## Abstract

The performance of the ARW model in real-time prediction of tropical cyclones (TCs) over the North Indian Ocean (NIO) at 27 km resolution is evaluated based on 100 forecasts for 17 TCs during 2007–2011. The analyses are carried out with respect to (i) basins of formation, (ii) straight moving and recurving TCs, (iii) TC intensity at model initialization, and (iv) season of occurrence. The impact of high resolution (18 and 9 km) on TC prediction is also studied.

Model results at 27 km resolution indicate that the mean track forecast errors (skill with reference to persistence track) over the NIO was found to vary from 113 to 375 km (7 to 51%) for 12-72 hour forecast. The model showed a right/eastward and slow bias in TC movement. The model is more skillful in track prediction when initialized at the severe cyclone or greater intensity stage than cyclone or less intensity stage. The model is more efficient in predicting landfall location than landfall time. The higher resolution (18 and 9 km) predictions yield an improvement in mean track error for the NIO basin by about 4–10% and 8–24% respectively. The 9 km predictions were found to be more accurate for recurving TC track predictions by ~13–28% and 5–15% compared to the 27 and 18 km runs respectively. The 9 km runs improve the intensity prediction by 15–40% over the 18 km predictions. This study highlights the operational ARW model capabilities over the Indian monsoon region and the continued need for high resolution models operational forecasts.



**Key words: North Indian Ocean, Landfalling tropical cyclones, ARW model, Track forecast errors**