


Congo Basin Rainfall Variability with ENSO, Global SST, and CESM2

Abstract

An analysis of the variability of rainfall over the Congo Basin is examined with the El Niño Southern Oscillation (ENSO), spatiotemporal correlations of sea surface temperatures (SST) through observations, and the Community Earth System Model version 2 (CESM2) Large Ensemble. Our understanding of rainfall variability over the Congo is limited and there is little knowledge about how rainfall variability is influenced by external forcings, such as ENSO or other global SST. This is partly attributed to the decline of ground-based observations over the past decades. The objective of this work is to investigate this rainfall variability, and determine if there is a robust connection to these external forcings. We discover that Congo rainfall correlates with neither phase of ENSO, but is observable in other well-documented regions of Africa. Neither do we discover a robust connection between Congo rainfall and global SSTs, however, do find it in Eastern Africa. SST and rainfall correlations are evaluated for a robust signal between CESM2 and observations during the rainy season of September, October, and November. We discover that the two CESM2 simulations, coupled and atmosphere-only, have a higher magnitude of correlation relative to the observations, and the observations tend to disagree with one another. With the disagreement between the observations, it is challenging to identify a robust signal associated with Congo rainfall variability.

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