



Potential Impacts of Climate Change on Extreme Rainfall Events over Three Coastal Cities in Africa

Babatunde J. Abiodun (1), Jimmy Adegoke (2), Abayomi Abatan (3,4)

(1) University of Cape Town, Environmental and Geographical Science, Cape Town, South Africa (babiodun@csag.uct.ac.za), (2) University of Missouri Kansa City, Missouri, USA, (3) Department of Geological and Atmospheric Sciences, Iowa State University, Ames, Iowa USA, (4) Department of Meteorology, Federal University of Technology, Akure, Nigeria

Abstract

This study examines the potential impacts of climate change on the characteristics extreme events over three coastal cities in Africa (Lagos, Cape Town and Cairo), with a focus on widespread extreme events (WERE) over the cities. An ensemble of regional climate model (RCA4) simulations, forced with CMIP5 (<http://cmip-pcmdi.llnl.gov/cmip5>) models under two climate scenarios (RCP 4.5 and RCP 8.5), were analyzed for the study. All the simulations were obtained from CORDEX (www.cordex.org). In this study, we used 95th percentile of daily rainfall as the threshold of extreme events and the simultaneous occurrence of extreme events over 50 % of the city area as widespread extreme events (WERE). The RCA ensemble gives a realistic simulation of seasonal and intra-seasonal variability of extreme rainfall events over the cities. The model ensemble projects an increase in the intensity and frequency of grid-point extreme rainfall events, but a decrease in the frequency of the WEREs over the cities in the future (2031 – 2065). The magnitudes of the changes are higher for RCP 8.5 than for RCP 4.5. The associated changes in the atmospheric circulations will be discussed at the conference. The result of this study has application in minimizing the vulnerabilities of these coastal cities to climate change impacts.