



Carbon Dioxide decrease led to Greenland glaciation in the Late Pliocene

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Loss of mass from the Greenland ice sheet (GrIS), and in particular the associated sea level rise, is one possible impact of anthropogenic global warming which is of fundamental concern; therefore, significant effort has recently been applied to modelling the future response of the GrIS to elevated greenhouse gas concentrations. However, many current theories for the *growth* of the Greenland ice sheet in the Late Pliocene (around 3 million years ago, 3 Ma) suggest that tectonic forcing factors or changes to ENSO (El Nio-Southern Oscillation), rather than direct greenhouse gas forcing, have been the primary controller of GrIS volume in the past. Here we show, contrary to these ideas, that the growth of the GrIS was intimately linked to a decline in atmospheric CO₂. The work indicates that future stabilisation of atmospheric CO₂ at elevated Late Pliocene levels (around 400ppmv) will lead to significant loss of mass from the GrIS in the long term.