



## **The last millenia sedimentary record of Lake Esponja, Northern Chilean Patagonia**

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We evaluate the climate and environmental variability of Northern Chilean Patagonia during the Last Millennium, using a multi-proxy analysis of a sediment core from Lago Esponja (45°09'S, 72°08'W). The lake is located in the region of Aysen del General Carlos Ibanez del Campo, in NW Patagonia. The study focuses on a multiproxy analysis of sedimentary records. The longest core (150 cm long) was collected in 2014 at 40 m depth. The sediment, which is composed of light brown organic-rich clayey silt, was analyzed for sedimentology (grain size, magnetic susceptibility organic matter and biogenic silica content), mineralogy (X-ray diffraction) and geochemistry (elemental and isotopic analyses of C and N, XRF core-scanner at 1 mm resolution). The radiocarbon ages, measured on 3 macro-remains, demonstrate that the core covers the last 6.700 years. The sedimentation rate ranges between 0.1 mm/yr in the lower section (100-150 cm) and 0.4 mm/yr in the upper meter. Visual descriptions and Scopix radiographies show that the sediment record is finely laminated except a massive decimetric coarser and darker layer corresponding to a tephra (estimated age 700AD±50). Magnetic susceptibility (confirmed by scopix radiographies) highlights the presence of 8 additional millimetric tephra layers. The biogenic silica content of the sediment is low (mean 5%). Diatom assemblage is dominated by benthic and acidophilous species, with high saprobic values. None marked changes were observed regarding the dynamic of the lake. The high organic matter content (mean 15%) and its high C/N ratio (12.7) throughout the core indicate inputs of allochthonous and terrestrial organic matter. Such parameters present high sediment variability also marked by changes in the chemical composition. The laminations reflect changes in the allochthonous sedimentary inputs, with high terrestrial inputs during wetter conditions in relation with the Westerlies. The sedimentary records of Lago Esponja will be compared with Eastern lacustrine record from the same latitude in order to confirm the climate-driven record.