

## Variations of fluorescent DOC in temperate forest catchments

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### Introduction

Forest catchments are important source of terrestrial DOC to the downstream ecosystem. However, although the DOC properties may vary depending on the difference of rainfall-runoff characteristics between catchments, how the characteristics affect on the DOC properties is still unknown. In this study, we discuss the relationship between rainfall-runoff characteristics and DOC properties based on the observations in five well-organized granite catchments.

### Methods

The observations were conducted in Kiryu Experimental Watershed (KEW) in Japan. We set up five catchments within KEW. Unsaturated soil waters (SW) through the profile, groundwater occurred in hillslope during rainstorms (HGW), transiently or seasonally occurred groundwater (TGW), and groundwater existed throughout the year (SGW) as well as the streamwaters in each catchment were sampled for four years. DOC concentrations, an indicator of molecular weight (SR) [1] and the humification index (HIX) [2] and relative contribution of three fluorescent components (%C1-%C3) identified by EEM-PARAFAC were considered. The C1 and C2 were humic-like, and C3 was protein-like component.

### Results and Discussion

Results of the principal component analysis with six parameters revealed the difference of DOC properties along with each hydrological process. The properties in SW at A<sub>0</sub> layer and in HGW were similar, and in SW at infiltration processes and in TGW were similar, respectively. The properties in SGW were classified by the depth; %C1 was dominant at the shallower layer, and %C3 increased at the deeper layer. The properties in the streamwaters at each catchment were different depending on the relative contributions of SGW from shallow and deep layers. Therefore, hydrological processes within catchments and runoff processes of groundwater are key factors of the DOC properties in streamwater.

[1]Helms et al. (2008) *Limnol. Oceanogr.* 53, 955-969. [2]Ohno (2002) *Environ. Sci. Technol.* 36, 742-746.