**A new data set of historical coastal climatology: Signal Stations of the German Marine Observatory Hamburg**

Hans von Storch
Exzellenzcluster CLISAP, Hamburg University
Hamburg, Germany

Dörte Röhrbein und Birger Tinz
German Meteorological Service
Hamburg, Germany

A long overseen source of synoptic data collected along the coast of Germany has been detected, and is presently digitized. The data stem from warning posts in harbors along the coast, so called "Signalstationen", which recorded estimated wind-speed and direction, wave conditions, air pressure and precipitation. The first post began operating in 1877 and the last ceased operation in 1999. Signal Stations were positioned close to the shore to convey severe weather warning of the German Marine Observatory in Hamburg to ships and the coastal population. This was done by raising optical signals such as balloons, triangles, cylinders and flags. Reports were prepared 3 to 9 times per day. These observations did not enter the regular weather analysis process of the weather service, but were later archived: Now, about 800 handwritten journals are archived at the German Meteorological Service in Hamburg, and some are now available for further analysis.

A first inspection of these data indicates a wealth of data, which are well suited for high-resolution description of historical coastal events such as the storm surges in the southern Baltic Sea on 31 January 1913 or in the German Bight on 12 March 1906. The temporal homogeneity is sometimes compromised and homogenization is required. Estimated wind conditions, available so far at two stations for more than 100 years, allow for the first time an assessment of changing storm conditions based on wind data (instead of proxies such as annual percentiles of geostrophic wind distributions). The pressure data may be used to generating fine-scale synoptic analysis but also for calculating geostrophic wind statistics on spatial scales much shorter than what was possible so far.