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Orbital forcing and climate response at the Oligocene-Miocene boundary: stable isotope records from the eastern equatorial Pacific

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An extreme, transient expansion of the Antarctic ice sheet at the Oligocene-Miocene boundary (the Mi-1 event) marks an important transition in Cenozoic climate. Cyclostratigraphic studies of previous marine records have linked the Mi-1 event to a node of low amplitude obliquity and eccentricity. Current understanding of the mechanisms operating between external forcing and climate response, especially the role of the carbon cycle, is limited. Here, we present new high-resolution astronomically tuned records across the Oligocene-Miocene boundary (22-24 Ma) from IODP Site U1334, in the eastern equatorial Pacific. Benthic foraminiferal stable isotope measurements and lithological proxy data from the site record the interactions between orbital forcing, ice sheet response and associated changes in the carbon cycle. These new data resolve climatic changes across the Mi-1 event and improve our understanding of this pivotal boundary.