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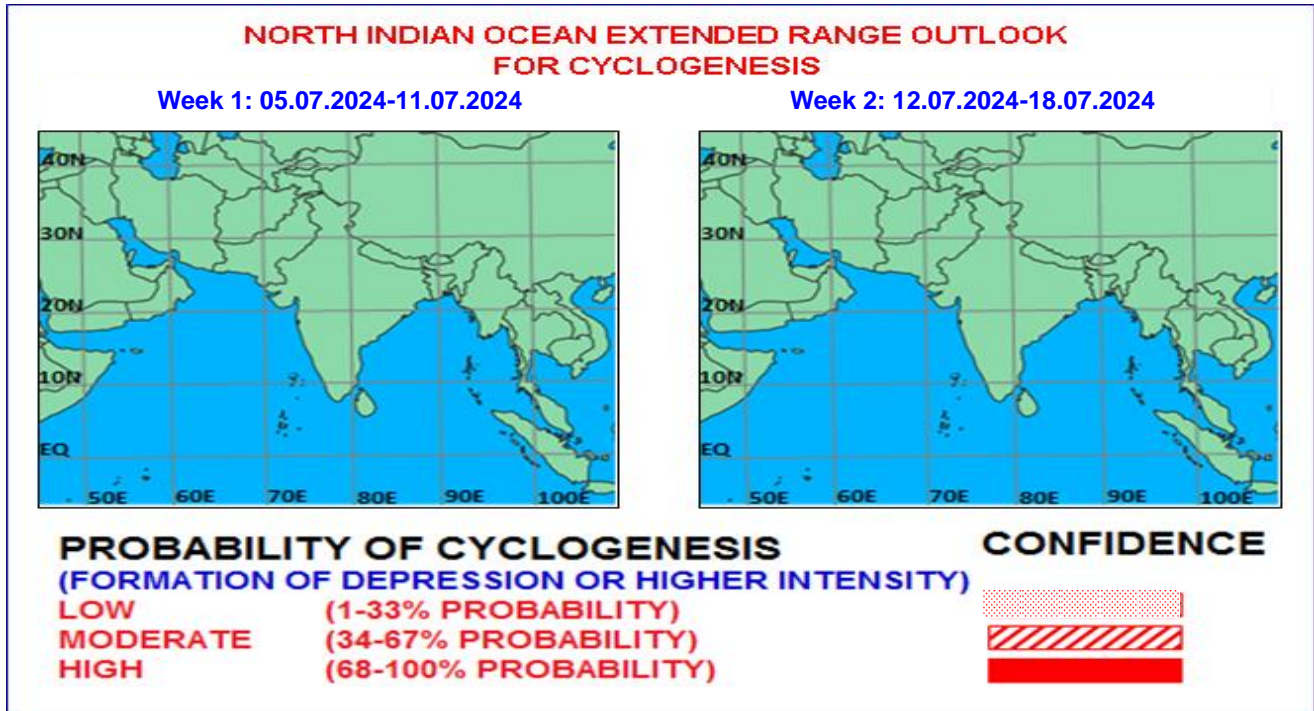


Fig. 1: Graphical Cyclogenesis over north Indian Ocean during next two weeks

I. Environmental features:

The Madden Julian Oscillation (MJO) index is currently located in phase 3 with an amplitude more than 1. It is likely to move across phase 4 with amplitude close to 1 during the first half of first week. Thereafter, it would move across phase 5 without any significant change in amplitude till the middle of week 2. In the later part of week 2, the amplitude will decrease gradually to become less than 1. Consequently, MJO phase and amplitude are favourable for the enhancement of convective activity over the north Bay of Bengal (BoB) during the forecast period.

The NCICS based forecasts for zonal winds indicate easterly winds (~ 3 to 5 mps) over north BoB and central India during first week. Subsequently, westerly winds (1-3 mps) over south BoB and easterly winds (1-3 mps) over north BoB are likely during the second week. Thus, zonal winds and equatorial waves are likely to contribute marginally towards the enhancement of convective activity over the BoB during week 2.

II. Model Guidance:

Various NWP models (IMD GFS, NCEP GFS, GEFS, ECMWF and NCUM) indicate strong southwesterly winds over AS and BoB during the next 10 days. But the temporal evolution of monsoon trough in terms of its position, extension and tilt with height is varying among different models. The GFS group of models indicates the likely formation of a cyclonic circulation in the lower tropospheric levels over westcentral & adjoining northwest BoB around 8th July with subsequent west-northwestwards movement along the monsoon trough across central India during later part of first week. During this period, the ECMWF model also predicts the likely formation of cyclonic circulation/feeble low pressure area over the same region. However, NCUM model does not indicate any weather system over BoB and AS

during next 10 days. IMD GPP forecasts for 7 days do not indicate any significant potential zone for cyclogenesis over BoB and AS. The NCEP GFS model predicts the formation of a low pressure area over westcentral BoB on 17th July. ECMM model indicates a land depression with low probability across Northwest India.

IMD extended range model CFSV2 indicates established strong southwesterly winds of monsoon at 850 hPa level over AS during both the weeks and over BoB during week 2. The wind anomaly field is indicating a cyclonic circulation over northeast AS off south Gujarat coast during first week which is likely to locate over eastcentral AS off Maharashtra coast during week 2. A feeble cyclonic circulation over central BoB is also likely during second week. The model also indicates 30-40% probability of cyclogenesis over land areas of north India during both weeks.

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 (ECMWF), GPP: Genesis Potential Parameter, National Centre for Environment Prediction (NCEP) GFS, ECMM: ECMWF multi model, GEFS: GFS ensemble, 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 there is no probability of cyclogenesis during the entire forecast period.

However, there is a:

- (a) moderate probability for the formation of a cyclonic circulation/low-pressure area over westcentral & adjoining northwest Bay of Bengal with subsequent northwestwards movement during middle of the first week.
- (b) low probability for the formation of another low-pressure area over westcentral Bay of Bengal during later part of the second week.

IV. Verification of forecast issued during last two weeks:

Forecast: Forecast issued on 20th June for second week (28.06.2024-04.07.2024) indicated low probability for the formation of a low pressure area/cyclonic circulation over the westcentral & adjoining northwest BoB in the beginning of week 2 and low probability of formation of a cyclonic circulation over northeast Arabian Sea during later half of week 2. The forecast issued on 27th June for first week (28.06.2024-04.07.2024) predicted low probability of formation of a feeble low-pressure area over northwest & adjoining westcentral BoB with northwestwards movement during first half of week 1. No cyclogenesis (formation of depression) was indicated in the forecasts issued during both weeks.

Realised: Actually, a cyclonic circulation formed over westcentral & adjoining northwest BoB on 26th June. Under its influence, a low pressure area formed over northwest BoB off North Odisha coast on 28th June. It moved nearly northwards and lay over northwest BoB and adjoining north Odisha-Gangetic West Bengal coasts on 29th June. It became less marked on 30th June. However, associated cyclonic circulation persisted and lay over east Jharkhand on 30th June; Sub-Himalayan West Bengal on 1st July; Bangladesh on 2nd & 3rd July and became less marked thereafter.

A cyclonic circulation formed over Central Gujarat on 27th June. It lay over South Gujarat on 28th June. It emerged into northeast Arabian Sea on 29th June. It moved north-northwestwards and lay over southeast Pakistan and adjoining Kutch on 30th June and became less marked on 1st July.

Hence, the likely formation of cyclonic circulation over BoB and AS could be captured well two weeks in advance.

NCMRWF-IMD satellite gauge merged data plots of realized 24 hours accumulated rainfall from 27th June to 3rd July, 2024 are presented in **Fig. 2**.

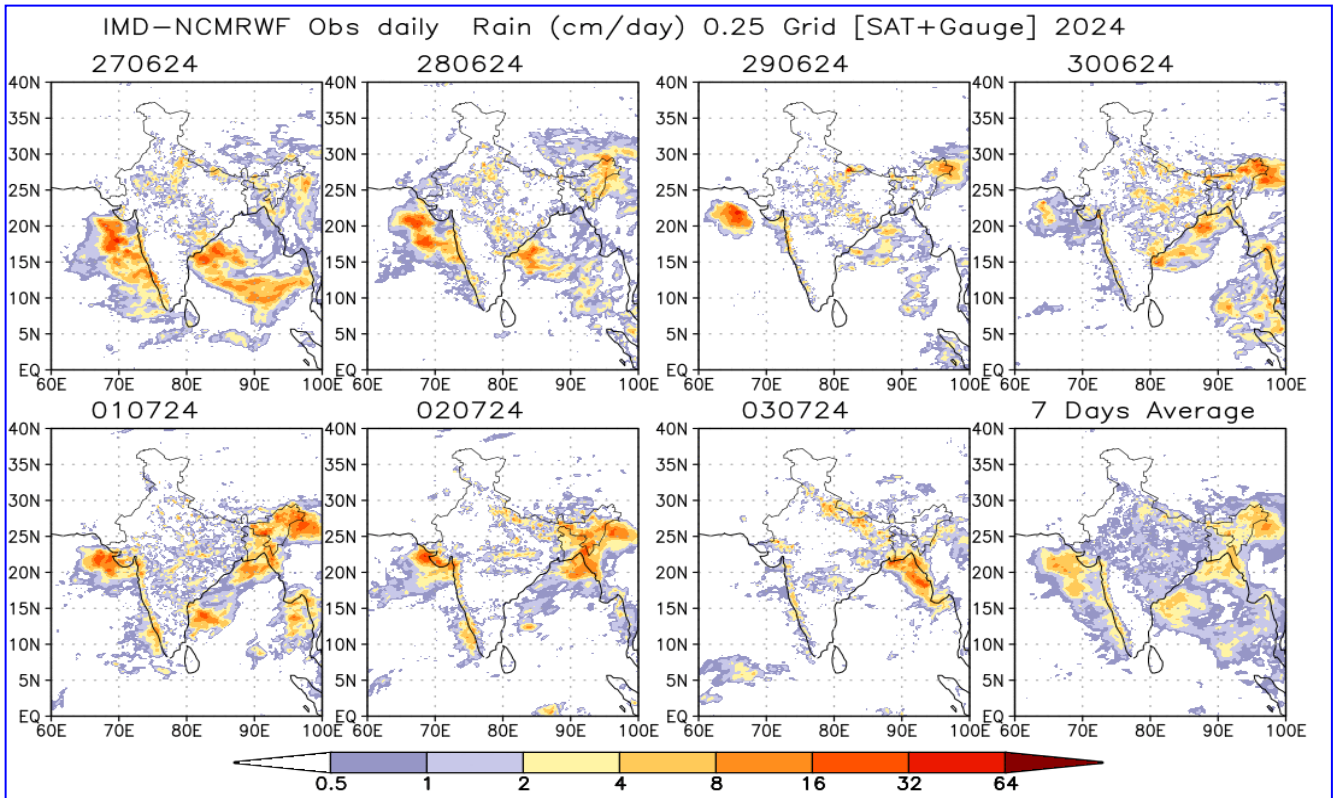


Fig. 2: NCMRWF-IMD satellite gauge merged data plots of observed 24 hours accumulated rainfall from 27th June to 3rd July, 2024.

Next update: 11.07.2024