Fukushima Dai-ichi and the Ocean: 10 years of study and insight Abstract Submission Form : Entry # 18

Name

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Title

Distribution and evolution of Fukushima Dai-ichi derived 137Cs, 90Sr, and 129I in surface seawater off the coast of Japan

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Session

Consequences for the ocean

Abstract (English, limited to 2000 characters)

The Fukushima Dai-ichi Nuclear Power Plants (FDNPPs) accident in 2011 led to an unprecedented release of radionuclides into the environment. Particularly important are 90Sr and 137Cs due to their known health detriments and long half-lives (T1/2 ≈ 30 y) relative to ecological systems. These radionuclides can be combined with the longer-lived 129I (T1/2 ≈ 15.7 My) to trace hydrologic, atmospheric, oceanic, and geochemical processes. This study seeks to evaluate 137Cs, 90Sr, and 129I concentrations in seawater off the coast of Japan, reconcile the sources of contaminated waters, and assess the application of 137Cs/90Sr, 129I/137Cs, and 129I/90Sr as oceanic tracers. We present new data from October 2015 and November 2016 off the coast of Japan, with observed concentrations reaching up to 198±4 Bq·m-3 for 137Cs, 9.1±0.7 Bq·m-3 for 90Sr, and (114±2) x10-5 Bq·m-3 for 129I. The utilization of activity ratios suggests a variety of sources, including sporadic and independent releases of radiocontaminants. Though overall concentrations are decreasing, concentrations are still elevated compared to pre-accident levels. In addition, Japan's Environment Minister has suggested that stored water from the FDNPPs may be released into the environment and thus continued efforts to understand the fate and distribution of these radionuclides is warranted.