COASTDAT at IfK of GKSS, I:
Detailed description and assessment of coastal climate change since 1958 in N Europe

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In a concerted effort of a series of quasi-realistic models of the regional atmosphere, the hydrodynamics of the North Sea and of the wave conditions, the global re-analyses of NCEP are downscaled to a high-resolution grid presentation of storminess, currents, water levels and wave heights in Northern Europe and particularly the North Sea area. In this way, the past development is estimated with an hourly time increment. Even if not all events are reproduced in detail, the statistics as conditioned by the large scale atmospheric state compare favourably with the limited instrumental evidence, in particular with respect to all aspects related to marine windiness.

The analysis of the changing conditions indicates that for most parts of Northern Europe, storminess was on the rise until the early 1990s, after which a decline took place with the notable exception of the southern North Sea. The characteristics of storm surge heights and wave heights followed this trend in marine windiness, with an increase of only a few centimeters in terms of storm surge heights but up to 80 cm in high waves during the past four decades in the German Bight.

The resulting hourly, high-resolution data set forms one of two major components of the data set COASTDAT, which is provided by the Institute for Coastal Research at GKSS to a variety of clients dealing with changing ecological conditions, coastal defense and offshore activity.