



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

**Tropical Cyclone Forecast Programme
Report Dated 19th November 2024**

Time of Issue: 1230 UTC

Synoptic features (based on 0300 UTC analysis):

- An upper air cyclonic circulation is likely to form over South Andaman Sea & adjoining areas around 21st November. It is likely to move west-northwestwards and become a low pressure area over southeast Bay of Bengal around 23rd November. Thereafter, it is likely to continue to move west-northwestwards and intensify into a depression over southwest Bay of Bengal during subsequent 2 days.
- Yesterday's cyclonic circulation over Comorin area & neighborhood at 0.9 km above mean sea level has become less marked at 0300 UTC of today, the 19th November, 2024.

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 entire Bob and Andaman Sea. 	<ul style="list-style-type: none"> ➤ 28-30°C over entire Arabian Sea except parts of westcentral and southwest Arabian Sea off Somalia & Oman-Yemen coasts.
Tropical Cyclone Heat Potential (TCHP) kJ/cm²	<ul style="list-style-type: none"> ➤ 120-160 over northeast & east central BoB and Andaman sea & 100-130 over northwest, extreme south BoB and adjoining EIO. ➤ 40-70 over remaining parts of BoB 	<ul style="list-style-type: none"> ➤ 100-110 over southeast AS, Lakshadweep islands area off south Kerala coast and adjoining EIO. ➤ 30-60 over west central & southwest AS off Oman, Yemen & Somalia coasts. ➤ 60-80 over rest of the Arabian Sea.
Cyclonic Relative vorticity (X10⁻⁶s⁻¹)	<ul style="list-style-type: none"> ➤ 20-30 over north & southwest BoB off Sri Lanka coast. 	<ul style="list-style-type: none"> ➤ 20-30 over southwest AS off Somalia coast & some parts of northeast AS off Gujarat coast.
Low Level convergence (X10⁻⁵ s⁻¹)	<ul style="list-style-type: none"> ➤ 5 over southwest BoB, Sri Lanka and adjoining EIO. 	<ul style="list-style-type: none"> ➤ 5 over southwest Arabian Sea off Somalia coast and 5 over southwest & Lakshadweep islands.
Upper-Level divergence (X10⁻⁵ s⁻¹)	<ul style="list-style-type: none"> ➤ 5-10 over parts of southwest BoB & Sri Lanka. 	<ul style="list-style-type: none"> ➤ 5-10 over central parts of south Arabian Sea. ➤ 5-10 over westcentral AS off Oman-Yemen coasts.
Vertical Wind Shear (VWS knots) Low: 05-10 knots Moderate: 10-20 knots	<ul style="list-style-type: none"> ➤ High over north & adjoining central BoB. ➤ Low-Moderate over rest of BoB. 	<ul style="list-style-type: none"> ➤ High over north & adjoining central AS and extreme south AS& adjoining EIO. ➤ Low-Moderate over rest of

High: >20 knots		AS.
Wind Shear Tendency (knots)	Decreasing over parts of southwest BoB. Increasing over eastcentral, northwest BoB, north Andaman Sea.	Decreasing over westcentral AS off Oman-Yemen coasts and northeast AS. Increasing over southwest AS & adjoining southeast AS off Somalia coast, Lakshadweep islands area and adjoining eastcentral AS.
Upper tropospheric Ridge	At 12 ⁰ N.	At 15 ⁰ N.

Satellite observations based on INSAT imagery (0300 UTC):

a) Over the BoB & Andaman Sea: -

Scattered low and medium clouds with embedded intense to very intense convection lay over southwest Bay of Bengal. Scattered low and medium clouds with embedded moderate to intense convection lay over eastcentral Bay of Bengal and south Andaman Sea and weak to moderate convection lay over southeast Bay of Bengal.

b) Over the Arabian Sea:

Scattered low and medium clouds with embedded moderate to intense convection lay over south adjoining central Arabian Sea, Lakshadweep islands, Comorin & Maldives area.

c) Outside India:

Scattered low & medium clouds with embedded moderate to intense convection over north Sri Lanka, Palk strait, Gulf of Mannar, Maldives, Tibet China, Yellow Sea, East China Sea, Taiwan, Thailand, Gulf of Thailand, Sumatra, Strait of Malacca, Malaysia, Borneo, South China Sea, Java Islands & Sea, Celebes Islands & Sea, Philippines, Sulu Sea, Mozambique channel and over Indian Ocean between latitude 5.0N to 25.0S longitude 40.0E to 120.0E.

M.J.O. Index:

Madden Julian Oscillation (MJO) index is currently in Phase 3 with an amplitude greater than 1. It will be in the same phase with amplitude greater than 1 till 23rd November, it will be in phase 4 with amplitude close to 1 on 24th November.

Storms and Depression over East China Sea adjoining Taiwan/ South Indian Ocean:

Vortex (BHEKI) over south Indian Ocean (area D60) centered near 17.7S/67.7E. Intensity T4.0/4.5. Maximum sustained winds 64-89 knots. Associated broken low & medium clouds with embedded intense to very intense convection over area between latitude 16.0S to 21.0S longitude 65.0E to 70.0E.

Vortex (MAN-YI) over South China Sea (area F05) centered near 18.7N/113.6E. Intensity T2.0/3.0. Maximum sustained winds 34-47 knots. Associated broken low & medium clouds with embedded intense to very intense convection over area between latitude 18.0N to 22.0N longitude 113.0E to 118.0E.

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	Low pressure area/depression over southeast BoB on 23 rd Nov, Deep Depression/CS over southwest and adjoining southeast BoB (5.8 N/87.5 E) on 24 th Nov, VSCS over southwest BoB (6.5.0 N/83.0 E) on 25 th , moving northwesterly and cross Sri Lanka coast on night of 25 th , it moves in same direction and cross southern tip of Tamil Nadu close to Tuticorn on early hours of 27 th as deep depression.	No Significant circulation over AS.
IMD-GEFS	Low pressure area over southeast BoB on 23 rd Nov, Depression over central parts of south BoB (6 N/88 E) on 24 th Nov, deep depression over southwest BoB (8.0 N/83.5 E) on 25 th , moving northwesterly and lay over southwest BoB (10.0 N/82 E) close to Tamil Nadu coast on 26 th as deep depression.	No Significant circulation over AS.
IMD-WRF	No Significant circulation over BoB.	No Significant circulation over AS.
NCMRWF-NCUM(G)	Extended low over southwest BoB on 25 th November, having westnorthwestwards without intensification.	Extended cyclonic circulation over southwest Arabian Sea on 24 th November, having its westward movement towards Somalia coast.
NCMRWF-NCUM(R)	No Significant circulation over BoB.	No Significant circulation over AS.
NCMRWF-NEPS	Extended low over southwest BoB on 25 th November, having westnorthwestwards without intensification.	No Significant circulation over AS.
ECMWF	LPA over southeast BoB on 23 rd November, Depression over southeast BoB (6.2 N/89.5 E) on 24 th November 03 UTC, moving westnorthwesterly and lay over southwest BoB (7.7 N/85.6 E) as deep depression on 25 th 00 UTC, moving then northwesterly towards Tamil Nadu coast and cross the coast as depression/deep depression on 00 UTC of 27 th November.	No Significant circulation over AS.
NCEP-GFS	Low pressure area over southeast BoB on 23 rd Nov with westwards movement, deep depression over southeast BoB on 24/12 UTC, moving west-northwestwards and	No Significant circulation over AS.

	lay over westcentral BoB (6.4 N/88.0 E) as deep CS/SCS on 25 th 00 UTC, VSCS over southwest BoB (7.7 N/86.7 E) on 25 th 12 UTC, moving northwestwards and lay over southwest BoB off Tamil Nadu coast (10.0 N/84 E) as ESCS on 26 th 06 UTC, moving in the same towards Tamil Nadu coast and lay over southwest BoB (11.5 N/ 83.1 E) as VSCS/SCS on 27 th November 06 UTC, moving in the same direction and cross the Tamil Nadu coast as CS on 29 th November 06 UTC.	
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Summary:

(a) Bay of Bengal:

Most of the models (IMD GFS, NCEP GFS, ECMWF, ECMM) are indicating likely formation of cyclonic circulation over South Andaman Sea and adjoining areas around 21st and its west-northwestwards movement with intensification into a low pressure area over southeast Bay of Bengal around 23rd and depression over southwest Bay of Bengal around 24th. However, NCUM group is not indicating any significant intensification of system. GFS group of models are indicating higher intensification and ECMWF model is indicating the system’s intensification upto deep depression.

(b) Arabian Sea

Most of the models are indicating no significant cyclonic circulation over Arabian Sea for the next seven days.

Inference:

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

Considering all the above it is inferred that, an upper air cyclonic circulation is likely to form over South Andaman Sea & adjoining areas around 21st November. It is likely to move west-northwestwards and become a low pressure area over southeast Bay of Bengal around 23rd November. Thereafter, it is likely to continue to move west-northwestwards and intensify into a depression over southwest Bay of Bengal during subsequent 2 days.

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	LOW	MOD	HIGH

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

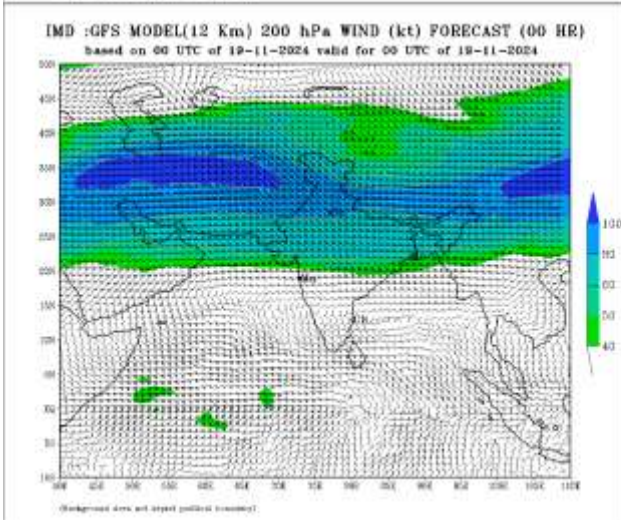
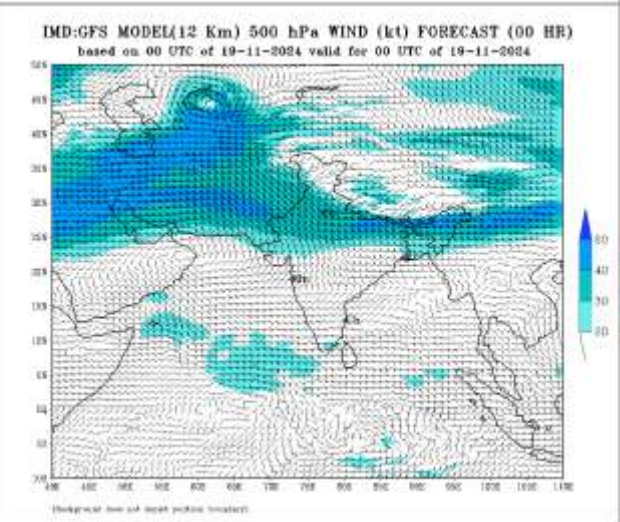
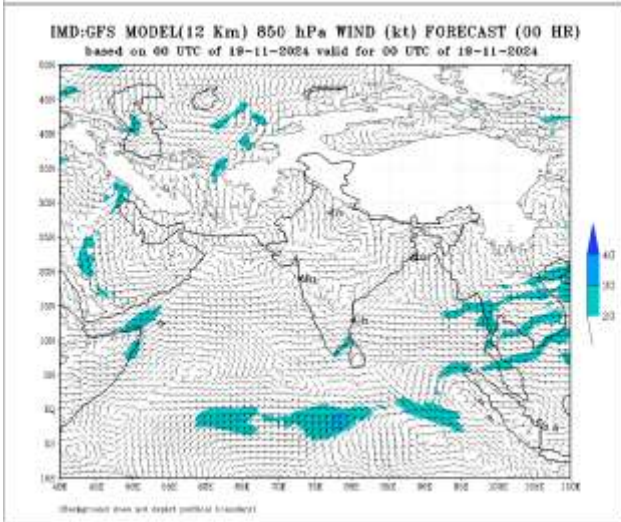
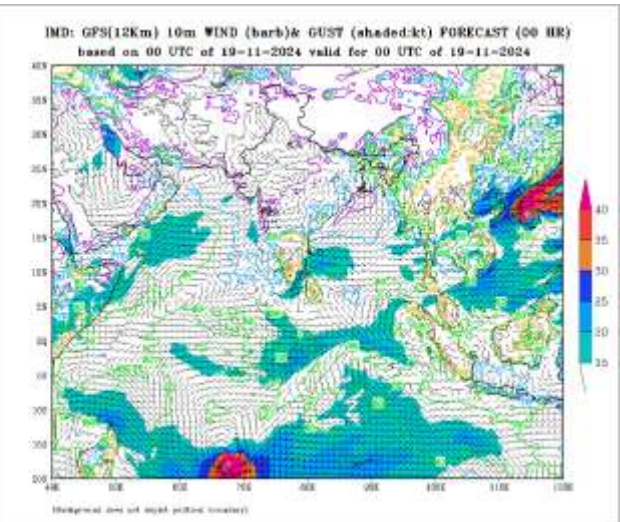
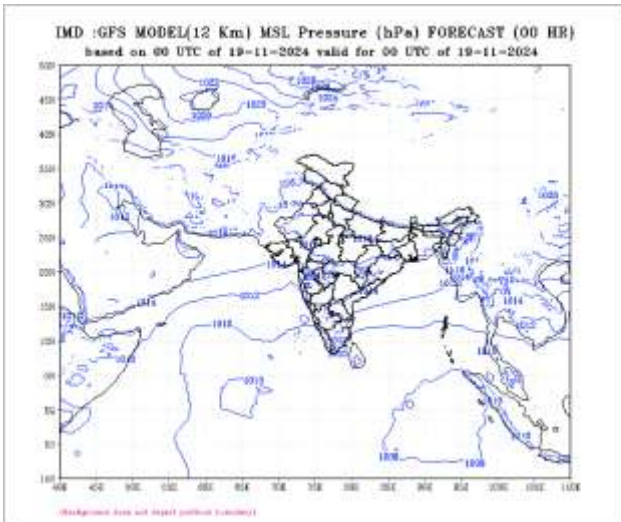
24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS	120-144 HOURS	144-168 HOURS
NIL	NIL	NIL	NIL	NIL	NIL	NIL

“- “indicates genesis has already occurred.

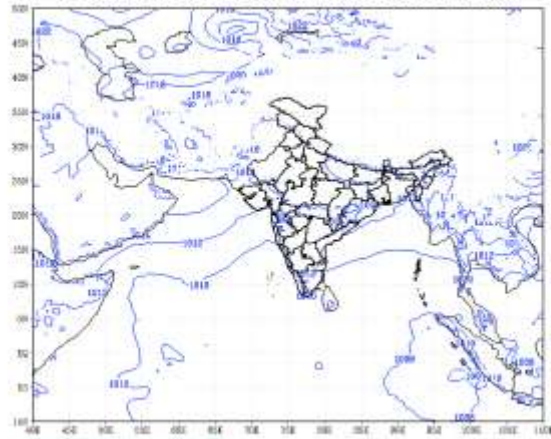
Probability is indicated as NIL for 0%, LOW for 1-33%, MOD for 34-67% and High for 68-100%.

Intense Observation Period (IOP): NIL

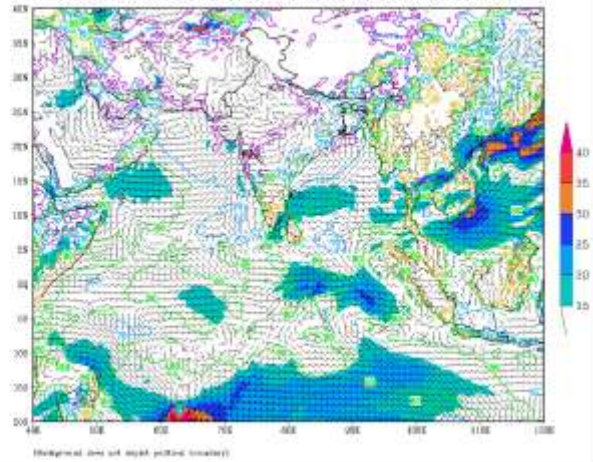
ANNEXURE



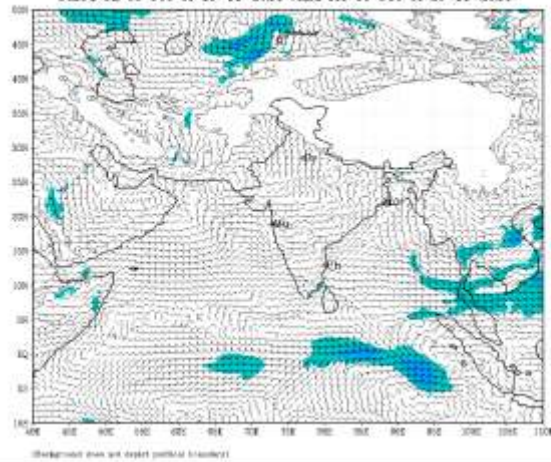
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based on 00 UTC of 19-11-2024 valid for 00 UTC of 20-11-2024



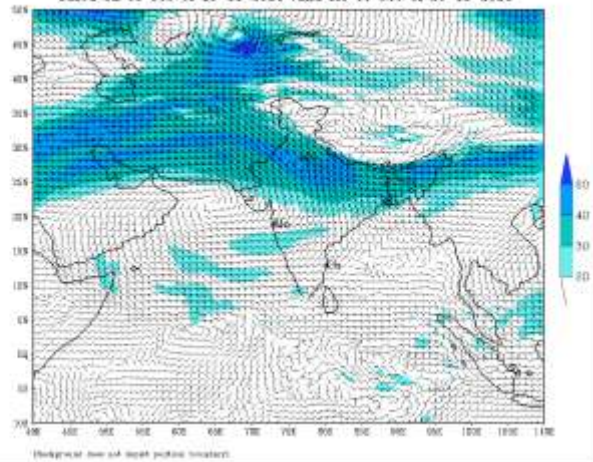
IMD :GFS(12Km) 10m WIND (barb)& GUST (shaded:kt) FORECAST (24 HR)
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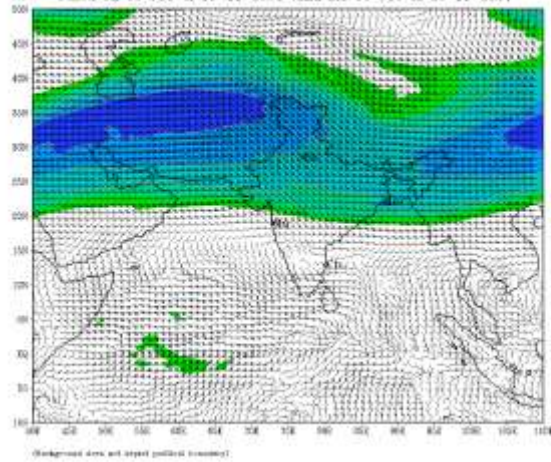
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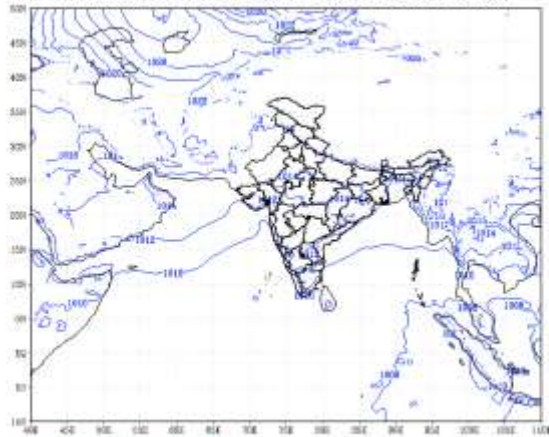
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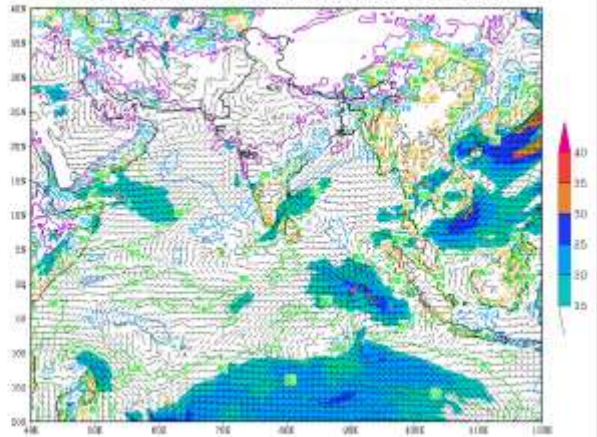
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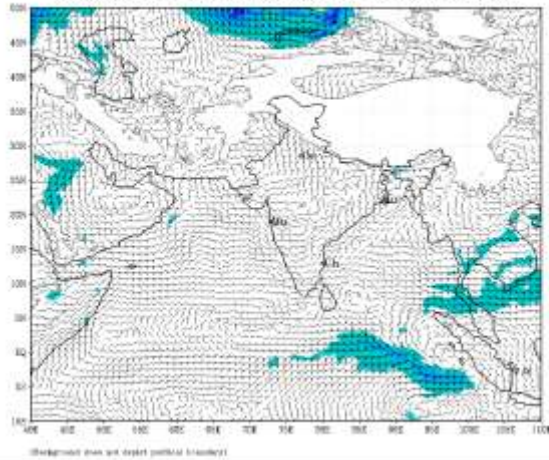
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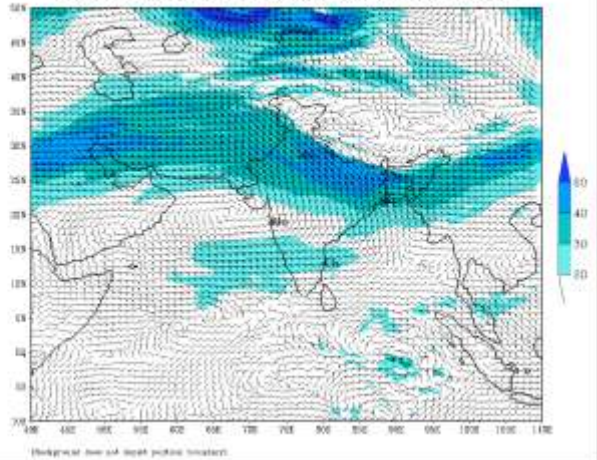
IMD: GFS(12Km) 10m WIND (barb)& GUST (shaded:kt) FORECAST (48 HR)
based on 00 UTC of 19-11-2024 valid for 00 UTC of 21-11-2024



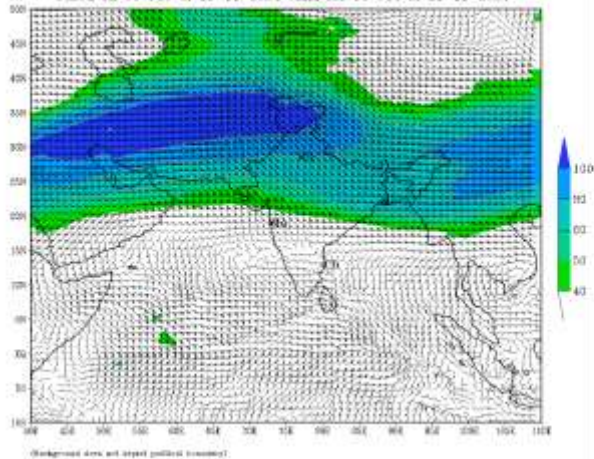
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based on 00 UTC of 19-11-2024 valid for 00 UTC of 21-11-2024



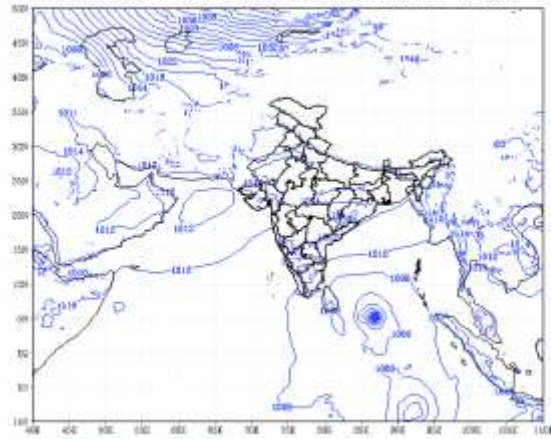
IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (48 HR)
based on 00 UTC of 19-11-2024 valid for 00 UTC of 21-11-2024



IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (48 HR)
based on 00 UTC of 19-11-2024 valid for 00 UTC of 21-11-2024

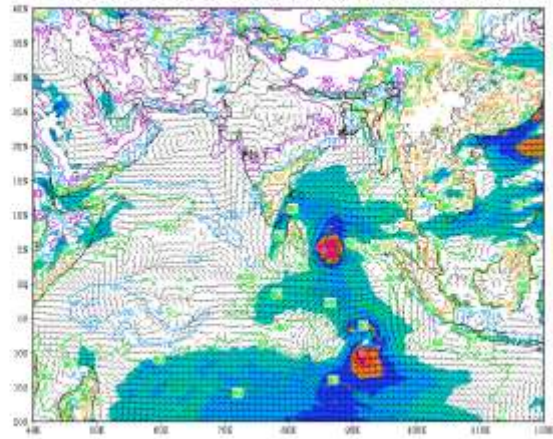


IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (120 HR)
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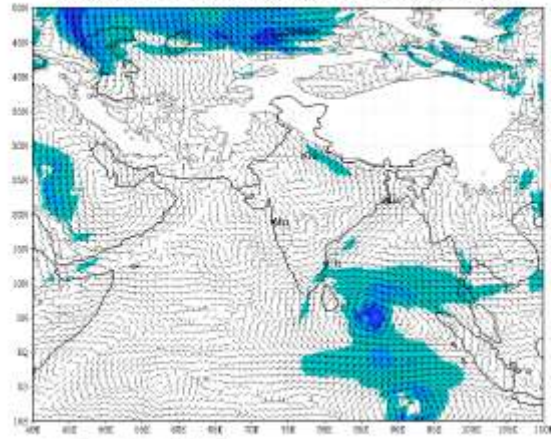
(Background area not depict political boundary)

IMD: GFS(12Km) 10m WIND (barb)& GUST (shaded:kt) FORECAST (120 HR)
based on 00 UTC of 19-11-2024 valid for 00 UTC of 24-11-2024



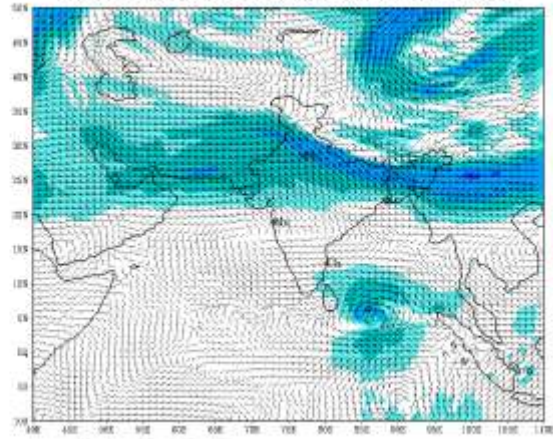
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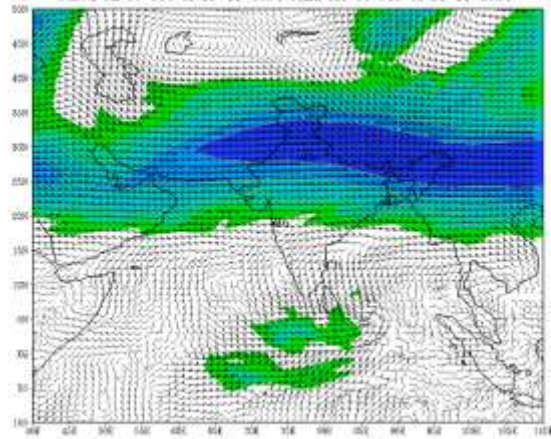
(Background area not depict political boundary)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (120 HR)
based on 00 UTC of 19-11-2024 valid for 00 UTC of 24-11-2024



(Background area not depict political boundary)

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (120 HR)
based on 00 UTC of 19-11-2024 valid for 00 UTC of 24-11-2024



(Background area not depict political boundary)

