



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

FDP (Cyclone) NOC Report Dated 03rd December, 2021

Time of Issue: 1200 UTC

Synoptic features (based on 0900 UTC analysis):

- ❖ Yesterday's depression over southeast Bay of Bengal (BoB) moved north-northwestwards and concentrated into a deep depression over westcentral & adjoining south BoB in the morning (0530 hours IST) and into the Cyclonic Storm "JAWAD" (pronounced as JOWAD) over westcentral BoB in the noon (1130 hours IST) of today, the 3rd December, 2021. At 1430 hrs IST of today, the 3rd December 2021, it lay over westcentral BoB near Lat. 15.0°N and Long. 85.3°E, about 360 km south-southeast of Vishakhapatnam (Andhra Pradesh), 470 km south-southeast of Gopalpur (Odisha), 530 km south-southwest of Puri (Odisha) and 600 km south-southwest of Paradip (Odisha). It is likely to move north-northwestwards, intensify further and reach west-central Bay of Bengal off north Andhra Pradesh – south Odisha coasts by tomorrow, the 4th December morning. Thereafter it is likely to recurve north-northeastwards and move along Odisha coast reaching near Puri around 5th December noon. Subsequently it is likely to continue to move north-northeastwards along coastal Odisha towards West Bengal coast.
- ❖ Yesterday's cyclonic circulation over northeast Arabian Sea off south Gujarat and north Konkan coasts persisted over the same region and extended upto 1.5 km above mean sea level.
- ❖ The trough at mean sea level from Southeast Arabian Sea to Northeast Arabian Sea off south Gujarat-north Konkan coasts extending upto 1.5 km above mean sea level with embedded cyclonic circulation over Northeast Arabian Sea off south Gujarat-north Konkan coasts persists.

Dynamical and thermodynamical features

Parameter	Bay of Bengal (BoB)	Arabian Sea (AS)
Sea Surface Temperature (SST) °C	29-30°C over major parts of west BoB and higher off south Andhra Pradesh-north Tamil Nadu coasts. Slightly less 27-28°C over north BoB and Andaman Sea.	28-29°C over major parts of AS. 29-30°C over eastcentral AS off Kerala coast.
Tropical Cyclone Heat Potential (TCHP) kJ/cm²	110-120 over parts of south Andaman Sea and adjoining southeast BoB. Gradually decreasing becoming 80-90 over central and north BoB.	70-80 over southeast & parts of eastcentral AS. 50-60 over central AS. Less than 50 over major parts of west AS.
Cyclonic Relative vorticity (X10⁻⁶s⁻¹)	Vorticity has increased during past 24 hours and is around 180 to the northwest of system	40 to 50 over northeast AS off south Gujarat coast with vertical extension upto 500 hPa.

		centre with vertical extension upto 500 hPa.	
Low Level convergence (X10⁻⁵ s⁻¹)		Low level convergence 10 to the northeast of system centre.	05 over Maharashtra and Konkan coasts.
Upper Level divergence (X10⁻⁵ s⁻¹)		05-10 over the system area and 30 to the northeast of system centre.	05 over Maharashtra and Konkan coasts.
Vertical Shear (VWS Knots)		Moderate (15-20) over system centre and also over adjoining westcentral BoB. Increasing slightly towards northwest and adjoining westcentral BoB.	Moderate 15-20 over southwest AS. High over major parts of AS.
Wind Shear Tendency (knots)		Decreasing over the system area. Decreasing along the southwest & adjoining westercentral BoB.	Decreasing over northeast AS.
Upper tropospheric Ridge		Along 15.0°N over the central BoB.	Not well defined..
Trough in Westerlies			A trough in mid & upper tropospheric westerlies runs along longitude 73°E to the north of latitude 15°N.

Satellite observations based on INSAT imagery (0900 UTC):

(a) Cyclonic storm “JAWAD” over southeast BoB:

The cloud mass has organized in shear pattern. The intensity of the system is characterized as T 2.5. The convective cloud clusters are sheared in northwest sector. Cloud bands with embedded moderate to intense convection are seen over North Andhra Pradesh, Odisha and south Gangetic West Bengal. Associated broken low & medium clouds with embedded intense to very intense convection lay over westcentral & northwest BoB between latitude 14.5N & 22.0N and longitude 81.0E & 92.0E.

(b) Arabian Sea

At 0900 UTC, scattered low & medium clouds with embedded isolated moderate to intense convection lay over southeast and adjoining eastcentral Arabian Sea off north Kerala and Karnataka coast.

M.J.O. Index:

MJO index is currently in Phase 6 with amplitude more than 1. It will continue in same phase for next 7 days.

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

No system over the area.

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

Model	BoB	AS
IMD-GFS	Indicates a Cyclonic Storm (CS) over west-central BoB at 00 UTC of 3 rd December, as a Severe Cyclonic Storm (SCS) over west-central BoB very close to north Andhra Pradesh coast at 00 UTC of 4 th , crossing south	No significant development is indicated.

	Odisha coast close to Puri around 17 UTC of 4 th and lying as a Depression over coastal Odisha at 00 UTC of 5 th and further weakening on 6 th & 7 th .	
IMD-GEFS	Same as above. However, there is large uncertainty with respect to the intensity. Shows complete dissipation on 6 th itself.	Same as above
IMD-WRF	Indicates a CS over central BoB on 3 rd , as an SCS over west-central BoB off north Andhra Pradesh coast on 4 th , as a Depression after crossing north Andhra Pradesh – south Odisha coasts over south coastal Odisha & neighbourhood on 5 th and as a Low Pressure Area (LPA) over Odisha & adjoining Chhattisgarh on 6 th .	No significant development is indicated.
NCMRWF-NCUM(Global)	Indicates a CS over west-central BoB on 3 rd , as an SCS over west-central BoB off north Andhra Pradesh coast on 4 th , as a Very Severe Cyclonic Storm (VSCS) over west-central & adjoining northwest BoB off north Andhra Pradesh – south Odisha coasts on 5 th , as an SCS over northwest BoB close to West Bengal coast on 6 th , as a Depression over north BoB off Bangladesh coast on 7 th and weakening on 8 th .	No significant development is indicated.
NCMRWF-NEPS	Similar to NCUM-G	Similar to NCUM-G
NCMRWF-UM (Regional)	Indicates a CS over central BoB on 3 rd , as an SCS over west-central BoB close to north Andhra Pradesh coast on 4 th , as a Depression after crossing south Odisha coast over the same region on 5 th and as an LPA over Gangetic West Bengal & adjoining north coastal Odisha on 6 th .	Same as above
ECMWF	A Depression over central BoB at 0000 UTC of 3 rd , as a CS over west-central BoB at 0600 UTC of 3 rd , as a CS over west-central BoB off north Andhra Pradesh coast at 00 UTC of 4 th , re-curving north-northeastwards along & off Andhra Pradesh coast with gradual weakening and lay as a Depression over coastal Odisha at 0600 UTC of 5 th and over southern parts of coastal West Bengal at 1800 UTC of 5 th and further weakening into an LPA over Bangladesh on 6 th .	No significant development is indicated.
ECMWF-EPS	90-100 % probability of cyclogenesis / strike over north Andhra Pradesh – south Odisha coasts on 6 th & 7 th and 50-60% over West Bengal coast on 8 th .	Nil
NCEP-GFS	Indicates a CS over west-central & adjoining northwest BoB off north Andhra Pradesh – south Odisha casts on 4 th , a Deep Depression over northwest & adjoining west-central BoB off south odisha – north Andhra Pradesh coasts on 5 th , as a Depression over northwest BoB off West Bengal coast on 6 th , as an LPA over north BoB and adjoining Bangladesh	No Low pressure system predicted.

	coast on 7 th and weakening on 8 th .	
IMD-GPP	Potential zone over central BoB on 3 rd . 2 detached zones, one over west-central & adjoining northwest BoB and another over northwest BoB off Odisha coast on 4 th and over northwest BoB off Odisha coast on 5 th , NIL during 6 th - 9 th .	No potential zone predicted.

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

Summary and Conclusion:

Most of the models are indicating that the current Cyclonic Storm (JAWAD) over west-central BoB would move northwestwards, intensify further and reach near the off coastal belt of north Andhra Pradesh – south Odisha by 00 UTC of 4th December and then start re-curving north-northeastwards traversing along Odisha coast on 5th December with gradual weakening. However, there is some divergence among various models w.r.t. the speed of movement and probable location of re-curvature. As a result, nearly 50 % of the models analysed are indicating likely crossing of the system over Odisha, close to Puri and re-emergence over to the Bay of Bengal or continued movement along West Bengal coast with rapid weakening. The time of crossing still varies among this group of models. The other 50 % are indicating a movement off the coast towards north Bay of Bengal off Bangladesh coast & weakening.

It may thus be concluded that,

1. The Cyclonic Storm ‘JAWAD’ (Pronounced as JOWAD) over west-central Bay of Bengal is likely to move north-northwestwards, intensify further and reach west-central Bay of Bengal off north Andhra Pradesh – south Odisha coasts by tomorrow, the 4th December morning. Thereafter it is likely to re-curve north-northeastwards and move along Odisha coast reaching near Puri around 5th December noon. Subsequently it is likely to continue to move north-northeastwards along coastal Odisha towards West Bengal coast.
2. No significant development is likely over the Arabian Sea during next 7 days.

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

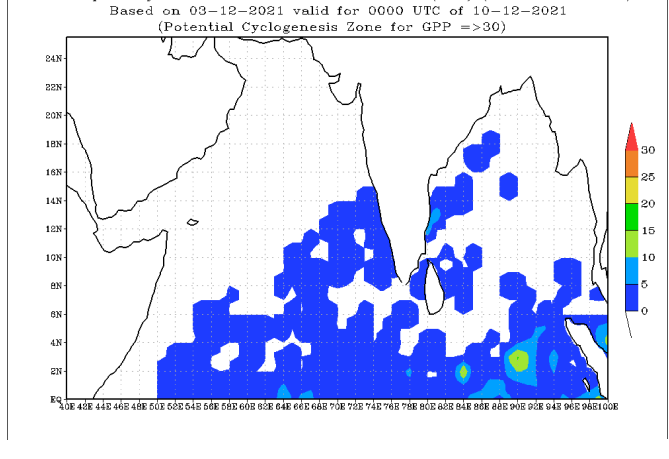
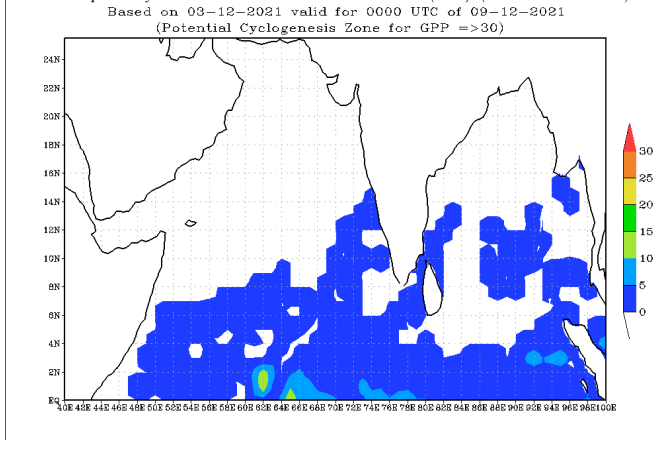
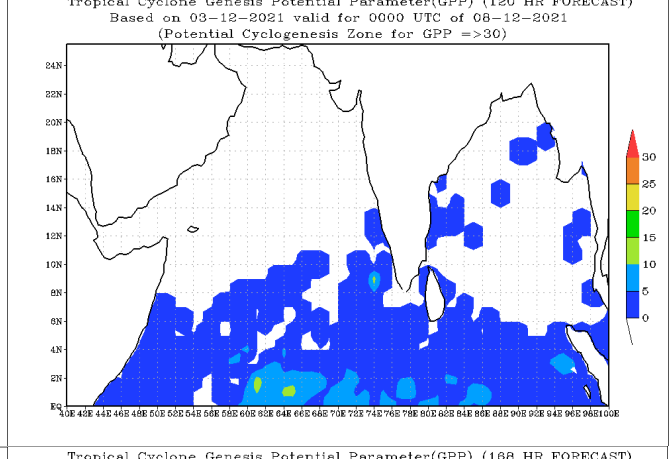
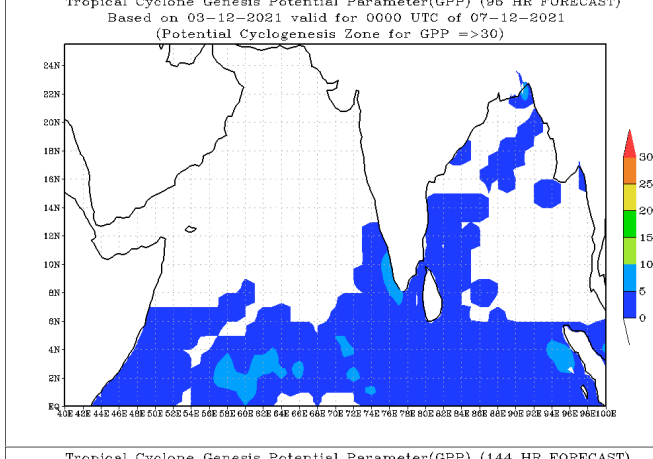
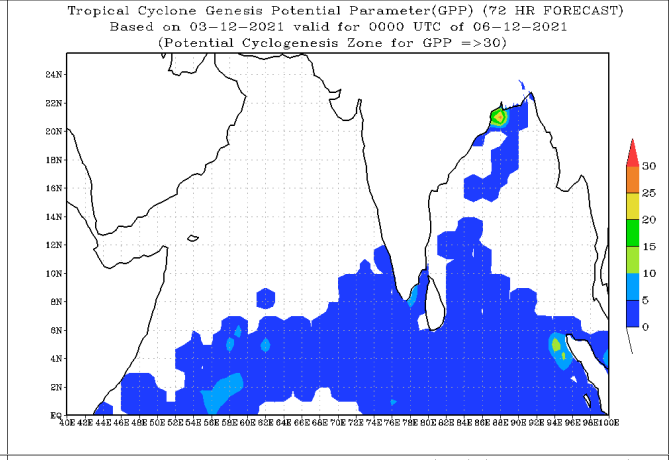
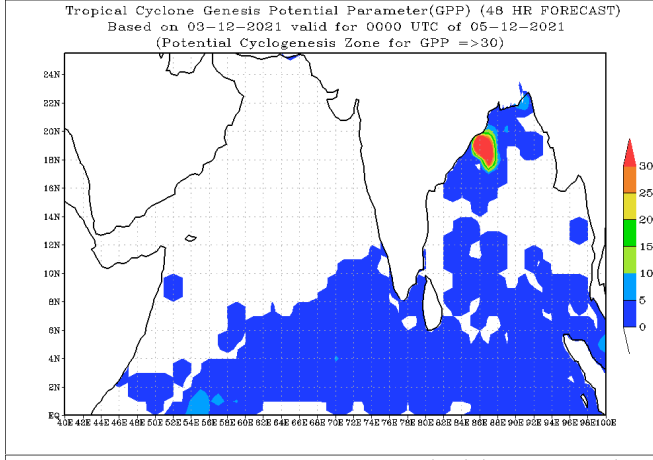
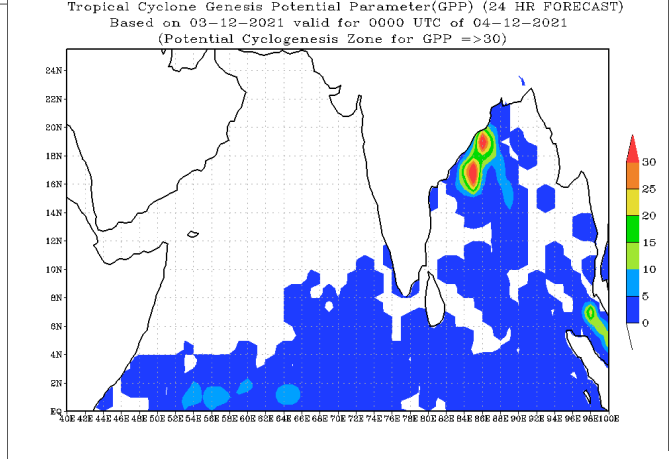
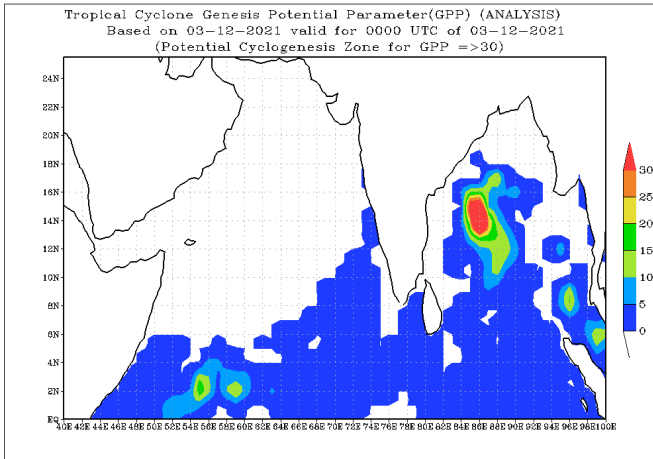
24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS	120-144 HOURS	144-168 HOURS
HIGH	HIGH	HIGH	LOW	NIL	NIL	NIL

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

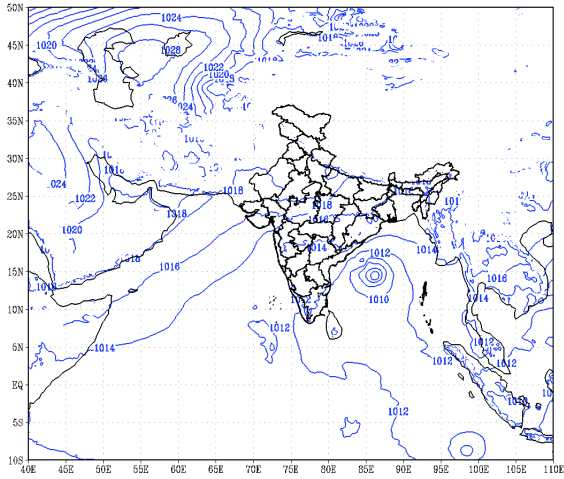
24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS	120-144 HOURS	144-168 HOURS
NIL	NIL	NIL	NIL	NIL	NIL	NIL

Advisory: The intensification and movement of the Cyclonic Storm ‘JAWAD’ over west-central Bay of Bengal is to be monitored regularly.

IOP is suggested for Andhra Pradesh coast on 4th December, Odisha coast on 4th - 5th December and for West Bengal coast on 5th December.

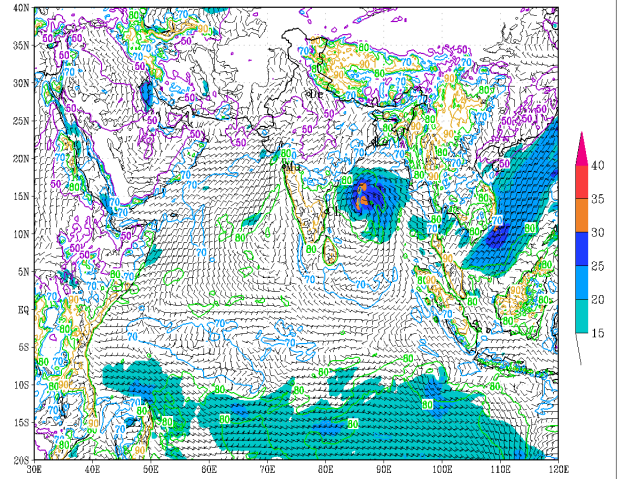


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 based on 06 UTC of 03-12-2021 valid for 06 UTC of 03-12-2021



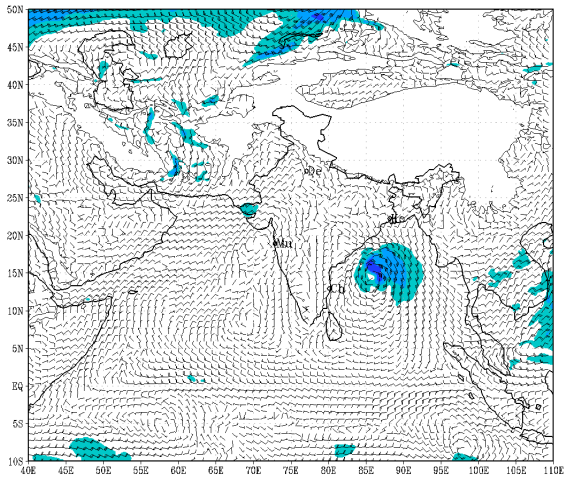
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IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (00 HR)
 based on 00 UTC of 03-12-2021 valid for 00 UTC of 03-12-2021



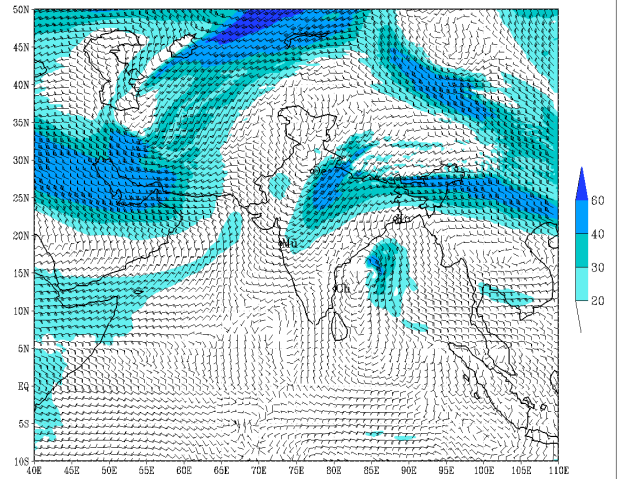
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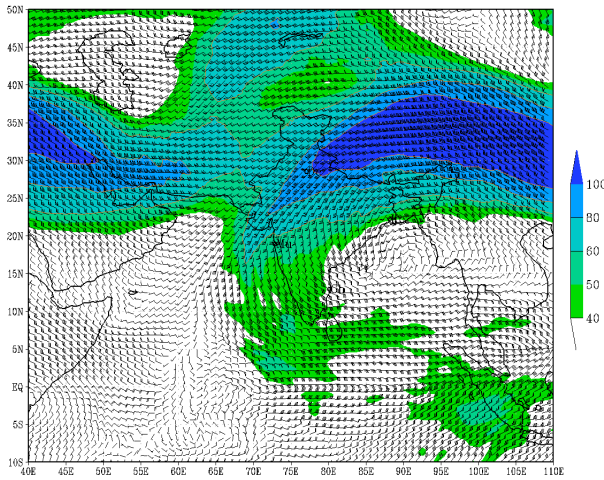
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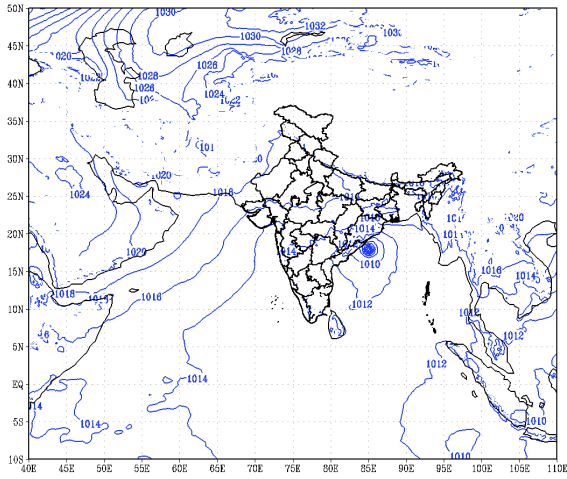
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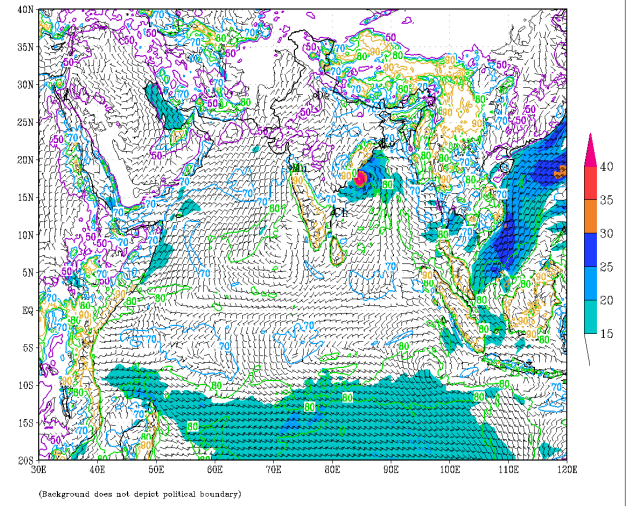


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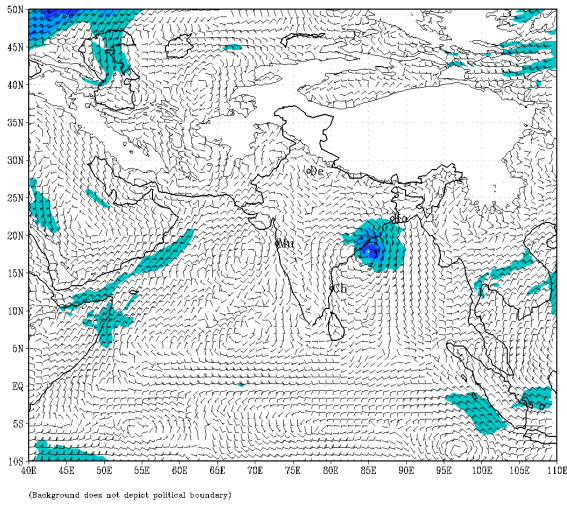
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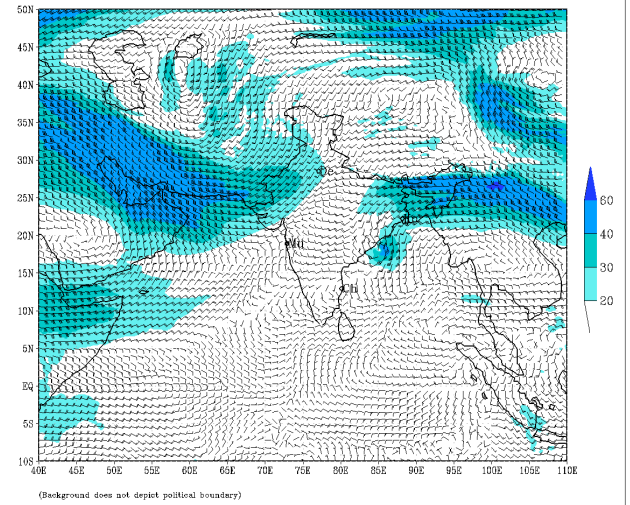
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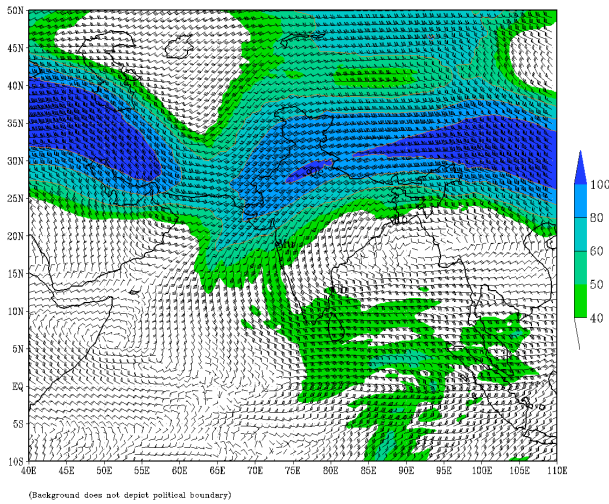
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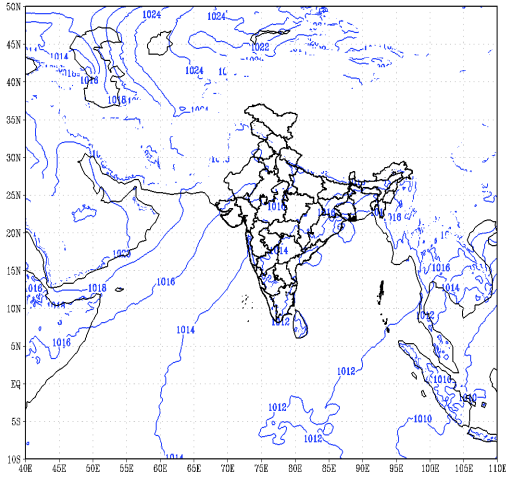
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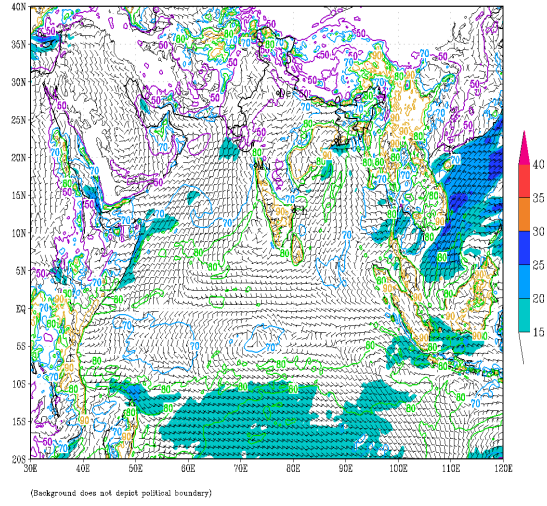
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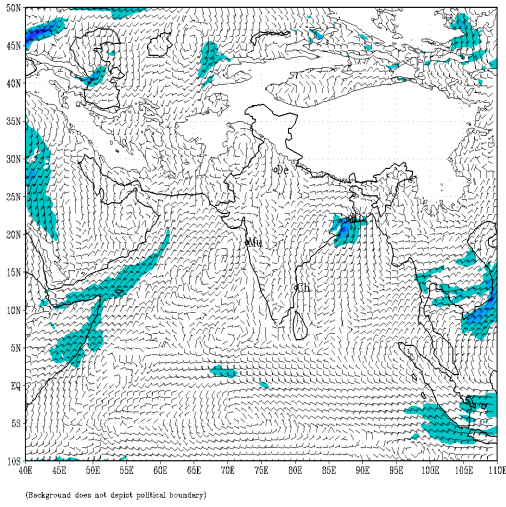
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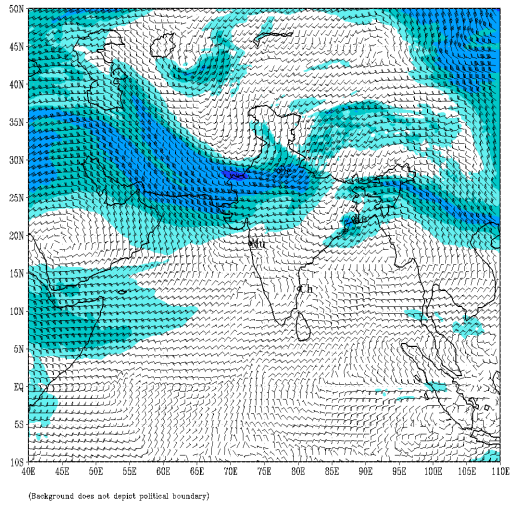
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (48 HR)
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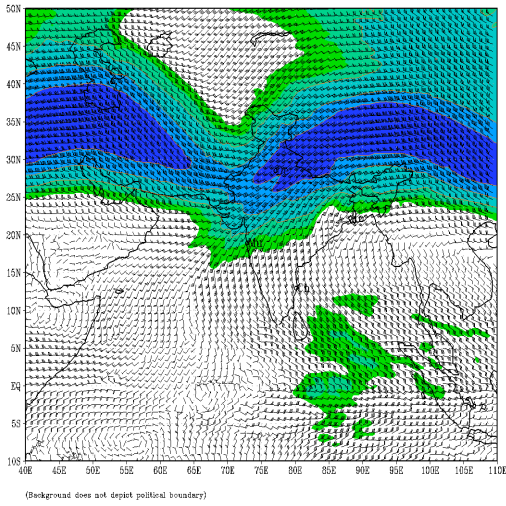
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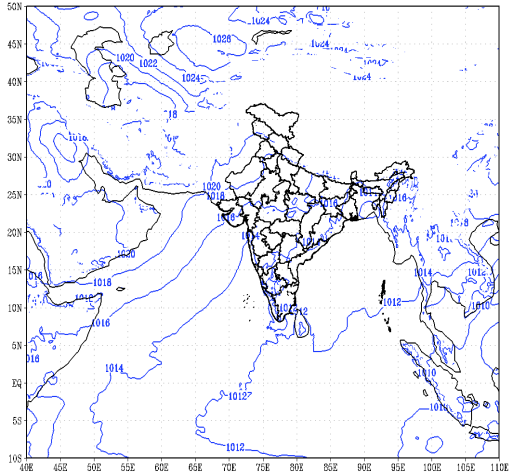
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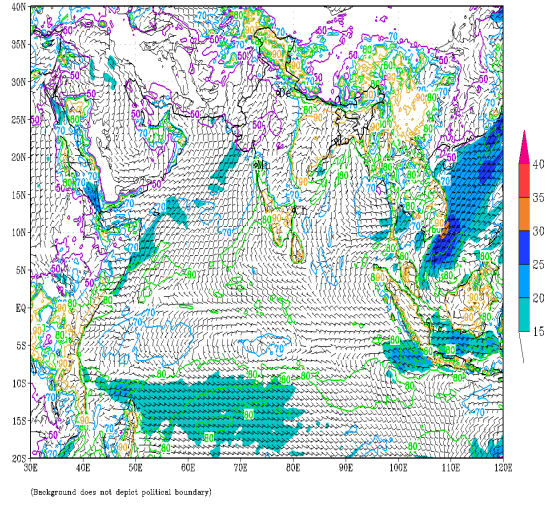


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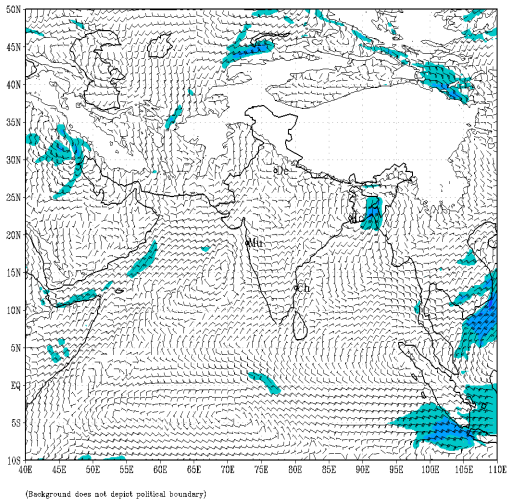
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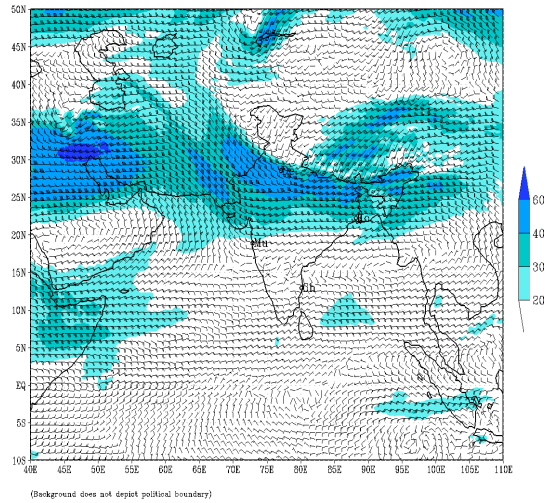
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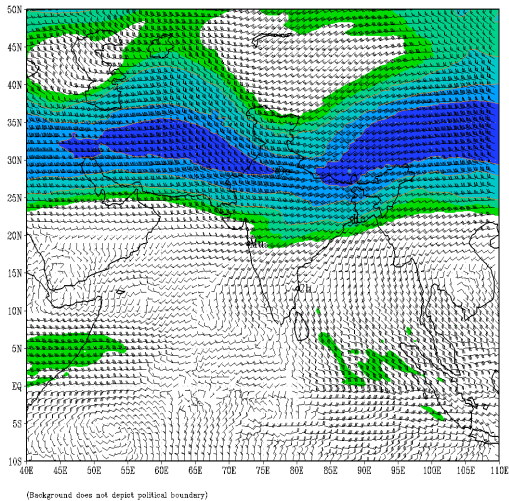
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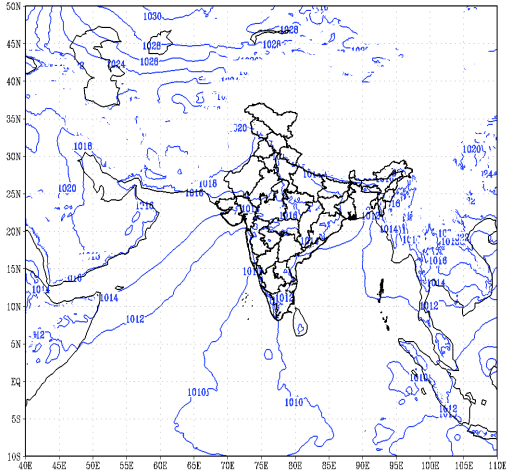
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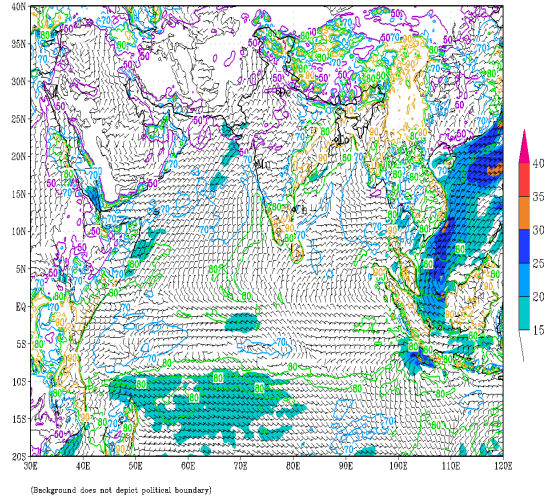


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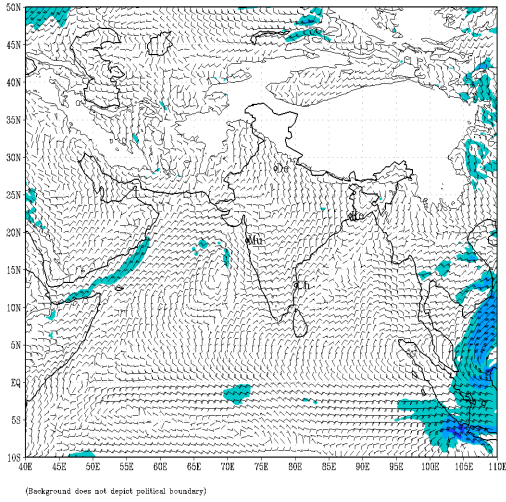
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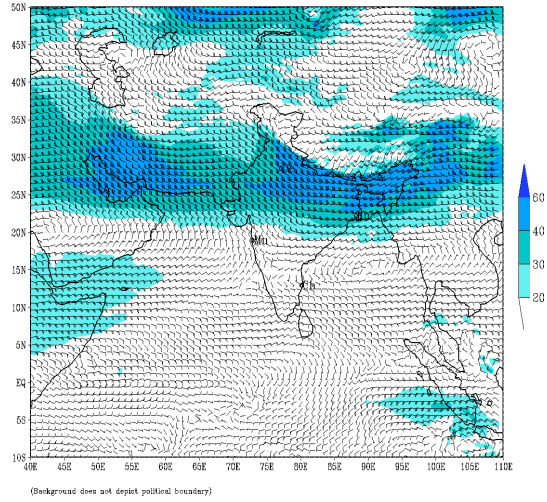
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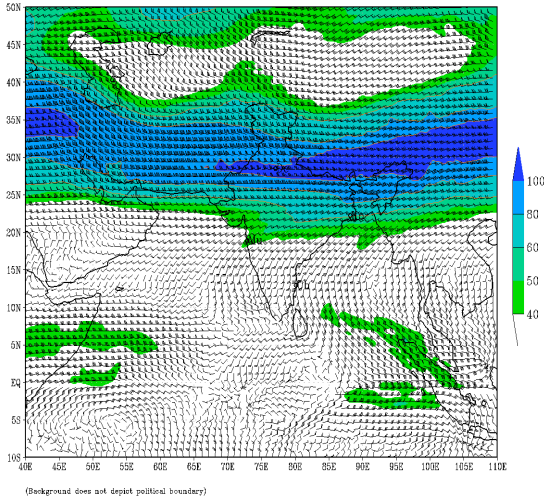
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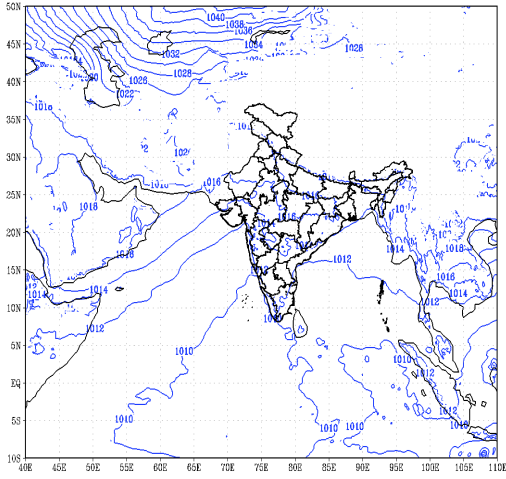
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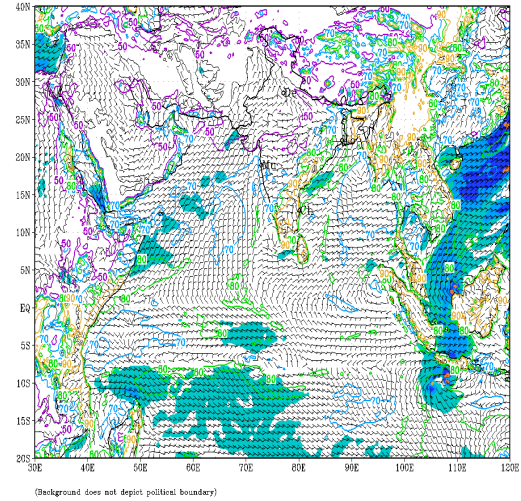
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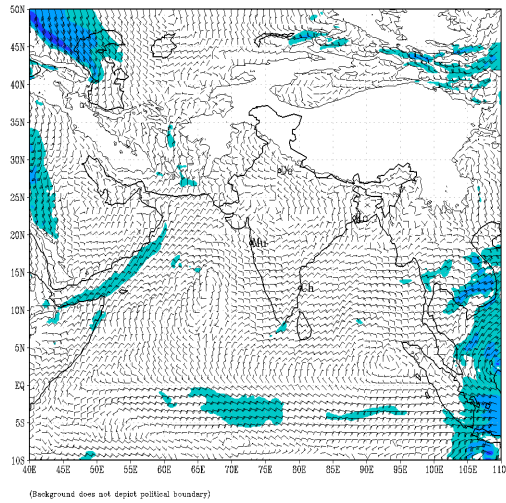
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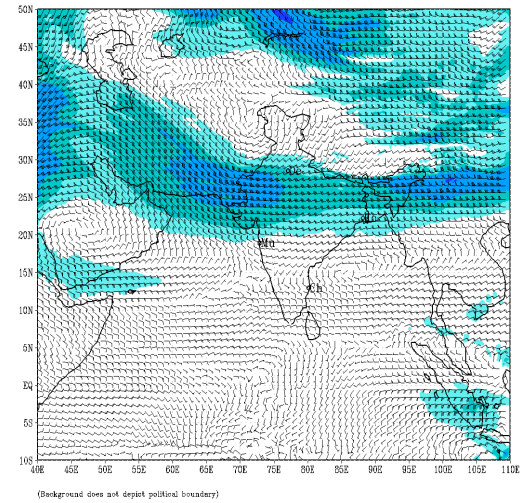
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based on 00 UTC of 03-12-2021 valid for 00 UTC of 08-12-2021



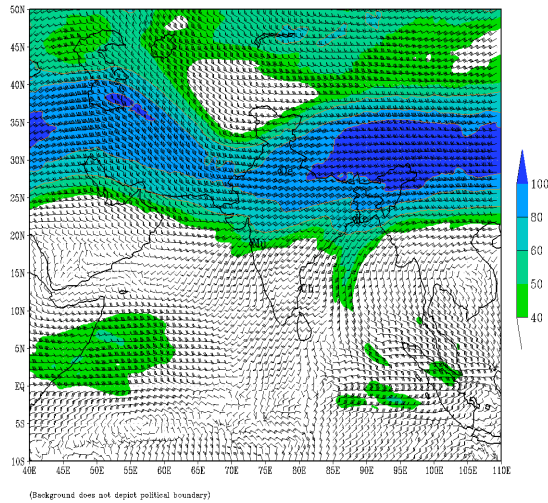
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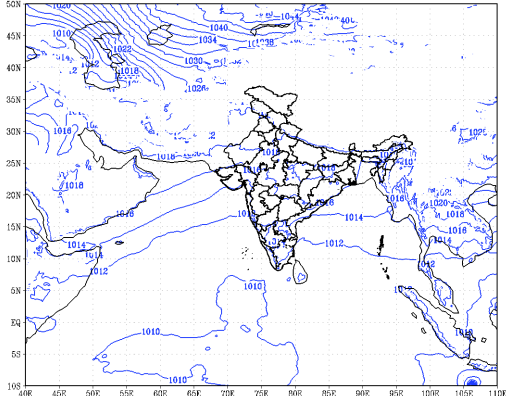
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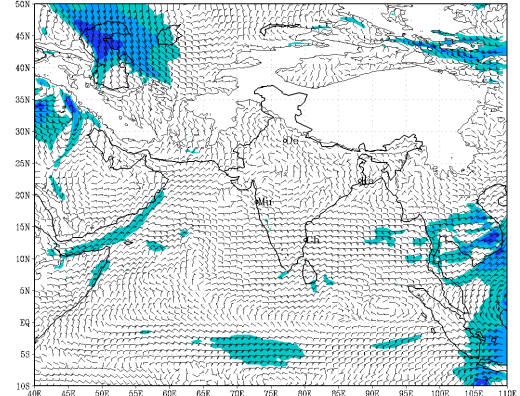


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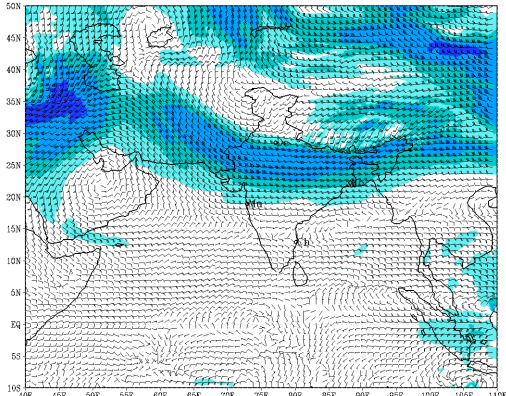
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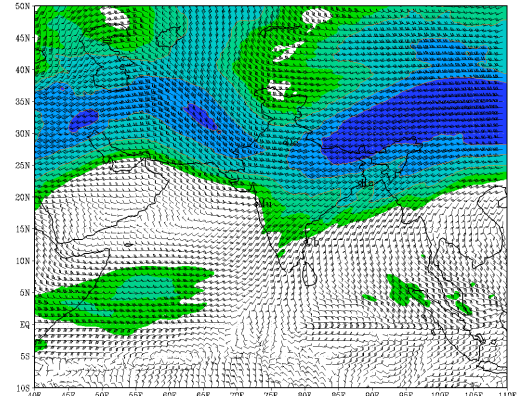
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IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (144 HR)
based on 00 UTC of 03-12-2021 valid for 00 UTC of 09-12-2021



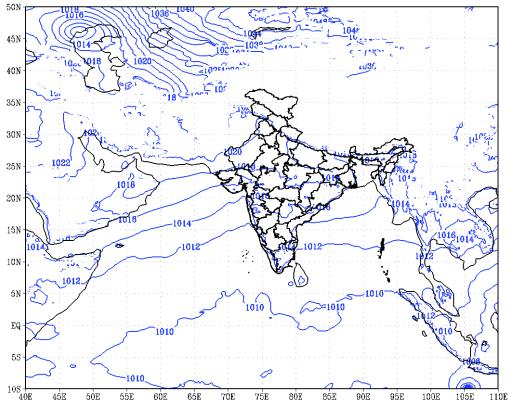
(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (144 HR)
based on 00 UTC of 03-12-2021 valid for 00 UTC of 09-12-2021



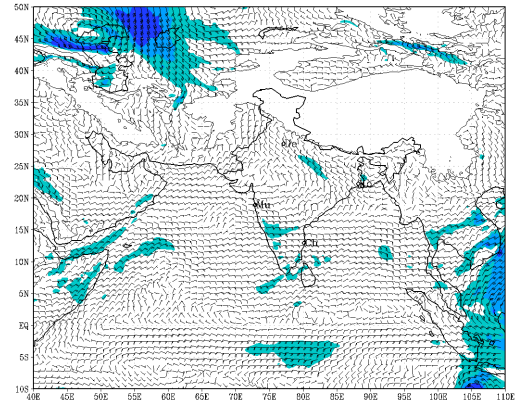
(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (168 HR)
 based on 00 UTC of 03-12-2021 valid for 00 UTC of 10-12-2021



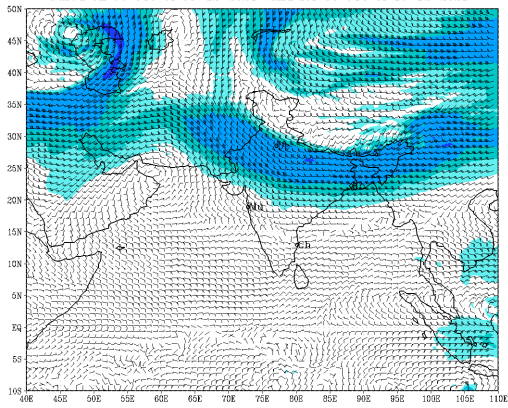
(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (168 HR)
 based on 00 UTC of 03-12-2021 valid for 00 UTC of 10-12-2021



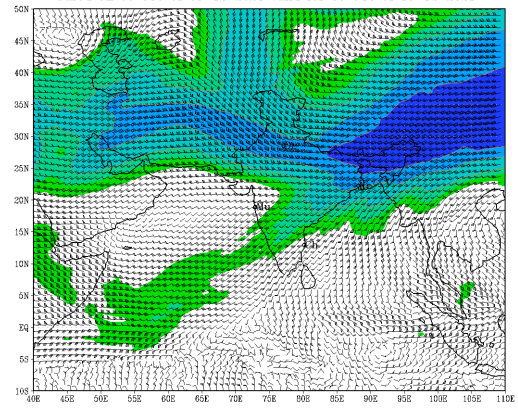
(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (168 HR)
 based on 00 UTC of 03-12-2021 valid for 00 UTC of 10-12-2021



(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (168 HR)
 based on 00 UTC of 03-12-2021 valid for 00 UTC of 10-12-2021



(Background does not depict political boundary)