

## **Nested ice-sheet modeling of long-term variations in the Pine Island-Thwaites Glacier basins.**

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Retreat of the West Antarctic Ice Sheet and consequent sea level rise in response to future warming is a serious concern. Recent observations of thinning, acceleration and grounding-line retreat of the Pine Island and Thwaites Glaciers (PIG/THW) identify this sector of the Amundsen Sea coast as particularly vulnerable. Here a hybrid ice sheet-shelf model is used to simulate past and future ice variations in this region. The model heuristically combines scaled equations for vertical shearing (stiffly grounded sheet) and horizontal stretching (stream and shelf) flow, and parameterizes ice flux across the grounding line as a function of local bedrock depth. For these experiments, the model is run on a nested domain centered on PIG/THW at 5 km resolution, driven at the boundaries by the results of a prior continental simulation.

Preliminary results are shown using various parameterized climates (modern, LGM, and future warm). Model parameter space is explored to obtain the best fits to the modern state, and to the much greater grounding-line extent at LGM reconstructed from geologic data across the continental shelf. The goal is to perform time-continuous experiments over the last 20 kyrs, validating against geologic data on deglacial retreat in this sector, and projecting these runs into the future.