

## **The benthic Mg/Ca temperature proxy: A *Uvigerina* core-top calibration and deglacial record from the Southwest Pacific**

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Understanding how ocean circulation may have differed under glacial conditions is key to understanding the ocean's role in Pleistocene climate and carbon cycle dynamics. To place constraints on past ocean stratification, we reconstruct bottom water temperatures from the Mg/Ca ratio in foraminiferal calcite. Here, we apply a new core-top calibration from the Southwest Pacific to a down-core Mg/Ca record from 2.5 km that spans the last glacial termination.

Sediment cores from New Zealand's Bay of Plenty and the Chatham Rise in the Southwest Pacific were sampled to provide a regional core-top calibration for the benthic foraminifer *Uvigerina peregrina*. Comparison of core-top Mg/Ca to local temperatures reveals a calibration broadly consistent with previous work [1]. In addition to temperature, other environmental parameters are examined for possible influence on the Mg/Ca of foraminiferal calcite. Such parameters may exert some influence at colder temperatures, particularly below temperatures of ~2°C.

A sediment core from 2.5 km water depth was sampled to generate a *Uvigerina* Mg/Ca record that captures bottom water conditions from the last glaciation into the Holocene with ~1 ky resolution. Applying our regional calibration to the down-core record yields bottom water temperatures throughout the deglaciation. Reconstructed temperatures are combined with  $\delta^{18}\text{O}$  measured on *Uvigerina* from the same samples to estimate seawater  $\delta^{18}\text{O}$ . This core forms the base of a 3-core depth transect that will be used to reconstruct ocean temperature profiles in this region during the past 30 ky.

[1] Elderfield H.E., Greaves M., Barker S., Hall I.R., Tripathi A., Ferretti P., Crowhurst S., Booth L., Daunt C. *Quaternary Science Reviews* **29**, 160-169.