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福島第一原発事故により放出された 134Cs と 137Cs の北太平洋における表層輸送経路および鉛直分布
134Cs and 137Cs in the North Pacific Ocean derived from the TEPCO Fukushima Dai-ichi Nuclear Power Plant accident

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We collected 2 - 10 litre surface seawater samples at more than 300 stations and water column samples were also collected at 24 stations.

The measured 137Cs concentration in a seawater sample at north 5 and 6 canal of the FNPP1 site reached 68 MBq m-3 on 6 April. It decreased to 1000 ? 10000 Bq m-3 during the period from August 2011 to July 2012 which means that direct discharge rate became very small, about ca. 100 GBq day-1. After July 2012, the activities of 137Cs in surface water at near FNPP1 site were still kept around 1000 Bq m-3 which corresponds about 10 GBq day-1.

After the FNPP1 accident, both 134Cs and 137Cs are observed in a wide area in the North Pacific Ocean and 134Cs activity and 137Cs activity ranged from 1000 +- 71 to less than 0.4 Bq m-3 and from 1080 +- 60 to 1.2 +- 0.2 Bq m-3, respectively. A zonal speed of FNPP1 derived radiocaesium in surface water at mid latitude in the North Pacific Ocean was 7 km day-1, 8 cm s-1, until March 2012 just after one year the accident (Aoyama et al., 2014). It after March 2012 till August 2014 was also estimated to be ca. 3 km day-1, 3.5 cm s-1 which showed apparent decrease of zonal speed. In 2013 and 2014, a maximum of Fukushima origin 137Cs activity in surface water was already close to pre-Fukushima level and observed at the eastern part of the North Pacific Ocean.

Until the end of 2011, a main body of Fukushima derived radiocaesium were existed at surface mixing layer, however, after winter cooling occurred subsurface maximum of Fukushima derived 134Cs and 137Cs due to subduction were observed at about 300 to 400 meters at 35 deg. N to 40 deg. N along 165 deg. E due to subduction. Southward transport due to subduction was also observed at 24 deg. N, 165 deg. E, too.