

How long was the LGM in East Antarctica? Insights from in-situ ^{14}C dating of bedrock surfaces

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The duration of ice advance and retreat in Antarctica provides insight into its overall sensitivity to environmental thresholds, the response time of the ice sheet to climate and sea level perturbations. While measuring the timing of ice retreat has become relatively routine through the advent of Be-10 exposure dating, determining the onset and the duration of glaciation remains difficult due to the challenges of obtaining pre-glacial sediments.

The measurement of in-situ C-14 in bedrock surfaces provides a low-resolution temporal approach that enables an understanding of whether LGM ice cover was brief or extended across several tens of thousands of years. Here, we present new observations from Princess Elizabeth Land in East Antarctica that demonstrates differing responses of the inland and coastal portions of the ice sheet. Inland at Mt Brown, C-14 inventories in bedrock are consistent with a 'long duration' LGM, with the ice sheet remaining at the maximum limit for at least 15,000 years before thinning in the early Holocene. In contrast, ice advance in coastal regions at Rauer Group was brief, and the areal limit of the ice sheet was similar to or smaller than today for most of the past 40,000 years.

This new evidence contributes to our understanding of the 'relative sea level paradox' recorded sediments around Prydz Bay, which indicate both an increased ice load, but a relatively restricted ice extent during much of the last 40,000 years. However, it in turn points to a radically different behaviour of the ice sheet in response to climate and sea level forcing than had been previously understood.

Level of Expertise

Experienced Researcher

Do you wish to take part in the poster slam

No

Travel Funding

No

Speakers Gender

Male

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