



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

**Tropical Cyclone Forecast Programme
Report Dated 29th November 2024**

Time of Issue: 1200 UTC

Synoptic features (based on 0900 UTC analysis):

The deep depression over southwest Bay of Bengal moved north-northwestwards with a speed of 13 kmph during past 6 hours, intensified into a cyclonic storm “Fengal” [pronounced as Feinjal] and lay centered at 0900 UTC of today, the 29th November 2024 over the same region near latitude 11.2°n and longitude 82.2°e, about 310 km north-northeast of Trincomalee (43418), 260 km east of Nagappattinam (43347), 270 km east-southeast of Puducherry (43331) and 300 km southeast of Chennai (43279).

It is likely to move west-northwestwards and cross north Tamil Nadu- Puducherry coasts between Karaikal and Mahabalipuram close to Puducherry as a cyclonic storm with a wind speed of 70-80 kmph gusting to 90 kmph during afternoon 30th November.

Environmental Features:

Parameter	Bay of Bengal (BoB)	Arabian Sea (AS)
Sea Surface Temperature (SST) °C	<ul style="list-style-type: none"> ➤ 28-30°C over BoB. ➤ 26-28°C over along and off Tamil Nadu/ Andhra Pradesh coasts 	<ul style="list-style-type: none"> ➤ 28-30°C over most parts of AS. ➤ 26-28°C over some parts of southwest, westcentral AS along and off Somalia coast AS.
Tropical Cyclone Heat Potential (TCHP) kJ/cm²	<ul style="list-style-type: none"> ➤ 140-150 over system area some part of northeast, south BoB & adjoining EIO. ➤ 40-50 over southwest & adjoining westcentral BoB and along & off Sri Lanka/Tamil Nadu/ Andhra Pradesh coasts 	<ul style="list-style-type: none"> ➤ 80-100 over most parts of south, central AS, Lakshadweep Island. ➤ 20-40 over rest of the area.
Cyclonic Relative vorticity (X10⁻⁶s⁻¹)	<ul style="list-style-type: none"> ➤ 140-150 over southwest BoB along & off Sri Lanka coast. 	<ul style="list-style-type: none"> ➤ 10-20 over central & South along AS the coast of Somalia.
Low Level convergence(X10⁻⁵ s⁻¹)	<ul style="list-style-type: none"> ➤ 10-20 over southwest and adjoining westcentral BoB along & off Sri Lanka/Tamil Nadu/ Andhra Pradesh coasts. 	--

Upper-Level divergence ($\times 10^{-5} \text{ s}^{-1}$)	➤ 20-30 over westcentral and adjoining southwest BoB	➤ 5-10 over parts of south & central AS.
Vertical Wind Shear (VWS knots) Low: 05-10 knots Moderate: 10-20 knots High: >20 knots	➤ High over north & central BoB. ➤ Moderate over southwest BoB. ➤ Low-Moderate over southeast BoB & south Andaman Sea.	➤ High over north AS. ➤ Moderate - High over eastcentral AS. ➤ Low-Moderate over westcentral AS.
Wind Shear Tendency (knots)	➤ Increasing over some parts of westcentral and southeast BoB. ➤ Decreasing over southwest BoB and along and off Tamil Nadu/ Andhra Pradesh coasts.	➤ Increasing over north AS.
Upper tropospheric Ridge	➤ At 15° N.	➤ At 12° 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 south Arabian Sea, 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, north Pakistan, east 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, Madagascar, Mozambique Channel and over Indian Ocean between Lat 5.0N to 10.0S Long 50.0E to 110.0E and between Lat 10.0S to 35.0S Long 90.0E 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 to 30th November onwards.

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

Vortex (Robyn) over South Indian Ocean (area H05) centered near 16.7S / 93.3E. Intensity T2.0/3.0. Maximum sustained winds of 48-63 KTS. Associated scattered to broken low and medium clouds with embedded intense to very intense convection lay over area between latitude 15.0⁰ S to 25.0⁰ S longitude 88.0⁰ E to 98.0⁰ 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 CS over southwest BoB as on today, it will move northwestwards and lay close to the Tamil Nadu coast as SCS on 30 th morning, and it will cross the coast around the morning as CS/SCS. It will move over southern peninsular India and emerge into the southeast Arabian Sea on 4 th December as WML.	The remnant of BoB system will emerge into the southeast Arabian Sea on 4 th December as WML. Model is indicating its west-southwestwards movement with further intensification.
IMD-WRF	Model is indicating CS over southwest BoB as on today, it will move northwestwards and lay close to the Tamil Nadu coast as SCS on 30 th morning, and it will cross the coast around the morning as CS/SCS. It will move over southern peninsular India and emerge into the southeast Arabian Sea	No Significant circulation over AS.
NCMRWF-NCUM(G)	Model is indicating DD over southwest BoB as on today, it will move northwestwards and lay close to the Tamil Nadu coast as CS on 30 th morning, and it will cross the coast around the morning of 30 th as DD/CS. It will move over southern peninsular India and emerge into the southeast Arabian Sea on 4 th December as WML.	The remnant of BoB system will emerge into the southeast Arabian Sea on 4 th December as WML. Model is indicating its west-southwestwards movement without further intensification.
NCMRWF-NCUM(R)	Model is indicating depression over southwest BoB as on today, it will move northwestwards and lay close to the Tamil Nadu coast as DD on 30 th morning, and it will cross the coast on 01 st December morning as D/DD.	No Significant circulation over AS.
NCMRWF-NEPS	Model is indicating CS over southwest BoB as on today, it will move northwestwards and lay close to the Tamil Nadu coast as SCS on 30 th morning, and it will cross the coast as CS on 1 st December morning. It will move over southern peninsular India and emerge into the southeast Arabian Sea	The remnant of BoB system will emerge into the southeast Arabian Sea on 4 th December as WML. Model is indicating its west-southwestwards movement without further intensification.

	on 4 th December as WML.	
ECMWF	Model is indicating CS over southwest BoB as on today, it will move northwestwards and lay close to the Tamil Nadu coast as SCS on 30 th morning, and it will cross the coast on 01 st December 09 UTC as CS. It will move over southern peninsular India and emerge into the southeast Arabian Sea on 4 th December as WML.	The remnant of BoB system will emerge into the southeast Arabian Sea on 4 th December 00 UTC as LPA. It will have southwestward movement with slight intensification till 5 th December 00 UTC and then weakening thereafter.
NCEP-GFS	Model is indicating CS over southwest BoB as on today, it will move northwestwards and lay close to the Tamil Nadu coast as SCS on 30 th morning. It will lay over the same region till 3 rd Dec while weakening and cross the coast as LPA on 03 rd December 06 UTC.	The remnant of BoB system will emerge into the southeast Arabian Sea on 4 th December 06 UTC as LPA. It will have southwestward movement and less marked by 6 th December.

Summary:

(a) Bay of Bengal:

Model guidance indicates that the system over southwest Bay of Bengal is likely to move northwestwards and intensify into a cyclonic storm by afternoon of today the 29th November. Thereafter, it is likely to move west-northwestwards and cross north Tamil Nadu-Puducherry coasts as a cyclonic storm

(b) Arabian Sea

Most of the models are indicating likely emergence of remnants of existing system over Bay of Bengal into southeast and adjoining eastcentral Arabian Sea around 03rd/4th December. Thereafter models are indicating the system will move west-southwestwards and without having significant intensification.

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 likely to move northwestwards and intensify into a cyclonic storm during next 06 hours. Thereafter, it is likely to continue to move northwestwards and cross north Tamil Nadu Puducherry coasts between Karaikal and Mahabalipuram close to Puducherry as a cyclonic storm with a wind speed of 70-80 kmph gusting to 90 kmph around 0900 UTC 30th November.

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:

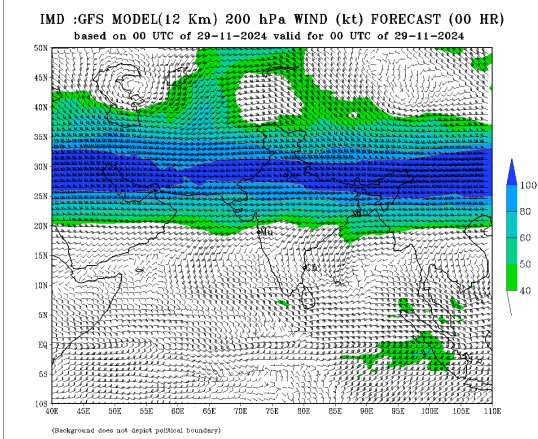
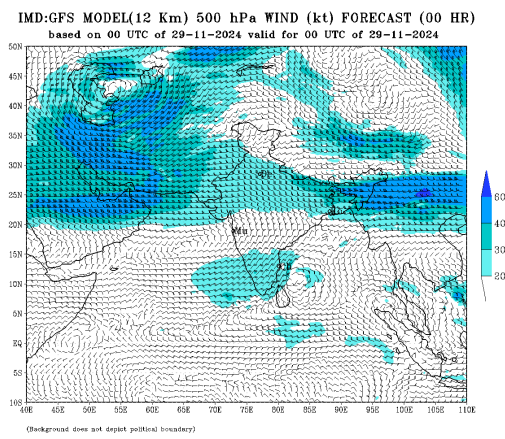
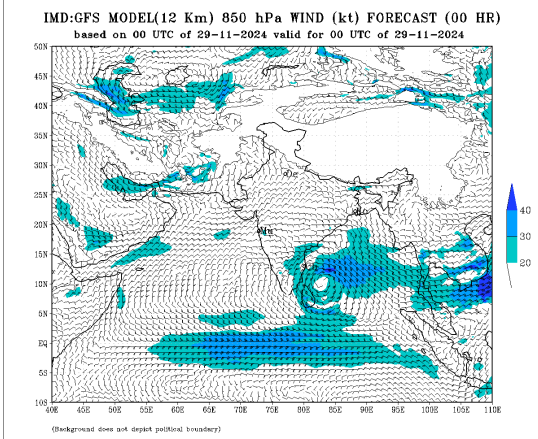
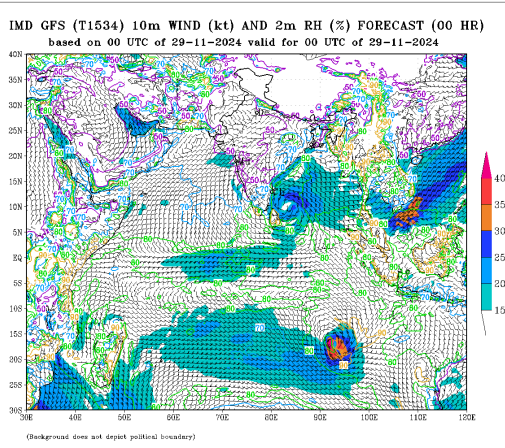
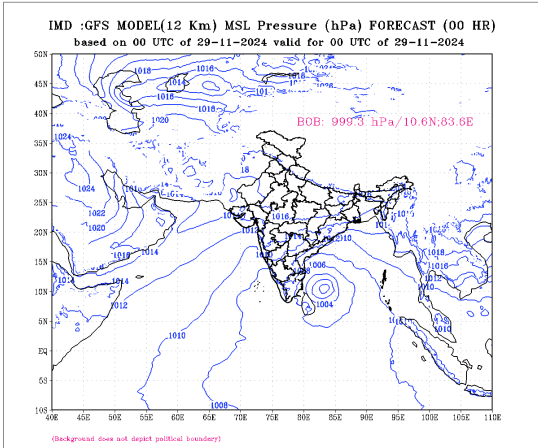
24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS	120-144 HOURS	144-168 HOURS
NIL	NIL	NIL	NIL	LOW	LOW	LOW

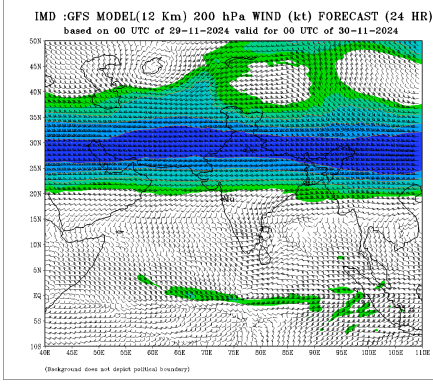
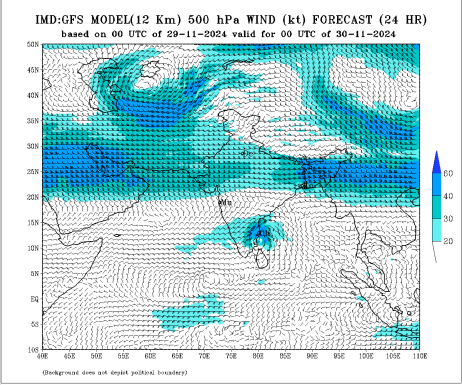
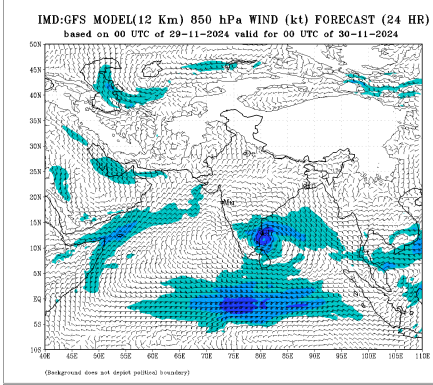
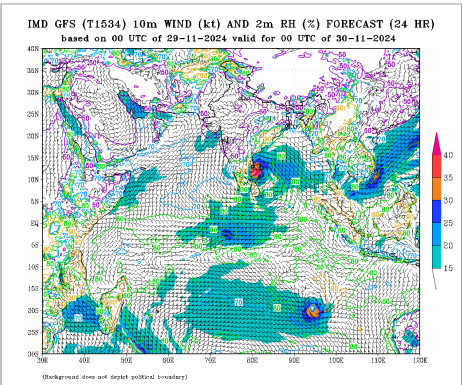
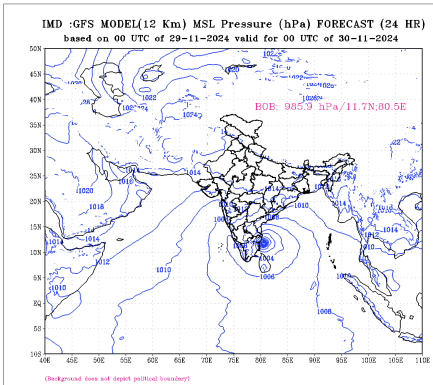
“- “indicates genesis has already occurred.

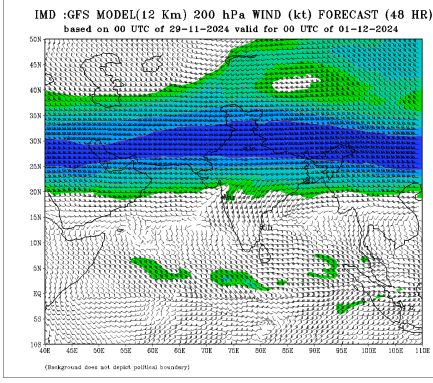
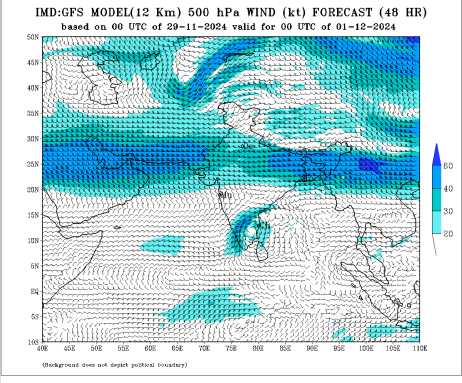
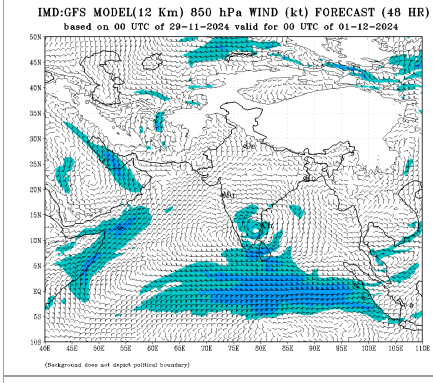
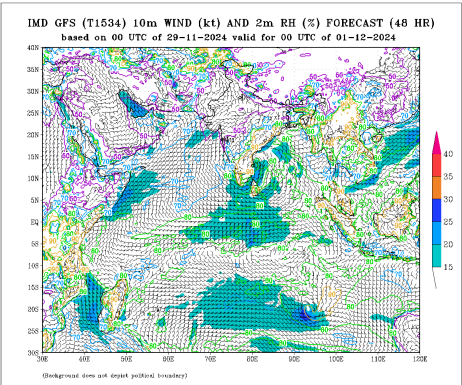
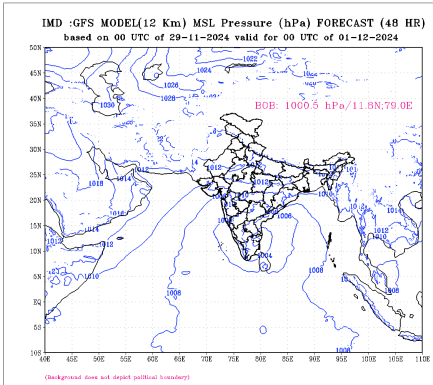
Probability is indicated as NIL for 0%, LOW for 1-33%, MOD for 34-67% and High for 68-100%.

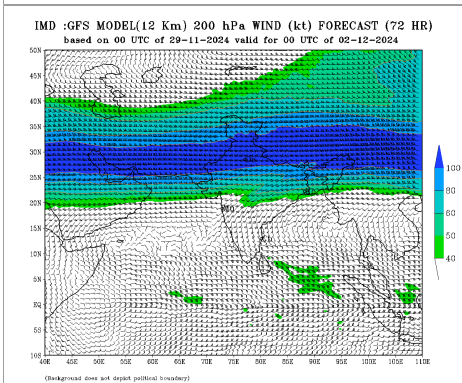
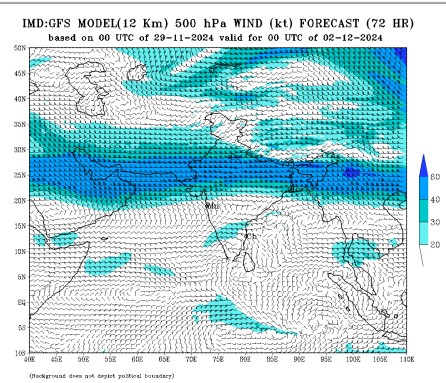
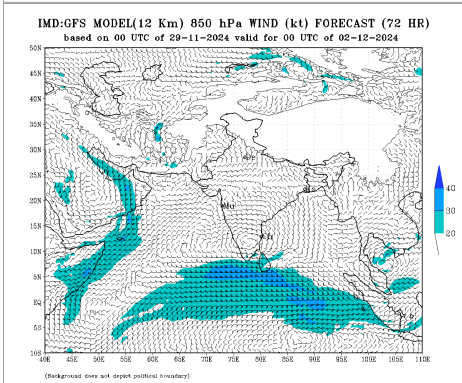
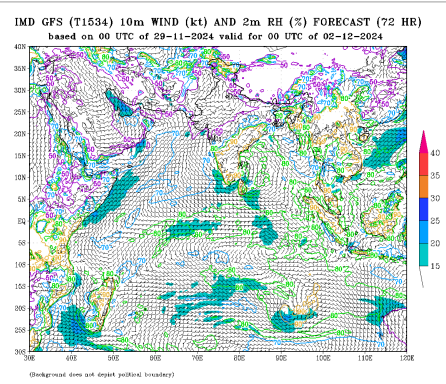
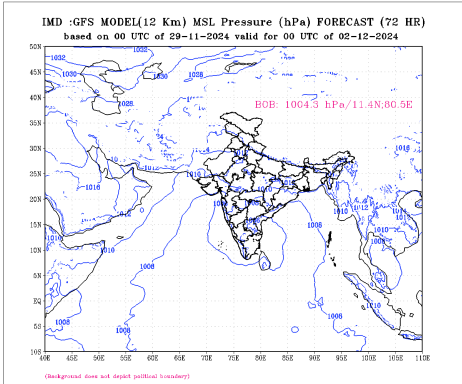
Intense Observation Period (IOP): Sri Lanka coasts during 29th-30thNovember, Tamil Nadu coast during 29th November - 01st December and south Andhra Pradesh coast during 29th November - 01st December.

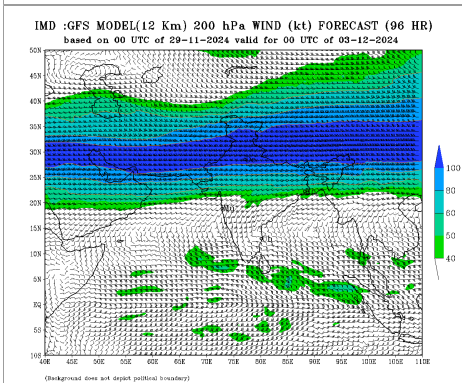
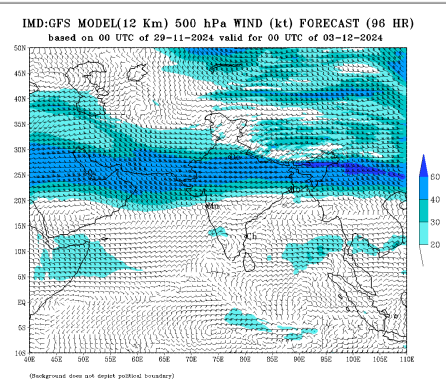
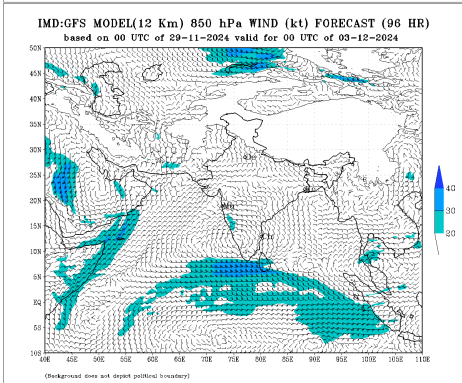
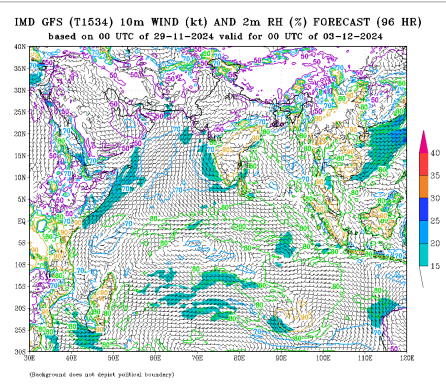
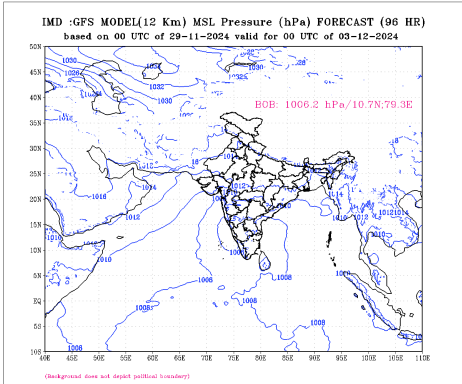
ANNEXURE

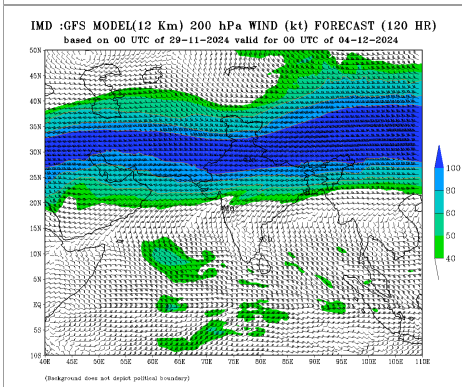
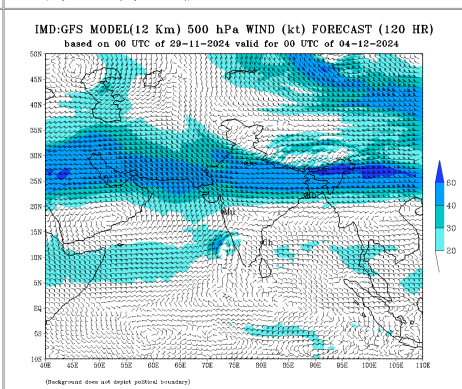
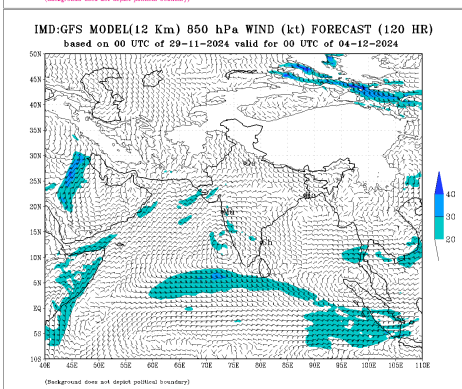
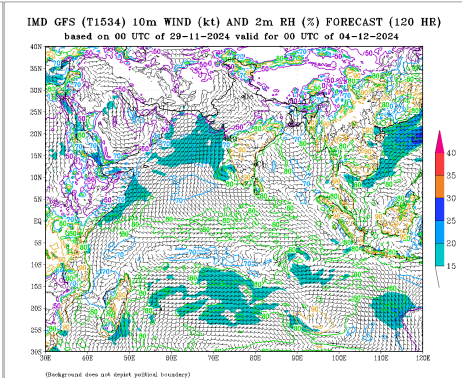
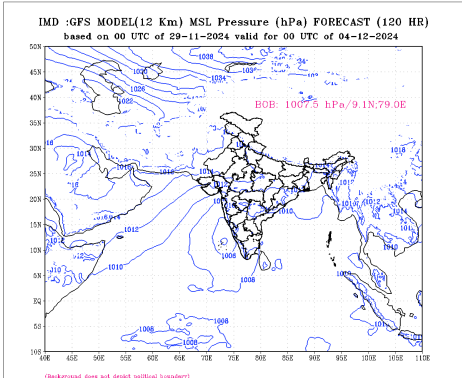




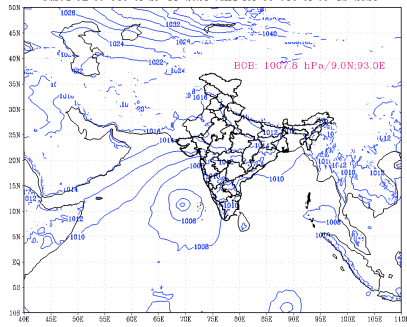




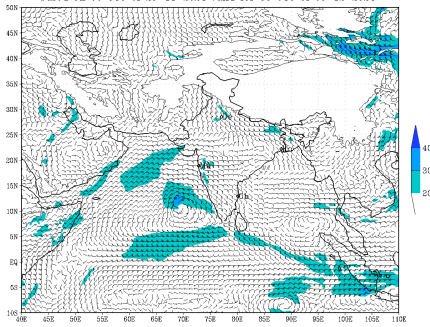




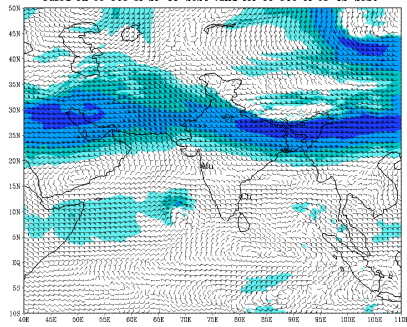
IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (144 HR)
based on 00 UTC of 29-11-2024 valid for 00 UTC of 05-12-2024



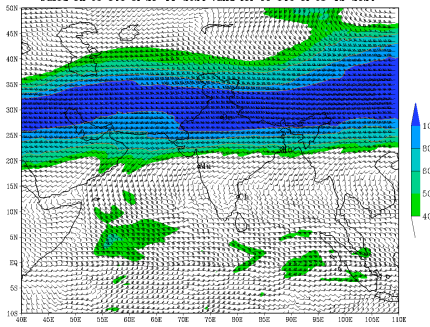
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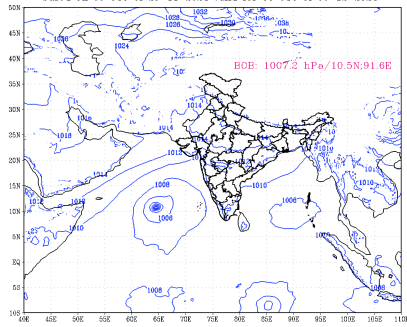
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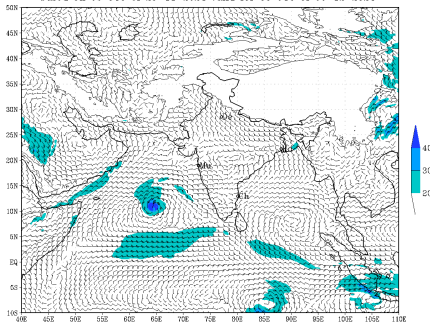
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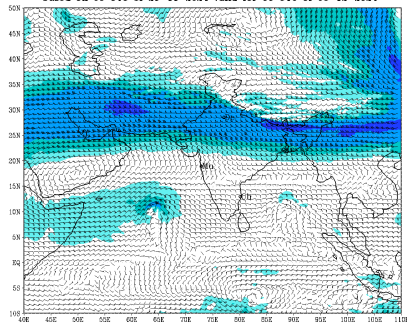
IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (168 HR)
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IMD :GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 29-11-2024 valid for 00 UTC of 06-12-2024



IMD :GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 29-11-2024 valid for 00 UTC of 06-12-2024



IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 29-11-2024 valid for 00 UTC of 06-12-2024

