



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

**Tropical Cyclone Forecast Programme
Report Dated 15th November, 2022**

Time of Issue: 1200 UTC

Synoptic features (based on 0600 UTC analysis):

- ❖ A cyclonic circulation lies over south Andaman Sea and adjoining Southeast Bay of Bengal. Under its influence, a Low pressure area is likely to form over Southeast Bay of Bengal & adjoining Andaman Sea on 16th November, 2022. It is likely to move west-northwestwards and gradually concentrate into a Depression over central parts of South Bay of Bengal around 18th November, 2022.
- ❖ The cyclonic circulation over Southeast Arabian sea now lies over Southeast & adjoining Southwest Arabian sea and extends upto 4.5 km above mean sea level.

Dynamical and thermo-dynamical features

Parameter	Bay of Bengal (BoB)	Arabian Sea (AS)
Sea Surface Temperature (SST) °C	About 28-29°C over major parts of BoB and 29-30°C over a small pocket southeast BoB and off Tamilnadu and Sri Lanka coast.	About 28-29°C over major parts of AS and 29-30°C Karnataka coast and parts of Kerala coast.
Tropical Cyclone Heat Potential (TCHP) kJ/cm ²	>110 over eastcentral BoB and adjoining southeast BoB, 90-100 over remaining central BoB, 70-80 over north BoB & south Andaman Sea and less than 40 over westcentral and southwest BoB and east coast of India.	90-100 over parts of Maldives & adjoining EIO, 70-80 over southeast AS & adjoining eastcentral AS, adjoining north AS and less than 30 KJ/cm ² over remaining AS and also off west coast of India.
Cyclonic Relative vorticity (X10 ⁻⁶ s ⁻¹)	Positive vorticity of 40-50 over south Andaman Sea, southwest BoB & adjoining EIO, 20-30 off Sri Lanka coast, Gulf of Mannar & adjoining EIO, northeast BoB.	Positive vorticity of 40-50 over southeast AS, comorin area, 20-30 over northern parts of central AS, southwest parts of central AS.
Low Level convergence (X10 ⁻⁵ s ⁻¹)	About 05-10 over southeast and adjoining southwest BoB, south Andaman Sea & Gulf of Thailand.	10-15 over Lakshadweep, central AS, 05 over Maldives, southwest EIO.
Upper Level divergence (X10 ⁻⁵ s ⁻¹)	05-20 over south BoB, Andaman sea and adjoining Gulf of Thailand.	5-10 over kerala coast, Maldives, Lakshadweep, Comorin areas, 05 over south parts of central AS
Vertical Wind Shear (VWS knots)	Moderate 10-20 knots over southwest & adjoining westcentral BoB, 5-10 over Andaman sea, 25 over central parts of BoB and north BoB.	05-10 over southeast & central AS, 10-15 over westcentral and adjoining southwest AS and over off Somalia & Yemen coasts. 30-40 over north AS.

Wind Shear Tendency (knots)	Decreasing over southeast BoB and south Andaman Sea. Increasing over westcentral BoB and adjoining south and north BoB.	Decreasing over southwest AS, central and adjoining Yemen coast. Increasing over north AS, south AS & adjoining EIO and off Oman coast.
Upper tropospheric Ridge	Along 16.0°N over the BoB.	Along 17.0°N over the AS.
Trough in westerlies		

Satellite observations based on INSAT imagery (0900 UTC):

(a) Over the BoB & Andaman Sea:-

Scattered to broken low and medium clouds with embedded intense to very intense convection lay over eastcentral & south Bay of Bengal and Andaman Sea. Scattered low and medium clouds with embedded isolated weak to moderate convection lay over northeast & westcentral Bay of Bengal.

(b) Over the Arabian Sea:-

Scattered to broken low and medium clouds with embedded intense to very intense convection lay over central & south Arabian sea, Lakshadweep Islands area and Comorin area.

M.J.O. Index:

MJO index is currently in Phase 5 with amplitude more than 1. It will continue in same phase for next 4 days. Thereafter, it would move to phase 6 with amplitude remaining more than 1.

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	A cycir over south Andaman Sea & adjoining southeast BoB on 15 th , LPA over Andaman Sea on 16 th , Well marked Low Pressure Area (WML) over southeast BoB on 17 th , over southeast & adjoining southwest BoB on 18 th , depression over southwest BoB on 19 th , deep depression over southwest BoB on 20 th , severe cyclonic storm over southwest BoB on 21 st , crossing North Tamil nadu-South Andhra Pradesh coast as a severe cyclonic storm on 21 st /2100 UTC, over TN on 22 nd , becoming less marked on 23 rd .	Cycir over southeast Arabian Sea to move nearly westwards towards southwest Arabian Sea till 19 th October.
IMD-GEFS	LPA over south Andaman Sea & adjoining southeast BoB on 15 th & 16 th , WML over southeast BoB on 17 th , depression over southeast & adjoining southwest BoB on 18 th , deep depression over southwest BoB on 19 th , deep depression over southwest BoB on 20 th ,	Cycir over southeast Arabian Sea to move nearly westwards towards southwest Arabian Sea till 18 th October.

	depression over southwest BoB on 21 st , WML over southwest BoB on 22 nd , low on 23 rd over southwest BoB.	
GEFS Probabilistic guidance	Not available	Not available
IMD WRF	A cycir over south Andaman Sea & adjoining southeast BoB on 15th, LPA over Andaman Sea on 16th, Well marked Low Pressure Area (WML) over southeast BoB on 17th, over southeast & adjoining southwest BoB on 18th, depression over southwest BoB on 19th.	Cycir over southeast Arabian Sea to move nearly westwards towards southwest Arabian Sea coast till 17 th October.
NCMRWF-NCUM	Cycir over south Andaman Sea on 15 th & 16 th , to move west-northwestwards, LPA over eastcentral & adjoining southeast BoB on 17 th , WML over same region on 18 th , depression over southwest BoB on 19 th , deep depression over southwest & adjoining westcentral BoB on 20 th , deep depression over westcentral BoB on 21 st , crossing to the north of Chennai around 21 st /0600 UTC as a deep depression, becoming less marked on 22 nd . A fresh cycir over south Andaman Sea on 23 rd , becoming LPA over southeast BoB on 24 th	The cycir over SE AS on 15 th to move nearly westwards towards westcentral AS till 18 th
NCMRWF-NEPS	Cycir over south Andaman Sea on 15th, LPA over southeast BoB & adjoining Andaman Sea on 16 th , WML over southeast BoB on 17 th , WML/depression over eastcentral BoB on 18 th , depression over southwest & adjoining southeast BoB on 19 th , deep depression over westcentral & adjoining southwest BoB on 20 th , deep depression over westcentral BoB off North TN-South AP coasts on 21 st , crossing North TN-South AP coasts around 21 st /0600 UTC as depression and becoming less marked thereafter.	Cycir over southeast AS to move westwards towards southwest AS till 17 th .
NCMRWF-UM (Regional)	Cycir over south Andaman Sea on 15 th & 16 th , to move west-northwestwards, LPA over eastcentral & adjoining southeast BoB on 17 th , WML over same region on 18 th ,	The cycir over SE AS on 15 th to move nearly westwards towards westcentral AS till 18 th
ECMWF	A cycir over south Andaman Sea on 15th with west-northwestwards movement and will become LPA on 16 th Nov, to move westwards towards TN coast with slight intensification. Fresh low pressure likely over central Andaman Sea on 23 rd .	A cycir over southeast AS on 14 th to move westwards till 18 th Nov.
ECMWF ensemble	30-40% probability of cyclogenesis over south BoB during 17 th -20 th .	20-30% probability of cyclogenesis over south AS during next 2-3 days
NCEP-GFS	LPA over south Andaman Sea and adjoining southeast BoB on 15th, WML over eastcentral BoB on 16th, depression over westcentral and adjoining eastcentral BoB on 17 th /18 th , deep depression on 18 th /19 th , will move west-northwestward and will weaken further.	The cycir over SE AS would move west northwestward till 20 th .

IMD MME	-	-
IMD HWRF	Available during cyclonic disturbance period only	Available during cyclonic disturbance period only.
IMD-Genesis Potential Parameter	A potential zone over Andaman Sea on 16 th Nov, over south BoB & another over south Andaman Sea on 17 th , over southeast & adjoining eastcentral BoB on 18 th , eastcentral BoB on 19 th , westcentral BoB on 20 th , westcentral BoB off AP coast on 21 st	No potential zone over Arabian Sea

Summary and conclusion:

- Most of models are indicating the cyclonic circulation over south Andaman Sea to concentrate into a low pressure area over southeast BoB and adjoining Andaman Sea around 16th and into a depression around 18th. Models are also indicating west-northwestwards movement of the system towards Tamil Nadu-Andhra Pradesh coasts. Regarding further intensification, IMD GFS is indicating intensification upto severe cyclonic storm, NCUM, NEPS, ECMW EPS, NCEP GFS are indicating intensification upto deep depression stage. Regarding crossing, NCUM is indicating the system to cross North TN-South AP coasts around 21st/0600 UTC as depression and GFS is indicating crossing close to Chennai as a severe cyclonic storm around 21st/2100 UTC.
- A Fresh low pressure is also likely over central Andaman Sea on 23rd/24th.

In view of all the above, it is inferred that

1. For the Bay of Bengal:

- Under the influence of cyclonic circulation over south Andaman Sea and adjoining southeast Bay of Bengal, a low pressure area is likely to form over Southeast Bay of Bengal & adjoining Andaman Sea on 16th November, 2022. It is likely to move west-northwestwards and gradually concentrate into a Depression over central parts of South Bay of Bengal around 18th November, 2022. Further intensification and movement of this system need to be monitored critically.
- **A Fresh low pressure is also likely over central Andaman Sea on 23rd/24th.**

2. For the Arabian Sea:

No significant system.

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	LOW	MOD	MOD	MOD	MOD

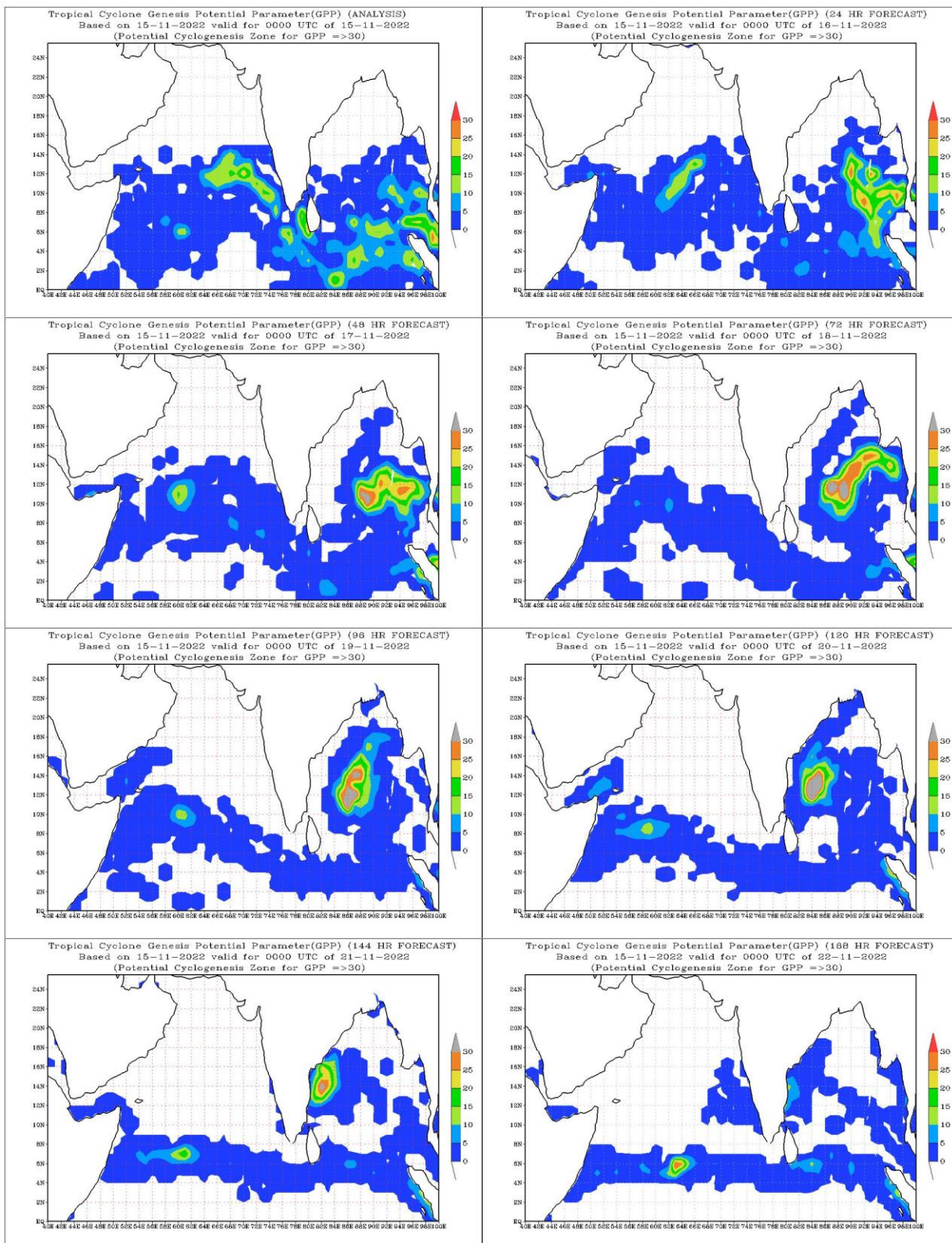
Probability of cyclogenesis (formation of depression and above intensity systems) over the Arabian Sea during next 168 hours:

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

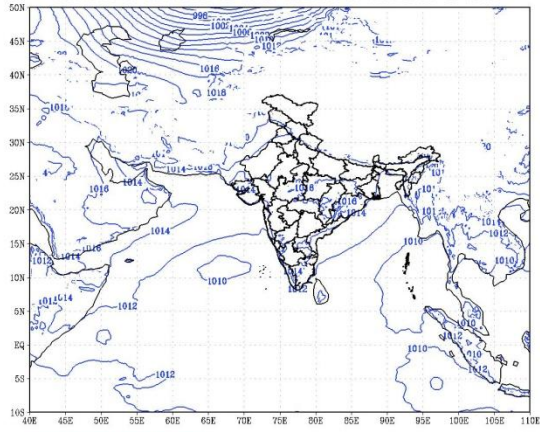
Advisory:

The possible cyclogenesis as indicated above needs to be watched and monitored.

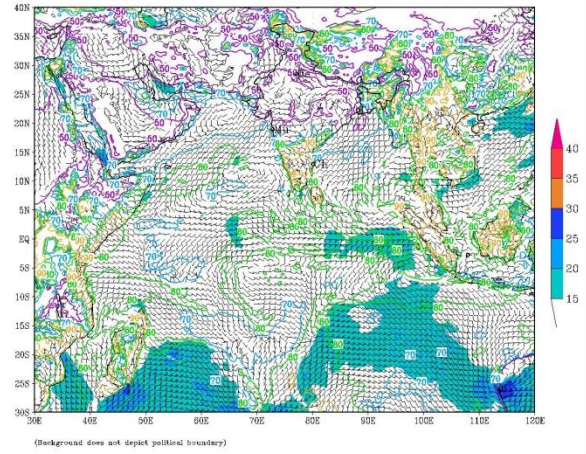
IOP: Andaman Sea for 16th & 17th, Sri Lanka for 18th & 19th, Tamil Nadu-Puducherry and adjoining Andhra Pradesh coasts on 20th & 21st.



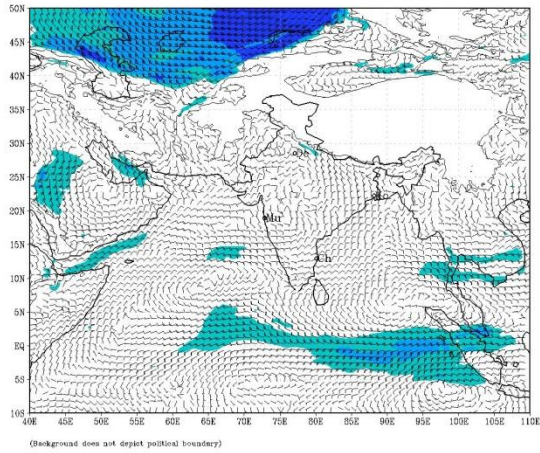
IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (00 HR)
based on 00 UTC of 15-11-2022 valid for 00 UTC of 15-11-2022



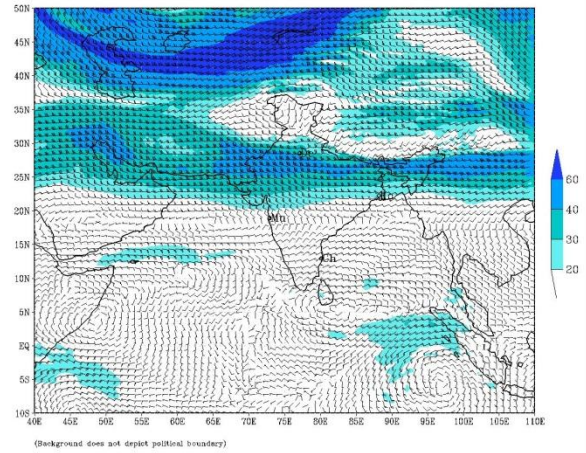
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (00 HR)
based on 00 UTC of 15-11-2022 valid for 00 UTC of 15-11-2022



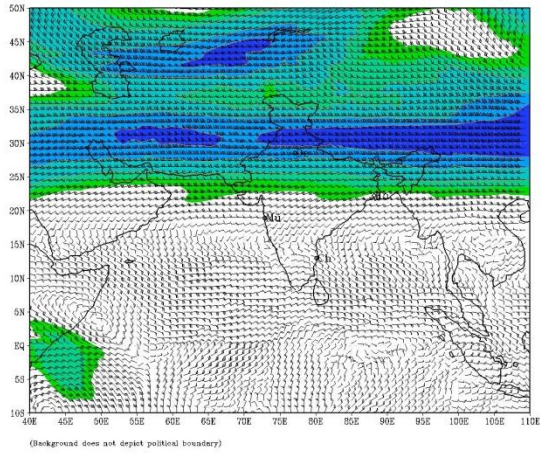
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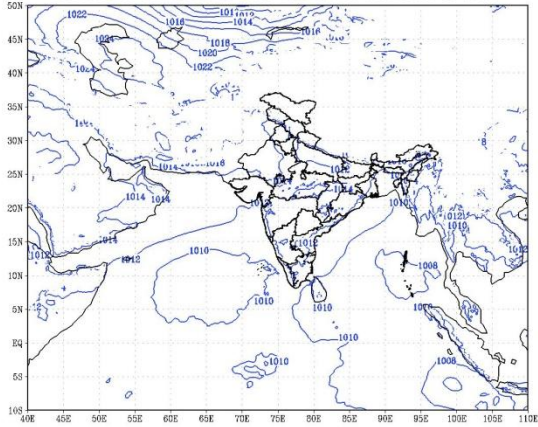
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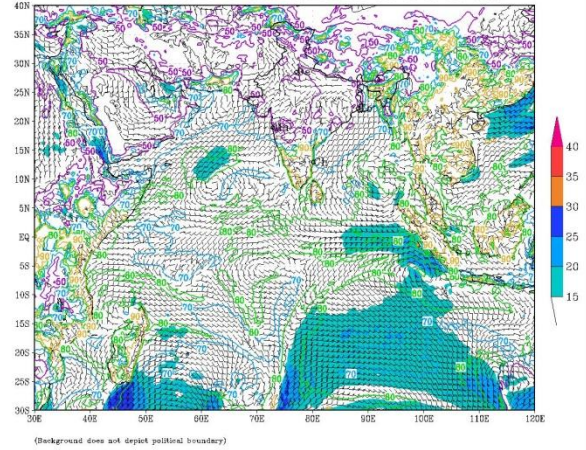
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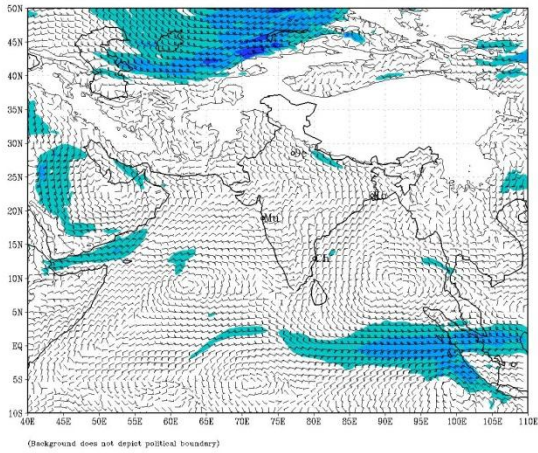
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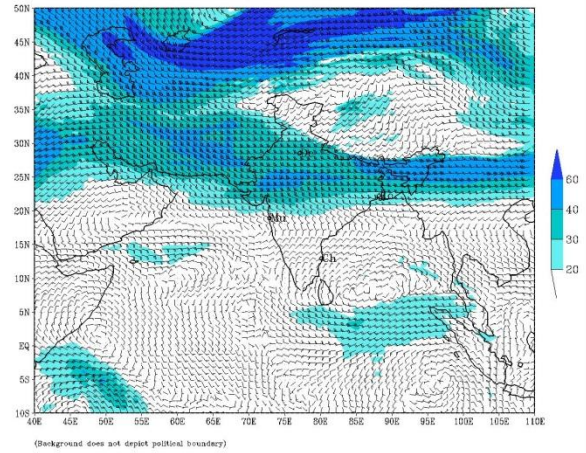
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (24 HR)
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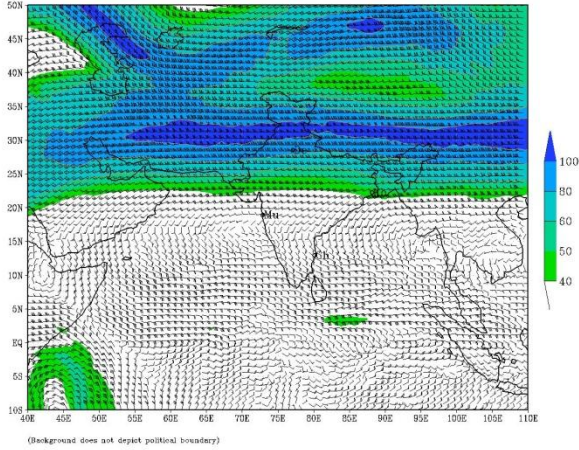
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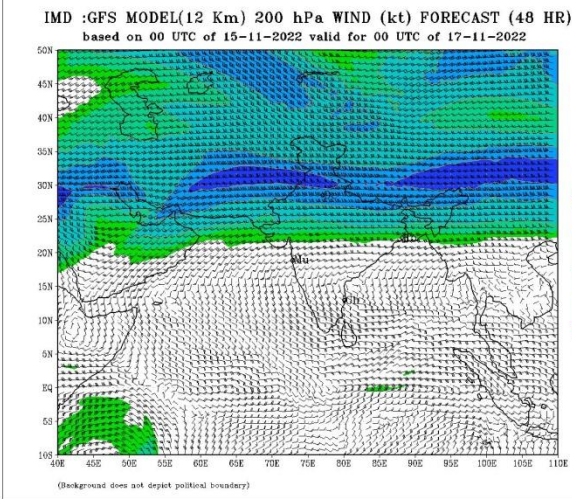
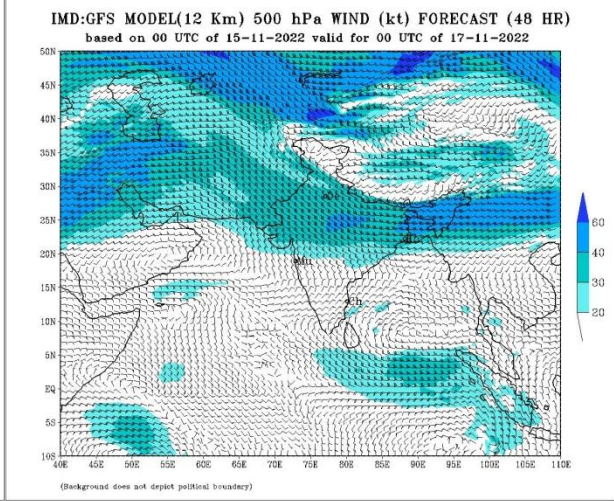
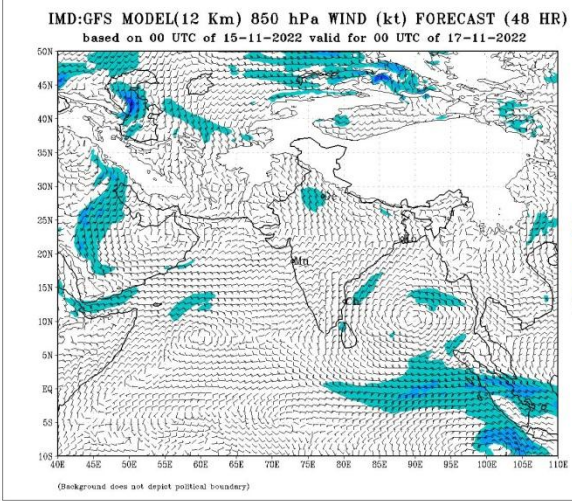
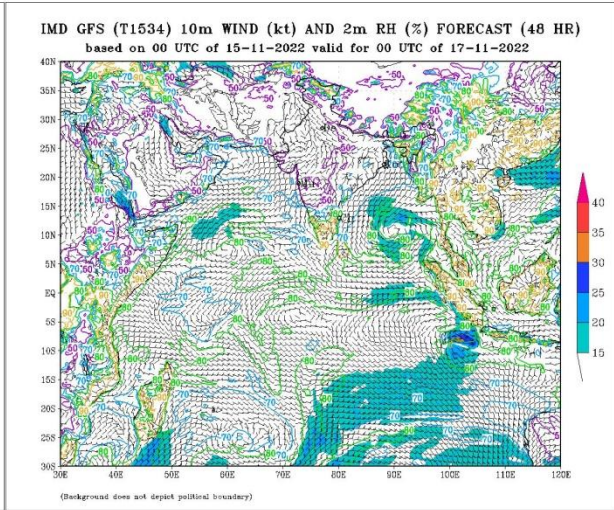
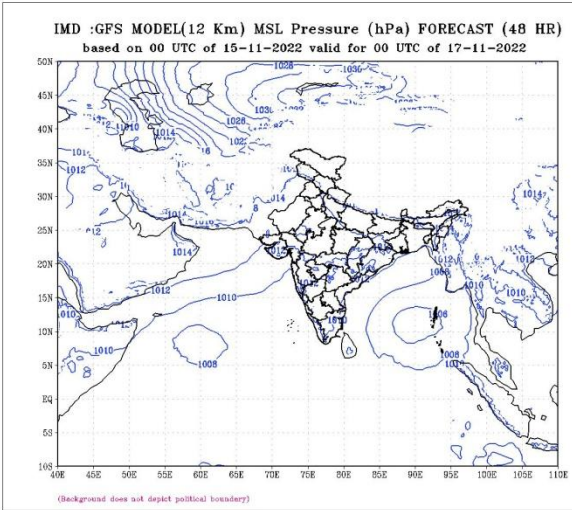


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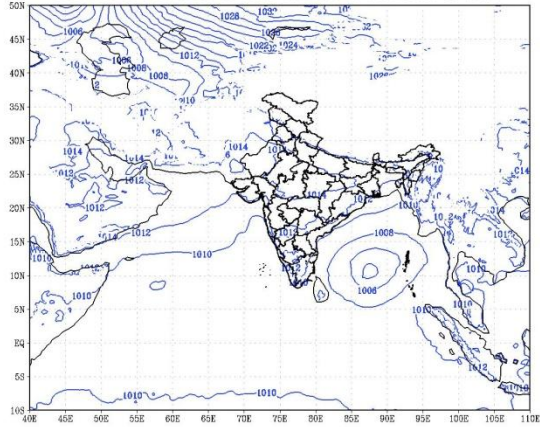


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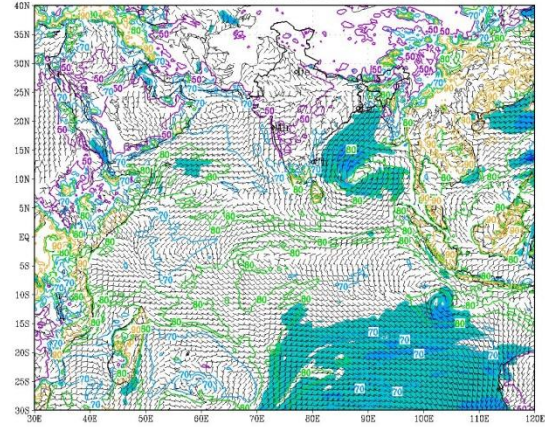


IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (72 HR)
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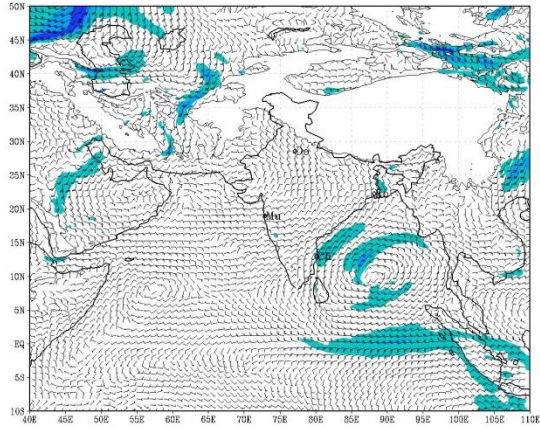
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IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (72 HR)
 based on 00 UTC of 15-11-2022 valid for 00 UTC of 18-11-2022



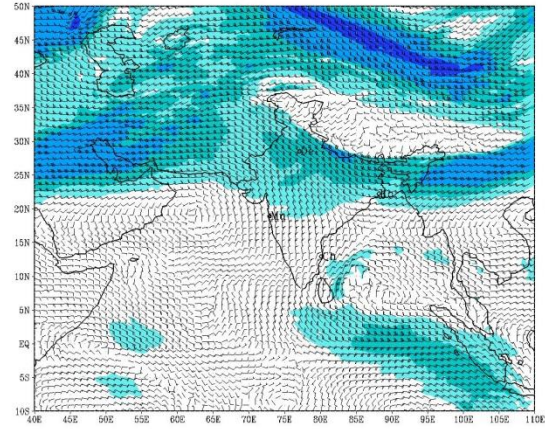
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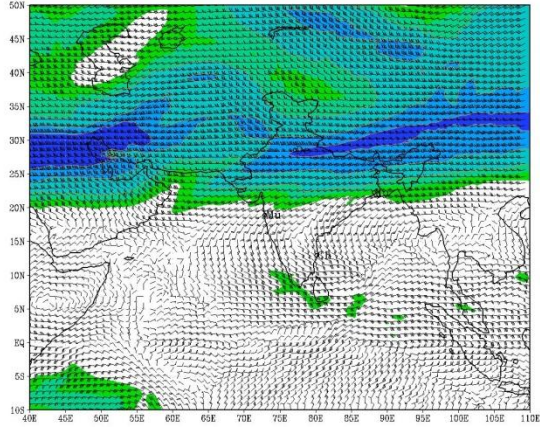
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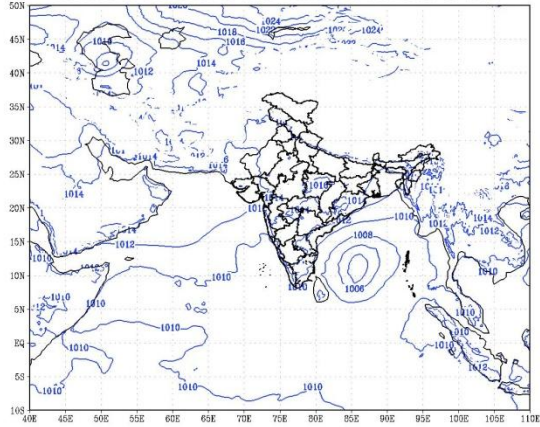
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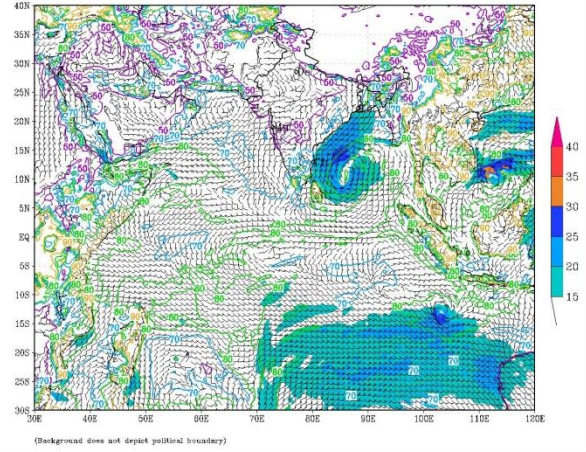


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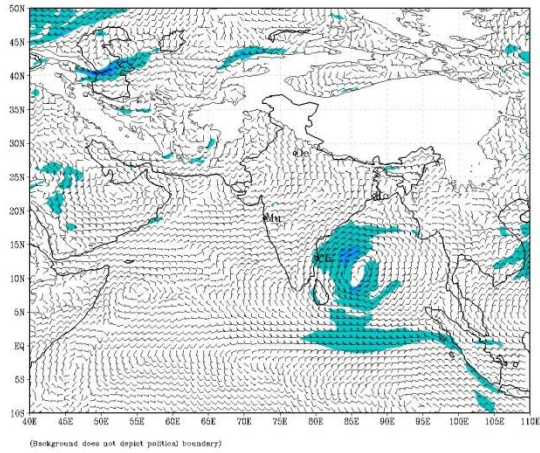
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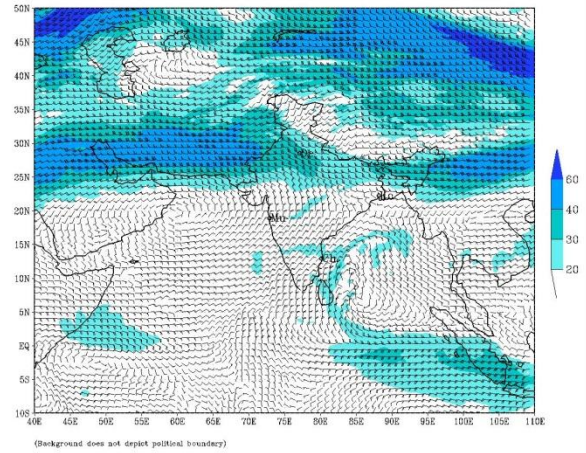
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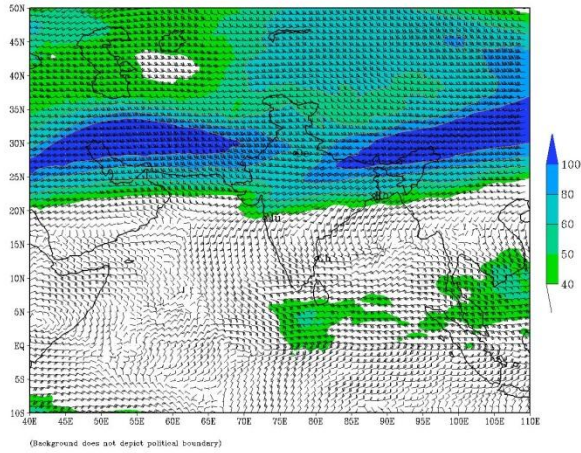
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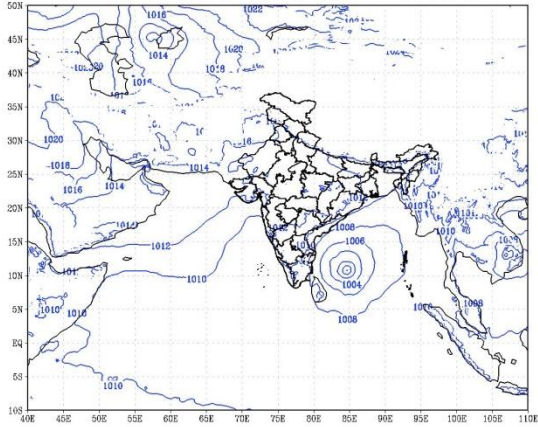
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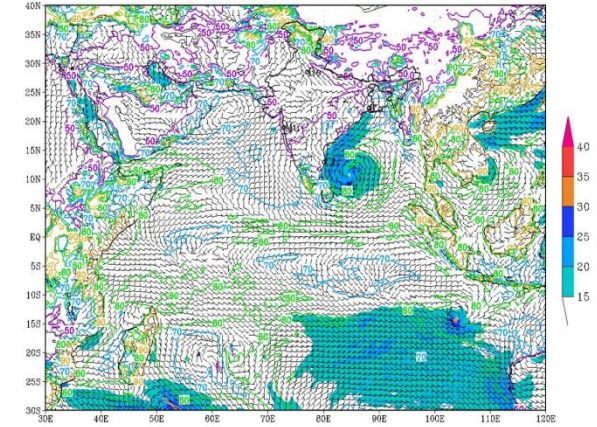


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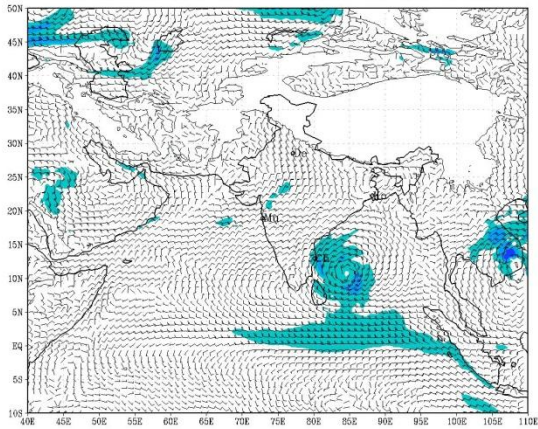
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IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (120 HR)
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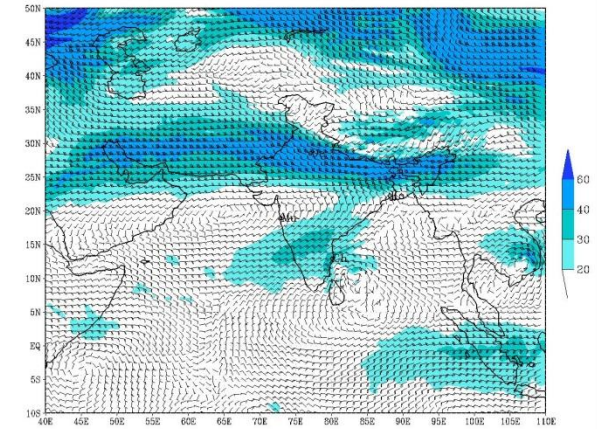
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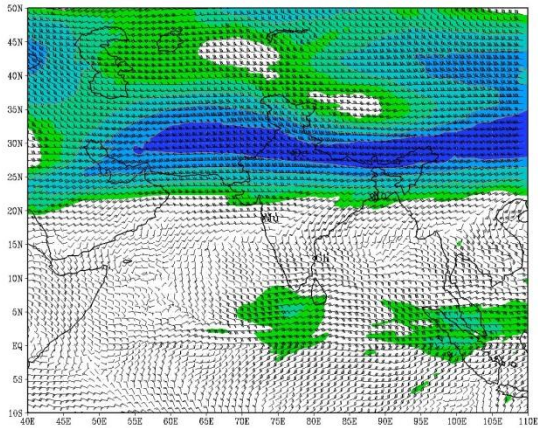
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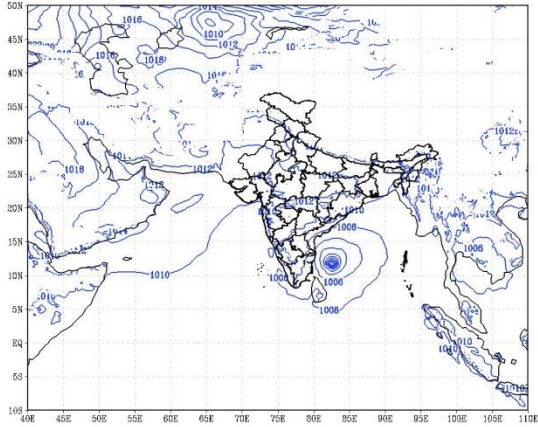
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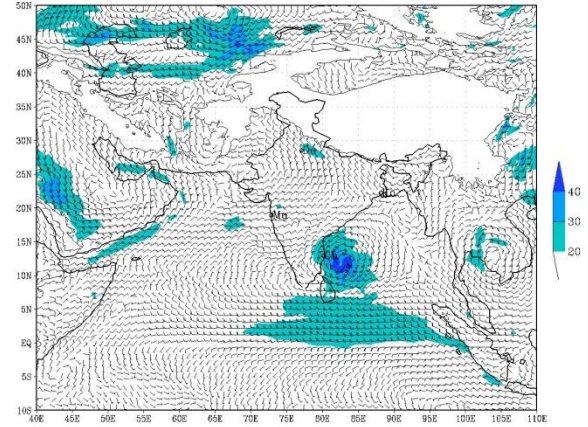
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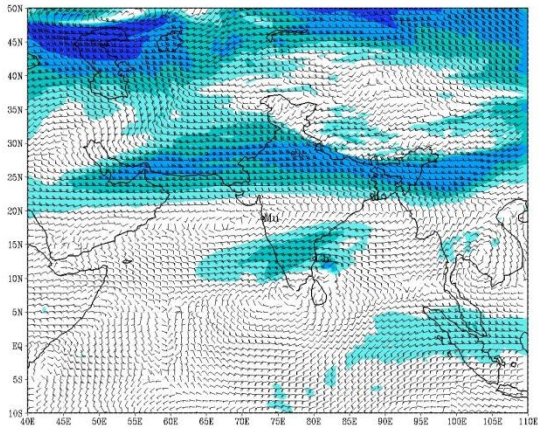
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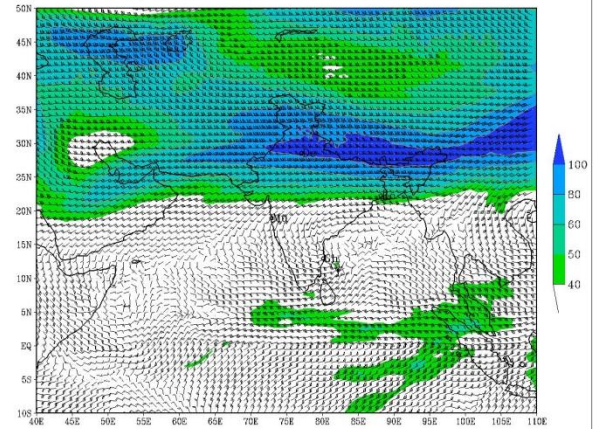
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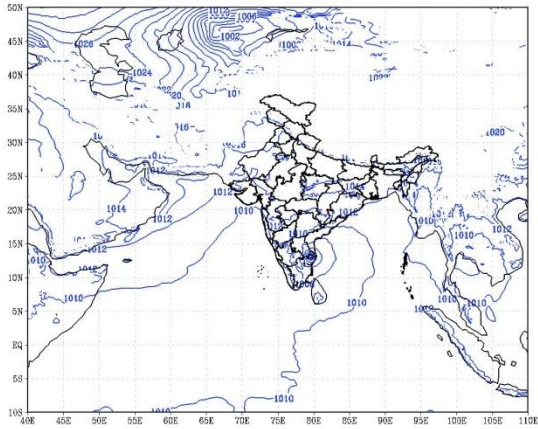
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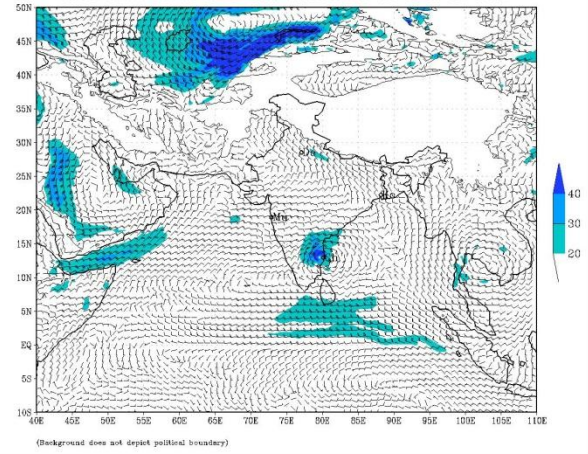


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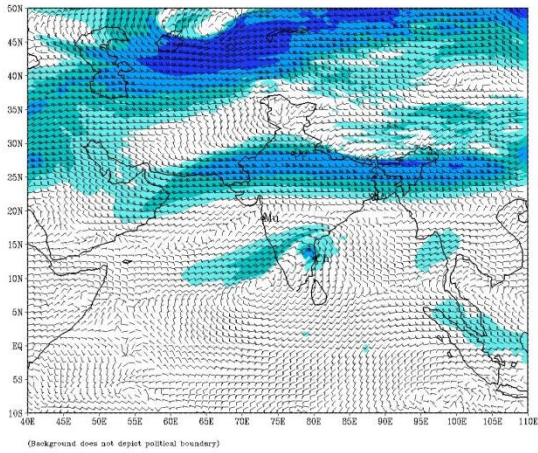
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based on 00 UTC of 15-11-2022 valid for 00 UTC of 22-11-2022



IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 15-11-2022 valid for 00 UTC of 22-11-2022



IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 15-11-2022 valid for 00 UTC of 22-11-2022



IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 15-11-2022 valid for 00 UTC of 22-11-2022

