

Reconstruction of Early 20th Century Climate from Atmospheric Data at Signal Stations along the German Baltic Coastline

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At the Hamburg office of Deutscher Wetterdienst (German Meteorological Service, DWD) historic handwritten journals of weather observations are archived. Among others, a considerable number of original observations sheets of signal stations at the western German coast and the southern Baltic Sea coast are now being digitized. The stations are called signal stations as they were positioned close to the shore to warn sailors of severe weather by optical signals such as balloons. A dataset of historic wind and pressure observations from 1877 to 1999 of about 160 signal stations along the western German coast and the southern Baltic Sea coast, from Germany to Lithuania, is potentially available to study long-term trends and extreme events along these coasts. In this study we present a first analysis of wind and surface air pressure data from 1910 to 1939 at 15 selected signal stations between Emden in Germany and Leba in Poland. During this time period, a major storm surge occurred on the coast of the southern Baltic in December 1913. This event is reconstructed and analysed using digitized data of 70 stations along the southern Baltic Sea coast and allows us to analyze this event in more detail than before. It is shown that the spatial homogeneity of the signal station data is sufficient for the description of historic events, but that temporal homogenization will be required for long-term trend analysis.