



Exploring drivers of retreat of the last British-Irish Ice Sheet: a numerical modelling study

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Following efforts of the BRITICE-CHRONO consortium the highly resolved retreat history of the last British-Irish Ice Sheet (BIIS) presents a valuable test for numerical ice sheet models. In turn, physics-based models can be used to test different hypotheses for drivers of retreat of the ice sheet. In this study we use a hybrid ice sheet-shelf model driven with a climate model. Our intention is not to try and reproduce the reconstructed extent of the BIIS as accurately as possible, but to find areas where our modeling framework struggles, with the ultimate goal of improving the model. We highlight two areas where there is a significant disagreement between the model and the reconstruction and describe efforts to remedy this disagreement. Firstly, the model fails to simulate ice inception over northwestern Scotland and western Ireland. We suggest that this is due to an underestimate of orthographic precipitation due to our low resolution climate model forcing. A new parameterization for orthographic precipitation has been developed that improves ice sheet inception. Secondly, although the pattern of deglaciation is similar to reconstructions, it is consistently ~ 4 kyr later than suggested from the BRITICE-CHRONO compilation. Again, we highlight an area in our modeling framework that could explain this discrepancy and the steps we have taken to improve the model. To conclude, we discuss what our numerical simulations may tell us about drivers of retreat of the last BIIS.