

## **Early deglaciation and paleolake history of Río Cisnes Glacier, Patagonian Ice Sheet (44°S)**

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### **Abstract**

The timing, structure and landscape change during the Patagonian Ice Sheet (PIS) deglaciation remains unresolved. In this paper, we provide a geomorphic, stratigraphic and geochronologic deglacial record of the Río Cisnes Glacier at 44°S and also from the nearby Río Ñirehuao and Río El Toqui Valleys (45°S) in Chilean Patagonia. Our  $^{14}\text{C}$ ,  $^{10}\text{Be}$  and OSL data indicate that after the Last Glacial Maximum, the Río Cisnes Glacier experienced c. 100 km deglaciation between >19.0 and 12.3 ka, accompanied by the formation of large glacial paleolakes. Deglaciation was interrupted by several ice readvances and by  $16.9 \pm 0.3$  ka, the Río Cisnes Glacier extended only c. 40% of its full glacial extent. The deglaciation of the Río Cisnes Glacier and other sensitive Patagonian glaciers, occurred at least 1 ka earlier than the c. 17.8 ka normally assumed date for the local termination, coincident with West Antarctic isotope records. This early deglaciation can be linked to an orbital forcing driven decline of Southern Ocean sea ice associated with a distinct atmospheric warming that is apparent for West Antarctica through Patagonia..