



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

**Tropical Cyclone Forecast Programme  
Report Dated 22<sup>nd</sup> October, 2024**

**Time of Issue: 1400 UTC**

**Synoptic features (based on 0900 UTC analysis):**

❖ **Depression over Eastcentral Bay of Bengal: Pre-Cyclone Watch for Odisha and West Bengal**

Yesterday's well marked low pressure area over Eastcentral Bay of Bengal moved west-northwestwards, intensified into a depression in the early morning (0530 hours IST) and lay centred at 0830 hrs IST of today, the 22<sup>nd</sup> October, over the same region near latitude 15.5° N and longitude 91.0°E, about 700 km southeast of Paradip (Odisha), 750 km south-southeast of Sagar Island (West Bengal) and 730 km south-southeast of Khepupara (Bangladesh).

It is very likely to move west-northwestwards and intensify into a cyclonic storm by 23<sup>rd</sup> October, 2024 over eastcentral Bay of Bengal. Thereafter, continuing to move northwestwards, it is very likely to intensify into a severe cyclonic storm over northwest Bay of Bengal by morning of 24<sup>th</sup> and cross north Odisha and West Bengal coasts between Puri and Sagar Island during night of 24<sup>th</sup> to morning of 25<sup>th</sup> October, 2024 as a severe Cyclonic Storm with a wind speed of 100-110 kmph gusting 120 kmph.

❖ Yesterday's low pressure area over westcentral Arabian Sea persists with the associated cyclonic circulation extending upto 3.1 km above mean sea level over the same region at 0830 hours IST of today, the 22<sup>nd</sup> October, 2024. It is likely to move west-northwestwards away from Indian coast and weaken further during next 12 hours

❖ Yesterday's cyclonic circulation over eastcentral Arabian Sea off north Karnataka coast over lay over Eastcentral Arabian Sea off Karnataka coast and extends between 1.5 km and 5.8 km above mean sea level at 0830 hours IST of today, the 22<sup>nd</sup> October, 2024

Parameter	Bay of Bengal (BoB)	Arabian Sea (AS)
<b>Sea Surface Temperature (SST) °C</b>	30°C over central & north BoB	<ul style="list-style-type: none"> <li>➤ 28-30°C over eastern parts of AS.</li> <li>➤ 27°C over the westcentral and southwest parts of AS</li> </ul>
<b>Tropical Cyclone Heat Potential (TCHP) kJ/cm<sup>2</sup></b>	<ul style="list-style-type: none"> <li>➤ 100 over westcentral BoB,</li> <li>➤ &lt;80 northwest BoB</li> </ul>	<ul style="list-style-type: none"> <li>➤ 80-90 over central parts of south AS and adjoining EIO.</li> <li>➤ 60-70 over eastcentral AS</li> <li>➤ &lt; 50 over westcentral AS &amp; off Oman and Somalia coasts</li> </ul>
<b>Cyclonic Relative vorticity (X10<sup>-6</sup>s<sup>-1</sup>)</b>	100 to the south of system centre over eastcentral BoB with vertical	30-40 over westcentral AS off Somalia coast with vertical

	extension upto 500 hpa level	extension upto 500 hpa level
<b>Low Level convergence (<math>\times 10^{-5} \text{ s}^{-1}</math>)</b>	10 to the south of system area	5-10 over eastcentral AS and another 5 over Somalia coast
<b>Upper Level divergence (<math>\times 10^{-5} \text{ s}^{-1}</math>)</b>	20 to the south of system area	➤ 10-20 over westcentral AS along Oman-Yemen coast ➤ another 5-10 over southeast AS.
<b>Vertical Wind Shear (VWS knots)</b> Low: 05-10 knots Moderate: 10-20 knots High: >20 knots	low to moderate over central BoB and high over north BoB	Low-moderate over central AS and high over north & south AS and adjoining EIO
<b>Wind Shear Tendency (knots)</b>	Decreasing tendency over andaman sea off thailand coast & adjoining and andaman & nicobar islands. Increasing tendency over central BoB	Decreasing tendency over Rest of AS. Increasing tendency over westcentral AS along Oman-Yemen coast
<b>Upper tropospheric Ridge</b>	along 20.0°N over BoB	Along 17.0°N over AS.

### **Satellite observations based on INSAT imagery (0300 UTC):**

#### **(a) Over the BoB & Andaman Sea:-**

scattered to broken low/med clouds with embedded intense to very intense convection lay over east Bay of Bengal, Andaman Islands, North Andaman Sea & neighbourhood (Minimum cloud top temperature minus 80-93 deg Celsius)

#### **(b) Over the Arabian Sea:-**

Scattered low and medium clouds with embedded intense to very intense convection lay over eastcentral & adjoining southeast Arabian Sea off south Maharashtra-Goa-Karnataka-Kerala coasts and westcentral Bay of Bengal (Minimum cloud top temperature is minus 70-80 degree Celsius). Scattered low and medium clouds with embedded moderate to intense convection lay over Gulf of Cambay, rest of southeast Arabian Sea, Lakshadweep Island Area and Comorin area.

#### **(c) Convection outside India:**

Scattered low and medium clouds with embedded moderate to intense convection lay over Sri Lanka, Palk Str, gulf of Mannar, Tibet, China, Yellow Sea, East China Sea, Myanmar, Thailand, Gulf of Thailand, Cambodia, Laos, Vietnam, Sumatra, Strait of Malacca, Malaysia, Borneo, South China Sea, Java Islands & Sea, Celebes Islands & Sea, Philippines, Sulu Sea, Madagascar, and over Indian Ocean between latitude 5.0° S to 18.0° S and longitude 47.0° E to 110.0° E.

#### **M.J.O. Index:**

Madden Julian Oscillation (MJO) index is currently in Phase 5 with amplitude greater than 1. It is likely to continue in same phase during next 5 days with amplitude remaining more 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)
<b>IMD-GFS</b>	IMD GFS is indicating Depression over Eastcentral BoB (15.4/92.5) on 22/00 UTC, Severe Cyclonic Storm (SCS) over Eastcentral BoB (16.6/90.2) on 23/00 UTC, VSCS over Northwest BoB (19.4/88.9) on 24/00 UTC and crossing over West Bengal Coasts around 24/21 UTC as Very Severe Cyclonic Storm (VSCS) near (21.9/87.8), becoming Low pressure area over Odisha near (20.2/85.2), Model is indicating westsouthwestwards of its remnant towards Eastcentral AS till 01 <sup>st</sup> Nov.	Cyclonic circulation over Eastcentral AS on 01 <sup>st</sup> Nov.
<b>IMD-GEFS</b>	IMD GEFS indicating Severe Cyclonic Storm (SCS) over eastcentral BoB (17.5/90) on 23/00 UTC, Very Severe Cyclonic Storm (VSCS) over northwest BoB off Odisha West Bengal Coast (19.5/89) on 24/00 UTC, crossing on 24/21 UTC near (21.5/87.8) over Bangladesh-West Bengal border, Model is indicating westsouthwestwards of its remnant towards Eastcentral AS till 01 <sup>st</sup> Nov.	Cyclonic circulation over Eastcentral AS on 01 <sup>st</sup> Nov.
<b>IMD-WRF</b>	WRF is indicating Depression over Eastcentral BoB (15.5/92.5) on 22/00 UTC, CS over Eastcentral BoB (16/90) on 23/00 UTC, Very Severe Cyclonic Storm over Northwest BoB (18/88) on 24/00 UTC, crossing over West Bengal near (21.2/87.8) on 25/03 UTC.	No Significant System during next 3 days
<b>NCMRWF-NCUM(G)</b>	NCUM(G) is indicating Depression over Eastcentral BoB (15/91) on 22/00 UTC, CS over Northeast BoB (16/89.8) on 23/00 UTC, SCS over central parts over north BoB near (18/89.5) on 24/00 UTC and crossing West Bengal coast (22/89) on 24/21 UTC. It is also indicating southwestwards movement towards Eastcentral AS till 31 <sup>st</sup> Oct.	Cyclonic circulation over Eastcentral AS off Maharashtra coast on 01 <sup>st</sup> Nov.
<b>NCMRWF-NCUM(R)</b>	NCUM(R) is indicating Depression Eastcentral BoB (15.5/92.5) on 22/00 UTC, SCS over Eastcentral BoB (16/90) on 23/00 UTC, VSCS over westcentral BoB (17.5/87.5) on 24/00 UTC, crossing over Odisha coast near (19/84.8) on 24/21 UTC.	No Significant System during next 3 days
<b>NCMRWF-NEPS</b>	Depression over Eastcentral BoB (15.2/91.8) on 22/00 UTC, Cyclonic Storm over Eastcentral BoB (15/90) on 23/00 UTC, VSCS over Eastcentral BoB (17.5/89.8) on 24/00 UTC, Crossing West Bengal coast (22/89) on 24/21 UTC. Model is indicating southwestwards of its remnant towards Eastcentral AS till 28 <sup>th</sup> Oct.	No Significant System

<b>ECMWF</b>	ECMWF is indicating Depression over Eastcentral BoB (15/92.2) on 22/00 UTC, Deep Depression over Eastcentral BoB (15.4/91.7) on 22/12 UTC, Cyclonic Storm (CS) over Eastcentral BoB (16.8/89.8) on 23/03 UTC, SCS over northwest BoB (20.2/87.7) on 24/06 UTC, crossing near Odisha Coast (21.2/86.5) as CS on 24/21 UTC. Model is indicating southwestwards of its remnant towards Eastcentral AS till 26 <sup>th</sup> Oct.	No System	Significant
<b>NCEP-GFS</b>	NCEP GFS Depression over Eastcentral BoB on 22/00 UTC, DD over Eastcentral BoB (16.6/90.6) on 22/12 UTC, CS over Eastcentral BoB (17/89.56) on 23/00 UTC, VSCS over northwest BoB (19.8/88.4) on 24/00 UTC, Crossing over West Bengal coasts (21.7/87.6) on 25/00 UTC as a SCS.	No System	Significant during next 10 days
<b>IMD MME</b>	IMD MME is indicating Deep Depression over Eastcentral BoB ON 22/00 UTC, CS on 23/00 UTC over Eastcentral BoB with Northwestwards movement towards Odisha-WestBengal coasts and crossing around 25/04 UTC near 21.6/87.5 as a CS.		-

### Summary:

#### (a) Bay of Bengal:

There is still divergence among various models wrt Landfall point. It is varying from Ganjam (Odisha) to Sagar Islands (West Bengal). The landfall time is varying between 24/21 UTC to 25/03 UTC. And intensity at the time of landfall is varying from cyclonic storm category (40 kt) to very severe cyclonic storm (70-80 kt).

Considering all the above, the Depression over Eastcentral Bay of Bengal is very likely to move west-northwestwards and intensify into a Cyclonic Storm by 23<sup>rd</sup> october, 2024 over Eastcentral Bay of Bengal. Thereafter, continuing to move northwestwards, it is very likely to intensify into a Severe Cyclonic Storm over Northwest Bay of Bengal around 0300 UTC of 24<sup>th</sup> and cross north Odisha and West Bengal coasts between Puri and Sagar island during 1800 UTC of 24<sup>th</sup> and 0000 UTC to 25<sup>th</sup> October, 2024 as a Severe Cyclonic Storm with a wind speed of 100-110 kmph gusting 120 kmph.

#### (b) Arabian Sea

Most of the numerical models are indicating nearly westwards movement of the low pressure area over westcentral Arabian Sea to weakening by 23/00 UTC.

### Inference:

**Considering various environmental conditions and model guidance, it is inferred that:**

- ❖ The Depression over Eastcentral Bay of Bengal is very likely to move west-northwestwards and intensify into a Cyclonic Storm by 23<sup>rd</sup> october, 2024 over Eastcentral Bay of Bengal. Thereafter, continuing to move northwestwards, it is very likely to intensify into a Severe Cyclonic Storm over Northwest Bay of Bengal around 0300 UTC of 24<sup>th</sup> and cross north Odisha and West Bengal coasts between Puri and

Sagar island during 1800 UTC of 24<sup>th</sup> and 0000 UTC to 25<sup>th</sup> October, 2024 as a Severe Cyclonic Storm with a wind speed of 100-110 kmph gusting 120 kmph.

- ❖ The existing low pressure area over westcentral Arabian Sea is likely to move westwards and become less marked by 23/00 UTC.

**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

“-“ indicate genesis has already occurred.

Probability is indicated as NIL for 0%, LOW for 1-33%, MOD for 34-67% and High for 68-100%.

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

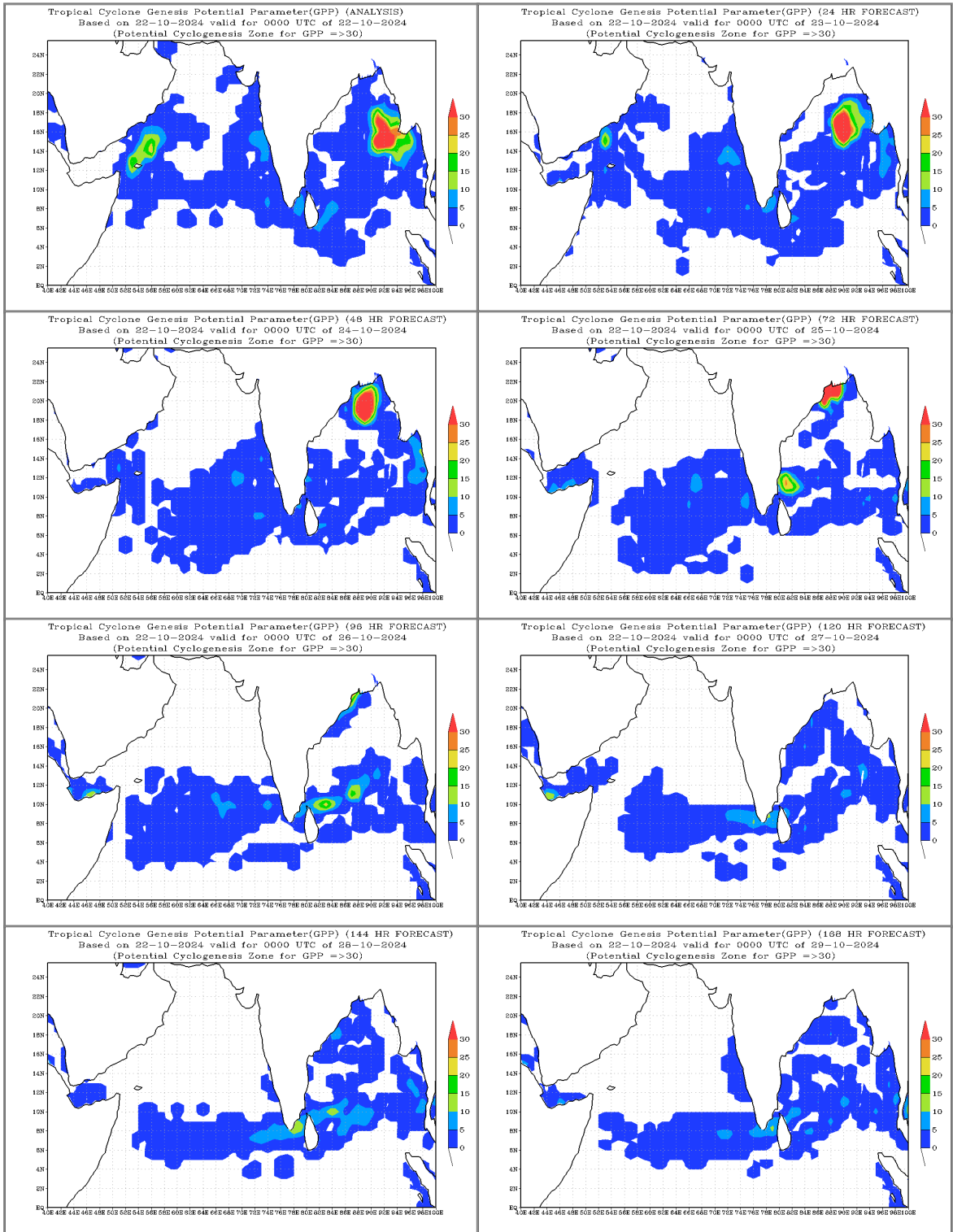
24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS	120-144 HOURS	144-168 HOURS
NIL	NIL	NIL	NIL	NIL	NIL	NIL

“-“ indicate genesis has already occurred.

Probability is indicated as NIL for 0%, LOW for 1-33%, MOD for 34-67% and High for 68-100%.

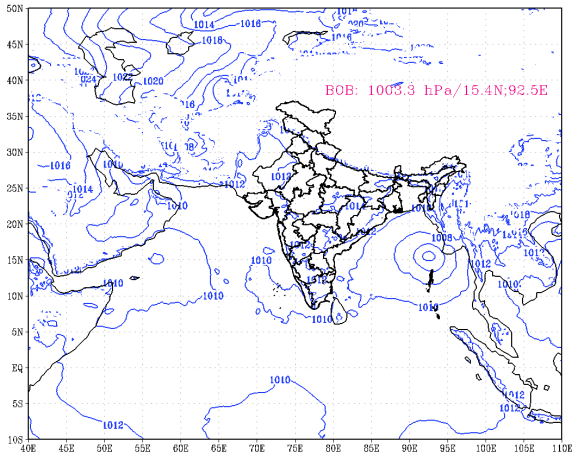
**Intense Observation Period (IOP) is suggested for:**

Odisha, West Bengal, Bangladesh and Myanmar coasts during 22<sup>nd</sup> – 25<sup>th</sup> October.



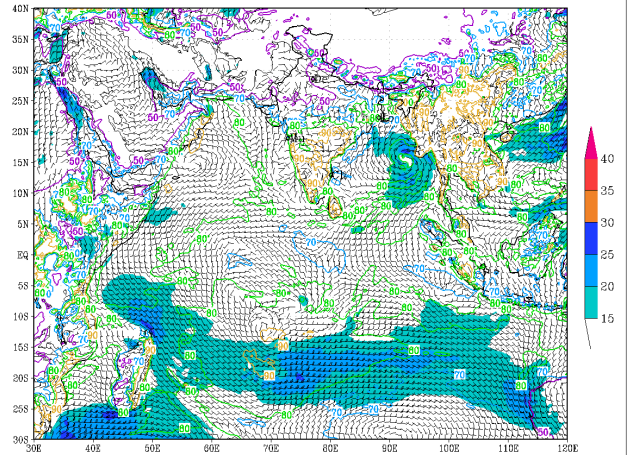


IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (00 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 22-10-2024



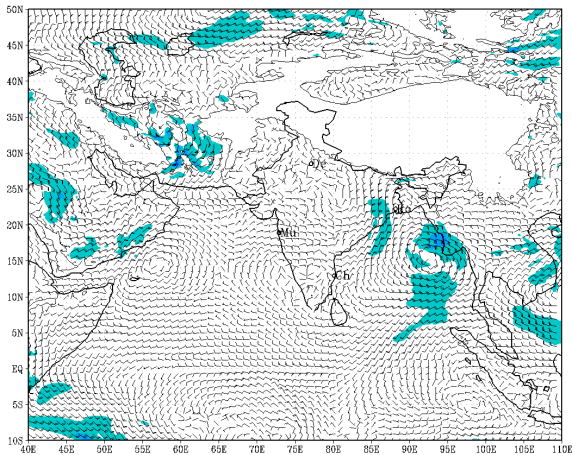
(Background does not depict political boundary)

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (00 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 22-10-2024



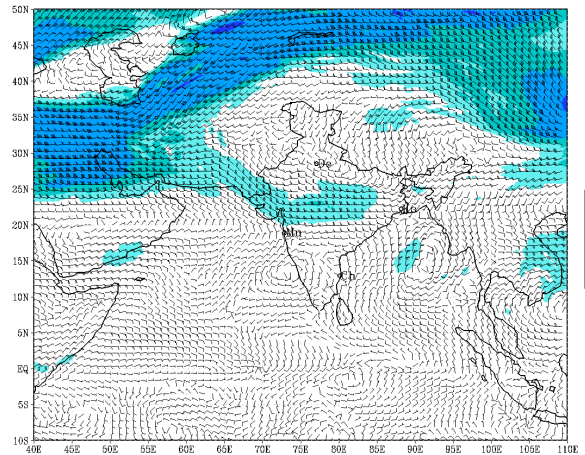
(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (00 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 22-10-2024



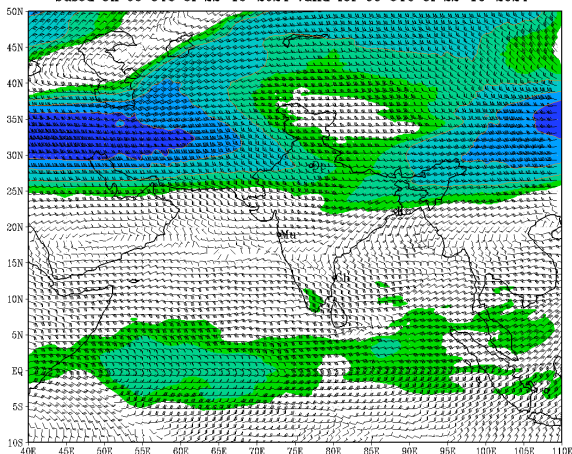
(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (00 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 22-10-2024



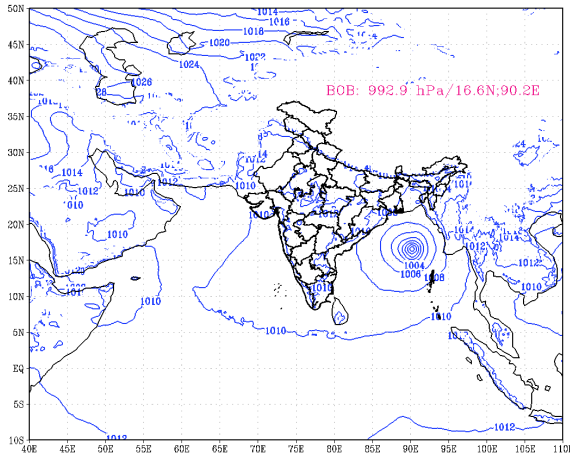
(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (00 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 22-10-2024



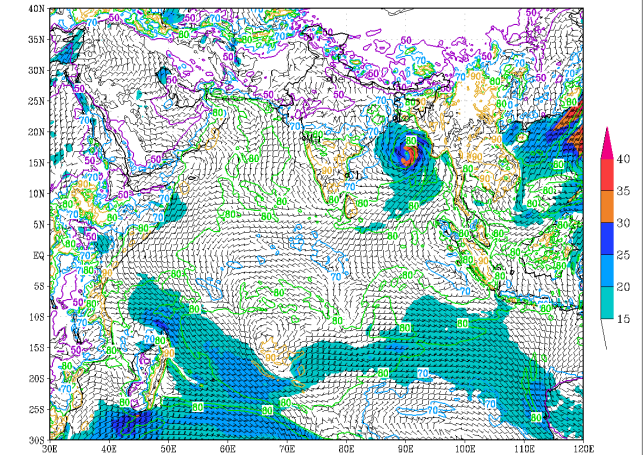
(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (24 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 23-10-2024



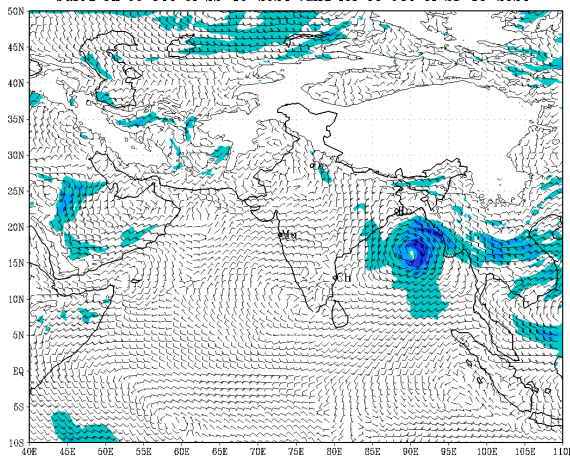
(Background does not depict political boundary)

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (24 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 23-10-2024



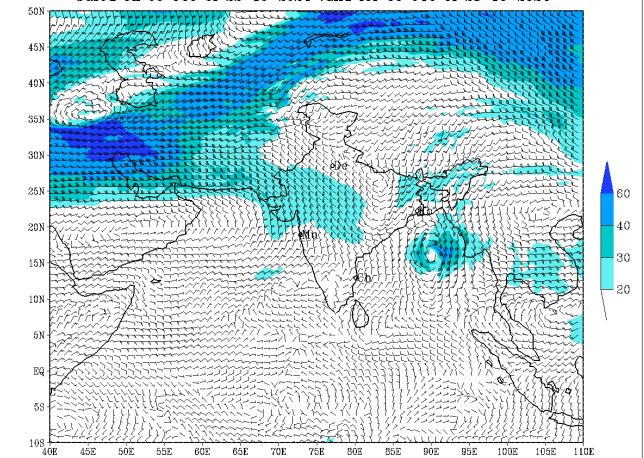
(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (24 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 23-10-2024



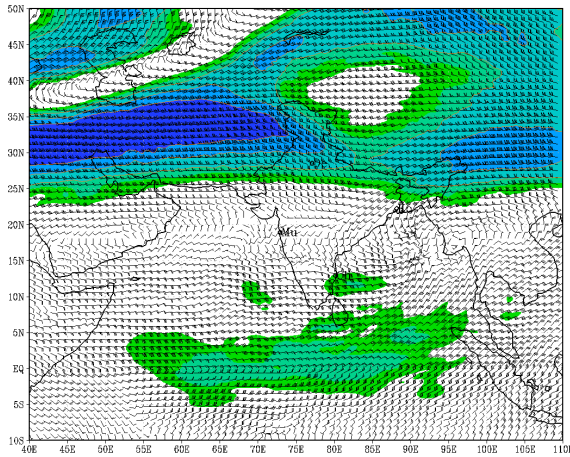
(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (24 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 23-10-2024



(Background does not depict political boundary)

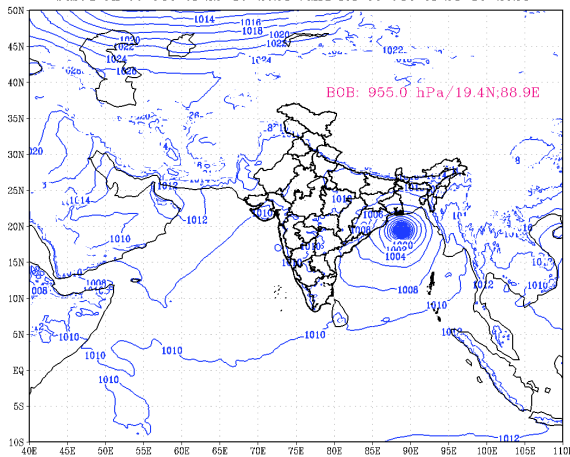
IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (24 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 23-10-2024



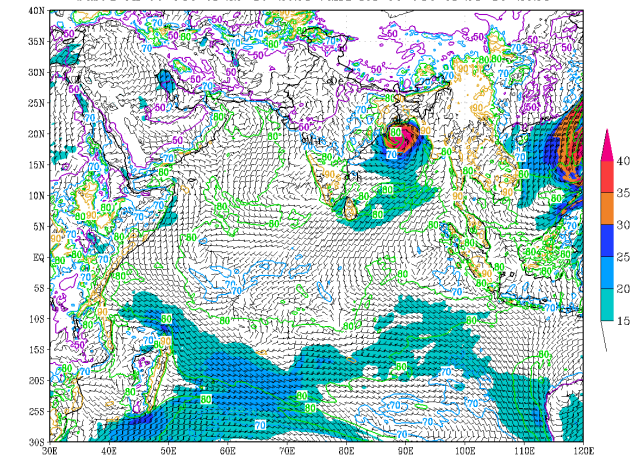
(Background does not depict political boundary)



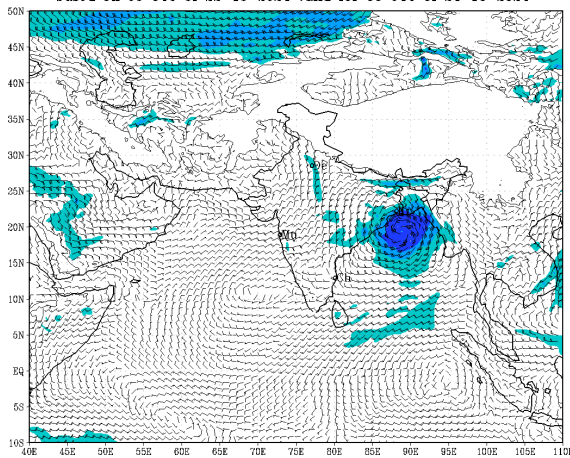
IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (48 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 24-10-2024



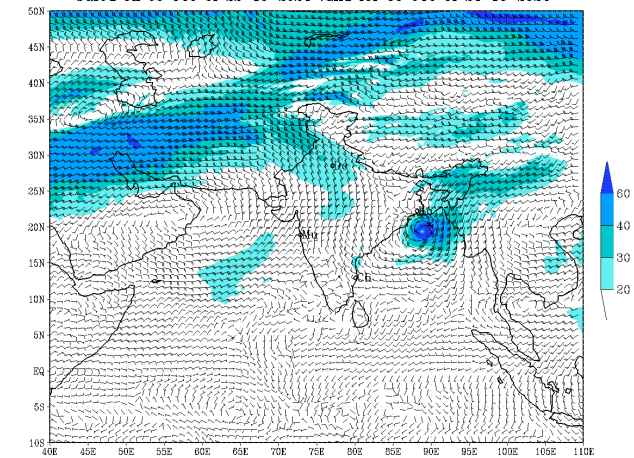
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (48 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 24-10-2024



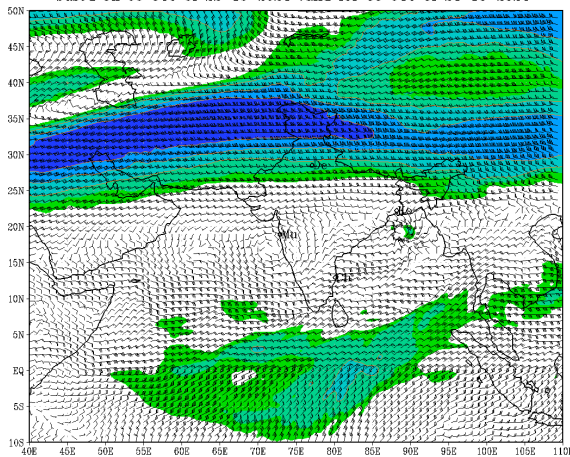
IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (48 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 24-10-2024



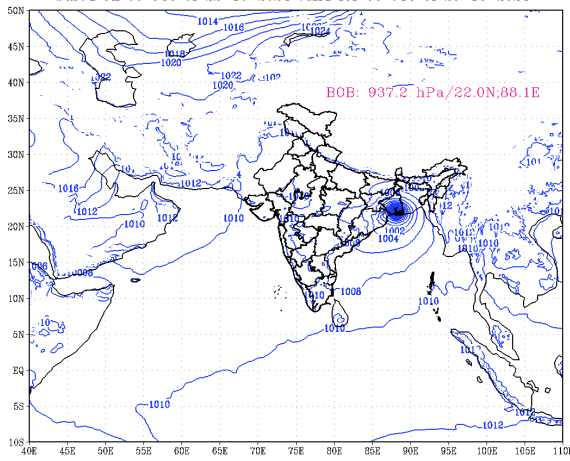
IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (48 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 24-10-2024



IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (48 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 24-10-2024

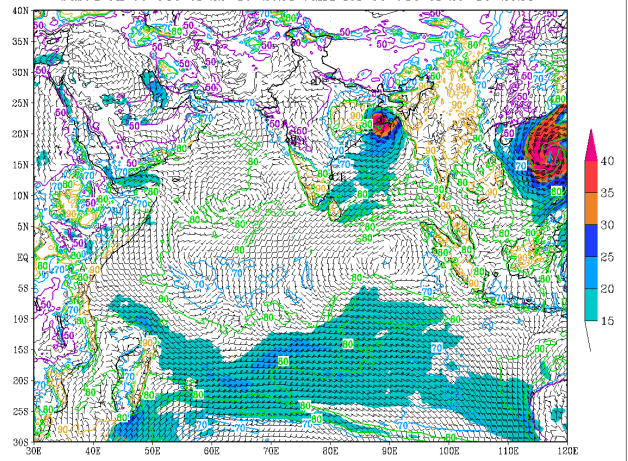


IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (72 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 25-10-2024



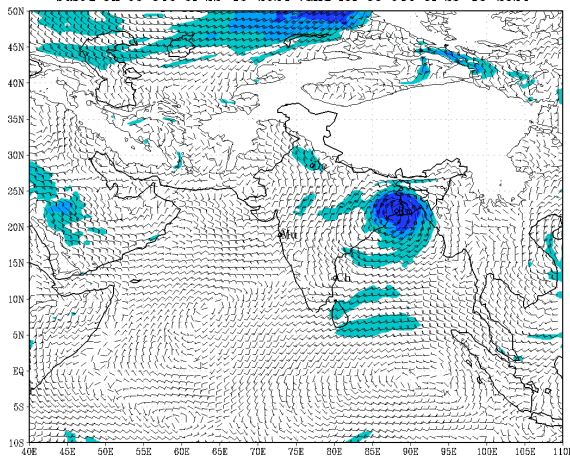
(Background does not depict political boundary)

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (72 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 25-10-2024



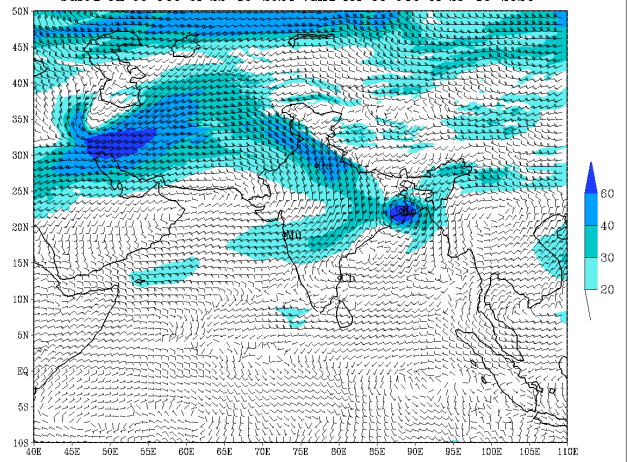
(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (72 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 25-10-2024



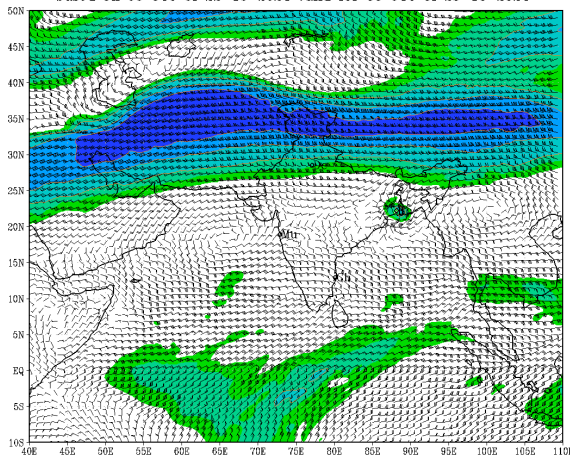
(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (72 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 25-10-2024



(Background does not depict political boundary)

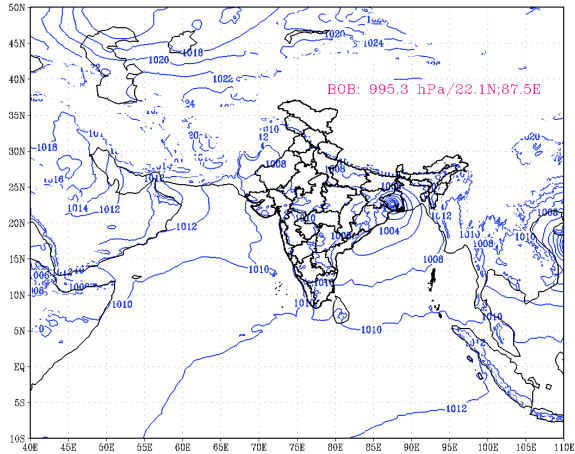
IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (72 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 25-10-2024



(Background does not depict political boundary)

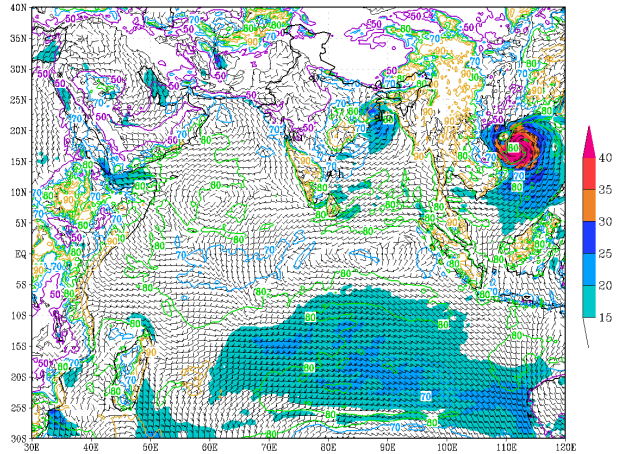


IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (96 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 26-10-2024



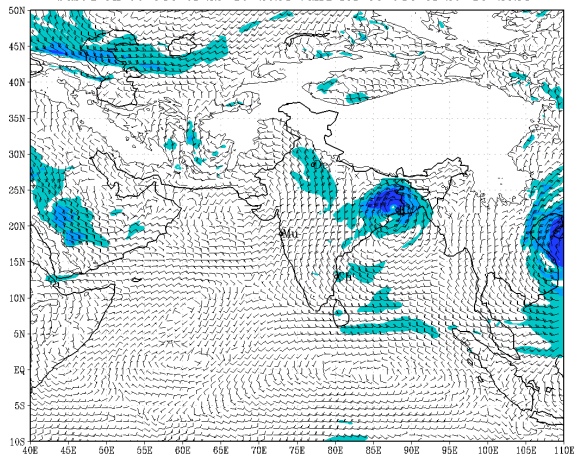
(Background does not depict political boundary)

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (96 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 26-10-2024



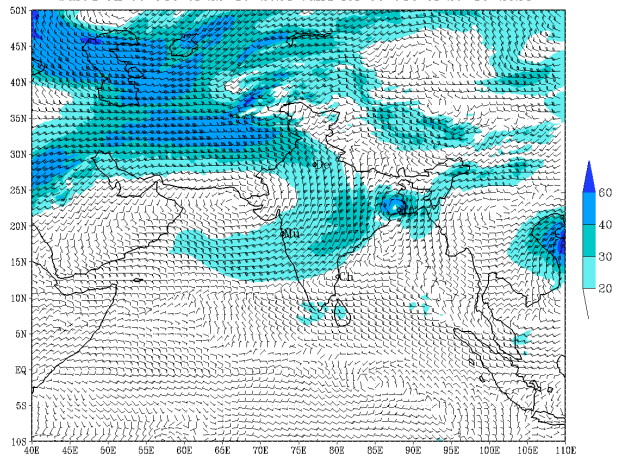
(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (96 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 26-10-2024



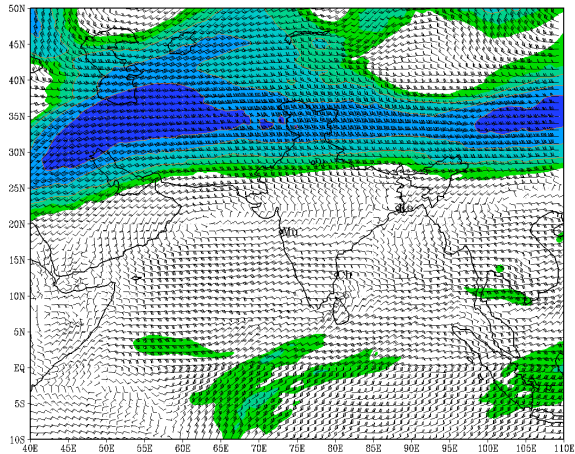
(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (96 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 26-10-2024



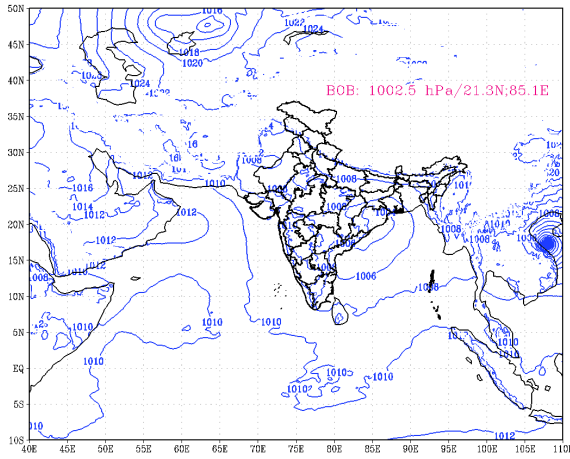
(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (96 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 26-10-2024



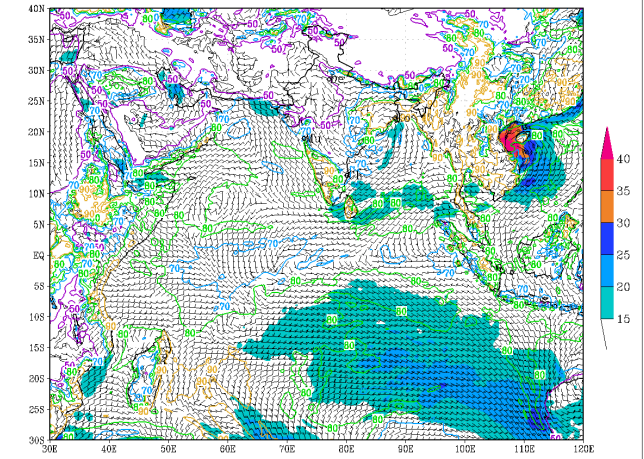
(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (120 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 27-10-2024



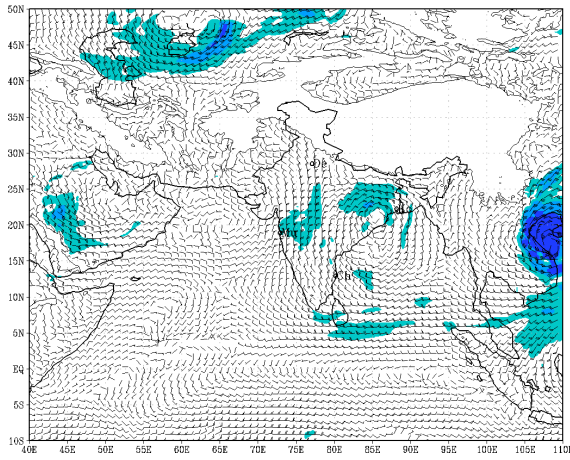
(Background does not depict political boundary)

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (120 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 27-10-2024



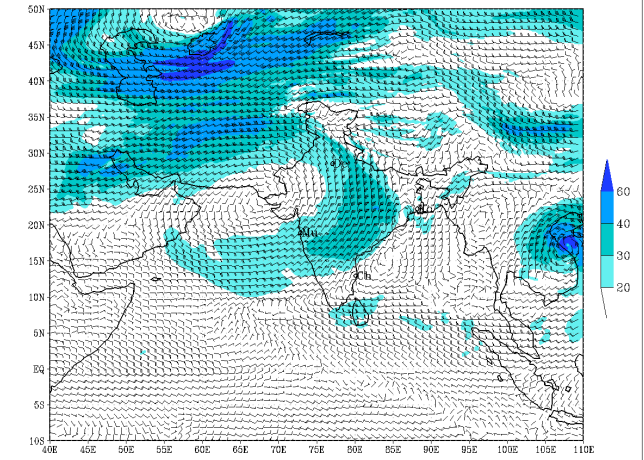
(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (120 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 27-10-2024



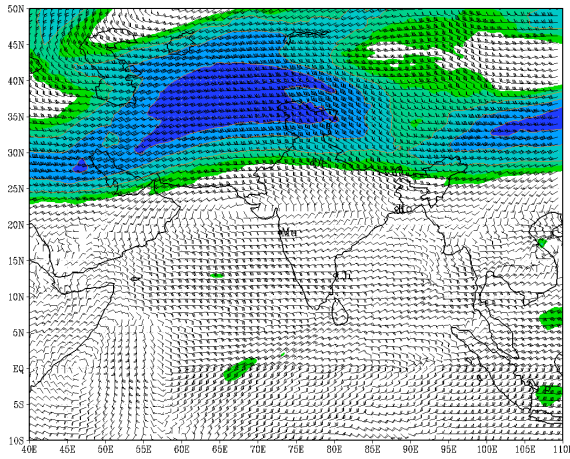
(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (120 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 27-10-2024



(Background does not depict political boundary)

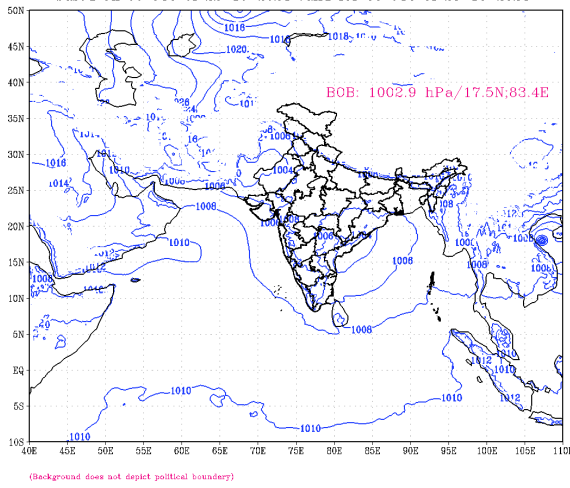
IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (120 HR)  
 based on 00 UTC of 22-10-2024 valid for 00 UTC of 27-10-2024



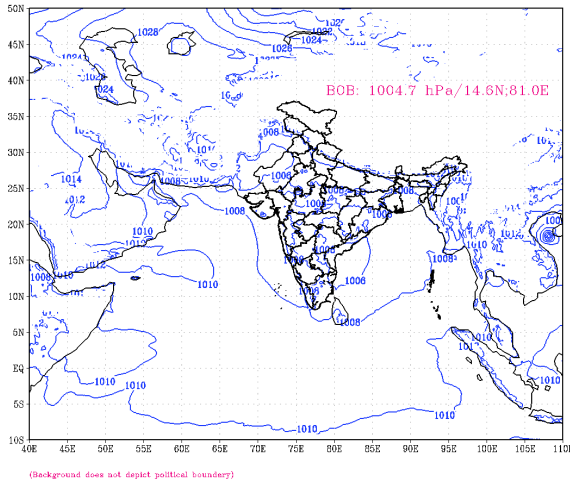
(Background does not depict political boundary)



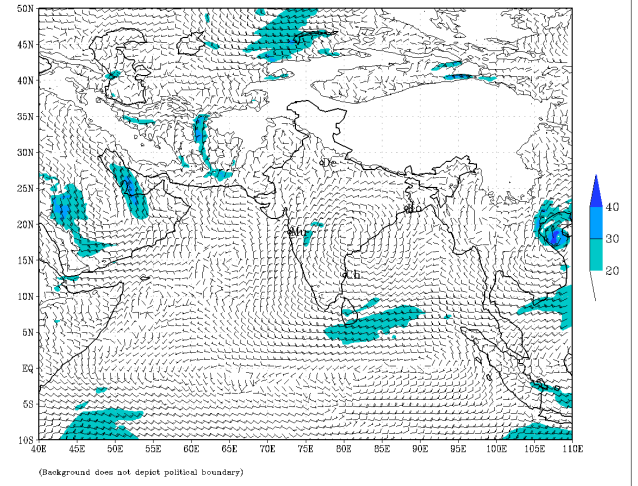
IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (144 HR)  
based on 00 UTC of 22-10-2024 valid for 00 UTC of 28-10-2024



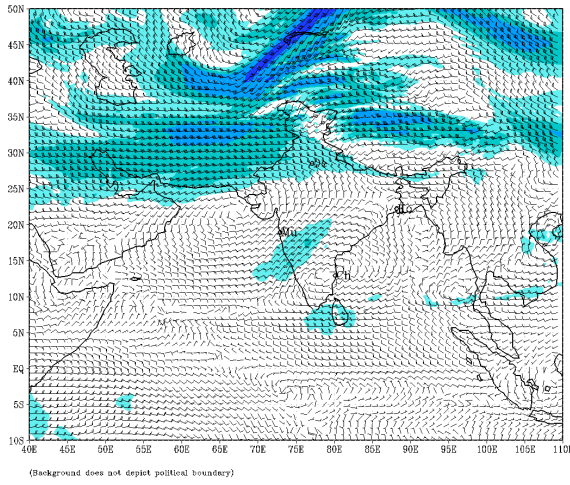
IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (168 HR)  
based on 00 UTC of 22-10-2024 valid for 00 UTC of 29-10-2024



IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (168 HR)  
based on 00 UTC of 22-10-2024 valid for 00 UTC of 29-10-2024



IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (168 HR)  
based on 00 UTC of 22-10-2024 valid for 00 UTC of 29-10-2024



IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (168 HR)  
based on 00 UTC of 22-10-2024 valid for 00 UTC of 29-10-2024

