Geophysical Research Abstracts
Vol. 18, EGU2016-6562, 2016
EGU General Assembly 2016

The transient response of ice volume to orbital-driven climate changes of the Late Pliocene

Bas de Boer, Stephen Hunter, Aisling Dolan, and Alan Haywood
University of Leeds, School of Earth and Environment, Leeds, United Kingdom

The contribution to sea-level rise of the Antarctic and Greenland ice sheets in a warming climate is uncertain. A better understanding is evidently needed to make more rigorous projections of the impact of regional sea-level rise. A warm interval within the Late Pliocene (3.264 to 3.025 million years before present) can be used to gain a better understanding of the response of the ice sheets to a warming climate with CO_2 levels close to or higher than present. Here, we will use a unique ice-sheet - sea-level model, ANICE-SELEN and couple this to the full-complexity intermediate-resolution FAMOUS climate model for the Late Pliocene interval.

A first approach is presented here with a one-way coupling, using FAMOUS to force the ice-sheet models in a transient mode. The FAMOUS simulation is driven by PRISM3 boundary conditions (which were also used in PlioMIP phase 1), where we apply a changing orbit, with and without dynamic vegetation. This 40 kyr simulation is centred on the warm interglacial peak, MIS KM5c (3.225 to 3.185 Myr ago). This experiment will give a first indication of the response of the Greenland and Antarctic ice sheets to the climate of the Late Pliocene. The results are compared with the equilibrated response of the ice sheet on Greenland and Antarctica to the PlioMIP phase 1 climate model output, as done so for the PLISMIP experiments.