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Laguna Potrok Aike, Argentina: the first non-tropical environmental record in South America extending far beyond the Late-Glacial – a progress report

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Within the framework of the ICDP-funded "Potrok Aike maar lake sediment archive drilling project" (PASADO) an international team of scientists carried out interdisciplinary research at the unique mid-Pleistocene (770 ka) maar lake of Laguna Potrok Aike in southern Patagonia (Province of Santa Cruz, Argentina). This lake is very sensitive to variations in southern hemispheric wind and pressure systems and thus holds a unique and continuous lacustrine record of climatic and ecological variability of global significance. Moreover, Southern Patagonia with its many active volcanoes is an ideal location to better understand the regional history of volcanism. These are two challenging geo-scientific themes that need to be tackled, especially as both of them have an increasing socio-economic relevance.

Three months of drilling activities that finished last November 2008 were carried out by DOSECC from the drilling platform R/V "Kerry Kelts". More than 500 m of lacustrine sediments were recovered. This sedimentary archive will provide (1) new insights into the processes of regional back arc volcanism within the Pali Aike Volcanic Field itself as well as the more distant explosive volcanism of the Andean mountain chains; and, (2) high-resolution (decadal) quantitative climate and environmental reconstructions supported by multiple dating and stratigraphic correlations. Marine – ice core – terrestrial linkages will be emphasized as well as the incorporation of results from global climate modelling simulations for the last ca. 100 ka.

The two drilled sites in the central deep basin of Laguna Potrok Aike have been selected based on four seismic surveys carried out between 2003 and 2005. Sediments were recovered at both drilled sites down to a subbottom depth of slightly more than 100 m using the GLAD800 drill rig with the hydraulic piston corer tool (HPC) at water depths varying between 95 and 100 m. The total core recovery is 94%. On-site core logging with the multi sensor core logger (MSCL) documents an excellent correlation between the four recovered holes drilled at Site 1 as well as with the three holes obtained from Site 2 which is located ca. 700 m south of Site 1. Additionally, a variety of sedimentological, physical and geochemical analyses were carried out on the core catcher samples in the field laboratory. Preliminary interpretation of all data that is available before core opening indicates that the record may go back in time as far as to the ending of oxygen isotope stage 5.

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