

EGU2020-21319

<https://doi.org/10.5194/egusphere-egu2020-21319>

EGU General Assembly 2020

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Analysis of temporal variations of Cs-137 discharge inventory from the port of Fukushima Daiichi Nuclear Power Plant over 9 years after the accident

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Just after Fukushima Daiichi Nuclear Power Plant (1F) accident occurred in March 2011, the direct discharges of highly-contaminated water from reactor Unit 2 and 3 into the 1F port followed. After the suppressions of the direct discharges, Kanda (Biogeosci. 10, 6107–6113, 2013) suggested that relatively small amounts of run-off of a radionuclide (Cs-137) from 1F port into Fukushima coastal region has continued based on his estimation method. However, Kanda's estimation period was limited up to September 2012. Therefore, we expand the estimation period of the discharged inventory up to very recently, March 2020 with significant accuracy improvements by the present authors. As a result, we find that totally, in the period over 9 years, the discharged inventory has gradually diminished together with various characteristic fluctuations. In this presentation, we analyze the observed diminishing trends with temporal fluctuations and discuss their relationships with various suppression measures and constructions toward decommissioning of 1F. Furthermore, we estimate the annual discharged amount of Cs-137 and evaluate its impacts on the coastal area in terms of seawater concentrations.