



Meltwater palaeohydrology of the Baker River basin (Chile/Argentina) during Late Pleistocene deglaciation of the Northern Patagonia Icefield

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The Late Pleistocene deglaciation of the Northern Patagonia Icefield (NPI) was characterised by rapid ice sheet thinning and retreat, and the development of large proglacial lake systems characterised by continental scale drainage reversals. In this region, research has focused primarily on the identification of former ice-limits (e.g. moraine ridges) for geochronological analyses, with little attention given to the meltwater palaeohydrology of major river valleys. The Baker River catchment drains the majority of the eastern ice shed of the NPI, with a basin area of 29,000 km² that includes the large transboundary lakes of General Carrera/Buenos Aires and Cochrane/Puerreydón. The Baker River valley is aligned north to south, crossing the east-west valleys of the main NPI outflow glaciers, and thus represents an important aspect of regional Late Pleistocene palaeogeography. The Baker River valley therefore has the potential to refine regional models of deglaciation through better understanding of relationships between glacier dynamics, ice dammed lakes and meltwater pathways. Here we present geomorphological mapping from the Atlantic-Pacific drainage divide (over 150 km east of the Cordillera) to the lower Baker valley, in order to reconstruct Late Pleistocene palaeohydrology. We provide new mapping of palaeolake shoreline elevations and evidence for glacial lake outburst flood (GLOF) pathways that require a re-evaluation of the currently accepted palaeogeographic models. For example, the palaeohydrological evidence does not support existing models of a unified Buenos Aires/Puerreydón mega-lake at ca. 400m elevation. We propose a relative chronology of palaeohydrological events that help refine the published moraine chronology derived from cosmogenic nuclide exposure dating. Controls on Late Pleistocene meltwater palaeohydrology of the Baker catchment are discussed, including the interplay of glacial processes and regional tectonics, in particular, dynamic topography.