



Hydrometeorological extremes and their impacts derived from taxation records for south-eastern Moravia (Czech Republic) in the period 1751–1900

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Hydrometeorological extremes always influenced human activities and caused great material damage or even loss of human lives. In the Czech Lands (recently the Czech Republic), systematic meteorological and hydrological observations started generally in the latter half of the 19th century. In order to create long-term series of hydrometeorological extremes, it is necessary to search for other sources of information for their study before 1850. In this study, written records associated with tax relief at ten estates located in south-eastern Moravia are used for the study of hydrometeorological extremes and their impacts during the period 1751–1900. The taxation system in Moravia allowed farmers to request tax relief if their crop yields had been negatively affected by hydrological and meteorological extremes. The documentation involved contains information about the type of extreme event and the date of its occurrence, and the impacts on crops may often be derived. A total of 175 extreme events resulting in some kind of damage is documented for 1751–1900, with the highest concentration between 1811 and 1860. The nature of events leading to damage (of a possible 272 types) include hailstorm (25.7%), torrential rain (21.7%), and flood (21.0%), followed by thunderstorm, flash flood, late frost and windstorm. The four most outstanding events, affecting the highest number of settlements, were thunderstorms with hailstorms (25 June 1825, 20 May 1847 and 29 June 1890) and flooding of the River Morava (mid-June 1847). Hydrometeorological extremes in the 1816–1855 period are compared with those occurring during the recent 1961–2000 period. The results obtained are inevitably influenced by uncertainties related to taxation records, such as their temporal and spatial incompleteness, the limits of the period of outside agricultural work (i.e. mainly May–August) and the purpose for which they were originally collected (primarily tax alleviation, i.e. information about hydrometeorological extremes was of secondary importance). Taxation records represent an important source of data for historical climatology and historical hydrology and have a great potential for use.