



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

**Tropical Cyclone Forecast Programme  
Report Dated 17<sup>th</sup> October, 2022**

**Time of Issue: 1200 UTC**

**Synoptic features (based on 0900 UTC analysis):**

- ❖ A cyclonic circulation lies over southwest Arabian Sea & neighbourhood and extends upto 3.1 km above mean sea level.
- ❖ Yesterday's cyclonic circulation over southeast Arabian Sea & adjoining Kerala coast extending upto 1.5 km above mean sea level persists.
- ❖ The trough from above cyclonic circulation over southeast Arabian Sea & adjoining Kerala coast to southwest Bay of Bengal extending upto 1.5 km above mean sea level across Kerala & Tamil Nadu persists.
- ❖ A cyclonic circulation formed over south Andaman Sea & neighbourhood at 0300 UTC of today, the 17<sup>th</sup> October and extends upto 3.1 km above mean sea level. Under its influence, a Low Pressure Area is likely to form over southeast & adjoining eastcentral Bay of Bengal around 20<sup>th</sup> October. It is likely to move west-northwestwards towards westcentral & adjoining southwest Bay of Bengal and become more marked during subsequent 48 hours.

**Dynamical and thermo-dynamical features**

<b>Parameter</b>	<b>Bay of Bengal (BoB)</b>	<b>Arabian Sea (AS)</b>
<b>Sea Surface Temperature (SST) °C</b>	About 29-31°C over entire BoB and Andaman Sea except over some parts of southwest BoB and over Comorin Area.	28-30°C over extreme north AS, southeast & adjoining eastcentral AS and off Maharashtra-South Gujarat coasts. 26-28°C over eastcentral, westcentral and southwest BoB. Less than 26°C off Oman & Somalia coast.
<b>Tropical Cyclone Heat Potential (TCHP) kJ/cm<sup>2</sup></b>	(a) 110-120 over eastcentral BoB and Andaman Sea off Myanmar-Thailand coasts & Sumatra Islands. (b) 60-80 over western parts of BoB and parts of southeast BoB. (c) 30-40 over some parts of westcentral & southwest BoB off TamilNadu & Andhra Pradesh coasts and Comorin Area.	(a) 60-80 over eastcentral & and also along & off west coast of India. (b) 30-40 over remaining AS.

<b>Cyclonic Relative vorticity (<math>\times 10^{-6} \text{s}^{-1}</math>)</b>	(a) Positive vorticity of 30-40 south Andaman Sea and adjoining southeast BoB with vertical extension upto 500 hPa level.	(a) Positive vorticity of 30-40 over central AS with vertical extension upto 500 hPa level. (b) 30-40 over southwest AS off Yemen coasts. (c) 20-30 over Comorin area, Lakshadweep area and adjoining southeast AS
<b>Low Level convergence (<math>\times 10^{-5} \text{s}^{-1}</math>)</b>	5-20 over south Andaman Sea and adjoining Gulf of Thailand and off Sumatra Islands. Small zone of value 05 over southwest BoB and another zone of 05 over Comorin Area.	5-20 over southeast AS. 5-10 over southwest AS. Small zones of value 05 over central AS and westcentral AS off Oman coast.
<b>Upper Level divergence (<math>\times 10^{-5} \text{s}^{-1}</math>)</b>	Divergence has further organized during past 24 hours. 05-20 over south Andaman Sea and southeast BoB. 5-10 over south BoB. Small zones of 5 over westcentral BoB off Andhrapradesh coast.	05-10 over southeast & adjoining eastcentral AS off Kerala-Karnataka coasts. 5-10 over northwest AS off Oman coast. Small zones of 5 over westcentral AS.
<b>Vertical Wind Shear (VWS knots)</b>	5-10 (favourable) over major parts of central BoB and north BoB. 25-30 (unfavourable) over extreme south BoB & adjoining EIO.	5-15 (favourable) over central & adjoining south AS. 5-15 over westcentral & adjoining southwest AS. 25 (unfavourable) over Comorin.
<b>Wind Shear Tendency (knots)</b>	Decreasing over south Andaman Sea and southwest BoB off TamilNadu coast.	Decreasing over westcentral & adjoining southwest AS.
<b>Upper tropospheric Ridge</b>	Along 19.0°N over the BoB.	Along 19.0°N over the AS.

### **Satellite observations based on INSAT imagery (0900 UTC):**

#### **(a) Over the BoB & Andaman Sea:-**

At 0900 UTC, scattered low and medium clouds with embedded intense to very intense convection lay over south Bay of Bengal and Andaman sea. Scattered low and medium clouds with embedded moderate to intense convection lay over rest of Bay of Bengal.

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

At 0900 UTC, scattered low and medium clouds with embedded intense to very intense convection lay over westcentral & south Arabian Sea. Scattered low and medium clouds with embedded moderate to intense convection lay over eastcentral Arabian Sea and Comorin area.

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

MJO index is currently in Phase 6 with amplitude greater than 1. It will continue in same phase for next 7 days with amplitude remaining greater than 1.

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

Vortex (NESAT) over South China Sea and neighbourhood moved nearly westwards & also intensified further in past 24 hours and lay near 19.1N / 115.9E with intensity T.No./C.I. No. 4.5/4.5 at 0600 UTC. Associated broken low and medium clouds with embedded intense to very intense convection lay over area between latitude 17.0N & 21.5N and longitude 113.0E & 118.0E.

**Input for FDP Cyclone based on 0000 UTC for the next 7 days**

<b>MODEL GUIDANCE</b>	<b>BoB</b>	<b>AS</b>
<b>IMD-GFS</b>	<p>Model is indicating a cycir over North Andaman Sea at 0000 UTC of 17<sup>th</sup>. It is likely to move nearly westwards and lie over eastcentral &amp; adjoining southeast BoB as a low pressure area (LPA) on 19<sup>th</sup>. Thereafter, moving north-northwestwards, it would lie as a depression over westcentral BoB on 22<sup>nd</sup>, a deep depression (DD) over westcentral BoB on 23<sup>rd</sup>, very severe cyclonic storm (VSCS) over westcentral BoB on 24<sup>th</sup>. GFS is indicating that the system would cross North Andhra Pradesh in the early hours of 25<sup>th</sup> to the north of Srikakulam near 18.5/84.0. Model is also indicating rapid intensification of the system during 0000 UTC of 23<sup>rd</sup> to 0000 UTC of 24<sup>th</sup>.</p> <p>A fresh cycir likely to emerge into Andaman Sea on 23<sup>rd</sup> and would persist over the same region till 25<sup>th</sup>.</p>	<p>A cycir over southeast AS and another over southwest AS on 17<sup>th</sup>, a cycir over southwest AS on 18<sup>th</sup>, becoming less marked thereafter.</p>
<b>IMD-GEFS</b>	<p>Extended circulation over Andaman Sea and adjoining central BoB during 17<sup>th</sup> to 20<sup>th</sup>. Lies as an LPA over southwest BoB on 21<sup>st</sup>, depression over westcentral &amp; adjoining southwest BoB on 22<sup>nd</sup>, deep depression over the southwest &amp; adjoining westcentral BoB on 23<sup>rd</sup>, cyclonic storm (CS) over westcentral BoB close to machhilipatnam on 24<sup>th</sup> with further weakening over south Odisha coast on 25<sup>th</sup>.</p>	<p>A cycir over southwest AS on 18<sup>th</sup>, becoming less marked on 19<sup>th</sup>.</p>
<b>IMD-WRF</b>	<p>A cycir over central parts of Andaman Islands and adjoining eastcentral BoB on 17<sup>th</sup>, LPA over eastcentral BoB on 18<sup>th</sup> &amp; 19<sup>th</sup> with gradual west-northwestwards movement and LPA over westcentral BoB &amp; adjoining southwest BoB on 20<sup>th</sup>.</p>	<p>An extended circulation over south AS on 17<sup>th</sup>, southwest AS on 18<sup>th</sup>, becoming less marked thereafter. Fresh cyclonic circulation over eastcentral AS on 19<sup>th</sup>, an LPA over eastcentral AS on 20<sup>th</sup>.</p>
<b>NCMRWF-NCUM</b>	<p>A cycir over North Andaman Sea on 17<sup>th</sup>. It is likely to move west-northwestwards and lie as an LPA over eastcentral BoB on 18<sup>th</sup>, depression over southeast &amp; adjoining eastcentral BoB on 21<sup>st</sup>, Cyclonic Storm over southeast &amp; adjoining eastcentral BoB on 22<sup>nd</sup>. Severe</p>	<p>A cycir lies over southwest AS on 17<sup>th</sup> &amp; 18<sup>th</sup> with gradual southwestwards movement and less</p>

	<p>cyclonic storm (SCS) over westcentral BoB on 23<sup>rd</sup> and thereafter system would cross North Andhra Pradesh coast near 18N/82E around 23<sup>rd</sup> night, as an SCS over North Andhra Pradesh coast on 24<sup>th</sup>. Thereafter indicating nearly northwards movement towards Chhattisgarh as a depression on 25<sup>th</sup>. This model has now shifted track northwards.</p>	<p>marked thereafter. Fresh cycir over eastcentral AS during 19<sup>th</sup> to 21<sup>st</sup>, over westcentral AS on 22<sup>nd</sup> becoming less marked thereafter.</p>
<b>NCMRWF-NEPS</b>	<p>A cycir over North Andaman Sea &amp; adjoining eastcentral BoB on 17<sup>th</sup>. It is likely to move west-northwestwards and lie as an LPA over southeast BoB on 18<sup>th</sup>, WML over southeast BoB on 19<sup>th</sup> &amp; 20<sup>th</sup>, depression over same region on 20<sup>th</sup>, as a deep depression over southwest &amp; adjoining westcentral BoB on 21<sup>st</sup>, CS over westcentral &amp; adjoining southwest BoB on 22<sup>nd</sup>, SCS over westcentral BoB on 23<sup>rd</sup>. Further it is indicating crossing North Andhra Pradesh coast as an SCS in the night of 23<sup>rd</sup>. As a CS over north interior Andhra Pradesh on 24<sup>th</sup>. Indicating nearly northwards movement towards Chhattisgarh as a DD on 25<sup>th</sup>.</p>	<p>A cycir lies over eastcentral &amp; adjoining southeast AS during 17<sup>th</sup> – 18<sup>th</sup> becoming less marked thereafter. Another cycir over eastcentral AS on 21<sup>st</sup>, LPA over southeast AS &amp; neighbourhood on 22<sup>nd</sup>, becoming less marked on 23<sup>rd</sup>.</p>
<b>NCMRWF-UM (Regional)</b>	<p>Cycir lies over North Andaman Sea on 17<sup>th</sup>, LPA over eastcentral BoB on 18<sup>th</sup> becoming WML on 19<sup>th</sup> over the same region.</p>	<p>A cycir lies over southeast &amp; adjoining eastcentral AS, persist over same region on 17<sup>th</sup>, lies over central &amp; adjoining south AS on 18<sup>th</sup>, becoming less marked on 19<sup>th</sup>.</p>
<b>ECMWF</b>	<p>A cycir over North Andaman Sea &amp; adjoining eastcentral BoB during 17<sup>th</sup>-19<sup>th</sup>, LPA over southeast &amp; adjoining southwest BoB on 20<sup>th</sup>, depression over southwest &amp; adjoining westcentral BoB on 21<sup>st</sup>, DD over westcentral BoB on 24<sup>th</sup> &amp; cyclonic storm over northwest &amp; adjoining westcentral BoB on 25<sup>th</sup>. It is further indicating that the system would cross Sunderbans as CS/SCS in the midnight of 25<sup>th</sup> near 21.8/88.8.</p>	<p>A extended cycir over central AS on 19<sup>th</sup> becoming less marked thereafter.</p>
<b>ECMWF-EPS</b>	<p>20-50% cyclogenesis probability over central BoB during next 5-7 days. Large variation in track with some members indicating nearly west-northwestwards movent towards westcentral &amp; adjoining southwest BoB and some members indicating initial west-northwestwards movement, followed by nearly northwards movement towards northwest BoB.</p>	<p>Model is indicating 60-80% probability of cyclogenesis over central parts of south AS during next 3 days and 30-60% cyclogenesis probability over eastcentral AS during next 3-6 days.</p>
<b>NCEP-GFS</b>	<p>Model is indicating a cycir over North Andaman Sea at 0000 UTC of 17<sup>th</sup>. It is likely to move nearly westwards and lie over eastcentral &amp; adjoining southeast BoB as a low pressure area (LPA) on 19<sup>th</sup>. Thereafter, moving north-northwestwards, it would lie as a depression over westcentral BoB on 22<sup>nd</sup>, a deep depression (DD) over westcentral BoB on 23<sup>rd</sup>, very severe cyclonic storm</p>	<p>A cycir over southeast AS and another over southwest AS on 17<sup>th</sup>, a cycir over southwest AS on 18<sup>th</sup>, becoming less marked thereafter.</p>

	(VSCS) over westcentral BoB on 24 <sup>th</sup> . GFS is indicating that the system would cross North Andhra Pradesh in around 0600 UTC of 26 <sup>th</sup> near 18.5/84.0. Model is also indicating rapid intensification of the system during 0000 UTC of 23 <sup>rd</sup> to 0000 UTC of 24 <sup>th</sup> .	
<b>IMD-Genesis Potential Parameter</b>	A Potential zone over South Andaman Sea & adjoining Gulf of Thailand on 17 <sup>th</sup> & 18 <sup>th</sup> , another zone over eastcentral BoB on 18 <sup>th</sup> . Two potential zones over North Andaman Sea & eastcentral BoB on 19 <sup>th</sup> , merger of two zones into a single consolidated zone over North Andaman Sea & adjoining eastcentral BoB, single consolidated circular zone over central parts of BoB on 21 <sup>st</sup> , slight weakening of potential zone over westcentral BoB on 22 <sup>nd</sup> , consolidated zone over westcentral BoB on 23 <sup>rd</sup>	Potential zone over southeast AS during 19 <sup>th</sup> – 20 <sup>th</sup> , over eastcentral AS on 21 <sup>st</sup> off Karnataka coast, consolidated single zone over eastcentral AS on 22 <sup>nd</sup> & 23 <sup>rd</sup> ,

### Summary and conclusion:

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

There is consensus among various models regarding formation of cyclonic circulation over Andaman Sea on 17<sup>th</sup>. Large variation among various models w.r.t. development of low pressure area and its movement & intensification. Under the influence of this cyclonic circulation, models are indicating development of low pressure area over eastcentral and adjoining southeast BoB during 18<sup>th</sup>-20<sup>th</sup> with NCUM group indicating early organisation around 18<sup>th</sup>, GFS group of models indicating formation of LPA on 19<sup>th</sup> and ECMWF around 20<sup>th</sup>. There is a consensus that there will be intensification of this system into a cyclonic storm. However, the time of intensification varies from 22<sup>nd</sup> to 25<sup>th</sup> and also models suggest further intensification. There is still large variation wrt movement & intensification of the system. The ECMWF is indicating CS on 25<sup>th</sup>, GFS group is indicating CS on 23<sup>rd</sup> and NCUM on 22<sup>nd</sup>. The NCUM & GFS groups are indicating northwestwards movement, ECMWF is indicating initial west-northwestwards movement followed by north-northwestwards movement. NCUM & GFS groups are now indicating landfall over North Andhra Pradesh coast and ECMWF is indicating landfall over West Bengal & adjoining Bangladesh coast.

**Hence, it is inferred that, a Low Pressure Area is likely to form over southeast & adjoining eastcentral Bay of Bengal around 20<sup>th</sup> October. It is likely to move west-northwestwards and concentrate into a depression by 22<sup>nd</sup> morning over westcentral Bay of Bengal. Thereafter, there is large variation wrt movement & intensification and hence it needs to be monitored continuously.**

The environmental conditions like SST and ocean thermal energy are favourable over south & central BoB for formation of low/depression. The La Nina conditions supported with negative IOD conditions will support the movement of remnant circulations from South China Sea to Andaman Sea with possible further intensification. However, MJO being in phase 6 with amplitude more than 1, will not be supportive for amplification of convection and hence the system.

#### 2. For the Arabian Sea:

The cycir over southeast AS & adjoining Kerala coast is likely to persist over same region during 17<sup>th</sup> & 18<sup>th</sup> and become less marked thereafter.

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	MODERATE	HIGH

**Probability of cyclogenesis (formation of depression and above intensity systems) over the BAY OF BENGAL of Bengal and Andaman Sea during next 168 hours:**

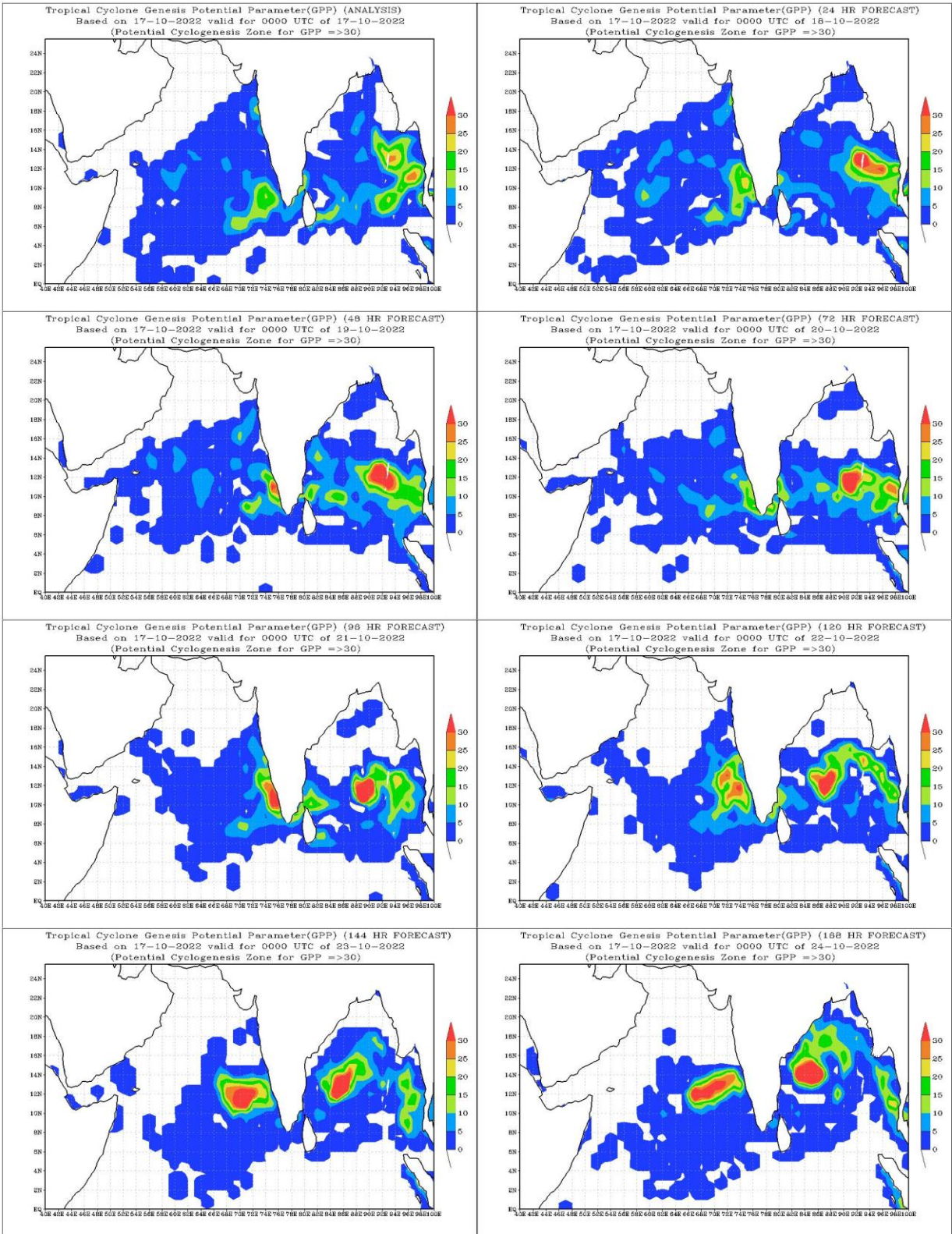
**Probability of cyclogenesis (formation of depression and above intensity systems) over the Arabian Sea during next 168 hours:**

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

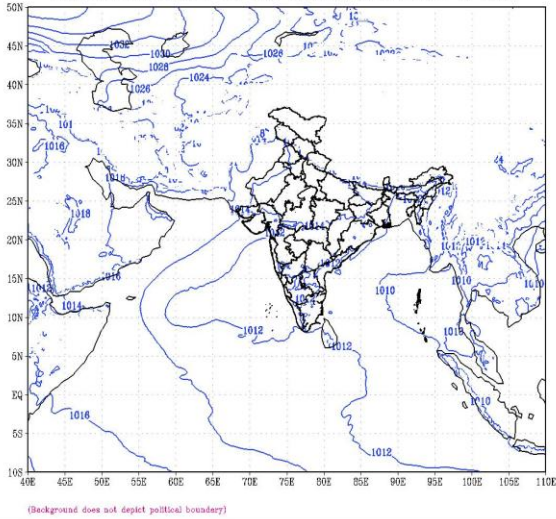
**Advisory:**

The intensification & movement of depression likely to form over westcentral Bay of Bengal around 22<sup>nd</sup> October need to be monitored.

**IOP is suggested for Andaman & Nicobar Islands on 19<sup>th</sup>.**

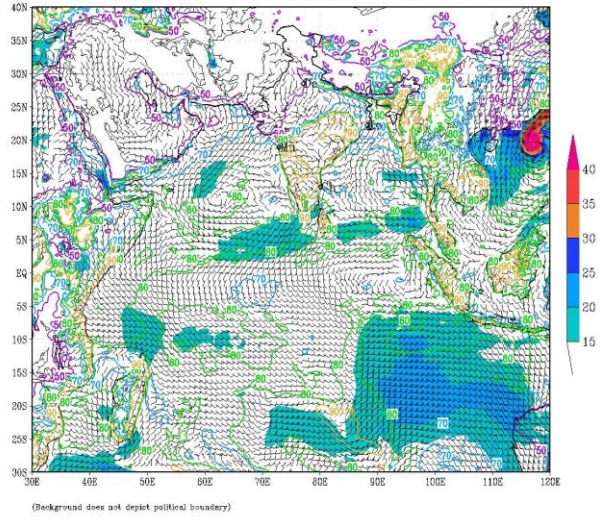


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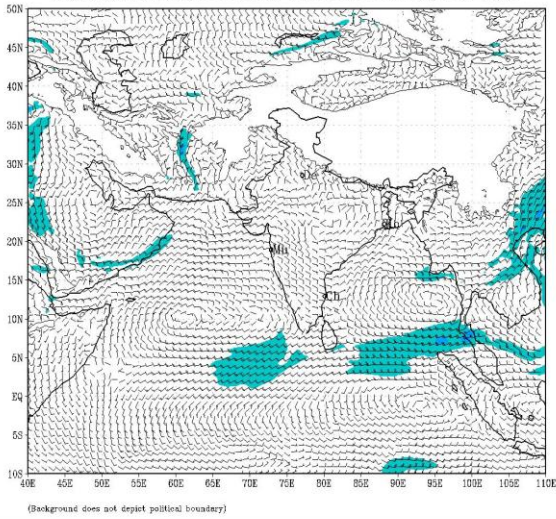
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IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (00 HR)  
 based on 00 UTC of 17-10-2022 valid for 00 UTC of 17-10-2022



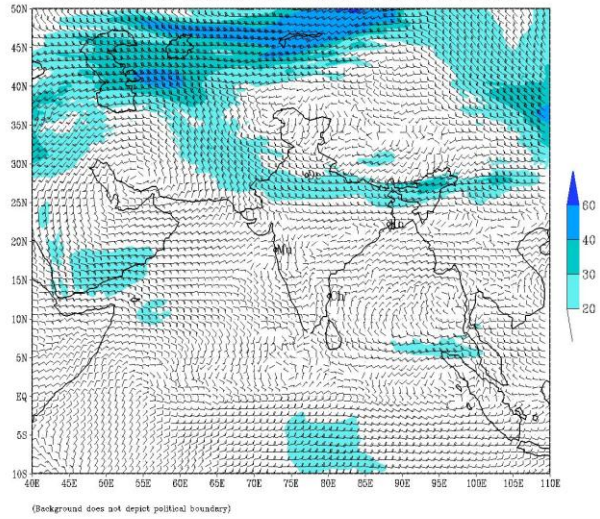
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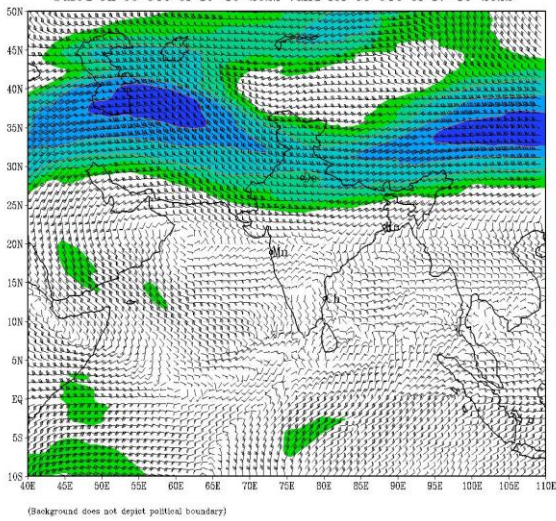
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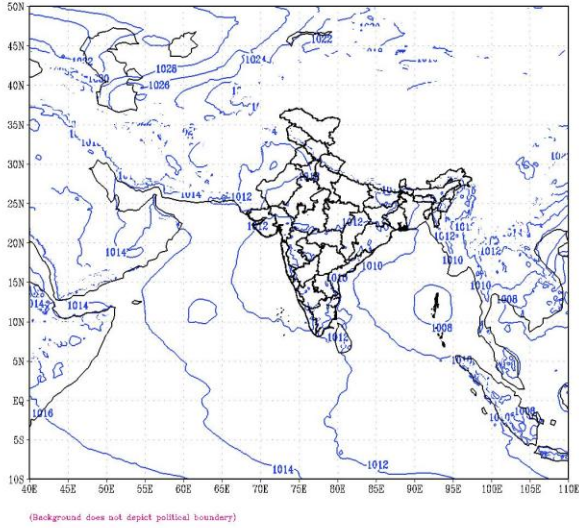
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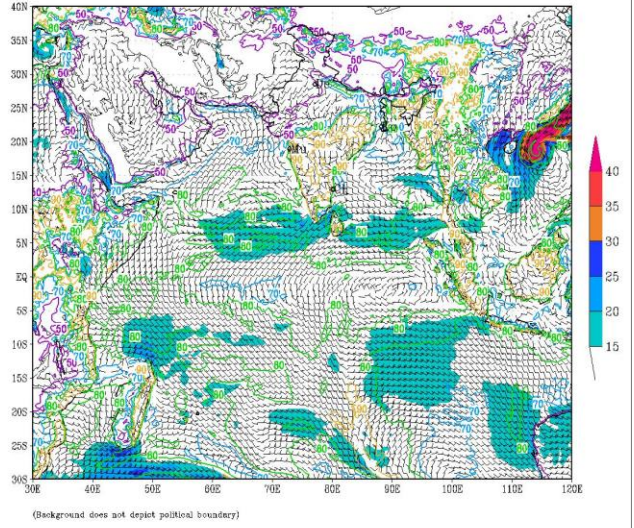
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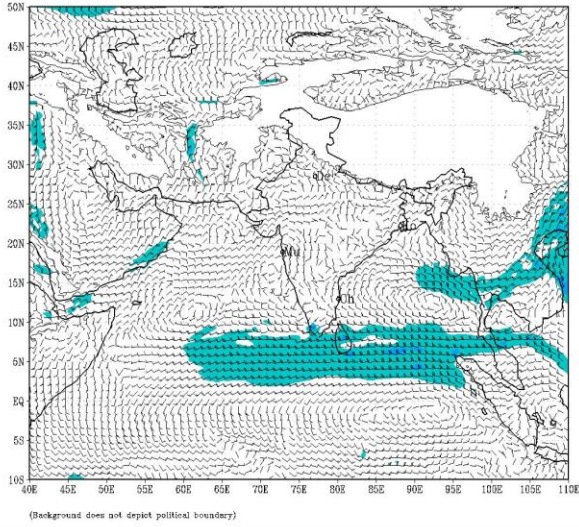
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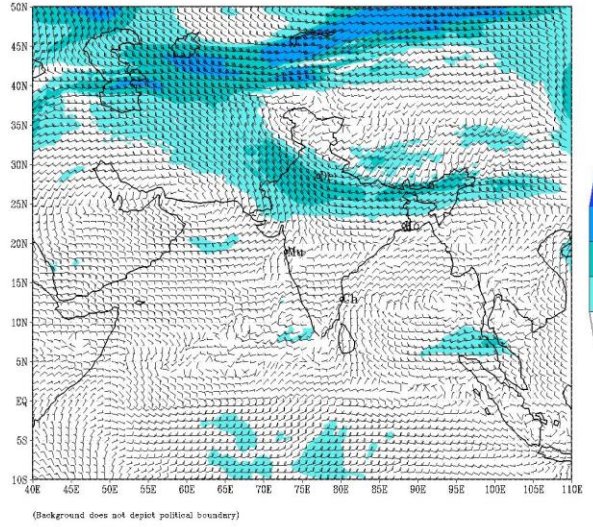
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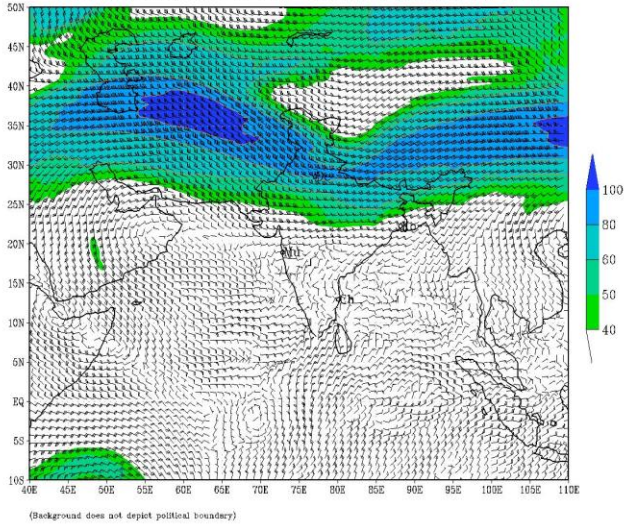
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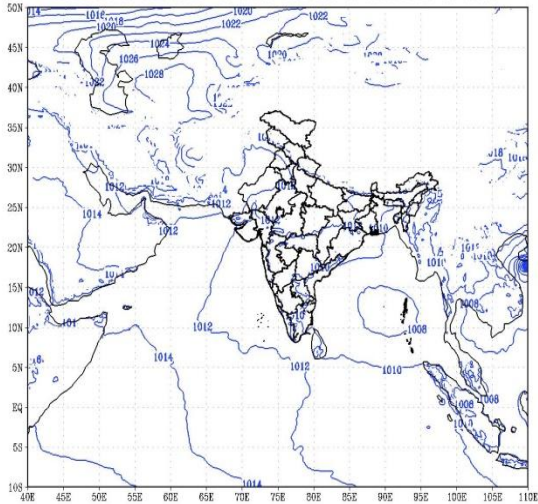
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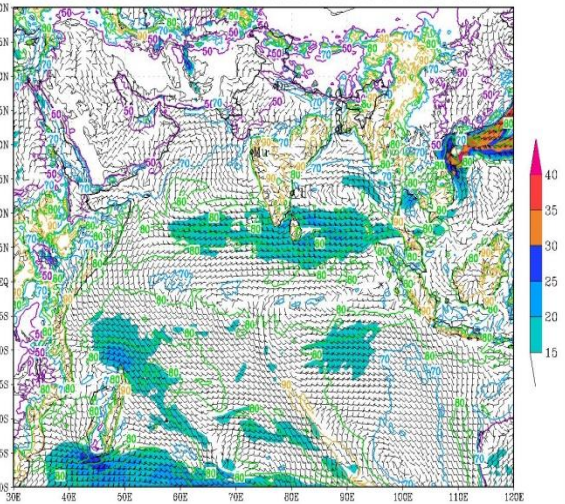


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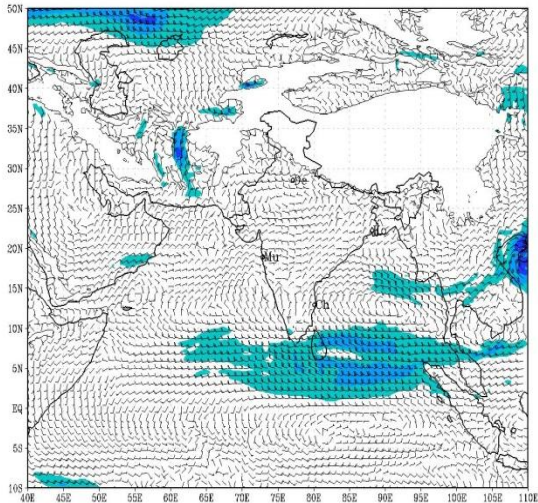
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IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (48 HR)  
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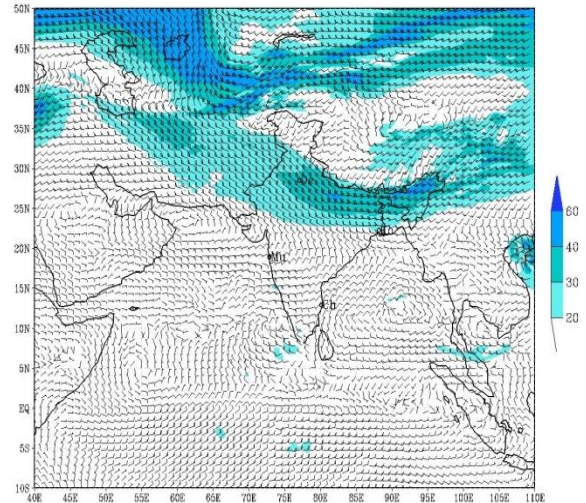
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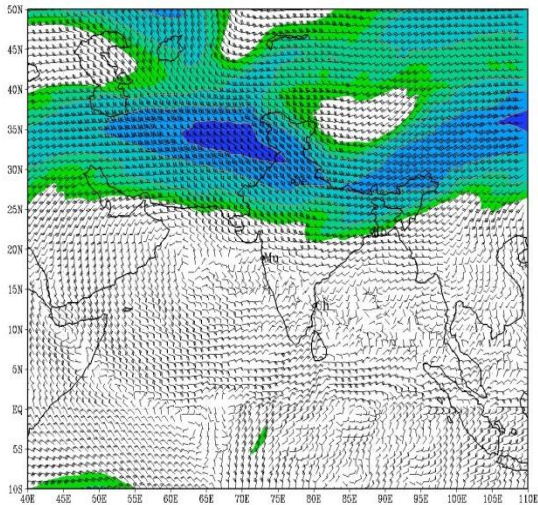
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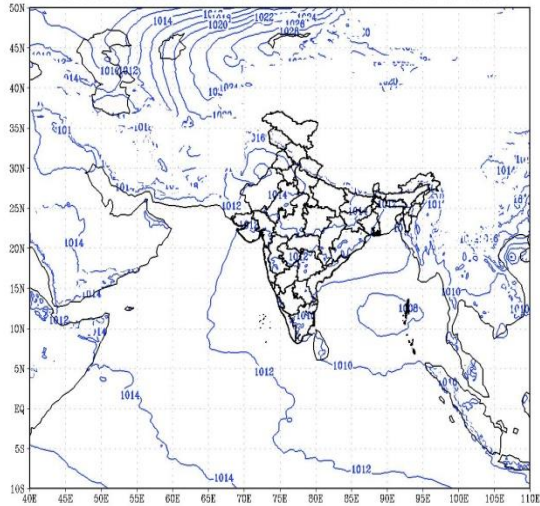
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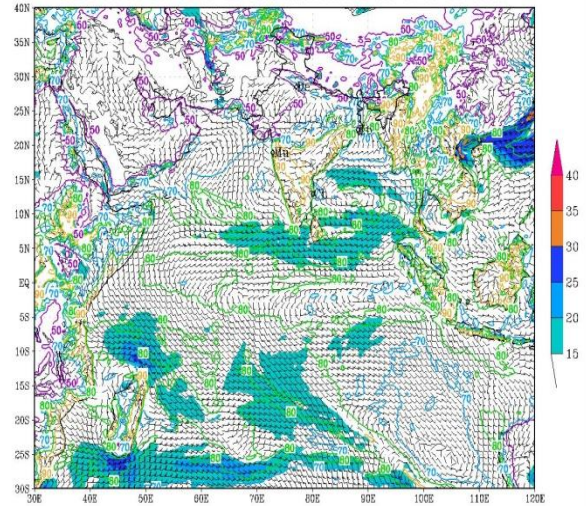
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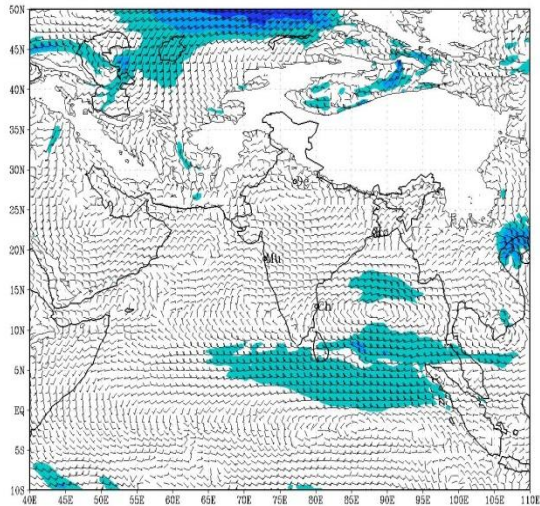
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IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (72 HR)  
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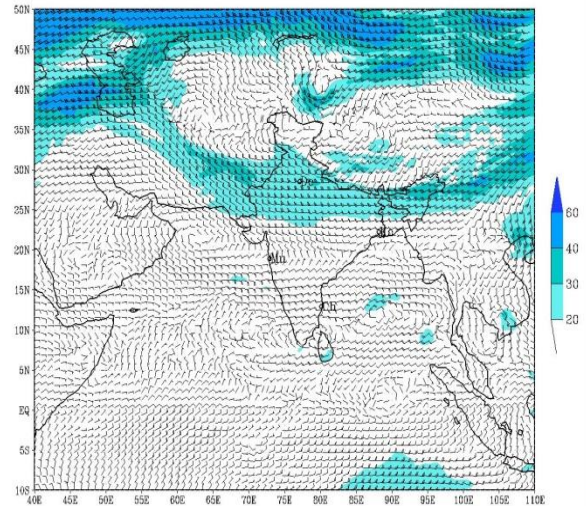
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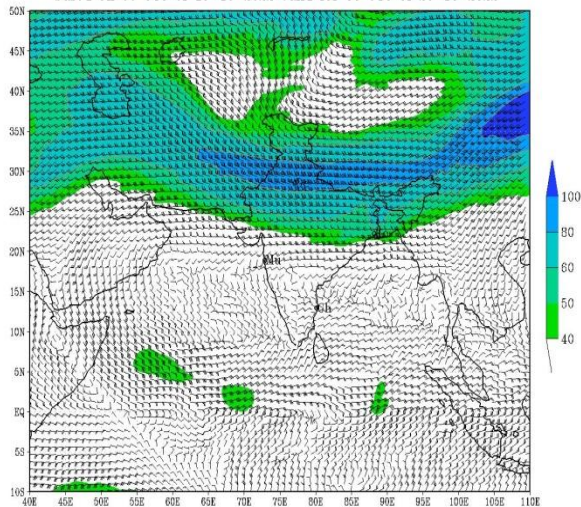
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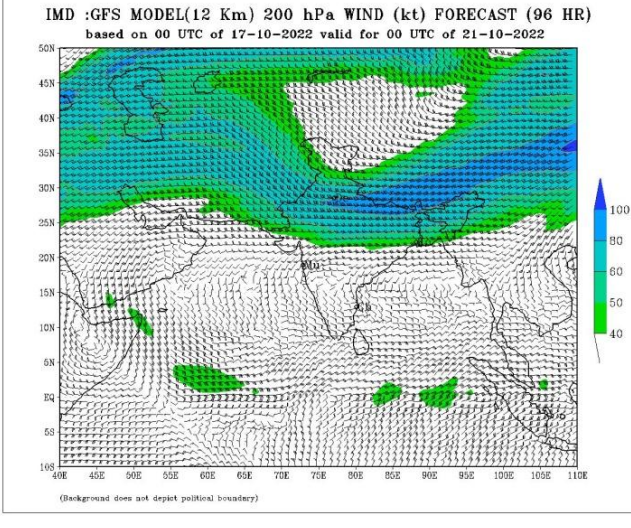
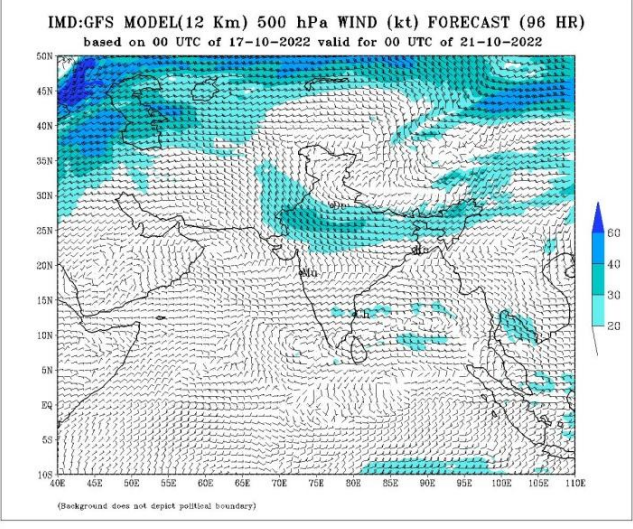
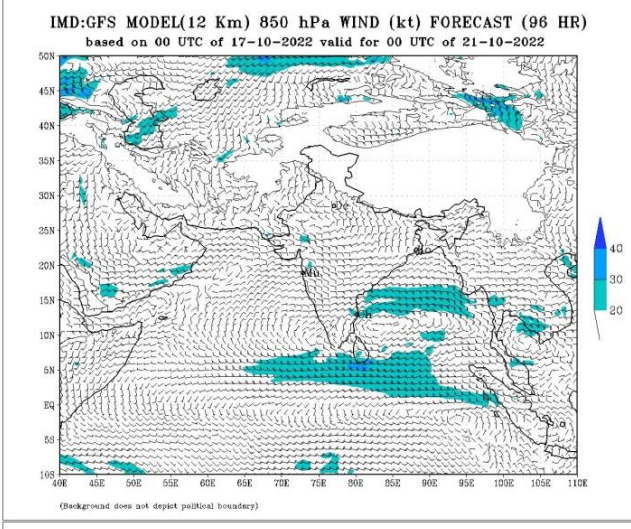
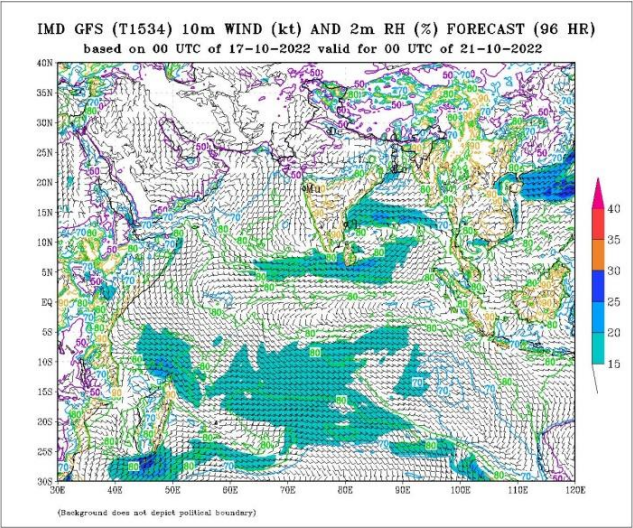
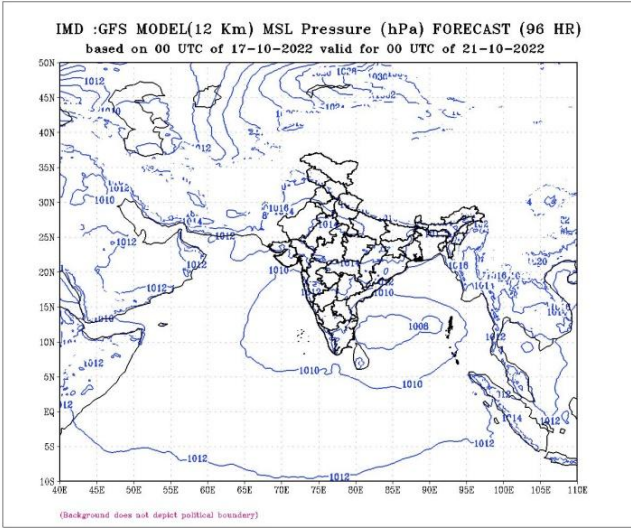


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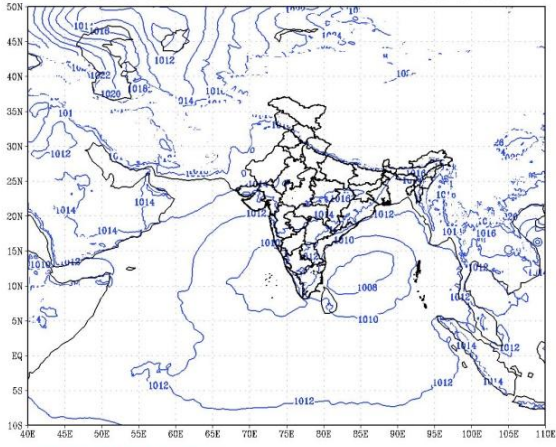
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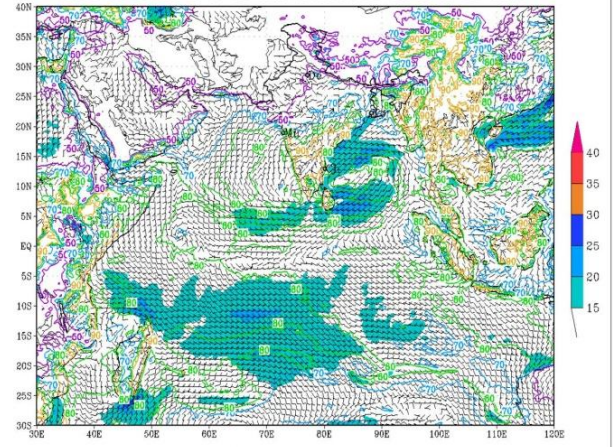


IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (120 HR)  
based on 00 UTC of 17-10-2022 valid for 00 UTC of 22-10-2022



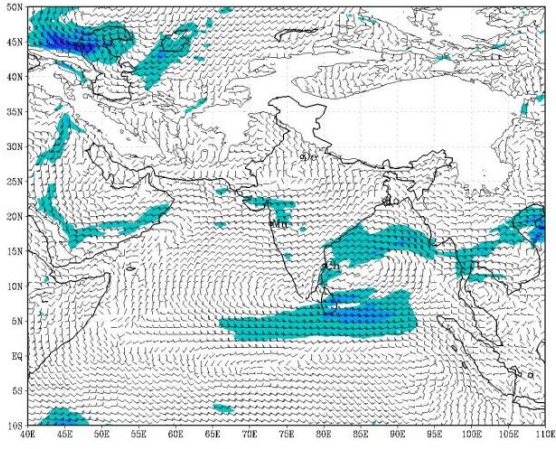
(Background does not depict political boundary)

IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (120 HR)  
based on 00 UTC of 17-10-2022 valid for 00 UTC of 22-10-2022



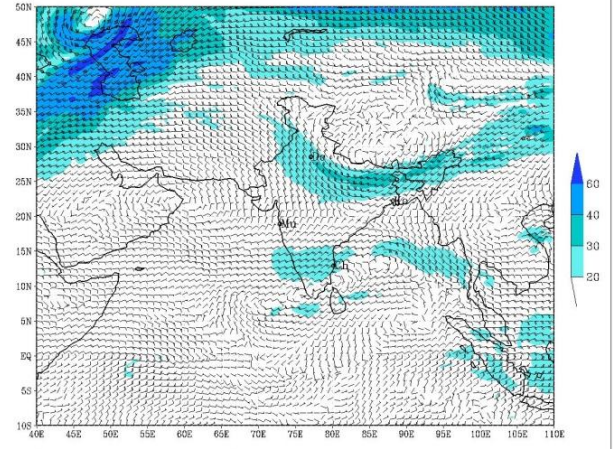
(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (120 HR)  
based on 00 UTC of 17-10-2022 valid for 00 UTC of 22-10-2022



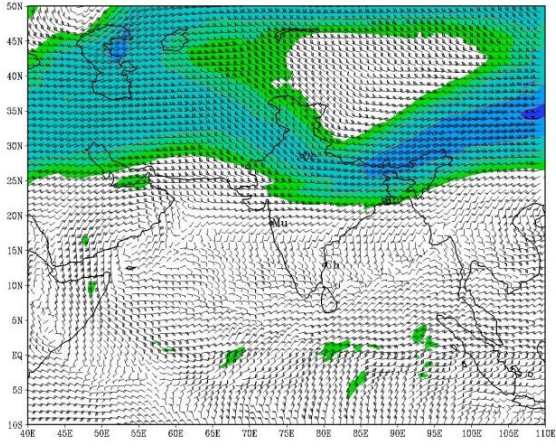
(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (120 HR)  
based on 00 UTC of 17-10-2022 valid for 00 UTC of 22-10-2022



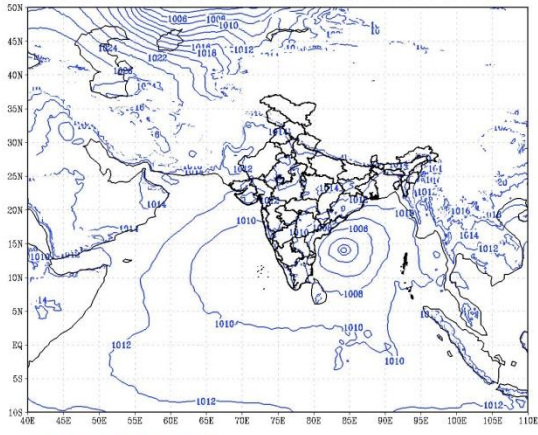
(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (120 HR)  
based on 00 UTC of 17-10-2022 valid for 00 UTC of 22-10-2022



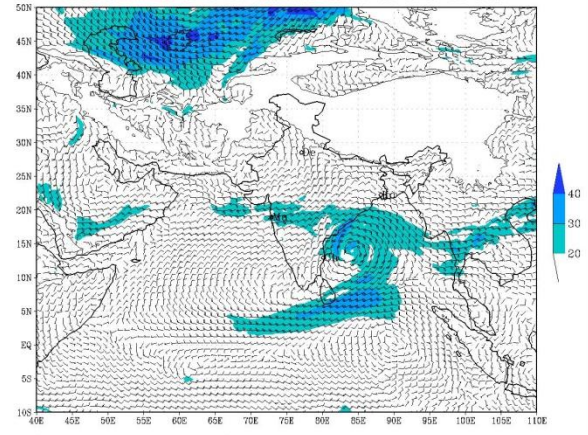
(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (144 HR)  
based on 00 UTC of 17-10-2022 valid for 00 UTC of 23-10-2022



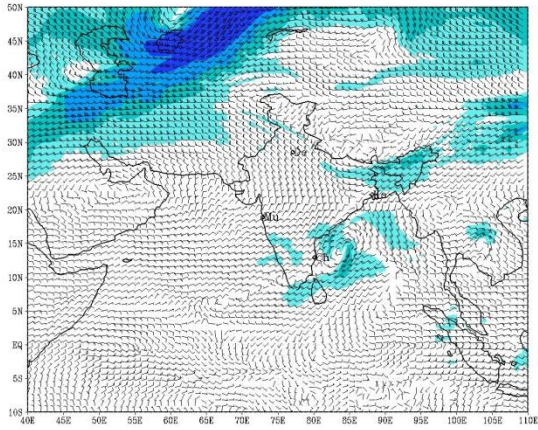
(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (144 HR)  
based on 00 UTC of 17-10-2022 valid for 00 UTC of 23-10-2022



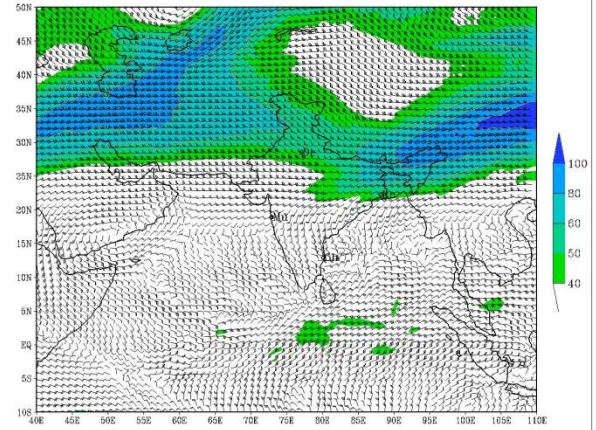
(Background does not depict political boundary)

IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (144 HR)  
based on 00 UTC of 17-10-2022 valid for 00 UTC of 23-10-2022



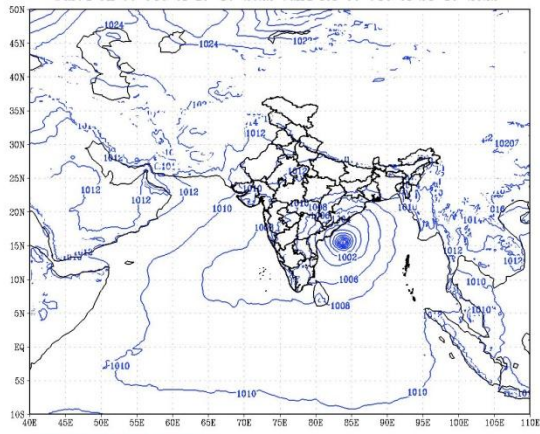
(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (144 HR)  
based on 00 UTC of 17-10-2022 valid for 00 UTC of 23-10-2022

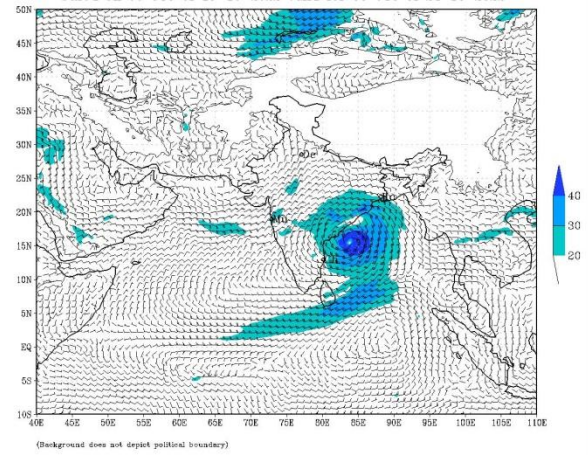


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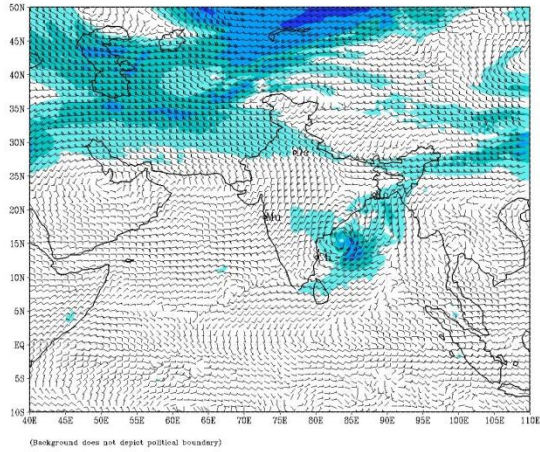
IMD:GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (168 HR)  
based on 00 UTC of 17-10-2022 valid for 00 UTC of 24-10-2022



IMD:GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (168 HR)  
based on 00 UTC of 17-10-2022 valid for 00 UTC of 24-10-2022



IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (168 HR)  
based on 00 UTC of 17-10-2022 valid for 00 UTC of 24-10-2022



IMD:GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (168 HR)  
based on 00 UTC of 17-10-2022 valid for 00 UTC of 24-10-2022

