

Classification of daily pressure pattern sequences since 1850 in Europe

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Pressure pattern classification is widely used as a tool to assess linkages between large scale atmospheric circulation and surface conditions for temperature and precipitation. However, the individual parameter values for both temperature and precipitation for a given day do not only depend on the current state of the pressure field but are also a product of the development during the preceding days of each observation. Therefore two approaches are presented reflecting the atmospheric development for periods of a few days: Extended Principal Component Analysis (EPCA) which is sometimes called Pattern Frequency Analysis and an equivalent method utilising non-hierarchical Cluster Analysis. Both methods are applied to reconstructed daily Sea Level Pressure fields reaching back to the year 1850. The impact of the resulting pattern sequences on temperature and precipitation and their extremes derived from long-term records of European station data are analysed comparatively for both classification methods. Furthermore long-term changes of the occurrence of typical pressure sequences are shown as well as changes of their impact for the meteorological surface parameters.