A new benthic Mg/Ca temperature calibration to reconstruct thermocline temperature variability in the Indonesian archipelago

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23 Multi-corer core tops representing a range of modern bottom water temperature (BWT) between 3°C and 8°C and covering a water depth between 500 and 2000 m were retrieved from the Makassar Strait (Indonesia) and the Timor Sea to produce a regional BWT calibration. Mg/Ca ratios of the benthic foraminifer *Hoeglundina elegans* show an exponential relation with temperature ($Mg/Ca=0.21e^{(0.23BWT)}$ $R^2=0.91$). This relationship differs significantly from previous calibrations [1, 2], but shows similarity to a later re-calibration [3]. We applied our calibration to sediment core SO18471, retrieved within the lower thermocline of the Indonesian Throughflow (ITF) outflow into the Timor Sea (9°21.987' S, 129°58.983' E, 485 m water depth, 13.5 m length). In core SO18471, we measured Mg/Ca ratios in ~10 tests of *H. elegans* in 10 cm intervals (~1-2 kyr time resolution) to reconstruct thermocline temperature variability. We based the age model on 5 AMS ^{14}C dates and on correlation of our benthic oxygen isotope curve to the Antarctic EDML1 ice core [4]. Preliminary results show that BWT varied from 5 to 10°C over the last 140 kyr (present day BWT is 8°C). During periods of relatively high sea level, thermocline waters cooled and freshened, suggesting a gradual shift from surface to thermocline dominated ITF. In contrast, during sea level lowstands, thermocline temperatures increased, supporting the hypothesis of a reduced thermocline flow during glacials. Although sea level variations appear to be the main control on ITF variability, changes in the global thermohaline circulation and the Australian-Asian monsoon were also influential. Our data suggest that cooling events in the Northern Hemisphere during MIS 3 led to a reduction in ITF intensity, resulting in higher thermocline temperatures in the Timor Strait.

[1] Rosenthal *et al.* (2006) *Paleoceanography* **21**, PA 1007. [2] Reichart *et al.* (2003) *Geology* **31**, 355-358. [3] Ní Fhlaithearta *et al.* (2010) *Paleoceanography* **25**, PA4225. [4] Ruth *et al.* (2007) *Clim. Past Discuss.* **3**, 349-574.