



Holocene vegetation and climate changes reconstructed from lake sediments of the Laguna Azul (Santa Cruz Province, Southern Patagonia, Argentina)

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In the framework of the German Climate Research Program (DEKLIM) the project „South Argentinean Lake Sediment Archives and Modelling” (SALSA) investigates sediments from the crater lake Laguna Azul. A high-resolution multi-proxy record from this site, located in the Pali Aike Volcanic Field (PAVF, 52° S), provides valuable information for reconstructing palaeoclimatic and palaeoenvironmental changes in south-eastern Patagonia during the Holocene. The multi-proxy approach includes methods like palaeobiology (pollen), sedimentology, geochemistry, geophysics and stable isotopes. Multiple dating (AMS ^{14}C , tephrochronology) results in a preliminary age model.

The last glaciation (Llanguihue) did not reach the PAVF. Therefore, lake sediments of the PAVF serve as a continuous, continental climate archives for the southern hemisphere, a key region for the understanding of the global climate system. The small Laguna Azul is a typical crater lake with a mean lake diameter of 560 m and a maximum water depth of 56 m. Due to its high crater walls it is wind protected and serves as a special pollen trap. The record discussed in this study is based on a 7.2 m long core from the centre of Laguna Azul. Two tephra layers in the sediment were ascribed to eruptions of the Mt. Burney and Aguilera volcanoes. Together with the other proxies we can reconstruct lake level changes for the Holocene, suggesting varying dryer

and more humid conditions in the past.

The climate of south-eastern Patagonia is determined by the southern westerlies and the rain shadow effect of the Andes. Both factors lead to a strong precipitation gradient from 1000 mm of annual precipitation in the west of the Andes to less than 200 mm in the east around the Laguna Azul. This precipitation gradient is reflected by characteristic vegetation zones. The PAVF is covered with steppe vegetation mainly made up by *Poaceae* and *Asteraceae*. Their pollen grains predominate in the pollen profile of Laguna Azul. *Nothofagus* pollen grains, transported by the strong westerly winds from the foot of the Andes, are frequent in the pollen profile. The pollen record shows varying amounts of *Nothofagus* and grasses. A clear human impact is restricted to the last two centuries when British sheep farmers arrived in the region of southern Patagonia. Evidence is given by the pollen record with *Rumex* as a neophytic European weed.