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For Immediate Release

State of the Ocean, 5 Years After Fukushima

New Annual Reviews Article Summarizes Current State of the Ocean After 2011 Tohoku Earthquake and Tsunami

Five years after the Fukushima disaster, radiation levels in the sea are decreasing rapidly, except in the harbor close to the nuclear plant, where ongoing releases of radioactive materials remain a concern, as does the lack of international support to continue monitoring radioactivity.

This is the main conclusion of a major review of the state of the ocean following the 2011 nuclear accident. The article (*Fukushima Daiichi–Derived Radionuclides in the Ocean: Transport, Fate, and Impacts*) was written by an international team of researchers working together as part of a Scientific Committee on Oceanic Research (SCOR) Working Group. The review will be published in an article of the 2017 *Annual Review of Marine Science* and presented at the Goldschmidt Conference in Japan.

"Overall, the results show a trend of decreasing radiation risk in oceans themselves and to marine life," said Ken Buesseler, of the Woods Hole Oceanographic Institution and lead author of the article. "This is generally true, except for the harbor at Fukushima nuclear power plant. The highest remaining oceanic contamination remains in seafloor sediments off the coast of Japan."

Focusing on caesium-137 (^{137}Cs), a radioisotope chosen for its long half-life and its abundance at the Fukushima Daiichi Nuclear Power Plants, the group was able to determine that the radioactivity released was one-fiftieth that of a nuclear weapon, and one-fifth of the 1986 Chernobyl disaster.

The fallout of the Fukushima accident, while well documented on land, is much more difficult to quantify in the ocean due to changing currents and sampling challenges. Even so, the study's models suggest that the larger portion of the radioactive materials released was initially vented into the atmosphere, then 80 percent of the fallout dropped into the ocean, the majority of which remained within a few hundred meters of the site.

By 2015, and except for the species found near the site of the accident, radioactivity had fallen below detection levels in marine life.

As for the impact on human lives, the total radiation dose the evacuees received would increase the risk of fatal cancer to 24.4 percent, from 24 percent, and no radiation-linked deaths were reported. In comparison, 15,000 people lost their lives in the Tohoku earthquake and tsunami, and 100,000 were evacuated. Tourism and the fishing industry were badly hit.

"Despite this, we are still concerned that there is little support to continue assessments as time goes by, both in Japan and from US federal agencies, which have never given any support," Dr. Buesseler said. "This is not good, as public concern is ongoing, and we can learn a lot even when levels go down in the environment, and are no longer of immediate health concern."

About Annual Reviews: Nonprofit publisher of highly cited reviews that synthesize the research literature in a clear and compelling style to stimulate discussion about the science that shapes our lives.

About the Goldschmidt Conference: The Goldschmidt Conference is the world's most important geochemistry conference. Around 3500 delegates will attend the 26th 2016 Goldschmidt conference in Yokohama, Japan from 26 June to 1 July 2016. The Goldschmidt Conference is co-sponsored by the Geochemical Society and the European Association of Geochemistry. http://goldschmidt.info/2016

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