



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

**Tropical Cyclone Forecast Programme
Report Dated 28th November 2024**

Time of Issue: 1000 UTC

Synoptic features (based on 0600 UTC analysis):

The **Deep Depression** over Southwest Bay of Bengal moved slowly north-northeastwards with a speed of 3 Kmph during past 6 hours and lay centred at 1130 hours IST of today, the 28th November 2024 over the same region near latitude 9.2°N and longitude 82.3°E, about 130 km east-northeast of Trincomalee (43418), 320 km east-southeast of Nagappattinam (43347), 410 km southeast of Puducherry (43331) and 480 km south-southeast of Chennai (43279). It is very likely to move nearly northwards skirting Sri Lanka coast during next 12 hours. Thereafter, it will move north-northwestwards and cross north Tamil Nadu-Puducherry coasts between Karaikal and Mahabalipuram around morning of 30th November as a deep depression with a wind speed of 50-60 kmph gusting to 70 kmph. There is a possibility of marginal intensification of the deep depression into a Cyclonic Storm with wind speed 60-70 kmph gusting to 80 kmph over southwest Bay of Bengal during the evening of 28th November to morning of 29th November 2024.

Environmental Features:

Parameter	Bay of Bengal (BoB)	Arabian Sea (AS)
Sea Surface Temperature (SST) °C	➤ 28-30°C over BoB.	➤ 29-30°C over most parts of AS. ➤ 26-28°C over southwest AS along and off Somalia coast and parts of westcentral AS.
Tropical Cyclone Heat Potential (TCHP) kJ/cm²	➤ 100-120 over south BoB & adjoining EIO. ➤ 30-40 over southwest & adjoining westcentral BoB and along & off Sri Lanka/Tamil Nadu/ Andhra Pradesh coasts	➤ 80-100 over most parts of south, central AS, Lakshadweep Island. ➤ 20-40 over rest of the area.
Cyclonic Relative vorticity (X10⁻⁶s⁻¹)	➤ 100-120 over southwest BoB along & off Sri Lanka & adjoining east EIO. ➤ 20-30 over north BoB.	➤ 10-20 over eastcentral AS, South AS, westcentral AS along the coast of Somalia.
Low Level convergence(X10⁻⁵ s⁻¹)	➤ 10-20 over westcentral and adjoining southwest BoB.	➤ 5 -10 over southwest & adjoining southeast AS
Upper-Level divergence (X10⁻⁵ s⁻¹)	➤ 40-50 over westcentral and adjoining southwest BoB	➤ 20-30 over south AS.
Vertical Wind Shear (VWS knots)	➤ High over north & central BoB.	➤ High over north AS. ➤ Moderate - High over central

Low: 05-10 knots Moderate: 10-20 knots High: >20 knots	<ul style="list-style-type: none"> ➤ Moderate – High over southwest BoB. ➤ Low-Moderate over southeast BoB & south Andaman Sea. 	AS.
Wind Shear Tendency (knots)	<ul style="list-style-type: none"> ➤ Increasing over North, central and southwest BoB. ➤ Decreasing over southeast BoB. 	<ul style="list-style-type: none"> ➤ Increasing over north & central AS. ➤ Decreasing over South AS.
Upper tropospheric Ridge	<ul style="list-style-type: none"> ➤ At 12⁰ N. 	<ul style="list-style-type: none"> ➤ At 11⁰ N.

Satellite observations based on INSAT imagery (0300 UTC):

a) Over the BoB & Andaman Sea: -

Scattered to broken low and medium clouds with embedded intense to very intense convection lay over south & central Bay of Bengal, (Minimum Cloud Top Temperature is minus 80-93 degrees Celsius). Scattered low and medium clouds with embedded moderate to intense convection lay over Palk strait, Gulf of Mannar, north Bay of Bengal & Andaman Sea.

b) Over the Arabian Sea:

Scattered low and medium clouds with embedded moderate to intense convection lay over eastcentral Arabian Sea off Goa - Karnataka coasts, south Arabian Sea, Lakshadweep Islands area, Maldives & Comorin area.

c) Outside India:

Scattered low/med clouds with embedded moderate to intense convection lay over Sri Lanka, Palk strait, Gulf of Mannar, Maldives, Tibet, China, Myanmar, Thailand, Gulf of Thailand, Cambodia, Vietnam, Sumatra, Strait of Malacca, Malaysia, Borneo, south China Sea, Java Islands & Sea, Celebes Islands & Sea, Philippines, Sulu Sea, north Madagascar, Mozambique Channel and over Indian Ocean between Lat 5.0N to 12.0S Long 50.0E to 80.0E and between Lat 5.0N to 25.0S Long 80.0E to 120.0E.

M.J.O. Index:

Madden Julian Oscillation (MJO) is in phase 4 with amplitude more than 1 and would move across phase 5 from 29th onwards.

Storms and Depression over east China sea adjoining Taiwan/ South Indian Ocean:

Vortex over South Indian Ocean (area H05 adjoining E85) centered near 14.9S / 89.9E. Intensity T3.0/3.0. Maximum sustained winds of 34 – 47 KTS. Associated scattered to broken low and medium clouds with embedded intense to very intense convection lay over area between latitude 12.0⁰ S to 23.0⁰ S longitude 85.0⁰ E to 95.0⁰ E.

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

MODEL GUIDANCE	Bay of Bengal (BoB)	Arabian Sea (AS)
IMD-GFS	Model is indicating DD/CS over southwest BoB as on today, it will move northwestwards and lay over southwest BoB as DD/CS on 29 th , it will cross the coast as DD around 30 th 00 UTC. It will then move over southern Peninsular India and emerge into southeast Arabian Sea on 2 nd December as WML.	A WML over southeast Arabian Sea on 2 nd December having its west-southwestwards movement towards Somalia coast while weakening.
IMD-GEFS	Model is indicating DD/CS over southwest BoB as on today, it will move northwestwards and lay over southwest BoB as DD/CS on 29 th , it will cross the coast as DD around 30 th 00 UTC. It will then move over southern Peninsular India and emerge into southeast Arabian Sea on 2 nd December as WML.	A WML over southeast Arabian Sea on 2 nd December having its west-southwestwards movement towards Somalia coast while weakening.
IMD-WRF	Model is indicating DD/CS over southwest BoB as on today, it will move northwestwards will cross the Tamil Nadu coast as DD around 30 th 00 UTC.	No Significant circulation over AS.
NCMRWF-NCUM(G)	Model is indicating DD/CS over southwest BoB as on today, it will move northwestwards and lay over southwest BoB as DD/CS on 29 th , it will cross the coast as DD around 30 th 00 UTC. It will then move over southern Peninsular India and emerge into southeast Arabian Sea on 2 nd December as WML.	A WML over southeast Arabian Sea on 3 rd December having its west-southwestwards movement towards Somalia coast while having slight intensification.
NCMRWF-NCUM(R)	Model is indicating DD/CS over southwest BoB as on today, it will move northwestwards and lay over southwest BoB as DD/CS on 29 th , it will cross the coast as DD around 30 th 00 UTC.	No Significant circulation over AS.
NCMRWF-NEPS	Model is indicating DD as on today the 27 th /00 UTC, moving northwestward and lay over southwest BoB as CS on 28 th , moving in the same direction towards Tamil Nadu coast and lay over southwest BoB as CS on 29 th , it will move in the same direction and cross the Tamil Nadu coast as DD around 30 th /00 UTC. It will move over land area and emerge into south east Arabian Sea as depression around 02 nd December 00 UTC. It will have its west-southwestward movement towards Somalia coast.	A WML over southeast Arabian Sea on 2 nd December having its west-southwestwards movement towards Somalia coast while having slight intensification.
ECMWF	Model is indicating DD/CS over southwest BoB as on today, it will move northwestwards and lay over southwest BoB as DD/CS on 29 th , it will cross the coast as DD around 30 th 00 UTC. It will	A WML over southeast Arabian Sea on 3 rd December having its west-southwestwards movement towards Somalia coast.

	then move over southern Peninsular India and emerge into southeast Arabian Sea on 3rd December as WML.	
NCEP-GFS	Model is indicating DD/CS over southwest BoB as on today, it will move northwestwards and lay over southwest BoB as DD/CS on 29 th , it will touch the Tamil Nadu coast as DD around 30 th 00 UTC. It will lay over the same region till 3 rd Dec while weakening	No Significant cyclonic circulation over AS.

Summary:

(a) Bay of Bengal:

Model guidance indicates that, there is still lack of consensus among various models with respect to movement and intensity. Some of the models are indicating intensification into marginal cyclonic storm during 28th /1200 UTC to 29th /0000 UTC. However, most of the models are indicating gradual weakening of the system thereafter as it moves towards the coast.

(b) Arabian Sea

Most of the models are indicating likely emergence of remnants of existing deep depression over Bay of Bengal into southeast and adjoining eastcentral Arabian Sea around 1st December. Thereafter models are indicating the system will move westwards and intensify into depression over central parts of Arabian Sea around 2nd December.

Inference:

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

Considering all the above, it is inferred that the deep depression over Southwest Bay of Bengal is very likely to move north-northwestwards skirting Sri Lanka coast during next 12 hours. Thereafter, it will continue to move north-northwestwards and cross north Tamil Nadu-Puducherry coasts between Karaikal and Mahabalipuram around morning of 30th November as a deep depression with a wind speed of 50-60 Kmph gusting to 70 Kmph.

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	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	LOW	LOW	-	-

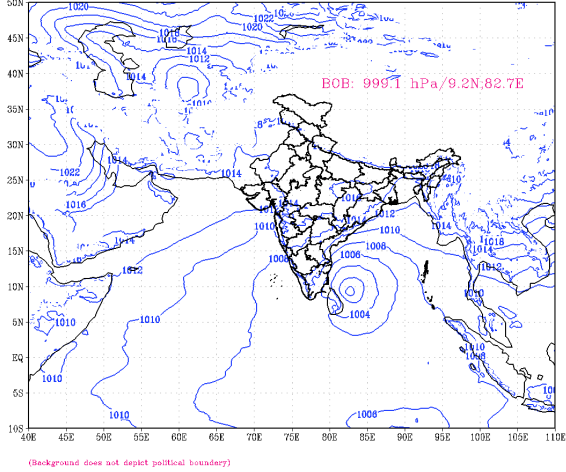
“- “indicates genesis has already occurred.

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

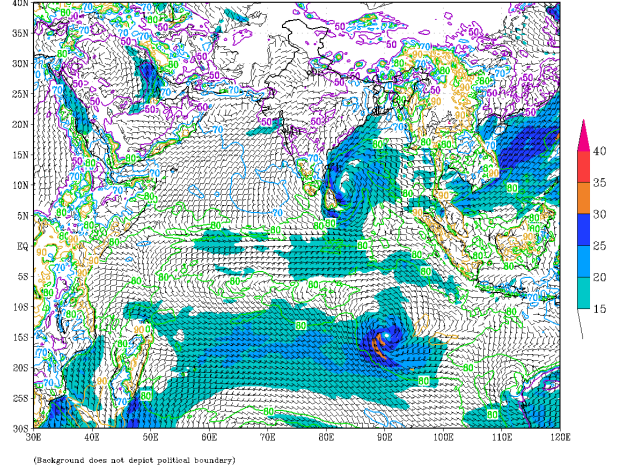
Intense Observation Period (IOP): Sri Lanka coasts during 28th-29th, Tamil Nadu coast during 28th-01st Dec November and south Andhra Pradesh coast during 28-01st Dec.

ANNEXURE

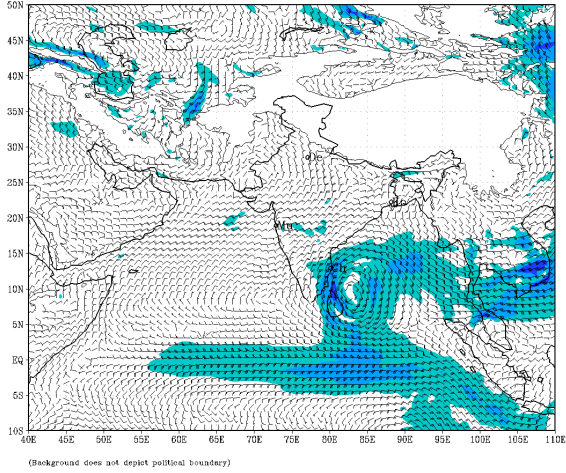
IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (00 HR)
 based on 00 UTC of 28-11-2024 valid for 00 UTC of 28-11-2024



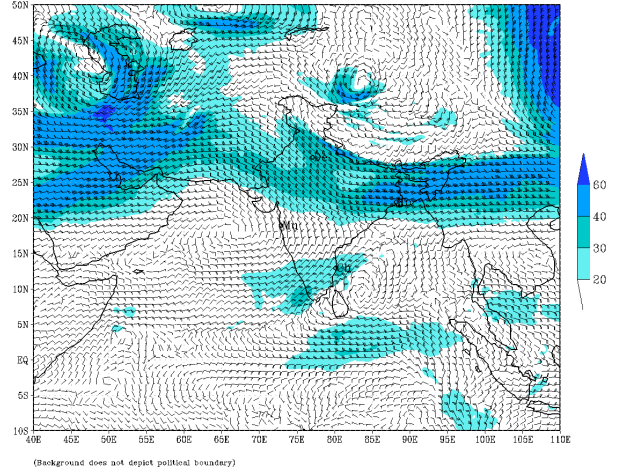
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (00 HR)
 based on 00 UTC of 28-11-2024 valid for 00 UTC of 28-11-2024



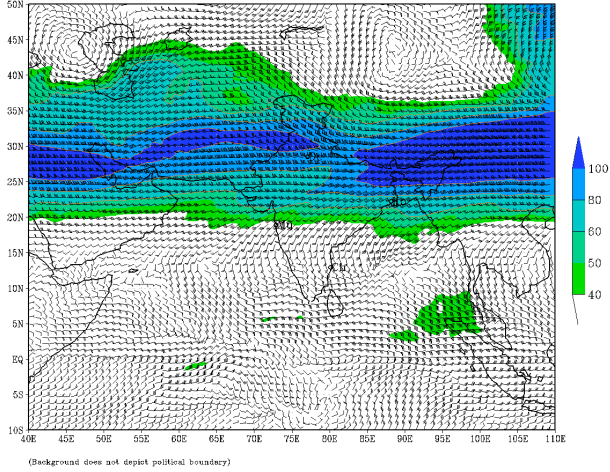
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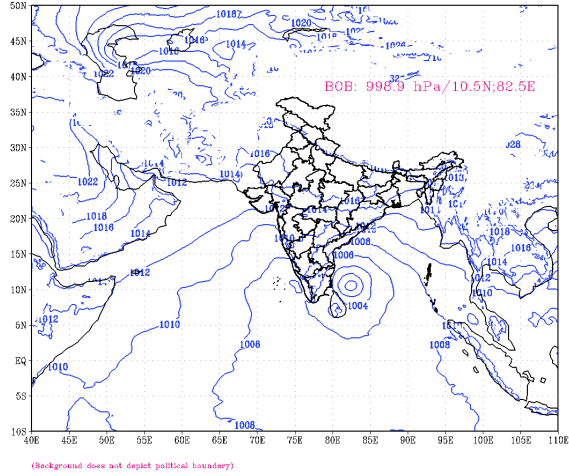
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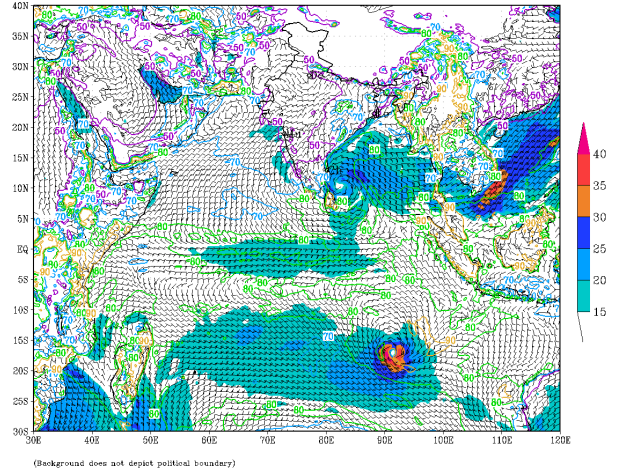
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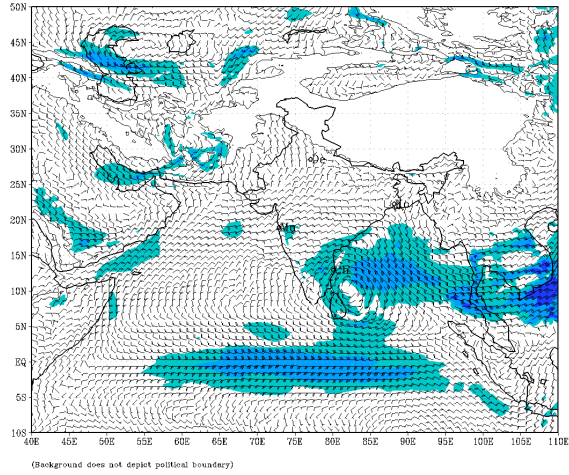
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based on 00 UTC of 28-11-2024 valid for 00 UTC of 29-11-2024



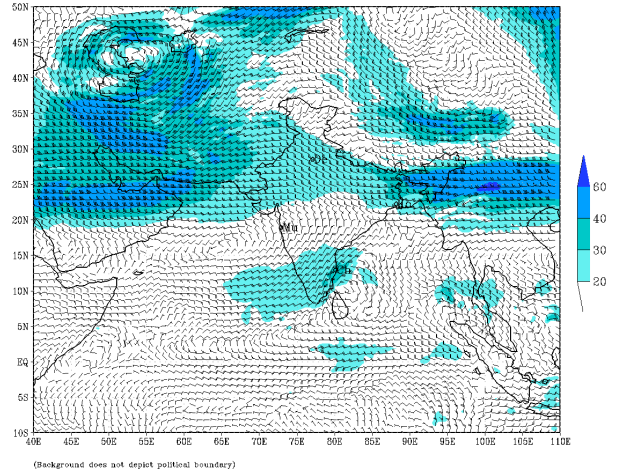
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (24 HR)
based on 00 UTC of 28-11-2024 valid for 00 UTC of 29-11-2024



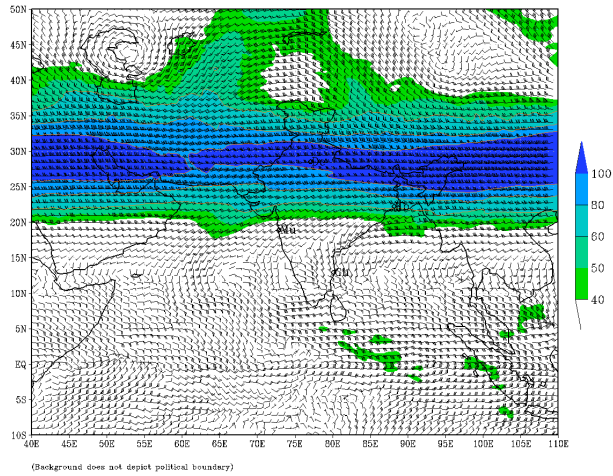
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based on 00 UTC of 28-11-2024 valid for 00 UTC of 29-11-2024



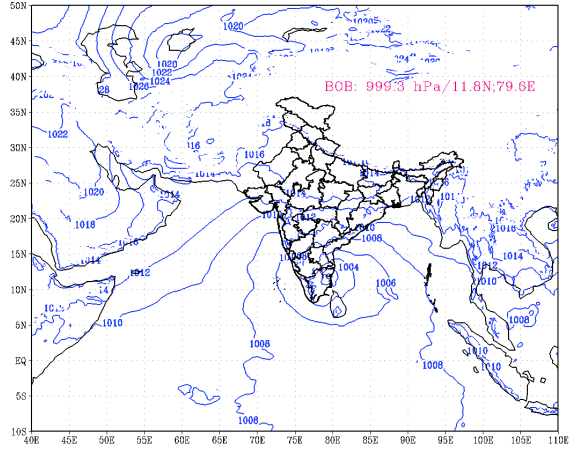
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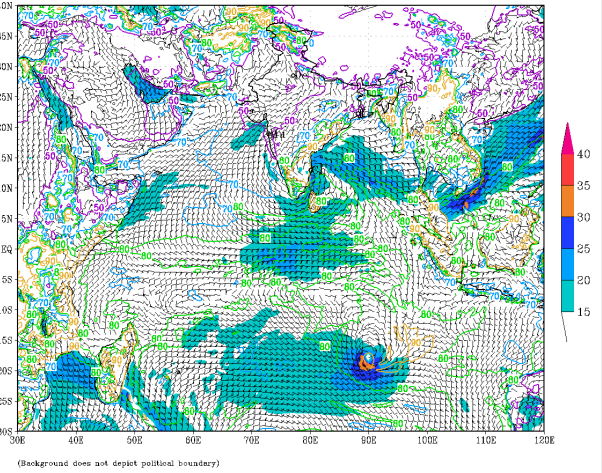
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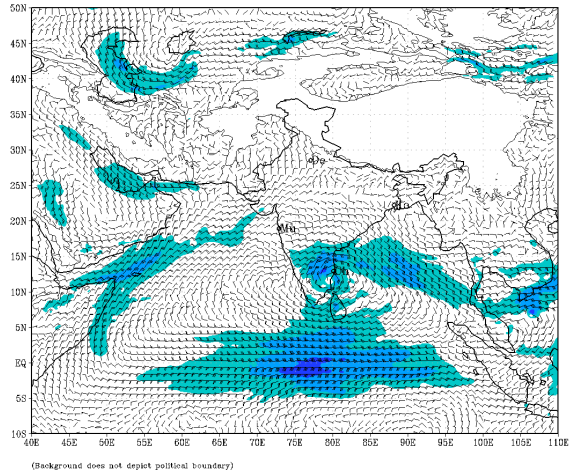
IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (48 HR)
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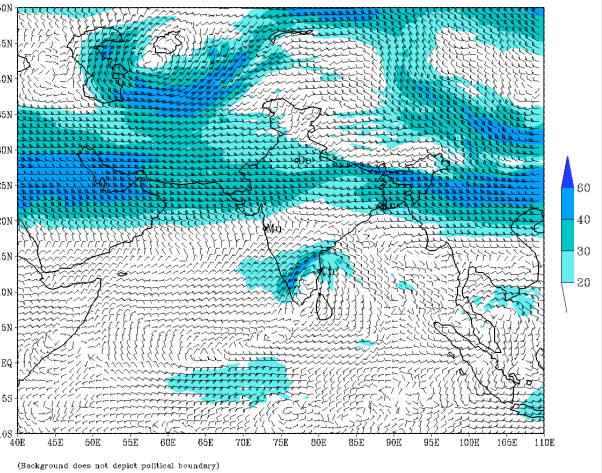
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (48 HR)
based on 00 UTC of 28-11-2024 valid for 00 UTC of 30-11-2024



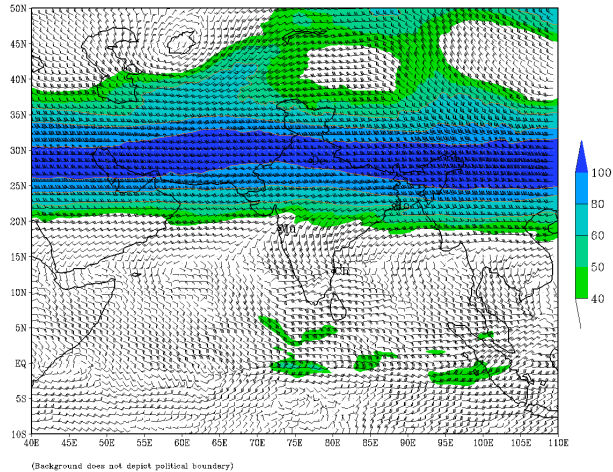
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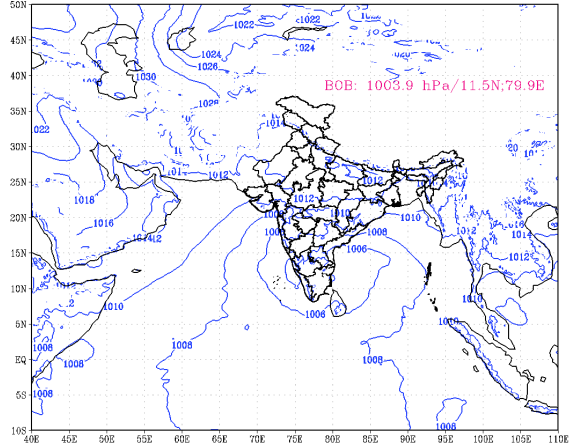
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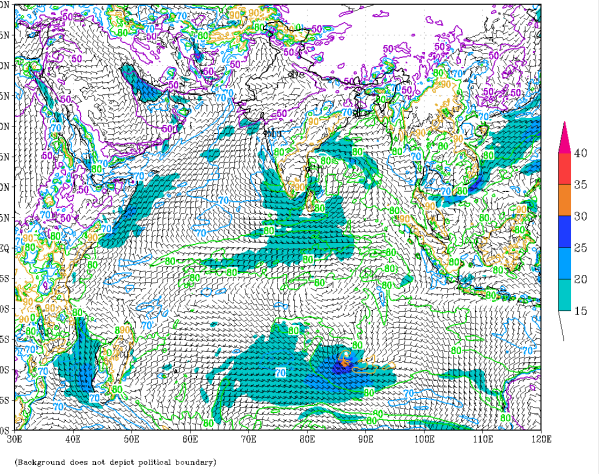
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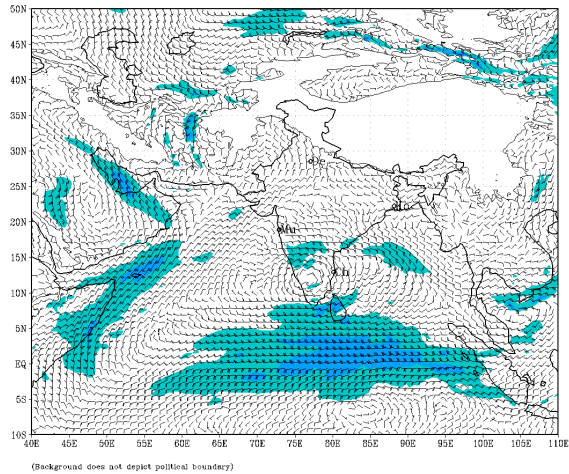
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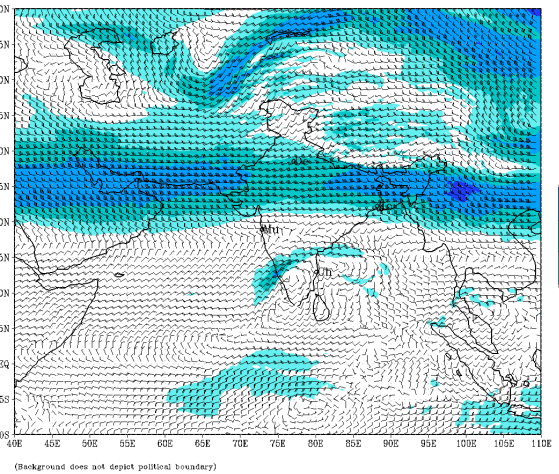
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (72 HR)
based on 00 UTC of 28-11-2024 valid for 00 UTC of 01-12-2024



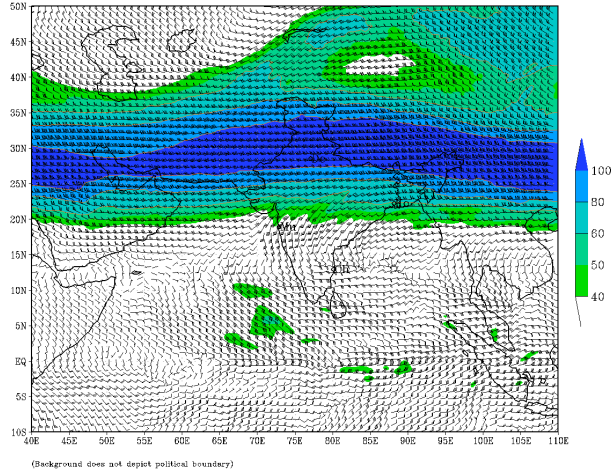
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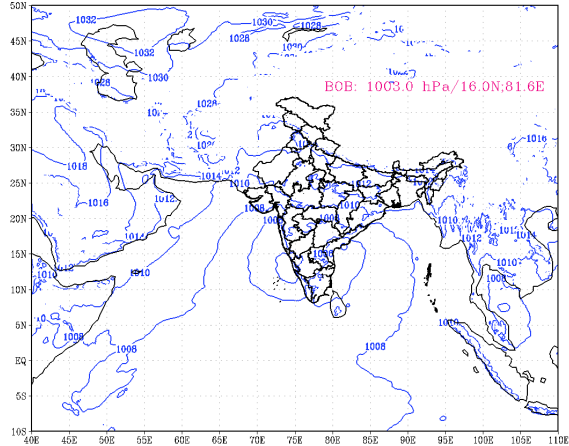
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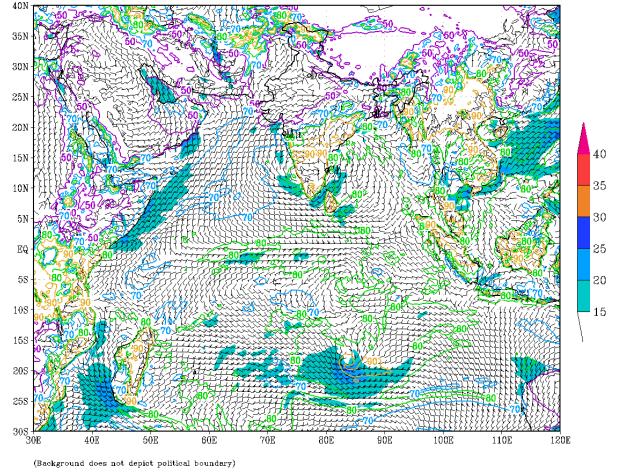
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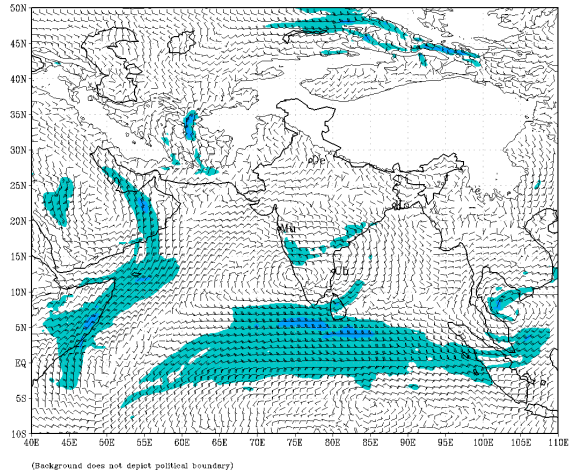
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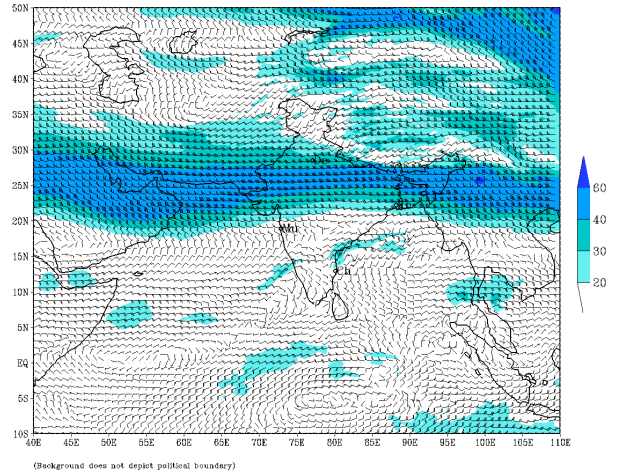
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (96 HR)
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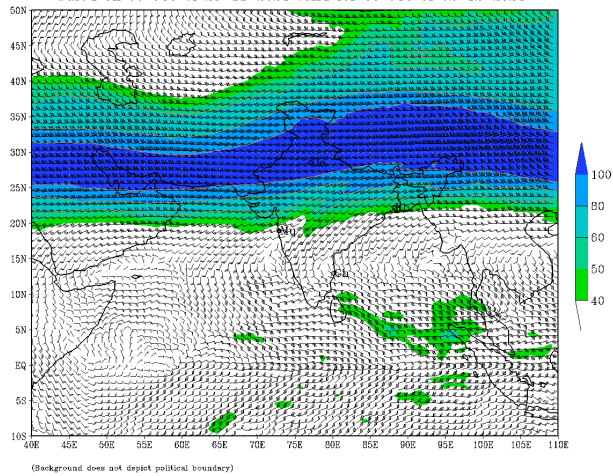
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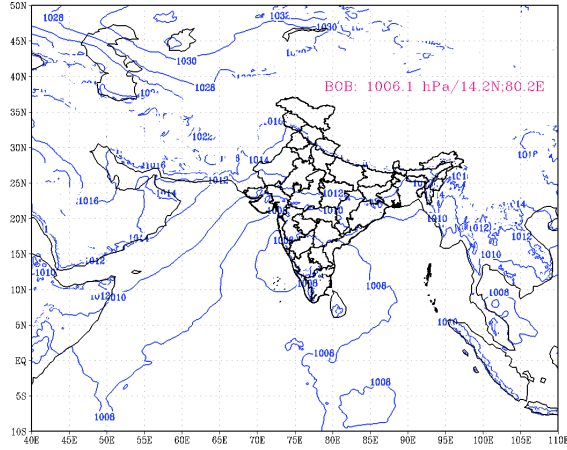
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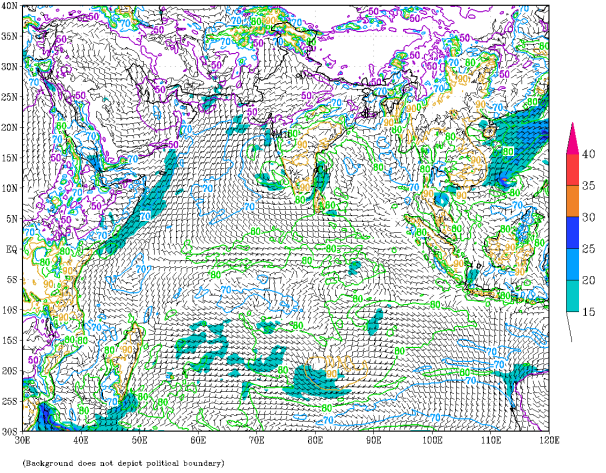
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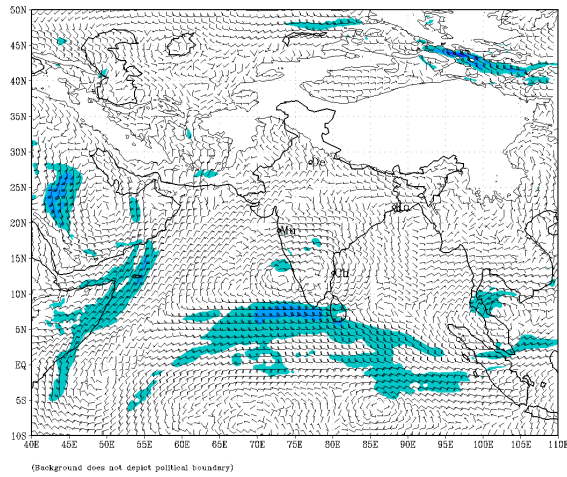
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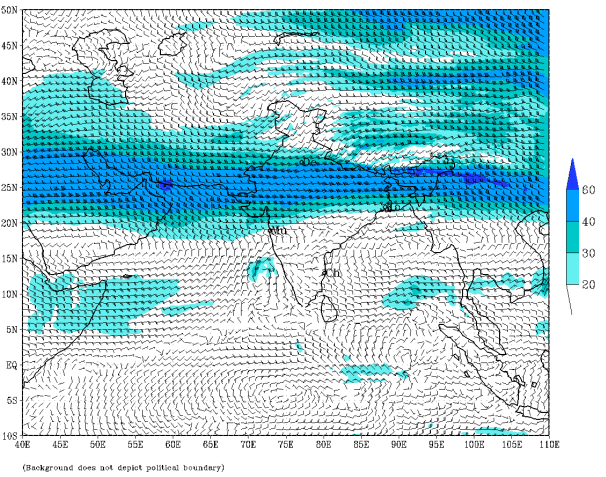
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (120 HR)
based on 00 UTC of 28-11-2024 valid for 00 UTC of 03-12-2024



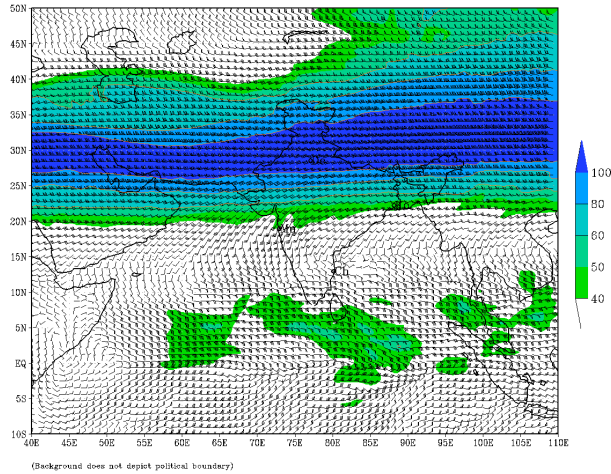
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based on 00 UTC of 28-11-2024 valid for 00 UTC of 03-12-2024

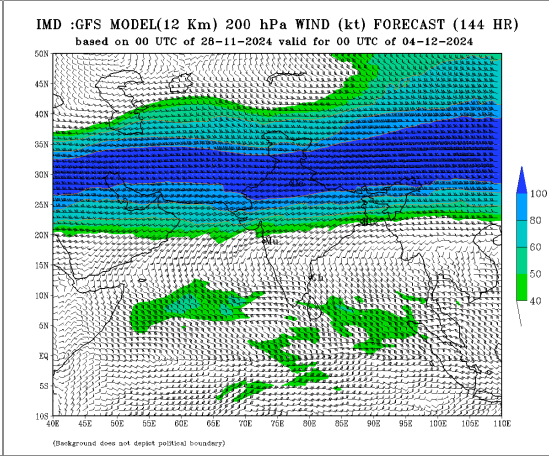
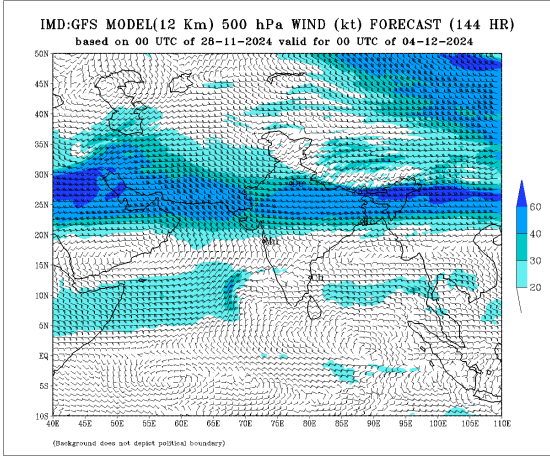
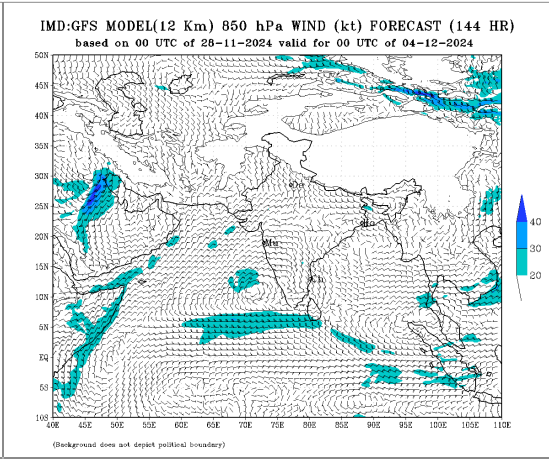
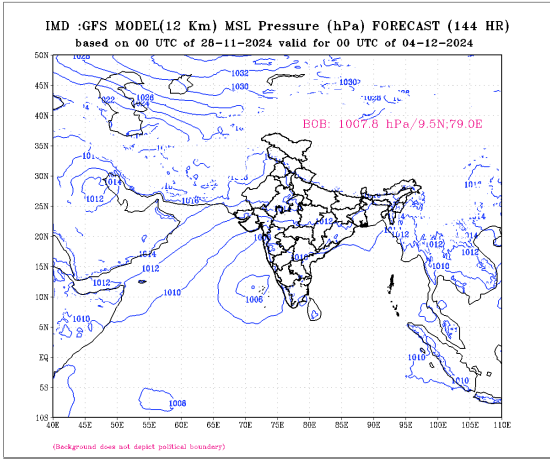


IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (120 HR)
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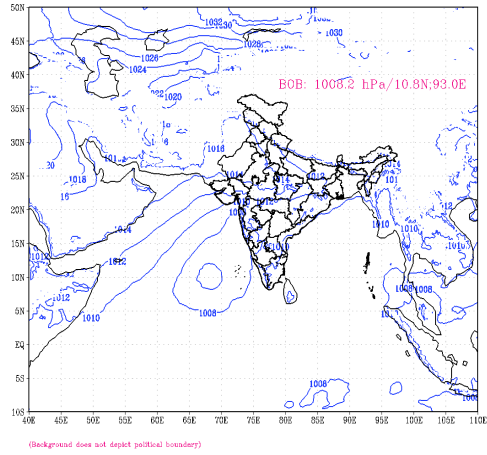


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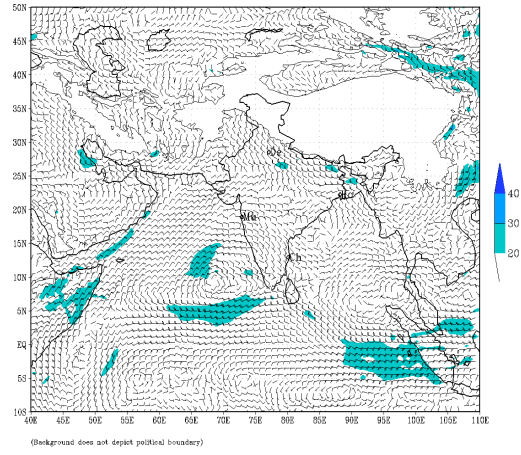




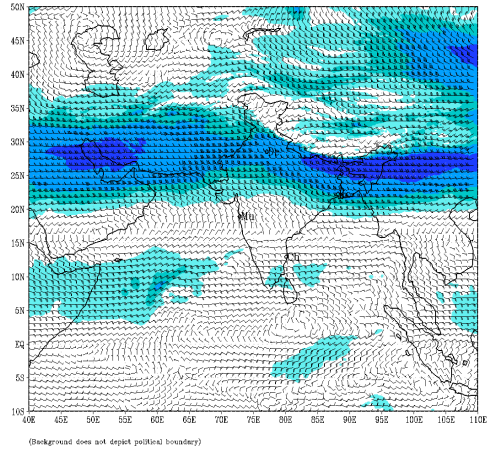
IMD:GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (168 HR)
 based on 00 UTC of 28-11-2024 valid for 00 UTC of 05-12-2024



IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (168 HR)
 based on 00 UTC of 28-11-2024 valid for 00 UTC of 05-12-2024



IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (168 HR)
 based on 00 UTC of 28-11-2024 valid for 00 UTC of 05-12-2024



IMD:GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (168 HR)
 based on 00 UTC of 28-11-2024 valid for 00 UTC of 05-12-2024

