India Meteorological Department
Ministry of Earth Sciences
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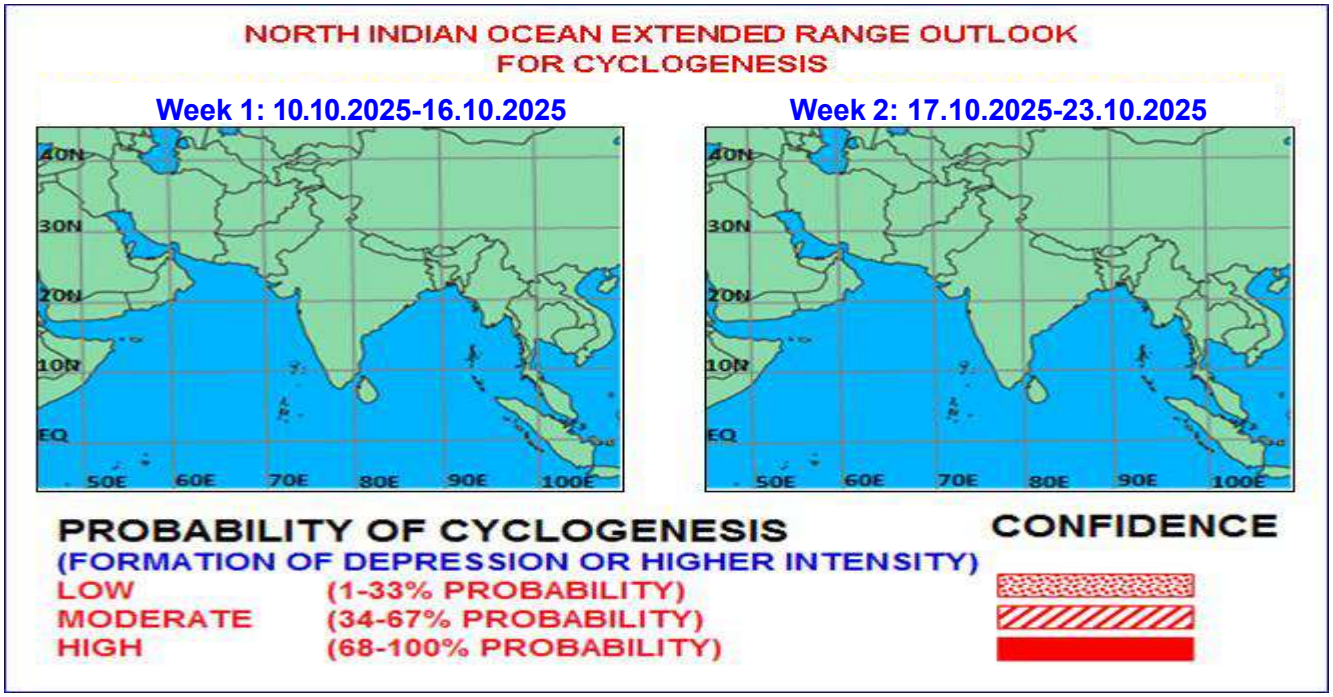

Fig. 1: Graphical Cyclogenesis over the north Indian Ocean during the next two weeks

I. Environmental features:

The guidance from ECMM model indicates that Madden Julian Oscillation (MJO) is currently in phase 1 with amplitude less than 1. It is likely to move to phase 2 with amplitude becoming more than 1 from end of week 1, and would continue in same phase till middle of week 2. Thereafter, it will enter into phase 3 with amplitude remaining more than 1. Thus, MJO would contribute to cyclogenesis over the Arabian Sea (AS) during the entire forecast period and over the Bay of Bengal (BoB)during later half of week 2.

The latest weekly sea surface temperature SST departure over NINO 3.4 region is -0.5^{o}C indicating development of La Niña conditions during October 2025. Negative IOD conditions are likely to continue during the October - December 2025.

The guidance from the NCICS CFS model is indicating westerly wind anomaly (5-7mps) over westcentral Arabian Sea (AS) along with Equatorial Rossby wave (ERW) over westcentral Arabian Sea & easterly wind anomaly (3-5mps) over northwest AS during first half of week 1. These features are supporting the existing well marked low pressure area over westcentral AS to maintain its intensity. During later part of week 1, easterly wind anomaly (1-3mps) is seen throughout the BoB, AS and Indian region. During week 2, further strengthening of easterly wind anomaly (3-7mps) is seen over the entire region. Thus, Equatorial waves may not contribute to cyclogenesis over the north Indian Ocean (NIO) during later part of week 1 and first half of week 2. However, during end of week 2, westerly wind anomaly (5-7mps) is seen over southern parts of NIO region along with ERW, MJO & easterly wind anomaly is seen over entire parts of north Bay, central India and central Arabian Sea. These features indicate a favorable environment for cyclogenesis over southern parts

of BoB during end of week 2.

II. **Model guidance:**

Guidance from deterministic models:

- Most of the models including IMD GFS, ECMWF & IMD GEFS are indicating existing well marked low pressure area over westcentral Arabian Sea to persist over the same region till 10th and become less marked thereafter.
- Most of the models (IMD GFS, ECMWF, NCEP & NCUM) are indicating an upper air cyclonic circulation over north Bay of Begal and adjoining south Bangladesh/ West Bengal coasts during 9th -12th October.
- IMD GFS, NCUM, ECAI, ECMWF are indicating development of an upper air cyclonic circulation over southwest BoB with nearly westwards movement towards southeast AS across Comorin area during 13th -17th October.
- ECMWF is also indicating development of an upper air cyclonic circulation over southwest BoB off Tamil Nadu coast around 23rd with west-northwestwards movement. NCEP GFS is indicating development of depression over southeast BoB around 21st with west-northwestwards movement towards Tamil Nadu and further intensification.

Guidance from extended range models:

The 850hPa mean wind forecast of IMD ERF model for the first week is indicating an upper air cyclonic circulation over north BoB off Bangladesh & west Bengal coasts and another upper air cyclonic circulation over south Tamil Nadu and adjoining Gulf of Munnar. A north-south trough from Sub-Himalayan West Bengal, passing through the centre of the cyclonic circulation over north BoB, is extending up to the centre of the cyclonic circulation over south Tamil Nadu. In the week 1 IMD ERF of 850hPa mean wind, an anticyclone is likely over Gujarat, and consequently the northerly wind is likely to prevail over north and central AS. However, westerly wind is likely to prevail over south AS and south BoB. The corresponding 850 hPa wind anomaly forecast of the model for week 1 is indicating an anti-cyclonic circulation over southwest & adjoining westcentral BoB. But an upper air cyclonic circulation is seen over Comorin and adjoining north equatorial Indian Ocean (NEIO) embedded in an east-west oriented ITCZ. Another cyclonic circulation is also seen over westcentral AS during week 1. The 850 hPa mean wind of IMD ERF model indicates that northeasterly/easterly winds are likely to prevail over most parts of the BoB and AS. The westerly winds are seen over southern parts of south AS and adjoining NEIO. A cyclonic circulation is seen over Comorin and neighbourhood with an east-west trough along 7ºN during week 2. Associated wind anomaly forecast of the model for week 2 imitates that the mean field with mostly northeasterly and easterly wind would prevail over AS and BoB respectively. A cyclonic circulation is indicated over southeast AS off Kerala coast during week 2.

In the NCMRWF ERF, both the mean and anomaly wind fields are representing wind circulation features similar to IMD ERF model. But, the mean 850 hPa wind field indicates an east-west trough across central parts of BoB with an embedded cyclonic circulation over westcentral BoB. Another cyclonic circulation is also seen over southeast AS east of Lakshadweep Islands during week 2. Accordingly, associated wind anomaly field is indicating cyclonic circulations over the same areas of BoB and AS.

IMD ERF model indicates a zone over southwest BoB off south Sri Lanka coast with a low probability (20-30%) of cyclogenesis during week 1. There is a low-moderate probability (30-40 %) of cyclogenesis over Comorin area in the model forecast of week 2. ECMWF ensemble prediction system indicates very low (5-10%) probability of cyclogenesis over westcentral BoB and southeast & adjoining eastcentral AS during week 1. ECMWF Sub-seasonal forecast is not indicating any area with significant probability of cyclogenesis over NIO region during the first week. However, the week 2 forecast indicated a low probability (20-30 %) of cyclogenesis over westcentral and adjoining southwest BoB off Andhra Pradesh coast during 20-27 October.

Climatological guidance:

Climatologically, there have been 16 cyclonic disturbances (maximum sustained wind speed ≥ 17 kts) over south BoB in the month of October during the period 1965-2024 **(Fig-2)**.

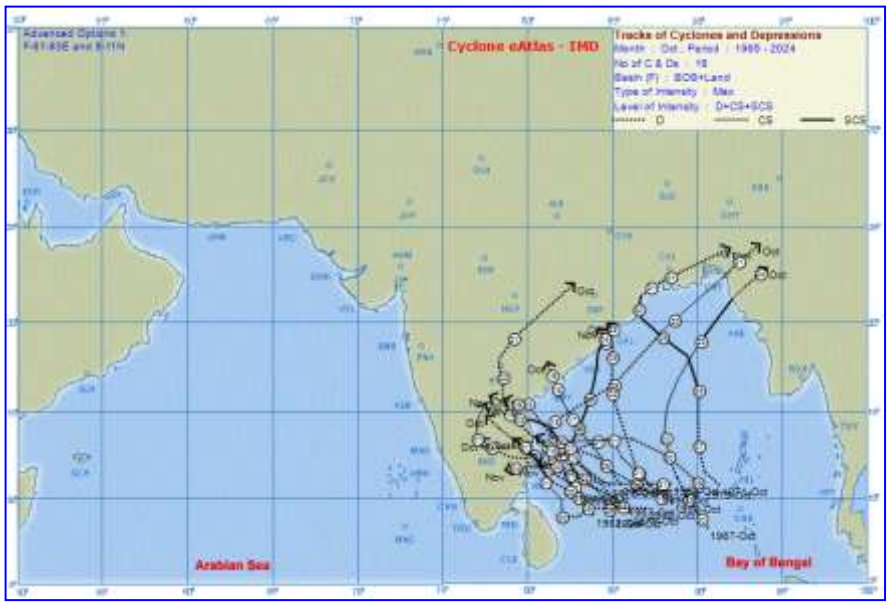

Fig.2: Tracks of cyclonic disturbances (maximum sustained wind speed ≥ 17 kts) over south BoB in the month of October during the period 1965-2024

III. Inference:

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

(a) The existing well marked low pressure area over westcentral Arabian Sea to persist over the same region till 10th and become less marked thereafter.

(b) The existing upper-air cyclonic circulation over south Bangladesh is likely to persist till 12th October.

(c) A fresh upper air cyclonic circulation may develop over southwest Bay of Bengal which would move to southeast Arabian Sea across Comorin Area during middle of week 1. The convective activity is likely to increase with the support of convectively coupled waves like low frequency background waves, Madden Julian Oscillation, Equatorial Rossby wave and Kelvin wave. All thes may lead to formation of a low-pressure area over southeast Arabian Sea towards first half of 2nd week.

(d) A low-pressure area is likely to form over south Bay of Bengal during middle of week 2 (around 22nd October). It is likely to move west-northwestwards and become more marked over southwest Bay of Bengal towards the end of week 2.

Impact expected:

(a) Due to the existing well marked low pressure area over westcentral Arabian Sea, moderate to rough sea conditions are likely to prevail over westcentral Arabian Sea.

(b) Due to the existing cyclonic circulation over south Bangladesh, above normal rainfall activity is likely over Bangladesh and northeastern states of India during next 2-3 days. There could be heavy rain at isolated places in these areas.

(c) In view of likely development of depression over southwest Bay of Bengal, rough to very sea conditions are likely over southwest Bay of Bengal towards the end of week 2 and above normal rainfall activity is likely over South Peninsular India (Andhra Pradesh, Tamil Nadu, Rayalaseema, Telangana, South Maharashtra, North Interior Karnataka). There could be localised flooding, landslides etc. in the hilly regions.

Anticipatory Actions:

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

(b) 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.

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

(d) Judicious regulation of recreational & tourism activities and surface transport.

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

The forecast issued on 25th September for week 2 (03.09.2025-09.10.2025) indicated:

(a) the emergence of low-pressure area over Gujarat into Northeast Arabian Sea off south Gujarat coast around 29th September with moderate probability of its further intensification into a depression over the same region around 30th September. It was indicated to move slowly westwards across south Gujarat and adjoining Northeast Arabian Sea till 2nd October. Thereafter, it was indicated to move nearly westwards across north Arabian Sea with a low probability of its further intensification.

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

The forecast issued on 2nd October for week 1 (03.09.2025-09.10.2025) indicated:

(a) the depression over northeast Arabian Sea to intensify further and move west-southwestwards towards northwest Arabian Sea during next 3 days.

(b) the development of a fresh cyclonic circulation /low pressure area over north Bay of Bengal during end of week 1 (around 9th October).

Realized:

(a) As indicated, the remnant of depression that developed over northwest Bay on 26th September, moved across Odisha, Chhattisgarh, Vidarbha, North Madhya Maharshtra, Gulf of Cambay & Saurashtra during 26th to 1st October (0000 UTC) and emerged into Northeast Arabian Sea on 1st October (0300 UTC). It intensified into cyclonic storm Shakhti on 3rd October (0600 UTC) and into a severe cyclonic storm on 4th October (0000 UTC). It underwent multiple recurvatures over northeast, northwest & westcentral Arabian Sea and weakened into a well marked low pressure area over westcentral Arabian Sea in the evening (1200 UTC) of 7th October. It is persisting as a well marked low pressure area over westcentral Arabian Sea since then.

(b) Under the influence of upper air cyclonic circulation over eastcentral Bay of Bengal & neighbourhood a low-pressure area formed over westcentral Bay of Bengal at 1200 UTC of 30th September. It concentrated into a depression over westcentral Bay of Bengal at 0600 UTC of 01st October. It moved north-northwestwards intensified into a Deep Depression at 1800 UTC of 1st October over westcentral and adjoining northwest Bay of Bengal and crossed South Odisha coast close to Gopalpur in the evening of 2nd October. It weakened into a well marked low pressure area interior Odisha and adjoining Chhattisgarh on 3rd October (0600 UTC).

(c) An upper-air cyclonic circulation formed over South Bangladesh on 7th October and lay over South Bangladesh and adjoining North Bay of Bengal on 9th October.

Thus, all the three systems were well predicted in the extended range outlooks but with some spatio-temporal variations. The deep depression over Bay of Bengal exhibited early intensification. The upper-air cyclonic circulation over North Bay of Bengal actually developed over South Bangladesh.

NCMRWF-IMD satellite gauge merged data plots of 24-hour accumulated rainfall from 2nd to 8th October 2025 is presented in Fig.2.

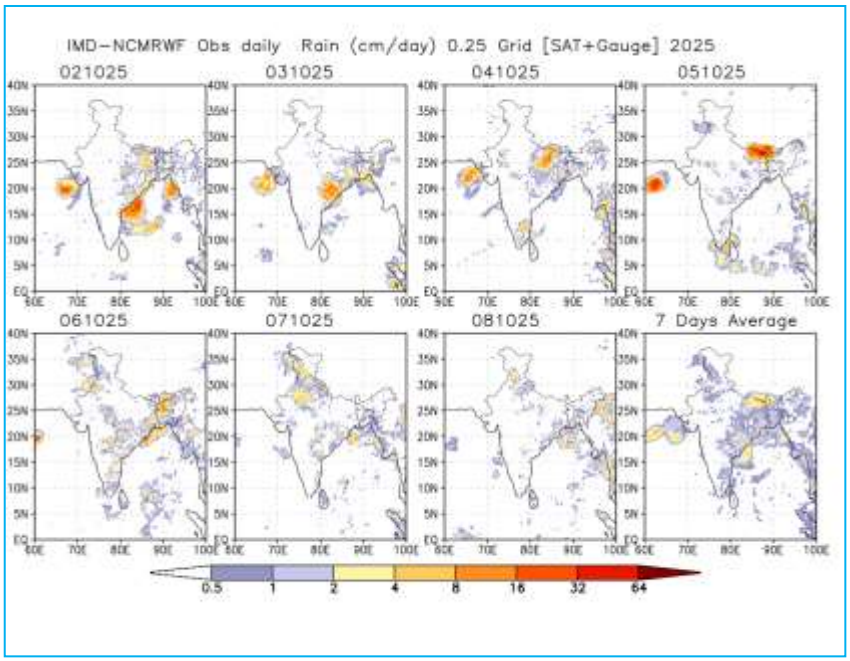

Fig. 2: NCMRWF-IMD satellite gauge merged data plots of 24-hour accumulated rainfall from 2nd to 8th October 2025

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, 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.

Next update: 16.10.2025