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Artificial radionuclides dataset of seawater, sediment and biota in marine environment at Black Sea and off Fukushima

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134Cs and 137Cs, hereafter radiocaesium, and some other artificial radionuclides were released to the North Pacific Ocean by the TEPCO Fukushima Dai-ichi Nuclear Power Plant (FNPP1) accident in March 2011. Total amount of released 137Cs to the North Pacific Ocean was 15-18 PBq (Aoyama et al., 2016). Before the FNPP1 accident, 137Cs was also injected to the North Pacific Ocean mainly due to atmospheric weapon tests fallout and small amount of fallout by Chernobyl Nuclear Power Plant (ChNPP) accident, and an inventory of 137Cs in the North Pacific Ocean was 69 PBq as of 2011. As a results of direct discharge from FNPP1 site (3.5 +- 0.7 PBq, Tsumune et al., 2012) and atmospheric fallout, 137Cs activity concentration in surface water close to the FNPP1 site sharply increased in April 2011 up to 108 times of the 137Cs activity concentration before the accident.
Due to the ChNPP accident in April 1986 radiocaesium, 90Sr and some other long lived artificial radionuclides were delivered to the Black and the Baltic seas mainly by the atmospheric transport and deposition on the sea surface. The contamination of the Baltic Sea is well studied and detailed datasets with measurements of radionuclides in the water, bottom sediments and marine organisms exist (for example, the MARiS and HELCOM databases), whereas there is no any available database with measurements for the Black Sea. Atmospheric fallout of 137Cs from ChNPP accident have been estimated 1.7 – 2.4 PBq, therefore as a results of ChNPP accident, the 137Cs inventory in the Black Sea water column increased by a factor of 6-10 compared with pre-Chernobyl inventory due to atmospheric weapon test fallout (Egorov et al., 2005). The inflow or radionuclides with the rivers water played secondary role.
We compiled artificial radionuclides dataset of seawater, sediment and biota in marine environment at Black Sea and off Fukushima. For the Black Sea, duration of dataset covers 1984 to 2007 including ChNPP accident period. For off Fukushima region, duration of dataset covers 1960s to 2016 including main global atmospheric weapon tests period late 1950s and early 1960s, ChNPP accident in 1986 and FNPP1 accident in 2011.
This dataset mainly aims to be used for validation of results of different models for transfer and fate of radioactivity in the marine environment. The dataset can also serve for process studies of temporal variation of artificial radionuclides at two regions affected by nuclear facility accidents.