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# Lowstand sea levels from U-Th dating of pre-LGM corals: Results from IODP expedition 310 "Tahiti sea level"

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U-Th dating of Pre-LGM corals, drilled during IODP Expedition 310 "Tahiti sea level", has provided new data about the timing and magnitude of sea level lowstands prior to the last deglaciation. Drilling during Expedition 310 recovered 632 m of core (at 57.5% conventional recovery) from 37 drill holes. Of these 37 holes 28 penetrated into material beneath the postglacial reef sequence. In contrast to previous onshore drilling, the pre-LGM material recovered here has provided fossil corals that have not suffered significant alteration. Much of the Pre-LGM material recovered is aragonitic (40% of pre-LGM corals screened by XRD have $<$1% calcite), and gives $\delta 234_i$ close to modern seawater (85% of pre-LGM corals, $<$150 ka, have $\delta 234_i$ between 138 and 150).

Measurement of U and Th isotopic ratios was performed by MC-ICP-MS using only 0.3 g of coral per measurement. This small sample size is advantageous due to the limited amount of material available from drill-core sampling. Uncertainties better than 1 per mill for 238/234 and typically 2 per mill for 230/238 ratios were achieved. The recovery, and successful dating, of pre-LGM corals from Expedition 310 has signif-

icant positive implications for the prospects of gaining further insights on Pre-LGM sea level from future drilling expeditions.

U/Th ages have been obtained from drill holes from each of the three localities around Tahiti visited by Expedition 310. Corals recovered from marine isotope stage VI throw light on sea level prior to Termination II and hence constrain the magnitude of the deglacial sea level rise. The timing of Termination II is also somewhat constrained by a single massive *Porites* sp., which appears to have grown during the deglaciation, although there is a large potential range in paleodepth for this coral. Corals from towards the end of stage III suggest a rapid fall in sea level from the relative highstand of stage III to glacial level by 29.5 ka. This corresponds to rapid ice sheet growth, possibly driven by a fall in northern hemisphere insolation.