

Seasonal variability of vertical export flux of metals in the northern Ulleung basin of East/Japan Sea

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The Metal (Al, Cd, Co, Cr, Cu, Fe, Mn, Ni, Pb, Ti, V and Zn) concentrations of the vertical export flux were determined at the northern Ulleung basin station in the East/Japan Sea. Time-series sediment traps were deployed at 1000 m-depth between 2010 and 2015 with 7 and 10 days sampling periods.

Total mass fluxes varied from 0.05 to 1.61 g/m²/day with the average of 0.42 g/m²/day. A highly significant correlation was observed between most metal fluxes (except Cd) and the vertical transport of aluminum. Elemental composition and fluxes in settling particles suggested that these elements were remarkably supplied by atmospheric deposition from land.

Crustal enrichment factors of metals showed that most elements were originated from lithogenic materials. The crustal enrichment factors (EF) of Cd (297), Cu (8.4), Pb (10.7) and Zn (9.4) in settling particles were relatively high during March 2011 and June 2013. This indicates that these elements were scavenged well by biogenic materials even though the input of lithogenic Al was low in this period.