

## Variations in intermediate water and ocean circulation during the last 26 ka based on a new benthic Mg/Ca calibration

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In order to understand variations in ocean circulation at intermediate depth in the North Pacific in subtropical area, bottom water temperatures (BWT), carbon isotope of benthic foraminifera, and oxygen isotope of seawater were reconstructed since 26 ka off east main Okinawa Island, northwestern Pacific. A new regional Mg/Ca calibration for benthic foraminifera *Cibicides wuellerstorfi* was established in order to convert benthic Mg/Ca value to temperature, based on twenty-nine surface sediment samples, including core top samples, retrieved around main Okinawa Island. On the other hand, in order to reconstruct changes in water properties since 26 ka, core GH08-2004 that was retrieved from water depth of 1166 m off east main Okinawa Island was used in this study. As a result, during the LGM from 24 ka to 18 ka, BWT showed relatively constant as approximately 2 °C, which was ~1.5-2 °C lower than today. One of the prominent features of our BWT records was a millennial scale variation in BWT during the last deglaciation. During the last deglaciation, BWT was higher in Heinrich Stadial 1 (H1) (~17 ka) and Younger Dryas (YD) (~12 ka), while lower in Bølling/Allerød (BA) interval (~14 ka). During the interval from 17 to 15 ka, BWT tended to decrease in association with a decrease in carbon isotope of *C. wuellerstorfi*, likely interpreted as increased upwelling of the older water mass that was stored in the abyssal Pacific during the glacial time. The timing of the signal of the upwelling coincided with deglacial atmospheric CO<sub>2</sub> rise initiated at ~17 ka, suggesting the increased upwelling in the subtropical northwestern Pacific from 17 to 15 ka contributes the carbon release to the atmosphere from the Pacific.