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# Antarctic ice sheet discharge driven by atmosphere-ocean feedbacks at the Last Glacial Termination

Christopher Fogwill (1,2,3), Chris Turney (2,3), Nick Golledge (4), David Etheridge (5), Maruro Rubino (1,5), David Thornoton (5), Andy Baker (1), John Woodward (6), Kate Winter (6), Tas van Ommen (7), Andrew Moy (7), Mark Curran (7), Siwan Davies (8), Mike Weber (9), Michale Bird (10), Niels Munksgaard (10), Laurie Menviel (3), Camilla Rootes (11), Alan Cooper (12), Helen Millman (1,2)

(1) University of Keele, School of Geography, Geology and the Environment, Keele, United Kingdom (cj.fogwill@keele.ac.uk), (2) PANGEA Research Centre, University of New South Wales, 2052, Australia., (3) Climate Change Research Centre, School of Biological Earth and Environmental Sciences, University of New South Wales, 2052, Australia, (4) Antarctic Research Centre, Victoria University of Wellington, Wellington 6140, New Zealand, (5) Antarctic Research Centre, Victoria University of Wellington, Wellington 6140, New Zealand, (6) Department of Geography, Faculty of Engineering and Environment, Northumbria University, Newcastle upon Tyne, NE1 8ST, United Kingdom, (7) Australian Antarctic Division, 203 Channel Highway, Kingston, Tasmania 7050, Australia, (8) Department of Geography, College of Science, Swansea University, Swansea, United Kingdom., (9) Steinmann Institute, University of Bonn, Poppelsdorfer Schloss, Bonn, Germany., (10) Centre for Tropical Environmental and Sustainability Science, College of Science and Engineering, James Cook University, Cairns, Australia., (11) Department of Geography, University of Sheffield, United Kingdom, (12) Australian Centre for Ancient DNA, University of Adelaide, 5005, Australia

Reconstructing the dynamic response of the Antarctic ice sheets to warming during the Last Glacial Termination (LGT; 18,000–11,650 yrs ago) allows us to disentangle ice-climate feedbacks that are key to improving future projections. Whilst the sequence of events during this period is reasonably well known, relatively poor chronological control has precluded precise alignment of ice, atmospheric and marine records, making it difficult to assess relationships between Antarctic ice-sheet (AIS) dynamics, climate change and sea level. Here we present results from a highly-resolved 'horizontal ice core' from the Weddell Sea Embayment, which records millennial-scale AIS dynamics across this extensive region.

Counterintuitively, we find AIS mass-loss across the full duration of the Antarctic Cold Reversal (ACR; 14,600–12,700 yrs ago), with stabilisation during the subsequent millennia of atmospheric warming. Earth-system and ice-sheet modelling suggests these contrasting trends were likely Antarctic-wide, sustained by feedbacks amplified by the delivery of Circumpolar Deep Water onto the continental shelf. Given the anti-phase relationship between inter-hemispheric climate trends across the LGT our findings demonstrate that Southern Ocean-AIS feedbacks were controlled by global atmospheric teleconnections. With increasing stratification of the Southern Ocean and intensification of mid-latitude westerly winds today, such teleconnections could amplify AIS mass loss and accelerate global sea-level rise.