Plutonium isotopes in seawater off Fukushima within two months after the accident

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Considering the complexity of marine environment, seawater samples at the early stage of Fukushima dai-ichi Nuclear Power Plant Accident (FDNPP) is more representative for revealing the impact of Fukushima-derived Pu contamination in the marine environment. In this study, using a rapid Pu analytical method [1], we measured Pu isotopes in seawater samples 33-163 km off Fukushima collected in May, 2011, to provide the isotope composition, the distribution and time evolution of $^{239+240}$Pu activity.

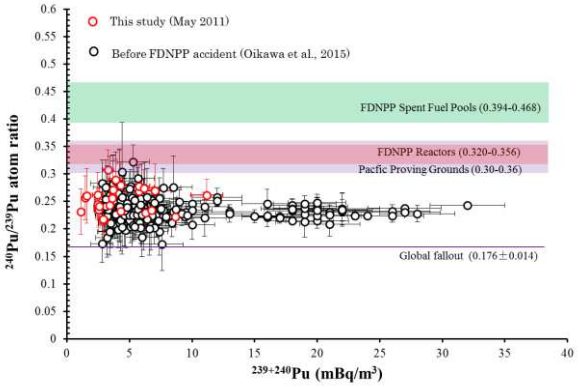

Figure 1: Pu activities and atom ratios in seawater samples.

Results and discussion

The results suggested that both $^{239+240}$Pu activities (0.81-11.18 mBq/m^3) and ^{240}Pu/^{239}Pu atom ratios (0.216-0.308) in the early stage seawater samples were within the corresponding background ranges before FDNPP accident, demonstrating that Fukushima-derived Pu isotopes were too limited to change the background level in the seawater. The Pu isotopes released from FDNPP accident into the marine environment were not notable.

[1] Men *et al*. (2018) Sci. Rep. **8**:1892