Geophysical Research Abstracts
Vol. 20, EGU2018-17255, 2018
EGU General Assembly 2018

Oceanic Forcing on Interannual Variability of Sahel Heavy and Moderate Daily Rainfall Events

Moussa Diakhate (1), Belen Rodríguez-Fonseca (2), Inigo Gómara (2,3), Elsa Mohino (2), Abdou Lahat Dieng (1), and Amadou Thierno Gaye (1)

(1) Laboratoire de Physique de l'Atmosphère et de l'Océan – Siméon Fongang, Ecole Supérieure Polytechnique, Université Cheikh Anta Diop, BP 5085, 10700 Dakar, Senegal (moussa1.diakhate@ucad.edu.sn), (2) Departamento de Geofísica y Meteorología, Universidad Complutense de Madrid, Madrid 28040, Spain., (3) Centro de Estudios e Investigación para la Gestión de Riesgos Agrarios y Medioambientales (CEIGRAM), Universidad Politécnica de Madrid, Madrid, Spain.

Sahelian rainfall variability is strongly influenced by atmospheric teleconnections triggered by anomalous sea surface temperatures (SST) from remote areas (e.g., Atlantic, Pacific and Mediterranean). The influence of teleconnections on seasonal precipitation rainfall over West Africa has been extensively analyzed in the literature. However, their impact on Sahelian daily rainfall event variability, stratified by intensity, has received little attention so far. In this article moderate (below 75th percentile) and extreme (above 95th percentile) precipitation events variability is analyzed for the boreal summer months (June to September) during the period 1981-2016, based on CHIRPS, ARC2, HadISST and ERA-Interim databases. Evidence is given that the interannual variability of Sahel moderate and extreme events is markedly different. On the one hand, the occurrence of moderate rainfall events appears to be enhanced by positive SST anomalies over the Tropical North Atlantic and Mediterranean, which act to increase low-level moisture advection towards the Sahel from the adjacent oceanic waters. The opposite holds for negative SSTs anomalies. On the other hand, extreme rainfall events seem to be linked to El Niño-Southern Oscillation (ENSO) variability. Under La Niña conditions, vertical atmospheric instability is increased over the Sahel and low-level moisture supply from the Equatorial Atlantic is enhanced over the area. The reverse is found for El Niño episodes. Attending to the total rainfall index, our results indicate that interannual variability of Sahel rainfall is mainly dominated by the extreme events. These findings may potentially contribute to improve seasonal predictions of weak/moderate and extreme precipitation events over the Sahel.