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The activity of radiocaesium in sediments around off Fukushima after the accident of TEPCO's Fukushima Dai-ich Nuclear Power Station.

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Abstract

The 2011 off the Pacific coast of Tohoku Earthquake and tsunami on March 11, 2011 have led to the accident of TEPCO's Fukushima Dai-ich Nuclear Power Station (FNPS) and large amount of radioactive material were discharged by the hydrogen explosion and leaked from FNPS to the ocean. About three years have passed after the accident, radiocaesium in seawater off Fukushima except for part of area is gradually decreasing to the level before the accident. However, because the decrease of radiocaesium in marine sediment is more slowly than that in seawater, it is worried to influence on marine biota dwelled around the seabed over the long term. The aim of this study was to elucidate the variation and behavior of radiocaesium (134Cs and 137Cs) activities in the marine environment. Sediment and seawater samples were collected from three sites in 5 km-20 km area from FNPS (NP2 site ; 37° 25 N, 141°06 E, water depth 30 m, AN6 site ; 37° 33 N, 141°07 E, water depth 30 m, and M01 site ; 37° 33 N, 141°20 E, water depth 60 m) in May and October 2013 during some cruise of Umitaka-maru and Shinyo-maru (Tokyo University of Marine and Technology) .Vertical changes of 134Cs concentration (Bq/kg-dry) in sediment ranged 17-28, 8.2-53, and 4.2-11 at NP2, AN6 and M01 sites as of May 2013, respectively. At NP2 site, 134Cs inventory (Bq/m2) in seawater in October was about four times higher than that of 134Cs inventory in May. At NP2 and M01 sites in May, 134Cs concentration was higher in the shallow layer (0 cm-1 cm). On the contrary, at AN6 site in May and NP2 site in October, 134Cs concentration was higher in the middle layer (4 cm-5 cm). Trend of organic content at all stations were consistent with that of vertical change of 134Cs concentration. These results suggest that highest radiocaesium layer in the shallow as well as in the middle depth was caused by increase of river input and resedimentation.