
C21D-1362: Assessing the response of sea ice, ocean circulation, and climate to projected increases in Antarctic Ice Sheet melt

Tuesday, 11 December 2018

08:00 - 12:20

📍 *Walter E Washington Convention Center - Hall A-C (Poster Hall)*

Observational evidence indicates that the West Antarctic Ice Sheet is losing mass at an accelerated rate while ice sheet models highlight the potential for a significant ice collapse in the next century. The impacts of this large fresh water forcing on sea-ice formation, ocean circulation and climate could be significant, but to-date they have not been investigated using complex numerical models with realistic fresh water forcing and dynamical ice sheet models. Here, we present results from several climate model simulations performed under IPCC future climate scenarios RCP 4.5 and 8.5 with a high-resolution, fully coupled, ocean-atmosphere model (CESM 1.2). In each experiment, runoff from Antarctica is prescribed from a regional dynamic/thermodynamic ice sheet/shelf model. Our results highlight a significant rise in subsurface ocean temperatures ($>1^{\circ}\text{C}$) at the ice sheet grounding line that may accelerate rates of ice melt beyond those currently projected. In contrast, the increased runoff creates a cold surface layer that allows Antarctic sea ice to continue to expand through the end of the current century. It is vital that these processes are accounted for in the next generation of climate and ice sheet models.

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