

Isotopic altitude effects of meteoric waters in Mt. Ontake

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In this study, we estimated the isotope altitude effects of precipitation and spring water, and the recharge altitude of springs and hot springs in the southeast slope of Mt. Ontake. Samples were collected at the altitude of 1000 - 3000 m from August, 1998 to October, 2000. The collected samples were analyzed in the isotopic composition of the oxygen and the hydrogen. The isotopic composition of precipitation waters was shown as the weighted mean. The ranges of the weighted mean of isotopic composition in precipitation were from -94.4 to -76.0 per mill delta D, and from -14.1 to -11.3 per mill delta 18O. And, isotopic composition of spring waters was in the ranges from -87.9 to -65.3 per mill delta D, and from -13.4 to -10.1 per mill delta 18O. Using precipitations and spring waters which were limited geomorphologically in the recharge area, isotopic altitude effects of precipitations and spring waters were estimated. The altitude effects of delta D and delta 18O of the precipitation were calculated at -0.95 per mill /100 m and -0.14 per mill /100 m, respectively. The altitude effects of delta D and delta 18O of the spring were calculated at -0.97 per mill /100 m and -0.13 per mill / 100m, respectively. The estimated values of the isotopic altitude effects were smaller than the other studies. Isotopic altitude effects of precipitation and spring water were consistent, while larger isotopic altitude effects of groundwater and spring water were reported in the past studies. Mean recharge altitude was estimated in the spring and the hot spring unused in the calculation of the recharge-water line. As the results, it was estimated that relatively small groundwater system was found around the springs. As to hot springs, it was thought that a possible large downward-stream in groundwater system might exist.

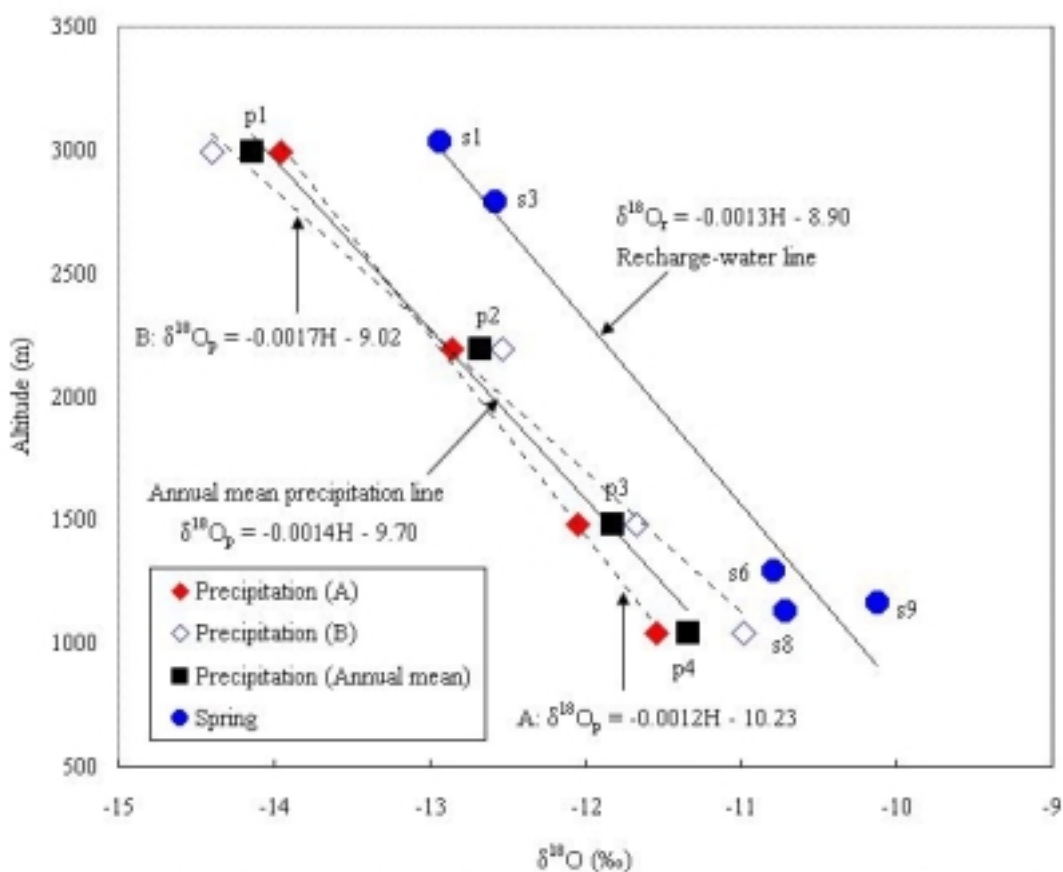
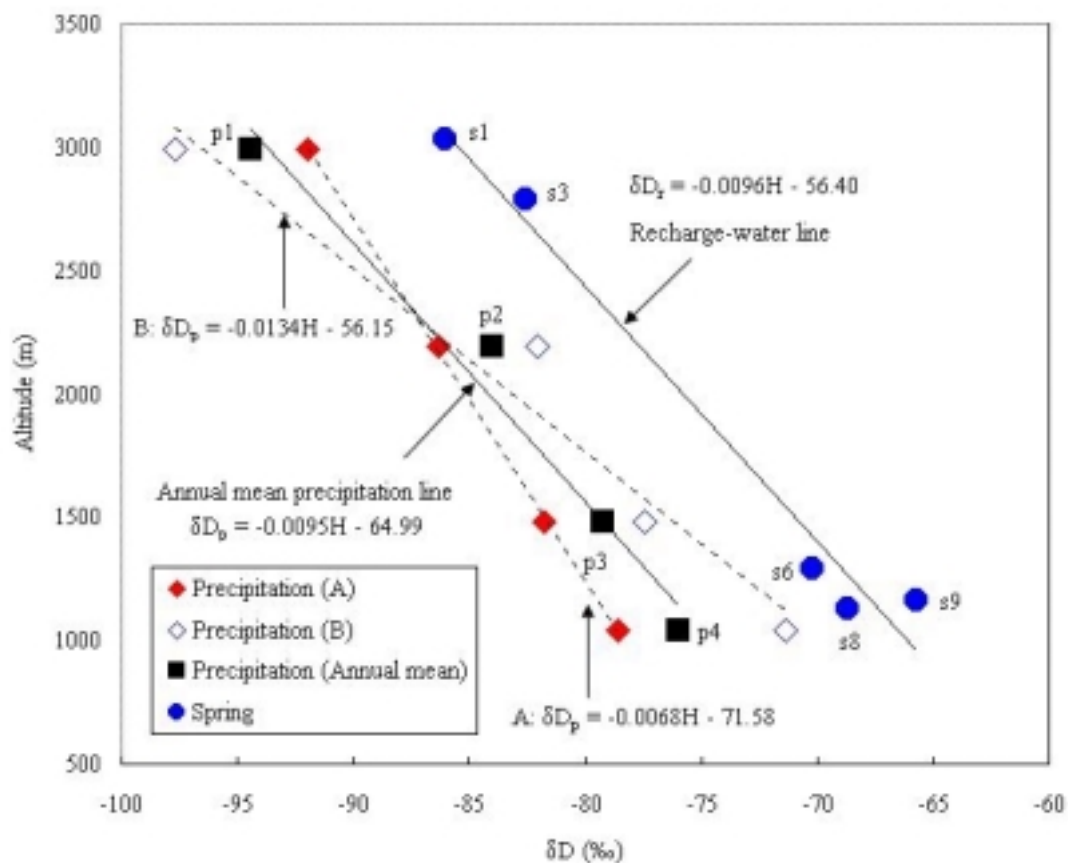


Fig.1 Plots of δD and $\delta^{18}O$ values versus sampling altitudes for precipitation waters, and plots of δD and $\delta^{18}O$ values versus geomorphic mean altitudes for spring waters.