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

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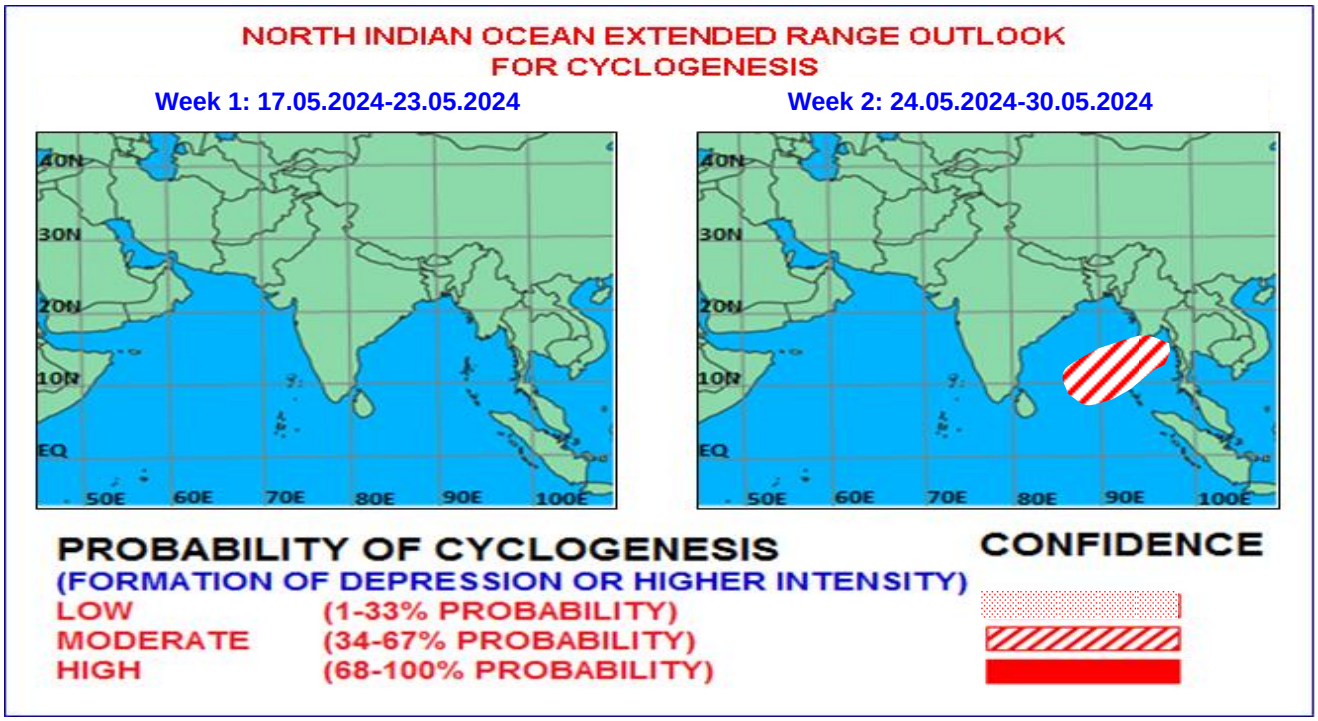

Fig. 1: Graphical Cyclogenesis over north Indian Ocean during next two weeks

I. Environmental features:

ECMWF bias corrected forecast indicates that Madden Julian Oscillation (MJO) index is currently in Phase 3 with amplitude more than 1. Thereafter, it will enter into phase 4 from 18th May onwards and would continue in same phase during entire forecast period with large amplitude (around 2). Thus MJO, phase and amplitude are highly favourable for enhancement of convective activity and hence cyclogenesis over the Bay of Bengal (BoB) during the entire forecast period.

The NCICS based forecasts for zonal winds indicate strong easterly winds (5 to 7 mps) over both the basins i.e., the Bay of Bengal (BoB) and the Arabian Sea (AS) during next 2 days. During middle of week 1, easterly winds (3-5 mps) are likely to prevail over south BoB and westcentral AS alongwith westerly winds (5-7 mps) over southeast AS and adjoining Comorin Area, Equatorial Rossby Waves (ERW) over South Andaman Sea are likely. During later part of week 1, strong westerly winds (5-7 mps), ERW, KW and MJO waves are likely over south BoB and adjoining areas of south AS alongwith easterly winds (3-5mps) over North Andaman Sea & adjoining eastcentral BoB. Similar features are likely to continue during beginning of week 2. The coupling between various equatorial waves is likely to increase positive vorticity at lower levels over the south BoB and also adjoining areas of southeast AS.

High sea surface temperatures (30-31°C) are prevailing over major parts of BoB and southeast & adjoining eastcentral AS, thereby creating a very conducive environment for cyclogenesis over the region. The guidance from INCOIS HYCOM model indicates, tropical cyclone heat potential of the order of 100-120 KJ/cm^2 over south BoB and adjoining Equatorial Indian Ocean (EIO) and over southeast & adjoining eastcentral AS. Neutral Indian Ocean Dipole conditions are prevailing currently.

Above environmental conditions are likely to support cyclogenesis over BoB and over southeast AS during week 2.

II. Model Guidance:

IMD GFS and GEFS are indicating development of a low pressure area (LPA) over southeast Arabian Sea off Kerala and Karnataka Coasts around 22nd May which is likely to persists for next 2-3 days over the same region with a little intensification. In addition, IMD GFS is indicating formation of a LPA ahead of monsoon surge over southeast and adjoining Andaman Sea around 24th May. It is likely to intensify further into a depression with probable east-northeastward movement towards south Myanmar coast. NCEP GFS model is predicting the formation of an LPA over southeast BoB around 23rd May, 2024. Thereafter, according to the model forecasts with initial northward movement the system is likely to intensify gradually into a depression over eastcentral BoB on 24th May and into a cyclonic storm by 25th May. Subsequently moving west-nothrthwestward, it is likely to intensify into a severe cyclonic storm over westcentral & adjoining northwest BoB off north Andhra Pradesh-south Odisha coasts on 26th May. It is likely to cross the north Andhra Pradesh-south Odisha coasts on 27th May, 2024. NCUM and NEPS are also indicating the formation of an LPA around 23rd May which likely to move north-northeastward towards north Myanmar and Bangladesh coasts and intensify into a depression on 26th May, 2024. ECMWF deterministic dynamical model is demonstrating the formation of an LPA southwest BoB on 23rd May which is moving east-northeastwards towards Andaman Islands before the system is dissipated over eastcentral & adjoining north Andaman Sea around 24th May, 2024. ECMWF ensemble is indicating low probability (less than 20%) of cyclogenesis over southeast BoB around 22nd May. The area of cyclogenesis is likely to move north-northeastwards and probability is likely to increase to 30 % over eastcentral BoB during next two days further reaching 40% over north BoB during 26 & 27th May, 2024.

IMD extended range forecast (ERF) model furnishing moderate (30-40%) probability of cyclogenesis over southeast AS & adjoining Comorin Area off Kerala coast during first week. It is also showing moderate probability (30-40%) of cyclogenesis over southeast BoB and south Andaman Sea during both the weeks. The ECMWF ERF is indicating 10-20% probability of cyclogenesis over north & adjoining eastcentral BoB during week 1 and similar probability over eastcentral & adjoining northeast AS during second week.

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

(i) A low pressure area is likely to form over southeast Bay of Bengal and adjoining Andaman Sea around 23rd May and there is a moderate probability for its further intensification into a depression over southeast Bay of Bengal and adjoining north Andaman Sea in the beginning of the second week. The system is likely to intensify further and move north-northeastwards during later part of the week.

(ii) A cyclonic circulation / low pressure area is likely to form over southeast Arabian Sea off Kerala coast during second half of the first week.

IV. Verification of forecast issued during last two weeks:

Forecast issued on 2nd May for second week (10.05.2024-16.05.2024) and forecast issued on 9th May for first week (10.05.2024-16.05.2024) indicated no cyclogenesis over the NIO during the forecast period. Actually, no cyclogenesis occurred over the region during the forecast period week. Thus no cyclogenesis was correctly predicted for the forecast period.

NCMRWF-IMD satellite gauge merged data plots of 24 hours accumulated realized rainfall during 9th May to 15th May, 2024 are presented in **Fig. 2**.

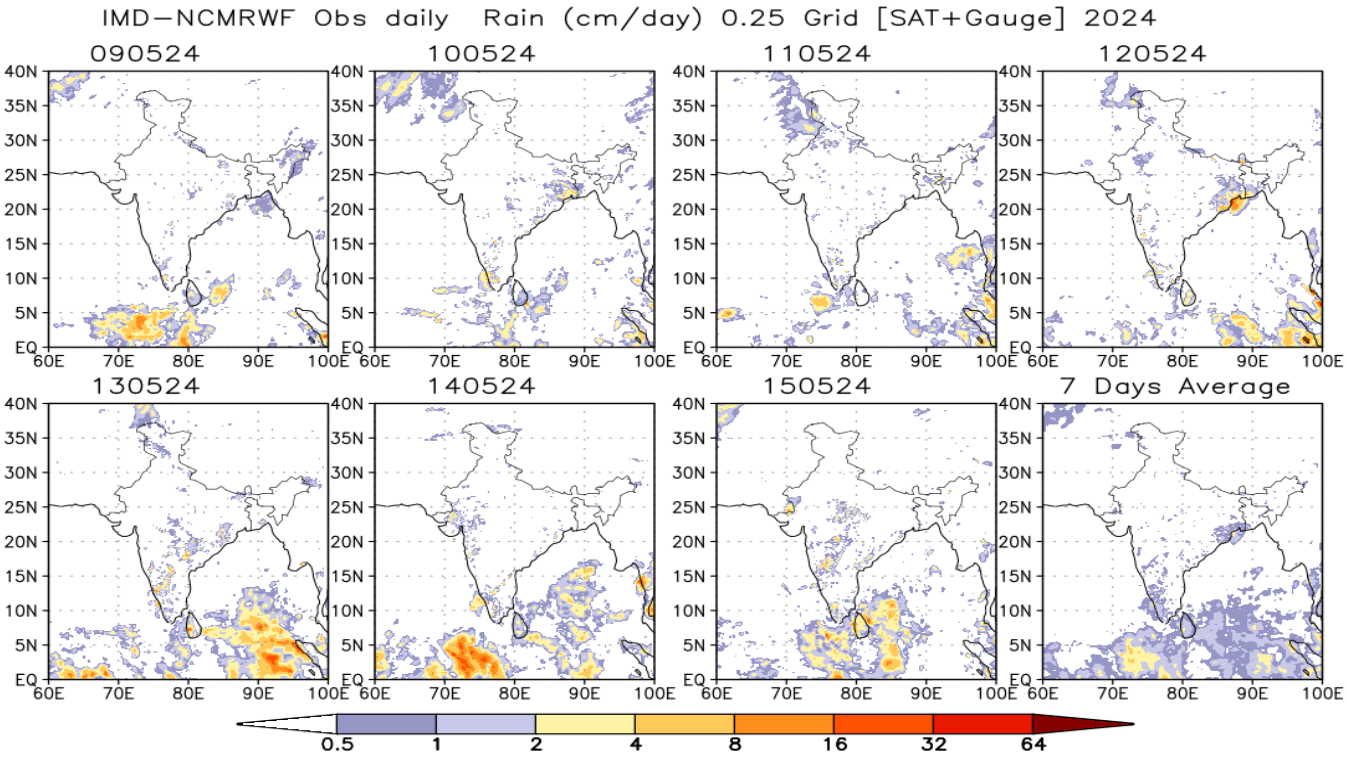

Fig.2: NCMRWF-IMD satellite gauge merged data plots of 24 hours accumulated realized rainfall during 9th May to 15th May, 2024.

Next update: 23.05.2024