India Meteorological Department

FDP STORM Bulletin No. 13 (19-03-2018)

1. CURRENT SYNOPTIC SITUATION:

NWFC INFERENCE (0300UTC of the Day):

♦ The Western Disturbance as an upper air cyclonic circulation over Iran & adjoining Afghanistan with a trough aloft now lies as a low pressure area over Iran & adjoining Afghanistan. Associated cyclonic circulation extends upto 9.5 km above mean sea level.

♦ The induced cyclonic circulation over south Pakistan and adjoining southwest Rajasthan extending upto 1.5 km above mean sea level now lies over south Pakistan & neighbourhood.

♦ A trough in the westerlies extending upto 0.9 km above mean sea level runs from East Bangladesh to interior Odisha with an embedded cyclonic circulation over north Odisha & neighbourhood.

♦ A cyclonic circulation extending upto 1.5 km above mean sea level lies over north Madhya Maharashtra & neighbourhood.

♦ A trough extending upto 0.9 km above mean sea level runs from the above cyclonic circulation to central parts of Rajasthan.

♦ A cyclonic circulation extending upto 0.9 km above mean sea level lies over southeast Arabian Sea off Kerala Coast.

♦ The trough in low level easterlies extending upto 0.9 km above mean sea level from Comorin area to Interior Karnataka now runs from the above cyclonic circulation to north Interior Karnataka across Kerala & south Interior Karnataka.

♦ The trough of low at mean sea level over Equatorial Indian Ocean and adjoining southeast Bay of Bengal persists and is feeble.

SATELLITE OBSERVATIONS during past 24hrs and current observation:

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

WESTERN DISTURBANCE (WD):

Scattered multi-layered clouds observed over East Iran, Afghanistan, North Pakistan in association with WD over the area.

Clouds description within India:

Scattered low/medium clouds with embedded isolated weak convection seen over Rajasthan, East Gujarat, South Interior Karnataka,
Scattered low/medium clouds were seen over Jammu & Kashmir,, North Himachal Pradesh, Southwest Punjab, Haryana adjoining Northwest Uttar Pradesh, Uttarakhand, South Odisha, Sikkim, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura, West Madhya Pradesh, Maharashtra, Telangana, Andhra Pradesh, North Interior Karnataka, Kerala, Tamilnadu, and Nicobar Islands.

Arabian Sea:

Scattered low/medium clouds with embedded moderate to intense convection seen over Southeast Arabian Sea off Kerala coast & Comorin.

Bay of Bengal & Andaman Sea:

Scattered low/medium clouds with embedded moderate to intense convection seen over extreme South Bay adjoining Indian Ocean between Lat 3.5N to 6.5N Long 80.0E to 90.0E.

Past Weather:

Convection (during last 24 hrs):
Intense to very Intense convection was observed over Karnataka Kerala and Moderate to intense convection observed over J&K and weak to moderate convection observed over Himachal Pradesh Uttarakhand Haryana Rajasthan Gujarat Maharashtra South-West Madhya Pradesh Telangana Rayalaseema Sikkim North-East States.

OLR:
Upto 230 wm^{-2} was observed over J & K, North Himachal Pradesh, North Uttarakhand, Sikkim, Arunachal Pradesh, South Interior Karnataka, Kerala and West Tamilnadu.

Synoptic Features:
Westerly Trough: Trough in westerlies previously along Longitude 58°E & north of Latitude 25°N now lies as a low pressure area over East Iran & adjoining Afghanistan.

Dynamic Features: Negative shear tendency is observed over north Odisha 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 Himachal Pradesh Uttrakhand Uttar Pradesh Gangetic West Bengal North Konkan North Madhya Maharashtra.
Negative Low Level Convergence is observed over Madhya Pradesh and Positive Low Level Convergence over rest parts of India.

Precipitation:
IMR:
Rainfall upto 50-70 mm observed over South Kerala and
Rainfall upto 30-50 mm observed over South-West parts of South Interior Karnataka adjoining North-West Tamilnadu and
Rainfall upto 01-10 mm observed over J&K North-East Himachal Pradesh rest Karnataka rest Kerala rest West Tamilnadu North Arunachal Pradesh.

HEM:
Rainfall upto 70 mm observed over South Kerala South-West parts of South Interior Karnataka adjoining North-West Tamilnadu and
Rainfall upto 14 mm observed over rest Karnataka rest Kerala.
Rainfall upto 7 mm observed over North Arunachal Pradesh

RADAR and RAPID RGB Observation:

No convection was seen in Radar Composite at 1130IST.

RAPID RGB Satellite imagery at 1100IST indicates light to moderate convection over Haryana, Northeast Rajasthan, Lakshadweep and Minicoy Islands.

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	19.03.2018	20.03.2018
PM10 (micro-g/m^3)	142	128
PM2.5 (micro-g/m^3)	80	72

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 3-4: 850 hPa Trough over Bangladesh and adjoining parts of East & NE India
12 UTC of Day 2-4: Trough in lower levels over Rajasthan & adjoining Pakistan, Induced CYCIR in Day 2.
00 UTC of Day 3: N-S Trough at 850 hPa from west U.P. to peninsular India through Central India moving eastward in Day 4

Confluence & Wind Discontinuity regions: UTC of Day 2-3: W-E wind discontinuity over peninsular & in Day 2-4 over Maharashtra-MP-Chhattisgarh-Odisha

Synoptic systems: At 500 hPa WD and associated cyclonic circulation over Pakistan, J & K and adjoining areas

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

Over SW Pakistan (Day-1) S Pakistan (Day-2) associated with WD

3. Convergence at 850 hPa:

Day/Index: Subdivisions with Lower Level Convergence > 15 x 10^-5 /s
Day0: Odisha, Coastal Andhra Pradesh, ,
Day1: Assam Meghalaya, NE NMMT, Jharkhand, West Rajasthan, Odisha, East MP, Chhattisgarh, Coastal Andhra Pradesh, SI Karnataka, Kerala,

Day2: NE NMMT, East UP, Himachal Pradesh, Odisha, West MP, Chhattisgarh, Coastal Andhra Pradesh, Tamilnadu, Puducherry, Kerala,
Day3: Jharkhand, West UP, Haryana, Chandigarh, Delhi, Chhattisgarh, Tamilnadu, Puducherry,
Day4: Assam Meghalaya, Jharkhand, Odisha, Coastal Andhra Pradesh, Tamilnadu, Puducherry, SI Karnataka

4. Spatial distribution of Low level Vorticity:

Day/Index: Subdivisions with Lower Level Vorticity > 15 x 10^-5 /s

Day0: Assam Meghalaya, NE NMMT, Uttarakhand, Himachal Pradesh, East Rajasthan,
Day1: Arunachal Pradesh, Assam Meghalaya, Bihar, Uttarakhand, Punjab, Odisha, Gujarat region,, Coastal Andhra Pradesh, ,
Day2: Assam Meghalaya, Bihar, East UP, Punjab, Odisha,
Day3: Haryana, Chandigarh, Delhi, Punjab, Odisha,
Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Jammu Kashmir

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

Day/Index: Subdivisions with Showalter Index < -4

Day0: Arunachal Pradesh, Sub Himalayan WB, Uttarakhand, Himachal Pradesh, Coastal Karnataka, SI Karnataka, Kerala,
Day1: Arunachal Pradesh, Sub Himalayan WB, Uttarakhand, Coastal Karnataka, SI Karnataka, Kerala,
Day2: Arunachal Pradesh, Sub Himalayan WB, Punjab, Himachal Pradesh, Tamilnadu, Puducherry, Coastal Karnataka, SI Karnataka, Kerala,
Day3: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, Gangetic WB, Tamilnadu, Puducherry, SI Karnataka, Kerala,
Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Kerala

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

Day/Index: Subdivisions with K Index > 40

Day0: Arunachal Pradesh, Sub Himalayan WB, Madhya Maharashtra, Marathwada, Vidarbha, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,
Day1: Arunachal Pradesh, Sub Himalayan WB, Rayalaseema, Tamilnadu, Puducherry, SI Karnataka, Kerala,
Day2: Arunachal Pradesh, Sub Himalayan WB, Coastal Andhra Pradesh, , Tamilnadu, Puducherry, SI Karnataka, Kerala,
Day3: Arunachal Pradesh, Sub Himalayan WB, Gangetic WB, Odisha, Coastal Andhra Pradesh, , Tamilnadu, Puducherry, SI Karnataka, Kerala,
Day4: Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Tamilnadu, Puducherry, 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, Uttarakhand, Himachal Pradesh, Jammu Kashmir,
Day1: Arunachal Pradesh, Sub Himalayan WB, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West Rajasthan,
Day2: Arunachal Pradesh, Sub Himalayan WB, East UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West Rajasthan,

Day3: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, Odisha, Chhattisgarh,
Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, Odisha

Day/Index: Subdivisions with Precipitation > 2 cm
Day1: Uttarakhand, Punjab, Himachal Pradesh, Jammu Kashmir,
Day2: Arunachal Pradesh, NE NMMT, Himachal Pradesh, Jammu Kashmir,
Day3: Arunachal Pradesh, Assam Meghalaya, NE NMMT,
Day4: Nil, Day5: Nil

3. IOP ADVISORY FOR 24 and 48Hrs:

Summary and Conclusions:

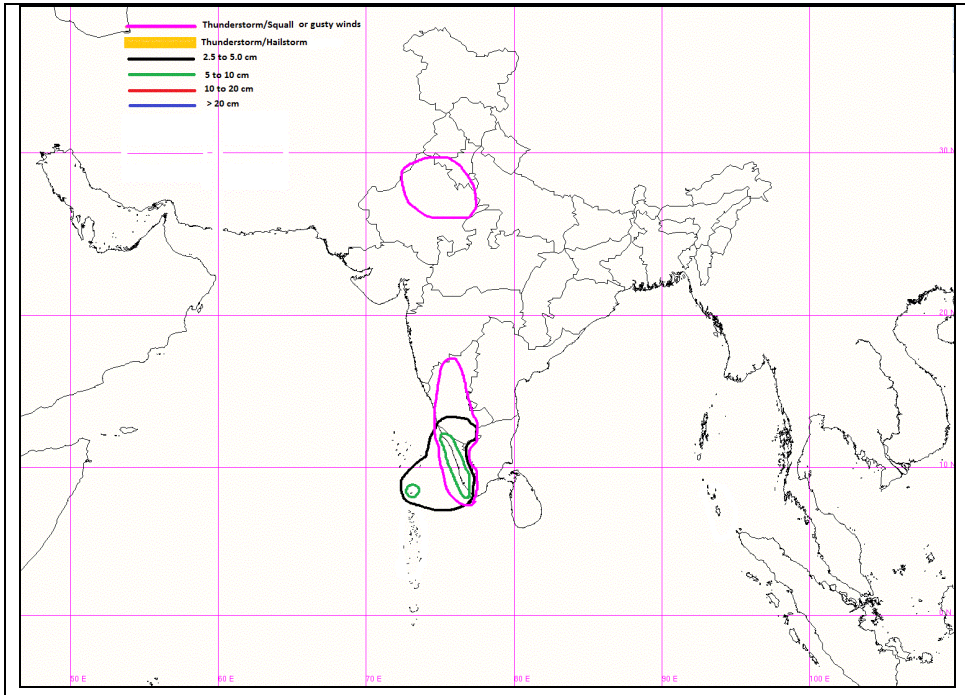
Day-1 & Day-2:

o There is an anticyclone over north-central India in the lower levels. There is also an induced cyclonic circulation over south Pakistan and & neighbourhood in the lower levels. The convergence of the dry winds on the periphery of the anticyclone with the moist south-westerly winds from the Arabian Sea over Rajasthan is likely to result in dust raising winds with isolated thunderstorms over Rajasthan and west Uttar Pradesh on day 1. On day 2, the induced cyclonic circulation is likely to move eastwards, and the region of dust raising winds is likely to extend eastwards to over Rajasthan, Haryana and West Uttar Pradesh.

o The main weather is expected today over the south Indian peninsula, associated with the cyclonic circulation in the lower levels over southeast Arabian Sea off Kerala Coast and the trough in low level easterlies in the lower levels, extending from this cyclonic circulation to north Interior Karnataka across Kerala & south Interior Karnataka. The associated moisture flow inland, is likely to result in heavy rainfall over Kerala and Minicoy Island. Less intense rainfall is expected over Interior Karnataka on day 1. On day 2, the trough is likely to de-intensify and weather due to the western disturbance is likely to dominate over the Indian region.

24 hour Advisory for IOP:	**48 hour Advisory for IOP:**
Rainfall: South Interior Karnataka, Kerala, Minicoy Island **Thunderstorm with associated phenomenon:** Kerala, Interior Karnataka, Rajasthan, Western Haryana	**Rainfall:** Nil **Thunderstorm with associated phenomenon:** Nil

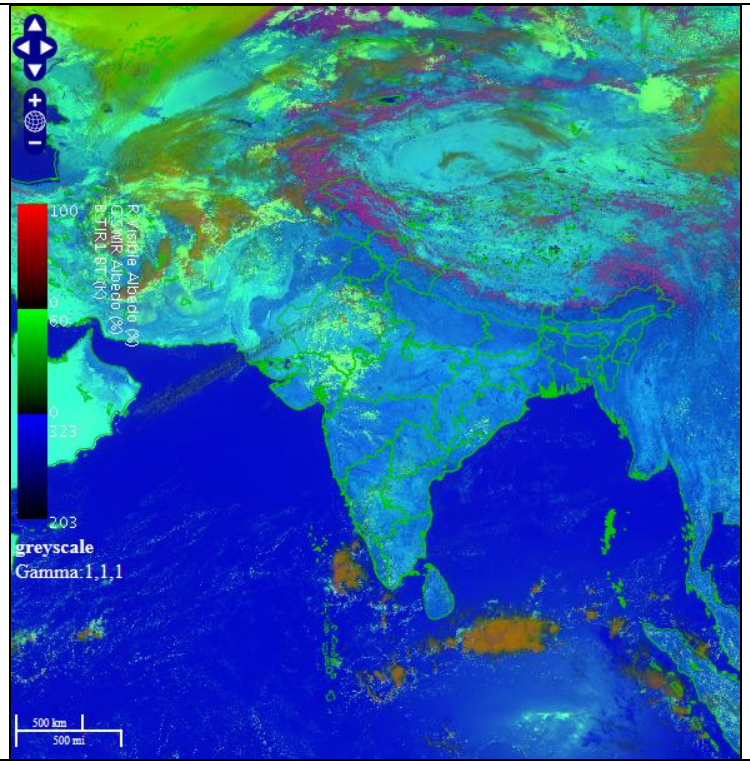
Graphical Presentation of Potential Areas for Severe Weather:



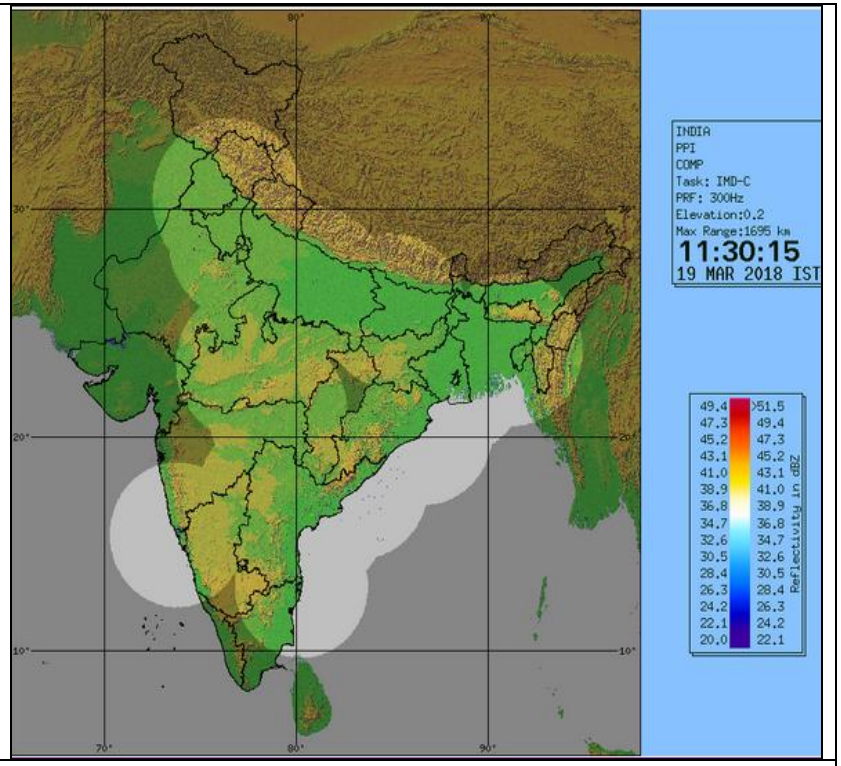
IOP Advisory for 24 hours

NO WARNING FOR SEVERE WEATHER

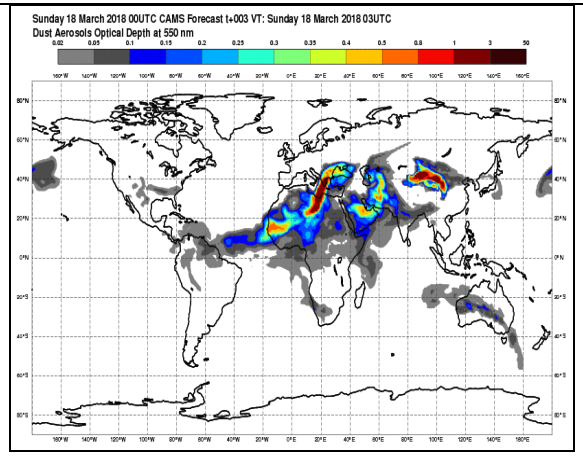
IOP Advisory for 48 hours



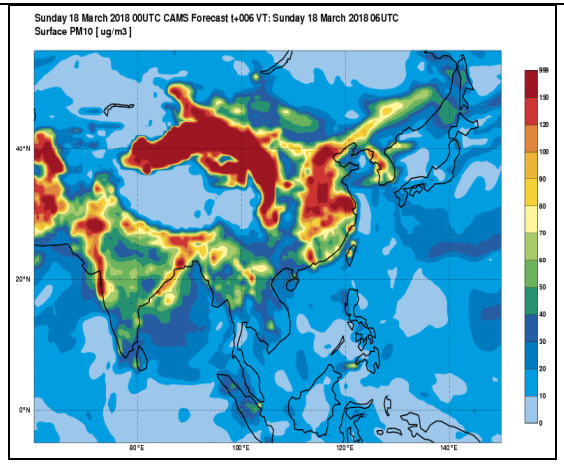
RAPID RGB Imagery at 1100 IST of the Day



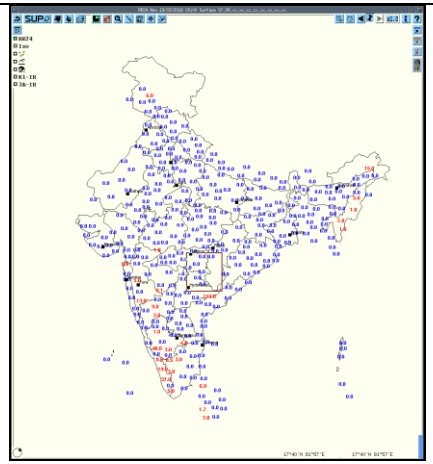
DWR Composite at 1130 IST of the Day



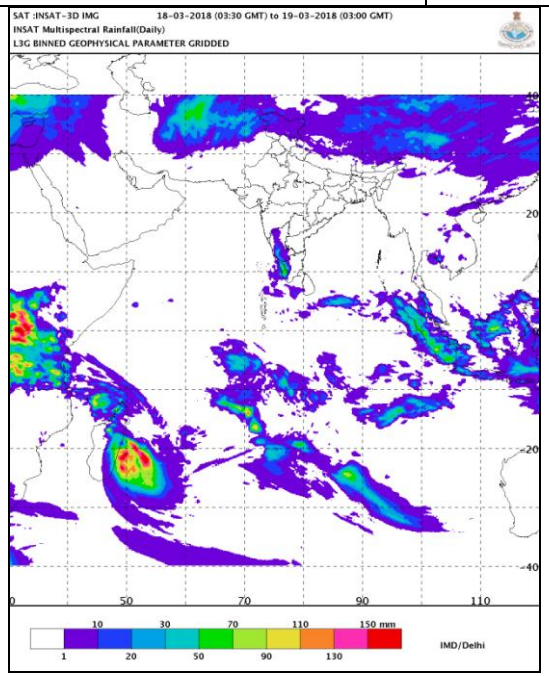
Forecast Dust Concentration



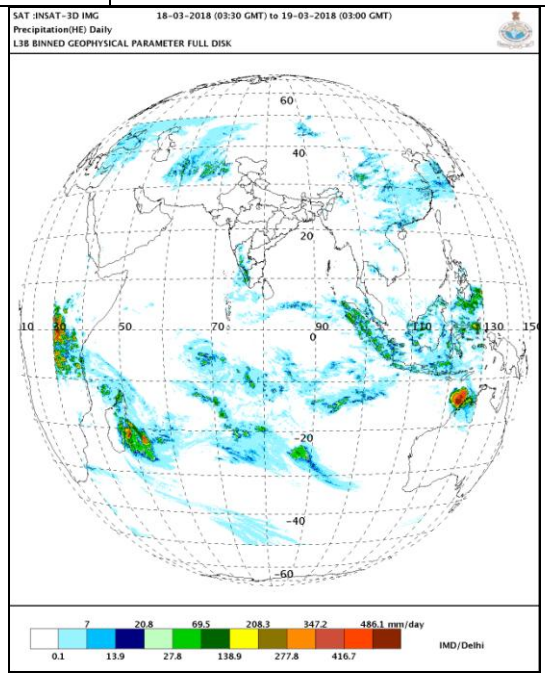
PM10 Forecast



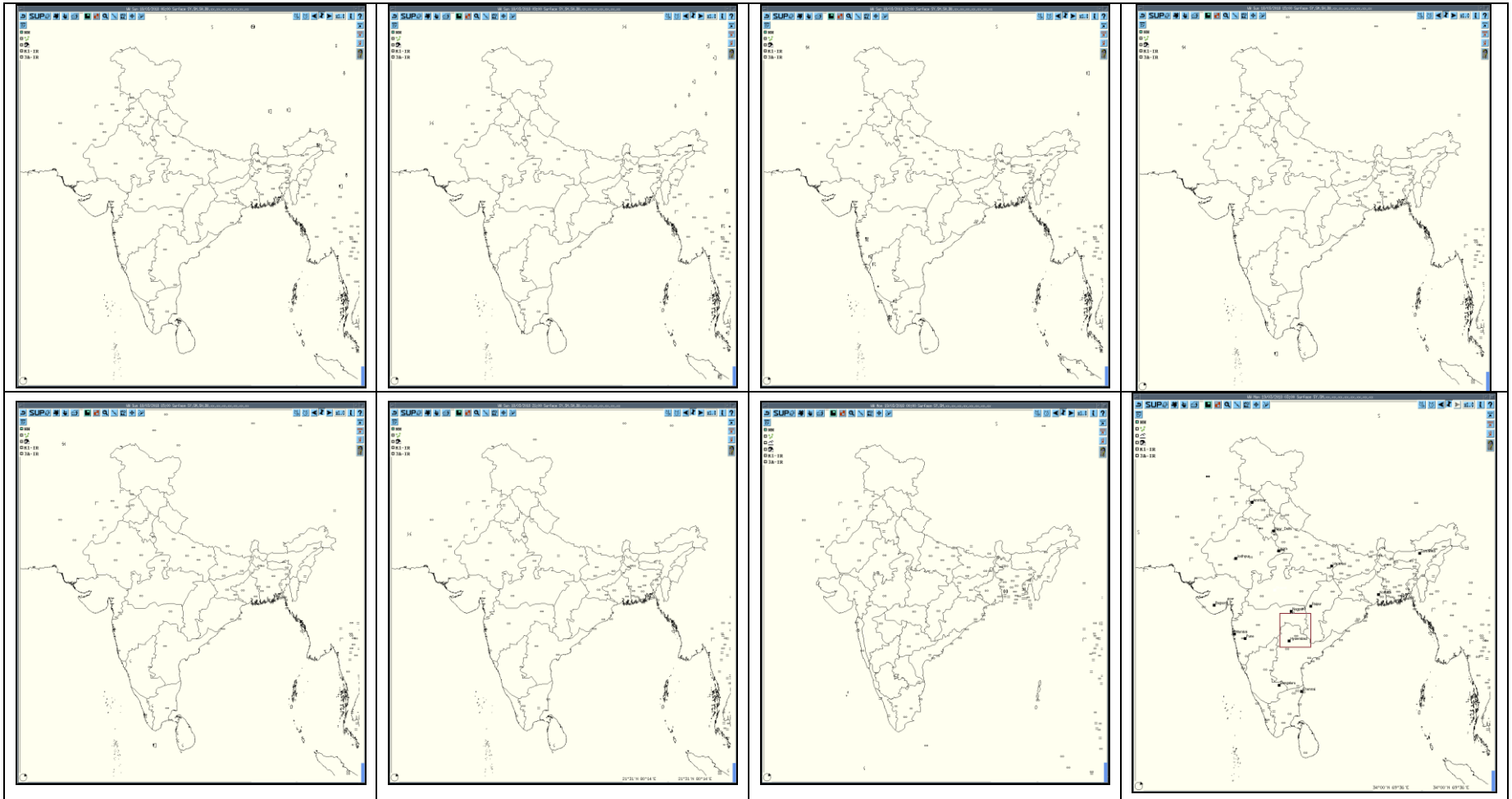
Accumulated 24 Hour rainfall (in red) recorded at 0300UTC of today



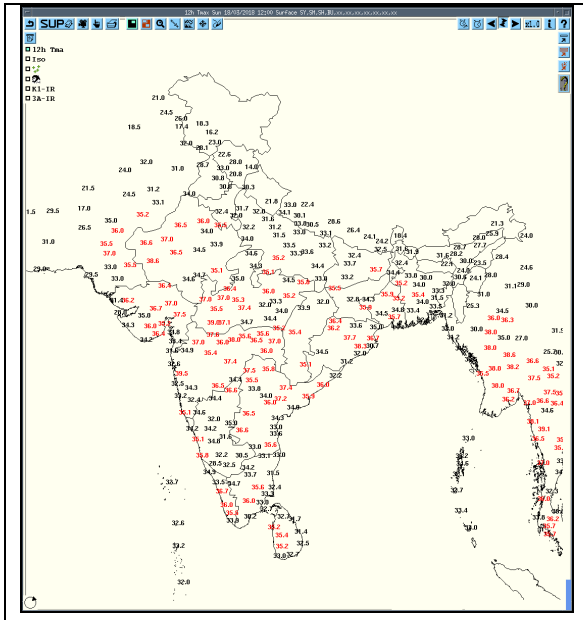
IMR



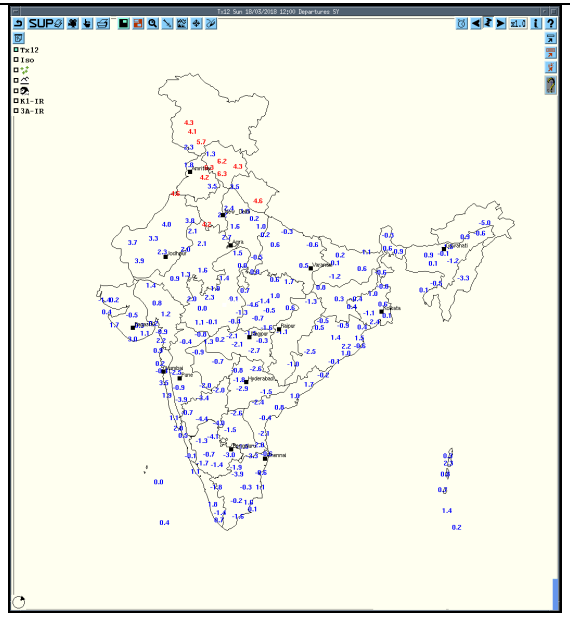
HEM



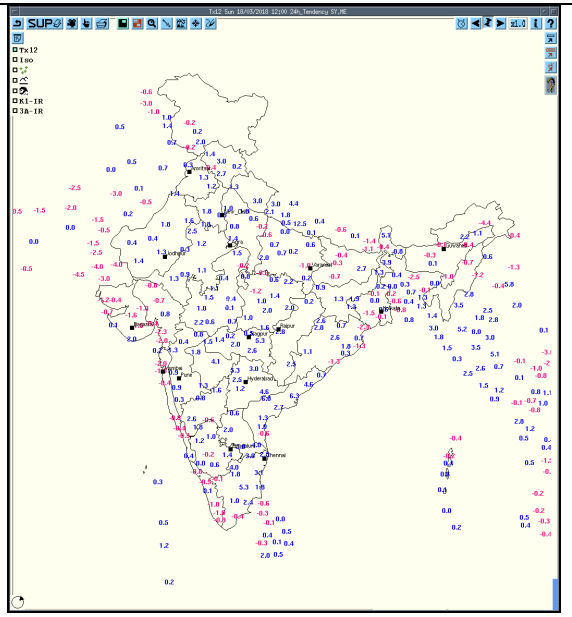
3hourly Past weather at 06, 09, 12, 15, 18, 21 UTC of yesterday and 00 & 03 hrs UTC of today



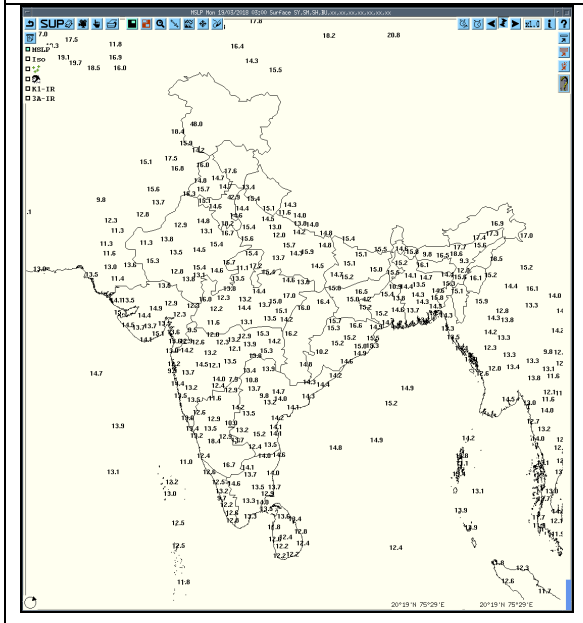
Tmax



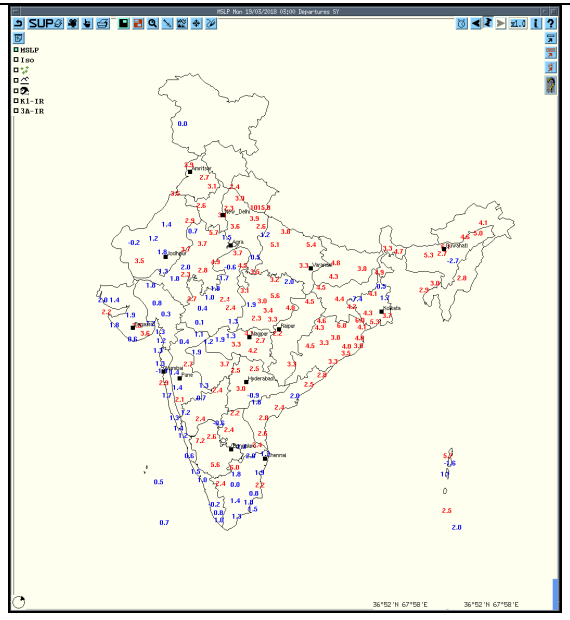
Departure Tmax



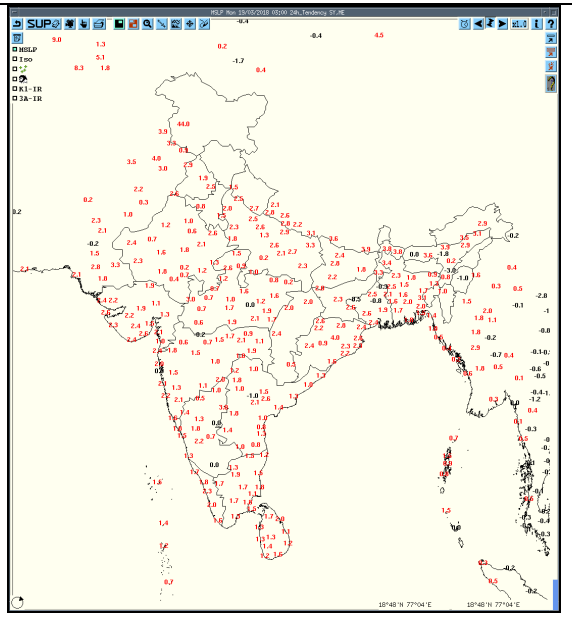
Tendency Tmax



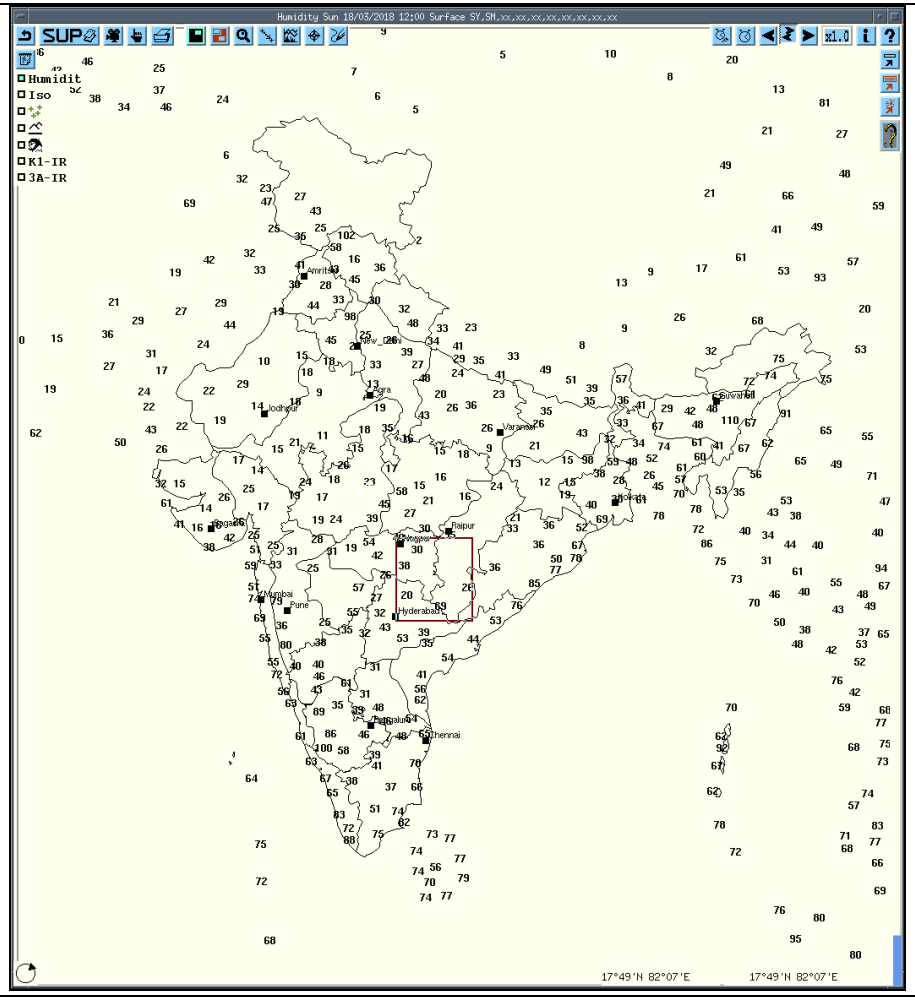
MSLP



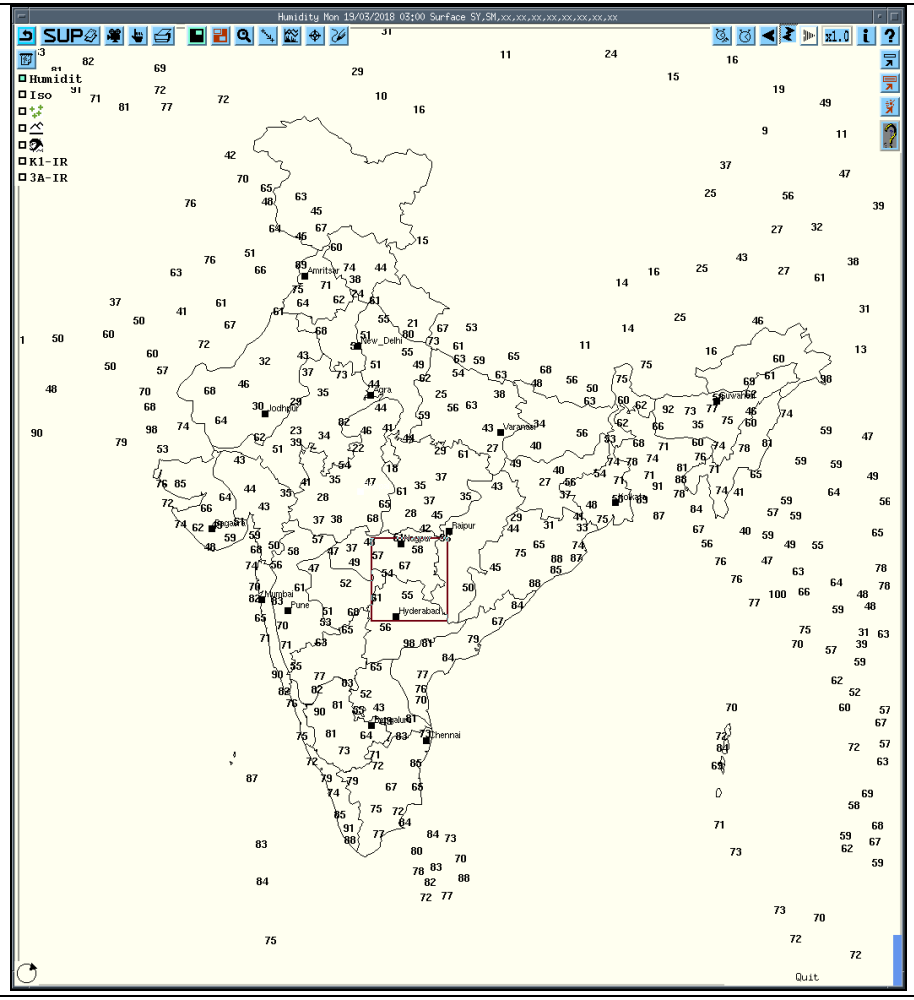
Departure MSLP



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	Associated Severe Weather if any	Districts affected
Agartala	19-03-18	180300-190300	ISLTD SINGLE, 44 dBz, 10 kms intensified to MLTPL cells and SQL LINE,60 dBZ,14 kms@ 180900z	60 Kms EAST(near AMBASSA)/E'ly,30 Kmph	Dissipated at 181030z/180 Kms SE near AZL	TSRA	NORTH TRIPURA DIST & LENGPUI(MIZORAM)
			Multiple Cell over North TRIPURA Dist ,47 dBZ,9 Kms intensified to SQL LINE 60 dBZ/10 Kms	40 Kms East(near AMBASSA)/E'ly,35 Kmph	Dissipated at 181402z,200 Kms ESE(near AZL)	Not known.	
Jaipur	19-03-18	180300-190300	Nil	Nil	Nil	Nil	Nil
Lucknow	19-03-18	180300-190300	Nil	Nil	Nil	Nil	Nil
Patiala	19-03-18	180300-190252	No Echo	--	--	--	--
Kolkata	19-03-18	180301-190300	Nil	Nil	Nil	Nil	Nil
Visakhapatnam	19-03-18	180300-190300	Nil	Nil	Nil	Nil	Nil
Patna	19-03-18	180300-190300	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)
Passighat	Northeast India	Arunachal Pradesh	Thunderstorm	18-03-18	0815	1240
Passighat	Northeast India	Arunachal Pradesh	Thunderstorm	18-03-18	1440	1620
Imphal	Northeast India	Manipur (NMMT)	Thunderstorm	18-03-18	0830	900
Imphal	Northeast India	Manipur (NMMT)	Thunderstorm	18-03-18	1250	1345
Lengpui	Northeast India	Mizoram (NMMT)	Thunderstorm	18-03-18	1421	1830

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: