

Marine Geological Record of Ice Retreat in the Antarctic Peninsula Since the Last Glacial Maximum

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Abstract

During the last glacial maximum (LGM), the Antarctic ice sheets expanded, reaching the shelf break in many places, including in the Antarctic Peninsula (AP); since the end of the LGM (~14,000 years ago) ice has retreated back to its current position, leaving a suite of subglacial geomorphic features on the seafloor. Sedimentary archives sequestered in deep fjords have formed under marine conditions, recording the ongoing glacial retreat and climatic fluctuations.

This talk will include multibeam swath bathymetry data and 3.5 kHz chirp profiles to illustrate the geomorphology of the seafloor, and thus the pattern of ice flow from the mountains and across the shelf. Sediment core data, including basic lithology description, grain size, shape, and texture, x-ray facies, multi-sensor core logs, and geochemical data will be combined with radiocarbon and ²¹⁰Pb data to reconstruct the history of the region.

Using cores from eleven different fjords across a latitudinal transect, we observe that while glacial retreat in the early deglacial period progressed from north to south in a predictable pattern, once grounding lines were inside individual fjords, the retreat in each basin followed individual patterns, including periods of readvance. Each of these styles is different from the current period of recent rapid warming, during which nearly all glaciers in the AP are uniformly retreating.