Press Releases

JAMSTEC
Japan Agency for Marine-Earth Science and Technology

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JAMSTEC

Radiocesium Reached Pacific Ocean Abyssal Depths One Month after Nuclear Accident
—Radiocesium Detected from Western North Pacific Sediment Trap Samples—

1. Overview

Team Leader Makio Honda of the Japan Agency for Marine-Earth Science and Technology (hereinafter referred to as JAMSTEC: Asahiko Taira, President) Research Institute for Global Change and Research Scientist Hajime Kawakami of the JAMSTEC Mutsu Institute for Oceanography found that radiocesium released to the atmosphere by the Fukushima Daiichi Nuclear Power Plant accident caused by the March 11, 2011 Tohoku-Oki Earthquake had reached the abyssal depths of the western North Pacific about 1 month after the accident. However, the amount reaching the depths was less than 1% of the radiocesium reaching the ocean surface, and almost all of the radiocesium was shown to be dissolved in seawater. These findings are based on time-series observation have been conducted by JAMSTEC since 2001. They are unique findings from observations of radioactive substances in sinking particles before and after their release in association with the accident.

These findings are anticipated to contribute to predictions of how radioactive substances supplied to the ocean will be transported, dispersed, and distributed. They were published in Biogeosciences Vol. 10 on June 3 (Japan time).

The findings were introduced as a rapid report at JAMSTEC 2012, which was held on March 14, 2012. The details will be reported on June 7 at The Society for Remediation of Radioactive Pollution International Symposium in Tokyo.

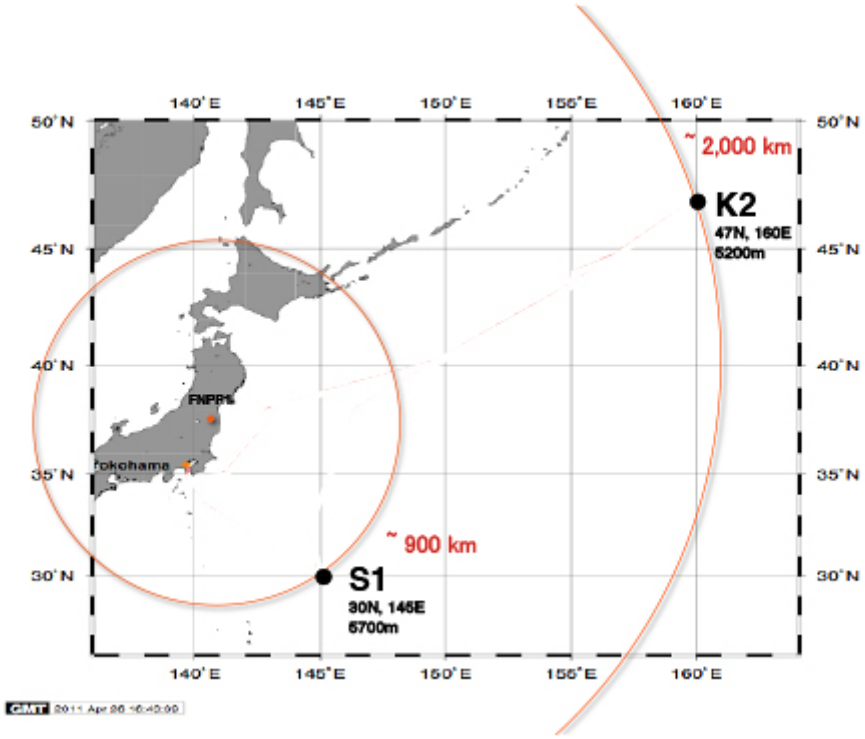

Figure 1. Observation Points K2 and S1. The concentric circles indicate the approximate distance from the Fukushima Daiichi Nuclear Power Plant (FNPP1). Sediment traps to collect sinking particles (see details in Figure 2) were moored at K2 and S1 at the time of the nuclear accident.

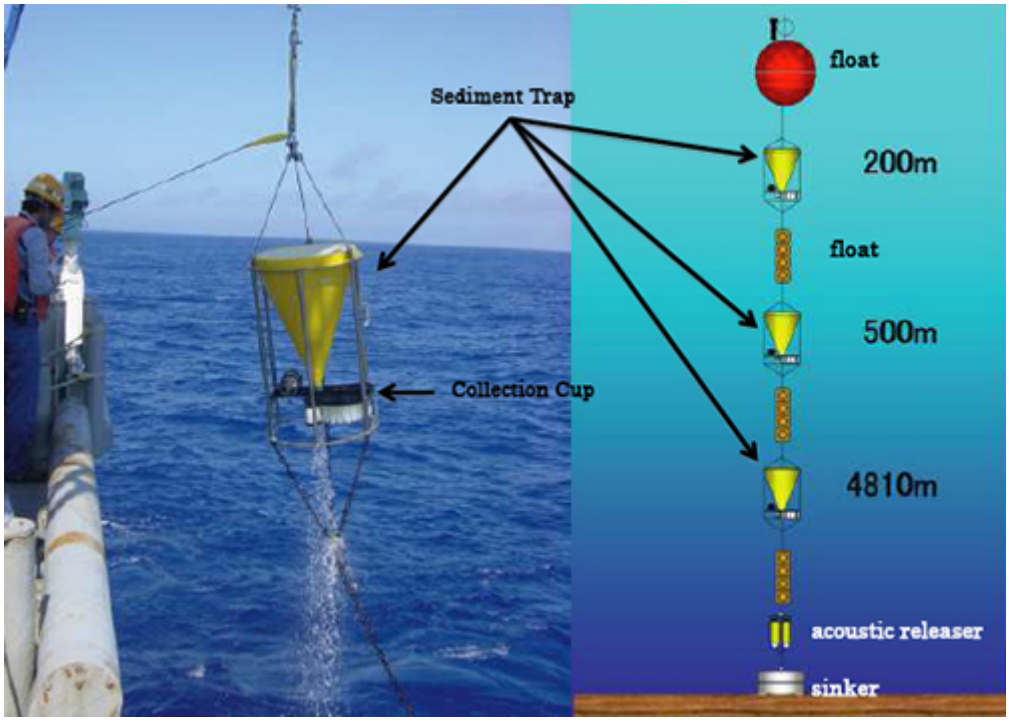

Figure 2. Time Series Sinking Particle Collector (Sediment Trap) Marine snow that has precipitated onto the upper part of yellow cone-shaped receptacle is collected in the collection cup containing preservative at the bottom of the receptacle. On the rotating plate are installed 21 collection cups, which are exchanged when the rotating plate rotates at preset intervals. The samplers are attached at various depths to a wire suspended from a float moored to the seafloor (tension is applied to maintain vertical orientation) and collect the marine snow per interval at each depth. They are usually

moored for one year, after which an acoustic signal is transmitted from a ship, the sinker is detached from the wire, and the mooring system is floated to the surface. The sampling cups are collected aboard the ship and preserved in a refrigerator. After returning to land, radioactive substances in the marine snow and other components are chemically analyzed.

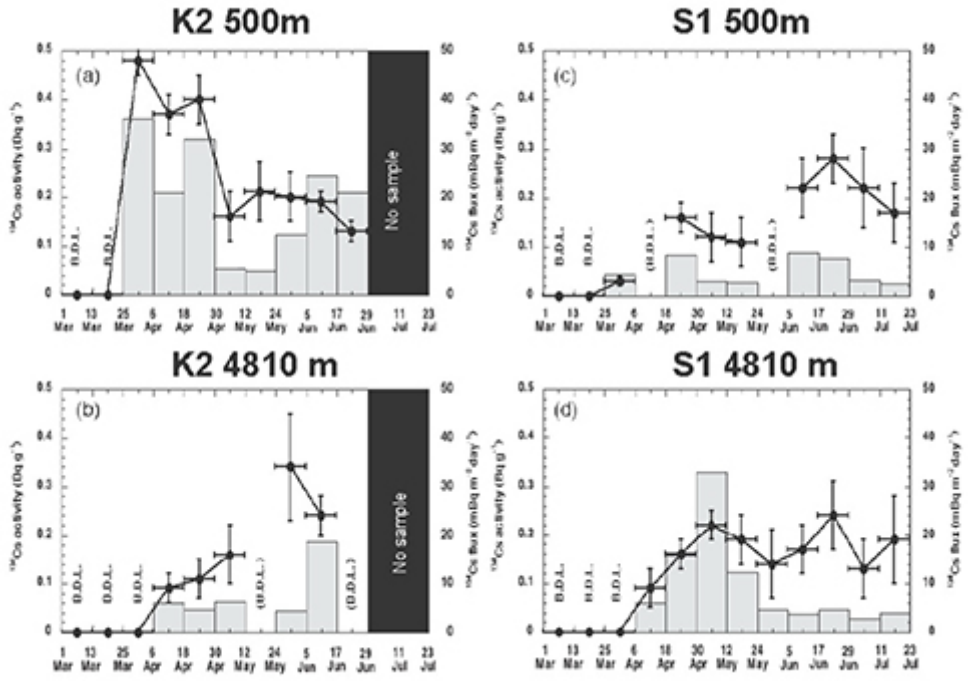

Figure 3. The radiocesium flux (^{134}Cs flux: bar graph) and concentration (^{134}Cs activity: line graph) observed from each sediment trap from March 1, 2011. (a) K2, 500 m; (b) K2, 4810 m; (c) S1, 500 m; (d) S1 4810 m. The dates are the days when each collection cup began collecting marine snow. Marine snow was collected for 12-day periods. BDL denotes marine snow samples that had radiocesium concentrations below the detection limit. Radiocesium was detected in marine snow from March 25, 2011 at 500 m depth and from April 6 at 4810 m depth.

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