



Pronounced interannual variability in South Pacific temperatures during the early deglacial - coral-based results from IODP Expedition 310

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From a total of more than 600 m of cores recovered during IODP Expedition 310 - Tahiti Sea Level, about 30 m consist of massive coral colonies, mostly of the genus *Porites*. The aragonitic skeletons of such annually-banded corals provide an opportunity to study changes in seasonality and interannual climate variability during the last deglaciation in the South Pacific. Sub-seasonally resolved records of Sr/Ca and oxygen isotopes derived from well-preserved and well-dated (U-series dating) coral skeletons can provide reconstructions of variations in temperature and hydrologic balance at the sea surface.

Here we present results of sub-seasonally resolved coral records from Tahiti for time windows around 14 to 15 kyr ago, a time interval that is characterized by abrupt climatic changes in the North Atlantic region, such as Heinrich event 1, the Bølling warming and the Older Dryas cooling. In particular, we have generated a 22-year record of monthly resolved Sr/Ca and oxygen isotope variations from an individual 60-cm-high *Porites* colony that was drilled in growth position. The records indicate clear annual cycles and pronounced interannual variability. Spectral analysis of the coral Sr/Ca paleothermometer record identifies highly significant peaks at periods of

5 and 2 years, suggesting pronounced interannual variability in the ENSO frequency band in the South Pacific at that time. Interestingly, this coral grew 15.0 kyr BP, at the time of Heinrich event 1, a period that was characterized by a near or complete shutdown of the Atlantic Meridional Overturning Circulation. Such boundary conditions significantly different from today might have had strong consequences for interannual climate variability in the Pacific basin via atmospheric teleconnections, and Pacific proxy records from such a period could provide important insights into ENSO dynamics.