Geophysical Research Abstracts
Vol. 17, EGU2015-8265, 2015
EGU General Assembly 2015

Three-year monitoring study of radiocesium transfer and ambient dose rate in forest environments affected by the Fukushima Dai-ichi Nuclear Power Plant accident

Hiroaki Kato (1), Yuichi Onda (1), Nicolas Loffredo (1), Ayumi Kawamori (1), and Keigo Hisadome (2)

(1) University of Tsukuba, Center for Research in Isotopes and Environmental Dynamics, Tsukuba, Japan (hiros980@ies.life.tsukuba.ac.jp), (2) Asia Air Survey Co., LTD.

We investigated the transfer of canopy-intercepted radiocesium to the forest floor during 3 years (July 2011∼) following the Fukushima Dai-ichi Nuclear Power Plant accident. The cesium-137 (Cs-137) contents of throughfall, stemflow, and litterfall were monitored in two coniferous stands (plantation of Japanese cedar) and a deciduous broad-leaved forest stand (Japanese oak with red pine). We also measured an ambient dose rate at different height in the forest by using a survey meter (TCS-172B, Hitachi-Aloka Medical, LTD.) and a portable Ge gamma-ray detector (Detective-DX-100T, Ortec, Ametek, Inc.). Furthermore, effects of forest decontamination on the reduction of ambient dose rate were assessed quantitatively.

Total Cs-137 deposition flux from the canopy to forest floor for the mature cedar, young cedar, and the mixed broad-leaved stands were 157 kBq/m2, 167 kBq/m2, and 54 kBq/m2, respectively. These values correspond to 36%, 39% and 12% of total atmospheric input after the accident. The ambient dose rate showed an exponential decrease with time for all the forest sites, however the decreasing trend differed depending on the forest type. These data suggested that an ambient dose rate in forest environment can be variable in spatially and temporally reflecting the transfer of radiocesium from canopy to forest floor. We presented the analysis results of the relationship between radiocesium deposition flux and ambient dose rate at the forest floor. In addition to that, we reported the effects of forest decontamination (e.g., tree felling, removal of organic materials, woodchip pavement) on the reduction of ambient dose rate in the forest environment.