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Cosmogenic 10Be ages from the Meirs and Garwood Valleys, Denton Hills, West Antarctica, suggest an absence in LGM Ice Sheet expansion.

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It has been hypothesised that during interglacials, thinning of the Ross Ice Shelf allowed a more open water environment with increased local precipitation. This resulted in outlet glaciers, which drain the Transantarctic Mountains and fed by the East Antarctic Ice Sheet, advancing during moist warmer periods, apparently out of phase with colder arid dry periods. Significantly the ice core record during these warm periods also shows increased accumulation continent wide

The geomorphology of the Denton Hills in the Royal Society Range, West Antarctica, is a result of Miocene fluvial incision reworked by subsequent glacial advances throughout the Quaternary. The Garwood and Miers glacial valleys drain ice across the Denton Hills into the Shelf, and should thus show maximum extent during interstadials. To understand the chronology of late Quaternary glaciations, 15 granitic boulders from terminal moraines were sampled for ^{10}Be and ^{26}Al cosmogenic dating.

Obtaining reliable exposure ages of erratics within moraines that represent timing of deposition (i.e. glacial advances) is problematic in polar regions, where glacial activity is principally controlled by ice sheet dynamics. Recycling of previously exposed debris, uncertainty in provenance of glacially transported boulders and a lack of a post-depositional hydrologic process to remove previously exposed material from a valley system, leads to ambiguities in multiple exposure ages from a single coeval glacial landform. More importantly, cold-based ice advance can leave a landform unmodified resulting in young erratics deposited on bedrock that shows weathering and/or inconsistent age-altitude relationships. Primarily, inheritance becomes a difficulty in qualifying exposure ages from polar regions.

Preliminary results from the Garwood and Miers Valleys indicate that glaciers in the Denton Hills had begun to retreat from their last maximum positions no later than 23-37 ka, and thus the local last glacial maximum occurred prior to the Antarctic LGM (18-22 ka). No evidence based on cosmogenic ages for post-LGM or Holocene advances were found. These results support an extensive exposure age data set from the nearby Darwin-Hatherton Glacier system that indicates an absence of EAIS expansion across the Transantarctic Mnts during the global LGM period.