

Dynamic association of radioactive cesium between sediment and suspended sediment in river

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Abstract

After earthquake and tsunami of 11 March 2011, a lot of radionuclides ^{134}Cs and ^{137}Cs were released into environment due to Fukushima Dai-ichi Nuclear Power Plant (FDNPP) accident. For the safety of people and the support of decontamination, the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) has taken a long term monitoring system, in which about river sediment, surrounding environment and water quality, in areas such as Iwate, Miyagi and Fukushima Prefectures since August 2011. Meanwhile, 7 sites were newly opened in Nakadori and Hamadori since July 2011, 24 sites were opened since October 2012, to monitor the dynamics of water quality and suspended sediment. However due to previous researches, we can see the obviously tendency of declining radiocesium concentration in suspended sediment, which slowed down after one year from the accident. But we cannot conclude the same ideal by analyzing the sediment samples which was taken by MEXT during 2011-2012, owing to the low correlation and widely variation between time and concentration caused by the influences of particle size. So during this survey we reanalyzed the particle size of samples and correction the particle size effect on the concentration of ^{137}Cs . As a result, 80% sites' declining rate and the relationship between time and concentration were improved. On the other hand, we compared the decline rate between suspended sediment and river sediment in the same watershed, we find there are same tendencies and numerical correlations of radiocesium between suspended sediment and river sediment.

Keywords: Radiocesium, Sediment, Suspended Sediment, Persistent