



Exploring regional projections of tropical cyclone activity through the application of high-resolution climate modeling

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This is an overview of ongoing work to evaluate how well tropical cyclone (TC) characteristics are captured in various versions of the Community Atmosphere Model version 5 (CAM5) in present and future climate. The main focus of this work is to better understand climate controls on TC intensity, location and frequency. For this work CAM5, a comprehensive atmospheric general circulation model, is configured with a global horizontal grid spacing of approximately 28 km and is forced with prescribed sea-surface temperatures (SSTs) and greenhouse gases. CAM5 is used with two different dynamical cores (i.e. the central fluid flow component of the model) to explore the impact of a warming climate on regional TC activity. In addition, this study includes a comparison of CAM5 simulations with and without airborne dust, by modifying the prognostic aerosol formulation to inhibit dust emissions globally. Such experiments examine the impacts of potential decreases in airborne dust in the future on regional TC activity. In general, we find a decrease in overall TC activity in a warming climate in regions across the globe, but increases in the most intense TCs. However, basin-scale projections of future TC activity are subject to large uncertainties due to uncertainties in future SST patterns and other climate controls (i.e. dust).