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Attribution of storm surge events in the Baltic Sea

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In November 1995 and 2006 severe storm surges occurred along the German Baltic Sea coast. Water level heights of 1.8 m above sea level were observed at tide gauges in German coastal cities as e.g. Wismar and Flensburg. Within the attribution science an interesting aspect to consider is whether individual extreme events of e.g. heat waves, droughts or storm surges can be related to human-induced climate change or natural climate variability. The question arises whether these individual storm surges of 1995 and 2006 in the Baltic Sea have changed due to human influence on climate or whether the knowledge is still too vague to obtain robust information of attribution.

We explore this question using two 15-member ensembles of Hadley Centre Global Environmental Model version 3-A (HadGEM3-A) as atmospheric forcing data for the regional ocean model TRIM-NP to downscale with 12.8 km spatial resolution and to calculate water level in the Baltic Sea. The ensemble of HadGEM3-A consists of two multi-decadal experiments from 1960-2013 - one with and one without anthropogenic forcings representing the actual and the natural climate respectively. This study, which is part of the EUCLEIA project (EUropean CLimate and weather Events: Interpretation and Attribution), will describe assessments of the human influence on the probability of occurrence of storm surge events in the German Baltic Sea.