The Deep Ocean Carbon System
Across the Mid-Pleistocene

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Earth’s climate underwent fundamental shifts during the Mid-Pleistocene Transition (MPT), including a reorganization of deep Atlantic ocean circulation, reduced glacial atmospheric pCO₂, and an increase in the dominant periodicity of ice ages[1,2]. Carbon and neodymium isotope records suggest an increased influence of a low-δ¹³C, southern-sourced water mass in the deep Atlantic at ~900 ka, which may have fostered enhanced deep ocean carbon storage[1]. To characterize the MPT carbon cycle perturbation, we use B/Ca in benthic foraminifera to reconstruct deep ocean carbonate ion ([CO₃²⁻]) in the deep Atlantic and Pacific oceans. Pre-to-post-MPT data from the Atlantic at ODP Sites 925 and 926 suggest a decrease in both glacial and interglacial [CO₃²⁻] at 900 ka, coincident with a decrease in δ¹³C and increase in southern-sourced water presence as indicated by εNd records[1], supporting an ocean circulation control on deep Atlantic [CO₃²⁻]. [CO₃²⁻] from ODP 926 follows the 500-kyr oscillations of global δ¹³C records[3], possibly signifying a global carbon cycle control on Atlantic water mass chemistry. B/Ca data from ODP Sites 805 and 806 from the Ontong Java Plateau will determine if there were globally coherent changes in deep ocean carbonate chemistry across the MPT.