

Issued on 15.08.2024

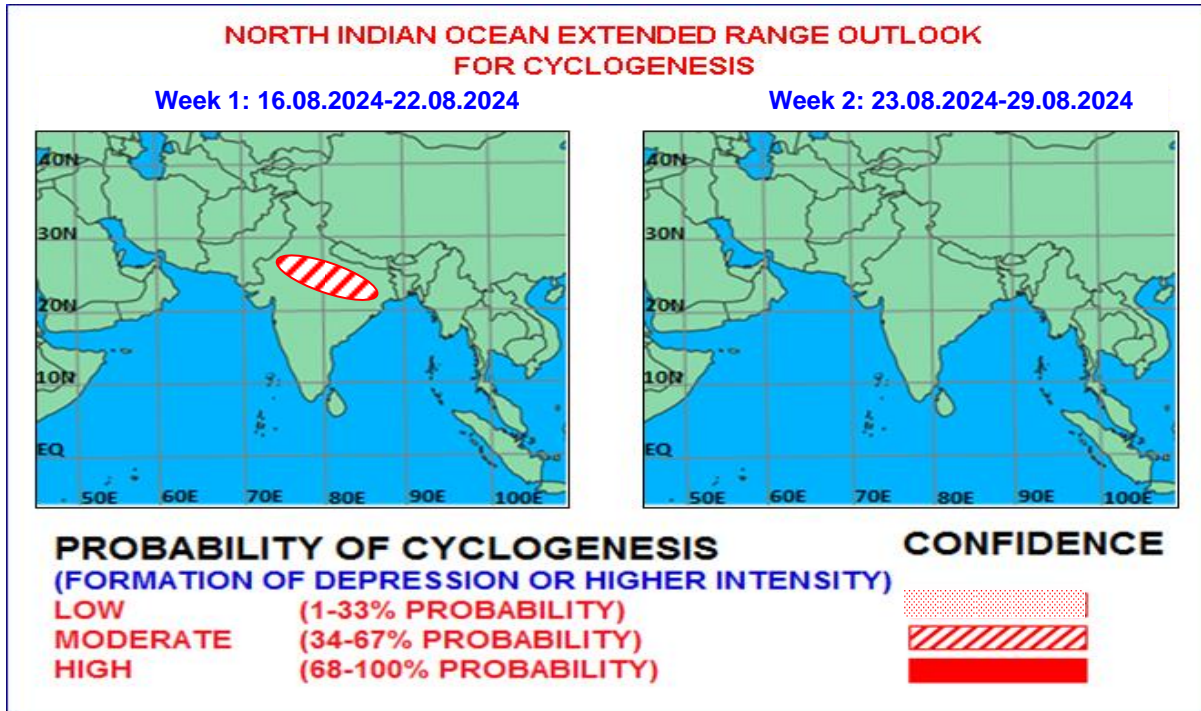


Fig. 1: Graphical Cyclogenesis over north Indian Ocean during next two weeks

I. Environmental features:

The Madden Julian Oscillation (MJO) index currently lies in phase 2 with amplitude greater than 1. The forecasts by various models indicate a consensus about the coherent eastward progress with amplitude more than 1 during next 10 days across phase 2 to 4 reaching upto phase 5 at the end of the second week. Moreover, the members of the ensemble prediction system portray limited spread with synchronous propagation in the forecast duration. Therefore, the MJO index is likely to enhance the convective activity over the Arabian Sea (AS) during the first week and over the Bay of Bengal (BoB) during both the weeks.

The NCICS forecasts indicate significant presence of convectively coupled Equatorial Rossby Waves (ERW) propagating westwards over BoB during both the weeks whereas it is likely over north AS and adjoining western India during first half of the week 1 only. The eastward moving Kelvin Waves (KW) are likely over northern parts of India during week 2. The weak zonal westerly winds (1-3 mps) over south and central BoB and AS along with weak easterly winds (1-3 mps) over northern parts of BoB and northern plains of India are likely to establish during second half of the first week. The similar condition is likely to remain over the region during 1st half of the second week. Therefore, the forecast of zonal winds and equatorial waves are likely to support convective activities associated with the cyclonic disturbances over northern parts of India during the first week and over north BoB during second week.

II. Model Guidance:

Most of the numerical weather prediction models (IMD GFS, NCEP GFS, GEFS, ECMWF and NCUM) indicate that under the influence of the cyclonic circulation over south Bangladesh & adjoining Gangetic West Bengal (GWB), a low pressure area is likely to form

over GWB and neighborhood during next 24 hours. According to the forecasts of the deterministic and probabilistic models, there is a moderate probability for the system to intensify further to become a depression during subsequent 2 days. However, the system is likely to move nearly westwards during next 3-4 days to reach up to east Rajasthan and neighborhood. Overall, all the models suggest the movement of cyclonic disturbances along monsoon trough zone and an active monsoon rainfall activity over monsoon core zone including central India and Indo-Gangetic Plains during next 7 days. The GFS group of models also suggests enhanced convective activity over southeast AS and west coast of India during some days of week 1.

The weekly mean wind field of IMD Extended Range Forecast (ERF) system indicates a cyclonic circulation over southeast AS off Kerala coast and a less prominent monsoon trough at its normal position during the first week. The mean wind flow pattern is likely to change during second week with strong southwesterly over AS with a cyclonic circulation over central India embedded within the monsoon trough. The forecast wind anomaly field at 850 hPa level indicates a cyclonic circulation over southeast AS during the forecast period moving north-northwestwards from first to second week. In the anomaly wind field, the anticyclone over eastcentral BoB during first week is likely to become less marked and a cyclonic circulation is likely over central India during the second week. The model also suggests moderate to high probability of cyclogenesis (50-80%) over Northern plains of India from Jharkhand across Uttar Pradesh and adjoining Madhya Pradesh to northwest India during first and low to moderate probability (20-50%) over the same area during the second week. The larger values of cyclogenesis probability are furnished over northwest India during week 1.

However, the ECMWF ensemble forecasts indicate 20-30% probability of cyclogenesis over a zone across central India along monsoon trough during the first week.

Legends: MJO: Madden Julian Oscillation, ERW: Equatorial Rossby Waves, KW: Kelvin Waves, NCICS: North Carolina Institute for Climate Studies (for Equatorial waves Forecast), IMD GFS: India Meteorological Department Global Forecast System, NCUM: National Centre for Medium Range Weather Forecasting Centre (NCMRWF) Unified Model, ECMWF: European Centre for Medium Range Weather Forecasting, ECMF: ECMWF-Ensemble System, ECMM: ECMWF-Ensemble System Bias Corrected, GPP: Genesis Potential Parameter, NCEP GFS: National Centre for Environment Prediction GFS, GEFS: GFS ensemble forecast system, NEPS: NCUM ensemble prediction system, CNCUM: Coupled NCUM, CPC: Climate Prediction Centre, NWS: National Weather Service, INCOIS: Indian National Centre for Ocean Information Services.

III. Inference:

Considering various environmental conditions and model guidance, it is inferred that there is no probability of cyclogenesis over the North Indian Ocean (NIO) region including the Bay of Bengal (BoB) and the Arabian Sea (AS) during the entire forecast period.

However, under the influence of an existing cyclonic circulation over south Bangladesh & adjoining Gangetic West Bengal, A low pressure area is to form over Gangetic West Bengal during next 24 hours. The system has a moderate probability to intensify further to become a depression and is likely to move nearly westwards during subsequent 2-3 days. There could be another cyclonic circulation or low pressure area over the north Bay of Bengal during second week (around 23rd August) in association with favourable environmental conditions as discussed above.

IV. Verification of forecast issued during last two weeks:

The forecast issued on 1st August for second week (09.08.2024-15.08.2024) indicated low probability of formation of a fresh cyclonic circulation/ low pressure area over coastal areas of Gangetic West Bengal and North Odisha around 8th August. The forecast issued on 8th August for first week (09.08.2024-15.08.2024) indicated existing cyclonic circulation over Jharkhand and neighborhood to move west-northwestwards during next 2-3 days.

Actually, a cyclonic circulation formed over Gangetic West Bengal & adjoining Jharkhand on 7th Aug. It moved west-northwestwards across Jharkhand & southeast Uttar Pradesh and became less marked over southeast Uttar Pradesh on 11th August.

The observed satellite-gauge merged analysis of 24 hours accumulated rainfall from 8th to 14th August, 2024 is shown in **Fig. 2**.

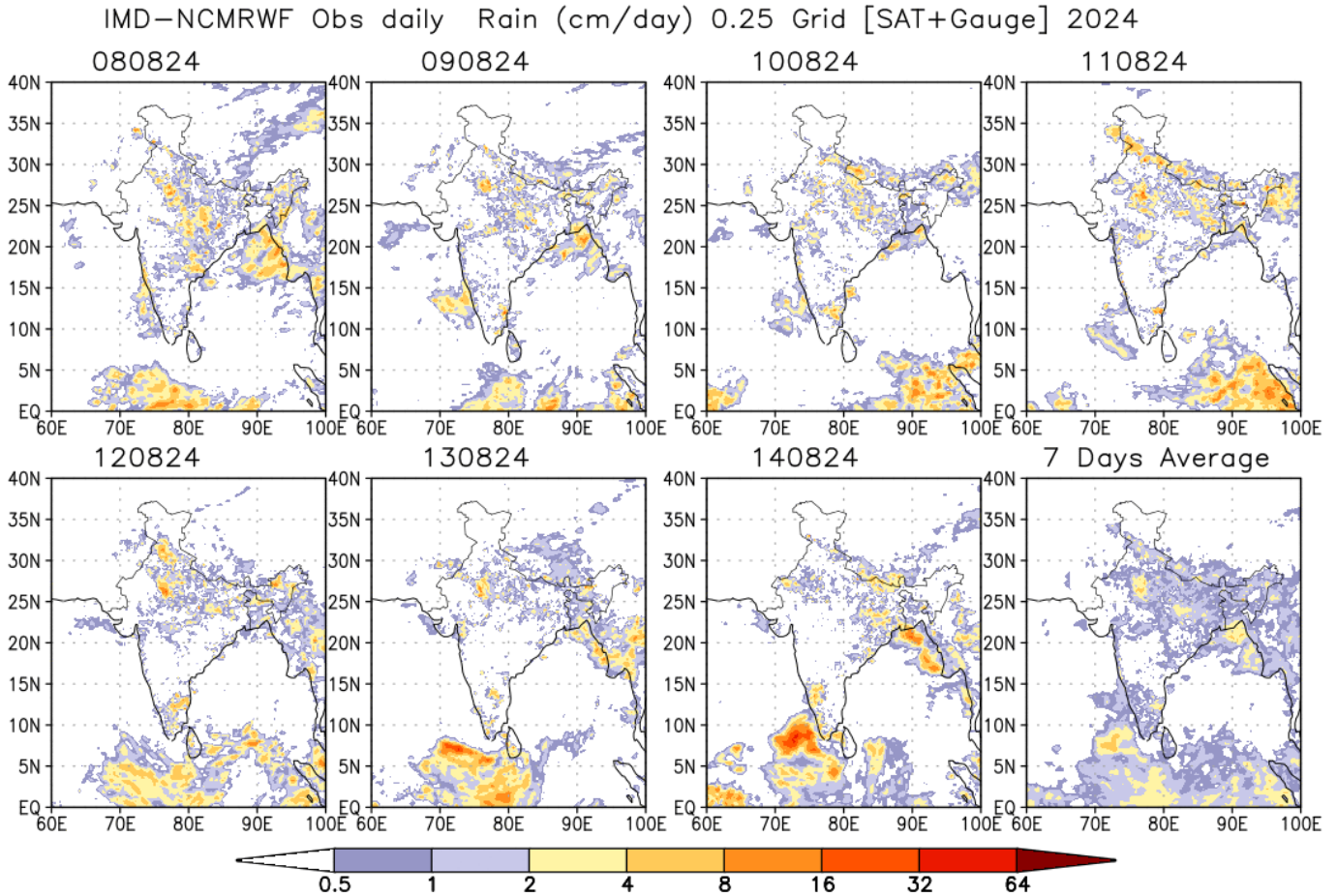


Fig. 2: NCMRWF-IMD satellite gauge merged data plots of realized 24 hours accumulated rainfall from 08th to 14th August, 2024.

Next update: 22.08.2024