

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

I. Environmental features:

Most of the models are indicating that currently, MJO is in phase 3 with amplitude less than 1. It would enter into phase 4 during next 2 days and thereafter move across phase 4 during week 1 with amplitude remaining less than 1. The CFS and ECMWF forecasts generally favour the eastward propagation of the MJO and it is likely to be in phase 5 during first half of week 2 and enter into phase 6 thereafter. Thus, the MJO is shifting eastward across the Maritime Continent and western Pacific through early October. The models remain divided with regards to the eventual amplitude of MJO with large ensemble spread. MJO is conducive for the convective activity over the Bay of Bengal (BoB) during entire forecast period.

NCICS based forecast for equatorial waves over the region indicates presence of westerly winds (5-7 mps) over the central and adjoining south & northeast AS and about 3-5 mps over central parts of Indian mainland and central BoB during week 1. The presence of Equatorial Rossby Waves (ERW) is likely over central AS and northeastern states of India and adjoining Myanmar during the same time. Further, the easterly winds (3-5 mps) over northern parts of India are indicated in the forecast of week 1. These features indicate enhanced convective activity over BoB during week 1. The westerly winds (7-9 mps) along with ERW are likely over south and adjoining central BoB in week 2 leading to development of cyclonic circulation over northern parts of BoB. Therefore, equatorial waves are likely to contribute towards cyclogenesis over BoB during week 2.

Model Guidance:

Most of the deterministic models including IMD GFS, NCEP GFS, NCUM and ECMWF are indicating that the existing low pressure area over southeast Jharkhand & neighbourhood would move slowly northwestwards and its remnant cyclonic circulation in the lower tropospheric levels is likely to move northward towards east Uttar Pradesh and adjoining Bihar during next 3-4 days. ECMWF and NCUM models are showing the formation of low pressure area over central BoB with intensification into depression during end of week 1 around 28th September and move further west-northwestwards towards north Andhra Pradesh-Odisha coasts during first half of week 2. The NCEP GFS model forecasts indicate that a low pressure area would form over eastcentral-southeast BoB and adjoining Andaman Sea around 29th

September which is likely to move west-northwestward and intensify further into a depression over Central BoB and subsequently into a cyclonic storm over westcentral BoB during next 3-4 days. However, IMD GFS model is not indicating any cyclogenesis over BoB during week 1.

The mean wind and anomaly of wind forecasts by extended range model IMD CFS (V2) are indicating a cyclonic circulation over central BoB and another over northeast & adjoining eastcentral AS during week 2. During the same period, the model is displaying 20-30 % probability of cyclogenesis over northeast AS and also over eastcentral BoB whereas the ECMWF model indicates 10-20 % probability over north and adjoining central BoB.

Legends: 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, European Centre for Medium Range Weather Forecasting, GPP: Genesis Potential Parameter, National Centre for Environment Prediction GFS, ECMM: ECMWF multi model, GEFS: GFS ensemble, NEPS: NCUM ensemble prediction system, CNCUM: Coupled NCUM, CPC: Climate Prediction Center, NWS: National Weather Service).

II. Inference:

Considering all the above it is inferred that:

- (i) There is no probability of cyclogenesis over the region during week 1.
- (ii) There is a likelihood of formation of low pressure area over eastcentral Bay of Bengal and adjoining area during first half of week 2 and a low probability of cyclogenesis over the same region.

III. Verification of forecast issued during last two weeks:

The forecast issued on 7th September for week 2 (15.09.2023-21.09.2023) indicated formation of cyclonic circulation over North BoB during the beginning of week 2.

The forecast issued on 14th September for week 1 (15.09.2023-21.09.2023) indicated the low pressure area over North Odisha/ it's remnant cyclonic circulation to move west-northwestwards over central parts of India and emerge into northeast AS towards the end of week.

Actually, a low pressure area formed over central parts of BoB on 13th September. It became well marked low pressure area on 14th September. It became low pressure area over North Odisha on 15th September. Thereafter, it moved west-northwestwards and became less marked on 18th September over southeast Rajasthan. However, associated cyclonic circulation, moved further west-northwestwards and lay over South Pakistan and adjoining Kutch on 21st September. Thus, the movement of low/pressure area/ it's cyclonic circulation and its emergence into northeast AS was correctly predicted with some spatial variation.

The forecast issued on 14th September also indicated the likelihood of formation of another cyclonic circulation over eastcentral BoB during later part of week 1 with west-northwestward movement towards north BoB in the beginning of week 2. Actually, a cyclonic circulation formed over eastcentral and adjoining northeast BoB on 18th September. It lay as a low pressure area over northwest BoB on 19th September. It moved west-northwestwards and lay over southeast Jharkhand on 21st September. Thus, likely formation of cyclonic circulation/low pressure area and its movement was correctly indicated in week 1 forecast.

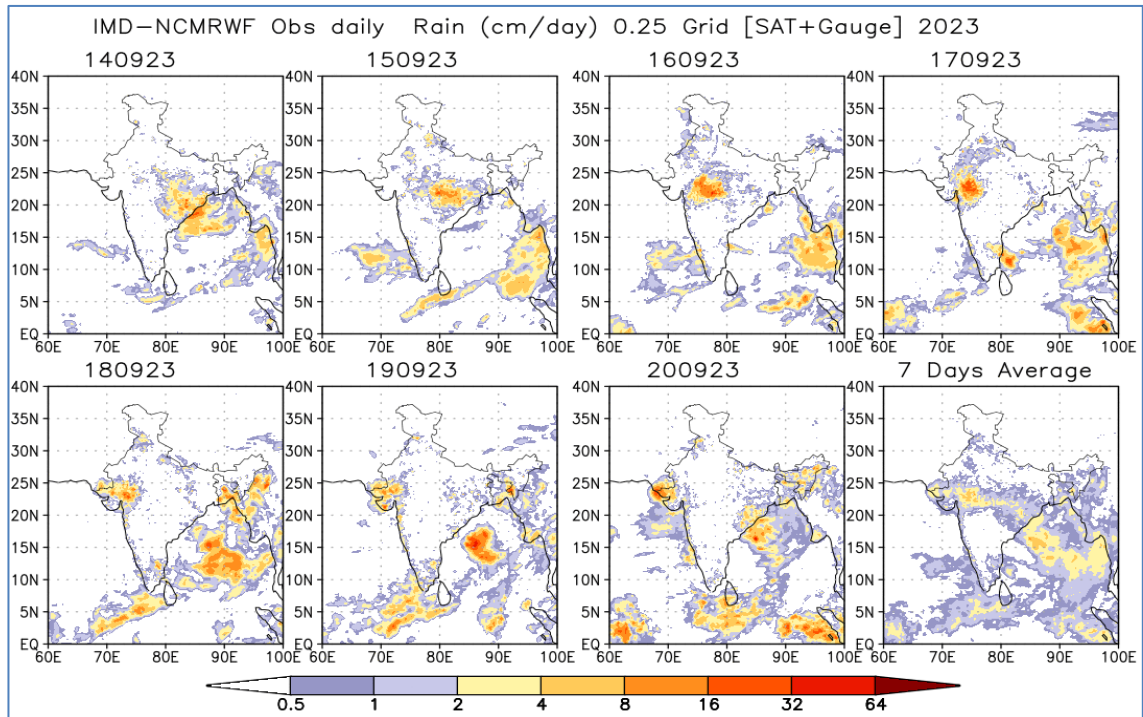


Fig.2: IMD-NCMRWF satellite-gauge merged data plots during 14th-20th September, 2023

Next update: 28.09.2023