Goldschmidt 2021 Abstract
https://doi.org/10.7185/gold2021.6716

North-south (145°W) and east-west (47°N) sectional distributions of dissolved trace metals during GEOTRACES Japan KH-17-3 cruise in the Pacific Ocean

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The subarctic North Pacific Ocean is known as the high-nutrient, low-chlorophyll (HNLC) region, where the trace metal concentrations and the biogeochemical cycles of elements are influencing the phytoplankton growth. The nine trace metals (Al, Mn, Fe, Co, Ni, Cu, Zn, Cd, and Pb) are important geochemical tracers and/or essential elements for marine life, especially Fe is the limiting factor for phytoplankton growth. The trace metal concentration in this region is under the influence of ocean currents, neighbouring continental shelve sources, as well as westerlies transporting yellow dust and anthropogenic aerosols. Since the marine ecosystem and biogeochemical cycles in this region are also reflecting the impacts by human activities, there has been a growing attention of GEOTRACES studies related to trace metals in the Pacific Ocean recently [1, 2].

In this study, seawater samples were collected during the R/V *Hakuho Maru* KH-17-3 cruise from June to August in 2017 along 47°N (13 stations) and 145°W (8 stations). An off-line automated solid-phase extraction system (SPE-100) with chelate resin column (NOBIAS Chelate-PA1)[3] was used to preconcentrate trace metals in filtered seawater samples (without UV irradiation), and the nine dissolved trace metals (dM) were determined by ICP-MS.

The concentrations of nine trace metals are affected by continental sources in their full-depth sectional distributions, especially near the continental slope in the Gulf of Alaska. dAl, dFe and dMn concentrations decrease with increasing distance from the continent. Subsurface dCo maxima are found extensively in the subarctic North Pacific Ocean. The impact of anthropogenic Pb is determined from the time series change in dPb via comparison with previous studies. dZn, dCd, dCu, dNi show strong correlations with major nutrients.

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[2] Zheng, L. *et al.* (2019), *Geochim. Cosmochim. Acta* **254**, 102–121.

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