Fukushima Dai-ichi and the Ocean: 10 years of study and insight Abstract Submission Form : Entry # 23

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Session

Consequences for the ocean

Abstract Title (English, limited to 300 characters)

Status and future of radiocesium in the seafloor off Fukushima

Abstract (English, limited to 2000 characters)

The amount of Cs-137 accumulated on the seafloor (0.1 to 0.3 PBq) is only about 0.5 to 2% of the Cs-137 released to the ocean by the accident of Fukushima Daiichi Nuclear Power Plant, but it has been revealed that the radiocesium retains in the coastal seafloor for several decades. This work focuses on radionuclides (mainly Cs-137) in the seafloor around Fukushima and reviews the research results on its distribution and behavior. The initial deposition of the accident-derived radiocesium on the seafloor around Fukushima was determined within about half a year after the accident. The mid-depth of sediment, buried with radiocesium in the early stages after the accident, serves as a peak layer that records the history of the accident in the long term, while serving as a source of radiocesium to the overlying water through porewater. The abundance of Cs-137 in surface (0-10 cm) sediments, which is expected to impact seafloor ecosystems, decreased to about one tenth in the 9 years after the accident. As a reduction mechanism other than radioactive decay, it was estimated that approximately 50~60% of the decrease was due to transport to the deeper sedimentary layers, and the remaining was due to desorption from the sediment and horizontal migration of sediment particles. The contribution ratios of these mechanisms have changed over time. When predicting radiocesium concentration (abundance) in the seafloor of the future, consideration should be given not only to the radiocesium concentration in the seafloor but also to the temporal changes in the processes controlling the concentration.