

ABSTRACT

Exploring Future Projections of Caribbean Rainfall and Temperature Extremes
from a Regional Climate Model

Natalie Melissa McLean

End-of-century changes in Caribbean climate extremes are derived from the Providing Regional Climate for Impact Studies (PRECIS) Regional Climate Model (RCM) under the A2 and B2 emission scenarios across five rainfall zones. Trends in rainfall, maximum temperature and minimum temperature extremes from the RCM are validated against meteorological stations over 1979-1989. The model displays greater skill at representing trends in consecutive wet days (CWD) and extreme rainfall (R95P) than consecutive dry days (CDD), wet days (R10) and maximum 5-day precipitation (RX5). Trends in warm nights, cool days and warm days were generally well reproduced. Projections for 2071-2099 relative to 1961-1989 are obtained from the ECHAM4 driven RCM. Northern and eastern zones are projected to experience more intense rainfall under A2 and B2. There is less consensus across scenarios with respect to changes in the dry and wet spell lengths. However, there is indication that a drying trend may manifest over zone 5 (Trinidad and Northern Guyana). Changes in the extreme temperature indices generally suggest a warmer Caribbean towards the end of century across both scenarios with strongest changes over zone 4 (Eastern Caribbean).

Keywords: Natalie Melissa McLean; Caribbean Climate Extremes; Regional Climate Model