



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

**Tropical Cyclone Forecast Programme  
Report Dated 01<sup>st</sup> December, 2022**

**Time of Issue: 1200 UTC**

**Synoptic features (based on 0600 UTC analysis):**

- A cyclonic circulation is likely to emerge into south Andaman Sea around 04th December, 2022. Under its influence, a Low Pressure Area (LPA) is likely to form over Southeast Bay of Bengal & adjoining south Andaman Sea around 05<sup>th</sup> December. It is likely to move west-northwestwards and concentrate into a Depression over Southeast Bay of Bengal during next 48 hours. Thereafter, it is likely to continue to move west-northwestwards and reach near Tamil Nadu-Puducherry coasts on 08<sup>th</sup> December, 2022.

**Dynamical and thermo-dynamical features**

Parameter	Bay of Bengal (BoB)	Arabian Sea (AS)
<b>Sea Surface Temperature (SST) °C</b>	About 30-32°C over Andaman Sea, entire BoB except small pockets of southwest BoB, and Gulf of Mannar.	About 30-32°C over the southeast and adjoining southwest AS off Karnataka and Kerala, south Gujarat coasts, north AS, 26-28°C over eastcentral and adjoining north AS, along and off Kerala and Karnataka coasts, 25-26°C over southwest AS, less than 24°C over southwest AS off Oman and Yemen coasts and adjoining sea areas.
<b>Tropical Cyclone Heat Potential (TCHP) kJ/cm<sup>2</sup></b>	>110 over south Andaman sea & adjoining southeast BoB, eastcentral BoB, 70-80 over north Andaman Sea, north parts of southwest BoB and adjoining westcentral BoB, off Sri Lanka, north BoB, and less than 40 over westcentral BoB, along and off Andhra Pradesh and Tamil Nadu coasts, west coast of Sri Lanka, Gulf of Mannar, some parts of southwest BoB.	70-90 over southeast and adjoining eastcentral and adjoining southwest AS, and less than 40 over remaining AS and also off west coast of India, Comorin area.
<b>Cyclonic Relative vorticity (X10<sup>-6</sup>s<sup>-1</sup>)</b>	10-20 over small pockets of westcentral BoB.	10-20 over northeast AS, Comorin and Maldives, southeast AS, along and off north Kerala.
<b>Low Level convergence (X10<sup>-5</sup> s<sup>-1</sup>)</b>	05 over small pockets of southwest BoB.	5 over southwest AS.

<b>Upper Level divergence (<math>X10^{-5} s^{-1}</math>)</b>	5-10 over southwest BoB and adjoining southeast BoB.	10-20 over southwest AS & along and off Oman coast, 05 over central parts of south AS.
<b>Vertical Wind Shear (VWS knots)</b>	5-15 over Andaman Sea, south BoB. 20-40 over central and north BoB.	5-15 over Lakshadweep and Comorin area, southeast, southwest AS & adjoining EIO. 25-40 over central and north AS.
<b>Wind Shear Tendency (knots)</b>	Decreasing over southwest BoB & adjoining EIO.	Decreasing over southeast AS, Lakshadweep, Comorin and Maldives area, & adjoining EIO.
<b>Upper tropospheric Ridge</b>	Along 12.0°N over the BoB.	Along 10.0°N over the AS.
<b>Trough in westerlies</b>	No significant trough	

**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 and south Andaman sea. Scattered low and medium clouds with embedded moderate to intense convection lay over north & eastcentral Bay of Bengal. Scattered low and medium clouds with embedded isolated weak to moderate convection lay over gulf of Martaban.

**b) Over the Arabian Sea:-**

Scattered low and medium clouds with embedded intense to very intense convection lay over southwest Arabian sea area. Scattered low and medium clouds with embedded moderate to intense convection lay over southeast Arabian sea and Comorin area. Scattered low and medium clouds with embedded weak to moderate convection lay over northeast and adjoining eastcentral Arabian Sea.

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

The Madden Julian Oscillation (MJO) Index is currently in Phase 8 with amplitude less than 1. Thereafter, it would move across phases 1, 2 & 3 with amplitude remaining less than 1.

**Storms and Depression over South China Sea/ South Indian Ocean:**

NIL

**Model guidance 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 LPA over south Andaman Sea on 4 <sup>th</sup> become well-marked low pressure area (WML) on 5 <sup>th</sup> dec morning which is moving west-northwestwards intensified rapidly into a depression in the 5 <sup>th</sup> evening over southeast BoB, into a cyclonic storm (CS) over southwest BoB on 6 <sup>th</sup> Dec morning and into a severe cyclonic storm (SCS) over southwest BoB close to northeast Sri Lanka coast on 7 <sup>th</sup> . It is making landfall on 8 <sup>th</sup> Dec morning close to Puducherry.	No significant system
<b>IMD-GEFS</b>	An extended cyclonic circulation over Gulf of to emerge into south Andaman Sea on	No significant system

	4 <sup>th</sup> Dec morning over south Andaman Sea, under its influence a low pressure area likely to form at the surface which is likely to intensify into a depression over south Andaman Sea & adjoining southeast BoB on 5 <sup>th</sup> Dec morning. It is intensifying rapidly into a CS subsequently into a SCS over southwest BoB during 6 <sup>th</sup> Dec. Moving west-northwestward it will be over southwest BoB close to NE Sri Lanka coast as a SCS on 7 <sup>th</sup> Dec. It is likely to make landfall on 8 <sup>th</sup> Dec as D/DD.	
<b>GEFS Probabilistic guidance</b>	Not available	Not available
<b>IMD WRF</b>	A cyclonic circulation will emerge into south Andaman Sea on 4 <sup>th</sup> Dec.	No significant system within forecast duration.
<b>NCMRWF-NCUM</b>	Cyclonic circulation over Gulf of Thailand on 3 <sup>rd</sup> Dec, to emerge into South Andaman Sea on 4 <sup>th</sup> Dec morning, under its influence a low pressure area likely to form over the same region to move nearly westwards initially and intensify into a depression over southeast BoB and adjoining South Andaman Sea on 6 <sup>th</sup> Dec, moving west-northwestwards become a DD over southwest BoB by 7 <sup>th</sup> Dec morning, and continue to move in the same direction towards Tamil Nadu & Puducherry coasts and weakening into a depression by morning of 8 <sup>th</sup> Dec and cross the north Tamil Nadu & Puducherry coasts on 8 <sup>th</sup> evening.	No significant system
<b>NCMRWF-NEPS</b>	Cyclonic circulation over Gulf of Thailand to emerge into South Andaman Sea on 4 <sup>th</sup> Dec and induce an extended low pressure area over the same region, move nearly west-northwestwards and intensify into an depression on 6 <sup>th</sup> Dec over southeast BoB, DD over southwest & adjoining southeast BoB on 7 <sup>th</sup> Dec, continuing west-northwest ward movement it is likely to lay over southwest BoB close to Tamil Nadu & Puducherry coasts as a depression on 8 <sup>th</sup> Dec. It is likely to make landfall over north Tamil Nadu & Puducherry coasts on 8 <sup>th</sup> evening.	No significant system
<b>NCMRWF-UM (Regional)</b>	A cyclonic circulation will emerge into south Andaman Sea on 4 <sup>th</sup> Dec.	No significant system within forecast duration
<b>ECMWF</b>	A cyclonic circulation from Gulf of Thailand to emerge into south Andaman Sea on 4 <sup>th</sup> Dec morning, likely to induce a low pressure area over the region which would move westward and become a depression on 5 <sup>th</sup> Dec afternoon over southeast BoB, will become CS by 6 <sup>th</sup> Dec evening. Continue to move in same direction towards Tamil Nādu & Puducherry coasts and will lay off NE Sri	No significant system

	Lanka coast as CS on 7 <sup>th</sup> Dec morning, continue in the same direction and will made landfall along Tamil Nadu – Puducherry coasts as D/DD on 9 <sup>th</sup> Dec morning.	
<b>ECMWF ensemble</b>	Likely cyclogenesis over South Andaman Sea during 4 <sup>th</sup> Dec, will track west-northwest wards with intensification up to Cyclonic Storm with 70-80% probability on 7 <sup>th</sup> Dec.	No significant system
<b>NCEP-GFS</b>	A cyclonic circulation from Gulf of Thailand is likely to emerge into South Andaman Sea on 4 <sup>th</sup> Dec morning. It will move west-northwest ward direction and become a depression on 6 <sup>th</sup> , CS on 7 <sup>th</sup> Dec over southwest & adjoining southeast BoB. Continuing to in the same direction, it lay as a CS on 8 <sup>th</sup> Dec over southwest BoB and subsequently weakened into a DD off NE Sri Lanka coast on 09 <sup>th</sup> Dec. Continuing to move slowly in same direction the system is likely to reach the Tamil Nadu – Puducherry coast as a Depression on 11 <sup>th</sup> Dec.	No significant system
<b>IMD MME</b>	Cyclonic circulation over south Andaman Sea will have its northwest ward movement and induce a LPA over the region which is likely to become a depression on 5 <sup>th</sup> Dec over southeast & adjoining south Andaman Sea, CS over southwest and adjoining southeast BoB on 6 <sup>th</sup> Dec evening/7 <sup>th</sup> Dec morning, continue in the same direction with decrease in intensity and will reach the coast during 9 <sup>th</sup> -10 <sup>th</sup> Dec as LPA.	Available during cyclonic disturbance period only
<b>IMD HWRF</b>	Available during cyclonic disturbance period only	Available during cyclonic disturbance period only
<b>IMD-Genesis Potential Parameter</b>	No potential zone over Bay of Bengal till 4 <sup>th</sup> December. A significant potential zone over south Andaman Sea on 5 <sup>th</sup> Dec having west-northwest ward movement.	No potential zone over Arabian Sea during next 7 days

### Summary and conclusion:

- Most of the NWP models are indicating likely emergence of a cyclonic circulation and under its influence formation of a low pressure area (remnant from South China Sea) over south Andaman Sea around 4<sup>th</sup> December. All models are unanimously indicating west-northwest ward movement with gradual intensification over southeast BoB and adjoining areas and lay as a depression on 5<sup>th</sup> Dec evening/6<sup>th</sup> Dec morning. Then continuing to move west-northwestwards over southwest & adjoining westcentral BoB towards Tamil Nadu & Puducherry coasts, most of the models except NCUM group are indicating further intensification of the system into cyclonic storm by 7<sup>th</sup> Dec.

In view of all the above, it is inferred that

#### 1. For the Bay of Bengal:

A cyclonic circulation is likely to emerge into South Andaman Sea around 4th Dec. Under its influence a low pressure area is likely to form over southeast Bay of Bengal and adjoining south Andaman Sea around 5th Dec. It is likely to move west- northwestwards and concentrate into a depression over southeast Bay of Bengal during next 48 hours. Thereafter, it is likely to continue to move west-northwestwards and reach near Tamil Nadu- Puducherry coasts on 8th December.

**2. For the Arabian Sea:**

**No significant system during next 7 days**

**Probability of cyclogenesis (formation of depression and above intensity systems) over the BAY OF BENGAL of Bengal and Andaman 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	MOD	HIGH

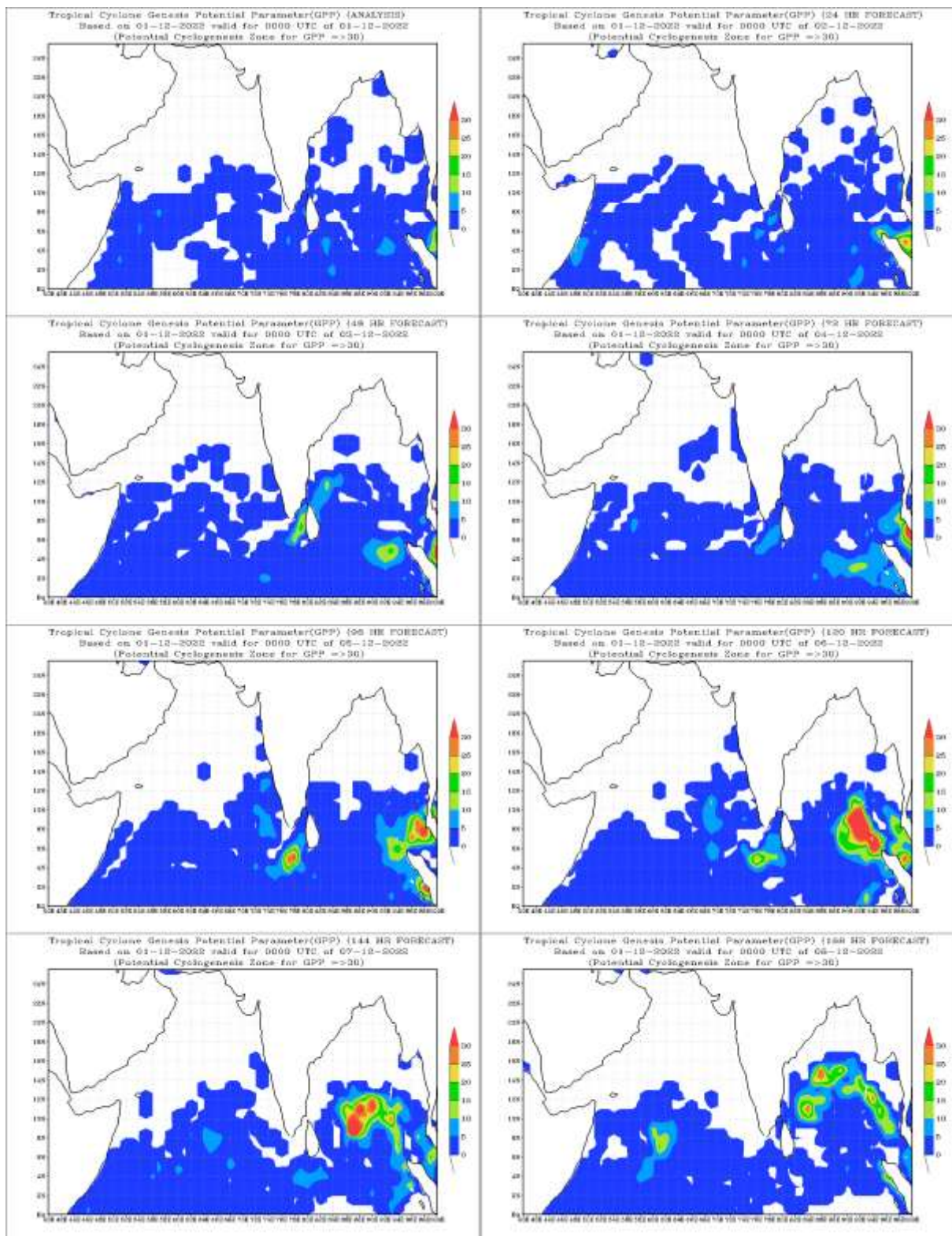
**Probability of cyclogenesis (formation of depression and above intensity systems) over the Arabian Sea during next 168 hours:**

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

**Advisory:**

The movement and intensification of low pressure area/depression (remnant from South China Sea) likely to emerge into south Andaman Sea around 4<sup>th</sup> December need to be monitored through various observations.

**IOP: NIL**



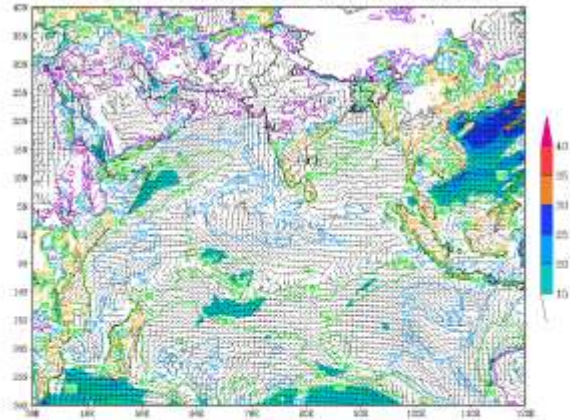


IMD-GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (24 HR)  
 based on 00 UTC of 01-12-2022 valid for 00 UTC of 02-12-2022



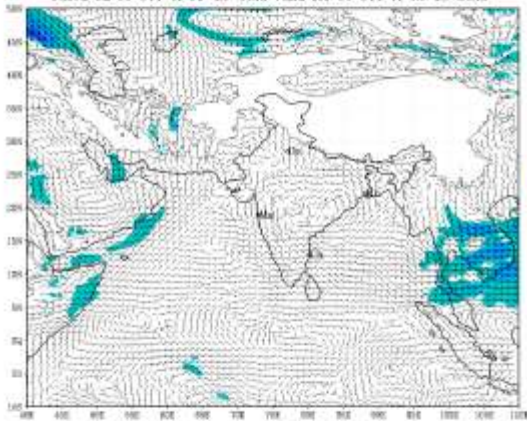
(Background line art depicts political boundary)

IMD-GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (24 HR)  
 based on 00 UTC of 01-12-2022 valid for 00 UTC of 02-12-2022



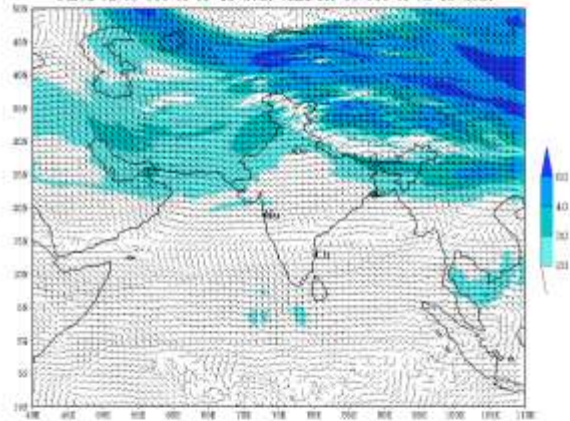
(Background line art depicts political boundary)

IMD-GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (24 HR)  
 based on 00 UTC of 01-12-2022 valid for 00 UTC of 02-12-2022



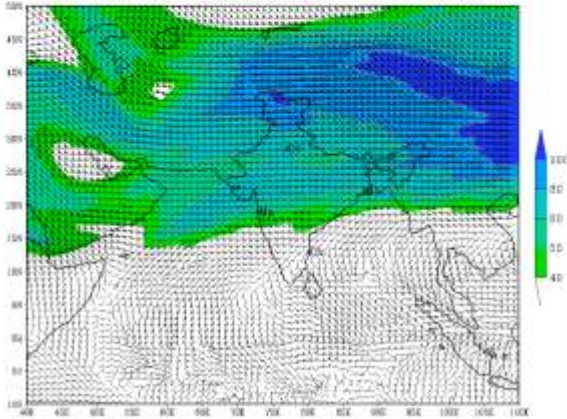
(Background line art depicts political boundary)

IMD-GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (24 HR)  
 based on 00 UTC of 01-12-2022 valid for 00 UTC of 02-12-2022



(Background line art depicts political boundary)

IMD-GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (24 HR)  
 based on 00 UTC of 01-12-2022 valid for 00 UTC of 02-12-2022



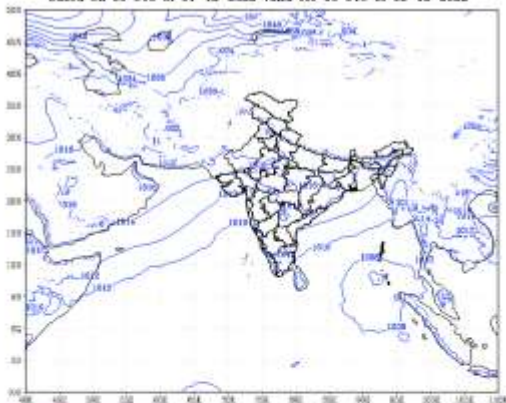
(Background line art depicts political boundary)





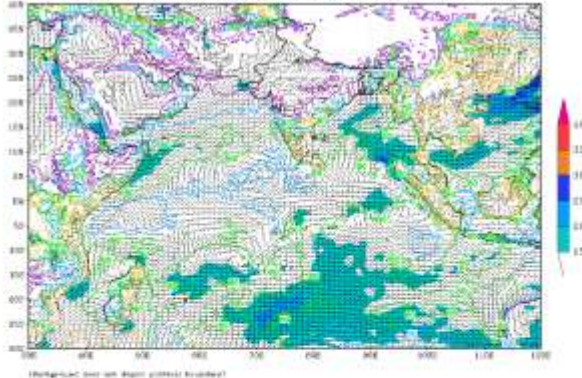


IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (96 HR)  
based on 00 UTC of 01-12-2022 valid for 00 UTC of 02-12-2022



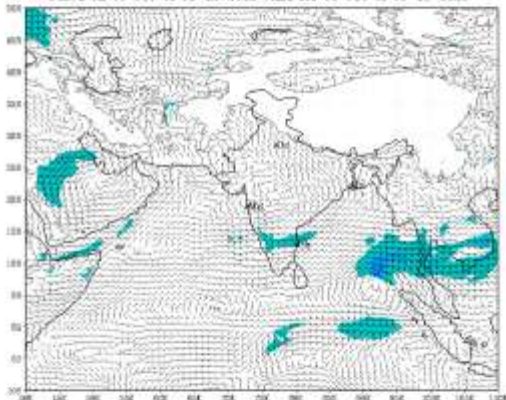
(Background line are eight-degree latitude)

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (96 HR)  
based on 00 UTC of 01-12-2022 valid for 00 UTC of 02-12-2022



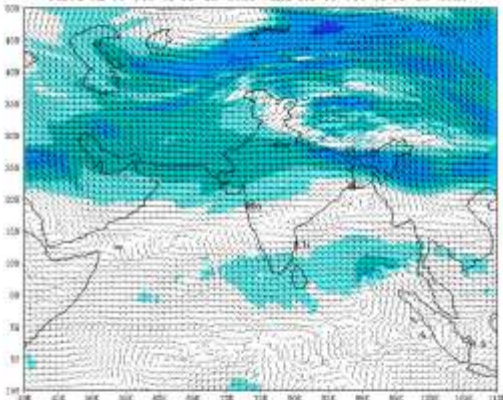
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IMD:GFS MODEL(12 Km) 950 hPa WIND (kt) FORECAST (96 HR)  
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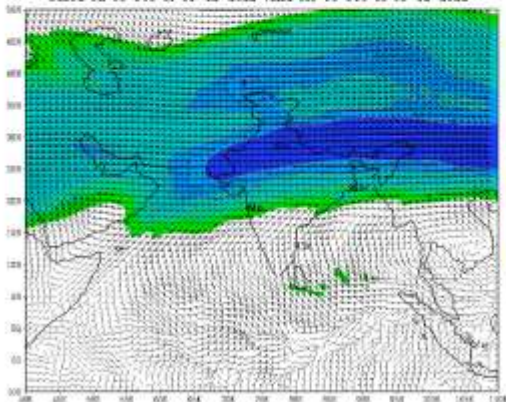
(Background line are eight-degree latitude)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (96 HR)  
based on 00 UTC of 01-12-2022 valid for 00 UTC of 02-12-2022



(Background line are eight-degree latitude)

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (96 HR)  
based on 00 UTC of 01-12-2022 valid for 00 UTC of 02-12-2022



(Background line are eight-degree latitude)

