



Environmental changes in two lakes of Northern Patagonia (Chile): A 1000 yr reconstruction based on pollen and charcoal

Vargas Nicole (1), Torres Laura (1), Araneda Alberto (1), Cruces Fabiola (1), Torrejón Fernando (1), Alvarez Denisse (1), Bizama G (1), Fagel Nathalie (2), and Urrutia Roberto (1)

(1) Aquatic Systems Research Unit, EULA – Chile Environmental Sciences Centre, University of Concepción, Casilla 160-C, Concepción, Chile, (2) AGEs - Clays, Sedimentary Environments and Geochemistry, Department of Geology, University of Liege, Allée du 6 août, B-4000, Liège, Belgium

We aim to reconstruct the environmental changes experimented in Patagonian ecosystems during the last 1000 years. We analyze sediment cores from two lakes (Thompson and Burgos), located in Aysen Region, Southern Chile. The samples were obtained using a gravity corer and sampled at intervals of 1 cm to 30 cm depth and every 5 cm until the end of the core. Thompson lake sediment core was sampled every 5 cm. Age model is based on radiocarbon datings on bulk sediments and macroremains.

In Burgos lake we evidence two main climatic changes. A wet period between 876-1444 AD is marked by the presence of Pteridophytes. A colder and dryer period is then evidenced by an increase of *Berberis* sp between 1444 and 1656 AD. From 1834 AD to Present the sediment record is mainly affected by human activities. High concentrations of carbon particles and a sharp change in pollen assemblage (increase of Poaceae, decrease of *Nothofagus dombeyi*-Type) are indicators of two large fire events.

The lacustrine sediment of Thompson is characterized by a wetter period, between 874 – 1168 AD, with abundance of Pteridophytes. Then from 1168 AD to Present the environmental conditions of the watershed were characterized by lower ferns and fire events. Two major fires were evidenced between 1850 AD and Present. Like in Burgos they are marked by major changes in plant associations (sharp increase in Poaceae, drastic loss of *Nothofagus dombeyi*-Type).

Wet periods identified in both lakes at the base of the sediment record could correspond to manifestations of a warm climate anomaly like the Medieval Warm Period. The dry and cold period, especially obvious in the Burgos record, could be associated to a cold climate anomaly. Finally the great changes in vegetation that occurred from the year ~ 1830 in the basin of the two lakes were directly related to human activities (forest cutting) developed during the nineteenth and twentieth centuries.

This research is funded by both Chilean and Belgian projects (Fondecyt project N° 1070508; WBI Wallonie-Chile cooperation project, FNRS and ULg fundings).