Surface concentrations of ^{90}Sr, ^{129}I, and actinides measured in coastal waters off Japan 2-3 years after the Fukushima Dai-ichi nuclear accident

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In the years following the Fukushima Dai-ichi Nuclear Power Plant (FDNPP) accident in 2011, monitoring of less radiologically relevant radionuclides has received limited attention. This is the case of ^{90}Sr, ^{129}I and actinides (^{236}U and Pu-isotopes). Their monitoring is however important because: i) they can be proxies for other radionuclides with radiological interest; and/or ii) they are suitable as geochemical tracers providing valuable information about hydrological, atmospheric, and geochemical processes. Additionally, two years after the accident, ^{90}Sr was still a major contaminant in waters accumulated within the nuclear facility and storage tanks.

In 2013 and 2014, three cruises took place in the coast off Japan, with the aim to re-evaluate the concentrations and the distribution of artificial radionuclides from FDNPP and identify the current potential sources of these isotopes, with particular emphasis to ^{90}Sr.

Here we present results of ^{90}Sr, ^{129}I, ^{236}U and Pu-isotopes from May 2013, May 2014 and October 2014 onboard R/V Daisan Kaiyo Maru and R/V Shinsei Maru. Surface concentrations of ^{90}Sr and ^{129}I up to 8.9±0.4 Bq·m^{-3} [1] and 780±15×10^{7} at·kg^{-1}, respectively, suggest ongoing releases of these radionuclides from the FDNPP. Potential releases of ^{236}U and Pu-isotopes remain under discussion. The evolution of atomic and/or activity ratios of ^{137}Cs/^{90}Sr, ^{129}I/^{137}Cs, ^{129}I/^{90}Sr with time corroborate the ongoing releases of radionuclides to the coast off Japan.

Upper boundary estimates of ^{90}Sr and ^{129}I releases during the years following the FDNPP accident are minor compared to the total amounts released in 2011. Yet this study indicates that a continuous surveillance of artificial radionuclides to the Pacific Ocean is still required.

[1] Castrillejo *et al.* (2016) *Environ. Sci. Technol.* **50**, 173-180.