



West African Monsoon precipitation response to Tropical Pacific Sea Surface Temperature anomalies in the late XX Century.

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Sea surface temperature (SST) anomalies in the tropical Pacific have been linked to the interannual variability of West African Monsoon (WAM) precipitation, in such a way that a warming is associated with decreased rainfall mainly in the Sahel region. Several teleconnection mechanisms have been proposed for the establishment of such a link. These mechanisms include changes in the Walker circulation, generation of equatorial waves, and enhanced vertical stability in the tropical troposphere due to the temperature increase.

In the framework of the AMMA-EU project the main inter-annual modes of co-variability between WAM rainfall and SST in the Pacific basin were obtained by performing multi-dimensional statistics based on Extended Maximum Covariance Analyses. A warming in the tropical Pacific during the latter part of the 20th century was found to be significantly and positively correlated with reduced precipitation mainly in the Gulf of Guinea (GoG) region. The present contribution investigates this association and its generation mechanisms. The approach is based on using the Atmosphere General Circulation Models (AGCMs) participating in the AMMA-EU project to assess the impact of an idealized SST anomaly pattern in the Indo-Pacific region on WAM rainfall. The SST anomaly pattern resembles El Niño in the tropics

In the AGCM simulations, the SST anomaly results in reduced precipitation over the Sahel region. It is found that this impact is established through the combination of a stationary Kelvin wave response to diabatic warming in the the Equatorial Pacific and an indirect Rossby wave response to the diabatic cooling due to weakening of the South Asian Monsoon. These results also suggest that the change in the Pacific SST-WAM link previously reported could be related to the Atlantic-Pacific relationship since the climate shift of the 1970's.