

Simulation study of sediment and radio-cesium transport over 2015 Typhoon Etau

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Typhoon Etau in 2015 was the highest intensity rainfall event to hit Fukushima Prefecture subsequent to the March 2011 nuclear accident. As typhoons are important vectors of radio-cesium redistribution, we performed a simulation study of this typhoon to understand its consequences.

We modeled five river basins surrounding the Fukushima Daiichi Nuclear Plant: the Odaka, Ukedo, Maeda, Kuma and Tomioka basins. The horizontal resolution of the grid cells varies between 10-250 m within the study area. The smaller cells are located around areas of high importance, such as river channels and banks. Previously we studied these basins over 2011 Typhoon Roke and multiple typhoons in 2013 [1,2]. Water, sediment and radio-cesium flows were calculated across the basins using the General purpose Terrestrial fluid FLOW Simulator (GETFLOWS) code [3].

The main results are erosion/accumulation quantities for the radio-cesium inventory within each of the grid-cells on the simulation mesh of the study area. The results show the locations where radio-cesium is mobilized due to soil erosion. Radio-cesium deposition occurs within dam reservoirs along the river courses, and in the lower parts of the basins on flood plains and towards the river mouths.

We also present results for total amount of sediment and radio-cesium export from each of the rivers to the Pacific Ocean over Typhoon Etau. These results are useful for parametrizing ocean models of radio-cesium transport around the Fukushima Daiichi site.

[1] Kitamura *et al.* (2016) *Earth Surf. Process. Lanf.* (in press). [2] Sakuma *et al.* (2016) Under review at *J. Environ. Radioact*

[3] Mori *et al.* (2015) *Environ. Model. Softw.* **72**, 126-146.