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The 500-year temperature and precipitation fluctuations in the Czech Lands derived from documentary evidence and instrumental measurements

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Series of temperature and precipitation indices (in ordinal scale) based on interpretation of various sources of documentary evidence (e.g. narrative written reports, visual daily weather records, personal correspondence, special prints, official economic records, etc.) are used as predictors in the reconstruction of mean seasonal temperatures and seasonal precipitation totals for the Czech Lands from A.D. 1500. Long instrumental measurements from 1771 (temperatures) and 1805 (precipitation) are used as a target values to calibrate and verify documentary-based index series. Reconstruction is based on linear regression with variance and mean adjustments.
Reconstructed series were compared with similar European documentary-based reconstructions as well as with reconstructions based on different natural proxies. Reconstructed series were analyzed with respect to trends on different time-scales and occurrence of extreme values. We discuss uncertainties typical for documentary evidence from historical archives. Besides the fact that reports on weather and climate in documentary archives cover all seasons, our reconstructions provide the best results for winter temperatures and summer precipitation. However, explained variance for these seasons is comparable to other existing reconstructions for Central Europe.