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

Tropical Cyclone Forecast Programme
Report Dated 4th November, 2022

Time of Issue: 1200 UTC

Synoptic features (based on 0600 UTC analysis):

- A Cyclonic circulation lies over Kerala coast & neighbourhood and an east-west trough runs from this system to south Andaman Sea in lower tropospheric levels. Another cyclonic circulation lies over south Andaman Sea & southeast Bay of Bengal in middle tropospheric levels.

- A Low Pressure area is likely to form over southwest Bay of Bengal off Sri Lanka coast around 09th November, 2022. It is very likely to move northwestwards towards Tamilnadu-Puducherry coasts with possible slight intensification during subsequent 48 hours.

Dynamical and thermo-dynamical features

Parameter	Bay of Bengal (BoB)	Arabian Sea (AS)
Sea Surface Temperature (SST) ºC	About 26-28°C over southern parts of southwest BoB, and about 29-31°C for the rest of the area over BoB	29-31°C over north AS, along and off south Gujarat, Maharashtra coasts, southeast AS. 26-28°C over central and southwest AS. Less than 24°C off Oman & Somalia coast and adjoining parts of southwest and westcentral AS. Less than 22°C along Somalia coast.
Tropical Cyclone Heat Potential (TCHP) kJ/cm^2	>100 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 south Andhra Pradesh and Tamil Nadu coasts & less than 30 over a small pocket over southwest BoB.	(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 20-40 over south parts of south BoB, off southwest Sri Lanka coast and also off south Tamil Nadu coast, south Andaman Sea, northeast BoB. Remaining area is having negative vorticity of -30 to -50.	Positive vorticity of 30-40 over southeast and adjoining southwest AS, off Maharashtra coast and adjoining east-central AS. Remaining area is having

		negative vorticity of -30 to -50.
Low Level convergence ($X10^{-5}$ s^{-1})	About 05 over southwest BoB, west-central BoB and Sri Lanka.	05 over off Kerala and Maharashtra coasts, off Yemen coast, -10 over parts of west central AS.
Upper Level divergence ($X10^{-5}$ s^{-1})	About 05 over central parts of BoB.	Positive zone 05 over eastern parts of east-central AS, negative values are noticed along western parts of west-central and off kerala coast.
Vertical Wind Shear (VWS knots)	Moderate 10-20 knots over major parts of south & central BoB. High values up to 30 over North BoB.	05-10 over major parts of south & adjoining central AS and high values up to 25 over north AS.
Wind Shear Tendency (knots)	Increasing over BoB from south to north.	Increasing from south to north.
Upper tropospheric Ridge	Along 16.0°N over the BoB.	Along 16.0°N over the AS.
Trough in westerlies	Along 88° E upto 28° N	

Satellite observations based on INSAT imagery (0600 UTC):

(a) Over the BoB & Andaman Sea:-

Scattered low/medium clouds with embedded intense to very intense convection lay over south BoB and south Andaman Sea, Scattered low/medium clouds with embedded intense convection over east-central BoB and weak to moderate convection over north and west-central Bay of Bengal, north Andaman Sea.

b) Over the Arabian Sea:-

Scattered low/medium clouds with isolate to embedded moderate to intense convection lay over southeast east-central and southeast AS, Lakshadweep area and Comorin area.

M.J.O. Index:

MJO index is currently in Phase 7 with amplitude greater than 1. It will continue in same phase with gradually decreasing amplitude during next 7 days.

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

A vortex lay centered at 10.0°S and 92.6°E at 0900 UTC of 04 Nov 2022 over South Indian Ocean. As per Dvorak technique the intensity is characterized as T 1.5/1.5 and associated maximum sustained wind speed is 25 kt.

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

MODEL GUIDANCE	BoB	AS
IMD-GFS	A feeble low over southeast BoB on 7th Nov will become as low pressure area on 8th Nov over central parts of south BoB. It will continue to move northwest wards and over southwest BoB on 10th Nov, and over southwest and adjoining west-central BoB on 11th Nov. It will become less marked on 12th Nov.	Cycir to form over southeast AS around 5th/6th and to move westwards with no significant intensification thereafter.
IMD-GEFS	A low pressure area over southwest BoB on 9th Nov will have its northwest ward movement till 10th Nov without further intensification.	No significant system
GEFS Probablistic guidance	Not available	Not available
IMD WRF	The cycir over southwest BoB to persist and gradually move northwestward without any intensification.	Cycir over southeast AS on 5th/6th will have westward movement with no significant intensification.
NCMRWF-NCUM	A cycir over southwest BoB on 6th Nov is showing its northwest ward movement. It becomes alow on 8tgh and persists as low on 9th over SW BoB near Tamil Nadu coast.	A cycir southeast AS on 6th Nov will have its westward movement with further intensification till 12th Nov.
NCMRWF-NEPS	No significant system over BoB	LPA over southeast AS on 12th November moving westwards with further intensification up to deep depression on 14th Nov.
NCMRWF-UM (Regional)	No significant system over BoB	Cycir over southeast AS on 5th moving westwards
ECMWF	The cycir over southwest and adjoining southeast BoB as on 7th Nov will have northwest ward movement towards Tamil Nadu coast with marginal intensification into a low on 10th and move closer to TN coast on 11th.	No significant system
ECMWF ensemble	50-60% probability of cyclogenesis over South East Bay of Bengal during 7th / 8th Nov, will have westward movement towards Tamil Nadu coast with further intensification.	No significant probability
NCEP-GFS	The cycir over southwest BoB will becomes LPA on 8th Nov and shows its northwestward movement with gradual intensification becoming depression on 10th over southwest BoB, reaching Tamil Nadu and adjoining Andhra Pradesh coast on 12th/0300 UTC Nov.	The cyclonic circulation over southeast AS becomes LPA on 9th Nov and shows it westward movement without further intensification.
IMD MME	The cycir over southeast BoB as on 6th Nov will have its northwest ward movement towards Tamil Nadu coast with further intensification up to depression.	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 southeast BoB on 6th, moving northwestwards during 7th to 11th November towards Tamil Nadu coast BoB	No significant zone.

Summary and conclusion:

Most of the models are indicating development of low pressure area over southwest BoB during 8th to 10th Nov. There is consensus among various models w.r.t northwestward movement of the system towards Tamil Nadu coast. However, there is variation w.r.t intensification of the system. IMD GFS, GEFS, WRF, NCUM, NEPS are not indicating any significant intensification. However, NCEP (GFS) and ECMWF-EPS are indicating slight intensification of the system up to depression around 10th Nov.

1. **For the Bay of Bengal**:

In view of all the above, it is inferred that a low pressure area is likely to form over southwest BoB around 9th November with low probability of it's intensification into a depression over southwest BoB around 11th. Hence low probability of cyclogenesis (formation of depression) is assigned to day 7.

2. **For the Arabian Sea**:

No cyclogenesis is predicted over Arabian Sea during next 7 days.

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	LOW

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

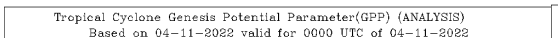
24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS	120-144 HOURS	144-168 HOURS
NIL	NIL	NIL	NIL	NIL	NIL	NIL

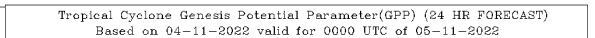
Advisory:

Nil

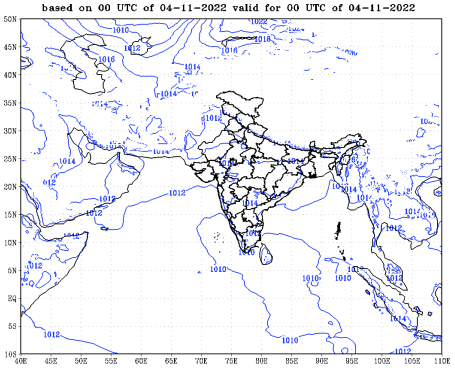
IOP: Kerala and Tamil Nadu during 24 hours

Annexure





IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (00 HR)
based on 00 UTC of 04-11-2022 valid for 00 UTC of 04-11-2022



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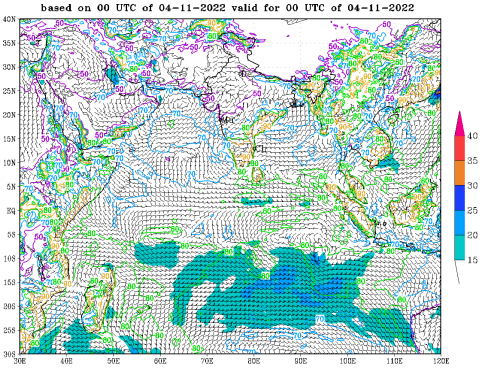
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (00 HR)
based on 00 UTC of 04-11-2022 valid for 00 UTC of 04-11-2022



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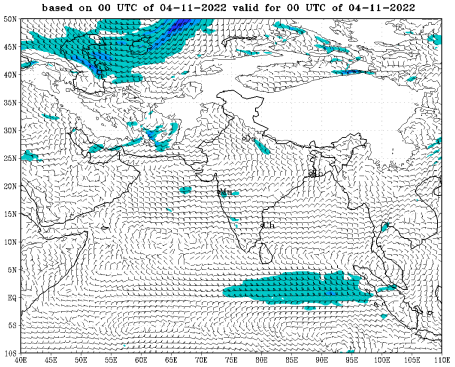

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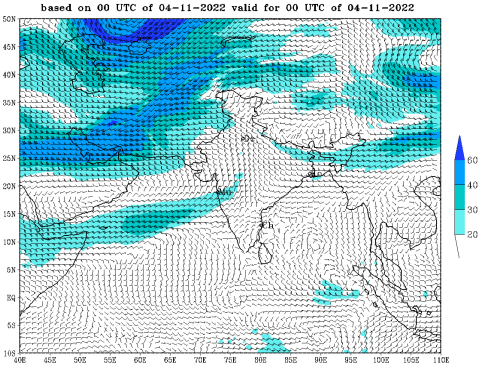

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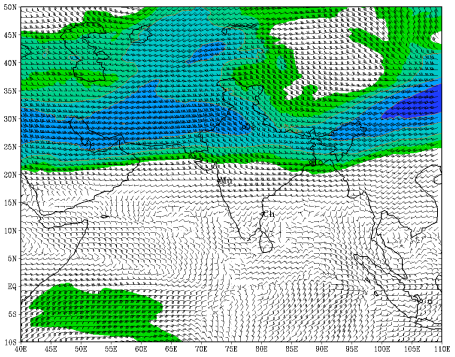

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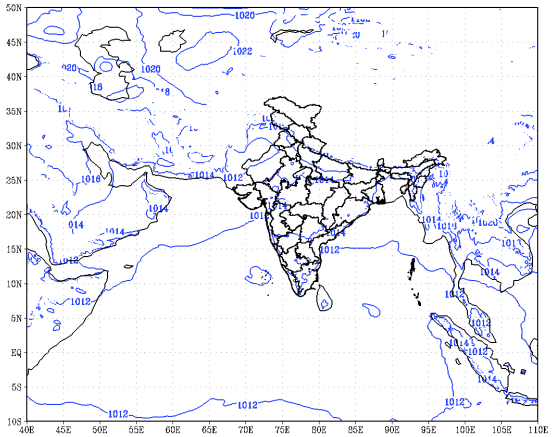

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IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (24 HR)

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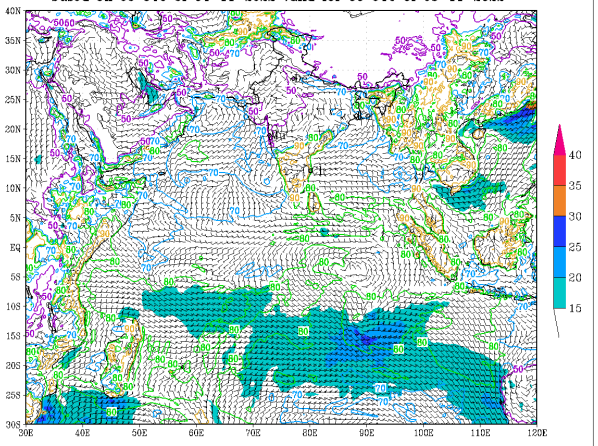

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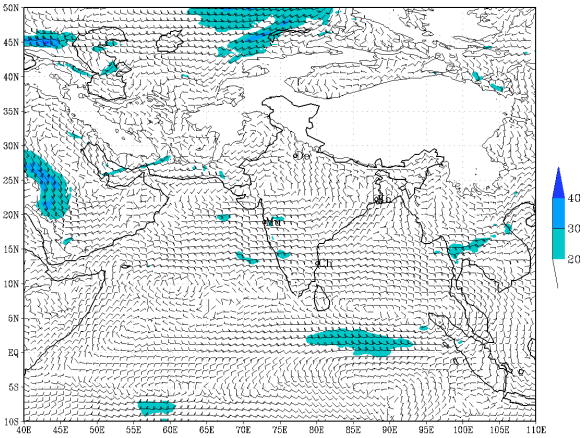

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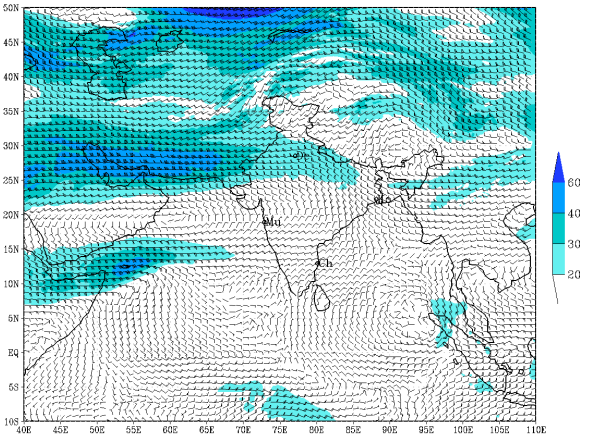

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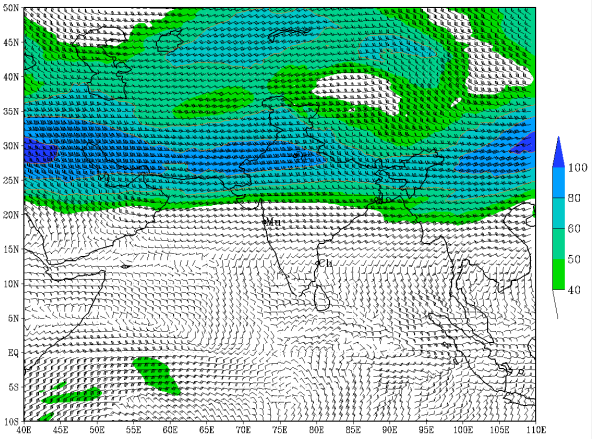

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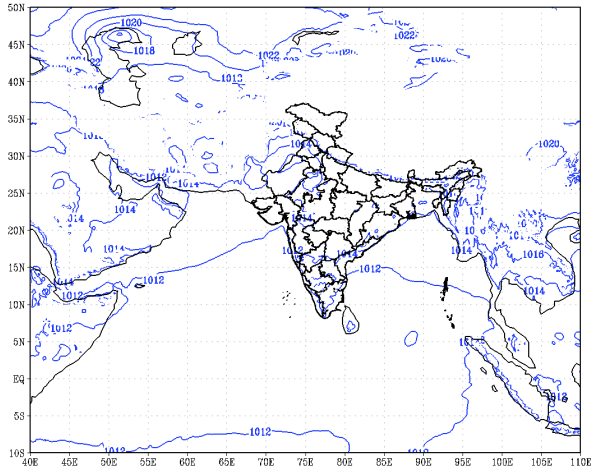

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IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (48 HR)

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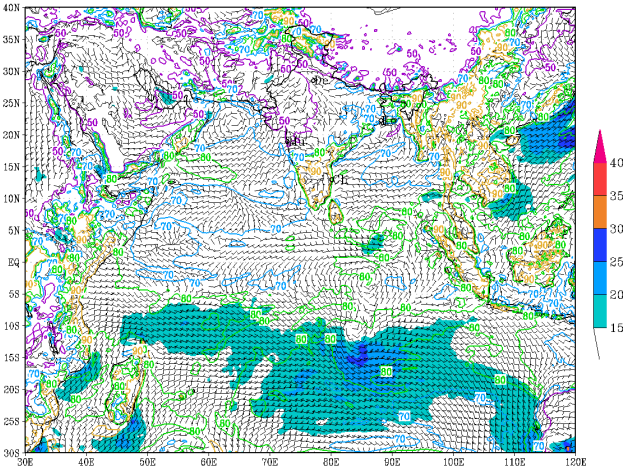

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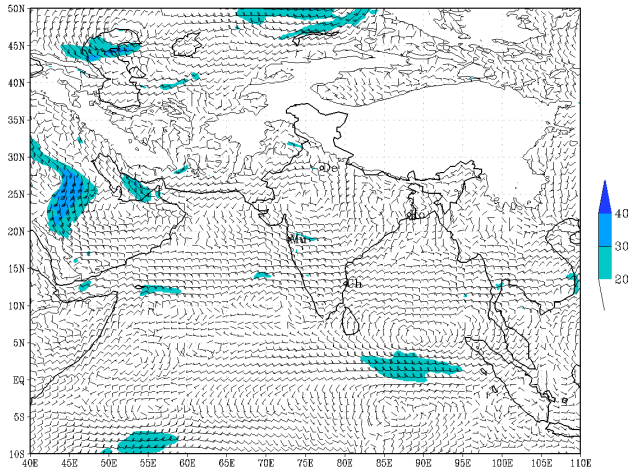

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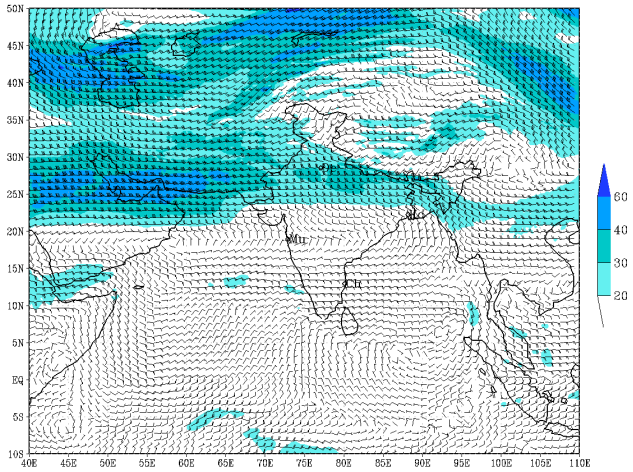

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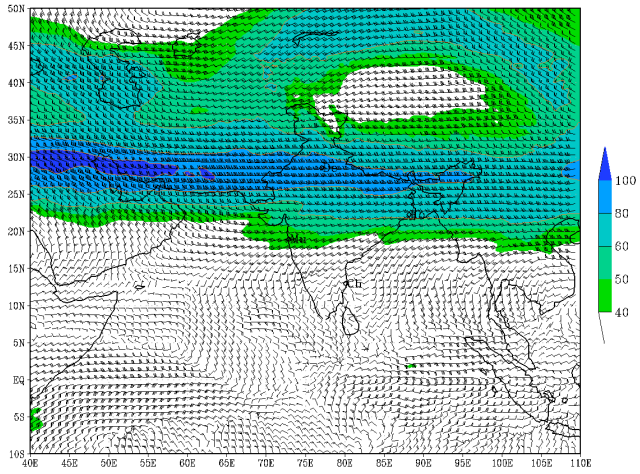

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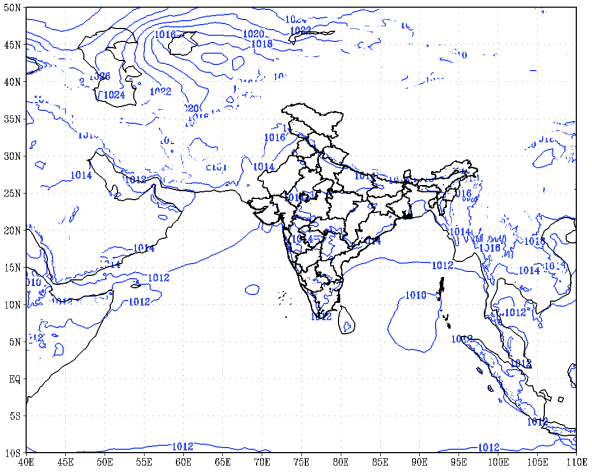

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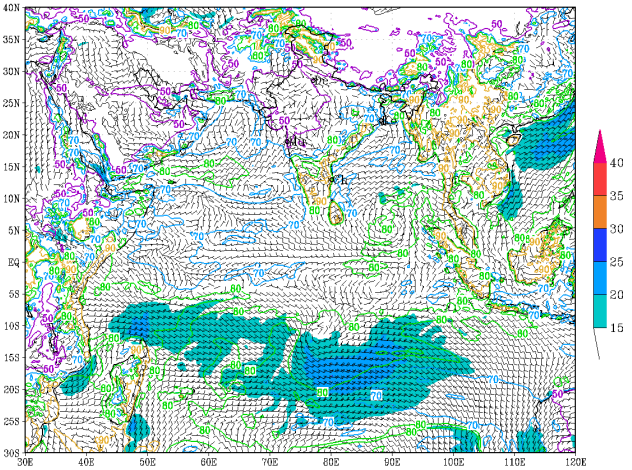
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (72 HR)

based on 00 UTC of 04-11-2022 valid for 00 UTC of 07-11-2022



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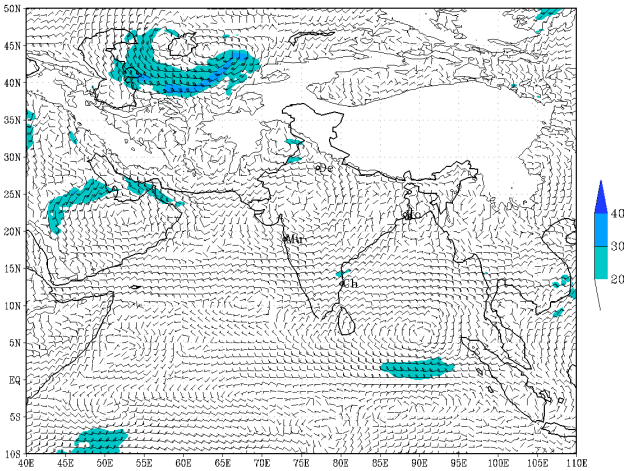

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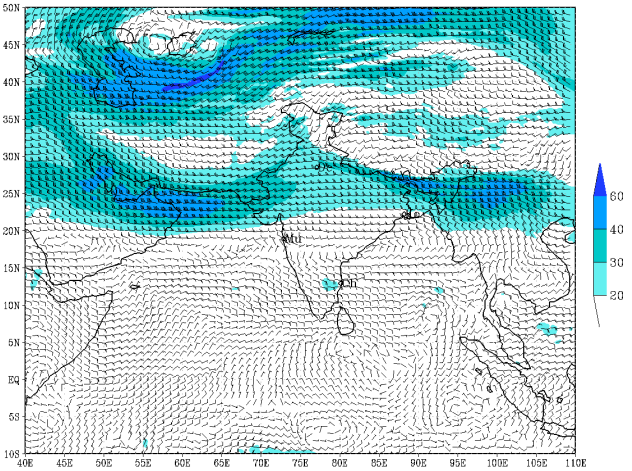

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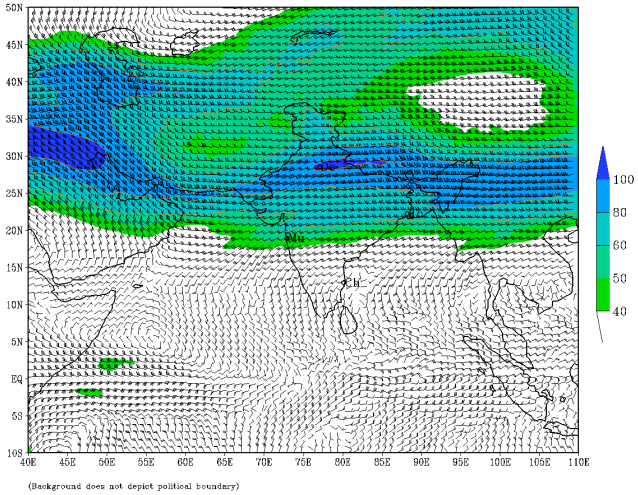

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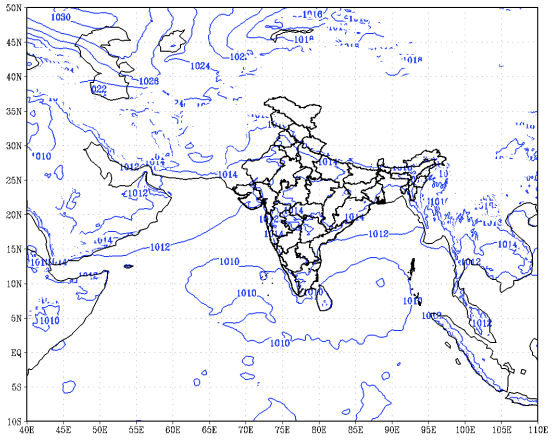

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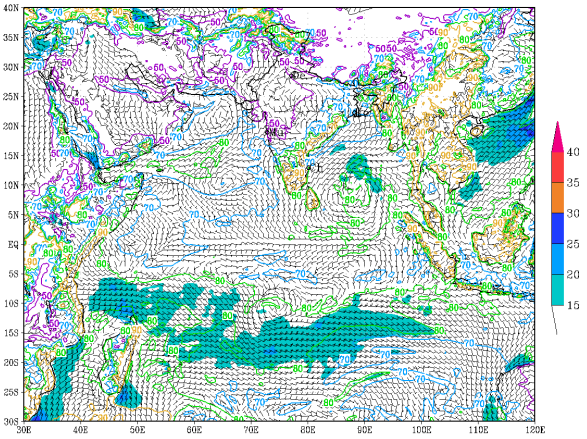
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (96 HR)
based on 00 UTC of 04-11-2022 valid for 00 UTC of 08-11-2022



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IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (96 HR)
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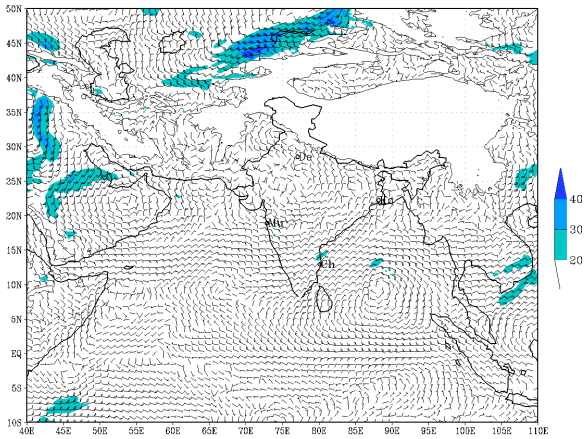

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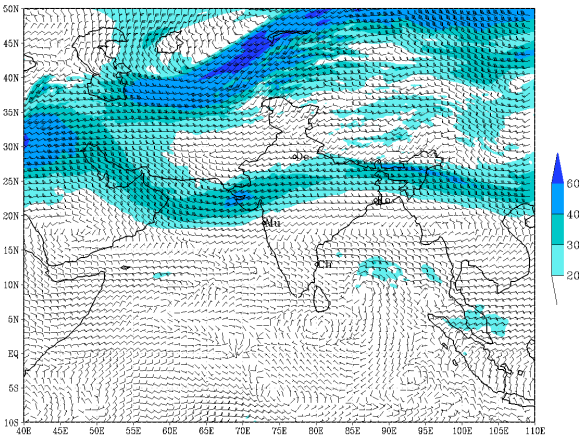

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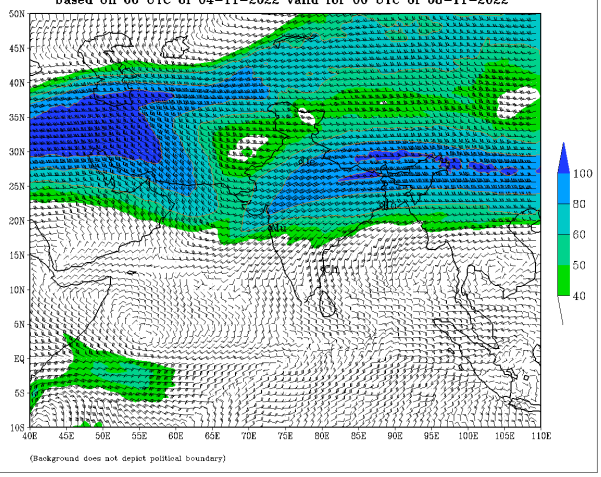

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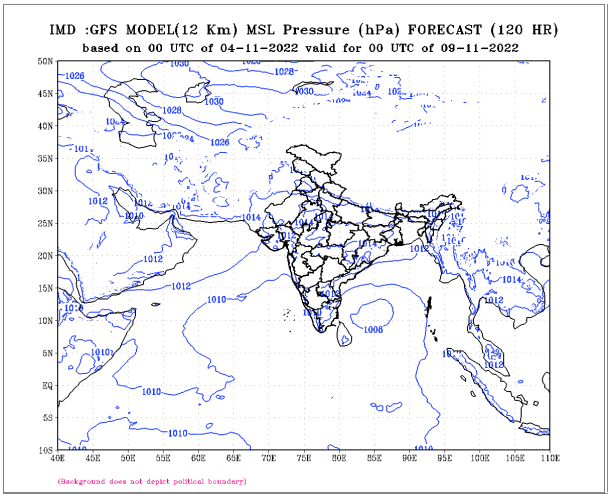
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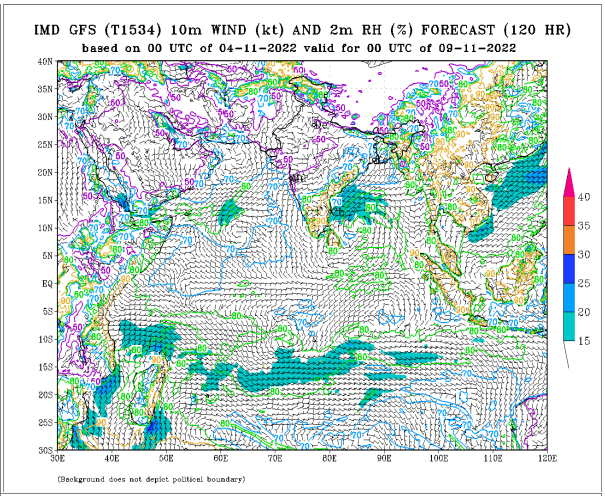
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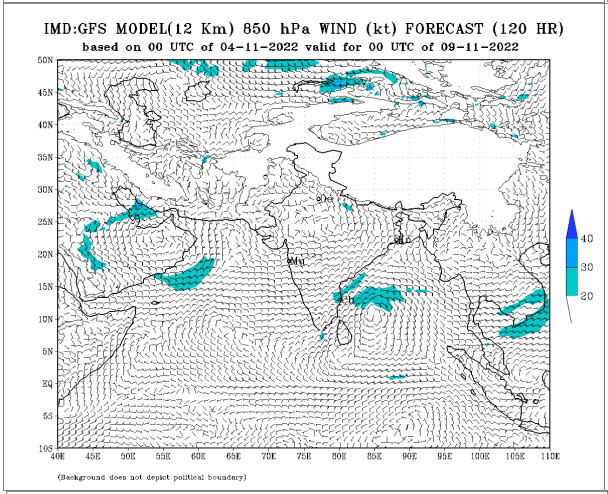
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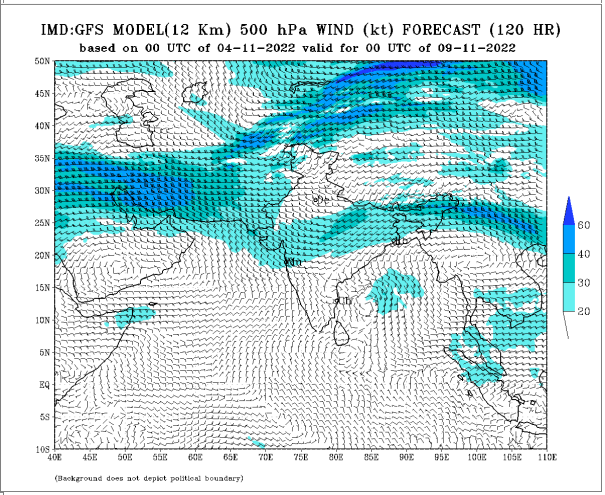
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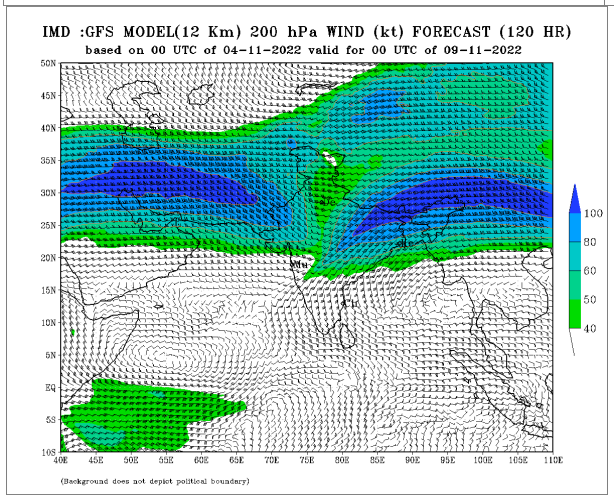
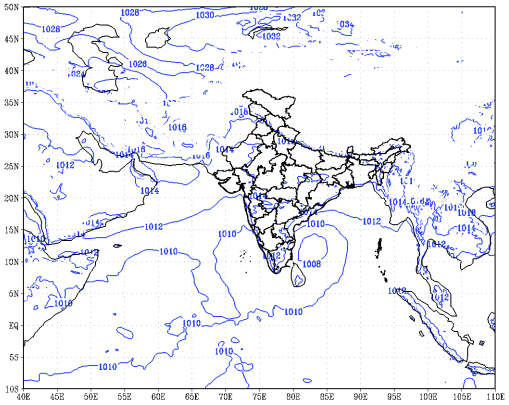
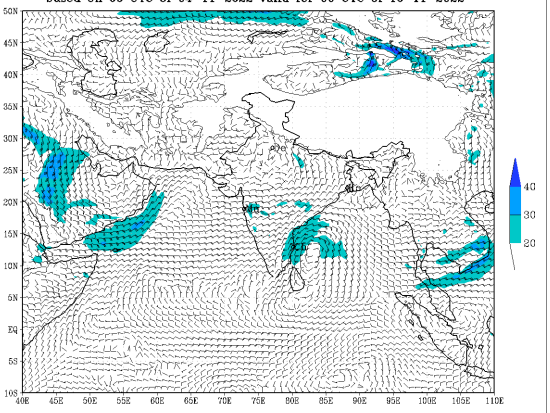

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (120 HR)
based on 00 UTC of 04-11-2022 valid for 00 UTC of 09-11-2022
(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (144 HR)
based on 00 UTC of 04-11-2022 valid for 00 UTC of 10-11-2022



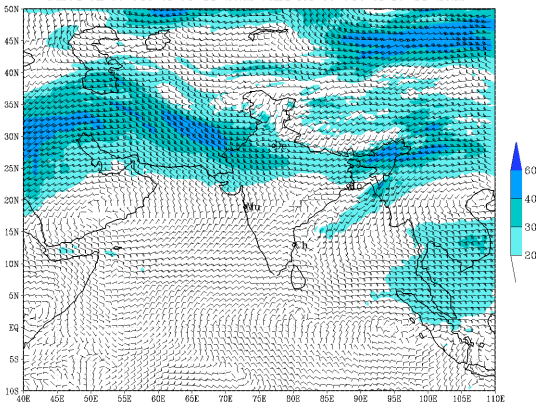
(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (144 HR)
based on 00 UTC of 04-11-2022 valid for 00 UTC of 10-11-2022



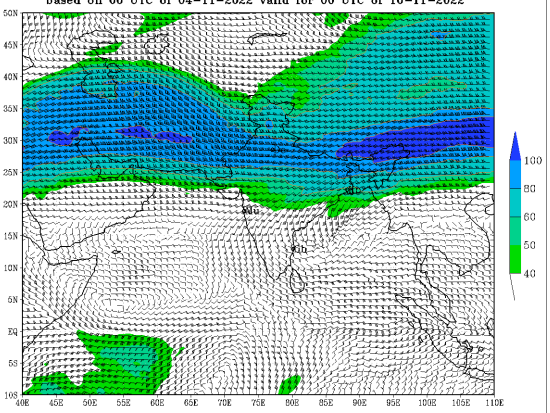
(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (144 HR)
based on 00 UTC of 04-11-2022 valid for 00 UTC of 10-11-2022

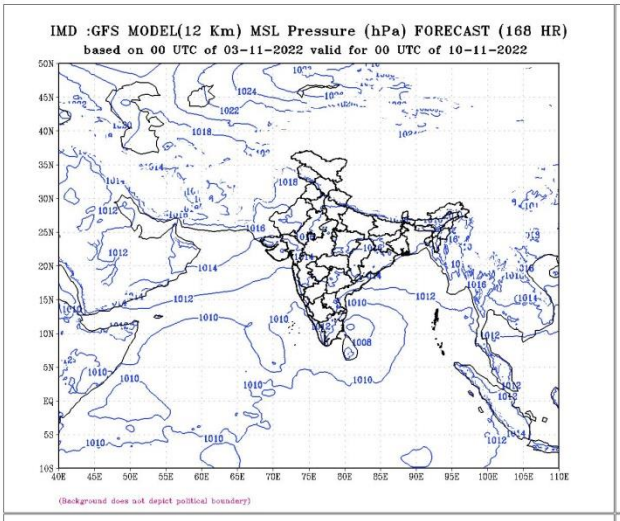


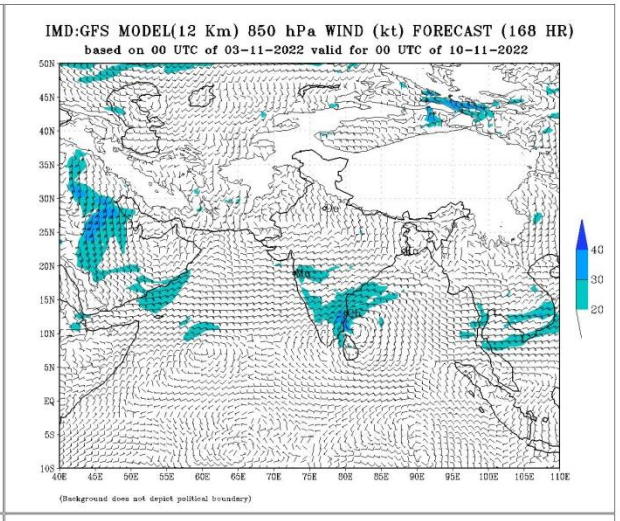
(Background does not depict political boundary)

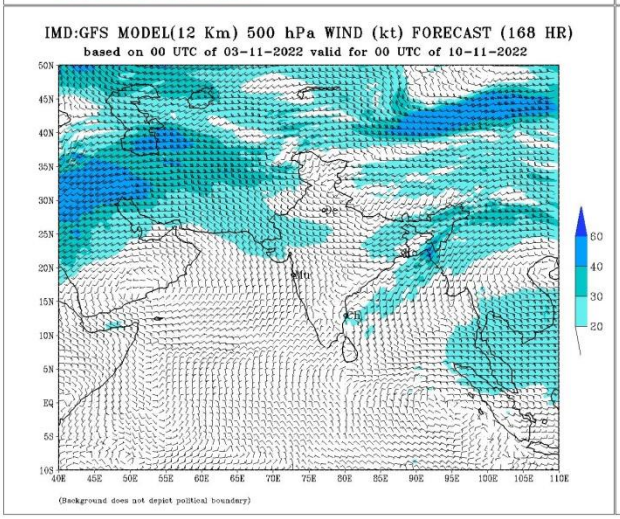
IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (144 HR)
based on 00 UTC of 04-11-2022 valid for 00 UTC of 10-11-2022

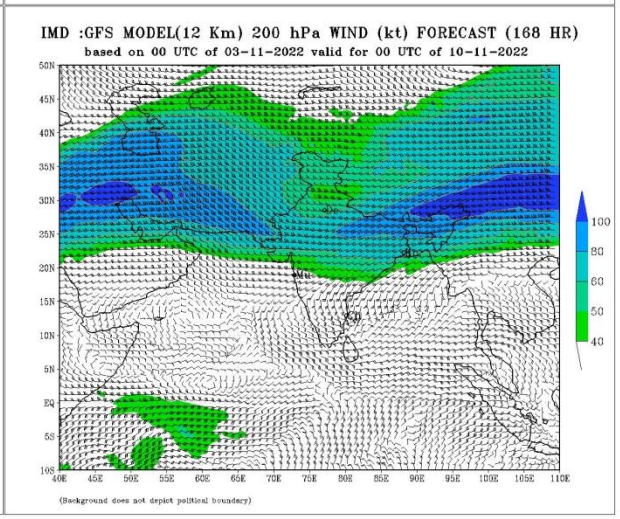


(Background does not depict political boundary)


IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (168 HR)
based on 00 UTC of 03-11-2022 valid for 00 UTC of 10-11-2022
(Background does not depict political boundary)


IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 03-11-2022 valid for 00 UTC of 10-11-2022
40
30
20
(Background does not depict political boundary)


IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 03-11-2022 valid for 00 UTC of 10-11-2022
60
40
30
20
(Background does not depict political boundary)


IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 03-11-2022 valid for 00 UTC of 10-11-2022
100
80
60
50
40
(Background does not depict political boundary)