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

Tropical Cyclone Forecast Programme
Report Dated 19th December 2024

Time of Issue: 1200 UTC

Synoptic features (based on 0300 UTC analysis):

- Yesterday's well marked low pressure area over southwest Bay of Bengal lay over southwest adjoining westcentral Bay of Bengal at 0300 UTC of today, the 19th December 2024. The associated upper cyclonic circulation extends up to 5.8 km above mean sea level. The system is likely to move nearly northwestwards towards north Tamil Nadu and south Andhra Pradesh coast during next 12 hours. Thereafter, it is likely to move nearly northwards along Andhra Pradesh coast in subsequent 24 hours. Associated Scattered to broken low and medium clouds with embedded intense to very intense convection lay over south & central Bay of Bengal between lat 8.0N to 16.0N and long 80.0E to 90.0E. Minimum Cloud Top Temperature is minus 75 to 85 deg C.

Environmental Features based on 0300 UTC:

Parameter	Bay of Bengal (BoB)	Arabian Sea (AS)
Sea Surface Temperature (SST) ºC	➢ 26-28°C over north BoB and western coast of BoB & adjoining sea area. ➢ 28-30°C over rest of BoB.	➢ 28-30°C over southeast AS, Lakshadweep Islands, Maldives and adjoining eastcentral & southwest AS. ➢ 25-28°C over rest of AS.
Tropical Cyclone Heat Potential (TCHP) kJ/cm^2	➢ 160-210 over some parts north BoB and adjoining parts of eastcentral BoB. ➢ 110-150 over southeast BOB & Andaman Sea. ➢ 20-30 over some parts of southwest BoB along & off north Sri Lanka coast. ➢ 60-80 over rest of BoB.	➢ 100-120 over southeast AS, Maldives Islands, Lakshadweep Islands and areas of eastcentral AS along Karnataka-Kerala coasts. ➢ 20-60 over rest AS.
Cyclonic Relative - vorticity (X10^{-6}s^{-1})	➢ 50-60 over southwest & adjoining westcentral BoB off Tamil Nadu and Sri Lanka coasts extending upto 500 hPa level.	-
Low-Level convergence (X10^{-5} s^{-1})	➢ 10-15 over some parts of southwest BoB off Tamil Nadu coast. ➢ 5 over south BoB.	➢ 5 over southeast AS.
Upper-Level divergence	➢ 10 over westcentral & adjoining southwest BoB.	➢ 5-10 over southern parts of southeast AS and adjoining

($X10^{-5}$ s^{-1})	➢ 5 over western parts of BoB.	EIO region.
Vertical Wind Shear (VWS knots) **Low: 05-10 knots** **Moderate: 10-20 knots** **High: >20 knots**	➢ Low-Moderate over many parts of south BoB & Andaman Sea. ➢ High over rest of BoB.	➢ Low-Moderate over Lakshadweep Islands, Maldives and south AS & adjoining EIO region. ➢ High over rest of Arabian Sea.
Wind Shear Tendency (knots)	➢ Increasing over some parts of Northwest BoB. ➢ Decreasing over some parts of southeast BoB & adjoining parts of south Andaman Sea.	➢ Decreasing over north AS, many parts of central AS and Lakshadweep Islands & adjoining areas.
Upper tropospheric Ridge	➢ At 11^0 N.	➢ At 10^0 N.

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 south Bay of Bengal, south Andaman Sea. Minimum Cloud Top Temperature is minus 70 to 85 deg C. Scattered low and medium clouds with embedded moderate to intense convection lay over North Bay of Bengal.

b) Over the Arabian Sea:

Scattered to broken low and medium clouds with embedded intense to very intense convection lay over south Arabian Sea, Maldives area & adjoining Equatorial Indian Ocean. Minimum Cloud Top Temperature is minus 70 to 85 deg C. Isolated low and medium clouds with embedded moderate to intense convection lay over eastcentral Arabian Sea & Comorin area and isolated weak to moderate convection lay over northwest adjoining westcentral Arabian Sea.

c) Outside India:

Scattered low & medium clouds with embedded moderate to intense convection over Sri Lanka, Palk Strait, Gulf of Mannar, Maldives, West Nepal, Tibet China, Yellow Sea, East China Sea, Sumatra, Strait of Malacca, Malaysia, Borneo, South China Sea, Java Islands & Sea, Celebes Islands & Sea, Philippines, Sulu Sea and over Indian Ocean between latitude 5.0N to 10.0S longitude 40.0E to 80.0E & between latitude 10.0S to 20.0S longitude 80.0E to 125.0E.

M.J.O. Index:

MJO is currently in phase 6 with amplitude greater than 1. It will be in same phase till 24th December with amplitude greater than 1.

NWP Guidance for FDP Cyclone:

MODEL GUIDANCE	Bay of Bengal (BoB)	Arabian Sea (AS)
IMD-GEFS	The model is indicating a Low Pressure area (LPA) over southwest Bay of Bengal as of today 19th/00 UTC, it will have Northwestwards movement till 20th as LPA over southwest and adjoining westcentral BoB, it will then recurve northeastwards till 22nd, less marked thereafter.	The model indicates no significant system over AS.
IMD-WRF	The model is indicating a Low Pressure area (LPA) over southwest Bay of Bengal as of 19th/00 UTC, it will have west-northwestwards movement and lay over southwest & adjoining westcentral BoB off North Tamil Nadu-South Andhra Pradesh coast as WML till 22nd.	The model indicates extended cyclonic circulation over equatorial Indian Ocean and adjoining southeast Arabian Sea as on 19th/00 UTC, less marked therafter.
NCMRWF-NCUM(G)	The model is indicating a Low Pressure area (LPA) over southwest BoB as of 19th/00 UTC, it will have northwestwards movement lay over southwest & adjoining westcentral BoB close to North Tamil Nadu-South Andhra Pradesh coast on 20th. Then it will move in the same direction till 22th as LPA along the coast, recurve northeastwards thereafter and less marked thereafter.	The model indicates no significant system over AS.
ECMWF	The model is indicating a LPA over southwest Bay of Bengal as of 19th December, it will have northwestwards movement and will lay close to the north Tamil Nadu & south Andhra coast as LPA on 20th/00 UTC. It will then recurve northeastwards and lay over westcental BoB as WML on 22nd/00 UTC, less marked thereafter.	The model indicates no significant system over AS.
NCEP-GFS	The model is indicating a Low Pressure area (LPA) over southwest BoB as of 19th/00 UTC, it will have northwestwards movement lay over southwest & adjoining westcentral BoB close to North Tamil Nadu-South Andhra Pradesh coast on 20th. Then it will move in the same direction till 22th as LPA along the coast, recurve northeastwards thereafter and less marked thereafter.	The model indicates no significant system over AS.

Summary:

(a) Bay of Bengal:
Models are indicating that, an low pressure area over southwest Bay of Bengal as on today the 19th December and will have northwestwards movement & lay over southwest Bay of Bengal & adjoining westcentral Bay of Bengal as Low Pressure Area on 20th December. Models are also indicating that, it will recurve & move northeastwards till 22nd while weakening.

(b) Arabian Sea
Most of the models are indicating no significant system over Arabian Sea.

Inference:

- Yesterday's well marked low pressure area over southwest Bay of Bengal lay over southwest adjoining westcentral Bay of Bengal at 0300 UTC of today, the 19th December 2024. The associated upper cyclonic circulation extends up to 5.8 km above mean sea level. The system is likely to move nearly northwestwards towards north Tamil Nadu and south Andhra Pradesh coast during next 12 hours. Thereafter, it is likely to move nearly northwards along Andhra Pradesh coast in subsequent 24 hours. Associated Scattered to broken low and medium clouds with embedded intense to very intense convection lay over south & central Bay of Bengal between lat 8.0N to 16.0N and long 80.0E to 90.0E. Minimum Cloud Top Temperature is minus 75 to 85 deg C.

Probability of cyclogenesis (formation of depression and above intensity systems) over the Bay of Bengal 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

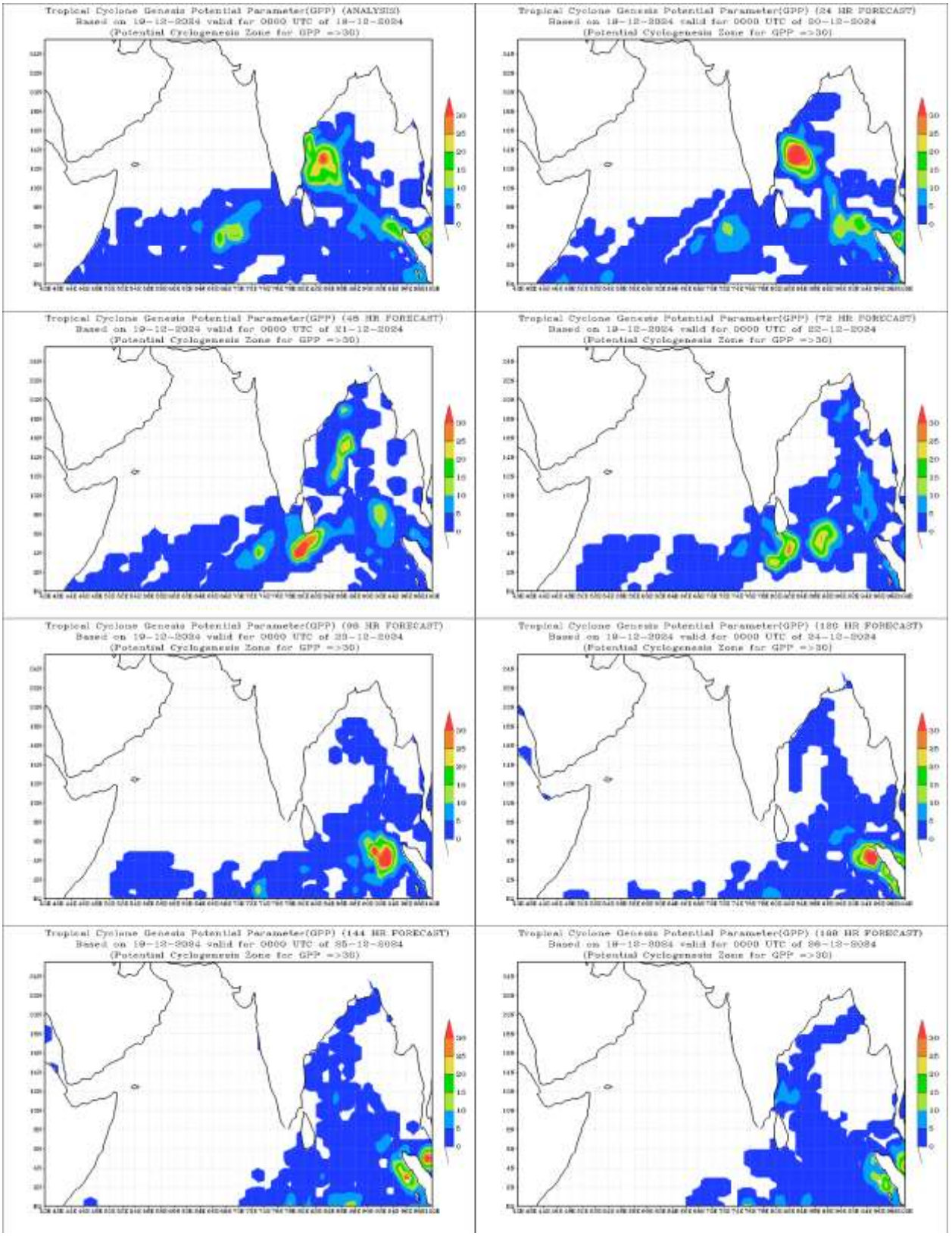
Probability of cyclogenesis (formation of depression and above intensity systems) over the Arabian Sea during next 168 hours:

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

"- "indicates genesis has already occurred.
Probability is indicated as NIL for 0%, LOW for 1-33%, MOD for 34-67% and High for 68-100%.

Intense Observation Period (IOP): NIL

ANNEXURE


Tropical Cyclone Genesis Potential Parameter(GPP) (ANALYSIS)
Based on 19-12-2024 valid for 0000 UTC of 19-12-2024
(Potential Cyclogenesis Zone for GPP =>30)
Tropical Cyclone Genesis Potential Parameter(GPP) (24 HR FORECAST)
Based on 19-12-2024 valid for 0000 UTC of 20-12-2024
(Potential Cyclogenesis Zone for GPP =>30)
Tropical Cyclone Genesis Potential Parameter(GPP) (48 HR FORECAST)
Based on 19-12-2024 valid for 0000 UTC of 21-12-2024
(Potential Cyclogenesis Zone for GPP =>30)
Tropical Cyclone Genesis Potential Parameter(GPP) (72 HR FORECAST)
Based on 19-12-2024 valid for 0000 UTC of 22-12-2024
(Potential Cyclogenesis Zone for GPP =>30)
Tropical Cyclone Genesis Potential Parameter(GPP) (96 HR FORECAST)
Based on 19-12-2024 valid for 0000 UTC of 23-12-2024
(Potential Cyclogenesis Zone for GPP =>30)
Tropical Cyclone Genesis Potential Parameter(GPP) (120 HR FORECAST)
Based on 19-12-2024 valid for 0000 UTC of 24-12-2024
(Potential Cyclogenesis Zone for GPP =>30)
Tropical Cyclone Genesis Potential Parameter(GPP) (144 HR FORECAST)
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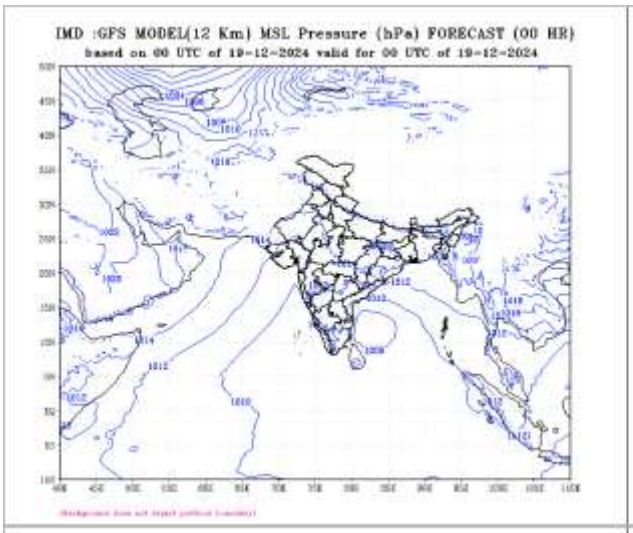
IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (00 HR)
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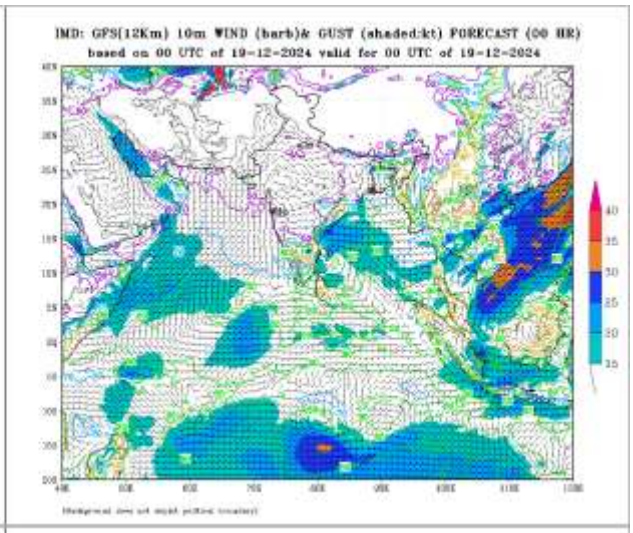
IMD: GFS(12Km) 10m WIND (barb)& GUST (shaded:kt) FORECAST (00 HR)
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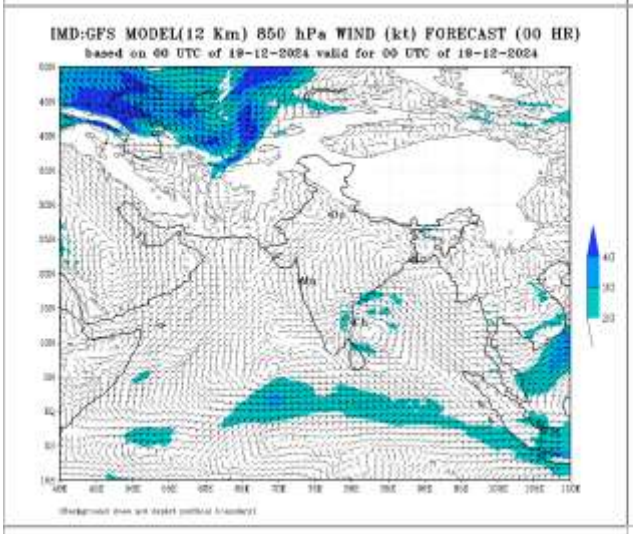
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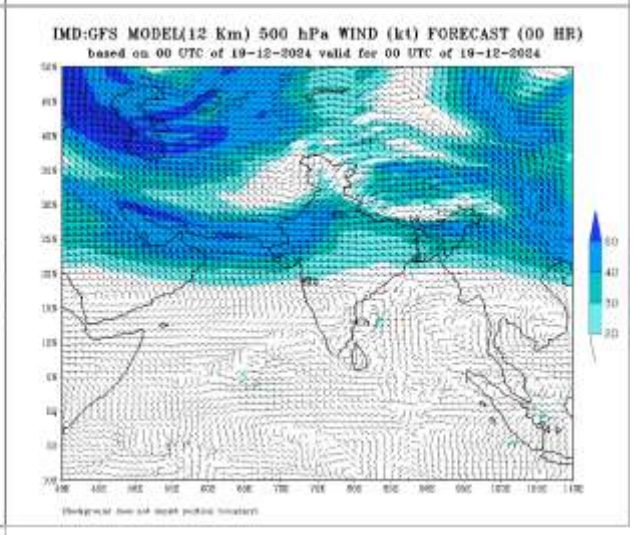
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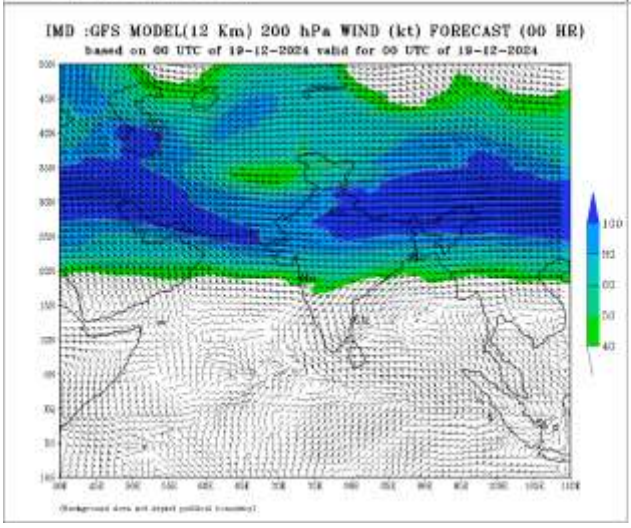
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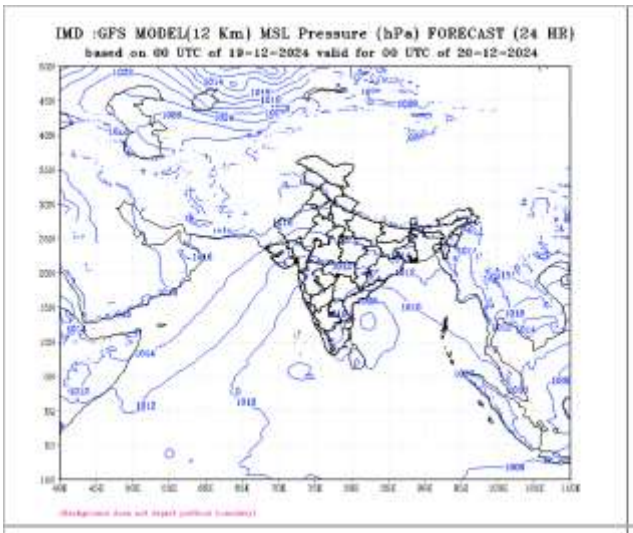
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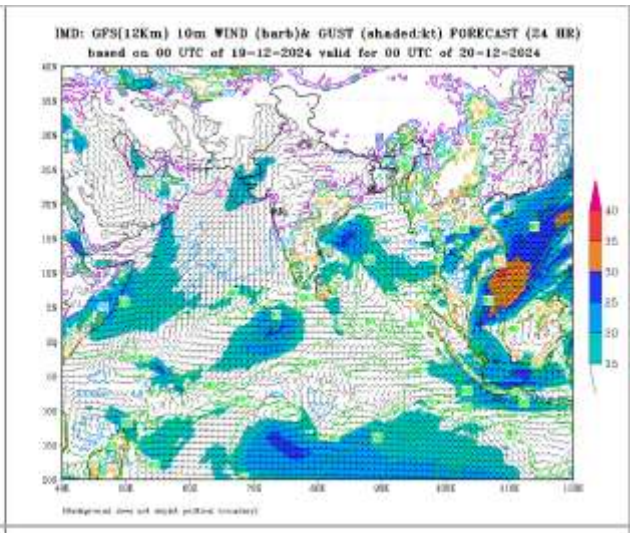
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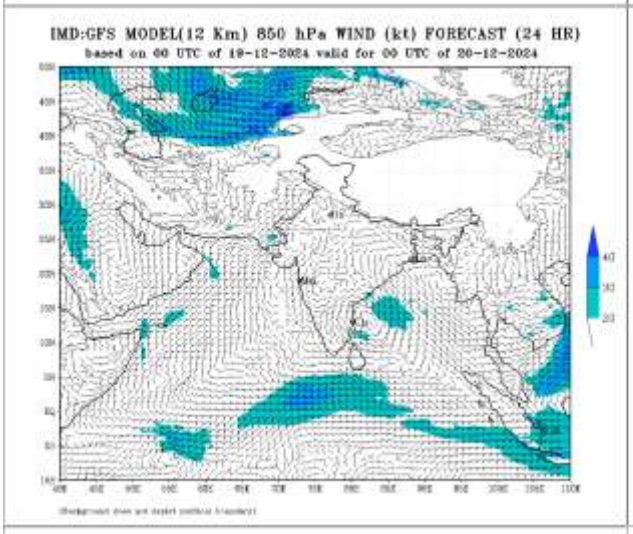
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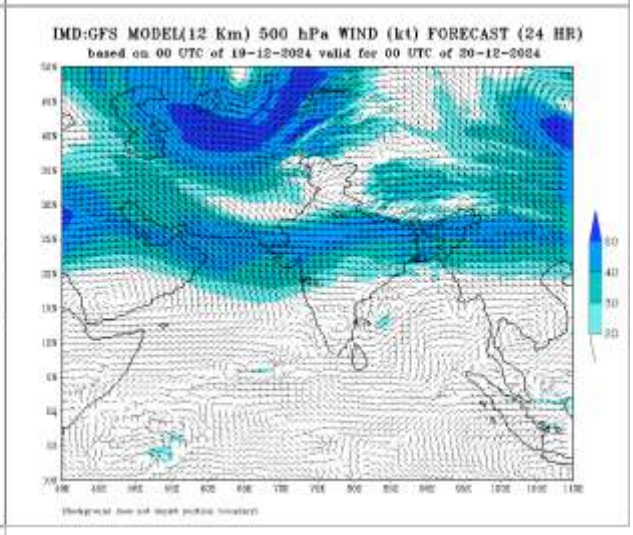
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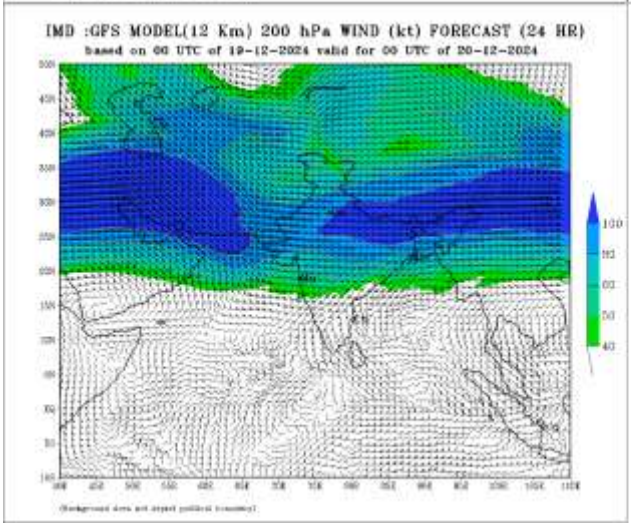
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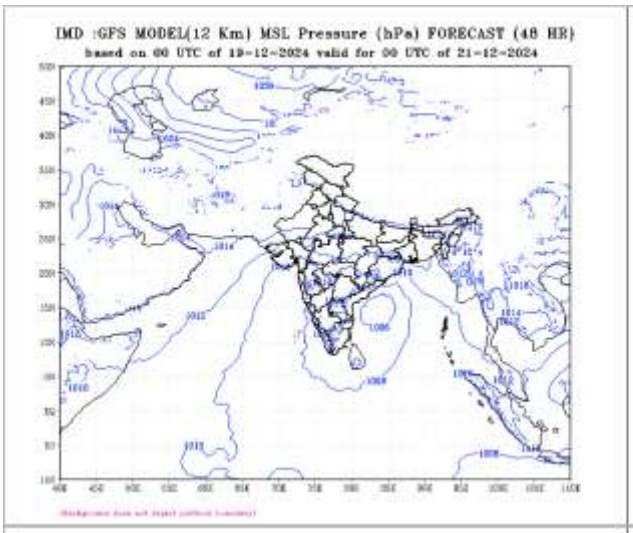
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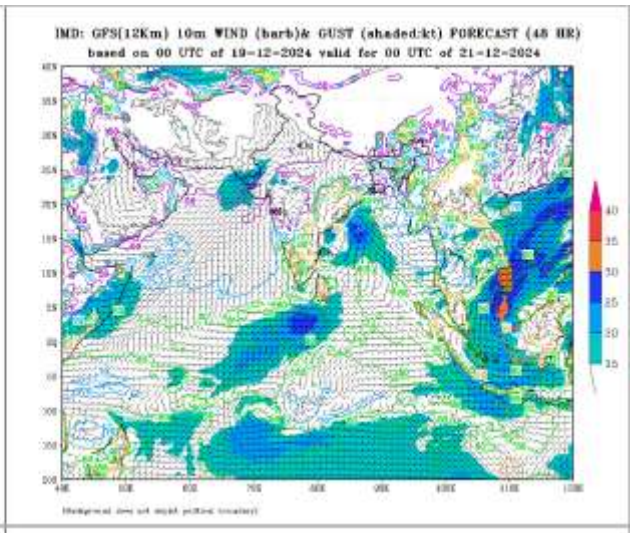
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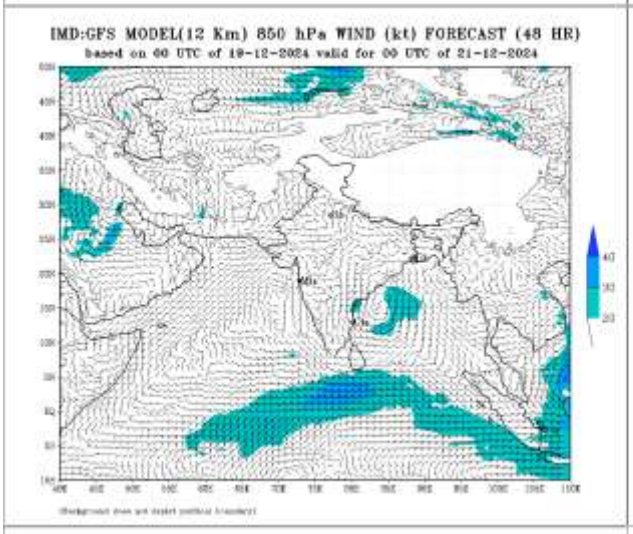
based on 00 UTC of 19-12-2024 valid for 00 UTC of 21-12-2024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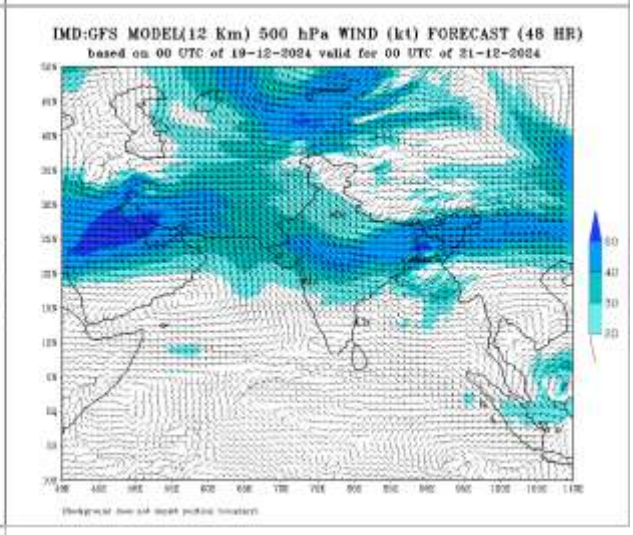
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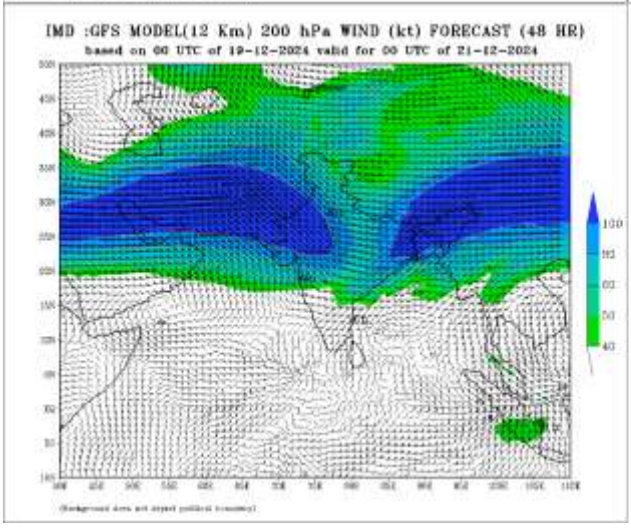
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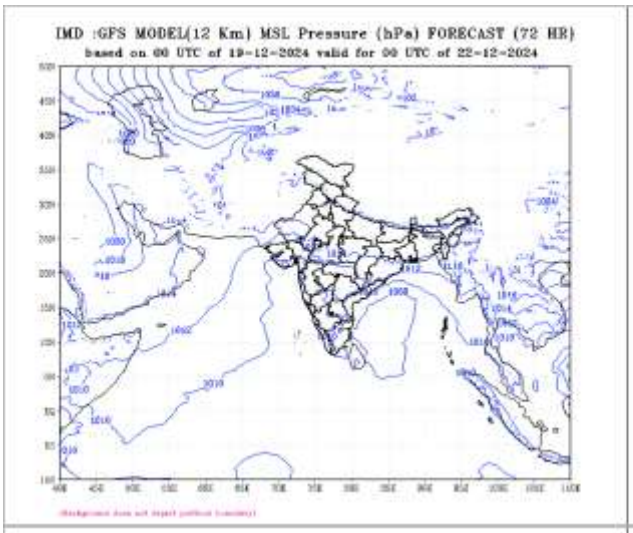
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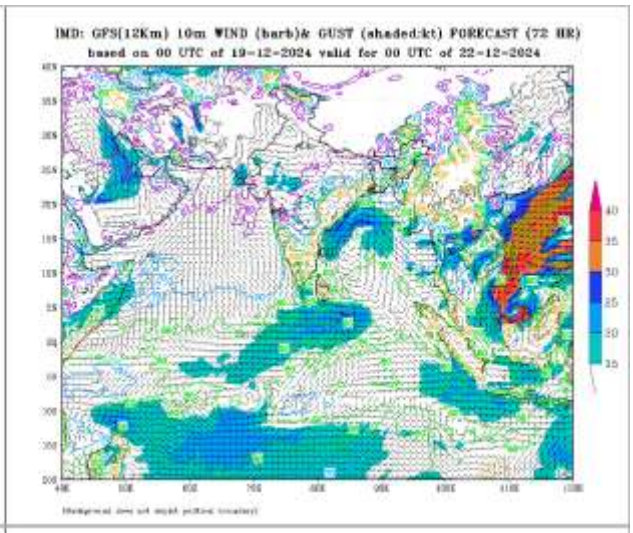
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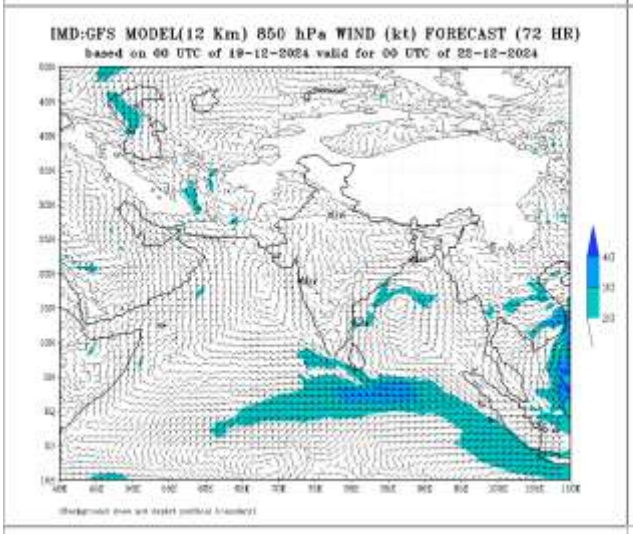
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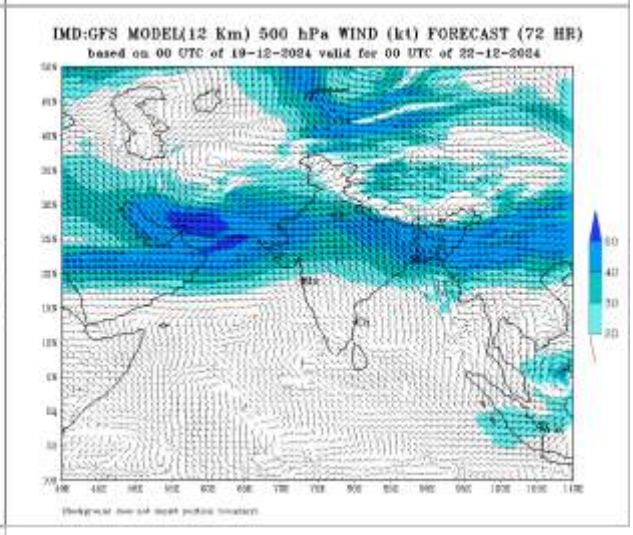
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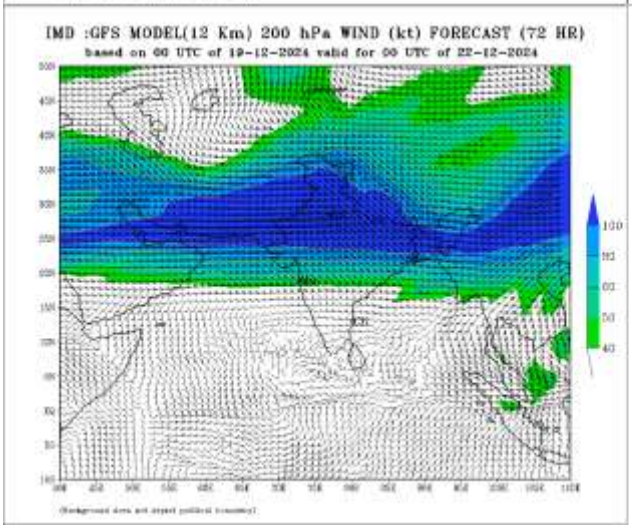
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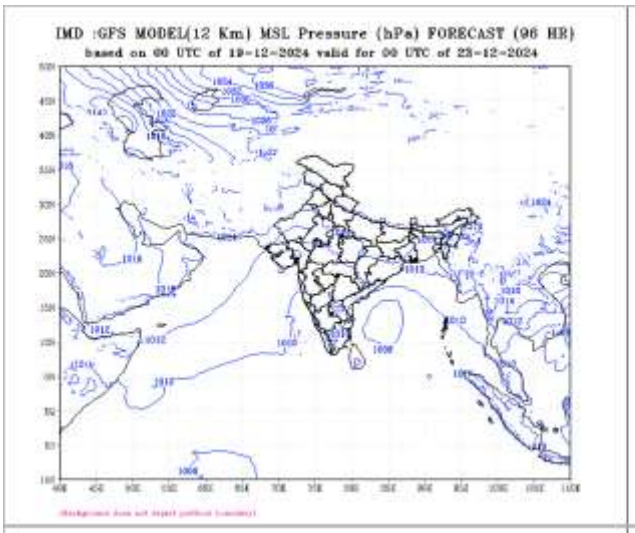
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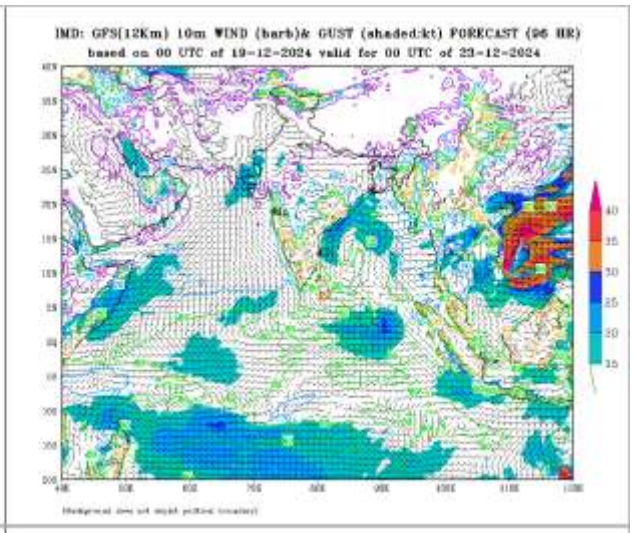
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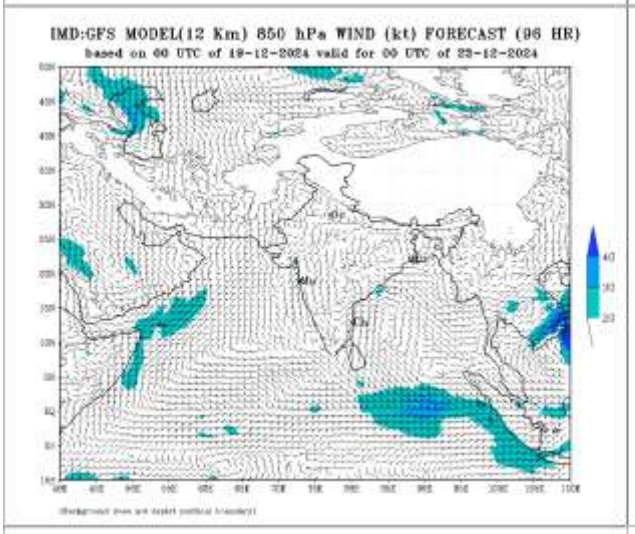
based on 00 UTC of 19-12-2024 valid for 00 UTC of 23-12-2024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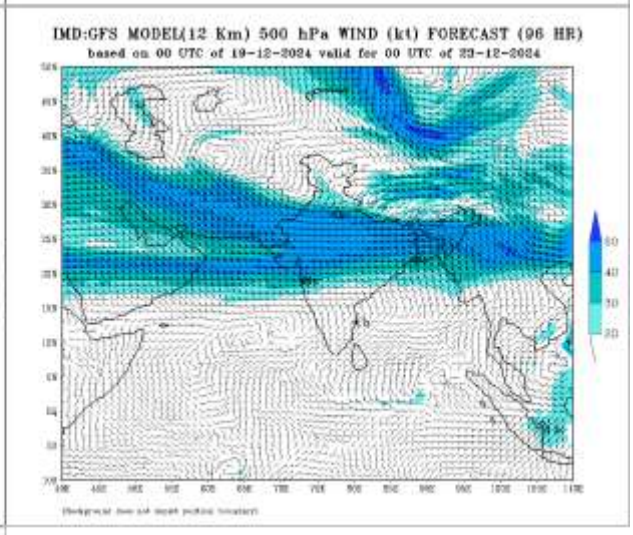
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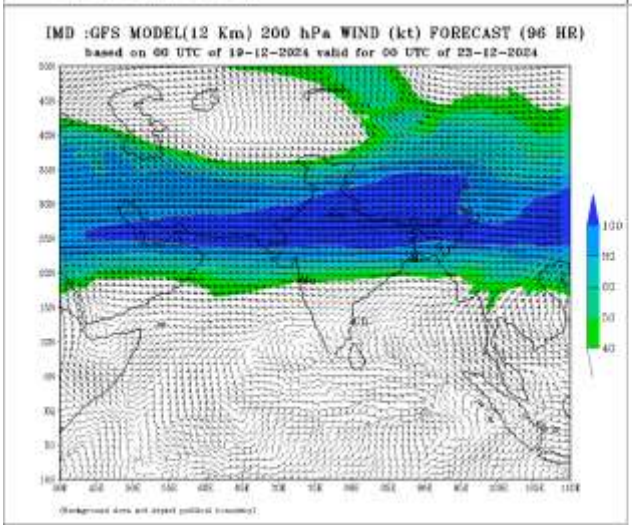
based on 00 UTC of 19-12-2024 valid for 00 UTC of 23-12-2024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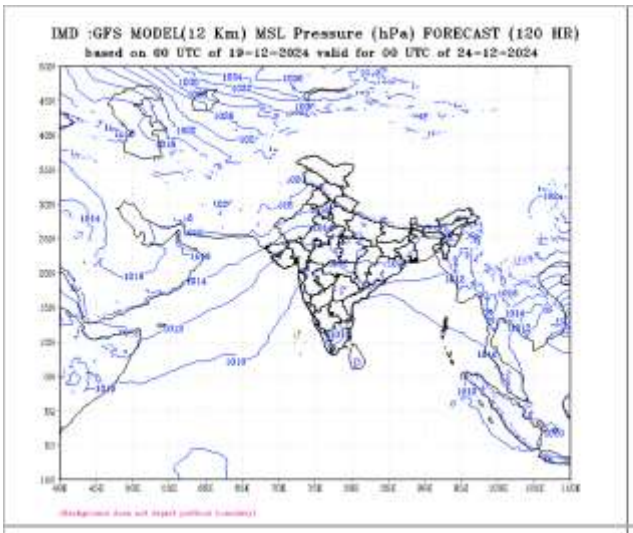
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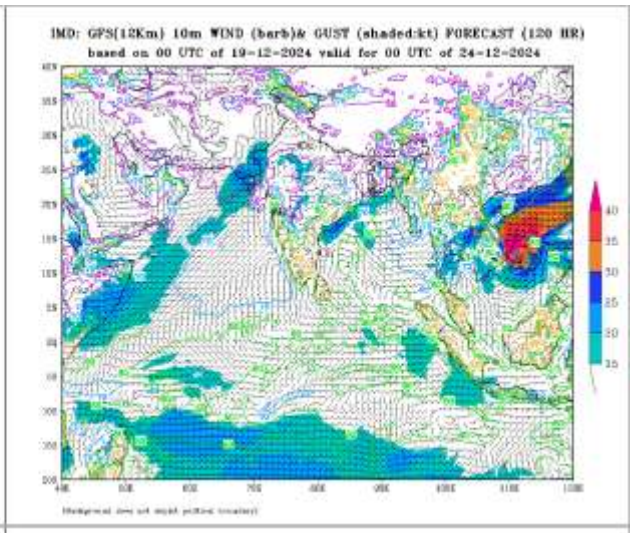
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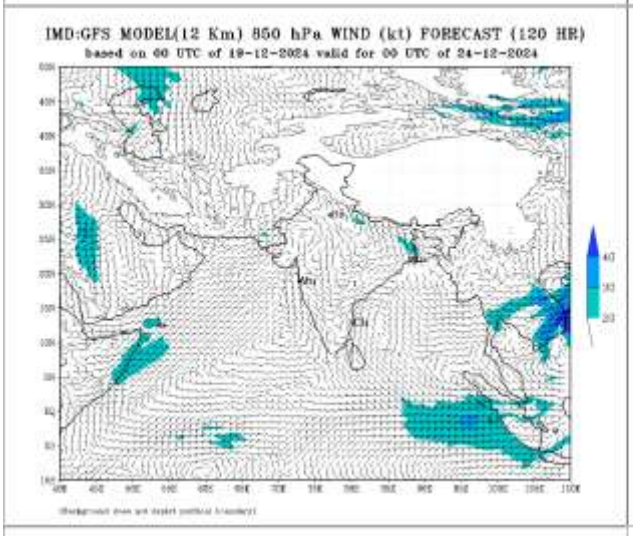
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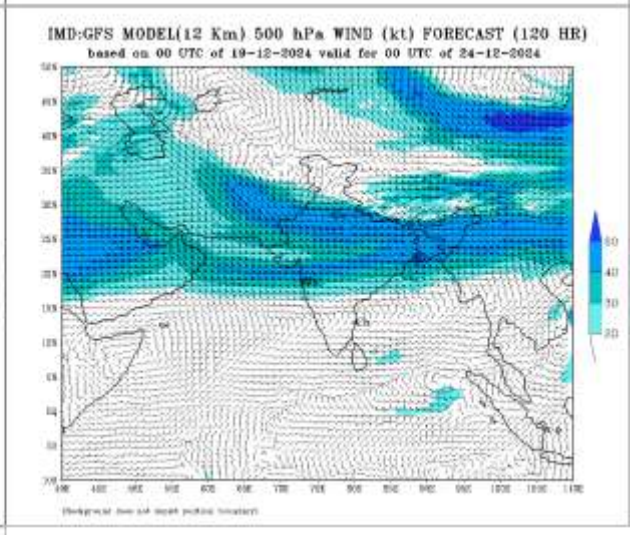
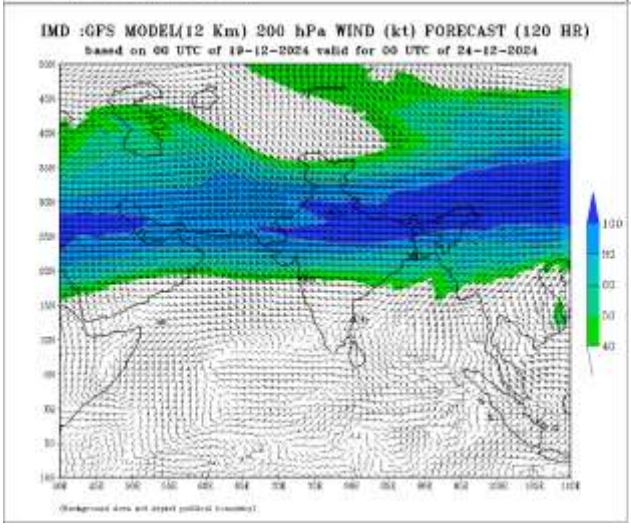
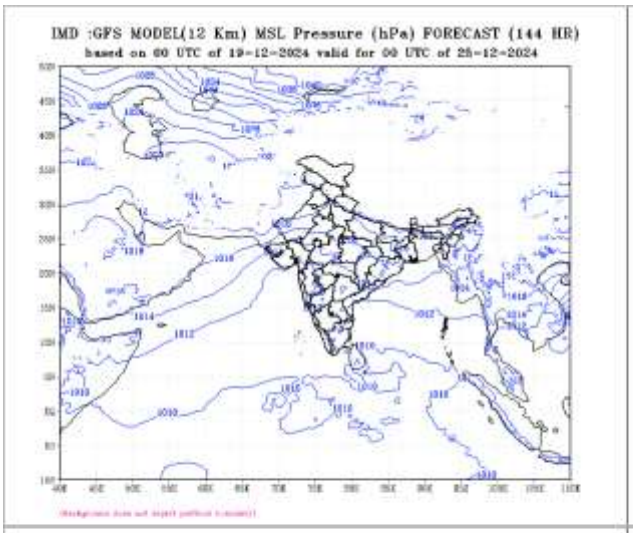
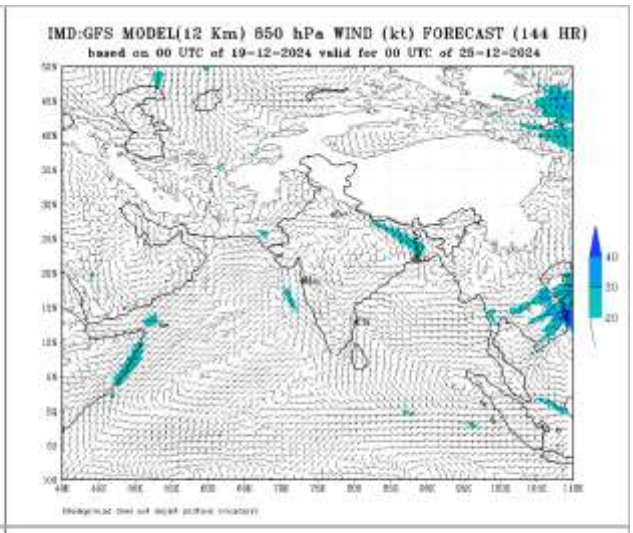
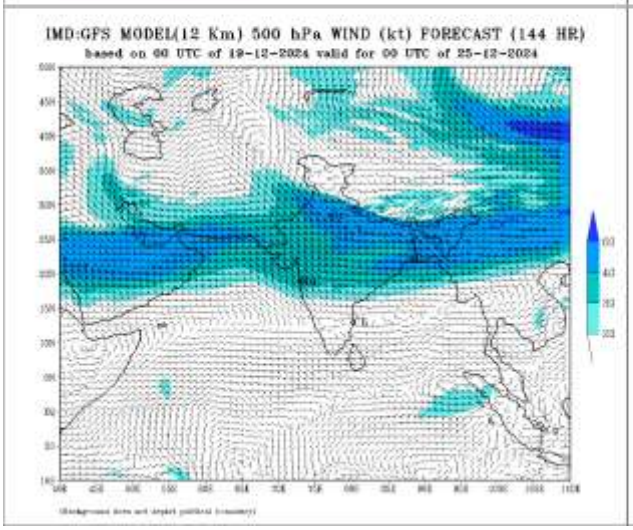
based on 00 UTC of 19-12-2024 valid for 00 UTC of 24-12-2024

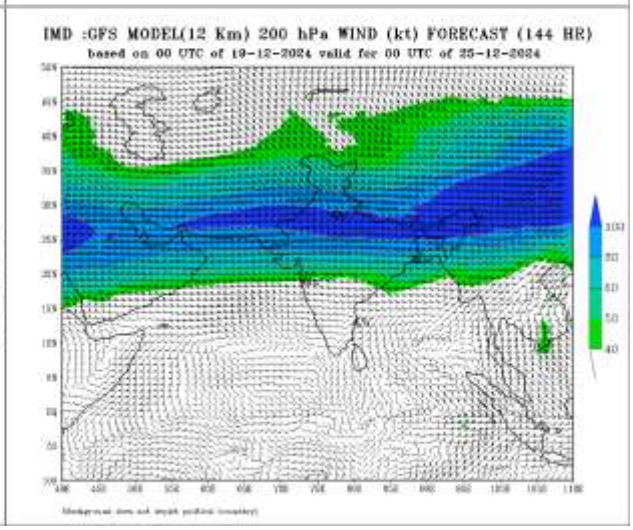

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (120 HR)
based on 00 UTC of 19-12-2024 valid for 00 UTC of 24-12-2024

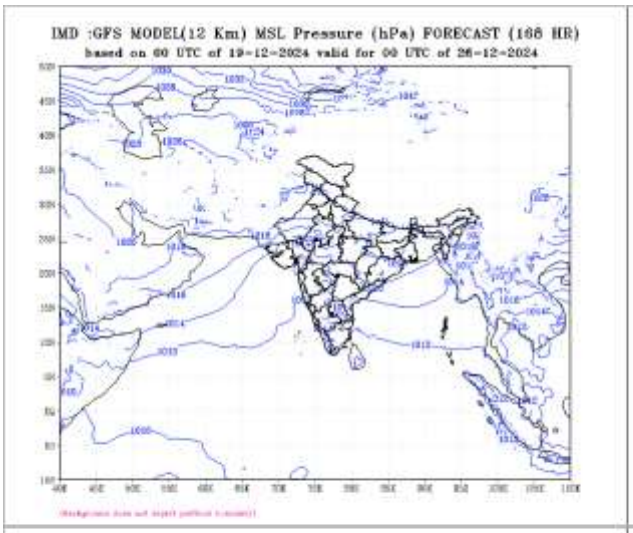

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (120 HR)
based on 00 UTC of 19-12-2024 valid for 00 UTC of 24-12-2024

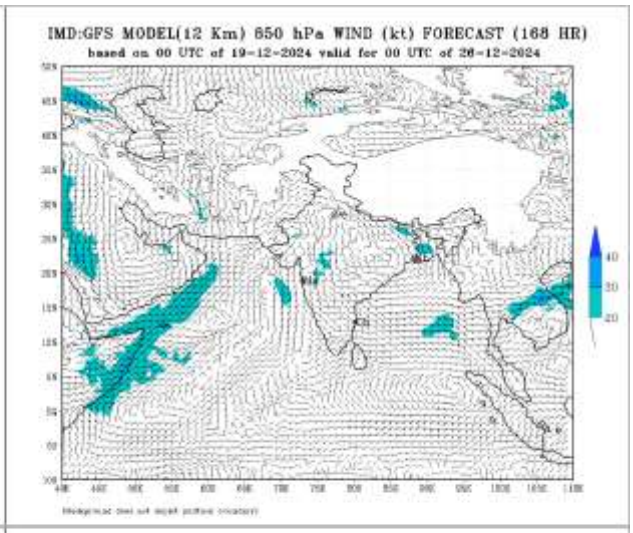

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (144 HR)
based on 00 UTC of 19-12-2024 valid for 00 UTC of 25-12-2024

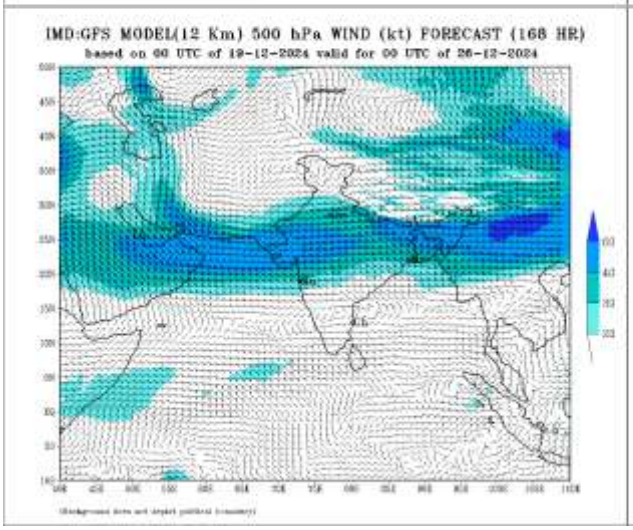

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (144 HR)
based on 00 UTC of 19-12-2024 valid for 00 UTC of 25-12-2024

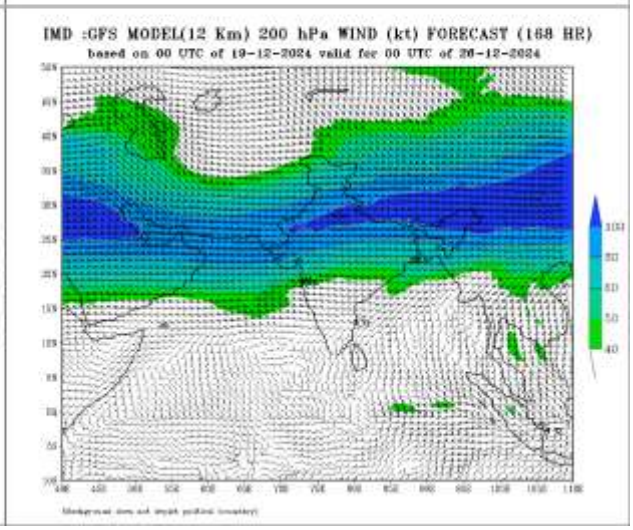

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (144 HR)
based on 00 UTC of 19-12-2024 valid for 00 UTC of 25-12-2024


IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (144 HR)
based on 00 UTC of 19-12-2024 valid for 00 UTC of 25-12-2024


IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (168 HR)
based on 00 UTC of 19-12-2024 valid for 00 UTC of 26-12-2024


IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 19-12-2024 valid for 00 UTC of 26-12-2024


IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 19-12-2024 valid for 00 UTC of 26-12-2024


IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 19-12-2024 valid for 00 UTC of 26-12-2024