



India Meteorological Department

FDP STORM Bulletin No. 8 (14-03-2018)

1. CURRENT SYNOPTIC SITUATION:

NWFC INFERENCE (0300UTC of the Day):

- ◆ The depression over southeast Arabian sea moved northwestwards with speed of about 14 kmph during past 06 hours and lay centred at 0830 hours IST of today, the 14th March 2018 over southeast Arabian sea near Latitude 7.5°N and Longitude 74.0°E, about 130 km southeast of Minicoy, 340 km west-southwest of Thiruvananthapuram and 380 km north-northeast of Male (Maldives). It is likely to move northwestwards and maintain the intensity of depression during next 24 hours. There is low probability for further intensification of the system into deep depression. It is likely to weaken gradually over southeast and adjoining east central Arabian Sea after 24 hours.
- ◆ The other Western Disturbance as a cyclonic circulation over eastern parts of Iran & neighbourhood now lies over Afghanistan & adjoining north Pakistan at 3.1 km above mean sea with a trough aloft in mid & upper tropospheric westerlies with its axis at 5.8 km above mean sea level runs roughly along Long. 66°E to the north of Lat. 25°N.
- ◆ An induced upper air cyclonic circulation lies over Punjab & neighbourhood and extends upto 1.5 km above mean sea level.
- ◆ The cyclonic circulation over north Madhya Maharashtra & adjoining Madhya Pradesh persists now extends upto 1.5 km above mean sea level.
- ◆ The trough from east Bihar to Manipur across north Bangladesh with an embedded cyclonic circulation over Sub-Himalayan West Bengal and adjoining Bihar & Jharkhand at 0.9 km above mean sea level persists.

SATELLITE OBSERVATIONS during past 24hrs and current observation:

Current Observation (based on 0300UTC imagery of INSAT 3D):

VORTEX:

Vortex over SE Arabian Sea centered within a half degree of Lat 7.3N/74.3E, Intensity T1.5 RPT T1.5, associated broken low/medium clouds with embedded intense to very intense convection seen over area between Lat 6.0N to 13.5N Long 70.0E to 78.0E Lakshadweep & Comorin. (Minimum CTT Minus 72 Deg C).

WESTERN DISTURBANCE (WD):

Broken low/medium clouds with embedded moderate to intense convection was observed over North Pakistan, Jammu & Kashmir, North Himachal Pradesh (**MINIMUM CTT MINUS 56 DEG C**), and over the area between Lat 37.0N to Lat 47.0N Long 70.0E to 90.0E in association with WD over the area.

Clouds description within India:

Scattered low/medium clouds seen over rest Himachal Pradesh, North Uttarakhand, Southeast Haryana, Delhi, West Uttar Pradesh, Sikkim, Sub Himalayan West Bengal, North Gangetic West Bengal, Northeast states and Bangladesh, extreme East Rajasthan, Madhya Pradesh, Southeast Gujarat, Maharashtra, Goa, North Interior Karnataka and Bay Islands. Broken low/medium clouds embedded moderate to intense convection seen over South Kerala (MINIMUM TBTMINUS 56 DEG C), South Tamilnadu (MINIMUM CTBT MINUS 64 DEG C) and Lakshadweep (MINIMUM CTT MINUS 70 DEG C) Scattered low/medium clouds with embedded weak to moderate convection seen over South Interior Karnataka, North Kerala, North Tamilnadu, Rayalaseema and Coastal Andhra Pradesh.

Arabian Sea:

Broken low medium clouds with embedded intense to very intense convection seen over Southeast Arabian Sea Comorin adjoining Indian ocean between Lat 2.0N to 7.0N Long 75.0E to 80.0E .

Bay of Bengal & Andaman Sea:

Scattered low/medium clouds with embedded isolated weak to moderate convection seen over Southwest Bay.

Past Weather:

Convection (during last 24 hrs):-

Intense to very Intense convection was observed over Kerala, Tamilnadu, Lakshadweep, and Moderate to intense convection observed over J & K, Sikkim, North-East States and weak to Moderate convection observed over South Interior Karnataka, Rayalaseema, South Coastal Andhra Pradesh.

OLR:

Upto 150 was observed over North-West J&K and Upto 250 wm^{-2} observed over rest J & K North Himachal Pradesh, North Uttarakhand, Sikkim, Arunachal Pradesh, Nagaland, Manipur, Assam Meghalaya, Kerala and Tamilnadu Upto 250 wm^{-2} observed over South Interior Karnataka, Rayalaseema, South Coastal Andhra Pradesh & rest North-East States.

Synoptic features:

Westerly Trough & Jet-Stream: Trough in westerlies roughly along Longitude 66°E to the north of Latitude 25°N.

Dynamic Features:

Negative shear tendency is observed over Rajasthan, East Uttar Pradesh, Bihar, Jharkhand, Gangetic West Bengal, North-East States and Positive shear tendency over rest parts of India. Medium to high wind shear is observed over North & Central India and low wind shear over South Peninsula region.

A positive Vorticity field is observed over Punjab, Haryana, Rajasthan, Uttar Pradesh, Bihar, Jharkhand & Gangetic West Bengal. Negative Low Level Convergence is observed over Bihar, Jharkhand, Gangetic West Bengal and Positive Low Level Convergence over rest parts of India.

Precipitation:

IMR:

Rainfall 70-90 mm observed over North-West J & K, South Tamilnadu and

Rainfall 30-50 mm observed over rest J&K Kerala Lakshadweep and

Rainfall 1-10 mm observed over North Himachal Pradesh Sikkim North-East States West parts of South Interior Karnataka.

HEM:

Rainfall upto 70 mm observed over West J&K South Tamilnadu South Kerala and

Rainfall upto 14 mm observed over North Kerala North Tamilnadu North-East States.

RADAR and RAPID RGB Observation:

No convection was seen in Radar Composite at 1300IST.

Light convection is seen over Kerala in RAPID RGB Satellite imagery at 1230IST.

Environmental condition (dust etc) and its forecast based on 00UTC of date:

Higher Dust concentration was observed over north Africa and Arab countries. Dust concentration is expected to increase slightly over north-western part of India for next five days. PM10 concentration is expected to increase over IGP in next five days.

Particulate matter concentration is expected to remain in moderate to poor category for next 2 days in Delhi.

Delhi – SAFAR analysis & Forecast	14.03.2018	15.03.2018
PM10 (micro-g/m ³)	209	229
PM2.5 (micro-g/m ³)	106	117

2. NWP MODEL GUIDANCE:

NCMRWF (NCUM Forecasts based on 00 UTC of the day):-

1. Weather Systems: Low level CYCIRs, Troughs:

12 UTC of Day 0-1: CYCIR over Arabian Sea moving west-northwestward

12 UTC of Day 0: 850 hPa Trough over western Rajasthan

12 UTC of Day 0: Trough at 850 hPa over East and NE India & adjoining Bangladesh in Day 0-4

Confluence & wind Discontinuity regions:

12 UTC of Day 0- 4: NE–SW wind discontinuity over central India extending from Maharashtra-MP-Chhattisgarh-Odisha. In Day 2-4 N-S wind discontinuity over southern peninsular India

Synoptic Systems: 00UTC Charts show: 12 UTC of Day 0-4: Anticyclone at 925 hPa over Bay of Bengal leading to moisture incursion over Indian land

12UTC of Day 0-2: At 500 hPa Western disturbance as trough over Jammu & Kashmir

2. Location of jet and jet core (>60kt) at 500hPa: Weaker core winds at 12 UTC on all days over India. 00UTC of Day 2 over east-northeast India strong core winds > 60kts

3. Convergence at 850 hPa:

Day/Index: Subdivisions with Lower Level Convergence > 15×10^{-5} /s

Day0: East UP, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu & Kashmir, Odisha, West, MP, East MP, Madhya, Maharashtra, Chhattisgarh, Coastal AP,

Day1: Gangetic WB, Jharkhand, Himachal Pradesh, East Haryana, Chandigarh, Delhi, Odisha, West MP, Rayalaseema, SI Karnataka,

Day2: Arunachal Pradesh, Assam, Meghalaya, Jharkhand, West UP, West MP, East MP, Chhattisgarh, SI Karnataka,

Day3: Arunachal Pradesh, Assam, Meghalaya, Jharkhand, Odisha, West MP, Coastal AP, SI Karnataka,

Day4: Arunachal Pradesh, Assam, Meghalaya, NE NMMT, Odisha, Marathwada, Coastal AP, NI Karnataka

4. Spatial distribution of Low level Vorticity:

Day/Index: Subdivisions with Lower Level Vortex > 15×10^{-5} /s

Day0: Assam, Meghalaya, Haryana, Chandigarh, Delhi, Punjab, Jammu Kashmir, West, Rajasthan, Odisha, Tamilnadu, Puducherry,

Day1: Gangetic WB, Jharkhand, East UP, Punjab, Himachal Pradesh, Odisha, Chhattisgarh, Coastal AP,

Day2: Arunachal Pradesh, Assam, Meghalaya, Sub Himalayan, WB, Uttarakhand, Himachal Pradesh, West Rajasthan, Odisha, Chhattisgarh,

Day3: Arunachal Pradesh, Assam, Meghalaya, Sub Himalayan WB, Uttarakhand, Himachal Pradesh,

Day4: Arunachal Pradesh, Assam, Meghalaya, Sub Himalayan WB, Gangetic WB, Uttarakhand, Odisha,

5. Showalter Index: -3 to -4[Very unstable]:

Day/Index: Subdivisions with Showalter Index < -4

Day0: Arunachal Pradesh, Sub Himalayan WB, Punjab, Jammu & Kashmir,

Day1: Arunachal Pradesh, Sub Himalayan WB, Uttarakhand, Himachal Pradesh, Jammu & Kashmir,

Day2: Arunachal Pradesh, NE NMMT, Sub Himalayan WB, Rayalaseema,

Day3: Arunachal Pradesh, Assam, Meghalaya, NE NMMT, Tamilnadu, Puducherry, SI Karnataka, Kerala,

Day4: Arunachal Pradesh, Assam, Meghalaya, NE NMMT, Coastal Karnataka, SI Karnataka, Kerala,

6. K-Index :-> 35[Very Unstable thunderstorm likely]:

Day/Index: Subdivisions with K Index > 40

Day0: Arunachal Pradesh, Sub Himalayan WB, Madhya Maharashtra, Rayalaseema, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day1: Arunachal Pradesh, Sub Himalayan WB, Coastal AP, Rayalaseema, NI Karnataka, SI Karnataka,

Day2: Sub Himalayan WB, Coastal AP, Rayalaseema, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka,

Day3: Arunachal Pradesh, Konkan, Goa, Telangana, Rayalaseema, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka,

Day4: Telangana, Coastal Karnataka, NI Karnataka, SI Karnataka,

7. Spatial distribution of TTI: TTI >50 [Scattered Thunderstorms few severe]:

Day/Index: Subdivision with Total Totals Index > 52

Day0: Arunachal Pradesh, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu & Kashmir, West Rajasthan

Day1: Arunachal Pradesh, Sub Himalayan WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu & Kashmir,

Day2: Arunachal Pradesh, Sub Himalayan WB, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu & Kashmir,

Day3: Arunachal Pradesh, Assam, Meghalaya, NE NMMT, Sub Himalayan WB, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu & Kashmir,

Day4: Arunachal Pradesh, Assam, Meghalaya, NE NMMT, Sub Himalayan WB, Himachal Pradesh, Jammu & Kashmir,

8. Rainfall and thunder storm activity:

Day/Index: Subdivisions with Precipitation > 2 cm

Day1: Himachal Pradesh, Jammu & Kashmir, Tamilnadu, Puducherry, Kerala,

Day2: Arunachal Pradesh, Assam, Meghalaya, NE NMMT, Himachal Pradesh, Jammu & Kashmir, Kerala,

Day3: Arunachal Pradesh, Assam, Meghalaya, NE NMMT, Odisha, Chhattisgarh, Telangana, Rayalaseema,

Day4: Arunachal Pradesh, Assam, Meghalaya, NE NMMT, Tamilnadu, Puducherry, SI Karnataka,

Day5: Arunachal Pradesh, Assam, Meghalaya, NE NMMT, SI Karnataka, Kerala,

IMD GFS (T1534) based on 00UTC the day:-

1. Synoptic Systems:

The analysis based on 00 UTC shows a cyclonic circulation in the lower tropospheric levels over North Pakistan associated with the trough in upper level westerlies gradually moves eastward in day 1 over Punjab and adjoining areas and moving further eastward in next 2 days it lies as a trough over East Uttar Pradesh in day 3. A north-east to south-west oriented trough extending from East Madhya Pradesh to Madhya Maharashtra is seen and it persists till day 1. Another north-south oriented trough extending from North Bihar to Jharkhand and adjoining GWB persists and gradually moves eastward and reaches over Assam and Meghalaya region in day 3. The cyclonic circulation over Southeast Arabian associated with the depression over the region gradually weakens as it moves further north-westward direction over east-central Arabian Seas in next 3 days.

2. Location of Jet and Jet Core (>60kt) at 500hPa:

Although the presence of strong westerlies is found but no jet core is over the Indian region for the next 3 days.

3. Low Level Vorticity {850hPa Positive Vorticity (>12 x 10⁻¹/s)}:

Mostly associated with the cyclonic circulation and along the trough is over parts of Punjab, Rajasthan, over Gangetic plain along foothills of Himalayas, parts of central India and north eastern states during next 3 days.

4. Spatial distribution of T-storm Initiation Index, Lifted Index, Total Total Index, CAPE, CIN and Sweat Index [High potential for thunderstorm]:

T-Storm Initiation Index (> 4): Higher than threshold value 4 over parts of Gujarat and Rajasthan in day 1 and 2, Over East Madhya Pradesh, Jharkhand, Gangetic West Bengal and adjoining Chhattisgarh on day 3. The moderate values of the index persist over extreme south peninsular India and coastal areas during next 3 days.

Lifted Index (< -2): It is less than threshold value -2 over the peninsular India and along the east coast during next 3 days. Near threshold values are also seen over some parts of Gujarat and Rajasthan during next 26 hours & higher than threshold value -2 all over rest of the country during next 3 days.

Total Total Index (> 50) : Above threshold value mostly over northwest and central parts of India which sometimes extends over Gangetic plain during next 3 days.

Sweat Index (> 300): Mostly along the coasts of Odisha and Andhra Pradesh during next 3 days. Parts of Gujarat and Rajasthan on day 1. Along west coast of Karnataka and south Konkan & Goa and over Madhya Pradesh and adjoining areas on day 3.

CAPE (> 1000): Mostly along southern parts peninsular India and along west coast and east coast during next 3 days.

CIN (50-150): Mostly along east coast and over parts of north eastern states during next 3 days. Over parts of Gujarat and adjoining Rajasthan on day 1 and over parts of Madhya Pradesh and adjoining Chhattisgarh on day3.

5. Rainfall Activity:

20-40 mm rainfall: over coastal areas of Kerala and Karnataka and parts of Jammu & Kashmir on day 1, over parts of Arunachal Pradesh, Kerala, interior Karnataka and adjoining Tamilnadu on day 2 and 3.

10-20 mm rainfall: over the rest parts Jammu & Kashmir on day 1 and rest of Interior Karnataka on day 2 and 3, rest of Arunachal Pradesh on day2 and day3.

Up to10 mm rainfall: Over parts of Himachal Pradesh, Uttarakhand, Uttar Pradesh on day 1, over parts of Marathwada, Konkan-Goa, Tamilnadu and north-eastern states during next 3 days & Parts of East Madhya Pradesh, Vidarbha, Telangana, Chhattisgarh, Rayalaseema, coastal Andhra Pradesh and Karnataka on day 2.

IMD WRF (9km based on 00UTC of the day):

1. Model Reflectivity (Max. dBz): > 20 dBZ Model Reflectivity: On day 1 over parts of Jammu & Kashmir, Himachal, Uttar Pradesh, Coastal and North Interior Karnataka; During day 2, over parts of East Uttar Pradesh, East Madhya Pradesh, North Chhattisgarh, Jharkhand, GWB and Bihar; over Konkan & Goa, North interior Karnataka, Marathwada, Madhya Maharashtra and Vidarbha; On day 3, Parts of Jammu & Kashmir, East Uttar Pradesh, East Madhya Pradesh and Bihar.

2. Spatial distribution of Total Total Index, K-Index, CAPE and CIN [High potential for thunderstorm]:

Total Total Index (> 50): Above threshold value is observed over most parts of the country except south peninsula, Jammu & Kashmir and Arunachal Pradesh during next 3 days.

K-Index (> 35): Less than threshold value is observed over the country except over some parts of Karnataka and Kerala during the next 2 days.

CAPE (> 1000): Greater than threshold value over the southern part of west coast, east coast, and parts of north-eastern states during the next 72 hours, over some parts of Punjab and adjoining areas during next 24 hours.

CIN (50-150): Mostly over Punjab, Haryana, Uttar Pradesh, west coast, east coast, Gangetic West Bengal and parts of north eastern states during next 3 days.

3. Rainfall and thunderstorm activity:

Rainfall 40-70 mm: over parts of J&K on day1; Over Arunachal Pradesh on day 2.

Rainfall 10-40 mm: over parts J&K and Himachal Pradesh on day1 and day2; over parts of Kerala and south Tamilnadu during all three days; Over some parts of Arunachal Pradesh and adjoining areas during day 2 and 3.

3. IOP ADVISORY FOR 24 and 48Hrs:

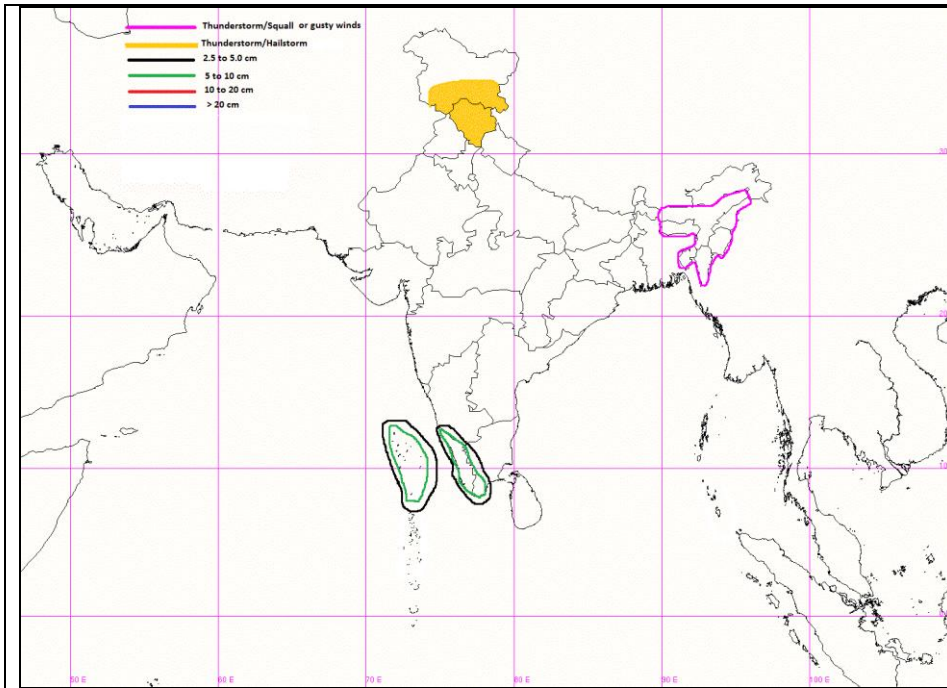
Summary and Conclusions:

- Strong southwesterly/southerly winds in lower levels are prevailing over south Tamilnadu and South Kerala due to persistence of a depression over southeast Arabian sea and easterly wind over interior Tamilnadu and Kerala, NWP model guidance and presences of low clouds are indicates that the thunderstorm accompanied with heavy rain at isolated places very likely over south Tamilnadu and Kerala during next 48 hours. Thunderstorm with gusty winds also likely over south Interior Karnataka, Raylaseema and Telangana during the same period.
- Due to approaching western disturbance and an induced cyclonic circulation over Punjab & neighbourhood, moderate Cape value and southeasterly wind in lower levels over the region suggest that the thunderstorm with gusty winds and hailstorm very likely over Jammu & Kashmir and Himachal Pradesh during next 24 hours and isolated thunderstorm also likely over Punjab, Haryana and north Rajasthan during next 48 hours.
- Wind convergence are taking place over northeast India and higher Cape value and convergence lies over northeastern states likely to cause thunderstorm with gusty winds at isolated places over Assam & Meghalaya and Nagaland, Manipur, Mozoram 7 Tripura during next 48 hours.
- Due to strengthening of anti cyclone over westcentral Bay of Bengal & neighbourhood and the moisture also likely to reach over Vidarbha & neighbourhood and prevailing higher temperatures over the region likly to cause thunderstorm with gusty winds over Vidarbha, southeast Madhya Pradesh, Chhattisgarh and Odisha during next 2-3 days.

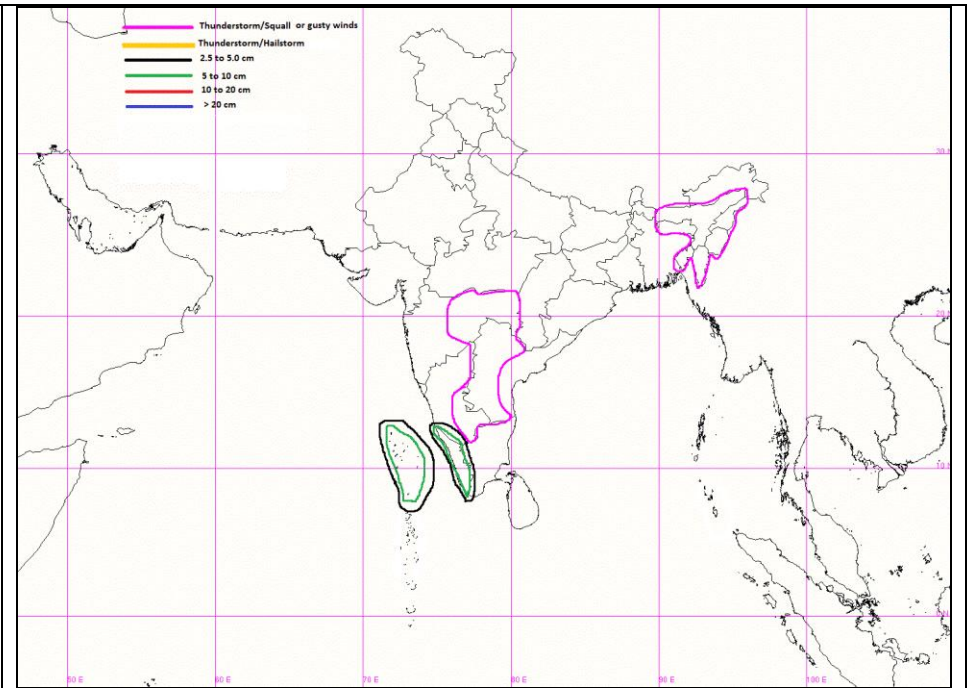
Day-1 & Day-2:

24 hour Advisory for IOP:	48 hour Advisory for IOP:
Rainfall:	Rainfall:
South Tamilnadu, Kerala, Lakshadweep Islands	Kerala, Lakshadweep Islands
Thunderstorm with associated phenomenon:	Thunderstorm with associated phenomenon:
Jammu & Kashmir, Himachal Pradesh, Assam & Meghalaya, Nagaland, Manipur, Mizoram & Tripura, Tamilnadu, Kerala	Assam & Meghalaya, Nagaland, Manipur, Mizoram & Tripura, Vidarbha, Telangana, Rayalaseema, South Interior Karnataka

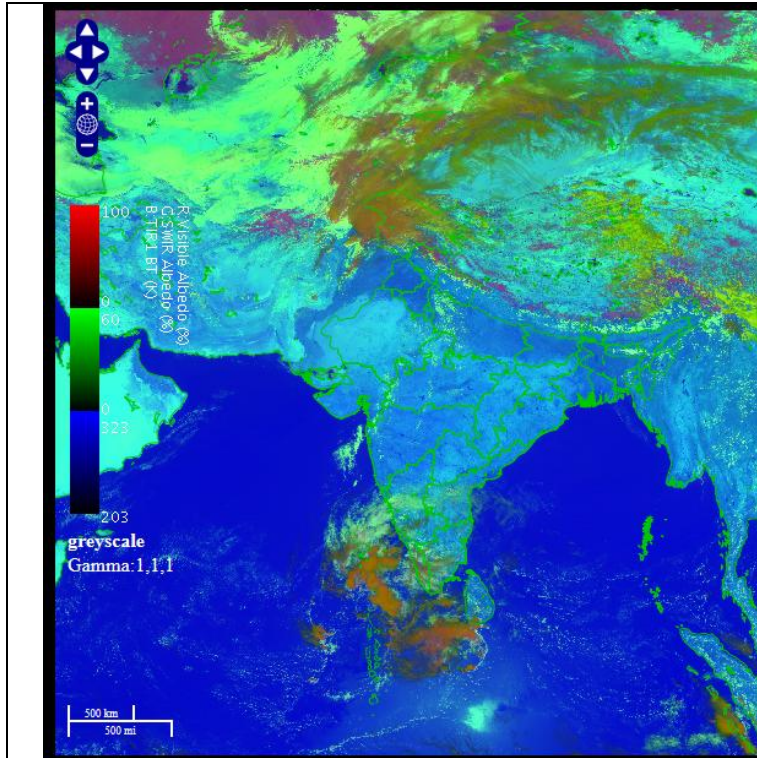
Graphical Presentation of Potential Areas for Severe Weather:



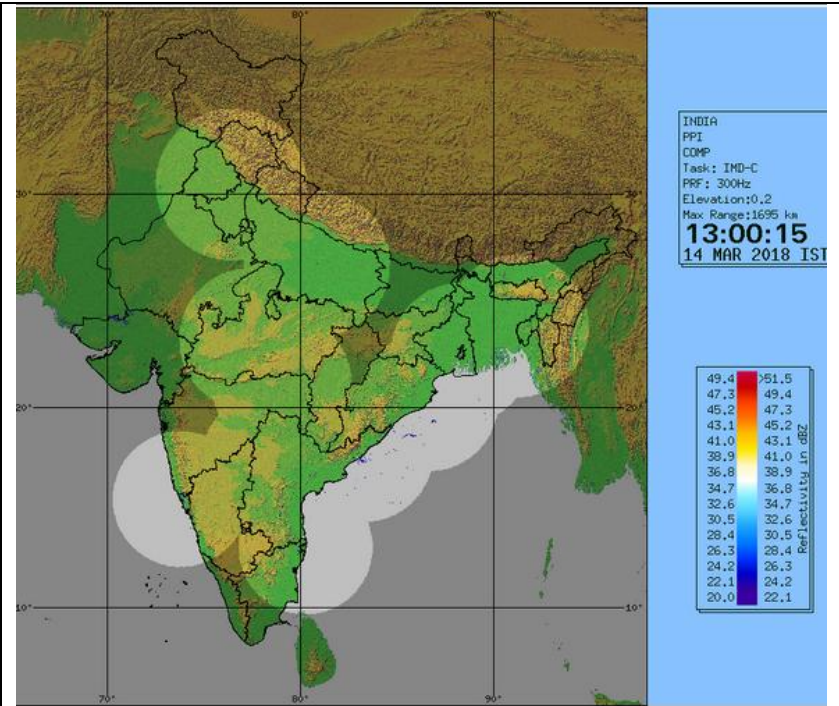
IOP Advisory for 24 hours



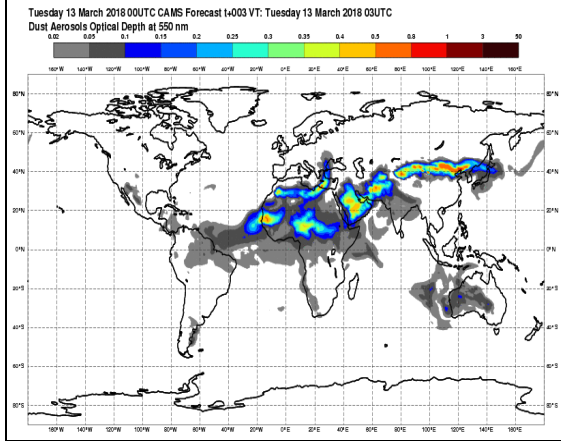
IOP Advisory for 48 hours



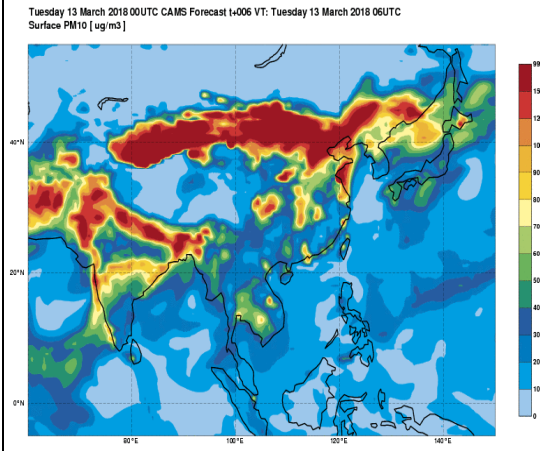
RAPID RGB Imagery at 1230IST of the Day



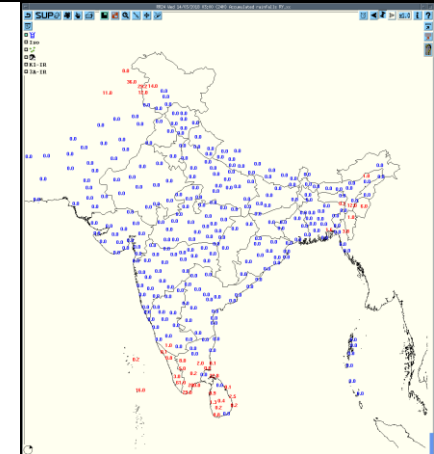
DWR Composite at 1300 IST of the Day



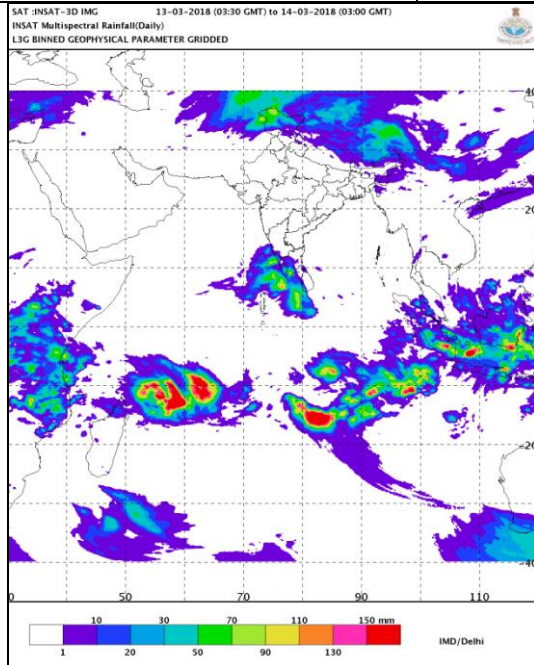
Forecast Dust Concentration



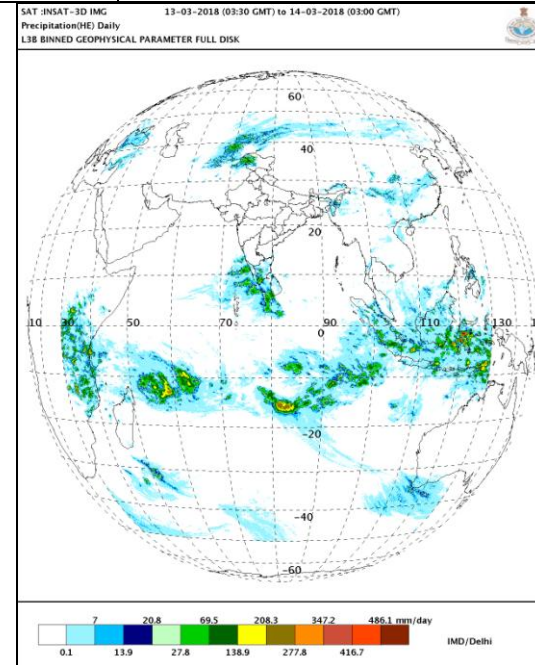
PM10 Forecast



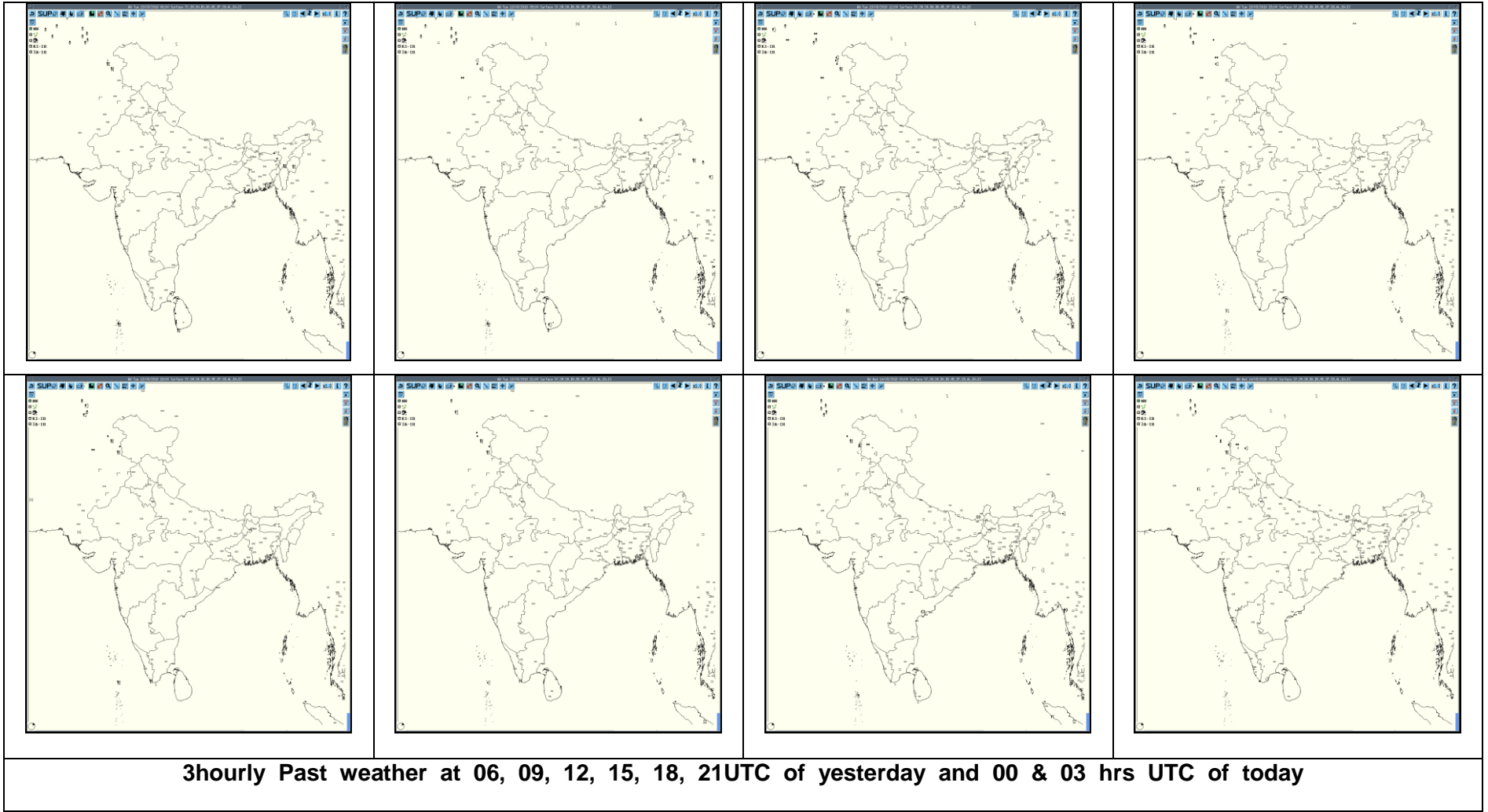
Accumulated 24 Hour rainfall (in red) recorded at 0300UTC of today



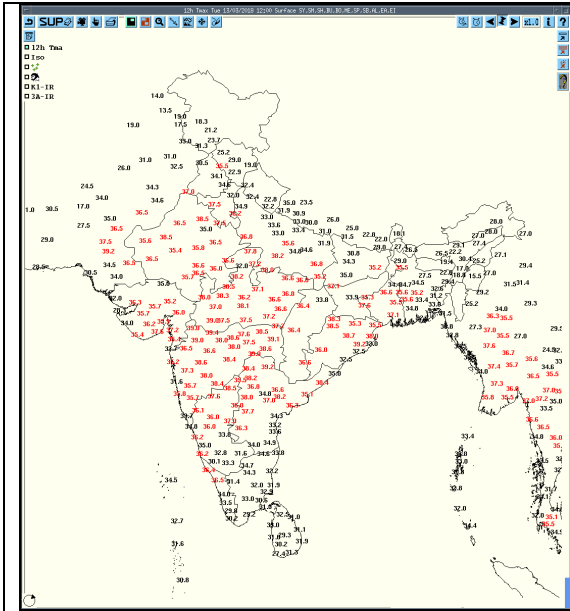
IMR



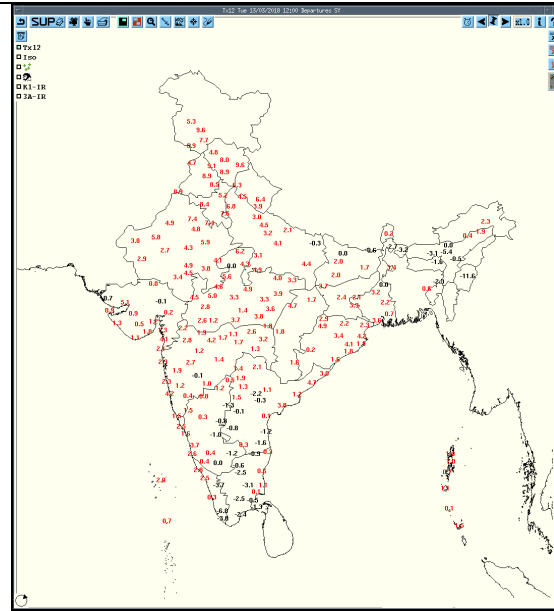
HEM



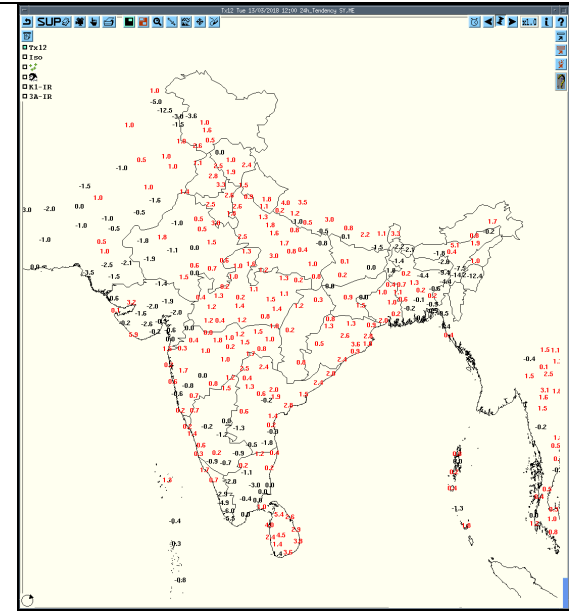
3hourly Past weather at 06, 09, 12, 15, 18, 21UTC of yesterday and 00 & 03 hrs UTC of today



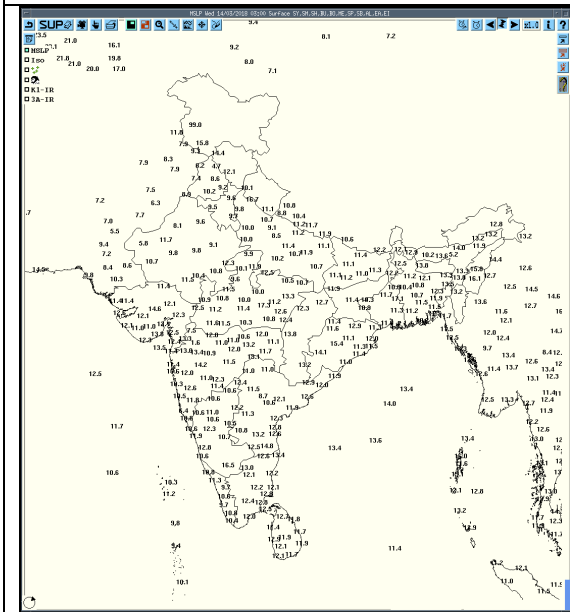
Tmax



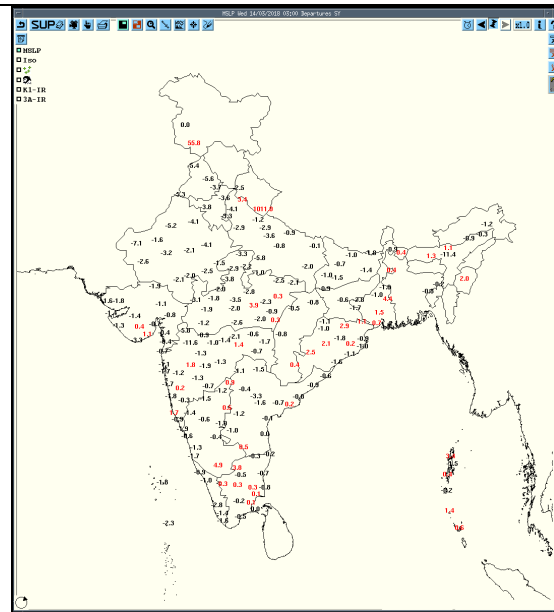
Departure Tmax



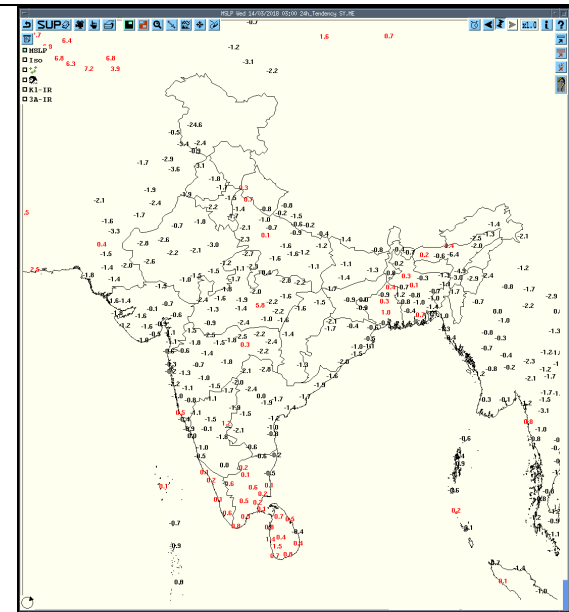
Tendency Tmax



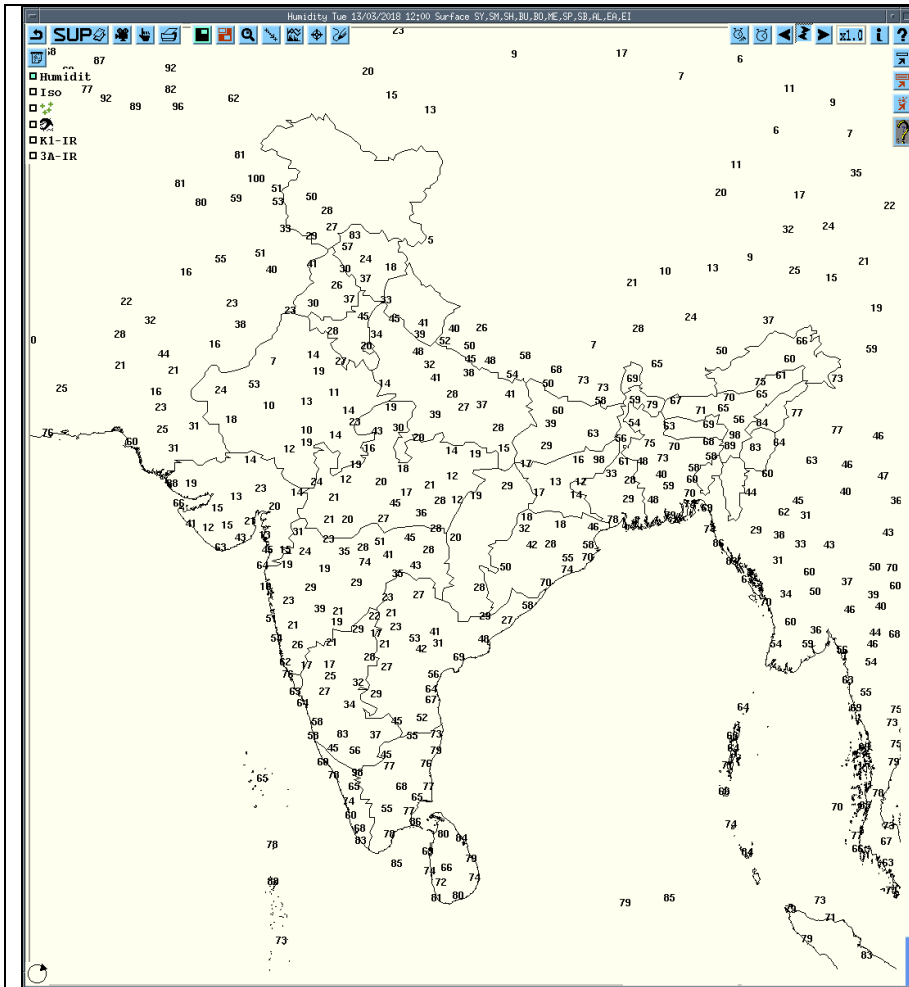
MSLP



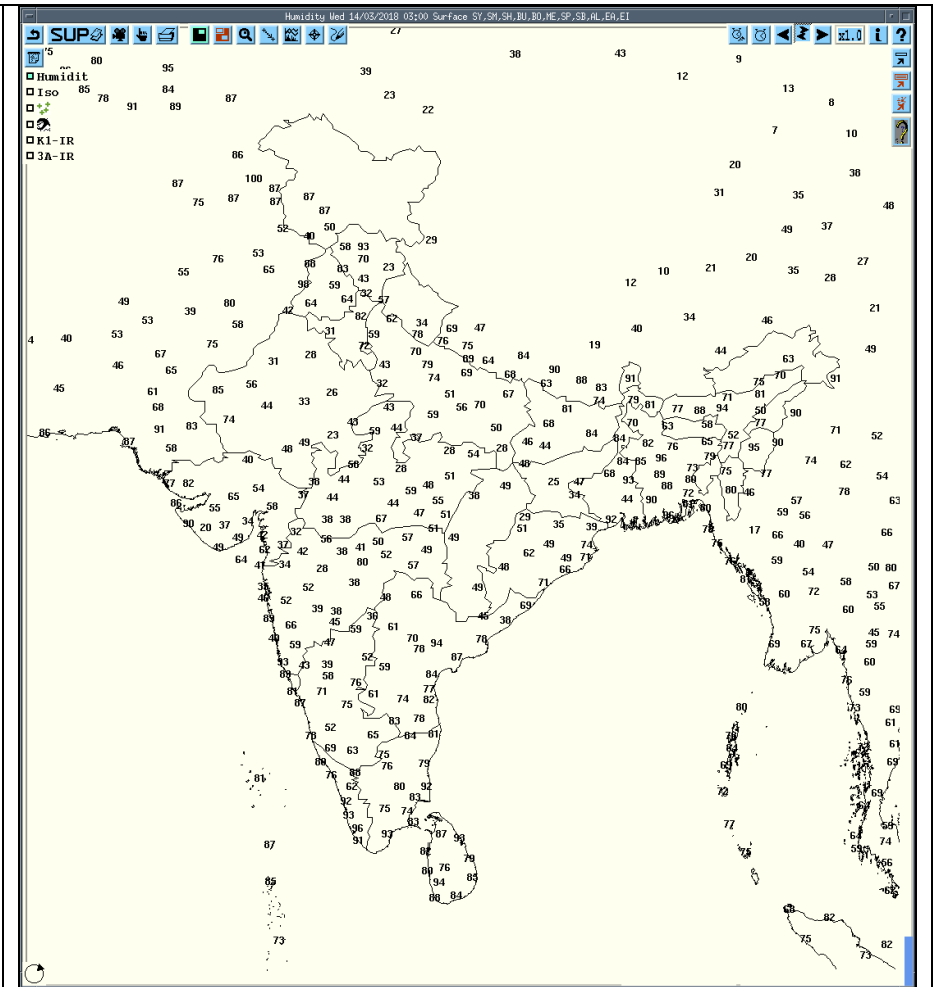
Departure MSLP



Tendency MSLP



RH at 12UTC yesterday



RH at 03UTC today

Past 24 hours DWR Report:

DWR Station Name	Date of Report	Time Interval of Observation (UTC)	Organisation of cells (Isolated single cells/multiple cells/convective regions/squall lines) with height of 20 dBZ echo top and maximum reflectivity	Formation w.r.t. radar station and Direction of movement	Remarks	Associated Severe Weather if any	Districts affected
Visakhapatnam	14/03/18	13/0300 - 14/0300	NIL	NIL	NIL	NIL	NIL
Agartala	14/03/18	13/0300 - 14/0300	Multiple Cells (57 dBZ over KAMALPUR & North Dists seen at 130730 UTC, max ht 10 Kms)	40 Kms NW/SE'y movement	Dissipated over B'Desh at approx 230 Kms SSE.	Thunderstorm activities	DHALAI, NORTH & UNAKOTI DISTS.
Lucknow	14/03/18	13/0300 - 14/0300	NIL	NIL	NIL	NIL	NIL
Patna	14/03/18	13/0300 - 14/0300	NIL	NIL	NIL	NIL	NIL
Kolkata	14/03/18	13/0300 - 14/0300	NIL	NIL	NIL	NIL	NIL
Jaipur	14/03/18	13/0300 - 14/0300	NIL	NIL	NIL	NIL	NIL
Patiala	14/03/18	13/0300 - 14/0300	NIL	NIL	NIL	NIL	NIL

IMPORTANT LINKS:

For NCMRWF NWP products:(<http://www.ncmrwf.gov.in/HomePage/NEPS-prod-1.php>)

For IMD NWP products:(http://nwp.imd.gov.in/diagpro_new.php)

For Synoptic plotted data and charts

<http://amssdelhi.gov.in/>

<http://www.amsskolkata.gov.in/>

For RANDHRA PRADESHID tool:

http://rAndhra_Pradeshid.imd.gov.in/

Low Level Winds

http://satellite.imd.gov.in/archive/INSAT-3D-IMAGER/3D-PRODUCTS/AMV/LLW/MAR_2017/?C=M;O=D

Upper level winds

http://satellite.imd.gov.in/archive/INSAT-3D-IMAGER/3D-PRODUCTS/AMV/HLW/MAR_2017/?C=M;O=D

Past24hourHEMandIMRrainfall(upto03UTCoftoday)

IMR: http://satellite.imd.gov.in/img/3Ddaily_imr.jpg

HEM: http://satellite.imd.gov.in/img/3Ddaily_he.jpg











ForRadarimagesofthepast24hoursincludingmosaicofimages:

http://ddgmui.imd.gov.in/dwr_img/

Satellite sounder based T- Phigram

http://satellite.imd.gov.in/mAndhra_Pradesh_skm2.html

WEATHER SYMBOLS:

	haze
	smoke
	dust or sand storm
	fog
	drizzle
	rain
	snow
	showers
	hail
	thunderstorm

Weather Symbols



+ thunderstorm



+ heavy thunderstorm



sandstorm or dust storm



squall



hail shower



tropical storm



+ tornado



+ lightning



+ hurricane

www.visualdictionaryonline.com