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

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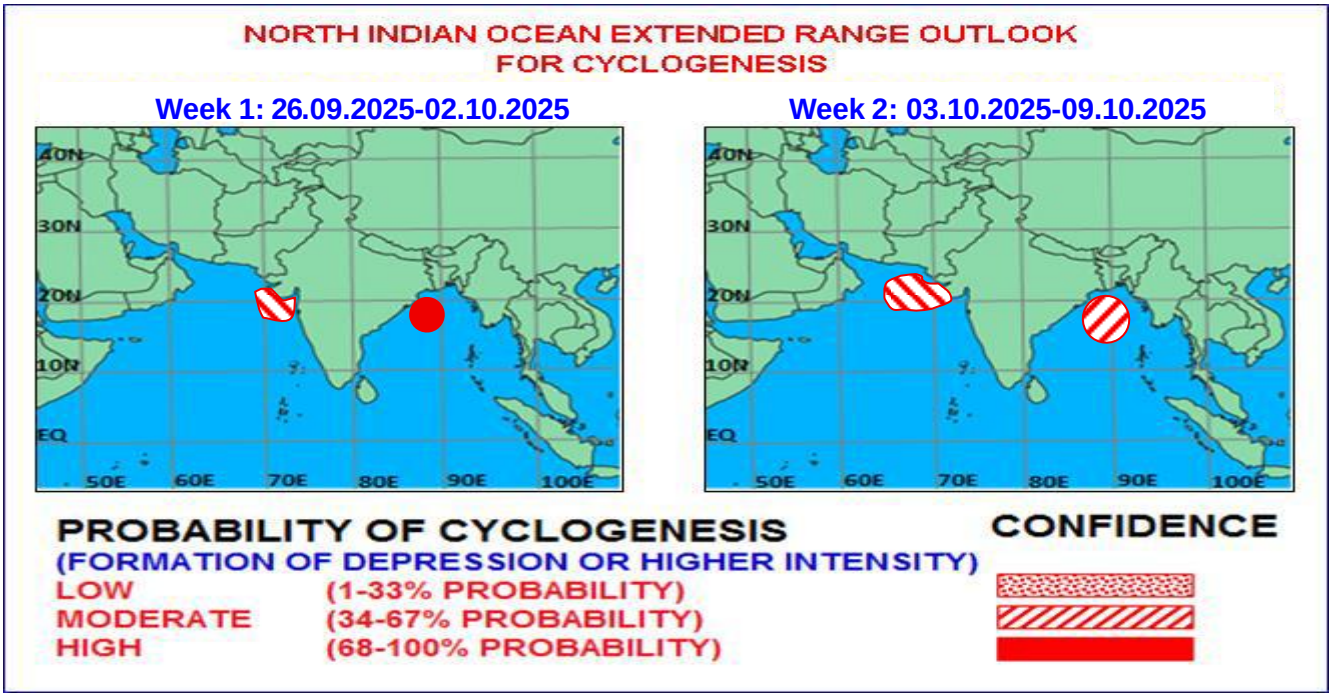

Fig. 1: Graphical Cyclogenesis over the north Indian Ocean during the next two weeks

I. Environmental features:

The guidance from various numerical models indicates that Madden Julian Oscillation (MJO) is currently in phase 3 with amplitude less than 1. It is likely to continue in same phase with gradually decreasing amplitude during first half of week 1. Thereafter, it is likely to loop and enter into phase 2 with amplitude gradually becoming more than 1. It will continue in same phase during remaining part of the forecast period with amplitude remaining more than 1 during later half of week 1. During first half of week 2, it is likely to continue to move across phase 2 with decreasing trend in amplitude. Towards the end of week 2, it is likely to move to phase 1. Thus, MJO is likely to contribute to enhancement of convective activity over the Bay of Bengal (BoB) during first half of week 1 and over the Arabian Sea (AS) during later half of week 1 and first half of week 2.

The guidance from the NCICS CFS model is indicating westerly wind anomaly (5-7mps) and Equatorial Rossby wave (ERW) over south & central Bay of Bengal (BoB) along with easterly winds anomaly (1-3mps) over north BoB during first half of week 1. The model is indicating westerly wind anomaly (5-7mps) over south AS alongwith MJO & ERW during first half of week 1. Thus, the Equatorial Waves over the BoB are phase locked leading to enhanced westerlies in the south and easterlies to the north and thus improve genesis potential parameters like low level vorticity, middle level humidity and deep convection required for genesis. Thus, the equatorial waves may contribute to development of existing cyclonic circulation over eastcentral BoB and adjoining areas into a low-pressure area and depression during first half of week1. During second half of week 1, the NCICS model is indicating extension of westerly wind anomaly (5-7 mps) over south AS across South Peninsular India and south BoB alongwith ERW, MJO and Kelvin wave (KW). Further, it is indicating, strong easterly wind anomaly (5-7 mps) to its north over Indo Gangetic Plains upto northwest India. All these features indicate gradual weakening of the depresion over land with likelihood of its subsequent emergence into Northeast off South Gujarat coast during later part of week 1.

The guidance from the NCICS CFS model indicates, prevalence of MJO and Equatorial waves over the AS & the BoB region during the entire forecast period. However, during week 1, all these waves are phase locked & thus favourable for cyclogenesis & enhancement of convective activity over the region. During week 2, due to their, they are not coherently active over the region leading to weakening of westerly winds and convection.

As per Bureau of Meteorology forecast, -ve Indian Ocean Dipole conditions are prevailing, which are likely to increase convective activity and cyclogenesis over the Bay of Bengal.

II. **Model guidance:**

Various deterministic models are indicating a favourable phase for cyclogenesis over the BoB and AS during the forecast period.

Most of the models including ECMWF, NCEP GFS, ECAI, IMD GFS, BFS and NCUM are capturing a low-pressure area over northwest BoB. Most of the models except IMD GFS & Bharat FS are capturing existing cyclonic circulation over eastcentral & adjoining BoB and another over Northwest BoB & neighbourhood are captured as a single system. However, synoptic analysis and IMD GFS & BharatFS are capturing two separate cyclonic circulations over BoB. The same is also supported in vorticity, convergence & divergemce fields. However, there is consensus among various models about development of low-pressure area over northwest & adjoining westcentral BoB on 26th and depression over westcentral & adjoining north BoB on 27th/0000 UTC with crossing over South Odisha-North Andhra Pradesh coasts as a depression around 27th/0300 UTC.

There is also good consensus among various models (ECMWF, ECAI, IMD GFS, BFS, NCUM, NCEP) wrt nearly west-northwestwards movement of this system across central India and its subsequent emergence into Northeast Arabian Sea off south Gujarat coast around 29th/0000 UTC. Many of the models (IMD GFS, ECMWF, ECAI) are also indicating further intensification of this system into a depression over the same region around 30th September. It is further predicted to move nearly north-northwestwards across Gujarat state and emerge into Northeast AS around 3rd October. Thereafter, it is predicted to move nearly westwards towards northwest AS with further intensification. The same is also supported by favourable MJO and Equatorial waves over the AS region.

Models (IMD GFS, NCEP GFS, NCUM) are also indicating emergence of an upper air cyclonic circulation into North Andaman Sea around 30th September. Thereafter, models (IMD GFS, NCEP GFS, NCUM, ECMWF, ECAI) are indicating a low-pressure area over North & adjoining central BoB around 1st October. The models (ECMWF, ECAI and NCEP GFS) are indicating further intensification into a depression over Northwest BoB around 2nd October.

The 850hPa mean wind field of IMD ERF model is indicating strong westerly winds over the south & Central parts of Arabian Sea and Bay of Bengal with a cyclonic circulation over westcentral and adjoining northwest Bay of Bengal off north Andhra Pradesh-South Odisha coasts during week 1. The Model is also indicating an east-west oriented monsoon shear zone along 18ºN latitude during the first week. This may lead to active monsoon condition and increase in rainfall activity over west coast, central and peninsular India. The associated anomaly wind field of week 1 is indicating a cyclonic circulation over south Gujarat-North Maharashtra coasts and a trough extending west-southwestwards across central AS.

The mean wind field forecast at 850 hPa for week 2 indicates a cyclonic circulation over north Chhattisgarh and neighbourhood. Accordingly, the monsoon shear zone is found to be shifted northwards, oriented along 20ºN latitude with monsoonal south-westerly winds prevailing over south-central AS and entire BoB during the second week. During week 2, the anomaly wind field is indicating a cyclonic circulation over south Gujarat and an east-west trough extending westwards upto another cyclonic circulation over Oman. This is likely to sustain rainfall activity over west coast and central & peninsular India during the week 2.

The model is also indicating high probability (>80%) of cyclogenesis over westcentral & adjoining northwest BoB off north Andhra Pradesh-south Odisha coasts during week 1. At the same time, there is an east-west oriented belt with moderate probability (30-60%) of cyclogenesis extending from the north BoB upto eastcentral-adjoining northeast AS off Maharashtra-Gujarat coasts across central India. During week 2, there is an area with moderate probability (30-60%) of cyclogenesis over Gangetic West Bengal and adjoining areas of north Odisha, Jharkhand, Bangladesh and northwest BoB.

The NCMRWF ERF model forecasts of mean wind field for week 1 is also indicating features nearly similar to IMD ERF. However, the mean wind filed of week 2 does not indicate any cyclonic circulation over east India rather shows a north-south trough. The anomaly wind field of week 2 also indicates a feeble cyclonic circulation over Gujarat state as seen in IMD ERF forecast. However, anomaly wind field indicates a feeble cyclonic circulation over Gangetic West Bengal and neighbourhood which is not seen in case of IMD ERF.

The ensemble forecasts of ECMWF indicate a low probability (20-30%) of cyclogenesis over westcentral & adjoining northwest BoB off north Andhra Pradesh-south Odisha coasts during first half of week 1. The model is also indicating a zone with moderate probability (60-70%) of cyclogenesis over northeast AS and adjoining

coastal areas of Maharashtra- south Gujarat coasts. The sub-seasonal forecast of ECMWF is indicating a low probability (10-20%) of cyclogenesis over westcentral & adjoining northwest BoB off north Andhra Pradesh-south Odisha coasts and a very low probability (~10%) over northeast AS and adjoining coastal areas of Gujarat and Maharashtra during week 2.

III. Inference:

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

(1) The existing upper-air cyclonic circulation over eastcentral & adjoining northeast Bay of Bengal is likely to move nearly westwards gradually. Under its influence, a low-pressure area is likely to form over north and adjoining central Bay of Bengal during next 12 hours. Moving nearly westwards, it is very likely to concentrate into a depression over northwest and adjoining westcentral Bay of Bengal off South Odisha-North Andhra Pradesh coasts on 26th September. It is very likely to cross South Odisha-North Andhra Pradesh coasts around 27th September morning.

(2) The remnant of the depression mentioned above is likely to move west-northwestwards across central India and emerge into Northeast Arabian Sea off south Gujarat coast as a low-pressure area around 29th September. There is a moderate probability for its further intensification into a depression over the same region around 30th September. It is likely to move slowly westwards across south Gujarat and adjoining Northeast Arabian Sea till 2nd October. Thereafter, it is likely to continue to move nearly westwards across north Arabian Sea with a low probability of its further intensification.

(3) There is a likely emergence of an upper air cyclonic circulation into North Andaman Sea around 30th September. Under its influence a low-pressure area is likely to form over North & adjoining central Bay of Bengal around 1st October. There is a low to moderate probability for its intensification into a depression over northwest Bay of Bengal around 2nd October.

Impact expected:

(1) Due to the **above likely formation of depression over BoB on 26th September and another around 2nd October, strong & squally winds with heavy rainfall is likely over north & central Bay of Bengal during week 1 and beginning of week 2**. Sea condition is likely to be rough to very rough during this period.

(2) Similarly, due to expected development of depression over Northeast & and adjoining Eastcentral Arabian Sea off south Gujarat coast around 30th September, squally winds and rough to very rough sea conditions are likely over the region during end of week 1 and beginning of week 2.

(3) During week 1, heavy to extremely heavy rainfall is likely over central and adjoining Peninsular India (South Odisha, Chhatisgarh, Telangana, Vidarbha, South Madhya Pradesh, Marathwada, Maharashtra, Konkan & Goa, Gujarat state and south Rajasthan) and above normal rainfall is likely over Central Myanmar.

(4) During first half of week 2, heavy to extremely heavy rainfall is likely over Eastern & Northeastern India (West Bengal, Odisha, Jharkhand, North Chhattisgarh & Bihar and Assam, Meghalaya, Arunachal Pradesh, Tripura, Nagaland, Manipur, Mizoram) and above normal rainfall is likely over Bangladesh. There could be localisedd flooding, landslides, landslips, mudslips etc. due to heavy rainfall in the region.

Anticipatory Actions:

(1) Forecasters may maintain round the clock watch and continuously monitor weather systems over the region as per Standard Operation Procedures during next 2 weeks.

(2) Disaster managers, media and general public are advised to closely monitor official weather forecasts from India Meteorological Department available on websites, social networking channels, face book, X and mobile Apps.

(3) Fishermen are advised to be cautious while venturing into sea and stay updated.

(4) Judicious regulation of recreational and tourism activities.

(5) Judicious regulation of offshore and onshore activities.

IV. Verification of forecast issued during the previous two weeks:

The forecast issued on 11th September for week 2 (19.09.2025-25.09.2025) indicated likelihood of formation of a fresh upper air cyclonic circulation/low-pressure area over westcentral & adjoining northwest BoB during first half of week 2 (around 20th September).

The forecast issued on 18th September for week 1 (19.09.2025-25.09.2025) indicated the existing upper air cyclonic circulation over North Andaman Sea and adjoining Myanmar coast to move slowly north-northwestwards along Myanmar coast and reach eastcentral & adjoining northeast Bay of Bengal off Myanmar coast by 21st September. Thereafter, it was indicated to move northwestwards across north Bay of Bengal and become a low-pressure area over north BoB around 23rd September.

Another low-pressure area is likely to form over northeast Bay of Bengal during 1st half of week 2 (around 26th September).

Realized:

An upper air cyclonic circulation formed over north Andaman Sea & adjoining Myanmar coast on 18th September/ 1200 UTC. It became a Low-Pressure area over northeast Bay of Bengal and neighborhood on 22nd September/0000 UTC. It became less marked on 24th September/ 1200 UTC over South Odisha and adjoining areas. However, the associated cyclonic circulation lay over northwest & adjoining westcentral Bay of Bengal and adjoining south Odisha-North Andhra Pradesh coasts on 25th September/ 0000 UTC and persisted over the same region at 0300 UTC of today, the 25th September.

Another upper air cyclonic circulation formed over coastal areas of central Myanmar and adjoining eastcentral Bay of Bengal on 24th September/0000 UTC. It moved nearly westwards and lay over eastcentral & adjoining northeast Bay of Bengal on 25th September/0000 UTC and persisted over the same region at 0300 UTC of today, the 25th September.

Thus, the formation of two back to back cyclonic circulations/ low pressure areas over the BoB around 20th September (actually formed on 18th September) and another over the eastcentral & adjoining northeast Bay of Bengal off Myanmar coast around 24th September was captured well in the extended range outlooks issued during last two weeks (with some spatial & temporal variations) and followed subsequently, in the regular bulletins issued by National Weather Forecasting Centre and Regional Specialised Meteorological Centre-Tropical Cyclones, New Delhi since 11th September.

NCMRWF-IMD satellite gauge merged data plots of 24-hour accumulated rainfall from 18th September to 24th September, 2025 is presented in Fig.2.

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, BFS: Bharat Forecast System, 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.

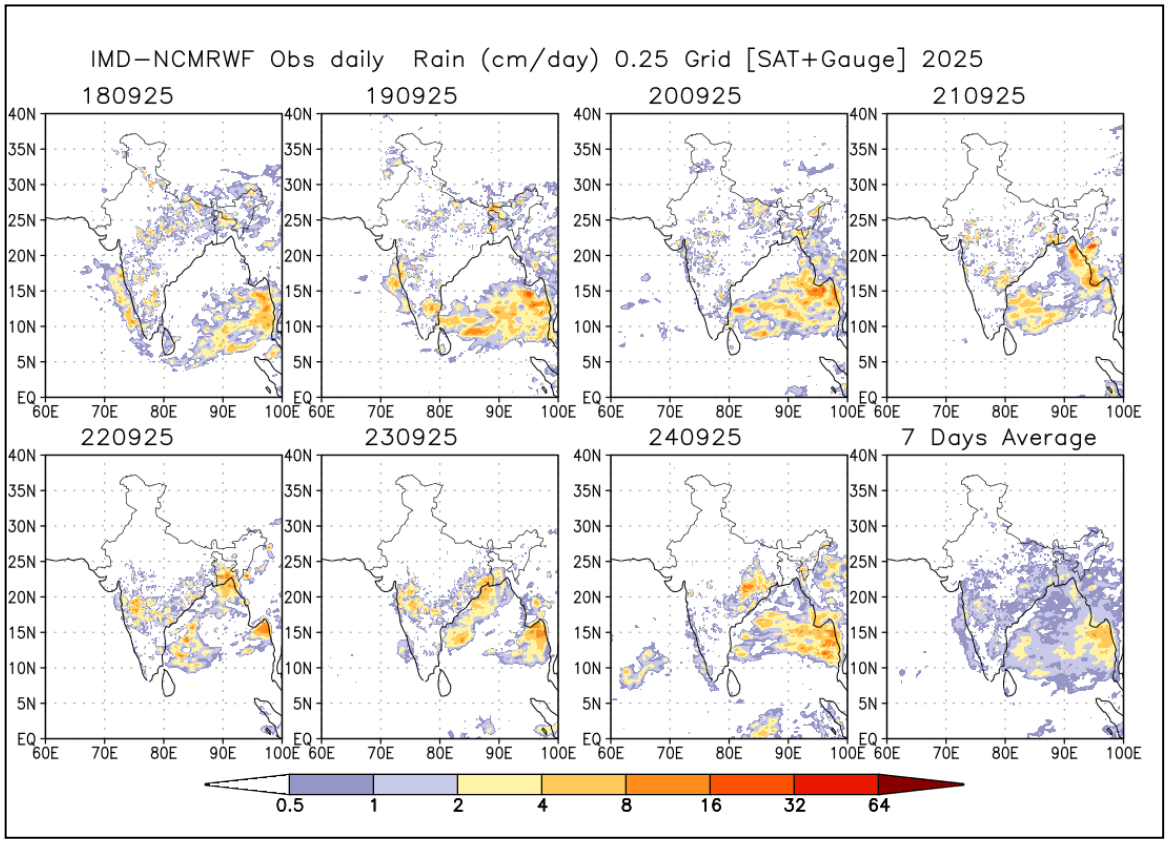

Fig. 2: NCMRWF-IMD satellite gauge merged data plots of 24-hour accumulated rainfall from 18th September to 24th September, 2025

Next update: 02.10.2025