



## **Storm surge and wind conditions for the North Sea under AR5 projections**

Iris Grabemann, Lidia Gaslikova, Nikolaus Groll, Elke M. I. Meyer, and Ralf Weisse  
Institute of Coastal Research, Helmholtz-Zentrum Geesthacht, 21502 Geesthacht, Germany

Future changes in storms and storm-related extreme water levels associated with changes in low pressure systems and additionally a rise in mean sea level may enhance coastal risks and endanger marine industry. Results from water level projections for the North Sea under IPCC AR5 RCP 8.5 scenario have been analyzed in terms of stormy conditions. As the wind is a key factor for storm surge development and extremes, the future alterations of the wind fields driving the hydrodynamic model to simulate water levels in the North Sea have also been investigated.

Spatial variations and changes in magnitude within and toward the end of the 21st century will be discussed for both the wind and storm surge fields. Seasonal changes and shifts in the occurrence of extremes will also be presented. By comparing these results to findings from IPCC AR4 A1B and B1 scenario projections the new RCP 8.5 projections will be put in relation with the fairly well assessed AR4 projections to better estimate uncertainties. A case study shows that in the second half of the 21st century a mean sea level rise associated with the RCP 8.5 scenario becomes at least as important as wind-induced future changes in water level extremes derived from the AR5 and AR4 projections.