



Pronounced interannual variability in tropical South Pacific temperatures during Heinrich stadial 1

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Reconstructing interannual climate variability in the tropical Pacific Ocean under boundary conditions different from today provides a way of understanding the dynamics of the El Niño-Southern Oscillation (ENSO) that impacts global climate on timescales relevant to society. For last glacial conditions, Pacific proxy records of interannual climate variability are extremely rare, and limited to reconstructions of the hydrological cycle. In modern observations, however, a more direct measure to describe ENSO variability is tropical Pacific sea surface temperature (SST). We used Sr/Ca in a fossil coral drilled offshore Tahiti by Integrated Ocean Drilling Program (IODP) Expedition 310 to reconstruct tropical South Pacific SST at 15,000 years ago. The monthly resolved SST reconstruction indicates pronounced interannual variability at typical ENSO periods. This finding is consistent with a climate model simulation and indicates that ENSO was operating during Heinrich stadial 1, a period at the end of the last glacial characterized by substantial weakening of the Atlantic Meridional Overturning Circulation. Our evidence of ENSO characteristics in an extreme climate can help to constrain climate models for more reliable projections under future climate change.