India Meteorological Department
Ministry of Earth Sciences
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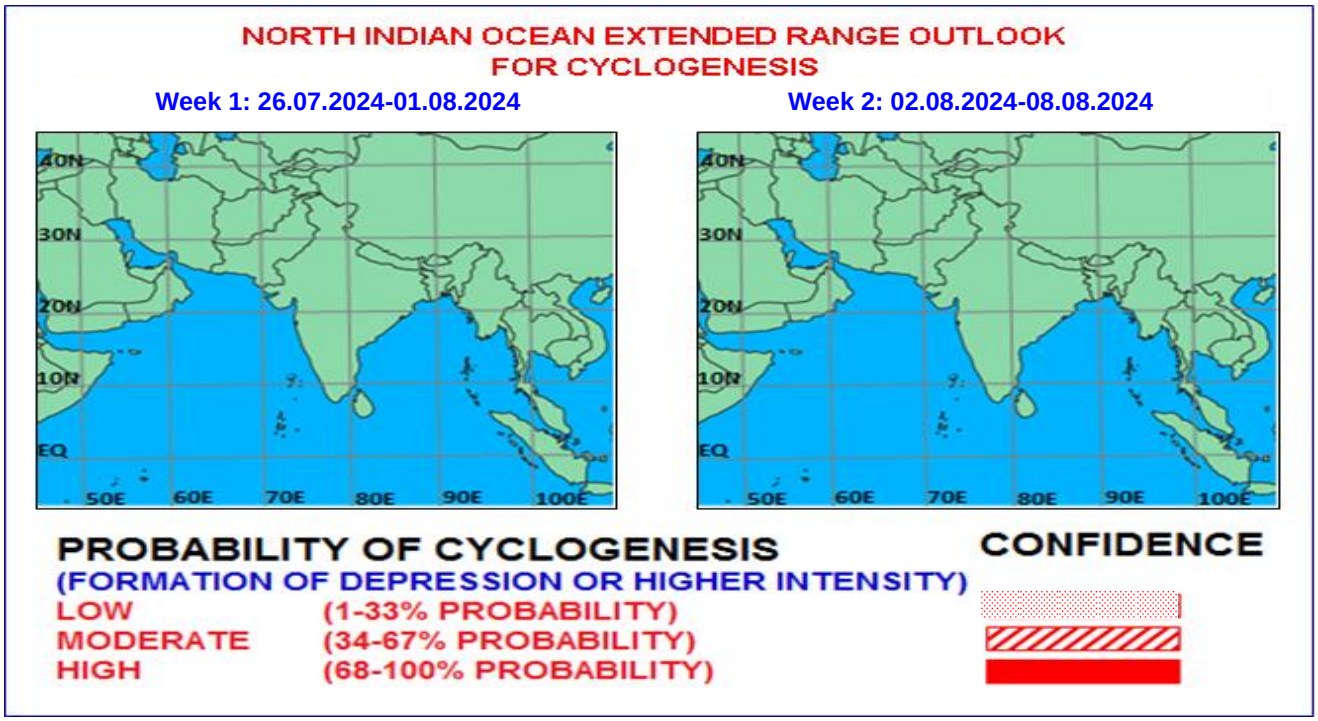

Fig. 1: Graphical Cyclogenesis over north Indian Ocean during next two weeks

I. Environmental features:

The Madden Julian Oscillation (MJO) index currently entered into phase 6 with amplitude less than 1. The ensemble members both GEFS and ECMWF are showing large spread in the MJO forecast for the next two weeks. Both the forecasts as well as CFS forecast indicate that the MJO index is likely to progress eastward during the week and enter into phase 7 at the end of first week. The eastward propagation of MJO index during second week is not very coherent in GEFS and ECMWF forecasts compared to CFS but it is likely reach phase 8 maintaining amplitude less than 1 during first half of second week and there is probability to enter into phase 1 during later part of the week. Thus, MJO phase and amplitude are less favorable for the convective activity over the North Indian Ocean (NIO) region during first week but it would gradually support the enhancement of convective activities over NIO during second week.

The NCICS based forecasts for zonal winds indicate strong easterly winds (~ 5 to 7 mps) over north Bay of Bengal (BoB) and adjoining central India and strong westerly winds (~ 7 to 9 mps) over the southeast & adjoining eastcentral Arabian Sea (AS), peninsular India and south & central parts of BoB during first week. The easterly winds are likely to weaken and remain only over a narrow belt in northern India as westerly winds would cover entire AS and BoB during week 2. The Equatorial Rossby Wave (ERW) is likely to prevail over the region with strong westerly winds during first week. The presence of ERW is not likely over NIO region during second week except over a small area of southwest AS near Somalia coast. Therefore, zonal winds and equatorial waves are likely to contribute towards the enhancement of convective activity over southeast & adjoining eastcentral AS and BoB during first week.

II. Model Guidance:

Most of the numerical models (IMD GFS, NCEP GFS, GEFS, ECMWF and NCUM) do not show any formation of low pressure area or cyclogenesis over NIO region next 10 days forecasts. All models suggest an active monsoon wind flow pattern with a monsoon trough remaining at its normal or south of its normal position during next 3-4 days. The cyclonic circulation over Gangetic West Bengal & adjoining Bangladesh is likely to move west-northwestwards during the same period. Thereafter, the western end of the monsoon trough is likely to shift northward towards the foothills of Himalayas. Simultaneously, there is likely formation of a cyclonic circulation over land area near head Bay during the end of the first week around 1st August, 2024. Subsequently, it is likely to move west-northwestwards and there is a low probability for the formation of a low pressure area over the same region.

IMD extended range forecast system indicates strong monsoonal flow at 850 hPa level with cyclonic circulation over north Odisha and neighborhood during week 1. The forecast wind anomaly field also indicates a cyclonic circulation over the same region. The wind anomaly field forecast of the model shows a cyclonic circulation over south Rajasthan in week 2 as the monsoon flow is weak in the mean wind field. The model also indicates 30-50% probability of cyclogenesis over land areas of Northern plains of India from coastal Odisha extending upto west Uttar Pradesh during the second week. However, the ECMWF extended range forecast does not indicate any probability of cyclogenesis over NIO during the entire forecast period.

Legends: 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, European Centre for Medium Range Weather Forecasting (ECMWF), GPP: Genesis Potential Parameter, National Centre for Environment Prediction (NCEP) GFS, ECMM: ECMWF Multi-Model, GEFS: GFS ensemble, 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 during the entire forecast period.

However, the existing cyclonic circulation in the lower tropospheric levels over Gangetic West Bengal & adjoining Bangladesh is likely move west-northwestwards during next 3 days.

Another fresh cyclonic circulation is likely to form over the head Bay area and neighbourhood at the end of first week around 1st August, 2024. It is likely to move west-northwestwards during the first half of week 2.

IV. Verification of forecast issued during last two weeks:

Forecast: The forecast issued on 11th July for the second week (19.07.2024-25.07.2024) indicated a high probability of the formation of a low-pressure area over northwest & adjoining westcentral Bay of Bengal with northwestwards movement during the beginning of week 2. The forecast issued on 18th July for first week (19.07.2024-25.07.2024) predicted a high probability of the existing low-pressure area becoming well marked low-pressure area over northwest & adjoining westcentral BoB by 19th July with northwestwards movement during first half of week 1. There was prediction with moderate probability for its intensification into a depression over northwest & adjoining westcentral BoB during first half of week 1.

Realised: A low pressure area formed over the northwest and adjoining westcentral Bay of Bengal off South Odisha coast in the morning (0830 hours IST) of 15th July, 2024. It lay as a well marked low pressure area over central and adjoining north Bay of Bengal in the evening (1730 hours IST) of 18th July, 2024. It moved northwestwards and concentrated into a depression over northwest and adjoining westcentral Bay of Bengal off Odisha and adjoining north Andhra Pradesh coasts in the morning (0830 hours IST) of the 19th July, 2024. It moved west-northwestwards and lay over Odisha coast near Chilika Lake in the early morning (0530 hours IST) of the 20th July, 2024. Continuing to move further northwestwards it weakened into a well-marked low pressure area over coastal Odisha in the same evening (1730 hours IST) of 20th July, 2024.
Verification: Hence, the likely formation of a low pressure area and its intensification into a Depression over northwest BoB was captured well two weeks in advance.

NCMRWF-IMD satellite gauge merged data plots of realized 24 hours accumulated rainfall from 18th to 24th July, 2024 are presented in **Fig. 2**.

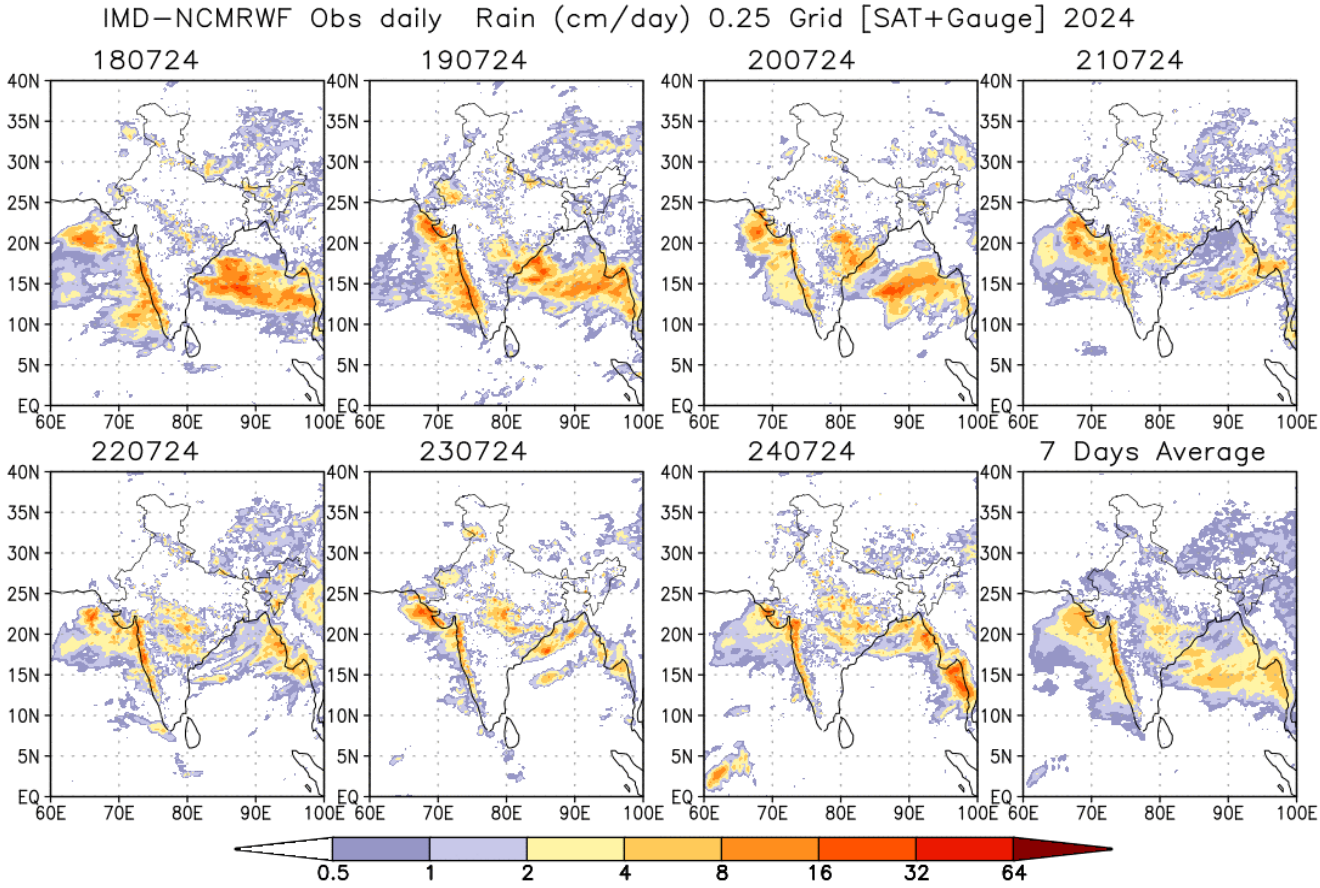

Fig. 2: NCMRWF-IMD satellite gauge merged data plots of realized 24 hours accumulated rainfall from 18th to 24th July, 2024.

Next update: 01.08.2024