

# Mg/Ca, Stable Isotopes and an Important paleo-Salinity Record from the Indo-Pacific Warm Pool

B.N. OPDYKE<sup>1</sup>, J. EDWARDS<sup>1</sup>, H.C. BOSTOCK<sup>1</sup>, D.W. LEA<sup>2</sup>, H.J. SPERO<sup>3</sup>, M. GAGAN<sup>1</sup>, AND K. FIFIELD<sup>1</sup>

<sup>1</sup>Department of Earth and Marine Sciences, Research School of Earth Science, Research School of Physical Sciences and Engineering Australian National University; [bnop@ems.anu.edu.au](mailto:bnop@ems.anu.edu.au); [jonathan.edwards@ga.gov.au](mailto:jonathan.edwards@ga.gov.au); [Helen.Bostock@anu.edu.au](mailto:Helen.Bostock@anu.edu.au); [Michael.Gagan@anu.edu.au](mailto:Michael.Gagan@anu.edu.au), [keith.fifield@anu.edu.au](mailto:keith.fifield@anu.edu.au)

<sup>2</sup>Department of Geological Sciences and Marine Science Institute, UCSD; [lea@geol.ucsb.edu](mailto:lea@geol.ucsb.edu)

<sup>3</sup>Department of Geology, UC Davis; [spero@geology.ucdavis.edu](mailto:spero@geology.ucdavis.edu)

Core MD-982167, latitude 13° 8.86S, Longitude 121° 34.69E, is located in the ideal location to monitor the changes in Austral-Asian Mediterranean Water as it flows from the Indonesian Archipelago. Recovered from 1981m water depth, the core has a typical sedimentation rates of between 10 and 20cm/ka, which has allowed us to recover a relatively high resolution paleoceanographic record. The Mg/Ca and  $\delta^{18}\text{O}$  were run on *Globigerinoides ruber* (white variety) for the termination of the last Glacial cycle.

We used a modified Lambeck and Chappell sea level curve to adjust for the ice volume signal <sup>[1]</sup>. The Mg/Ca signal was derived using the Lea et al., 2000 methods of preparation for planktonic foraminifera <sup>[2]</sup>. The Mg/Ca signal was used as a proxy for temperature and subtracted from the residual  $\delta^{18}\text{O}$  record to yield a  $\Delta\delta^{18}\text{O}$ , which serves as a proxy for sea water salinity change.

We found salinity freshened rapidly, by 0.7 permil, at 18,000 calendar years ago. The signal does is more saline between 13 and 10 ka, before freshening to 6 ka and then gradually becoming more saline to 2800 years ago. The mid – Holocene freshening of surface water corresponds to local strengthening of the Australian monsoon. The early, 18ka, event is probably tracking an event farther a field.

## References

- [1] Lambeck K. and Chappell J. (2001) *Science* **292**, 679-686.  
[2] Lea D.W., Pak D.K., and Spero H.J., (2000) *Science* **289**, 1719-1724.