India Meteorological Department
Ministry of Earth Sciences
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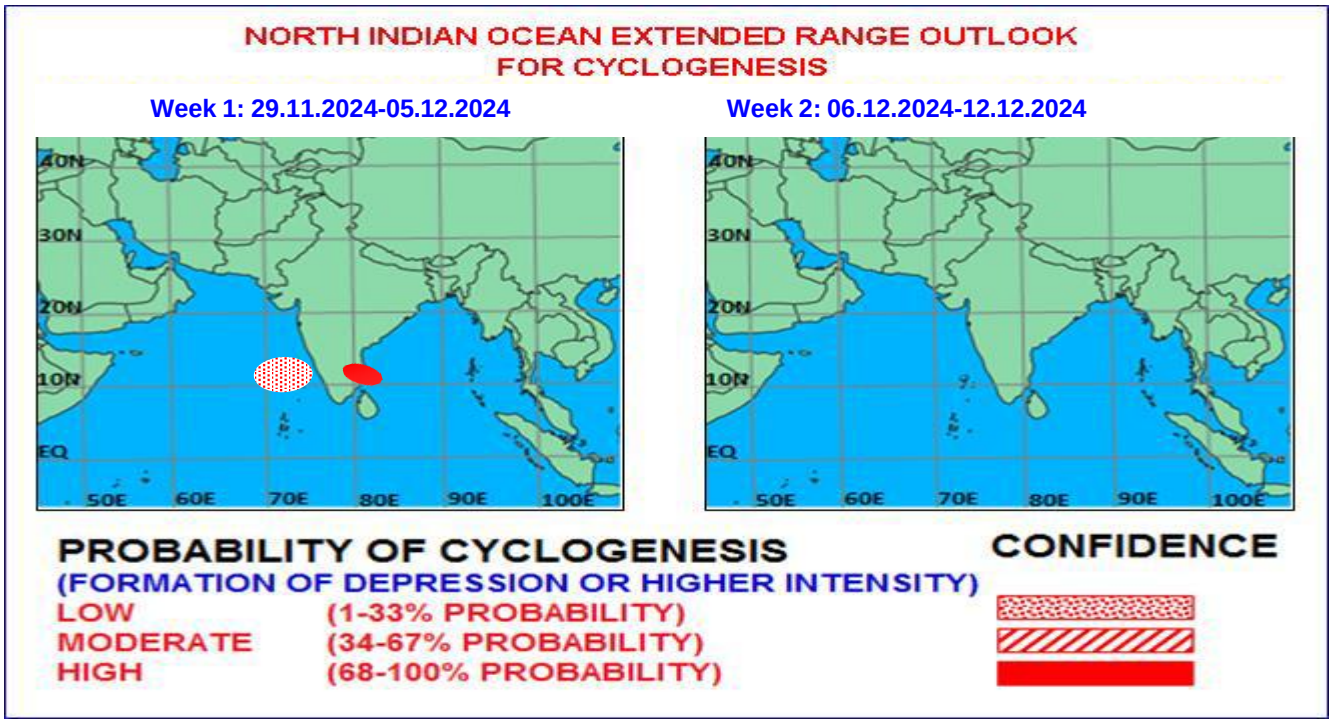

Fig. 1: Graphical Cyclogenesis over the north Indian Ocean during next two weeks

I. Environmental features:

Monitoring of Madden Julian Oscillations (MJO) indicates it is currently in phase 4 with an amplitude greater than 1. Various model forecasts suggest that the MJO signal is very likely to propagate eastward within phase 4 during the first half of week 1 and enter into phase 5 with a slow variation in amplitude. The model forecast guidance suggests MJO is likely to take a looping movement within phase 5 with decreasing amplitude during the second half of the first week. Thereafter, although the ensemble members are showing a large spread for both group of models GEFS-CFS and ECMF-ECMM, in general, the MJO is likely to propagate eastward across phase 5 coherently during the second week. The ECMF model mean forecast indicates comparatively faster movement to reach phase 6 compared to ECMM, GEFS & CFS models. Thus, the MJO is likely to support the enhancement of convective activity over Bay of Bengal (BoB) during the first week. The support is likely to decrease during the second week.

The CFS-NCICS model-based forecast indicates that the westerly wind anomaly (3-5 mps) is likely to prevail over southeast Arabian Sea (AS) south BoB & adjoining Andaman Sea during week 1. A weak (1-3 mps) easterly wind anomaly is likely over central and northern parts of BoB during the first week. The westerly wind anomaly is likely to persist over south BoB during the second week whereas there will be no westerly wind anomaly over AS during the second week. The easterly wind anomaly is only persisting over north BoB during the second week. During both the weeks, there is no activity likely related to Equatorial Rossby Waves (ERW) over the North Indian Ocean (NIO) region. The eastward-moving Kelvin waves are likely to be seen over southeast AS during the later part of the second week. Therefore, zonal wind characteristics along with MJO and other equatorial waves are likely to provide marginal support the convective activity over South BoB and adjoining Andaman Sea during both weeks.

The El Niño–Southern Oscillation (ENSO) is neutral condition, but on the negative side. The Indian Ocean Dipole (IOD) is likely to remain neutral, but weakly negative, during next 2 weeks. These broadscale features (transition towards LaNina and slightly negative IOD conditions) indicate a favorable environment for convective activity/cyclogenesis over the BoB.

II. Model Guidance:

Various deterministic model forecasts are suggesting that the existing deep depression over southwest Bay of Bengal is likely to move north-northwestwards and cross Tamil Nadu coast on 30th November. Thereafter, models are also indicating the system to move across southern peninsular India and emerge into southeast and adjoining eastcentral Arabian Sea as a well-marked low pressure area (WML) on 1st December.

IMD-CFS V2 (Extended Range Model) mean wind forecasts at 850 hPa is indicating a cyclonic circulation over southwest Bay of Bengal during first half of week1. The wind anomaly field at 850 hPa is indicating a cyclonic wind anomaly during first half of week 1. The model also suggests high probability of cyclogenesis during week 1 over southwest Bay of Bengal and another over south Andaman Sea during later part of week 1. However, the model does not indicate any cyclogenesis during week 2. The ECMWF ensemble forecasts indicate a high probability (70-80%) of cyclogenesis over southeast and adjoining eastcentral Arabian Sea during middle of week 1, 30-40% probability of cyclogenesis over south Andaman Sea during later part of week 1. The ECMWF ERF suggests similar probability of cyclogenesis during week 1 and low to moderate (20-40%) probability over south Andaman Sea and adjoining southeast BoB 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:

The deep depression over southwest Bay of Bengal is very likely to move nearly northwards skirting Sri Lanka coast during next 12 hours. Thereafter, it will move north-northwestwards and cross north Tamil Nadu-Puducherry coasts between Karaikal and Mahabalipuram around morning of 30th November as a deep depression. Thereafter, it is likely move further northwestwards across peninsular India as a low pressure area and emerge into southeast and

adjoining eastcentral Arabian Sea during middle of week 1. There is low probability of its intensification into a depression (cyclogenesis) over central parts of Arabian Sea later part of week 1.

There is no probability of any further cyclogenesis during the second week.

IV. Verification of forecast issued during last two weeks:

The forecast issued on 14th November for week 2(22-28 Nov) indicated no cyclogenesis over both the basins. The forecast issued on 21st November for week 1 (22-28 Nov) indicated existing cyclonic circulation over the EIO off Sumatra coast and adjoining South Andaman Sea to became a low pressure area over southeast BoB around 23rd November, move west-northwestwards, intensify into a depression over central parts of south BoB on 25th November, and move west-northwestwards towards Tamil Nadu-Sri Lanka coasts subsequently.

Actually, A low pressure area formed over east EIO and adjoining Southeast BoB at 0830 hrs IST of 23rd November 2024 and it became a well-marked low pressure area over southeast BoB and adjoining East EIO at 0830 hours IST of 24th November 2024. It intensified into a depression over central parts of south BoB and adjoining East EIO at 0830 hours IST of 25th November 2024 and a Deep Depression over Southwest BoB at 0830 hours IST of 26th November 2024. It moved north-northwestwards and lay over southwest BoB at 1730 hours IST of 28th November.

NCMRWF-IMD satellite gauge merged data plots of realized 24 hours accumulated rainfall from 21st November – 27th November, 2024 are presented in Fig. 2.

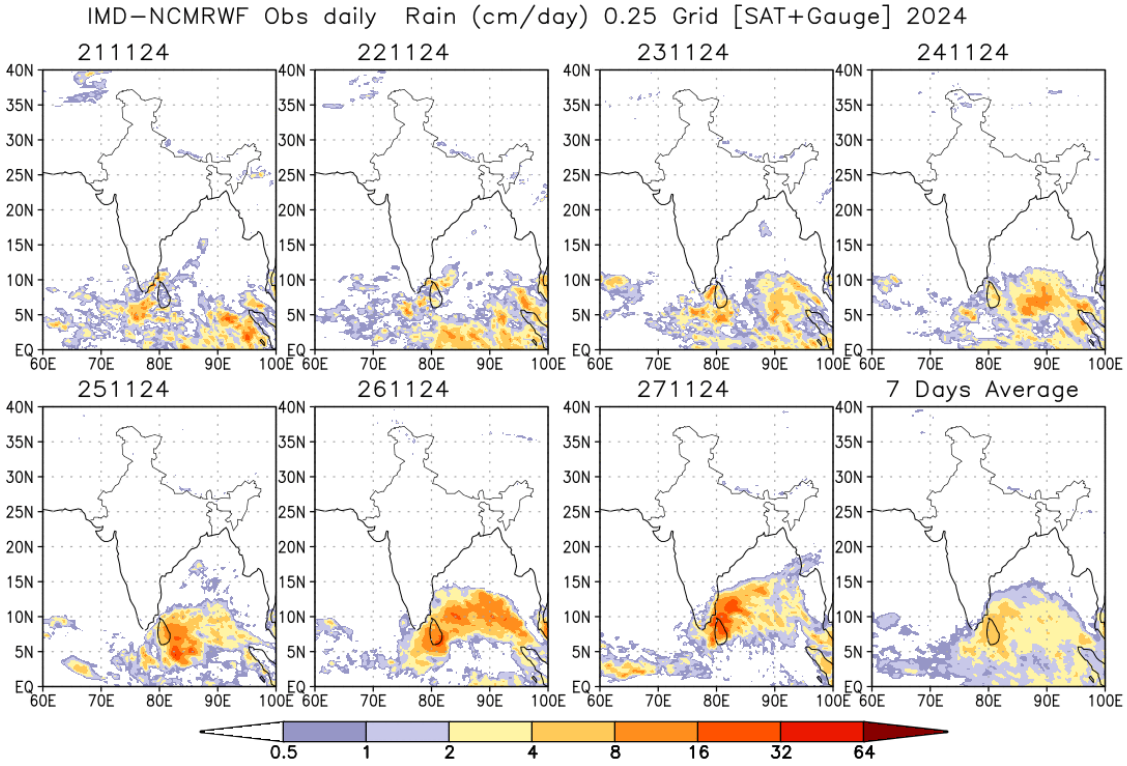

Fig. 2: NCMRWF-IMD satellite gauge merged data plots of realized 24 hours accumulated rainfall from 21st November – 27th November, 2024.

Next update: 05.12.2024