

Meltwater discharge from Wilkes Basin, East Antarctica at around 4.2 ka revealed from Beryllium-10 analysis of marine sediments

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Understanding Antarctic ice sheet dynamics related to global climate change is of scientific and societal interest as the future behavior of the ice sheets under currently changing climate is unknown. We present beryllium-10 analysis of a high-resolution marine sediment core from Adélie Basin near the Wilkes Land ice sheet, which is susceptible to retreat due to the low-lying nature and down-sloping trough of the Wilkes Basin. Combined with a newly constructed age model using compound specific radiocarbon dates, the data reveal three ice sheet meltwater discharge events at ca. ~10 ka, ca. ~6.5 ka and ca. ~4 ka. The earlier events correspond to the disappearance of Northern Hemisphere ice sheets and interglacial level atmospheric CO₂. The timing of the latest meltwater influx complements the 4.2 ka event, a period of abrupt global climatic change and the beginning of the Meghalayan Age.

Keywords: Holocene, East Antarctica, Adélie Basin, 4.2 ka event, Beryllium-10