

Spatial distribution of dissolved and particulate trace metals (Fe, Mn, Cd, Ni) in the Ulleung basin, Est Sea

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In order to elucidate the biogeochemical processes in the Ulleung basin, East Sea, dissolved and particulate Fe, Mn, Cd and Ni were acquired from 13 seawater columns covering slope to basin areas, and surface to near bottom water depth (bottom boundary layer: BBL) during May 2014 and September 2015.

In the surface waters, dissolved Mn, Cd and Ni concentrations were nearly constant while dissolved Fe decreased from nearshore to offshore. On the meanwhile, dissolved Mn decreased (particulate Mn decreased) but dissolved Cd and Ni increased (particulate forms decreased) with water depth throughout all the areas, which indicated that dissolved Mn supplied from the atmosphere was scavenged but Cd and Ni was remineralized from the degradation of organic matters. Dissolved Fe was scavenged in nearshore sites but showed uniform vertical profiles. In the intermediate water, dissolved Fe and Mn concentrations were nearly uniform even though different water masses could be found [1]. Dissolved Cd and Ni showed nutrient like profiles although they were little depleted in surface seawaters. In bottom boundary layer, dissolved and particulate Mn and Fe concentrations increased sharply toward the bottom accompanied with the decrease of dissolved oxygen and increase of alkalinity and turbidity, while dissolved Cd and Ni concentrations showed little variation.

Since high concentrations of dissolved and particulate Fe and Mn in the bottom boundary layer would be related to the emanation from sediments and the consumption of dissolved oxygen in the BBL, respectively, dissolved Mn and Fe supplied from sedimentary sources would be important in surface seawaters of the Ulleung basin because of high supply of terrestrial materials and organic matters [2].

[1] Shin et al., 2007. *Ocean and Polar research* 29(1):33-42

[2] Cha et al., 2007. *J. Asian Ear. Sci.*, 29:685-697.