



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

FDP (Cyclone) NOC Report Dated 18th November, 2021

Time of Issue: 1200 UTC

Synoptic features (based on 0900 UTC analysis):

- ❖ Yesterday's Low Pressure Area (LPA) over southeast and adjoining southwest Bay of Bengal (BoB) moved west-northwestwards and lay as a well marked low pressure area over southwest & adjoining westcentral BoB off north Tamil Nadu and South Andhra Pradesh coasts at 0000 UTC and into a depression over southwest BoB off North Tamil Nadu coast at 0300 UTC of today, the 18th November 2021. At 0600 UTC of today, it lay over southwest BoB off north Tamil Nadu coast near Lat. 11.2°N/Long. 81.7°E, about 250 km south-southeast of Chennai and 220 km east-southeast of Puducherry and 210 km east-northeast of Karaikal. It is very likely to continue to move west northwestwards and cross north Tamilnadu & adjoining south Andhra Pradesh coasts between Puducherry and Chennai by the early morning of 19th November, 2021
- ❖ Yesterday's LPA over eastcentral Arabian Sea off Goa & adjoining south Maharashtra coasts lay over eastcentral Arabian Sea (AS) at 0300 UTC of today, the 18th November. It persisted over the same region at 0600 UTC. Associated cyclonic circulation extended upto 5.8 km above mean sea level. It is likely to move west-southwestwards and become more marked during next 48 hours.
- ❖ The trough from the cyclonic circulation associated with the above Low Pressure Area over eastcentral AS to south Madhya Pradesh across north Maharashtra extending upto 0.9 km above mean sea level.

Dynamical and thermo-dynamical features

Parameter	Bay of Bengal (BoB)	Arabian Sea (AS)
Sea Surface Temperature (SST) °C	29-31°C over entire BoB region.	28-29°C over eastern parts of AS. 26-27°C over western parts of AS off Somalia, Yemen & Oman coasts.
Tropical Cyclone Heat Potential (TCHP) kJ/cm²	(a) 80-100 over southwest BoB, (b) 100-120 over eastern equatorial Indian Ocean and adjoining south Andaman Sea & southeast BoB.	(a) 60-80 over eastcentral & adjoining southeast AS and also over adjoining southwest AS. (b) It is less than 50 over western parts of AS.
Cyclonic Relative vorticity (X10⁻⁶s⁻¹)	(a) 100 to the south of system centre over southwest AS with vertical extension upto 500 hPa level.	80-100 (increased compared to yesterday) over eastcentral AS with vertical extension upto 500 hPa level.
Low Level convergence (X10⁻⁵)	30 over North Tamil Nadu to the northwest of system centre.	Small zone of 05 over eastcentral AS.

5 s^{-1})		
Upper Level divergence ($\times 10^{-5} \text{ s}^{-1}$)	(a) 30 over North Tamil Nadu to the northwest of system centre. (b) A large extended zone 05-10 over south Andaman Sea and adjoining southeast BoB.	No significant zone seen over the system area. North-south oriented large extending zone 05-10 over parts of southeast AS.
Vertical Wind Shear (VWS knots)	Moderate (15-20) over the system area and along the forecast track. Moderate (15-20) also over eastern parts of BoB & Andaman Sea. High (>25) over southwest and extreme North BoB.	Moderate (15-20) over eastcentral AS. High over all other parts of AS.
Wind Shear Tendency (knots)	Decreasing along expected track.	Increasing along the expected direction of movement.
Upper tropospheric Ridge	Along 19.5°N.	Not well defined

Satellite observations based on INSAT imagery (0900 UTC):

(a) Associated with low pressure area over eastcentral Arabian Sea

At 0900 UTC, scattered to broken low & medium clouds with embedded moderate to intense convection lay over eastcentral AS between latitude 15.0N & 19.0N and longitude 67.0E & 71.0E. Minimum cloud top temperature is minus 70°C. The system is persisting over the same region during past 18 hours. Associated outflow cloud bands lie over Gujarat, East Rajasthan, northwest Madhya Pradesh, Uttar Pradesh and adjoining Nepal.

(b) Associated with depression over southwest Bay of Bengal off north Tamil Nadu coast

At 0900 UTC, the intensity of the system is characterised as T 1.5. Clouds are organized in shear pattern. Broken low & medium clouds with embedded intense to very intense convection lay over southwest & adjoining westcentral BoB between latitude 10.0N & 14.5N and west of longitude 81.5E, over Tamil Nadu and adjoining south Andhra Pradesh and south interior Karnataka. Minimum cloud top temperature is minus 93°C. Microwave imagery at 0754 UTC exposes the low level circulation to the east of the cloud mass. Intense convection cloud mass is sheared to west of the system centre. Due to land interaction the convective cloud mass over north Tamil Nadu has got slightly disorganised and fractured into multiple convective cells spreading across north Tamil Nadu and adjoining south Andhra Pradesh.

M.J.O. Index:

MJO index is currently in Phase 4 with amplitude close to 1. It will continue in same phase for next 7 days with amplitude less than 1.

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

No storm / depression prevail over these Sea areas as on today.

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

Model	BoB	AS
IMD-GFS	Indicates a marginal Depression over southwest BoB off north Tamil Nadu coast on 18 th , a Low Pressure Area (LPA) over north coastal Tamil Nadu & adjoining south coastal Andhra	Indicates an LPA over eastcentral AS on 18 th , Well Marked Low (WML) over the same region on 19 th , west-southwestward movement

	Pradesh on 19 th and weakening on 20 th .	over to east-central & adjoining southeast AS on 20 th , as an LPA over southeast & adjoining east-central AS on 21 st and further west-southwestward movement and weakening by 24 th .
IMD-GEFS	Same as above	Same as above
IMD-WRF	Indicates a Depression over southwest BoB off Tamil Nadu coast on 18 th , over north coastal Tamil Nadu on 19 th , as an LPA over Rayalaseema on 20 th and further weakening on 21 st .	Indicates an LPA over east-central AS on 18 th & 19 th , as a WML over east-central & adjoining southeast AS on 20 th and over southeast & adjoining east-central AS on 21 st .
NCMRWF-NCUM	Indicates a Depression over southwest BoB off north Tamil Nadu coast on 18 th , as a WML over north coastal Tamil Nadu on 19 th and dissipation on 20 th .	Indicates a Well Marked Low over east-central AS on 18 th & 19 th , as an LPA over east-central AS on 20 th & 21 st , again as a WML over southwest AS on 22 nd , to the east of Somalia on 23 rd and as an LPA over southwest AS off Somalia coast on 23 rd .
NCMRWF-NEPS	-Do-	-Do-
NCMRWF-UM (Regional)	-Do-	-Do-
ECMWF	Indicates a Depression over southwest BoB off north Tamil Nadu coast on 18 th , crossing north Tamil Nadu coast around 2100 UTC of 18 th , as a WML over north coastal Tamil Nadu on 19 th and further weakening on 20 th .	Indicates an LPA over east-central AS with gradual weakening & west-southwestward movement over to southwest AS during 18 th - 23 rd .
ECMWF-EPS	Genesis & strike probability NIL for the period 21 st – 24 th .	Genesis & strike probability NIL for the period 21 st – 24 th .
NCEP-GFS	Indicates an LPA over southwest & adjoining west-central BoB off north Tamil Nadu – south Andhra Pradesh coasts on 19 th , over south coastal Andhra Pradesh on 20 th , weakening into a broad-scale Low over southeast Peninsular India on 21 st , persistence on 22 nd and dissipation on 23 rd .	Indicates an LPA over east-central AS with slight southward movement during 19 th – 21 st and weakening on 22 nd .
IMD-GPP	A Potential zone over southwest BoB off north Tamil Nadu coast on 18 th , over west-central BoB off south Andhra Pradesh coast on 19 th and NIL during the rest of the days.	Potential zone over east-central AS with gradual southwestward shift during 18 th – 21 st .

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

Summary and Conclusion:

- 1. For the Bay of Bengal:** Majority of the models analysed above simulated the Depression in their 00 UTC analysis, going against their forecasts given yesterday. All of them predict it's west-northwestward movement, and crossing north Tamil Nadu coast, about 50-60 km to the south of Chennai around 2100 UTC of 18th or 0000 UTC of 19th as a Depression. None of

them indicate further intensification, though a few models like NCEP GFS are showing weakening prior to crossing the coast and an along-shore northward movement.

2. **For the Arabian Sea:** Most of the models indicate the persistence of the present Low Pressure Area over east-central Arabian Sea during 18th – 21st. Majority of them indicate gradual west-southwestward movement with no significant intensification. The NCUM group (NCUM, NEPS & NCUM (R)) which had been indicating intensification into a Depression and further into a Cyclonic Storm also has reduced the intensity upto the stage of a Well Marked Low based on today 00 UTC, initial conditions.

It may thus be concluded that,

1. The depression over southwest Bay of Bengal **off north Tamil Nadu coast** is likely to move west-northwestwards and cross north Tamil Nadu & adjoining south Andhra Pradesh coasts, between Puducherry & Chennai by the early morning of tomorrow, the 19th November, 2021.
2. The Low Pressure Area over east-central Arabian Sea is likely to move west-southwestwards and become more marked during next 48 hours. The ‘Low’ probability which was assigned yesterday for its intensification into a Depression has been removed based on the latest model consensus. However, we may keep a watch over this system, once the Depression over the Bay of Bengal weakens and the remnant vorticity advection takes place westwards.

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

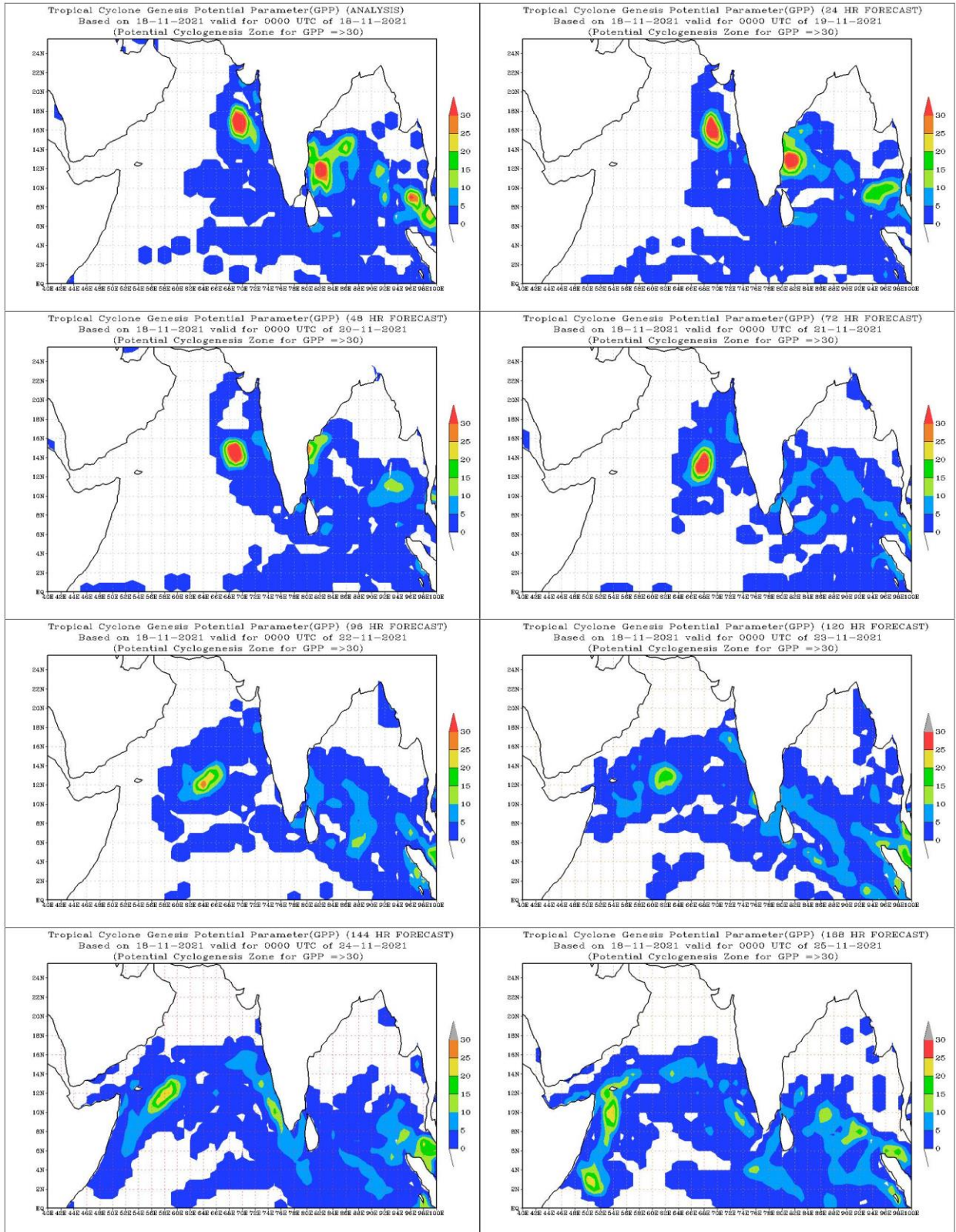
Probability of cyclogenesis (formation of depression and above intensity systems) over the Arabian Sea during next 168 hours:

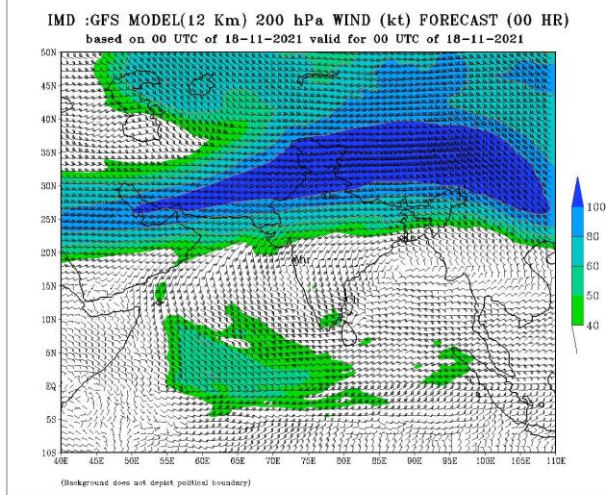
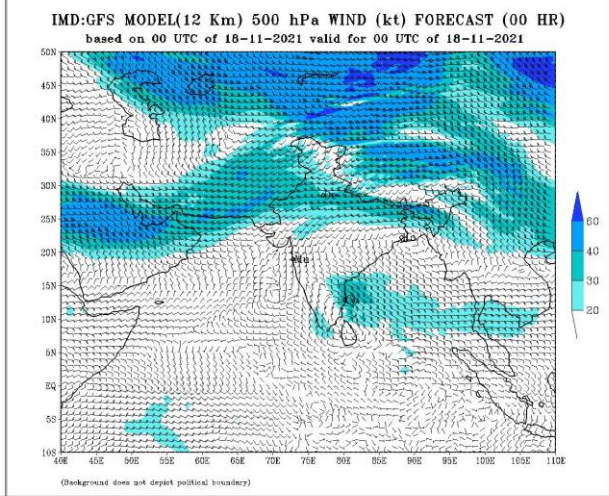
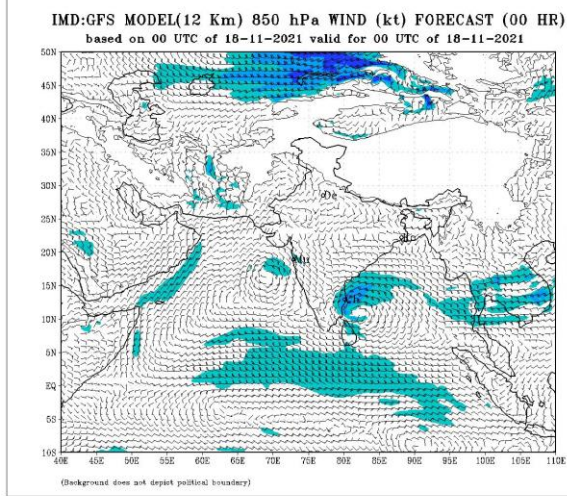
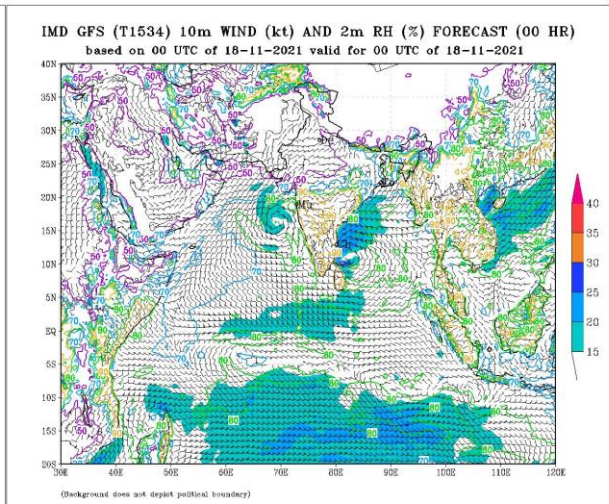
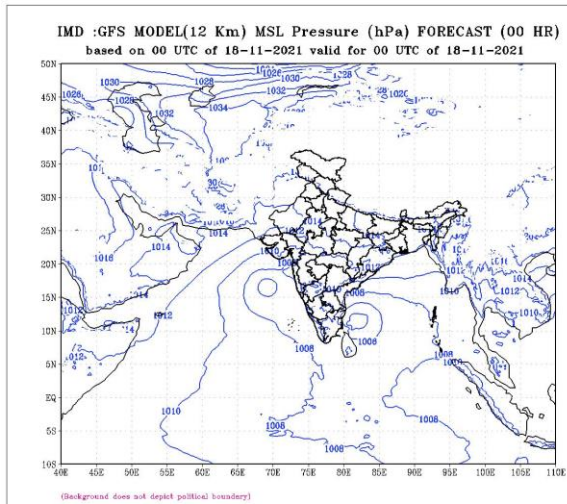
24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS	120-144 HOURS	144-168 HOURS
NIL	NIL	NIL	NIL	NIL	NIL	NIL

Advisory:

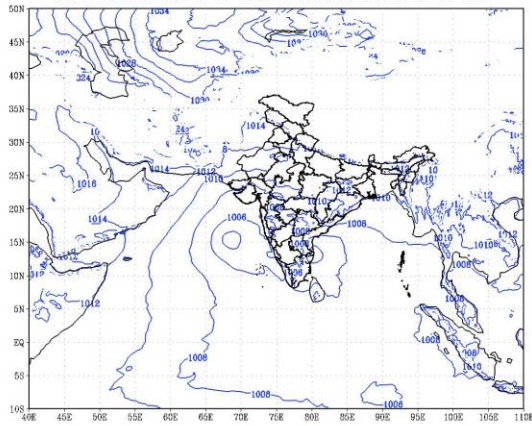
- (1) Likely movement & crossing of the Depression over southwest Bay of Bengal needs to be monitored. (2) Likely intensification & movement of Low pressure Area over east-central Arabian Sea also needs to be monitored.

IOP is suggested for north Tamil Nadu - south Andhra Pradesh coasts during next 24 hours.



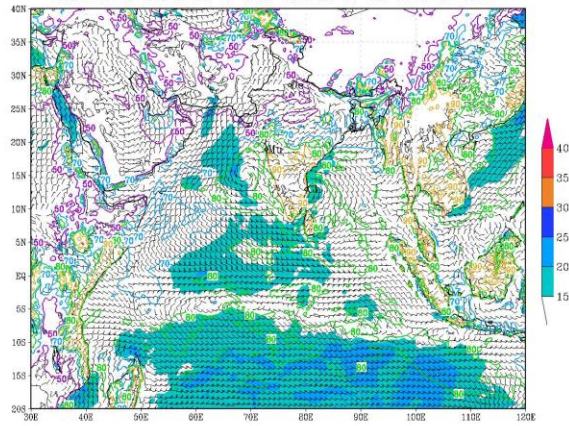


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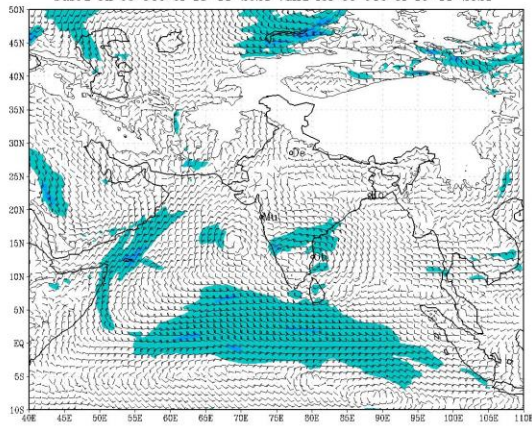
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IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (24 HR)
based on 00 UTC of 18-11-2021 valid for 00 UTC of 19-11-2021



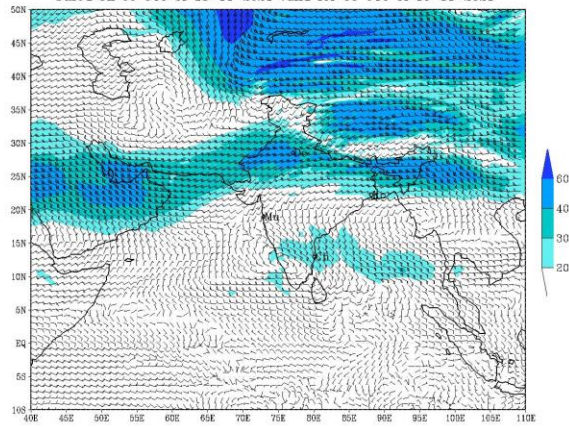
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IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (24 HR)
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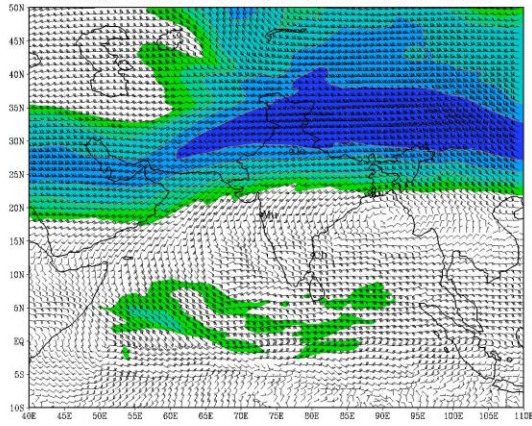
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IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (24 HR)
based on 00 UTC of 18-11-2021 valid for 00 UTC of 19-11-2021

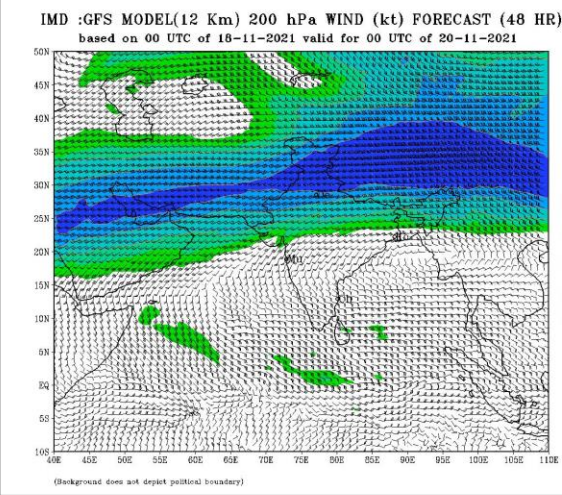
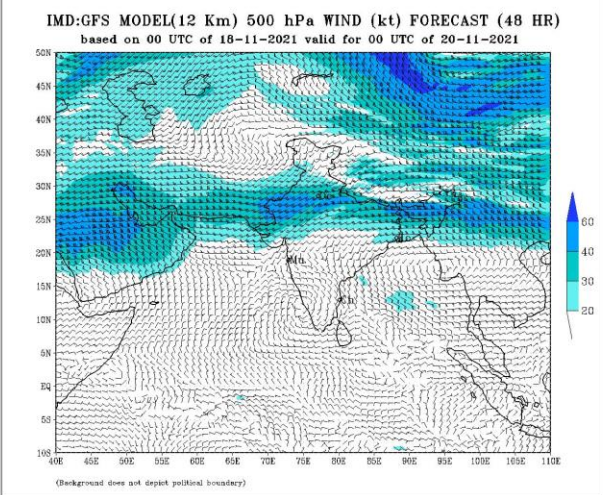
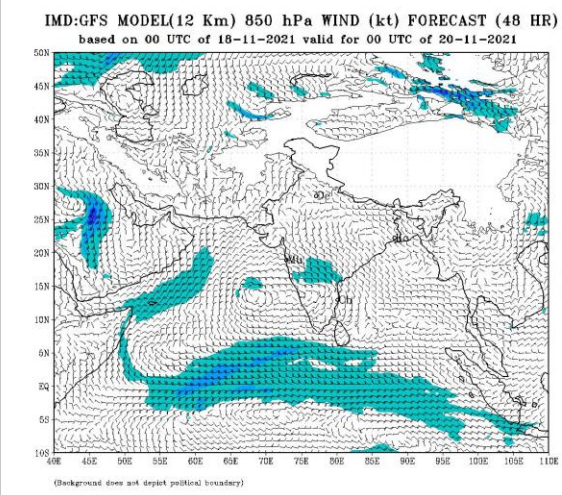
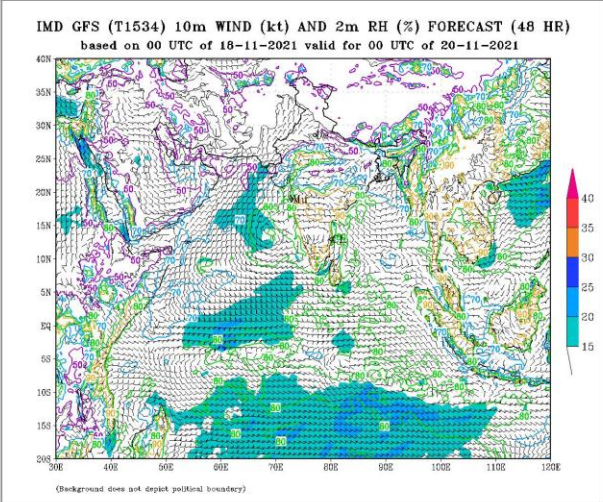
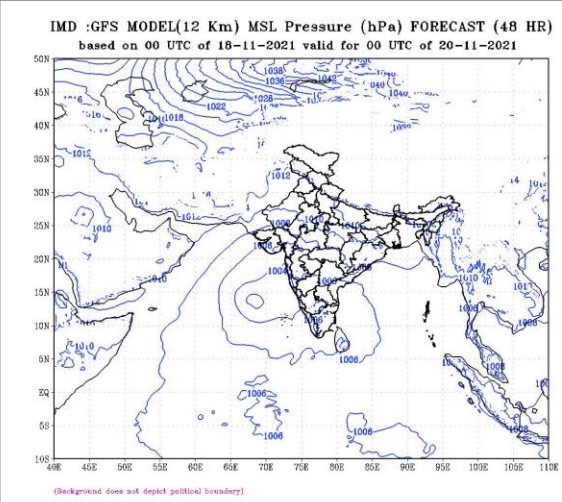


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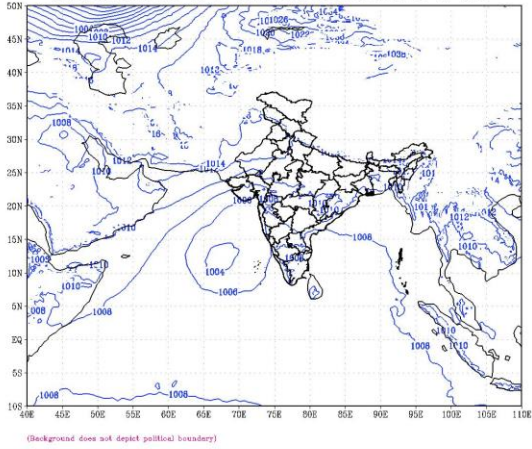
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based on 00 UTC of 18-11-2021 valid for 00 UTC of 19-11-2021



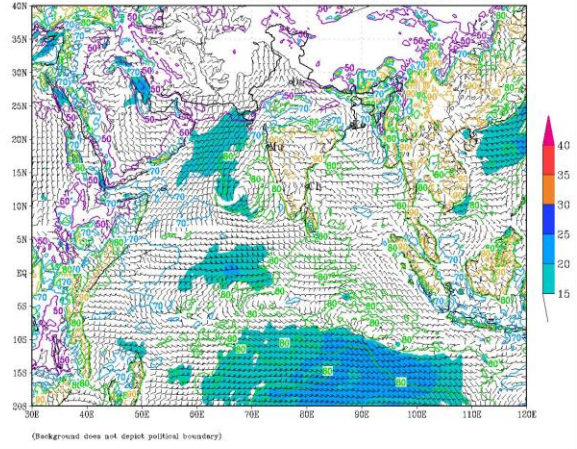
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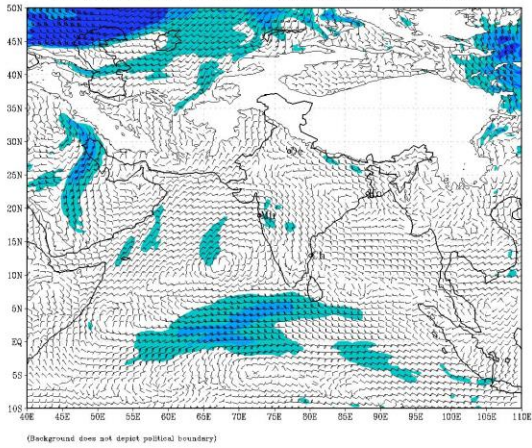
IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (72 HR)
based on 00 UTC of 18-11-2021 valid for 00 UTC of 21-11-2021



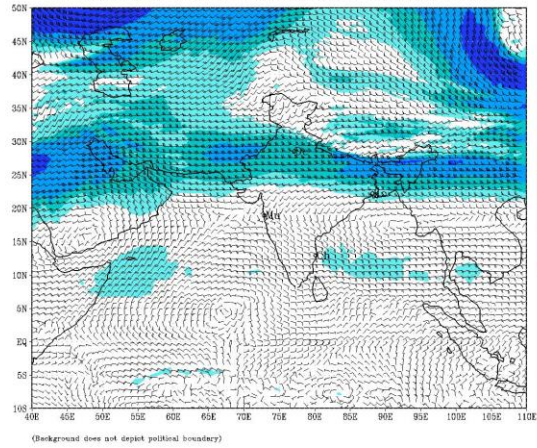
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based on 00 UTC of 18-11-2021 valid for 00 UTC of 21-11-2021



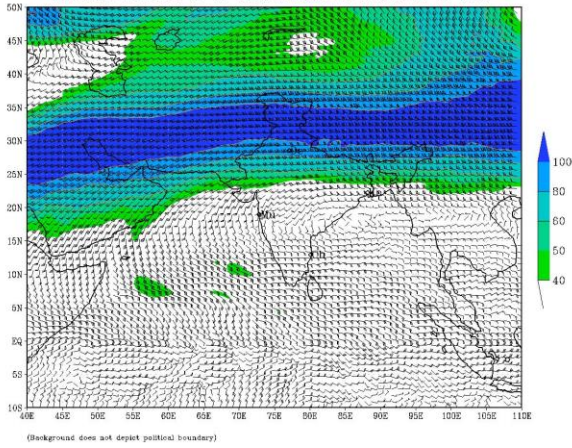
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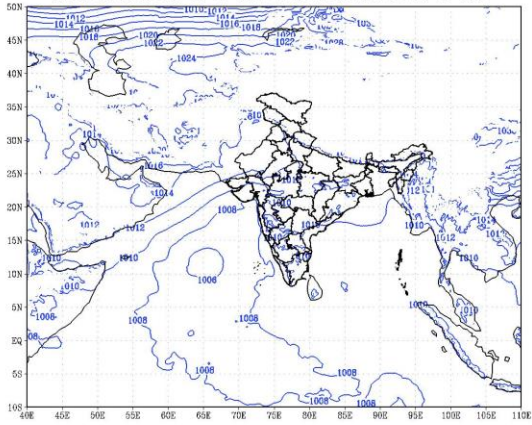
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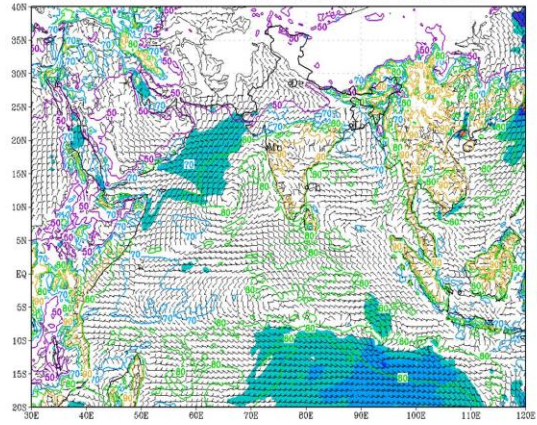


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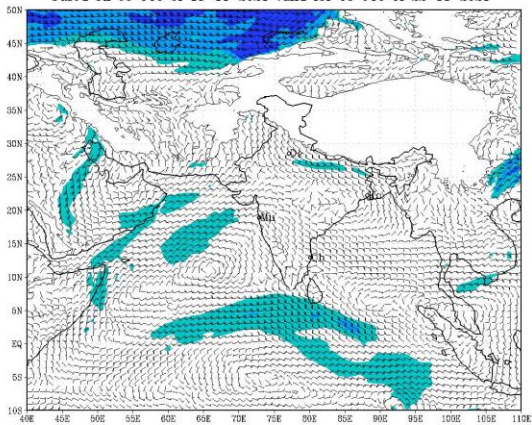
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IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (96 HR)
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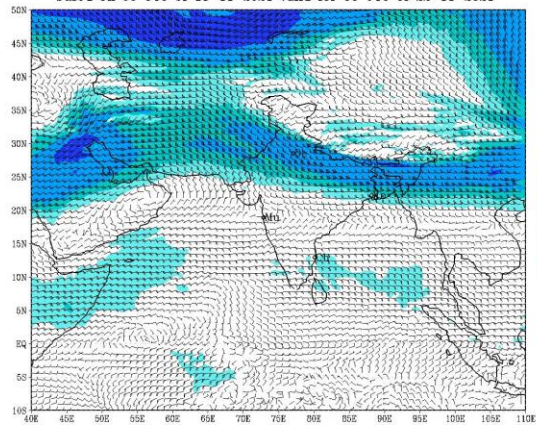
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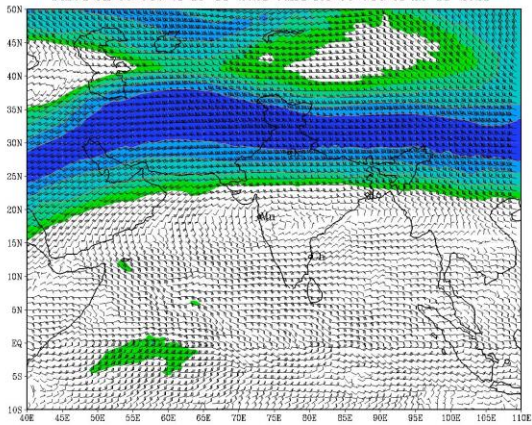
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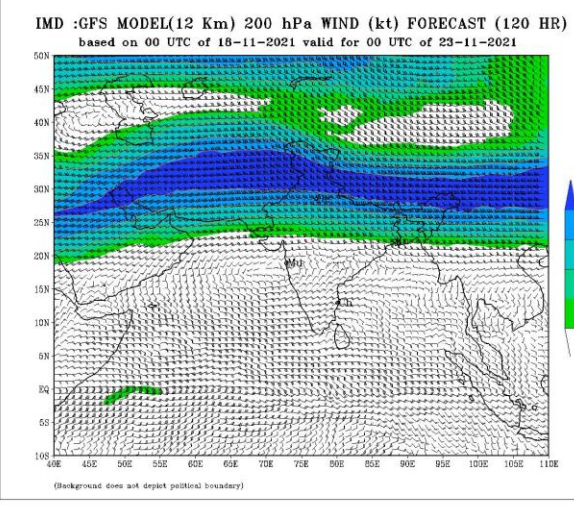
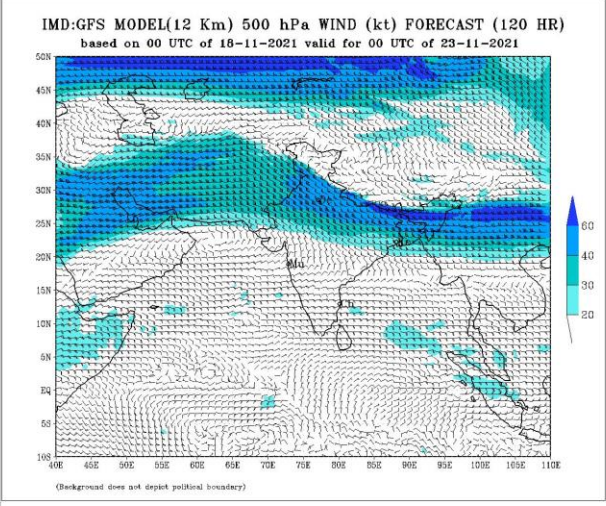
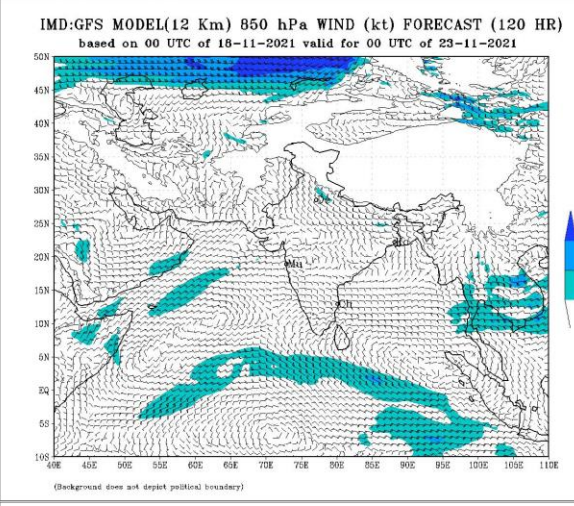
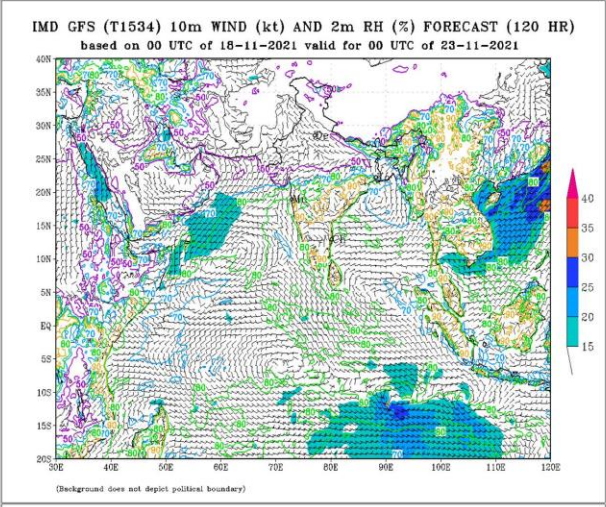
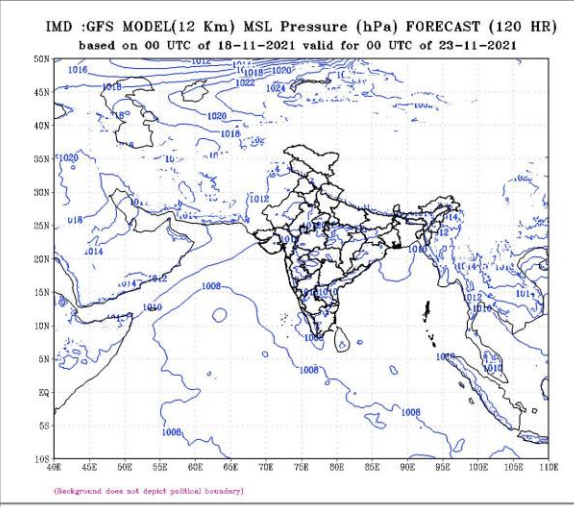


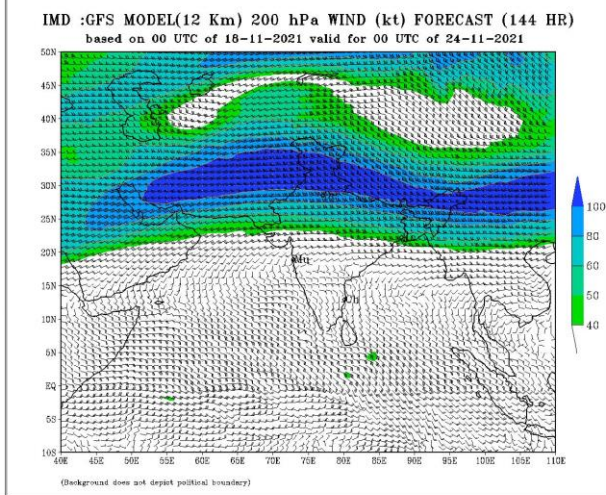
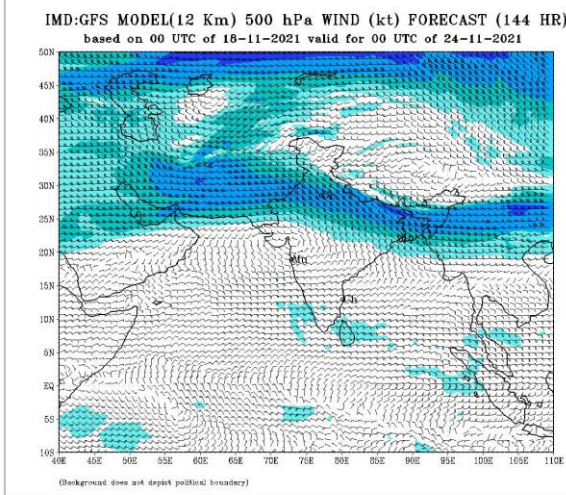
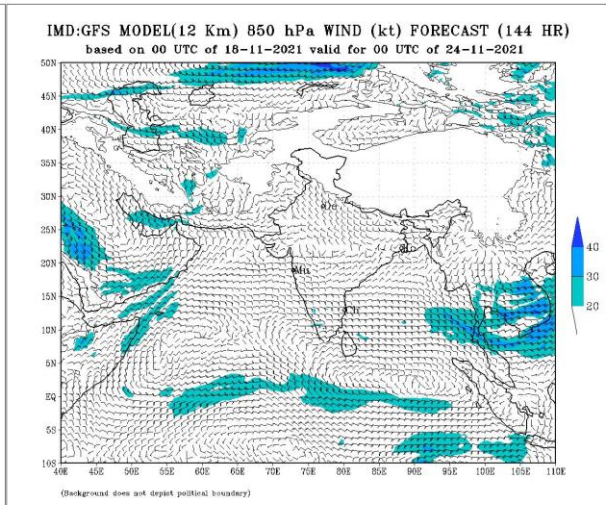
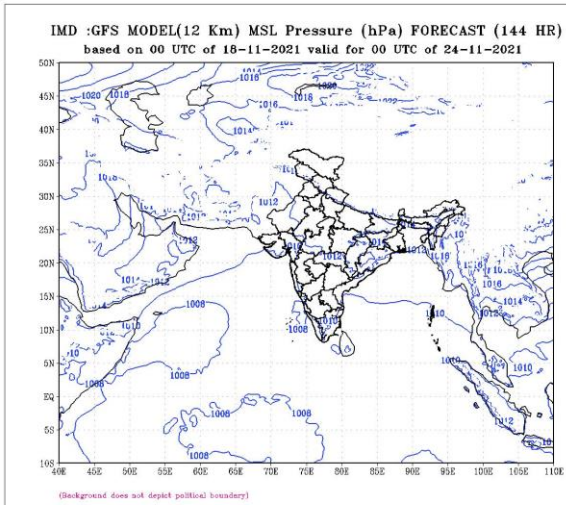
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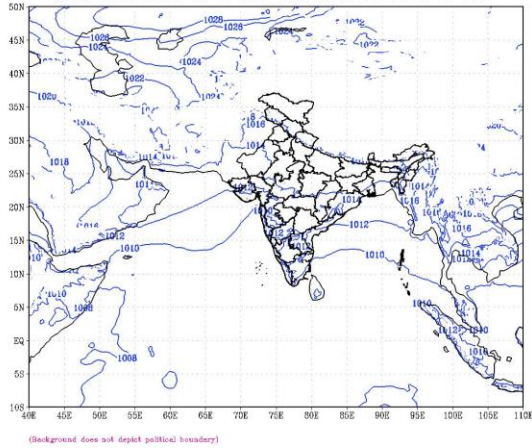


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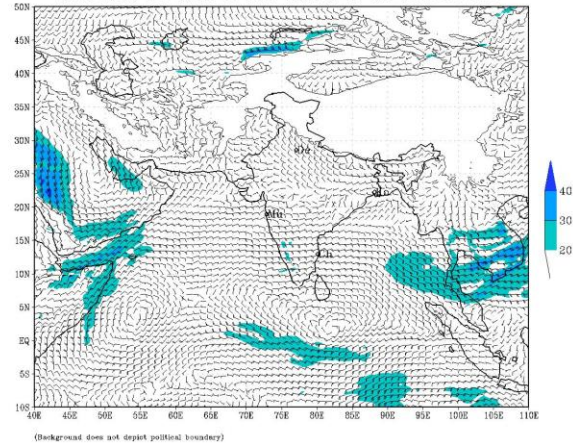




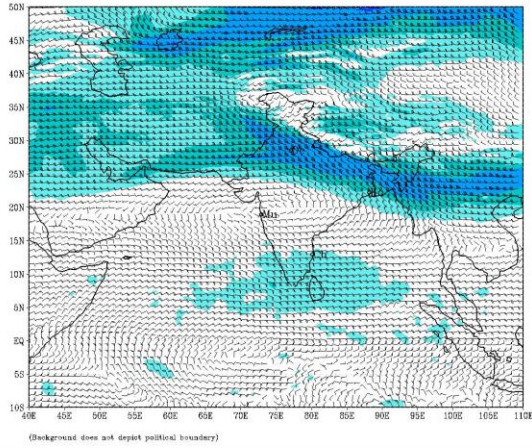
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based on 00 UTC of 18-11-2021 valid for 00 UTC of 25-11-2021



IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 18-11-2021 valid for 00 UTC of 25-11-2021



IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 18-11-2021 valid for 00 UTC of 25-11-2021



IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 18-11-2021 valid for 00 UTC of 25-11-2021

