



Local and long range contributions to Congo Basin precipitation seasonality and variability

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The Congo Basin is an extremely interesting and dynamic hydrological region. Regionally it most resembles the Amazon but in comparison it is greatly understudied. Local evaporation plays an important role in the bulk of Congo Basin precipitation, but the variability and seasonality of the precipitation cannot be attributed mainly to local sources. We examine the relative importance of the neighbouring ocean basins to precipitation variability in the Congo Basin, using a new water tracer capability in the Community Earth System Model (CESM1.2), in which water is tagged as it is evaporated in geographically defined regions. In this approach, regional vapor tracers are tracked through phase changes until the vapor is precipitated. We employ a small ensemble using CESM1.2 in an AMIP configuration, and results are compared with the ECMWF Interim reanalysis and the Climate Research Unit rainfall data set. We find that variability in Indian Ocean sea surface temperatures (SSTs) is significant, with the Indian Ocean dipole providing a important contribution to variability in Congo Basin precipitation. We also examine the difference between the two rainy seasons and find that they are a function of the moisture source contribution and the vertical structure of moisture flux convergence. This structure is further examined in the context of local seasonal circulation features such as the African Easterly Jet.