

High-resolution reconstruction of paleoenvironmental changes during the last deglaciation period in the northwestern Pacific

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To reconstruct the environmental change from the last glacial maximum to Holocene, we conducted super high-resolution oxygen isotope analysis of both benthic and planktonic foraminifera and C37 alkenones on an IMAGES core off central Japan, in the northwest Pacific.

Sediment core MD01-2409 was collected at 975 m water depth on the continental margin off the northern Japan (41°34' N, 141°52' E), during the IMAGES 2001 cruise. The core site is located near the gateway between the Pacific Ocean and the Japan Sea, which had been isolated during the Last Glacial Maximum (LGM). This site has been under the influence of the Tsugaru warm current and the Oyashio current except during the low sea level period.

Alkenone-based sea water temperatures and the foraminiferal assemblages suggested that seawater exchange in the Tsugaru Strait commenced in the following sequence: the strait opened at ~15.5 ka, the water exchange started at ~10.3 ka and the strength of the Tsugaru Warm Current became comparable to that at modern conditions at 4.8ka. The alkenone-based SST increased by 6 °C from 12.5 ka to 9.5ka. However, oxygen isotopic values of *N. pachyderma* (sinistral) decreased by 1.5 ‰ from LGM to Holocene. If oxygen isotopic values of seawater decreased by 1.0 ‰ due to the change of ice volume, SST at the study site increased by ~2.5 °C. According to the plankton net experiment around this site, *N. pachyderma* (sin.) was dwelling mainly at 120~160 m water depth. On the other hand, alkenones record SST at <10 m. As the Tsugaru warm water overlays the Oyashio water, the alkenone and oxygen isotope values record the ST of the former and the latter, respectively.

Alkenone SST and oxygen isotopic values of planktonic foraminifera also suggest that the abrupt warming and salinity change occurred in the last deglaciation period. That period was characterized by laminated structures and high production. During the last deglaciation period expect Younger Dryas-like cold period, the relative abundance of alkenone was the highest. We discuss about the process of seawater exchange, sea surface temperature and salinity changes by sea level rising.

Keywords: northwestern Pacific; paleo-SST; alkenone; oxygen isotope; foraminifera