



Future projections of the Greenland ice sheet mass balance using the regional climate MAR model coupled with the GRISLI ice sheet model.

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During the two last decades, the Greenland ice sheet (GrIS) contribution to the global mean sea level rise has significantly increased. But, difficulties remain to assess GrIS future contribution because of large uncertainties linked to the feedback between the surface mass balance (SMB) and GrIS topography changes. The regional climate MAR model has been coupled with the GRISLI ice sheet model, in order to account of this feedback in the future projections. The aim of this study is to assess the pertinence of the MAR-GRISLI coupling which requires long computation time. In order to identify GRISLI sensitivity to MAR forcing, GRISLI has been forced with various non-coupled (i.e. using a fixed topography), coupled and modified non-coupled MAR outputs. To adapt the non-coupled MAR outputs to the GRISLI topography changes, we use an interpolation technique based on SMB vs elevation vertical gradient. These experiences evaluate the performances/limits of this interpolation technique used to avoid a RCM-ice sheet model coupling.