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Tracking climate events during the past 16 ka in southern South America – the high-resolution multi-proxy record of Laguna Potrok Aike (52˚S)

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The maar lake Laguna Potrok Aike is located in the semi-arid Patagonian steppe (52˚S), an area with hitherto only scarce paleoenvironmental information. Within the project SALSA (South Argentinean Lake Sediment Archives and modeling) Laguna Potrok Aike turned out to be the key site for recording climate events in that area. With a continuous, high-resolution multi-proxy approach applied to the radiocarbon, OSL and tephra dated sediments it is possible to distinguish between lake level high and low stands. Those do not only give information about climate events like the Little Ice Age or the Medieval Climate Anomaly but also reflect rapid hydrological variations in southern Patagonia during the past 16,000 cal. BP as well as during Oxygen Isotope Stage 3. In this context the total inorganic carbon content was identified as a sensitive lake level indicator which is supported by various other proxies for lake level changes, like minerogenic input or redox-conditions inferred from elemental analyses obtained by XRF-scanning. The latter also showed to be well suited for reconstruct-

ing paleoenvironmental conditions. The multi-proxy approach is completed by further geochemical and geophysical measurements, stable isotope as well as pollen- and diatom analyses.

Above mentioned proxies suggest a high lake level for Laguna Potrok Aike during Oxygen Isotope Stage 3. At least similar, probably even higher lake levels are assumed for the period between 16,000 and 13,100 cal. BP. From 13,100 until 11,400 cal. BP the lake level lowered. Contemporaneously, data imply that this period was a major warm phase in southeastern Patagonia approximately simultaneous to the Younger Dryas chronozone in the northern hemisphere (12,700-11,500 cal. BP). A transgression starting at 11,400 cal. BP lasted until 8,650 cal. BP when the lake level started to drop to the lowest position of the record. After a transgression, beginning shortly before 6,750 cal. BP, the lake level was variable with humid intervals. The last wet period ascribed to the Little Ice Age, was the most extended humid period since early Holocene high lake levels at Laguna Potrok Aike before 8,650 cal. BP.