

Sub-Seasonal to Interannual Variability and Predictability of Rainfall over East Africa

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The overarching objective of this project is to build capacity of the Atmospheric Science and Meteorology Program at North Carolina A&T State University (NCAT), a historically black college and university, through experiential training and mentoring of graduate and undergraduate students. The project aims to train NCAT students with advanced computation techniques and equip them with cutting-edge research with a new collaboration with Pacific Northwest National Laboratory's (PNNL) Water Cycle and Climate Extremes Science Focus Area (WACCEM SFA). The partnership with WACCEM SFA will fill a critical gap that involves high-end computational regional climate modeling. In addition, the partnership will provide an opportunity for a sustainable undergraduate and graduate education and research program in climate and environmental sciences, consistent with DOE's strategic plan through the Office of Science's BER program.

The project will focus on two distinct but integrated areas of research: (1) intraseasonal to interannual variability of precipitation and its interaction with different types of moist convective processes, and (2) frequency and variability of extended wet and dry events within the rainy period and how they relate to intraseasonal modes of variability. The project expects to advance knowledge and understanding of the subseasonal to interannual variability of precipitation processes, including the impact of intraseasonal modes on different types of deep convection, and diurnal rainfall cycle over East Africa.

The project will accomplish its objectives through experiential learning and training of students and conducting deep observational and theoretical analysis, integrated with regional modeling. The project will address one of the most important concerns of the nation: increasing participation of underrepresented minorities that have very little involvement in atmospheric sciences research and, thereby, increasing a well-trained diverse workforce. This research and educational program will be impactful because it will fill a critical gap in climate science education and research through a lasting partnership with PNNL's WACCEM SFA in areas of shared interest. It will provide undergraduate and beginning graduate students with a practical introduction to regional climate modeling at subseasonal to seasonal timescales, familiarizing them with high-performance computing methods and tools.