



Late Holocene climate variability in the Sahel: inferences from a marine dust record offshore Senegal

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Societies and ecosystems in northern Africa are strongly affected by the availability of water. As a consequence, long-term absence of rainfall has very dear effects on the ecosystems, as was dramatically shown in the 70'ies and 80'ies of the 20 century.

Recent high-resolution reconstructions of Sahel palaeoclimate allow for new insights into these drastic climate variations and to disentangle the effects of the different components of the climate system on African climate change.

In this study we extend the instrumental record of climate variability using a marine sediment core that was retrieved off the coast of Senegal, northwest Africa. The 530-cm long record covers the last 4,000 years continuously.

A Pb age model allows for a matching of the proxy record with instrumental data. Specifically, variations in the grain-size distributions of the terrigenous sediment fraction, deconvolved with an end-member modelling algorithm (Weltje, 1997) are used to reconstruct rainfall variability on land. In addition, chemical data are used to study the effect of human-induced dust production throughout the late Holocene. We show that dust deposition is closely related to monsoonal precipitation in West Africa until the 17th century AD, followed by a sharp increase in dust deposition at the beginning of the 18th century. We hypothesise that this increase in dust mobilisation is related to the advent of commercial agriculture in the Sahel region.