



Temperature reconstruction based on documentary evidence for the Czech Republic, AD 1501-2006

P. Dobrovolny (1), R. Brazdil (1), M. Halickova (1), J. Mackova (1), O. Kotyza (2), H. Valasek (3)

(1) Masaryk University, Brno, Czech Republic (2) Regional Museum, Litomerice, Czech Republic (3) Moravian Land Archives, Brno, Czech Republic (dobro@sci.muni.cz / Phone: +420-549491491)

Documentary evidence includes direct and proxy data about weather and related phenomena. Several groups of such evidence are available for the territory of the recent Czech Republic: narrative written reports, visual daily weather records, personal correspondence, special prints, official economic records, newspapers, pictorial documentation, stall-keepers' and market songs, epigraphic data, early instrumental observations, early scientific papers and communications. Data obtained from these sources were critically evaluated and used for creation of weighted monthly temperature indices in the seven degree scale from -3 to $+3$: -3 extremely cold, -2 very cold, -1 cold, 0 normal, $+1$ warm, $+2$ very warm, $+3$ extremely warm. Seasonal (DJF, MAM, JJA, SON) and annual indices are computed as a sum of corresponding months. Series of seasonal and annual indices are presented for the period 1501–1850 based on interpretation of documentary data. Overlapping period with instrumental measurements of Prague-Klementinum since 1771 was used for quantitative reconstruction. Linear regression model was applied to data in calibration period (1771–1810) and reconstruction skill of the model was tested for verification period (1811–1850) using RE, CE and Durbin-Watson statistics, and *vice versa*. Reconstructed temperature series for the period AD 1501–2006 are presented and compared with other Central European proxy and instrumental series. The quality of temperature reconstruction based on documentary evidence is comparable to other proxies like tree-rings, particularly for seasonal temperature series. Compiled indices explain more than 80% of

DJF temperature variability of the verification period. Corresponding values for the other seasons are 70% (MAM), 59% (JJA), 42% (SON), and 64% of annual temperature variability. Both the method and database of indices presented are supposed to be further improved and used for climate reconstructions in the EU project No. 017008-2 Millennium.