

Description of Additional Supplementary Files:

Supplementary Data 1: Annual mean proxy-model comparison, showing sea surface temperature (-40 to -54.22 S) and surface air temperature (-75 to -79 S)

Supplementary Data 2: Summer (DJF) mean proxy vs model SST anomalies

Supplementary Data 3: Summary table of experiments. Here, 'G15' refers to Golledge et al (2015), using their RCP4.5 scenario at year 5000, using their 'high-melt' scenario which uses a sub-grid basal melting parameterisation. Experiments SL4.1, FW4.1, COMB4.1; SL7.1, FW7.1 and COMB7.1 were all initiated from year 1000 of the LIG experiment.