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

Tropical Cyclone Forecast Programme
Report Dated 06th December, 2022

Time of Issue: 1200 UTC

Synoptic features (based on 0600 UTC analysis):

A Well marked low pressure area lies over Southeast Bay of Bengal at 0830 hours IST of 06th December 2022. It is likely to move west-northwestwards and concentrate into a Depression over Southeast Bay of Bengal by today evening. Thereafter, it is likely to continue to move west-northwestwards, intensify further gradually into a Cyclonic Storm around 7th December evening and reach Southwest Bay of Bengal off north Tamil Nadu-Puducherry & adjoining south Andhra Pradesh coasts by 08th December morning. It will continue to move west-northwestwards towards north Tamil Nadu-Puducherry & adjoining south Andhra Pradesh coasts during subsequent 48 hours.

Dynamical and thermo-dynamical features

Parameter	Bay of Bengal (BoB)	Arabian Sea (AS)
Sea Surface Temperature (SST) ºC	Around 28-29^{0}C over Andaman sea and increase to 29^{0}C over southeast and adjoining parts of central BoB, southwest BoB and off Tamil Nadu and Sri Lanka coast.	About 28-29°C over the southeast and adjoining southwest AS off Karntaka and Kerala, north AS, 26-28°C over eastcentral and adjoining north AS, along and off Kerala and Karnataka coasts, 25-26°C over south Gujarat coasts, southwest AS, less than 24°C over southwest AS off Oman and Yemen coasts and adjoining sea areas.
Tropical Cyclone Heat Potential (TCHP) kJ/cm^2	90-100 KJ/cm2 over south Andaman sea and adjoining southeast BoB and less than 50 KJ/cm2 over westcentral and southwest BoB along east coast of India.	70-90 over southeast and adjoining eastcentral and adjoining southwest AS, and less than 40 over remaining AS and also off west coast of India, Comorin area.
Cyclonic Relative vorticity (X10^{-6}s^{-1})	100 over southeast BoB.	30-40 over Maldives and Comorin area. 10-20 over northeast AS, southeast AS & adjoining EIO.
Low Level convergence (X10^{-5} s^{-1})	30 over southeast BoB.	5-10 over south AS, Comorin area and Maldives.
Upper Level divergence (X10^{-5} s^{-1})	30 over southeast BoB.	5-10 over southwest AS.

Vertical Wind Shear (VWS knots)	5-10 over southeast BoB and 10-20 knots over southeast BoB, along the expected track.	15 over south AS, 30-40 over central and north AS.
Wind Shear Tendency (knots)	Decreasing over south Andaman sea & adjoining southeast & westcentral BoB.	Decreasing over entire AS.
Upper tropospheric Ridge	Along 14.0°N over the BoB.	Along 8.0°N over the AS.
Trough in westerlies	No significant trough	

Satellite observations based on INSAT imagery (0300 UTC):

a) Over the BoB & Andaman Sea:-
Scattered to broken low and medium clouds with embedded intense to very intense convection lay over central & south Bay of Bengal and andaman sea. Scattered low and medium clouds with embedded moderate to intense convection lay over north Bay of Bengal.

b) Over the Arabian Sea:-
Scattered low and medium clouds with embedded intense to very intense convection lay over south Arabian sea and Comorin area.

M.J.O. Index:
The Madden Julian Oscillation (MJO) Index is currently in Phase 2 with amplitude less than 1. It will continue in same phase for next 2 days. Thereafter, it will move to phase 3 remain there till and will remain there for next 5 days.

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

NIL

Model guidance based on 0000 UTC for the next 7 days

MODEL GUIDANCE	Bay of Bengal (BoB)	Arabian Sea (AS)
IMD-GFS	A cyclonic storm (CS) over southeast Bay of Bengal as on today 6th will intensify into severe cyclonic storm (SCS) over southwest BoB on 7th, will move in west-northwest ward and will lay as VSCS over southwest BoB on 8th, it then move west-northwestward and lay as SCS over southwest BoB on 9th, and close to north Tamil Nadu – south Andhra Pradesh coast on 10th Dec morning as CS. It will make landfall along north Tamil Nadu – south Andhra Pradesh coast between 10th to 11th Dec with reduced intensity.	No significant system
IMD-GEFS	A cyclonic storm (CS) over southeast Bay of Bengal as on today 6th will intensify into severe cyclonic storm (SCS) over southwest BoB on 7th, will move in west-northwest ward and will lay as VSCS over southwest BoB on 8th, it then move west-northwestward and lay as SCS over southwest BoB on 9th, and close to north	No significant system

	Tamil Nadu – south Andhra Pradesh coast on 10th Dec morning as CS. It will make landfall along north Tamil Nadu – south Andhra Pradesh coast between 10th Dec as CS.	
GEFS Probabilistic guidance	Based on the models guidance, 70-90 % probability is indicating that system to make landfall along north Tamil Nadu – south Andhra Pradesh coast.	Not available
IMD WRF	A cyclonic storm (CS) over southeast Bay of Bengal as on today 6th will intensify into severe cyclonic storm (SCS) over southwest BoB on 7th, will move in west-northwest ward and will lay as VSCS over southwest BoB on 8th, will move west-northwest ward and lay as VSCS over southwest BoB on 9th.	No significant system within forecast duration.
NCMRWF-NCUM	The LPA over southeast BoB on 6th become depression by 7th morning, DD on 7th evening, CS on 8th morning over southwest BoB, will move in west-northwestward direction as CS and close to north Tamil Nadu – south Andhra Pradesh coast on 9th morning, it will make its landfall on 9th evening as deep depression along north Tamil Nadu – south Andhra Pradesh coast.	No significant system
NCMRWF-NEPS	The depression over southeast BoB on 6th morning, deep depression over southwest BoB on 6th evening, CS/SCS over southwest BoB close to northeast of Sri Lanka coast on 7th, close to north Tamil Nadu – south Andhra Pradesh coast as VSCS on 9th, will make landfall with reduced intensity on the same day and lay as WML over land.	No significant system
NCMRWF-UM (Regional)	The LPA over southeast BoB on 6th will become deep depression over southwest BoB on 7th, CS over southwest BoB close to Tamil Nadu - Puducherry coast on 8th.	No significant system
ECMWF	The WML over southeast BoB on 6th morning will become depression over southeast BoB on 6th evening, CS on 7th over southwest BoB, CS over southwest BoB close to northeast Sri Lanka coast on 8th and it will have its maximum intensity on this day, it will close to north Tamil Nadu – south Andhra Pradesh coast on 9th 0600 UTC and cross the coast at around 0000 UTC of 10th Dec.	No significant system
ECMWF ensemble	Depression over Southeast BoB as on 6th Dec, will track west-northwest wards with intensification up to Cyclonic Storm with 70-80% probability on 7th Dec and will reach north Tamil Nadu – south Andhra Pradesh coast.	No significant system

NCEP-GFS	Depression over southeast BoB on 6th, CS over southwest BoB on 7th, lay as deep depression over southwest BoB on 8th Dec. Continuing to move west-northwestwards and weakening into depression over southwest BoB close to north Tamil Nadu – south Andhra Pradesh coast on 9th, it will touch the coast as LPA on 10th morning along north Tamil Nadu – south Andhra Pradesh coast and cross the coast on the afternoon of the same day.	No significant system
IMD MME	The depression over southeast BoB on 6th, CS on 7th Dec over southwest BoB, CS over southwest BoB on 8th, it will then move northwest wards and will lay over southwest BoB as CS on 9th, it will then move northwest wards and will weaken into DD over southwest Bay on 10th morning, will cross Tamil Nadu – south Andhra Pradesh coasts as LPA on 11th morning.	No significant system
IMD HWRF	Available during cyclonic disturbance period only	Available during cyclonic disturbance period only
IMD-Genesis Potential Parameter	A significant potential zone over south southeast BoB as on 6th Dec having northwestward movement.	No potential zone over Arabian Sea during next 7 days

Summary and conclusion:

- Most of the NWP models are indicating depression over southeast BoB on 6th Dec will have west-northwest ward movement. All the models are unanimously indicating its intensification into cyclonic storm. ECMWF, NCMRWF-NEPS, NCEP-GFS are indicating the CS on 7th, whereas, NCUM, NCMRWF-regional are indicating intensification into a cyclonic storm during 8th; IMD-GFS and IMD-GEFS are indicating intensification up to very severe cyclonic storm stage; Most of the models are indicating landfall along north Tamil Nadu – south Andhra Pradesh coasts during 9th evening to 10th, whereas, MME and IMD-GFS are indicating its landfall around 10th evening.

In view of all the above, it is inferred that

1. For the Bay of Bengal:

A Well marked low pressure area lies over Southeast Bay of Bengal at 0830 hours IST of 06th December 2022. It is likely to move west-northwestwards and concentrate into a Depression over Southeast Bay of Bengal by today evening. Thereafter, it is likely to continue to move west-northwestwards, intensify further gradually into a Cyclonic Storm around 7th December evening and reach Southwest Bay of Bengal off north Tamil Nadu-Puducherry & adjoining south Andhra Pradesh coasts by 08th December morning. It will continue to move west-northwestwards towards north Tamil Nadu-Puducherry & adjoining south Andhra Pradesh coasts during subsequent 48 hours.

2. For the Arabian Sea:

No significant system 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
HIGH	HIGH	HIGH	HIGH	LOW	--	--

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

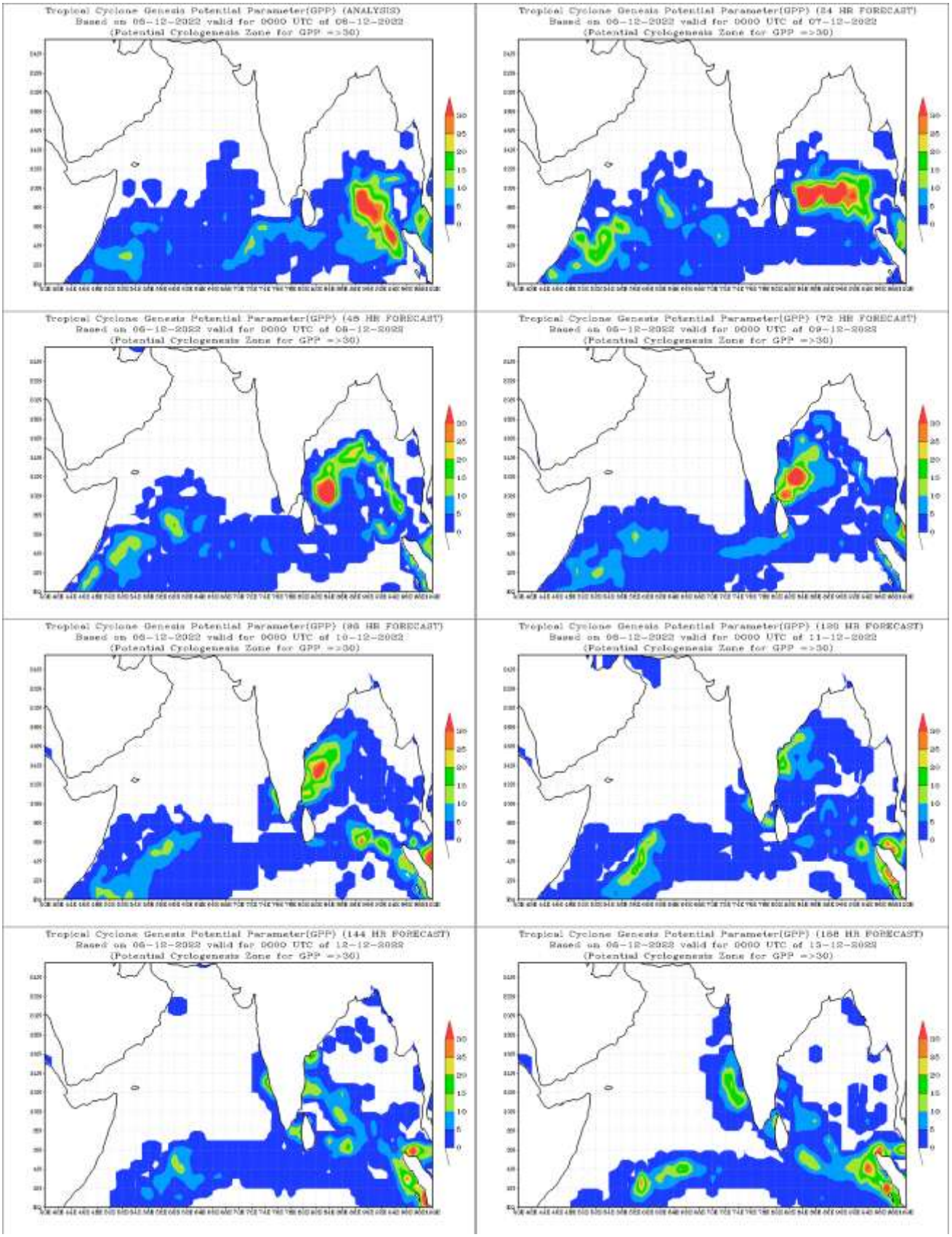
24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS	120-144 HOURS	144-168 HOURS
NIL	NIL	NIL	NIL	NIL	NIL	NIL

Advisory:

The movement and intensification of low pressure area/depression (remnant from South China Sea) likely to emerge into south Andaman Sea around 4th December need to be monitored through various observations.

IOP: NIL

Annexure


Tropical Cyclone Genesis Potential Parameter(GPP) (ANALYSIS)
Based on 06-12-2022 valid for 0000 UTC of 06-12-2022
(Potential Cyclogenesis Zone for GPP =>30)
Tropical Cyclone Genesis Potential Parameter(GPP) (24 HR FORECAST)
Based on 06-12-2022 valid for 0000 UTC of 07-12-2022
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Tropical Cyclone Genesis Potential Parameter(GPP) (48 HR FORECAST)
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Tropical Cyclone Genesis Potential Parameter(GPP) (120 HR FORECAST)
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Tropical Cyclone Genesis Potential Parameter(GPP) (144 HR FORECAST)
Based on 06-12-2022 valid for 0000 UTC of 12-12-2022
(Potential Cyclogenesis Zone for GPP =>30)
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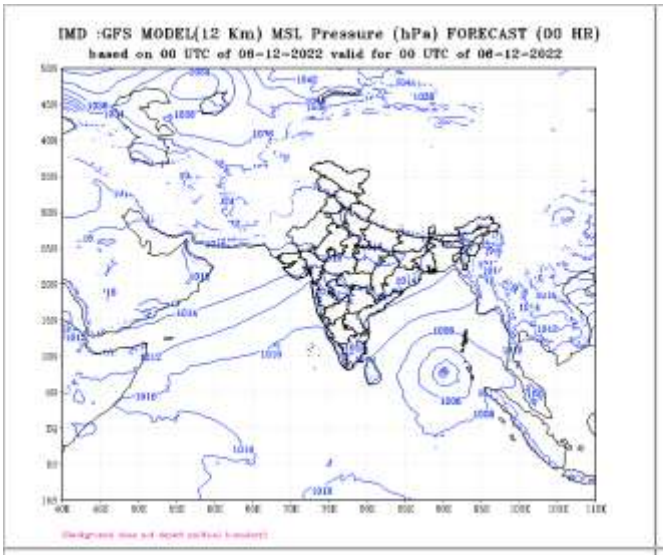
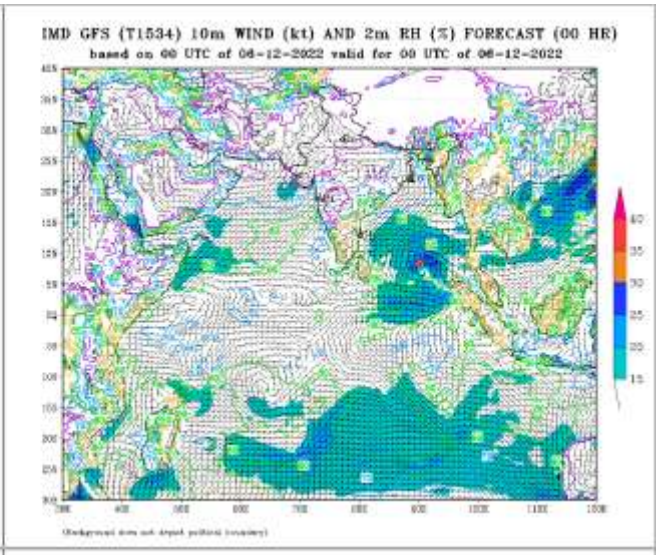
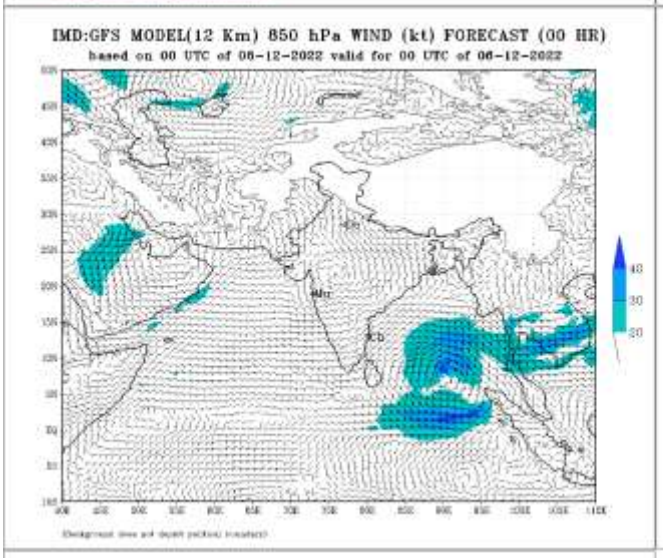

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (00 HR)
based on 00 UTC of 06-12-2022 valid for 00 UTC of 06-12-2022


IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (00 HR)
based on 00 UTC of 06-12-2022 valid for 00 UTC of 06-12-2022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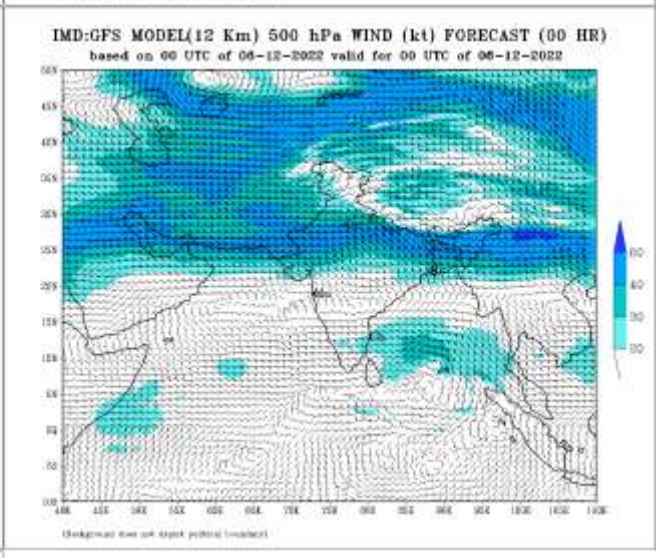
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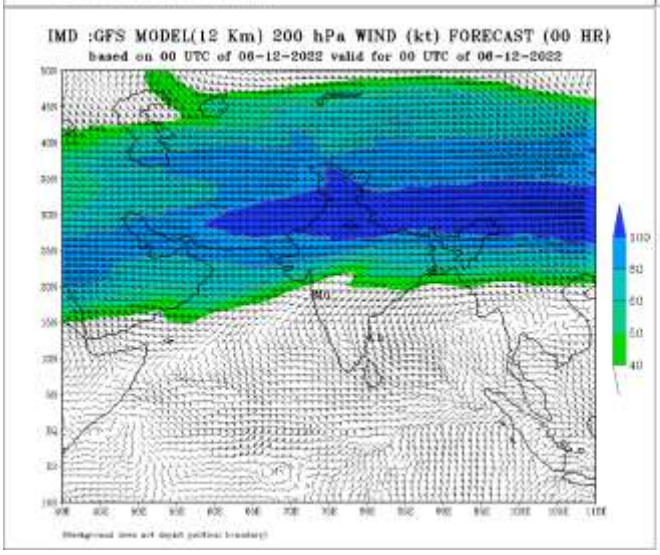
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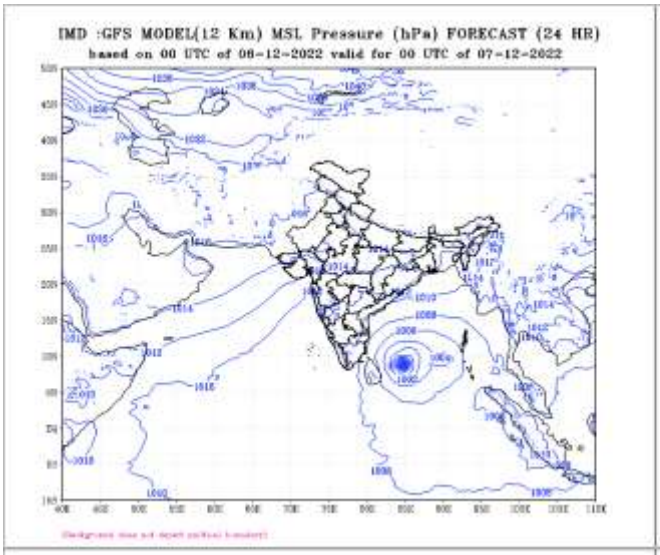
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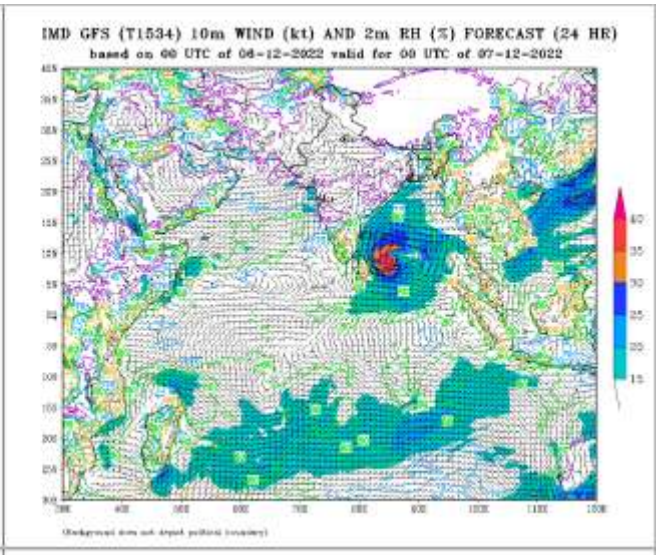
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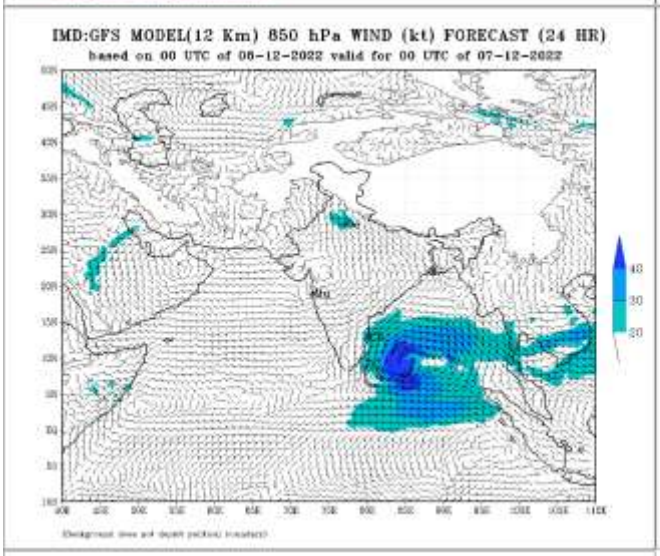
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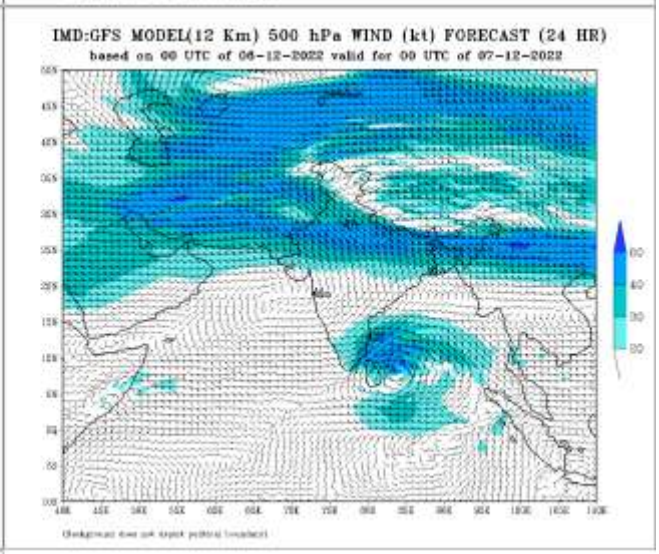
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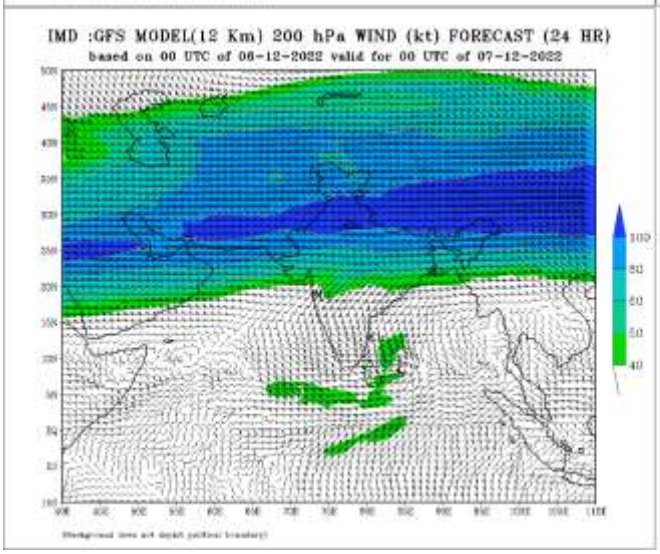
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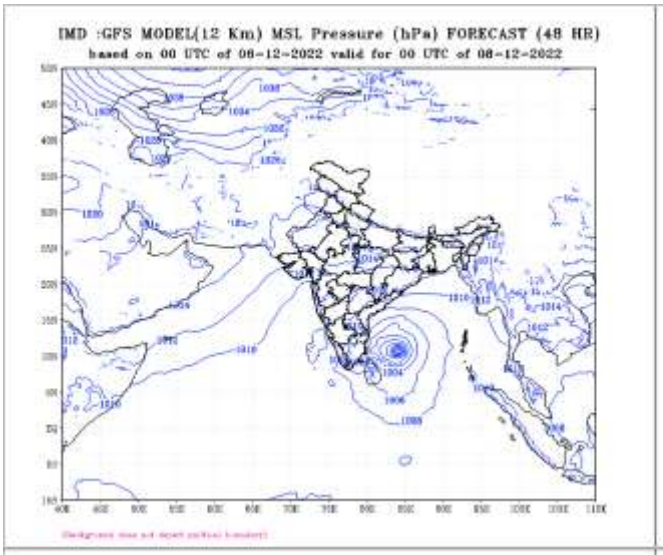
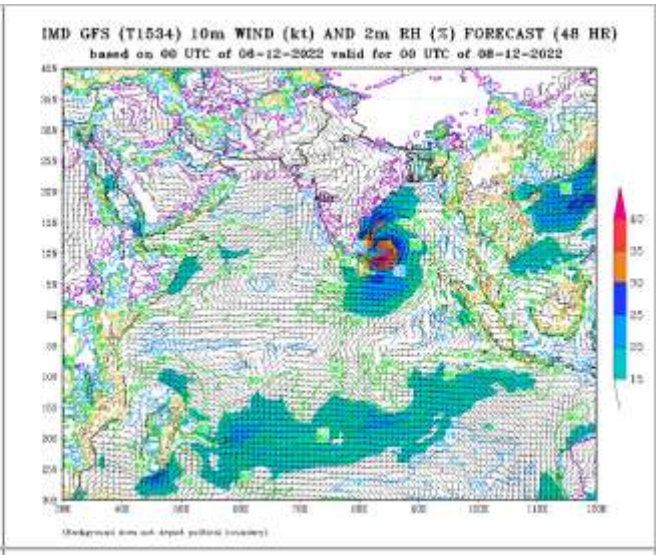

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (48 HR)
based on 00 UTC of 06-12-2022 valid for 00 UTC of 08-12-2022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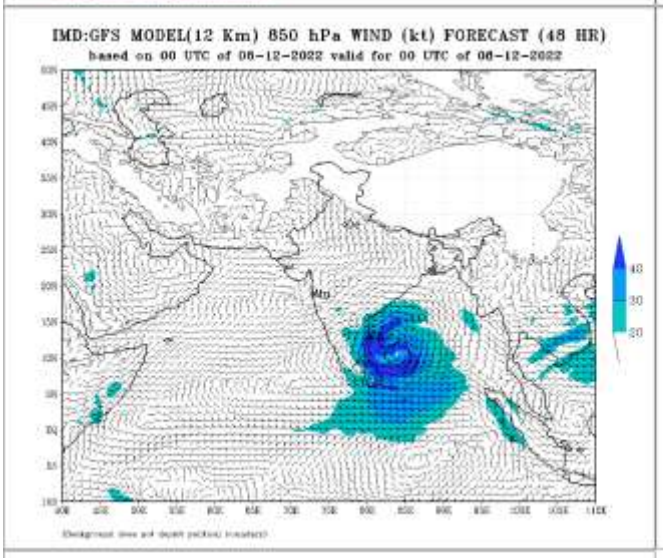
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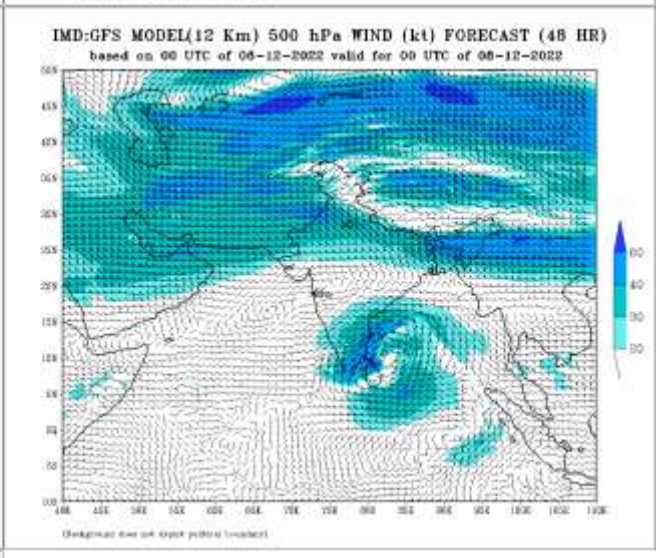
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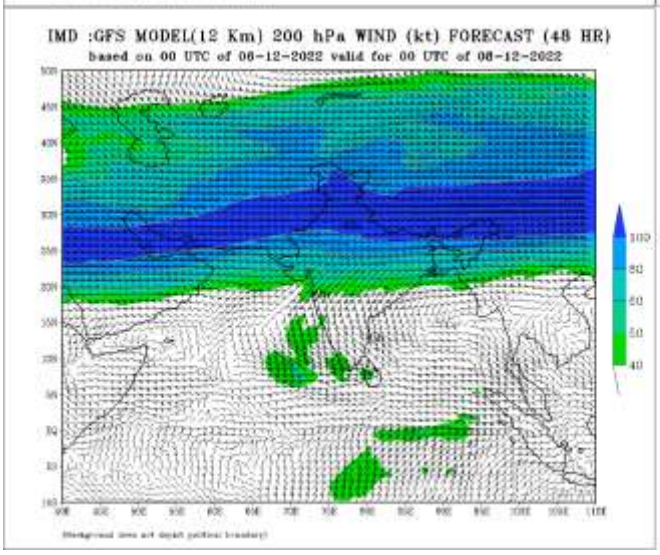
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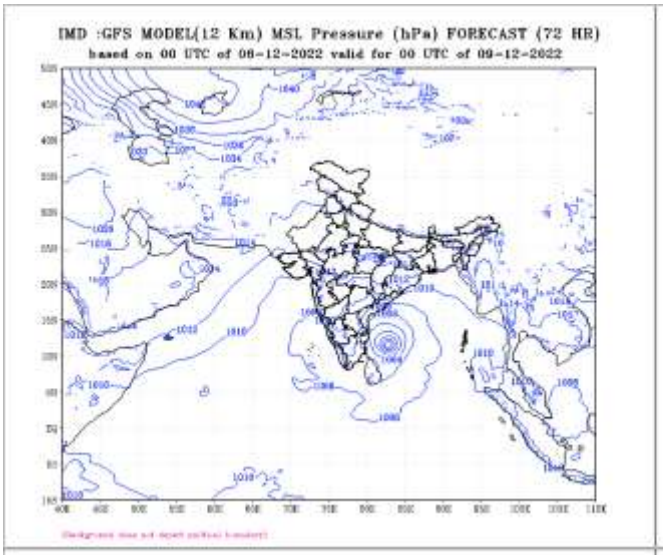
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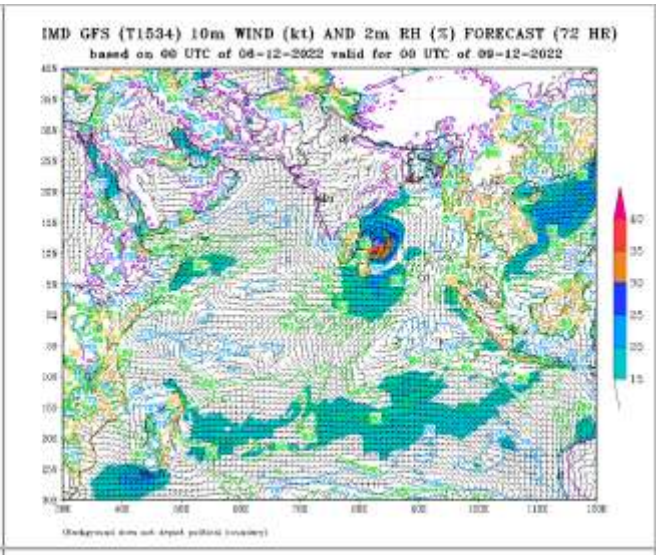
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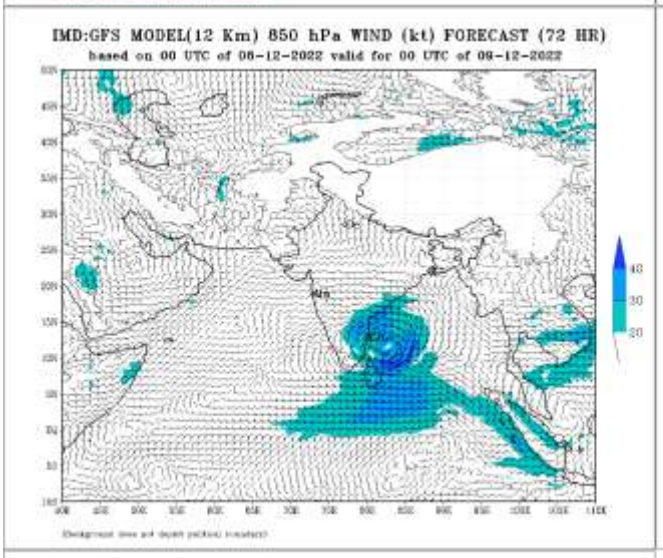
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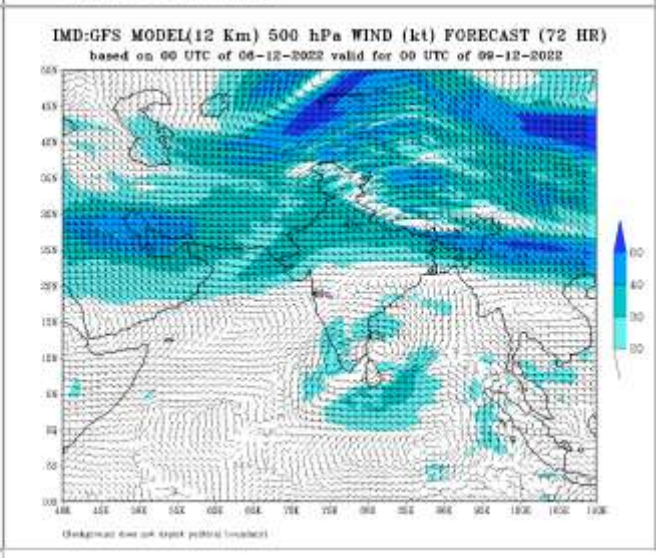
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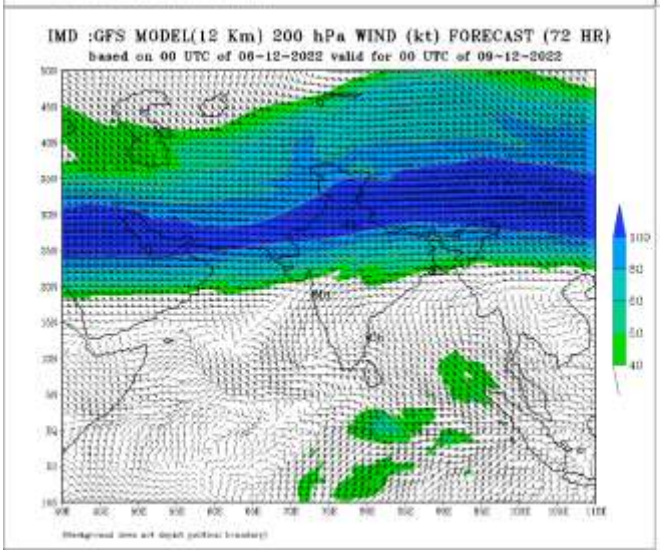
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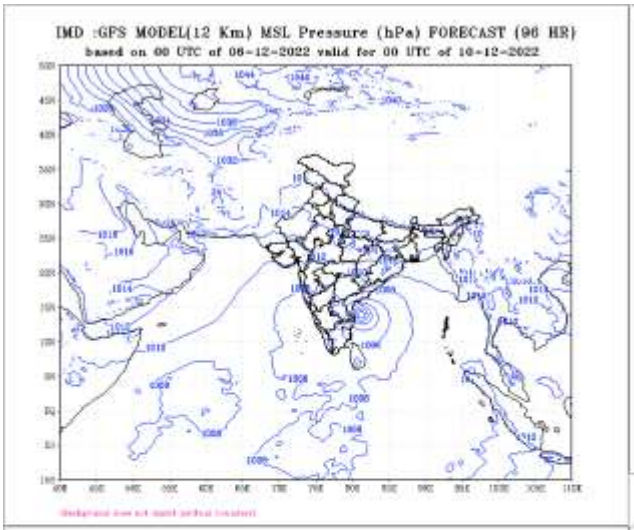
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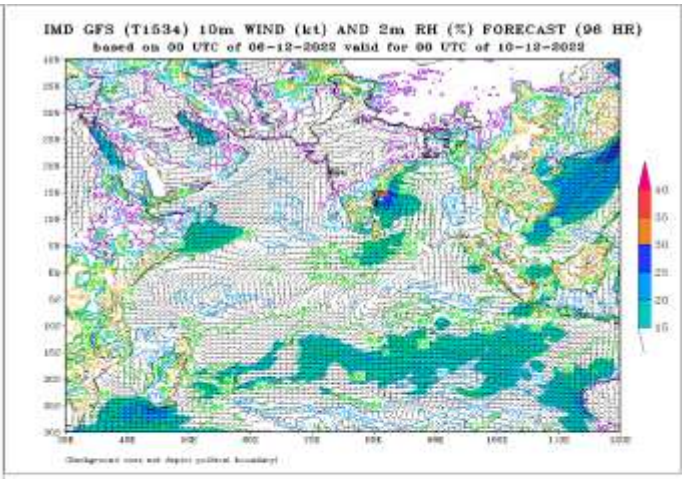
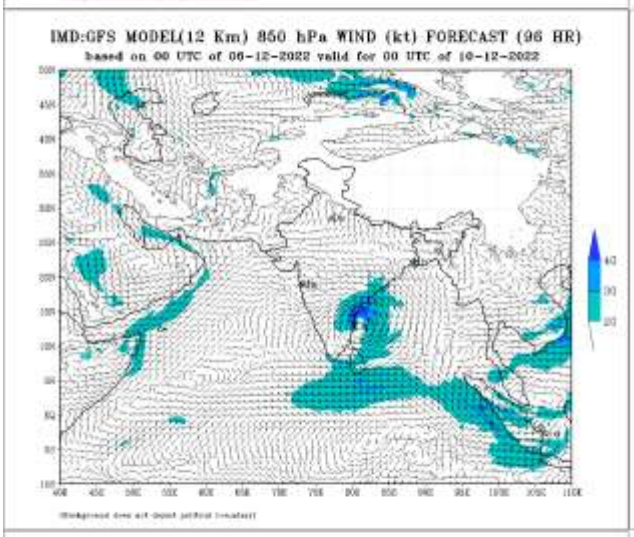

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (96 HR)
based on 00 UTC of 06-12-2022 valid for 00 UTC of 10-12-2022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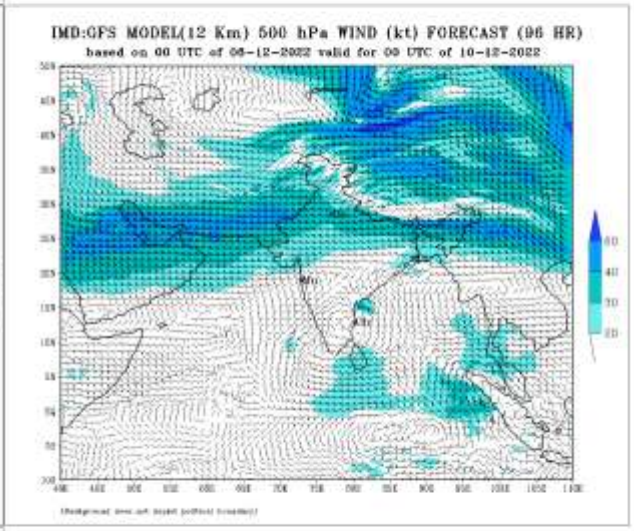
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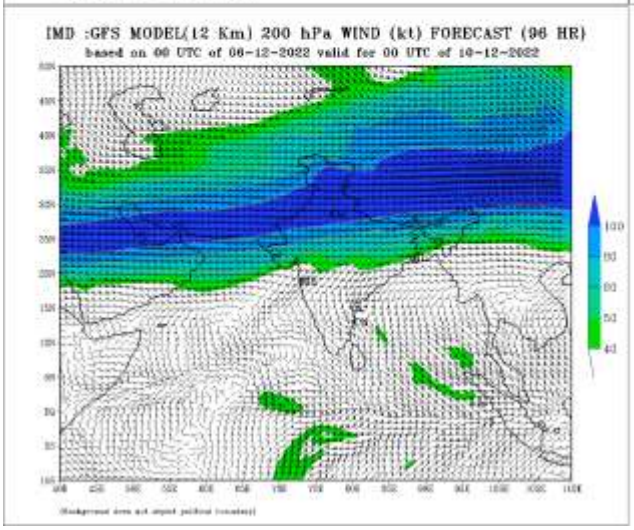
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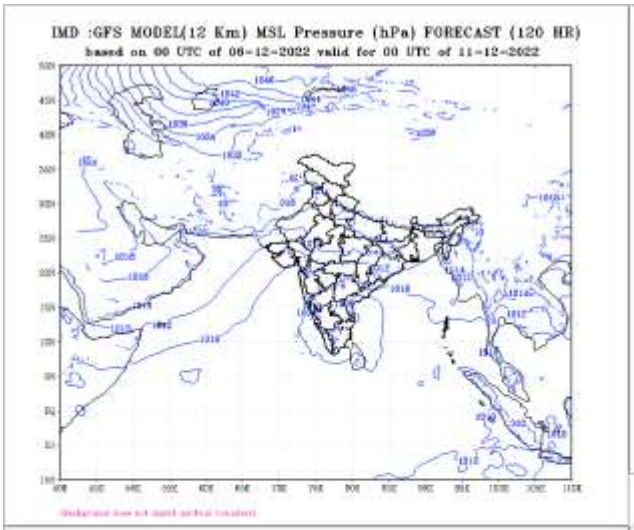
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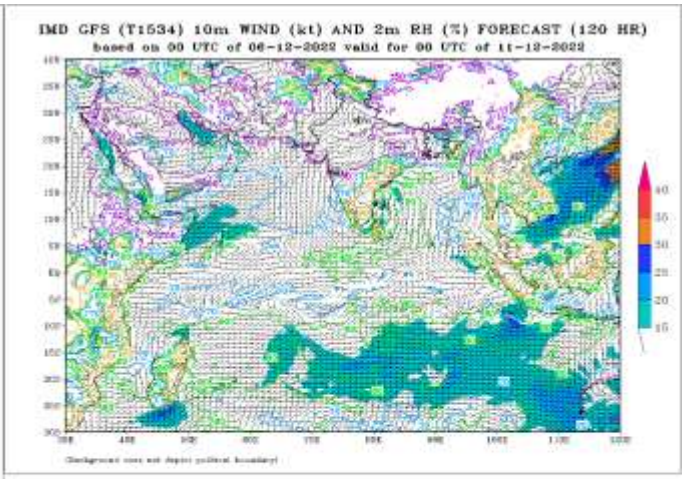
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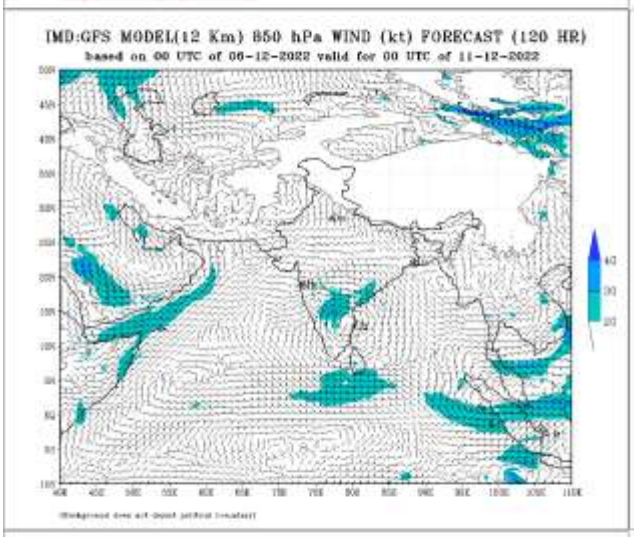
based on 00 UTC of 06-12-2022 valid for 00 UTC of 11-12-2022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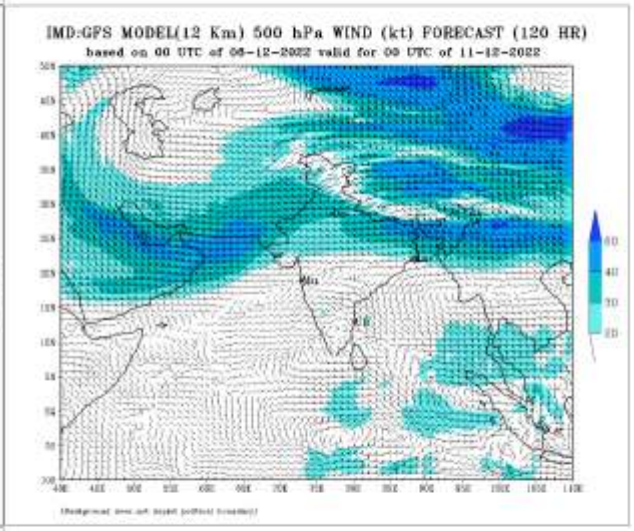
based on 00 UTC of 06-12-2022 valid for 00 UTC of 11-12-2022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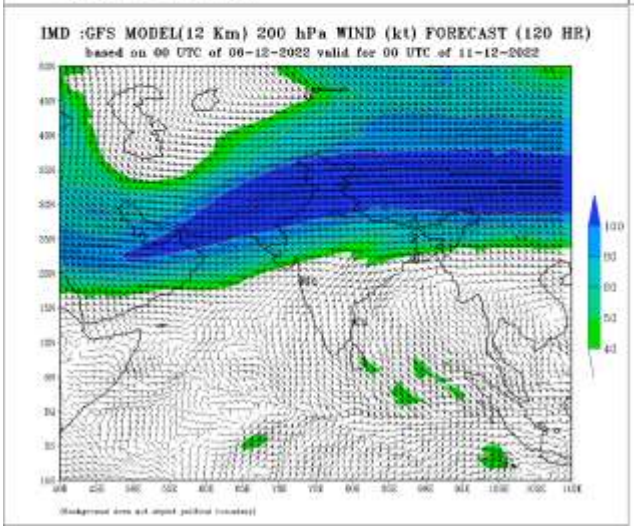
based on 00 UTC of 06-12-2022 valid for 00 UTC of 11-12-2022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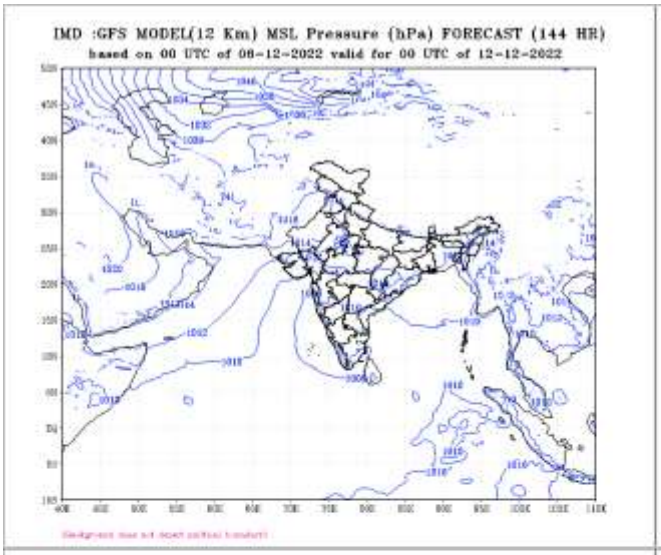
based on 00 UTC of 06-12-2022 valid for 00 UTC of 11-12-2022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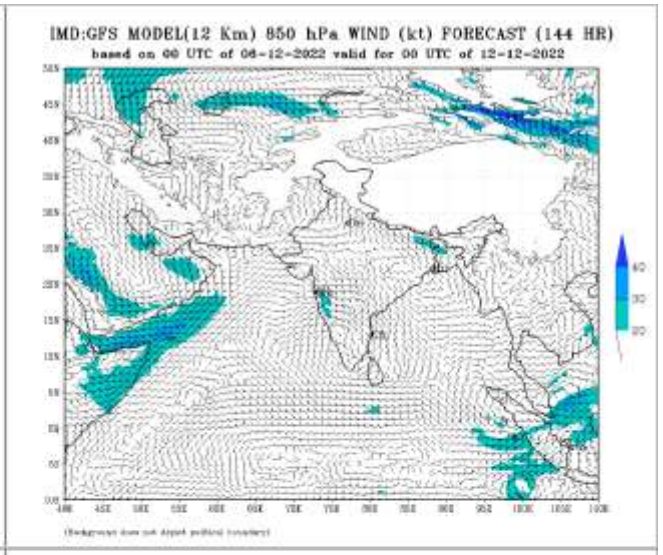
based on 00 UTC of 06-12-2022 valid for 00 UTC of 12-12-2022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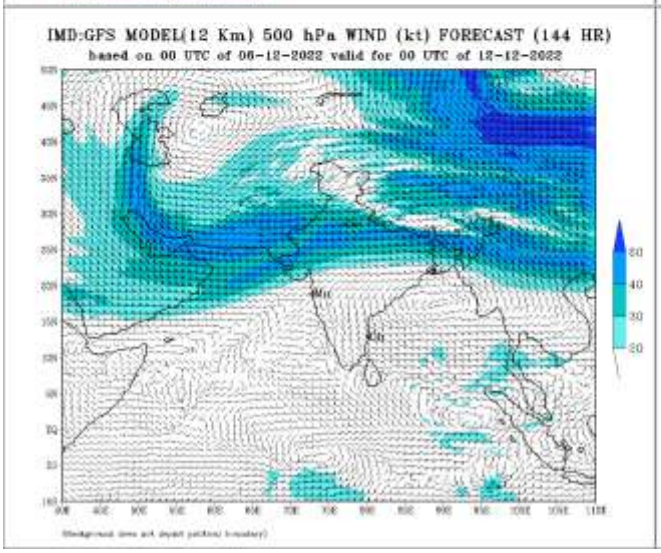
based on 00 UTC of 06-12-2022 valid for 00 UTC of 12-12-2022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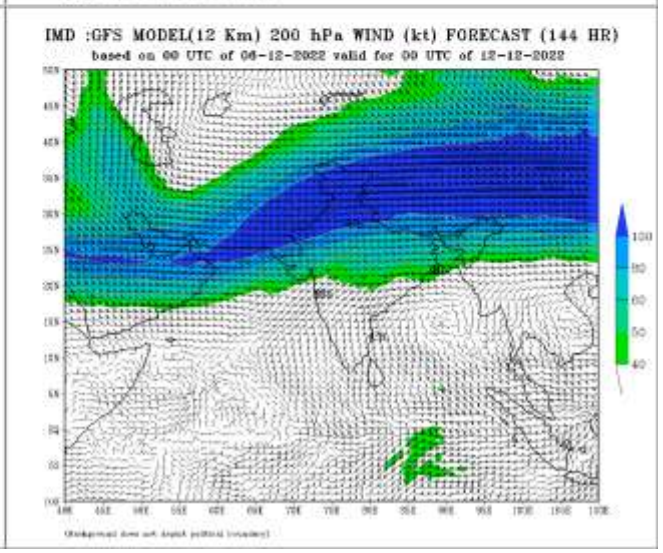
based on 00 UTC of 06-12-2022 valid for 00 UTC of 12-12-2022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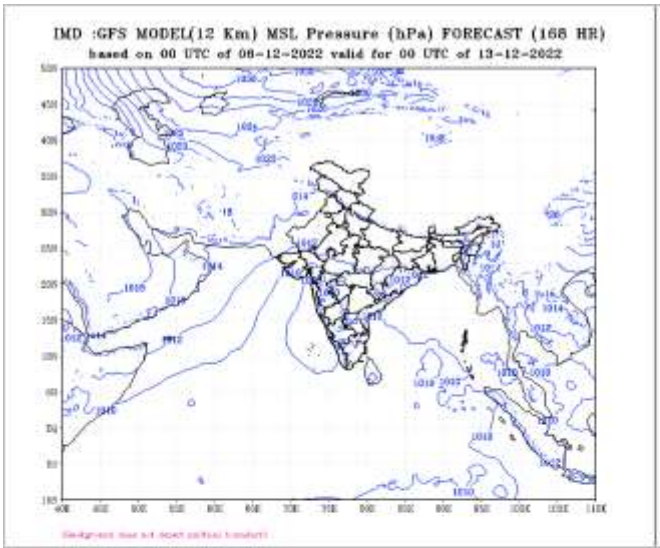
based on 00 UTC of 06-12-2022 valid for 00 UTC of 12-12-2022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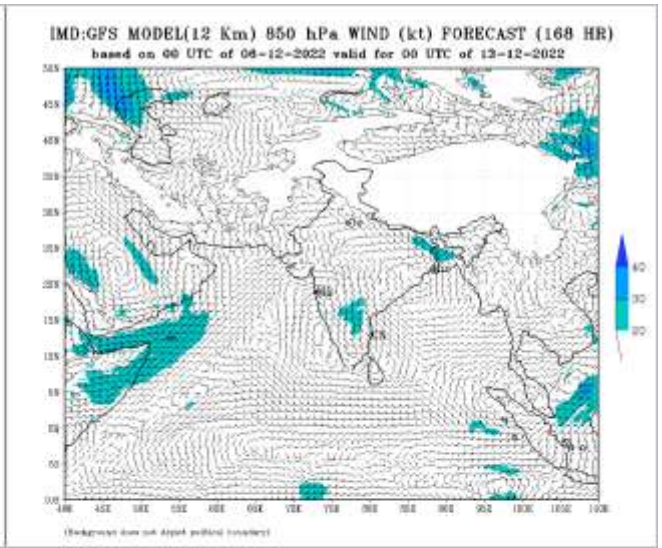
based on 00 UTC of 06-12-2022 valid for 00 UTC of 13-12-2022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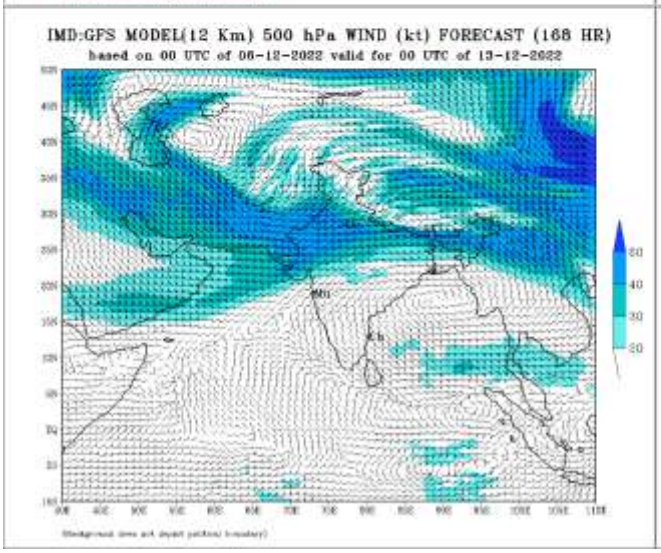
based on 00 UTC of 06-12-2022 valid for 00 UTC of 13-12-2022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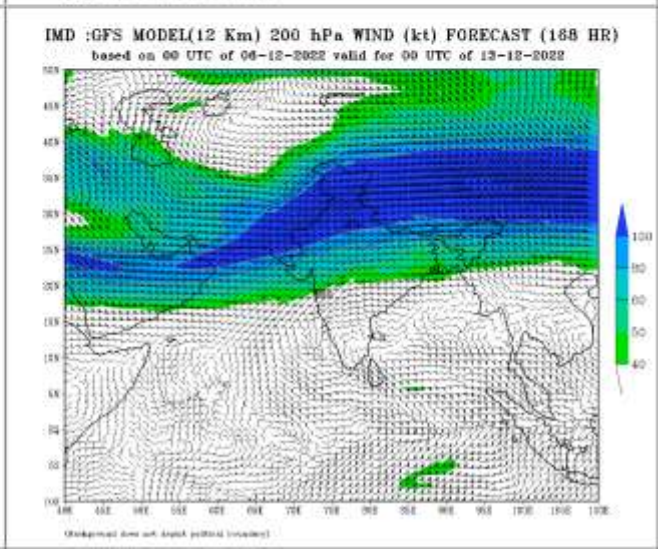
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based on 00 UTC of 06-12-2022 valid for 00 UTC of 13-12-2022