



Mean and extreme sea level changes in the southwestern Baltic Sea

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In this contribution an overview over the BMBF project AMSeL_Ostsee (2015-2018) for the assessment of mean and extreme sea level changes over the past 150 years in the southwestern Baltic Sea is presented. We compile several high resolution tide gauge records provided by the Water and Shipping Administration (WSV) along the German Baltic Sea coastline and merge them in internationally available data bases (UHSLC, PSMSL, and data officially available at national authorities). In addition, we make efforts in digitizing historical records to expand the number of available data sets in this complex and vulnerable coastal region. To separate absolute from relative long-term changes in sea level the vertical land motion (VLM) at specific sites is assessed. Possible sources of VLM are independently assessed by using different state-of-the-art approaches, that is: Glacial Isostatic Adjustment (GIA) modelled by viscoelastic Earth models, GPS derived VLM, and the difference between tide gauge and nearby satellite altimetry. The VLM corrected tide gauge records are further assessed for linear and non-linear trends as well as possible acceleration/deceleration patterns by applying advanced time series models such as Singular System Analysis (SSA) combined with a Monte-Carlo-Autoregressive-Padding approach (Wahl et al., 2010). These trend assessments are applied to mean and extreme sea levels independently to prove whether observed changes in extremes are either due to an underlying trend on mean sea levels or changes in storminess.

References:

Wahl, T., Jensen, J., Frank, T. (2011): On analysing sea level rise in the German Bight since 1844, NHESS, 10, 171-179.