

A cooling of the northwestern Pacific and the East Asia during the last deglaciation

Masanobu Yamamoto[1]

[1] Env. Earth Sci., Hokkaido University

<http://geos.ees.hokudai.ac.jp/yamamoto/>

The mid-latitude northwestern Pacific and the East Asia are one of the region of the globe where deglacial warming occurred latest at Termination I. We reconstructed paleo-sea surface temperature (SST) and terrestrial vegetation by analyzing biomarkers in five marine cores from the East Asian transect from the tropical to subarctic regions.

At the Japan margin in the NW Pacific and the northern East China Sea, alkenone temperatures were cooler in the Oldest Dryas and Younger Dryas than those in the last glacial maximum. The cool SST reflected the southward displacement of the Kuroshio-Oyashio boundary as well as the summer westerly jet. SST variation was pronounced at 23,000-year period (Precession). April precession corresponded to SST minima. The cooling was not significant in the South China Sea, suggesting that this cooling was significant only in the region along the westerly jet.

Lignin composition varied during the last deglacial at the Japan margin. Cinnamyl structure was more abundant in lignin from the last deglacial samples, implying the expansion of grassland. This change was associated with the increase of Larix pollen. These findings suggest that winter temperature significantly dropped during the last deglaciation. The abundance of cinnamyl structure varied in response to 41,000-year obliquity cycle. Large tilt corresponded to abundant cinnamyl structure.

These results suggest that the last deglaciation was the period that both precession-controlled low-latitude and obliquity-controlled high-latitude processes led to cooling in the mid-latitude NW Pacific and the East Asia.