



Reconstruction of precipitation from documentary evidence and long instrumental measurements in the Czech Lands since AD 1500

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Various sources of documentary evidence from the territory of the Czech Republic (CZ) were critically evaluated and interpreted in terms of monthly precipitation indices on a seven-degree scale from -3 (extremely dry conditions) to $+3$ (extremely wet conditions), covering the 1501–1854 period. As no relevant information on precipitation for some months appeared, missing index values were filled in from the parallel index series that are available for Germany and Switzerland. Seasonal indices were calculated as the sum of corresponding monthly values. The mean CZ precipitation series completed from long and homogenised instrumental series for 14 stations and covering the 1804–2010 period was used as the target data. Precipitation indices were calibrated against instrumental series over a full overlapping period, 1804–1854, using ordinary least square regression. Two independent verifications were also carried out and the reconstruction skill of precipitation indices was tested by means of commonly-used statistics with evaluation of their statistical significance. We found that the common signal in the full overlapping period is the strongest for transitory seasons (spring and autumn) and for these seasons documentary indices explain almost 50% of precipitation variance. The corresponding value for summer is 36% while the weakest signal is in winter (25%). We compare our results with similar Central European proxy-based reconstructions. Further we verify occurrence of extremely dry/wet seasons against CZ standard oak TRW chronology. Finally we discuss possible sources of uncertainties and we stress the importance of multi-proxy approach to climate reconstructions.