

Temporal changes of radiocesium outflow in mountainous forest of the Abukuma Mountains, Fukushima

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This paper presents outflow characteristics of Cs-137 in mountainous forest of the Abukuma Mountains, Fukushima, during 2013-2014. Cs-137 deposition via throughfall, stemflow, and litterfall processes was estimated to be on the order of 10^3 Bq m⁻², and the outflow of Cs-137 via surface washoff was estimated to be on the order of 10^2 Bq m⁻² from April 2013 to December 2014 in the experimental plots installed in deciduous broad-leaved and cedar forests in the Abukuma Mountains. Cs-137 inventories of forest soil down to a level of 1 cm were decreasing in ridge and valley-bottom soil during the period from December 2012 to October 2014. The inventories in mountain slope showed both decreasing and increasing tendencies because of the heterogeneous transportation of Cs-137 via surface washoff on the slope. The results of outflow rate simulations using the SACT model developed in the Japan Atomic Energy Agency indicate decreasing tendency accompanied with a deeper penetration of Cs-137 into soil profile. Thus, the forest floor in the mountainous forest seems to be a sink of radiocesium contamination rather than a source for the contamination of the other ecosystems.

Keywords: Fukushima Dai-ichi Nuclear Power Plant accident, radiocesium, mountainous forest