



Climate and Vegetation History of the Subtropical Crater Lake “Tswaing”, South Africa

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Deeper time palaeoclimate reconstructions are still rare on the continental southern hemisphere. Here we present new biogeochemical data from a core retrieved in crater lake “Tswaing” (formerly “Pretoria saltpan”). This study attempts to get a more detailed view into climate variability of the subtropical region of South Africa on the glacial/interglacial time scale.

Today the basin contains a shallow (< 3 m water depth), hypersaline (pH ~ 10) lake with a diameter of about 300 m in a small, about 1 km wide crater. Hence, the lake catchment is small with no water in- or outflow indicating that the lake is a sensitive recorder for variations in rainfall and probably wind stress.

Our 90 m composite core profile consists of partly fine-laminated lake sediments intercalated with mudflow deposits with grain sizes ranging from sand to gravel. Previous investigations and our new data reveal a considerable variability of bulk geochemical proxies such as total inorganic carbon (TIC) and total organic carbon (TOC) as well as the carbon isotopic composition of the bulk organic matter. Interpretation of these proxies is complemented by more detailed investigations in thin sections, major element patterns derived from μ XRF scanning, maceral analysis, lipid biomarker studies and the carbon and hydrogen isotopic composition of selected biomarkers of the organic material in the sediments. These data argue for substantial changes in the depositional environment of the lake system during the last 200 kyr. First results allow to distinguish intervals with completely different ecosystems and hydrology during lake history. Intervals with dinoflagellates and algae as main primary producers alternate with phases dominated by bacteria and ciliates feeding on them. Future detailed

analyses will provide new insights into the development of these climate sensitive lacustrine habitats as well as the surrounding vegetation in the catchment area over at least two glacial cycles.