



External surges in the South-Eastern North Sea.

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The atmospheric influence is one of the key factors defining the sea surface height in the Southern North Sea. Whereas the direct impact of sea level pressure and wind over the North Sea is normally considered, the external surge component, namely the water level variations generated in the North-East Atlantic and at the continental shelf and propagating into the North Sea, is not always taken into account. The main interest in external surges is historically connected to the potential of local storm surge amplification due to coincident high external surge. Previous studies were focused mostly on observed storm events where external surges were estimated by empirical models. In addition, some case studies for selected storm events have been conducted with a dynamic model.

In the present study, the method for explicit separation of external surge from other components contributing to water level is proposed and applied. The climatology of external surges for the past 69 years is constructed by the means of hydrodynamic modeling. This dataset is further used for investigation and description of external surge generation and propagation in the North Sea. The weather situations associated with external surge generation are identified. The contribution of external surges to the total water levels in the German Bight is assessed for different sea surface heights, occurring, for example, during calm as well as stormy conditions.