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Reconstruction of Holocene southern African continental climate using biomarkers from salt pan sediments

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The climate system of southern Africa is strongly influenced by large scale atmospheric and marine circulation processes and, therefore, very sensitive to global climate change. Recent publications provided evidence for strong spatial and temporal climate variability in southern Africa over the Holocene. It is of major importance to understand the mechanisms driving the southern African climate system in order to estimate regional implications of current global change. However, proxy datasets from continental geoarchives especially of the semi-arid western Kalahari region are still scarce. A main problem is the absence of conventional continental climatic archives, due to the lack of lacustrine systems. In this study we are exploring the utility of sediments from western Kalahari salt pans, i.e. local depressions which are flooded temporarily during rainfall events. Besides the analyses of basic geochemical bulk parameters including TOC, $\delta^{13}C_{org}$, TIC, $\delta^{13}C_{carb}$, $\delta^{18}O_{carb}$, TN, $\delta^{15}N$, the paleo-climatic approach focuses on reconstruction of local vegetation assemblages to identify changes in the ecosystem. This is pursued using plant biomarkers, particularly leaf wax n-alkanes and n-alcohols and their stable carbon and hydrogen isotopic signatures. Preliminary results show prominent shifts in n-alkane distribution and $\delta^{13}C$ values of the C_{33} homologue during late Pleistocene and early Holocene. These shifts correlate to changes of the TOC content. Our data indicate changes in carbon sources which possibly reflect major environmental changes.