Goldschmidt 2025 Abstract
https://doi.org/10.7185/gold2025.30734

Spatial Distribution of Dissolved Trace Metals in the Nakdong River Estuary: Impact of an Estuarine Barrage on Their Chemical Behaviors

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Trace metals are known as essential micronutrients for the growth and metabolism of marine microorganisms, but they may become toxic at high concentrations. Estuaries are dynamic environments where river water and seawater mix, altering the fluxes and compositions of dissolved trace metals that are transported into the ocean. The behaviors and distributions of trace metals in estuaries could be controlled by physical and biogeochemical processes, including estuarine circulation, organic and inorganic complexation, desorption from riverine suspended particles, and sediment resuspension. Therefore, evaluating trace metal distributions in estuarine systems is crucial for assessing their impacts on the coastal ocean.

The Nakdong River Estuary, located on the southeastern coast, is one of the largest rivers in Korea. As an estuarine barrage has been constructed to regulate the water supply for drinking, agriculture, and industrial use, this barrage may affect behaviors of dissolved trace metals. Thus, we investigated the spatial distributions of dissolved trace metals in the Nakdong River Estuary to assess the impact of the estuarine barrage on behaviors of dissolved trace metals in estuarine systems.