

Issued on 17.10.2024

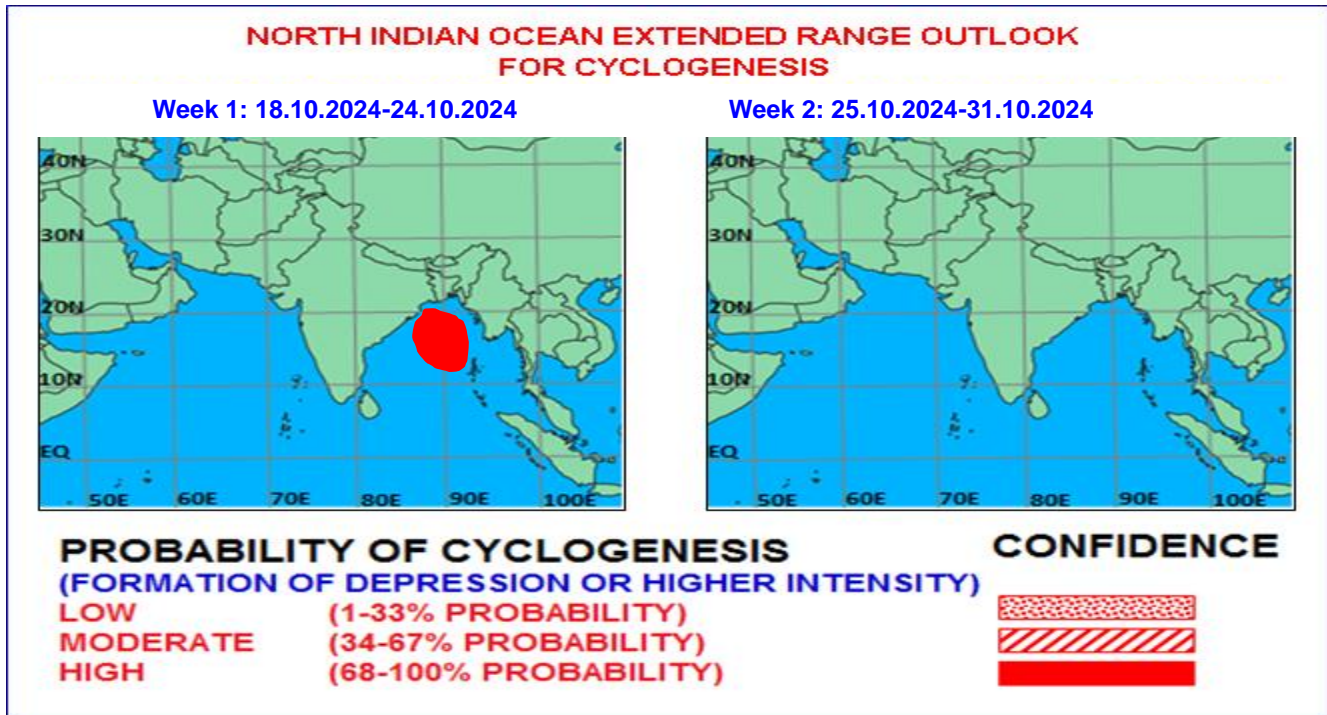


Fig. 1: Graphical Cyclogenesis over the north Indian Ocean during next two weeks

I. Environmental features:

ECMM based forecast indicates that Madden Julian Oscillation (MJO) index is currently in Phase 5 with amplitude greater than 1. It is likely to continue in same phase with amplitude remaining more than 1 during week 1. Thereafter, it will propagate eastwards and move across phase 6 during week 2. Therefore, the MJO phase and amplitude are likely to support enhancement of convective activity over the Bay of Bengal (BoB) during week 1.

The El Niño–Southern Oscillation (ENSO) is neutral, with both sea surface temperatures (SSTs) in the central equatorial Pacific Ocean and atmospheric patterns at ENSO-neutral levels. The Indian Ocean Dipole (IOD) is likely to remain neutral, but weakly negative, during next 2 months. These broadscale features (transition towards LaNina and slightly negative IOD conditions) also indicate a favourable environment for enhancement of convective activity/cyclogenesis over the BoB.

The CFS-NCICS model forecast indicate presence of strong westerly wind anomaly (5-7 mps) alongwith low frequency background waves & MJO over south BoB, easterly wind anomaly (1-3 mps) over central BoB and emergence of an equatorial Rossby Wave (ERW) over North Andaman Sea during week 1. These features are indicating an enhancement towards the end of week 1. During first half of week 2, similar features are indicated over the BoB with extension of westerly wind anomaly (5-7 mps) upto central BoB and easterly wind anomaly (3-5 mps) over North BoB & adjoining coastal Areas Odisha-West Bengal. ERW, MJO and low frequency background waves are likely over central parts of BoB during first half of week 2. Towards the later half of week 2, weakening in easterly wind anomaly over northern parts of BoB is indicated. However, MJO, ERW and low frequency background waves along with strong westerly wind anomaly (5-7 mps) are still likely to persist. Thus,

equatorial waves are likely to contribute towards enhancement of convective activity/cyclogenesis over the BoB during next two weeks.

Over the Arabian Sea (AS) also similar features are likely to prevail during week 1 with prevalence of westerly wind anomaly (3-5 mps) alongwith low frequency background waves & MJO over south AS, easterly wind anomaly (3-5 mps) over central AS. These features will support enhancement of convective activity over the AS during week 1. During week 2, all features indicate diminishing trend.

The sea surface temperature is 28-32°C over the entire BoB. The sea surface temperature is 28-32°C over the eastern parts of AS and is less than 26°C over westcentral & southwest AS off coasts of Oman, Yemen and Somalia. Tropical Cyclone Heat Potential (TCHP) is high 80-100 KJ/cm² over entire BoB except over a few parts over westcentral BoB off Odisha-North Andhra Pradesh coasts and southwest BoB off east off Sri Lanka coast.

Considering all the environmental features, it is inferred that the conditions are favourable for the development of cyclonic disturbances over the Bay of Bengal during end of week 1 and beginning of week 2 and marginally favourable for development of cyclonic circulations/low pressure area over central AS during week 1.

II. Model Guidance:

(i) Bay of Bengal:

Most of the deterministic models (IMD GFS, GEFS, NCEP GFS, ECMWF, ECAI, NCUM-G, NEPS) are indicating emergence of a cyclonic circulation into North Andaman Sea around 20th October. Models (IMD GFS, GEFS, NCEP GFS, ECMWF, ECAI) are indicating intensification of this cyclonic circulation into a low pressure area over central BoB around 22nd October and depression by 24th October. However, there is variation among models regarding peak intensification with ECMWF & GFS indicating depression intensity & NCEP is indicating intensification upto severe cyclonic storm. These models are also indicating movement of the system towards Odisha coast. NCUM group of models is not indicating any cyclogenesis over the BoB during next 10 days. IMD CFS V2 850 hPa anomaly field is indicating a cyclonic anomaly over central BoB during week 1 and another over Odisha during beginning of week 2. The week 1 forecast of the NCMRWF ERF model also portrays similar features in the mean wind field. The IMD ERF model indicates a low to moderate probability (30-40%) of cyclogenesis over central and adjoining south BoB with an extension towards northwest BoB during week 1. No area is found with a significant probability of cyclogenesis during week 2. The ECMWF ensemble forecast Model also indicates moderate probability (40-50%) over the westcentral and adjoining northwest BoB during week 1. A very Low probability (~10%) of cyclogenesis is predicted by the model over westcentral and adjoining eastcentral BoB during the second week.

(ii) Arabian Sea:

Most of the numerical models are indicating low/cyclonic circulation over eastcentral AS to move West-Northwestwards without any significant intensification. Extended range models area also not indicating any cyclogenesis over the Arabian Sea during the period.

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: National Centre for Environment Prediction GFS, GEFS: GFS ensemble forecast system, 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) There is high probability of cyclogenesis (formation of depression) over central Bay of Bengal during 23rd to 24th October.
- (ii) The existing cyclonic circulation over North Lakshadweep is likely to move west-northwestwards during next 3-5 days without any significant intensification.

IV. Impact Expected and Action suggested:

Rough to very rough sea conditions over Andaman Sea during 21st to 23rd, Central Bay of Bengal during 22nd-24th and North Bay of Bengal during 24th-26th October and along & off coastal areas of Odisha, West Bengal, Andhra Pradesh, Bangladesh and Myanmar during 24th-26th October.

Advisory:

Fishermen are advised not to venture into central Bay of Bengal and North Andaman Sea from 22nd to 24th and north Bay of Bengal during 24th to 26th October.

Judicious regulation of Shipping, Port and Naval base activities during above period.

Tourism activities may be guided over the Andaman & Nicobar Islands and adjoining sea areas during 21st-23rd October.

V. Verification of forecast issued during last two weeks:

The extended range outlook issued on 3rd October indicated cyclogenesis over the Bay of Bengal during week 2 (11-17 Oct) and no cyclogenesis over the Arabian Sea. The extended range outlook issued on 10th October indicated cyclogenesis over central parts of Arabian Sea with high probability and over southwest Bay of Bengal during week 1 (11-17 Oct). Actually, depression formed over central Arabian Sea on 13th October and another over southwest Bay of Bengal on 15th October. Thus, the cyclogenesis over Bay of Bengal could be predicted in week 2 and week 1 forecasts and that over Arabian Sea 1 could be well indicated in week 1 forecast. Verification of extended range outlook issued on 3rd and 10th October is graphically shown in Fig. 2.

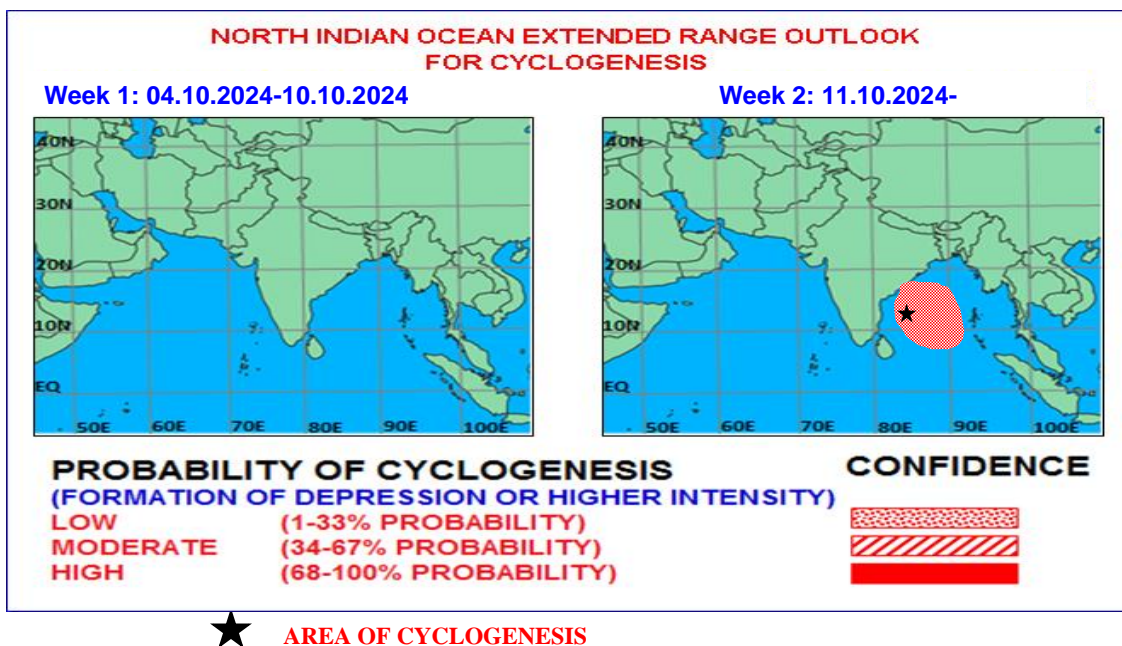


Fig. 2 (a): Extended Range Outlook issued on 3rd October indicating probability of Cyclogenesis over Bay of Bengal

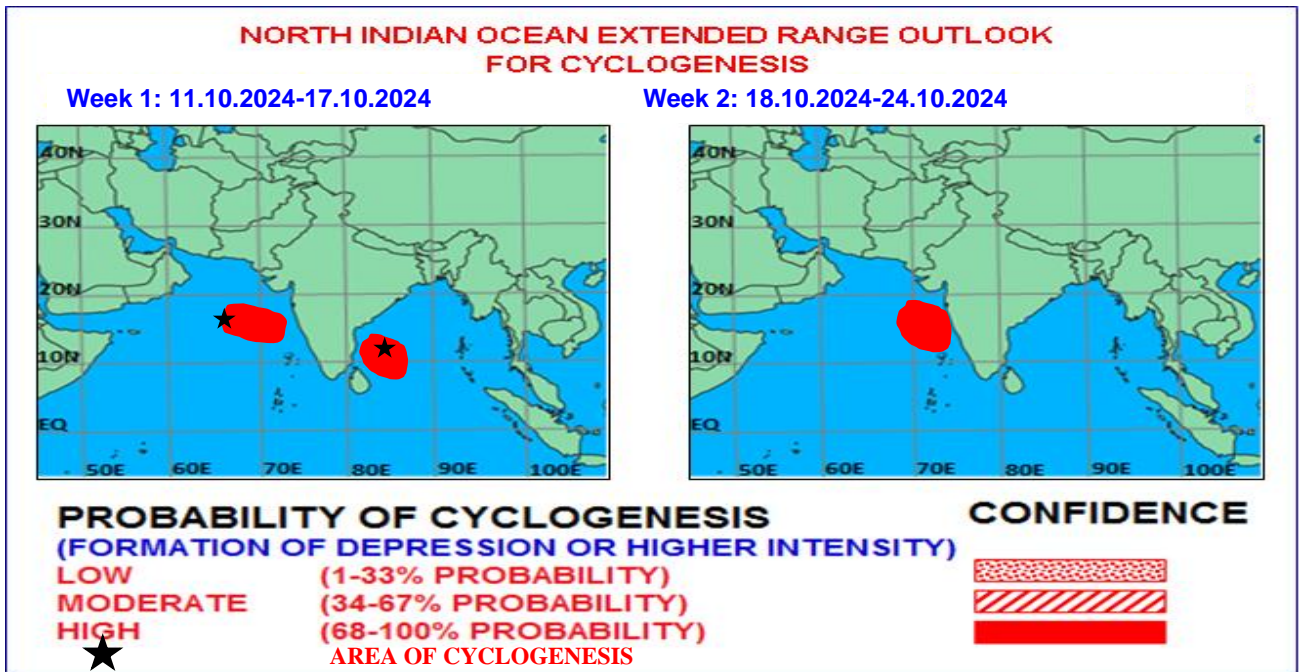


Fig. 2(b): Extended Range Outlook issued on 10th October indicating probability of Cyclogenesis over Bay of Bengal and Arabian Sea

The observed satellite-gauge merged analysis of 24 hours accumulated rainfall from 10th October to 16th October, 2024 is shown in Fig. 3.

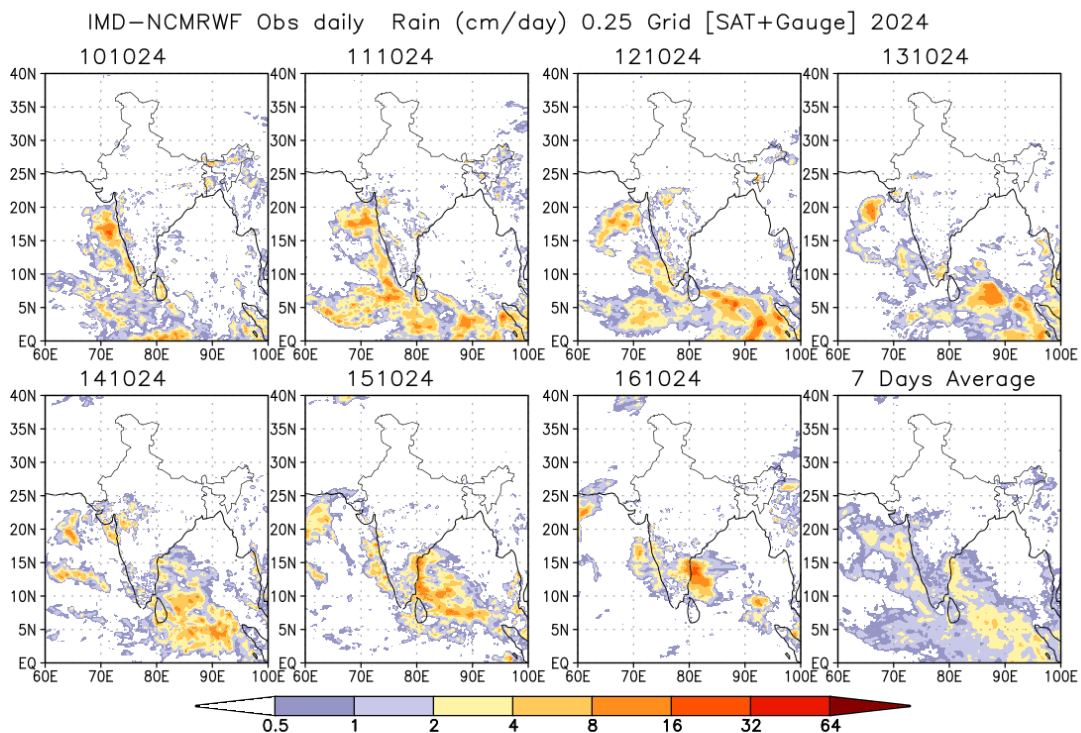


Fig. 3: NCMRWF-IMD satellite gauge merged data plots of realized 24 hours accumulated rainfall from 10th October to 16th October, 2024.

Next update: 24.10.2024