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Spatial variability of cesium-137 at forest floor of Japanese cedar plantation following the Fukushima Dai-ichi NPP accident

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Fukushima Dai-ichi Nuclear Power Plant accident resulted in a radioactive contamination over wide range of forest environment, however a significant variability of atmospheric fallout at forest floor hampers understanding of the contamination situation in forest area. A cedar forest plantation which is common forest type in Fukushima and the neighboring prefectures, was selected as study site. We determined spatial pattern of cesium-137 within a area of approximately 100-m2 at the forest floor by means of a systematic sampling of litter and soil materials. The results of this study indicated that cesium-137 inventory was heterogeneously distributed at forest floor, canopy structure was possibly a crucial factor determining spatial pattern of the atmospherically deposited cesium-137 in cedar forest. Furthermore, increasing numbers of sampling location didn't reduce variations of cesium-137 inventory sufficiently. The results of statistical analysis of the measured cesium-137 inventories suggested that further investigation is required to optimize sampling strategy for determination of representative inventory value of cesium-137 at forest floor.