

## Evaluation of Radioactive sediment transport in Tokyo Bay released from TMR

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Radioactive contaminants released from TEPCO Fukushima nuclear powerplant into Tokyo Metropolitan Region (TMR), mainly on 21-22 March 2011, are accumulated via hydrological cycle and released into the shallow estuary ? Tokyo Bay. Major streams (Edo, Ara, and Tama) carry radioactive contaminants via suspended particulate form. Some of them may stay in the riverbed and finally transported into the river outlets. In this study, numerical modeling approach using Hydro3D -an catchment-estuary integrated model ? is introduced. Three-major Fission Products (Cs137, Cs134, I131) are calculated based on the initial radioactive distribution recomposed from aerial radioactive monitoring by METI. Fission Products (FP) transport in TMR are calculated using both Euler surface dissolved / non-dissolved transport and Lagrangian form sediment-marker transport models, showing serious accumulation into major streams. Effects of particle coagulation at the river outlets are calculated according to the salinity and diameter of suspended particulate material. Those released materials into Tokyo Bay are calculated using three-dimensional estuary model and bottom-sediment transport model. According to the numerical simulation, the radioactive sediment concentration composed with Fission Products in Tokyo Bay may increase due to increase of hydrological transport within three years (mainly induced by the Cs137/134) and then last more than 10 years (mainly by Cs137). Bottom-sediment contamination near the Obitsu River outlet is predicted by the numerical simulation, in addition to the hotspots predicted at outlets of Edo and Ara rivers.

Keywords: Fission Products, Radioactive sediment, Tokyo Bay, TMR, Hydrological Cycle