

Spatiotemporal variations in stable isotope ratios of precipitation in the Japanese Alps Region

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We collected precipitation samples and observed weather every month from January 2011 to December 2018 at nine locations in the Japanese Alps Region (Nagano, Matsumoto, Suwa, Omachi, Sugadaira, Norikura, Kamikochi, Shigakogen, Nishihotaka). The collected water samples were brought back to the laboratory to stable isotope analysis to determine δD , $\delta^{18}O$ and calculated d-excess. The $\delta^{18}O$ in precipitation was weighted average using the amount of precipitation and was taken as the average monthly value. As a result of examining the seasonal variation of $\delta^{18}O$ from 2011 to 2018, $\delta^{18}O$ showed two peaks in spring and summer. In order to investigate the spatial variation, the coefficient of determination between latitude, longitude, altitude and $\delta^{18}O$ was calculated, it clearly correlated with altitude from April to October. d-excess showed seasonal variation which is high in winter and low in summer. As a spatial variation, correlation with altitude is high in summer and correlation with longitude and latitude is high in winter. The correlation between longitude, latitude and d-excess in winter is thought that high d-excess precipitation was brought by the winter pressure pattern to Omachi, Nagano, Sugadaira and Shigakogen in the Northeastern part of the sampling area.

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