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Temporal changes of the radiocesium activity concentration in river bottom sediment and suspended sediment in Eastern Japan

Yuichi Onda[1], Chen Tang[1], Xiang Gao[1], Yukio Takeuchi[1,2], Keisuke Taniguchi[2], Momo Kurihara[1,3], and Katsumi Hirose[1]

[1]University of Tsukuba, Center for Research in Isotopes and Environmental Dynamics, Tsukuba, Japan (onda@geoenv.tsukuba.ac.jp)

[2]Fukushima Prefectural Centre for Environmental Creation, Miharu, Fukushima, Japan

[3]National Institutes for Quantum and Radiological Science and Technology, Chiba, Japan

We examined the temporal trend of Cs-137 concentration of river sediment and suspended sediment in Eastern Japan areas from September 2011 to January 2017. We used 716 monitoring data by the Ministry of the Environment from 461 sites and applied particle size correction to eliminate the influence of changes in particle size distribution in the concentration of Cs-137.Also, in some locations, we also compared the activity concentration of suspended sediment and dissolved water in Cs-137 and compared. The results showed that Cs-137 concentration decreased through the study period in most sites, and the average declining, λ, is about 0.168 in the 2013-2018 period. In some sites increasing trend or larger rate of decline were found, but these locations are limited to lower contaminated catchments (less than 50k Bq/m2). The particle size corrected Kd value of the bottom sediment (Kd ac) shows around 10-4 to 10-5 Kg/L, but varied significantly where the initial catchment inventories are less than 50 kBq/m2. In most sites, Cs-137 concentration on the particle size corrected Suspended sediment and bottom sediment show similar values, except for some specific sites (such as near the coast, etc). These data imply that the activity concentration of dissolved Cs is important to control the rate and processes of interaction of dissolved radionuclides with the bottom sediment interface layer in the river environment affected by the Fukushima fallout.