Preliminary results using Regionally Refined Ocean and Sea-ice Meshes for
the E3SM v2 Cryosphere Science Campaign

Darin Comeau, Los Alamos National Laboratory

Xylar Asay-Davis, Los Alamos National Laboratory

Carolyn Begeman, Los Alamos National Laboratory

Kristin Hoch, Los Alamos National Laboratory

Matthew Hoffman, Los Alamos National Laboratory
Wuyin Lin, Brookhaven National Laboratory

Mathew Maltrud, Los Alamos National Laboratory

Mark Petersen, Los Alamos National Laboratory

Stephen Price, Los Alamos National Laboratory

Andrew Roberts, Los Alamos National Laboratory
Luke Van Roekel, Los Alamos National Laboratory

Milena Veneziani, Los Alamos National Laboratory

Jonathan Wolfe, Los Alamos National Laboratory

In this follow-up presentation to "Designing Regionally Refined Ocean and Sea-ice Meshes for the E3SM v2 Cryosphere Science Campaign", we present results from preliminary simulations using the newly developed regionally refined ocean/sea-ice meshes for cryosphere configurations. These simulations include our team's first effort to run fully coupled simulations with high resolution around Antarctica that include prognostic ice-shelf melt fluxes. We find the regionally refined simulations to have improved certain biases relative to their low-resolution counterparts, and in particular "tipping point" behavior to high melt regimes seen in many low-resolution simulations seem to be mitigated with the regionally refined meshes. In addition to the fully coupled simulations, we will also present results from active ocean/sea-ice configurations with data atmosphere forcing. These early results show promise for the v2 Cryosphere Simulation Campaign, where we aim to run pre-industrial control simulations (both low-resolution and regionally refined) that will allow us to branch off scenario simulations for the first time.