



## **Climate change scenarios for storm surges in the North Sea**

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Anthropogenic climate change may cause long-term changes in the storm conditions of the North Sea. This could lead to an increased endangerment of human safety and activities. To estimate possible future wind-induced changes of the water levels, the effects of four transient climate realizations for 2001-2100 are analysed in comparison to control simulations presenting conditions for 1960-2000. Regionalized pressure and wind fields (regional climate model CLM) from the global control and four climate realizations (global circulation model ECHAM5/MPIOM), which consist of combinations of two scenarios of future emissions (IPCC A1B and B1) and of two different initial conditions, are used to force the circulation model TRIM for the North Sea. The analysis of future wind-induced changes of the water levels is focussed on extreme values. Special emphasis is given to the German Bight (SE North Sea). Comparing the 30-years averages of the annual 99 percentiles of the wind-induced water levels of the four climate realizations for 2071-2100 to the values of the two control climates for 1961-1990, a small tendency towards an increase is inferred for all climate change realizations. These results are consistent with those of previous investigations e.g. by Woth et al. (2006) or Woth (2005) using other emission scenario/model combinations. Furthermore, our study suggests that, considering the whole time series (1960-2100) for selected areas, this tendency is superimposed with strong fluctuations on time scales of decades. Uncertainties related to emission scenarios but also to initial conditions will be discussed.