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Climate evaluation of storminess at the German Bight and the southwestern coast of the Baltic Sea

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The knowledge of historical, current and future change of the storminess in Northern Europe plays an important role with regard to possible storm surges at the coasts of the German Bight and the southwestern Baltic Sea. The extension of the historic record and the detection of trends in storminess from wind observations is almost impossible because of the insufficient length and homogeneity of the wind data. Previous studies showed that surface air pressure data can serve as proxy data for wind statistics. For the period from 1923 to 2012, a new time series of the geostrophic wind will be derived from sea level pressure data for offshore areas of the North Sea and southern Baltic Sea. An established method for calculating the geostrophic wind, the triangle method by Schmidt and v. Storch will be used here. To evaluate the results with observations, data of several reanalysis will be used; these are CoastDat-2 (HZG), the 20th Century Reanalysis (NOAA) and the ERA-Interim Reanalysis (ECMWF). Climate model projections have the potential to indicate future trends in storminess. Potential changes of storm surges at the German Bight and the southern coast of the Baltic Sea caused by sustained wind fields that might lead to maximum water levels will be shown using a statistical analysis.