



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

**Tropical Cyclone Forecast Programme
Report Dated 10th November, 2022**

Time of Issue: 1200 UTC

Synoptic features (based on 0600 UTC analysis):

- ❖ Yesterday's Low Pressure Area (LPA) over southwest Bay of Bengal (BoB) and adjoining Equatorial Indian Ocean (EIO) lay over southwest BoB off Sri Lanka coast at 0000 UTC and persisted over the same region at 0900 UTC. It is likely to become more marked during next 24 hours and move northwestwards towards Tamilnadu-Puducherry coasts till 12th November. Thereafter, it would move west-northwestwards across Tamil Nadu-Puducherry and Kerala during 12th-13th November, 2022.

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/cm ²	>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 ⁻⁶ s ⁻¹)	Positive vorticity of 50-60 over southwest BoB & adjoining EIO and also over some parts of south Andaman Sea.	Positive vorticity of 30-40 over central parts of south AS.

Low Level convergence ($X10^{-5} s^{-1}$)	About 05-10 over southwest and adjoining eastcentral BoB and another over South Andaman Sea.	05 over southeast AS and adjoining EIO.
Upper Level divergence ($X10^{-5} s^{-1}$)	20 over southwest BoB.	Positive zone 05-10 over southwest AS.
Vertical Wind Shear (VWS knots)	Moderate 10-20 knots over south & adjoining central BoB. 25-40 over north BoB and adjoining central BoB.	10-20 over south & adjoining central AS and over southwest AS off Somalia & Yemen coasts. 25-30 over north AS and adjoining central AS.
Wind Shear Tendency (knots)	Decreasing over eastcentral BoB and adjoining southeast BoB.	Decreasing over southeast AS and adjoining EIO.
Upper tropospheric Ridge	Along 18.0°N over the BoB.	Along 17.0°N over the AS.
Trough in westerlies	Along 78° E upto 20° N	

Satellite observations based on INSAT imagery (0900 UTC):

(a) Over the BoB & Andaman Sea:-

Low level cyclonic circulation over southwest BoB off Sri Lanka coast. Scattered to broken low/medium clouds with embedded intense to very intense convection lay over southwest adjoining westcentral BoB. Minimum cloud top temperature is -87 degree cecius. Scattered low/medium clouds with embedded moderate to intense convection lay over southeast BoB and south Andaman Sea.

(b) Over the Arabian Sea:-

Scattered low/medium clouds with embedded moderate to intense convection lay over south AS and Comorin area.

M.J.O. Index:

MJO index is currently in Phase 7 with amplitude less than 1. It will continue in same phase for next 1 day. Thereafter, it would move to phase 5 from middle of week 1 across phase 6 with gradually increasing amplitude during subsequent 9 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	LPA over southwest BoB on 10 th , over southwest BoB and adjoining Sri Lanka-Tamil Nadu coasts on 11 th & 12 th , to move wet-northwestwards across south peninsular region on 13 th and emerge into AS on 14 th	LPA over southeast AS on 14 th , to move nearly westwards as an LPA towards Somalia coast till 20 th .

	A fresh cycir over south Andaman Sea & adjoining Equatorial Indian Ocean (EIO) on 13 th with west-northwestwards movement and gradual intensification into an LPA on 15 th over south Andaman Sea, well marked low pressure area over southeast BoB & adjoining South Andaman Sea on 16 th , depression over southeast BoB on 17 th , deep depression over southeast & adjoining southwest BoB on 18 th , cyclonic storm (CS) over southeast & adjoining eastcentral BoB on 19 th , severe cyclonic storm over westcentral BoB on 20 th .	
IMD-GEFS	LPA over southwest BoB on 10 th & 11 th , close to Tamil Nadu coast on 12 th with nearly westwards movement across south Peninsular region and emergence into southeast Arabian Sea on 13 th . A fresh cycir over south Andaman Sea & adjoining southeast BoB on 14 th & 15 th , LPA over southeast BoB on 16 th , Depression over eastcentral & adjoining southeast BoB on 17 th , deep depression over westcentral & adjoining southwest BoB on 18 th	The LPA over southeast AS on 13 th to move nearly westwards, intensify into a depression over southeast & adjoining southwest AS on 15 th , move nearly west-northwestwards towards Yemen coast as a well marked low pressure area/depression till 18 th Nov.
GEFS Probablistic guidance	Available during cyclone	Available during cyclone
IMD WRF	LPA over southwest BoB on 9 th & 10 th , LPA over southwest BoB on 11 th , LPA off Tamil Nadu coast on 12 th , to move across south peninsular region and emerge into southeast AS on 13 th . Fresh cycir over south Andaman Sea on 13 th .	LPA over southeast AS on 13 th
NCMRWF-NCUM	LPA over southwest BoB off SriLanka coast on 10th, LPA over southwest BoB near Tamil Nadu & Sri Lanka coasts on 11th, LPA off Tamil Nadu coast on 12th, to move across south peninsular region on 13th as cycir and emerge into southeast AS on 14th. Fresh cycir over southwest BoB on 14th, to move west-northwestwards, lay over southwest BoB on 18th as an extended low, LPA over southwest BoB on 19th.	LPA over southeast AS on 14th. LPA, depression over southeast AS on 15th, to move west-northwestwards and intensify into a deep depression over southeast & adjoining eastcentral AS on 16th, CS over westcentral AS on 17th, severe CS over westcentral AS on 18th, extremely severe CS off Yemen coast on 19th, to cross Yemen as a extremely severe CS on 19 th /1200 UTC and weaken rapidly into a depression over Yemen on 20th.
NCMRWF-NEPS	LPA over southwest BoB on 10 th , well marked low over southwest BoB off SriLanka Coast on 11 th , LPA off Tamil Nadu coast on 12 th , to move across south peninsular region on 13 th as a cycir and emerge into southeast AS on 14 th .	Cycir to emerge into southeast AS as an LPA on 14 th , depression over southeast & adjoining eastcentral AS on 15 th , to intensify into deep depression on 16 th , to move west-northwestwards and intensify into CS over westcentral AS on 17 th , severe

	Fresh cycir over south Andaman Sea on 14 th , 15 th , LPA over southeast BoB on 16 th , 17 th , 18 th , depression over southwest & adjoining westcentral BoB on 19 th , depression over westcentral BoB on 20 th .	CS over westcentral AS on 18 th , extremely severe CS off Yemen coast on 19 th , to cross Yemen as a extremely severe CS on 19 th /1200 UTC and weaken rapidly into a depression over Yemen on 20th.
NCMRWF-UM (Regional)	LPA over southwest BoB off SriLanka coast on 10th, LPA over southwest BoB near Tamil Nadu & Sri Lanka coasts on 11th, LPA off Tamil Nadu coast on 12th, to move across south peninsular region on 13th as cycir and emerge into southeast AS on 14th. Fresh cycir over southwest BoB on 14th,	LPA over southeast AS on 14th.
ECMWF	Yesterday's LPA over southwest BoB moved northwestwards and lies today over southwest BoB off Sri Lanka coast. It will become extended low over southwest BoB on 11th, LPA over southwest BoB off Tamil Nadu. A fresh cycir over south Andaman Sea & adjoining Equatorial Indian Ocean (EIO) on 13th with west-northwestwards movement till 18th with slight intensification.	A cycir over southeast AS on 13th, becoming LPA on 14th and moving westwards thereafter.
ECMWF ensemble	30-40% probability for Low pressure area over southwest BoB east of Sri Lanka to track northwest ward and crosses south Tamil Nadu coast on 12th Nov noon	30-40 % probability of cyclogenesis over southeast AS during 14th -15 with system likely to move nearly west-northwestwards.
NCEP-GFS	LPA over southwest BoB on 10th & 11th, LPA over southwest BoB off Tamil Nadu coast on 12th, to move across southern peninsular region as a cycir on 13th and emerge as extended low over southeast AS on 14th. Fresh LPA over south Andaman Sea on 16th, LPA over southeast BoB on 17th., WML over eastcentral BoB on 18 th , depression over westcentral BoB on 19 th & 20 th , LPA over westcentral BoB off North Tamil Nadu-South Odisha coasts on 21 st	Extended low over southeast AS on 14th, 15th & 16th, less marked on 17th, LPA over southeast AS on 18th Nov.
IMD MME	The LPA over southwest BoB to move west-northwestwards and reach Tamil Nadu coast as well marked low pressure area/depression on 12th Nov.	The LPA over southwest BoB will emerge into southeast AS on 13th morning and will have west-northwestward movement.
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 10th – 12th towards Tamil Nadu coast.	-

Summary and conclusion:

- Most of the models like IMD GFS, GEFS, NCEP GFS, ECMWF, ECMWF ensemble and NCUM are indicating the low pressure area over southwest BoB on 10th to move northwestwards towards Tamil Nadu coast till 12th morning (0000 UTC). No significant intensification of this system is indicated by the models.
- However, models are indicating this low pressure area/it's remnant to move across south Peninsular region on 13th and emerge into Arabian Sea, intensify further and move northwestwards towards Yemen coast. However, NCUM group of models are indicating intensification of this system into severe cyclonic storm and above and movement towards Yemen-Oman coasts till 19th evening (1200 UTC). GFS, GEFS, NCEP GFS and ECMWF are not indicating any significant intensification of the system over Arabian Sea.
- 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 over southeast & adjoining eastcentral BoB around 18th. However, GFS group is indicating significant intensification of this system into a cyclonic storm around 19th. NCEP & ECMWF are not indicating any significant intensification. NCUM group is not indicating any significant intensification of this system.
- Overall, Models are indicating simultaneous development of cyclonic disturbances over the BoB and the AS from 15th onwards. NCEP GFS and ECMWF are indicating no significant intensification of both the systems. GFS group is indicating the system over BoB to intensify into a depression around 18th and further into a cyclonic storm around 19th. NCUM group is indicating marginal intensification of system over BoB, but it is indicating system over AS to intensify into a depression on 15th and into a CS on 17th.
- Both the systems are exhibiting some interaction. Consequently, GFS group is indicating intensification of system over BoB and weakening of system over AS on 16th. Similarly, NCUM group is indicating intensification over system over AS from 15th onwards.

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 during next 24 hours and move northwestwards towards Tamilnadu-Puducherry coasts till 12th November. Thereafter, it would move west-northwestwards across Tamil Nadu-Puducherry and Kerala during 12th-13th November, 2022.**
- **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 17th. Thereafter, the intensification and movement of this system need to be monitored.**

2. For the Arabian Sea:

- **There is likelihood of emergence of the existing low pressure area/it's remnant over into southeast Arabian Sea around 14th. The system is likely to move west-northwestwards and intensify gradually into a depression around 15th. However, low probability of cyclogenesis (formation of depression) is predicted over Arabian Sea on day 6 & day 7. 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

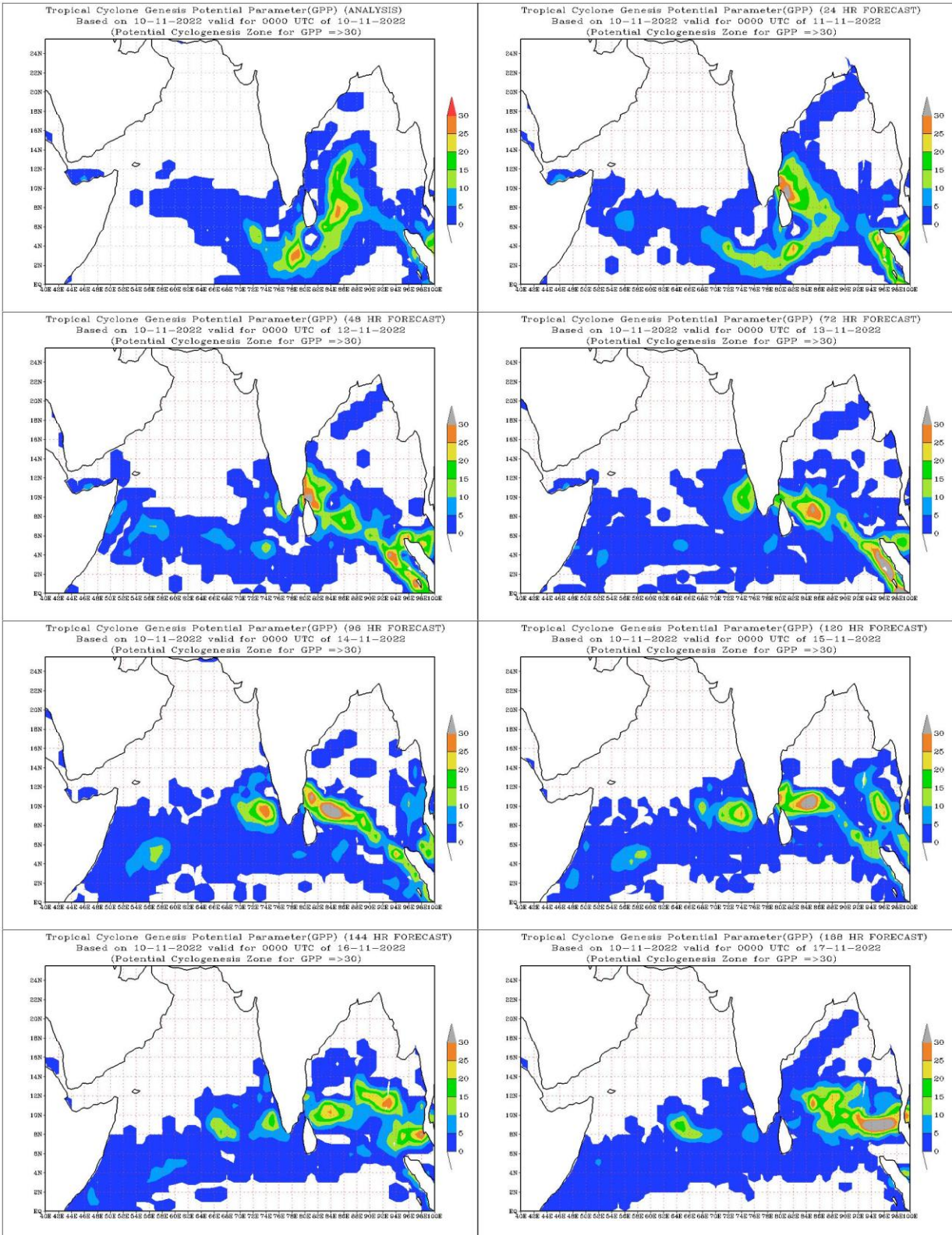
Probability of cyclogenesis (formation of depression and above intensity systems) over the Arabian Sea during next 168 hours:

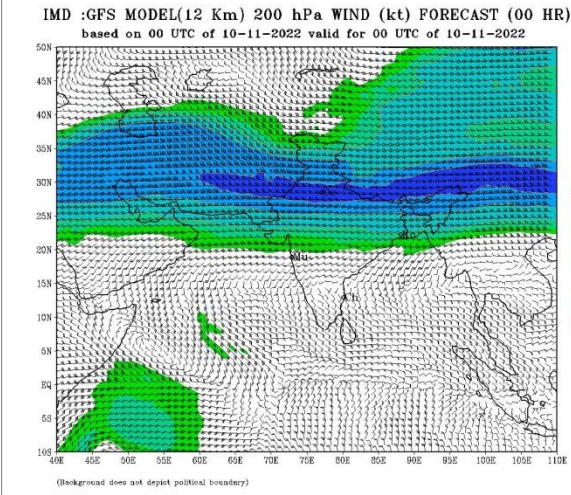
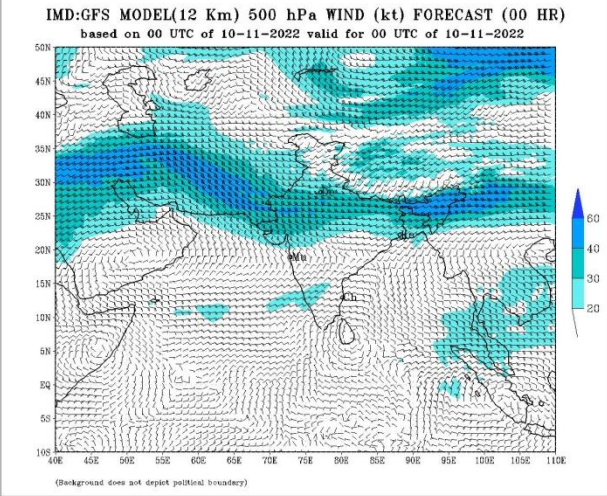
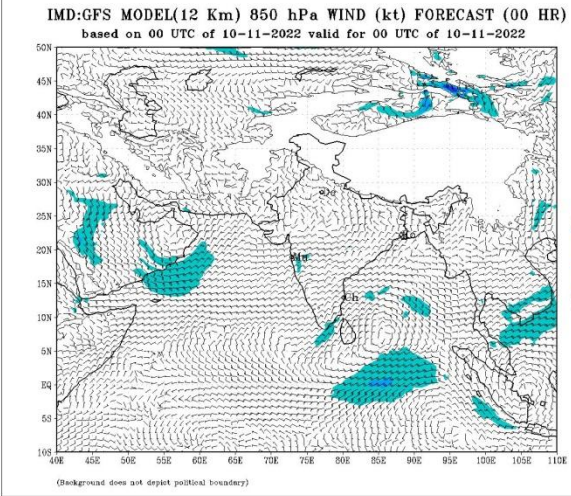
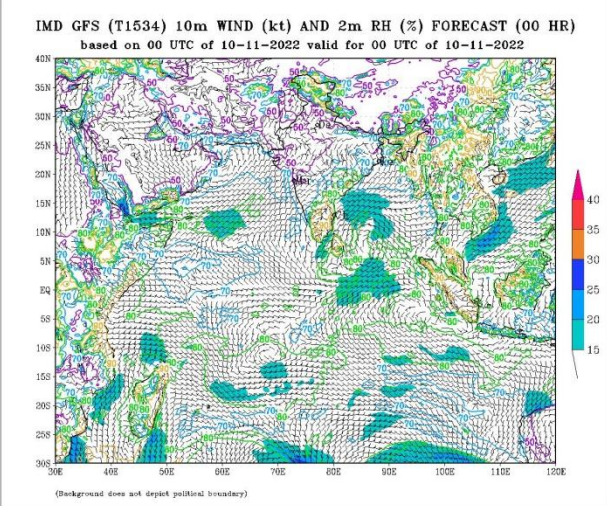
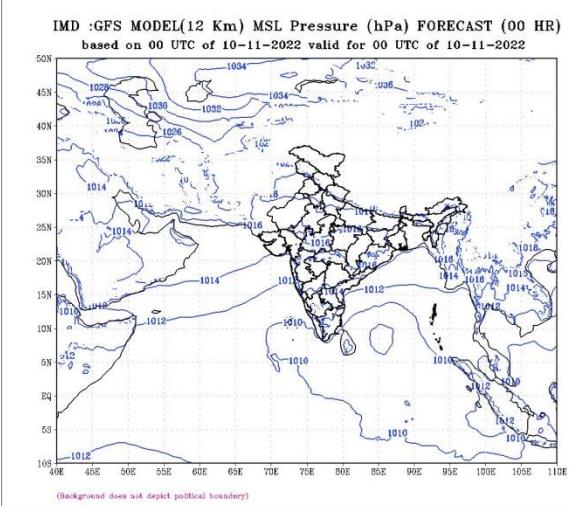
24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS	120-144 HOURS	144-168 HOURS
NIL	NIL	NIL	NIL	NIL	LOW	LOW

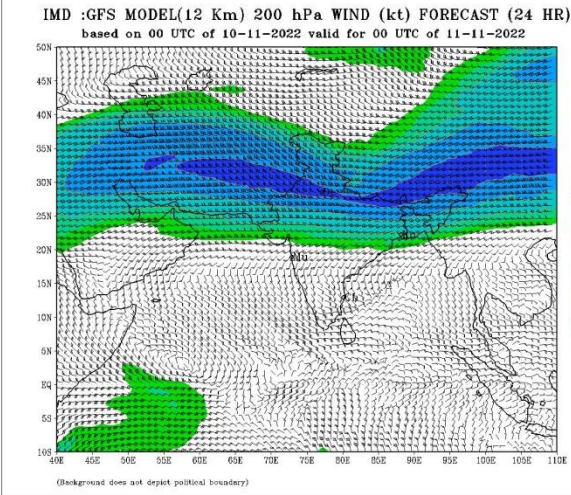
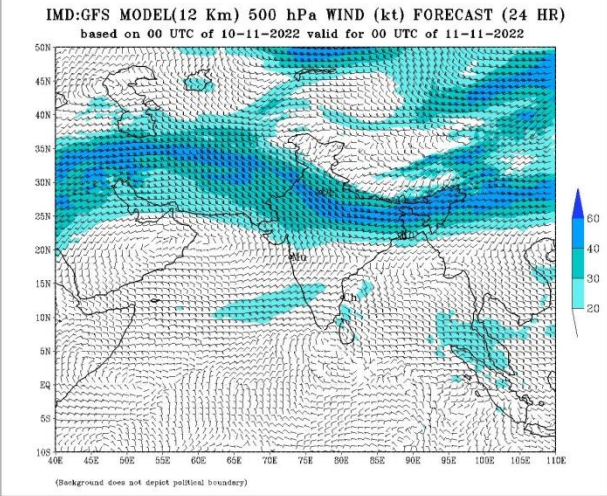
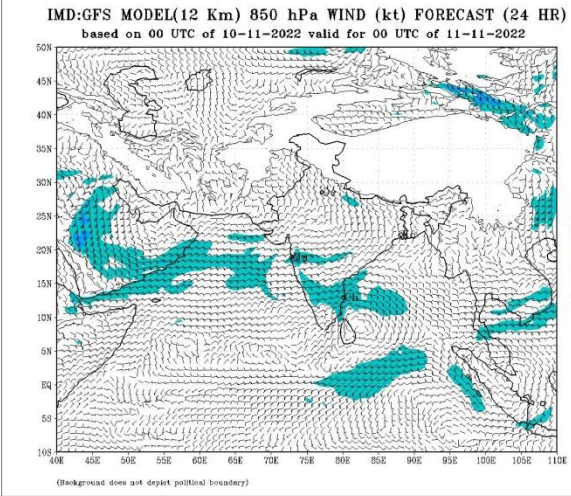
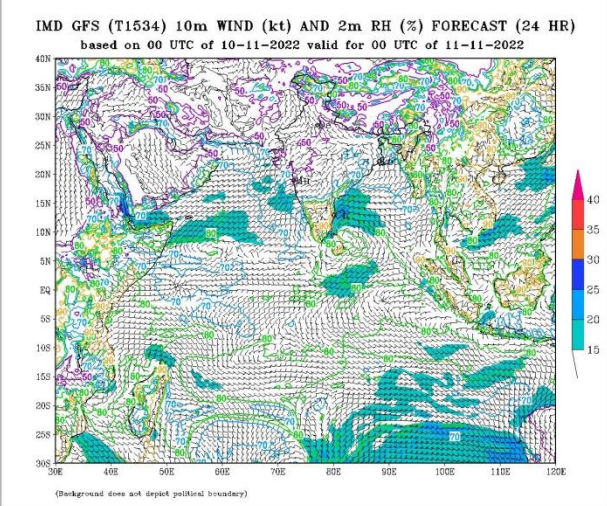
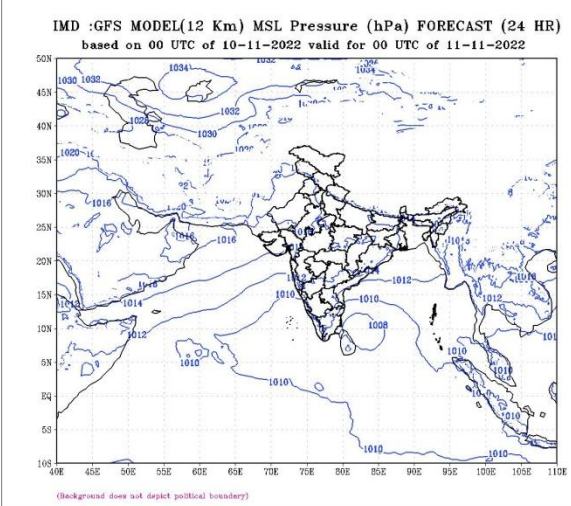
Advisory:

Nil

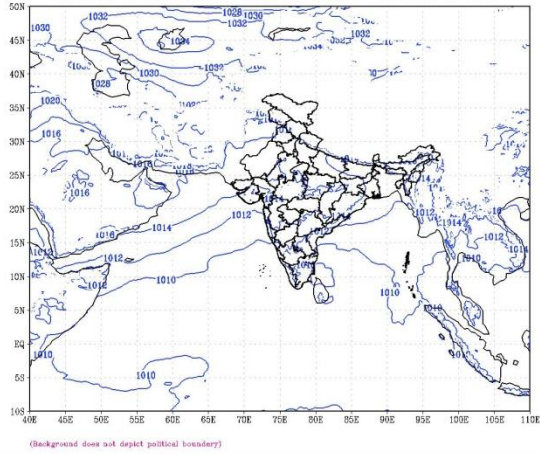
IOP: Tamil Nadu-Puducherry and Kerala during 11th to 13th.



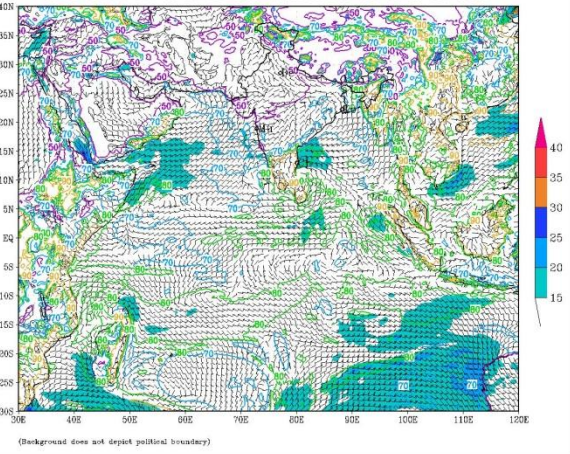




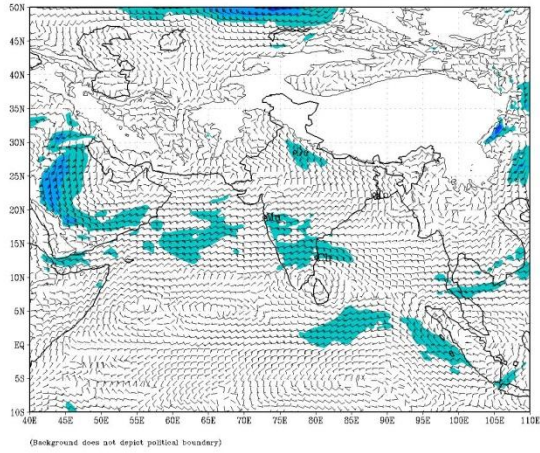
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based on 00 UTC of 10-11-2022 valid for 00 UTC of 12-11-2022



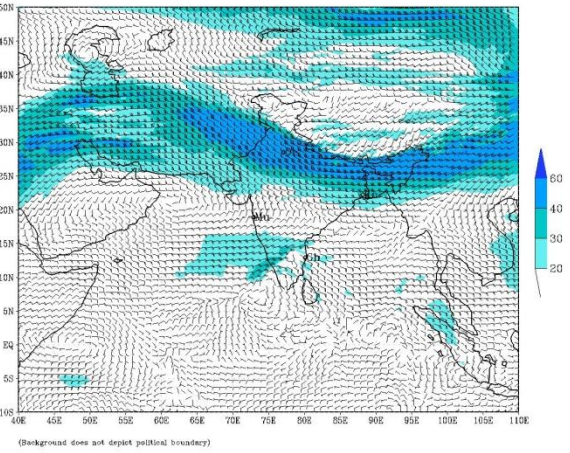
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (48 HR)
based on 00 UTC of 10-11-2022 valid for 00 UTC of 12-11-2022



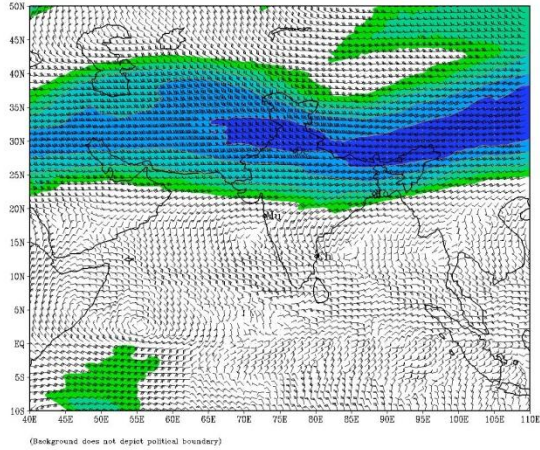
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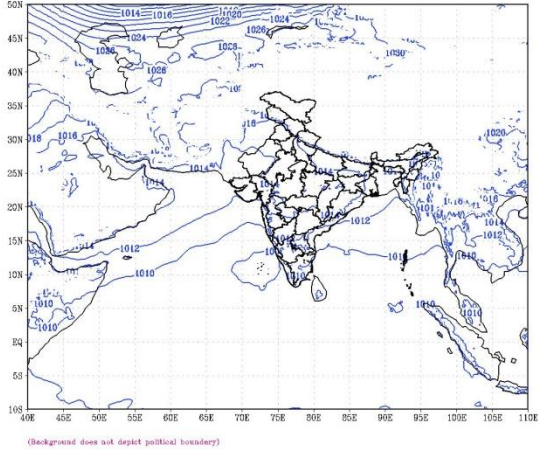
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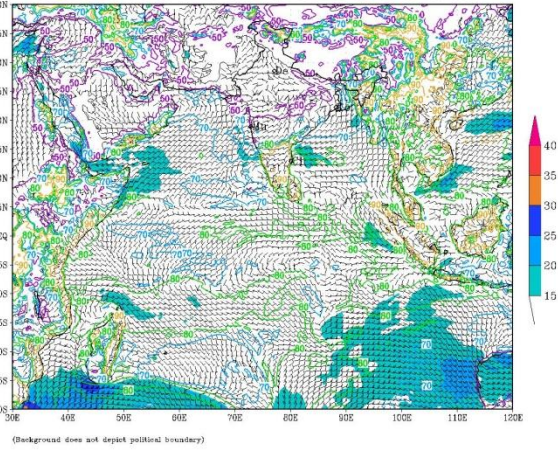
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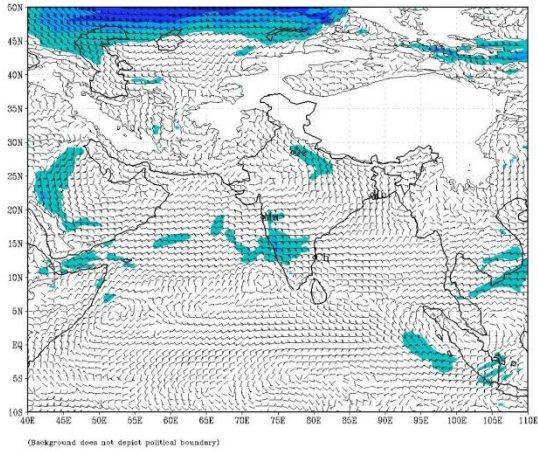
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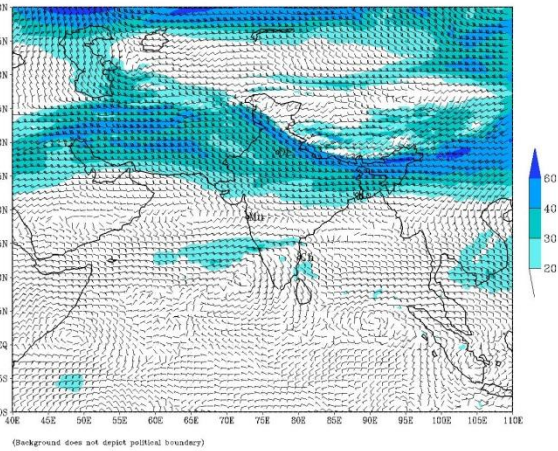
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (72 HR)
based on 00 UTC of 10-11-2022 valid for 00 UTC of 13-11-2022



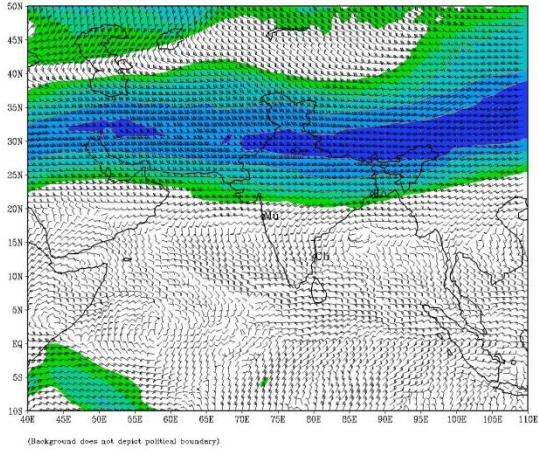
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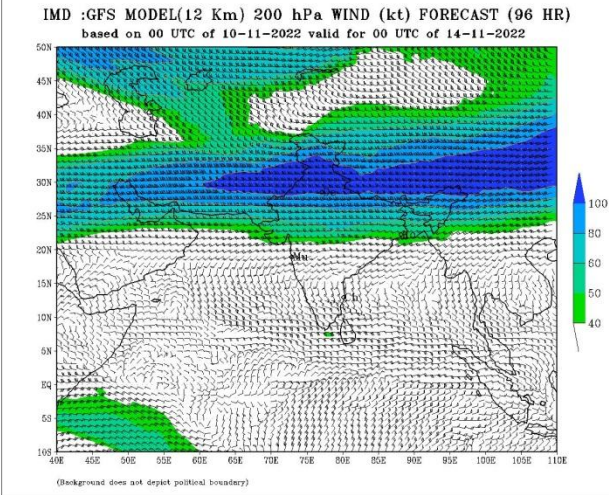
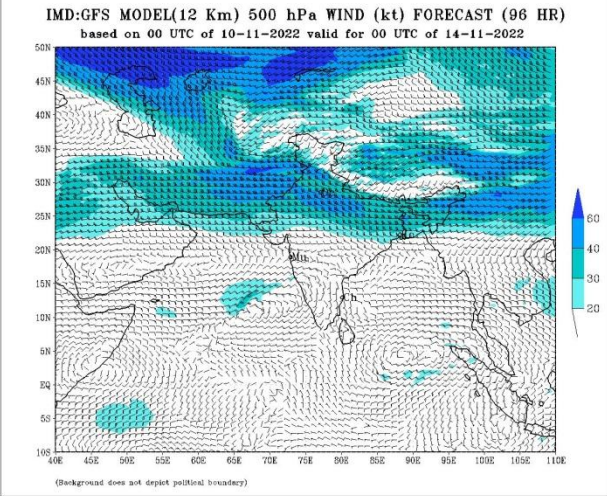
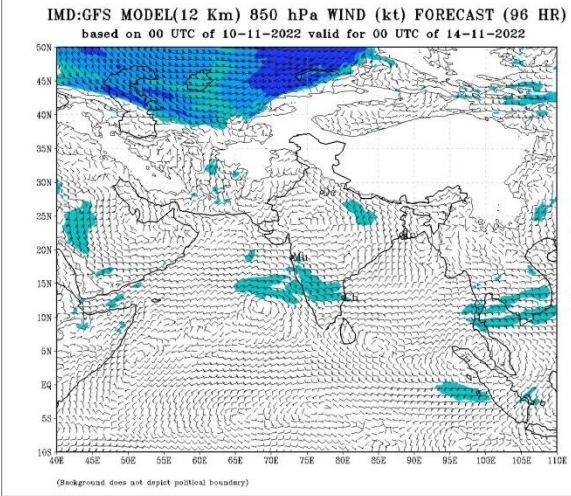
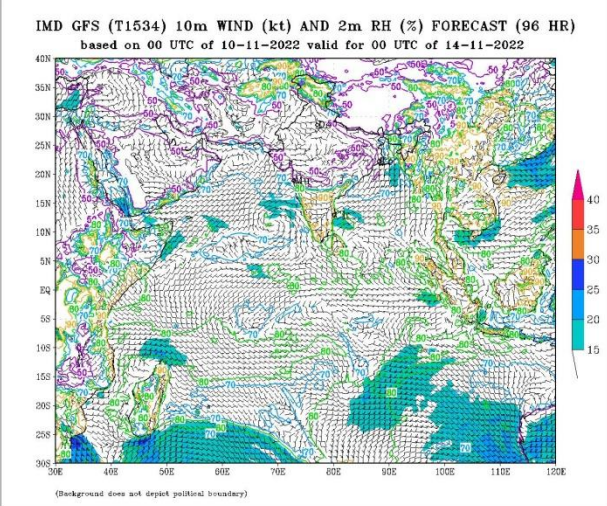
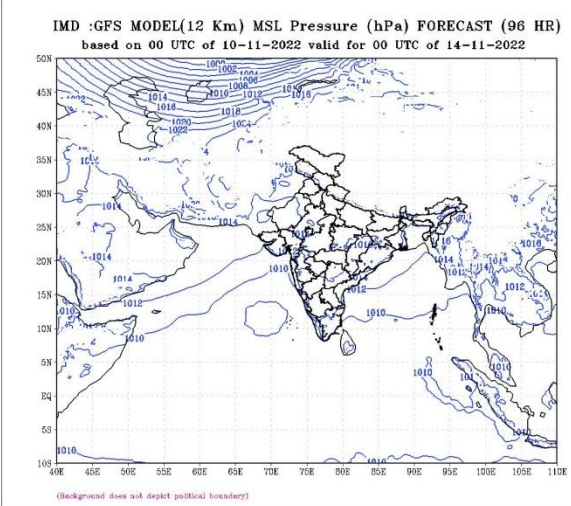


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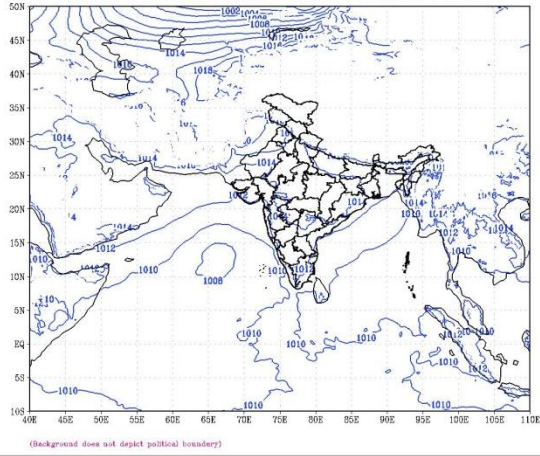


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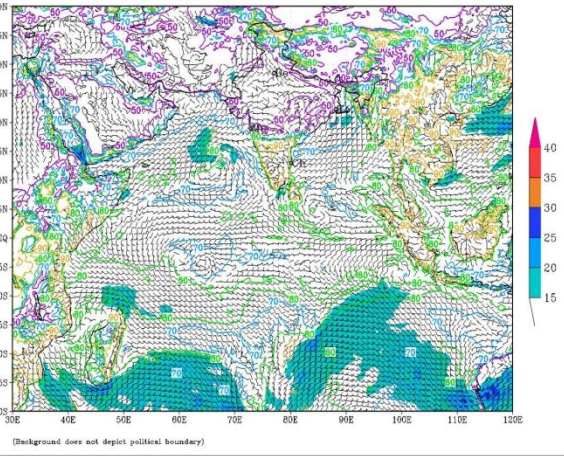




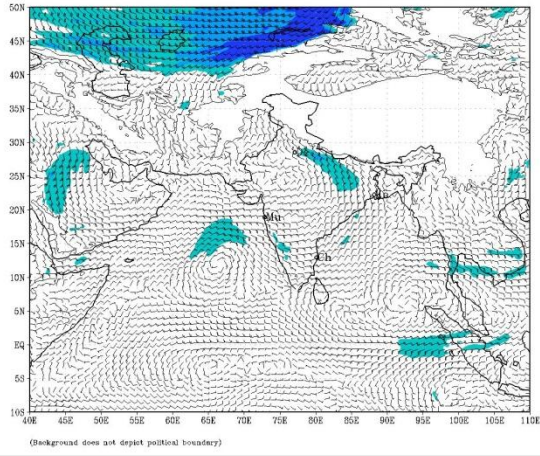
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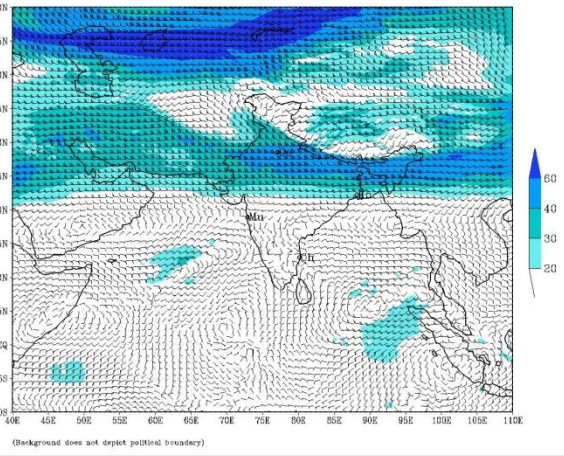
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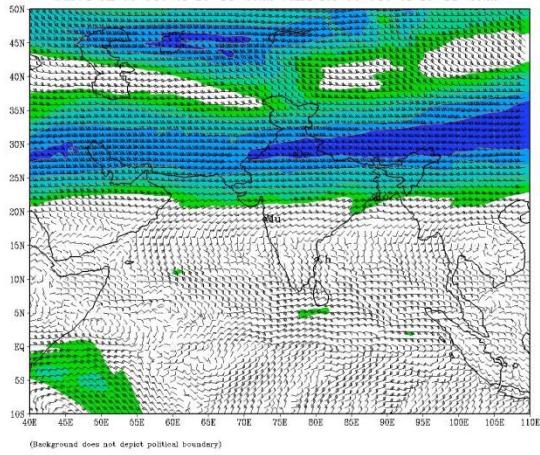
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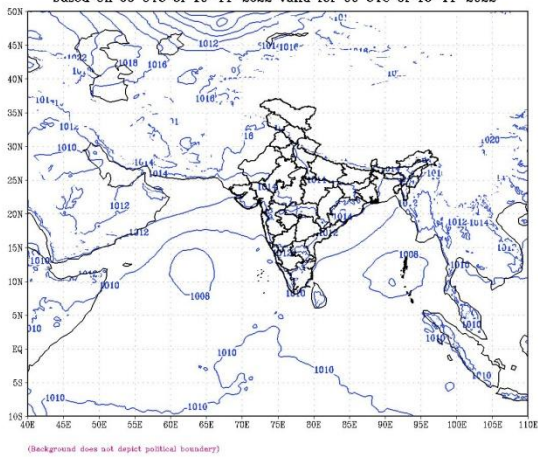
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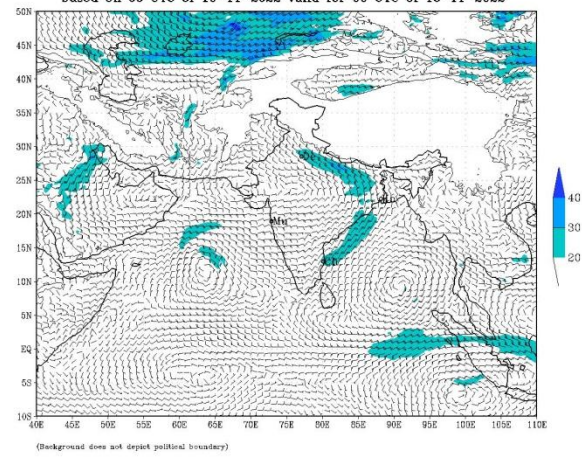
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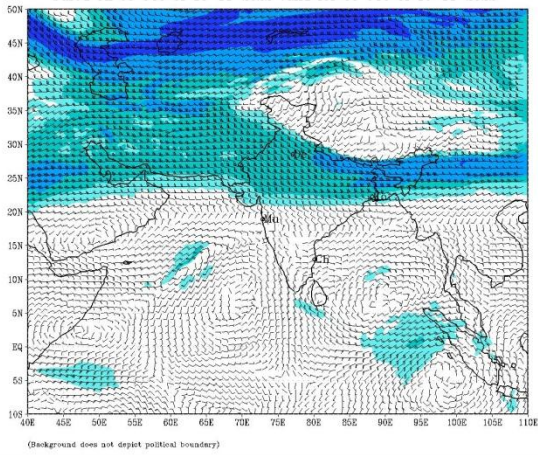
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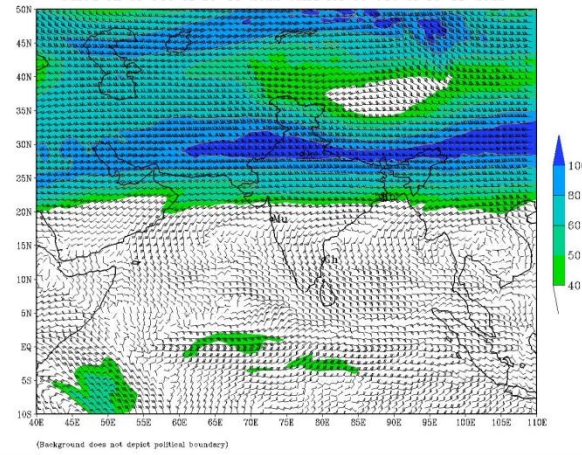
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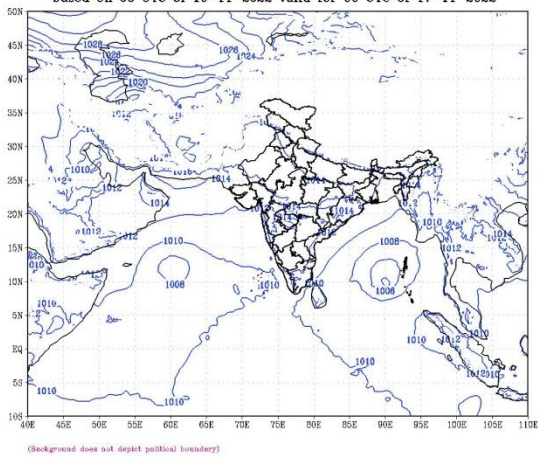
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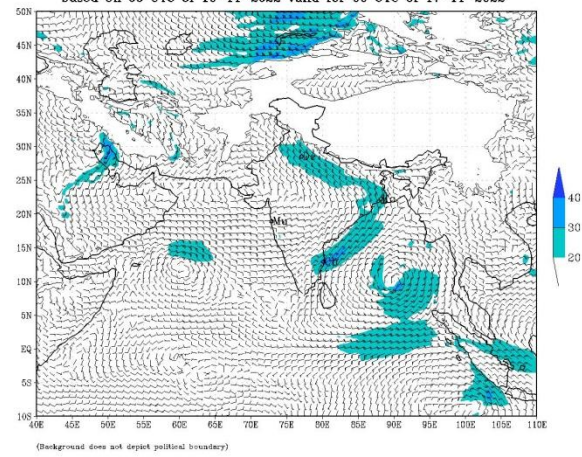
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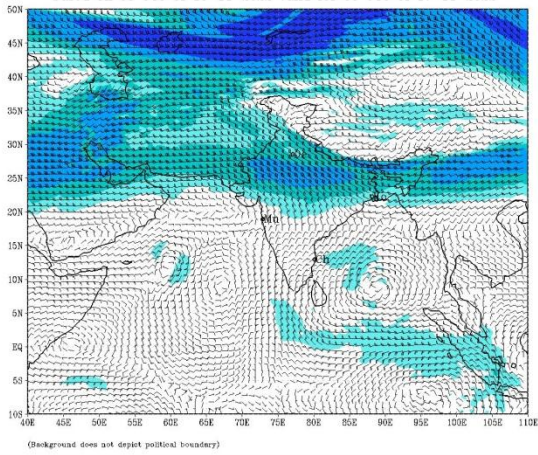
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based on 00 UTC of 10-11-2022 valid for 00 UTC of 17-11-2022



IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 10-11-2022 valid for 00 UTC of 17-11-2022



IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 10-11-2022 valid for 00 UTC of 17-11-2022

