India Meteorological Department
Ministry of Earth Sciences
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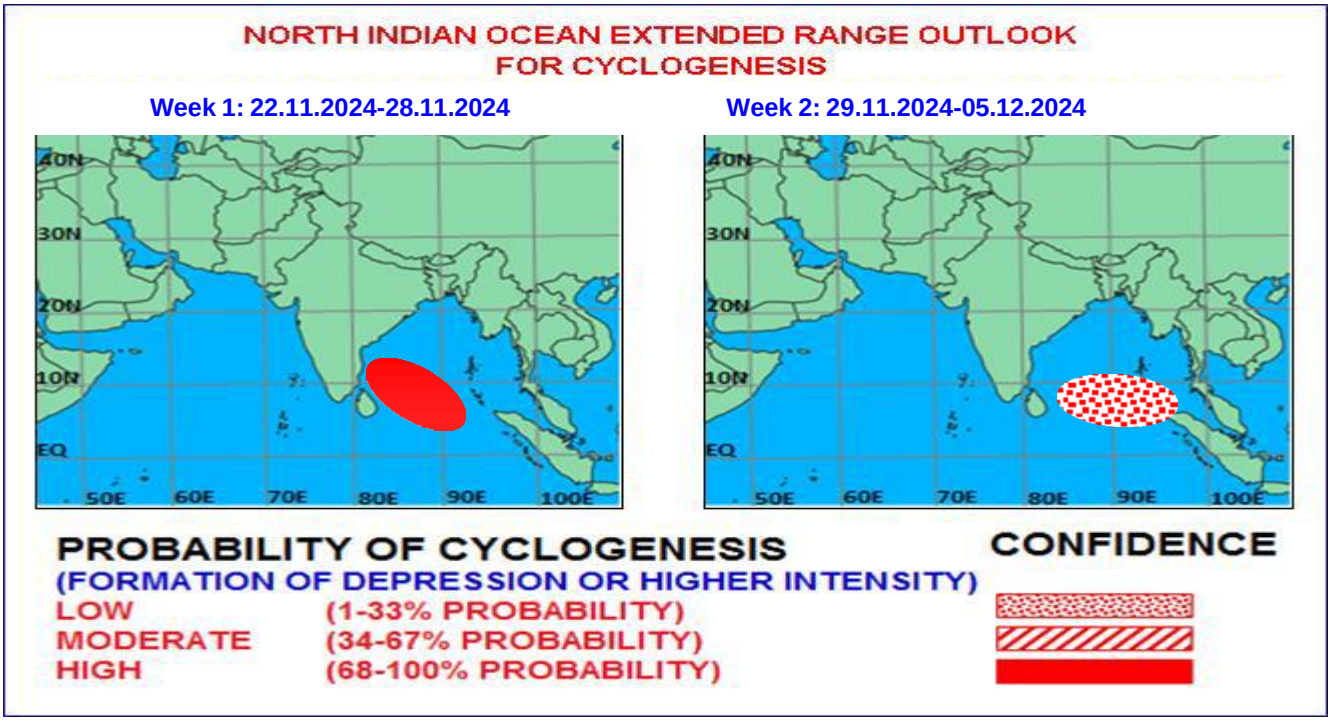

Fig. 1: Graphical Cyclogenesis over the north Indian Ocean during next two weeks

I. Environmental features:

Monitoring of Madden Julian Oscillations (MJO) indicates that it has entered into phase 3 with an amplitude greater than 1. Different model forecasts suggest that it will be within phase 3 till the later part of the week with a slow variation in amplitude. At the end of the first week, MJO is likely to enter into phase 4 and propagate eastward across phase 4 coherently in the first half and within phase 5 during the second half of the second week. The GEFS and CFS models show eastward propagation in phase diagram with higher amplitude whereas ECMF and ECMM keep amplitude close to unity. Thus, MJO would actively support the enhancement of convective activity over both the Arabian Sea (AS) and Bay of Bengal (BoB) basins during the first week and cyclogenesis over Bay of Bengal during both weeks.

The CFS-NCICS model-based forecast indicates that the westerly wind anomaly (5-7 mps) is likely to prevail over south BoB & adjoining Andaman Sea and North Equatorial Indian Ocean (NEIO) during week 1. The westerly wind anomaly would expand and increase further (7-9 mps) over the same region and especially over south BoB during the later part of the first week. Strong westerly winds are likely to continue till the first half of the second week. Strong easterly winds (3-5 mps) are likely over central & adjoining south BoB during week 1 and weaker (1- 3 mps) easterly wind anomaly is likely over central and adjoining north BoB during week 2. In addition, during both the weeks, Equatorial Rossby Waves (ERW) alongwith low-frequency background waves and MJO waves are likely over Andaman Sea and South BoB.

All the features of zonal wind and equatorial waves indicate favorable conditions for the enhancement of convective activity over the south BoB during second half of week 1 and during entire week 2.

The El Niño–Southern Oscillation (ENSO) is neutral condition, but on the negative side. The Indian Ocean Dipole (IOD) is likely to remain neutral, but weakly negative, during next 2 weeks. These broadscale features (transition towards LaNina and slightly negative IOD conditions) indicate a favorable environment for enhancement of convective activity/cyclogenesis over the BoB.

II. Model Guidance:

Various deterministic model forecasts are suggesting formation of a low pressure system a low pressure area is likely to form over southeast Bay of Bengal around 23rd November. Thereafter, it is likely to move west-northwestwards and intensify into a depression over central parts of south Bay of Bengal during subsequent 2 days. Thereafter, there is a lack of agreement amongst models regarding further movement and intensification of the system. IMD GFS model indicates that the system is likely to intensify into a severe cyclonic storm by 24th, thereafter while moving west-northwestwards intensify further into a very severe cyclonic storm on 25th November and cross north Sri Lanka coast and south Tamil Nadu Coast during night of 26th November. The NCEP GFS model also suggest the maximum intensify of the system reaching upto very severe Cyclonic storm. But the movement of the system is comparatively slower, more northwestward and weaken before it reaches near north Tamil Nadu coast on 28th morning as a cyclonic storm. The model suggests landfall over north Tamil Nadu during forenoon of 28th November as a deep depression. The ECMWF model indicates that the intensification of the system is very slow and the system is likely to intensify into a depression by 25th morning over southwest BoB off Sri Lanka coast. Thereafter the system likely to move nearly northwestwards along Sri Lanka coast across southwest BoB for two days and weaken reaching near Tamil Nadu coast 27th November morning. Further weakening, it is likely to cross north Tamil Nadu caost 28th Novmber morning as a low pressure area. The NCUMG model predicted an extended low over southwest BoB off south Sri Lanka on 26th November. Thereafter, it moves northwards and gradually intensify into a depression on 27th over southwest BoB off Tamil Nadu coast, into a cyclonic storm on 28th over westcentral BoB of south Andhra Pradesh coast. It is likely to recurve thereafter over westecentral BoB off north Andhra Pradesh coast and intensify further into a severe cyclonic storm on 29th and 30th November as it is likely to move northwestwards across westcentral BoB.

The GPP guidance products indicate that a zone of significant values of GPP (>30) is prevailing over southeast BoB. The zone gradually move west-northwestwards initially across southeast BoB and then northwestwards across southwest BoB to reach near north Tamil Nadu coast on 28th November. IMD-CFS V2 (Extended Range Model) mean wind forecasts at 850 hPa indicate a strong cyclonic circulation over the southwest Bay of Bengal during the first week. The cyclonic circulation is also seen during week 2 over southern parts of the peninsular India and adjoining southeast AS. The wind anomaly at 850 hPa for the first week portray a weak cyclonic circulation over southwest BoB during week 1. The week 2 wind anomaly field suggests a strong cyclonic circulation over eastcentral AS off the Karnataka-Goa coasts. The model also indicates a high probability (>80%) of cyclogenesis over southwest BoB during first week. The ECMWF ensemble forecasts indicate a high probability (>80%) over central parts of south BoB on 26th November and a low-moderate probability (20-50%) over eastcentral and adjoining southeast AS during around 1st December. The model also suggests a moderate probability (40-50 %) of cyclogenesis over

the south Bay of Bengal during second week.

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/GEFS/CFS: National Centre for Environment Prediction GFS/GEFSv12/CFSv2, 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.

III. Inference:

Considering all the above environmental conditions and model guidance it is inferred that:

(1) Existing cyclonic circulation over the Equatorial Indian Ocean off Sumatra coast and adjoining South Andaman Sea is likely to become a low pressure area over southeast Bay of Bengal around 23rd November. It is likely to move west-northwestwards and intensify into a depression over central parts of south Bay of Bengal around 25th November. It is likely to move west-northwestwards towards Tamil Nadu-Sri Lanka coasts subsequently. Hence there is high probability of cyclogenesis over central parts of south Bay of Bengal during first half of week 1.
(2) There is also low probability of fresh cyclogenesis over the south Bay of Bengal during week 2.

IV. Verification of forecast issued during last two weeks:

The forecast issued on 7th November for week 2 (15-21 Nov) indicated no cyclogenesis over both the basins. The forecast issued on 14th November indicated a low probability of cyclogenesis over the south Bay of Bengal during the first half of the second week.

Actually no cyclogenesis occurred during 15-21st November. However, an upper air cyclonic circulation has formed over Equatorial Indian Ocean off Sumatra coast and adjoining South Andaman Sea in lower tropospheric level in the morning of today, the 21st November, 2024.

NCMRWF-IMD satellite gauge merged data plots of realized 24 hours accumulated rainfall from 14th November – 20th November, 2024 are presented in Fig. 2.

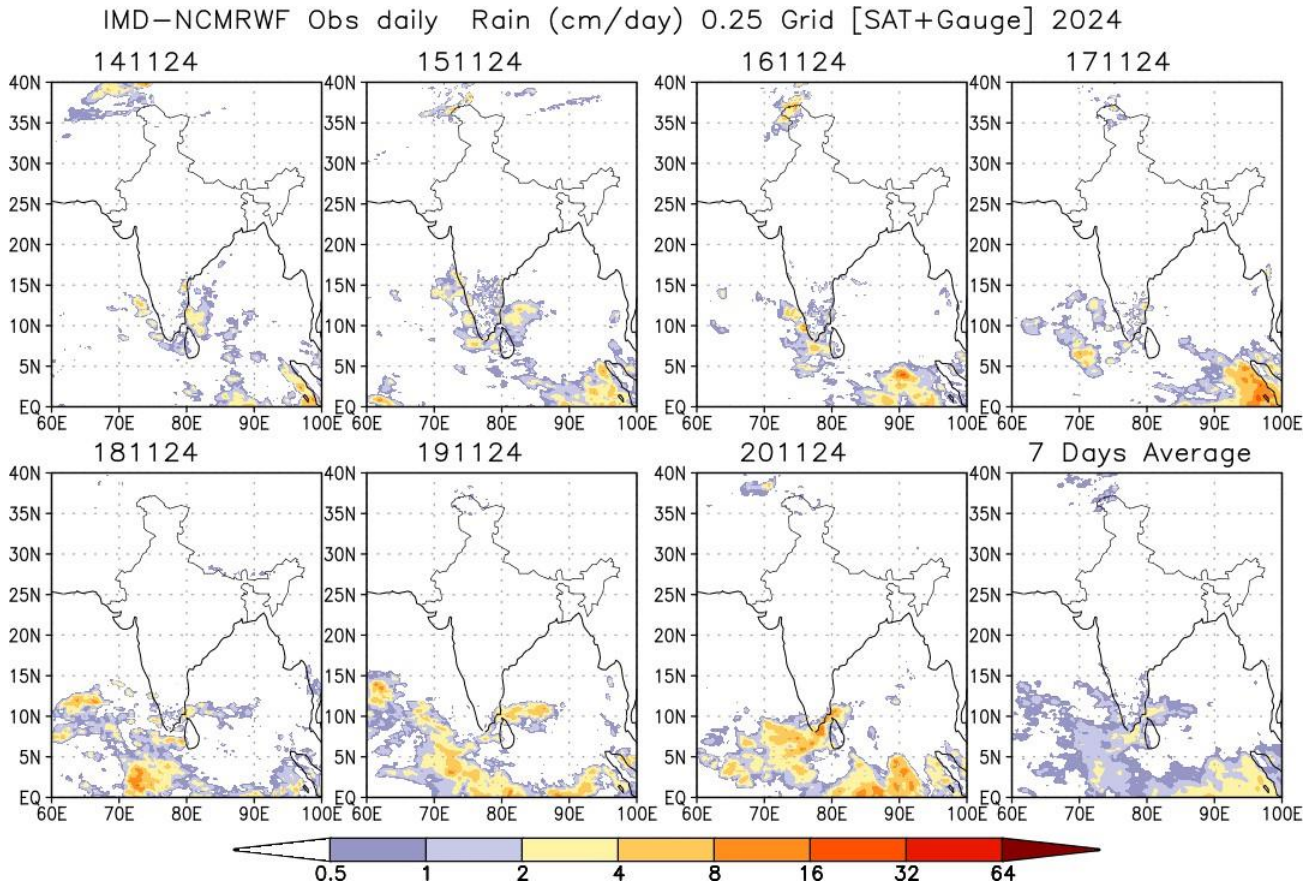

Fig. 2: NCMRWF-IMD satellite gauge merged data plots of realized 24 hours accumulated rainfall from 14th November – 20th November, 2024.

Next update: 28.11.2024