



## **High-resolution benthic foraminiferal $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ records of ODP Site 807 in the western equatorial Pacific since 3.5 Ma and its response to the late Pliocene onset of the Northern Hemisphere Glaciation**

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We presented benthic foraminiferal  $\delta^{18}\text{O}$  and  $\delta^{13}\text{C}$  records of Ocean Drilling Program (ODP) Site 807 ( $3^{\circ}36'\text{N}$ ,  $156^{\circ}37'\text{E}$ , 2804m) in the western equatorial Pacific in 3.5-0 Ma by 1345 paired isotopic measurements, with a time resolution of 2.6 Kyr. The most significant event in benthic  $\delta^{18}\text{O}$  is a gradual increase of nearly 1.2‰ in 3.3-2.5 Ma (Tiedemann et al., 1994; Shackleton et al., 1995; Tian et al., 2002; Tian et al., 2006), which indicates the late Pliocene onset of the Northern Hemisphere Glaciation (NHG). Based on the benthic  $\delta^{18}\text{O}$  record of ODP Site 807 and other records from the Atlantic, the Eastern Pacific, the Indian Ocean and Southern Oceans, we tentatively discussed the response of benthic foraminiferal  $\delta^{18}\text{O}$  to the late Pliocene onset of the NHG. We carried out linear regression analyses on the benthic foraminiferal  $\delta^{18}\text{O}$  to investigate the amplitude of the variability of  $\delta^{18}\text{O}$  within the period between Marine Isotope Stages M2 and G6 ( $\sim$ 3.3-2.7 Ma). The deep water sites in the North Atlantic (DSDP (Deep Sea Drilling Program) Site 607( $41^{\circ}00'\text{N}$ ,  $32^{\circ}58'\text{W}$ , 3427m), and ODP Site 659( $18^{\circ}05'\text{N}$ ,  $21^{\circ}02'\text{W}$ , 3070m)) and the Southern Ocean (ODP Site 704( $46^{\circ}53'\text{S}$ ,  $7^{\circ}25'\text{E}$ , 2532m)) display the most significant increase in  $\delta^{18}\text{O}$ , while those in the western equatorial Pacific (ODP Site 807) and the Indian Ocean (ODP Site 758( $5^{\circ}23'\text{N}$ ,  $90^{\circ}21'\text{E}$ , 2925m)) exhibit moderate increase in  $\delta^{18}\text{O}$ . ODP Site 982( $57^{\circ}31'\text{N}$ ,  $15^{\circ}53'\text{W}$ , 1145m) in the North Atlantic intermediate water also exhibits relatively small increase in benthic foraminiferal  $\delta^{18}\text{O}$ . Both the sea surface temperature and bottom water temperature of ODP Site 982 show an increasing trend from 3.3 Ma to 2.7 Ma. The basin-to-basin difference in the responses of the benthic foraminiferal  $\delta^{18}\text{O}$  to the late Pliocene onset of the NHG probably reflect the status of the global Thermohaline Circulation (THC). We speculate that the production of the North Atlantic Deep Water (NADW) might become sluggish during this period, indicating a weakened Thermohaline Circulation.