



## **A 550 ka record of aeolian activity near North West Cape, Australia: inferences from grain-size distributions and bulk chemistry of SE Indian Ocean deep-sea sediments**

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The terrigenous fraction of sediments from a deep-sea sediment core recovered from the northwestern Western Australian continental slope offshore North West Cape, SE Indian Ocean, reveals a history of Western Australian climate throughout the last 550 ka. End-member modelling of a data set of grain-size distributions ( $n=438$ ) of the terrigenous sediment fraction allows to interpret the record in terms of aeolian and fluvial sediment deposition, both related to palaeo-environmental conditions in the North West Cape area. The data set can be best described by two aeolian end members and one fluvial one. Changes in the ratio of the two aeolian end members over the fluvial one are interpreted as aridity variations in northwestern Western Australia. These grain-size data are compared with bulk geochemical data obtained by XRF scans of the core. Log-ratios of the elements Zr/Fe and Ti/Ca, which indicate a terrigenous origin, corroborate the grain-size data. We postulate that the mid- to late Quaternary near North West Cape climate was relatively arid during the glacial and relatively humid during the interglacial stages, owing to meridional shifts in the atmospheric circulation system. Opposite to published palaeo-environmental records from the same latitude ( $20^{\circ}\text{S}$ ) offshore Chile and offshore Namibia, the Australian aridity record does not show the typical southern hemisphere climate variability of humid glacials and dry interglacials, which we interpret to be the result of the relatively large land mass of the Australian continent, which emphasises a strong monsoonal climatic system.