

How Well Can We Detect Tropical Cyclone Tracks in the Reanalyses Data

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The majority of current approaches for using dynamical model to project the impact of climate change on the tropical cyclone (TC) activities involved the detection and tracking of TC-like vortices simulated in the model. Although typically the detection and tracking schemes used the common structure and environmental conditions associated with TCs as their objective criteria, there are thresholds and specifications needed to be adjusted to the model characteristics to make the statistics of TC climatology in the model comparable to the observational TC archives. The question remained on how reliable are these schemes. Can one just simply tune the various thresholds used in the schemes to obtain better model TC statistics? What are the influences from individual criteria and thresholds? Can the same scheme applied to different model simulations. If the tunable thresholds are resolution dependent, what are the proper spatial scaling factors to use? Fundamentally the answer relies on testing the schemes to a reliable high resolution meteorological analyses that can resolve TC activities. Unfortunately the scale of TC and limited observational data prevent the availability of such data. We will propose a methodology to test the reliability of TC detection and tracking algorithm using reanalysis data. How sensitive the hit and false alarm rates against best track archive to the thresholds and criteria will be discussed.