



Embedding a 1D calving ice model into a large-scale 3D ice dynamical model for Greenland.

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With a large-scale 3D ice dynamical model a reconstruction of the Greenland ice sheet is carried out over the period 1960-2100 with boundary conditions from the latest Ice2Sea topographic data set and the RACMO regional climate forcing fields. The Ice2Sea and RACMO fields have been remapped with an optimal centered oblique stereographic projection. The spatial resolution of most of the large scale ice sheet models is not enough to resolve the dynamics of narrow deep outlet glaciers. Processes acting at the marine boundary such as calving and submarine melt can not be represented in enough detail. To improve the large-scale ice model, a detailed 1D calving ice model is embedded at the location of an important outlet system. Here we present results for Jakobshavn Isbræ. Both models exchange information with the mapping tool OBLIMAP at as many time steps as required by the user. The coupling can be done at various levels of detail. A first order coupling considers the geometrical adaptation of the ice sheet. A more sophisticated coupling takes in addition the ice fluxes precisely into account. Results are compared with stand-alone 1D flow line results indicating the importance of the coupling process.