



Evaluating ice sheet model performance over the last glacial cycle using paleo data

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Estimating the past evolution of ice sheets is important for improving our understanding of their role in the Earth system and for quantifying their contribution to sea-level changes. Limited but significant paleo data and proxies are available to give insights into past changes that are valid, at least, on a local scale. Meanwhile, models can be used to provide a mechanistic picture of ice sheet changes. Combined data-model comparisons are therefore useful exercises that allow models to be confronted with real-world information and lead to better understanding of the mechanisms driving changes. In turn, models can potentially be used to validate the data by providing a physical explanation for observed phenomena.

Here we focus on the evolution of the Greenland ice sheet through the last glacial cycle to highlight common problems and potential opportunities for data-model comparisons. We will present several examples of how present generation model results are inconsistent with estimates from paleo data, either in terms of the boundary forcing given to the model or the resulting characteristics of the ice sheet. We also propose a set of data-model comparisons as the starting point for developing a more standardized paleo model performance check. Incorporating such a test into modeling efforts could generate new insights in coupled climate – ice sheet modeling.