



Operational wave prediction of extreme storms in Northern Europe

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During the last three years several extreme storms afflicted the North Sea and Baltic Sea area generating high waves and storm surges with devastating effects on the marine environment. The most destructive of those were the extratropical cyclones Gudrun in January 2005, Britta in November 2006 and Kyrill in January 2007. The wave conditions during these storms have been predicted by the regional wave model of the operational wave forecast system running at the German weather service (Deutscher Wetterdienst, DWD) twice a day. The analysis of the wave forecast results shows that the wave model predicted the storm events successfully already about two days in advance with increasing quality of the results obtained by the following runs, that are nearer in time to the corresponding storm peak. Therefore the numerical wave forecasts provide an appropriate source for a warning tool for all offshore activities and coastal facilities. Since the wave conditions during Gudrun have been investigated already in detail by Soomere et al. (2008), the main attention here is concentrated on the seastates during the two most recent extratropical cyclones Britta and Kyrill. The results of the corresponding forecast runs have been compared with buoy measurements recorded at a number of buoy locations in the North Sea area and an extensive statistical analysis of the comparisons has been done for the months November 2006 (Britta) and January 2007 (Kyrill). The final statistics show impressively that the wave forecasts of the regional wave model of the DWD for the North Sea and Baltic Sea are of good quality.

References

Soomere, T., A. Behrens, L. Tuomi, J.W. Nielsen, 2008. Unusual wave conditions in the northern Baltic Sea during windstorm Gudrun in January 2005. *Natural Hazards and Earth System Sciences*, in press.