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The Baltic Sea Surge 1872: Testing some hypotheses

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Bundesamt für Seeschifffahrt und Hydrographie (BSH, Federal Maritime and Hydrographic Agency) is in charge of issuing water level forecasts and warnings for the German Bight and the western Baltic Sea. For most parts of the western Baltic, the reference flood for coastal protection is that of November 1872. Therefore, an attempt was made to reconstruct it numerically as part of the project "Modelling of extreme storm surges at the German Baltic Sea Coastline (MUSTOK)", a co-operation project between Research Institute for Water and Environment (fwu), German Weather Service (DWD), GKSS Research Centre, University of Kiel, Federal Environmental Agency (STAUN), and BSH. The results of a revised version taking a closer look at atmospheric pressure over the North Sea and Baltic Proper and at North Sea tides are discussed.
However, the focus of this presentation is on the testing of assumptions on what made the surge of November 1872 so special. This was done by means of numerical experiments and by comparing re-analysed water levels and winds with typical extremes obtained as part of MUSTOK. The storms causing extreme water levels in the western Baltic were members of ensemble hindcasts of weather conditions which occurred during 1964 to 2005. Both methods led to the conclusion that only details of the wind pattern in space and time were responsible for the extreme high water in the Kiel and Mecklenburg Bights in November 1872. According to contemporary authors, this surge was not an extreme event in the Pomeranian Bight. Observed water levels in the Pomeranian Bight, which rather resembles the German Bight in the North Sea, have a high probability of being exceeded by the extreme surge levels of the project.