



## **A multiproxy reconstruction of the Late Holocene in Lake Laja (Central Chile): Evidence of Little Ice Age-like event in a Southern Hemisphere record**

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A 4m sediment core of Lake Laja (36°54'S, 71°05'W) –encompassing the last 2000 years-, was extracted from a Chilean lake using a Uwitec drilling platform. The sediment was subsampled for loss on ignition (LOI), nutrients, biogenic silica and for biological proxies; diatoms, chironomids and pollen. The sedimentary profile is interrupted by several coarse volcanic derived layers. LOI, nutrients and biogenic silica show an increasing trend upwards, which could be reflect a recent shift to higher trophic status of the lake. Diatoms assemblages also record a higher nutrient content by the increase of *Aulacoseira granulata*, *A. distans* and *Asterionella formosa*. At the same time a marked change of benthic and facultative planktonic taxa could be associate to a cooling. The age of this change is in agreement with the European Little Ice Age (LIA). Chironomid assemblages show in turn four important zones in the profile, distinguished by changes mainly in the abundance of Tanytarsini, *Parachironomus* and *Macropelopia*. Like diatoms chironomid also seems to reflect a change toward higher trophic conditions in the upper part of the core, due to the increase in taxa like *Tribelos/Phaenopsectra*, *Cricotopus/Orthocladius* and *Ablabesmyia*. But the most striking feature in chironomid assemblage is the abundance of Podonominae, *Parapsectrocladius* and *Limnophyes/Comptosmittia*, which could be associated to a cold-dry period between 1500-1900 AD in Lake Laja (European LIA time span).

On the other hand, pollen evidenced fluctuations in the humidity, revealed by changes in *Nothofagus dombeyi* type, Poaceae and *Ephedra*; besides a strong human impact during the last 100 years was registered, inferred by the appearance of *Plantago* and the increase of Poaceae and Asteraceae subf. Cichorioideae. However the increase of Poaceae and *Ephedra* during the temporal window of the European LIA, would be reflecting dry conditions, reinforcing the inference made by chironomids of a dry-cold period during the LIA in Lake Laja. Research funding by Project Fondecyt 1070508 and the CGRI Wallonie-Chile cooperation project.