



## **Holocene environmental changes in lake sediments from Northern Chilean Patagonia (45-48°S)**

L. Nuttin (1), N. Fagel (1), S. Bertrand (2), A. Araneda (3,4), F. Torrejon (3,4), R. Urrutia (3,4)

(1) AGEs - Clays, sedimentary environments and geochemistry, Department of Geology, University of Liege, Allée du 6 août, B-4000, Liège, Belgium, (2) EU Marie Curie Postdoctoral Fellow, AWI, Bremerhaven, Germany, (3) Aquatic Systems Research Unit, EULA – Chile Environmental Sciences Centre, University of Concepción, Casilla 160-C, Concepción, Chile, (4) Patagonian Ecosystems Research Center (CIEP)

The Southern Hemisphere has a crucial, but still not well constrained, role in global climatic fluctuations. In order to improve our understanding of the past climate changes in southern South America, we investigated the sedimentary record of three small lakes located between 45 and 48°S in Northern Chilean Patagonia. Our aim is to evaluate the occurrence of decennial-centennial scale climate events during the Late Holocene. In each lake, the coring site was chosen after a bathymetric survey using an echo-sounder. The short cores were retrieved using an Uwitec gravity corer. The length of the cores ranges from 60 to 140 cm. We conducted a multiproxy study combining sedimentological and geochemical analyses (LOI 105, 550 and 950°C, magnetic susceptibility, C/N ratio, bulk X-ray diffraction, and inorganic geochemistry by ICP-AES and ITRAX core scanning). According to preliminary age-depth models, the two southern lakes are characterised by very low sedimentation rates, averaging 0.06 and 0.2 mm/yr in Lago Larga (47°S) and Sitting Bull (46°S), respectively. On the opposite, the sedimentation rate in Lago Thompson (45°S) is much higher (1 mm/yr), allowing paleoreconstructions at decennial resolution. Macroscopic descriptions and smear slide observations reveal the occurrence of a few volcanic layers. In particular one 4 cm-thick layer is observed at the base of the core retrieved in Lago Larga. This layer probably corresponds to a major eruption of the Hudson volcano ~8 kyr ago. The recent sediments of Lago Sitting Bull are characterised by a significant increase in C/N ratio, most likely related to the construction of a nearby major road in the eighties. Identification of biological assemblages (diatoms, chironomids, pollen) will be compared with sedimentological features to reconstruct paleoenvironmental and/or paleoclimatic changes over the last millenia. This research is funded by Fondecyt project # 1070508 and a CGRI Wallonie-Chile cooperation project.