



Aridity changes in the Sahel and their relation to Atlantic-Ocean circulation

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Life in the semiarid Sahel belt of tropical North Africa strongly depends on the availability of water and has, at least since the Pliocene, been frequently affected by shifts to more arid climate. A recent example of abrupt droughts occurred in the early 70's and 80's of the last century.

Here we present grain-size distribution data, analysed with an end-member modelling algorithm (Weltje 1997) as well as bulk chemical data of a sediment core collected from the continental slope offshore Senegal, covering the last 57 kyr. These data suggest that during this time interval there were several periods where a relatively humid climate changed abruptly to dry conditions.

These dry conditions, which lasted up to several millennia, occurred synchronously with cold sea surface temperatures (SSTs) in the North Atlantic and reductions in the meridional overturning circulation in the Atlantic Ocean, suggesting that Atlantic Ocean circulation could be closely related to climate conditions in the Sahel. Climate modeling suggests that this drying is induced by a southward shift of the West African monsoon trough in conjunction with an intensification and southward expansion of the midtropospheric African Easterly Jet.