



India Meteorological Department

FDP STORM Bulletin No. 19 (25-03-2018)

1. CURRENT SYNOPTIC SITUATION:

NWFC INFERENCE (0300UTC of the Day):

- ◆ The feeble Western disturbance as a trough in mid & upper tropospheric westerlies roughly along Long.78°E to the north of Lat.30°N at 5.8 km above mean sea level persists.
- ◆ The core of sub-tropical westerly Jet stream passes between Lat. 24°N and 28°N at 9.5 km above mean sea level over the Indian region.
- ◆ The cyclonic circulation over Sub Himalayan West Bengal and neighbourhood extending upto 0.9 km above mean sea level persists.
- ◆ The trough extending upto 0.9 km above mean sea level from the above system to north Coastal Andhra Pradesh across Gangetic West Bengal and Odisha now runs from the above system to Marathwada across east Jharkhand, interior Odisha, south Chhattisgarh and Vidarbha.
- ◆ The cyclonic circulation lies over southeast Arabian Sea off Kerala Karnataka coasts and extends upto 0.9 km above mean sea level.
- ◆ The cyclonic circulation over Comorin area and neighbourhood upto 0.9 km above mean sea level.

SATELLITE OBSERVATIONS during past 24hrs and current observation:

Current Observation (based on 0900UTC imagery of INSAT 3D):

Western Disturbance (WD):

Broken multi-layered clouds with embedded moderate to intense convection seen over Caspian Sea & neighbourhood, Afghanistan, Jammu & Kashmir Himachal Pradesh, Uttarakhand, Tibet adjoining China and over the area between lat 37.0°N to 50.0°N, long 60.0°E to 107.0°E in association with WD over the area.

Clouds description within India:

Scattered low/medium clouds were seen over embedded weak to moderate convection seen over Nicobar Islands and isolated over North central Andhra Pradesh and Tamilnadu. Scattered low/medium clouds were seen over Punjab, , Sikkim, Arunachal Pradesh and isolated over Nagaland, and North Manipur.

Arabian Sea:

Scattered low/medium clouds were seen over west central Arabian Sea.

Bay of Bengal & Andaman Sea:

Scattered low/medium clouds with weak to moderate convection were seen over Southeast Bay, South of Lat. 9.0N and Andaman Sea.

Past Weather:

Convection (during last 24 hrs):

Moderate to intense convection was observed over J&K North Himachal Pradesh South GWB adjoining NE Orissa.

OLR:

Upto 230 wm^{-2} was observed over J&K North Himachal Pradesh north Uttarakhand Sikkim Arunachal Pradesh and east Tamilnadu.

Synoptic features:

Trough in Westerly roughly along Long 78.0E To North Of Lat 28.0N.

Dynamic Features:

Shear tendency is observed normal over India.

Medium to high wind shear is observed over North & Central India and low wind shear over South Peninsula region.

Precipitation:

IMR:

Rainfall upto 30-50 mm observed over north-east J & K.

Rainfall upto 10-30 mm observed over some parts of J & K extreme south GWB adjoining Odisha.

Rainfall upto 01-10 mm observed over rest parts of J & K north Himachal Pradesh rest GWB some parts of NE Odisha & some parts of SIK.

HEM:

Rainfall upto 14mm observed over some parts of J&K Himachal Pradesh GWB NE Odisha east Meghalaya and SIK.

RADAR and RAPID RGB Observation:

Isolated moderate/strong echoes (dBZ around 55 and height >12km) was seen on DWR Kolkata domain at around 1640 IST. Isolated light/moderate echoes were also seen on DWR Paradeep, Machilipatnam and Patiala DWR domains at around 1640 IST.

RAPID RGB Satellite imagery at 1230IST indicates isolated to moderate convective clouds over Gangetic West Bengal, North Odisha and North Coastal Andhra Pradesh.

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

Not Received (Due to unavailability of model results)

NWP MODEL GUIDANCE: Not Received

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

1. Synoptic Systems:

The analysis based on 00 UTC shows a cyclonic circulation in lower troposphere up to 850 hPa over SHWB and adjoining NE India, another cyclonic circulation over Rayalaseema and adjoining north Interior Karnataka. The trough running over GWB, Orissa and adjoining areas in between the two cyclonic circulations mentioned above. In the forecasts, this trough persists for next two days although south-western end shifts westward over coastal Karnataka and adjoining areas. Analysis also shows another cyclonic circulation over east-central Arabian Sea off Konkan coast. A north-south trough in easterlies found running from south Interior Karnataka up to Comorin area which gradually shift westward towards west coast of Kerala and Karnataka.

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

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

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

Mostly along the foothills of Himalayas from Himachal up to north eastern states on all 3 days, also found in the vicinity of cyclonic circulation and along the trough which is more pronounced over south peninsular India on all 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 (> 3): Higher than a value 3 over parts of Gujarat coastal areas of Gangetic West Bengal, Orissa, Andhra Pradesh, Telangana, Rayalaseema, Kerala, Karnataka, Tamil Nadu, coastal Maharashtra, Konkan & Goa, coastal areas along the east coast and west coast extreme south peninsular India, Tripura and adjoining area on all 3 days. Some parts of Jharkhand and Vidarbha on day 1 and 2; Over parts of Assam, Arunachal Pradesh, Nagaland and adjoining area on day 3; Maximum value of index is seen over parts of Orissa and its coastal area, coastal Andhra Pradesh, coastal Karnataka, Konkan and Goa, and coastal Maharashtra during all 3 days.

Lifted Index (< -2): The threshold value of the is below -2 over parts coastal Andhra Pradesh, coastal Karnataka, Kerala and Tamil Nadu, southern part of west coast, coastal areas along the east coast, coastal Orissa, GWB, Konkan and Goa on all 3 days; over some parts of Jharkhand, Chhattisgarh, Telangana on day 1; maximum negative value of the index can be seen over coastal area along east coast and southern part of west coast, GWB, Orissa, Kerala, Andhra Pradesh, Kerala and Tamil Nadu on day 1; on day 2 and 3 over coastal Kerala, Karnataka, Konkan and Goa; on day 3 over some parts of GWB, Tripura and adjoining area.

Total Total Index (> 50): Above threshold value over parts Himachal Pradesh, Uttarakhand, foothills of Himalaya, Gujarat, south Rajasthan, Chhattisgarh, Madhya Pradesh adjoining East Uttar Pradesh, Madhya Maharashtra, Marathwada, Vidarbha and coastal Maharashtra, Orissa, Jharkhand, Telangana and Karnataka region on day 1; over parts of J&K, Haryana, Punjab, Rajasthan, Gujarat, Himachal Pradesh, Uttarakhand, foothills of Himalaya, Uttar Pradesh, Madhya Pradesh, Chhattisgarh, Bihar, Jharkhand, Orissa, Andhra Pradesh, Karnataka, Telangana, coastal Maharashtra, Madhya Maharashtra and Marathwada and Vidarbha, GWB. On day 2 and 3; Maximum value of the index can be seen on day 3 over most places over India except NE states and extreme south peninsular India.

Sweat Index (> 300): Over Parts of, GWB, Peninsular India, Konkan & Goa, Bihar, Jharkhand, Orissa, and Himachal Pradesh, Uttarakhand coastal areas of south and east coast during all 3 days. Over parts of Tripura and adjoining area on day 1; Maximum value of the index can be seen over GWB adjoining Tripura and adjoining area on day 3.

CAPE (> 1000): Mostly along coastal areas of southern peninsular India along west coast and over east coast and coastal areas of GWB and adjoining Bihar, Jharkhand and Orissa and Andhra Pradesh and some parts of Gujarat during all 3 days. Maximum value can be seen on day 1 over coastal Orissa, coastal Andhra Pradesh, Tamil Nadu and Kerala.

CIN (50-150): Mostly over parts of Gujarat, along east coast along west coast from Saurashtra & Kutch to coastal Karnataka, Konkan and Goa, coastal Orissa, Telangana, Rayalaseema, Andhra Pradesh and GWB and NE states, Bihar, Jharkhand and adjoining area during all 3 days. Over parts of J&K, Punjab, Haryana, North west Rajasthan on day 1. over some parts of Delhi and adjoining Haryana on day 2; Maximum value of the index is seen over parts of Orissa and Telangana region from day 2 onwards.

5. Rainfall Activity:

10- 40 mm rainfall: over parts of Arunachal Pradesh and adjoining area on day 2.

Up to 10 mm rainfall: Over most parts of North East India on day 1; on day 2 over some parts of coastal Karnataka and adjoining south Maharashtra region; Over J&K, parts of Himachal Pradesh, NE states, Kerala, Tamil Nadu, Karnataka, on all three days.

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

1. Model Reflectivity (Max. dBz):

> 25 dBZ Model Reflectivity: On day 1 over parts of GWB and adjoining area; over parts of Assam, Meghalaya, Tripura, Mizoram, Arunachal Pradesh and adjoining area on day 2

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 peninsular India, along east coast and southern part of west coast, north-eastern states, coastal Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, Orissa, GWB, some parts of Telangana and Chhattisgarh during all 3 days; below threshold value is observed on day 1 over some parts of Uttar Pradesh.

K-Index (> 35): Less than threshold value is observed over most of the part of the country during the next 3 days

CAPE (> 1000): Greater than threshold value over coastal areas of southern part of west coast, coastal areas along the east coast, coastal Orissa, GWB, Assam, Tripura and adjoining areas, parts of Tamil Nadu, Kerala, Andhra Pradesh and Extreme south peninsular India during all 3 days; over parts of south interior Karnataka and adjoining Andhra Pradesh on day 1; over parts of Arunachal Pradesh and adjoining areas on day 3; Maximum value greater than 3000 is seen over the parts of Orissa and its coastal areas, GWB, coastal Tamil Nadu and Kerala, coastal Andhra Pradesh on day 1; on day 2 and 3 over coastal areas of southern part of west Konkan and Goa.

CIN (50-150): Over parts of north west Rajasthan, J&K, Punjab, Haryana, Delhi and adjoining areas on day 1 and 2; over coastal areas of east coast and west coast, GWB, Parts of Orissa, Jharkhand and adjoining Bihar region, Andhra Pradesh, Tamil Nadu, Kerala, Coastal Maharashtra, Konkan and Goa, Telangana, Rayalaseema, and NE states on all 3 days; Maximum value of the index is seen over coastal Gujarat, Northern parts of coastal Maharashtra on day 1; over J&K, adjoining Punjab on day 2; over coastal Maharashtra, Bombay region, coastal Andhra Pradesh and GWB on day 3.

3. Rainfall and thunderstorm activity:

10- 40 mm rainfall: Over parts of Kerala, Tamil Nadu on day 2 and 3; over parts of Arunachal Pradesh during all 3 days; over parts of GWB and Kolkata on day 1; over NE states on day 3.

Up to 10 mm rainfall: Over NE states, Kerala, Tamil Nadu, GWB on all 3 days; Over parts of J&K, Himachal Pradesh, Uttarakhand on day 2 and 3; over parts of Orissa on day 1 and 2 NE states, places along Foothills of Himalaya, parts of Orissa, Jharkhand, GWB, Andhra Pradesh, Kerala and Tamil Nadu on all 3 days; some parts of Punjab and Haryana on day 1; some parts of Madhya Maharashtra, Marathwada and adjoining Vidharbha on day 3; some parts of Telangana on day 2.

3. IOP ADVISORY FOR 24 and 48Hrs:

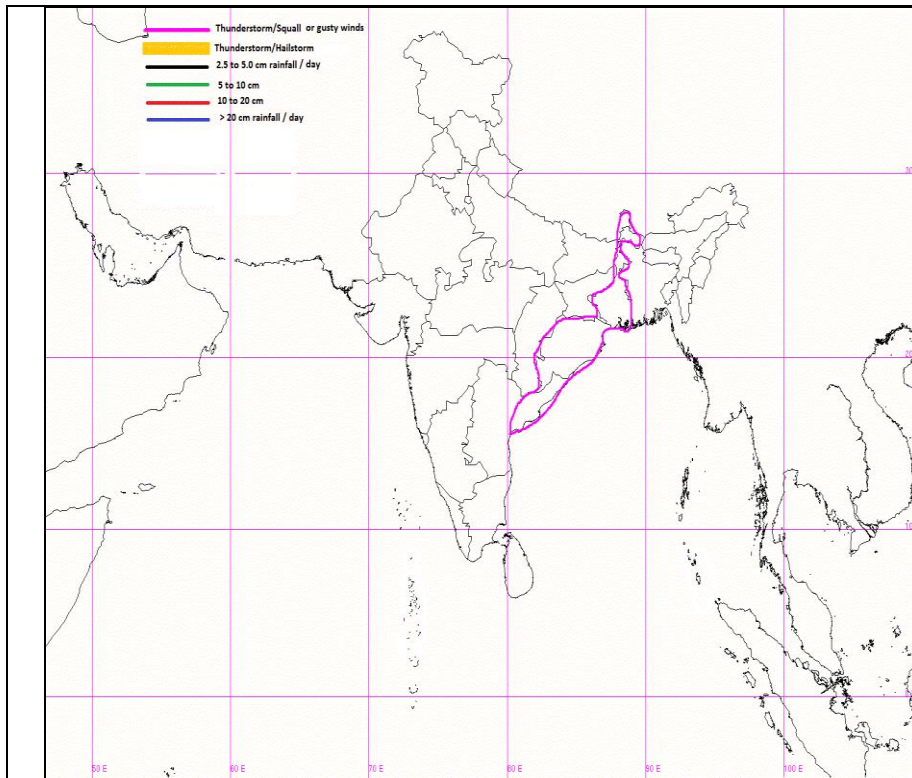
Summary and Conclusions:

Day-1 & Day-2:

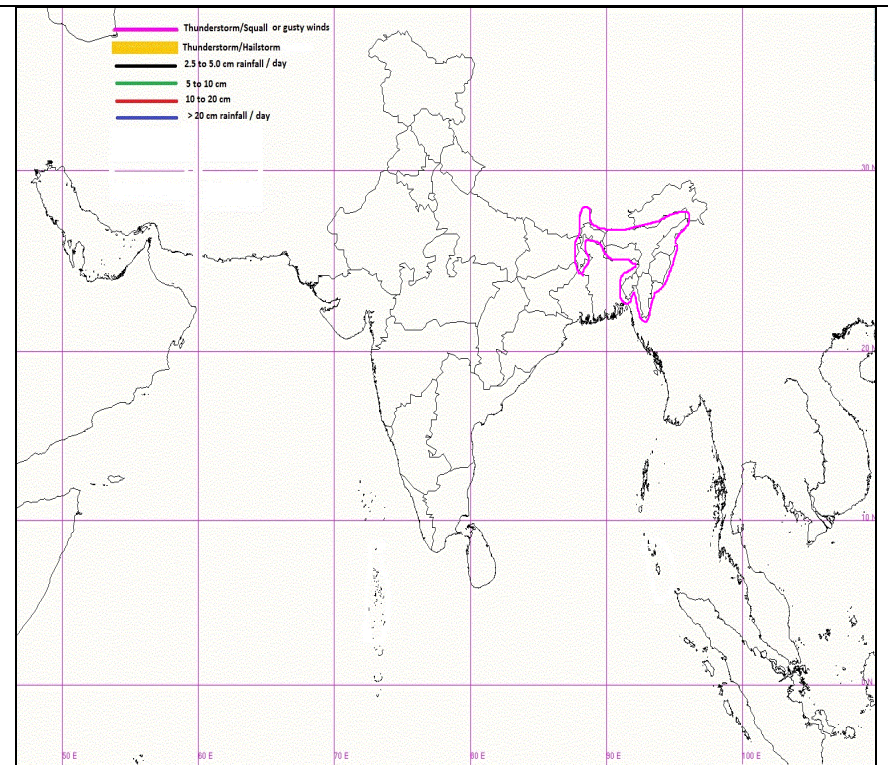
In the present synoptic situations, the cyclonic circulation over Sub Himalayan West Bengal and neighbourhood is persisting. Apart from this, a trough is also extending across east Jharkhand, interior Odisha, south Chhattisgarh and Vidarbha. Scattered low/medium clouds were also observed from satellite over North Coastal Odisha, Sikkim and Coastal Andhra Pradesh. These may give rise to thunderstorms with gusty winds over north coastal Andhra Pradesh, Odisha, GWB and SHWB on Day-1. On Day-2, these activities will be more likely over north-eastern states including Sub Himalayan West Bengal and neighbourhood.

24 hour Advisory for IOP: Rainfall: Nil Thunderstorm with associated phenomenon: Sikkim, West Bengal, Odisha and North Coastal Andhra Pradesh	48 hour Advisory for IOP: Rainfall: Nil Thunderstorm with associated phenomenon: Sikkim, Sub Himalayan West Bengal, Assam, Meghalaya, Nagaland, Manipur, Mizoram, Tripura
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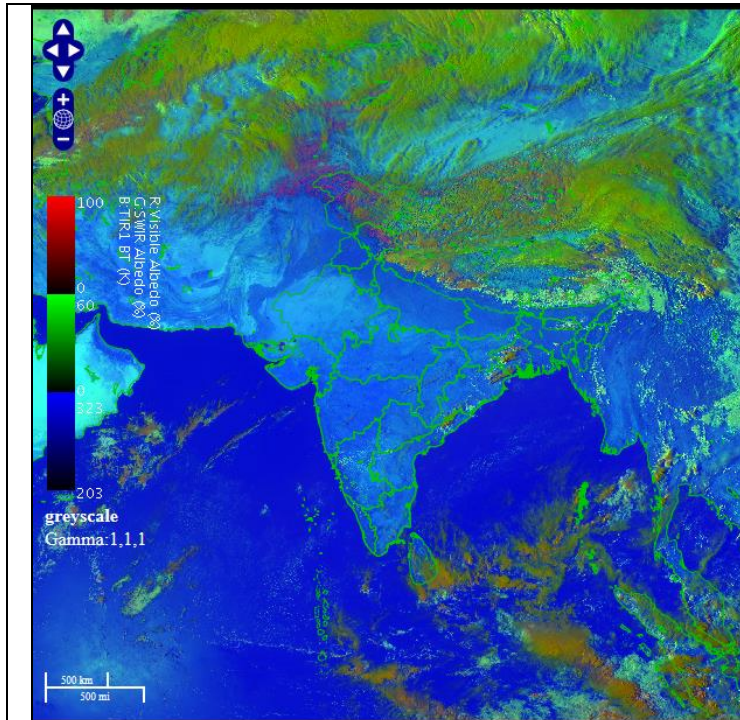
Graphical Presentation of Potential Areas for Severe Weather:



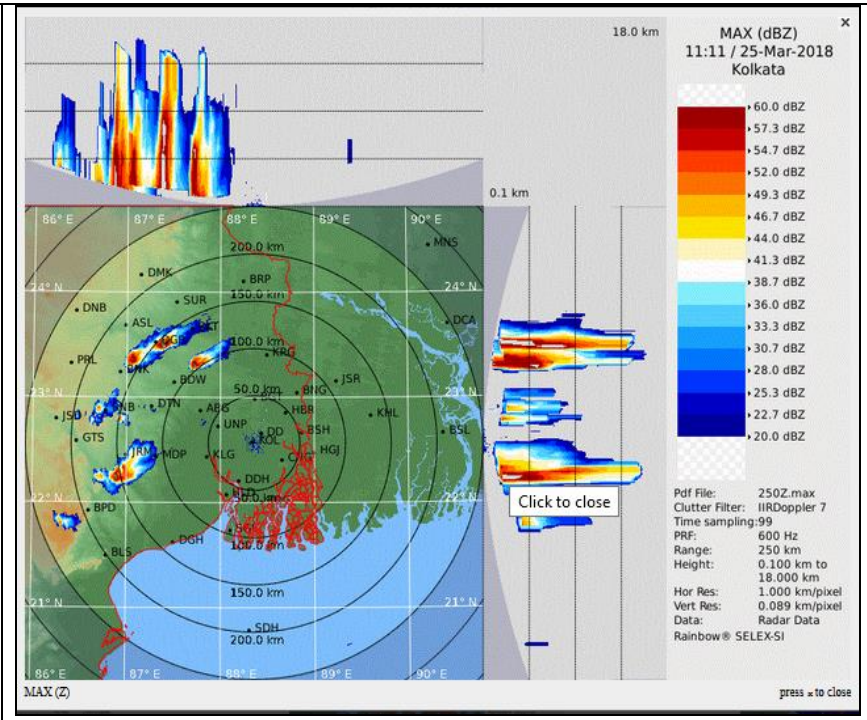
IOP Advisory for 24 hours



IOP Advisory for 48 hours



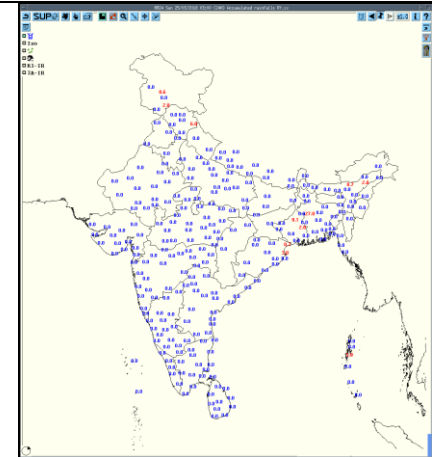
RAPID RGB Imagery at 1530 IST of the Day



DWR Kolkata at 1641 IST of the Day

Not Received
(Due to unavailability of model results)

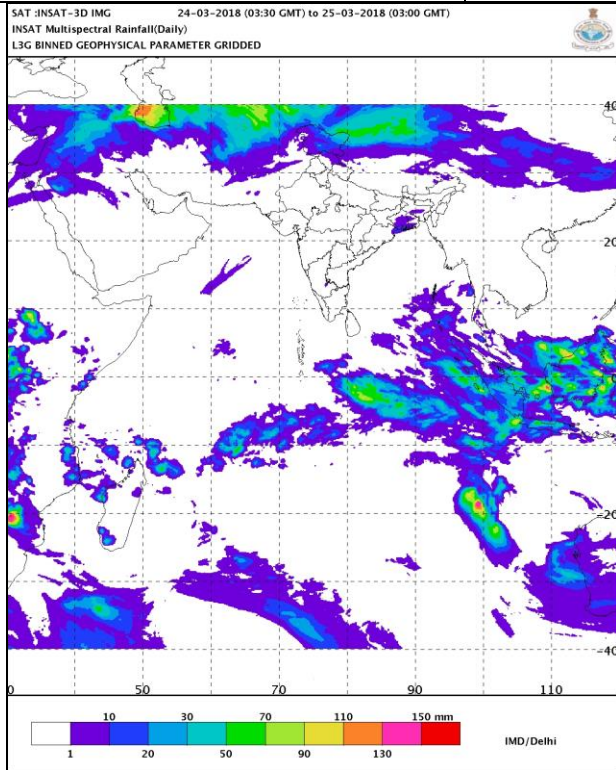
Not Received
(Due to unavailability of model results)



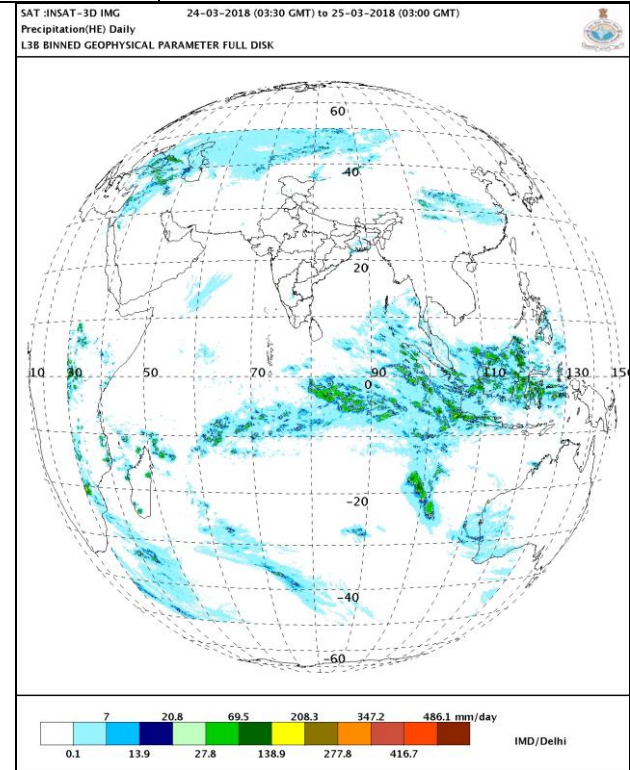
Forecast Dust Concentration

PM10 Forecast

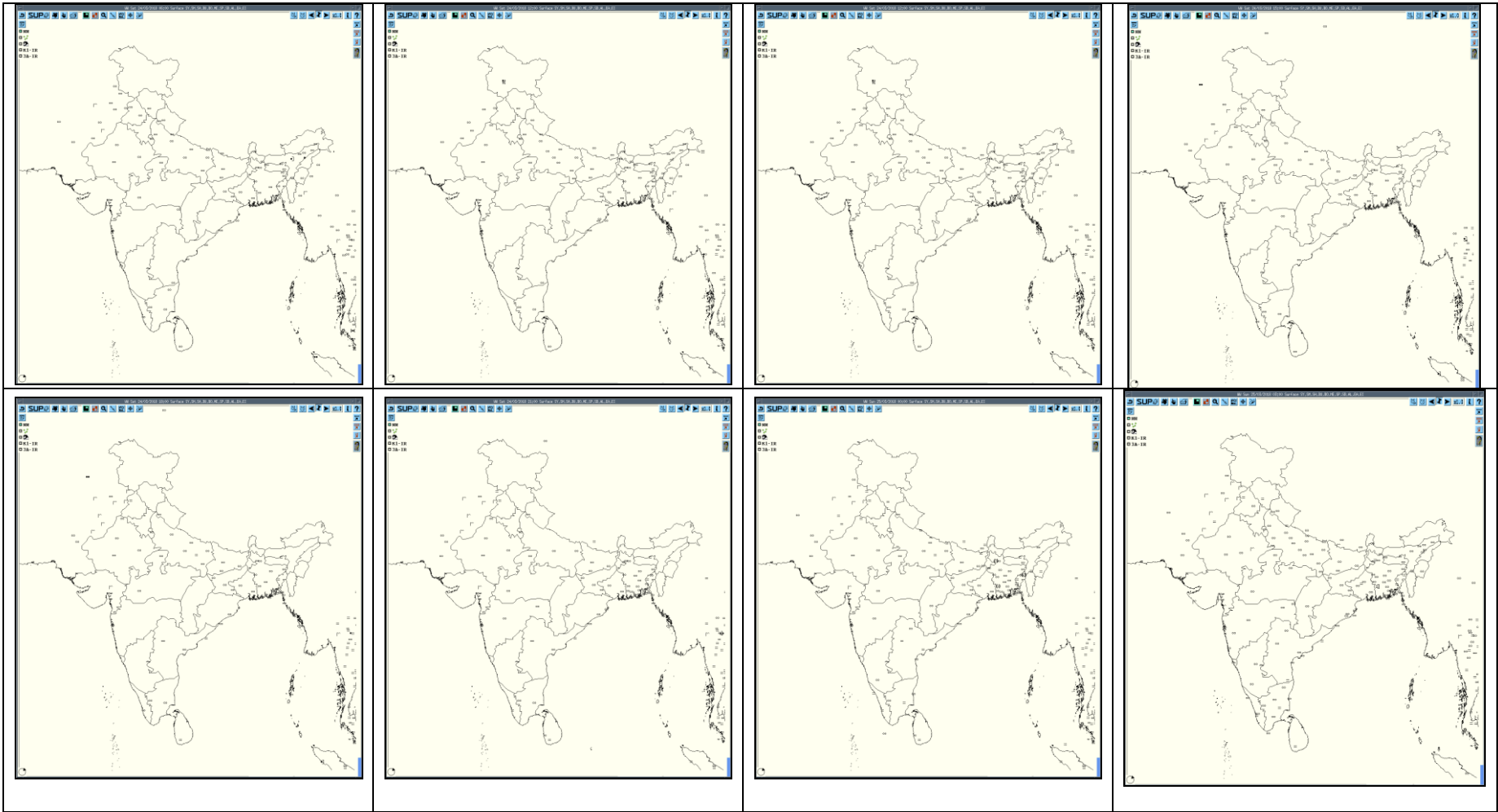
**Accumulated 24 Hour rainfall (in red)
recorded at 0300UTC of today**



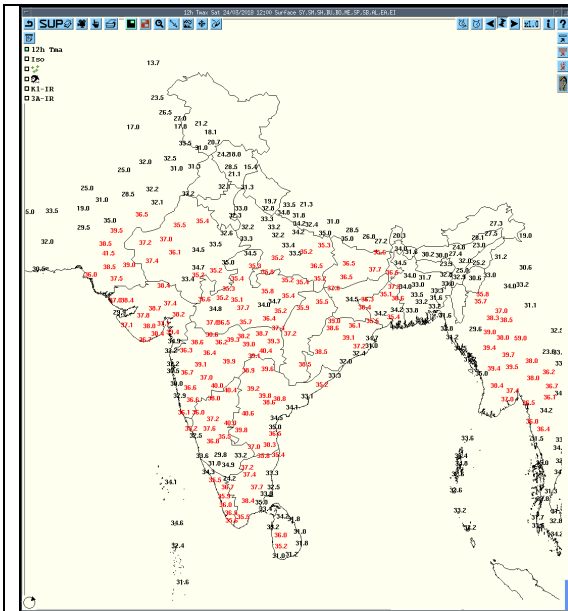
IMR



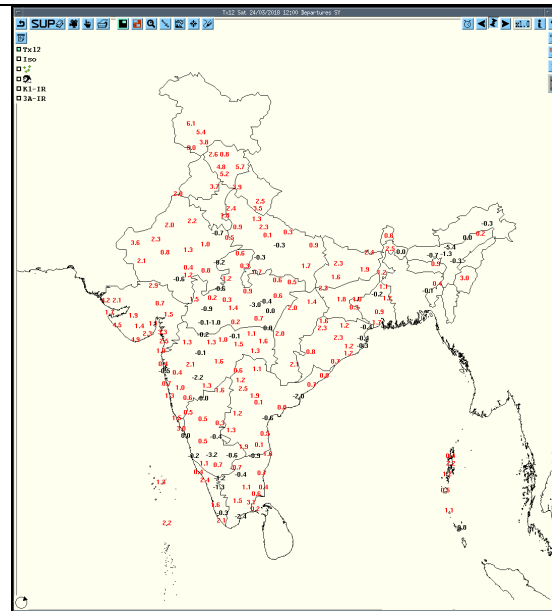
HEM



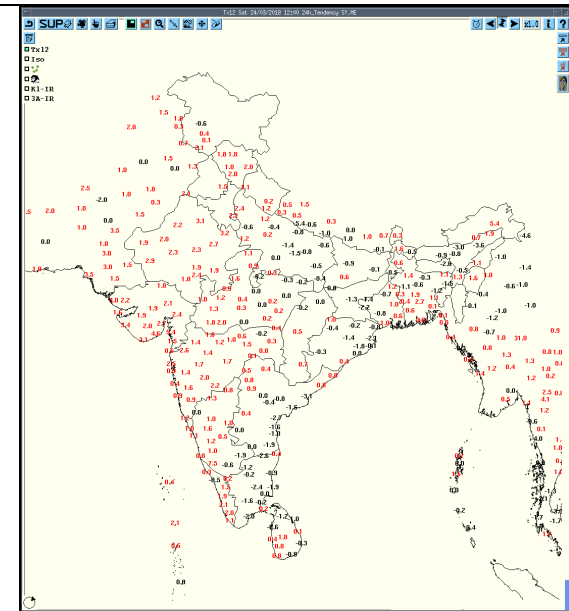
3hourly Past weather at 06, 09, 12, 15, 18, 21 UTC of yesterday and 00 & 03 hrs UTC of today



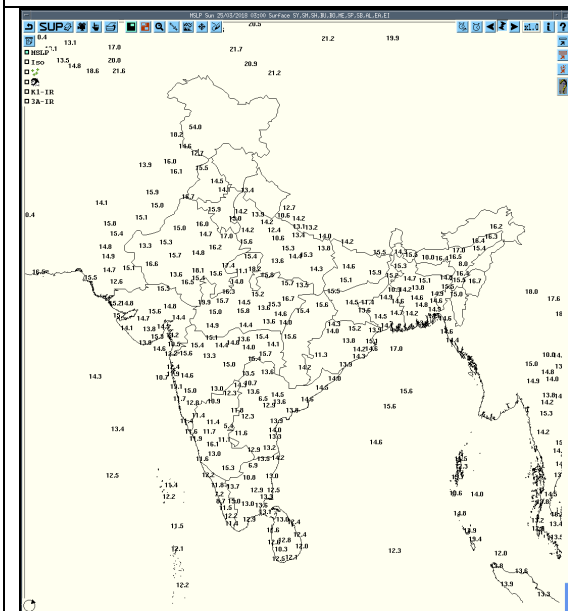
Tmax



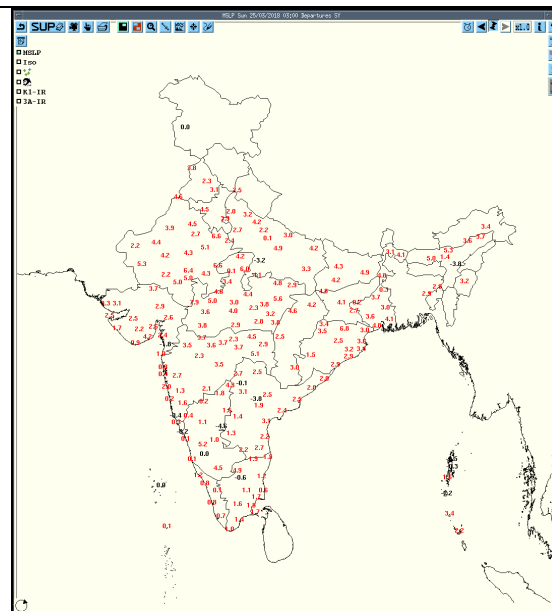
Departure Tmax



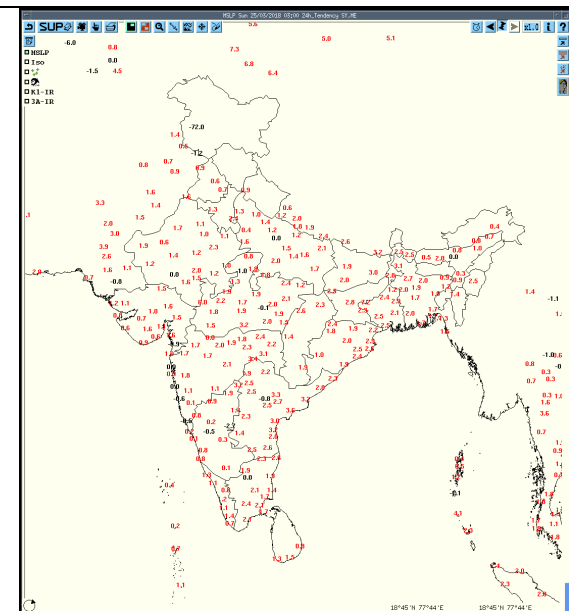
Tendency Tmax



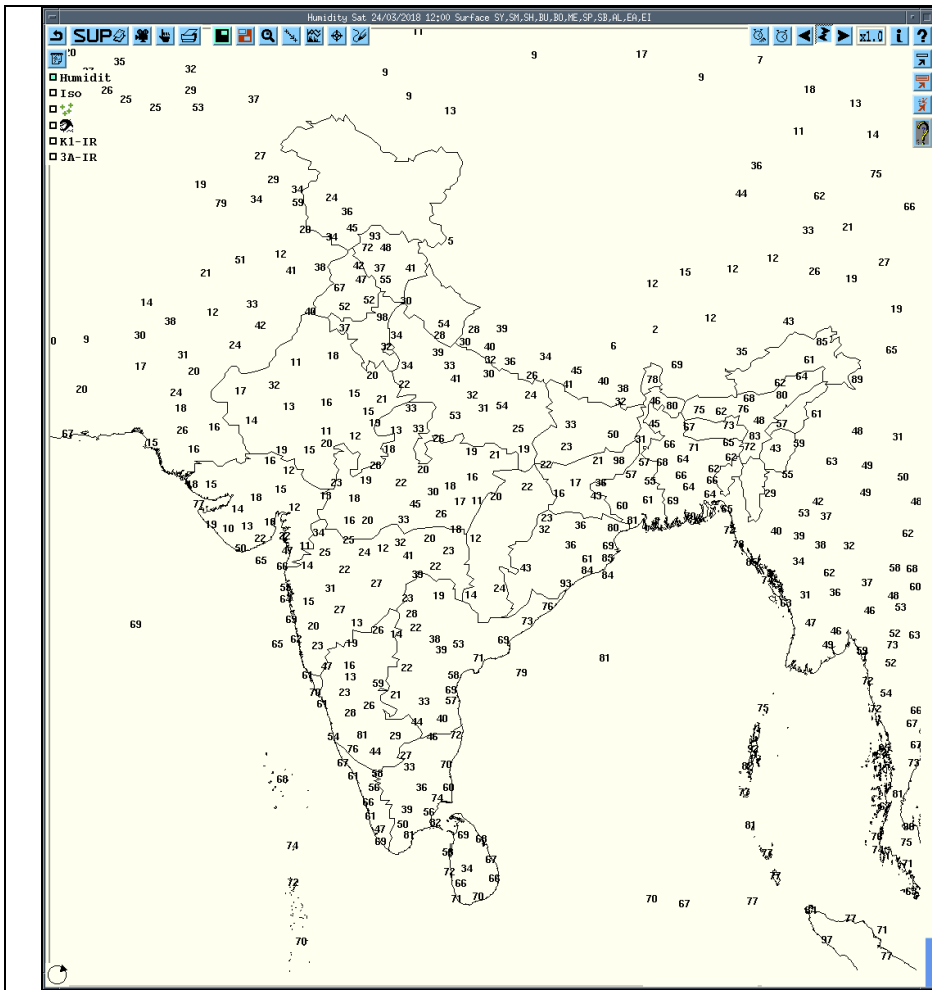
MSLP



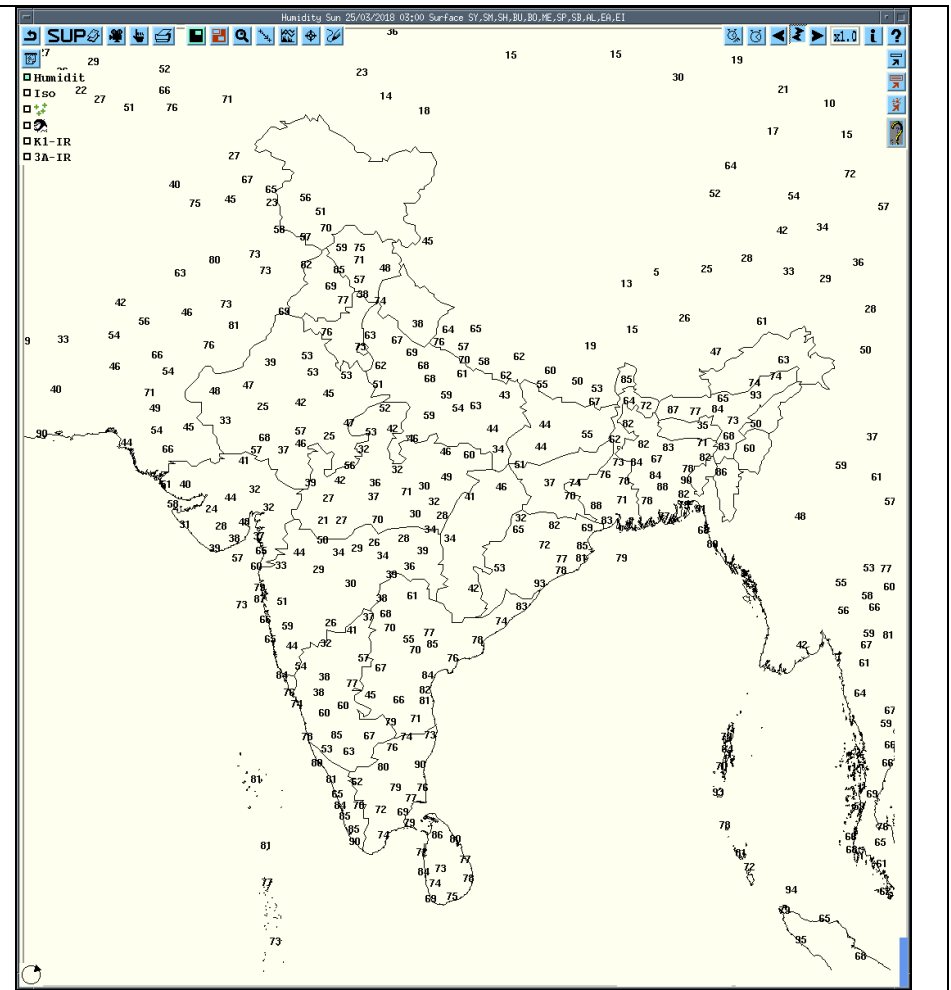
Departure MSLP



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	Associate d Severe Weather if any	Districts affected
Kolkata	25-03-18	24/0301 – 24/0801	NIL	NIL	NOSIG ECHO	NIL	NIL
		24/0801–24/2100 UTC	1. Isolated single cell developed 0801 UTC AT 21.701N / 86.651 E / 241.6 Degree / 200.2 km. and maximum reflectivity of 59.5 dBz at 0911 UTC and maximum height 13.70 at 0911 UTC	SW (200.2 km) to moving in Easterly direction.	Isolated Single cell developed into multi cell system formed in SW direction at a distance 200.2 km. and dissipated at 1212 UTC at a distance 244.9 K.M. from Radar.	Thunderstorm / Rain	N/A
			2. Isolated single cell developed 1011 UTC AT 21.979N / 86.541 E / 251.1 Degree / 197.7 km. and maximum reflectivity of 57.0 dBz at 1141 UTC and maximum height 15.31 at 1141 UTC	SW (197.7 km) to moving in NE-ly direction	Isolated Single cell developed in the SW direction at a distance 197.7 km. matured and dissipated at 1311 UTC at a distance 104.8 K.M. from Radar.	Thunderstorm / Rain	N/A
3. Isolated single cell developed 1122 UTC AT 22.972N / 86.655 E / 284.8 Degree / 179.7 km. and maximum reflectivity of 57.5 dBz at 1212 UTC and maximum height 10.66 at 1212 UTC	West (179.7 km) to moving in East-ly direction	Isolated Single cell developed into multi cell system formed in WEST direction at a distance 179.7 km. Matured and dissipated at 1431 UTC at a distance 88.4 K.M. from Radar.	Thunderstorm / Rain	N/A			
Patna	25-03-2018	240300UTC- 250300UTC	-NIL-	-NIL-	-NIL-	-NIL-	-NIL-
Agartala	25/03/18	240300-250300	A) Isolated Single Cell Forming Multiple Cells 54 dBZ,12 Kms formed @240552Z B) Isolated Cell, 58Dbz,12.8 Kms Formed @241120Z	A) 230 KMS. TO North Over Meghalaya Hills/W TO E-WARDS /30 Kmph. B) 250 KMS.TO WESTOVER Bangladesh/West To E-Wards/30 Kmph.	A) Dissipated over the hills @241152z. B)Dissipated over Bangladesh @241320Z	-	-
Lucknow	25-03-2018	240300UTC- 250300UTC	-NIL-	-NIL-	-NIL-	-NIL-	-NIL-

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	Associate d Severe Weather if any	Districts affected
Jaipur	25-03-18	240300-250252	Nil	Nil	Nil	25-03-18	Nil
Patiala	25-03-18	240300-250252	Nil	Nil	Nil	Nil	Nil
Visakhapatnam	25-03-18	0900UTC	Convective cell formed at 0721UTC and matured to max. Reflectivity of 53dBz at 0741 UTC with average height 7 Km.	NEly and 173 Km	It start dissipating from 0831UTC	NIL	Gajapati (Odisha)
		1200UTC	Convective cell formed at 0831UTC and matured to max. Reflectivity of 59dBz at 0931 UTC with average height 7 Km.	NW'ly and NEly at 84 Km	It start dissipating from 0951UTC	NIL	Gajapati (Odisha) and East Godavari (AP)

Realised past 24hrs TS/SQ/HS Data:

Realised TS/HS/SQ during past 24 hours ending at 0300UTC of today(received from RMCs/MCs)						
Name of Station Reporting	Region	State/Sub Division	Weather Event (TS/Hail/Squall)	Date	Time of Commencement (IST)	Time of end (IST)
Pahalgam	Northwest India	Jammu & Kashmir	Thunderstorm	24-03-18	1610	1800
Bhaderwah	Northwest India	Jammu & Kashmir	Thunderstorm	24-03-18	1830	1930
Jorhat	Northeast India	Assam & Meghalaya	Thunderstorm	24-03-18	0830	1400
Bankura	East India	GWB	Thunderstorm	24-03-18	1815	1830
Balasore	East India	Odisha	Thunderstorm	24-03-18	1510	1610
Chandbali	East India	Odisha	Thunderstorm	24-03-18	1800	1840

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

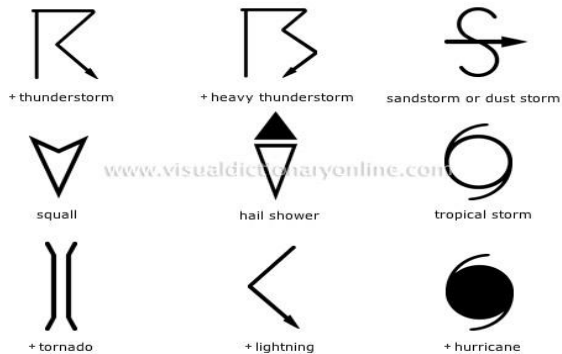
ForRadarimagesofthepast24hoursincludingmosaicofimages:

http://ddgmuimd.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