

Evaluation of different versions of NCUM global model for simulation of track and intensity of tropical cyclones over Bay of Bengal

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Abstract: The global UK Met office Unified Model (UM) is currently operational at National Centre for Medium Range Weather Forecasting (NCMRWF), the global model named as NCUM. An inter-comparison of two different versions of NCUM has been carried out for simulating the track and intensity of Tropical Cyclones (TCs), which formed over the Bay of Bengal (BoB). For this purpose, two series of numerical experiments named as NCUM25 (New Dynamical core with NCUM N512 resolution) and NCUM17 (ENDGame core with NCUMN768 resolution and upgraded physics and data assimilation scheme) are carried out with seven different initial conditions (ICs) for two TCs. The results suggested that the location, intensity, and vertical structure of the TCs are reasonably well predicted by the NCUM17 over the NCUM25. The Direct Position Error (DPE) and landfall error of TCs are reduced in the NCUM17 in comparison to the NCUM25 for all initial conditions. The mean DPEs and intensity error are reduced by 21641% and 18621% in NCUM17 over NCUM25 in both the cases respectively. Improvements in mean landfall position errors are shown to range from 43 to 65% in the NCUM17 as compared to the NCUM25. The mean statistical skill scores for rainfall are considerably improved in NCUM17.

Keywords: NCUM global model, Tropical cyclones, Dynamical core, Statistical skill scores.