocean model to assess the risk of future storm surges in the North Sea

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Although various studies on storm surges in the North Sea region suggests an increasing trend towards the end of this century, other studies find no significant trend. This obvious contradiction proves that there still exists a large uncertainty associated with the prediction of the future extreme storm surges. A comparatively high resolution coupled ocean-atmosphere model is considered to provide additional benefits in studying the detailed air-sea interaction patterns. The present study focuses on the development of a high resolution regional coupled ocean-atmosphere climate model system for the North-Sea region, aiming to a better representation of the observed mid-latitude storm events in the 20th century. The oceanic component of the model system consists of the Regional Ocean Modeling System (ROMS), whereas the Weather Research and Forecasting (WRF) Model is used to represent the atmosphere. Using a one-way nesting approach, an intermediate-scale setup for the northeastern domain of the Atlantic Ocean (0.5° resolution) will be used to communicate between forcing fields from global modelling experiments and the regional model for the southern North Sea (0.1° resolution). Further, the most likely range of future extremes in the storm intensity and frequency for the southern North Sea will be quantified using a range of available AR4 projections. As a first step towards this development we will present results from the ocean model for the 20th century.