

# CGD Seminar Series

## Seasonal Climatology, Variability, and Temporal Characteristics of Caribbean Rainfall

**Carlos Martinez**

*Columbia University*

**Date:** Tuesday 26 January 2021

**Time:** 11am – 12pm

*For Zoom information, please contact*

*Tracy Baker [tbaker@ucar.edu](mailto:tbaker@ucar.edu)*

*For live stream information, visit the  
CGD Seminar Webpage*

### ABSTRACT

The Caribbean is a topographically complex region that heavily relies on its rainfall cycle for its economic and societal needs. This makes the Caribbean especially susceptible to hydro-meteorological disasters (e.g., droughts and floods). Previous studies have investigated the seasonal cycle and variability of rainfall in the Caribbean with monthly or longer resolutions that often mask the seasonal transitions and regional differences of rainfall. In addition, temporal characteristics (e.g., onset, demise), which are useful for farmers, have yet to be investigated. To address this, the study conducts principal component, moisture budget, and composite analyses to better understand the Caribbean rainfall cycle and its variability using 38 rain gauges and ERA-Interim Reanalysis over the region. The seasonal climatology of Caribbean rainfall hinges on two main facilitators of moisture convergence: The Intertropical Convergence Zone and the North Atlantic Subtropical High, and two regional modifiers of moisture convergence: the Atlantic Warm Pool, and the Caribbean Low-Level Jet. The spatial and temporal evolution of these dynamical mechanisms vary across the five regions of the Caribbean. The early and late rainfall seasons of the Caribbean are impacted in distinctly different ways by two different, and largely independent large-scale phenomena: The North Atlantic Oscillation, and the El Niño-Southern Oscillation, respectively. Onsets and demises that are calculated based on yearly rainfall seasonal means effectively characterize the seasonal evolution of mean onsets and demises in the Caribbean. Onsets and demises that are calculated based on the climatological seasonal mean resemble the variability of seasonal rainfall totals in the Caribbean. The study has important implications for prediction of rainfall and modeling capabilities.

For more information, contact Tracy Baker | [tbaker@ucar.edu](mailto:tbaker@ucar.edu) | x1366