

Category

CR Cryosphere

Session Number

CR-4

Session Title

Ice sheets, ice shelves & proximal processes in past, present & future climates

Session Description

Ice sheets terminating in marine environments and/or grounded below sea level are dynamic and sensitive portions of the cryosphere, especially vulnerable to change. They are also one of the largest uncertainties in understanding the fate of ice sheets under predicted atmospheric and oceanic warming. The exposed beds of palaeo-marine ice sheets offer a rich means of studying ice dynamics over large areas and long timescales, using the geological record to provide vital insight into the processes and feedbacks that regulate marine-based ice sheet retreat.

Over the past two decades, ice shelves have thinned considerably along the Amundsen coast in West Antarctica, and partly destabilized in the Antarctic Peninsula. Destabilization of ice shelves is manifested by basal thinning through inflow of warm ocean waters, by hydrofracturing of surface melt water driven by regionally warming winds, by ice cliff failure at the ice shelf front, or by a combination of these three processes.

Here we invite contributions that aim to give insight in past, present and future ice shelf changes and their drivers across all of the atmosphere, ice, ocean, and terrestrial subglacial disciplines. Studies presenting observations, from palaeo or sub-recent in situ or remote sensing data, and models, both theoretical and numerical, are encouraged to apply, especially those that combine observations and models.

Keywords: Antarctic, geology, cross-disciplinary, Arctic, atmosphere, ocean, paleoclimate, ice, subglacial, glaciology, observations, remote sensing, modeling, theory, ice shelves, marine ice sheets, proxies

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