Maldives Multispecies Foraminifera Hydrography Reconstruction over the Pleistocene and Oxygen Minimum Zone History

SIYAO MARK YU[1], LINDA V. GODFREY[1], RICHARD MORTLOCK[1] AND JAMES D. WRIGHT[1]

[1]Department of Earth and Planetary Sciences, Rutgers, the State University of New Jersey (*correspondance: sdy10@eps.rutgers.edu

The southwest summer monsoon winds blow over the Western Arabian Sea and result in coastal upwelling of cold, nutrient rich waters. Productivity greatly increases and dissolved O_2 is consumed by respiration at rates which exceed O_2 supply to produce an oxygen minimum zone (OMZ). The perennial OMZ in the Arabian Sea develops between 150 and 1000 m water depth due to this seasonal increase in productivity [1]. We present the bulk sediment $\delta^{15}N$ record from the Inner Sea of the Maldives as part of IODP Expedition 359, Maldives Monsoon and Sea Level, extending past Marine Isotope Stage 5. Located at its distal edge, the Maldives are at an ideal location to capture any temporal expansion of the Arabian Sea OMZ . In addition, we present the $\delta^{13}C$ and $\delta^{18}O$ record of four planktonic foraminifera species. *Gs. ruber* and *T. sacculfer* are used to constrain sea surface conditions while *N. dutertrei* and *G. menardii* are used to monitor variations in the thermocline temperature and ventilation history. The foraminiferal stable isotope records reveal little change to the water column thermal gradient across the last 150 kyrs, spanning two glacial terminations. The $\delta^{13}C$ values of the surface species mirror each other with an ~0.2 ‰ offset. Likewise, the $\delta^{18}O$ values of the surface and planktonic species mirror each other with a slight offset. When transposed with the Monsoon intensity index (difference in insolation at 30°N and 30°S) [2], the stable isotope records reveal monsoon driven changes to the ventilation history, productivity, and expansion of the OMZ in the Maldives.

[1] *Tripathi et al.* (2016) *Scientific Reports* **7**, 1-7 [2] *Leuschner and Sirocko* (2003) Palaeogeogr. Palaeoclimatol. Palaeoecol. **197**, 83-95