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Air temperature changes in Żagań (Poland) in the period from 1781 to 1792

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The temperature measurements in Żagań were made within the Mannheim network of stations established for Europe and North America by the Palatine Meteorological Society in 1780. The meteorological observations made there in the period 1781 – 1792 were taken according to the rules for observers (“Monitum ad observatores”) written by Johann Hemmer (Director of the Palatine Meteorological Society), using calibrated instruments sent by the Society. Source raw data from three measurements a day, taken at morning, noon and evening and available in the publication *Ephemerides Societatis Meteorologicae Palatinae* have been used for the analysis. Daily means originally calculated using Mannheim’s formula have been corrected to the true daily mean based on statistical analysis using hourly temperature data from modern meteorological station in Wrocław, located near Żagań. The mean annual air temperature for the study period (7.9°C) was about 0.8°C lower than its value for the period 1981–2010, calculated from Grabik data (the nearest station to Żagań). The coldest year was 1785 (6.3°C), while the warmest was 1781 (9.6°C). The clearly colder sub-period 1784 – 1788 was probably significantly influenced by the eruption of the Laki volcano in Iceland in 1783 / 1784. Warmer temperatures than we have today (by +0.4°C) occurred only in summer. However, the greatest cooling was observed in autumn and winter (temperatures lower than today in both seasons by 1.1°C). Summer and in particular winter were markedly longer in historical times in comparison to our present-day climate, while other seasons were shorter. Investigations confirm the correctness of the view based on multiproxy data that the continentality of the climate in Poland in the 18th century was greater than today. Both daily and monthly temperature series from Żagań are strongly correlated with other 18th-century temperature series from Poland and Central Europe (with a correlation coefficient mostly higher than 0.90).