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

Tropical Cyclone Forecast Programme
Report Dated 29th November, 2022

Time of Issue: 1200 UTC

Synoptic features (based on 0600 UTC analysis):

- Yesterday's cyclonic circulation over central parts of Bay of Bengal persists over same region at 0830 hours IST (0300 UTC) of today, the 29th November, 2022.

Dynamical and thermo-dynamical features

Parameter	Bay of Bengal (BoB)	Arabian Sea (AS)
Sea Surface Temperature (SST) ºC	About 28-29°C over the system and major parts of BoB, 29-30°C over southeast BoB and along south Sri Lanka coast & adjoining Andaman Sea, 25-26°C over northwest BoB along West Bengal, Bangladesh and Odisha coast.	About 29-30°C over the southeast and adjoining southwest AS off Karntaka and Kerala coasts, 26-28°C over eastcentral and adjoining north AS, 25-26°C over southwest AS off south Gujarat and Maharashtra coasts, less than 24°C over southwest AS off Oman and Yemen coasts and adjoining sea areas.
Tropical Cyclone Heat Potential (TCHP) kJ/cm^2	>110 over south Andaman sea & eastcentral BoB, 70-80 over north Andaman Sea, north parts of southwest BoB and adjoining westcentral BoB, off Sri Lanka, north BoB, and less than 40 over westcentral BoB, along and off east coast of India, west coast of SriLanka, Gulf of Mannar, some parts of southwest BoB.	70-90 over southeast and adjoining eastcentral and adjoining southwest AS, Maldives & adjoining EIO, Comorin area and less than 40 over remaining AS and also off west coast of India, Comorin area.
Cyclonic Relative vorticity (X10^{-6}s^{-1})	40-50 over southwest BoB. 30-40 over westcentral & adjoining southwest BoB.	40-50 over southwest AS & adjoining EIO. 30-40 over southwest parts of AS.
Low Level convergence (X10^{-5} s^{-1})	Small zone of 05 over Gulf of Thailand and another of 05 value over southwest BoB.	05-10 over southeast AS off Kerala and Karnataka coasts.
Upper Level divergence (X10^{-5} s^{-1})	Small zone of 05 over gulf of Thailand.	5-10 over westcentral AS Lakshadweep, Maldives & adjoining EIO.
Vertical Wind Shear (VWS knots)	5-15 over Andaman Sea and central & adjoining south BoB.	5-15 over westcentral AS Lakshadweep, Maldives & adjoining EIO.

Wind Shear Tendency (knots)	Decreasing over southeast BoB & adjoining EIO.	Decreasing over southeast AS.
Upper tropospheric Ridge	Along 10.0°N over the BoB.	Along 15.0°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 low and medium clouds with embedded isolated moderate to intense convection lay over north Bay of Bengal, central parts of central Bay of Bengal and south Andaman sea.

b) Over the Arabian Sea:-

Scattered low and medium clouds with embedded isolated moderate to intense convection lay over eastcentral & southwest Arabian sea. Scattered low and medium clouds with embedded isolated weak convection lay over southeast Arabian sea.

M.J.O. Index:

The Madden Julian Oscillation (MJO) Index is currently in Phase 7 with amplitude more than 1. Thereafter, it would move across phases 8, 2, 3 & 4 with gradually decreasing amplitude but remaining less than 1.

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	The cyclonic circulation (cycir) over central parts of BoB on 29th, to persist over the same region during next 1 days & less marked thereafter. A Cycir over Gulf of Thailand to emerge into south Andaman Sea as a low pressure area LPA on 4th, to move westwards and lie as a depression over South Andaman Sea on 5th, to move west-northwestwards and lie as a cyclonic storm/severe cyclonic storm over southeast on 6th, severe cyclonic storm over southwest BoB on 6th, continue as severe cyclonic storm on 7th.	No significant system
IMD-GEFS	An extended circulation over Gulf of Thailand on 2nd & 3rd December, to emerge into south Andaman Sea on 4th over south Andaman Sea, intensify into depression over southeast BoB on 5th, intensify into a DD over southwest BoB on 6th Dec.	No significant system

GEFS Probablistic guidance	Not available	Not available
IMD WRF	No significant system	No significant system
NCMRWF-NCUM	Cycir over Gulf of Thailand on 3rd Dec, to emerge into South Andaman Sea on 4th Dec, to move nearly westwards and intensify into a depression over southeast BoB and adjoining South Andaman Sea on 6th Dec, cyclonic storm over southwest and adjoining southeast BoB on 7th Dec. and severe cyclonic storm on 8th Dec over southwest BoB, continue as severe cyclonic storm on 9th Dec.	No significant system
NCMRWF-NEPS	Cycir over Gulf of Thailand to emerge into South Andaman Sea on 4th Dec as extended low, move nearly west-northwestwards and intensify into an depression on 5th/6th Dec over southeast BoB, CS on 7th Dec over southeast and adjoining southwest BoB, SCS on 9th Dec over southwest BoB.	No significant system
NCMRWF-UM (Regional)	Cycir over central parts of BoB on 29th, to persist over same region during next 1 days and less marked thereafter	No significant system
ECMWF	Cycir over central parts of BoB on 29th to persist over same region during next 1 day and become less marked thereafter. A low pressure area over Gulf of Thailand (8.5N/99.7E) on 4th Dec., to move westwards and emerge into South Andaman Sea as a depression on 5th Dec., cyclonic storm on 9th Dec.	No significant system
ECMWF ensemble	Likely cyclogenesis over South BoB during 4th/05th Dec. will track west-northwest wards with intensification upto Cyclonic Storm (50-60% probability). 20-30% Enesmle members indicate likely northwestwards movement towards Andhra Pradesh-Tamil Nadu coasts.	No significant system
NCEP-GFS	Cycir over central parts of BoB on 29th to become less marked less marked during next 1 day. LPA over Gulf of Thailand (8.5N/99.7E) on 3rd Dec. & 4th Dec, to emerge into South Andaman Sea as a depression/deep depression on 5th , cyclonic storm over southeast BoB on 6th, severe cyclonic storm over southeast BoB and adjoining southwest BoB on 7th Dec.	No significant system
IMD MME	Available during cyclonic disturbance period only	Available during cyclonic disturbance period only

IMD HWRF	Available during cyclonic disturbance period only	Available during cyclonic disturbance period only
IMD-Genesis Potential Parameter	No potential zone over Bay of Bengal till 4th December. A significant potential zone over south Andaman Sea on 5th Dec having nearly westward movement.	No potential zone over Arabian Sea during next 7 days

Summary and conclusion:

- Most of the models are indicating that the existing cyclonic circulation over eastcentral Bay of Bengal would persist over central parts of Bay of Bengal for a day with no significant intensification.

- Most of the models except NCMRWF-UM (Regional) model are indicating likely emergence of another low pressure area/depression (remnant from South China Sea) into south Andaman Sea around 4th December. All models are unanimously indicating initial nearly westwards movement over southeast BoB and adjoining areas then west-northwestwards towards southwest & adjoining westcentral BoB. The system is likely to intensify further during subsequent 2-3 days.

In view of all the above, it is inferred that
1. For the Bay of Bengal:

The cyclonic circulation over central parts of Bay of Bengal is likely to persist over the same region during next 1 day.

Another low pressure area/depression (remnant from South China Sea) is likely to emerge into south Andaman Sea around 4th December. The movement and intensification of this system need to be monitored critically during the period 5th-10th December.

Thus, LOW probability is assigned to formation of depression over Bay of Bengal during day 7.

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
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:

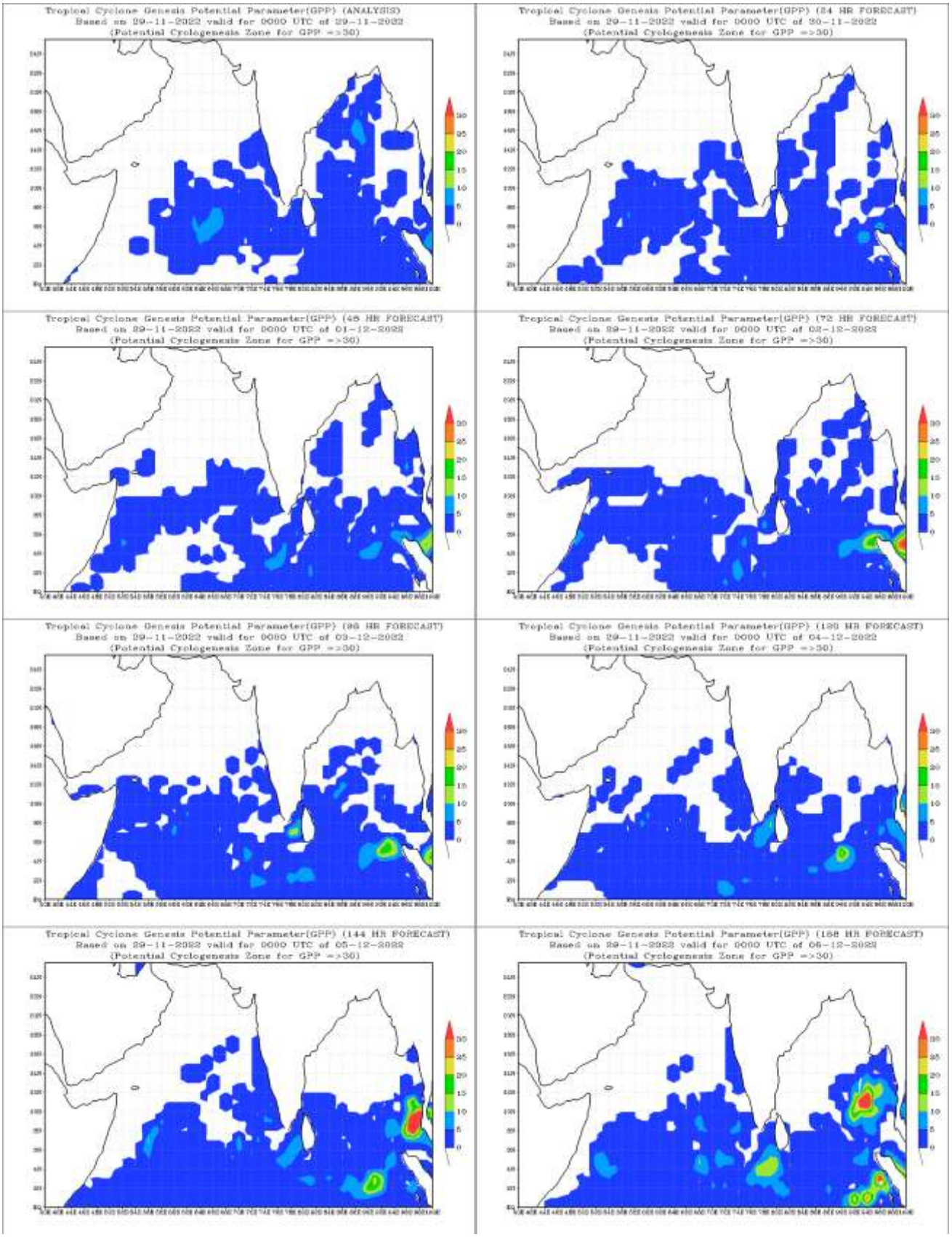
24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS	120-144 HOURS	144-168 HOURS
NIL	NIL	NIL	NIL	NIL	NIL	NIL

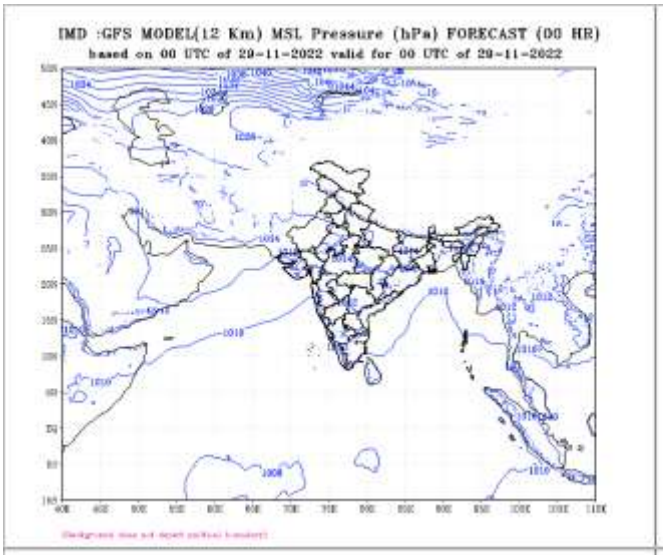
Advisory:

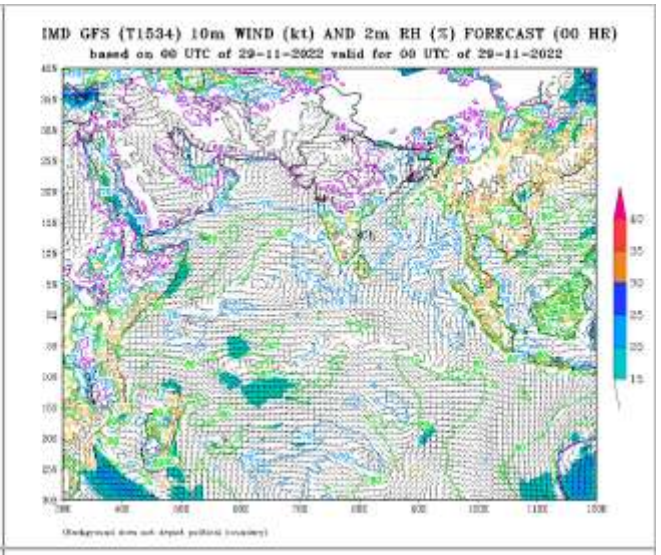
The movement and intensification of low pressure area/depression (remnant from South China Sea) likely to emerge into south Andaman Sea around 4th December need to be monitored through various observations.

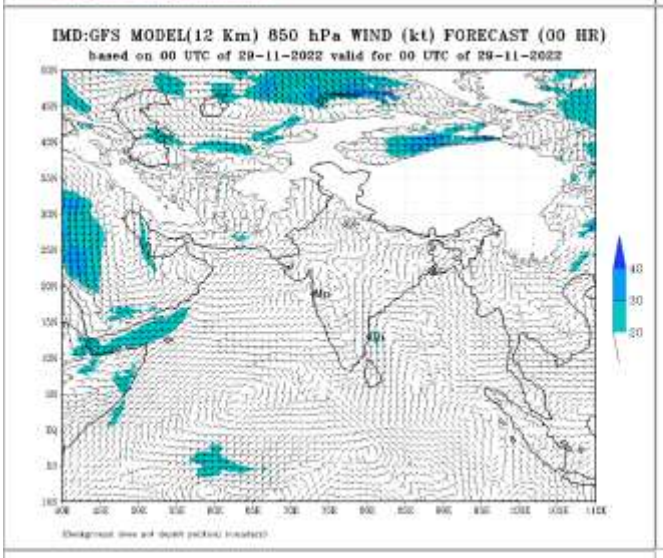
IOP: NIL

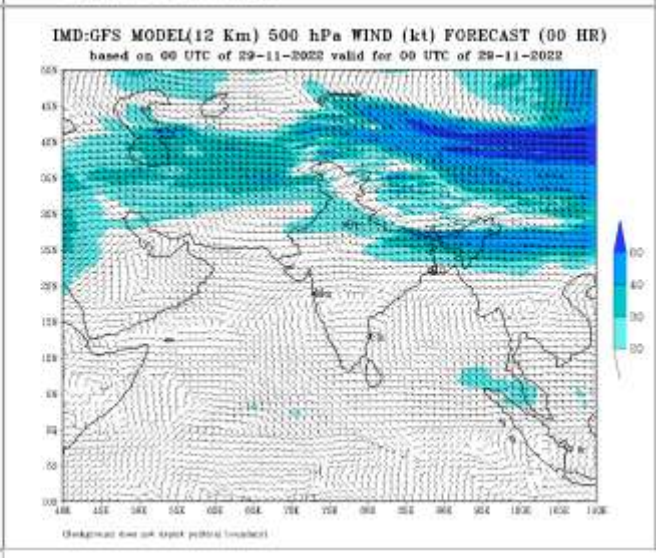
Annexure

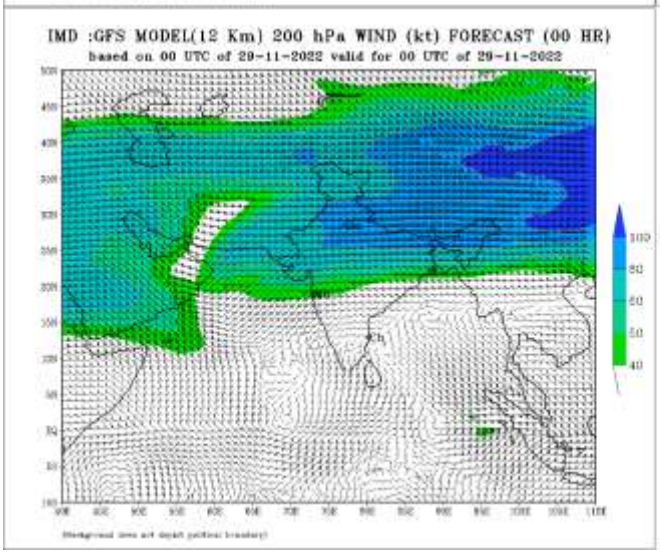

Tropical Cyclone Genesis Potential Parameter(GPP) (ANALYSIS)
Based on 29-11-2022 valid for 0000 UTC of 29-11-2022
(Potential Cyclogenesis Zone for GPP =>30)
Tropical Cyclone Genesis Potential Parameter(GPP) (24 HR FORECAST)
Based on 29-11-2022 valid for 0000 UTC of 30-11-2022
(Potential Cyclogenesis Zone for GPP =>30)
Tropical Cyclone Genesis Potential Parameter(GPP) (48 HR FORECAST)
Based on 29-11-2022 valid for 0000 UTC of 01-12-2022
(Potential Cyclogenesis Zone for GPP =>30)
Tropical Cyclone Genesis Potential Parameter(GPP) (72 HR FORECAST)
Based on 29-11-2022 valid for 0000 UTC of 02-12-2022
(Potential Cyclogenesis Zone for GPP =>30)
Tropical Cyclone Genesis Potential Parameter(GPP) (96 HR FORECAST)
Based on 29-11-2022 valid for 0000 UTC of 03-12-2022
(Potential Cyclogenesis Zone for GPP =>30)
Tropical Cyclone Genesis Potential Parameter(GPP) (120 HR FORECAST)
Based on 29-11-2022 valid for 0000 UTC of 04-12-2022
(Potential Cyclogenesis Zone for GPP =>30)
Tropical Cyclone Genesis Potential Parameter(GPP) (144 HR FORECAST)
Based on 29-11-2022 valid for 0000 UTC of 05-12-2022
(Potential Cyclogenesis Zone for GPP =>30)
Tropical Cyclone Genesis Potential Parameter(GPP) (168 HR FORECAST)
Based on 29-11-2022 valid for 0000 UTC of 06-12-2022
(Potential Cyclogenesis Zone for GPP =>30)

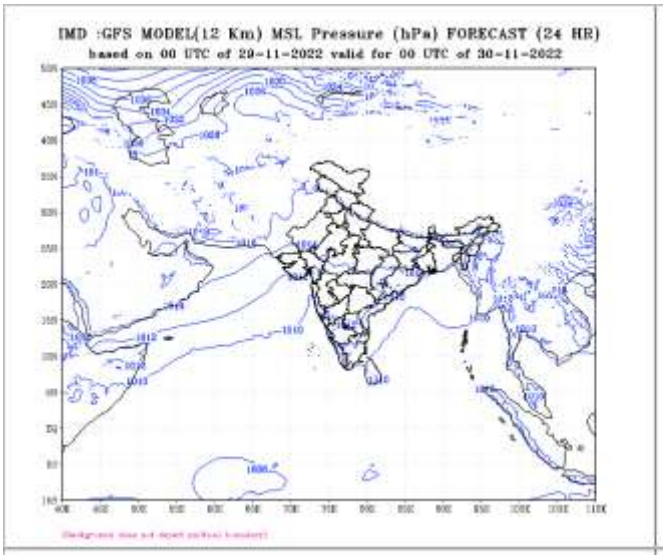

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (00 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 29-11-2022

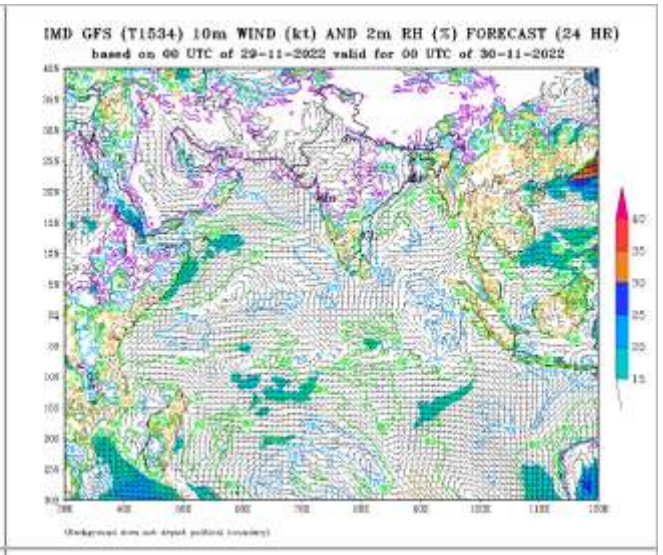

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (00 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 29-11-2022

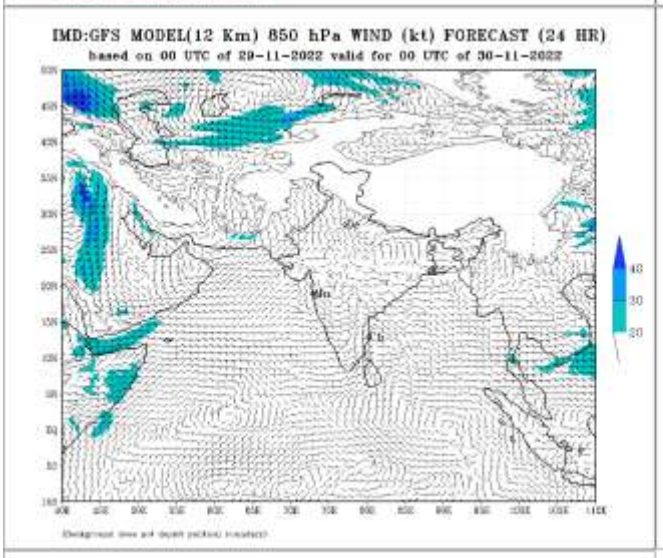

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (00 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 29-11-2022

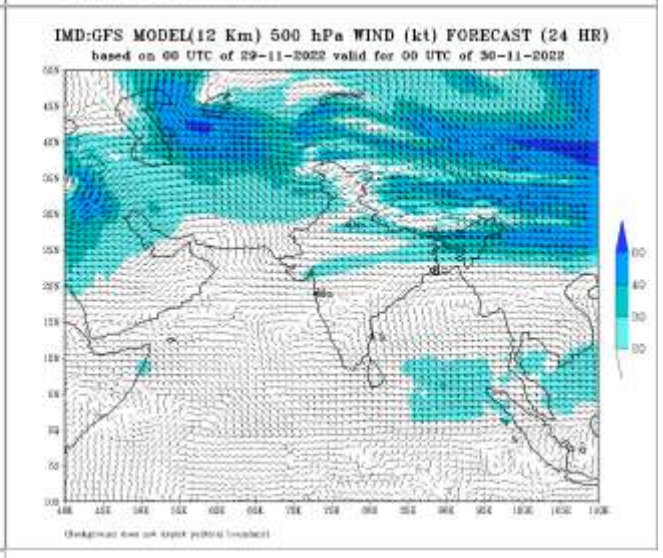

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (00 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 29-11-2022

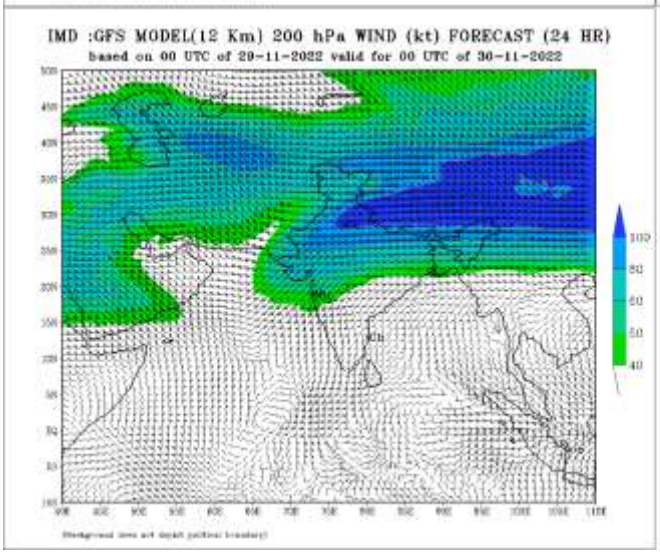

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (00 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 29-11-2022

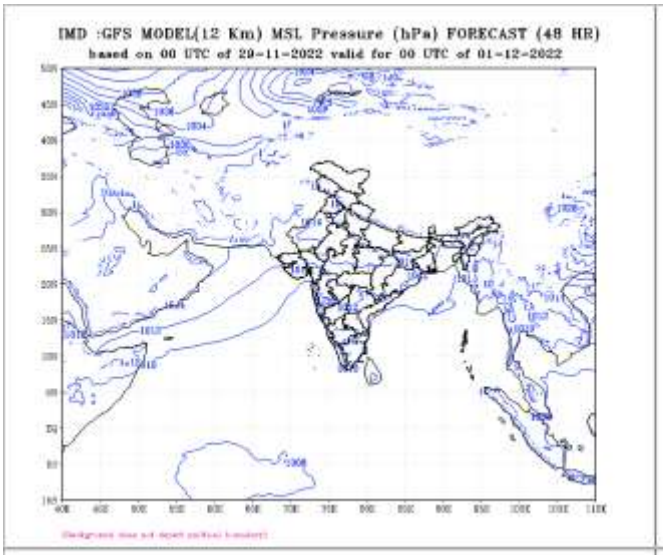

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (24 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 30-11-2022

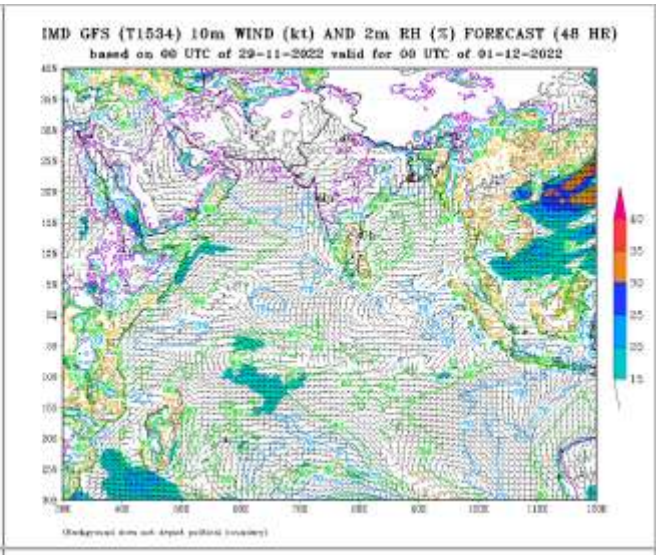

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (24 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 30-11-2022

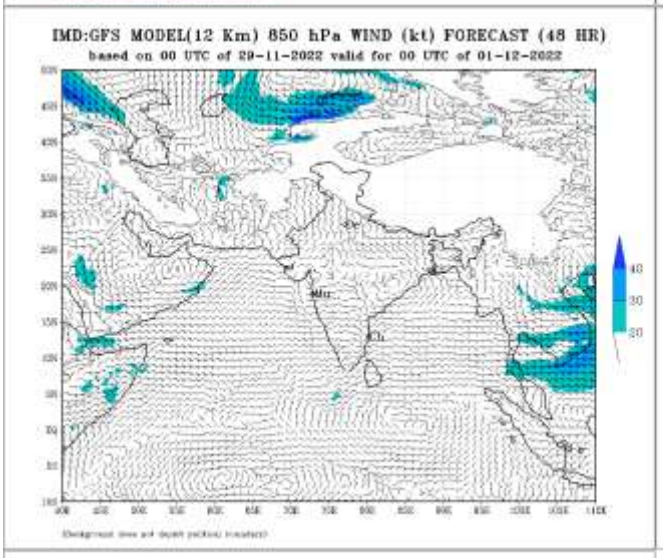

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (24 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 30-11-2022

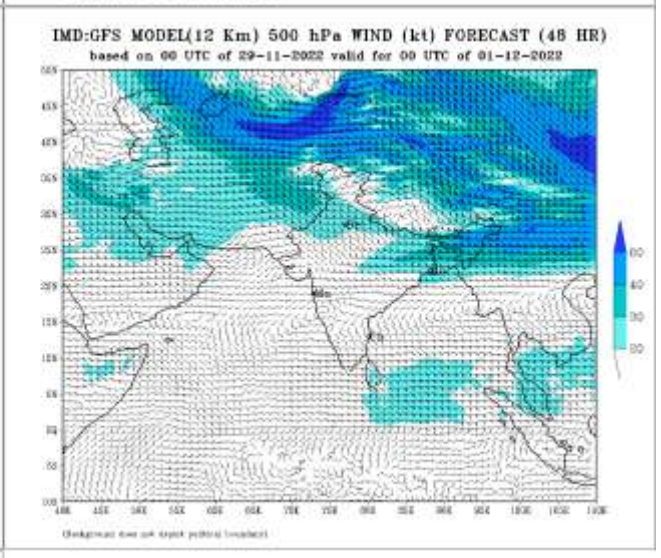

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (24 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 30-11-2022

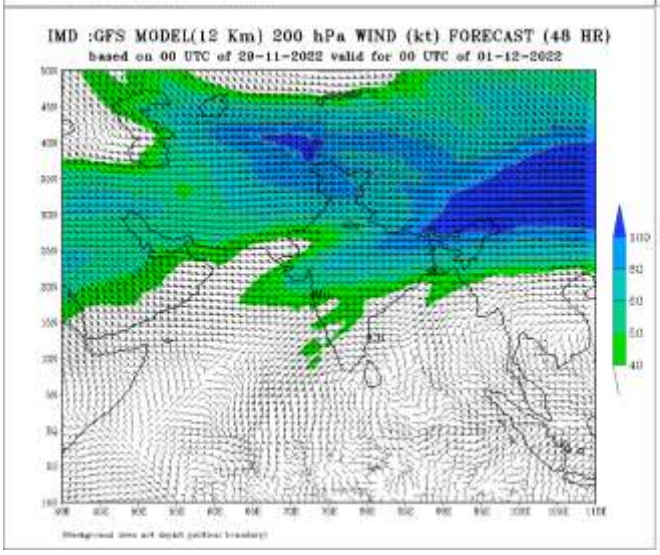

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (24 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 30-11-2022

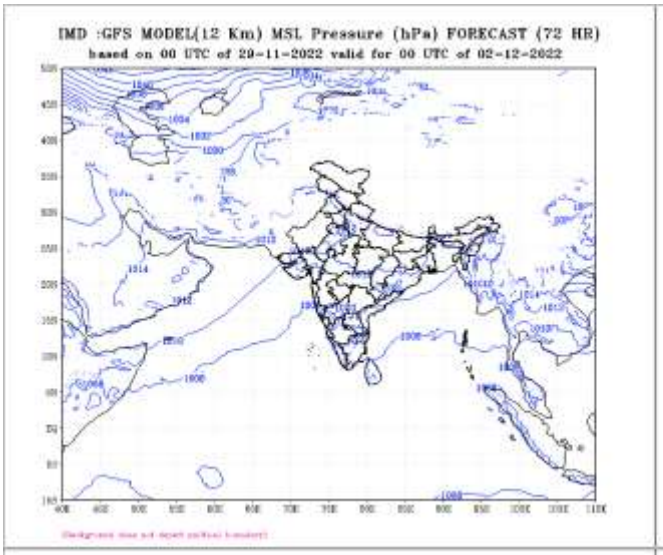

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (48 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 01-12-2022

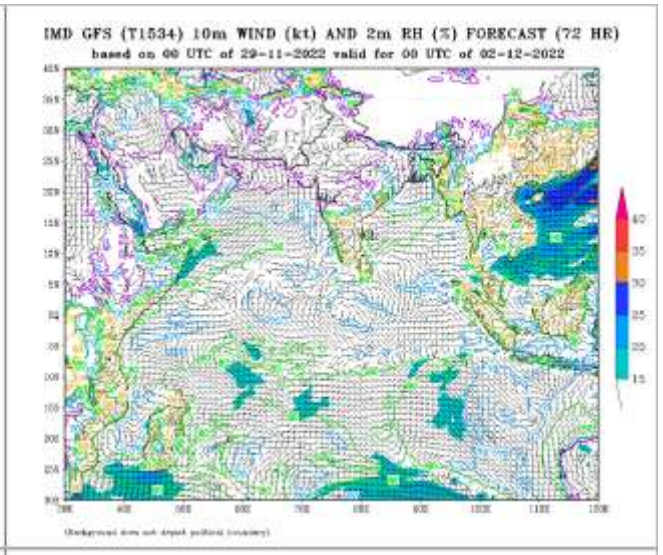

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (48 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 01-12-2022

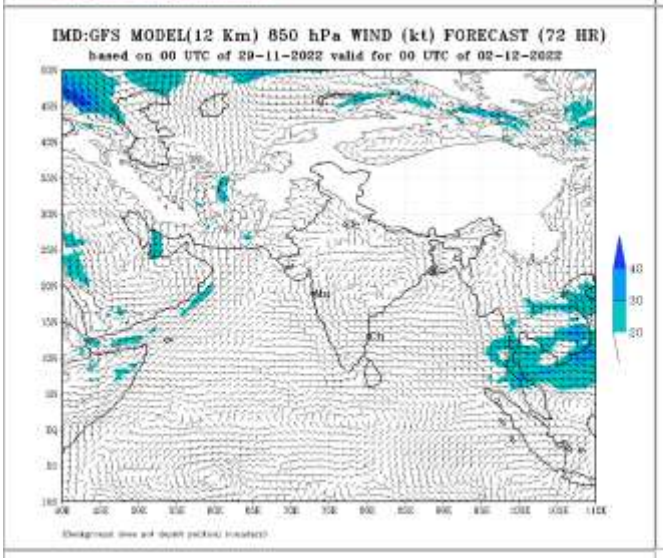

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (48 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 01-12-2022

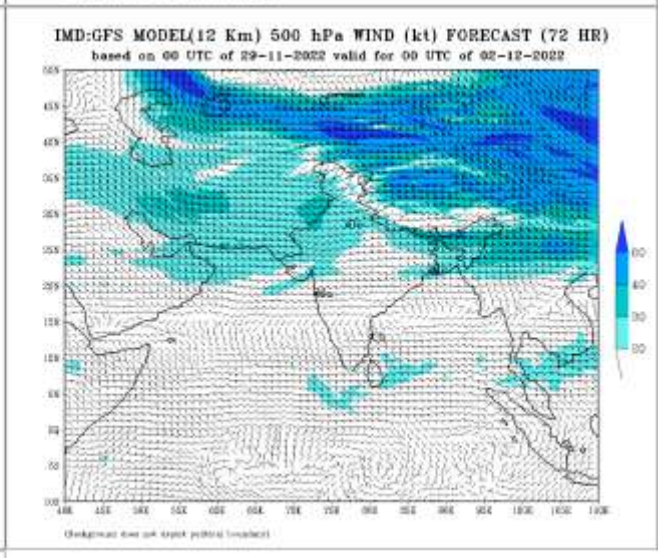

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (48 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 01-12-2022

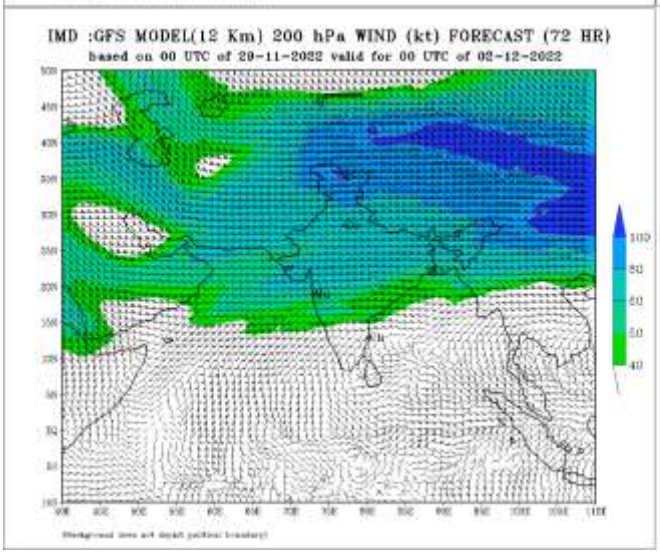

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (48 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 01-12-2022

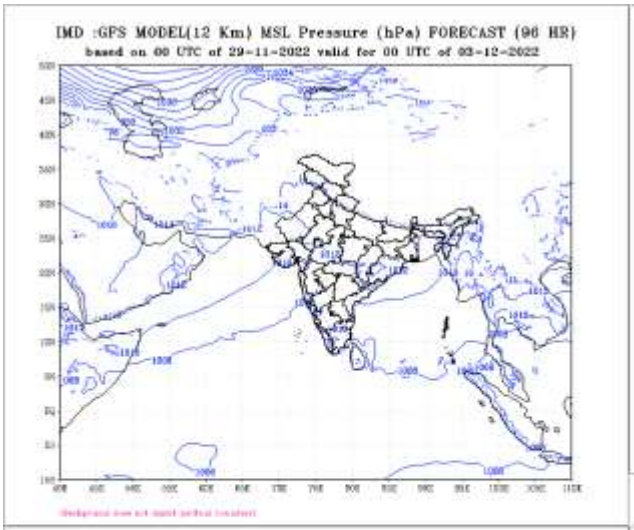

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (72 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 02-12-2022

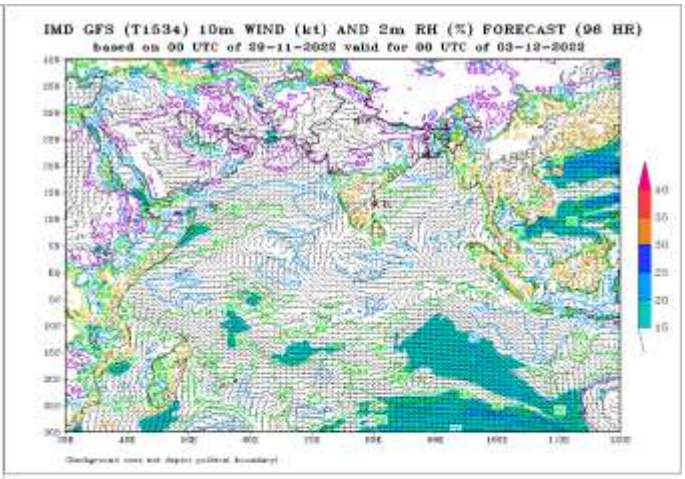

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (72 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 02-12-2022

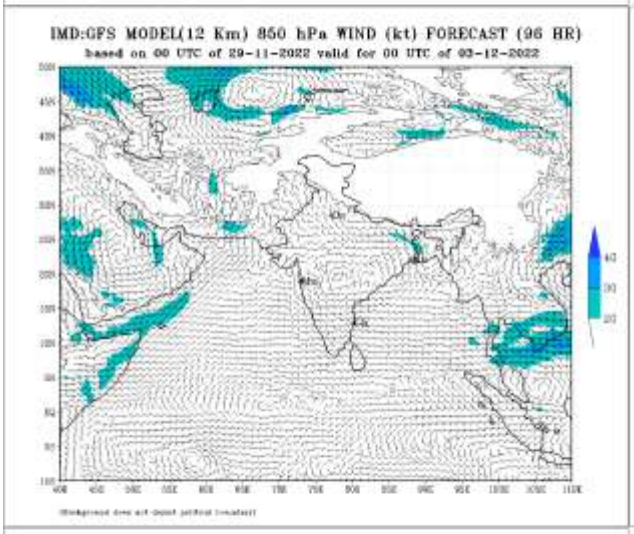

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (72 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 02-12-2022

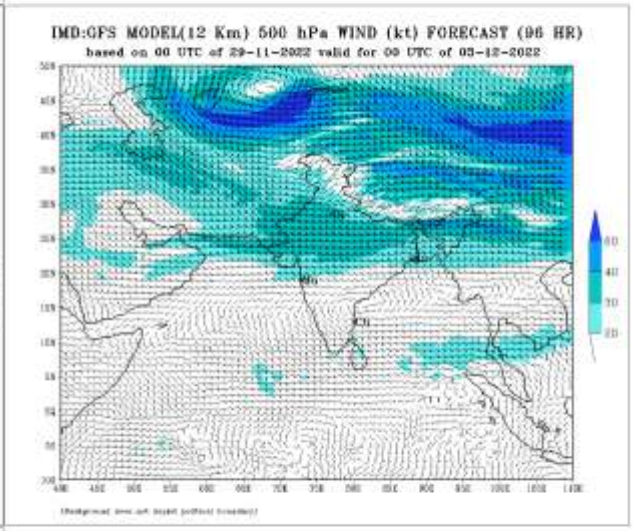

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (72 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 02-12-2022

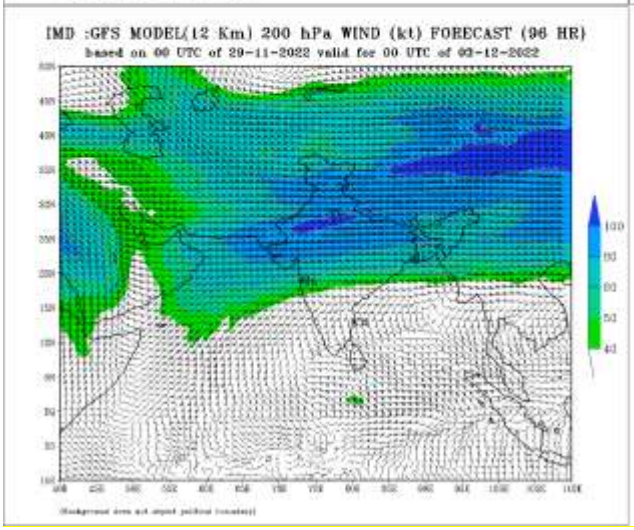

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (72 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 02-12-2022

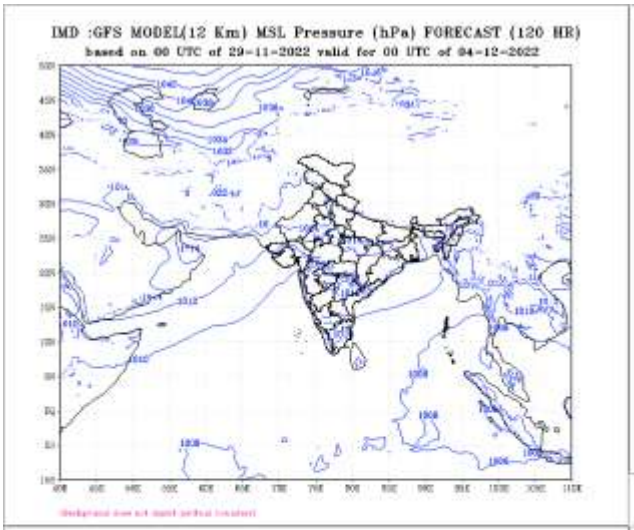

IMD :GPS MODEL(12 Km) MSL Pressure (hPa) FORECAST (96 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 03-12-2022

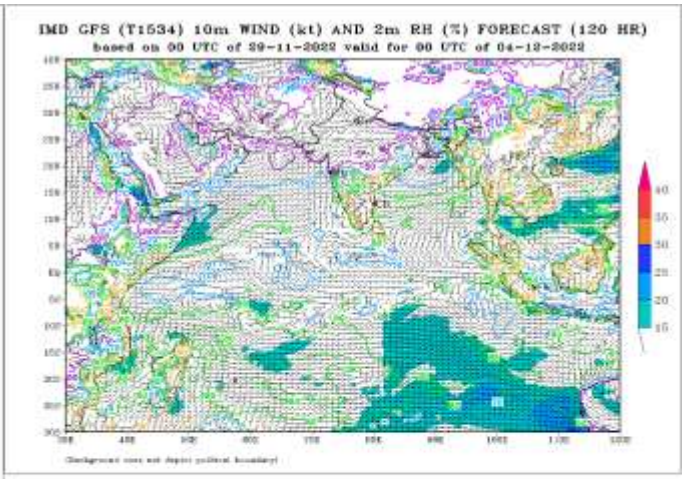

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (96 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 03-12-2022

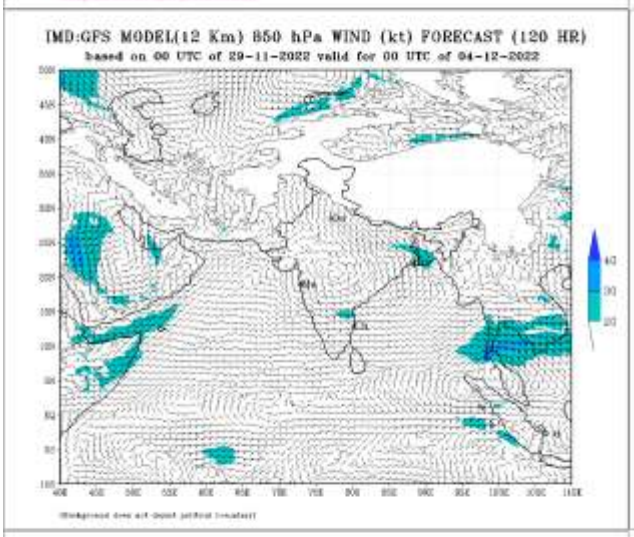

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (96 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 03-12-2022

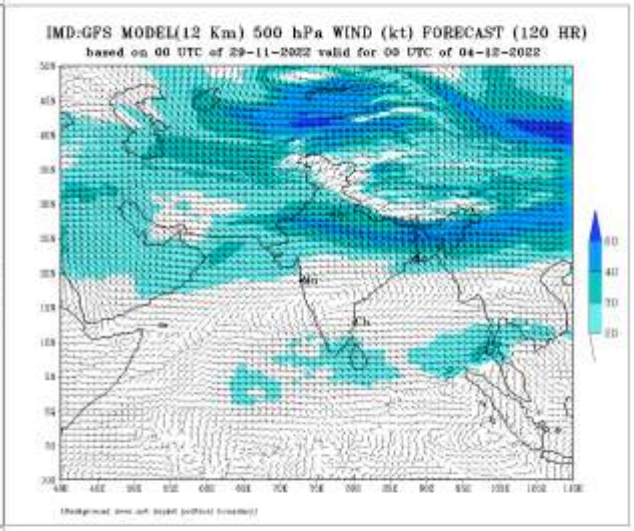

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (96 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 03-12-2022

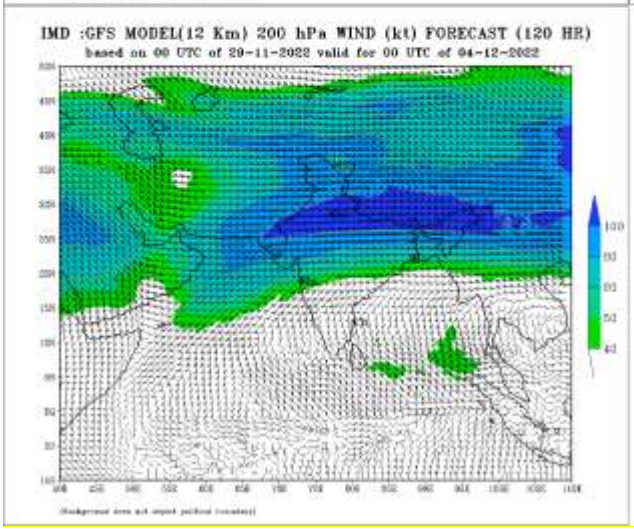

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (96 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 03-12-2022

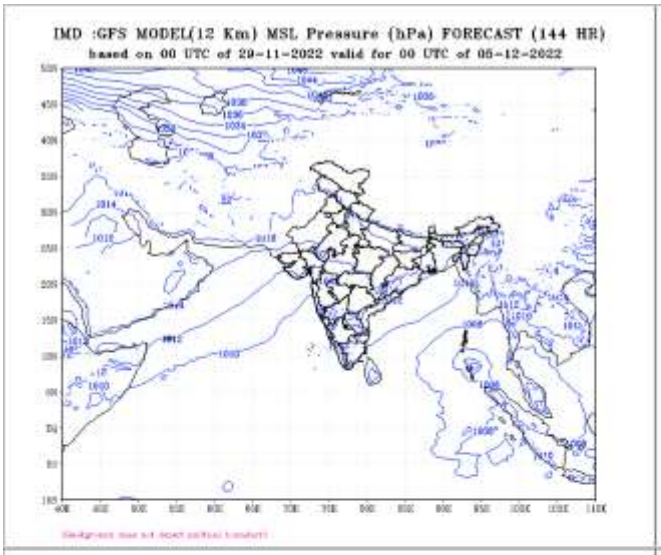

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (120 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 04-12-2022

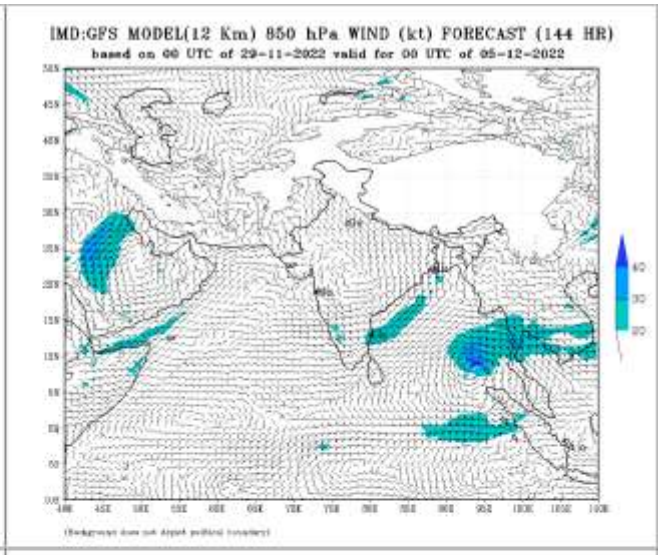

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (120 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 04-12-2022

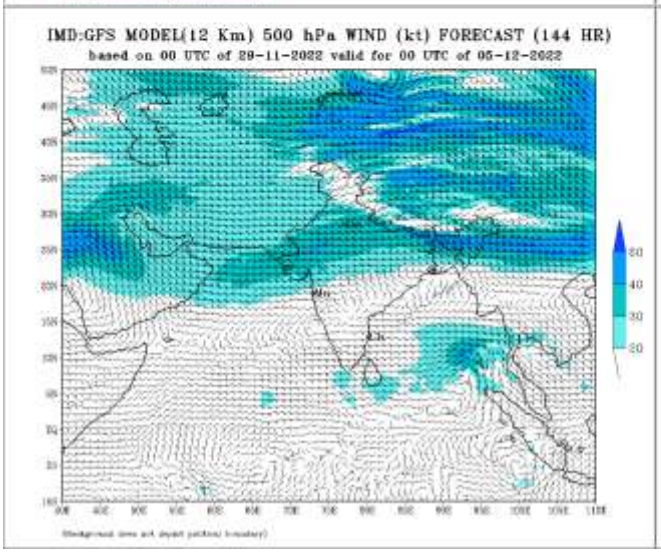

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (120 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 04-12-2022

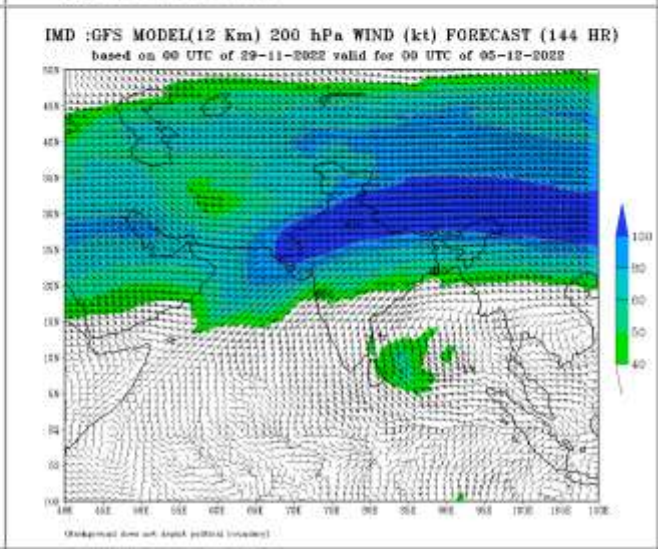

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (120 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 04-12-2022

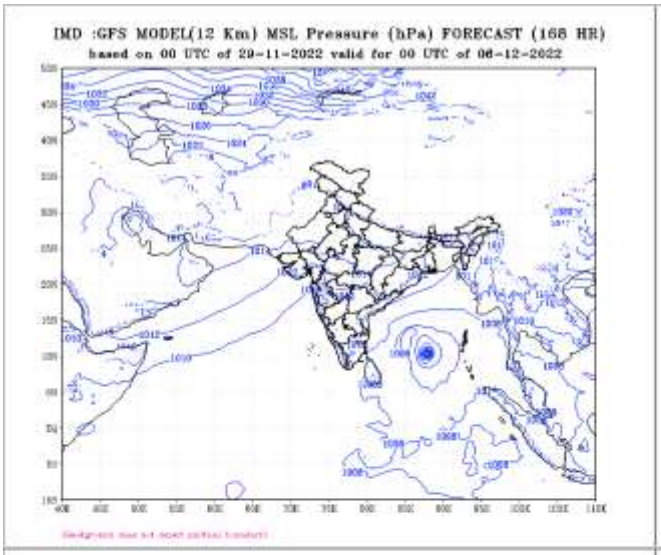

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (120 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 04-12-2022

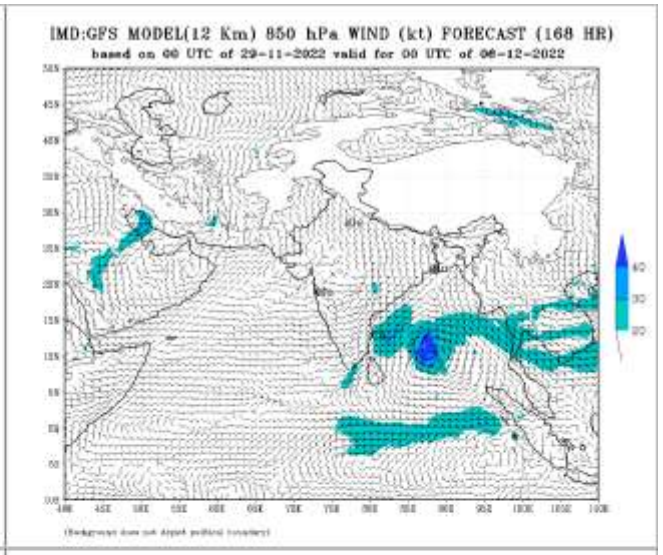

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (144 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 05-12-2022

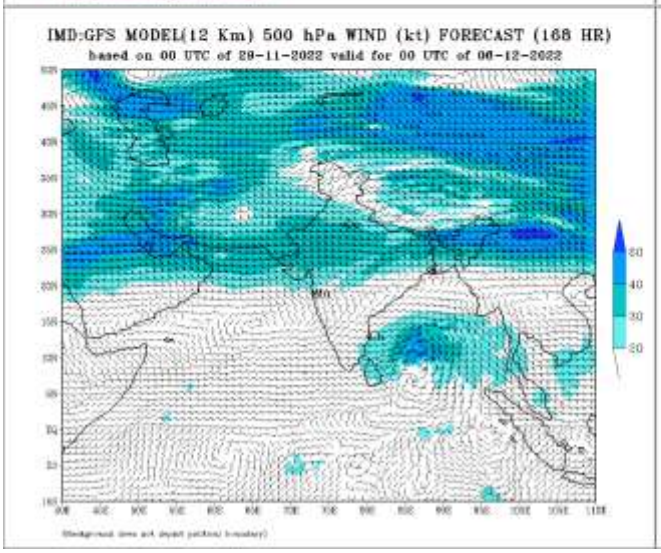

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (144 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 05-12-2022

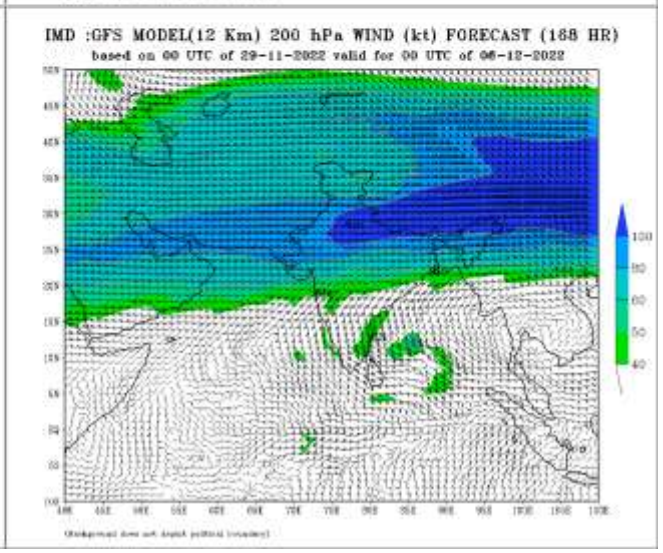

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (144 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 05-12-2022


IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (144 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 05-12-2022


IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (168 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 06-12-2022


IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 06-12-2022


IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 06-12-2022


IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 29-11-2022 valid for 00 UTC of 06-12-2022