



## **Extreme storm tides in the German Bight and their possible amplifications.**

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Coastal protection and utilization planning requires information about the probability of very severe storm tides and their possible modifications under possible changing conditions.

Within the project EXTREMENESS (“Extreme North Sea storm surges and their consequences.”) the possibility and probability of highly unlikely severe storm tide events that are physically plausible and can cause extreme impacts are investigated. For that, a comprehensive dataset of model results for water levels, wind and sea level pressure fields is analyzed. The dataset consists of reconstructions and climate projections. The focus region of the project is the East Frisian coast, in particular the island of Borkum and the Ems estuary. The storm events with the highest water levels were identified and sorted for different coastal location. For Borkum, storm events with water levels higher than measured during the past 100 years were found in the dataset. For the selected severe events the potential of their amplification under slightly modified but physically plausible conditions is investigated.

In the previous thematically related project MUSE („Model-based investigation of storm surge events with low probability of occurrence at the German North Sea coast“.) the amplifications of the observed storm tide events caused by variations in meteorological conditions have been already investigated. In the present study other sources of potential amplification are considered with the focus on variations of magnitude and arrival time of the astronomical tides with respect to the storm events. Several events, namely one with the highest water level found near Borkum, one with the longest period of water level exceeding mean high tide + 1.5m and a chain of storm events will be presented and their potential impact will be discussed.