Fukushima Radioactivity Detected West of America

Monitoring efforts along the Pacific Coast of the US and Canada have detected the presence of small amounts of radioactivity from the 2011 Fukushima Dai-ichi Nuclear Power Plant accident 100 miles (150km) due west of Eureka, California. Scientists at the Woods Hole Oceanographic Institution (WHOI) found the trace amounts of telltale radioactive compounds as part of their ongoing monitoring of natural and human sources of radioactivity in the ocean.

In the aftermath of the 2011 tsunami off Japan, the Fukushima Dai-ichi Nuclear Power Plant released caesium-134 and other radioactive elements into the ocean at unprecedented levels. Since then, the radioactive plume has traveled west across the Pacific, propelled largely by ocean currents and being diluted along the way. At their highest near the damaged nuclear power plant in 2011, radioactivity levels peaked at more than 10 million times the levels recently detected near North America.

The amount of cesium-134 reported in these new offshore data is less than 2 Becquerels per cubic metre (the number of decay events per second per 260 gallons of water). This Fukushima-derived cesium is far below where one might expect any measurable risk to human health or marine life, according to international health agencies. And it is more than 1000 times lower than acceptable limits in drinking water set by US EPA.

Scientists have used models to predict when and how much caesium-134 from Fukushima would appear offshore of Alaska and the coast of Canada. They forecast that detectable amounts will move south along the coast of North America and eventually back towards Hawaii, but models differ greatly on when and how much would be found.

Because no US federal agency is currently funding monitoring of ocean radioactivity in coastal waters, Buesseler launched a crowd-funded, citizen-science programme to engage the public in gathering samples and to provide up-to-date scientific data on the levels of cesium isotopes along the west coast of North America and Hawaii. Since January 2014, when Buesseler launched the programme, individuals and groups have collected more than 50 seawater samples and raised funds to have them analysed. The results of samples collected from Alaska to San Diego and on the North Shore of Hawaii are posted on the website. To date, all of the coastal samples tested in Buesseler's lab have shown no sign of caesium-134 from Fukushima (all are less than their detection limit of 0.2 Becquerel per cubic metre).

The offshore radioactivity reported begin September came from water samples collected and sent to Buesseler's lab for analysis in August by a group of volunteers on the research vessel *Point Sur* sailing between Dutch Harbor, Alaska, and Eureka, California. These results confirm prior data described at a scientific meeting in Honolulu in February 2014 by John Smith, a scientist at Fisheries and Oceans Canada in Dartmouth, Nova Scotia, who found similar levels on earlier research cruises off shore of Canada. Buesseler and Smith are now working together on a new project, led by Jay Cullen at the University of Victoria, Canada, called InFORM that involves Canadian academic, government and NGO partners to determine and communicate the environmental risks posed by Fukushima for Canada's Pacific and Arctic coasts and their inhabitants.