

# **Distribution and sources of dissolved heavy metals and nutrients in industrialized coastal waters, Kyeonggi Bay, Korea**

SOJUNG PARK AND MANSIK CHOI

Chungnam National University

Presenting Author: p.soj1009@gmail.com

In order to investigate the spatial and temporal distribution of heavy metals and nutrients in Kyunggi Bay, Korea, their present status and seasonal variability, and their sources were determined. Two surveys (May and August 2017) covering the entire Kyunggi Bay (15 sites) and twelve surveys over four seasons (February, May, August, and November of 2016–2018) covering the Incheon Special Management Area (7 sites) were carried out to collect surface seawaters. Although the concentration gradients of nutrient type heavy metals (e.g. copper, nickel, zinc, and cadmium) corresponded to patterns of salinity in both dry and wet seasons, there was little seasonal variability over the three years studied. However, there was evidence that heavy metals were released during mixing with freshwaters in the wet season, likely from river outflow or direct coastal inputs such as effluents from Shihwa Lake. For nutrients, whereas the conservative mixing of dissolved inorganic nitrogen and the release of dissolved inorganic phosphate and dissolved silica were observed in the wet season, the concentrations of organic particles (e.g., chlorophyll-a, particulate organic carbon, and particulate organic nitrogen) had an inverse relationship with salinity in the dry season (May). Scavenged metals (e.g., manganese and cobalt) had non-freshwater coastal sources, such as benthic remobilization from suboxic sediments, and exhibited seasonal variation; they progressively increased in concentration from winter to spring and summer, and dropped to their minimum levels in the fall, which was presumably related to variation in microbial activity in sediments. Based on their relationship with salinity, heavy metals were deduced to be derived from coastal sources such as effluents from Shihwa Lake and freshwater from the Han River.