



Reconstruction of summer temperature variations in Kawanishi town, Northern Japan based on historical weather documents

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We estimated the July maximum temperature variations from 1830 to 2011 in the town of Kawanishi in northern Japan using daily weather reports and observations documented in an old personal diary. Using historical weather reports, we computed number of “fine” weather days for each July during the study period. Then, July maximum temperatures in Kawanishi were estimated using a simple linear regression analysis based on the relationship between the July maximum temperature and number of “fine” weather days, computed from historical weather reports. The results of this analysis showed that there were cool periods in the 1830s, 1860s, the 1900s, and a period extending from the 1980s to the early 1990s. Among them, 1830s, 1860s, and the 1900s are in accordance with poor rice harvests and severe famines in northern Japan. Warm summers were observed in the 1850s, a period extending from the 1870s to the 1880s, and the 1920s. We indicated that temperatures in the early 1850s were almost comparable to those of warm summers in the late 20th century.