Polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs) in sediments beneath three ocean dump sites (East Sea 1, East Sea 2, and Yellow Sea 1) of Korea

C. J. KIM[1], K. Y. CHOI[2]*, C. S. CHUNG[1] AND Y. I. KIM[2]

[1]Korea Institute of Ocean Science & Technology, 787, Haeanro, Ansan, 426-744, Korea (kcj201@kiost.ac)

[2]Korea Institute of Ocean Science & Technology, East Sea Research Institute, 48, Haeyangscience-gil, Jukbyeon-myeon, Uljin, 767-813, Korea (*correspondence: sberri@kiost.ac)

Ocean dumping in Korea (Rep.) began in 1987, and three dumping sites (East Sea 1, East Sea 2, and Yellow Sea 1) were established in 1993. Since then, wastes from land-based activities have been dumped from disposal vessels using both dispersed and concentrated dumping methods. At the same time, continuous efforts have been made to prohibit certain types of ocean dumping by enacting relevant laws and improving waste treatment systems. As of early 2015, all materials except wastewater fall under the prohibition list. The Korea Institute of Ocean Science and Technology (KIOST) collected sediment samples from 16 stations at Yellow Sea 1 site using the R/V Eardo in July 2014 and from 15 stations at East Sea 1 and 2 sites in October 2014 using the R/V Onnuri. From the samples, concentrations of 36 polychlorinated biphenyls (PCBs) and 27 polycyclic aromatic hydrocarbons (PAHs) were quantified. The concentration ranges for 36 PCBs and 27 PAHs from the Yellow Sea 1 samples were 1.75–13.44 and 170–394 ng/g d.w., respectively, while the concentration ranges for the East Sea 1 were 0.20–5.72 and 330–918 ng/g d.w., and those for the East Sea 2 were n.d.–1.07 and 50.5–480 ng/g d.w. The results of an ecotoxicological risk evaluation using 13 PAHs revealed that all three sit around the dumping sites do not exert adverse influence on the benthic organisms inhabiting the areas (mERL-Q <1).