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

FDP (Cyclone) NOC Report Dated 04th December, 2021

Time of Issue: 1200 UTC

Synoptic features (based on 0900 UTC analysis):

❖ Yesterday's Cyclonic Storm "JAWAD" (pronounced as JOWAD) over westcentral bay of Bengal (BoB) moved nearly north-northwestwards during past 24 hours and lay centered at 1430 hrs IST of today, the 04th December 2021, over westcentral BoB near Lat. 16.5°N and Long. 84.7°E, about 200 km east-southeast of Vishakhapatnam (Andhra Pradesh), 310 km south-southwest of Gopalpur (Odisha), 380 km south-southwest of Puri (Odisha) and 470 km south-southwest of Paradip (Odisha). It is likely to move nearly northwards and weaken into a Deep Depression during next 06 hours and then move north-northeastwards along Odisha coast and reach near Puri around 5th December noon. Subsequently, it is likely to weaken further and continue to move north-northeastwards along Odisha coast towards West Bengal coast.

❖ The cyclonic circulation over Northeast Arabian Sea off south Gujarat coast between 1.5 & 3.1 km above mean sea level persists.

❖ A cyclonic circulation lay over Gulf of Mannar & neighbourhood extending upto 0.9 km above mean sea level at 0830 hours IST of today, the 4th December and it persisted over the same region at 1430 hours IST.

Dynamical and thermodynamical features

Parameter	Bay of Bengal (BoB)	Arabian Sea (AS)
Sea Surface Temperature (SST) ºC	28-29°C over westcentral BoB. Slightly less 27-28°C over northwest BoB.	28-29°C over major parts of AS. 29-308°C over eastcentral AS off Kerala coast.
Tropical Cyclone Heat Potential (TCHP) kJ/cm²	80-100 over westcentral BoB. Gradually decreasing becoming 50-60 over northwest BoB.	70-80 over southeast & parts of eastcentral AS. 50-60 over central AS. Less than 50 over major parts of west AS.
Cyclonic Relative vorticity (X10^{-6}s^{-1})	Vorticity has decreased during past 24 hours and is around 100 to the southwest of system centre with vertical extension upto 500 hPa.	40 to 50 over northeast AS off south Gujarat coast with vertical extension upto 500 hPa.
Low Level convergence (X10^{-5}s^{-1})	Low level convergence is 30 to the north of system centre.	05-10 over Maharashtra and Konkan coasts.
Upper Level divergence (X10^{-5}s^{-1})	20 to the northeast of system centre.	05-10 over extreme southwest BoB
Vertical Wind Shear (VWS	Moderate (15-20) over system centre and also over adjoining	Moderate 15-20 over southwest AS. High over major parts of AS.

Knots)	northwest BoB.	
Wind Shear Tendency (knots)	Decreasing over the system area and also over norththwest BoB.	Decreasing over southeast AS.
Upper tropospheric Ridge	Along 18.0°N over the central BoB.	Not well defined..

Satellite observations based on INSAT imagery (0900 UTC):

(a) Cyclonic storm "JAWAD" over southeast BoB:
The cloud mass has disorgansied. The intensity of the system is characterized as T 2.0/C.I. 2.5. Cloud bands with embedded moderate to intense convection are seen over north coastal Andhra Pradesh, Odisha, Jharkhand, gangetic West Bengal and southeast Bihar. Associated broken low & medium clouds with embedded intense to very intense convection lay over westcentral & north BoB between latitude 15.5N & 22.0N and longitude 82.5E & 92.0E. Minimum cloud top temperature is minus 93deg C.

(b) Arabian Sea
At 0900 UTC, scattered low & medium clouds with embedded moderate to intense convection lay over southeast Arabian Sea off Kerala and Comorin Area.

M.J.O. Index:
MJO index is currently in Phase 6 with amplitude more than 1. It will continue in same phase for next 7 days.

Storms and Depression over South China Sea/ South Indian Ocean:
No system over the area.

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

Model	BoB	AS
IMD-GFS	Indicates a **Cyclonic Storm** (CS) over west-central BoB at 00 UTC of 4th December, as a Deep Depression over west-central BoB close to north Andhra Pradesh coast at 00 UTC of 5th, as a Low Pressure Area (LPA) over northwest Bay of Bengal off Odisha coast at 1200 UTC of 5th, over northwest BoB off west Bengal coast on 6th, over south Bangladesh and adjoining north BoB at 00 UTC of 7th and further weakening by 0600 UTC of 7th.	No significant development is indicated.
IMD-GEFS	Indicates a **Cyclonic Storm** (CS) over west-central BoB at 00 UTC of 4th December, as a Depression over northwest & adjoining west-central BoB off south Odisha - north Andhra Pradesh coasts on 5th, as a Low pressure area over northwest Bay of Bengal off West Bengal coast on 6th and weakening on 7th.	Same as above
IMD-WRF	Indicates a CS over central BoB on 4th, over west-central & adjoining northwest BoB on 5th, as a Depression over interior Odisha, after crossing south Odisha coast on 6th and as an LPA over Gangetic West Bengal on 7th.	No significant development is indicated.
NCMRWF-NCUM(Global)	Indicates a CS over west-central BoB off Andhra Pradesh coast on 4th, over west-central & adjoining northwest BoB off north Andhra Pradesh – south Odisha coasts on 5th, as a Depression over north coastal Odisha on	No significant development is indicated.

	6th, as an LPA over north BoB off West Bengal coast on 7th and weakening on 8th.	
NCMRWF-NEPS	Similar to NCUM-G	Similar to NCUM-G
NCMRWF-UM (Regional)	Indicates a Deep Depression over central BoB off Andhra Pradesh coast on 4th, over northwest BoB off south Odisha coast on 5th, as an LPA over northwest BoB off north Odisha coast on 6th & 7th.	Same as above
ECMWF	A Depression over west-central BoB on 4th, a Well Marked Low (WML) over northwest & adjoining west-central BoB off south Odisha - Andhra Pradesh coasts on 5th, as an LPA over coastal West Bengal and adjoining northwest BoB on 6th, over Bangladesh on 7th and dissipation on 8th.	No significant development is indicated.
ECMWF-EPS	90-100 % probability of cyclogenesis / strike over northwest BoB and coastal Odisha on 7th and 40-50% over West Bengal coast on 8th.	Nil
NCEP-GFS	Indicates an LPA over northwest BoB off south Odisha coast on 5th and weakening on 6th.	No Low pressure system predicted.
IMD-GPP	Could not be generated due to technical problem.	Could not be generated due to technical problem.

GPP- Genesis Potential Parameter based on Dynamical Statistical model developed by IMD.

Summary and Conclusion:

Most of the models are indicating that the current Cyclonic Storm (JAWAD) over west-central BoB would re-curve north-northeastwards and weaken gradually into a Low Pressure Area over north Bay of Bengal & adjoining Bangladesh by 7th December. However, a few of them like WRF are still indicating that the system would cross south Odisha coast on 5th.

It may thus be concluded that,

1. The **Cyclonic Storm 'JAWAD'** is likely **to** move nearly northwards and **weaken into a Deep Depression** during next 03 hours and then move north-northeastwards along Odisha coast and reach near Puri around 5th December noon. Subsequently, **it is likely to weaken further** and continue to move north-northeastwards along Odisha coast towards West Bengal coast.

2. No significant development is likely over the Arabian Sea during next 7 days.

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

Advisory: The movement & intensity of the Cyclonic Storm 'JAWAD' over west-central Bay of Bengal and its remnant is to be monitored regularly.

IOP is suggested for Odisha & West Bengal coasts on 5th December.

GPP Not available due to technical problems

GPP Not available due to technical problems

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (00 HR)
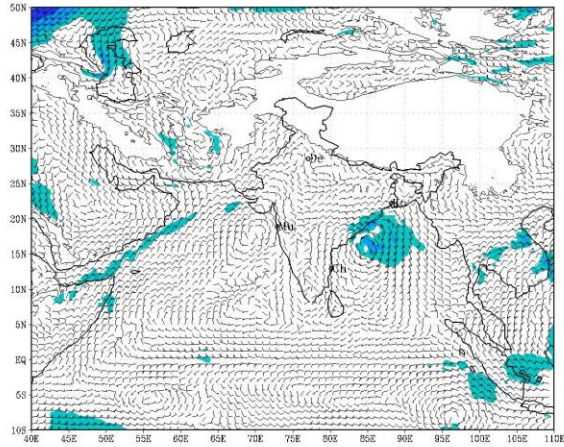based on 00 UTC of 04-12-2021 valid for 00 UTC of 04-12-2021
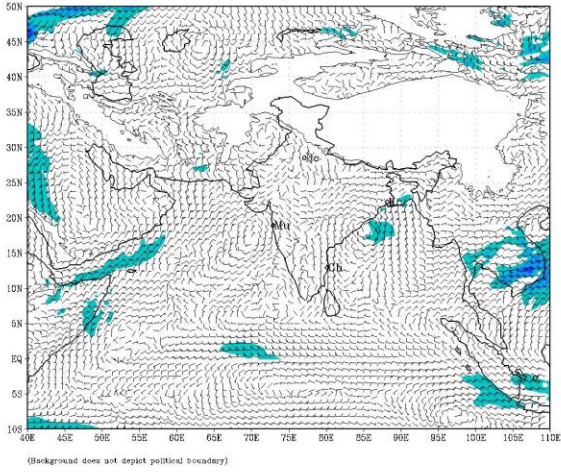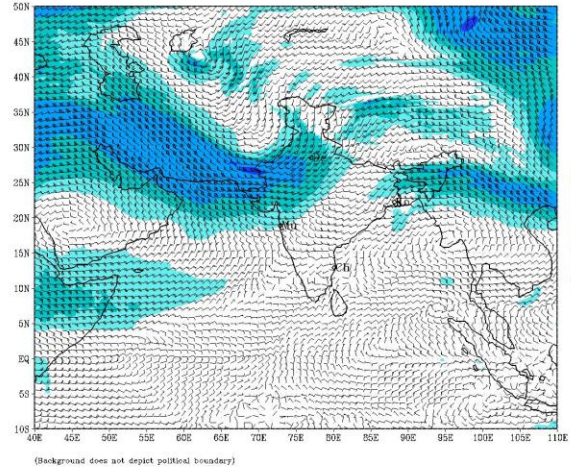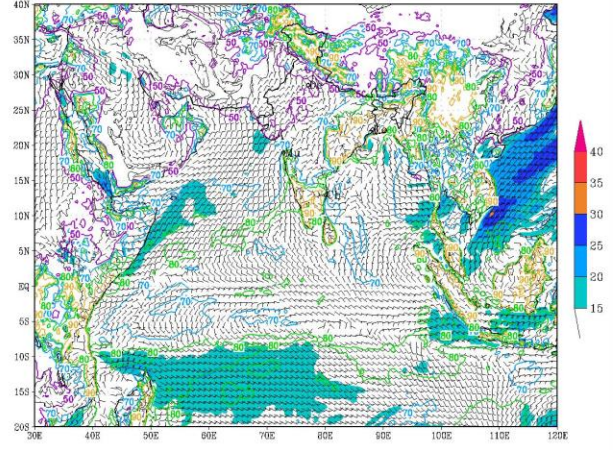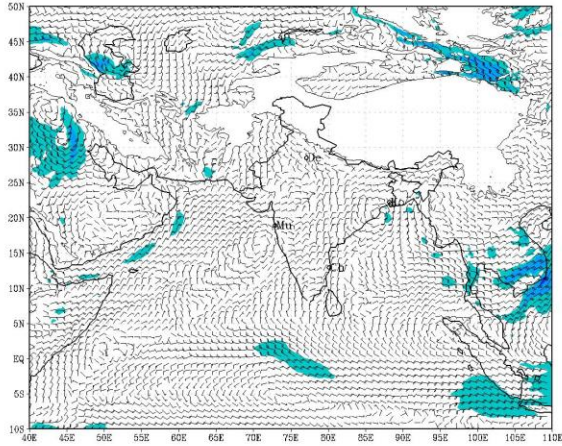(Background does not depict political boundary)
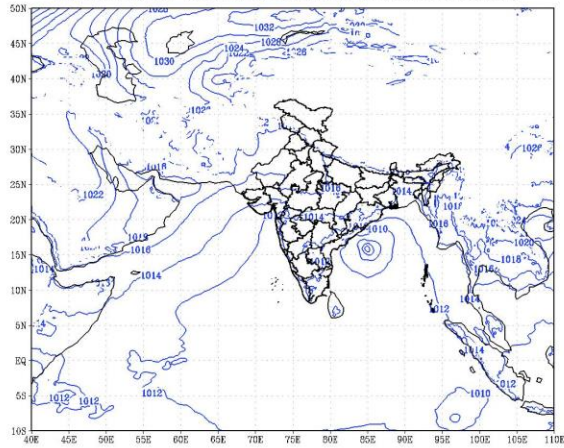
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (00 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 04-12-2021
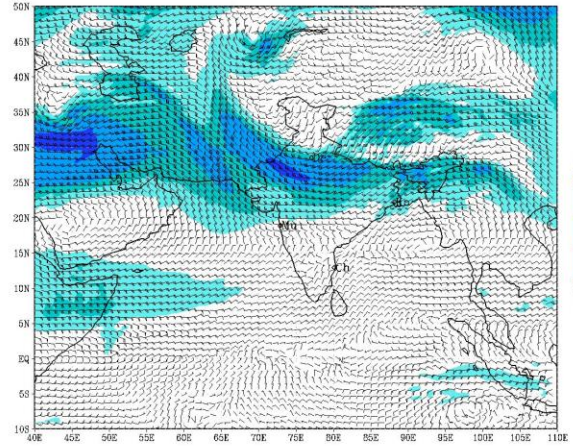(Background does not depict political boundary)
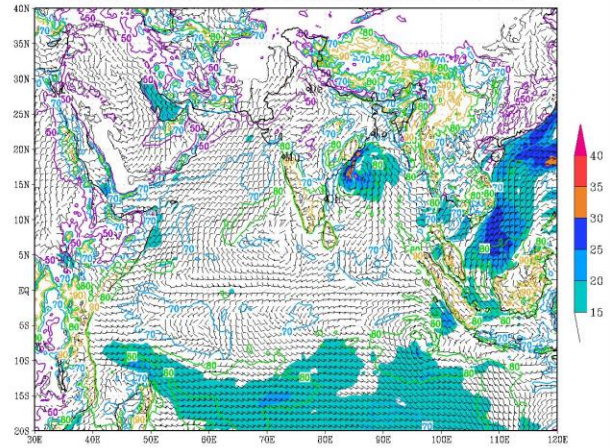
IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (00 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 04-12-2021
(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (00 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 04-12-2021
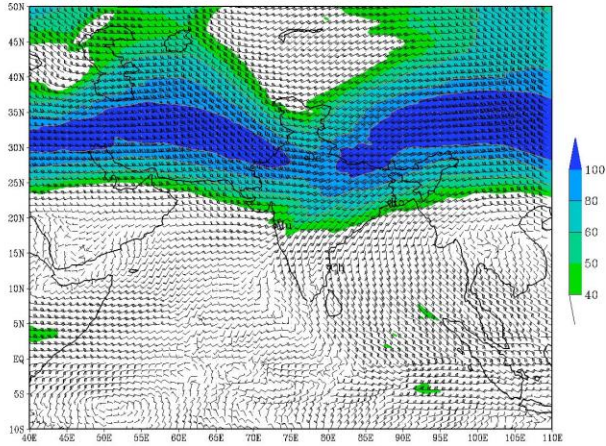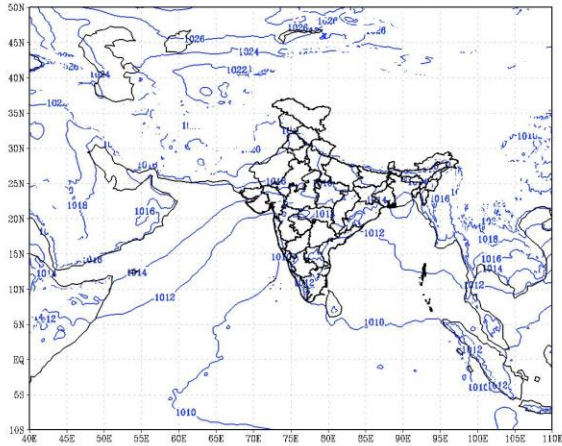(Background does not depict political boundary)
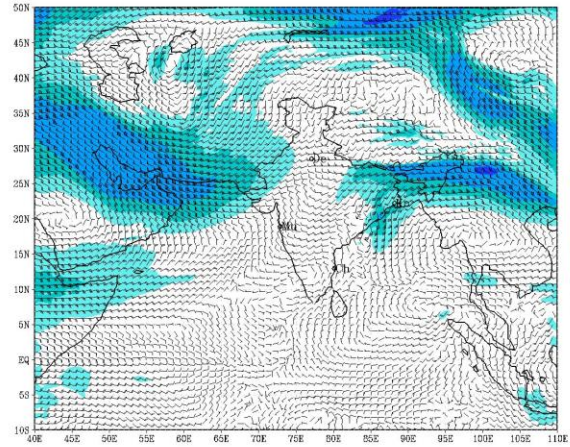
IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (00 HR)
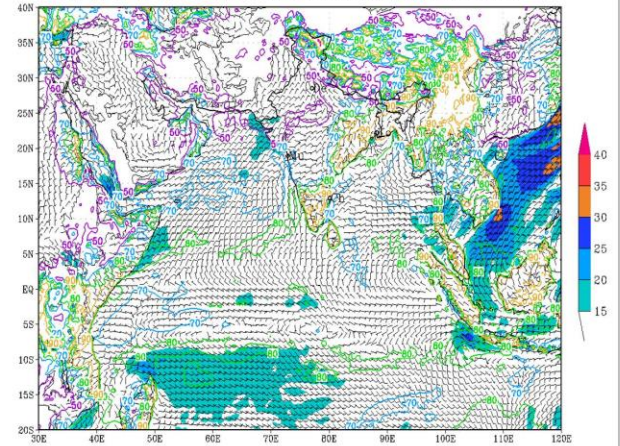based on 00 UTC of 04-12-2021 valid for 00 UTC of 04-12-2021
(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (24 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 05-12-2021
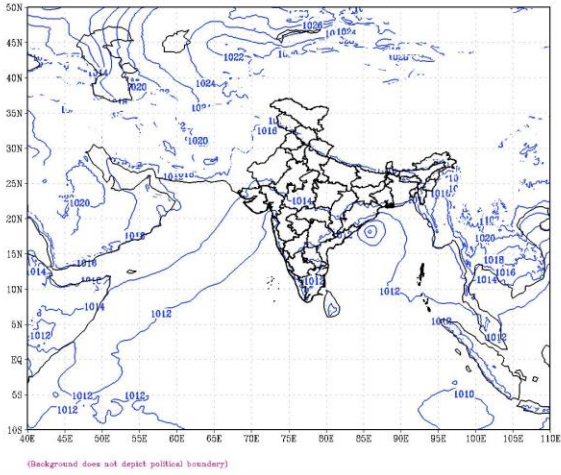
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (24 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 05-12-2021
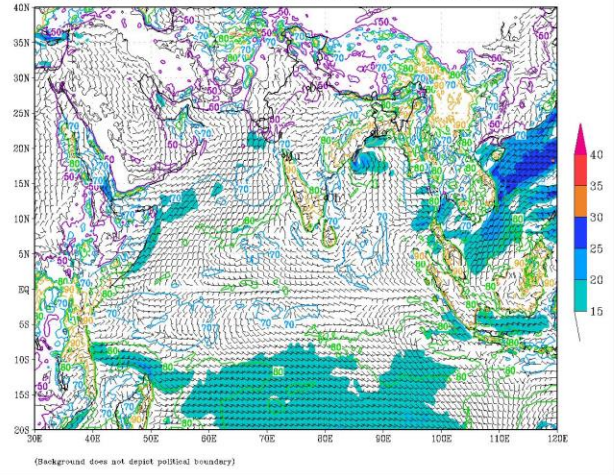
IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (24 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 05-12-2021

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (24 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 05-12-2021

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (24 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 05-12-2021

7
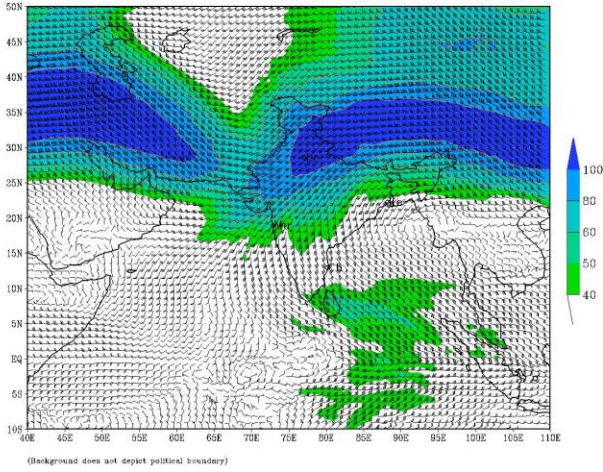
IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (48 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 06-12-2021
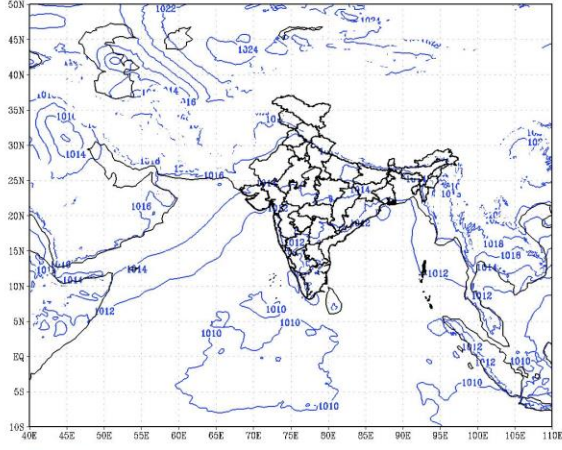
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (48 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 06-12-2021

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (48 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 06-12-2021

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (48 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 06-12-2021

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (48 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 06-12-2021

(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (72 HR)
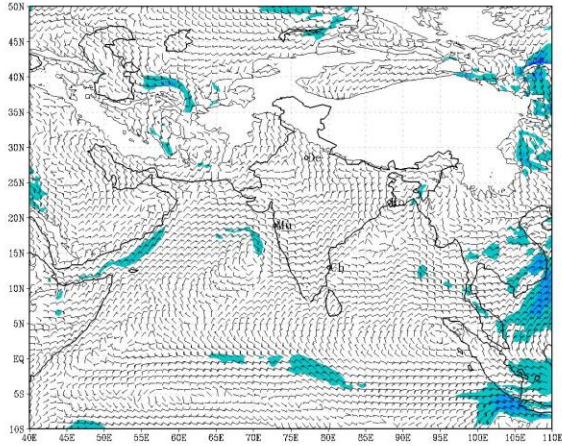based on 00 UTC of 04-12-2021 valid for 00 UTC of 07-12-2021

(Background does not depict political boundary)

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (72 HR)
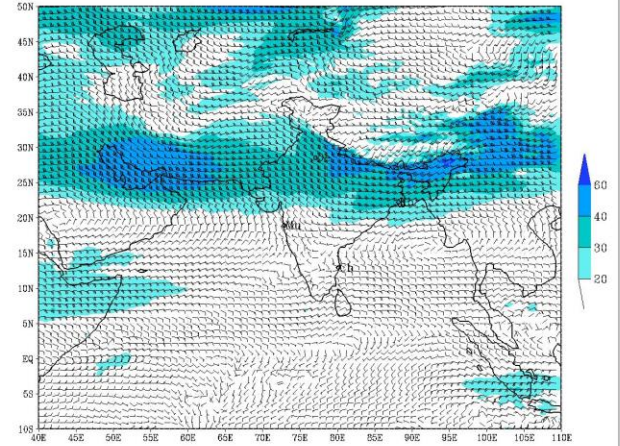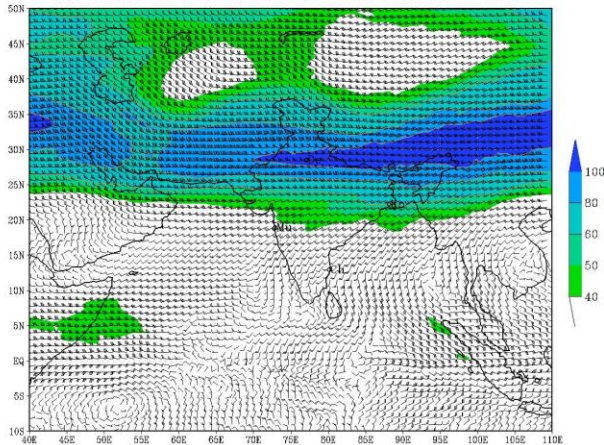based on 00 UTC of 04-12-2021 valid for 00 UTC of 07-12-2021

(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (72 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 07-12-2021

(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (72 HR)
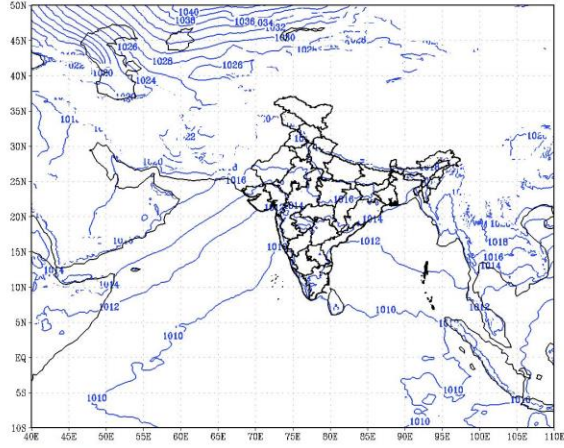based on 00 UTC of 04-12-2021 valid for 00 UTC of 07-12-2021

(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (72 HR)
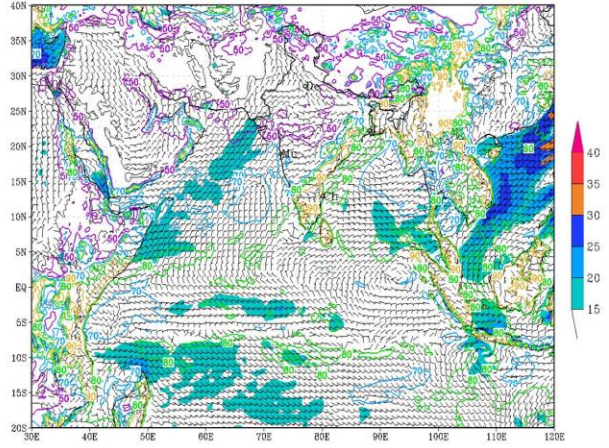based on 00 UTC of 04-12-2021 valid for 00 UTC of 07-12-2021

(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (96 HR)
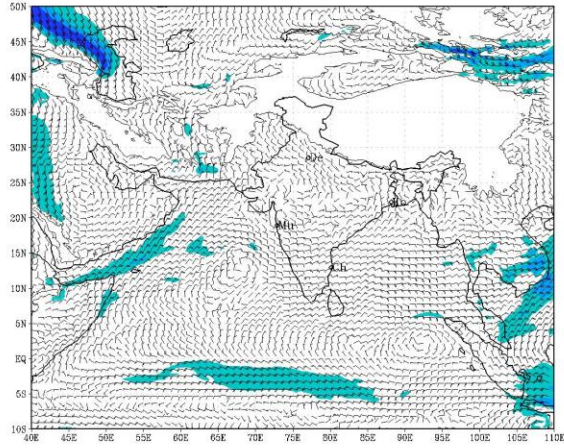based on 00 UTC of 04-12-2021 valid for 00 UTC of 08-12-2021

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (96 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 08-12-2021

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (96 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 08-12-2021

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (96 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 08-12-2021

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (96 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 08-12-2021

(Background does not depict political boundary)

10

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (120 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 09-12-2021

(Background does not depict political boundary)

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (120 HR)
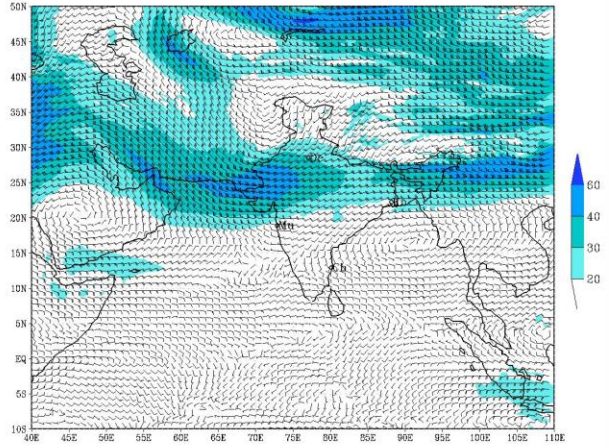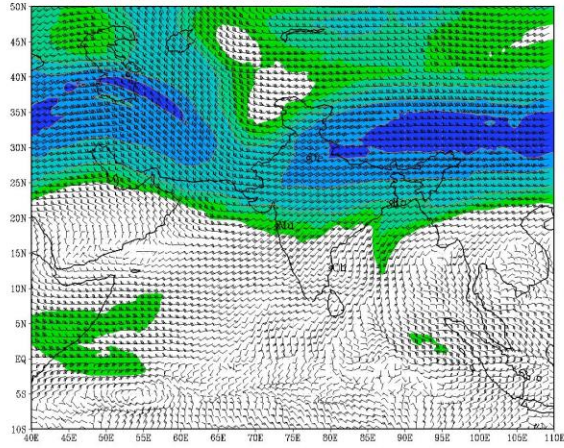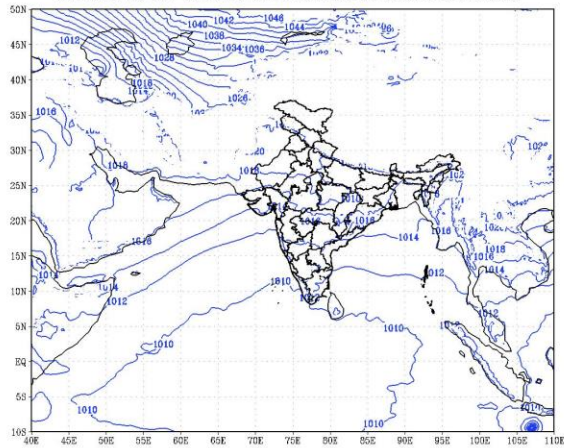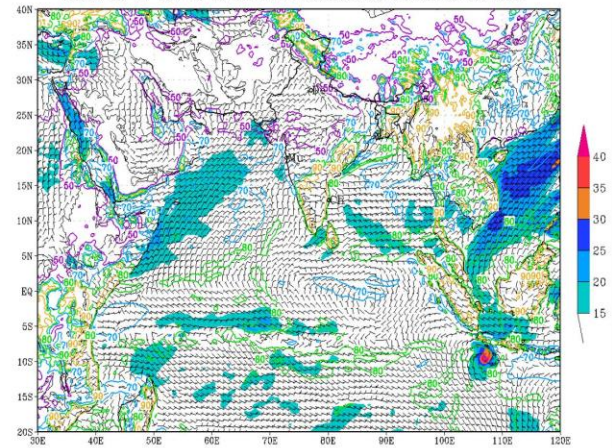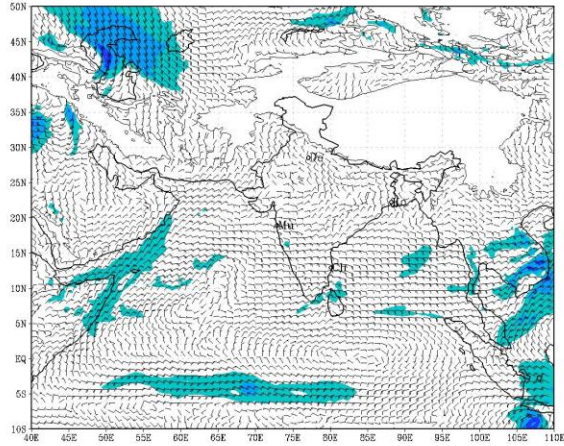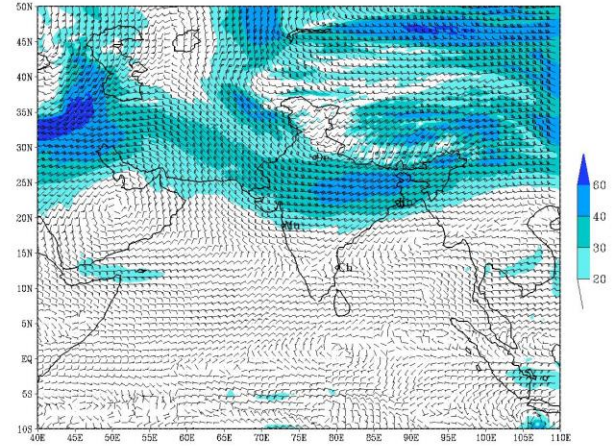based on 00 UTC of 04-12-2021 valid for 00 UTC of 09-12-2021

(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (120 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 09-12-2021
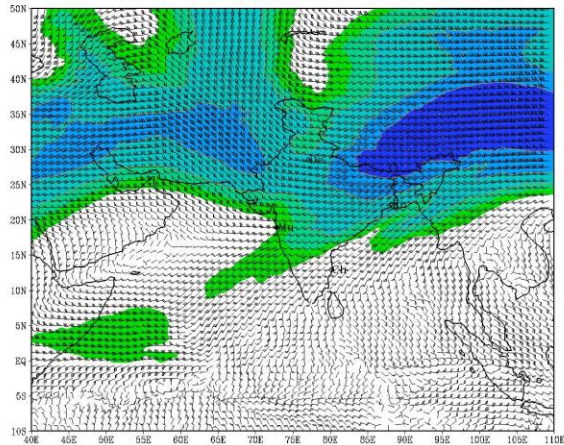
(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (120 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 09-12-2021
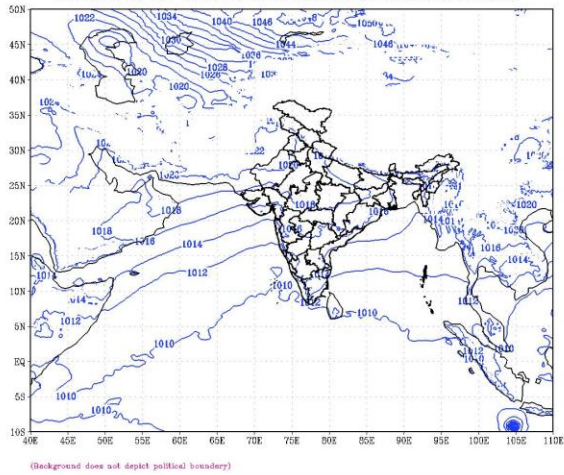
(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (120 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 09-12-2021

(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (144 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 10-12-2021

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (144 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 10-12-2021

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (144 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 10-12-2021

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (144 HR)
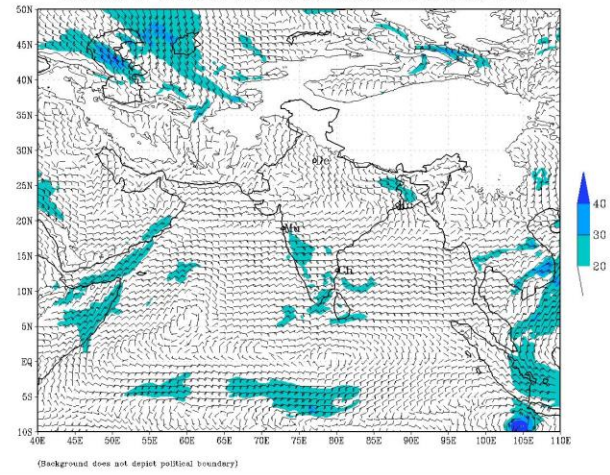based on 00 UTC of 04-12-2021 valid for 00 UTC of 10-12-2021

(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (168 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 11-12-2021

(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 11-12-2021

(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 11-12-2021

(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 04-12-2021 valid for 00 UTC of 11-12-2021

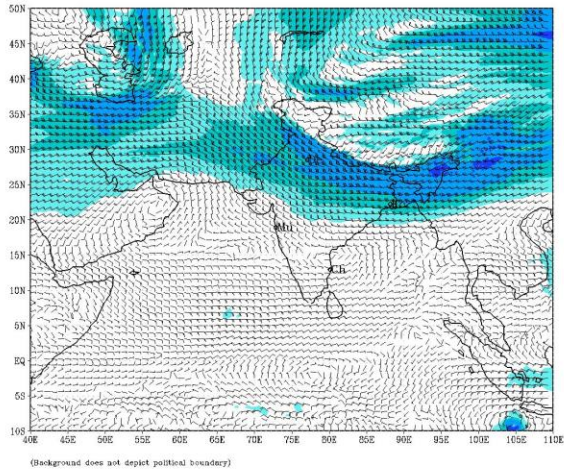(Background does not depict political boundary)