



## Hydrographic changes in the northern Okinawa Trough over the last 88 ka

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The surface hydrographic conditions of the northern Okinawa Trough are influenced strongly by fluctuations of the East Asian Monsoon (EAM) and the Kuroshio. However, the high-resolution records of past surface hydrographic condition remain scarce in the northern Okinawa Trough (OT) on orbital and millennial time scales. In this study, we applied a multiproxy (planktonic foraminiferal species,  $\delta^{18}\text{O}$ , alkenone sea surface temperature (SST) and salinity (SSS)) reconstruction from sediment core CSH1, which is located at the main axis of the Tsushima Warm Current, a branch of the Kuroshio, in the northern OT since the last 88 ka. The relative abundances of the warm-water planktonic foraminiferal species related to the Kuroshio are high during MIS 1 and MIS 5.1, while cold-water species related to East Asian Winter Monsoon (EAWM) and subarctic water mass are high during MIS 2. Alkenone SST measured from core CSH1 ranges between 21 and 25 [U+2103], with higher values during interglacials (MIS 1, 3.3, 5.1) and interstadials and lower values during glacials and Heinrich (H)/stadial events. The CSH1 SSS appears to be mainly controlled by the local river runoff and the Kuroshio, while the DOT change seems to be closely related to the strength of the Kuroshio and the latitudinal shift of the subarctic frontal zone. Our records suggest that, during MIS 1 and MIS 5.1, while global sea level was high, the Kuroshio was dominant; while during MIS 2, MIS 3 and MIS 4, with a low sea level, stronger EAWM and a more southerly subarctic front played important roles in governing the hydrographic characteristics in the OT. The hydrographic records, such as SST, SSS and DOT, show regional responses corresponding mainly to the global sea level, the Kuroshio, EAWM and subarctic front, factors which are consistently invoked in the interpretations of other regional records from the OT.

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