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Millennial-scale oceanic CO₂ release during marine isotope stage 3

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During the last glacial period atmospheric CO₂ and temperature in Antarctica varied together on millennial timescales, with CO₂ abruptly increasing by 10-20 ppm in <1000 years in some cases. The exact causes of these rapid CO₂ changes during a cold glacial climate remain unclear. Here we examine the role of ocean carbon storage and atmospheric exchange by applying the boron isotope-pH (CO₂) proxy to *Globigerina bulloides* from core site TAN110628 located in the Pacific Sector of the Southern Ocean. By reconstructing the surface carbonate system at TAN110628 at high temporal resolution (1 sample every 1 kyr) from 30 to 64 kyr we are able to fully constrain the nature of carbon leakage from the Sub Antarctic Zone of the Southern Pacific Ocean associated with these millennial-scale changes in atmospheric CO₂. This provides unique insights into the causes of abrupt changes in atmospheric CO₂ during Marine Isotope Stage 3 and the last termination.