



India Meteorological Department

FDP STORM Bulletin No. 18 (24-03-2018)

1. CURRENT SYNOPTIC SITUATION:

NWFC INFERENCE (0300UTC of the Day):

- ◆ The feeble Western disturbance as a trough in mid tropospheric westerlies has strengthened and now seen as a NE-SW oriented trough in mid & upper tropospheric westerlies running from Lat.36°N/Long.74°E to Lat.26°N/Long.64 °E at 5.8 km above mean sea level.
- ◆ The cyclonic circulation between 1.5 km and 3.1 km above mean sea level over Haryana and adjoining areas of West Uttar Pradesh & north Rajasthan has become less marked.
- ◆ The core of sub-tropical westerly Jet stream passes between Lat. 20°N and 25°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 0.9km above mean sea level persists.
- ◆ The trough extending upto 0.9 km above mean sea level from the above system now runs upto north Coastal Andhra Pradesh across Gangetic West Bengal and Odisha.
- ◆ A cyclonic circulation extending between 0.9 km & 1.5 km above mean sea level lies over north Konkan and adjoining eastcentral Arabian Sea.
- ◆ A trough in easterlies at 1.5 km above mean sea level runs from south Kerala coast to Rayalaseema.
- ◆ The cyclonic circulation over southwest Bay of Bengal off Sri Lanka Coast is now seen upto 0.9 km above mean sea level over Comorin area and neighbourhood.

SATELLITE OBSERVATIONS during past 24hrs and current observation:

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

Western Disturbance (WD):

Broken multi-layered clouds with embedded intense to very intense convection seen over Black Sea, Caspian Sea & neighbourhood, Northeast Iran, Afghanistan, North Pakistan, Jammu & Kashmir, North Himachal Pradesh, Punjab and over the area between lat 37.0°N to 50.0°N, long 70.0°E to 90.0°E in association with WD over the area.

Clouds description within India:

Scattered low/medium clouds with embedded isolated weak to moderate convection seen over Bay Islands. Isolated low/medium clouds were seen over Sikkim, Arunachal Pradesh, East Assam, and Nagaland. Scattered high/medium clouds were seen over North Kerala.

Arabian Sea:

No significant clouds seen over the Arabian Sea. .

Bay of Bengal & Andaman Sea:

Scattered low/medium clouds with isolated moderate to intense convection were seen over Southeast Bay and Andaman Sea.

Past Weather:**Convection (during last 24 hrs):**

Weak to moderate convection was observed over J&K North Himachal Pradesh NE Rayalaseema NE Orissa ADJ South GWB Central TN Assam Kerala (.)

OLR:-

Upto 230 w m^{-2} was observed over J&K & upto 280 w m^2 in Arunachal Pradesh Assam Nagaland.

Dynamic Features:

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

Precipitation:**IMR:**

Rainfall upto 10-110 mm observed over north East J & K. & 10-20mm North Himachal Pradesh

HEM:

Rainfall upto 14mm observed over J & K.

RADAR and RAPID RGB Observation:

Isolated moderate echoes (dBZ around 50 and height 10-12km) are seen on DWR Agartala and Cherrapunjee domains at around 1245 IST. Isolated/multiple light to moderate echoes are also seen on DWR Srinagar domain at around 1245IST.

RAPID RGB Satellite imagery at 1130IST indicates significant convective clouds over Andaman & Nicobar Islands and Jammu & Kashmir. It also indicates isolated convection over Meghalaya and Central parts of Assam.

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

Higher Dust concentration was observed over Arab countries and northern part of Africa. Dust concentration is expected to increase 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 category for next 2 days in Delhi.

Delhi – SAFAR analysis & Forecast	24.03.2018	25.03.2018
PM10 (micro-g/m ³)	157	172
PM2.5 (micro-g/m ³)	70	76

2. NWP MODEL GUIDANCE:

NCMRWF (NCUM forecast based on 000UTC of the day):

1. Weather Systems:

Low level CYCIRS, Troughs:

12 UTC of Day 0-4: 850 hPa trough over WB and adjoining parts of Bihar and Bangladesh

00 UTC of Day 1-3: 850 hPa NE-SW feeble trough from Bihar to AP

Confluence & Wind Discontinuity Regions:

12 UTC of Day 1-3: at 850 hPa SW-NE wind discontinuity over east coast of India

Synoptic Systems:

12 UTC of Day 1-2: At 500 hPa WD and associated cyclonic circulation over Punjab and adjoin areas of J & K, HP

2. Location of jet and jet core (>60kt) at 500hPa:

12 UTC of Day 0-4 Weaker core in all the days except in Day 3 Bangladesh when jet core is strong (>60kt)

3. Convergence at 850 hPa:

Day/Index: Subdivisions with Lower Level Convergence > 15 x 10⁻⁵ /s

Day0: Odisha, Madhya_Maharashtra, Coastal_AP, Coastal_Karnataka, SI_Karnataka,

Day1: NE_NMMT, Odisha, Madhya_Maharashtra, Coastal_AP, Coastal_Karnataka, NI_Karnataka, SI_Karnataka, Kerala,

Day2: Assam_Meghalaya, Odisha, East_MP, Chhattisgarh, Coastal_Karnataka, NI_Karnataka, SI_Karnataka, Kerala,

Day3: Assam_Meghalaya, Odisha, Madhya_Maharashtra, Coastal_AP, TN_Puducherry, NI_Karnataka, SI_Karnataka, Kerala,

Day4: Odisha, Madhya_Maharashtra, Chhattisgarh, Coastal_AP, TN_Puducherry, NI_Karnataka, SI_Karnataka, Kerala

4. Low level Vorticity:-Positive Vorticity:

Day/Index: Subdivisions with Lower Level Vortex > 15 x 10⁻⁵ /s

Day0: Assam_Meghalaya, NE_NMMT, Sub_Himalayan_WB, Himachal_Pradesh,

Day1: Assam_Meghalaya, NE_NMMT, Gangetic_WB,

Day2: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Gangetic_WB, Uttarakhand, Himachal_Pradesh, Odisha, SI_Karnataka, Kerala,

Day3: Assam_Meghalaya, NE_NMMT, Gangetic_WB, Himachal_Pradesh, Odisha, Coastal_AP, SI_Karnataka,

Day4: Assam_Meghalaya, Uttarakhand, Himachal_Pradesh, Odisha, Coastal_AP

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

Day/Index: Subdivisions with Showalter Index < -4

Day0: Arunachal_Pradesh, Sub_Himalayan_WB, Gangetic_WB, Uttarakhand, Himachal_Pradesh, Kerala,

Day1: Arunachal_Pradesh, Sub_Himalayan_WB, Hry_Chhd_Delhi, Himachal_Pradesh, Jammu_Kashmir,

Day2: Arunachal_Pradesh, Sub_Himalayan_WB, Konkan_Goa, Madhya_Maharashtra, Coastal_Karnataka, SI_Karnataka, Kerala,

Day3: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Sub_Himalayan_WB, Konkan_Goa, Madhya_Maharashtra, Coastal_Karnataka, NI_Karnataka, SI_Karnataka, Kerala,

Day4: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Sub_Himalayan_WB, Uttarakhand, Konkan_Goa, Madhya_Maharashtra, TN_Puducherry, Coastal_Karnataka, NI_Karnataka

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

Day/Index: Subdivisions with K Index > 40

Day0: Arunachal_Pradesh, Sub_Himalayan_WB, Coastal_AP, Rayalseema, TN_Puducherry, SI_Karnataka, Kerala,

Day1: Arunachal_Pradesh, Konkan_Goa, Coastal_AP, Coastal_Karnataka,

Day2: Arunachal_Pradesh, Sub_Himalayan_WB, Konkan_Goa, Madhya_Maharashtra, Coastal_AP,

Day3: Arunachal_Pradesh, Assam_Meghalaya, Madhya_Maharashtra, TN_Puducherry, NI_Karnataka,

Day4: Arunachal_Pradesh, NE_NMMT, Sub_Himalayan_WB, Uttarakhand, TN_Puducherry, NI_Karnataka, SI_Karnataka, Kerala

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

Day/Index: Subdivision with Total Totals Index > 52

- Day0: Arunachal_Pradesh, Sub_Himalayan_WB, West_UP, Uttarakhand, Hry_Chd_Delhi, Punjab, Himachal_Pradesh, Jammu_Kashmir, West_RJ,
- Day1: Arunachal_Pradesh, Sub_Himalayan_WB, West_UP, Uttarakhand, Hry_Chd_Delhi, Punjab, Himachal_Pradesh, Jammu_Kashmir,
- Day2: Arunachal_Pradesh, Sub_Himalayan_WB, West_UP, Uttarakhand, Punjab, Himachal_Pradesh, Jammu_Kashmir, Konkan_Goa, Madhya_Maharashtra,
- Day3: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Sub_Himalayan_WB, Uttarakhand, Himachal_Pradesh, Jammu_Kashmir, Konkan_Goa, Madhya_Maharashtra, Coastal_Karnataka, NI_Karnataka,
- Day4: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Sub_Himalayan_WB, Bihar, Uttarakhand, Himachal_Pradesh, Jammu_Kashmir

8. Rainfall and thunder storm activity:

Day/Index: Subdivisions with Precipitation > 2 cm

- Day1: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT,
- Day2: Arunachal_Pradesh, Jammu_Kashmir,
- Day3: Assam_Meghalaya,
- Day4: --
- Day5: --

3. IOP ADVISORY FOR 24 and 48Hrs:

Summary and Conclusions:

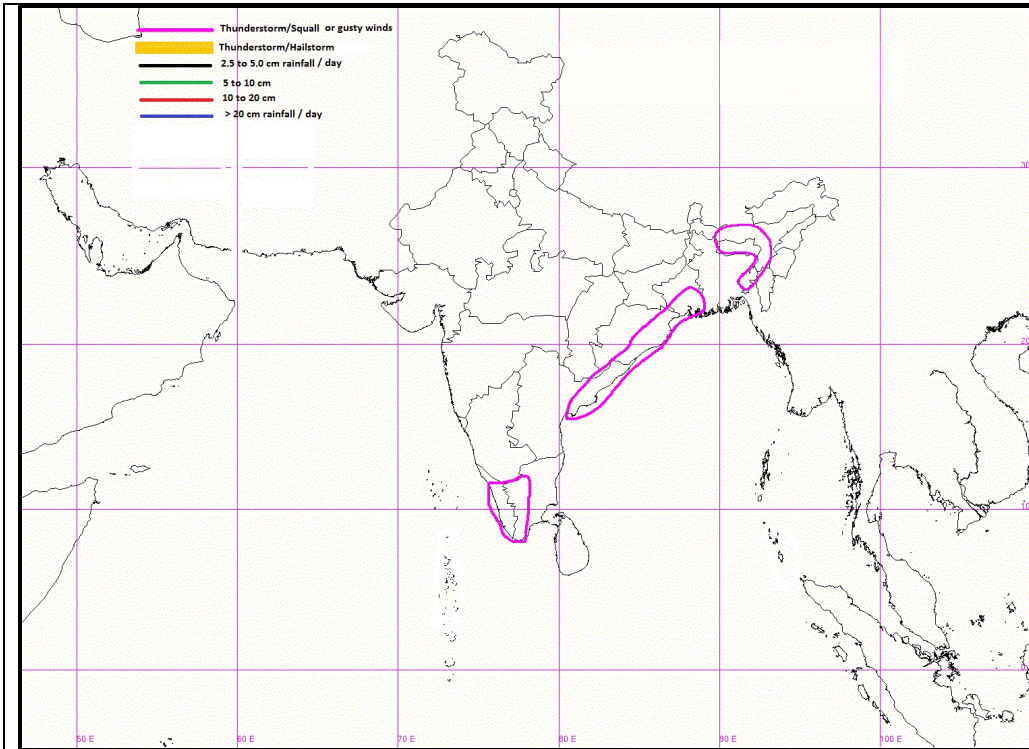
Day-1 & Day-2:

o Yesterday's trough in the low level westerlies, extending from Sub Himalayan West Bengal to South Tamil Nadu, has withdrawn northwards and extends today from Sub Himalayan West Bengal upto north Coastal Andhra Pradesh. The Bay of Bengal anticyclone is over central Bay of Bengal and this is pumping moisture into the northeast-southwest oriented trough over eastern India. This is likely to give rise to thunderstorms with gusty winds over the coastal regions of Andhra Pradesh, Odisha and Gangetic West Bengal and Northeast India on day 1. ECMWF and IMD GFS deterministic models indicate that on day 2, the trough is likely to weaken and be seen as a cyclonic circulation off Odisha coast. Hence, some isolated rainfall, with decreased intensity is likely to persist over Odisha and Gangetic West Bengal on day 2.

o Over the south peninsula, a fresh trough in the easterlies extends from south Kerala coast to Rayalaseema has replaced the previous extension westerly trough. Yesterday's cyclonic circulation over southwest Bay of Bengal off Sri Lanka Coast has moved eastwards and is now seen over Comorin area and neighbourhood in the lower levels. The cyclonic circulation is likely to pump in some moisture in the lower levels into the trough over Interior Tamil Nadu and Kerala, giving rise to thunderstorms over this region on day 1. On day 2, the trough as well as the cyclonic circulation are likely to move westwards, and rainfall with decreasing intensity is likely to be confined to Kerala on day 2.

24 hour Advisory for IOP: Rainfall: Nil Thunderstorm with associated phenomenon: Kerala, Interior Tamilnadu, North Coastal Andhra Pradesh, Coastal Odisha and Coastal Gangetic West Bengal West and South Assam, Meghalaya, Tripura	48 hour Advisory for IOP: Rainfall: Nil Thunderstorm with associated phenomenon: Nil
--	---

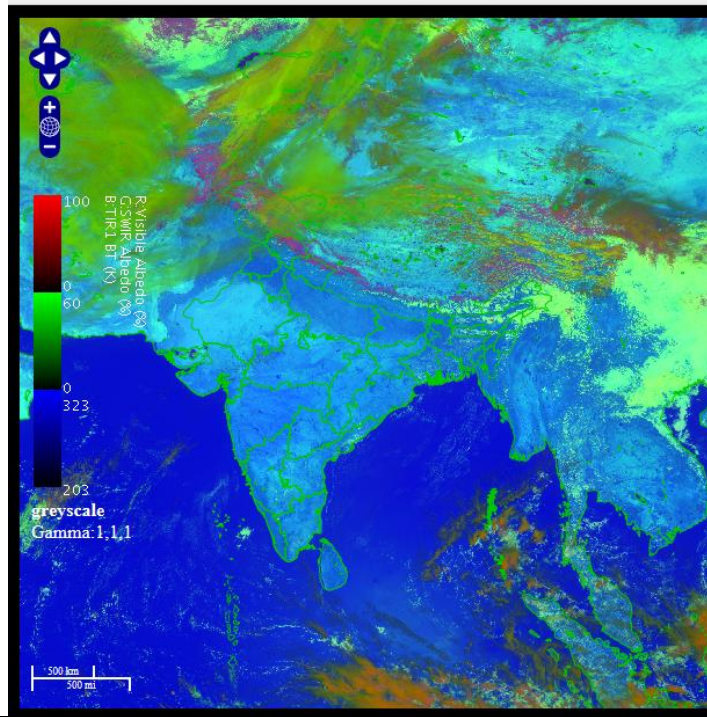
Graphical Presentation of Potential Areas for Severe Weather:



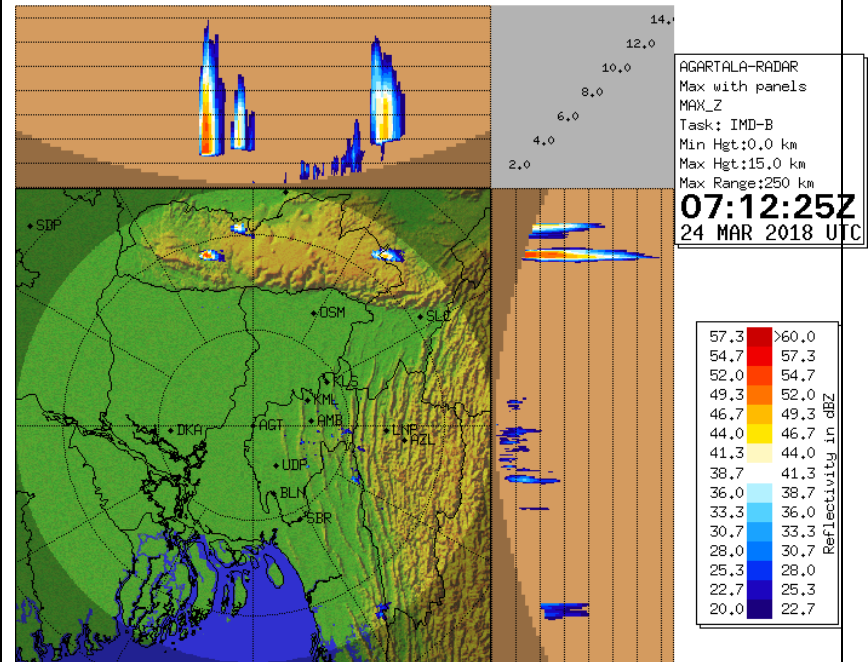
IOP Advisory for 24 hours

NO WARNING FOR SEVERE WEATHER

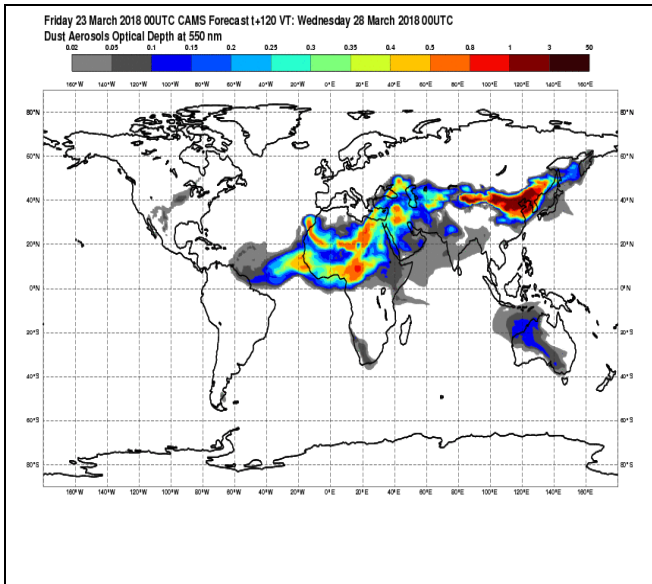
IOP Advisory for 48 hours



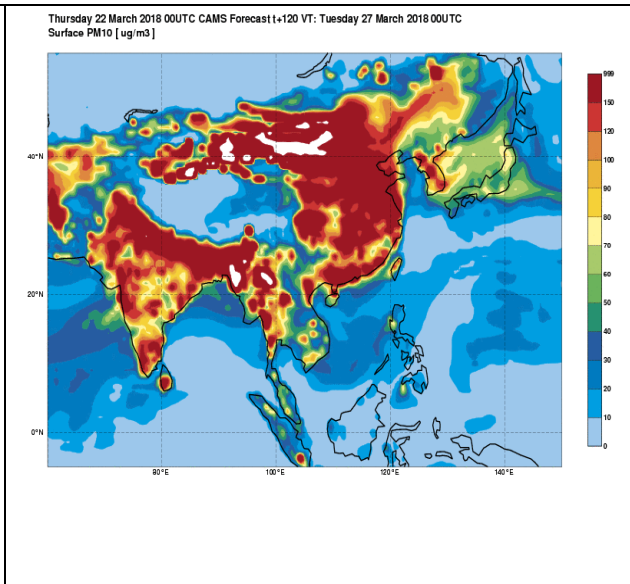
RAPID RGB Imagery at 1130 IST of the Day



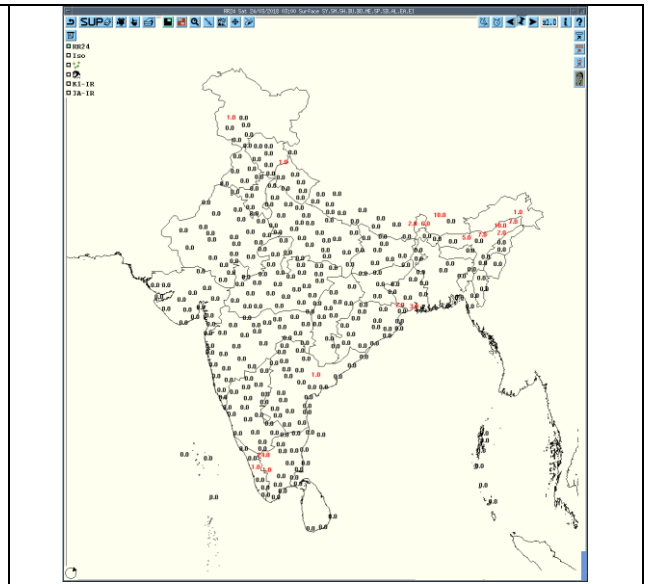
DWR Agartala at 1242 IST of the Day



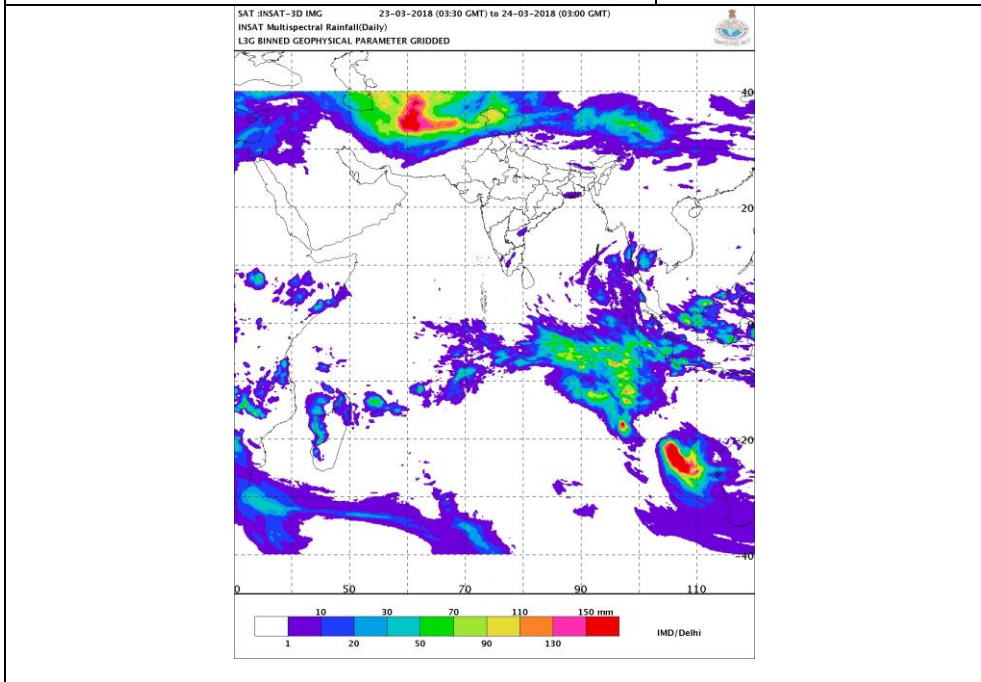
Forecast Dust Concentration



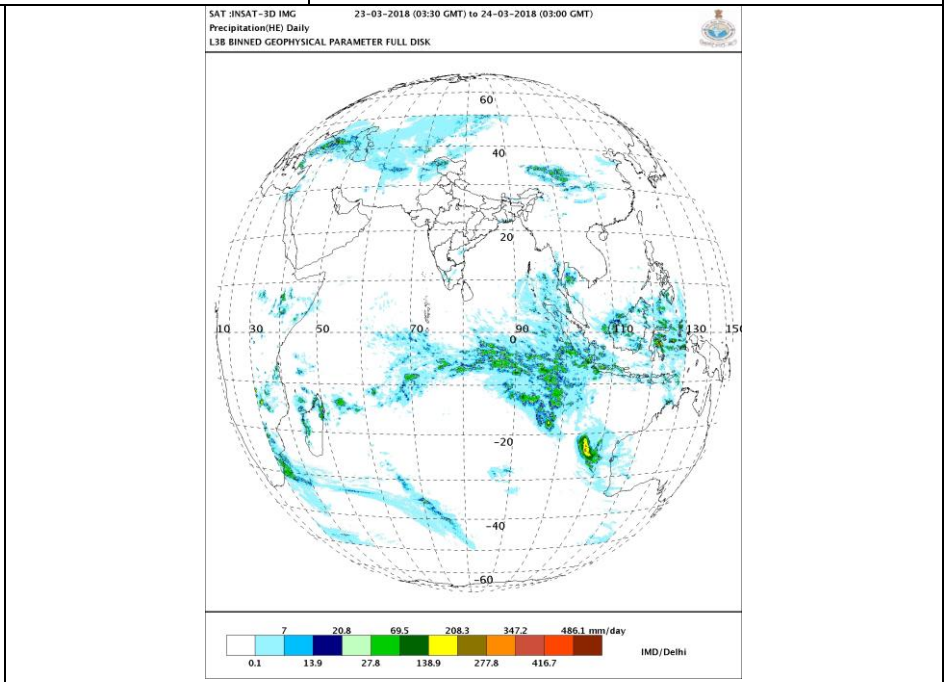
PM10 Forecast



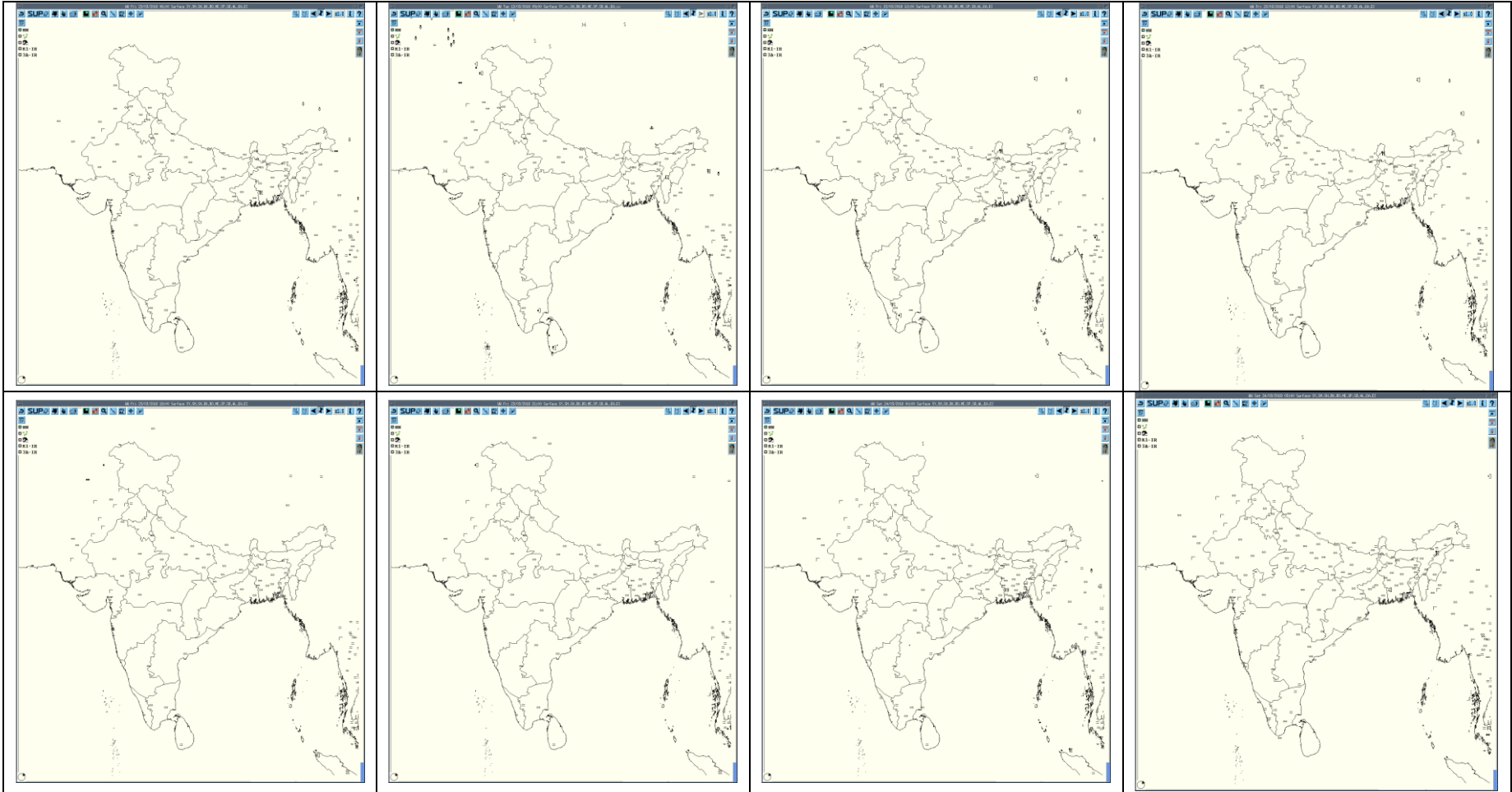
Accumulated 24 Hour rainfall (in red) recorded at 0300UTC of today



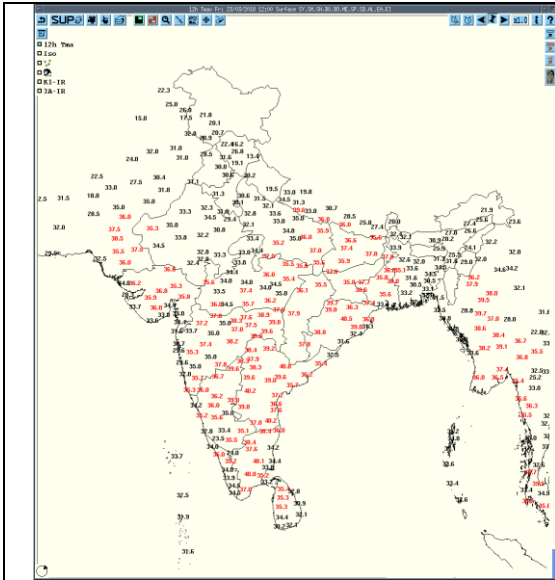
IMR



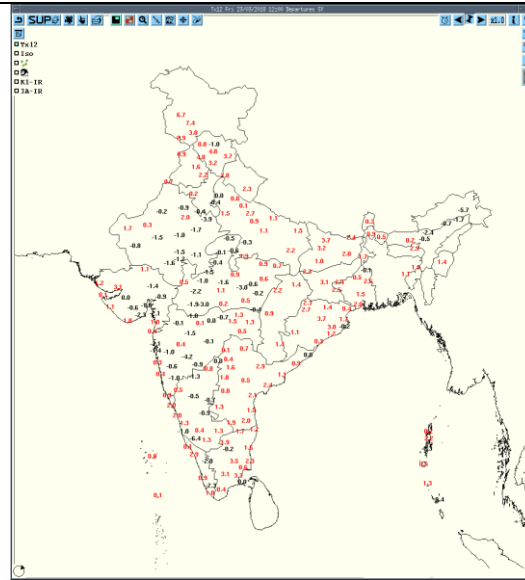
HEM



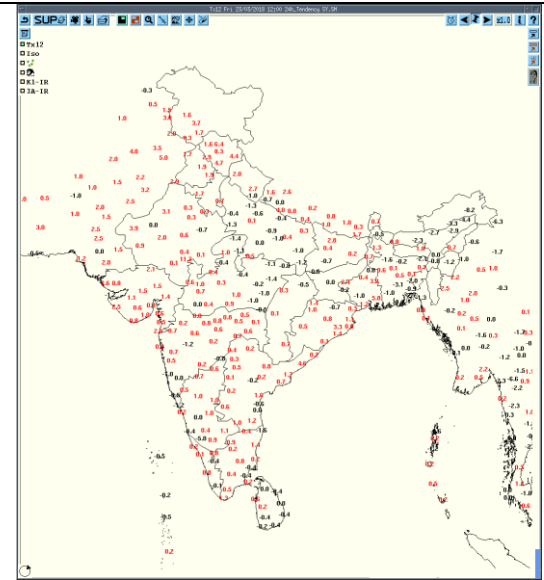
3hourly Past weather at 06, 09, 12, 15, 18, 21 UTC of yesterday and 00 & 03 hrs UTC of today



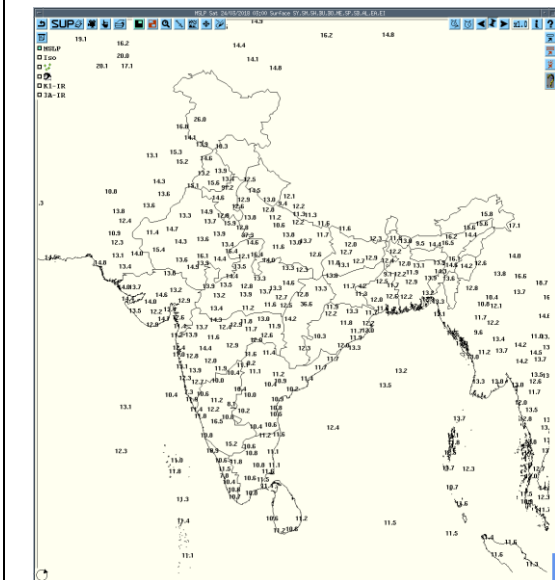
Tmax



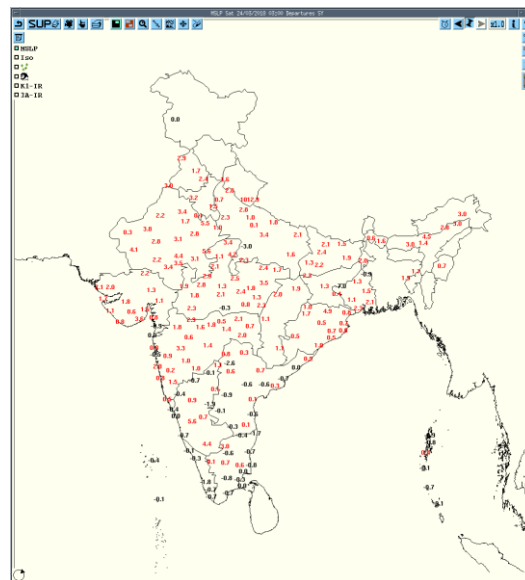
Departure Tmax



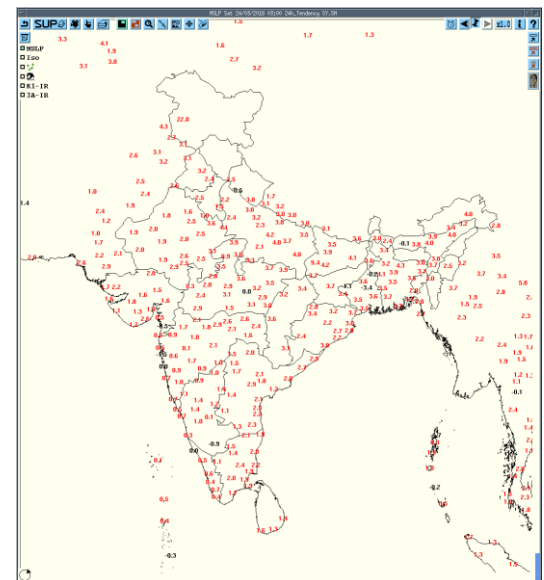
Tendency Tmax



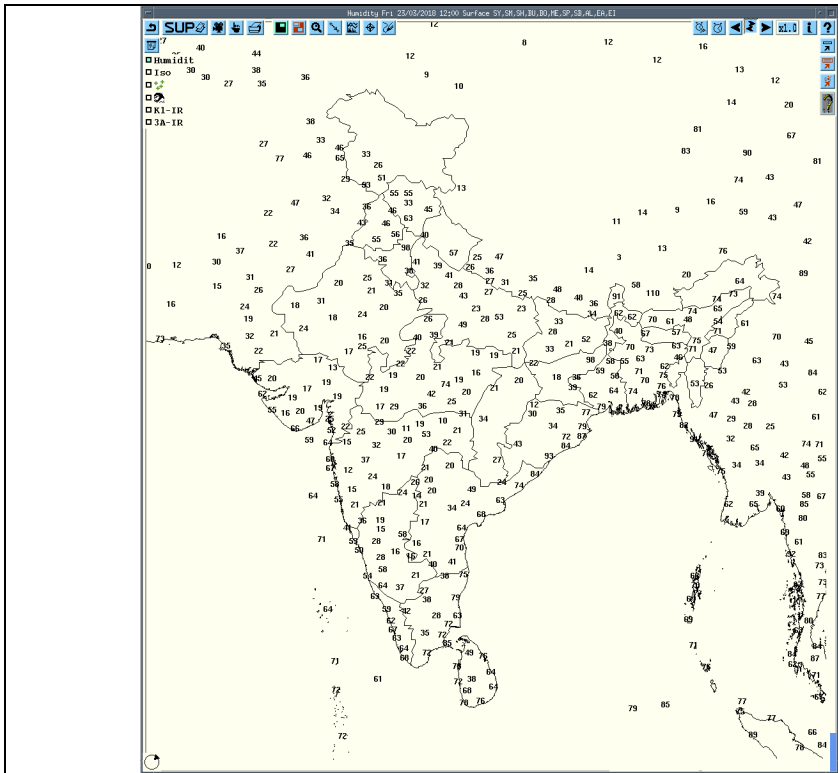
MSLP



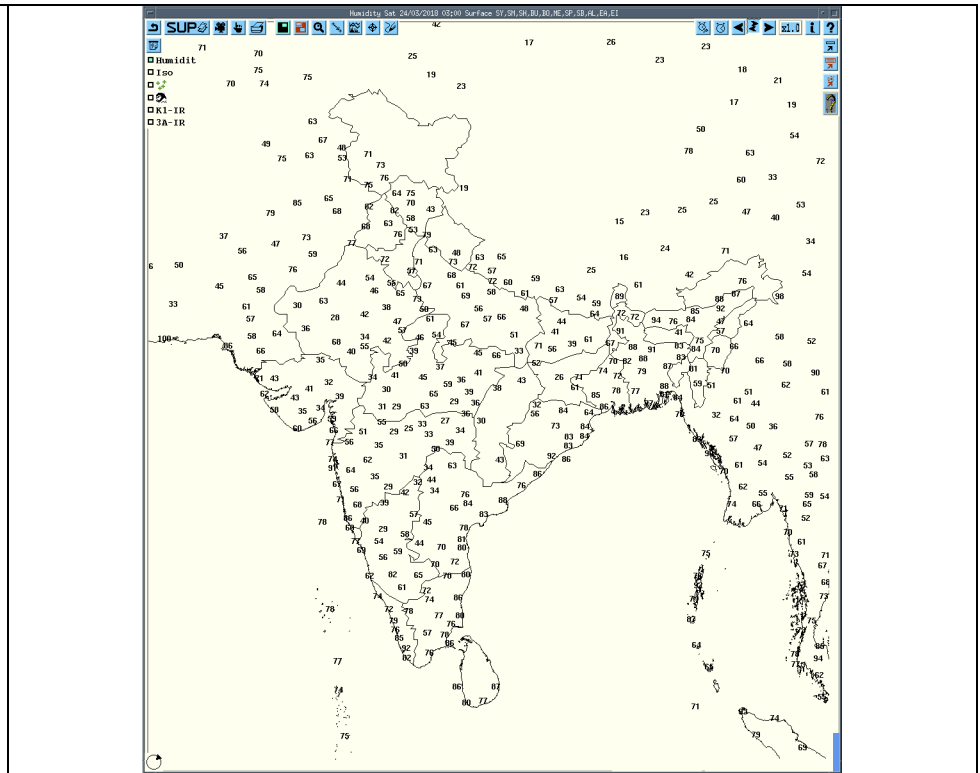
Departure MSLP



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
Jaipur	24-03-18	230300-240300	Nil	Nil	Nil	Nil	Nil
Patiala	24-03-18	230300-240252	No Echo	Nil	Nil	Nil	Nil
Lucknow	24-03-18	230300-240300	Nil	Nil	Nil	Nil	Nil
Agartala	24-03-18	230300-240300	ISLTD SINGLE CELL,50 dBZ,11 Kms formed @230842z	200 NNE over MEGHALAYA HILLS,E'ly.30 Kmph	Dissipated over the hills @231000z.	Not Known	
Visakhapatnam	24-03-18	230300-230600	A line of convection region SW ly with 41dbz and height 3kms	--	Being dissipated	--	--
		230900-231200	Isolated single cell of maximum reflectivity of 54dBz and average height of 10km	NE at a distance of 181 km and moving SEly	Convective cell formed at 1001UTC and matured to max. reflectivity of 54dBz at 1021 UTC. It start dissipating from 1041UTC	--	Ganjam and Gajapati Dist. (Orissa)
		231200-231500	Isolated single cell of maximum reflectivity of 55dBz and average height of 4km	NE at a distance of 136 km and moving SEly	Convective cell formed at 1401UTC and matured to max. reflectivity of 55dBz at 1421 UTC. It start dissipating from 1441UTC	--	Ganjam and Gajapati Dist. (Orissa)
		2631500-231800	Convective region of maximum reflectivity of 39dBz and average height of 3.5km	SSE at a distance of 147 km and moving Ely	Convective cell formed at 1701UTC and matured to max. reflectivity of 39dBz at 1711 UTC. It start dissipating from 1741UTC	--	--
		231800-240000	Isolated multiple cells of maximum reflectivity of 30dBz	SE at a distance of 141 km and moving Ely	Isolated multiple cell formed at 2031UTC and matured to max. reflectivity of 30dBz at 2051 UTC. It start dissipating from 21011UTC	--	--

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
Kolkata	24-03-18	230301-230401	Isolated single cell developed 0142 UTC AT 23.161N / 88.495 E / 12.0 Degree / 67.2 k.m. and maximum reflectivity of 55.5 dBz at 0241 UTC and maximum height 4.93 at 0241 UTC	NORTH (62.5 km) to moving in Easterly direction.	Isolated Single cell formed in North direction at a distance 62.5 km and dissipated at 0401 UTC at a distance 117.5 K.M. from Radar.	Thunders torm / Rain	N/A
		230411-230951	Nil	Nil	NOSIG ECHO	Nil	Nil
		231002-231401	<p>1.Isolated single cell with maximum reflectivity of 57.5 dBz at 1041 UTC and maximum height of 15.9 km at 1041 UTC</p> <p>2.Isolated single cell with maximum reflectivity of 58.5 dBz at 1041 UTC and maximum height of 12.7 km at 1041 UTC</p> <p>3.Single cell with</p>	<p>1.WSW/206.8 km moving in Easterly direction</p> <p>2.WSW/169.6 km moving in Easterly direction</p>	<p>1.Isolated Single cell formed at 1002 UTC in WSW direction at a distance 206.8 k.m. and merged with cell no. 2 to form cell no. 3 at 1051 UTC.</p> <p>2.Isolated Single cell formed at 1002 UTC in WSW direction at a distance 169.6 k.m. and merged with cell no. 1 to form cell no. 3 at 1051 UTC.</p>	<p>Thunders torm / Rain</p> <p>Thunders torm / Rain</p>	<p>N/A</p> <p>N/A</p>

			maximum reflectivity of 66.0 dBz at 1121 UTC and maximum height more than 18 km at 1111 UTC	3.WSW/180.2 km moving in Easterly direction	3.Single cell formed at 1051 UTC by merging cell no. 1 and 2 in WSW direction at a distance 180.2 k.m. matured and dissipated at S at a distance 137.3 km from radar at 1401 UTC.	Thunders torm / Rain/Hail	N/A
		231002-231401	4.Single cell with maximum reflectivity of 62.0 dBz at 1131 UTC and maximum height 13.8 km at 1101 UTC 5.Single cell with maximum reflectivity of 52.5 dBz at 1222 UTC and maximum height 09.9 km at 1211 UTC	4.WSW/131.5 km moving in Easterly direction 5.WSW/132.4 km moving in Easterly direction	4. Isolated Single cell formed in WSW direction at 1032 UTC at a distance 131.5 k.m. Matured and dissipated at SW at a distance of 107.3 km from radar at 1231UTC. 5. Isolated Single cell formed at 1202 UTC in WSW direction at a distance 132.4 k.m. Matured and dissipated at WSW at a distance of 122.2 km from radar at 1301 UTC.	Thunders torm / Rain/Hail Thunders torm / Rain	N/A N/A
		231411-232351	Nil	Nil	NOSIG ECHO	Nil	Nil
		240002-240301	Nil	Nil	NOSIG ECHO	Nil	Nil
Patna	24-03-18	230300-240300	Nil	Nil	Nil	Nil	Nil

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)
Jorhat	Northeast India	Assam	Thunderstorm	24-03-18	0730	0830
N/Lakhimpur	Northeast India	Assam	Thunderstorm	23/24-03-18	232200	240200
Tezpur	Northeast India	Assam	Thunderstorm	24-03-18	0030	0130
Gangtok	East India	Sikkim	Thunderstorm	23-03-18	1445 1600	1515 1740
Tadong	East India	Sikkim	Thunderstorm	23-03-18	1510	1845
Haldia	East India	West Bengal (GWB)	Thunderstorm	23-03-18	1740	1755
Digha	East India	West Bengal (GWB)	Thunderstorm	23-03-18	1722	1925

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

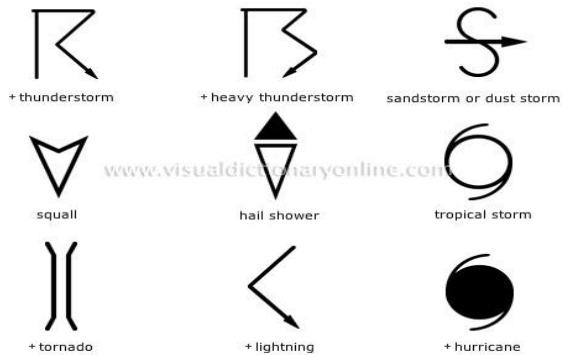
ForRadarimagesofthepast24hoursincludingmosaicofimages:

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	