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Large Tropical Cyclone Track Forecast Errors of Global Numerical Weather Prediction Models in Western North Pacific Basin

Abstract

Tropical cyclone (TC) track forecast errors (TFEs) have substantially decreased in recent decades. There are still many cases with large TFEs. Using nine models' data from The International Grand Global Ensemble (TIGGE) and twelve cases which have the large TFE from Working Group on Numerical Experimentation (WGNE) to study the possible reasons and compare the performance of different numerical weather prediction (NWP) models.

There are four categories of situations found to be associated with large TFEs. Including the interaction of the outer structure of the TC with tropical weather systems, the intensity of the TC, the extension of the subtropical high (SH) and the interaction with the westerly trough. This study shows that most models over-predicted the strength of the southwesterly wind when TC interact with the monsoon trough and/or the southwesterly flow. The TC interacts with nearby tropical synoptic systems (e.g. the monsoon trough) which most models cannot well represent. The southwestward extension of the SH also led to TFE. The different intensity of the TC of different models prediction would be the reason of TFE.

Keywords

Tropical cyclone track forecast error (TFEs)

Reference

Tang C. K., Johnny C.L. Chan, Munehiko Yamaguchi, 2021 : Large Tropical Cyclone Track Forecast Errors of Global Numerical Weather Prediction Models in Western North Pacific Basin. *Tropical Cyclone Research and Review*, 2225-6032, <https://doi.org/10.1016/j.tcrr.2021.07.001>.