[EJ] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-HW Hydrology & Water Environment

[A-HW23]Residence time of groundwater / surface water and water / mass cycle processes in watershed

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The residence time of ground/ surface water is one of the most important parameters to understand hydrological and mass cycle processes in a watershed. However, residence time information of the water is still lacking to charactrize watersheds with steep topography underlain by young lithology, with a special concern of soil / gravel discharge, solute transport and hydro-geomorphological processes. Generally, we investigate the residence time of the water by applying radionuclides / noble gas tracers showing apparent age as 3H, 36Cl, CFCs and SF6, and/ or conservative tracers like stable isotopes, and need to understand a difference of residence time estimated by different type of tracers in various hydro-geological settings.
In this session, we compare the residence time of ground/ surface water and mass transport processes observed in various types of the watershed, and discuss issues to be solved and future perspectives on water age and mass cycle research topics.

[AHW23-P06]Spatial distribution of residence time and total number of prokaryotes in spring water in headwater catchments underlain by different lithology

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The residence time in the spring water and groundwater is principle to understand the groundwater flow system in the mountainous area. Chlorofluorocarbons (CFCs) and Sulfur hexafluoride (SF_6) are useful as the tracers for age dating of the young groundwater, especially it is effective in the headwaters Japan, where the young groundwater less than 50 years is dominant. Also, a possibility of microbe as a tracer for groundwater flow path has been investigated recently, however, there are few studies focusing on the relationship between residence time and total number of prokaryotes in the groundwater in different lithology. In this study, we focused on the spring water, and estimated the residence time using CFCs and SF_6 as tracers, and counted the total number of prokaryotes in mountainous headwater catchments underlain by granite, sedimentary rock, basalt, and serpentine, Japan, and spring located Christchurch area underlain by marine sediment, New Zealand. We aim to investigate the spatial distribution of the residence time and the microbe information in the spring water focusing on the groundwater flow dynamics in Japan and New Zealand. The residence time in granite area ranged from 2.2 years to 29.4 years and that in sedimentary rock area ranged from 7.8 years to 15.5 years. The total number of prokaryotes ranged from 10^3 to 10^5 cells/mL in granitic area and 10^4 to 10^6 cells/mL in

sedimentary rock area. The total number of prokaryotes in the spring water with younger residence time tends to show wide variation in values ranging from 10^3 to 10^6 cells/mL, whereas that of older spring water tends to converge on 10^3 cells/mL. Generally, the groundwater with older residence time has deeper groundwater flow path, also, there is a report that the total number of prokaryotes in the groundwater decreases with depth. Therefore, we could find a relationship between the residence time and total number of prokaryotes. In addition, the total number of prokaryotes tends to be smaller as the groundwater storage becomes larger. It seems to be explained by the groundwater flow characteristics mentioned above.