

Response of Greenland ice sheet to Global Warming and its dependence on model parameters

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Study of the response of Greenland ice sheet to global warming is important for future sea level change and source of fresh water in the North Atlantic and Arctic. The timing and amount of change are studied using a GCM (MIROC3.2) and an Ice sheet model (IcIES). It is shown that the volume change of Greenland ice sheet has a long lasting effect even a stabilization of greenhouse gas or temperature is sustained. It is also shown that the response of change of the ice sheet is highly dependent on the climate sensitivity and also on the uncertainty of the model parameters such as flow parameter, sliding coefficient and geothermal heat flux. Although the sea level rise at the end of 21st century is projected to be at most 10 cm, the range of change at year 2500 could be from 0.5 to 2.5 meters. Narrowing both the range of uncertainty in climate sensitivity and ice sheet model parameters is needed.