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Estimation of storm surge potential under anthropogenic climate change for the German Bight by means of high resolution storm simulations

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Storm surges in the German Bight are a major hazard in the Central European area affecting the coast of Germany as well as the coastlines of its neighbouring states. This study aims at the estimation of possible anthropogenic induced changes of the meteorological storm surge potential in the German Bight. In a first step, from historical observations and reanalysis date relevant storm situations for surges are identified, its typical time development and horizontal distribution investigated, and as far as possible catalogued.
The storm surge climate of the German Bight is characterised by specific meteorological conditions, necessary for the genesis of sever surge events. Especially, the surface near wind direction, wind speed and their time developments are of crucial importance.
In order to estimate the level of any surge, a higher time and spatial resolution than widely delivered by global reanalysis and climate model simulations is needed. Thus, in this study high resolution regional model simulations for the identified potential and real situations are performed, leading to high spatial and time resolved information. Analogue, for future climate states following the SRES A1B scenario, large scale surge prone situations will be identified and downscaled by RCM episode simulations. This will lead to estimates of potential climatological changes of the driving meteorological conditions for storm surges.