



## **Using a Glacial Isostatic Adjustment model to investigate the contribution of the Antarctic and Greenland Ice sheet to the Last Interglacial Sea Level.**

Sarah Bradley and Richard C A Hindmarsh

British Antarctic Survey, United Kingdom (d80ngv@gmail.com)

Eustatic Sea Level during the Last interglacial (LIG) is likely to have been 4- 6 m higher than present day, with the observed relative sea level (RSL) at numerous far-field sites even higher [Dutton and Lambeck, 2012]. It has been suggested to generate this higher than present day sea level requires a retreat of both the Antarctic (AIS) and Greenland (GIS) Ice sheets beyond the present day extent, but the exact contribution of these two global ice sheets has yet to be resolved.

By combing a Glacial Isostatic Adjustment (GIA) model with a suite of LIG ice-loading histories we will address a number of outstanding issues (i) What was the contribution of the AIS and GIS to ESL, (ii) Was the AIS or the GIS smaller during the LIG than the present interglacial? (iii) Can we generate the observed higher LIG RSL at a range of far-field sites?

The suite of AIS and GIS ice-loading histories is constrained using the most recent near-field evidence, LIG stable isotope ice core data [Dahl-Jensen et al., 2013; Masson-Delmotte et al., 2011] and the output from ice sheet and climate models [Helsen et al., 2013; Pollard and DeConto, 2009; Stone et al., 2013]. Comparing the predicted RSL to a recent database of observed LIG far-field sea level [Dutton and Lambeck, 2012] allows for an assessment of the plausibility of the suite of ice loading histories. With this study, we aim to provide insight into the LIG history of the AIS and GIS.

Dahl-Jensen, D., et al. (2013), Eemian interglacial reconstructed from a Greenland folded ice core, *Nature*, 493(7433), 489-494.

Dutton, A., and K. Lambeck (2012), Ice Volume and Sea Level During the Last Interglacial, *Science*, 337(6091), 216-219.

Helsen, M. M., W. J. van de Berg, R. S. W. van de Wal, M. R. van den Broeke, and J. Oerlemans (2013), Coupled regional climate-ice-sheet simulation shows limited Greenland ice loss during the Eemian, *Clim Past*, 9(4), 1773-1788.

Masson-Delmotte, V., et al. (2011), A comparison of the present and last interglacial periods in six Antarctic ice cores, *Clim Past*, 7(2), 397-423.

Pollard, D., and R. M. DeConto (2009), Modelling West Antarctic ice sheet growth and collapse through the past five million years, *Nature*, 458(7236), 329-U389.

Stone, E. J., D. J. Lunt, J. D. Annan, and J. C. Hargreaves (2013), Quantification of the Greenland ice sheet contribution to Last Interglacial sea level rise, *Clim Past*, 9(2), 621-639.