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Deglacial chronology of SW Patagonia implies an in-phase relationship with Antarctica and the Northern Hemisphere

P.I. Moreno (1,2), M.R. Kaplan, R. Villa-Martínez, M.L. Cárdenas

(1) Inst. Ecology and Biodiversity, U. of Chile, (2) CEQUA, U. of Magallanes, (3) U. of Edinburgh

We will discuss new results on the glacial stratigraphy, geomorphology, and geochronology of Seno Última Esperanza and Torres del Paine National Park in SW Patagonia, and compare them with similar records from NW Patagonia and the Magellan Strait. Our aim is to decipher the timing, direction, geographic extent and origin of paleoclimate signals during the last glacial termination in the southern mid-latitudes.

Stratigraphic and geomorphic evidence indicate that outlet glacier lobes from an expanded Patagonian Ice Sheet descended into the lowlands of Seno Última Esperanza and Torres del Paine National Park during the LGM. Radiocarbon dating of glacial deposits and landforms afford close minimum dates of 17.5 and 16.9 cal kyr for thinning and recession (respectively) of the Seno Ultima Esperanza lobe at the onset of the last termination. A large ice-dammed proglacial lake developed following moderate recession from the LGM front, this led to the deposition of abundant glaciolacustrine mud with varying amounts of ice rafted detritus below 150 m elevation along Seno Última Esperanza. Stratigraphic and geomorphic evidence suggest a subsequent glacier readvance within this proglacial lake environment. Sediment cores from Lago Eberhard, located only a few km from the inferred ice front, show a conspicuous IRD-enriched zone between 14.5-12.8 cal kyr, which we interpret as a distal expression of the readvance. Ice recession at 12.8 cal kyr drained ice-dammed lakes in Última Esperanza and Torres del Paine National Park, marking the end of the glacial readvance. Palynological data demonstrate that extreme cold conditions persisted until 11.4 cal kyr. An abrupt expansion of Nothofagus forests, indicative of rapid warming, mark the beginning of the Holocene.

Our results indicate a common deglacial pattern in western Patagonia along 14 degrees of latitude. Strong similarities in timing and direction with Antarctic ice cores and (some) paleoclimate records from the North Atlantic region suggest tight intra- and interhemispheric coupling and (quite possibly) a common cause, despite apparent antiphases at millennial timescales