A Probabilistic Storm Surge Risk Model for the German Coast in the Context of Natural Catastrophe Insurance

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Both the German North Sea and Baltic Sea coast are exposed to storm surges. The North Sea region, which is mainly protected by dikes, was heavily affected by severe events in 1962 and 1976. The Baltic Sea was hit by an exceptional extreme event in 1872, but since then storm surge hazard has been more or less forgotten until now.

With the exception of a few industrial risks, storm surge is not widely insured in Germany. However Aon Benfield is developing a new risk model for this peril in close cooperation with the German Insurance Association (GDV), to assess storm surge risk and generate a basis for industry discussion on future cover. The project is also commissioned by the GDV.

The model reflects the whole process from the meteorological origin of storm surges through to the resulting water levels at the coast. This includes wave impacts and simulating the consequences such as defence failures, followed by inundation in the coastal hinterland and flood damages at properties. The aim of this project is also to consider for possible climate change impacts on storm surge hazard, e.g. possible mean sea level rise.

The model approach consists of a probabilistic event driven hazard and a vulnerability module, while an exposure interface and a financial module account for specific re/insurance conditions. In this contribution the hazard side of coastal flooding is being emphasized.