



India Meteorological Department

FDP STORM Bulletin No. 24 (30-03-2018)

1. CURRENT SYNOPTIC SITUATION:

NWFC INFERENCE (0300UTC of the Day):

- The remnant Western Disturbance as a trough in mid & upper tropospheric westerlies with its axis at 5.8 km above mean sea level now runs roughly along 86°E to the north of Lat. 25°N.
- The core of sub-tropical westerly Jet stream at 9.5 km above mean sea level over Indian region is now seen embedded in the above trough.
- A fresh Western Disturbance is likely to affect Western Himalayan Region from 2nd April.
- A trough extending upto 1.5 km above mean sea level runs from east Bihar to South Interior Odisha across northeast Jharkhand and Gangetic West Bengal.
- The cyclonic circulation over east Jharkhand & adjoining West Bengal and Bihar extending upto 0.9 km above mean sea level now lies embedded in the above trough.
- A trough extending upto 1.5 km above mean sea level runs from south Madhya Maharashtra to Comorin area across interior Karnataka and interior Tamilnadu.

SATELLITE OBSERVATIONS during past 24hrs and current observation:

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

Convective Activity:

Cell No	Date/Time(UTC)	Area/Location	MINIMUM CTT (minus °C)	Remarks
9	29/1700	W Meghalaya	58	Developing
	29/2130	Meghalaya, W Assam	54	N-Wards
	29/2300	W Assam adjoining SHWB	60	--
	30/0000	Extreme W Assam adjoining SHWB	54	--
	30/0100	Extreme W Assam adjoining SHWB, Bihar	54	--
	30/0200	W Assam adjoining SHWB E Bihar	67	--
	30/0300	W Assam adjoining SHWB, Bihar, Arunachal Pradesh, Sikkim	62	--

	30/0400	SHWB adjoining Assam	66	--
	30/0500	do	66	--
	30/0600	do	65	--
	30/0700	SHWB adjoining W Meghalaya	66	--
	30/0800	do	73	--
	30/0900	do	77	--

Western Disturbance (WD):

Scattered multi-layered clouds seen over Nepal and Tibet adjoining china in association with WD over the area.

Broken multi-layered clouds seen over Caspian Sea and neighbourhood in association with another WD over the area.

Clouds description within India:

Scattered low/medium clouds with embedded intense to very intense convection seen over Sub-Himalayan West Bengal adjoining West Meghalaya. Broken low/medium clouds with embedded moderate to intense convection seen over Marathawada. Scattered low/medium clouds with embedded isolated moderate to intense convection seen over Southeast Uttarakhand, North Uttar Pradesh, South Interior Karnataka, Andhra Pradesh and North Tamilnadu. Isolated weak to moderate convection seen over Sikkim, Manipur and rest Odisha. Scattered low/medium clouds seen over Jammu & Kashmir, North Himachal Pradesh, East Rajasthan, North Madhya Pradesh, Kankan & Goa, rest Sub-Himalayan West Bengal, rest Northeastern States, Telangana, rest Karnataka and Andaman & Nicobar Islands.

Arabian Sea:

Scattered low/medium clouds with embedded moderate to intense convection seen over Southwest Arabian Sea adjoining Indian Ocean between lat 2.0N^o to 16.0^oN, long 51.0^oE to 70.0^oE.

Bay of Bengal & Andaman Sea:

Broken low/medium clouds with embedded moderate to intense convection seen over South Andaman Sea adjoining Southeast Bay.

Past Weather:

Convection (during last 24 hrs):

Moderate to intense convection was observed over Bihar Sikkim Arunachal Pradesh Assam Nagaland Meghalaya Tripura Manipur Mizoram Sub Himalayan west Bengal Orissa Andhra Pradesh Telangana and weak to moderate convection was observed over J&K Himachal Pradesh Uttarakhand Gujarat Punjab Haryana Maharashtra Karnataka.

OLR:-

Upto 370 wm^{-2} was observed over north Maharashtra south Madhya Pradesh

Upto 230 wm^{-2} was observed over J&K North Himachal Pradesh North Uttarakhand Sikkim SHWB Arunachal Pradesh Assam Meghalaya Nagaland Manipur Telangana And north Andhra Pradesh.

Convective Activity (past 24hrs):

Cell No.	Date/ Time (UTC)	Area/ Location	Minimum CTBT (Minus Deg C)	Movement/ Remarks
1	29/0300	W ASSAM	47	
	0600	DO	35	WEAK
2	29/0300	MANI ADJ ASSAM	40	
	0600	DO	----	DISSIPATED
3	29/0600	SHWB	50	DEVELOPING
	0700	DO	53	
	0800	DO	57	
	0900	SHWB ADJ ASSAM	65	
	1200	SHWB	55	
	1300	DO	47	
	1400	DO	45	
	1500	DO	----	DISSIPATED
4	29/1200	ASSAM MEGHA	67	DEVELOPING
	1300	DO	65	
	1400	NE BD MEGHA ASSAM	66	
	1500	NE BD MEGHA ASSAM NAGA	66	E-WARDS
	1600	NE BD MEGHA ASSAM NAGA MANI	64	
	1700	E MEGHA E ASSAM NAGA MANI	57	
	2130	DO	----	DISSIPATED
5	29/1200	NAGA	47	DEVELOPING
	1300	DO	53	
	1400	DO	----	DISSIPATED
6	29/1200	S GWB ADJ ORS	57	DEVELOPING
	1300	DO	58	
	1400	DO	----	DISSIPATED
7	29/1200	COTL ORS	59	DEVELOPING
	1300	N COTL ORS	50	
	1400	DO	----	DISSIPATED
8	29/1200	N COTL AP	60	DEVELOPING
	1300	COTL AP	60	

	1400	NE RYLSM S TLNGN N COTL AP	58	
	1500	DO	55	
	1600	NE RYLSM	44	
	1700	DO	----	DISSIPATED
9	29/1700	W MEGHA	58	DEVELOPING
	2130	MEGHA W ASSAM	54	N-WARDS
	2300	W ASSAM ADJ SHWB	60	
	30/0000	EXT W ASSAM ADJ SHWB	54	
	30/0100	EXT W ASSAM ADJ SHWB BHR	54	
	30/0200	W ASSAM ADJ SHWB E BHR	67	
	30/0300	W ASSAM ADJ SHWB BHR ARUPR SKM	62	

Synoptic Features:

Trough in Westerlies runs roughly along Longitude 72.0E & North of Latitude 23.0N.

Dynamic Features:-

Negative shear tendency is observed over Uttar Pradesh Haryana Rajasthan and positive shear tendency observed over rest 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 south J&K North Himachal Pradesh north Uttarakhand Uttar Pradesh North Andhra Pradesh Orissa Gangetic west Bengal.

Negative low level convergence over Gujarat Maharashtra Sub Himalayan West Bengal North-East States and Positive Low Level Convergence over rest India region

Precipitation:

IMR:

Rainfall upto 50-70 mm observed over north east J&K and north east Uttarakhand

Rainfall upto 30-50 mm observed over rest North east J&K and rest north east Uttarakhand

Rainfall upto 10-30 mm observed over rest north J&K and north Uttarakhand

Rainfall upto 01-10 mm observed over rest J&K Himachal Pradesh rest Uttarakhand North-East states West Orissa Gangetic west Bengal Telangana north Andhra Pradesh south Karnataka and north Tamilnadu.

HEM:

Rainfall upto 139 mm observed over north east Uttarakhand

Rainfall upto 1-14 mm observed over west Assam adjoining Sub-Himalayan West Bengal west Meghalaya Manipur adjoining Assam south east Orissa Telangana North Andhra Pradesh some parts of south Karnataka and Kerala.

RADAR and RAPID RGB Observation:

Strong isolated/multiple echoes are seen on DWR Kolkata (dBZ >60 and height >15km) over West Bangladesh and adjoining extreme East Gangetic West Bengal at around 1530 IST. Moderate to strong isolated/multiple echoes were also seen on DWR Machilipatnam (dBZ around 55 and height >15km), Agartala (dBZ around 50 and height around 12-15km), Chennai (dBZ around 55 and height around 15km), Hyderabad ((dBZ around 50 and height around 15km), Cherrapunjee (dBZ 45-50 and height around 15km) domains at around 1530 IST.

RAPID RGB Satellite imagery at 1500IST indicates significant convection over Sikkim, West & Central Assam, Meghalaya, Western parts of Arunachal Pradesh, Odisha, Coastal Andhra Pradesh, South Interior Karnataka adjoining Tamilnadu & adjoining Rayalaseema Telangana and over Nicobar Islands.

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

Higher Dust concentration was observed over Arab countries and western part of India. 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	30.03.2018	31.03.2018
PM10 (micro-g/m ³)	193	185
PM2.5 (micro-g/m ³)	85	81

2. NWP MODEL GUIDANCE:

NCMRWF (NCUM forecast based on 00UTC the day):

1. Weather Systems:

Low level CYCIRS, Troughs:

12 UTC of Day 0-2: 850 hPa over Bihar-WB region which forms closed weak cyclonic circulation in Day-2-4 shifting SW wards to over Jharkhand and adjoining Chhattisgarh. Prominent in 700 hPa circulation.

Confluence & Wind Discontinuity Regions:

12 UTC of Day 0-1: at 925 hPa S-N wind discontinuity over interior peninsula extending SW-NE along the east coast

12 UTC of Day 2-3: at 925 hPa S-N wind discontinuity over interior peninsula.

Synoptic Systems:

12 UTC of Day 1-3: At 500 hPa westerly trough over UP in Day-1 to Day-2 and to over east UP and Bihar in Day-3. The trough is rather deep extending to parts of peninsula.

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

12UTC Day-0 to 1: over UP shifting towards Bihar.

3. Convergence at 850 hPa:

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

Day0: Assam_Meghalaya, Gangetic_WB, Jharkhand, Bihar, East_UP, Odisha, Madhya_Maharashtra, Chhattisgarh, Telangana, TN_Puducherry, NI_Karnataka, SI_Karnataka, Kerala,

Day1: Arunachal_Pradesh, Jharkhand, West_UP, Odisha, West_MP, East_MP, Madhya_Maharashtra, Vidarbha, Chhattisgarh, Telangana, TN_Puducherry, NI_Karnataka, SI_Karnataka,

Day2: Gangetic_WB, Jharkhand, Odisha, East_MP, Madhya_Maharashtra, Vidarbha, Chhattisgarh, Coastal_AP, Telangana, NI_Karnataka, SI_Karnataka,

Day3: NE_NMMT, Jharkhand, Odisha, Madhya_Maharashtra, Chhattisgarh, NI_Karnataka, SI_Karnataka,

Day4: NE_NMMT, East_MP, Madhya_Maharashtra, NI_Karnataka, SI_Karnataka

4. Low level Vorticity:-Positive Vorticity:

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

Day0: Assam_Meghalaya, Sub_Himalayan_WB, Jharkhand, Bihar, East_UP, West_UP, Jammu_Kashmir, Odisha, TN_Puducherry,

Day1: Assam_Meghalaya, Gangetic_WB, Jharkhand, Odisha, East_MP,

Day2: Gangetic_WB, Jharkhand, Chhattisgarh,

Day3: NE_NMMT, Madhya_Maharashtra,

Day4: Assam_Meghalaya

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

Day/Index: Subdivisions with Showalter Index < -4

Day0: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Sub_Himalayan_WB, Jharkhand, Bihar, East_UP, Odisha, Coastal_AP, Rayalseema, TN_Puducherry, Coastal_Karnataka, SI_Karnataka, Kerala,

Day1: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Sub_Himalayan_WB, Gangetic_WB, Jharkhand, Bihar, East_UP, Odisha, Vidarbha, Chhattisgarh, Coastal_AP, Telangana, Rayalseema, TN_Puducherry, SI_Karnataka, Kerala,

Day2: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Sub_Himalayan_WB, Gangetic_WB, Jharkhand, Bihar, East_UP, Himachal_Pradesh, Jammu_Kashmir, Odisha, East_MP, Vidarbha, Chhattisgarh, Coastal_AP, Telangana, Rayalseema, TN_Puducherry, SI_Karnataka, Kerala,

Day3: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Sub_Himalayan_WB, Gangetic_WB, Jharkhand, Bihar, East_UP, Uttarakhand, Jammu_Kashmir, Odisha, East_MP, Vidarbha, Chhattisgarh, Coastal_AP, Telangana, Rayalseema, TN_Puducherry, Kerala,

Day4: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Sub_Himalayan_WB, Gangetic_WB, Uttarakhand, Himachal_Pradesh, Jammu_Kashmir, Odisha, Vidarbha, Chhattisgarh, Coastal_AP, Telangana, Rayalseema, TN_Puducherry, Kerala.

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

Day/Index: Subdivisions with K Index > 40

Day0: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Sub_Himalayan_WB, Gangetic_WB, Jharkhand, Bihar, East_UP, West_UP, Uttarakhand, Hry_Chnd_Delhi, Punjab, Himachal_Pradesh, Jammu_Kashmir, Odisha, Coastal_AP, Rayalseema, SI_Karnataka,

Day1: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Sub_Himalayan_WB, Gangetic_WB, Jharkhand, Bihar, East_UP, West_UP, Uttarakhand, Hry_Chnd_Delhi, Jammu_Kashmir, East_RJ, Odisha, West_MP, East_MP, Vidarbha, Chhattisgarh, Coastal_AP, Telangana, Rayalseema,

Day2: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Sub_Himalayan_WB, Gangetic_WB, Jharkhand, Bihar, East_UP, West_UP, Uttarakhand, Himachal_Pradesh, Jammu_Kashmir, East_RJ, Odisha, West_MP, East_MP, Vidarbha, Chhattisgarh, Coastal_AP, Telangana, Rayalseema, NI_Karnataka,

Day3: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Sub_Himalayan_WB, Gangetic_WB, Jharkhand, Bihar, East_UP, Himachal_Pradesh, Jammu_Kashmir, Odisha, East_MP, Vidarbha, Chhattisgarh, Coastal_AP, Telangana, Rayalseema, NI_Karnataka, SI_Karnataka,

Day4: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Sub_Himalayan_WB, Gangetic_WB, Jharkhand, Bihar, West_UP, Uttarakhand, Hry_Chnd_Delhi, Punjab, Himachal_Pradesh, Jammu_Kashmir, Odisha, Vidarbha, Chhattisgarh, Coastal_AP, Telangana.

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

Day/Index: Subdivision with Total Totals Index > 52

Day0: Arunachal_Pradesh, Assam_Meghalaya, Sub_Himalayan_WB, Coastal_AP, Telangana, Rayalseema, TN_Puducherry, Coastal_Karnataka, SI_Karnataka, Kerala,

Day1: Assam_Meghalaya, NE_NMMT, Gangetic_WB, Odisha, Chhattisgarh, Coastal_AP, Telangana, Rayalseema, TN_Puducherry, SI_Karnataka, Kerala,

Day2: Gangetic_WB, Jharkhand, Bihar, East_UP, West_UP, Uttarakhand, Odisha, East_MP, Chhattisgarh, Coastal_AP, Telangana, Rayalseema, TN_Puducherry, SI_Karnataka, Kerala,

Day3: Arunachal_Pradesh, Jharkhand, Bihar, Uttarakhand, Jammu_Kashmir, Odisha, East_MP, Vidarbha, Chhattisgarh, Coastal_AP, Telangana, Rayalseema, TN_Puducherry, SI_Karnataka,

Day4: Arunachal_Pradesh, Sub_Himalayan_WB, Uttarakhand, Himachal_Pradesh, Jammu_Kashmir, Coastal_AP, Telangana, Rayalseema, TN_Puducherry, SI_Karnataka.

8. Rainfall and thunder storm activity:

Day/Index: Subdivisions with Precipitation > 2 cm

Day1: Arunachal_Pradesh, Assam_Meghalaya, Sub_Himalayan_WB, Bihar, SI_Karnataka, Kerala,
Day2: Arunachal_Pradesh, Assam_Meghalaya, Sub_Himalayan_WB, Gangetic_WB, Jharkhand, Odisha, Coastal_AP,
Day3: Gangetic_WB, Jharkhand, Bihar, Odisha, Chhattisgarh, Coastal_AP,
Day4: Jharkhand, Odisha, Chhattisgarh, Coastal_AP,
Day5: Jammu_Kashmir

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

1. Synoptic Systems:

The analysis based on 00 UTC North-South trough in lower troposphere extending from East Uttar Pradesh extending southward up to Tamil Nadu has become less marked thereafter. Analysis also shows a Trough from south Madhya Maharashtra to interior Tamilnadu persist in next 3 days forecast. Another trough is seen in the analysis extending from Bihar up to south interior Orissa persist for next 3 days forecast. Another trough is seen in the analysis extending from north of Orissa across Chhattisgarh East Madhya Pradesh up to Telangana. The forecast shows a cyclonic circulation over west Uttar Pradesh and adjoining areas in next 24 Hours moving south eastwards and become less marked thereafter. Forecast also shows a feeble cyclonic circulation over Bihar and adjoining Jharkhand region in next 24 hour becoming less marked thereafter.

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 Punjab, Himachal Pradesh, East Uttar Pradesh up to Bihar Jharkhand and adjoining areas and NE states on all 3 days. Also found in the vicinity of trough over Bihar across GWB, Orissa and Chhattisgarh up to Telangana.

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 coastal areas of Gangetic West Bengal and Kolkata, Orissa, Bihar, Jharkhand, Andhra Pradesh, Telangana, Rayalaseema, Kerala, Karnataka, Tamil Nadu, parts of Gujarat, coastal Maharashtra, Konkan & Goa, Madhya Maharashtra, Marathawada, East Vidarbha adjoining Chhattisgarh, coastal areas along the east coast and west coast, extreme south peninsular India, NE states and parts of Uttar Pradesh on all 3 days; over parts of North West Rajasthan and East Madhya Pradesh on day 2 and 3; Maximum value of the index is seen over parts of Gujarat, coastal areas along the west coast, Konkan and Goa, coastal Maharashtra, Karnataka, GWB, coastal Orissa, Bihar, Jharkhand, East Vidarbha, Chhattisgarh, coastal Andhra Pradesh, Telangana, Tamil Nadu, Over parts Tripura and adjoining area during all 3 days; over some parts of east Uttar Pradesh and adjoining area from day 2 onwards.

Lifted Index (< -2): The threshold value of the index is below -2 over parts of Gujarat, Saurashtra region, coastal Andhra Pradesh, coastal Karnataka, Telangana, Rayalaseema, Konkan and Goa, Kerala, Tamil Nadu, southern part of west coast, coastal areas along the east coast, coastal Orissa, Chhattisgarh, GWB, Konkan and Goa, Bihar, Jharkhand, East Uttar Pradesh, NE states on all 3 days; over parts of East Madhya Pradesh from day 2 onwards; over parts of west Uttar Pradesh on day 3; maximum negative value of the index less than -10 can be seen over parts of Bihar, Jharkhand, GWB and Kolkata and Orissa during all 3 days; over some parts of East Uttar Pradesh on day 2; over parts of coastal Andhra Pradesh and Telangana on day 3.

Total Total Index (> 50): Above threshold value is seen over most of the parts of India except NE states, extreme southern peninsular India and coastal areas along the east coast on day 1 and 2; higher than threshold value is seen over most of the part of country except southern Peninsular India, Bihar, Jharkhand, East Uttar Pradesh, GWB and NE states.

Sweat Index (> 300): Higher than threshold value of index over Parts of J&K, NE states, GWB, coastal areas along the east coast and west coast, Gujarat, Himachal Pradesh, Uttarakhand, Foothills of Himalaya, Uttar Pradesh, Orissa, Andhra Pradesh, Kerala, Tamil Nadu, Konkan and Goa, Coastal Maharashtra, Karnataka, Bihar and Jharkhand, Chhattisgarh, Vidarbha, East and West Madhya Pradesh during all three days; over parts of Rajasthan on day 2 and 3; Maximum value of the index greater than 800 is seen over Assam Tripura and adjoining area, GWB, Orissa, Andhra Pradesh, Chhattisgarh, Bihar and Jharkhand on all 3 days; over parts of Telangana on day 3.

CAPE (> 1000): Mostly in areas of southern peninsular India, along west coast and over east coast and coastal areas of GWB, Orissa, Andhra Pradesh, Telangana, Rayalaseema, Kerala, Tamilnadu, Karnataka, Konkan and Goa, Gujarat and coastal Maharashtra, Madhya Maharashtra, Marathawada, Vidarbha, Bihar, Jharkhand, East Uttar Pradesh and NE states during all 3 days; over parts of and East Madhya Pradesh from day 2 onwards; Maximum value of the index can be seen mostly over coastal areas along the east coast from GWB to southern parts of coastal Tamil Nadu, Orissa, Andhra Pradesh, Bihar, Jharkhand during all 3 days, over parts of East Uttar Pradesh on day 2 and 3; over parts of Chhattisgarh from day 2 onwards.

CIN (50-150): Mostly over parts of Gujarat, along east coast along west coast from Saurashtra & Kutch to coastal Karnataka and Kerala, Konkan and Goa, coastal Orissa, Telangana, Rayalaseema, Vidarbha, Andhra Pradesh and GWB, NE states, Bihar, Jharkhand, East Uttar Pradesh and adjoining /Madhya Pradesh region during all 3 days. Over parts of west Uttar Pradesh, Uttarakhand and Rajasthan on day 2 and 3.

5. Rainfall Activity:

70-130 mm Rainfall: Over parts of GWB, Kolkata and adjoining areas on day 3.

40-70 mm Rainfall; over parts of GWB and Kolkata on day 2 and 3; over some parts of Orissa and Jharkhand on day 3.

10- 40 mm rainfall: over parts of Arunachal Pradesh, Sikkim, Assam, Tripura, Meghalaya, Nagaland and adjoining, Kerala, Tamil Nadu and south Karnataka area during all 3 days; over parts of SHWB and Sikkim on day 1; over parts of Orissa, GWB and Kolkata on day 2 and 3; over parts of Bihar, Jharkhand, Orissa and Andhra Pradesh on day 3.

Up to 10 mm rainfall: Over NE states, Foothills of Himalaya, East Uttar Pradesh, Bihar, Jharkhand, Andhra Pradesh, Kerala, Karnataka, Tamil Nadu, Telangana, Rayalaseema, Orissa, Chhattisgarh, during all 3 days; over parts of J&K, on day 1 and 3; over parts of Himachal Pradesh on day 1; over parts of Uttarakhand on day 1 and 2; over parts of East Madhya Pradesh on day 2 and 3.

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

1. Model Reflectivity (Max.dBz):

Over parts of Assam, Meghalaya, Tripura, Mizoram, Sikkim, Arunachal Pradesh and adjoining area, East Uttar Pradesh, Bihar, Jharkhand, GWB and Kolkata, Orissa and Foothills of Himalaya on all three days; over parts of J&K on day 1 and 3; over parts of Tamil Nadu adjoining Kerala, Andhra Pradesh and Karnataka on day 1; maximum value of the Model reflectivity greater than 50 dBZ can be seen over parts of Bihar, Jharkhand, Orissa, SHWB and NE states during all three days; over parts of East Uttar Pradesh and GWB on day 2 and 3; over some parts of Andhra Pradesh on day 1.

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 southern part of east coast and west coast and some part of NE states on day 1 and 2; and over parts of Punjab, Haryana, Himachal Pradesh, East and West Uttar Pradesh, Jharkhand, Bihar, Orissa, East Madhya Pradesh and Chhattisgarh on day 3; maximum value of the index is seen over parts of Rajasthan, Uttar Pradesh, Madhya Pradesh, Vidarbha, Chhattisgarh, Bihar, Jharkhand, Orissa, GWB, Andhra Pradesh, Karnataka, Telangana, Madhya Maharashtra and Marathwada region on all 3 days.

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 parts of Gujarat, coastal areas of southern part of west coast, coastal Maharashtra, Konkan and Goa, coastal areas along the east coast, coastal Orissa, GWB, NE states, parts of Tamil Nadu, Kerala, Karnataka, Andhra Pradesh, Uttar Pradesh, Bihar, Jharkhand, Chhattisgarh, Telangana, Rayalaseema and Extreme south peninsular India during all 3 days; over parts of J&K on day 1; over Parts of Vidarbha and Madhya Pradesh from day 1 onwards; over parts of West Uttar Pradesh, Punjab Haryana, North West Rajasthan and Delhi on day 3; Maximum value of the index is seen over the parts of Orissa and its coastal areas, coastal Andhra Pradesh and GWB and Kolkata, southern part of west coast, over east coast from Orissa to Tamil Nadu, Bihar and Jharkhand on all 3 days; some parts of Assam and adjoining areas on day1; parts of East Uttar Pradesh, coastal Kerala, Karnataka, Telangana and adjoining areas on day 2 and 3.

CIN (50-150): Over coastal areas of east coast and west coast, GWB, parts of Orissa, Jharkhand and adjoining Bihar region, Jharkhand, Uttar Pradesh, Andhra Pradesh, Tamil Nadu, Kerala, Karnataka, Coastal Maharashtra, Konkan and Goa, Telangana, Rayalaseema, and NE states on all 3 days; over Parts of Madhya Pradesh, Vidarbha Chhattisgarh from day 2 onwards; over parts of J&K, Himachal Pradesh, Uttarakhand, Punjab, Haryana, Delhi, Rajasthan, Madhya Pradesh, Chhattisgarh and adjoining areas on day 3..

3. Rainfall and thunderstorm activity:

Above 130 mm Rainfall: over some parts of Jharkhand on day3.

70- 130 mm Rainfall: over some parts of East Uttar Pradesh, Bihar and Jharkhand on day 3.

40-70 mm Rainfall: over parts Assam, Arunachal Pradesh and adjoining areas, SHWB, Tamil Nadu on day 1 South Interior Karnataka on day 1; over parts of East Uttar Pradesh, Bihar, Jharkhand and Orissa on day 3.

10- 40 mm Rainfall: Over parts of Kerala, Tamil Nadu, adjoining Karnataka region, GWB, SHWB, Sikkim and NE states on all 3 days; over parts Bihar, Jharkhand on day 1 and 3; over parts of Andhra Pradesh on day 1 and 2; over parts of Orissa and adjoining Chhattisgarh on day 3; over parts of East Uttar Pradesh on day 2 and 3.

Up to10 mm Rainfall: Over parts of Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, Telangana, Orissa, Bihar, Jharkhand, GWB, NE states and foothills of Himalaya on all 3 days; over parts of Himachal Pradesh, Uttarakhand and J&K on day 1 and 3, over parts of East Uttar Pradesh and Chhattisgarh on day 2 and 3.

3. IOP ADVISORY FOR 24 and 48Hrs:

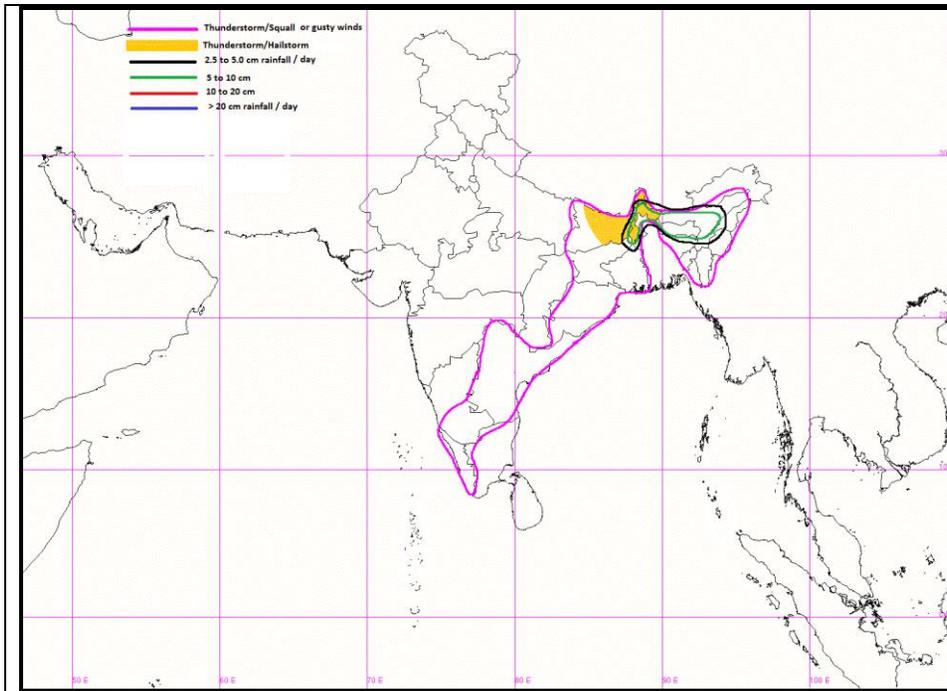
Summary and Conclusions:

Day-1 & Day-2:

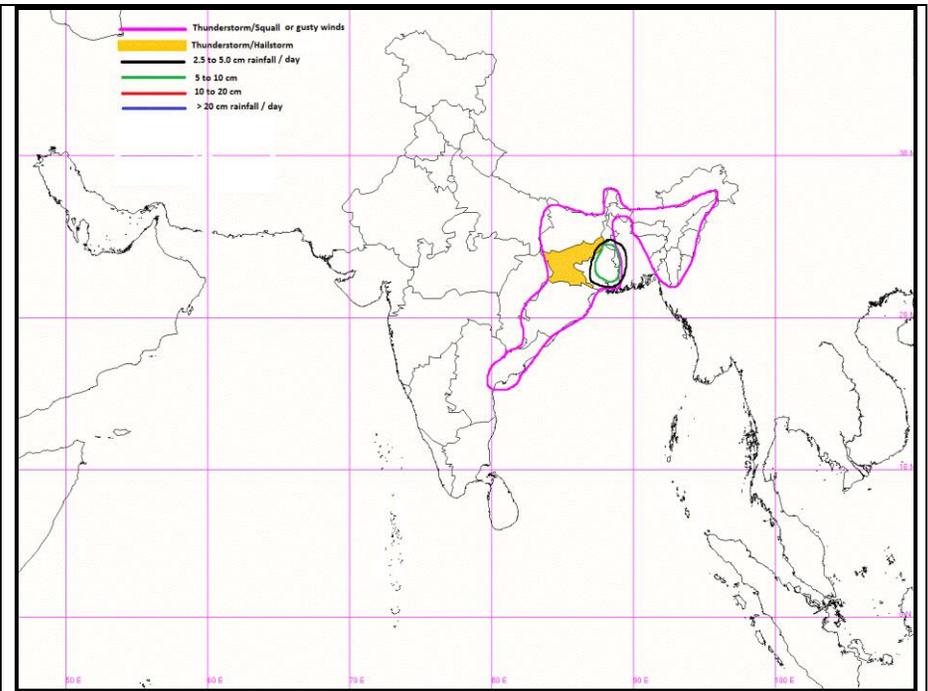
- The remnant Western Disturbance as a trough in the mid & upper tropospheric westerlies could remain practically stationary for today & tomorrow, roughly along 86-87°E. It has deepened as compared to yesterday. Also the core of sub-tropical westerly jet is now lying embedded in this trough. This situation is providing strong westerly shear over north-eastern parts of Gangetic West Bengal, Sub-Himalayan West Bengal, Assam & Meghalaya, and Nagaland-Manipur-Mizoram & Tripura at present. Significant low level convergence and upper level divergence, though absent at present, are likely to develop towards afternoon/ evening over these regions.
- Moisture incursion towards Sub-Himalayan West Bengal and West Assam is likely to continue today, over to Gangetic West Bengal from today evening and adjoining areas of eastern India during late evening of D1 and also during Day-2.
- Thunderstorm associated with Hailstorm / squalls are likely over Sub-Himalayan West Bengal & Sikkim, adjoining districts of Gangetic West Bengal and northern parts of Odisha, Bihar Assam & Meghalaya and Nagaland, Manipur, Mizoram and Tripura, today and tomorrow. Jharkhand also need to be monitored for Thunderstorm developments for tomorrow.
- There is likelihood of heavy rains in a few districts of Sub-Himalayan West Bengal and West Assam today (Day-1) and over northeastern parts of Gangetic west Bengal tomorrow (Day-2).
- There is a north south trough extending upto 1.5 km a.s.l. from south Madhya Maharashtra to Comorin area. Regions like Telangana and north coastal Andhra Pradesh to the east of this trough line and Kerala to the west of this trough line are also need to be monitored for development of singular CB cells on Day1 & Day-2

24 hour Advisory for IOP:	48 hour Advisory for IOP:
<p>Rainfall: Sub Himalayan West Bengal, West Assam, Meghalaya</p> <p>Thunderstorm with associated phenomenon: West Bengal & Sikkim Bihar, Odisha, Jharkhand Assam and Meghalaya, Nagaland, Manipur, Mizoram and Tripura Kerala, Telangana, South Interior Karnataka, Rayalaseema, Coastal Andhra Pradesh</p>	<p>Rainfall: Gangetic West Bengal</p> <p>Thunderstorm with associated phenomenon: West Bengal & Sikkim Bihar, Odisha, Jharkhand North Coastal Andhra Pradesh Assam and Meghalaya, Nagaland, Manipur, Mizoram and Tripura</p>

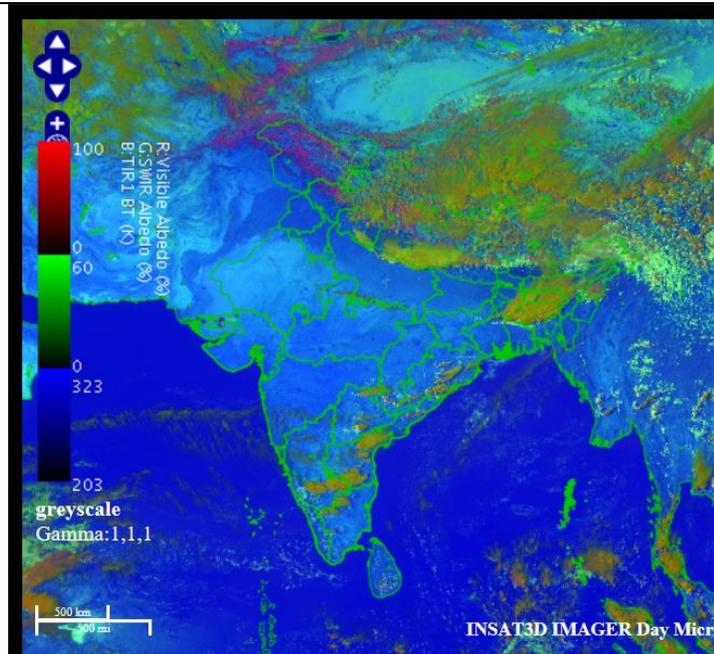
Graphical Presentation of Potential Areas for Severe Weather:



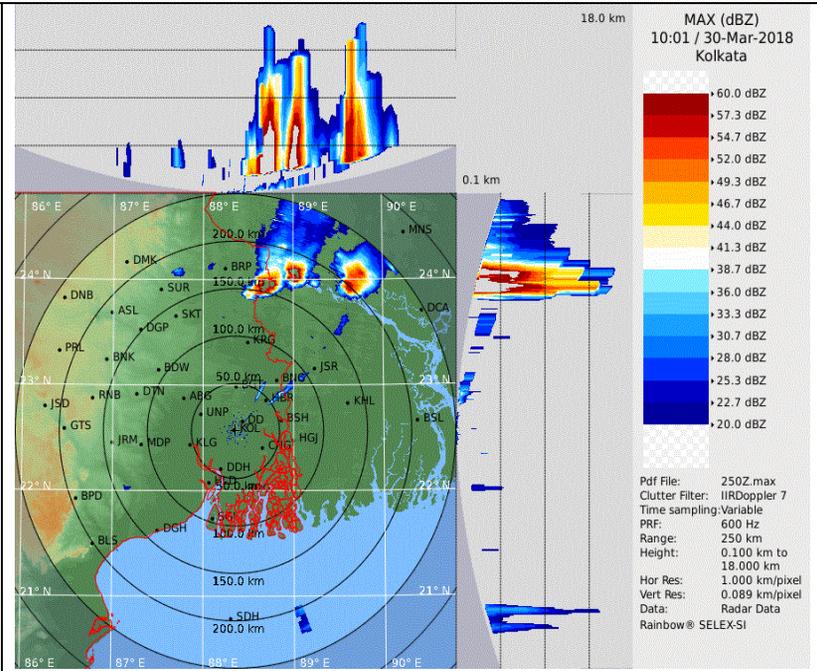
IOP Advisory for 24 hours



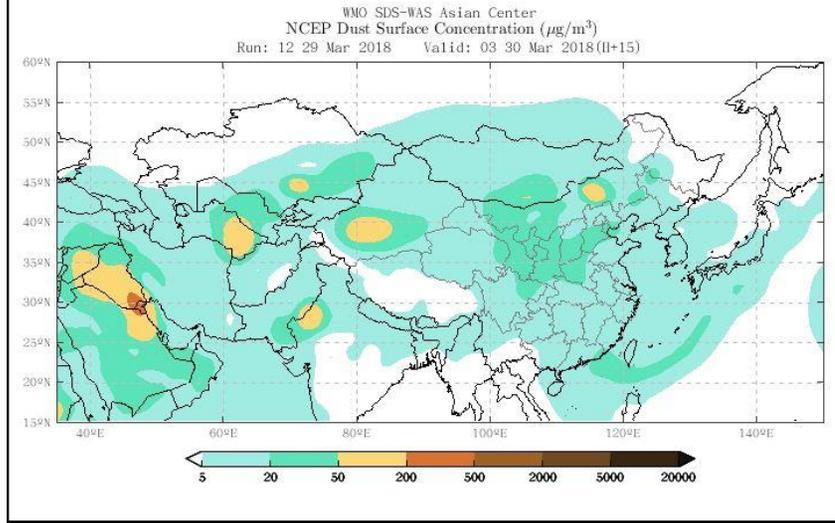
IOP Advisory for 48 hours



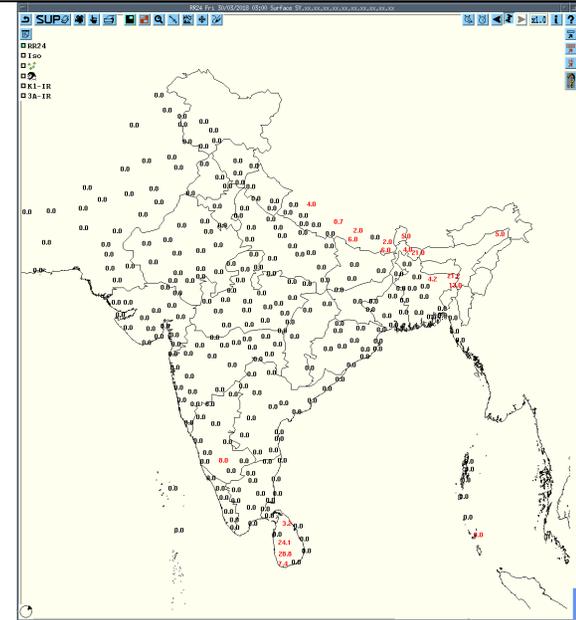
RAPID RGB Imagery at 1500 IST of the Day



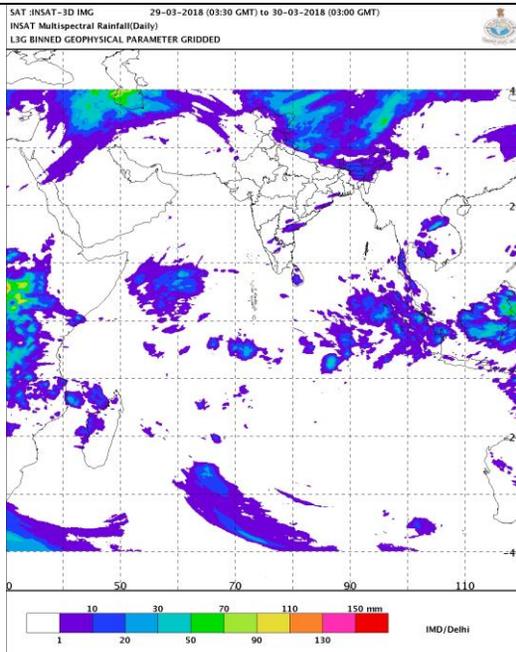
DWR Kolkata at 1531IST of the Day



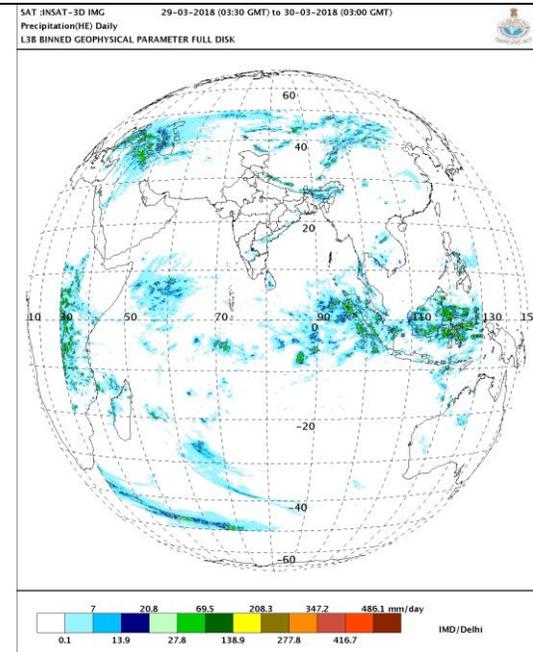
Dust AOD Forecast



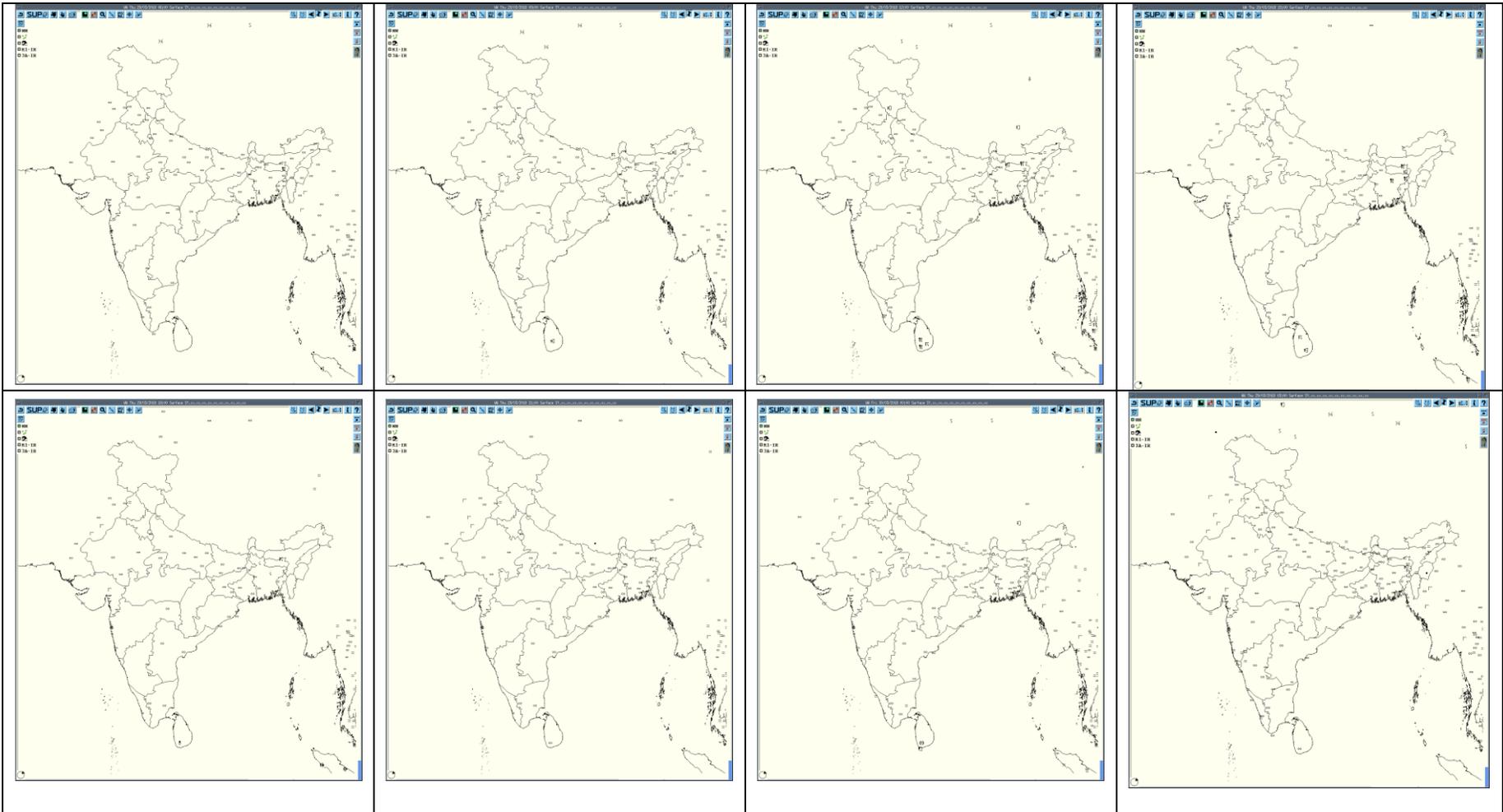
Accumulated 24 Hour rainfall (in red) recorded at 0300UTC of today



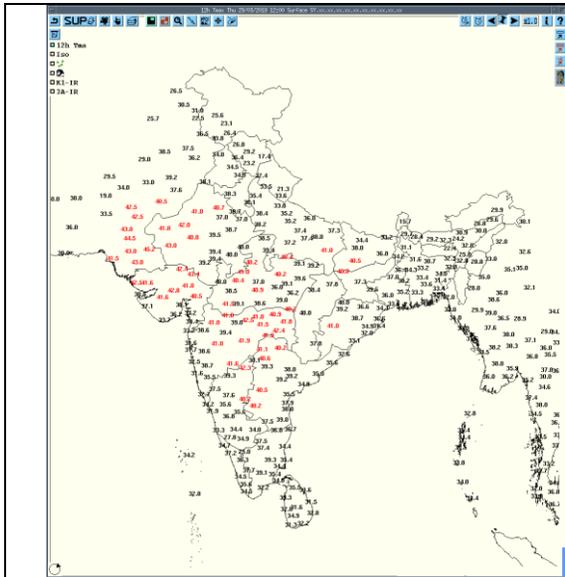
IMR



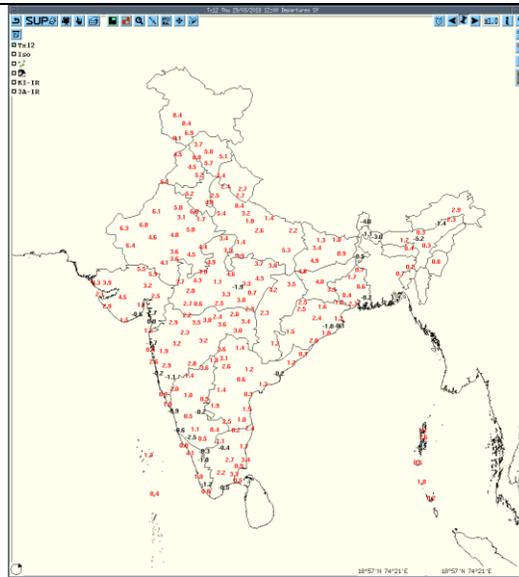
HEM



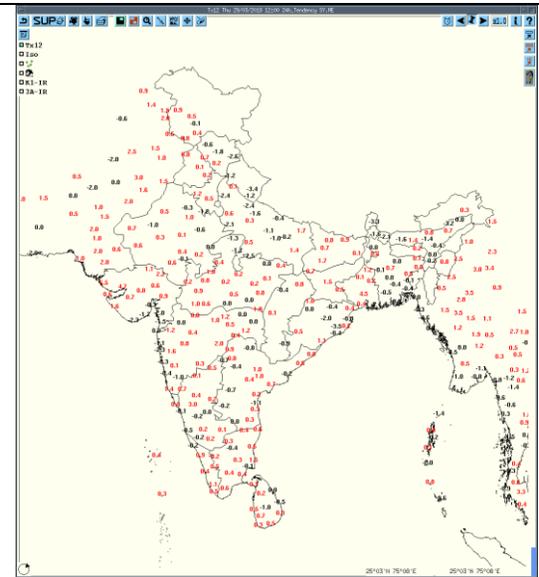
3hourly Past weather at 06, 09, 12, 15, 18, 21 UTC of yesterday and 00 & 03 hrs UTC of today



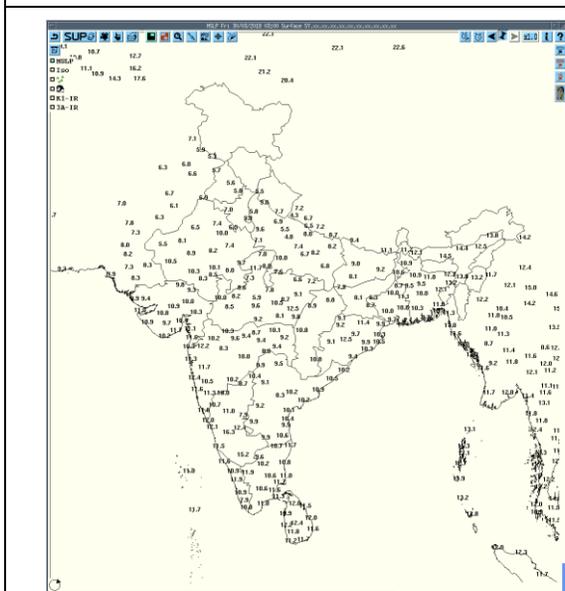
Tmax



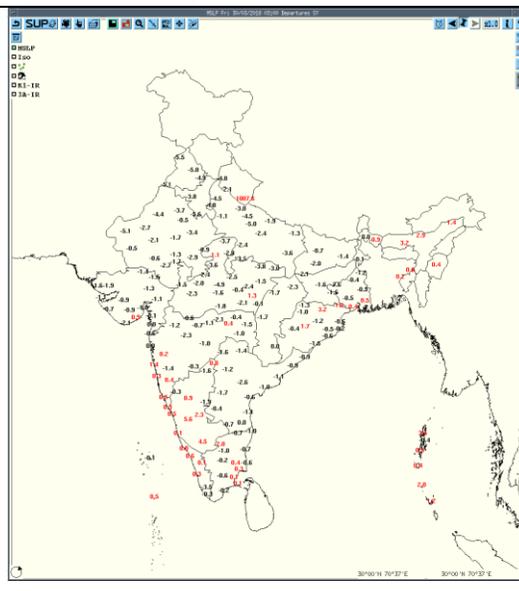
Departure Tmax



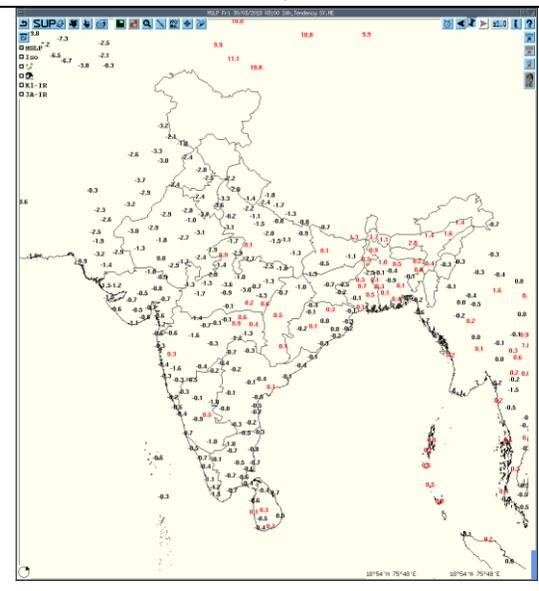
Tendency Tmax



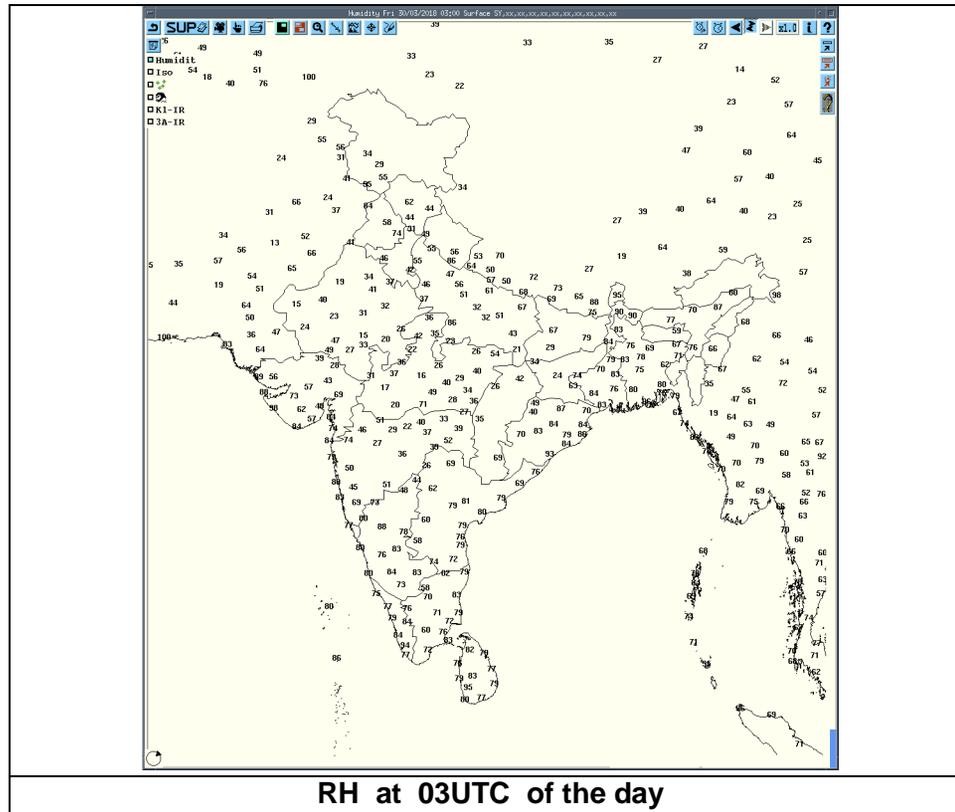
MSLP



Departure MSLP



Tendency MSLP



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
Patiala	30-03-18	290300-290900	No Echo	--	--	--	--
		290900-291200	Multiple cells. Ht. 12-14KMS. DBZ 53.0.	North Sector. Movement Ese –Wards.	_____	RA/TS	Dharamshala, Palampur, Manali And Its Adjoining Areas.
		291200-300300	No Echo	--	--	--	--
Jaipur	30-03-18	290300-300300	Nil	Nil	Nil	Nil	Nil
Kolkata		290300-290921	NIL	NIL	NO SIG ECHO	Nil	NIL
		290931-291151	Isolated single cell with maximum reflectivity 53.0 dBz at 1001 UTC and maximum height 12.90 at 1011 UTC	N (175.5 km) movement initially stationary thereafter SE –wards	Single cell formed in N direction at a distance of 175.5 km. from radar at 0931 UTC. Matured and dissipated at 1151 UTC in NNE at a distance 161.1 K.M. from Radar.	Thunderstorm / Rain	N / A
		291201-300000	NIL	NIL	NO SIG ECHO	Nil	NIL
		300000-300301	NIL	NIL	NOSIG ECHO	NIL	NIL
Agartala	30-03-18	290300-300300	Multiple cells found over Meghalayan hills at 290452Z, ABOUT 10KMS, 44DBZ	About 200 kms North, 30 KMPH , E-ly	Dissipated over Meghalayan hills at 290902Z	Not Known.	
			Multiple cells again found over Meghalayan hills at 290912z, about 14KMS, 55DBZ (radar non-operational due to no power from 291233Z to 291500Z	About 220 kms North, 30 KMPH , E-ly	Persists over Meghalayan hills at 291232Z	Not Known.	
			Squall line stretching about 100 kms found over Meghalayan hills and part of Bangladesh at 291202Z, 14KMS, 55DBZ (radar non-operational due to no power from 291233Z to 291500Z	About 190 kms NE, 40 Kmph, NE-ly	Persists with moderate intensity over Meghalayan hills and part of Bangladesh at 291232Z	Not Known.	

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
Lucknow	30-03-18	292012-292042	Isolated single cell system formed at 2012 UTC. The height reached 9 Km on 20 dBZ echo top scale. Max. reflectivity was observed 43 dBZ.	The cell formed over 80 Km NNE w.r.t. the station, moved along SE with an avg. velocity 12 m/s .	The cell weakened over 90 Km. NE and dissipated at 2042 UTC over 100 Km NE from the station.	NIL	NIL
Visakhapatnam	30-03-18	291200	Cb cells formed NE ly with max. reflectivity of 60dbz with maximum height of 14kms	NE (155, 225kms) moving SE ly	Cb cells formed at 0941 UTC matured at 1101 UTC and started dissipating from 1151 UTC	NIL	Ganjam, Gajapati and Rayagada dist. Of Orissa
		291500	Cb cell of max. reflectivity of 49dBz with maximum height of 12kms	NE (215 kms) moving SE ly	Cb started dissipating from 1151 UTC and dissipated completely at 1231 UTC	NIL	Ganjam dist. Of Orissa
		291800	Isolated single cell of max. reflectivity of 40dBz with height of 10kms	Nly at a distance of 245 KM moving ESEly	CB cell formed at 1641UTC and developing with max. reflectivity of 40dBz at 1741UTC. Convective region formed in bay of Bengal at 1501UTC and Max. reflectivity of 42dBz at 1731UTC	Nil	Kandhamal, Ganjam dist.(Orissa)
			Convective region of max. reflectivity of 42dBz with height of 5 kms	Sly at a distance of 183 km		Nil	
		300000	Isolated single cell of max. reflectivity of 58dBz with height of 13kms	NEly at a distance of 238 KM moving ESEly	CB cell developing with max. reflectivity of 58dBz at 2001UTC and start dissipating. Cb cell dissipated completely at 2051UTC.	NIL	Ganjam dist.(Orissa)
300300	convective cell of max. reflectivity of 57dbz with height of 4 kms	SE(182kms)moving NE ly	Convective cell formed at 0041 UTC and matured at 0101 UTC	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)
Sundernagar	Northwest India	Himachal Pradesh	Thunderstorm	29-03-18	1557	1700
Gorakhpur	Northwest India	East Uttar Pradesh	Thunderstorm	30-03-18	0550	0600
Itanagar	Northeast India	Arunachal Pradesh	Thunderstorm	29-03-18	1755	1758
Jorhat	Northeast India	Assam	Thunderstorm	29-03-18	2000	2110
Silchar	Northeast India	Assam	Thunderstorm	29-03-18	2050	2320
Dibrugarh	Northeast India	Assam	Thunderstorm	29-03-18	2030	2400
N/Lakhimpur	Northeast India	Assam	Thunderstorm	29-03-18	1200 1800	1400 2130
Tezpur	Northeast India	Assam	Thunderstorm	29/30-03-18	291900 300530	292000, 300615
Dhubri	Northeast India	Assam	Thunderstorm	29/30-03-18	291545 300600 300820	291635 300630 300830
			Hailstorm (dimeter:2.5cm)	29-03-18	1600	1625
Guwahati	Northeast India	Assam	Thunderstorm	29/30-03-18	291545 300820	300250 300830
Barapani	Northeast India	Meghalaya	Thunderstorm	29-3-18	1515	1710
Cherrapunjee	Northeast India	Meghalaya	Thunderstorm	29-/30-03-18	291900	300830
Shillong	Northeast India	Meghalaya	Thunderstorm	29-03-18	1040 1900	1220 1950
			Hailstorm(diameter:0.2cm)	29-03-18	1058	1101
Lengpui	Northeast India	Mizoram	Thunderstorm	29-03-18	1945	2045
Kailasahar	Northeast India	Tripura	Thunderstorm	29-03-18	2050	2230
Gangtok	East India	Sikkim	Thunderstorm	29-03-18	0850	1025
Chamarajanagar	South India	Karnataka (SIK)	Thunderstorm	29-03-18	1825	1910
Bengaluru HAL AP	South India	Karnataka (SIK)	Thunderstorm	29-03-18	1840	2100
Yelahanka IAF	South India	Karnataka (SIK)	Thunderstorm	29-03-18	1630	1730
Bengaluru City	South India	Karnataka (SIK)	Thunderstorm	29-03-18	1900	1920
Tadong	East India	Sikkim	Thunderstorm	29-03-18	0850	1020
Jalpaiguri	East India	West Bengal (SHWB)	Thunderstorm	29/30-03-18	1325 300715	1415 300830
			Thunderstorm	29/30-03-18	1440 300415	1530 300550
Coochbehar	East India	West Bengal (SHWB)	Squall from North with max wind speed 55kmph	29-03-18	1450	1451

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

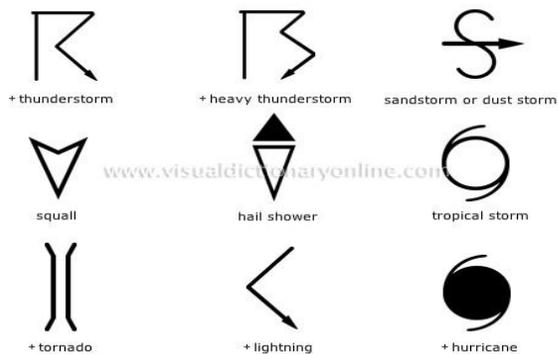
For Radar images of the past 24 hours including mosaic of images:

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	