# Nd isotopic composition in Northcentral Pacific Ocean

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Nd isotopic composition is frequently used for identifying water masses and further discussion on seawater circulation. Over the past several years, many Nd isotopic compositions of seawaters from the Atlantic Ocean have been reported. This is very contrasting with the situation of the Pacific Ocean, which has only the very limited available Nd isotopic data on seawaters.

Here, we report Nd vertical profiles of Nd isotopic composition at two Northcentral Pacific stations (BO-3: 30˚N, 160˚W, BO-5: 20˚N, 175˚W) to clarify the Nd isotopic variation in the Pacific Ocean.

Except for the bottom sample, the vertical profile at BO-3 shows not so wide range in $\varepsilon_{Nd}$ values, i.e., $\varepsilon_{Nd}$ = –5.6 ~ - 2.8. The $\varepsilon_{Nd}$ values show –4.5 at surface and decrease to –5.6 at ~200m. Then, the $\varepsilon_{Nd}$ values turn into the gradual increase and become ~ -3.3 at 800m. Below 1000m, the $\varepsilon_{Nd}$ values are almost constant, averaging ~ –4. Besides the surface, the vertical profile at BO-5 is almost same as that of BO-3. The samples above 50m at BO-5 show $\varepsilon_{Nd}$ values around –2, which are apparently higher than that at BO-3. This seems to be due to the difference in the $\varepsilon_{Nd}$ values of the surface currents.

The only available full profile of Nd isotopic composition at the Central Pacific so far is the compiled data of various stations in the vicinity of Hawaii [1]. The profile shows the highest values at the surface ($\varepsilon_{Nd}$ = ~ 0) and a minimum value at 300m. Below 300m, the $\varepsilon_{Nd}$ values gradually increase to –1.1 at 1300m and again gradually decrease to –3.5 at ~3000m. Between 1000m ~ 3000m, the large difference in $\varepsilon_{Nd}$ values is observed between the compiled data and our data at the BO stations. Above 1000m, however, both data have a common feature, i.e., taking minimum values at depth around 200m ~ 300m. The station LM-2, which shows a same hydrographical feature as BO-3 station, has a minimum ($\varepsilon_{Nd}$ = ~ -7.4) at ~250m in the depth profile [2]. This minimum value is explained in terms of the influence of continentally derived Nd from the continental shelf. The minimum observed in the profile at BO-3 may also be due to the direct or indirect influence of the continental shelf.

**References**

[1] Vance et al. (2004) *Paleoceanograhy* **19,** doi:10,1029/2003PA00957.
[2] Amakawa et al. (2004) *GCA* **68,** 715-727.