

## **Hydrological regime characteristics due to the development of proglacial lakes at Glacier Soler, Northern Patagonia Icefield, Chile**

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**Abstract** Comparing the hydrological regimes of a stream from Glacier Soler in Patagonia, which were observed before (1985) and after (1998) the onset of proglacial lake development (1992) due to the large-scale retreat of the glacier, the following differences were found: (a) an increase in glacier flow speed; (b) advance in occurrence time of the daily maximum discharge; (c) steepening of the diurnal rising and falling limbs of hydrographs; (d) occurrence of a flood due to sudden drainage from the lakes; (e) decrease in the range of variation in electric conductivity; and (f) positive correlation between discharge and electric conductivity within each day of the period. The differences in glacier flow and stream discharge variation may have resulted from the change in the hydraulic features of the subglacial drainage system due to thinning of the glacier and/or the development of lakes. The complexity of flow paths of meltwater within the glacier owing to the development of lakes may have caused the differences in chemical features of the stream water.

**Key words** Glacier Soler; hydrograph; meltwater; Northern Patagonia Icefield; proglacial lake; specific electric conductivity; stream discharge

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