

Deposition and Migration of Radioactive Cs in the Matsukawa Ura and Feeder Rivers, Fukushima, Japan (Preliminary report)

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Radionuclides were released into the environment by the associated accident at the Fukushima Daiichi Nuclear Power Plant (FDNPP). Radioactive Cs that are released from FDNPP and is deposited on the land will migrate to the ocean finally through the surface flow. In this study, we were intended to determine the actual transport of radioactive material in the system of river - estuary - ocean as a model area the feeder rivers and Matsukawa Ura located in Soma City, Fukushima Prefecture. Sediment sampling were continuously obtained from Matsukawa Ura and feeder rivers (Uda River, Koizumi River, Ume River and Nikkeshi River) from September 2013. The radioactivity of the Gamma ray nuclide was measured using a Ge semiconductor detector. Radioactive Cs activity in the Ume River and Nikkeshi River, which are located on the south side were higher than that in the Koizumi River and Uda River, located on the north side, because that reduced rainfall led to the increases in radioactive Cs concentration, except for the Nikkeshi River effected by heavy rain. Thus, it is thought there is a strong correlation between precipitation and radioactive Cs inventory of Matsukawa Ura, and the river flow in brackish area is dominant by the increasing precipitation which led to the increasing of flow rate, result in the river bed sediment inflowing to Matsukawa Ura. So it suggests that radioactive Cs activity has decreased because of increasing precipitation. In the Nikkeshi River, radioactive Cs activity was increased and sediment was changed to fine grain size at the same time after heavy rain as compared with before. This is considered that fine particles have been transported due to salt water intrusion during returning from overflow to the calm water after the heavy rain event. Transport situation of radioactive material in the river - estuary - ocean system revealed that physical and chemical process contributes significantly influence on it such as water flow and dynamics of fine sediment.

Keywords: Radioactive Cs, Matsukawa Ura, Brackish water area