

Microfossil archives for the high spatiotemporal resolution paleoceanographic reconstruction

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The microfossils usually provide qualitative rather than quantitative paleoceanographic information. The transfer function methods have been developed in several microfossil groups, sometimes providing the quantitative information such as sea surface temperature and salinity. The global sea surface temperature reconstruction by CLIMAP project based on the microfossil assemblages is generally reproduced well by simulation results and consistent with geochemical proxies, suggesting the usefulness of the microfossil data as one of the quantitative paleoceanographic archives in glacial-interglacial time scale. However, there are several issues to deal with for the time-series paleoceanographic reconstruction with high time resolution. For example, a temporal variability of the summer sea surface temperature based on the transfer function of planktic foraminiferal assemblage sometimes does not match up well with the high time resolution geochemical proxies such as Mg/Ca that is thought to reflect summer surface temperature as well. This discrepancy is probably owing to difference in seasonality among the proxies and/or effect of the other factors such as salinity or nutrient on the microfossil assemblages, which should be assessed to illustrate more probable ocean environment in the past. Nevertheless, so far, there is accumulation of microfossil data in the northwestern Pacific including marginal seas. We will present how we utilize the microfossil data as a quantitative marine environment archive, listing the challenges to integrate into the other proxies.