



## **Catchment similarity and classification in areas of high hydrologic gradients: the case of Chilean Patagonia**

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The Baker River Basin is located in Patagonia, Southern South America, with a total drainage area of 26,726 km<sup>2</sup> (second-largest river basin in Chile). The Baker River has the highest mean annual discharge rate of all Chilean rivers (1,133 m<sup>3</sup>/s), and flows out of Bertrand Lake, which in turn receives the draining waters from the General Carrera Lake (surface area of about 1800 km<sup>2</sup>, Latin America's second largest). Geology and climate gradients are even more extreme than in the rest of the country, from mountain to sea, and sometimes having mean annual rainfalls change from 8000 mm to 400 mm in less than 60 km. Bigger basins, like the Baker, have Eastern sub-basins with even a semi-arid character, whereas Western sub-catchments drain from ice fields. Thus, flow regimes may have very diverse characters in combination. And regarding sediment, although many rivers are born in lakes (many bi-national), they have important profile slopes and plenty of sediment available (partly due to glacial deposits). In spite of this huge natural variability, there is scant data due to low resources and remoteness: few meteorological and flow stations (having few decades or much shorter data series), and lack of stations in Western areas, linked to mountainous terrain, glaciers, and the ice fields. Nevertheless, decisions are being made with what seems extremely limited hydro-meteorological, streamflow, and in general, river data. In fact, Chile is currently in a crossroad due to mega projects being planned in Aysén, Chilean Patagonia (at least 5 hydropower dams producing more than 2000 MW). We characterize streamflows for ungauged basins, such as floods, mean annual flows, and flow duration curves, which can then be used related to a more sustainable design and operation of dams for hydropower. Relations extracted from gauged catchments to their geomorphologic characteristics and indices will be used to transfer those relations to ungauged catchments.