



Deglaciation in the South Pacific: an unconventional ocean?

Jenny Roberts (1), Thomas Ronge (1), Sambuddha Misra (2), Ralf Tiedemann (1), Jelle Bijma (1), and Frank Lamy (1)

(1) Alfred Wegener Institute, Germany , (2) Centre for Earth Sciences, Indian Institute of Science, Bangalore, India

It is widely understood that the deep ocean acted as a major reservoir of CO₂ during the last glacial period. This has been reinforced through reconstructions of deep ocean radiocarbon, which suggests a poorly ventilated abyssal ocean, and mapping of ocean δ¹³C, which suggests strong chemical stratification during this time. In this study, we turn to two marine sediment cores in the deep (3500m) South Pacific located on either flank of the East Pacific Rise. We have generated high resolution records of deep ocean pH (based on benthic foraminifer δ¹¹B) and ventilation (based on foraminifer δ¹⁴C). We find here, rather surprisingly, that during the Last Glacial Maximum, the deep South Pacific was well ventilated, with low benthic-planktonic radiocarbon age offsets, and a pH not significantly lower than its present-day value. In contrast, the early deglaciation (HS1; 18-15 ka) is characterised by poorly ventilated, low pH deep waters. Do these records imply that the deep South Pacific was not acting as a reservoir of CO₂ during the last glacial period? Or are secondary processes (e.g. mid-ocean ridge volcanism or carbonate dissolution) at play here?