Statistical approaches to the integration of multi-proxy data for the reconstruction of high and low water episodes in Central Europe of the last millennium

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Based on monthly resolved temperature and precipitation indices for Central Europe since 1500, which are derived from the virtual research environment tambora.org, statistical methods are presented to use the drought and moisture indices derived from tree ring data such as the scPDSI by Cook et al. (2015), long historical indexed flood series (Bloeschl et al. 2020) as well as local and regional wine quality series to improve and refine periods of high and low water levels. Additionally, it will be demonstrated, how this approach can be used to interpolate climate parameters not only temporally but also spatially.

Therefore Bayesian methods are used to mutually verify and derive existing indices that are available on different scales. Furthermore, the references of indices to text quotes are mapped automatically. This not only makes the direct weather, weather and climate descriptions accessible, but also their immediate causes as well as the consequences and effects on the environment and societies. Overall, with this approach, new text quotes can be automatically analysed and integrated into the data pool. This also creates a bridge between historical and recent data and information.