Dissolved and labile particulate trace metal (Al, Mn, Fe, Co, Ni, Cu, Cd, and Pb) distributions in seawater along 160° W in the North Pacific

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The North Pacific Ocean is at the end of oceanic general circulation, characterized by influx of North Pacific Intermediate Water and by aeolian supply of dust and aerosol through westerly wind. GEOTRACES ocean section studies of trace metals in seawater have covered the Atlantic Ocean but still limited in the Pacific Ocean. Recently, we have reported the distributions of trace metals around the Juan de Fuca Ridge[1]. In this study, we report the distributions of Al, Mn, Fe, Co, Ni, Cu, Cd, and Pb in dissolved (d) and labile particulate (lp) fractions along 160°W. Seawater samples were collected during the R/V *Hakuho-Maru* KH-05-2 cruise in August-September, 2005 and were preconcentrated using an off-line automated preconcentration system (SPE-100)[2].

The dAl concentrations were low at high latitude stations and the bottom maximum extended from south to north. DFe and lpFe concentrations took maxima at station ST14 that is ~190 km off the Aleutian Islands and fell sharply when leaving from the continent. Both d and lp Mn and Co showed a maximum in surface water (~20m) at ST14 and nearly constant concentrations in deep water. It is considered that Al, Mn, Fe, and Co are supplied from different depths of the continental shelf and slope, making local maxima at the north stations. DNi and dCd showed nutrient-type distributions. LpNi and lpCd were not detected. DCu showed a hybrid-type distribution that increased almost linearly from surface to a depth of 4000 m. There was a strong correlation between dCu and Si down to a depth of 2000 m (r^2 = 0.747), but dCu substantially increased in deep water due to supply from the sediment. For Pb, the lp fraction was hardly detectable and d fraction showed a subsurface maximum (~200 m) centered at 35°N. It is likely that anthropogenic Pb in aerosol particles caused by coal burning in the Asian continent firstly descended to the Pacific Ocean, subducted with surface seawater, and then spread throughout the North Pacific Ocean by ocean current.

[1] Zheng, L. *et al*. (2017), *J. Oceanogr*., doi: 10.1007/s10872-017-0424-2

[2] Minami, T. *et al*. (2015), *Anal. Chim. Acta* **854**, 183-190.