



Modeling the oxygen isotopic composition of the Antarctic ice sheet and significance to Pliocene sea level

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In addition to measuring the elevations of paleoshorelines, attempts to constrain past sea level and changing ice volume have made use of oxygen isotope records from benthic foraminifera. These reconstructions either rely on partitioning the temperature and ice volume components of these records or make use of independent temperature records. A number of recent studies have also suggested that the interpretation of these records may be complicated by changes in the isotopic composition of the ice sheets due to changing climate and the isotopic composition of precipitation. This may have led to an overestimate of sea level change when using constant oxygen isotope to sea level calibrations. Here we simulate the isotopic composition of the Antarctic ice sheet for a range of proposed mid-Pliocene configurations. Our simulations account for ice flow and the incorporation of the surface isotopic signal within the ice sheet. We also discuss the magnitude of the mid-Pliocene isotope excursion and significance to Pliocene sea level estimates.