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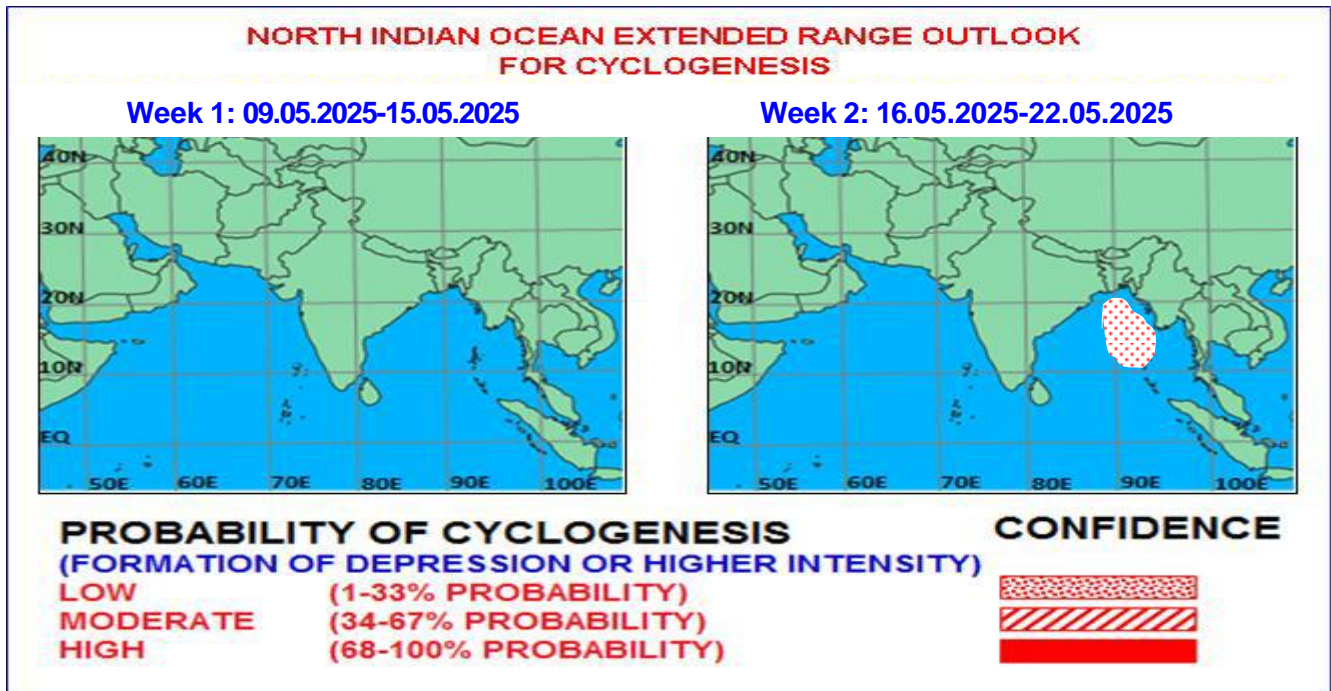


Fig. 1: Graphical Cyclogenesis over the north Indian Ocean during next two weeks

I. Environmental features:

The guidance from the ECMM model indicates that the Madden Julian Oscillation (MJO) is currently in phase 5 with amplitude less than 1. It is likely to continue in same phase during week 1 with amplitude remaining less than 1. Thereafter during week 2 it is predicted to move rapidly across phases 6, 7 & 8 and move across phases 2 & 3 during second half of the week 2 with amplitude remaining less than 1. Similar features are indicated by NOAA CFS V2 also. Thus, MJO is favorable for enhancement of convective activity forecast and cyclogenesis over the Bay of Bengal (BoB) during week1 and later part of week 2. NCICS, CFS model indicates prevalence of westerly wind anomaly (3-5 mps) over southeast BoB and adjoining south Andaman Sea alongwith Equatorial Rossby Waves (ERW) and easterly wind anomaly (3-5 mps) over remaining parts of BoB during week1. Over the Arabian Sea (AS), the model is indicating, westerly wind anomaly over central parts of AS and easterly wind anomaly (3-5 mps) over northwest India (Gujarat, Rajasthan and adjoining west MP region during week1. These features indicate a supporting environment for development of cyclonic circulation/ low pressure areas over east central and adjoining northeast BoB and over northwest India during week 1.

During week 2, the model is indicating further increase in cross equatorial flow with increase in westerly wind anomaly over Andaman Sea and adjoining south BoB. Over the AS, the model is indicating westerly wind anomaly (3-5 mps) over Equatorial Indian Ocean (EIO) & off Somalia coasts and easterly wind anomaly (1-3 mps) over southwest and adjoining AS. These features indicate a favorable environment for enhancement of cross equatorial flow over BoB during week 2 and further advancement of southwest monsoon over southeast BoB.

II. Model Guidance:

Most of the models including IMD GFS, NCUM, GEFS, NEPS, ECMWF and NCEP-GFS are in consensus about the increase cross-equatorial flow over south BoB and north EIO during next 7 days and development of a shear zone over central BoB and adjoining north Andaman Sea. However,

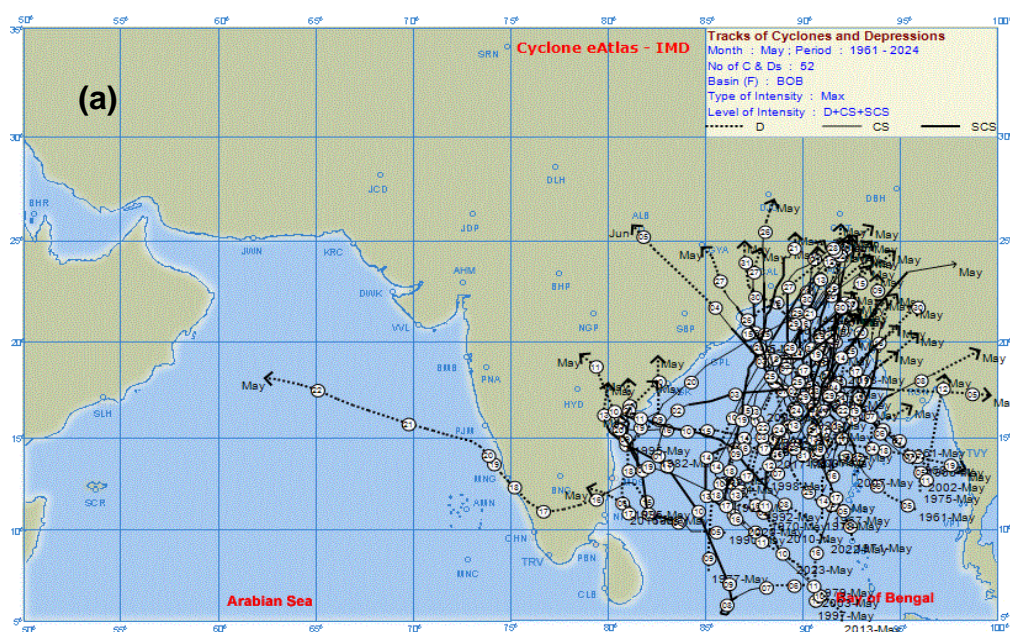
models are not suggesting any formation of low and depression during the period. IMD GFS and NCUM-G as well as their ensemble counterparts GEFS and NEPS are indicating seasonal southwesterly flow over BoB during next 10 days without any cyclonic disturbances. On the other hand, NCEP-GFS is predicting the formation of the low pressure area over eastcentral BoB and adjoining north Andaman Sea around 16th May. Thereafter, the low pressure system is likely to move northwestwards and intensify into a depression over the same area around 17th May. The model also indicate further intensification of the system into a cyclonic storm by 19th May while moving towards Odisha coast. The ECMWF model is indicating formation of a feeble low pressure area/cyclonic circulation over eastcentral BoB around 17th May which is likely to move further northwestwards towards north BoB by 19th May. The EC-AIFS model indicates probable cyclogenesis around 15th May over eastcentral BoB which is likely to move initially north-northwestwards over central parts of north BoB and then recurving northeastwards towards Bangladesh coast by 20th May.

The 850 hPa mean wind field of IMD ERF Model indicates a cyclonic circulation over northeast AS off Gujarat coast during week 1. The mean wind forecast is suggesting southwesterly flow over AS and BoB without any cyclonic circulation/low pressure area. However, the 850 hPa wind anomaly indicates a cyclonic circulation over eastcentral AS during week 1 and over central AS during week 2. The model wind anomaly field also indicates a cyclonic circulation over north Andaman Sea migrating from south China Sea during week 1. The week 2 wind anomaly forecast also suggests a cyclonic circulation over southwest BoB. The NCMRWF-ERF model wind anomaly field suggests a cyclonic circulation over central parts of AS during week 1. The model also indicates a shear zone over southwest BoB during same period. During week 2, wind anomaly indicates cyclonic circulation over northeast AS.

The ECMWF ensemble model predicts low to moderate (30-40%) probability of cyclogenesis over eastcentral and adjoining northeast BoB during 17th & 18th May. The ECMWF extending range prediction system suggests low (20-30%) probability of cyclogenesis over the same region during both the weeks.

III. Climatology:

A total of 52 cyclonic disturbances (maximum sustained wind speed (MSW) ≥ 31 kmph) developed over the BoB during 1961-2024 (Fig 2[a]). Out of these 39 intensified into cyclones (MSW ≥ 63 kmph). Out of these 39, 18 crossed Bangladesh, 7 Myanmar, 4 Andhra Pradesh, 3 each West Bengal & Odisha, 1 Tamil Nadu and 3 dissipated over sea during 1961-2024.



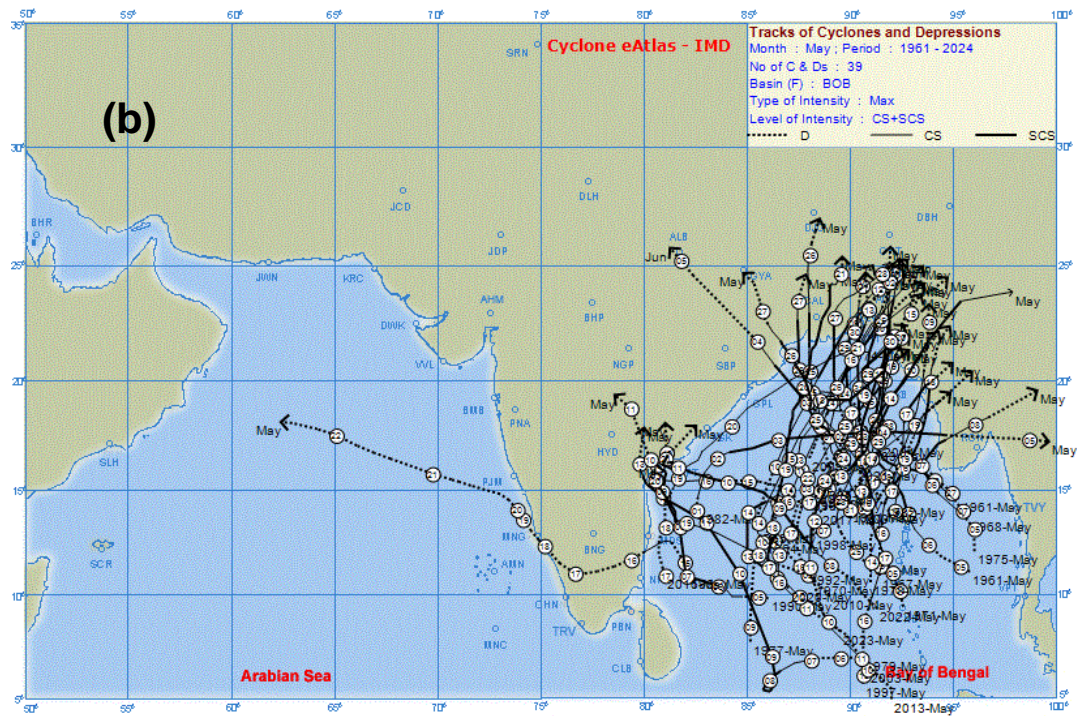


Fig. 2: (a) Cyclonic disturbances in the month of May during 1961-2024 (Total 52), (b) Cyclones in the month of May during 1961-2024 (Total 39)

IV. Inference:

Considering large-scale environmental features and model guidance, it is inferred that:

- (i) there is no probability of cyclogenesis over the North Indian Ocean region during week 1. However, during week 1 with the expected advancement of southwest monsoon over southeast Bay of Bengal and south Andaman Sea around 13th May, an east-west shear zone is likely to develop over the region. Under its influence there is possibility of development of a cyclonic circulation in lower-middle tropospheric levels during the same period.
- (ii) there is low to moderate probability of cyclogenesis over eastcentral and adjoining northeast Bay of Bengal during week 2.

Verification of forecast issued during last two weeks:

The forecast issued on 27th April for week 2 (2nd - 8th May) indicated no probability of cyclogenesis (formation of depression) over NIO region. The forecast issued on 1st May for week 1 (2nd - 8th May) also indicated no probability of cyclogenesis (formation of depression) over NIO region. However, it was indicated that a north-south trough in lower tropospheric levels over south peninsular India extending up to Comorin region with embedded upper-air cyclonic circulation will prevail during many days of week 1.

Actually, no cyclogenesis occurred during this period over NIO region. A fresh upper air cyclonic circulation formed over northeast Arabian Sea & adjoining Gujarat coasts on 4th May, 2025 and it became less marked on 5th May 2025. A north-south trough extended from southeast Madhya Pradesh to South Interior Karnataka on 5th May, 2025. Afterwards, it extended from south Telangana and neighbourhood to Gulf of Mannar on 6th May and from south Telangana to Gulf of Mannar in lower tropospheric levels from 7th to today, the 8th May, 2025. A cyclonic circulation formed over southeast Bay of Bengal and adjoining South Andaman Sea on 7th May and persisted over the same region on 8th May.

Hence, the nil probability of cyclogenesis and formation of north south trough were predicted correctly in week 1 forecast.

NCMRWF-IMD satellite gauge merged data plots of realized 24 hours accumulated rainfall from, 01th – 07th May, 2025 are presented in **Fig. 2**.

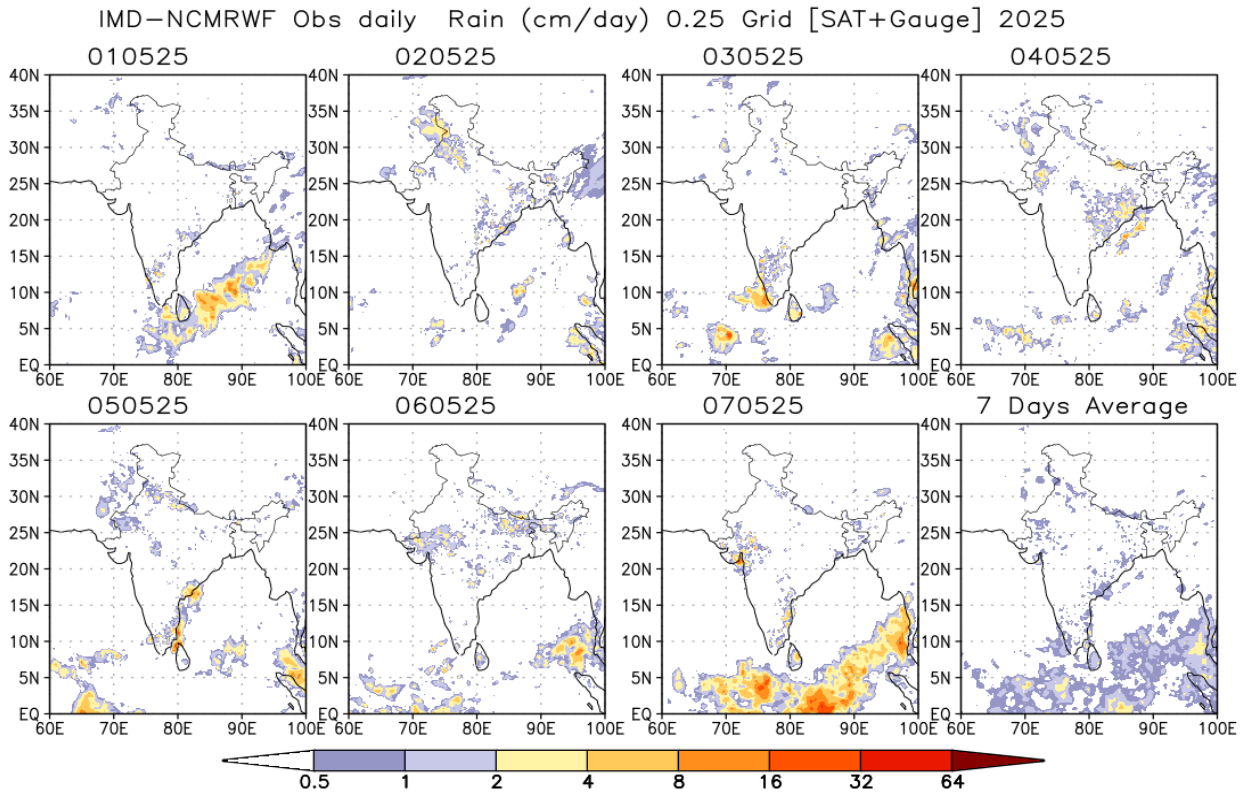


Fig.2: NCMRWF-IMD satellite gauge merged data plots of realized 24 hours accumulated rainfall from 01th to 07th May, 2025.

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, EC-AIFS: ECMWF Artificial Intelligence Forecasting System, ECMM: ECMWF-Ensemble System Bias Corrected, GPP: Genesis Potential Parameter, NCEP GFS/GEFS/CFS: National Centre for Environment Prediction GFS/GEFSv12/CFSv2, CPC: Climate Prediction Center (for MJO update), 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.

Next update: 15.05.2025