

## **Hybrid Approach for the Assessment of Changes of Extreme Waves at the German Baltic Sea Coast on the Basis of Regional Climate Model Data**

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### **Abstract**

One of the most important effects of climate change on the near-shore hydrodynamics are changes of the local sea state caused by changes of the local wind field over the sea. Possible changes of extreme wave events can reduce the effectiveness and safety of coastal and flood protection structures under storm conditions, hence have to be taken into account for the development of future adaptation measures of the constructions.

A combined statistical-numerical approach is used for the calculation of transient time series of significant wave heights for the time period 1960-2100 on the basis of wind conditions from runs of the regional climate model Cosmo-CLM. The time series are calculated for two realisations each of the SRES-emission scenarios A1B and B1. Finally the log-normal extreme value distribution is used to calculate extreme wave events with a return period of 200 years from time periods of 40 years.

The future changes of the extreme wave heights are different along the German Baltic Sea coast and are depending on the SRES-emission scenario and the projection period. Increases and decreases of the extreme wave heights are within a range from +14% down to -14% and no robust trend is found for the changes.