

CGD SEMINAR



DATE: Tuesday 4 February, 2020

TIME: 11 am – 12 pm

LOCATION: NCAR, 1850 Table Mesa Drive
Mesa Lab, Main Seminar Room

TITLE: Advances in modeling interactions
between sea ice and ocean surface
waves

SPEAKER: Lettie Roach, University of Washington

ABSTRACT:

Sea ice, composed of a mosaic of individual floes, is a critical component of the coupled polar climate system. Over recent decades, the Arctic has changed dramatically: sea ice has declined in areal extent and age, the ice-free season has lengthened and there is enhanced ocean surface wave activity. These changes may result in feedbacks not yet included in coupled climate models.

In this talk, I will present new developments to the sea ice model CICE, a component of CESM, that allow us to represent two-way interactions between sea ice and ocean surface waves for the first time. Besides sea ice thickness and concentration, the model can now additionally represent sub-grid-scale variations in sea ice floe size. Floe sizes evolve subject to melting, freezing, new ice formation, welding, and fracture by ocean surface waves. Global model experiments with wave-ice coupling highlight the large role played by ocean surface waves in determining the fragmentation of sea ice. These results have motivated new ongoing observational work to capture the complexity of the sea ice system. Finally, I will discuss how this work opens up new opportunities to investigate feedback processes that are potentially of importance in the 'new Arctic'.

Live webcast: <https://www.ucar.edu/live>

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