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Supplement of

Relative importance of the mechanisms triggering the Eurasian ice sheet deglaciation in the GRISLI2.0 ice sheet model

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Supplement

Figure S1: Drainage basins used for the basal melting parameterization

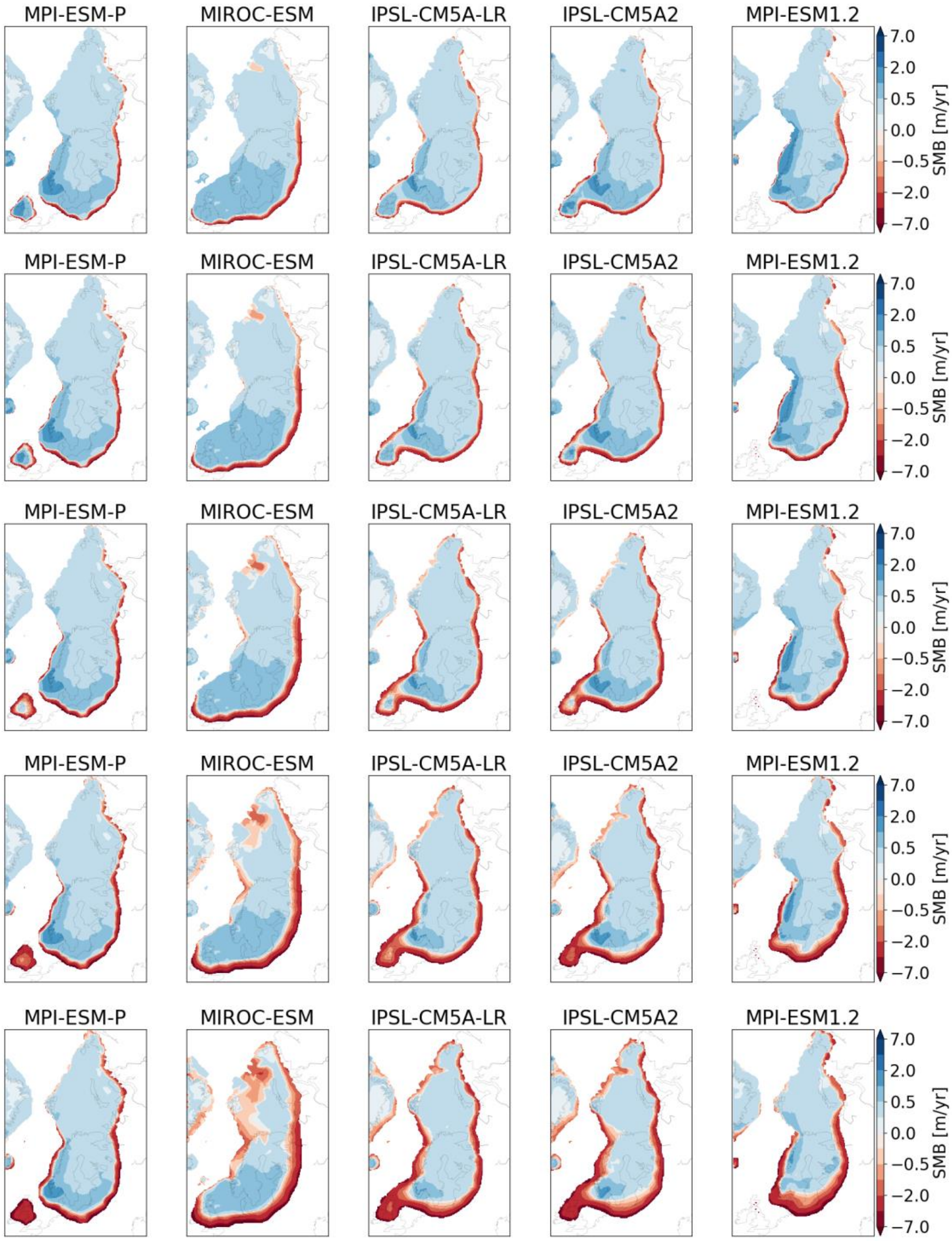

Figure S2: Surface mass balance calculated with each GCM forcing for 1°C (top) to 5°C (bottom) atmospheric temperature perturbations.

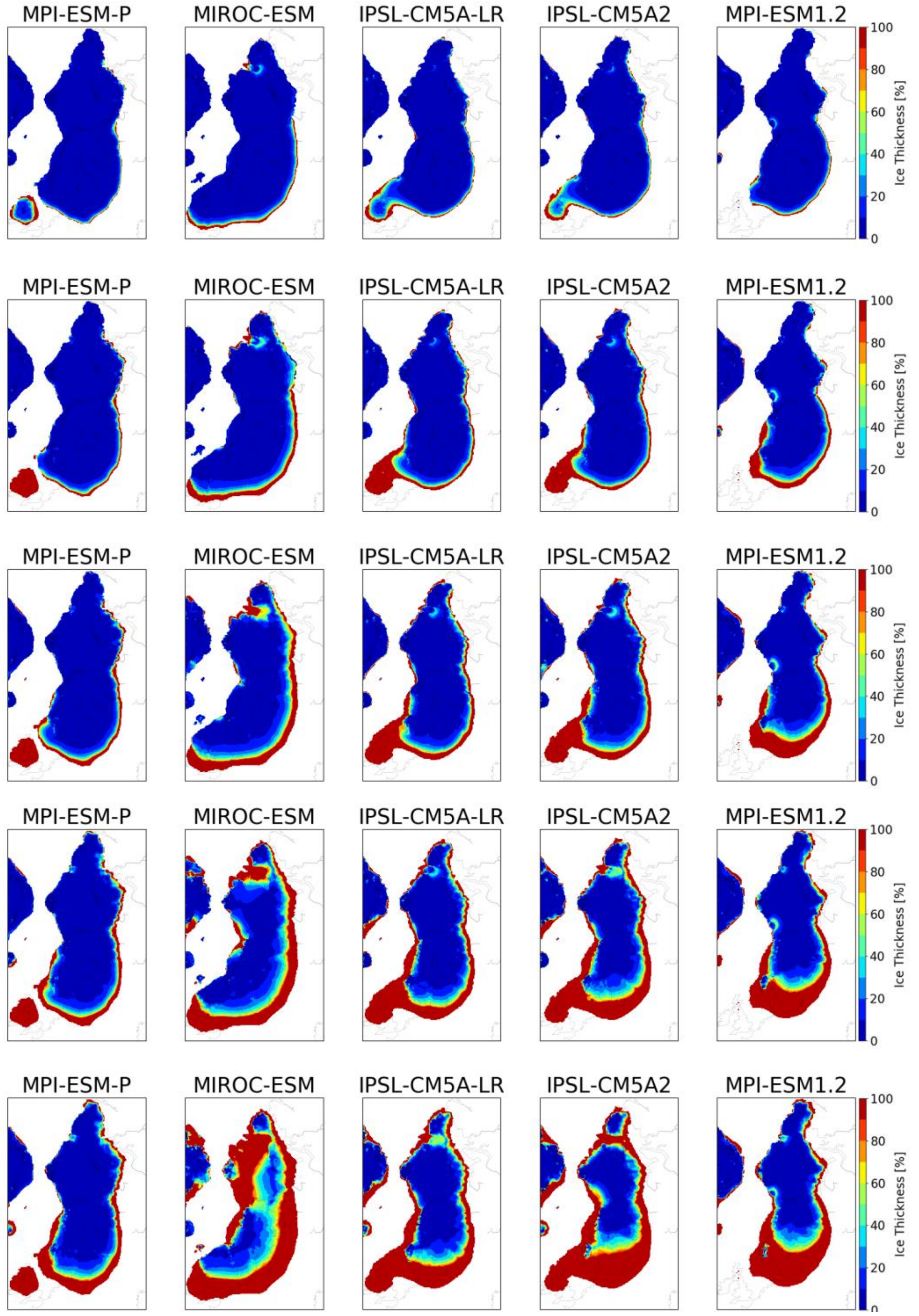

Figure S3: Ice thickness lost obtained in the EXP1 experiments for each GCM forcing compared to the initial LGM ice sheet for 1°C (top) to 5°C (bottom) atmospheric temperature perturbations.

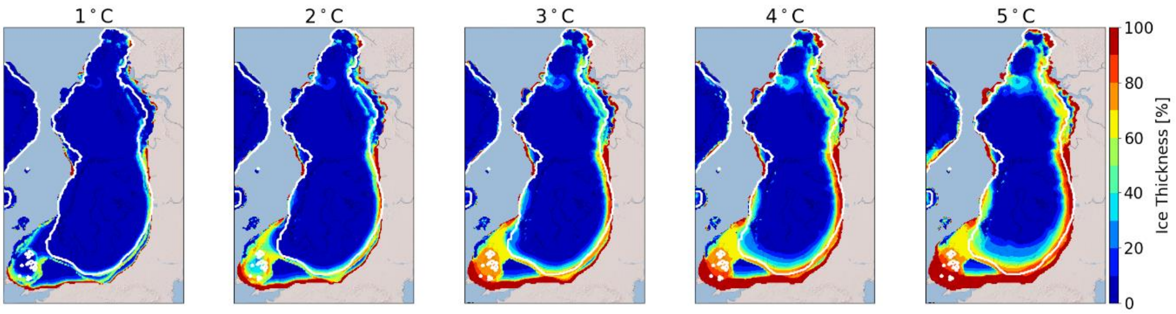

Figure S4: Multi-model mean of the ice thickness lost after 1000 years compared to the initial ice sheet for the EXP2 experiments. (Red: 100% lost). White line indicates the areas where the multi-model mean is done on the 5 models.

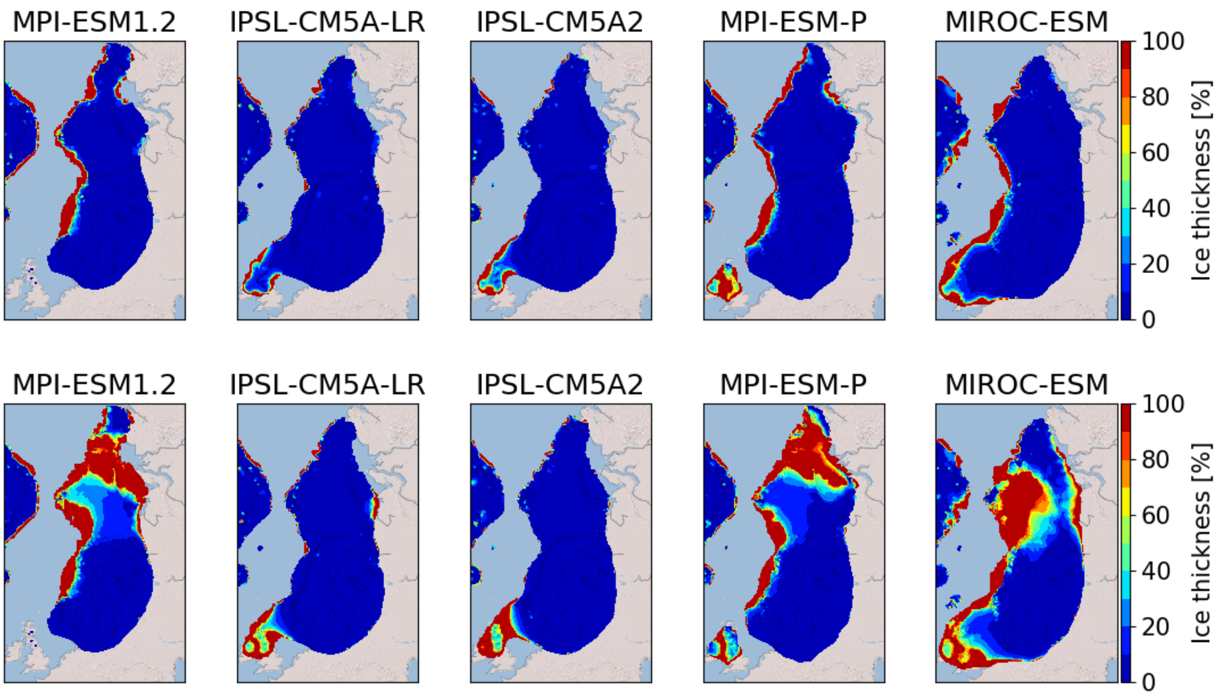

Figure S5: Ice thickness lost after 1000 years (top) and 10000 years (bottom) compared to the initial ice sheet for a basal melting perturbation of Kt = 50 m $°C^{-1}$ yr^{-1} for each GCM forcing. (Red 100% lost).

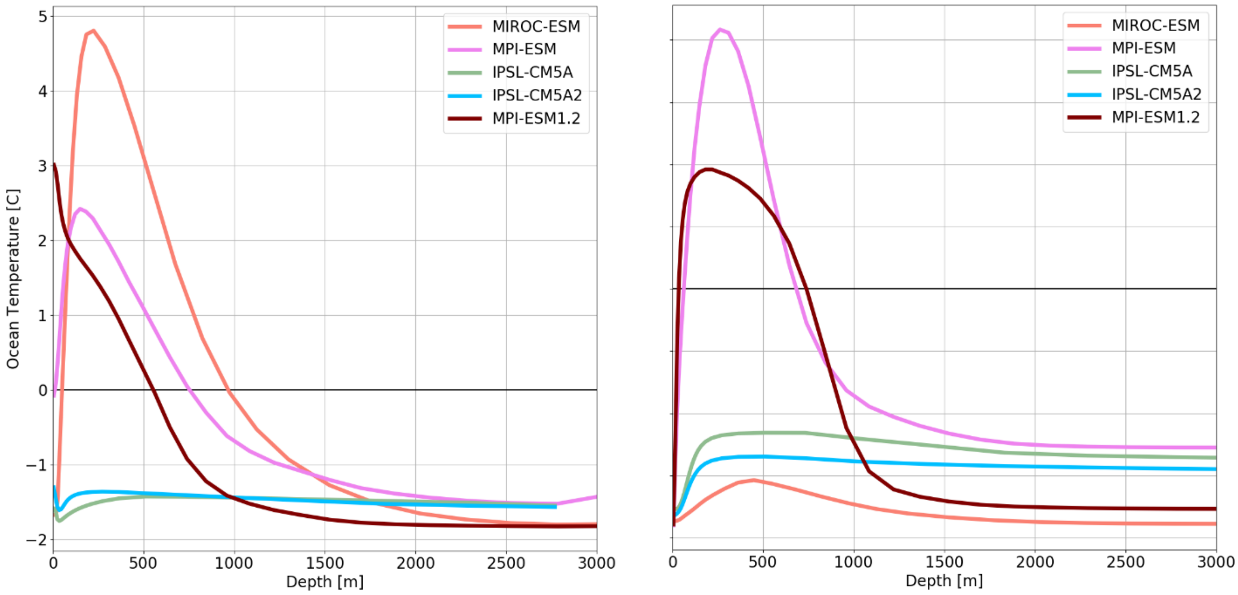

Figure S6: Average ocean temperature in the BJR (left) and SA sectors as a function of ocean depth.

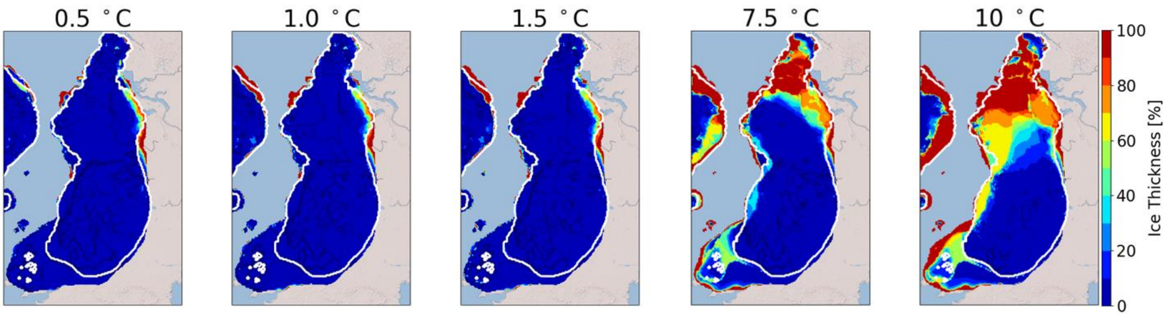

Figure S7: Multi-model mean of the ice thickness lost after 10000 years compared to the initial ice sheet for EXP3.2. (Red: 100% lost). For this experiment, Kt has been fixed to 7 m °C^{-1} yr^{-1}. The white line represents the most credible extent derived from the DATED-1 compilation

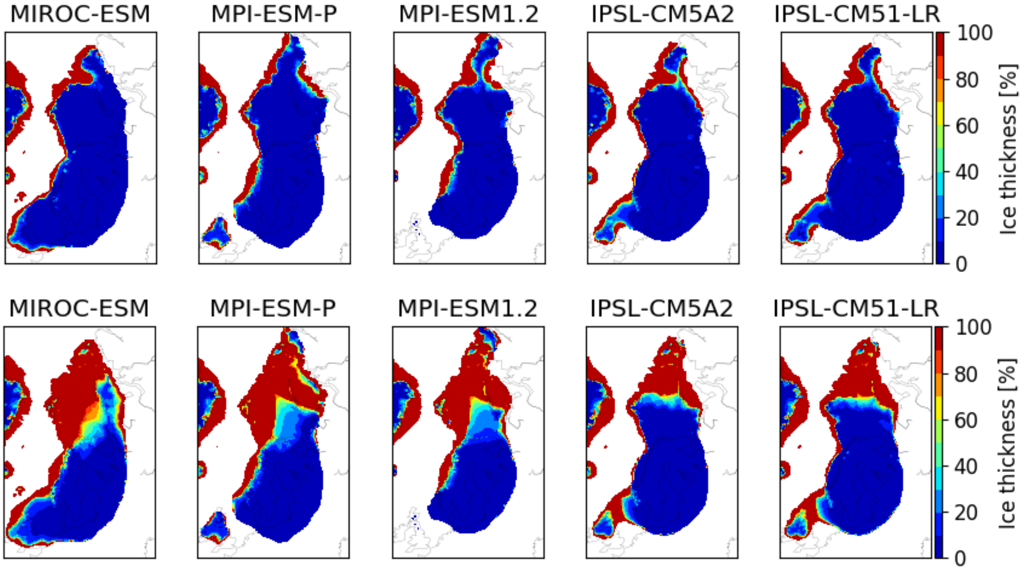

Figure S8: Ice thickness lost after 1000 (top) and 10000 (bottom) model years compared to the initial LGM ice sheet for an oceanic temperature perturbation of 10°C for each GCM forcing. (Red: 100% lost).

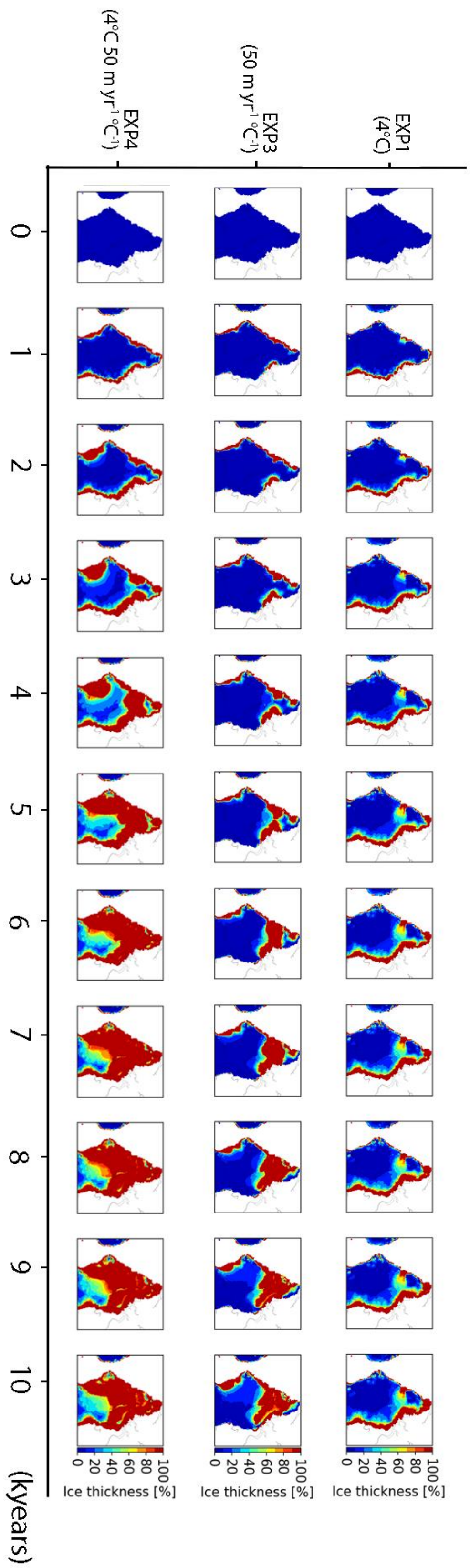

Figure S9: top/ Ice thickness lost for simulation forced by MPI-ESM-P from 1000 to 10000 years with respect to the ice thickness of the LGM ice-sheet in the EXP1 (4°C) experiment Middle/ same as top/ for EXP3 (50 m °C^{-1} yr^{-1}). Bottom/ same as top for EXP4 (4°C and 50 m °C^{-1} yr^{-1}).

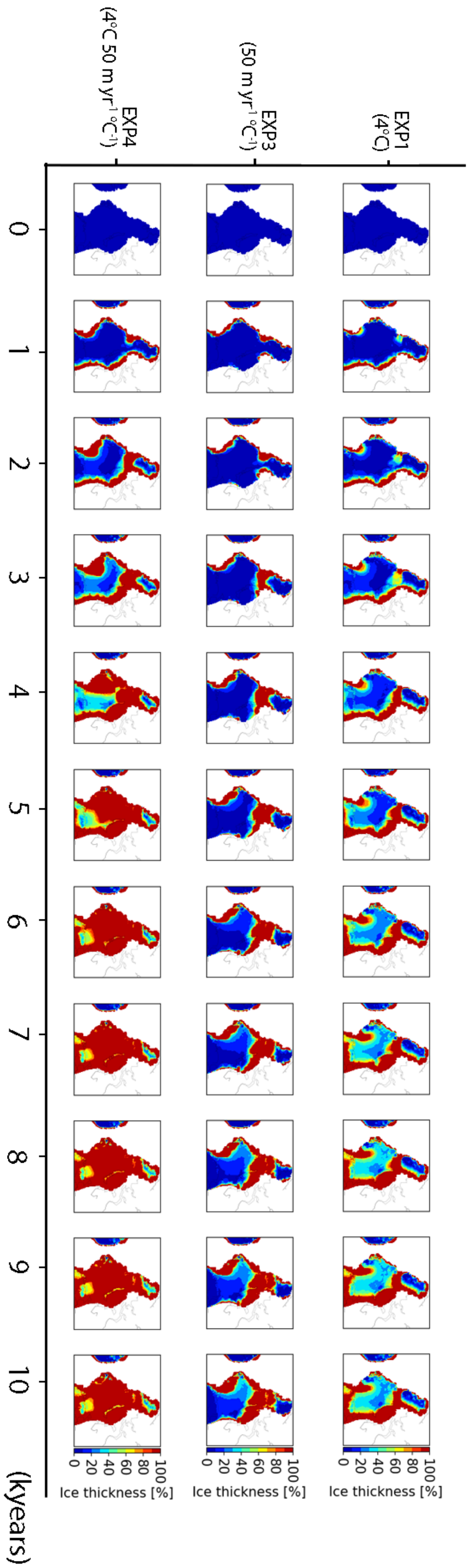

Figure S10: Same as Figure S9 for the simulation forced by MPI-ESM1.2

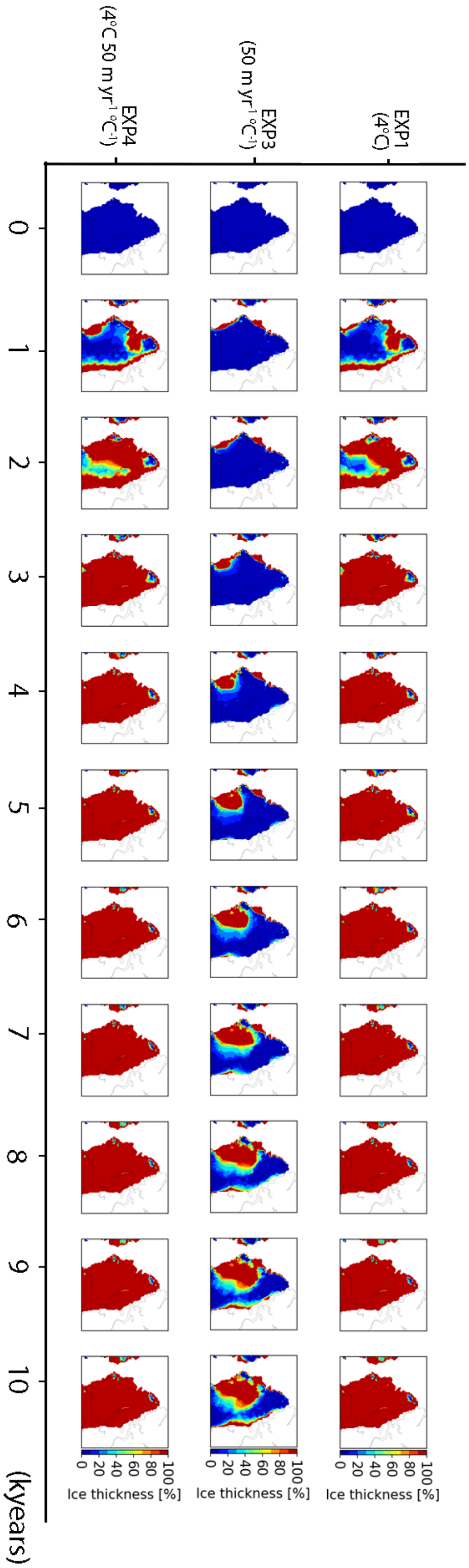

Figure S11: Same as Figure S9 for the simulation forced by MIROC-ESM.

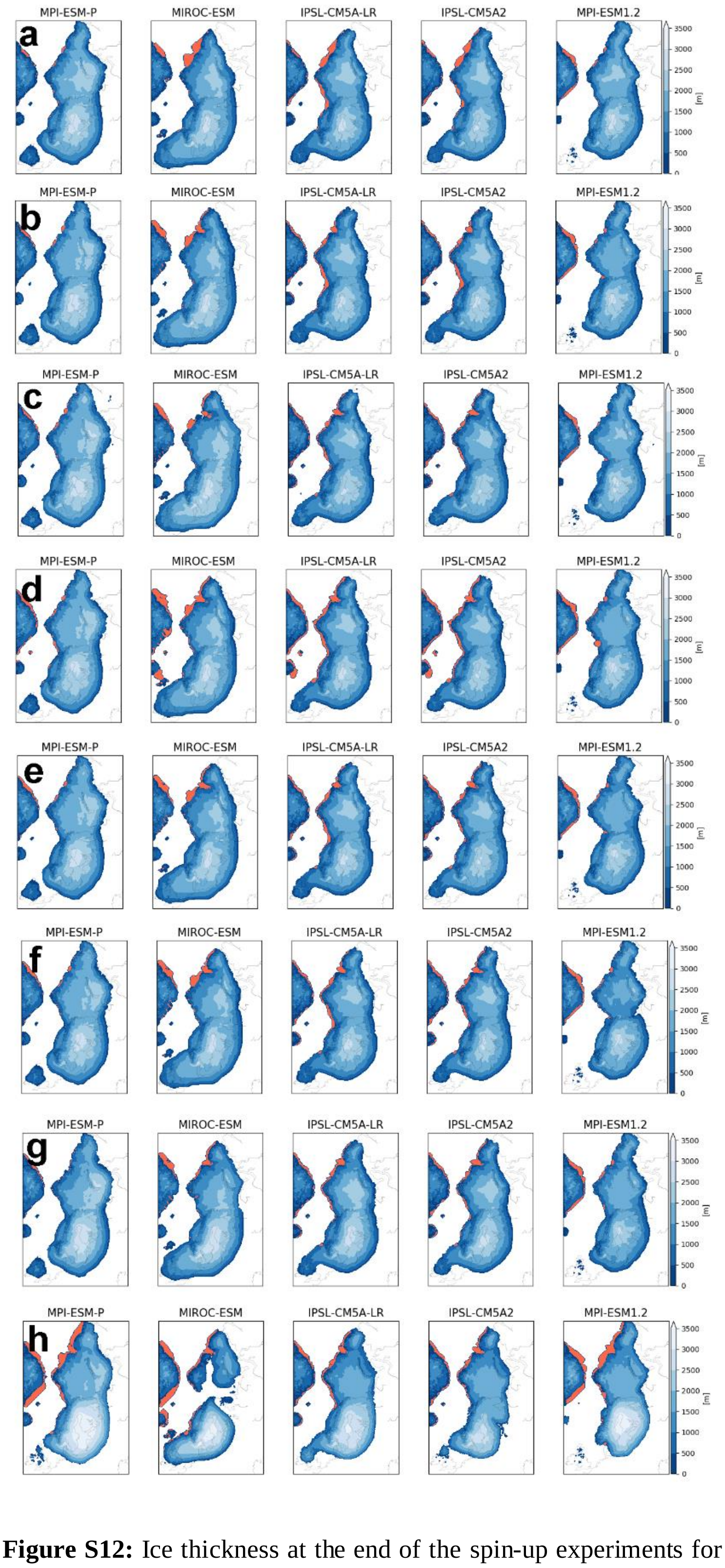

Figure S12: Ice thickness at the end of the spin-up experiments for the different GRISLI configurations: a/ No flux at the grounding line; b/ λ = 4°C km^{-1}; c/ ω = 0.05 °C^{-1}; d/ H_{cut} = 50 m; e/ PDD factors -25%; f/ PDD factor +25%; g/ Coulomb's law (plastic dragging law); h/ Transient spin-up method. The orange areas are the simulated ice shelves.

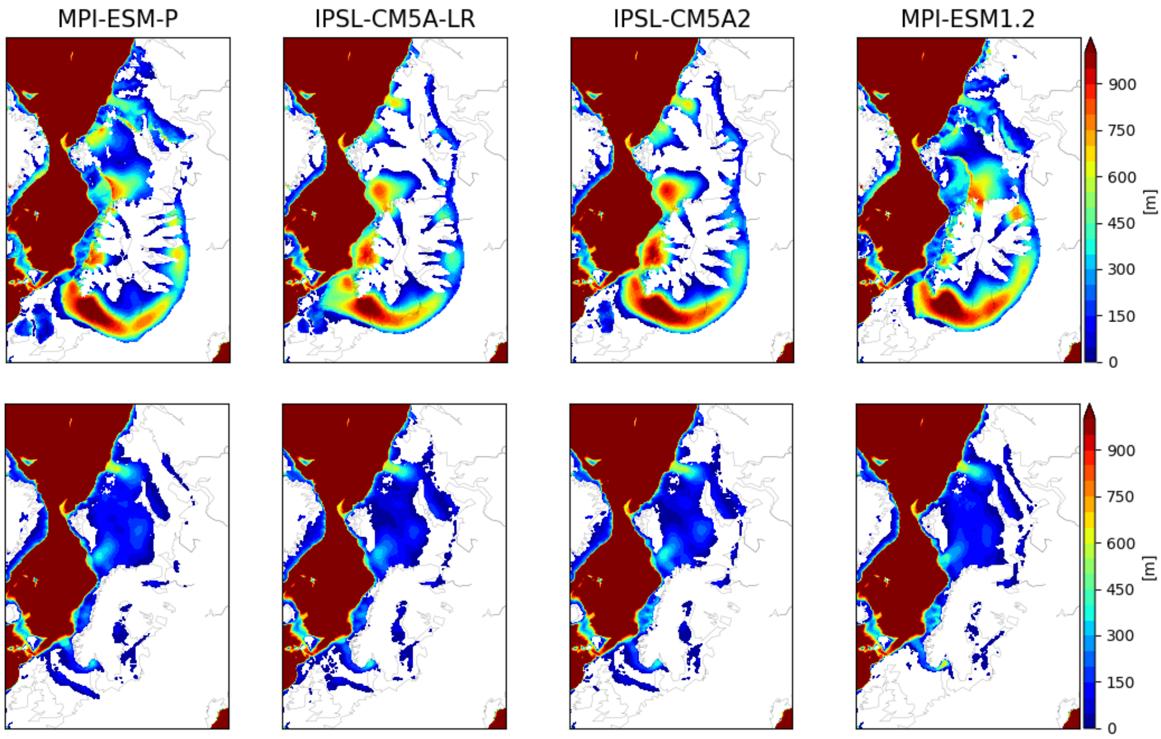

Figure S13: subglacial water height at the end of the spin-up for the constant LGM method (top) and the transient method (bottom).

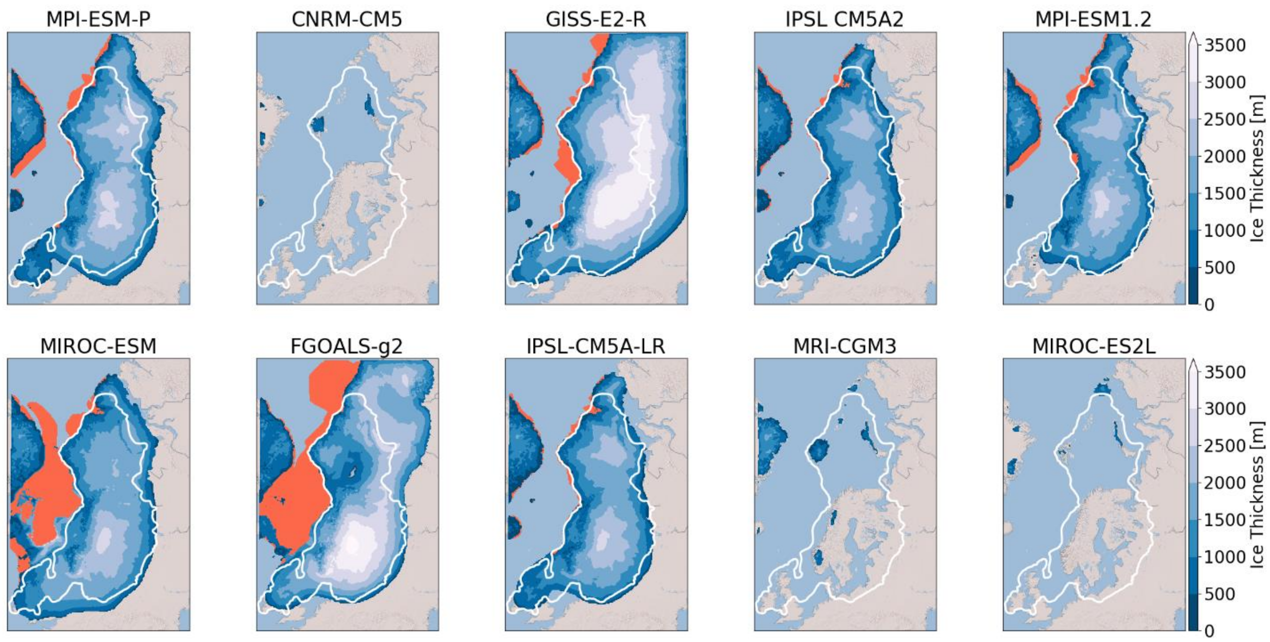

Figure S14: Ice thickness at the end of the 100,000-year LGM simulation (spin-up) for the different GCMs used as inputs to GRISLI. Basal melting is set to 0.1 m yr^{-1}as in Petrini et al., (2020). The white line is the most credible extent derived from the DATED-1 compilation and the orange areas are the simulated ice shelves.