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Reconstruction of regional climate and climate change in past decades

Regional climate models, which are constrained by large scale information (spectral nudging) provided by re-analyses, allow for the construction of a mostly homogeneous description of regional weather statistics since about 1950. The potential of this approach has been demonstrated for Northern Europe. That data set, named CoastDat, does not only contain hourly data on atmospheric variables, in particular wind, but also on marine weather, i.e., short term water level, current and sea state variations. Another example is the multi-decadal variability of Polar Lows in the subarctic waters.

The utility of such data sets is broad, from risk assessments related to coastal wind and wave conditions, assessment of determining the causes for regional climate change, a-posteriori analysis of the efficiency of environmental legislation (example: lead).

In the paper, the methodology is outlined, examples are provided and the utility of the product discussed.