

Title: Fukushima radionuclide tracer in the North Pacific, observation and modeling

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Contaminated waters from the Fukushima nuclear power plant (FNPP) were discharged directly into the North Pacific Ocean in March 2011. While the coastal current system in this region is not well understood, especially regarding the time scale of the exchange between the coastal waters and the open ocean, both observations and numerical model simulations do suggest relatively rapid eastward advection of contaminants into the highly energetic confluence region of the Kuroshio and the Oyashio. Surface drifters deployed near the FNPP in early summer of 2011, for example, show trajectories crossing the North Pacific after one year. The goal of this project is to use radionuclides of Fukushima origin as a tracer to understand the North Pacific Ocean circulation and the mixing process after three years of the release. Hydrographic observations along the 30°N section showed that the radionuclide signals propagated from 174.3°W in 2012 to the east at 160.6°W in 2013. The signal was also found up to 500m depth west of 180°E, but this penetration depth shoaled toward the east with a complete diminish at 152°W. Available historical drifter datasets are also being examined to estimate the spread rate of the radionuclides in the Pacific Ocean on over 5-year time scales.