



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

**Tropical Cyclone Forecast Programme
Report Dated 9th November, 2022**

Time of Issue: 1200 UTC

Synoptic features (based on 0600 UTC analysis):

- ❖ Under the influence of yesterday's cyclonic circulation over southwest Bay of Bengal (BoB) and adjoining Equatorial Indian Ocean (EIO), a Low Pressure Area (LPA) has formed over the same region at 0300 UTC of today, the 9th November. It is likely to become more marked and move northwestwards towards Tamilnadu-Puducherry coasts during 9th-12th November.

Dynamical and thermo-dynamical features

Parameter	Bay of Bengal (BoB)	Arabian Sea (AS)
Sea Surface Temperature (SST) °C	About 28-30°C over major parts of BoB and 24-28°C over a small pocket over southwest BoB and Comorin area.	29-31°C over extreme north AS, along and off south Gujarat & Maharashtra coasts and southeast AS & adjoining EIO. 26-28°C over remaining parts of AS with less than 24°C off Oman & Somalia coast, Socotra Islands and adjoining parts of southwest and westcentral AS.
Tropical Cyclone Heat Potential (TCHP) kJ/cm²	>110 KJ/cm ² over eastcentral BoB & south Andaman Sea, 70-80 KJ/cm ² over north BoB & westcentral BoB, southwest BoB, north Andaman Sea, less than 40 KJ/cm ² off Andhra Pradesh and southwest BoB & adjoining Tamil Nadu & Sri Lanka coasts & less than 30 over a small pocket over southwest BoB & Comorin Area.	(a) 60-70 over southeast AS & adjoining eastcentral AS. (b) Less than 30 KJ/cm ² over remaining AS and also off west coast of India.
Cyclonic Relative vorticity (X10⁻⁶s⁻¹)	Positive vorticity of 60-70 over southwest BoB & adjoining EIO and also over some parts of southeast BoB.	Positive vorticity of 30-40 over southeast AS and northern parts of north AS.

Low Level convergence ($X10^{-5} s^{-1}$)	About 05 over southwest BoB off North Sri Lanka coast. 05-10 over southwest BoB and adjoining EIO and over North Andaman Sea.	05-10 over southeast AS and adjoining EIO and 05 over southwest AS.
Upper Level divergence ($X10^{-5} s^{-1}$)	10-20 over southwest BoB and along & off Sri Lanka and adjoining EIO. 05-10 over central BoB.	Positive zone 10-20 over Comorin Area and southeast AS.
Vertical Wind Shear (VWS knots)	Moderate 10-20 knots over south & adjoining central BoB. 25-30 over north BoB and adjoining central BoB.	10-20 over south & adjoining central AS. 25-30 over north AS and adjoining central AS.
Wind Shear Tendency (knots)	Decreasing over eastcentral BoB and adjoining southeast BoB & off Andhra Pradesh-Tamil Nadu coasts.	Decreasing over southeast AS and central AS.
Upper tropospheric Ridge	Along 12.0°N over the BoB.	Along 12.0°N over the AS.
Trough in westerlies	Along 82° E upto 22° N	

Satellite observations based on INSAT imagery (0600 UTC):

(a) Over the BoB & Andaman Sea:-

Scattered to broken low/medium clouds with embedded intense to very intense convection lay over south BoB and south Andaman Sea. Scattered low/medium clouds with embedded moderate to intense convection lay over central BoB and isolated weak convection over north BoB.

(b) Over the Arabian Sea:-

Scattered low/medium clouds with embedded moderate to intense convection lay over northwest AS, south parts of central AS, Lakshadweep area and Comorin area. Isolated weak to moderate convection lay over northeast AS.

M.J.O. Index:

MJO index is currently in Phase 7 with amplitude less than 1. It will continue in same phase for next 2 days. Thereafter, it would move to phase 5 across phase 6 with gradually increasing amplitude subsequent 5 days.

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

Nil

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

MODEL GUIDANCE	BoB	AS
IMD-GFS	Extended low over southwest BoB on 9 th & 10 th , over southwest BoB and adjoining Sri Lanka-Tamil Nadu coasts on 11 th , less marked thereafter. A fresh cycir over south Andaman Sea & adjoining Equatorial Indian Ocean (EIO) on 13 th with west-northwestwards movement	Extended low pressure area over southeast AS.

	and gradual intensification into an LPA on 15 th over south Andaman Sea, well marked low pressure area over Andaman Sea, deep depression over southeast BoB on 17 th , cyclonic storm (CS) over southeast & adjoining eastcentral BoB on 18 th , depression over westcentral BoB on 19 th .	
IMD-GEFS	LPA over southwest BoB on 9 th , 10 th & 11 th with northwestwards movement towards Tamil Nadu coast, becoming less marked thereafter. A fresh cycir over south Andaman Sea & adjoining southeast BoB on 13 th & 14 th , LPA over southeast BoB on 16 th , Depression over eastcentral BoB on 17 th	No significant cycir during forecast period.
GEFS Probabilistic guidance	Available during cyclone	Available during cyclone
IMD WRF	LPA over southwest BoB on 9 th and another well marked low over southwest BoB off Sri Lanka coast, LPA over southwest BoB on 10 th , 11 th with northwestwards movement towards Tamil Nadu and crossing over Tamil Nadu on 12 th as an LPA.	No significant system
NCMRWF-NCUM	LPA over southwest BoB on 9 th & 10 th , well marked low over southwest BoB off Tamil Nadu on 11 th , LPA off tamil nadu coast on 12 th , to move across south peninsular region on 13 th as cycir. Fresh cycir over south Andaman Sea on 14 th , to move west-northwestwards, lay over southwest BoB on 18 th .	Cycir to emerge into southeast AS as an LPA on 14 th . LPA, depression over southeast AS on 15 th , to move west-northwestwards and intensify into a deep depression over southeast & adjoining eastcentral AS on 17 th , CS over westcentral AS on 18 th , extremely severe CS off Yemen coast on 19 th .
NCMRWF-NEPS	Trough over southwest BoB on 9 th , LPA over southwest BoB on 10 th , LPA over southwest BoB off Tamil Nadu on 11 th , LPA off Tamil Nadu coast on 12 th , to move across south peninsular region on 13 th as cycir. Fresh cycir over south Andaman Sea on 14 th , to move west-northwestwards, lay over southwest BoB on 18 th as an extended low, LPA over southwest BoB on 19 th .	Cycir to emerge into southeast AS as an LPA on 14 th . LPA, depression over southeast AS on 15 th , to move west-northwestwards and intensify into a deep depression over southeast & adjoining eastcentral AS on 16 th , CS over westcentral AS on 17 th , severe CS over westcentral AS on 18 th , extremely secrete CS off Yemen coast on 19 th .
NCMRWF-UM (Regional)	LPA over southwest BoB on 9 th & 10 th , well marked low over southwest BoB off Tamil Nadu on 11 th , LPA off tamil nadu coast on 12 th , to move across south peninsular region on 13 th as cycir.	No significant system
ECMWF	LPA over southwest BoB on 9 th & 10 th Nov., extended low over southwest BoB on 11 th , LPA over southwest BoB off Tamil Nadu	A cycir over southeast AS on 13 th , becoming LPA on 14 th and moving westwards thereafter.

	coast on 12 th , crossing coast thereafter. A fresh cycir over south Andaman Sea & adjoining Equatorial Indian Ocean (EIO) on 13 th with west-northwestwards movement till 17 th .	
ECMWF ensemble	30-40% probability of cyclogenesis over southwest Bay of Bengal during 9 th /10 th Nov, will have initial northwards movement followed by westwards movement towards Tamil Nadu coast.	30-40 % probability of cyclogenesis over southeast AS during 14 th -15 th with system likely to move nearly west-northwestwards.
NCEP-GFS	Cycir over southwest BoB on 9 th Nov, LPA over southwest BoB on 10 th & 11 th , LPA over southwest BoB off Tamil Nadu coast on 12 th , to move across southern peninsular region as a cycir on 13 th and emerge as extended low over southeast AS on 14 th . Fresh LPA over south Andaman Sea on 16 th , LPA over southeast BoB on 17 th .	Extended low over southeast AS on 14 th , 15 th & 16 th , LPA over southeast AS on 18 th Nov.
IMD MME	The LPA over southwest BoB on 9 th Nov., to move west-northwestwards and reach Tamil Nadu coast as well marked low pressure area/depression on 13 th .	No significant system.
IMD HWRF	Available during cyclonic disturbance period only	Available during cyclonic disturbance period only.
IMD-Genesis Potential Parameter	A potential zone over southwest BoB during 9 th – 12 th towards Tamil Nadu coast.	No significant zone.

Summary and conclusion:

- Most of the models like IMD GFS, GEFS, NCEP GFS, ECMWF, ECMWF ensemble and NCUM are indicating a low pressure area over southwest BoB on 9th to move northwestwards towards Tamil Nadu coast till 12th morning (0000 UTC). No significant intensification of this system is indicated.
- However, models are also indicating the remnant of this low pressure area to emerge into Arabian Sea, intensify further and move northwestwards towards westcentral Arabian Sea. However, NCUM group of models are indicating intensification of this system into severe cyclonic storm and above and move towards Yemen-Oman coasts.
- Models are also indicating development of fresh cyclonic circulation over south Andaman sea around 14th, low pressure area over Andaman Sea and adjoining southeast BoB around 15th and depression around 18th.

1. For the Bay of Bengal:

In view of all the above, it is inferred that

- **The Low Pressure Area (LPA) over southwest Bay of Bengal is likely to become more marked and move northwestwards towards Tamilnadu-Puducherry coasts during 9th-12th November. It would move across South Peninsular region and emerge into southeast Arabian Sea around 14th.**
- **There is also likelihood of development of a fresh cyclonic circulation over south Andaman Sea/ southeast BoB around 14th Nov. It is likely to move west-northwestwards and intensify gradually. However, no cyclogenesis (formation of depression) is likely**

over the BoB till 15th. Thereafter, the intensification and movement of this system need to be monitored.

2. For the Arabian Sea:

- There is likelihood of emergence of the remnant of existing low pressure area over southwest BoB into Arabian Sea around 14th. The system is likely to move west-northwestwards and intensify gradually. However, no cyclogenesis (formation of depression) is predicted over Arabian Sea till 15th. Thereafter, the intensification and movement of this system need to be monitored.

Probability of cyclogenesis (formation of depression and above intensity systems) over the BAY OF BENGAL 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

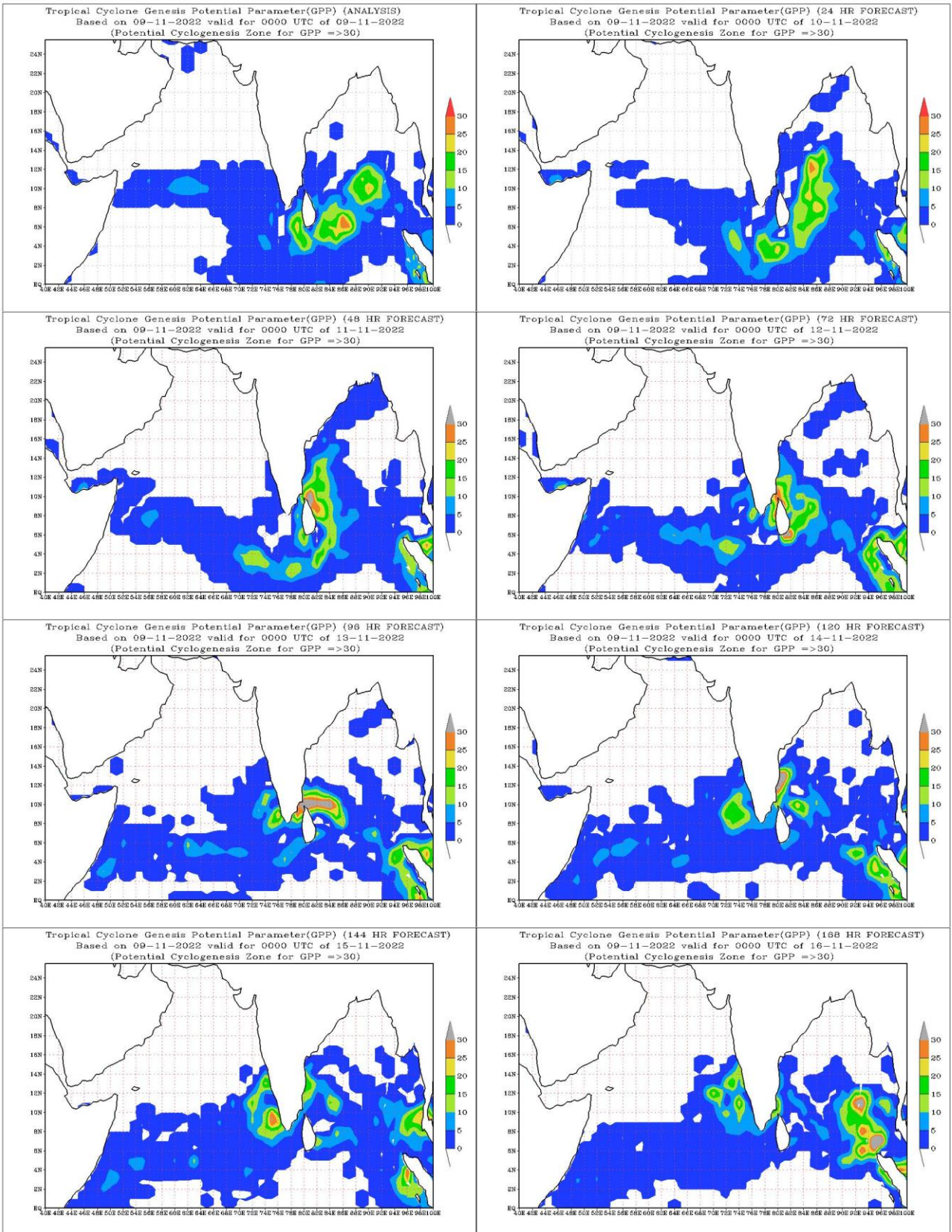
Probability of cyclogenesis (formation of depression and above intensity systems) over the Arabian Sea during next 168 hours:

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

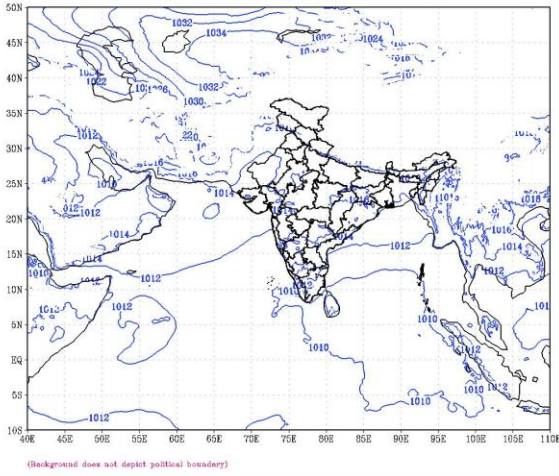
Advisory:

Nil

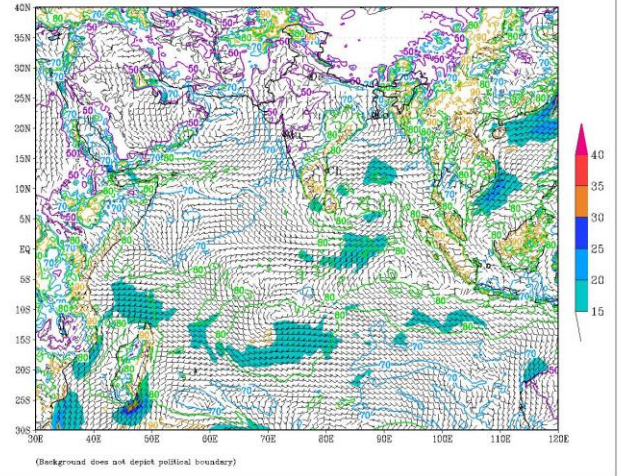
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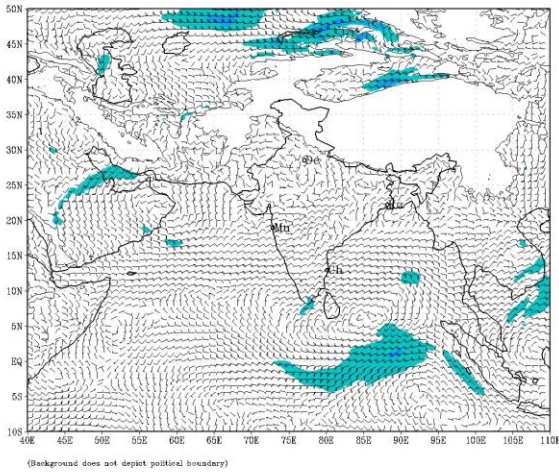
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based on 00 UTC of 09-11-2022 valid for 00 UTC of 09-11-2022



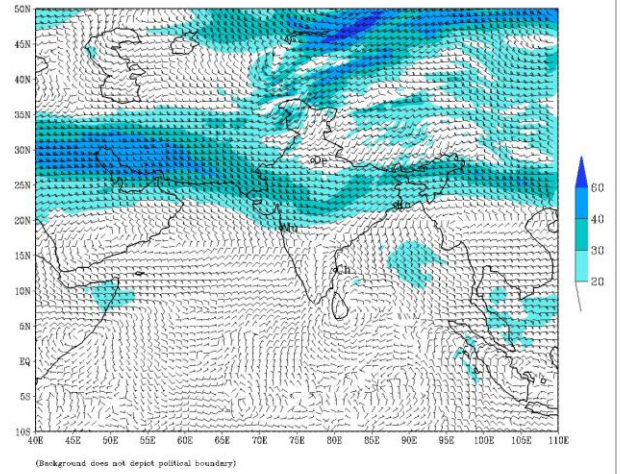
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based on 00 UTC of 09-11-2022 valid for 00 UTC of 09-11-2022



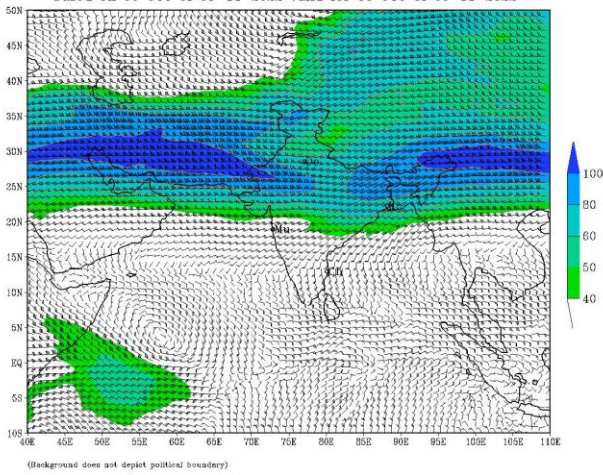
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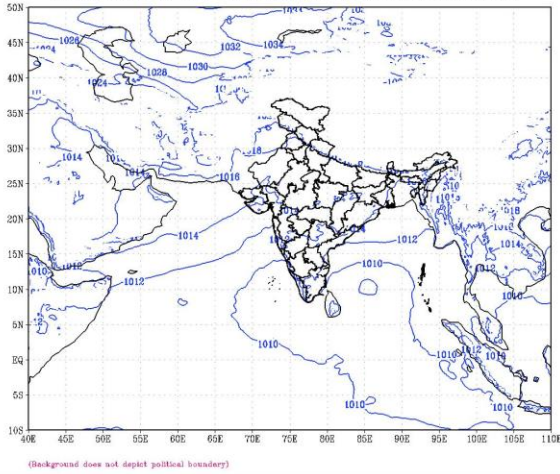
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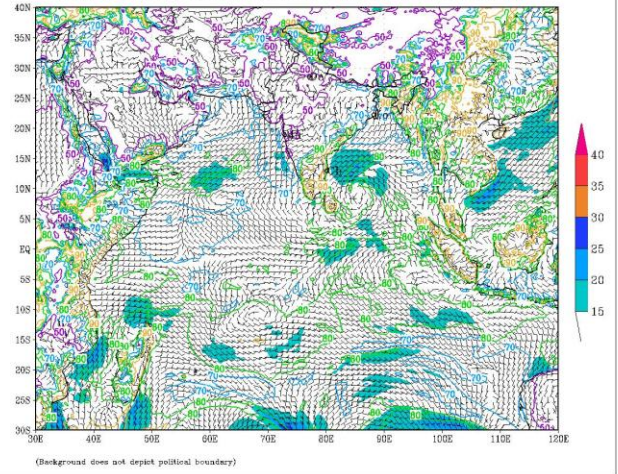
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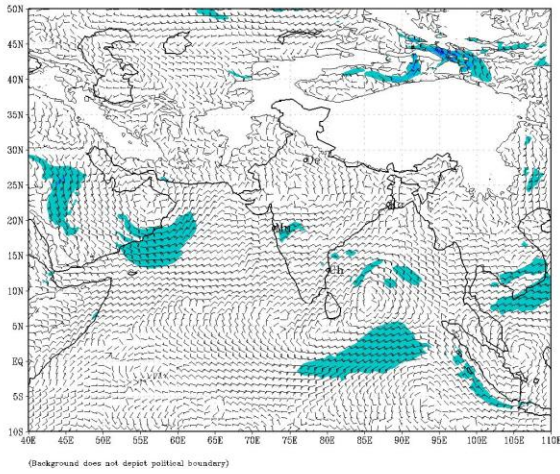
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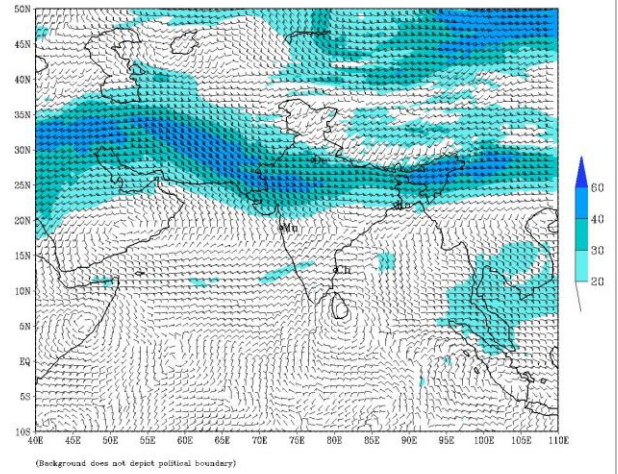
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (24 HR)
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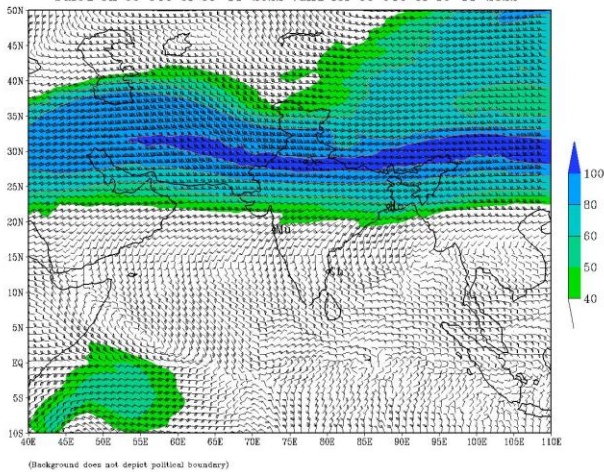
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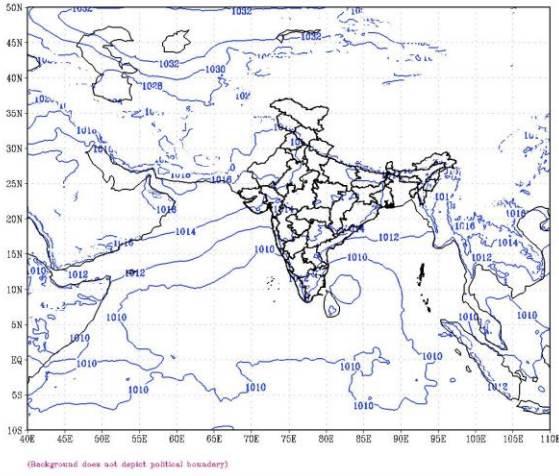
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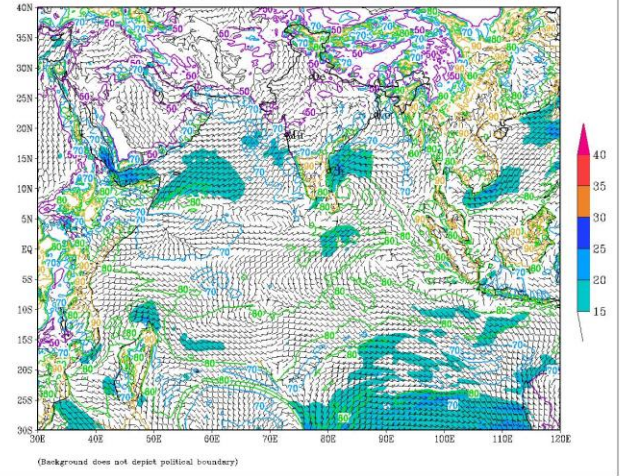
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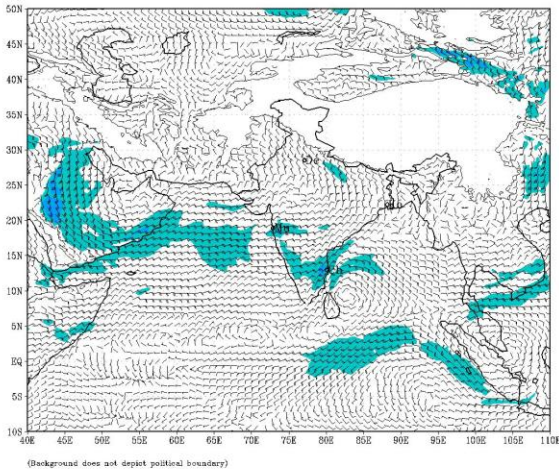
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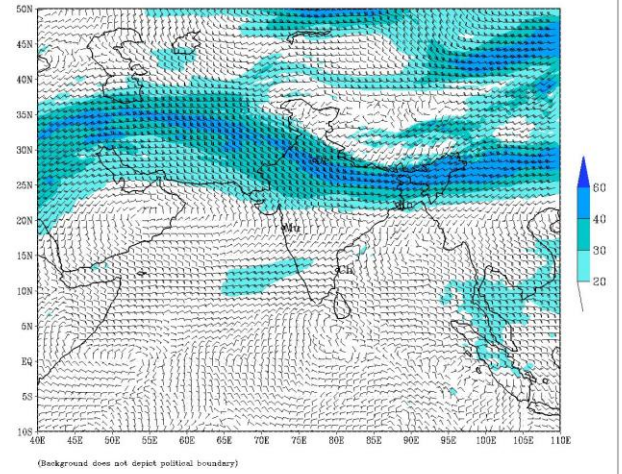
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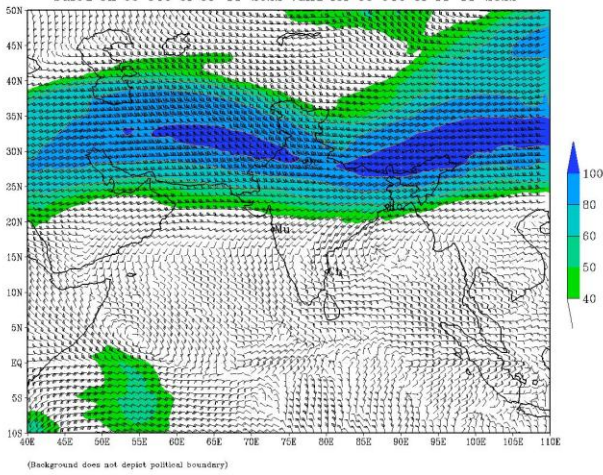
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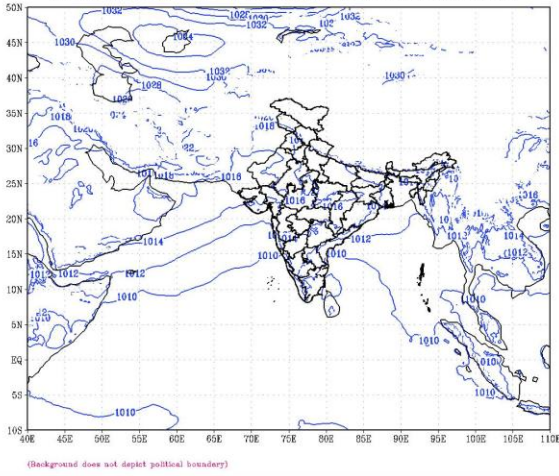
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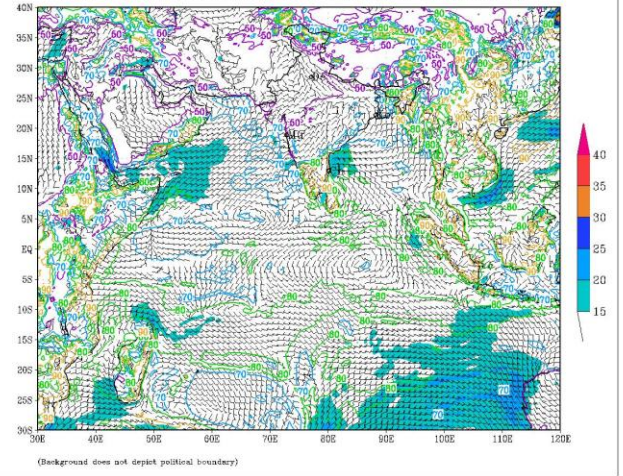
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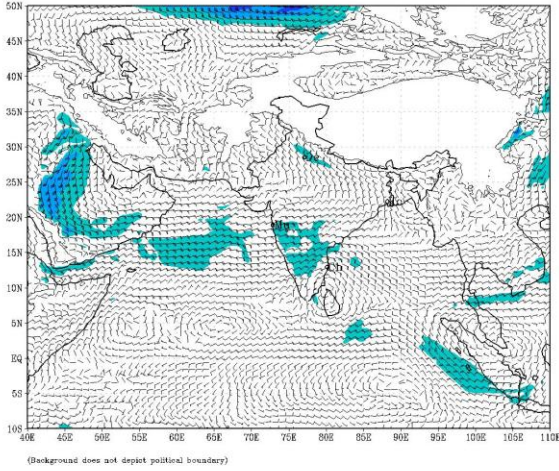
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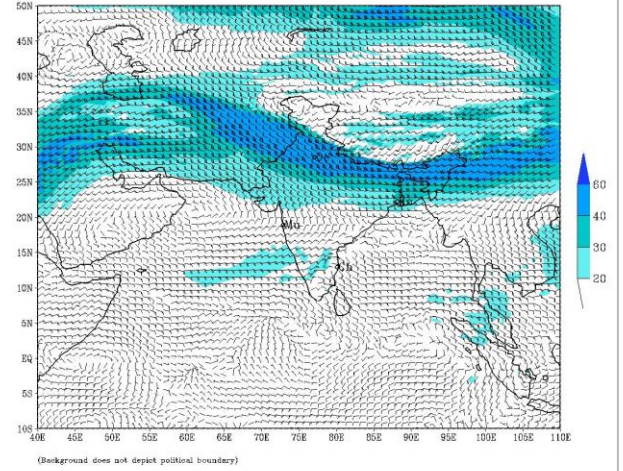
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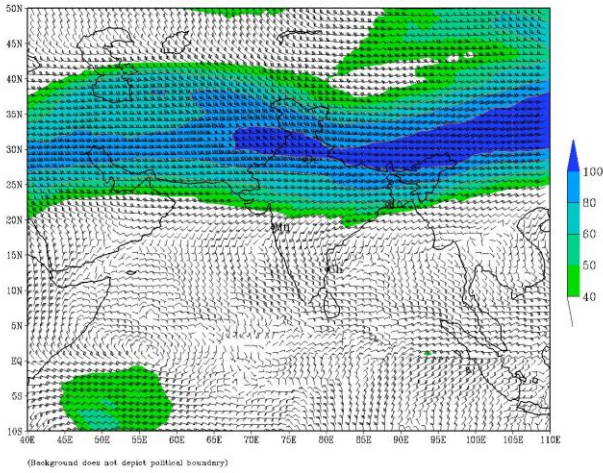
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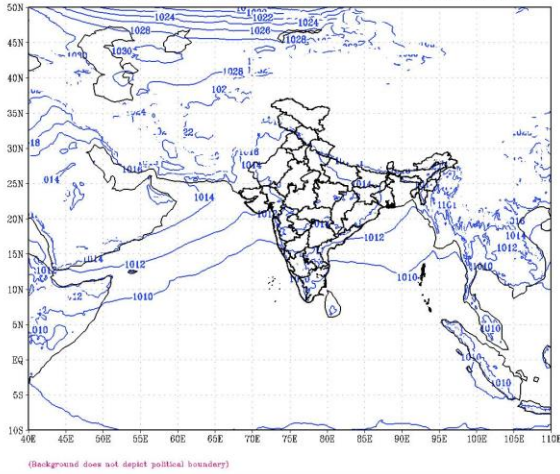
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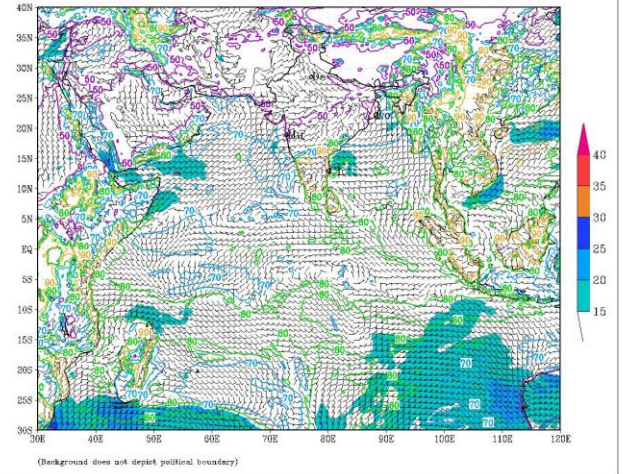
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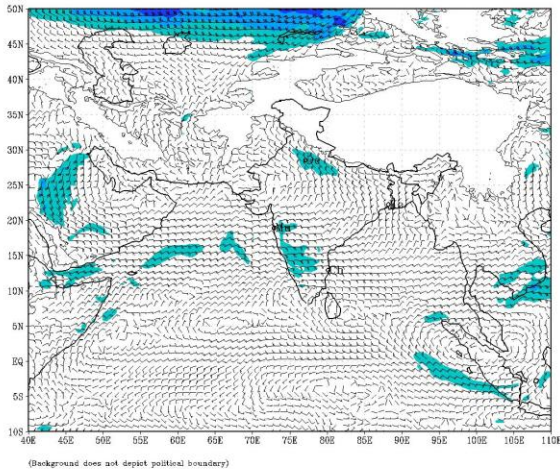
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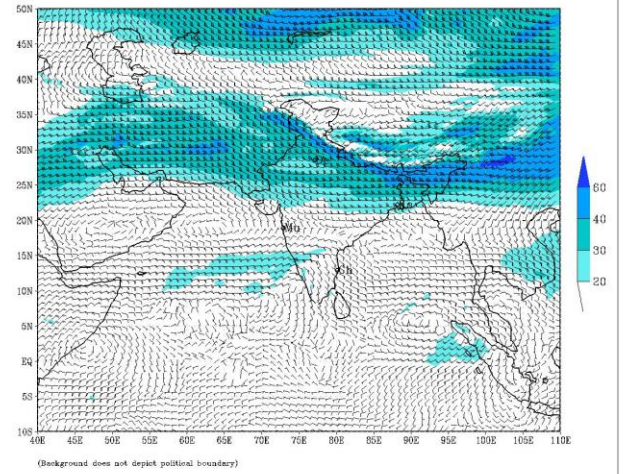
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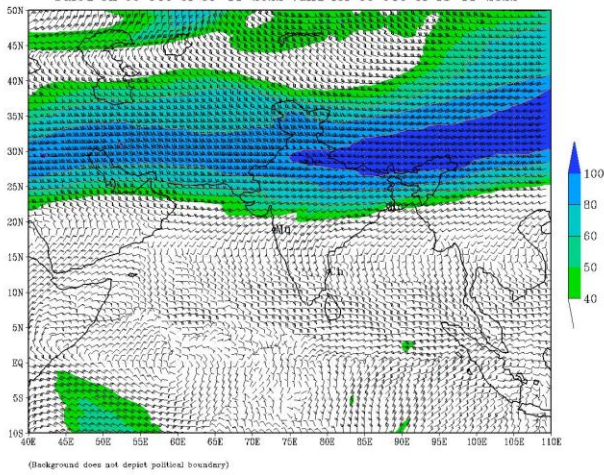
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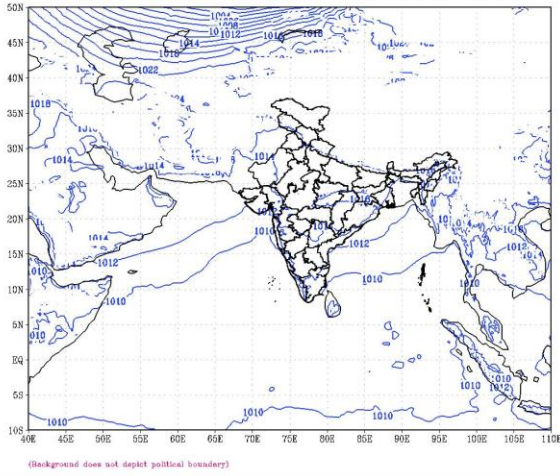
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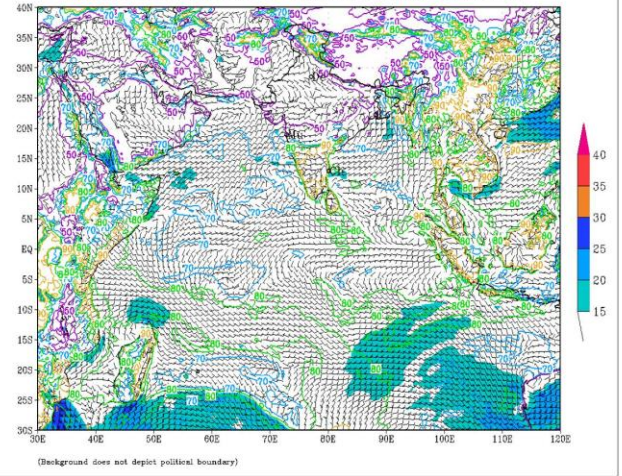
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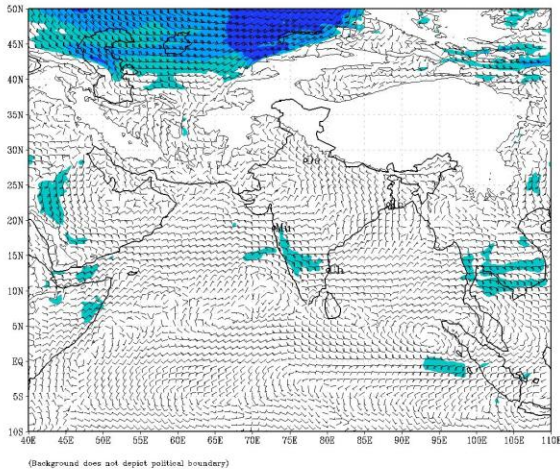
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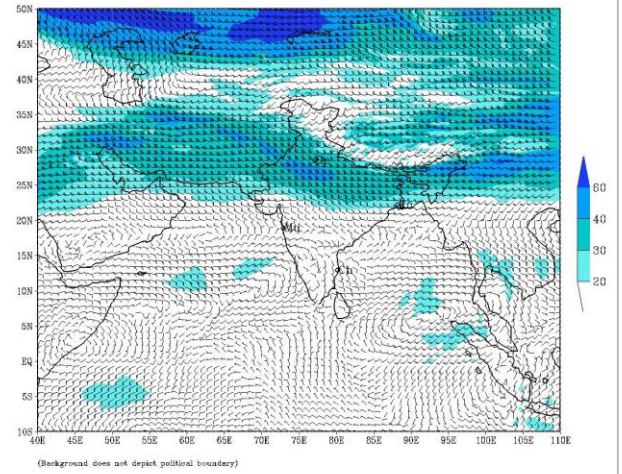
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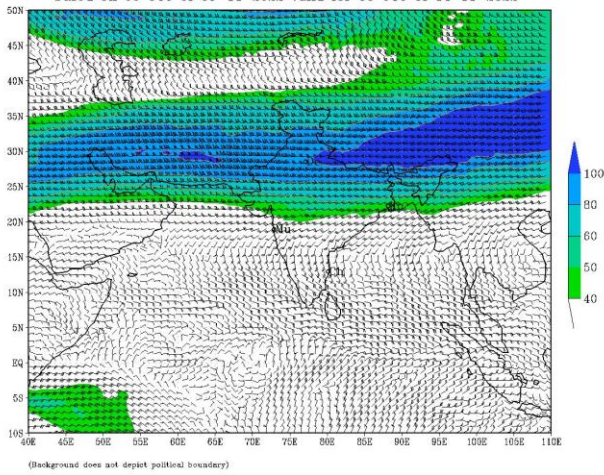
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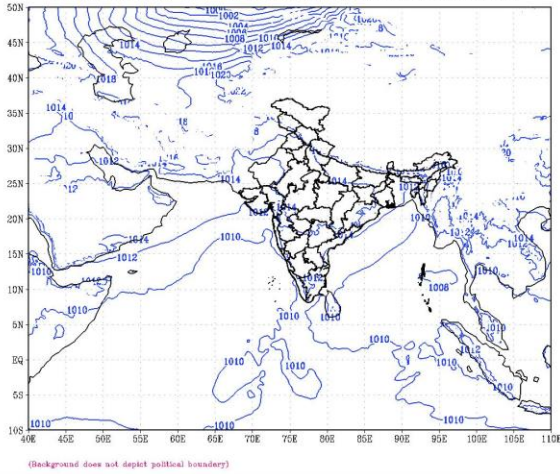
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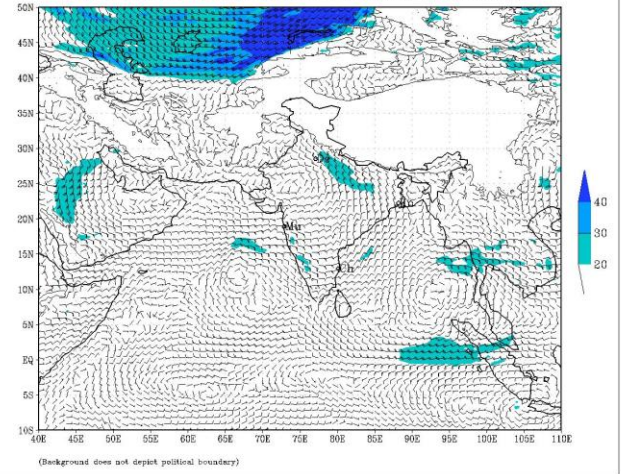
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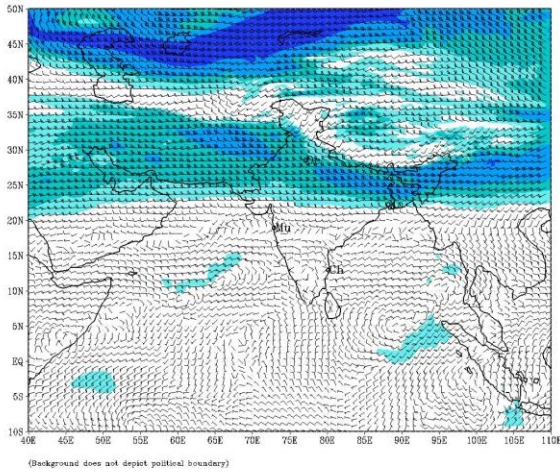
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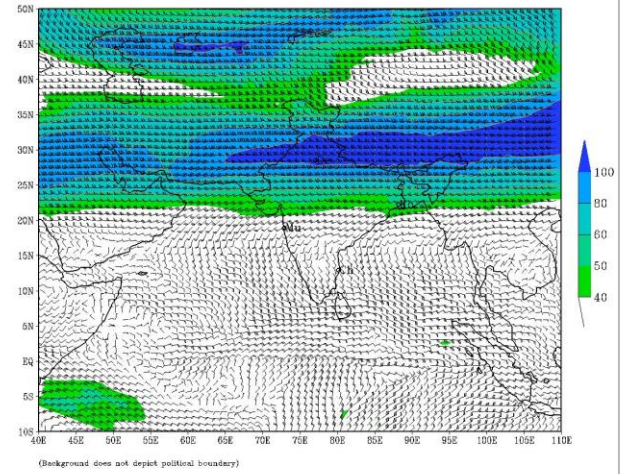
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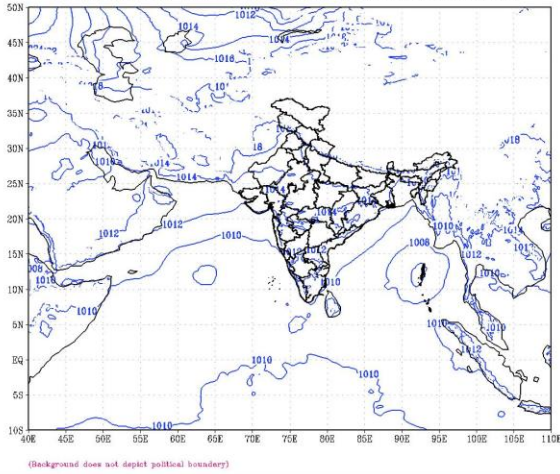
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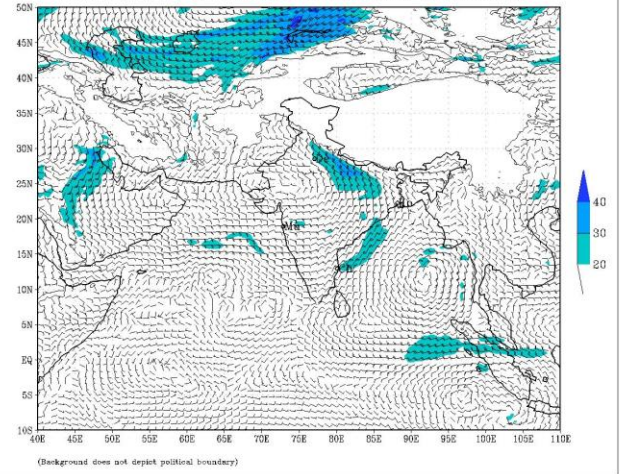
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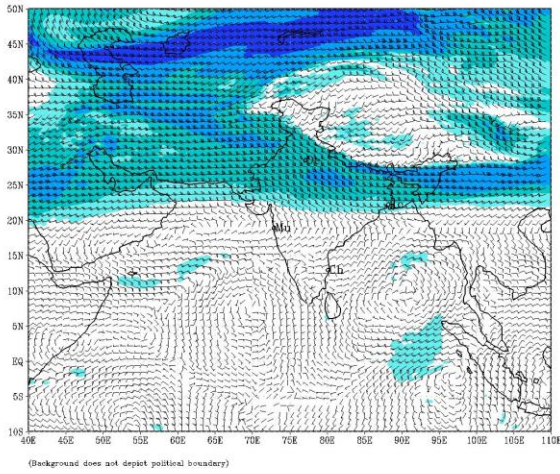
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IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 09-11-2022 valid for 00 UTC of 16-11-2022



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