

Geographical and temporal variations of multiple geochemical components in rainwater, river water, and groundwater in Saijo city, southwestern Japan

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We determined the chemical compositions and stable isotope ratios of H, O, Sr, and S for groundwater and river water in Saijo city of southwestern Japan. Geographical analysis for about 1500 water samples shows that (1) the groundwater is divided into several areas dependent on the recharging area and the interaction with sediments and other waters such as seawater and fossil brine in the aquifer, and (2) the unconfined groundwater in the eastern plain is recharged from the head of alluvial fan of the Kamo river, whereas the artesian water in deeper aquifer is from more mountainous areas. Based on this finding, we started monthly monitoring for the Kamo river water, two types of groundwater, and rain water at several key sites after 2007. Temporal analysis of chemical data and $\delta^2\text{H}$ - $\delta^{18}\text{O}$ data for monitoring waters demonstrates the seasonal and yearly variations and the temporal differences among water types which are ascribed to the time from rainfall to river discharge and from recharging river water to groundwater. Geochemical mapping and subsequent monitoring of multiple water components for various type of water, which have been conducted in cooperation with city government and citizens, are useful for the sustainable management of water circulation in a watershed.