



Ministry of Earth Sciences
India Meteorological Department
Cyclone Warning Division, New Delhi



FDP (Cyclone) NOC Report Dated 28th November, 2019

Time of Issue: 1200 UTC

Synoptic features:

- No significant weather system is seen over NIO region.

Dynamical and thermodynamical features

Sea Surface Temperature (SST):

Sea Surface Temperature is around 26-28°C over westcentral Arabian Sea and north Arabian Sea and western parts of southwest Arabian Sea. It increases to 28-30°C over eastcentral and southeast Arabian Sea. There is a very small pocket of values around 25°C over northeast AS.

SST is around 26-28 °C over most parts of north BoB and adjoining WC BoB. It is between 28 - 30°C over rest BoB with higher values over eastcentral and south BoB.

Tropical Cyclone Heat Potential (TCHP):

Tropical Cyclone Heat Potential (TCHP) is 20-50 kJ/cm² over north Arabian Sea, westcentral, adjoining eastcentral and western parts of southwest Arabian Sea. Over southeast Arabian Sea it is of value 80-100 kJ/cm². There are areas of values more than 100 kJ/cm² southeast Arabian Sea, off Kerala coast & Lakshadweep area.

TCHP is around 30-50 kJ/cm² over north BoB and adjoining westcentral BoB. It is around 80-90 kJ/cm² over rest of the BOB.

Relative Vorticity:

No significant areas of cyclonic relative vorticity seen over BoB, rather anti-cyclonic vorticity prevails over major parts of the BoB.

Cyclonic relative vorticity of value $10-50 \times 10^{-5} \text{ s}^{-1}$ seen over major parts of the southwest Arabian Sea.

Low level Convergence:

An area of positive lower level convergence of value $10-20 \times 10^{-5} \text{ s}^{-1}$ is seen over southwest BoB off Sri Lanka coast.

Areas of positive lower level convergence of value $30-40 \times 10^{-5} \text{ s}^{-1}$ is seen over equatorial Indian Ocean to the south of southwest Arabian Sea.

Upper level Divergence:

An area of positive upper level divergence of value $10-20 \times 10^{-5} \text{ s}^{-1}$ is seen over southwest BoB off Sri Lanka coast and adjoining equatorial Indian Ocean.

An area of positive upper level divergence of value $20-30 \times 10^{-5} \text{ s}^{-1}$ is seen over west equatorial Indian Ocean to the south of southwest Arabian Sea.

Wind Shear:

Wind shear is high over north and central Arabian Sea and low to moderate over southeast Arabian Sea and adjoining equatorial Indian Ocean.

Wind shear is high over north and adjoining central BoB. It is low to moderate over rest BoB and Andaman Sea and adjoining equatorial Indian Ocean.

Wind Shear Tendency:

The wind shear tendency is positive or neutral over entire BoB.

It is negative or neutral over most parts of Arabian Sea.

Upper tropospheric ridge:

The upper tropospheric ridge at 200 hPa runs roughly along 12°N over BoB and roughly along 10°N over Arabian Sea.

Satellite observations based on INSAT imagery:

Arabian Sea:-

As per the satellite imagery at 0900 UTC of 28th November, 2019, scattered low to medium clouds with embedded intense to very intense convection lies over south and adjoining central Arabian Sea to the south of 17°N latitude.

Bay of Bengal & Andaman Sea:

According to 0900 UTC satellite imagery, scattered low/medium clouds with embedded moderate to intense convection lies over south BoB and south and central Andaman Sea.

Large scale features

M.J.O. Index:

MJO index is in Phase 1 with amplitude near to 1. It is likely to further amplify and remain in the same phase for next 3-4 days and move to Phase -2 thereafter.

Storms and Depression over South China Sea/ South Indian Ocean: Nil

NWP Input for FDP Cyclone based on 0000 UTC of today

IMD-GFS T-1534: Indicates a low pressure area over equatorial Indian Ocean and adjoining southwest Arabian Sea on 29th and 30th, which becomes less marked thereafter.

IMD-GEFS: Indicates development of a Low Pressure area (Lopar) over equatorial IO to the south of southwest Arabian Sea (AS) on 29th and 30th November and a twin of this as a well marked Lopar over south equatorial IO. No further development is forecast for the system over the north IO during the subsequent 7 days.

IMD-WRF: Forecast shows no significant Low Pressure system for the next 3 days.

NCMRWF-NCUM: Indicates a low pressure area over equatorial Indian Ocean and adjoining southwest Arabian Sea from 29th to 2nd December, which becomes a depression on 3rd and a CS on 4th and 5th off Somali coast and becomes less marked on 6th.

NCMRWF-UM-Regional Model: Indicates development of no low pressure system for the next 3 days.

NEPS Model: Indicates development of a low pressure area, over equatorial Indian Ocean to the south of southwest Arabian Sea on 29th November. It intensifies into a well Marked Low by 2nd December and a depression by 3rd December and reaches Somalia coast during 4th to 5th December as a CS. It becomes less marked on 6th.

ECMWF: Indicates a low pressure area over equatorial Indian Ocean and adjoining southwest Arabian Sea on 01st December which becomes a depression on 2nd December off Somali coast. It becomes unimportant the next day.

NCEP-GFS: Indicates development of a low pressure area on 29th November which becomes a WML on 30th and a depression from 01st to 04th December over southwest Arabian Sea and adjoining equatorial Indian Ocean, close to Somali coast. It starts weakening from 5th December and becomes less marked thereafter.

ARP-Meteo France : Nil.

Dynamical statistical models

IMD Genesis Potential Parameter (GPP):

An area of significant zone of GPP is seen to develop over southwest Arabian Sea during on 28th November, which increases in area by 30th and persists over the same area till 03rd December. On 4th and 5th December, it is seen over southwest Arabian Sea off Somalia coast.

IMD NWP products are available at:

<http://nwp.imd.gov.in/bias/gfsproducts.php>

<http://nwp.imd.gov.in/bias/wrf27pro.php>

http://www.rsmcnewdelhi.imd.gov.in/NWP_CYC/Analysis.htm or

[http://www.rsmcnewdelhi.imd.gov.in/NWP_CYC/<HH> hrs.htm](http://www.rsmcnewdelhi.imd.gov.in/NWP_CYC/<HH>hrs.htm)

<HH> are forecast hours i.e. 24, 48, 72 and etc.

Summary and Conclusion:

Amongst the NWP models considered, most of them including IMD GFS, GEFS, NCEP GFS, NCUM, NEPS and ECMWF are indicating development of a low pressure area over equatorial Indian Ocean and adjoining southwest Arabian Sea during 29th/ 30th November. Most of these models are indicating further intensification of the system to a depression during 01st to 03rd December. Except for NCUM and NEPS, no other model is indicating the system to further intensify into a CS. The development of a low pressure area over southwest Arabian Sea and its possible intensification needs to be monitored.

Probability of cyclogenesis over Bay of Bengal and Andaman Sea during next 120 hours:

24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS
Nil	Nil	Nil	Nil	Nil

Probability of cyclogenesis over Arabian Sea during next 120 hours:

24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS
Nil	Nil	Nil	Low	Low

Advisory: No IOP area for the next 5 days













