

Characteristics of water quality and stable isotopes in river water, groundwater and precipitation at Mt. Tsukuba

Shiho Yabusaki[1]; Norio Tase[2]; Maki Tsujimura[3]; Yousay Hayashi[4]

[1] TERC, Univ. Tsukuba; [2] Life and Environ. Sci., Univ. Tsukuba; [3] Grad. Sch. Life Environ. Sci., Univ. Tsukuba; [4] Geoenvironmental Sci, Tsukuba Univ

Mt. Tsukuba, which is located at the northwest in Ibaraki Prefecture, is one of the source areas of the Kasumigaura basin. To make clear the water quality of river water, groundwater and spring water and characteristics of water flow in Mt. Tsukuba is important for estimating the movement and budget of chemical materials in the basin. The objectives of this study are (1) understanding the characteristics of water quality and stable isotopes at Mt. Tsukuba, (2) estimating the residence time and (3) clarifying the water movement at Mt. Tsukuba. The river water, groundwater and spring water samples have been collected periodically since July 2005. Monthly precipitation samples have been collected at 6 sites (30, 160, 275, 450, 640 and 878 m above the sea level) since December 2005. Stable isotopes of oxygen and hydrogen were analyzed for all samples.

There was not seasonal variability of water quality in river water, groundwater and spring water. The stable isotopes of oxygen and hydrogen were similar for most part of the sampling site. These isotope ratios of river water, groundwater and spring water were almost correspond to amount-weighted mean isotope ratio of precipitation which have been collected at University of Tsukuba. The isotope ratios of river water, groundwater and spring water in winter were slightly heavier than those in summer, but future research is needed. The stream discharge was almost constant at the foot and middle slope of Mt. Tsukuba from summer to winter. Near the top of Mt. Tsukuba, however, stream discharge was relatively little in winter. The stable isotopes in precipitation at Mt. Tsukuba indicated the altitude effect. It is considered that the recharge area can be estimated when the isotope ratio of river water or groundwater samples are compared to those of precipitation samples at Mt. Tsukuba.