

## Lacustrine record of last millennia precipitation from Lake Esponja and Lake Bertrand of Northern Chilean Patagonia (72°W)

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The aim of this study is to reconstruct climatic variability and its impact on the environment in Northern Chilean Patagonia during the last millennium, using a multi-proxy analysis of sediment cores from Lake Esponja (45°09'S, 72°08'W) and Lake Bertrand (46°55'S 72°50'W). The lakes are located in the Aysen del General Carlos Ibanez del Campo region of north-western Patagonia. Core LEs14 (150 cm) was collected in Lake Esponja in 2014 at a depth of 40 m and core LBb11A (161 cm) was collected in a sub-basin of Bertrand Lake in 2011 at a depth of 21 m.

XRF core scanner geochemistry and SCOPIX X-radiography were conducted at 1 mm sampling resolution. The lake sediments are mainly composed of clayey silts with some organic-rich layers. The XRF core scanner geochemistry indicates dominant detrital supplies (> 80%) into the Lake Bertrand. The organic matter mainly comes from the watershed. Correlations between sedimentological and geochemical parameters as well as instrumental data allowed the identification of precipitation proxies. A multivariate analysis was used to reconstruct the precipitation for the last 2200 years through the sedimentary sequences of the lake. Both the Little Ice Age and the Medieval Warming events are identified within these reconstructions.

The obtained reconstruction was compared with each other and with paleoclimatic information obtained from lake sediments and other climate archives. The application of similar methodology to other Patagonian lake sequences would bring a more global vision of the evolution of the climate in Patagonia over the last millennia.

### **Keywords**

Holocene, Patagonia, Precipitation, Lake sediment, XRF core scanner geochemistry, Little Ice Age, Medieval warm period