

福島第一原子力発電所事故に由来する放射性物質の北太平洋での表層輸送経路および冬季沈み込みについて

Surface pathway and subduction of Fukushima radioactivity in the North Pacific Ocean in March 2011 - June 2012

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¹³⁴Cs and ¹³⁷Cs were released to the North Pacific Ocean by two major likely pathways, direct discharge from the Fukushima NPP1 accident site and atmospheric deposition. High density observations of ¹³⁴Cs and ¹³⁷Cs in the surface water were carried out at 322 stations by 17 cruises of cargo ships and several research vessel cruises since March 2011 till March 2012. Main body of radioactive surface plume of which activity was exceed 10 Bq m⁻³ had been travelling along 40 oN, and reached International Date Line on March 2012. A feature was that the radioactive plume was confined along 40 oN when the plume reached International Date Line. Although activities of ¹³⁴Cs and ¹³⁷Cs in the surface water decreased rapidly, a maximum of activities of ¹³⁴Cs and ¹³⁷Cs in seawater at about 300 meters depth was observed at 40 oN 165 oE in June 2012. We can say that the observed maximum of ¹³⁴Cs and ¹³⁷Cs was formed by subduction in winter 2011/2012 because a density of Central Mode Water of 26.3 kg m⁻³ corresponded to about 300 meters depth in this region. Water column inventory of ¹³⁴Cs from surface to 1000 meters depth was 2710 +- 210 Bq m⁻² in October 2011 at 40 oN 165 oE and 80 % of water column inventory of ¹³⁴Cs existed shallower than 200 meters, however only 20 % of water column inventory of ¹³⁴Cs was shallower than 200 meters while 80% was deeper than 200 meters in June 2012 due to subduction in winter 2011/2012.

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