



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

**Tropical Cyclone Forecast Programme  
Report Dated 13<sup>th</sup> December 2024**

**Time of Issue: 1200 UTC**

**Synoptic features (based on 0300 UTC analysis):**

Yesterday's well marked low pressure area over Gulf of Mannar & adjoining neighbourhood lay as low pressure area over Lakshadweep & adjoining Maldives area at 0300 UTC of today, the 13th December, 2024. The associated upper air cyclonic circulation extends upto 5.8 km above mean sea level. It is likely to move westwards and become less marked during next 24 hours.

**Environmental Features based on 0300 UTC:**

Parameter	Bay of Bengal (BoB)	Arabian Sea (AS)
<b>Sea Surface Temperature (SST) °C</b>	<ul style="list-style-type: none"><li>➤ 26-28°C over extreme north BoB.</li><li>➤ 28-30°C over rest of BoB</li></ul>	<ul style="list-style-type: none"><li>➤ 28-30°C over southeast &amp; eastcentral AS and adjoining areas.</li><li>➤ 25-28°C over rest of AS.</li></ul>
<b>Tropical Cyclone Heat Potential (TCHP) kJ/cm<sup>2</sup></b>	<ul style="list-style-type: none"><li>➤ 130-190 over north BoB and adjoining east central BoB.</li><li>➤ 110-150 over Andaman Sea.</li><li>➤ 100-120 over southeast BoB and adjoining areas of southwest BoB.</li><li>➤ 20-30 over northern parts of southwest BoB and adjoining westcentral BoB off Sri Lanka coast.</li><li>➤ 60-80 over rest of BoB.</li></ul>	<ul style="list-style-type: none"><li>➤ 100-120 over southeast AS, Maldives Islands, Lakshadweep Islands and adjoining EIO.</li><li>➤ 20-60 over rest AS.</li></ul>
<b>Cyclonic Relative vorticity (X10<sup>-6</sup>s<sup>-1</sup>)</b>	<ul style="list-style-type: none"><li>➤ 40-50 over south &amp; adjoining north Andaman Sea and on &amp; off Sri Lanka coast.</li></ul>	30-40 over Gulf of Mannar, Comorin area and south Lakshadweep Islands & adjoining areas.
<b>Low-Level convergence (X10<sup>-5</sup> s<sup>-1</sup>)</b>	<ul style="list-style-type: none"><li>➤ 10-20 over Andaman Sea.</li></ul>	<ul style="list-style-type: none"><li>➤ 10-15 over Comorin area on Sri Lanka Coast.</li><li>➤ 5-10 over central parts of south AS.</li></ul>
<b>Upper-Level divergence (X10<sup>-5</sup> s<sup>-1</sup>)</b>	<ul style="list-style-type: none"><li>➤ 05-10 Tamil Nadu and north Sri Lanka coast.</li><li>➤ 10-20 over Andaman Sea.</li></ul>	<ul style="list-style-type: none"><li>➤ 05-10 over central parts of south AS and Comorin area.</li></ul>

<b>Vertical Wind Shear (VWS knots)</b> Low: 05-10 knots Moderate: 10-20 knots High: >20 knots	➤ High over north, westcentral and extreme south BoB. ➤ Low-Moderate over rest of BoB.	➤ High over entire of AS.
<b>Wind Shear Tendency (knots)</b>	➤ Increasing over south BoB. ➤ Decreasing over Andaman Sea.	➤ Decreasing over lakhshadweep area and western parts of AS.
<b>Upper tropospheric Ridge</b>	➤ At 12° N.	➤ At 12° 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 south Bay of Bengal & Andaman Sea. Scattered low and medium clouds with embedded moderate to intense convection lay over Tenasserim coast.

**b) Over the Arabian Sea:**

Scattered low and medium clouds with embedded moderate to intense convection lay over south Arabian Sea adjoining Comorin area & Lakshadweep Island. Scattered low and medium clouds with embedded isolated weak to moderate convection lay over west central Arabian Sea.

**c) Outside India:**

Scattered low & medium clouds with embedded moderate to intense convection over north Sri Lanka, Palk Strait, Gulf of Mannar, China, Yellow Sea, South Myanmar, Thailand, Gulf of Thailand, Cambodia, Laos, Vietnam, Hainan, 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 5.0N to 20.0S longitude 40.0E to 120.0E.

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

MJO is currently in phase 5 with amplitude greater than 1. It will be in same phase till 17<sup>th</sup> December with amplitude greater than 1.

### **NWP Guidance 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>	The model is indicating a cyclonic circulation over south Andaman Sea and adjoining southeast BoB on 14 <sup>th</sup> December, it will have west-northwestwards movement and lay over southeast BoB as LPA on 15 <sup>th</sup> . Then it will move in the same direction & lay over southwest BoB as WML on 16 <sup>th</sup> . Afterwards it will make landfall along the Tamil Nadu coast as CS on 17 <sup>th</sup> . Less marked thereafter.	Model indicates no significant system over AS during next 7 days.

<b>IMD-GEFS</b>	The model is indicating a cyclonic circulation over south Andaman Sea and adjoining southeast BoB on 14 <sup>th</sup> December, it will have west-northwestwards movement and lay over southeast BoB as extended Low on 15 <sup>th</sup> 00 UTC. Then it will move in the same direction & lay over southwest BoB as WML on 16 <sup>th</sup> 00 UTC. Afterwards it will make landfall over Tamil Nadu coast as DD on 17 <sup>th</sup> . Less marked thereafter.	Model indicates no significant system over AS during next 7 days.
<b>IMD-WRF</b>	The model is indicating a cyclonic circulation over south Andaman Sea on 14 <sup>th</sup> December, it will have west-northwestwards movement and lay over southeast BoB as extended Low on 15 <sup>th</sup> . Then it will move in the same direction & lay close to the Sri Lanka coast on 16 <sup>th</sup> .	Model indicates no significant system over AS during next 3 days.
<b>NCMRWF-NCUM(G)</b>	The model is indicating a cyclonic circulation over south Andaman Sea and adjoining southeast BoB on 14 <sup>th</sup> December, it will have west-northwestwards movement and lay over southeast BoB as LPA on 15 <sup>th</sup> . Then it will move in the same direction & lay over southwest BoB as LPA on 16 <sup>th</sup> . Afterwards it will cross Tamil Nadu coast as LP on 17 <sup>th</sup> . Less marked thereafter.	Model indicates no significant system over AS during next 7 days.
<b>NCMRWF-NCUM(R)</b>	The model is indicating an extended Low over south Andaman Sea & adjoining southeast BoB on 14 <sup>th</sup> December, it will have west-northwestwards movement and lay over southeast BoB as cyclonic circulation on 15 <sup>th</sup> . Then it will move in the same direction & lay over southwest BoB as LPA on 16 <sup>th</sup> of Dec 2024.	Model indicates no significant system over AS during next 3 days
<b>NCMRWF-NEPS</b>	The model is indicating a extended Low over south Andaman Sea and adjoining southeast BoB on 14 <sup>th</sup> December, it will have west-northwestwards movement and lay over southeast BoB as extended low on 15 <sup>th</sup> . Then it will move in the same direction & lay over southwest BoB as extended low on 16 <sup>th</sup> , then It will be off Tamil Nadu coast as LPA/WML on 17 <sup>th</sup> . On 18 <sup>th</sup> it will move towards Tamil Nadu Coast as LPA and less marked thereafter.	Model indicates no significant system over AS during next 3 days.
<b>ECMWF</b>	The model is indicating a cyclonic circulation over south Andaman Sea and adjoining southeast BoB on 14 <sup>th</sup> December, it will have west-north-	Model indicates no significant system over AS during next 7 days.

	westwards movement and lay over southeast BoB as cyclonic circulation on 15 <sup>th</sup> . Then it will move in the same direction & lay over southwest BoB as LPA on 16 <sup>th</sup> , then It will be over southwest BoB off Tamil Nadu coast as LPA on 17 <sup>th</sup> . On 18 <sup>th</sup> it will cross Tamil Nadu Coast as LPA and less marked thereafter.	
<b>NCEP-GFS</b>	The model is indicating a cyclonic circulation over south Andaman Sea and adjoining southeast BoB on 14 <sup>th</sup> December, it will have west-north-westwards movement and lay over southeast BoB as Depression on 15 <sup>th</sup> . Then it will move in the same direction & lay over southwest BoB as cyclonic circulation on 16 <sup>th</sup> , then It will make landfall along the tamil Nadu coast as CS/DD on 17 <sup>th</sup> and less marked thereafter.	Model indicates no significant system over AS during next 7 days.

**Summary:**

**(a) Bay of Bengal:**

All the models are indicating a cyclonic Circulation over South Andaman Sea on 14<sup>th</sup>. It will be moving west northwestwards and lay over Southeast BoB as cyclonic circulation/LPA on 15<sup>th</sup>. It will lay over southwest Bay of Bengal as LPA on 16<sup>th</sup>. Models are also indicating it will cross the Tamil Nadu coast on 17/18<sup>th</sup> as LPA/WML. GFS group of Models are indicating high intensity up to CS.

**(b) Arabian Sea**

No significant cyclonic disturbance is indicated by any of the models.

**Inference:**

Yesterday's well marked low pressure area over Gulf of Mannar & adjoining neighbourhood lay as low pressure area over Lakshadweep & adjoining Maldives area at 0300 UTC of today, the 13th December, 2024. The associated upper air cyclonic circulation extends upto 5.8 km above mean sea level. It is likely to move westwards and become less marked during next 24 hours.

**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	NIL	NIL

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

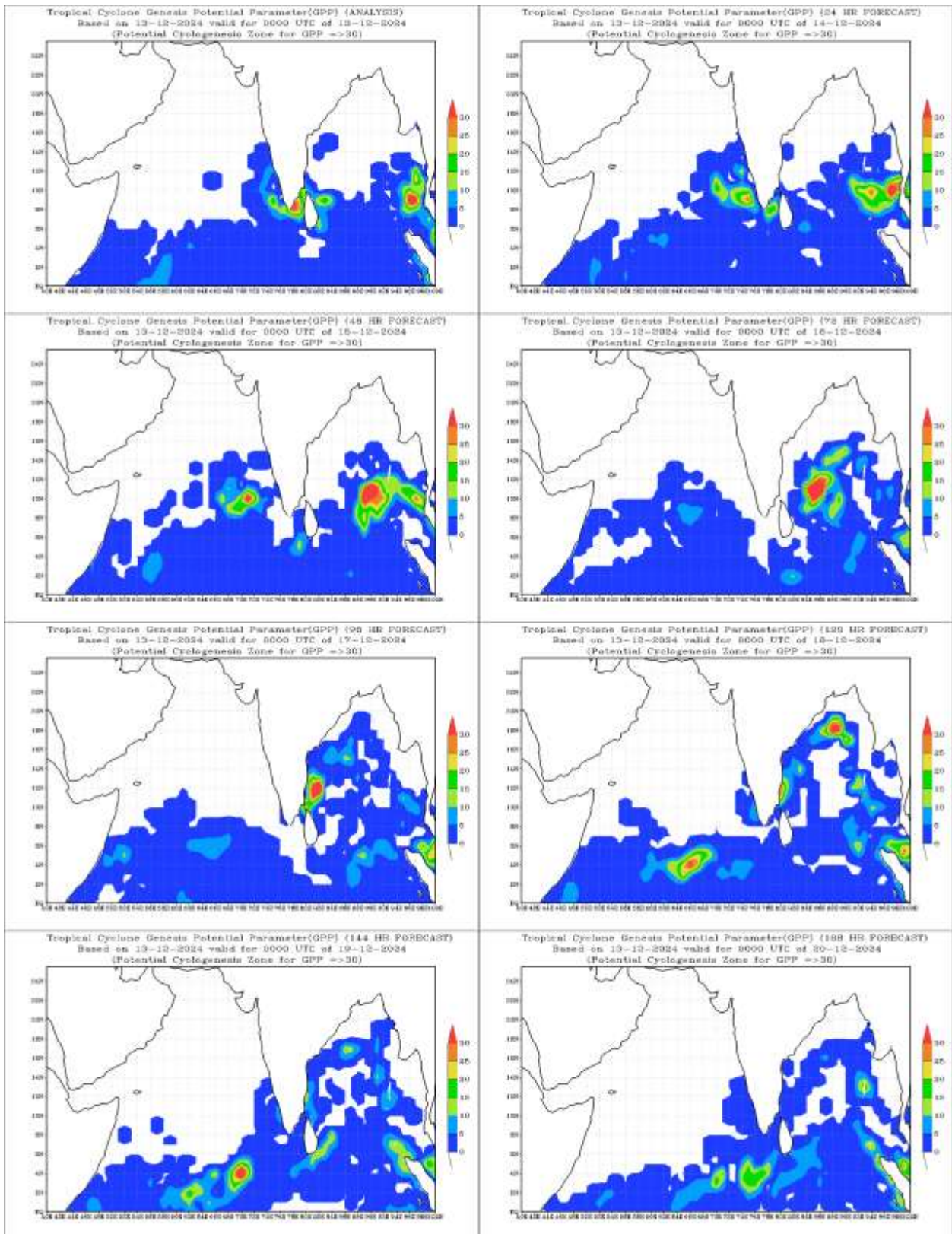
24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS	120-144 HOURS	144-168 HOURS
NIL	NIL	NIL	NIL	NIL	NIL	NIL

“- “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

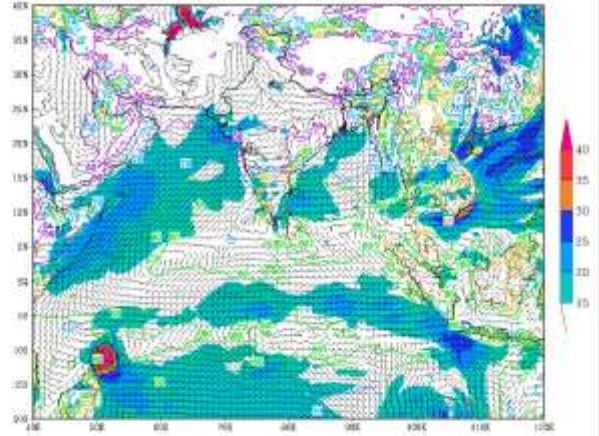


IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (00 HR)  
based on 00 UTC of 13-12-2024 valid for 00 UTC of 13-12-2024



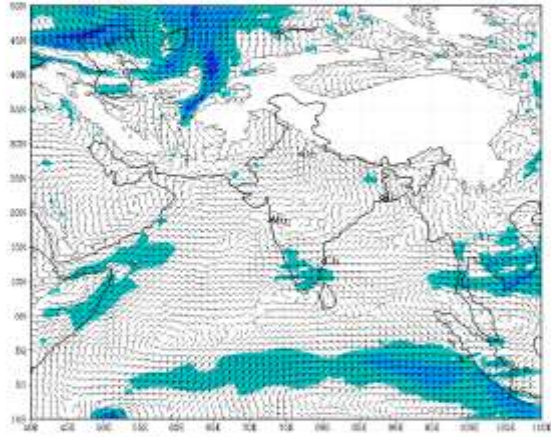
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IMD: GFS(12Km) 10m WIND (barb)& GUST (shaded:kt) FORECAST (00 HR)  
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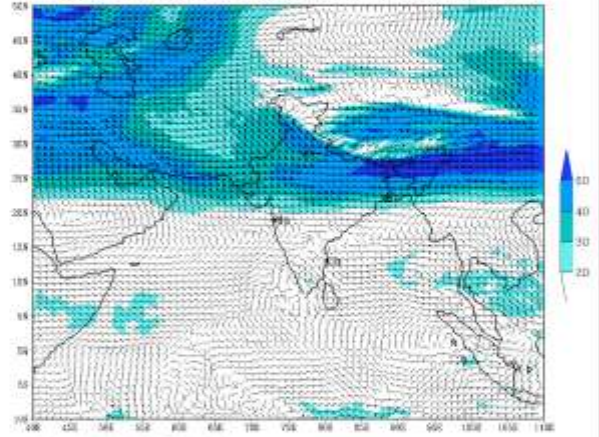
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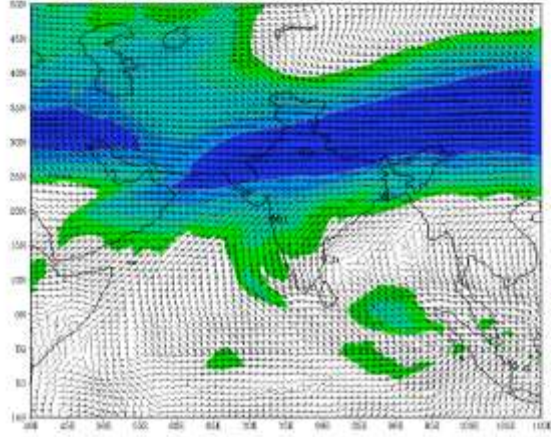
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IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (00 HR)  
based on 00 UTC of 13-12-2024 valid for 00 UTC of 13-12-2024



(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (00 HR)  
based on 00 UTC of 13-12-2024 valid for 00 UTC of 13-12-2024

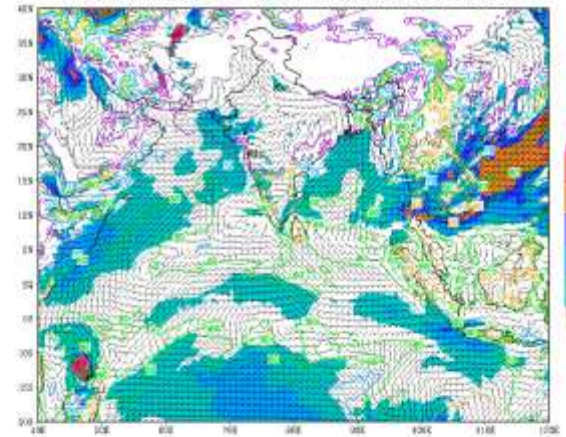


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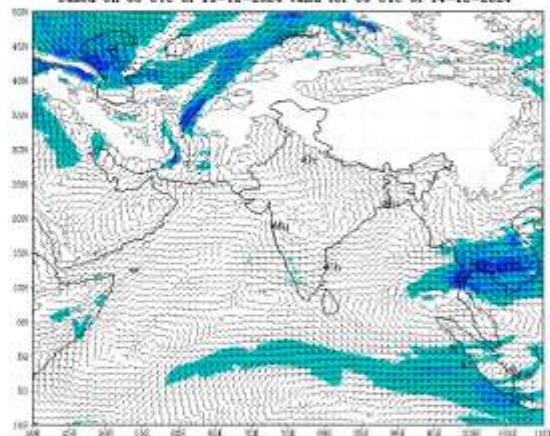
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based on 00 UTC of 13-12-2024 valid for 00 UTC of 14-12-2024



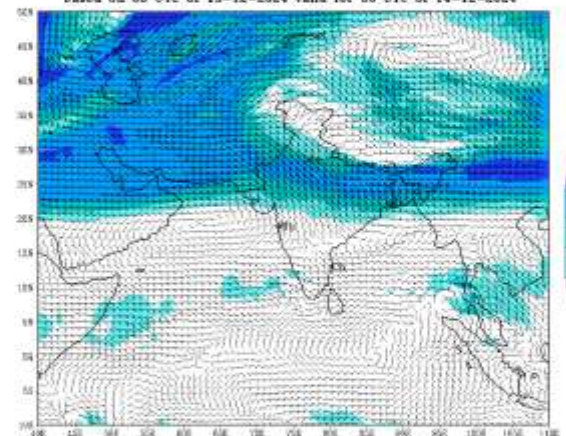
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based on 00 UTC of 13-12-2024 valid for 00 UTC of 14-12-2024



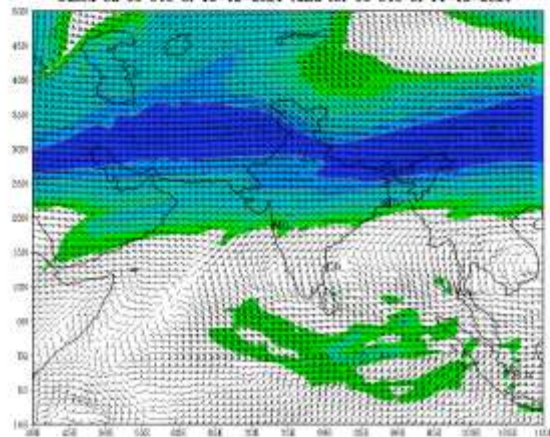
IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (24 HR)  
based on 00 UTC of 13-12-2024 valid for 00 UTC of 14-12-2024



IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (24 HR)  
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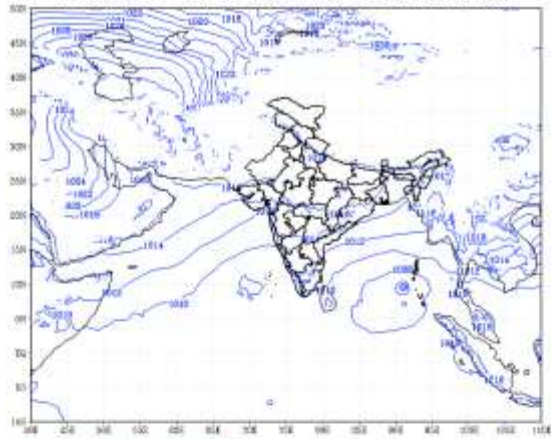


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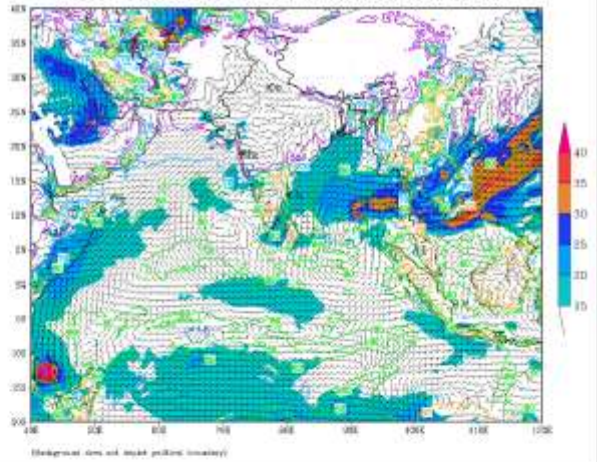




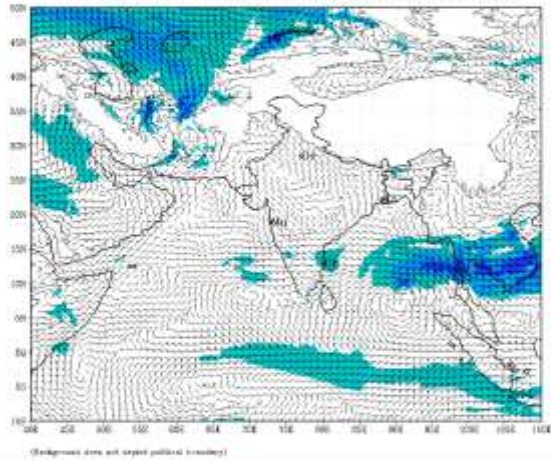
IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (48 HR)  
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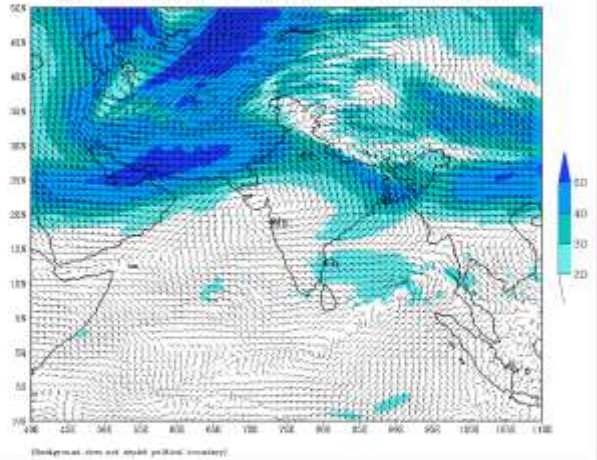
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based on 00 UTC of 13-12-2024 valid for 00 UTC of 15-12-2024



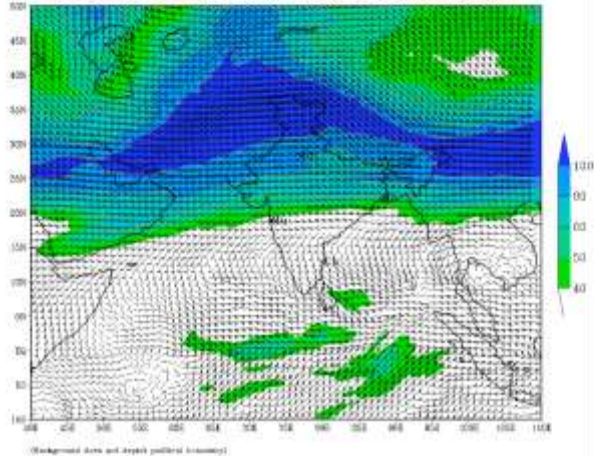
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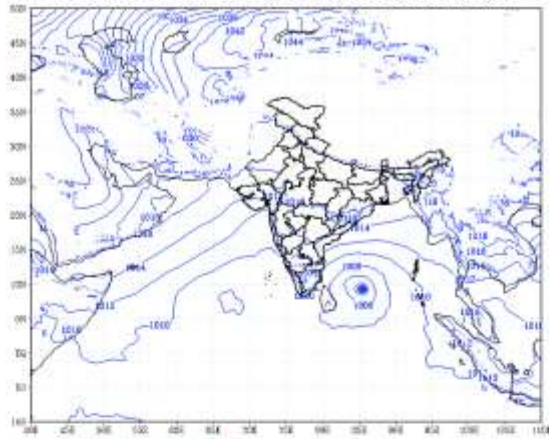
IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (48 HR)  
based on 00 UTC of 13-12-2024 valid for 00 UTC of 15-12-2024



IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (48 HR)  
based on 00 UTC of 13-12-2024 valid for 00 UTC of 15-12-2024

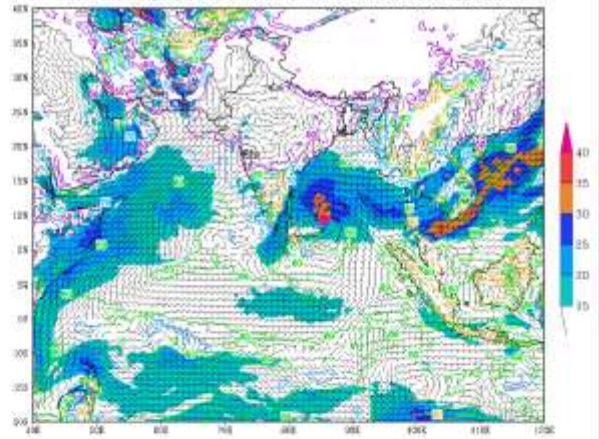


IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (72 HR)  
based on 00 UTC of 13-12-2024 valid for 00 UTC of 16-12-2024



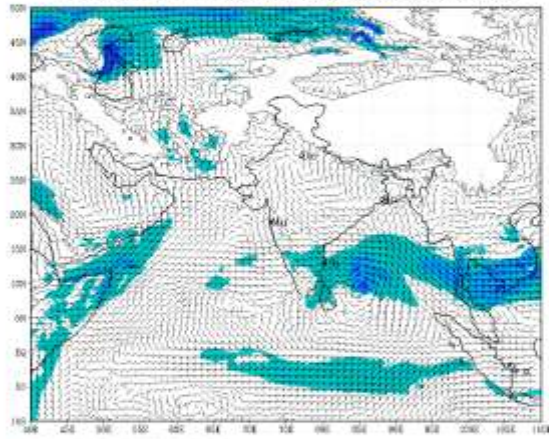
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IMD: GFS(12Km) 10m WIND (barb)& GUST (shaded:kt) FORECAST (72 HR)  
based on 00 UTC of 13-12-2024 valid for 00 UTC of 16-12-2024



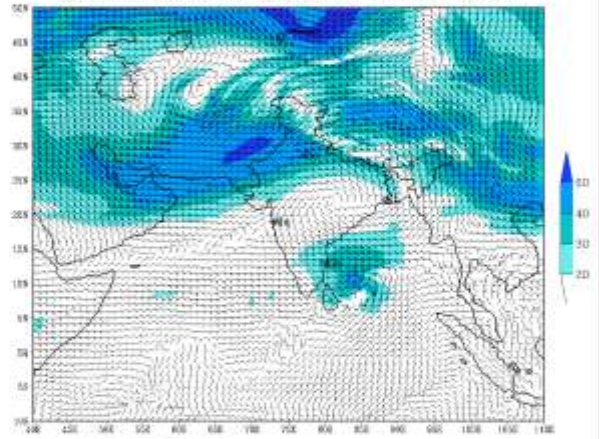
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based on 00 UTC of 13-12-2024 valid for 00 UTC of 16-12-2024



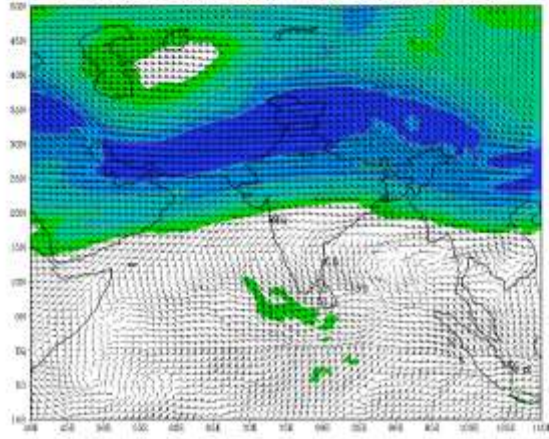
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based on 00 UTC of 13-12-2024 valid for 00 UTC of 16-12-2024



(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (72 HR)  
based on 00 UTC of 13-12-2024 valid for 00 UTC of 16-12-2024



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