



Register of the last 1000 years of environmental, climatic and anthropogenic change in Isla Grande de Chiloé, inferred through a multi-proxy approach: Lake Pastahué, Chile-South Center (42°S)

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Knowledge of the past environmental and climatic conditions of the lake ecosystems of the Isla Grande de Chiloé and its relationship with the anthropic effect, on a high temporal resolution scale, is scarcely known. Specifically, multi-proxy studies provide a better understanding of the context in which changes occurred in the past. This insular region is particularly interesting because environmental conditions (pre and post-Hispanic) and knowledge about the impacts generated in the ecosystems during the Spanish colonization process have so far been little studied, compared to the rest of Chile continental. This research is a new contribution to the scarce information existing for the last millennium of the Isla Grande de Chiloé. The objective of this work was to reconstruct the environmental and climatic history of the last 1000 years, from the Lake Pastahué, in the Isla Grande de Chiloé through a multi-proxy analysis and compare them with other records for the region. The core sediment was sub-sampled to perform sedimentological analysis (organic matter, carbonates, magnetic susceptibility and granulometry) and biological indicators (pollen, chironomids). The age model was constructed from the activity of ^{210}Pb , ^{137}Cs and ^{14}C . The pollen results reveal a composition of nordpatagónico forest represented by *Nothofagus*, *Weinmannia*, *Drimys*, *Tepualia*, *Myrtaceae*, *Poaceae* and *Pteridophyta*, while the anthropic effect for the last cm of the profile is represented by *Rumex* and *Pinus*. The results show a significant increase in magnetic susceptibility since the middle of the 20th century, suggesting an increase in allochthonous material to the lake. The sedimentological parameters and the chironomid assembly show similar variations along the profile, which also shows changes in the trophic state of the lake. The changes recorded in lake Pastahué are directly related to past climatic phenomena occurring in the last millennium, such as the medieval climatic anomaly (MCA) and the Little Ice Age (LIA) manifested in increases and decreases in temperatures, these antecedents are in agreement with others records for the region. The variations observed for the last cm of the profile could be a result of the decrease of the forests due to the intensification of the agricultural and cattle activities generated by the chilotes from century XX to the present time. The data provided by this research are still insufficient to establish an extralocal climatic influence of MCA and LIA events in Chiloé; although certain trends are observed.

Research Funded by the projects: CONICYT- Scholarship PhD National 2014, FONDECYT N°1120807 and CRHIAM / CONICYT / FONDAP / 15130015.