

Identification of hydrological characteristics on the groundwater recharge in volcanic and non-volcanic mountains

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Kofu basin is located at the central part of Japan, Yamanashi and lies 300 km away from Japan Sea. 80% of this basin area is covered by the mountains that are originated from the volcanism and diastrophism with various geological settings. This study focuses on identifying the groundwater recharge processes in Kai city derived from volcanic mountain and Minami Alps city formed from the fault block mountains, located at the western Kofu basin of Yamanashi prefecture. Water samples were collected from major river, deep tube wells and mountain springs at 2011 to 2013 and 2018.

Spring water collected from the mountains and river water were observed with almost similar depleted value ranges. However, in both cities, the high d-excess values are detected. Higher d-excess value in the mountain might occur from the higher rainfall and snow during winter season, whereas the low d-excess values detected on the alluvial fan might be due to the less winter rainfall and snow in comparison with mountain area. The spatial distributions of the d-excess values and the Cl⁻ concentrations suggested the Minami Alps city is recharged from the water infiltrated at the mountain to the alluvial fan. Meanwhile, water originated from mountain is recharged to the hill, but it is not recharged to the alluvial fan in Kai city. Thus, the combination of d-excess value and Cl⁻ tracer is useful in identifying the groundwater recharge process of areas with different geological origin.

Keywords: stable isotope of water, Water quality, Groundwater recharge, Mountain block recharge