



Sea level rise from the Greenland Ice Sheet during the Eemian interglacial: Review of previous work with focus on the surface mass balance

Andreas Plach (1,2) and Kerim Hestnes Nisancioglu (1,2)

(1) University of Bergen, Department of Earth Science, Bergen, Norway (andreas.plach@uib.no), (2) Bjerknes Centre for Climate Research, Bergen, Norway

The contribution from the Greenland Ice Sheet (GIS) to the global sea level rise during the Eemian interglacial (about 125,000 year ago) was the focus of many studies in the past. A main reason for the interest in this period is the considerable warmer climate during the Eemian which is often seen as an equivalent for possible future climate conditions. Simulated sea level rise during the Eemian can therefore be used to better understand a possible future sea level rise.

The most recent assessment report of the Intergovernmental Panel on Climate Change (IPCC AR5) gives an overview of several studies and discusses the possible implications for a future sea level rise. The report also reveals the big differences between these studies in terms of simulated GIS extent and corresponding sea level rise.

The present study gives a more exhaustive review of previous work discussing sea level rise from the GIS during the Eemian interglacial. The smallest extents of the GIS simulated by various authors are shown and summarized. A focus is thereby given to the methods used to calculate the surface mass balance. A hypothesis of the present work is that the varying results of the previous studies can largely be explained due to the various methods used to calculate the surface mass balance.

In addition, as a first step for future work, the surface mass balance of the GIS for a proxy-data derived forcing ("index method") and a direct forcing with a General Circulation Model (GCM) are shown and discussed.