



Towards the Direct Simulation of Tropical Cyclones in the High-Resolution Community Atmosphere Model

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As General Circulation Models (GCMs) become capable of running operationally at higher horizontal resolutions than ever before, the simulation of tropical cyclones using such models has become a rapidly growing field. The use GCMs for tropical cyclone studies still remains difficult due to the relatively small size of the storms, the intense convection and a host of large-scale–small-scale interactions. In this study we investigate the tropical cyclone climatology and individual storm characteristics of decadal climate simulations using the NCAR supported Community Atmosphere Model CAM 5.1. In particular, the hydrostatic finite-volume (FV) version of CAM 5.1 is used at the horizontal equatorial grid spacing of approximately 25 km. The decadal climate simulations are configured in a manner similar to the Atmospheric Model Intercomparison Project (AMIP) with prescribed SSTs and greenhouse gases. Select individual storms are chosen for the analysis of the cyclone structure and other individual characteristics. The climatology investigation sheds light on the tropical cyclone intensity distribution, regional distribution and tracks. All results are compared to past decadal observations of tropical cyclones.