Abstract

Accurate prediction of track and intensity of land-falling tropical cyclones is of the great importance in weather prediction in making an effective tropical cyclone warning. This study examines the impact of initial condition on real time prediction of Bay of Bengal cyclone Viyaru. For this purpose, the customized version of Advanced Research core of Weather Research and Forecasting (ARW-WRF) model with two-way interactive double nested model at 27 km and 9 km resolutions is used to predict the storm. The model initial conditions are derived from the FNL analysis and Global Forecasting System (GFS) analysis and the lateral boundary condition is provided every 3 hourly from GFS forecast. The model predicted track and intensity of the storm are compared with the India Meteorological Department (IMD) best-fit track. Results indicate that the track of the storm is reasonably well predicted by the model with both FNL and GFS initial condition. The track of the storm is better predicted by the model with FNL initial condition. It is found that in reference to the track predicted errors with GFS initial condition, the use of FNL initial analysis as condition resulted in 41%, 8%, 5% and 19% improvement respectively in 24h, 48h, 72h, and 96h forecast. This is due to less initial positional error in FNL analysis. The landfall time and location of the storm is also better predicted by the model with FNL initial condition. The trend of intensification and dissipation of the storm is also better predicted with FNL as the initial condition. The intensity of the storm in term of central sea level
pressure (CSLP) and maximum surface wind (MSW) is over-predicted by the model with both initial conditions. The 24 hours accumulated precipitation around the landfall time is also better predicted by the model with FNL initial condition.

References


Impact of Initial Condition on Prediction of Bay of Bengal Cyclone ‘Viyaru’ – A Case Study


Index Terms

Computer Science Information Sciences

Keywords

Viyaru Bay of Bengal pressure wind precipitation.