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

FDP (Cyclone) NOC Report Dated 16th October, 2021

Time of Issue: 1200 UTC

Synoptic features (based on 0900 UTC analysis):

- Yesterday's low pressure area over west-central and adjoining northwest Bay of Bengal (BoB) off north Andhra Pradesh – south Odisha coasts lay over north coastal Andhra Pradesh and adjoining west-central BoB at 0300 UTC of today. At 0900 UTC of today, the 16th October, it lay over north coastal Andhra Pradesh & neighbourhood with the associated cyclonic circulation extending upto 5.8 km above mean sea level tilting southwestwards with height.
- The trough between 1.5 km & 5.8 km above mean sea level extending from Gulf of Martaban adjoining North Andaman Sea to the cyclonic circulation associated with the above Low Pressure Area across east-central BoB persisted.
- Yesterday's low pressure area over Lakshadweep area & adjoining southeast Arabian Sea lay over southeast Arabian Sea off Kerala coast at 0300 UTC of today. At 0900 UTC of today, the 16th October, it lay over southeast AS and adjoining Kerala with the associated cyclonic circulation extending upto 4.5 km above mean sea level.
- The east-west trough across south peninsular India extended roughly along Lat. 15°N across South Peninsular India at 5.8 km above mean sea level.

Dynamical and thermodynamical features

Parameter	Bay of Bengal (BoB)	Arabian Sea (AS)
Sea Surface Temperature (SST) °C	29-30°C over major parts of BoB	28-29°C over the AS outside southwest & adjoining west-central AS where it is 26-27°C
Tropical Cyclone Heat Potential (TCHP) kJ/cm^2	70-80 over most parts and 110-120 over a small patch over northwest BoB off Odisha coast.	60-70 over southeast & east-central AS. Less than 50 over north, west-central & southwest AS and along & off Oman – Yemen coasts.
Relative vorticity (X10^{-6}s^{-1})	50-60 over west-central BoB off Andhra Pradesh coast. Another zone of positive vorticity (50-60) over Gulf of Martaban, east-central BoB and adjoining Myanmar coast	80-90 over southeast AS & adjoining Kerala coast and Comorin area
Low Level convergence	A circular area of 15-20 over	A circular region of positive

($X10^{-5} s^{-1}$)	Andaman Sea, east-central BoB and Gulf of Martaban	convergence of 10-15 over southeast AS, Lakshadweep area and Kerala coast
Upper Level divergence ($X10^{-5} s^{-1}$)	Extended zone of positive value ranging upto 20 over Andaman Sea, Gulf of Martaban and southeast BoB	A circular region of positive divergence of 20 over southeast AS, south Kerala and adjoining Lakshadweep area
Vertical Wind Shear (VWS Knots)	Low (5-10) over north BoB, High (20-30) over rest of the BoB	Low (10-15) over southeast & central AS, Lakshadweep area and High (20-40) elsewhere
Wind Shear Tendency (knots)	Decreasing over southwest BoB and increasing elsewhere	Decreasing over southeast AS and central AS and neutral elsewhere.
Upper tropospheric Ridge	Around 24°N to the north of the BoB	Not well defined owing to the presence of a deep mid-latitude trough reaching upto 20ºN.

Satellite observations based on INSAT imagery (0900 UTC):

Bay of Bengal & Andaman Sea:-
At 0900 UTC, scattered to broken low to medium clouds with embedded intense to very intense convection lay over north coastal Andhra Pradesh, Telangana, south Chhattisgarh, south Odisha and neighbourhood in association with the low pressure area over the region. Minimum cloud top temperature is minus 93ºC.
Arabian Sea:-

At 0900 UTC, broken Low to medium clouds with embedded intense to very intense convection lay over Kerala and adjoining southeast Arabian Sea, Lakshadweep area and neighbourhood, in association with the low pressure area over the region. The minimum Cloud Top Temperature is minus 93ºC.

M.J.O. Index:
MJO index is in Phase 6 with amplitude less than 1. It is likely to move into Phase 2, after 2 days with much subdued amplitude and retrace into Phase 1 with gradual increase in amplitude for the subsequent period. Thus the Phase of MJO may not contribute to Cyclogenesis over NIO during next 7 days.

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

No Storm or Depression prevails over South China Sea & South Indian Ocean as on today.

NWP Input for FDP Cyclone based on 0000 UTC for the next 7 days

Model	BoB	AS
IMD-GFS	Fresh feeble LPA over northeast BoB on 17th, moving over to northwest BoB and adjoining West	No fresh genesis predicted.

	Bengal coasts on 18th and weakening on 19th. No fresh genesis predicted.	
IMD-GEFS	LPA over northwest BoB and adjoining West Bengal coast on 18th and its moving inland on 19th. No fresh genesis predicted.	No fresh genesis predicted.
IMD-WRF	No fresh genesis predicted.	LPA over southeast AS off Kerala coast on 16th and weakening on 17th.
NCMRWF-NCUM	LPA over north coastal Andhra Pradesh on 16th and weakening on 17th. No fresh genesis predicted.	No fresh genesis predicted.
NCMRWF-NEPS	-do-	-do-
NCMRWF-UM (Regional)	Depression over coastal West Bengal on 18th, rapid northwestward movement and weakening on 19th.	LPA over southeast AS off Kerala coast on 16th and weakening on 17th.
ECMWF	Well marked LPA over West Bengal coast and adjoining northwest BoB on 18th and weakening on 19th.	No fresh genesis predicted.
ECMWF-EPS	Shows 10-20% strike probability for West Bengal coast on 18th.	Shows NIL probability
NCEP-GFS	LPA over northwest BoB and adjoining West Bengal coast on 19th and weakening on 20th.	No fresh genesis predicted.
IMD-GPP	Potential zone over Gulf of Martaban on 16th, an elongated area over north BoB on 17th & 18th, Nil on the remaining days	A small potential zone over southeast AS off Kerala coast on 16th alone.

GPP- Genesis Potential Parameter based on Dynamical Statistical model developed by IMD.

Summary and Conclusion:

Most of the models are indicating that the present Low pressure Area over north coastal Andhra Pradesh would weaken into a trough of Low by 17th October. Also the other Low Pressure area over southeast AS and adjoining Kerala coast would weaken gradually during next 24 hours. A few of the models also indicate formation of a fresh LPA over northwest BoB and adjoining West Bengal coast around 18th October and its moving inland and weakening during the subsequent 24 hours. No other significant Low pressure system development is indicated during the next 7 days.

It may thus be concluded that,

Fresh cyclogenesis over the north Indian Ocean is un-likely during the forecast period.

Probability of cyclogenesis (formation of depression and above intensity systems) over the Bay of Bengal and Andaman Sea during next 168 hours:

24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS	120-144 HOURS	144-168 HOURS
NIL	NIL	NIL	NIL	NIL	NIL	NIL

Probability of cyclogenesis (formation of depression and above intensity systems) over the Arabian Sea during next 168 hours:

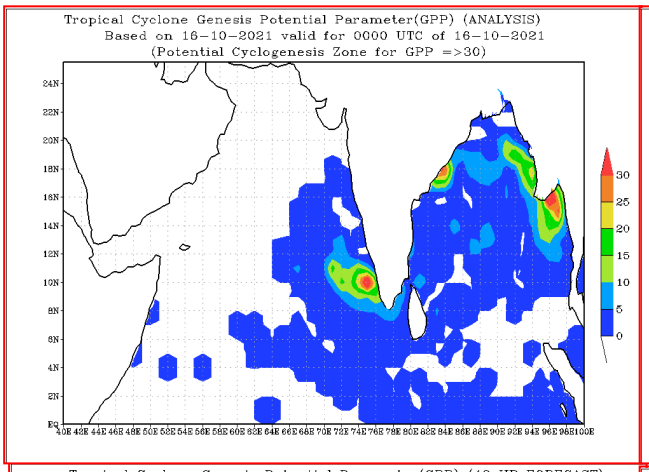
24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS	120-144 HOURS	144-168 HOURS
NIL	NIL	NIL	NIL	NIL	NIL	NIL

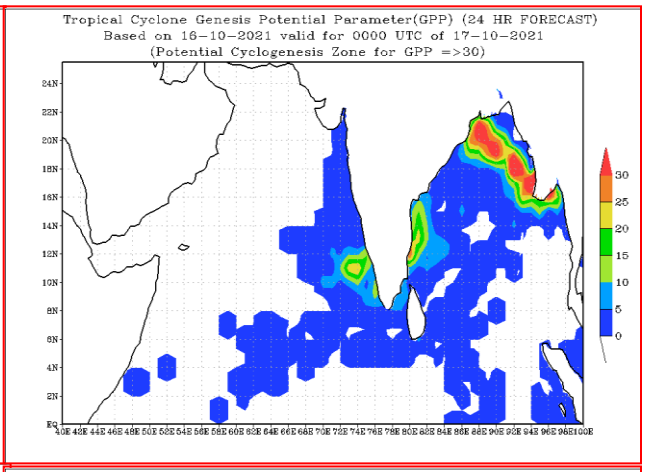
Advisory:

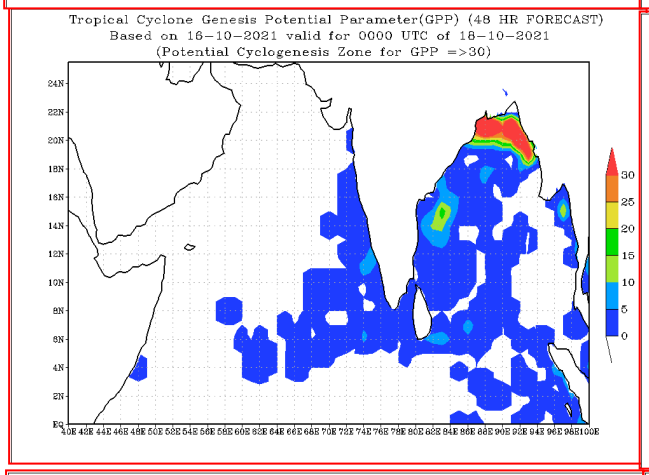
Watch has to be maintained w.r.t. the current Low pressure areas, (i) over north coastal Andhra Pradesh & neighbourhood (ii) over southeast AS and adjoining Kerala coast during next 24 hours and (iii) Likely formation of a Low Pressure area over northwest Bay of Bengal and adjoining West Bengal coast around 18th October 2021.

IOP is suggested for West Bengal and north Odisha coasts on 18th & 19th October 2021.

Annexure-I


Tropical Cyclone Genesis Potential Parameter(GPP) (ANALYSIS)
Based on 16-10-2021 valid for 0000 UTC of 16-10-2021
(Potential Cyclogenesis Zone for GPP =>30)


Tropical Cyclone Genesis Potential Parameter(GPP) (24 HR FORECAST)
Based on 16-10-2021 valid for 0000 UTC of 17-10-2021
(Potential Cyclogenesis Zone for GPP =>30)


Tropical Cyclone Genesis Potential Parameter(GPP) (48 HR FORECAST)
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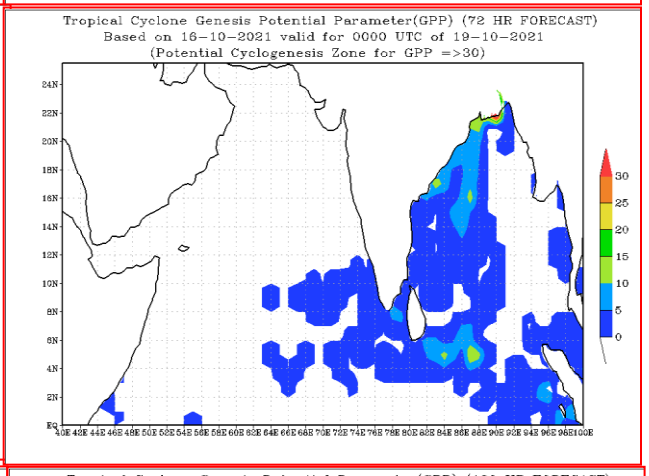
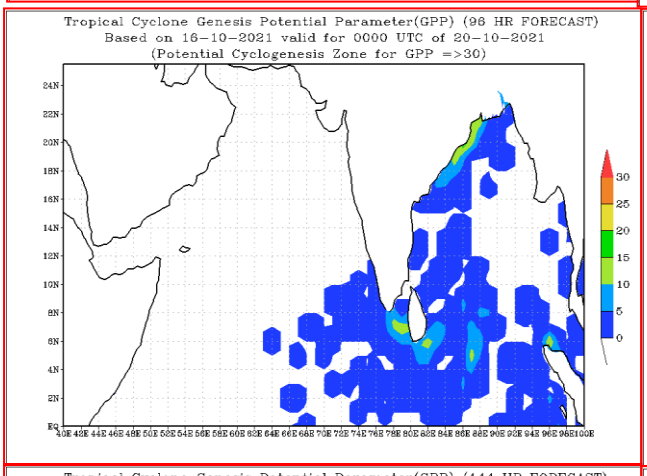
(Potential Cyclogenesis Zone for GPP =>30)


Tropical Cyclone Genesis Potential Parameter(GPP) (72 HR FORECAST)
Based on 16-10-2021 valid for 0000 UTC of 19-10-2021
(Potential Cyclogenesis Zone for GPP =>30)


Tropical Cyclone Genesis Potential Parameter(GPP) (96 HR FORECAST)
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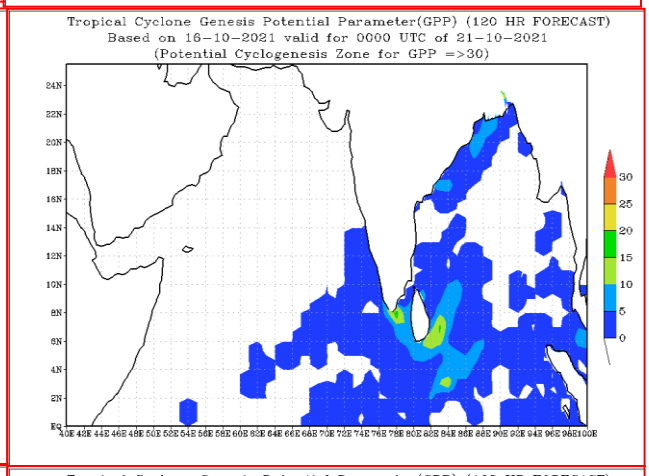
(Potential Cyclogenesis Zone for GPP =>30)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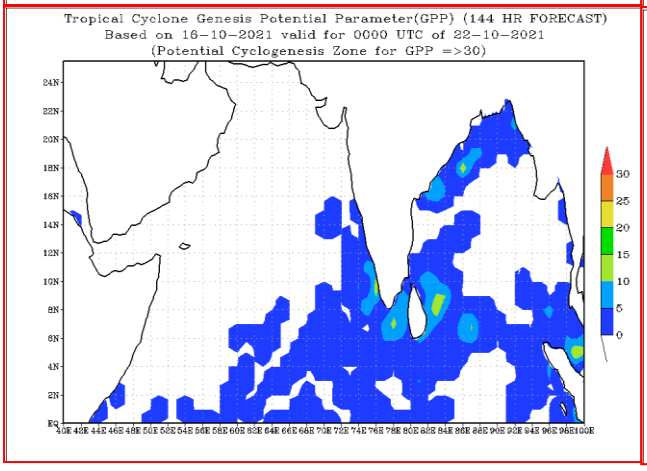
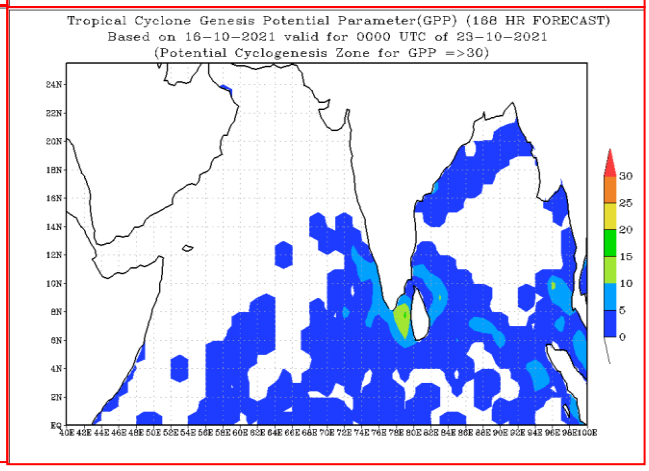
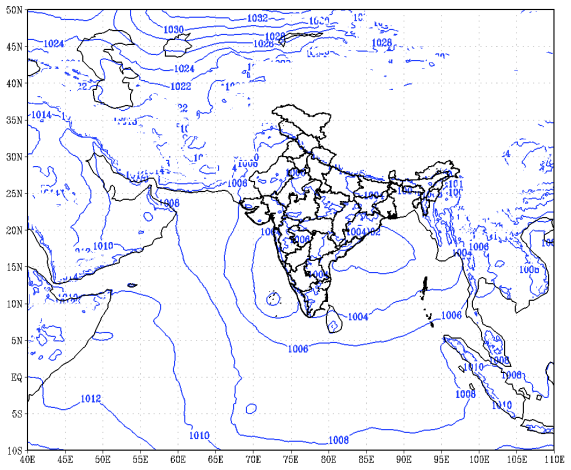

Tropical Cyclone Genesis Potential Parameter(GPP) (144 HR FORECAST)
Based on 16-10-2021 valid for 0000 UTC of 22-10-2021
(Potential Cyclogenesis Zone for GPP =>30)


Tropical Cyclone Genesis Potential Parameter(GPP) (168 HR FORECAST)
Based on 16-10-2021 valid for 0000 UTC of 23-10-2021
(Potential Cyclogenesis Zone for GPP =>30)

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (00 HR)

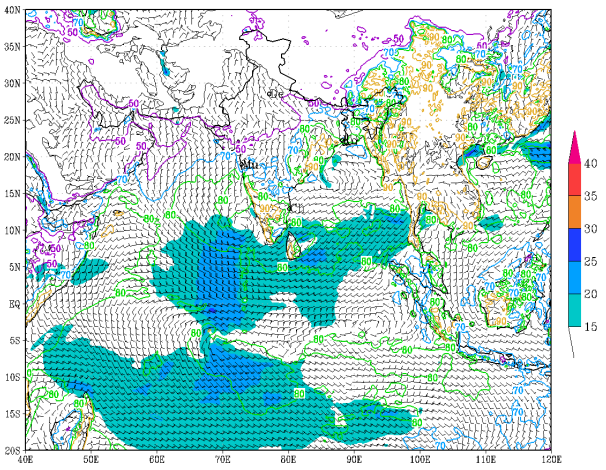
based on 00 UTC of 15-10-2021 valid for 00 UTC of 15-10-2021



(Background does not depict political boundary)

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (00 HR)

based on 00 UTC of 15-10-2021 valid for 00 UTC of 15-10-2021



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IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (00 HR)

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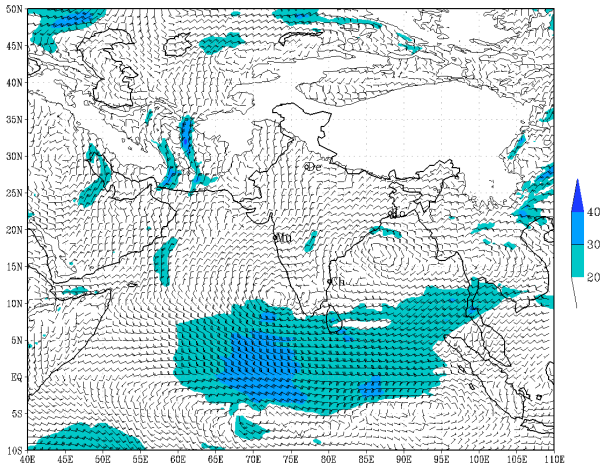

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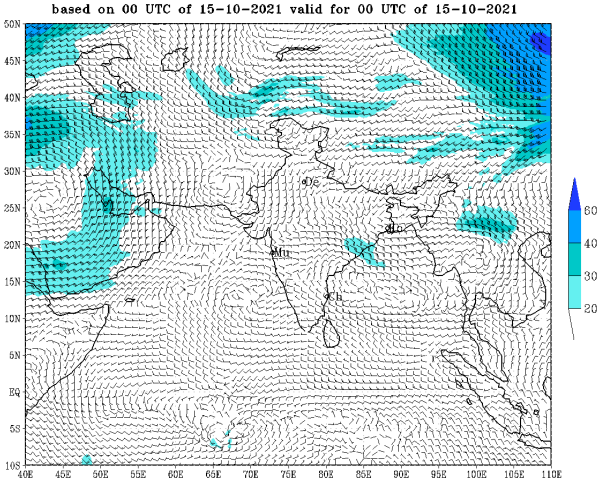
IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (00 HR)

based on 00 UTC of 15-10-2021 valid for 00 UTC of 15-10-2021



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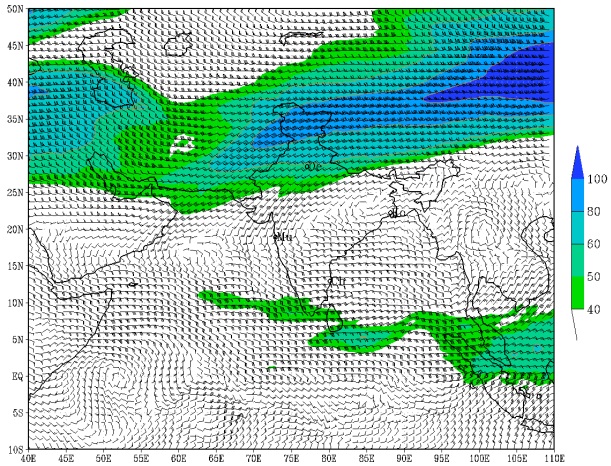
based on 00 UTC of 15-10-2021 valid for 00 UTC of 15-10-2021



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IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (24 HR)

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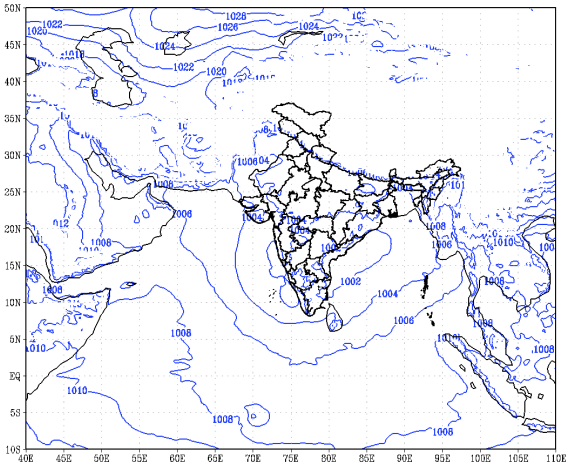

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IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (24 HR)

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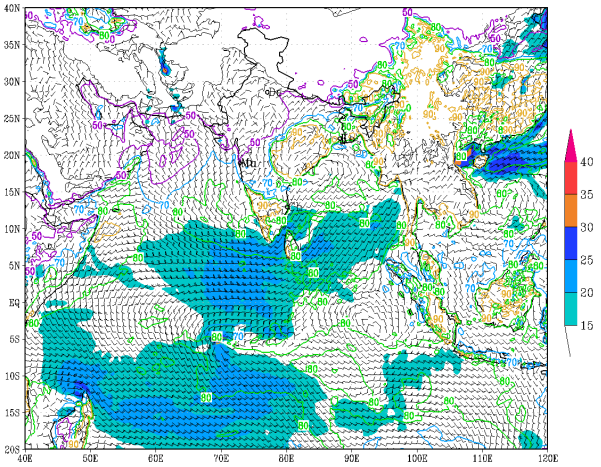

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IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (24 HR)

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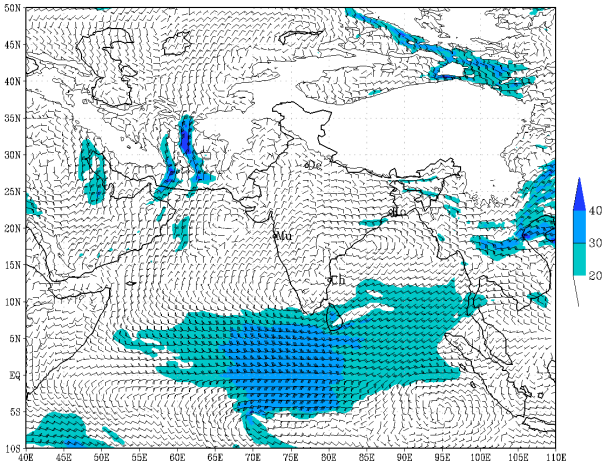

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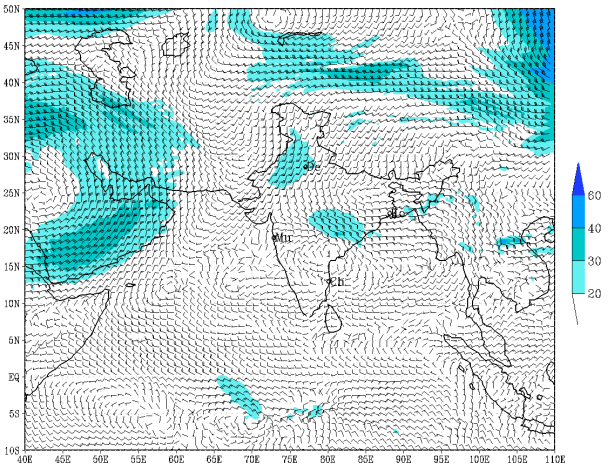
based on 00 UTC of 15-10-2021 valid for 00 UTC of 16-10-2021



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IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (24 HR)

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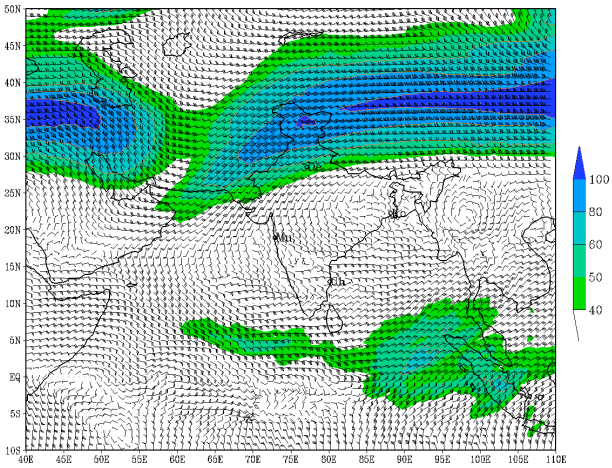

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IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (48 HR)

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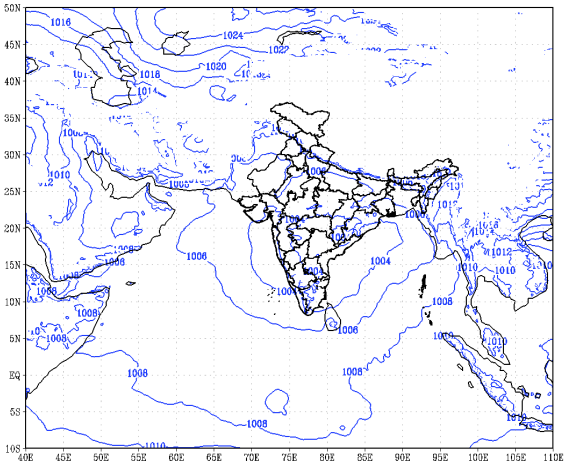

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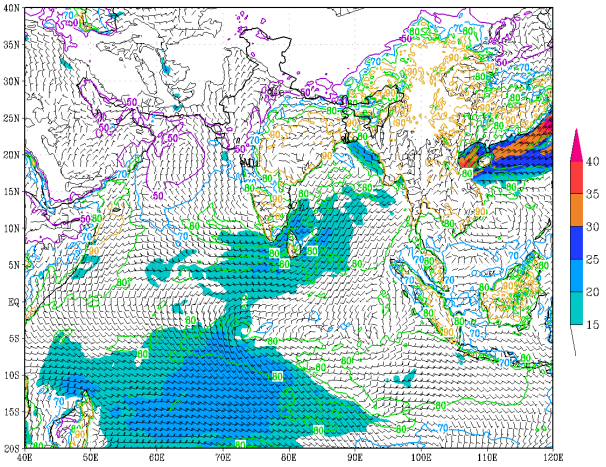
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (48 HR)

based on 00 UTC of 15-10-2021 valid for 00 UTC of 17-10-2021



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IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (48 HR)

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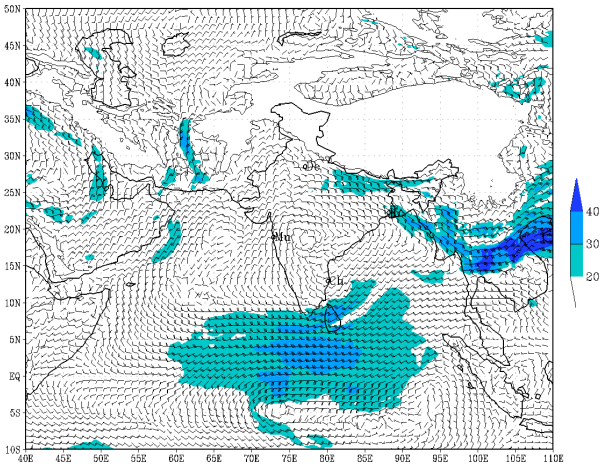

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IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (48 HR)

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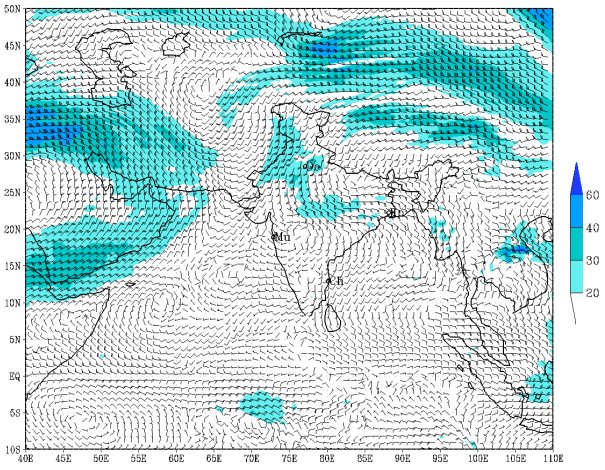

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IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (48 HR)

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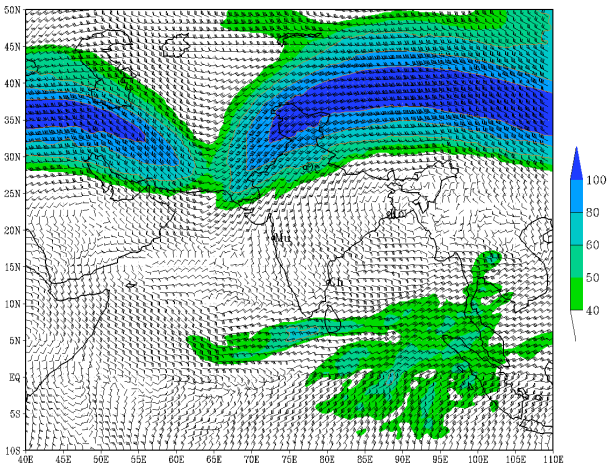

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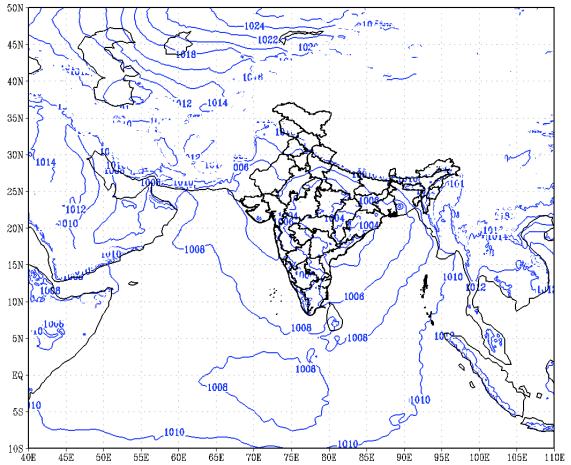
IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (72 HR)

based on 00 UTC of 15-10-2021 valid for 00 UTC of 18-10-2021



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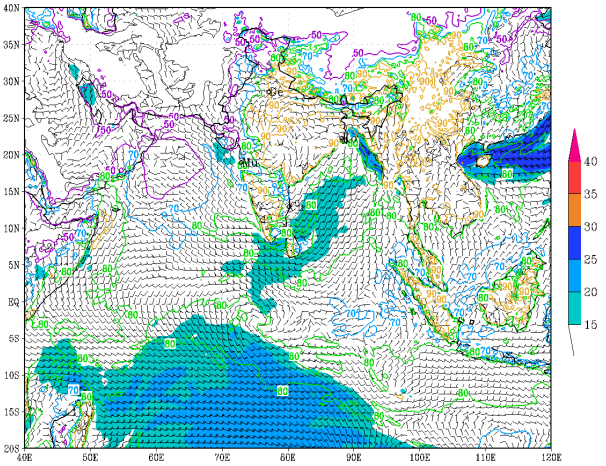
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (72 HR)

based on 00 UTC of 15-10-2021 valid for 00 UTC of 18-10-2021



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IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (72 HR)

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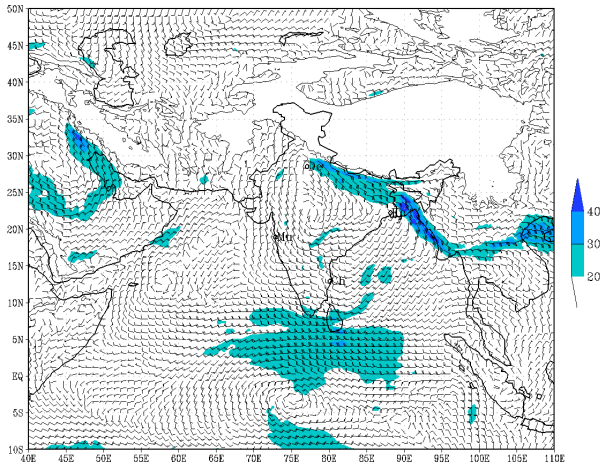

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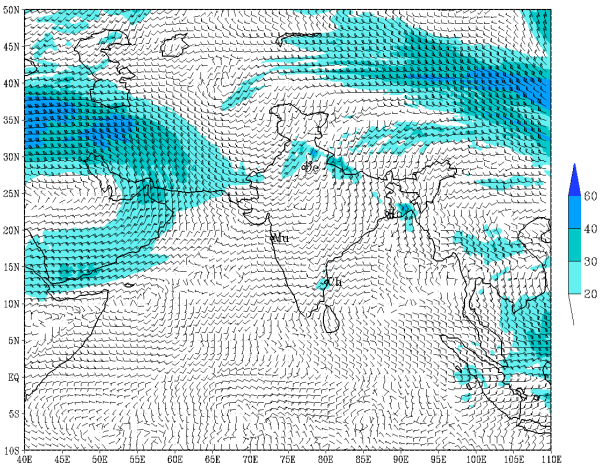

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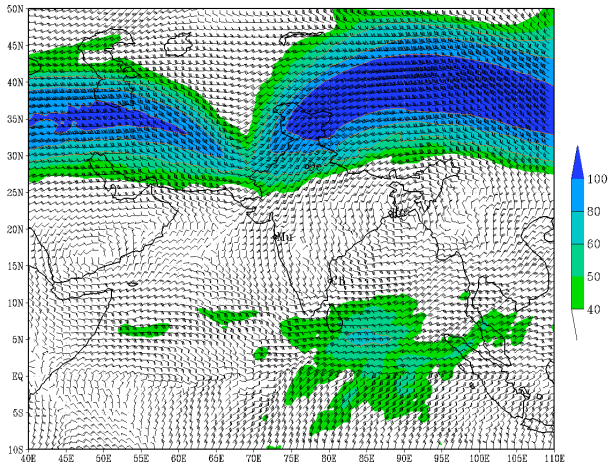

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IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (96 HR)

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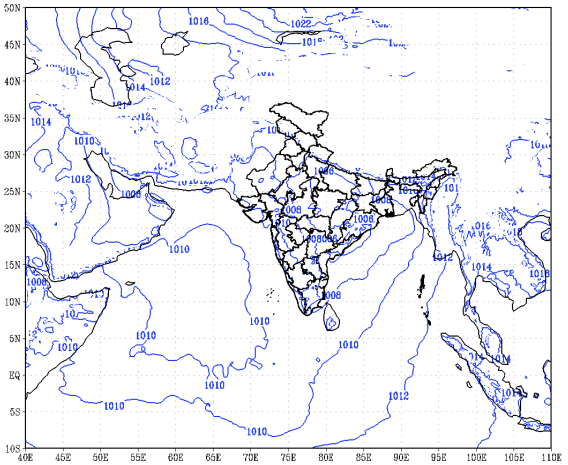

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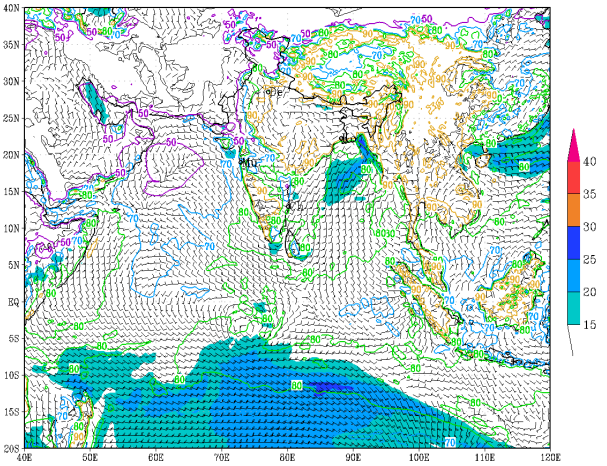
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (96 HR)

based on 00 UTC of 15-10-2021 valid for 00 UTC of 19-10-2021



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IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (96 HR)

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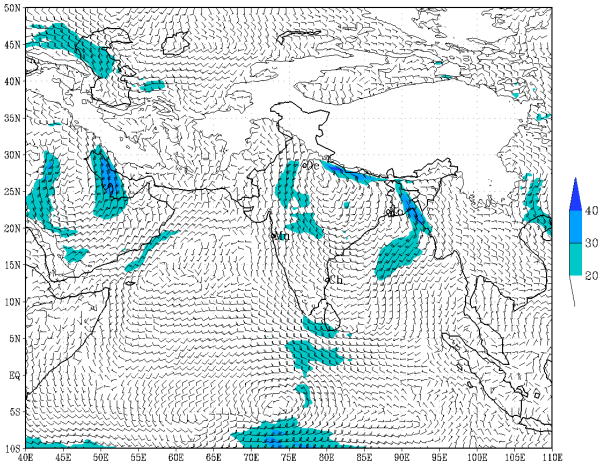

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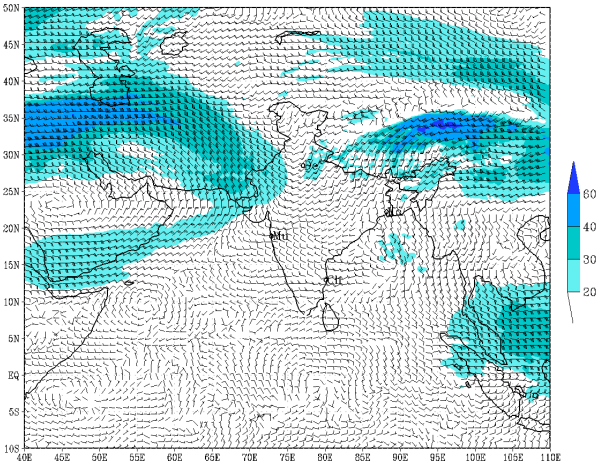

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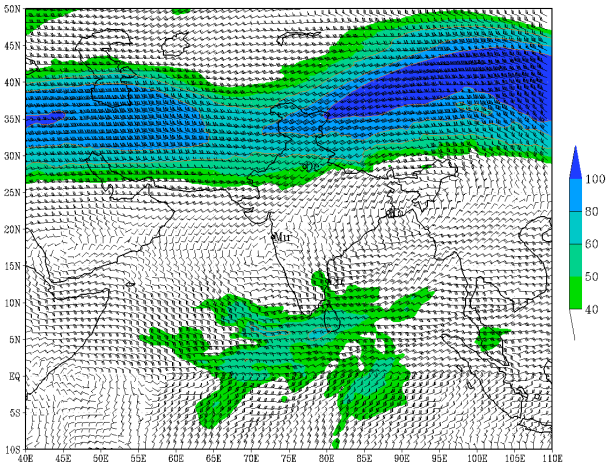
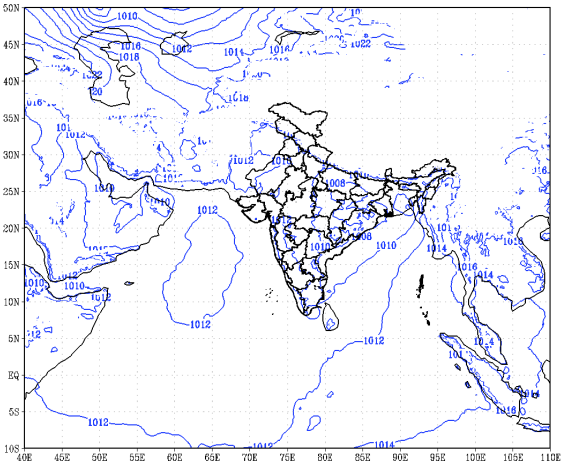
based on 00 UTC of 15-10-2021 valid for 00 UTC of 19-10-2021



(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (120 HR)

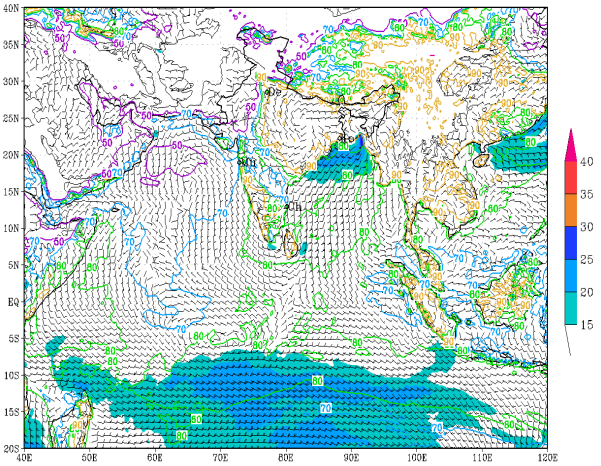
based on 00 UTC of 15-10-2021 valid for 00 UTC of 20-10-2021



(Background does not depict political boundary)

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (120 HR)

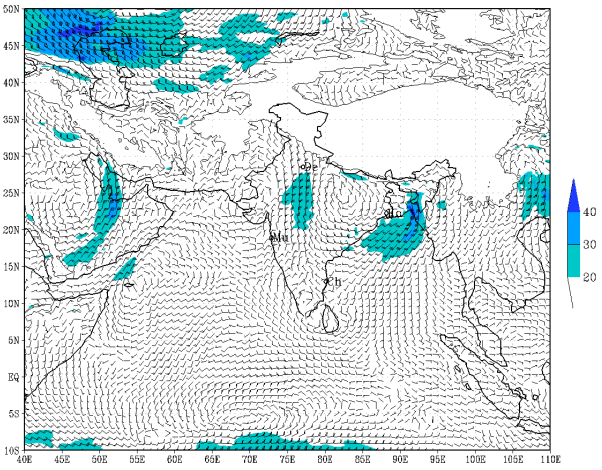
based on 00 UTC of 15-10-2021 valid for 00 UTC of 20-10-2021



(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (120 HR)

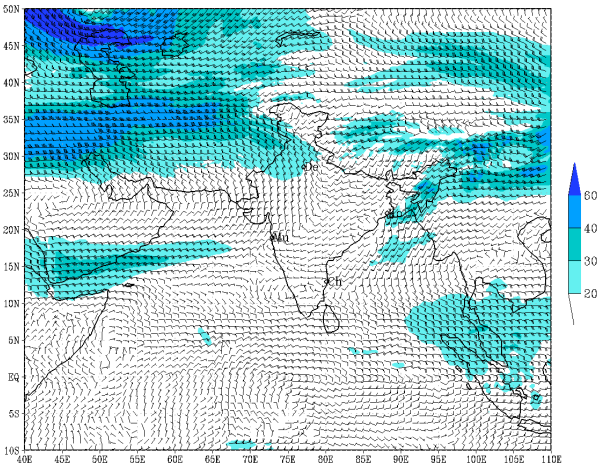
based on 00 UTC of 15-10-2021 valid for 00 UTC of 20-10-2021



(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (120 HR)

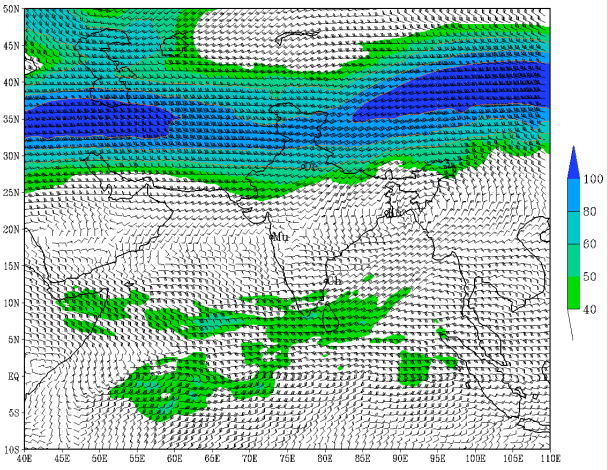
based on 00 UTC of 15-10-2021 valid for 00 UTC of 20-10-2021



(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (120 HR)

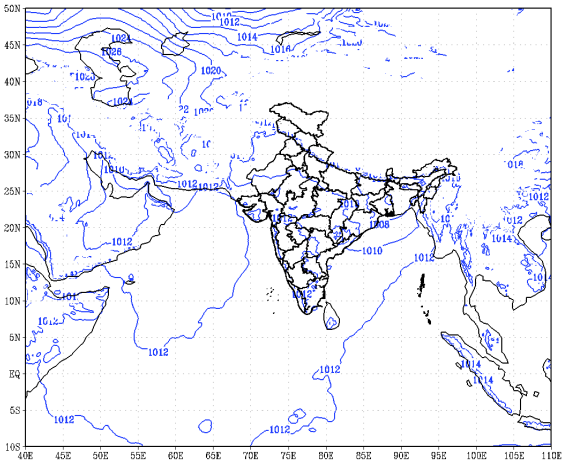
based on 00 UTC of 15-10-2021 valid for 00 UTC of 20-10-2021



(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (144 HR)

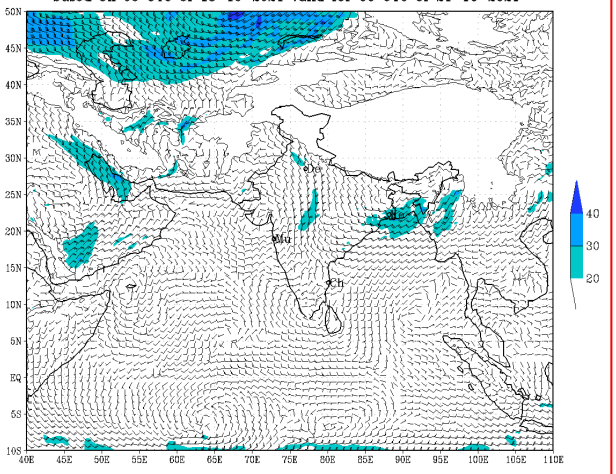
based on 00 UTC of 15-10-2021 valid for 00 UTC of 21-10-2021



(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (144 HR)

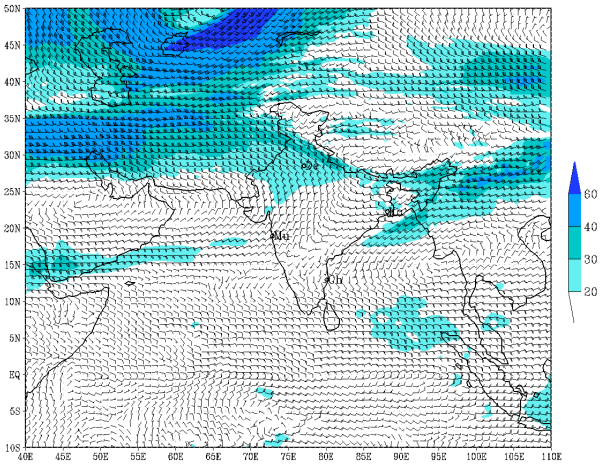
based on 00 UTC of 15-10-2021 valid for 00 UTC of 21-10-2021



(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (144 HR)

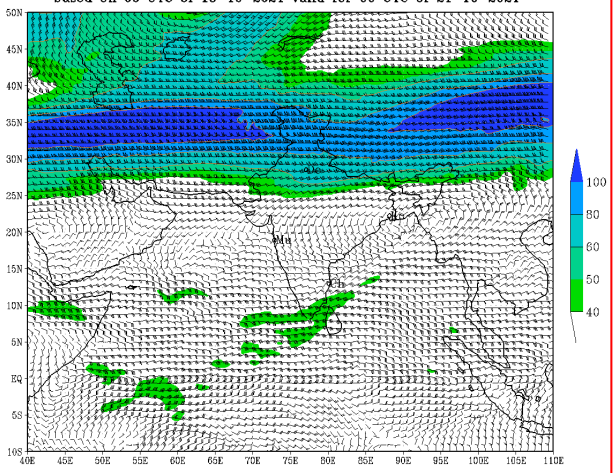
based on 00 UTC of 15-10-2021 valid for 00 UTC of 21-10-2021



(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (144 HR)

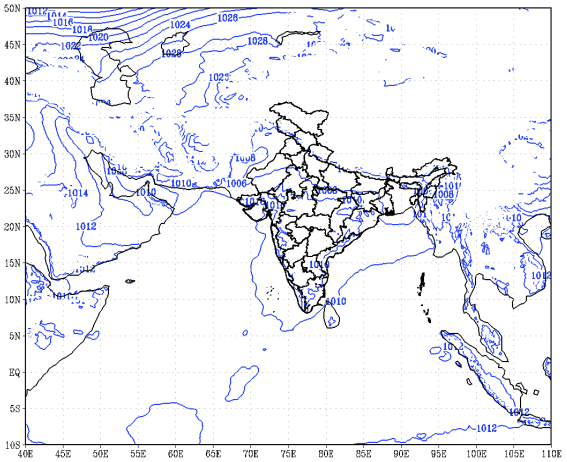
based on 00 UTC of 15-10-2021 valid for 00 UTC of 21-10-2021



(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (168 HR)

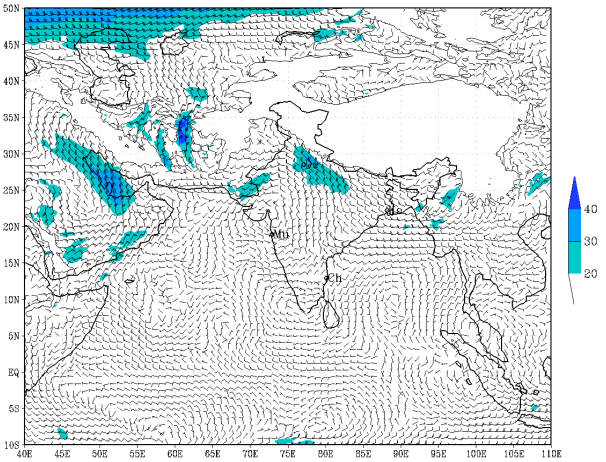
based on 00 UTC of 15-10-2021 valid for 00 UTC of 22-10-2021



(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (168 HR)

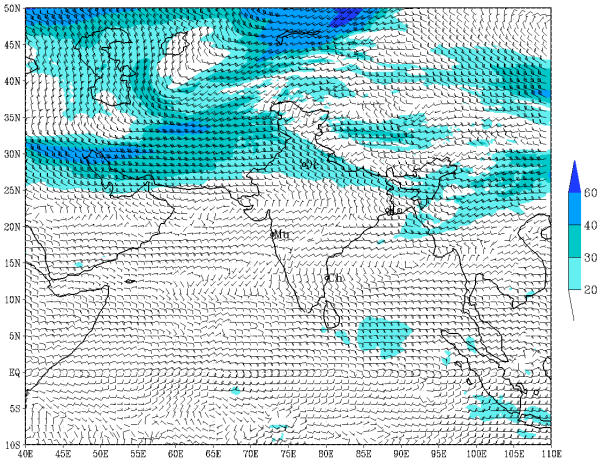
based on 00 UTC of 15-10-2021 valid for 00 UTC of 22-10-2021



(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (168 HR)

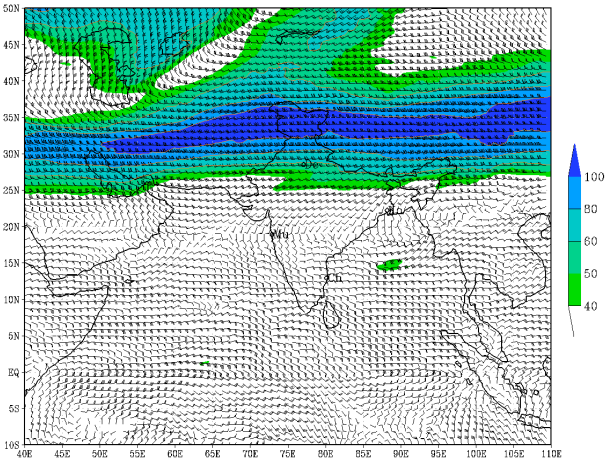
based on 00 UTC of 15-10-2021 valid for 00 UTC of 22-10-2021



(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (168 HR)

based on 00 UTC of 15-10-2021 valid for 00 UTC of 22-10-2021



(Background does not depict political boundary)