India Meteorological Department
Ministry of Earth Sciences
Mausam Bhawan, Lodhi Road, New Delhi-110003

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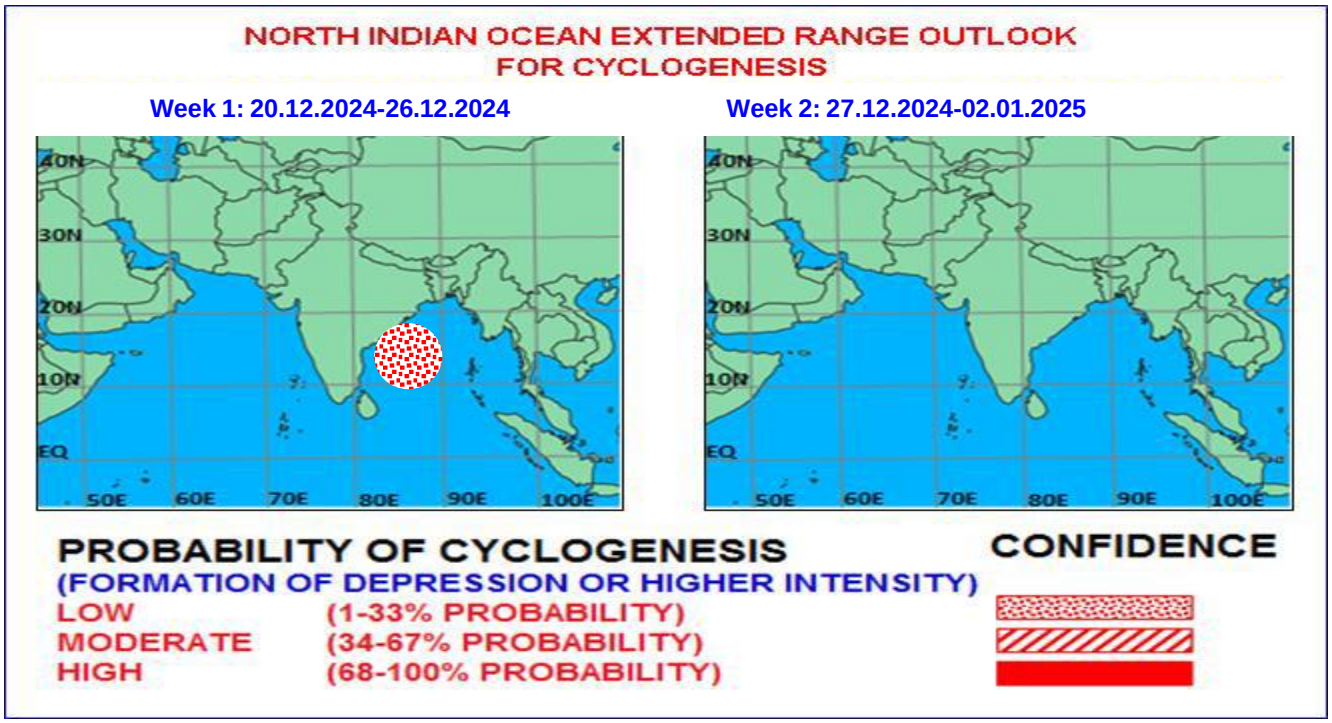

Fig. 1: Graphical Cyclogenesis over the north Indian Ocean during next two weeks

I. Environmental features:

The continuous monitoring of the Madden Julian Oscillations (MJO) indicates that it is currently in phase 6 with an amplitude of around 1. The forecasts of various dynamical models suggest that the MJO is likely to advance incoherently eastwards within phase 6 during the first week and enter into phase 7 at the end of the week. The ECMM-ECMWF guidance based on ensemble members indicates that it would continue to move further eastwards in phases 6 and 7 with wavelike variation in its amplitude and reach up to phase 8 by the end of week 2. The GEFS-CFS group of models does not indicate very coherent eastward movement within phase 7 as ensemble members have a large spread amongst them. However, in general it may be inferred that the MJO is likely to propagate eastwards within phase 6 and phase 7 during week 1 and week 2 respectively. Thereafter, it is not likely to support the convective activity significantly over North Indian Ocean during the entire forecast period.

The CFS-NCICS model-based forecast indicates westerly wind anomaly (3-5 mps) along with Equatorial Rossby Waves (ERW) is likely to prevail over southwest and westcentral Bay of Bengal (BoB) during first half of the week 1. During the same period easterly wind anomaly (1-3 mps) is likely over the Andaman Sea, southeast and east central BoB. The westerly wind anomaly along with ERW is likely to be predominant over the entire Arabian Sea (AS) with a maximum of 5-7 mps over southeast and central AS. During the latter part of week 1, the westerly wind anomaly (3-5 mps) is likely over entire BoB region. Thereafter, the westerly wind anomaly is likely to disappear gradually over the region starting from the eastern parts of BoB covering up to the entire BoB by the first half of week 2. Simultaneously, low-frequency waves are likely to appear over south BoB and AS. During the latter half of week 2, the easterly wind anomaly (1-3 mps) is likely to prevail over entire BoB and most parts of AS.

Considering all the above, the equatorial waves are likely to support convective activity over the southwest and central Bay of Bengal during the first half of week 1.

II. Model Guidance:

The GFS and GEFS group of model indicates a Low Pressure area (LPA) over southwest Bay of Bengal as of today 19th/00 UTC, it is likely to move Northwestwards till 20th as LPA over southwest and adjoining westcentral BoB and then recurve northeastwards as a well marked low pressure area till 22nd before it become less marked thereafter. The NCUM(G) model predicts a LPA over southwest BoB at 19th/00 UTC, it is likely to have northwards movement and lay over southwest & adjoining westcentral BoB close to North Tamil Nadu-South Andhra Pradesh coasts on 20th. Then it is likely to remain over the same region with an intensification into a marginal depression around 22nd December. It is likely to recurve southwards and become less marked thereafter. The ECMWF model indicates a LPA over southwest Bay of Bengal on 19th December. Moving northwestwards it is likely to reach close to the north Tamil Nadu & south Andhra coast as LPA on 20th/00 UTC. Then recurve northeastwards and likely to reach over westcental BoB as WML on 22nd/00 UTC with its peak intensity of depression and weaken gradually thereafter over the same region. The NCEP-GFS model analysis and forecasts suggest that a Low Pressure area (LPA) over southwest BoB on 19th/00 UTC is likely to move northwestwards over southwest & adjoining westcentral BoB close to North Tamil Nadu-South Andhra Pradesh coast on 20th. It is likely to move in the same direction to reach over westcentral BoB and intensify into a depression over the same region on 21st. It is likely to recurve northeastwards till 22nd December and become marked thereafter.

The GPP guidance products indicate that a zone of significant values of GPP (>25) is prevailing over Southwest BoB and neighbourhood on 19th December. The zone gradually moves northwards till 20th, then northeastwards and weakens gradually thereafter on 22nd December over westcentral BoB. The 850 hPa wind field of the IMD ERF Model indicates a trough of low over southwest and adjoining westcentral BoB during week 1. Similarly, another north-south trough and embedded cyclonic circulation is predicted over eastcentral AS during the first week. The forecast of wind anomaly indicates a cyclonic circulation over northeast AS. During week 2, the mean wind field suggests dominant northeasterly winds over the region with an anticyclone over Andhra Pradesh. Associated wind anomaly field exhibits northeasterlies over BoB and a cyclonic circulation over central AS. The model also indicates a moderate to high probability (70-80 %) of cyclogenesis over westcentral BoB off Andhra Pradesh coast during week 1. The ECMM model indicates a moderate to high probability (70-80%) of cyclogenesis over westcentral Bay of Bengal during week 1. The ECMWF ensemble model suggests a low-moderate probability (40-60 %) of cyclogenesis during the second 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/GEFS/CFS: National Centre for Environment Prediction GFS/GEFSv12/CFSv2, IMD-GEFS: GFS ensemble forecast system of IMD, 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 all the above environmental conditions and model guidance it is inferred that there is a low probability of cyclogenesis over westecentral Bay of Bengal during first half of week 1. The current well marked low pressure area over southwest adjoining westcentral Bay of Bengal is likely to move nearly northwestwards towards north Tamil Nadu and south Andhra Pradesh coast during next 12 hours. Thereafter, it is likely to move nearly northwards over westcentral Bay of Bengal along Andhra Pradesh coast during subsequent 24 hours and there is a low probability for further intensification into a depression over the same region around 22nd December.

However, there is no probability of cyclogenesis over both the basins of the North Indian Ocean during second week.

IV. Verification of forecast issued during last two weeks:

The forecast issued on 5th December for week 2 (13 Dec-19 Dec) indicated no probability of cyclogenesis. However there is a possibility of the formation of low pressure area over southeast Bay of Bengal during week 2.

The forecast issued on 12th December for week 1 (13 Dec-19 Dec) indicated There is no probability of cyclogenesis over both the basins of the North Indian Ocean during week 1. However, there is a likelihood for the formation of a low pressure area over southeast Bay of Bengal around 14th December. It is likely to move nearly west-northwestwards, become more marked and reach Tamil Nadu- North Sri Lanka coasts around 16th December.

Actually, a Low-Pressure Area formed over central parts of south Bay of Bengal at 0300 UTC of today the 16th December, 2024. It became well-marked low pressure area over southwest Bay of Bengal on 18th December, 2024. It lay over southwest adjoining westcentral Bay of Bengal on 19th December, 2024.

Thus, likely formation of low pressure area over southeast Bay of Bengal was correctly captured two week in advance.

NCMRWF-IMD satellite gauge merged data plots of realized 24 hours accumulated rainfall from, 12th December – 18th December, 2024 are presented in **Fig. 2**.

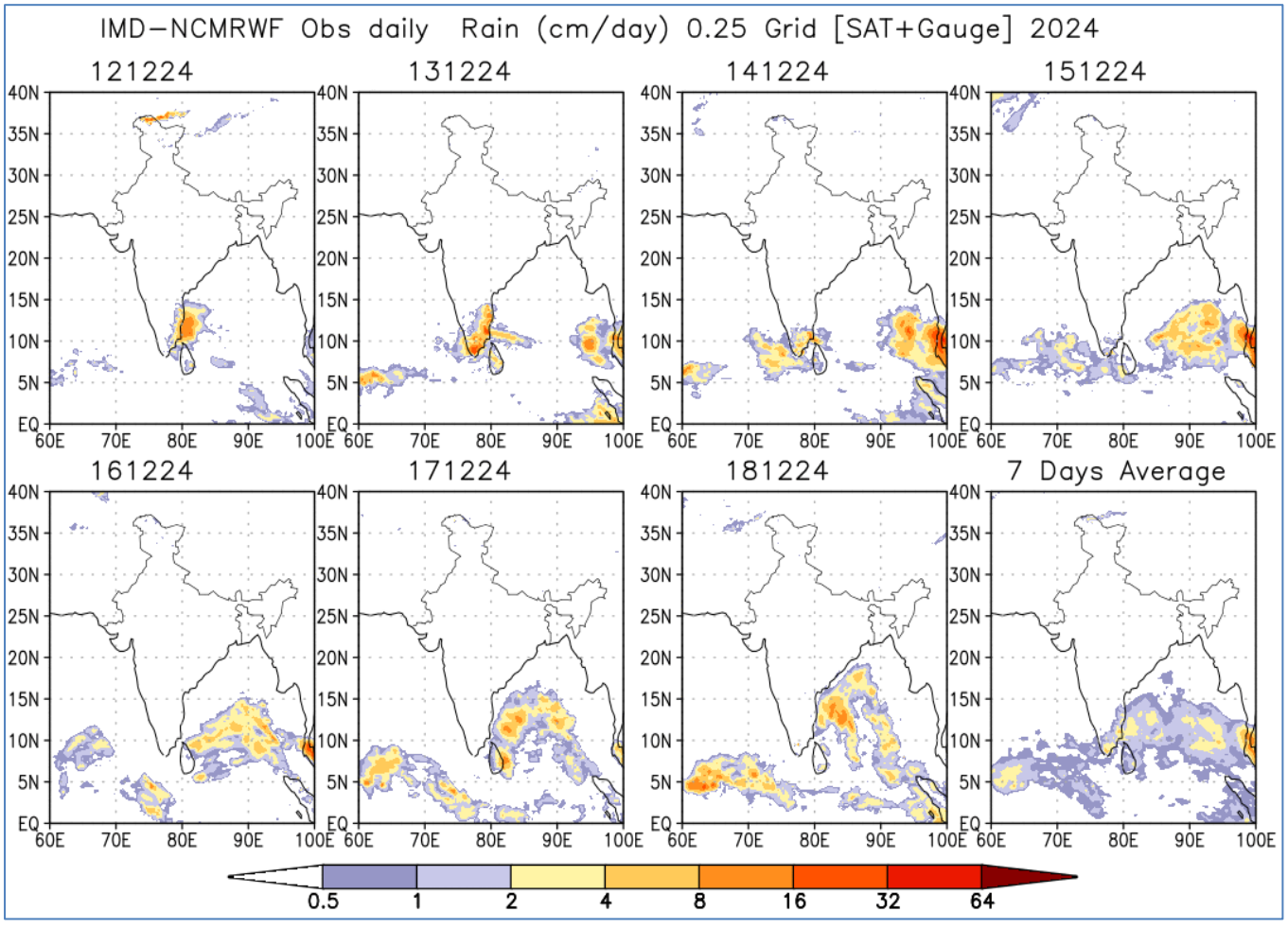

Fig.2: NCMRWF-IMD satellite gauge merged data plots of realized 24 hours accumulated rainfall from 12th December – 18th December, 2024.

Next update: 26.12.2024

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