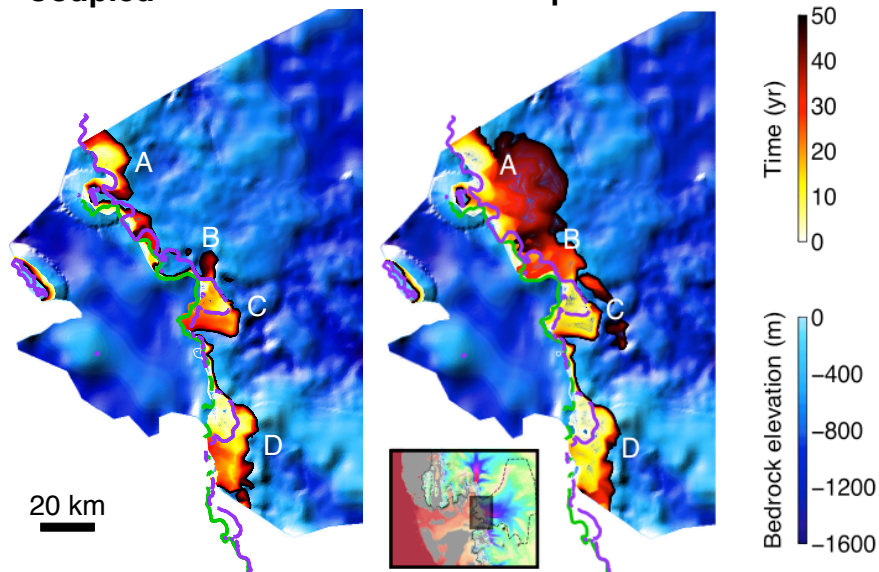


ICE-OCEAN MODELING OF THWAITES GLACIER

Helene Seroussi

Coupled

Non-coupled



Evolution of the grounding line of Thwaites line over the next 50 years for coupled ice-ocean model (ISSM-MITgcm, left) and standalone ice sheet model with parameterized melting (right). Background shows the bed topography. Green and purple lines represent, respectively, the 1996 and 2011 observed grounding line positions.

Reference: Seroussi, H., Y. Nakayama, E. Larour, D. Menemenlis, M. Morlighem, E. Rignot, and A. Khazendar (2017), Continued retreat of Thwaites Glacier, West Antarctica, controlled by bed topography and ocean circulation, *Geophys. Res. Lett.*, 44, doi:10.1002/2017GL072910.

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Science Question:

Glaciers in the Amundsen Sea Sector are rapidly changing. What is the role of the ocean and how is it going to affect the future of Thwaites Glacier?

Results & Data:

- Thwaites Glacier will continue to lose mass at a similar rate over the next decades.
- Grounding line retreat governed by bed topography but retreat rate depends on oceanic conditions
- Coupled ice-ocean models produce more realistic estimates of glacier retreat rates than ice models driven by parameterized melt.

Data from **Operation IceBridge** (bedrock, bathymetry), **MEaSUREs** (velocities and grounding lines) and **ECCO2** estimates used to initialize, run and validate the models.

Significance:

Results highlight the importance of coupling ice and ocean models and improve projections of ice sheet contribution to sea level rise.