



Water level derived from pressure data - a validation tool and analysis of time series data from the East Frisian Wadden Sea

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The quality of time series data sets on water level can vary significantly with periods of good and bad quality. Here, we present a method for obtaining high quality water level data derived from pressure measurements. This method is then applied to data obtained at a Time Series Station situated in a tidal inlet between the islands of Spiekeroog and Langeoog in the East Frisian Wadden Sea (southern North Sea). The data is analyzed with respect to i) the tidal signal and ii) extreme events.

A common problem with time series measurements is the occurrence of data gaps and outliers, e.g. due to sensor failures or maintenance of the station. In particular, outliers have to be analyzed carefully, in order to distinguish between real outliers and high values due to extreme events (storm surges). The method to fill such data gaps and handle outliers will be described. In addition, particularly pressure sensors can drift in time, a problem which is also addressed within this work.

The results of the validation process will be presented. Further, a frequency and a storm flood analyses was conducted. Results from these two analyses are compared with a corresponding analysis of the raw data showing that the validated data are much more reliable and the resulting analysis more exact.