

Application of Vortex-Tracking WRF in Forecasting Tropical Cyclones; Case of Tropical Cyclone Sagar 16-20th May 2018

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Tropical cyclones in the western Indian Ocean basin usually occur over the October – May season. Historical data shows that cyclones rarely make landfall over the Greater Horn of Africa region. However, tropical cyclone Sagar that formed in the Arabian Sea made landfall in north-western Somalia on the 19th May 2018, causing massive flooding in the climatologically dry region resulting to several fatalities, displacement of thousands of people and unprecedented destruction of property. In Djibouti, sections of the Ambouli International Airport runway were affected, disrupting both inbound and outbound flights. On this background, the IGAD Climate and Prediction Centre (ICPAC), which provides climate services for the Greater Horn of Africa region has initiated efforts in tropical cyclone forecasting using the vortex-tracking Weather Research and Forecasting (WRF). This research shows a case study of forecasting tropical cyclone Sagar, 16 – 20th May 2018. A nested domain experiment at 10 and 30 km resolutions, for the child and parent domains respectively, is set-up and initialized on 14th May 2018 06 UTC using NCEP's Global Forecasting System (GFS) initial and boundary conditions. The experiment runs for six days forecast period and updated daily at 06 UTC up to the 23rd May 2018 with the vortex tracking level set at 850 hPa. The results are assessed against the Global Hazards Map tropical cyclone forecasts, which use ECMWF and UK Met Office models. In addition, the skill of the track is evaluated against the best-track data obtained from Unisys Hurricane Data portal. The results from this study will enable ICPAC to enhance its capacity in forecasting extreme weather and providing timely early-warnings in the event of future cyclone developments.

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