

Resuspension and lateral transport of radiologically-contaminated seafloor sediment off Fukushima daiichi nuclear power plant

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In order to investigate behavior of particulate radiocesium emitted from Fukushima daiichi nuclear power plant (FINPP), time-series sediment traps were deployed at 500 m and 1000 m of station F1 located on the continental shelf slope ~ 100 km southeastward from FINPP and settling particles were collected. About three years time-series observation (July 2011 - July 2014) revealed that radiocesium emitted from FINPP (¹³⁴Cs and ¹³⁷Cs with both activity ratio of ~1) were largely collected in 2011 and early 2012, and thereafter decreased with time [1]. However, radiocesium was still detected in July 2014 and tended to increase in autumn. Major component of settling particles collected by sediment traps were lithogenic materials. Temporal variability in settling particles did not synchronize with that in marine primary productivity in upper layer. In addition, ratios of radiocesium (¹³⁷Cs) to excess radiopb (210-Pb) were similar to those of seafloor sediment off FINPP. Based on these observations, it was suspected that time-series sediment trap collected mainly radiologically-contaminated seafloor sediment that were resuspended and laterally transported to the continental shelf slope and the open ocean. During observation period, several typhoons passed through near FINPP or station F1 in autumn. Increase in radiocesium flux in autumn was likely attributed to more active resuspension / lateral transport of seafloor sediment by typhoon.

[1] Buesseler *et al.* (2015) Tracking the fate of particle associated Fukushima daiichi cesium in the ocean off Japan. *Environ. Sci. Technol.* **49**, 9807-9816, DOI: 10.1021/acs.est.5b02635.