



## Droughts in the Czech Lands, AD 1090–2012

R. Brázdil (1), P. Dobrovolný (1), M. Trnka (2), O. Kotyza (3), L. Řezníčková (1), H. Valášek (4), P. Zahradníček (5), and P. Štěpánek (5)

(1) Institute of Geography, Masaryk University, and Global Change Research Centre AV ČR, Brno, Czech Republic (brazdil@sci.muni.cz, +420-549491487), (2) Institute of Agrosystems and Bioclimatology, Mendel University, and Global Change Research Centre AV ČR, Brno, Czech Republic, (3) Regional Museum, Litoměřice, Czech Republic, (4) Moravian Land Archives, Brno, Czech Republic, (5) Global Change Research Centre AV ČR, and Czech Hydrometeorological Institute, Brno, Czech Republic

The paper deals with droughts in the Czech Land in AD 1090–2012 based on documentary evidence and instrumental records. Various documentary sources were used for selection of drought events which were interpreted with the monthly resolution. While the data about droughts before AD 1500 are scarce, analysis concentrated mainly on droughts afterwards. A dry year in 1501–1804 (i.e. pre-instrumental period) was defined as a year during which dry patterns occurred at least at two consequent months. Using this definition 129 dry years were identified (in average one drought per 2.4 years). From the 16th to the 18th centuries are these numbers 41, 36 and 49 years with prevailing occurrence of dry months from April to September (73.7%). Drought indices – SPEI-1, Z-index and PDSI – calculated for the Czech Lands in April–September describe drought patterns between 1805 and 2012 (instrumental period). For each of three indices N-year re-occurrence intervals were calculated. Using  $N \geq 5$  years, SPEI-1 indicates 40 drought years, Z-index 39 years and PDSI 47 years. SPEI-1 and Z-index recorded 100-year in 1834, 1842, 1868, 1947 and 2003. PDSI as indicator of long-term drought shows two important drought periods: 1863–1874 and 2004–2012. The first period is related to the lack of precipitation, the second can be attributed to the recent temperature rise without significant changes in precipitation. Droughts from pre-instrumental and instrumental period were used to compile the long-term drought chronology of the Czech Lands. The number of years with drought fluctuates between 26 in 1951–2000 and 16 in 1651–1700. Only nine such years were recorded between 1641 and 1680, while between 1981 and 2012 it was 22 years. Discussion of results contains uncertainty problem, spatial variability of droughts, comparison with tree-ring reconstructions from Southern Moravia and broader Central European context.