



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

**Tropical Cyclone Forecast Programme
Report Dated 23rd November, 2023**

Time of Issue: 1230 UTC

Synoptic features (based on 0300 UTC analysis):

A Cyclonic Circulation is likely to emerge over South Andaman Sea & neighbourhood around 25th November. Under its influence, a Low Pressure Area is likely to form over South Andaman Sea & neighbourhood around 26th November. It is likely to move west-northwestwards and intensify into a Depression over Southeast Bay of Bengal & adjoining Andaman Sea around 27th November.

Dynamical and thermo-dynamical features

Parameter	Bay of Bengal (BoB)	Arabian Sea (AS)
Sea Surface Temperature (SST) °C	28-30 ⁰ C over major parts of BoB. 26-28 ⁰ C over parts of westcentral and north BoB.	29-30 over southeast, adjoining southwest and eastcentral AS and north AS. 26-28 over most parts of central adjoining AS.
Tropical Cyclone Heat Potential (TCHP) kJ/cm²	70-90 over Andaman Sea and parts of eastcentral BoB. 90-100 over southwest BoB.	100-110 over parts of south and eastcentral AS.
Cyclonic Relative vorticity (X10⁻⁶s⁻¹)	20-30 over parts of southwest BoB adjoining to EIO, 10-20 over parts of southeast BoB and south Andaman Sea, northeast BoB.	20-30 over parts of Comorin area, southwest AS. 10-20 over most parts of AS.
Low Level convergence (X10⁻⁵ s⁻¹)	5-10 over southwest BoB adjoining to EIO	5-10 over parts of southeast AS, 5 over parts of southwest AS, -5 over parts of central and north AS.
Upper Level divergence (X10⁻⁵ s⁻¹)	5-10 over southwest BoB adjoining to EIO. 10 over South Andaman Sea, westcentral BoB along and of south Andhra Pradesh coast. -5 to -10 over northeast BoB.	10-20 over southeast AS, Lakshadweep area, along and off Kerala coast, 5 over parts of southwest AS, -5 to -10 over parts of eastcentral AS, along and off Gujarat and Maharashtra coast. -10 over north AS.
Vertical Wind Shear (VWS knots) Low: 05-10 knots	5-15 knots over south Andaman Sea. 5-10 over south BoB. 20 knots over parts of central BoB and north Andaman Sea. High (>20knots) over central & north	5-15 over the south AS, 20 over southern parts of central AS, High (>20 knots) over the central and North AS.

Moderate:10-20 knots High: >20 knots	BoB.	
Wind Shear Tendency (knots)	Decreasing over south BoB and adjoining Andaman Sea, north BoB. Increasing over central BoB.	Decreasing over southeast and adjoining southwest AS, increasing over remaining parts of AS.
Upper Tropospheric Ridge	Along 12°N over BoB.	Along 11°N over AS.

Satellite observations based on INSAT imagery (0300 UTC):

(a) Over the Bay of Bengal & Andaman Sea:-

Scattered low and medium clouds with embedded moderate to intense convection lay over southwest adjoining westcentral Bay of Bengal, south Andaman Sea and isolated weak to moderate convection lay over southeast Bay of Bengal.

(b) Over the Arabian Sea:-

Scattered Low and Medium Clouds with Embedded Intense to Very Intense Convection lay Over Southeast Arabian Sea off Kerala Coast and Moderate to Intense Convection over Rest of South Arabian Sea Comorin Area.

(c) Convection outside India:-

Scattered low and medium clouds with embedded moderate to intense convection lay over Sri Lanka Palk Strait, Gulf of Mannar, Maldives, Bhutan, Tibet, China, Yellow Sea, Gulf of Thailand, Cambodia, South Vietnam, Sumatra, Strait of Malacca, Malaysia, Borneo, South China Sea, Java Islands & Sea, Celebes Islands & Sea, Philippines, Sulu Sea, North Madagascar, North Mozambique channel and over Indian Ocean between latitude 5.0N to 5.0S longitude 40.0E to 100.0E and between latitude 5.0S to 20.0S longitude 40.0E to 70.0E.

M.J.O. Index:

MJO index is currently in Phase 2 with amplitude greater than 1. It will remain in same phase till 26th Nov with amplitude greater than 1. It will enter phase 3 on 27th Nov with amplitude less than 1 and will remain there till 29th Nov. It will enter phase 4 on 30th Nov with amplitude less than 1.

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

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

MODEL GUIDANCE	Bay of Bengal (BoB)	Arabian Sea (AS)
IMD-GFS	WML over South Andaman Sea on 26 th Nov, Moving northwestwards and becomes depression over southeast BoB and adjoining Andaman sea on 27 th Nov, cyclonic storm (CS) over southeast BoB on the same day. Moving then westnorthwestwards and lay over southeast and adjoining southwest BoB as cyclonic storm/severe cyclonic storm (SCS) on 27 th Nov, moving in the same direction and becomes severe cyclonic storm over westcentral BoB on 28 th Nov, moving then northeastwards towards Bangladesh coast and lay over northeast BoB on 29 th Nov as severe cyclonic storm/very severe cyclonic storm (VSCS).	No significant system during next 7 days.

IMD-GEFS	LPA over South Andaman Sea on 26 th Nov, moving in westnorthwestward and becomes depression over southeast BoB and adjoining Andaman Sea on 27 th Nov, deep depression (DD) over westcentral and adjoining southwest BoB on 28 th Nov, CS over westcentral BoB on 29 th Nov, moving then northeastward and weakens over northeast BoB as WML on 30 th Nov.	No significant system during next 7 days.
IMD-WRF	LPA over south Andaman Sea on 25 th Nov.	No significant system during next 3 days.
NCMRWF-NCUM	No significant system during next 7 days.	Cycir over southeast AS on 28 th Nov having westward movement without intensification.
NCMRWF-NEPS	No significant system during next 7 days.	Cycir over southeast AS on 28 th Nov having westward movement without intensification.
NCMRWF-UM (Regional)	No significant system during next 3 days.	No significant system during next 7 days.
ECMWF	LPA over southwest BoB on 29 th Nov, moving westnorthwestward and lay as DD over the same region on the same day, moving in the same direction and lay over the same region as CS on 30 th Nov, moving in the same direction and lay over southwest and adjoining westcentral BoB as CS on 1 st Dec.	No significant system during next 7 days.
ECMM	Indicating a depression over southeast BoB around 27 th Nov.	No significant system during next 7 days.
NCEP-GFS	LPA over South Andaman Sea on 27 th Nov, WML/D over South Andaman Sea on the same day, moving westnorthwestward and become CS on 28 th Nov over southeast BoB and adjoining Andaman Sea, moving in the same direction and lay as SCS over eastcentral BoB on 29 th Nov, moving in the same direction and lay as VSCS over westcentral and adjoining eastcentral BoB on 30 th Nov, Moving then northeastward and lay over northeast BoB as VSCS on 1 st Dec.	No significant system.
IMD-Genesis Potential Parameter	Potential zone over South Andaman Sea on 26 th and 27 th Nov, over southeast BoB and adjoining Andaman Sea on 28 th Nov, over southeast and adjoining eastcentral BoB on 29 th Nov, over eastcentral BoB on 30 th Nov.	No potential zone over AS

Summary and conclusion:

1. For Bay of Bengal:

Most of the models including IMD GFS, NCEP GFS, ECMWF and ECMWF ensemble are indicating likely emergence of a cyclonic circulation into south Andaman Sea around 25th with formation of low pressure area around 26th over south Andaman Sea. These models are also indicating formation of depression over south BoB during 26th – 30th (IMD GFS around 27th, NCEP GFS on 27th and ECMWF around 29th/30th but over southwest BoB). GFS group of models are also indicating further intensification of this system into a severe cyclonic storm. WRT movement, GFS group of models are indicating initial west-northwestwards movement till 28th towards central BoB followed by north-northeastwards movement towards Bangladesh coast. ECMWF is however indicating west-northwestwards movement towards westcentral Bay of Bengal till 2nd December and gradual recurvature thereafter. NCUM group of models are not indicating any significant system over the Bay of Bengal.

In view of all the above, it is inferred that there is likelihood of emergence of a cyclonic circulation over South Andaman Sea and neighbourhood around 25th November. Under its influence, a low pressure area is likely to form over South Andaman Sea around 26th November. It is likely to move west-northwestwards and intensify into a depression over southeast Bay of Bengal & adjoining Andaman Sea around 27th November, 2023.

Probability of Cyclogenesis (formation of depression and above intensity systems) over 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
NIL	NIL	NIL	NIL	LOW	MOD	HIGH

Every 24 hour forecast is valid upto 0300 of next day.

2. For the Arabian Sea:

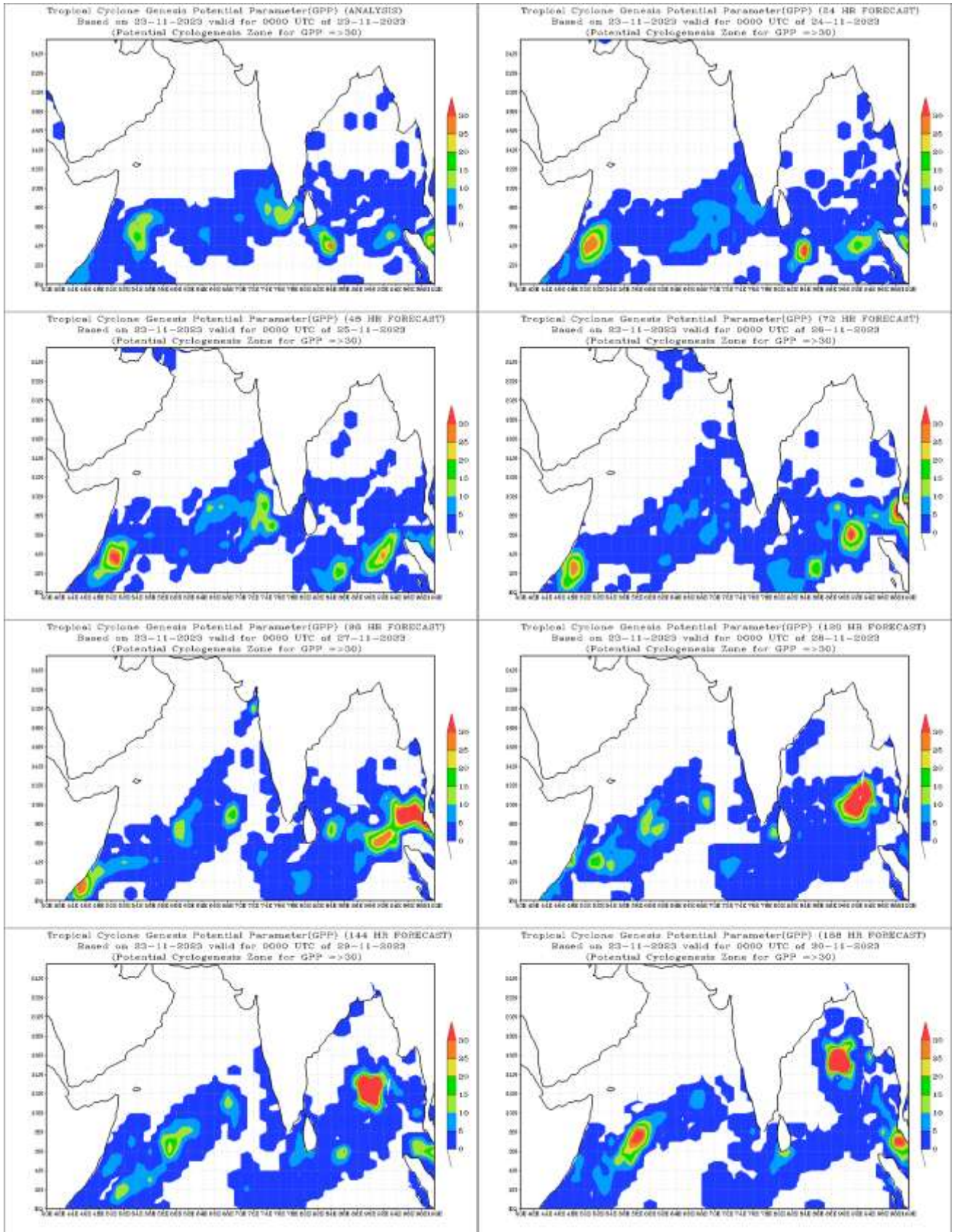
Most of the models are indicating that there will be no significant system for the next seven days.

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

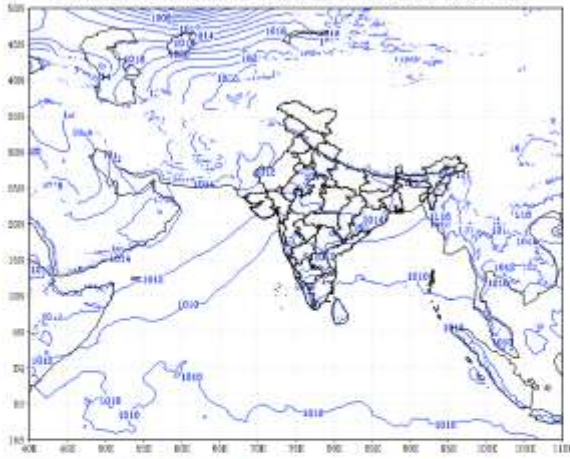
24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS	120-144 HOURS	144-168 HOURS
NIL	NIL	NIL	NIL	NIL	NIL	NIL

Every 24 hour forecast is valid upto 0300 of next day.

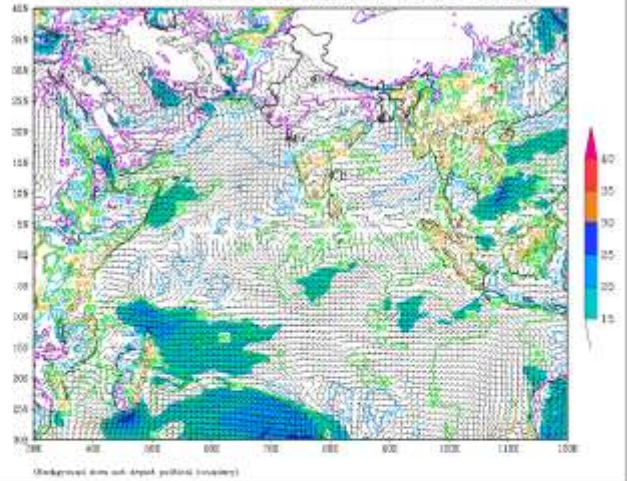
IOP: IOP for Andaman & Nicobar Islands for 26th and 27th.



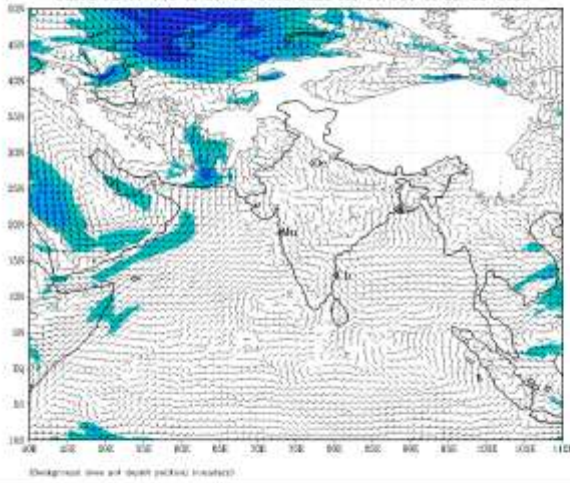
IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (00 HR)
 based on 00 UTC of 23-11-2023 valid for 00 UTC of 23-11-2023



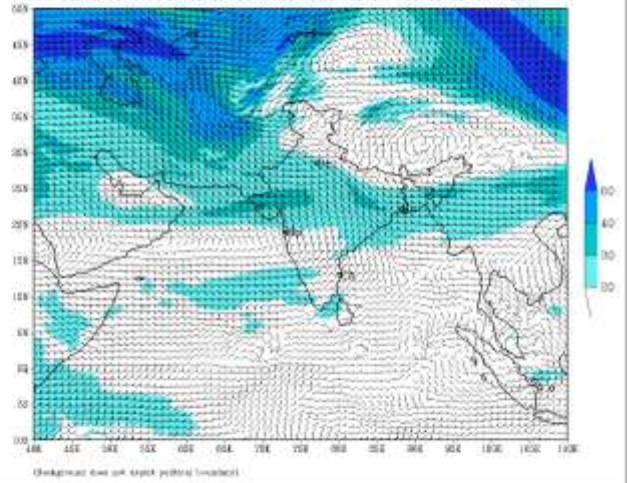
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (00 HR)
 based on 00 UTC of 23-11-2023 valid for 00 UTC of 23-11-2023



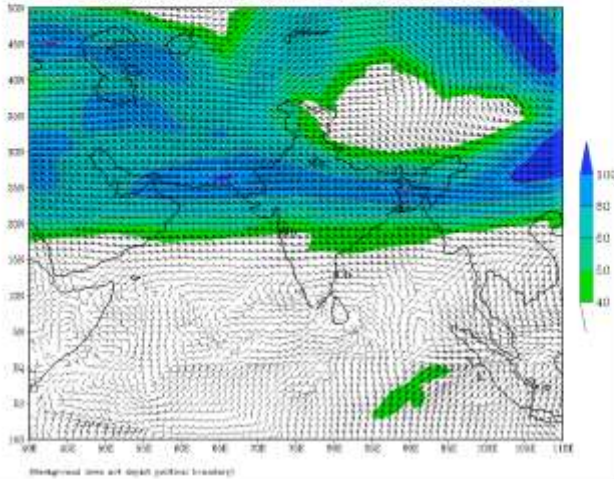
IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (00 HR)
 based on 00 UTC of 23-11-2023 valid for 00 UTC of 23-11-2023



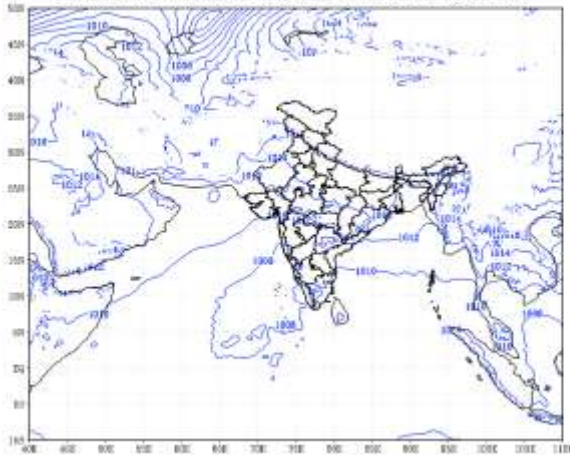
IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (00 HR)
 based on 00 UTC of 23-11-2023 valid for 00 UTC of 23-11-2023



IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (00 HR)
 based on 00 UTC of 23-11-2023 valid for 00 UTC of 23-11-2023

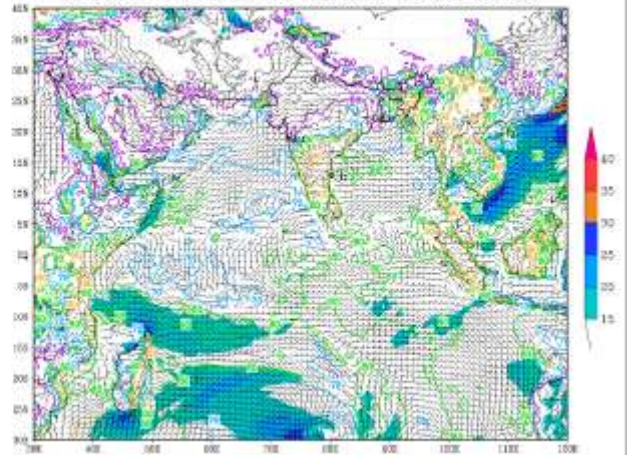


IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (24 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 24-11-2023



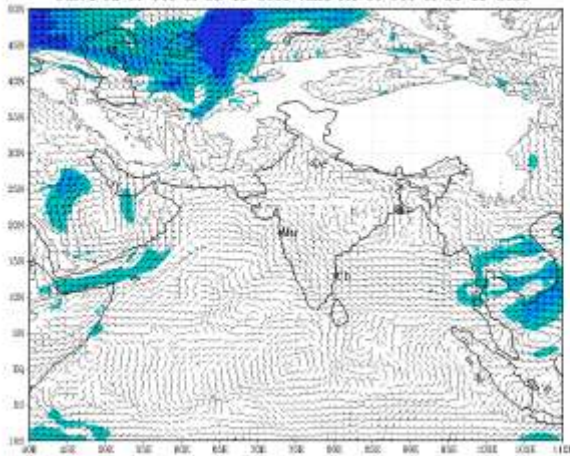
(Background line not depict political boundary)

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (24 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 24-11-2023



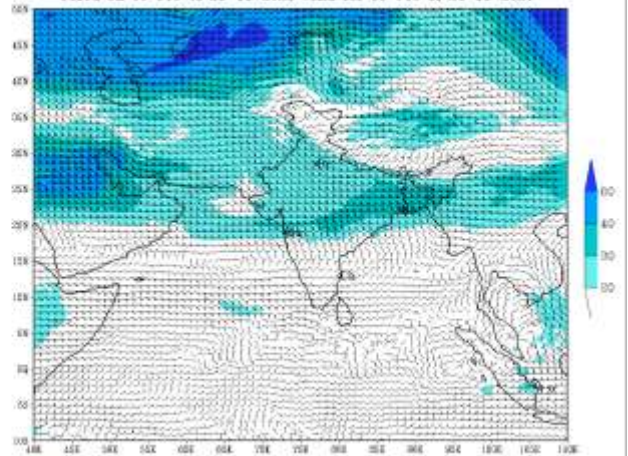
(Background line not depict political boundary)

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (24 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 24-11-2023



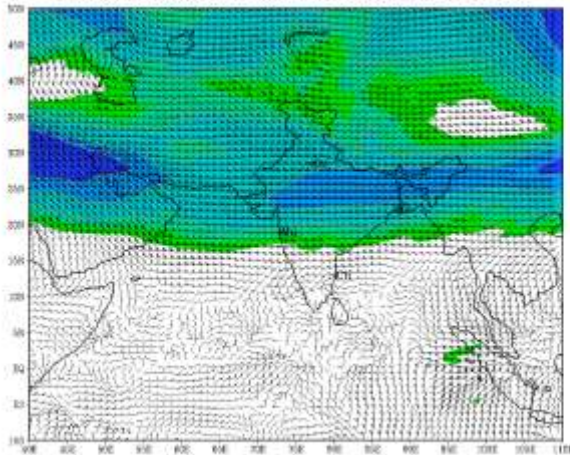
(Background line not depict political boundary)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (24 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 24-11-2023



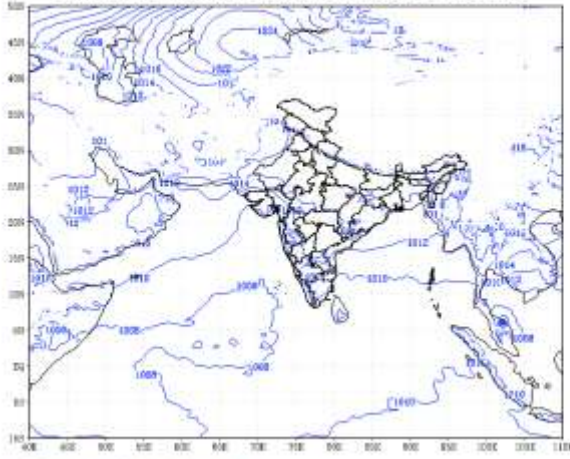
(Background line not depict political boundary)

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (24 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 24-11-2023



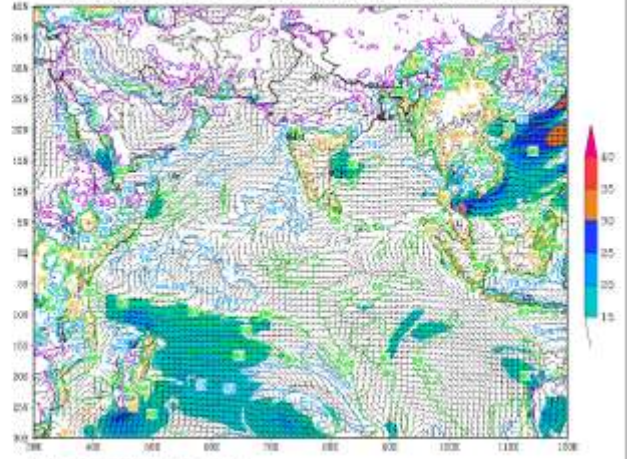
(Background line not depict political boundary)

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (48 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 25-11-2023



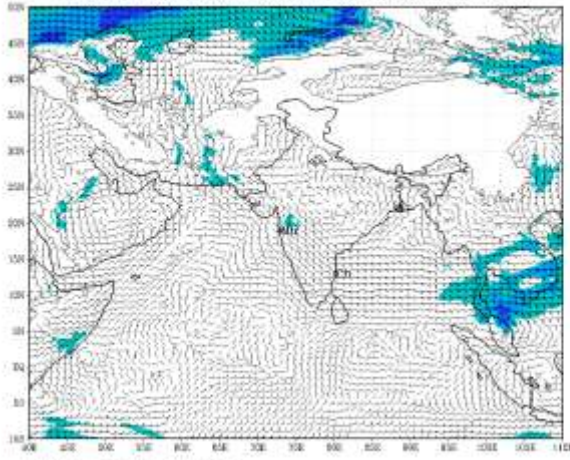
(Background line not depict political boundary)

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (48 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 25-11-2023



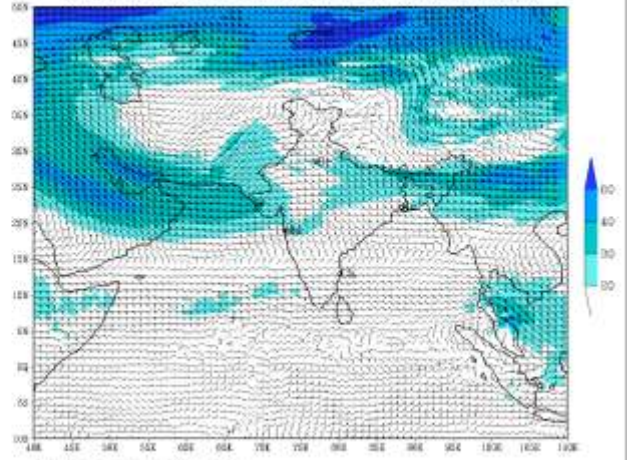
(Background line not depict political boundary)

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (48 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 25-11-2023



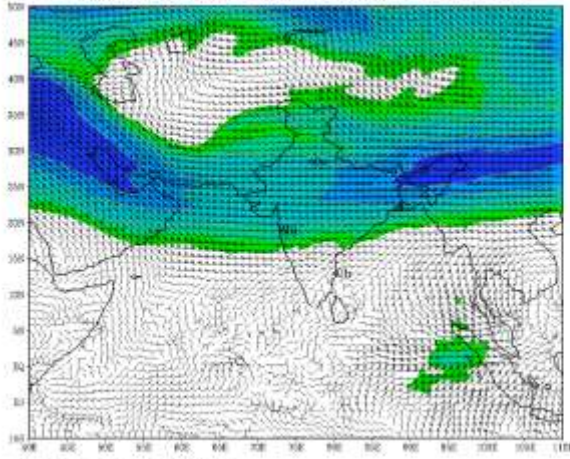
(Background line not depict political boundary)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (48 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 25-11-2023



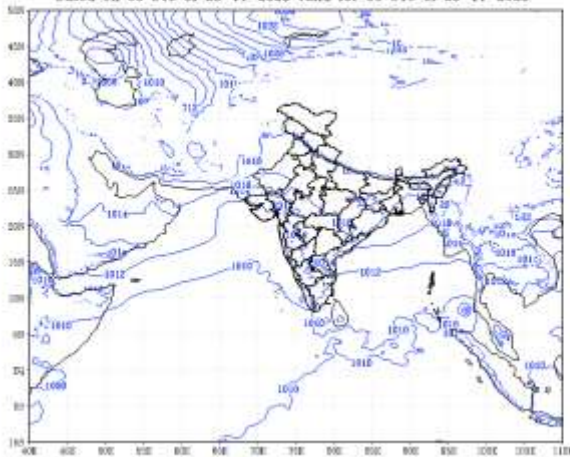
(Background line not depict political boundary)

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (48 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 25-11-2023



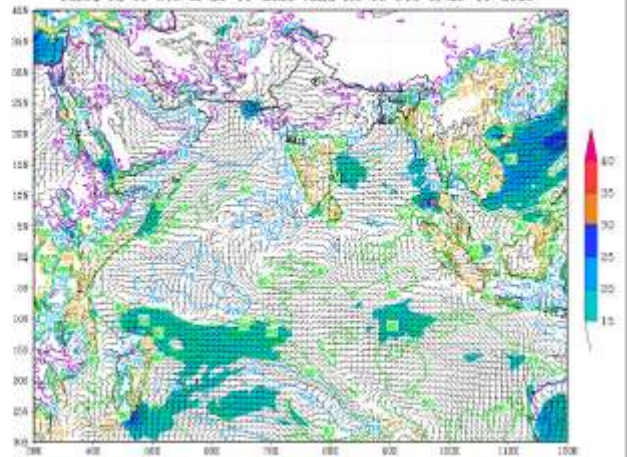
(Background line not depict political boundary)

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (72 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 26-11-2023



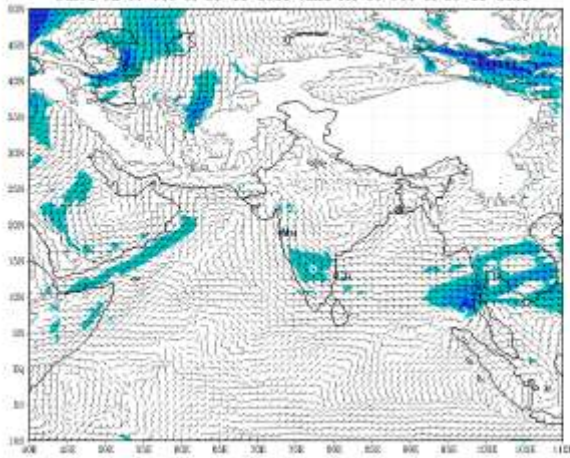
(Background line not depict political boundary)

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (72 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 26-11-2023



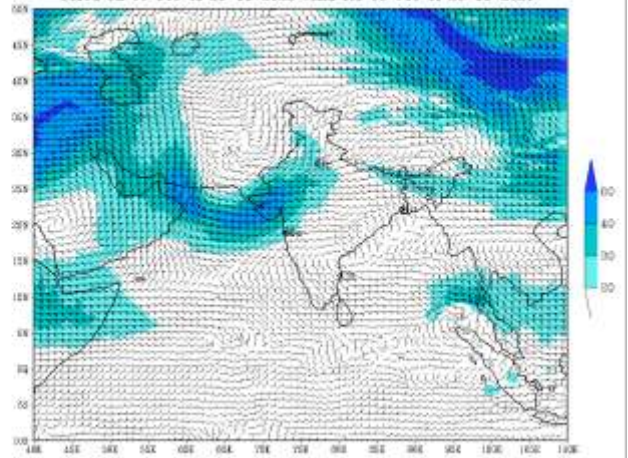
(Background line not depict political boundary)

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (72 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 26-11-2023



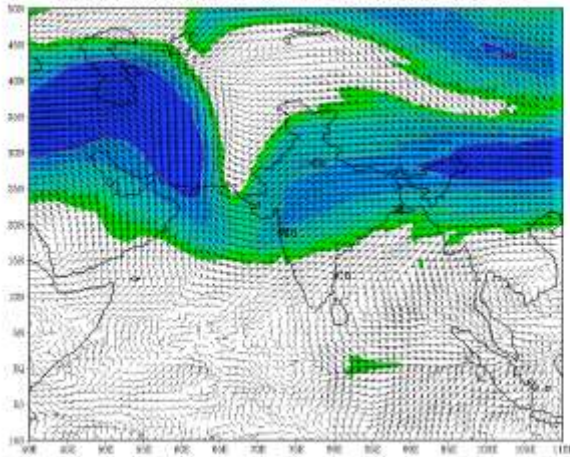
(Background line not depict political boundary)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (72 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 26-11-2023



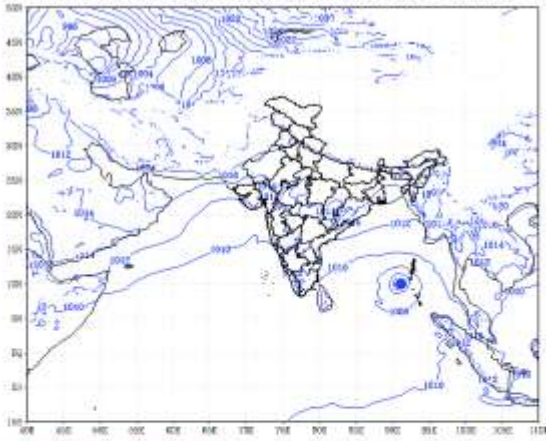
(Background line not depict political boundary)

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (72 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 26-11-2023



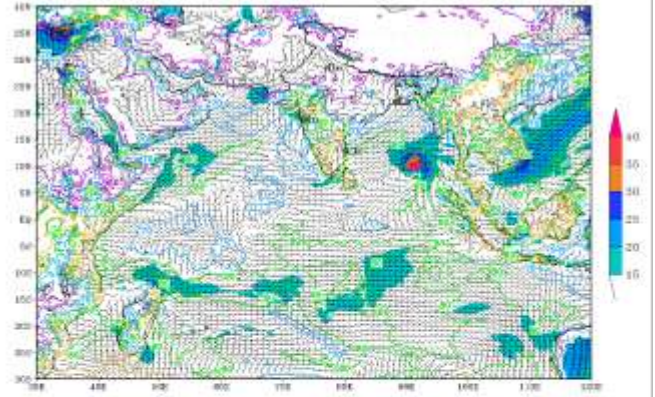
(Background line not depict political boundary)

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (96 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 27-11-2023



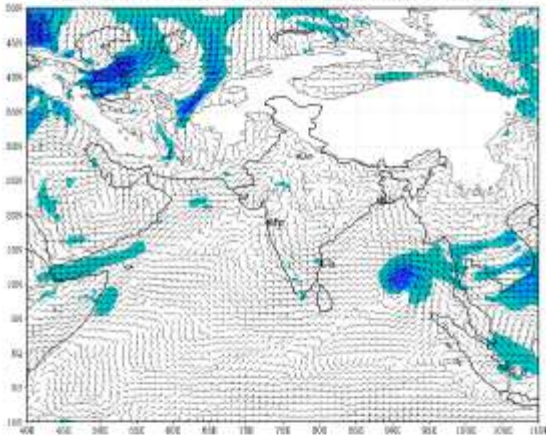
(Background over sea level political boundary)

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (96 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 27-11-2023



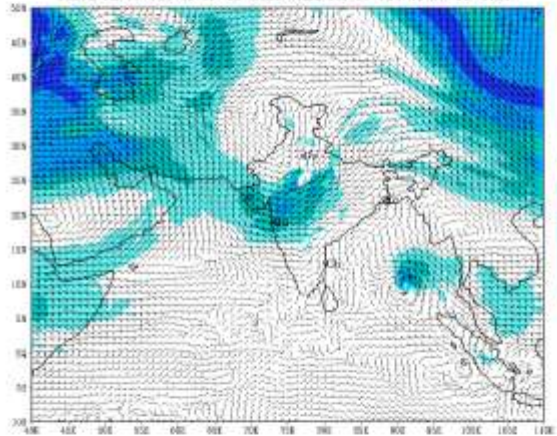
(Background over sea level political boundary)

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (96 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 27-11-2023



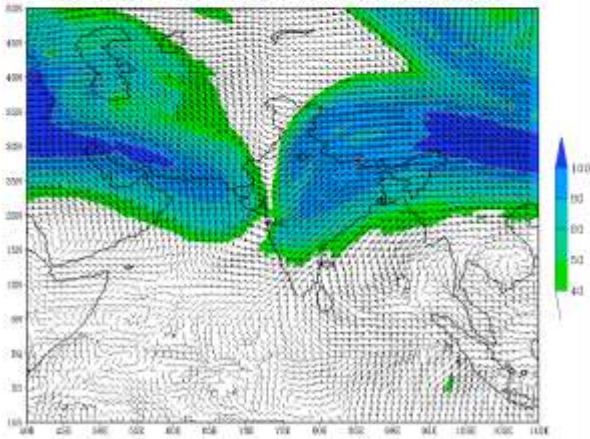
(Background over sea level political boundary)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (96 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 27-11-2023



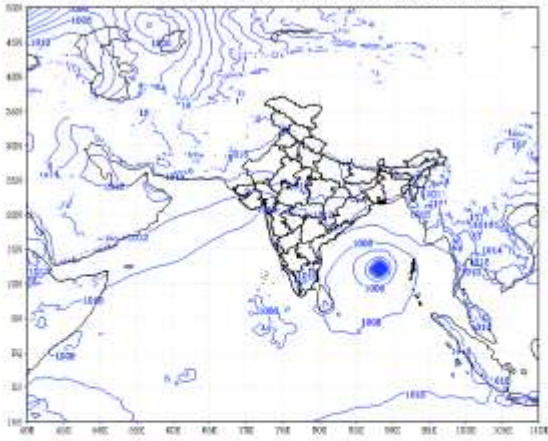
(Background over sea level political boundary)

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (96 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 27-11-2023



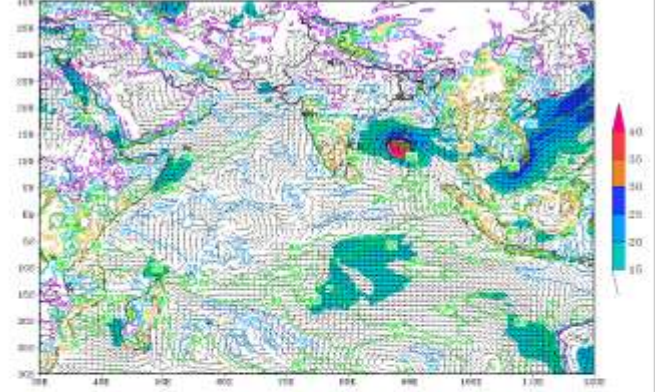
(Background over sea level political boundary)

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (120 HR)
 based on 00 UTC of 23-11-2023 valid for 00 UTC of 28-11-2023



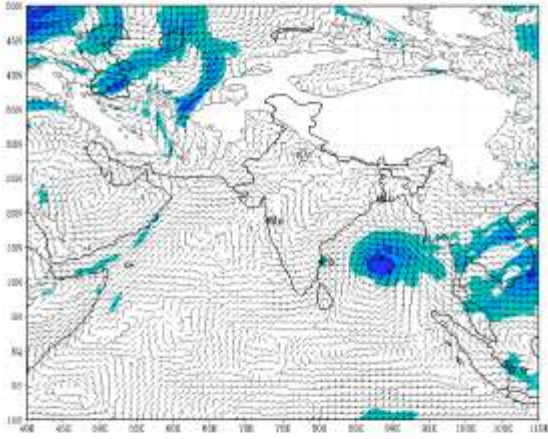
(Background over sea depicts political boundary)

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (120 HR)
 based on 00 UTC of 23-11-2023 valid for 00 UTC of 28-11-2023



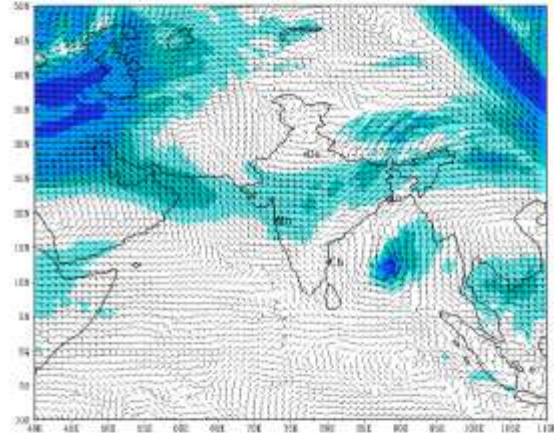
(Background over sea depicts political boundary)

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (120 HR)
 based on 00 UTC of 23-11-2023 valid for 00 UTC of 28-11-2023



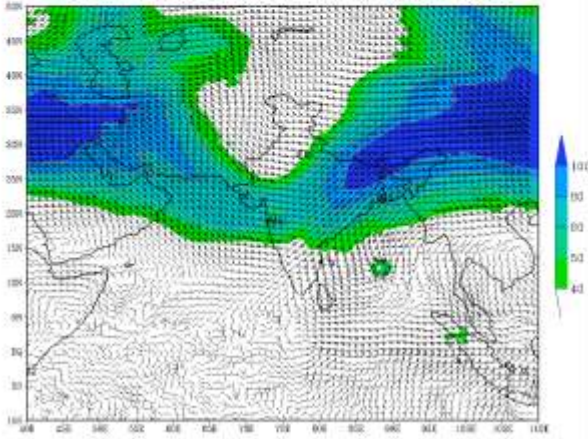
(Background over sea depicts political boundary)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (120 HR)
 based on 00 UTC of 23-11-2023 valid for 00 UTC of 28-11-2023



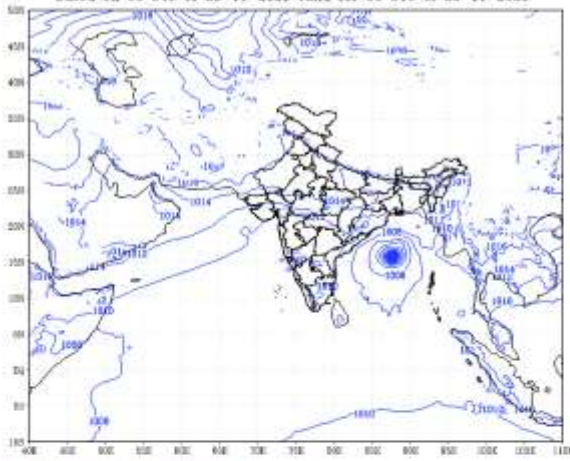
(Background over sea depicts political boundary)

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (120 HR)
 based on 00 UTC of 23-11-2023 valid for 00 UTC of 28-11-2023



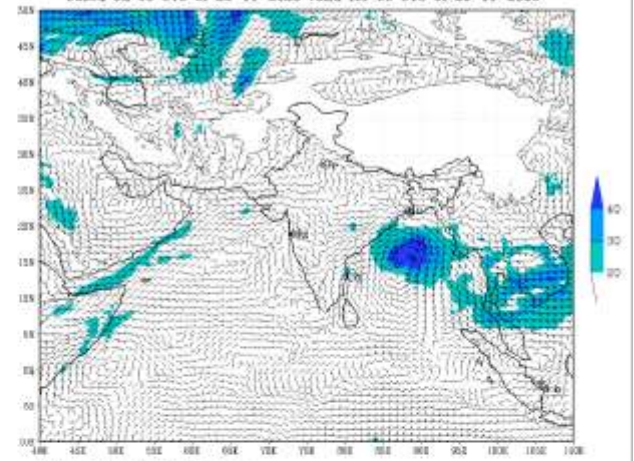
(Background over sea depicts political boundary)

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (144 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 29-11-2023



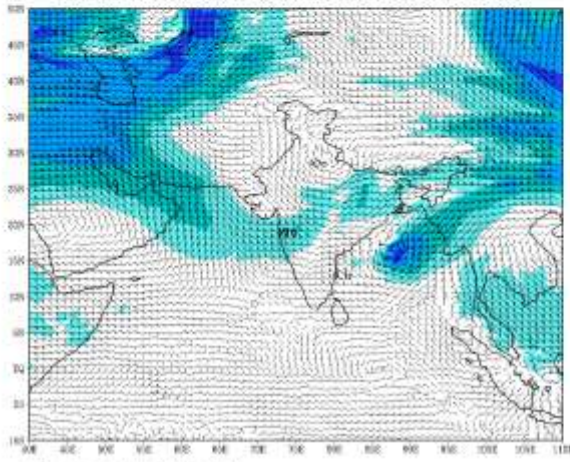
(Background line with dashed political boundary)

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (144 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 29-11-2023



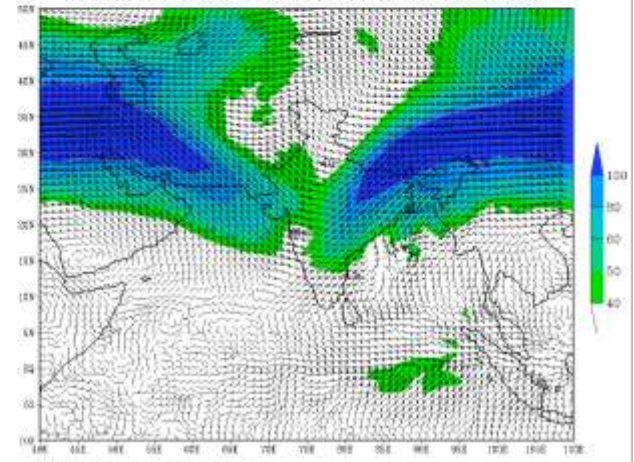
(Background line with dashed political boundary)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (144 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 29-11-2023



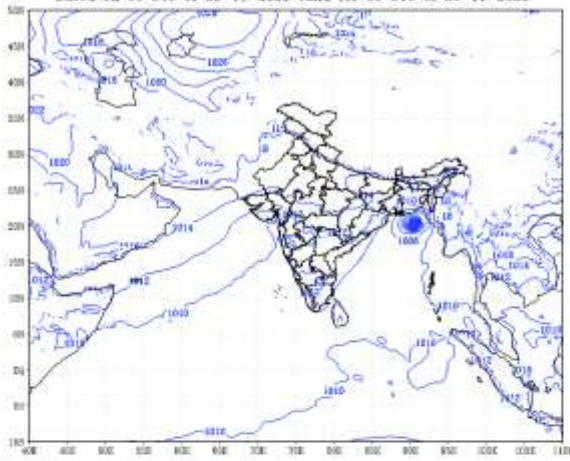
(Background line with dashed political boundary)

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (144 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 29-11-2023



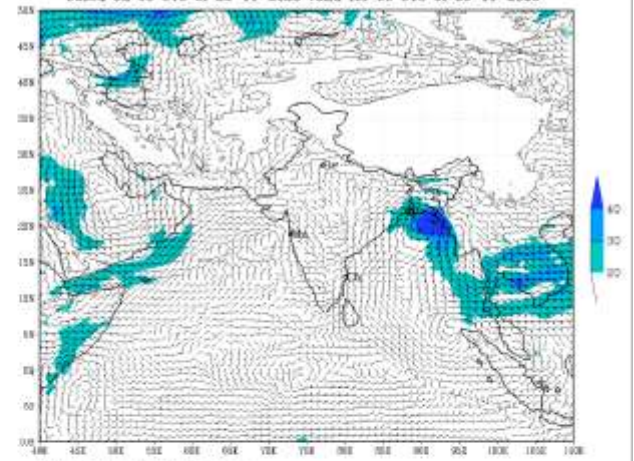
(Background line with dashed political boundary)

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (168 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 30-11-2023



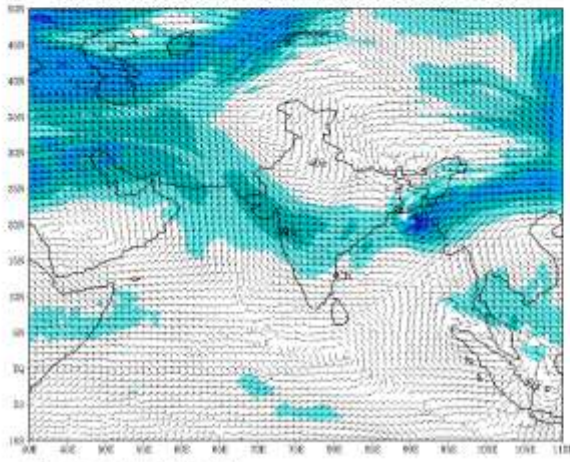
(Background line with light purple/red boundary)

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 30-11-2023



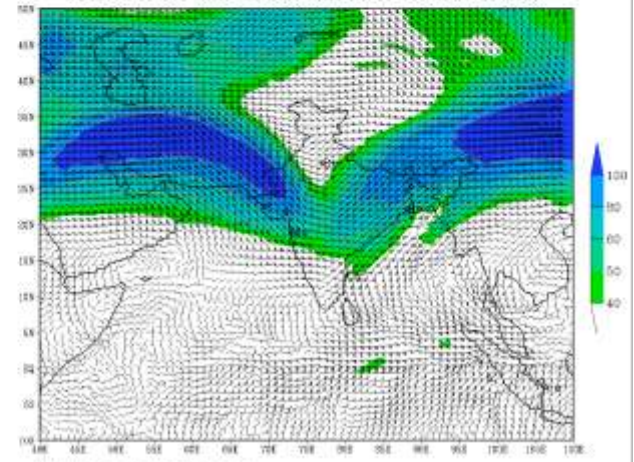
(Background line with light purple/red boundary)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 30-11-2023



(Background line with light purple/red boundary)

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 23-11-2023 valid for 00 UTC of 30-11-2023



(Background line with light purple/red boundary)