



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

**Tropical Cyclone Forecast Programme  
Report Dated 21<sup>st</sup> October, 2024**

**Time of Issue: 1400 UTC**

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

**Well Marked Low Pressure Area over eastcentral Bay of Bengal: Pre-Cyclone Watch for Odisha and West Bengal coasts**

❖ Yesterday's upper air cyclonic circulation over central Andaman Sea lay over North Andaman Sea and adjoining eastcentral & southeast Bay of Bengal in the same evening (1730 hours IST of 20th October). Under its influence a \*Low Pressure Area\* formed over the Eastcentral Bay of Bengal and adjoining north Andaman Sea in the early morning (0530 hours IST) of today, the 21st October 2024. It moved west-northwestwards and lay as a well marked low pressure area over eastcentral Bay of Bengal at 1130 hours IST of today, the 21st October 2024.

It is very likely to move west-northwestwards and intensify into a depression by 22nd October morning and into a cyclonic storm by 23rd October, 2024 over eastcentral Bay of Bengal. Thereafter, it is very likely to move northwestwards and reach northwest Bay of Bengal off Odisha-West Bengal coasts by 24th October morning. Continuing to move northwestwards, it is very likely to cross north Odisha and West Bengal coasts between Puri and Sagar Island during night of 24th and early morning 25th 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. It is likely to move west-northwestwards away from Indian coast and weaken further during next 12 hours

❖ Yesterday's upper air cyclonic circulation over southwest & adjoining westcentral Bay of Bengal off north Tamil Nadu & south Andhra Pradesh lay over Tamil Nadu & neighbourhood extending upto 5.8 km above mean sea level at 0830 hours IST of today, the 21<sup>st</sup> October, 2024

❖ An upper air cyclonic circulation lay over eastcentral Arabian Sea off north Karnataka coast at 1.5 km above mean sea level at 0830 hours IST of today, the 21<sup>st</sup> October, 2024

Parameter	Bay of Bengal (BoB)	Arabian Sea (AS)
Sea Surface Temperature (SST) °C	29-32°C over entire BoB	➤ 28-30°C over eastern parts of AS. ➤ 27°C over the westcentral and southwest parts of AS
Tropical Cyclone Heat Potential (TCHP) kJ/cm <sup>2</sup>	➤ >120 over northeast BoB, westcentral BoB and south Andaman Sea. ➤ <80 over northwest & adjoining westcentral BoB ➤ 80-100 over remaining BoB	➤ 80-90 over central parts of south AS and adjoining EIO. ➤ 60-70 over eastcentral AS ➤ < 50 over westcentral AS & off Oman and Somalia coasts

<b>Cyclonic Relative vorticity (<math>X10^{-6}s^{-1}</math>)</b>	100 over north Andaman Sea & adjoining eastcentral BoB with vertical extension upto 500 hpa	30-40 over westcentral AS with vertical extension upto 500 hpa level
<b>Low Level convergence (<math>X10^{-5} s^{-1}</math>)</b>	5-10 over north Andaman Sea off Thailand coast and Andaman & Nicobar islands 5-10 over westcentral BoB off Andhra Pradesh coast	5 over westcentral AS and another 5 over Somalia coast
<b>Upper Level divergence (<math>X10^{-5} s^{-1}</math>)</b>	20-30 over north Andaman Sea, westcentral BoB and Andaman & Nicobar islands off Thailand coast. 5-10 over south BoB.	5 over westcentral AS off Oman-Yemen coast and another 5 over eastcentral & Lakshadweep islands area off Karnataka coast.
<b>Vertical Wind Shear (VWS knots)</b> <b>Low: 05-10 knots</b> <b>Moderate: 10-20 knots</b> <b>High: &gt;20 knots</b>	Low-moderate over central Bob and high over north & south BoB and adjoining EIO	Low-moderate over central AS and high over north & south AS and adjoining EIO
<b>Wind Shear Tendency (knots)</b>	Increasing tendency over Andaman Sea off Thailand coast & adjoining and Andaman & Nicobar islands. Decreasing tendency over southwest BoB and adjoining EIO.	Increasing tendency over westcentral AS and adjoining north AS off Oman coast. Decreasing tendency over Rest of AS.
<b>Upper tropospheric Ridge</b>	Along 18.0°N over BoB.	Along 16.0°N over AS.

### **Satellite observations based on INSAT imagery (0600 UTC):**

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

Scattered low and medium clouds with embedded intense to very intense convection lay over northeast & eastcentral Bay of Bengal and south Bay of Bengal, Andaman sea, Tenasserim coast and gulf of Martaban (minimum Cloud Top Temperature is minus 80° - 85° C). Scattered low and medium clouds with embedded moderate to intense convection lay over northwest & westcentral Bay of Bengal & Arakan Coast and South Andaman Sea

#### **(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 Konkan-Karnataka-Goa coasts and westcentral Arabian Sea (minimum Cloud Top Temperature is minus 80° - 85°C). Scattered low and medium clouds with embedded moderate to intense convection lay over Gulf of Cambay, rest of southeast Arabian Sea, Lakshadweep islands 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, Nepal, Tibet, China, Yellow Sea, East China Sea, Myanmar, Thailand, Gulf of Thailand, Cambodia, Laos, Vietnam, Gulf of Tonkin, Sumatra, Strait of Malacca, Malaysia, Borneo, South China Sea, Java Islands & Sea, Celebes Islands & Sea, Philippines, Sulu Sea, Madagascar, and over Indian Ocean between equator to 5.0°N and longitude 70.0° E to 100.0° E and between equator to 18.0° S and longitude 55.0° E to 90.0° E.

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

Madden Julian Oscillation (MJO) index is currently in Phase 5 with amplitude greater than 1. It is likely to move to phase 6 during end of week 1 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**

<b>MODEL GUIDANCE</b>	<b>Bay of Bengal (BoB)</b>	<b>Arabian Sea (AS)</b>
<b>IMD-GFS</b>	IMD GFS is indicating low-pressure area over Eastcentral BoB and adjoining north Andaman sea (14.7/93) on 21/00 UTC, Depression over Eastcentral BoB (17/92.9) on 21/12 UTC, Cyclonic storm (cs) over east central parts of BoB (16.8/92.2) at 22/00 UTC, indicating higher intensification upto SCS stage (60 kt) between 23/00 UTC & 24/00 UTC and crossing over Bangladesh coast as SCS (22/89.9) on 24/03 UTC.	WML over Westcentral Arabian Sea on 21/00 UTC, becoming less marked on 23/00 UTC.
<b>IMD-GEFS</b>	IMD GEFS indicating Depression over eastcentral BoB (17/92) on 22/00 UTC, Severe Cyclonic Storm (CS) over central BoB (18.5/89.8) on 23/00 UTC, Severe Cyclonic Storm (CS) over northwest BoB (19/89) crossing over Bangladesh-West Bengal border as CS (22/89) on 25/00 UTC.	No Significant System during next 8 days
<b>IMD-WRF</b>	WRF is indicating Depression over Eastcentral BoB (15/93) on 21/00 UTC, Deep Depression over Central BoB (17.5/90) on 23/00 UTC, Severe Cyclonic Storm and above over North BoB (20.1/89.8) near Bangladesh-West Bengal coasts on 24/00 UTC.	No Significant System during next 3 days
<b>NCMRWF-NCUM(G)</b>	NCUM(G) is indicating a low-pressure area over Eastcentral BoB 7 adjoining North Andaman (15/93) on 21/00 UTC, Depression over Eastcentral BoB (15.3/91.8) on 22/00 UTC, CS over Eastcentral bob (16.8/89.9) on 23/00 UTC, and crossing Odisha coast (20.5/86.8) on 24/21 UTC. Peak intensity of SCS (60 kt) between 24/00 UTC & 25/00 UTC is indicated.	Low pressure area over westcentral AS on 21/00 UTC with westwards movement towards Gulf of Aden till 23/00 UTC and becoming less marked thereafter.

<b>NCMRWF-NCUM(R)</b>	NCUM(R) is indicating a Well marked Low pressure area over Eastcentral BoB (15/93.5) on 21/00 UTC, Depression over Eastcentral BoB (15/92) on 22/00 UTC, further intensification into SCS and above over Westcentral BoB (15.5/87.5) on 23/00 UTC, VSCS over westcentral BoB (17.5/85.2) near Andhra Pradesh coast on 24/00 UTC.	No Significant System during next 3 days
<b>NCMRWF-NEPS</b>	Well Low Pressure Area over EastCentral BOB (15/94) on 21/00 UTC, Deep Depression over eastcentral BoB (15.2/91) on 22/00 UTC, Cyclonic Storm over central BoB (15.2/89.8) on 23/00 UTC, SCS and above over central BoB (17.5/89) on 24/00 UTC, Crossing Odisha coast (20/86.8) (near Bhubaneshwar) on 25/00 UTC.	Low pressure area over westcentral AS on 21/00 UTC with westwards movement towards Gulf of Aden till 23/00 UTC and becoming less marked thereafter.
<b>ECMWF</b>	ECMWF is indicating well marked low over Eastcentral BoB (15.0/92.3) on 21/00 UTC, Depression over Eastcentral BoB (15.6/91.7) on 22/00 UTC, Cyclonic Storm (CS) over Westcentral BoB (17.4/87.8) on 24/00 UTC and crossing over Odisha coast (20.2/86.4) on 25/00 UTC. Peak intensity of 45 kt is indicated by the model.	Low pressure area over westcentral AS on 21/00 UTC becoming less marked on 21/12 UTC.
<b>NCEP-GFS</b>	NCEP GFS is indicating well marked low over eastcentral & adjoining north andaman sea (15.6/92.6) on 21/00 UTC, depression over eastcentral bob (15.7/91.9) on 22/00 UTC, cs over eastcentral bob (16.4/91.6) on 22/12 UTC and crossing over west bengal-bangladesh coasts (21.6/87.8) 24/06 UTC as a scs category systems.	WML over Westcentral Arabian Sea on 21/00 UTC, becoming less marked on 23/00 UTC.
<b>IMD MME</b>	IMD MME is indicating Depression over Eastcentral BoB & adjoining North Andaman sea on 21st oct, CS on 22/12 UTC over Eastcentral BoB with Northwestwards movement towards Odisha-WestBengal and crossing around 25/05 UTC near 22.13/88.2 as a Deep Depression.	-

**Summary:**

**(a) Bay of Bengal:**

There is large variation among various models wrt movement of the system after becoming cyclonic storm over eastcentral BoB. Landfall point is varying from Gopalpur (Odisha) to Khepupara (south Bangladesh). Similarly, the landfall time is varying between 24/03 UTC to 25/06 UTC. And intensity at the time of landfall is varying from deep depression category (30 kt) to severe cyclonic storm (60 kt).

Considering all the above, the well marked low pressure area over eastcentral Bay of Bengal is very likely to move west-northwestwards and intensify into a depression by 22<sup>nd</sup> October morning and into a cyclonic storm by 23<sup>rd</sup> October, 2024 over eastcentral Bay of Bengal. Thereafter, it is very likely to move northwestwards, intensify into a severe cyclonic storm and cross north Odisha and West Bengal coasts between Puri and Sagar Island during 1800 UTC of 24<sup>th</sup> and 0000 UTC of 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 system and it's weakening by 22/00 UTC.

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

- ❖ The well marked low pressure area over eastcentral Bay of Bengal is very likely to move west-northwestwards and intensify into a depression by 22<sup>nd</sup> October morning and into a cyclonic storm by 23<sup>rd</sup> October, 2024 over eastcentral Bay of Bengal. Thereafter, it is very likely to move northwestwards, intensify into a severe cyclonic storm and cross north Odisha and West Bengal coasts between Puri and Sagar Island during 1800 UTC of 24<sup>th</sup> and 0000 UTC of 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 22/00 UTC.

**Probability of cyclogenesis (formation of depression and above intensity systems) over the BAY OF BENGAL of Bengal and Andaman Sea during next 168 hours:**

<u>24 HOURS</u>	<u>24-48 HOURS</u>	<u>48-72 HOURS</u>	<u>72-96 HOURS</u>	<u>96-120 HOURS</u>	<u>120-144 HOURS</u>	<u>144-168 HOURS</u>
HIGH	HIGH	-	-	-	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

“-“ 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%.

**Advisory:**

**Impact Expected over Sea Area of Central & North Bay of Bengal and districts of Odisha (Baleswar, Bhadrak, Kendrapara, Jagatsinghpur, Puri, Khorda, Mayurbhanj,**

**Kendujhar, Jajpur, Cuttack, Dhenkanal) and West Bengal (South & North 24 Parganas, East & West Medinipur, Howrah, Hooghly, Kolkata, & Bankura)**

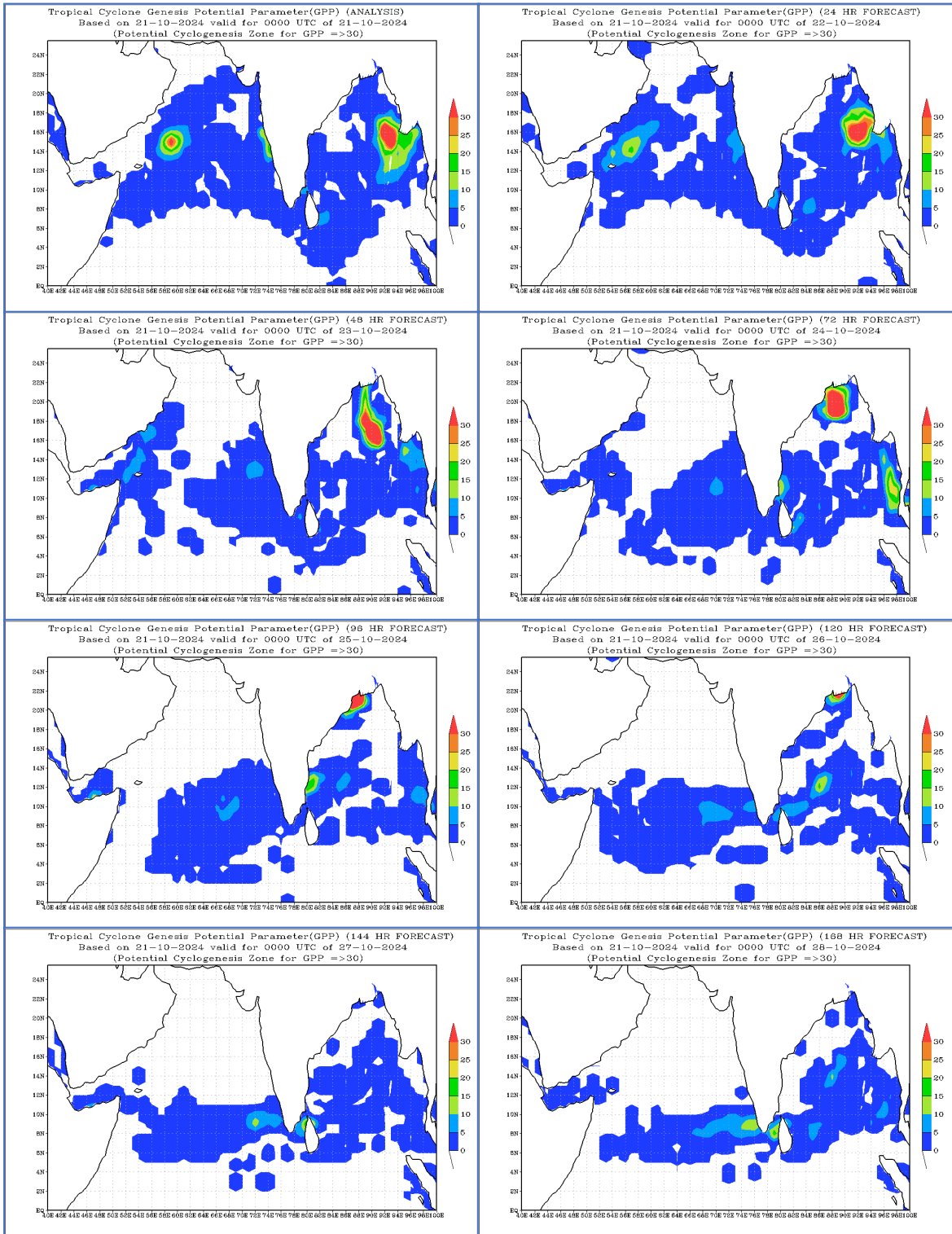
- Major damage to thatched houses/ huts. Roof tops may blow off. Unattached metal sheets may fly.
- Minor damage to power and communication lines.
- Damage to Kutcha & some damage to Pucca roads. Flooding of escape routes.
- Possibilities of damage to vulnerable structure. Breaking of tree branches and uprooting of trees.
- Moderate damage to banana and papaya trees. Large dead limbs blown from trees.
- Damage to horticulture and standing crops in some areas due to inundation and wind.
- Damage to embankments/ salt pans.
- Localized Flooding of roads, water logging in low lying areas and closure of underpasses mainly in urban areas of the above region.
- Occasional reduction in visibility due to heavy rainfall.
- Disruption of traffic in major cities and roadways due to water logging in roads and poor visibility due to heavy rain leading to increased travel time and incidents
- Localized Landslides/Mudslides/landslips/mud slips/land sinks/mud sinks.
- Likely disruption of marine and inland water transportation like small boats and trawlers.
- It may lead to riverine flooding in some river catchments (for riverine flooding please visit Webpage of Central Water Commission)

**Action Suggested over Sea Area of Central & North Bay of Bengal and Baleswar, Bhadrak, Kendrapara, Jagatsinghpur, Puri, Khorda, Mayurbhanj, Kendujhar, Jajpur, Cuttack, Dhenkanal) and West Bengal (South & North 24 Parganas, East & West Medinipur, Howrah, Hooghly, Kolkata & Bankura)**

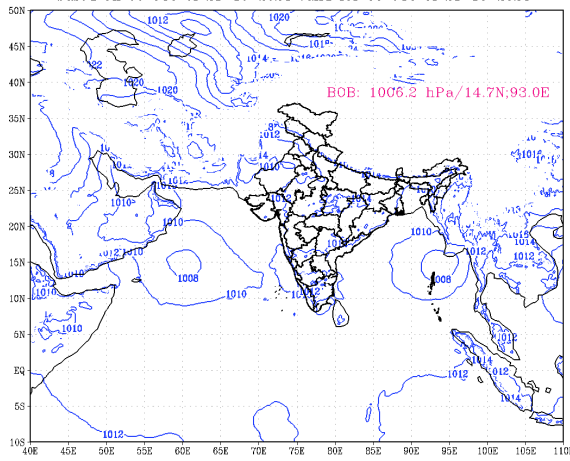
- Fishermen are advised not to venture into
  - ✓ Andaman Sea till 21<sup>st</sup> October.
  - ✓ Eastcentral Bay of Bengal during 21<sup>st</sup>-24<sup>th</sup> October.
  - ✓ **Adjoining areas of Westcentral Bay of Bengal on 23<sup>rd</sup> and 24<sup>th</sup> Oct.**
  - ✓ **North Bay of Bengal** and along & off Odisha-West Bengal coasts during 23<sup>rd</sup> to 25<sup>th</sup> October morning.
- Fishermen out at sea are advised to return to coasts by 21<sup>st</sup> October.
- Total suspension of fishing operations during 22<sup>nd</sup> to 25<sup>th</sup> Oct over Central and North Bay of Bengal.
- Movement in motor boats unsafe
- Coastal hutment dwellers to be moved to safer places.
- People in affected areas to remain indoors.
- Judicious regulation of onshore/offshore, Port and maritime activities including shipping.
- Judicious regulation of tourism activities in Andaman & Nicobar Islands.
- Judicious regulation of surface transports including railways and roadways.
- Check for traffic congestion on your route before leaving for your destination.
- Follow any traffic advisories that are issued in this regard.
- Avoid going to areas that face the water logging problems often.
- Avoid staying in vulnerable structure.

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

Andaman Sea during 21<sup>st</sup> and Odisha, West Bengal, Bangladesh and Myanmar coasts during 22<sup>nd</sup> – 25<sup>th</sup> October.

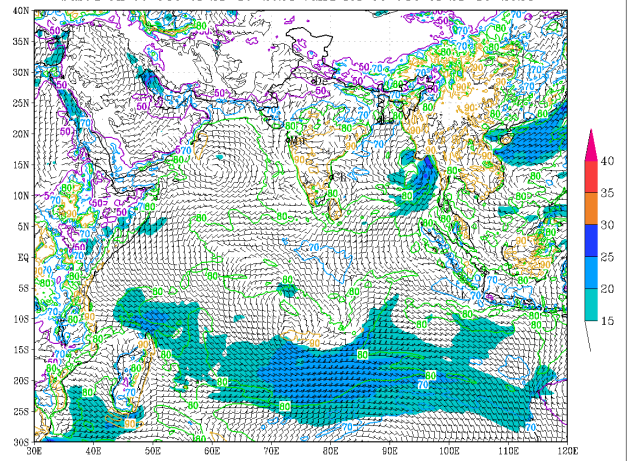


IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (00 HR)  
based on 00 UTC of 21-10-2024 valid for 00 UTC of 21-10-2024



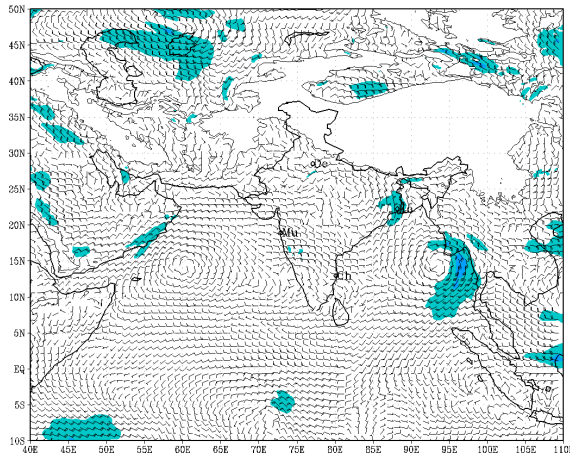
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IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (00 HR)  
based on 00 UTC of 21-10-2024 valid for 00 UTC of 21-10-2024



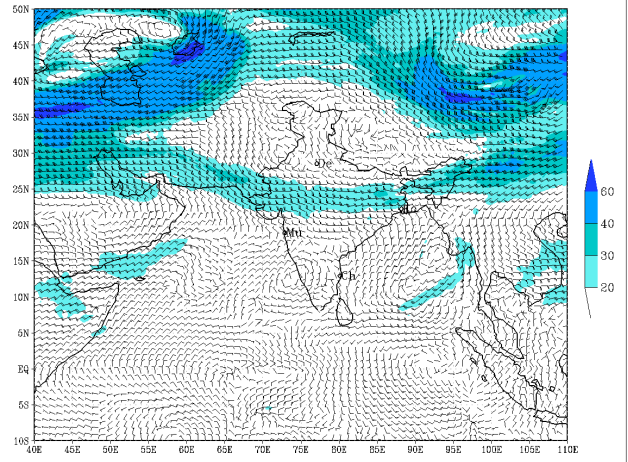
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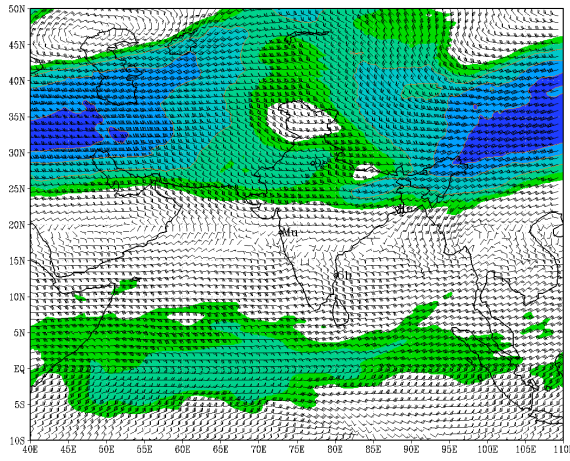
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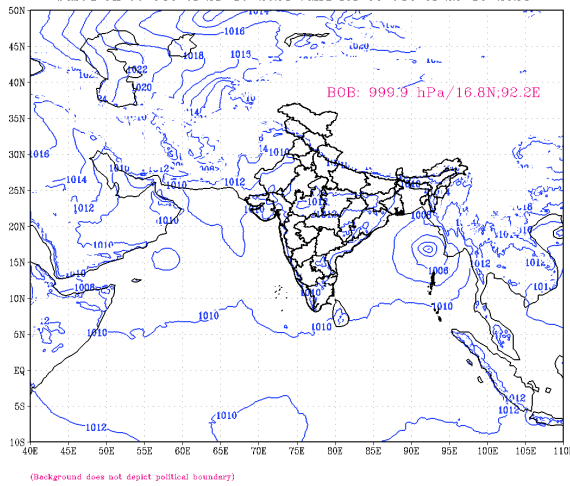
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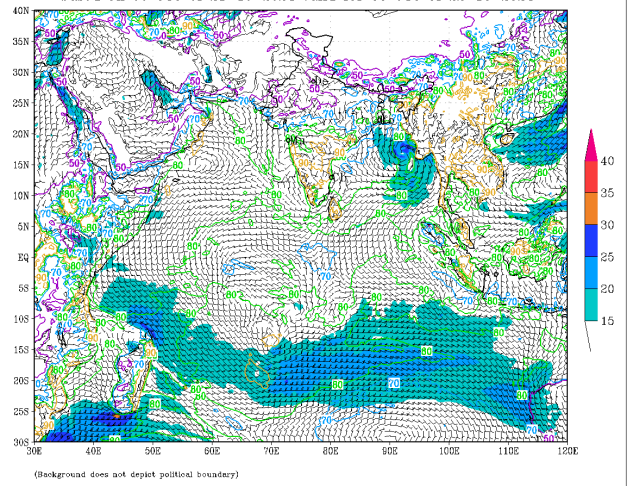
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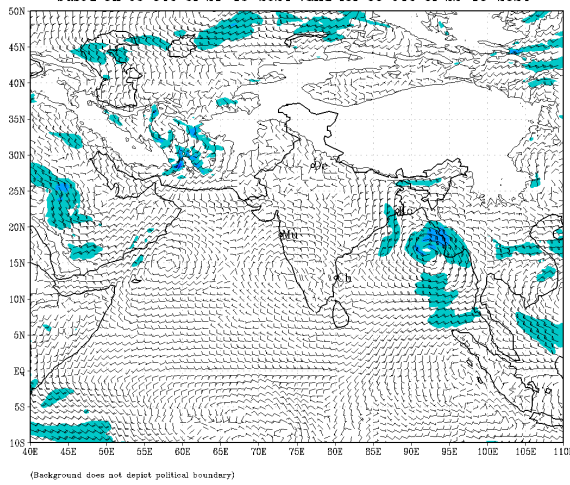
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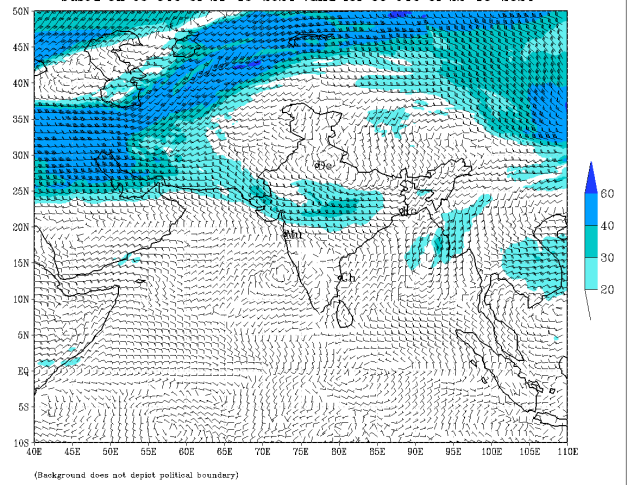
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (24 HR)  
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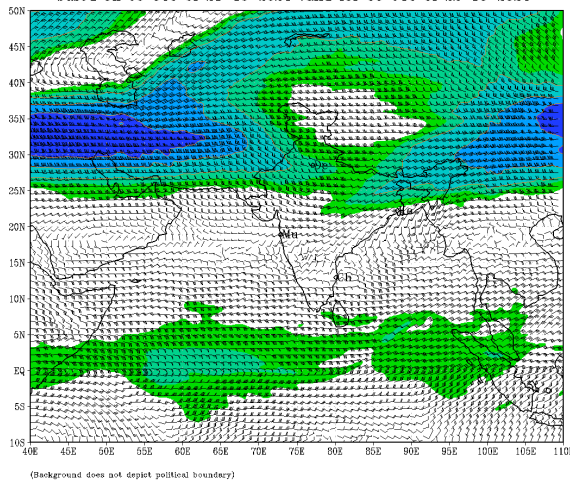
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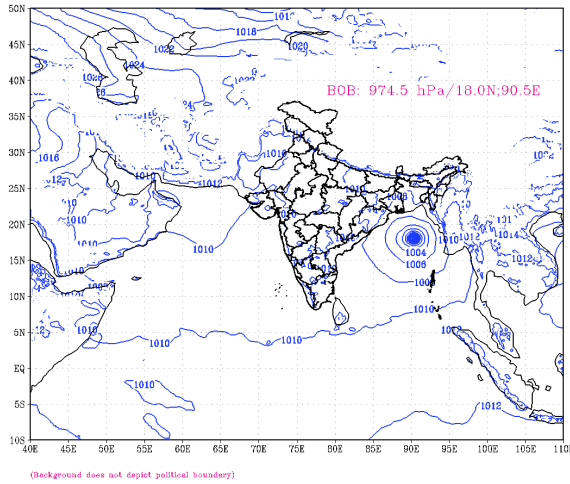
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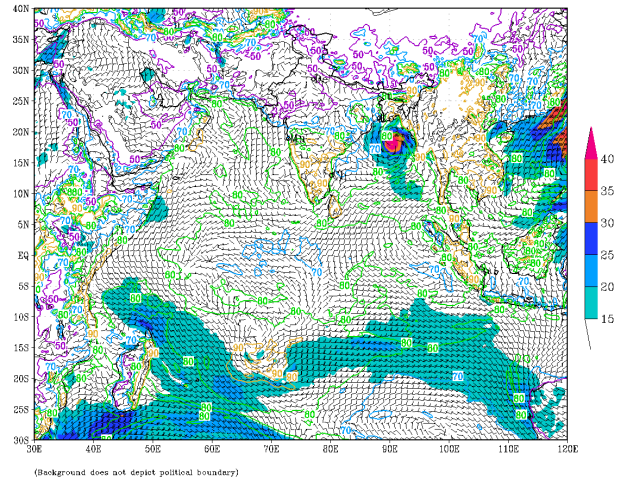
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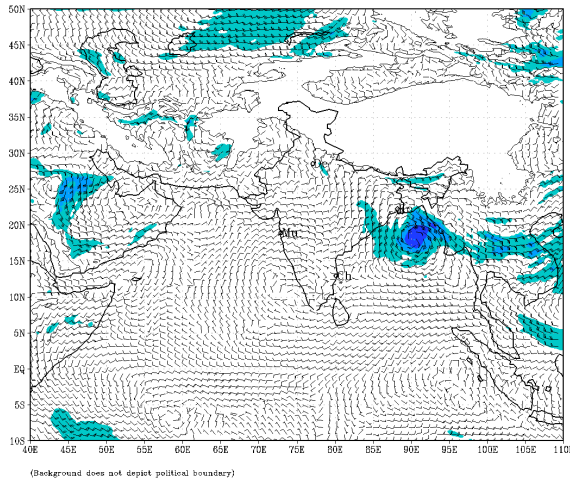
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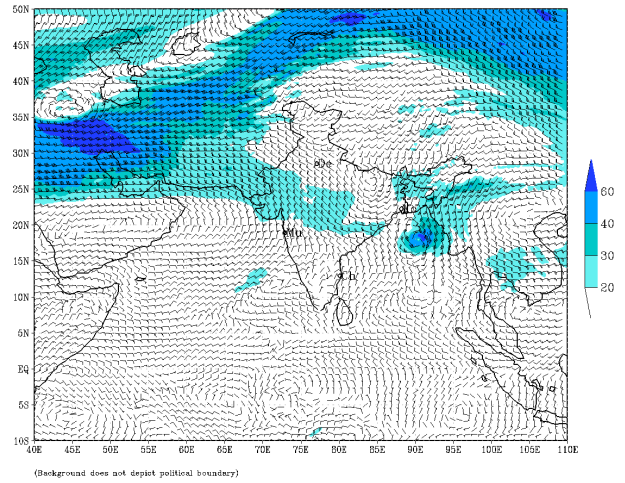
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (48 HR)  
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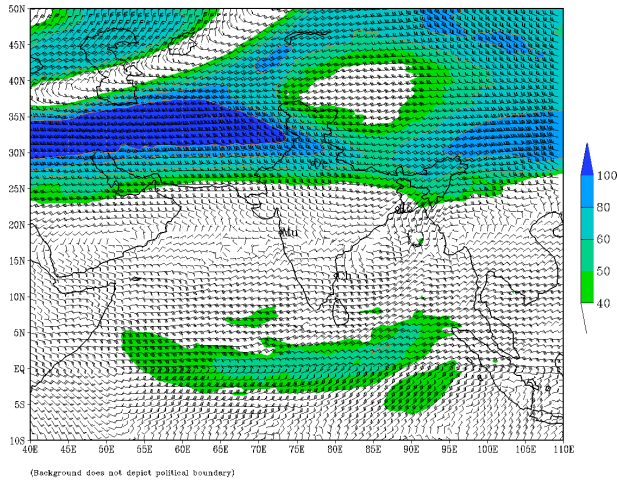
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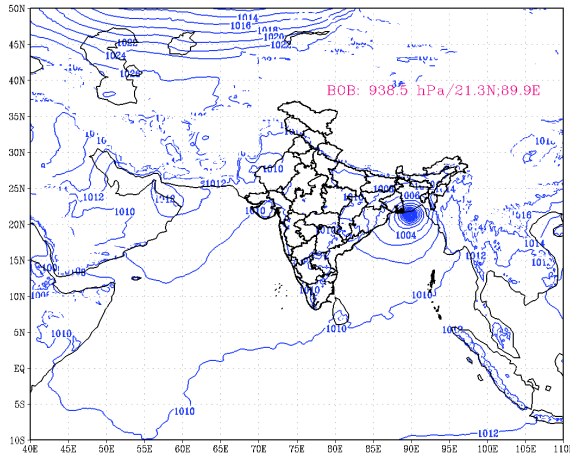
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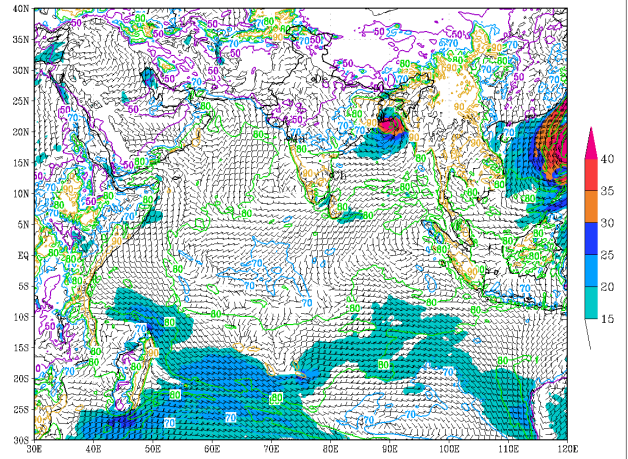


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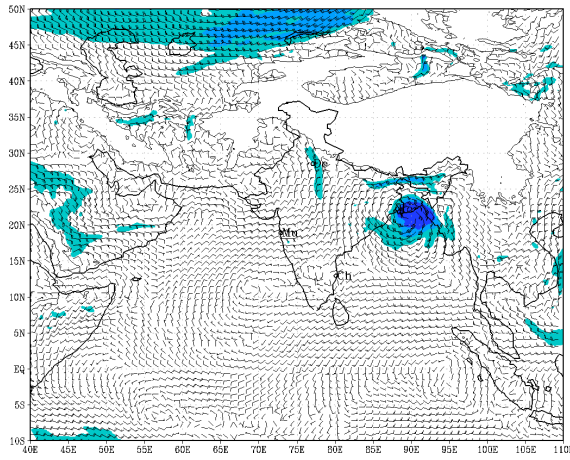
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IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (72 HR)  
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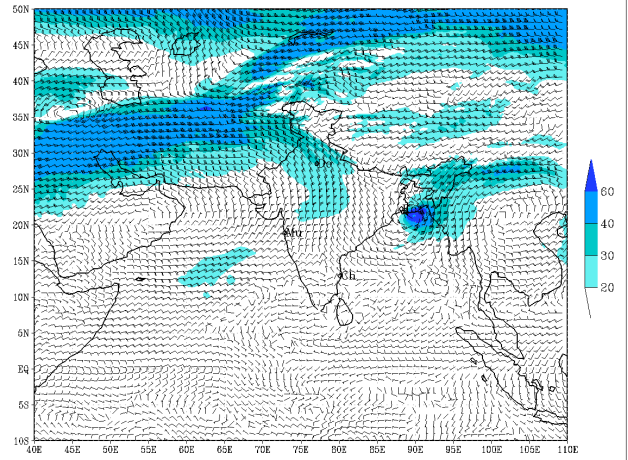
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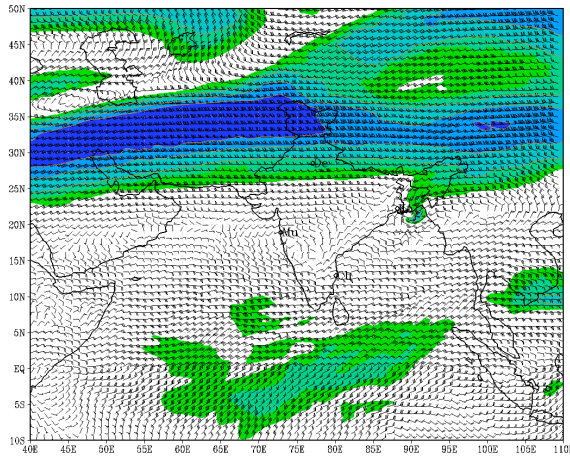
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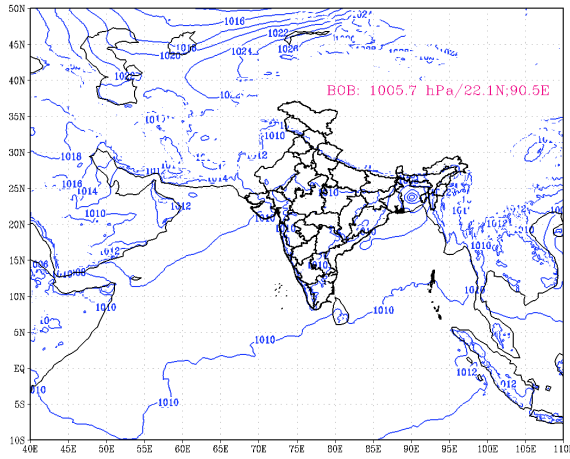
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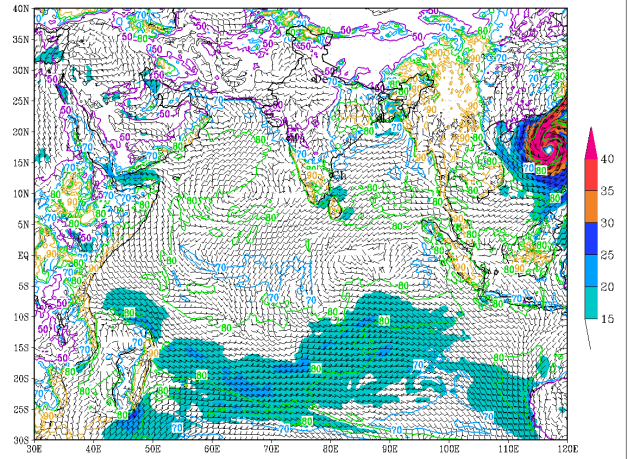
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IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (96 HR)  
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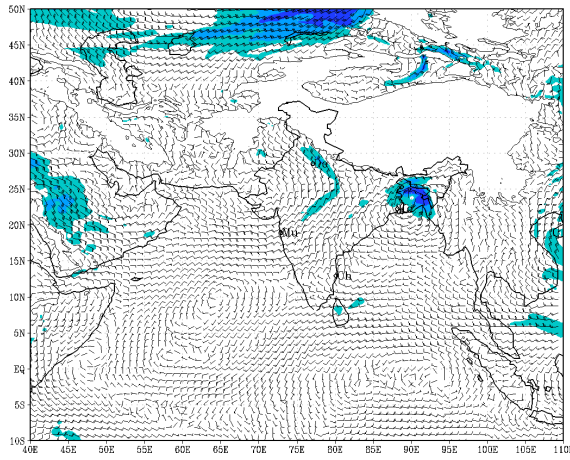
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IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (96 HR)  
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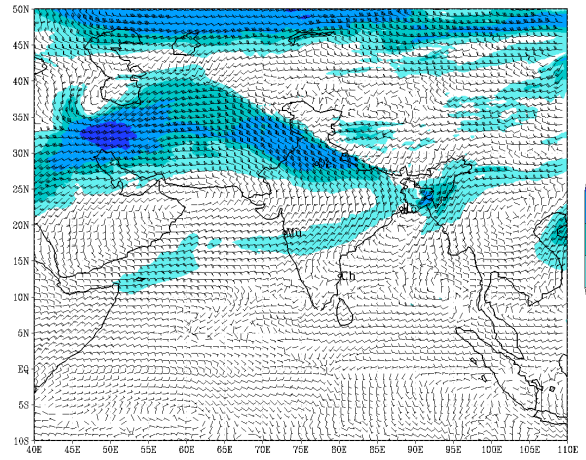
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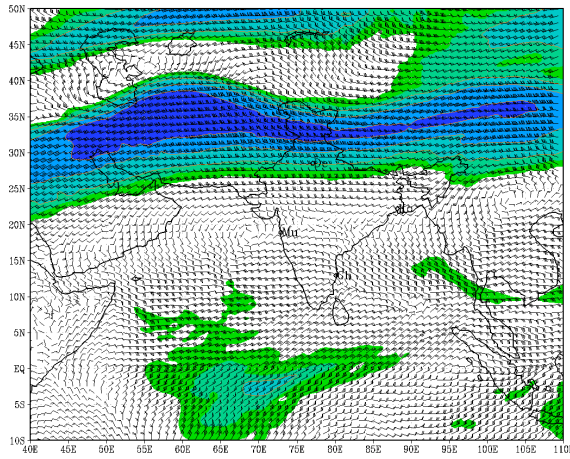
(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (96 HR)  
 based on 00 UTC of 21-10-2024 valid for 00 UTC of 25-10-2024



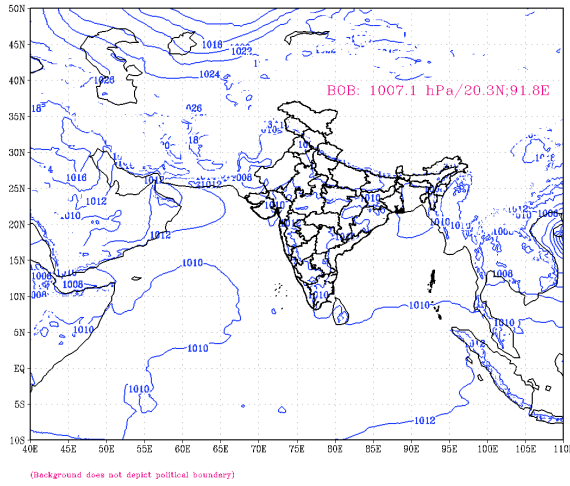
(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (96 HR)  
 based on 00 UTC of 21-10-2024 valid for 00 UTC of 25-10-2024

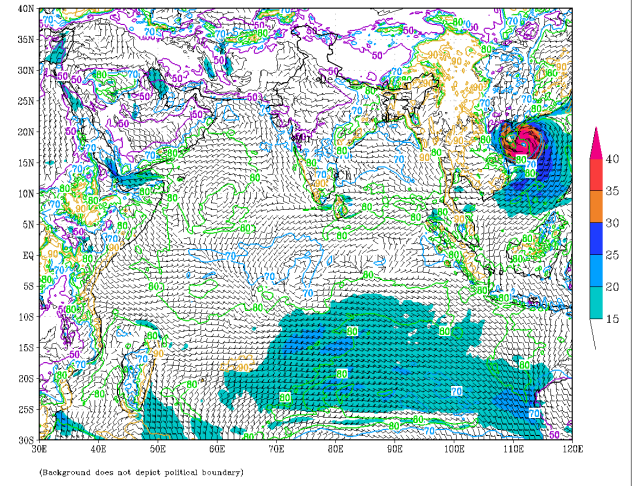


(Background does not depict political boundary)

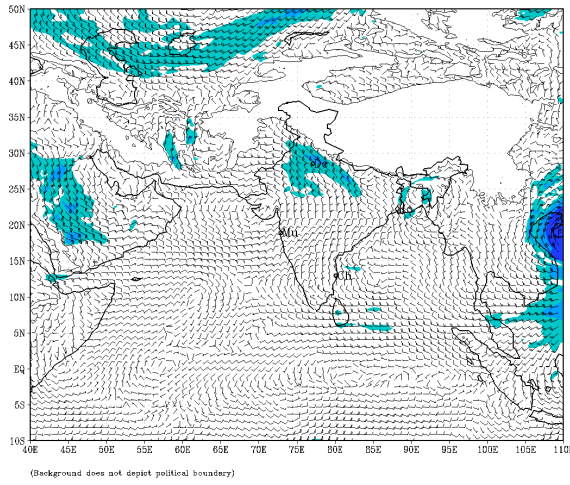
IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (120 HR)  
based on 00 UTC of 21-10-2024 valid for 00 UTC of 26-10-2024



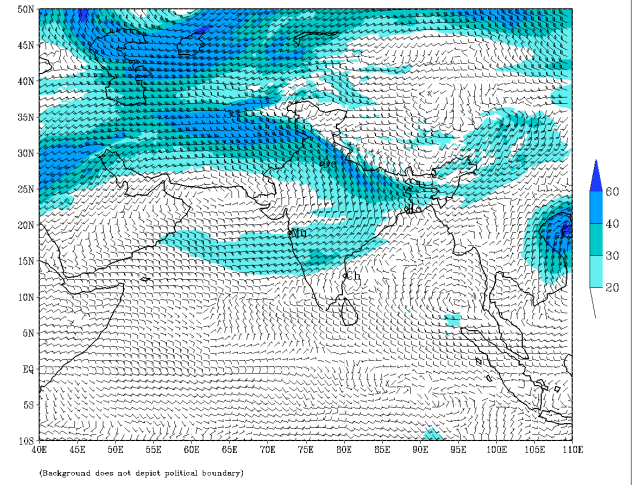
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (120 HR)  
based on 00 UTC of 21-10-2024 valid for 00 UTC of 26-10-2024



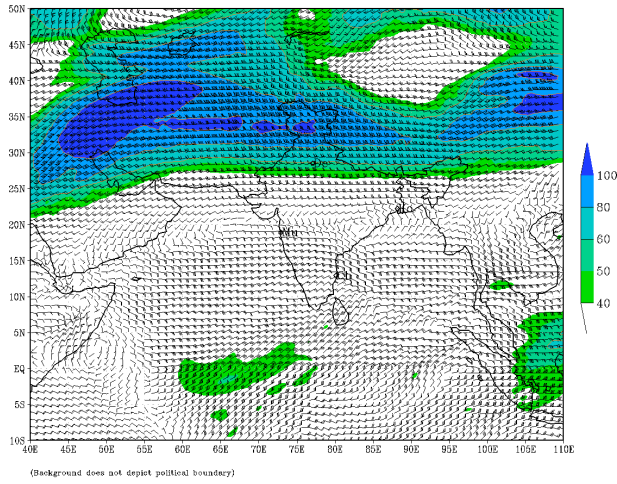
IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (120 HR)  
based on 00 UTC of 21-10-2024 valid for 00 UTC of 26-10-2024



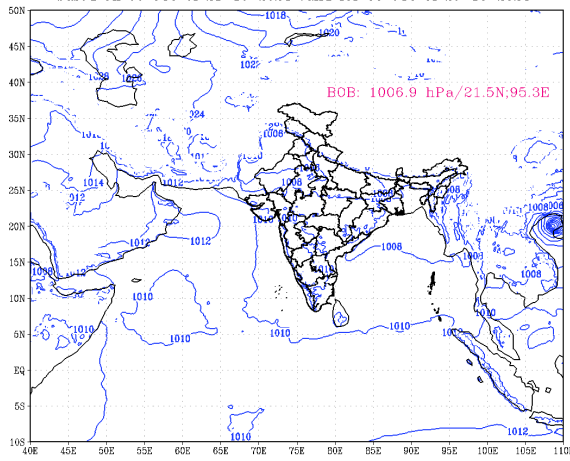
IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (120 HR)  
based on 00 UTC of 21-10-2024 valid for 00 UTC of 26-10-2024



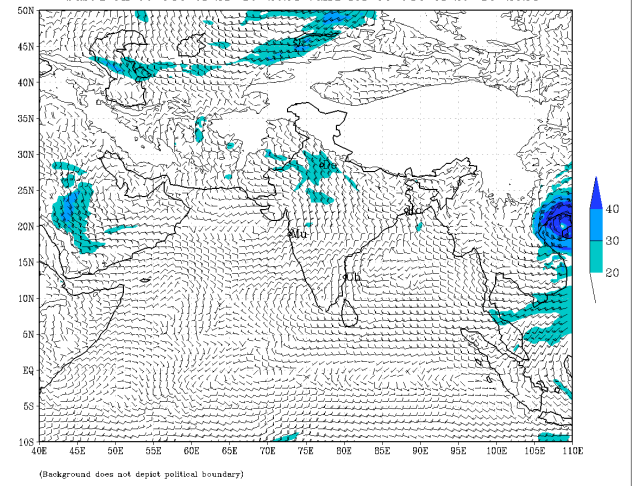
IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (120 HR)  
based on 00 UTC of 21-10-2024 valid for 00 UTC of 26-10-2024



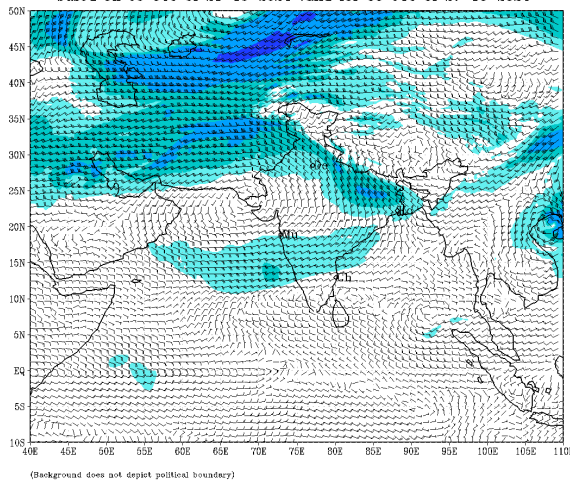
IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (144 HR)  
based on 00 UTC of 21-10-2024 valid for 00 UTC of 27-10-2024



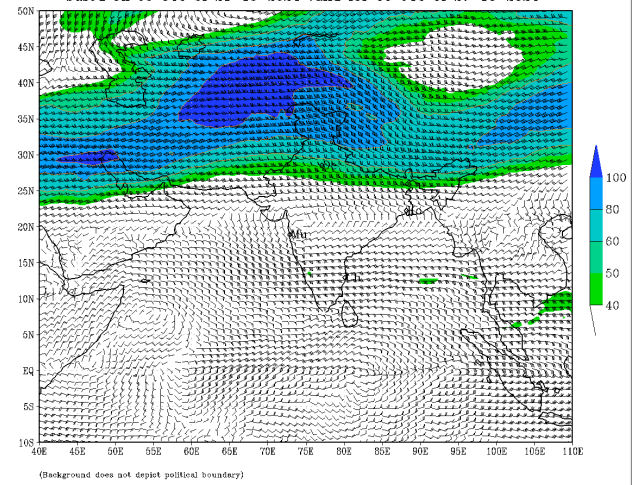
IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (144 HR)  
based on 00 UTC of 21-10-2024 valid for 00 UTC of 27-10-2024



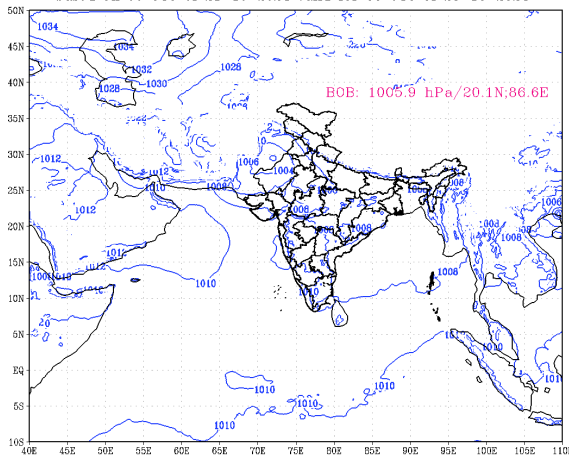
IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (144 HR)  
based on 00 UTC of 21-10-2024 valid for 00 UTC of 27-10-2024



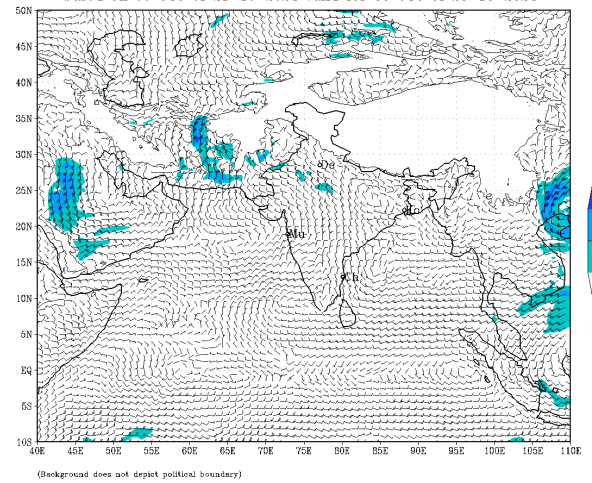
IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (144 HR)  
based on 00 UTC of 21-10-2024 valid for 00 UTC of 27-10-2024



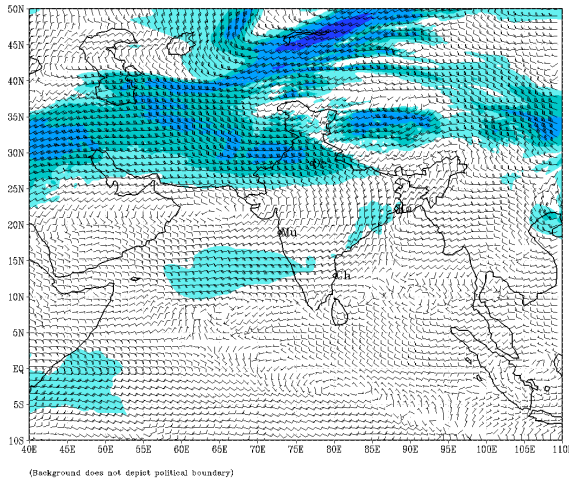
IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (168 HR)  
 based on 00 UTC of 21-10-2024 valid for 00 UTC of 28-10-2024



IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (168 HR)  
 based on 00 UTC of 21-10-2024 valid for 00 UTC of 28-10-2024



IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (168 HR)  
 based on 00 UTC of 21-10-2024 valid for 00 UTC of 28-10-2024



IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (168 HR)  
 based on 00 UTC of 21-10-2024 valid for 00 UTC of 28-10-2024

