

**Fukushima Dai-ichi and the Ocean: 10 years of study and insight Abstract Submission Form : Entry # 57**

**Name**

Ken Buesseler

**Title**

Dr.

**Affiliation**

Woods Hole Oceanographic Institution

**Email**

[kbuesseler@whoi.edu](mailto:kbuesseler@whoi.edu)

**Country**

US

**Session**

What happened

**Abstract Title (English, limited to 300 characters)**

Opening the Floodgates at Fukushima

**Abstract (English)**

Nearly 10 years after the Tohoku-oki earthquake and tsunami devastated Japan's Fukushima Dai-ichi Nuclear Power Plant (FDNPP) radioactivity levels in the ocean off FDNPP are 100,000's of times lower than at their peak in April 2011, and since mid-2015, none of the fish caught nearby exceed Japan's strict limit of 100 Bq/kg. However, enormous challenges remain in the decommissioning of the reactors and clean up on land. A future concern is the release of water from more than 1,000 tanks on the grounds of the power plant that are filling with ground water and cooling water that have become contaminated through contact with the reactors and their containment buildings. One of the radioactive isotopes that remains at the highest levels in the tanks and would be released is tritium, an isotope of hydrogen is almost impossible to remove. However, tritium has a relatively short half-life (12.3 years), which measures the rate of decay of an isotope; is not absorbed as easily by marine life or seafloor sediments; and produces beta particles, which is not as damaging to living tissue as other forms of radiation. Of concern are other radioactive contaminants that remain in the treated wastewater, including carbon-14, cobalt-60, ruthenium-106 and strontium-90. These and the other isotopes that remain, which were only revealed in 2018, have much greater affinities for seafloor sediments and marine organisms like fish, which means they could be potentially of concern to humans and in the environment for much longer and in more complex ways than tritium. Reduction in the levels of non-tritium contaminants before release is possible, but should be started soon with independently verified levels of contaminants in each tank. If there is a planned release, support is needed for independent studies of multiple radioactive contaminants in seawater, marine biota and seafloor sediments before, during and after any releases.