

A comparison of initial deposition and current inventory of radiocesium in forest ecosystems surrounding Tokyo metropolitan area

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The Fukushima Daiichi Nuclear Power Plant (FD1NPP) accident in March 2011 resulted in the release of enormous amounts of radionuclides into the atmosphere. Those radionuclides were deposited over a large forested area in the Tohoku and Kanto districts. Using preserved rainfall monitoring samples that we had collected prior to the accident, we identified the initial radiocesium influx to the forested area in the Kanto region. The results show that the initial radiocesium deposition by bulk precipitation was not related to the distance from the FD1NPP. Atmospheric radiocesium inputs to forest sites were strongly influenced by interception and temporal retention by the forest canopy. We collected litter-layer and forest surface soil (0–20 cm depth) samples at the same forest sites in 2011, 2014, and 2016 after the accident. We then investigated the radiocesium inventory of forest floor and soil. Within five years, most of the radiocesium that had reached the forest floor had migrated into the surface soil. At all sites, we found the amount of radiocesium on the forest floor and surface soil layer in 2016 to be greater than the initial radiocesium influx by bulk precipitation. This suggests that the atmospheric radiocesium inputs to the forest sites were affected by dry depositions as well as rainfall and snowfall.