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

FDP (Cyclone) NOC Report Dated 27th 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 ºC over most parts of north BoB and adjoining WC BoB. It is between 28 - 30ºC 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/cm^2 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/cm^2. There are areas of values more than 100 kJ/cm^2 southeast Arabian Sea, off Kerala coast & Lakshadweep area.

TCHP is around 30-50 kJ/cm^2 over north BoB and adjoining westcentral BoB. It is around 80-90 kJ/cm^2 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 10-50x10^{-5} s-1 seen over major parts of the Arabian Sea.

Low level Convergence:

An area of positive lower level convergence of value 10x10^{-5} s-1is seen over southwest BoB off Sri Lanka coast.

Areas of positive lower level convergence of value 30x10^{-5} s-1 is also seen over equatorial Indian Ocean to the south of southwest Arabian Sea and 15x10^{-5} s-1, over the equatorial Indian Ocean to the south of southeast Arabian Sea.

Upper level Divergence:

An area of positive upper level divergence of value 05x10^{-5} s-1 is seen over southwest BoB off Sri Lanka coast.

An area of positive upper level divergence of value 05-10x10^{-5} s-1 is seen over west equatorial Indian Ocean and adjoining south Arabian Sea.

Wind Shear:

Wind shear is high over north and central Arabian Sea and low to moderate over south 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 27th November, 2019, scattered low to medium clouds with embedded intense to very intense convection lies over south Arabian Sea and scattered low to medium clouds with embedded moderate to intense convection over westcentral Arabian Sea & Maldives.

Bay of Bengal & Andaman Sea:

According to 0900 UTC satellite imagery, scattered low/medium clouds with embedded intense to very intense convection lies over southwest BoB. Scattered low/medium clouds with embedded moderate to intense convection lies over southeast and adjoining west central BoB and south 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 propagate eastwards to Phase -2 during next 5-6 days.

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 development of no low pressure area over NIO region for the next 10 days.

IMD-GEFS: Indicates development of a Low Pressure area (Lopar) over equatorial IO to the south of southwest Arabian Sea (AS) on 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 development of no low pressure area over NIO region for the next 10 days.

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 3rd December and reaches Somalia coast on 4th December. During the period, its twin over the south equatorial IO develops into a Cyclonic Storm.

ECMWF: Indicates no significant low pressure system over NIO region for the next 10 days.

NCEP-GFS: Indicates development of a low pressure area/ WML on 01st December over southwest Arabian Sea and adjoining equatorial Indian Ocean. It moves westwards and reaches Somalia coast by 4th December.

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

Summary and Conclusion:

Amongst the NWP models considered, only NCEP GFS, NEPS, GEFS and GPP derived from IMDGFS are indicating development of a low pressure area over southwest Arabian Sea and adjoining equatorial Indian Ocean during 29th November/ 01st December. However, none of these are currently indicating further intensification over the North IO. The development of a low pressure area over southwest Arabian Sea and any possible intensification needs to be monitored.

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

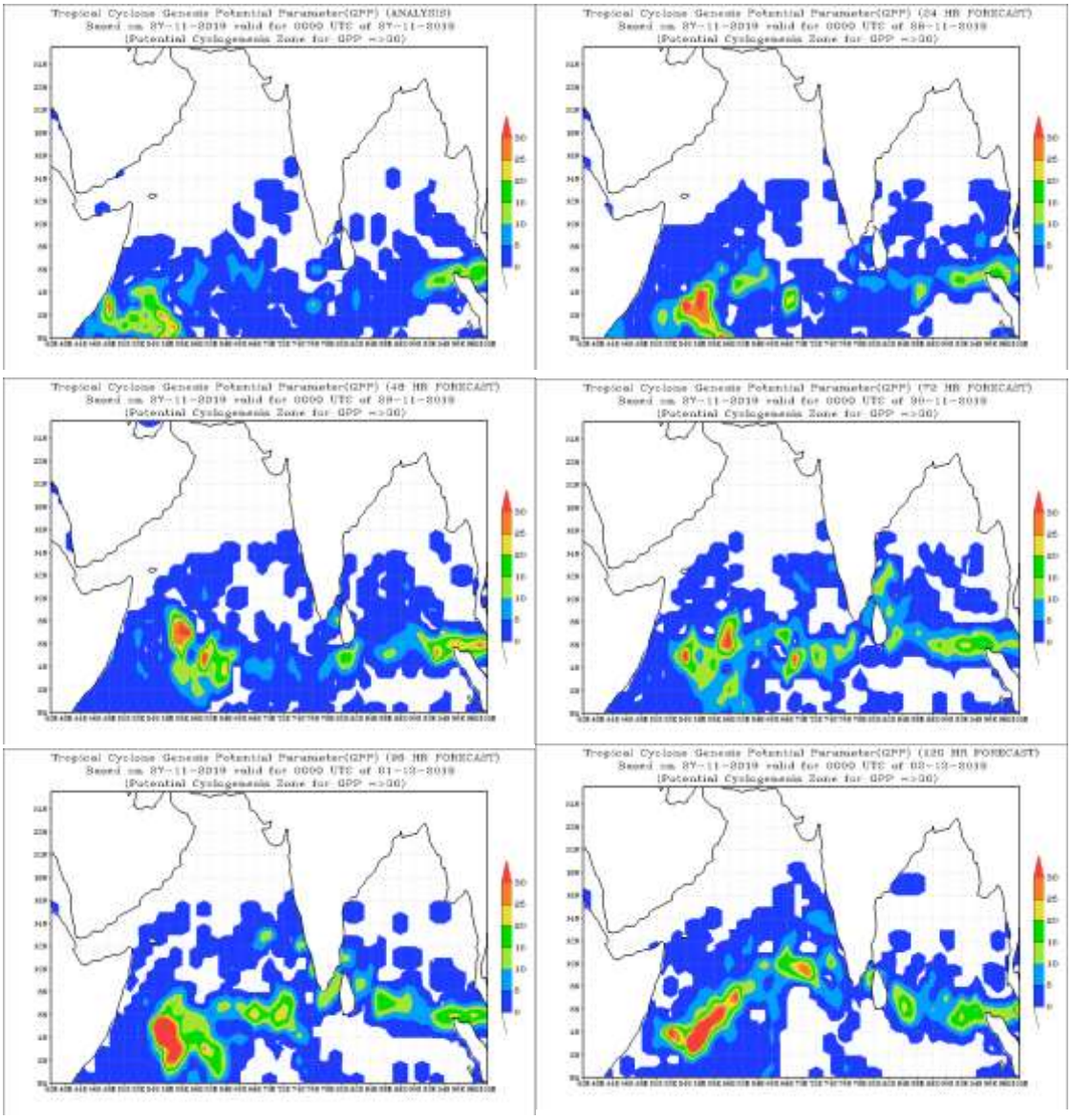
24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS
Nil	Nil	Nil	Nil	Nil

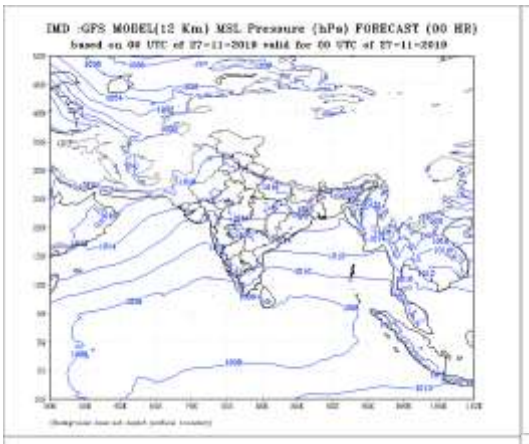
Probability of cyclogenesis over Arabian Sea during next 120 hours:

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

Advisory: No IOP area for the next 5 days

Annexure-1


Tropical Cyclone Genesis Potential Parameter(GPP) (ANALYSIS)
Tropical Cyclone Genesis Potential Parameter(GPP) (24 HR FORECAST)
Tropical Cyclone Genesis Potential Parameter(GPP) (48 HR FORECAST)
Tropical Cyclone Genesis Potential Parameter(GPP) (72 HR FORECAST)
Tropical Cyclone Genesis Potential Parameter(GPP) (96 HR FORECAST)
Tropical Cyclone Genesis Potential Parameter(GPP) (120 HR FORECAST)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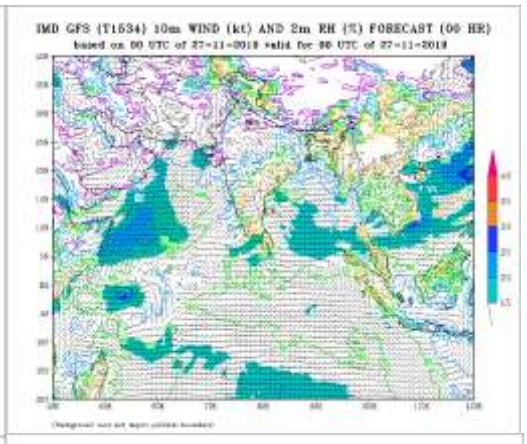
based on 00 UTC of 27-11-2019 valid for 00 UTC of 27-11-2019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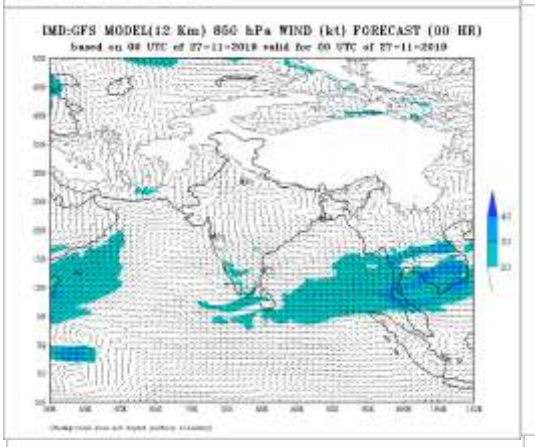
based on 00 UTC of 27-11-2019 valid for 00 UTC of 27-11-2019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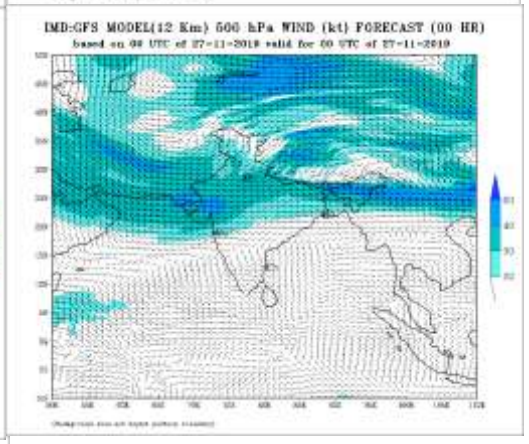
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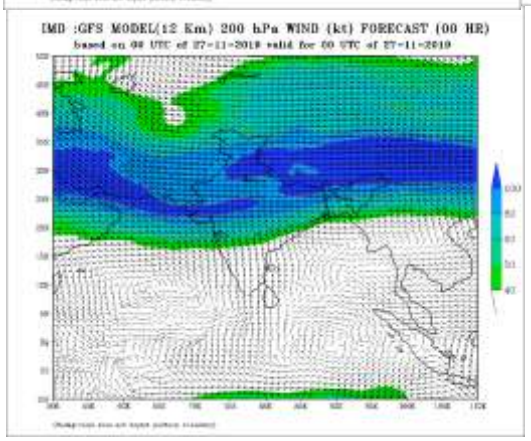
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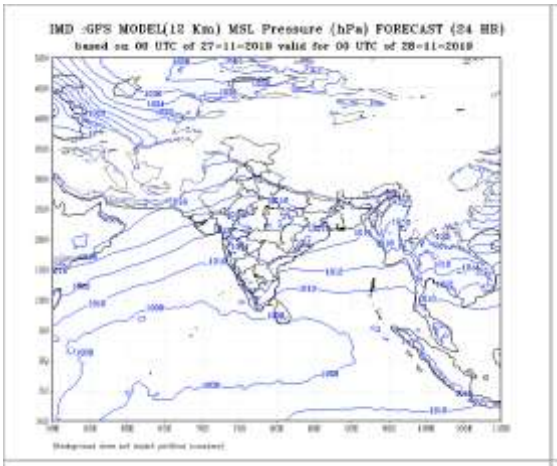
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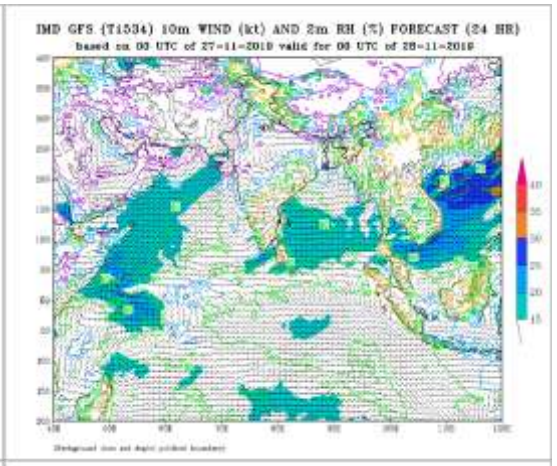
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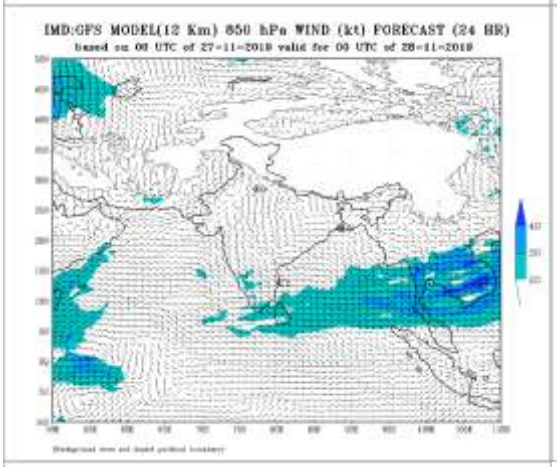
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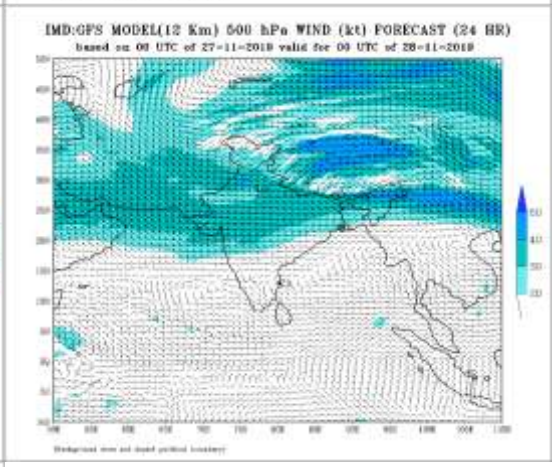
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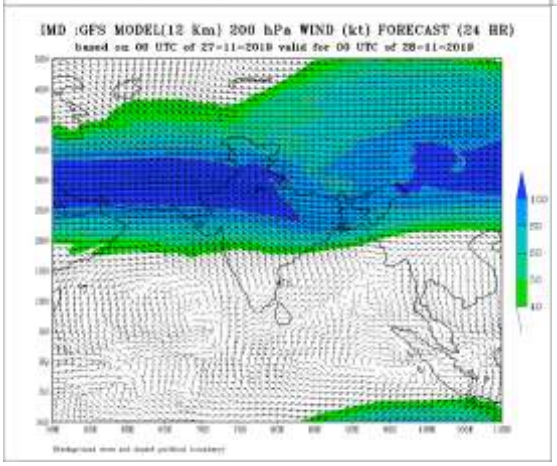
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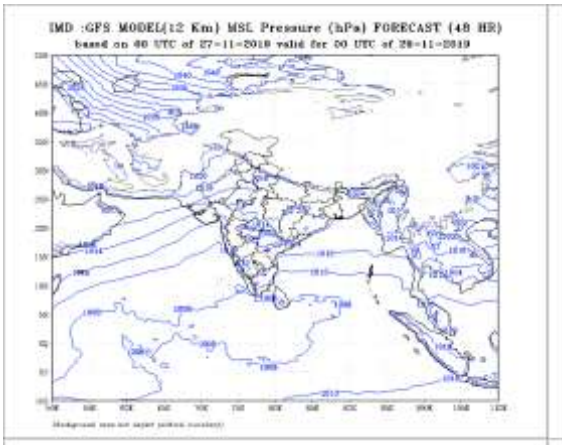
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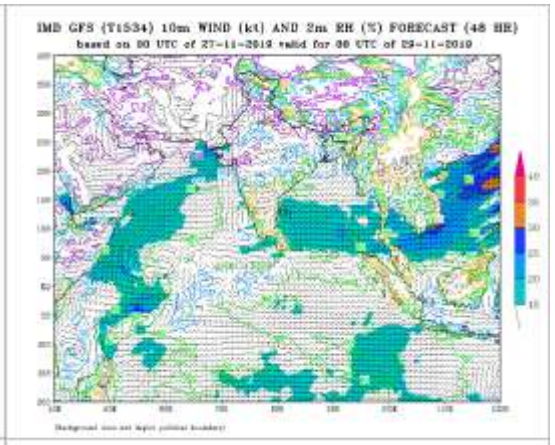
based on 00 UTC of 27-11-2019 valid for 00 UTC of 29-11-2019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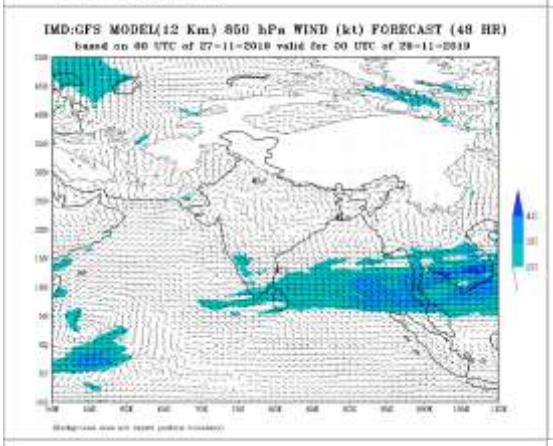
based on 00 UTC of 27-11-2019 valid for 00 UTC of 29-11-2019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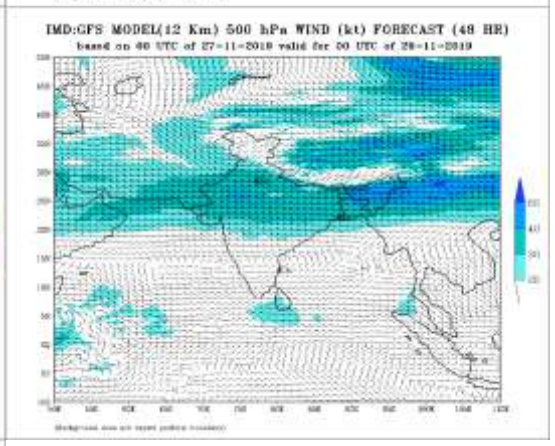
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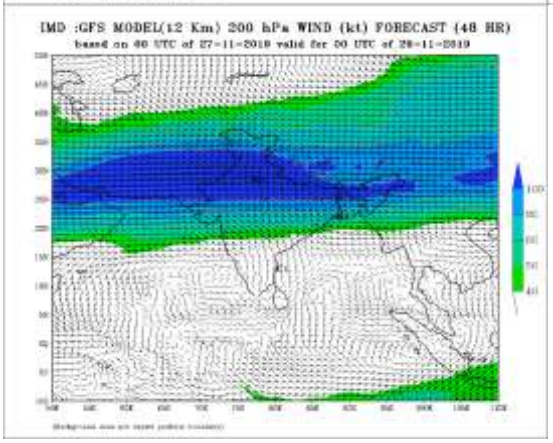
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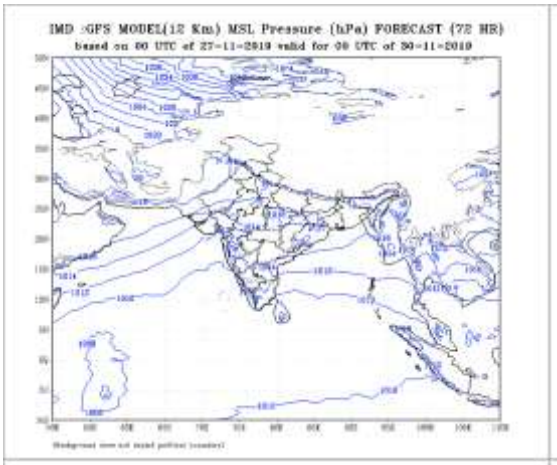
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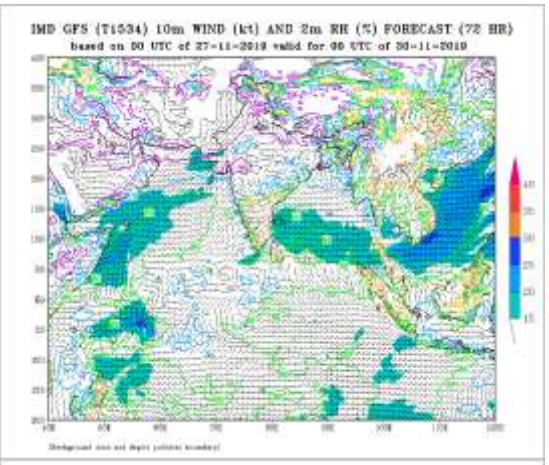
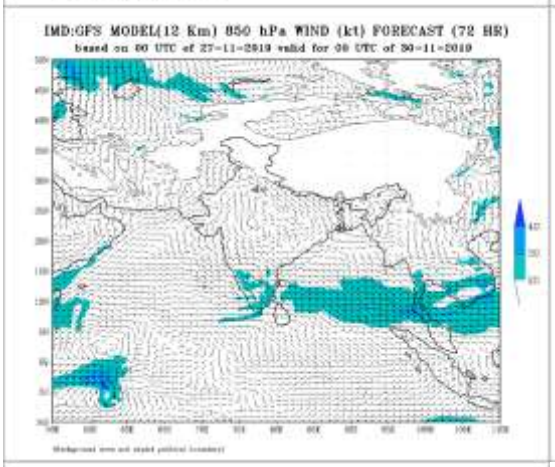
based on 00 UTC of 27-11-2019 valid for 00 UTC of 30-11-2019


IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (72 HR)
based on 00 UTC of 27-11-2019 valid for 00 UTC of 30-11-2019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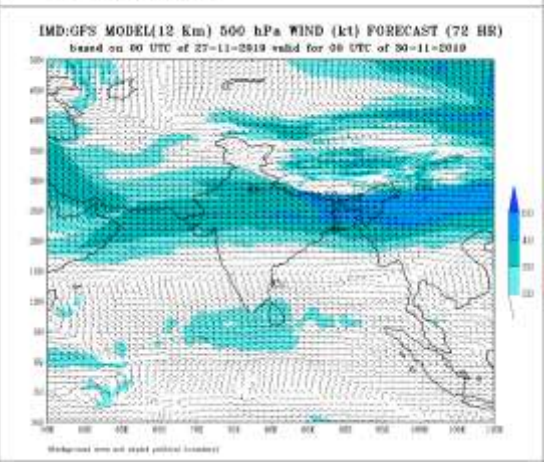
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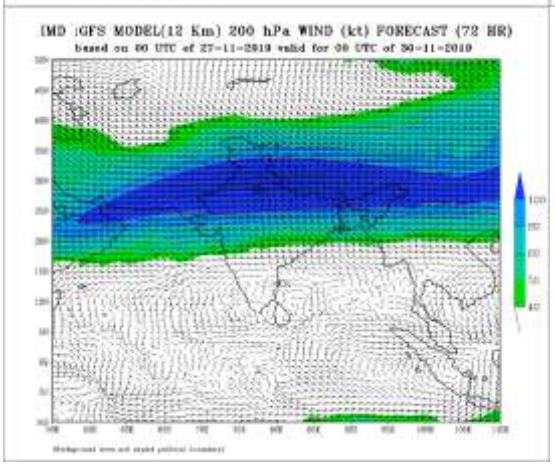
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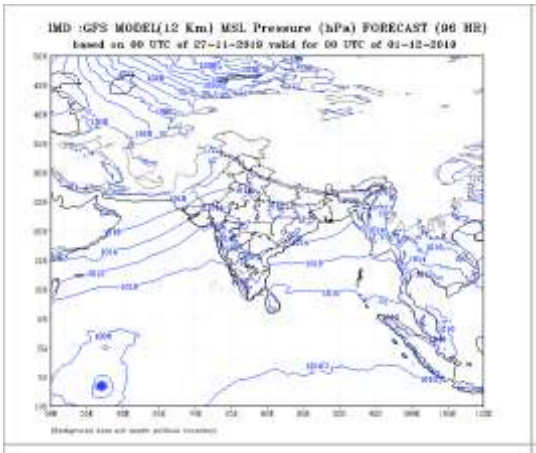
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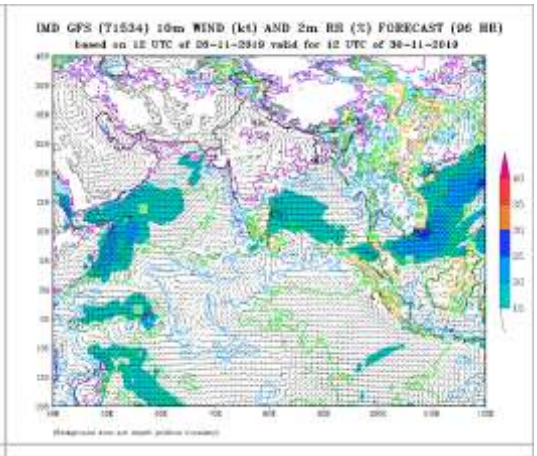
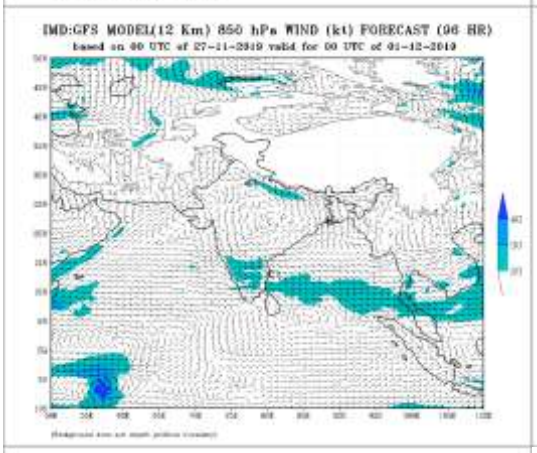

IMD GFS (71534) 10m WIND (kt) AND 2m RH (%) FORECAST (96 HR)
based on 12 UTC of 29-11-2019 valid for 12 UTC of 30-11-2019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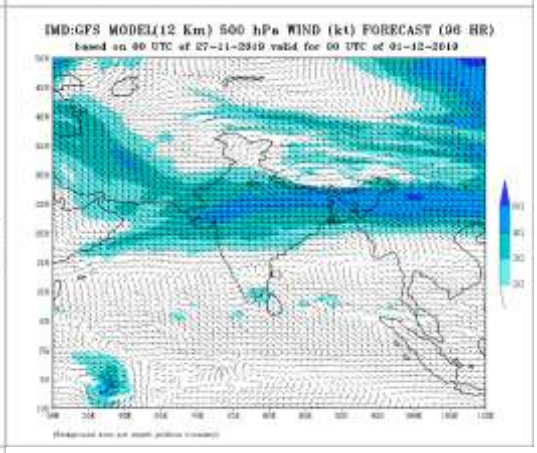
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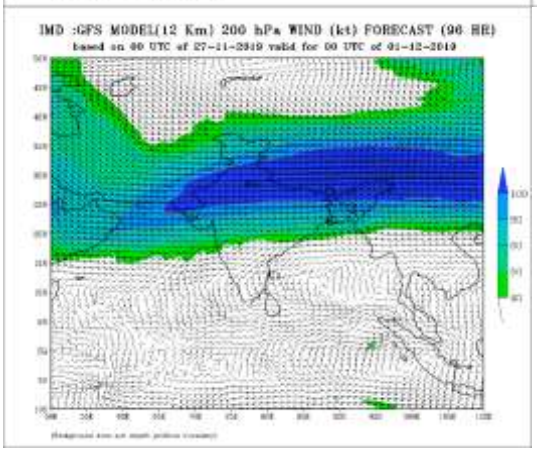
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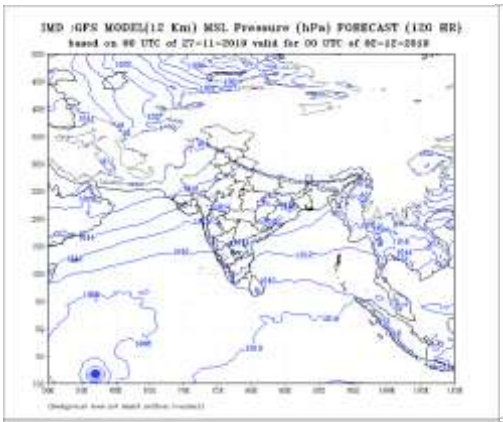
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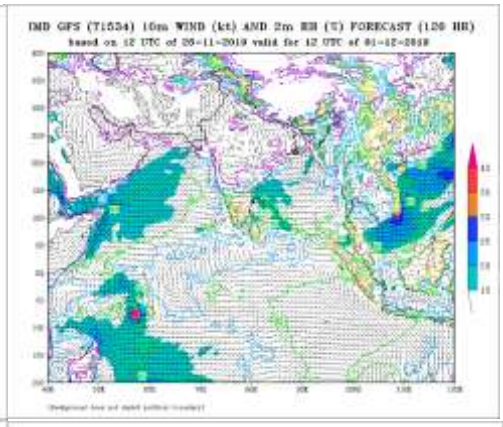
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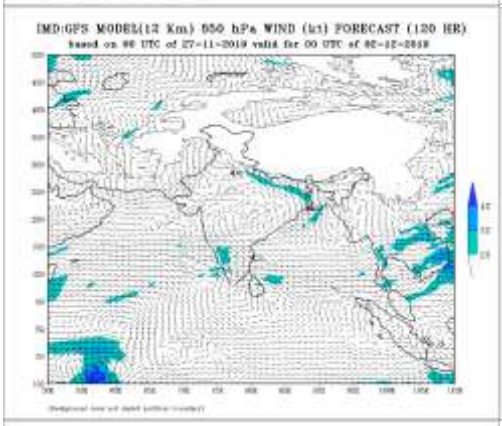
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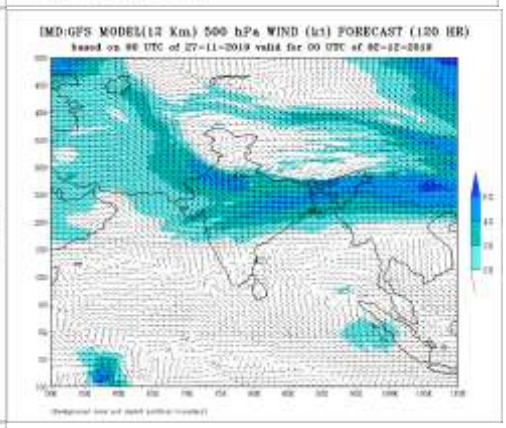
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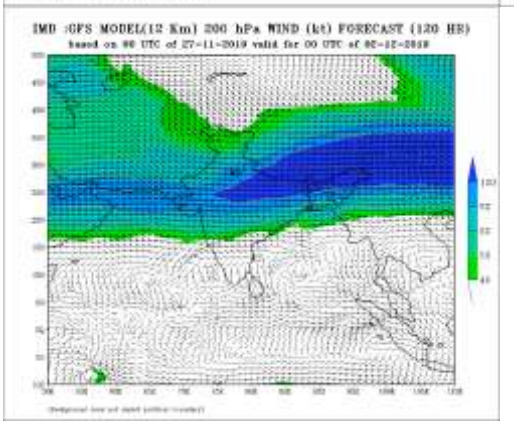
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based on 00 UTC of 27-11-2019 valid for 00 UTC of 02-12-2019