**Distribution of 137Cs in the East Sea and coastal water off southern Korea Peninsula**

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This study investigates the vertical and horizontal distribution of the artificial radionuclide, cesium-137 (137Cs, half-life: 30.17 year), in seawater of the Korean seas (the East Sea and the coastal water off southern part of Korean Peninsula) immediately after the Fukushima wastewater release in 2024. In the East Sea surface, 137Cs activities ranged from 0.88 - 1.55 mBq kg-1 (average: 1.19±0.27 mBq kg-1, n=8). The activity was highest at the surface and decreased with depth, reaching value with minimum detectable activity (MDA), < 0.27 mBq kg-1 ­at depths >2,000m. 137Cs activities in the surface off southern Korean sea, ranged from 1.38 - 2.24 mBq kg-1 (average: 1.68±0.34 mBq kg-1, n=5), with slightly higher activities in the surface compared to those in deeper water. The temporal variation of 137Cs activities in both regions showed an overall exponential decrease of 137Cs since the 2000s, except for the few years after the Fukushima accident (in March, 2011). Based on this trend, effective environmental residence time (τEF) of 137Cs in the mixed layer depth of the East Sea was estimated to be 21.1±8.3 years. The oceanic residence time (τOC) was calculated to be 69.8±1.2 years. According to the 137Cs mass balance in the East Sea (based on the balance between atmospheric input and vertical mixing), the downward flux of 137Cs from mixed layer to the deep-water (1,350 - 2,000 m) were calculated to be 1.87 -1.89 Bq m-2 yr-1 with oceanic residence time of 50.0 - 50.6 yrs.