



Extreme drought of 1842 in Europe as described by documentary data and instrumental measurements

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Extreme droughts represent important weather phenomena characterised by significant environmental and even societal impacts with possible human responses in some regions. While extreme droughts occurring in the instrumental period are based on systematic instrumental (e.g. meteorological or hydrological) measurements, droughts of the pre-instrumental period are characterised by usually qualitative documentary evidence. Extreme drought of 1842 represents a case where it is already possible to combine information from documentary data with systematic meteorological observations. Seasonal gridded precipitation reconstructions are used to describe DJF, MAM and JJA precipitation patterns in absolute (mm) and relative expression (% of 1961–1990 mean). Monthly temperature and precipitation values of 1842 were used to show annual variations with respect to the 1961–1990 period, which have been complemented by calculation of selected drought indices (SPI-1, SPEI-1 and Z-index). The mean circulation patterns of driest months are complemented by SLP maps. General drier patterns in 1842 prevailed in January–February and with different intensity particularly from April to August. From the spatial point of view, the driest patterns extended in a broad zonal belt from France to the eastern part of central Europe. Different documentary data were used to describe peculiarities of agricultural, hydrological and socio-economic droughts of 1842 with a particular attention to environmental and societal impacts and corresponding human responses. Although grain yields were not so strongly influenced, very bad hay and more-or-less no aftermath and potato caused particularly critical situation in cattle breeding before coming winter 1842/1843 (selling of cattle below market prices, reducing of their numbers etc.). Drought 1842 was further discussed with respect to long-term drought chronology, European scPDSI reconstruction based on tree-rings and a broader context of societal impacts.