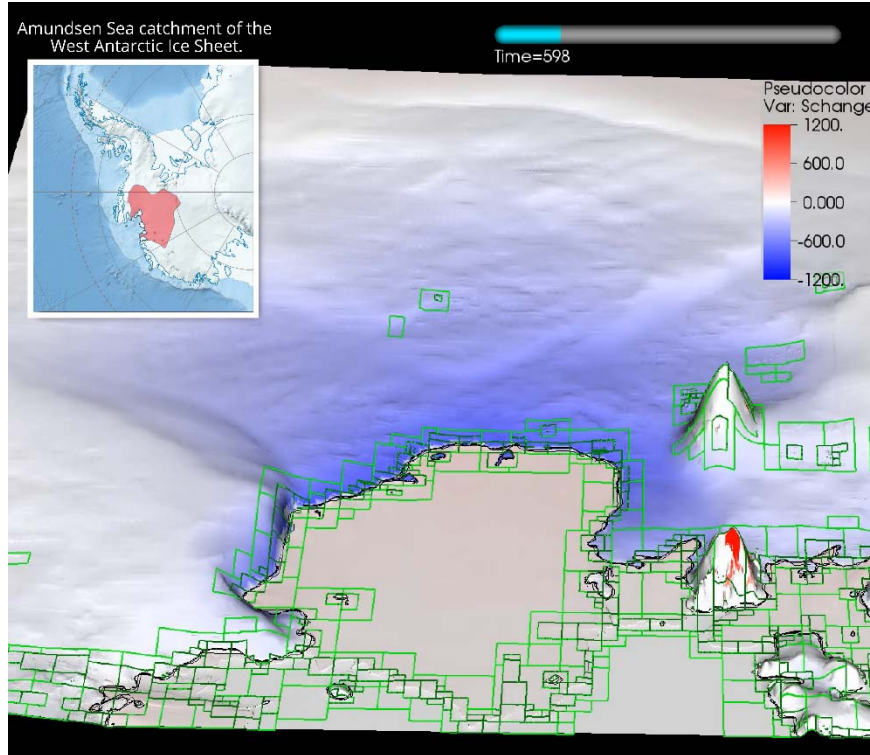


# Subglacial bathymetry and the future of the West Antarctic Ice Sheet

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**Abstract:** The motto for early 21st Century cryospheric science might be "that happened faster than I thought it would." Nearly everywhere we look, Earth's icy realms are responding to climate change and the rates at which these responses take place often challenge our theoretical tools to keep up. Glaciologists who study the West Antarctic Ice Sheet (WAIS) have been concerned about the possibility of rapid response to global warming since the 1970s and in some locations, rapid retreat is indeed underway. What such changes imply for the future is less clear.

Projecting future change in the WAIS is complicated by poorly known boundary conditions. Central among these is the attribute of the system that also makes it vulnerable: the shape of the sea floor over which the ice flows. Beginning from an explanation of the physics that make rapid response to small environmental forcing possible, the presentation will examine how knowledge of subglacial bathymetry affects model-simulated response to ocean warming. Thwaites Glacier, a major outlet of the WAIS, is the subject of the study. Overall, it is found that bed resolution sets a threshold for initiation of rapid retreat while the size of the climate forcing sets the rate of retreat.