



Impacts of North Atlantic Surface Temperatures on European Climate during the Last Glacial Maximum in a regional climate model simulation

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Global earth system models overestimate North Atlantic sea surface temperatures (SST) under glacial climate conditions compared to proxy data. In this study, the influence of SSTs on the regional climate over Europe during the last glacial maximum (LGM) is examined. Regional model simulations with revised SSTs based on proxy data considerably improve the representation of simulated temperature and precipitation over Europe. Likewise, the simulated permafrost distribution is more accurately reproduced with the SST modifications. Additionally, the regional atmospheric circulation reacts on the revised SSTs. In particular, the changes in maritime circulation patterns reveal colder and drier conditions over Western Europe. Sensitivity tests with prescribed vegetation for LGM conditions provide evidence of the sensitivity of the simulated glacial climate due to changes in boundary conditions. The results of this study reveal the importance of considering more realistic SST and vegetation boundary conditions for a more accurate representation of regional climate variability under glacial conditions.