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# Reconstruction of summer temperatures since the 18th century in western Japan

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Historical weather documents are useful form of proxy data for reconstructing climate variations during the 18th to the 19th centuries in Japan. In particular, the diaries of the feudal clan in the Edo era (1600–1867), provide useful information about daily weather conditions. In the present study, we firstly examined reconstruction methodology of summer temperature variations. By examining modern meteorological data, we found that the number of rainy days in July and August is negatively correlated with summer temperature variations in western Japan. Then, we reconstructed July and August temperatures from 1779 to 1871 based on the monthly number of rainy days computed from a historical weather diary at Hiroshima in western Japan. High positive correlation between reconstructed temperatures and early meteorological series during the 19th century in Japan confirms reliability of reconstruction. Reconstructed results show that temperatures before the 1800s and during the 1830s were lower than present day average. On the other hand, we found temporary warm epochs during the 1820s and the 1850s. Temperature in these warm epochs were almost comparable to the present day climatology. By investigating spatial representativity of temperature variations, we confirmed that reconstructed results represent synoptic-scale summer temperature variations over large areas of western Japan.