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

FDP (Cyclone) NOC Report Dated 10th December, 2019

Time of Issue: 1200 UTC

Synoptic features:

- Yesterday's Depression over southwest Arabian Sea moved westwards and weakened into a Well Marked Low Pressure Area at 0600 UTC of 10th December, 2019, over southwest Arabian Sea. It further weakened into a low pressure area at 0900 UTC over the same region.
- A trough in easterlies extending upto 0.9 km above mean sea level lies over Equatorial Indian Ocean & adjoining Comorin area.
- A cyclonic circulation lies over southeast Arabian Sea & adjoining Lakshadweep area between 1.5 & 3.1 km above mean sea level.

Dynamical and thermodynamical features

Sea Surface Temperature (SST):

Sea Surface Temperature is around 25-28°C over north, westcentral and most parts of southwest Arabian Sea. It is around 28-30°C over rest Arabian Sea.
SST is around 25-28°C over north and adjoining westcentral BoB. It is around 28-29°C over rest BoB.

Tropical Cyclone Heat Potential (TCHP):

Tropical Cyclone Heat Potential (TCHP) is less than 40-50 kJ/cm^2 over north, westcentral and most parts of southwest Arabian Sea. There are areas where TCHP is more than 100 kJ/cm^2 over south Arabian Sea.
Tropical Cyclone Heat Potential (TCHP) is less than 40-50 kJ/cm^2 over north, westcentral and some parts of southwest BoB. It is around 50-80 kJ/cm^2 over rest area.

Relative Vorticity:

Cyclonic relative vorticity of value 30-40x10^{-5} s-1 is seen in association with the LOPAR in southwest Arabian Sea.
There are no other significant zones of positive vorticity in Arabian sea as well as BoB.

Low level Convergence:

Positive lower level convergence of value 5-10x10^{-5} s^{-1} is seen to the south of Sri Lanka.

Upper level Divergence:

Positive upper level divergence of value 10x10^{-5} s^{-1} is seen in association with the LOPAR over southwest Arabian Sea.
Positive lower level divergence of value 5-10x10^{-5} s^{-1} is seen to the south of Sri Lanka.

Wind Shear:

Wind shear is low to moderate (10-20 knots) over south Arabian Sea as well as south BoB.

Wind Shear Tendency:

The wind shear tendency is negative or neutral over the system area in southeast Arabian Sea and also over Comorin area and adjoining southwest BoB. It is positive over rest area.

Upper tropospheric ridge:

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

Satellite observations based on INSAT imagery:

Arabian Sea:-
As per the satellite imagery of 0900 UTC on 10th December, 2019, scattered low to medium clouds with embedded moderate to intense convection lies over southwest Arabian Sea between lat 9.5^0N to 13.5^0N and long 53.0^0E to 56.5^0E in association with the low level circulation over the area.

Bay of Bengal & Andaman Sea:

According to 0900 UTC satellite imagery, scattered low/medium clouds with embedded moderate to intense convection lies over southwest BoB.

Large scale features

M.J.O. Index:
MJO index is in Phase 2 with amplitude near to 1. It is likely to remain in the same phase for next 5-6 days with amplitude more than 1.

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:
A LOPAR is seen over southwest Arabian Sea on 10th and becomes less marked on 11th. No other system is seen to form over NIO region during the forecast period.

IMD-GEFS:
A LOPAR is seen over southwest Arabian Sea on 10th and becomes less marked on 11th.

IMD-WRF:

A LOPAR is seen on 10th over southwest Arabian Sea and also over southwest BoB which becomes less marked on 11th.

NCMRWF-NCUM:
This model is not indicating any significant low pressure system in NIO region in the next 10 days.

NCMRWF-UM-Regional Model: Indicates no low pressure system in its domain for next 3days Sea.
NEPS Model: This model is not indicating any significant low pressure system in NIO region in the next 10 days.

ECMWF:
No significant system is forecast to form over NIO region for next 10 days.

NCEP-GFS:
No significant low pressure system is forecast to form over NIO for the next 10 days.
ARP-Meteo France :
No significant low pressure system is forecast to form over NIO for the next 3 days

Dynamical statistical models
IMD Genesis Potential Parameter (GPP):
No significant GPP zone is forecast for next 5 days.

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

Summary and Conclusion:

None of the models is forecasting formation of significant low pressure systems during the forecast period.

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

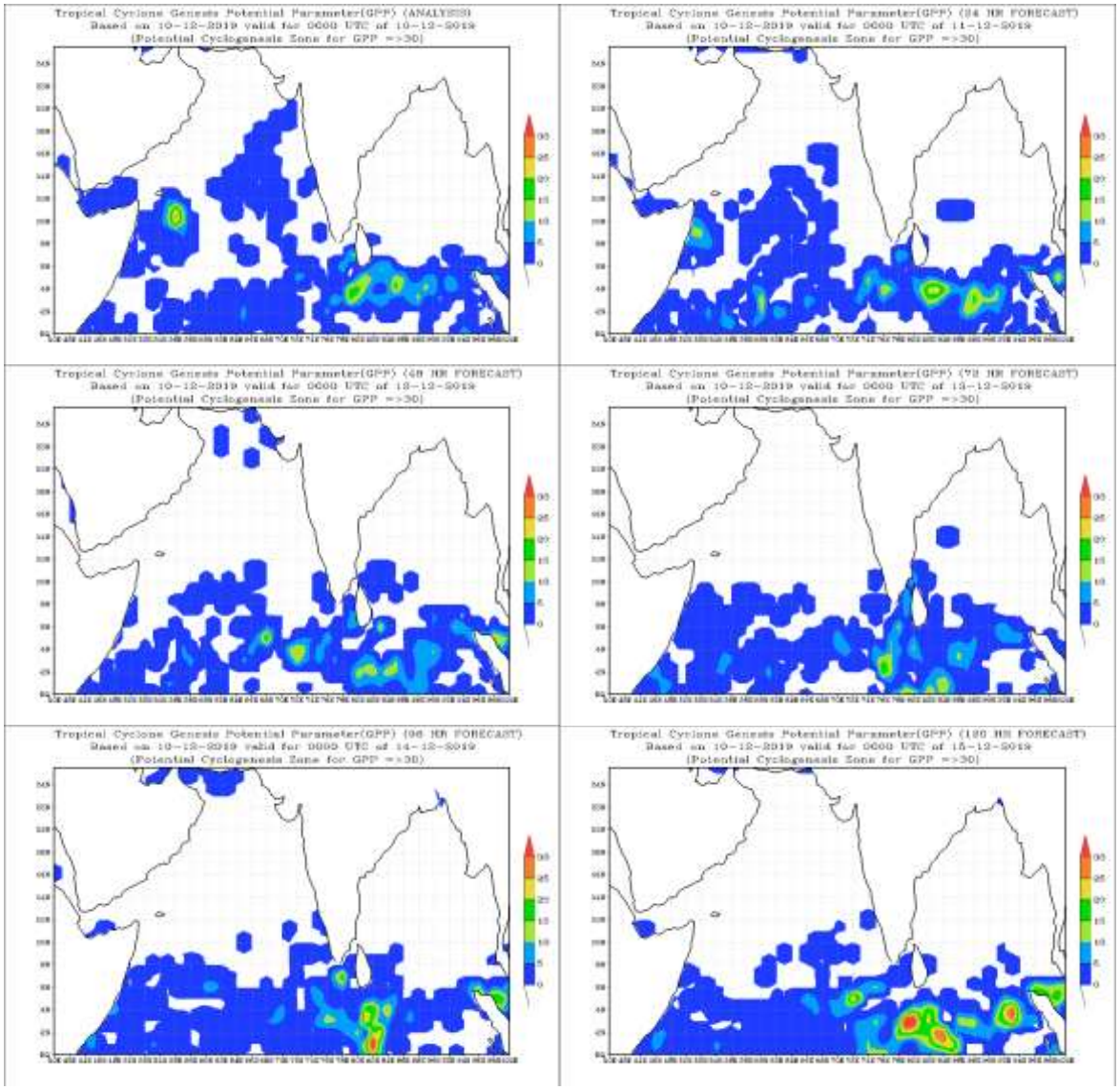
24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS
Nil	Nil	Nil	Nil	Nil

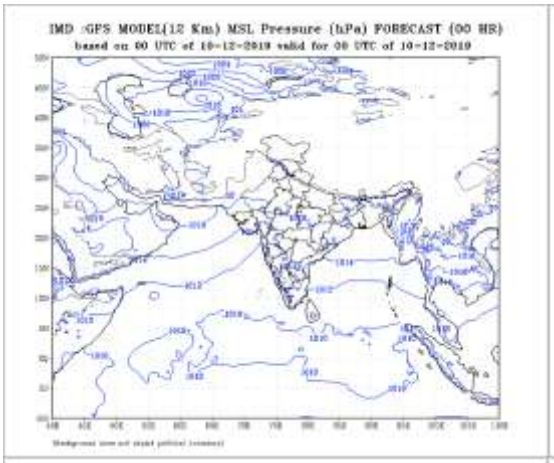
Probability of cyclogenesis over Arabian Sea during next 120 hours:

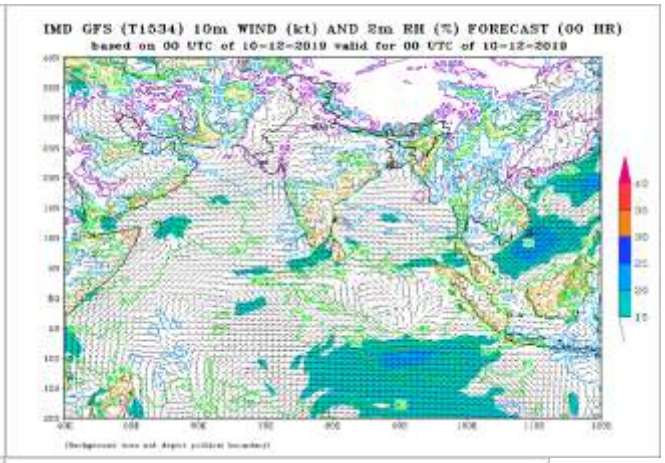
24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS
Nil	Nil	Nil	Nil	Nil

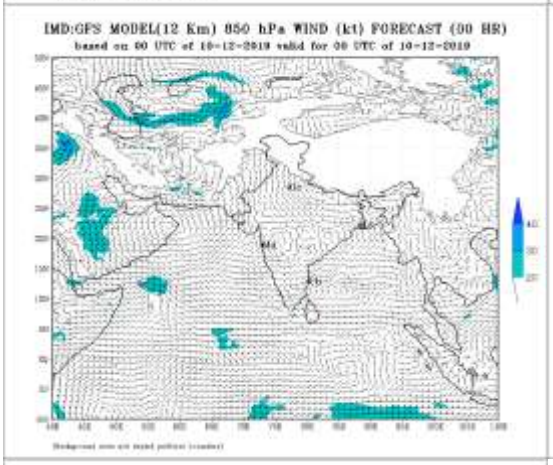
Advisory: No IOP area for the next 5 days

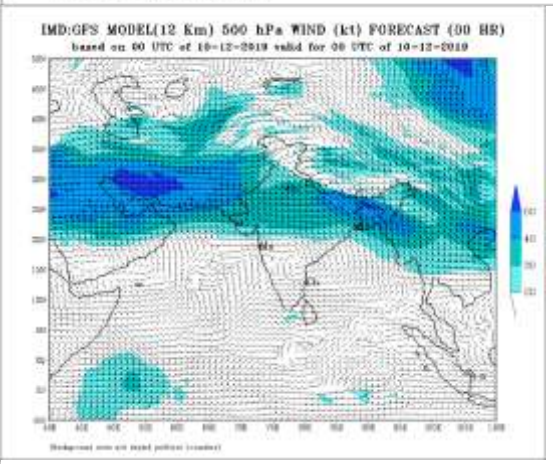
Annexure-1

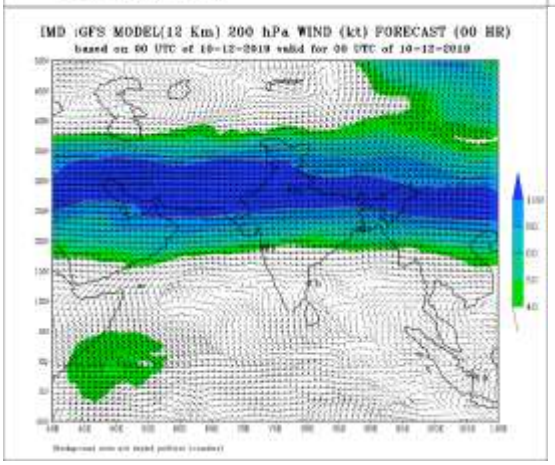

Tropical Cyclone Genesis Potential Parameter(GPP) (ANALYSIS)
Based on 10-12-2019 valid for 0600 UTC of 10-12-2019
(Potential Cyclogenesis Zone for GPP =>30)
Tropical Cyclone Genesis Potential Parameter(GPP) (24 HR FORECAST)
Based on 10-12-2019 valid for 0600 UTC of 11-12-2019
(Potential Cyclogenesis Zone for GPP =>30)
Tropical Cyclone Genesis Potential Parameter(GPP) (48 HR FORECAST)
Based on 10-12-2019 valid for 0600 UTC of 12-12-2019
(Potential Cyclogenesis Zone for GPP =>30)
Tropical Cyclone Genesis Potential Parameter(GPP) (72 HR FORECAST)
Based on 10-12-2019 valid for 0600 UTC of 13-12-2019
(Potential Cyclogenesis Zone for GPP =>30)
Tropical Cyclone Genesis Potential Parameter(GPP) (96 HR FORECAST)
Based on 10-12-2019 valid for 0600 UTC of 14-12-2019
(Potential Cyclogenesis Zone for GPP =>30)
Tropical Cyclone Genesis Potential Parameter(GPP) (120 HR FORECAST)
Based on 10-12-2019 valid for 0600 UTC of 15-12-2019
(Potential Cyclogenesis Zone for GPP =>30)

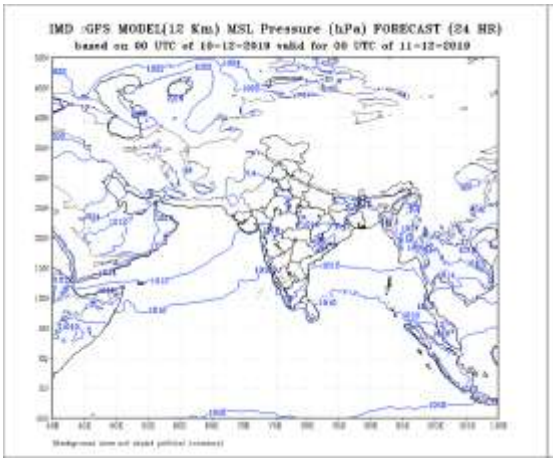

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (00 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 10-12-2019

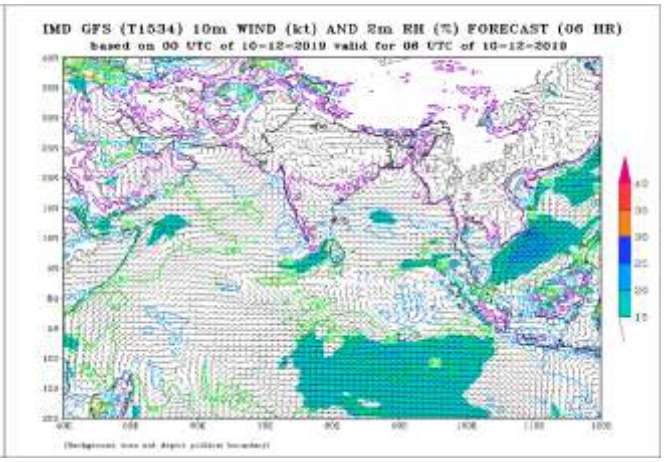

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (00 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 10-12-2019

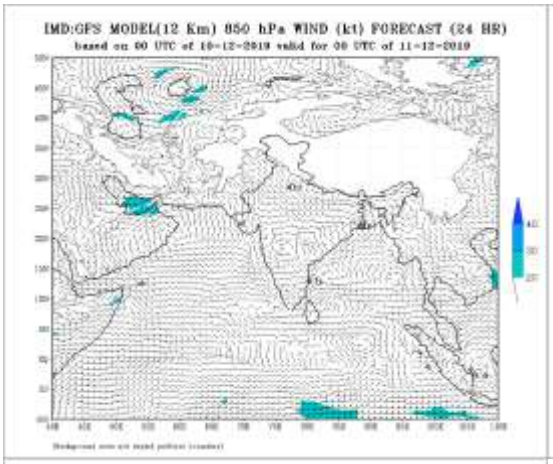

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (00 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 10-12-2019

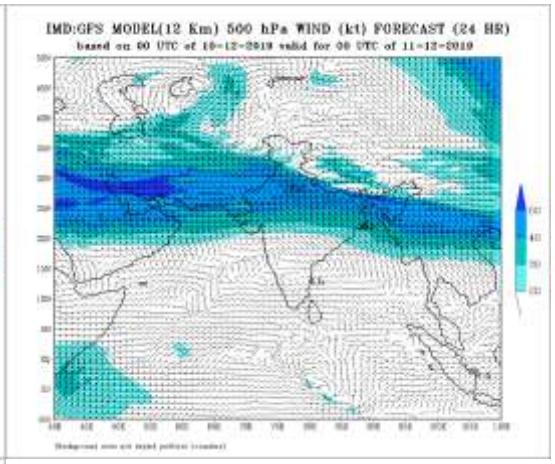

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (00 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 10-12-2019

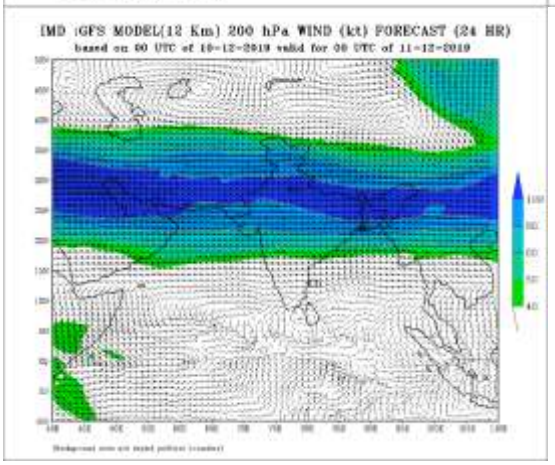

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (00 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 10-12-2019

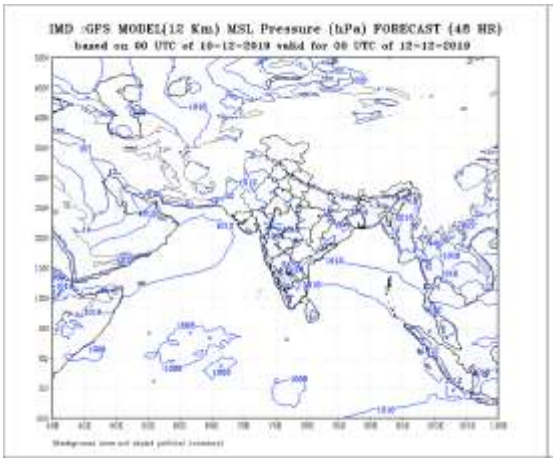

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (24 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 11-12-2019

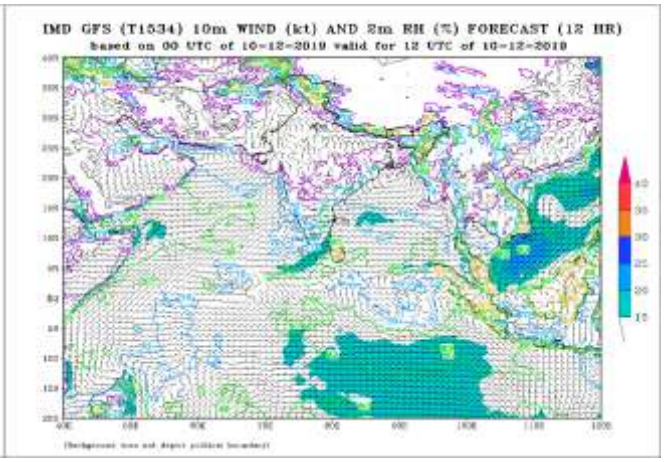

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (06 HR)
based on 00 UTC of 10-12-2019 valid for 06 UTC of 10-12-2019

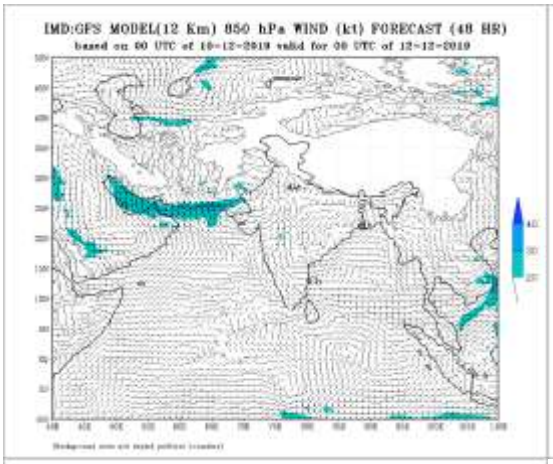

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (24 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 11-12-2019

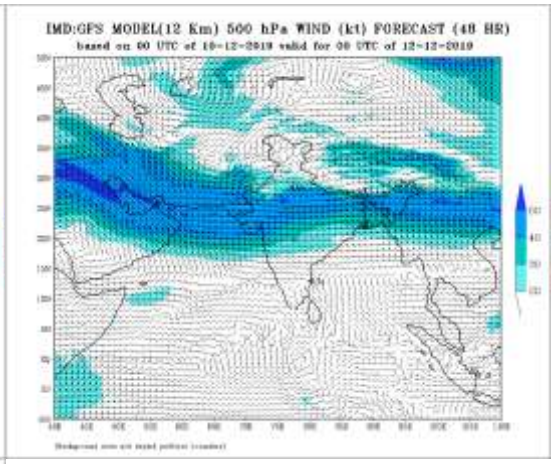

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (24 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 11-12-2019

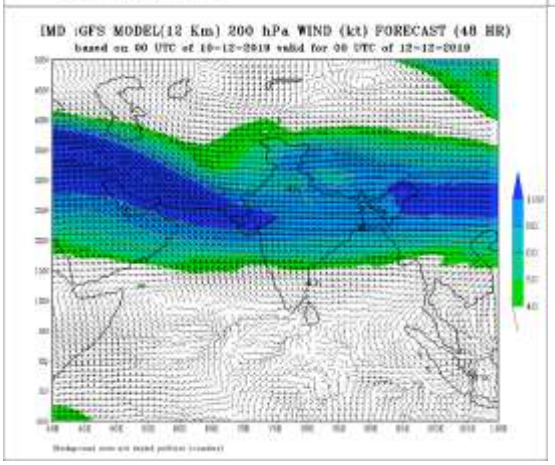

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (24 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 11-12-2019

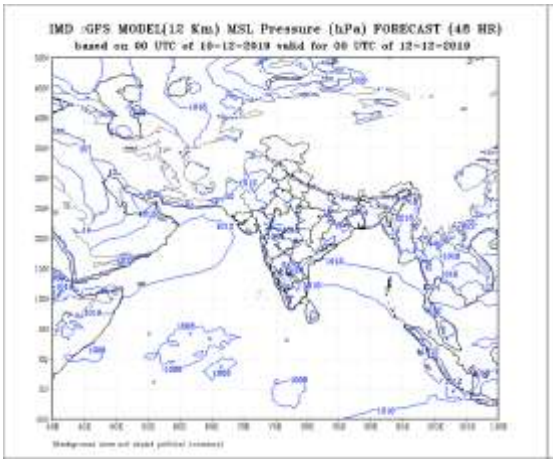

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (48 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 12-12-2019

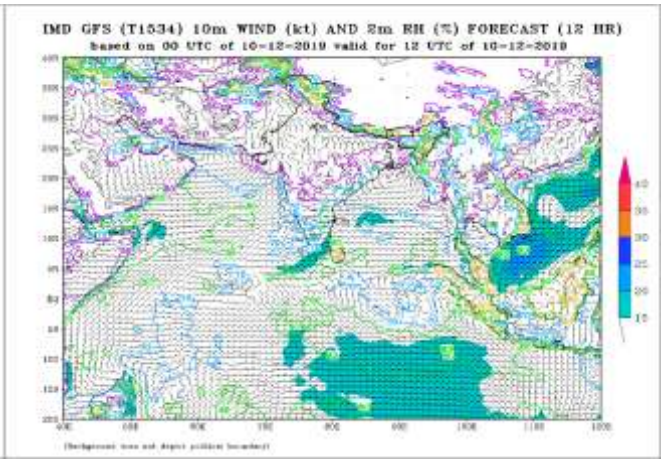

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (12 HR)
based on 00 UTC of 10-12-2019 valid for 12 UTC of 10-12-2019

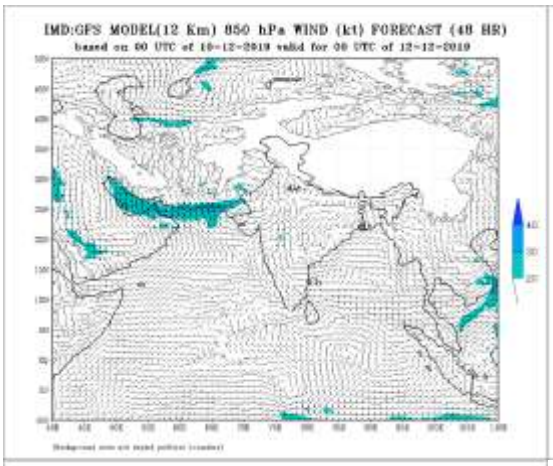

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (48 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 12-12-2019

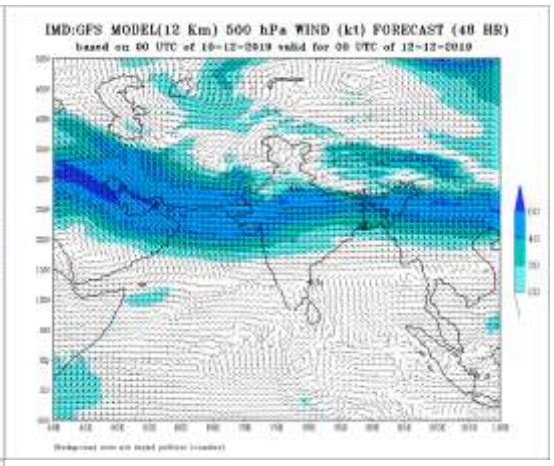

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (48 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 12-12-2019

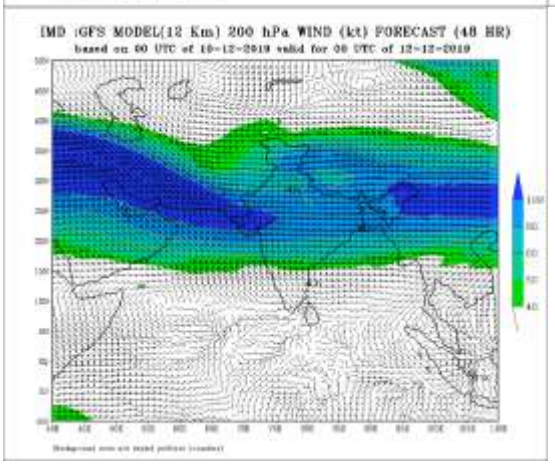

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (48 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 12-12-2019

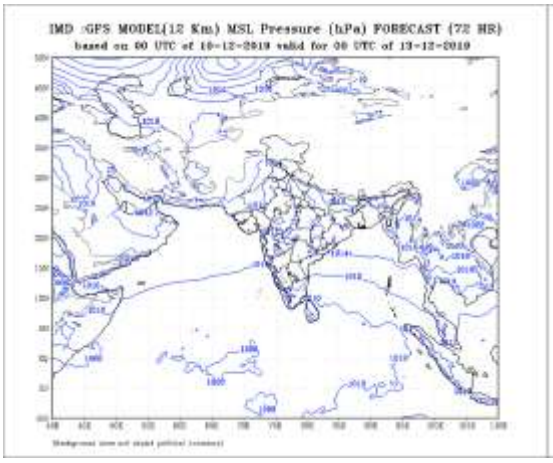

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (48 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 12-12-2019

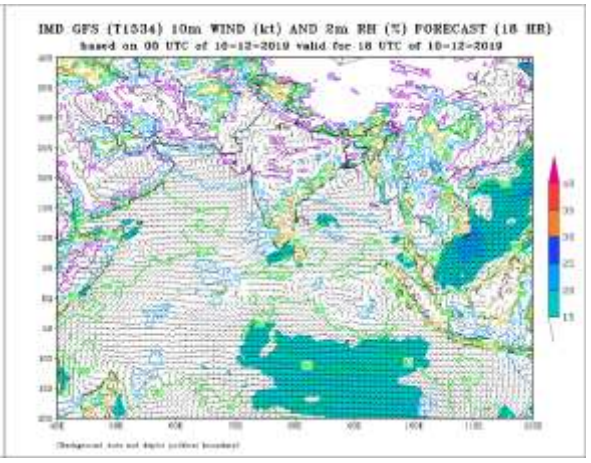

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (12 HR)
based on 00 UTC of 10-12-2019 valid for 12 UTC of 10-12-2019

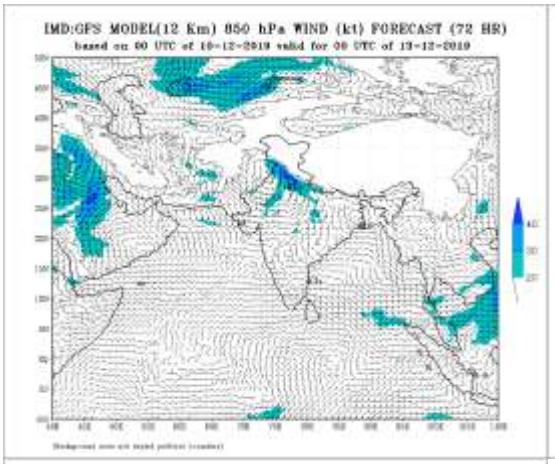

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (48 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 12-12-2019

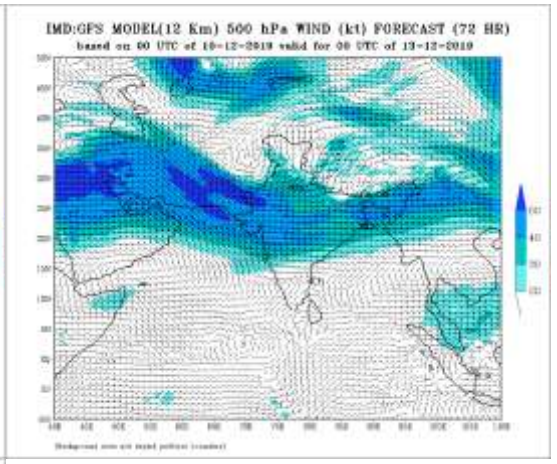

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (48 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 12-12-2019

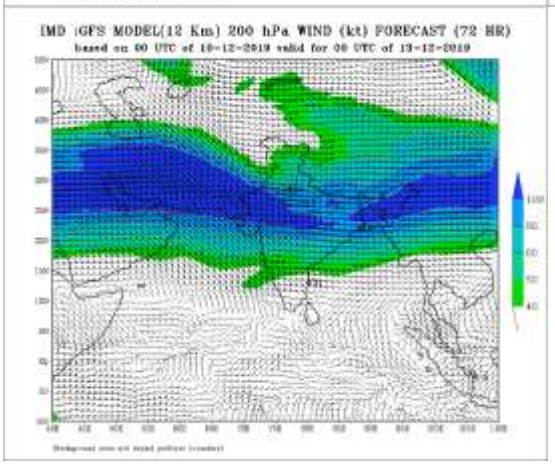

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (48 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 12-12-2019

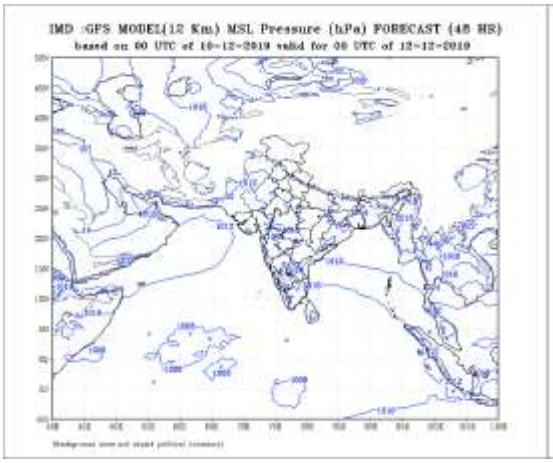

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (72 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 13-12-2019

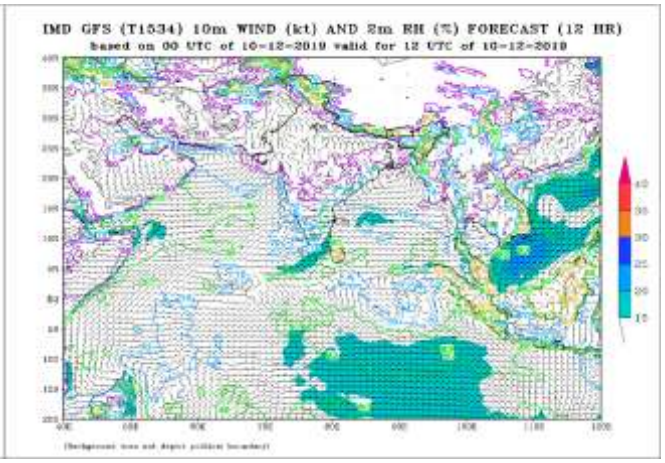

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (18 HR)
based on 00 UTC of 10-12-2019 valid for 18 UTC of 10-12-2019

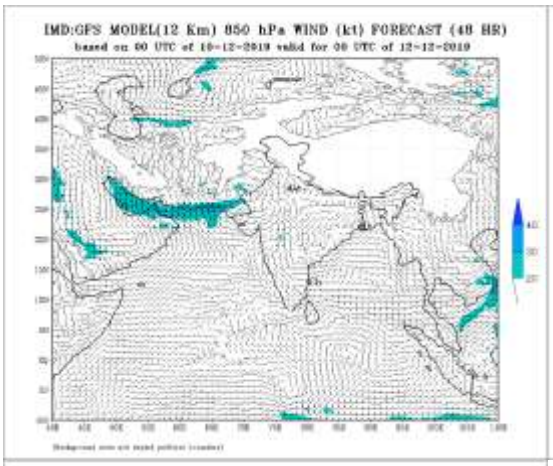

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (72 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 13-12-2019

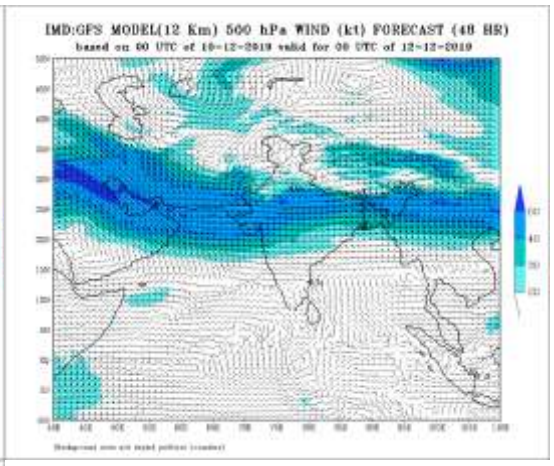

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (72 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 13-12-2019

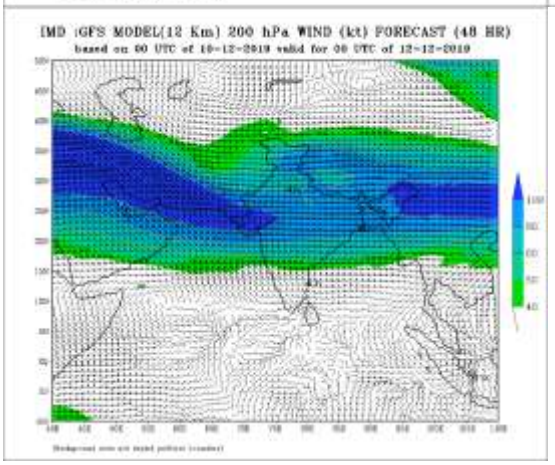

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (72 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 13-12-2019

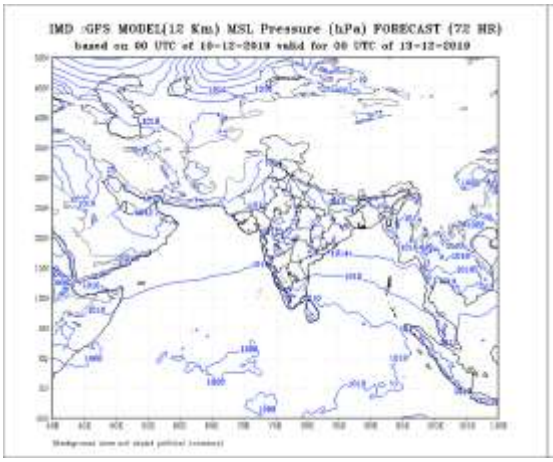

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (48 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 12-12-2019


IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (12 HR)
based on 00 UTC of 10-12-2019 valid for 12 UTC of 10-12-2019

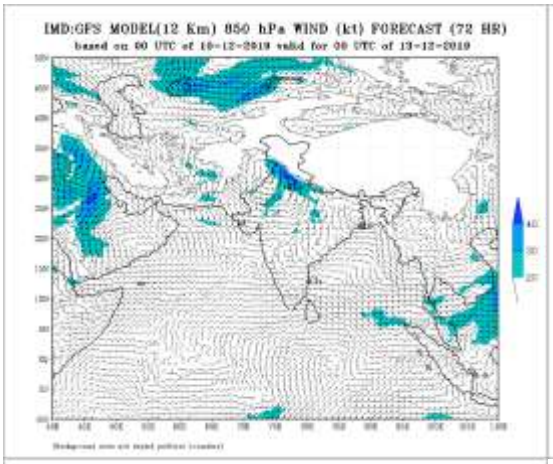

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (48 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 12-12-2019

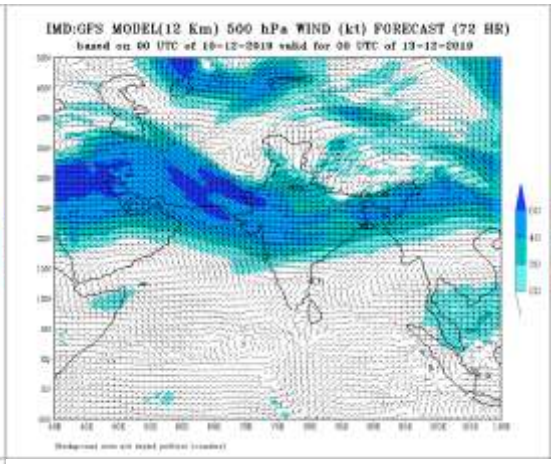

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (48 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 12-12-2019

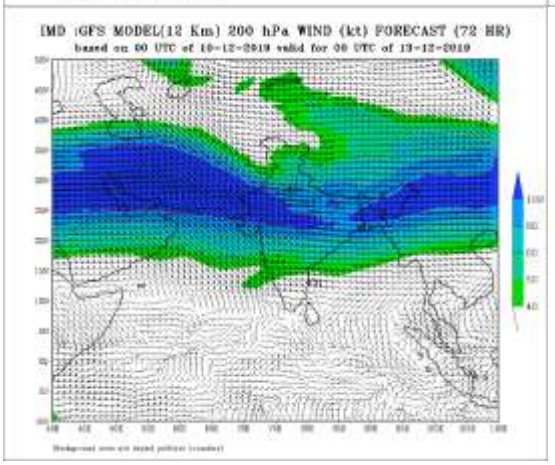

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (48 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 12-12-2019

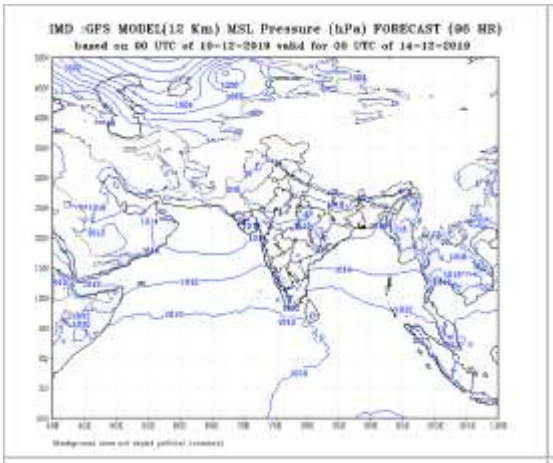

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (72 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 13-12-2019

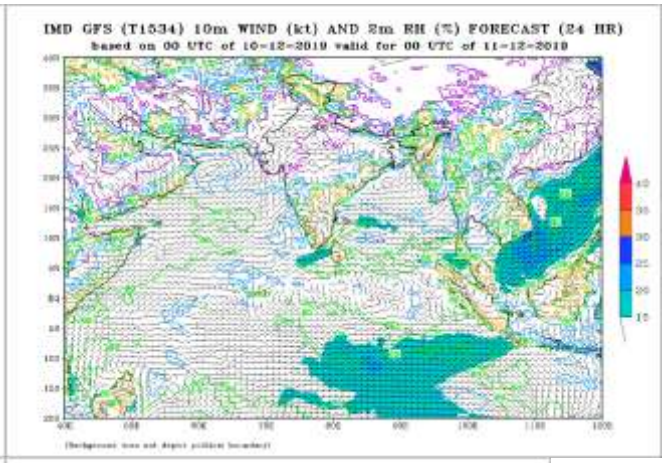

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (18 HR)
based on 00 UTC of 10-12-2019 valid for 18 UTC of 10-12-2019

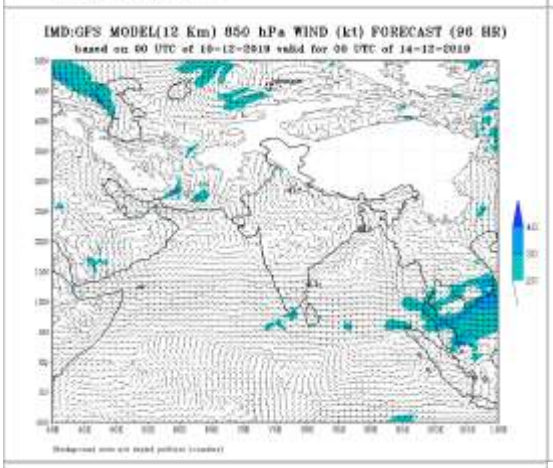

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (72 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 13-12-2019

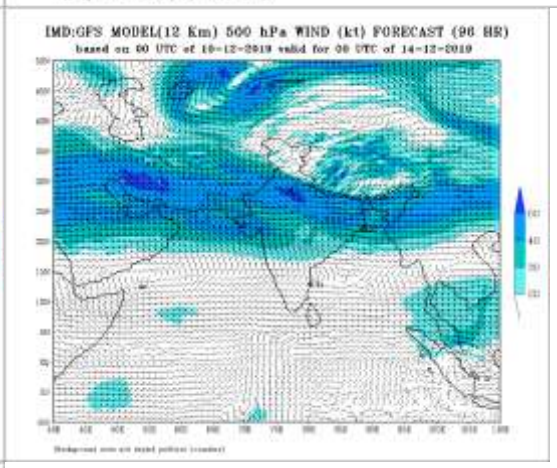

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (72 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 13-12-2019

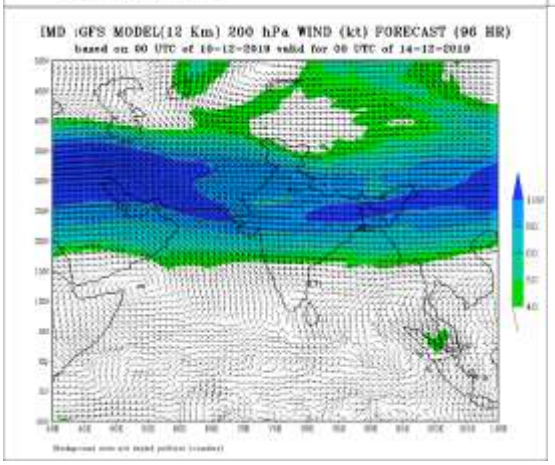

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (72 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 13-12-2019

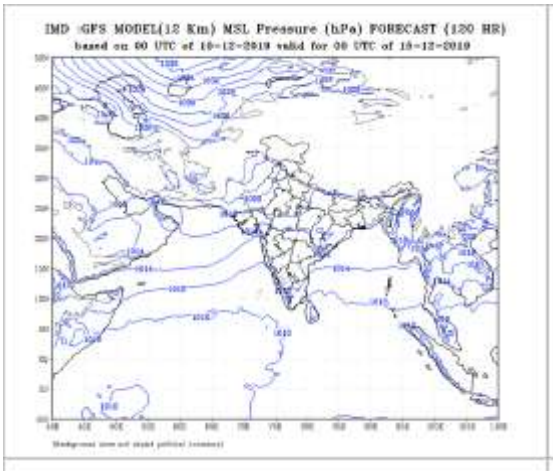

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (96 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 14-12-2019

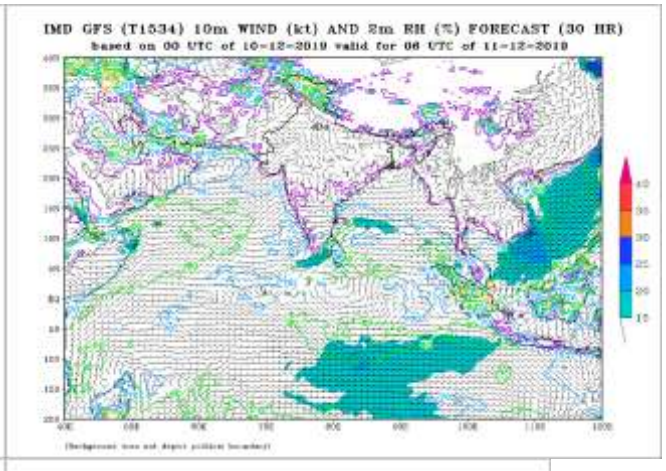

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (24 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 11-12-2019

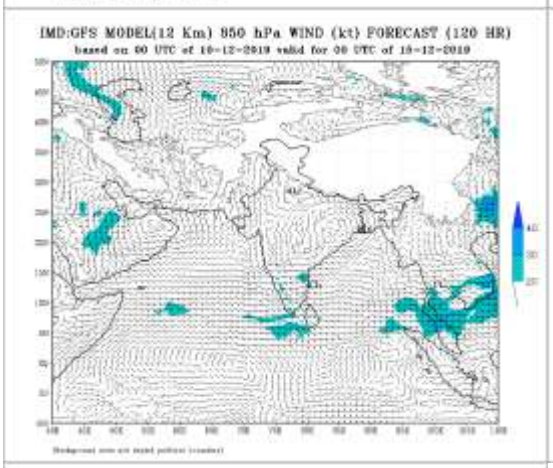

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (96 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 14-12-2019

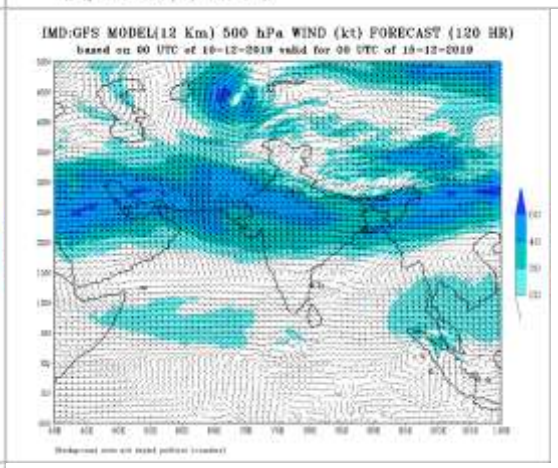

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (96 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 14-12-2019

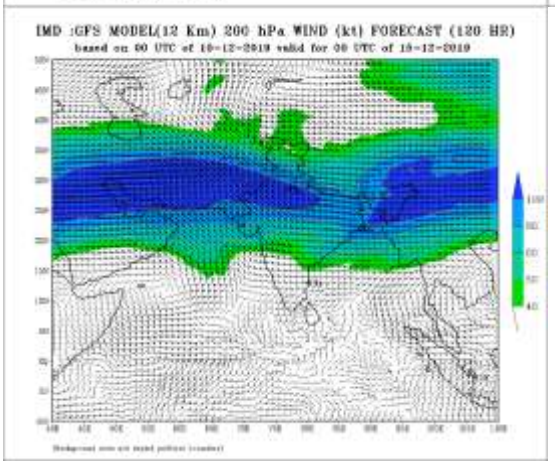

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (96 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 14-12-2019


IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (120 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 15-12-2019


IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (30 HR)
based on 00 UTC of 10-12-2019 valid for 06 UTC of 11-12-2019


IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (120 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 15-12-2019


IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (120 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 15-12-2019


IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (120 HR)
based on 00 UTC of 10-12-2019 valid for 00 UTC of 15-12-2019