Numerical study of transport pathways of radiocesium from forests to freshwater fish

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Restrictions remain on the sale of some freshwater fish products from Fukushima Prefecture following the accident at the Fukushima Dai-ichi NPP in 2011. It is thought that radiocesium exported from forests is the main source of the radiocesium taken up by freshwater fish, so it is important to clarify the export mechanism to predict future trends. In this study we developed a compartment model to assess catchment-scale migration of radiocesium and evaluated three potential transport pathways from forests to freshwater fish: direct litter fall into rivers, lateral inflow from litter layers in forests, and lateral inflow from underlying forest soils. The results suggest that a combination of direct litter fall and lateral inflow from the litter layer are the main export mechanisms influencing the radiocesium concentration of freshwater fish. It is expected that these results will be useful not only for predicting future trends but also for the assessment of countermeasures designed for reducing the uptake into fish.

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