

Results of the SeaRISE numerical experiments with the model SICOPOLIS for the Greenland ice sheet

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SeaRISE (Sea-level Response to Ice Sheet Evolution) is a multi-model community effort to predict the likely range of the contribution of the Greenland and Antarctic ice sheets to sea level rise over the next few hundred years under global warming conditions. The Japanese ice sheet modelling community is contributing to SeaRISE with three large-scale, dynamic/thermodynamic models: SICOPOLIS, IcIES and Elmer/Ice. Here, results for the Greenland ice sheet obtained with SICOPOLIS are discussed under the forcings (surface temperature and precipitation scenarios) defined by the SeaRISE effort. A crucial point for meaningful simulations into the future is to obtain initial conditions that are close to the observed state of the present-day ice sheet. This is achieved by proper tuning during model spin-up from the last glacial/interglacial cycle to today. Experiments over 500 years into the future investigate the sensitivity of the ice sheet to changed conditions at the ice surface (future climate warming), the base (increased basal sliding) and the margin (increased melting of marine ice fronts).

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