



Simulated changes in the relationship between tropical ocean temperatures and Northwest African summer rainfall during the mid-Holocene

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Results from several coupled ocean-atmosphere simulations have been used to investigate the changes in variability of summer monsoon precipitation over Northwestern Africa (20W-10E, 0-20N, NW Africa) related to global tropical Sea Surface Temperature (SST, 180W-180E, 20S-20N). We first apply the Canonical Correlation Analysis (CCA) method to evaluate the ability of climate model to reproduce climate variability at present time, then investigate the change in the relationships at mid-Holocene. Most of the models reproduce the modern observed rainfall-SST correlations, including the negative correlation between Western Sahelian rainfall and SST anomalies in the Eastern Tropical Pacific (ETP), and the positive correlation between SST anomalies in the East Tropical Atlantic (ETA) and rainfall over the Guinean coastal region. These relationships are present in the mid-Holocene simulations. However, the strength of the teleconnection between NW African precipitation and ETP SST is weaker in the mid-Holocene. Our study also suggests coherency between NW African precipitation and tropical SST slightly shifts to the longer term frequency band. At last, we discuss the possible reasons to the changes in precipitation-SST relationship.