



The year-long unprecedented European heat and drought of 1540 – a worst case

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The heat waves of 2003 in Western Europe and 2010 in Russia, commonly labelled as rare climatic anomalies outside of previous experience, are often taken as harbingers of more frequent extremes in the global warming-influenced future. However, a recent reconstruction of spring–summer temperatures for WE resulted in the likelihood of significantly higher temperatures in 1540. In order to check the plausibility of this result we investigated the severity of the 1540 drought by putting forward the argument of the known soil desiccation-temperature feedback. Based on more than 300 first-hand documentary weather report sources originating from an area of 2 to 3 million km², we show that Europe was affected by an unprecedented 11-month-long Megadrought. The estimated number of precipitation days and precipitation amount for Central and Western Europe in 1540 is significantly lower than the 100-year minima of the instrumental measurement period for spring, summer and autumn. This result is supported by independent documentary evidence about extremely low river flows and Europe-wide wild-, forest and settlement fires. We found that an event of this severity cannot be simulated by state-of-the-art climate models.