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Extreme Storm Surges in the North Sea

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Climate Change will cause a rise of the sea level and probably more frequent and more violent storm surges. This has serious consequences for the safety of people as well as for their values and assets behind the dikes. It is therefore inevitable to first assess how sea level rise and an extreme storm surge event designes. In a second step it is possible to determine the risk for specific locations and develop strategies.

The Project XtremRisk – Extreme Storm Surges at the North Sea Coast and in Estuaries. Risk calculation and risk strategies, funded by the German Federal Government will help answering these questions. The „Source-Pathway-Receptor“ Concept will be used as a basis for risk analysis and development of new strategies.

The Project offers methods to assess the development of extreme events under the conditions of today. Under conditions reflecting the climate change it will be tried to design an extreme event. For these three main points will be considered:

a) Analysis and calculation of each factor, which produce a storm surge and its maximum level occurring in the last 100 years. These are:
- maximum surge level: surge (due to the wind),
- influence of the tide and the interaction between surge and tide,
- influence of external surges ,
b) The hydrodynamics of a storm surge cause nonlinear effects in the interaction of the named factors. These factors and effects will both be taken into account to calculate the magnitude of the extreme storm surge. This step is very complex and need additional examination by numerical models.
c) Analysis of the different scenarios to mean sea level rise and to the increase of wind speed due to the climate change.

The presentation will introduce methods and show first results of the analysis of extreme events and the mean sea level rise.