India Meteorological Department

FDP STORM Bulletin No. 13(18-03-2017)

1. CURRENT SYNOPTIC SITUATION at 0300 UTC of 18-03-2017:

SYNOPTIC FEATURES:

The Western Disturbance as an upper air cyclonic circulation over eastern part of Jammu & Kashmir and neighbourhood, now lies over northeast Jammu & Kashmir at 3.1 km above mean sea level and is moving away.

A trough in mid and upper tropospheric westerlies runs roughly along longitude 90.0°E and north of latitude 20.0°N.

An upper air cyclonic circulation lies over southeast Rajasthan & adjoining West Madhya Pradesh and extends upto 0.9 km above mean sea level.

The trough from northeast Madhya Pradesh to North Interior Karnataka between 0.9 km & 1.5 km above mean sea level, now runs from east Bihar to north Tamilnadu across Gangetic West Bengal, south Chhattisgarh, Odisha and Andhra Pradesh and extends upto 0.9 km above mean sea level.

The trough from Sub-Himalayan West Bengal to Gangetic West Bengal extending upto 0.9 km above mean sea level has become less marked.

A fresh Western Disturbance very likely to affect western Himalayan region from 21st March onwards.

SATELLITE OBSERVATIONS during past 24hrs and current observation:

Clouds (based on 0900 UTC imagery of INSAT3D)):

Scattered multi/layered clouds over north J & K and northeast Himachal Pradesh in association with western disturbance over the area.

Scattered low/medium clouds with embedded moderate to intense convection over coastal Odisha, northwest Assam, east Assam, Arunachal Pradesh, Nagaland, Manipur, Mizoram, north coastal and extreme south Andhra Pradesh, and coastal Tamilnadu. Scattered low/medium clouds with embedded isolated weak to moderate convection over Rajasthan. Scattered low/medium clouds over rest J & K, eat Andhra Pradesh, rest Tamilnadu and Kerala.

Arabian Sea:

Scattered low/medium clouds with embedded moderate to intense convection over south Arabia Sea between lat 7.5°N to 10.0°N long 63.0°E to 68.0°E.

Bay of Bengal & Andaman Sea:

Scattered low/medium clouds with embedded isolated weak to moderate convection over north Bay of Bengal.

Convection:

Weak convection (CTT above 250° K in some places) was observed over north Rajasthan, UP and Bihar.

Moderate convection was observed over northern parts of J&K HP and Uttarakhand with CTT > 240° K.

Strong convection with CTT reaching upto 220° K was observed over S Kerala.

Synoptic features:

No Jet stream and a trough is observed over north Chhattisgarh.

Dynamic Features:

A positive vorticity field is seen over UP,Bihar, Jharkhand, GWB, Odisha and Chhattisgargh. A medium wind shear is present over north-central and high wind shear over north-west parts of the country. Positive shear tendency is observed over most parts of the country and negative shear tendency is observed over Kerala. No water vapour content is seen over the country.

Precipitation:

No data available

RADAR and RAPID observation:

Convection appears to be in progress over Andhra and Odisha coasts, Assam & Meghalaya in DWR Composite at 1600hrs IST. RGB RAPID image (1600hrs IST) also indicates convective clouds over northeastern states, Andhra and Odisha coast and isolated convective cells over Rajasthan, Kerala and Tamilnadu.

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

No significant dust concentration observed over Arabian Peninsula and west Rajasthan. No significant change in dust concentration expected over northern India for next three days.

2. NWP MODEL GUIDANCE:

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

1. Weather Systems:

Feeble trough at 12UTC in forecasts Day-0 -1 and Day 3-4 at MSLP over J&K. On Day-2, the region is under the influence of a developing low pressure system over Afghanistan and Pakistan region.

Wind discontinuity only in Day-0-2: at 925 and 850 hPa extends over parts of AP, Maharashtra, Odisha, and Chhattisgarh.

850hPa anticyclonic flow over Arabian Sea in Day-0 and Day-1 is migrating to near Gujarat coast in Day-2 and subsequently lies over the Sea. Similarly another anticyclonic circulation over Bay of Bengal can also be located.

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

Strong jet core over Bihar and WB on Day-0. Between Day 2-3 strong jet can be seen over Bihar, WB migrating to over Bangladesh and Myanmar.

Weaker magnitude during Day- 0 to 1.

3. Convergence at 850 hPa:

Weak noisy low level convergence at several places over India

4. Low level Vorticity:-Positive Vorticity (>15 x 10^{-5}/s):

Weak noisy scattered in 12UTC on all days.

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

Day-0: Parts of TN and Kerala in South India and parts of NE India

Day-1-2: Parts of east coast of India including Odisha and WB extending to Mizoram Tripura.

Day-4-5: Mainly over J&K and adjoining Punjab and HP.

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

Day-0: Parts of TN and Kerala in South India and parts of NE India

Day-1-2: Parts of east coast of India including Odisha and WB extending to Mizoram Tripura.

Day-4-5: Mainly over J&K and adjoining Punjab and HP

7. Spatial distribution of TTI: TTI >44 [Scattered Numerous Thunderstorms]:

Day0-2 high values of TTI over NW India moving eastwards between 12h-60hforecasts. Day-2-3 over Odisha and WB and large parts of NE

8. Rainfall and thunder storm activity:

Day-1,3: (>4cm/day) Parts of Arunachal Pradesh.

Day-2(>4cm/day) over WB and adjoining Bangladesh.

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

1. Weather Systems:

In the analysis, a trough in the lower troposphere up to 850 hPa, orients in north-east and southwest direction extending from Assam to interior Karnataka. The wind confluence is also seen over east Uttar Pradesh and adjoining areas. There are 3 cyclonic circulations exists over east Rajasthan, Chhattisgarh and interior Karnataka region in day 1 forecast. Associated with these CYCIR, one trough is seen extending from east Rajasthan to Chhattisgarh and another one is from Chhattisgarh to interior Karnataka. The trough re-establishes in north-east and southwest direction with embedded cyclonic circulations over interior Karnataka and Jharkhand in day 3 forecast. Day 2 onwards, a north-south trough is seen extending from Assam and adjoining areas up to Bay of Bengal which persists till day 5 with anticyclonic flow dominates over rest of India

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

The Jet at 500 hPa does not exist over India during next 5 days but strong westerly persists over northern part of India for next 2 days. In day 3, a deep trough in westerlies lies over north-eastern states and adjoining areas.

3. Low level Vorticity:-Positive Vorticity (>15x10^{-5}/s):

Mainly along foothill of Himalaya during next 5 days during morning hours. The significant vorticity zones associated with the troughs and embedded cyclonic circulations are seen over the regions during next 3 days only in morning hours

4. Spatial distribution of T-Storm Initiation Index, Lifted Index, Total Total Index, CAPE, CINE and Sweat Index(High potential for thunderstorm]:

T-Storm Initiation Index (> 4): No significant zone is seen over the country during next 5 days.

Lifted Index (< -2): The areas with index less than threshold lies along east coast regions for next 3 days with maxima over GWB, Orissa and coastal AP. During the same period, the index also crosses threshold along the west coast over Kerala, parts of coastal Karnataka and Konkan-Goa. The significant zones are also seen over Rajasthan and adjoining areas till day 2.

Sweat Index (> 400): Then significant zones are confined along east coast of India over GWB, Orissa and coastal AP with maximum values over GWB and Orissa till 3. Some areas appear over Rajasthan and adjoining MP till day 2.

Total Total Index (> 50) : Above threshold value in some parts of central India over Madhya Pradesh and Maharashtra and adjoining areas in next 2 days with an extension towards Chhattisgarh. Day 3 onwards, the index crosses threshold over whole central India reaching over Rajasthan and Gujarat and up to interior Karnataka towards south till day 5.

CAPE (> 1000): Mostly along east coast of India over Gangetic West Bengal, Orissa, coastal Andhra Pradesh and Tamilnadu coast during next 5 days. The CAPE values also above threshold over Kerala and parts of coastal Karnataka, Konkan-Goa during the same period.

CINE (50-150): Maximum CINE values are found in pockets along east coast over GWB, Odisha, coastal AP and Tamilnadu from Day-1 to Day-5. The zone sometime extends inland over interior Karnataka to west coast region over coastal Karnataka and Konkan-Goa. CIN values are higher over west Rajasthan adjoining Gujarat in day 1.

5. Rainfall and thunderstorm activity:

10-40 mm rainfall over north-eastern states and Kerala and adjoining Konkan & Goa during next 3 days. In day 2, over some parts of GWB and Orissa. Over J&K in day 4.

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

1. Weather Systems:

In the analysis, a trough is seen in north-east and south-west direction along east coast extending from Assam to interior Karnataka over GWB, Jharkhand, Chhattisgarh, Telangana and adjoining Vidarbha and coastal AP. The trough re-establishes again in day 3. During day 2 only, a cyclonic circulation develops over east Rajasthan and adjoining areas and associated trough extends up to Chhattisgarh crossing over MP. A north-south trough persists over east part of north-eastern states during all 3 days

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

The Jet at 500 hPa does not exist over India during next 3 days but strong westerly wind persists around 25 deg. N latitude over northern parts of India. A trough in westerly passes over east and north-east India towards east during day 2-3.

3. Low level positive Vorticity (850hPa (>12 x 10^{-1}/s)):

Mostly along foothills of Himalaya during morning hours in next 3 days. The significant vorticity zones are seen associated with the troughs and cyclonic circulation in the lower tropospheric level during morning hours.

4. Model Reflectivity (Max. dBZ) (>25 dBz):

over north-eastern states during next 3 days with increasing intensity during day 2. Over some parts of east Rajasthan in the evening of day 1 which gradually moves eastward over north Madhya Pradesh and reaches up to Jharkhand in the morning of day 2. Over some parts of south GWB and adjoining Orissa during day 2 evening and night.

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

Total Total Index (> 50): Above threshold value mostly over most parts of India during next 3 days except parts of extreme south peninsular region and northeastern states during morning hours.

K-Index (> 35): Less than threshold value over most parts of India during next 3 days but significant values are seen over peninsular India and mostly over Marathwada, interior Karnataka and adjoining regions.

CAPE (> 1000): Mostly along east coast of India over GWB, Orissa, Andhara Pradesh and Tamilnadu during next 3 days. Another zone along west coast over Kerala, coastal Karntaka and Konkan & Goa.

CINE (50-150): CINE values are small all over India during all three days of forecasts except some areas along coastal areas of India over Orissa, coastal AP, coastal Karnataka and Konkan-Goa. During day 1, over Rajasthan and adjoining Gujarat and over Delhi and Haryana.

6. Rainfall Activity:

Rainfall activity (~ 10-40 mm) over north-eastern states during next 3 days.

10-40 mm over extreme south peninsular region over Kerala and adjoining interior Karnataka and Tamilnadu during next 2 days.

10-40 mm over parts of GWB realized on day 2.

3. IOP ADVISORY FOR 24 and 48Hrs:

Summary and Conclusions:

Day 1 & Day 2:

Upper level winds indicate that there are two jet cores over the Indian region. One jet core is over east Rajasthan and the other core is over Assam. Low level winds indicate that there is an upper air cyclonic circulation over southeast Rajasthan & adjoining West Madhya Pradesh and extends upto 0.9 km above mean sea level. However, there is no significant moisture flow into this region during the next 48 hours, Hence, thunderstorms are expected over North Rajasthan and West Madhya Pradesh during the next 24 hours. There may also be isolated duststorms over North Rajasthan during the next 24 hours.

A trough in mid and upper tropospheric westerlies runs roughly along longitude 90.0°E and north of latitude 20.0°N and is overlaid with a jet core. Hence, during the next 24 hours, isolated heavy rainfall is expected over Arunachal Pradesh, Meghalaya and Assam, thunderstorms accompanied by hail is expected over Nagaland and Manipur, while thunderstorms accompanied by squall is expected over Mizoram, Tripura, Gangetic West Bengal and coastal Orissa. On day 2, thunderstorms with squally winds are expected over Sub Himalayan West Bengal, Coastal Orissa, Gangetic West Bengal.

24 hour Advisory for IOP:

Arunachal Pradesh, Meghalaya and Assam.
Nagaland, Manipur, Mizoram and Tripura.

48 hour Advisory for IOP:

Sub Himalayan West Bengal, Coastal Orissa, Gangetic West Bengal

ForNCMRWFNWPproducts:(http://www.ncmrwf.gov.in/HomePage/NEPS-prod-1.php)
ForIMDNWPproducts:(http://nwp.imd.gov.in/diagpro_new.php)
ForSynopticplotteddataandcharts
http://amssdelhi.gov.in/
http://www.amsskolkata.gov.in/
ForRAPIDtool:
http://rapid.imd.gov.in/
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Past24hourHEMandIMRrainfall(upto03UTCoftoday)
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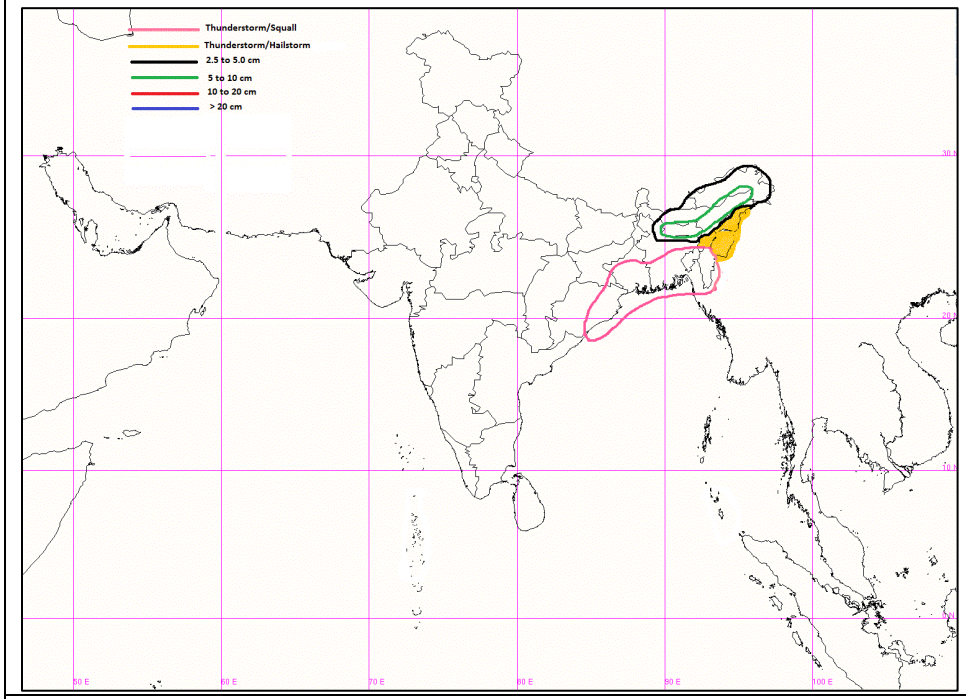
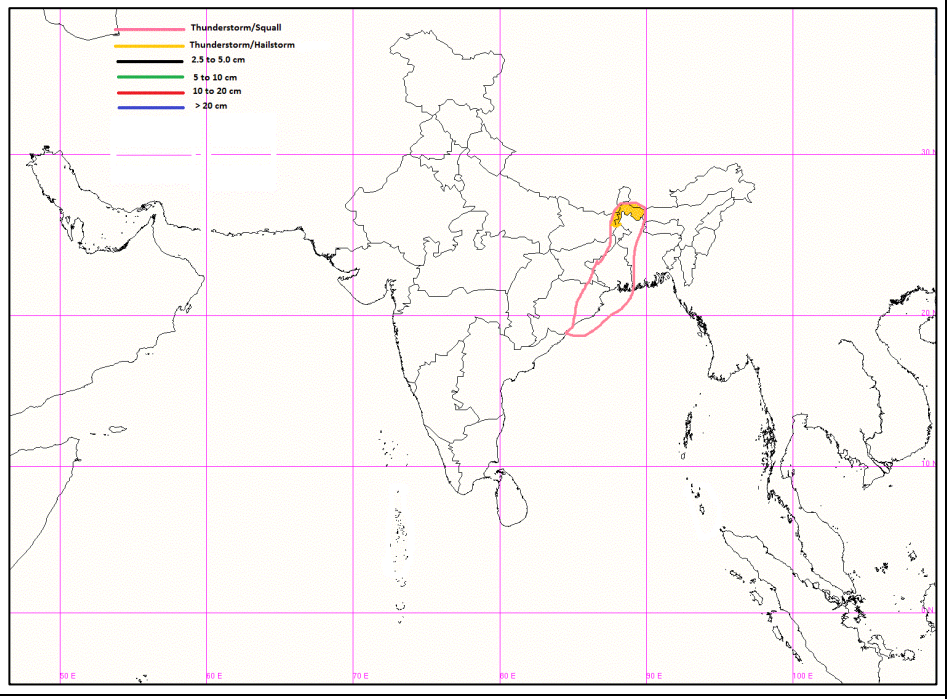
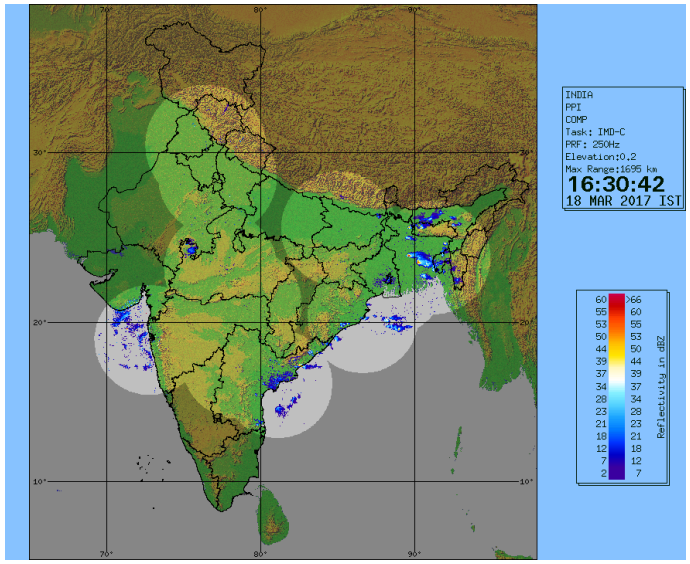


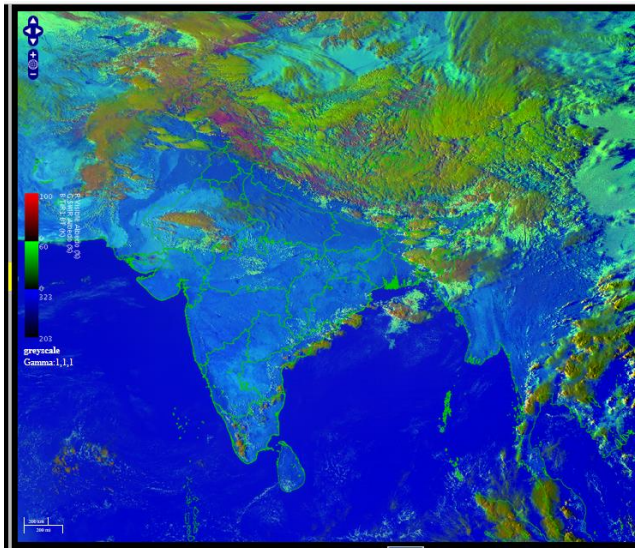
IOP Advisory for 24hours



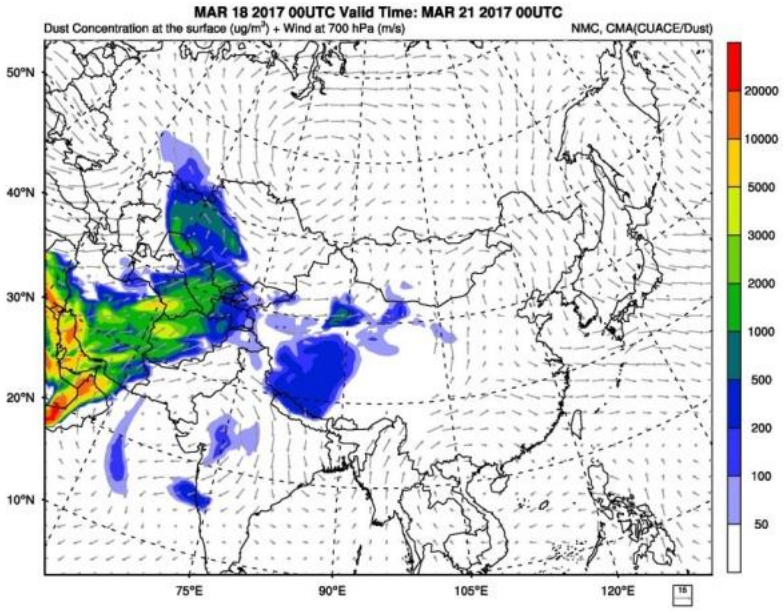
IOP Advisory for 48hours



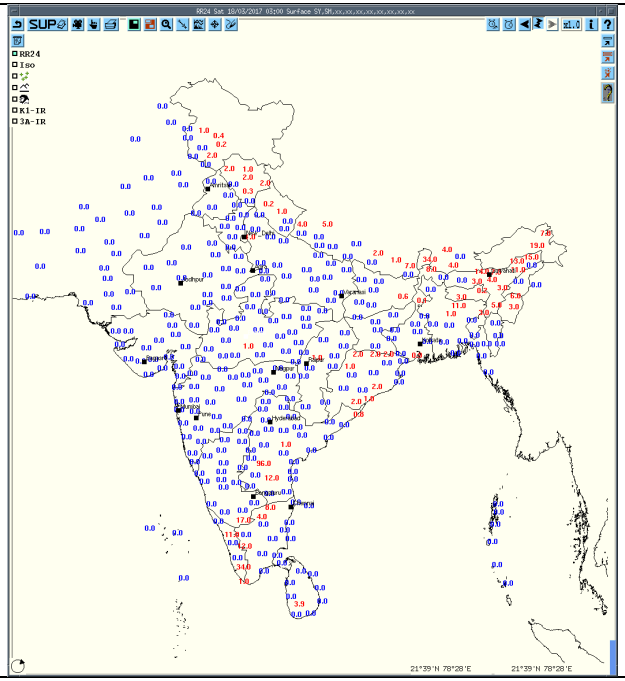
DWR Composite at 1630 IST of today



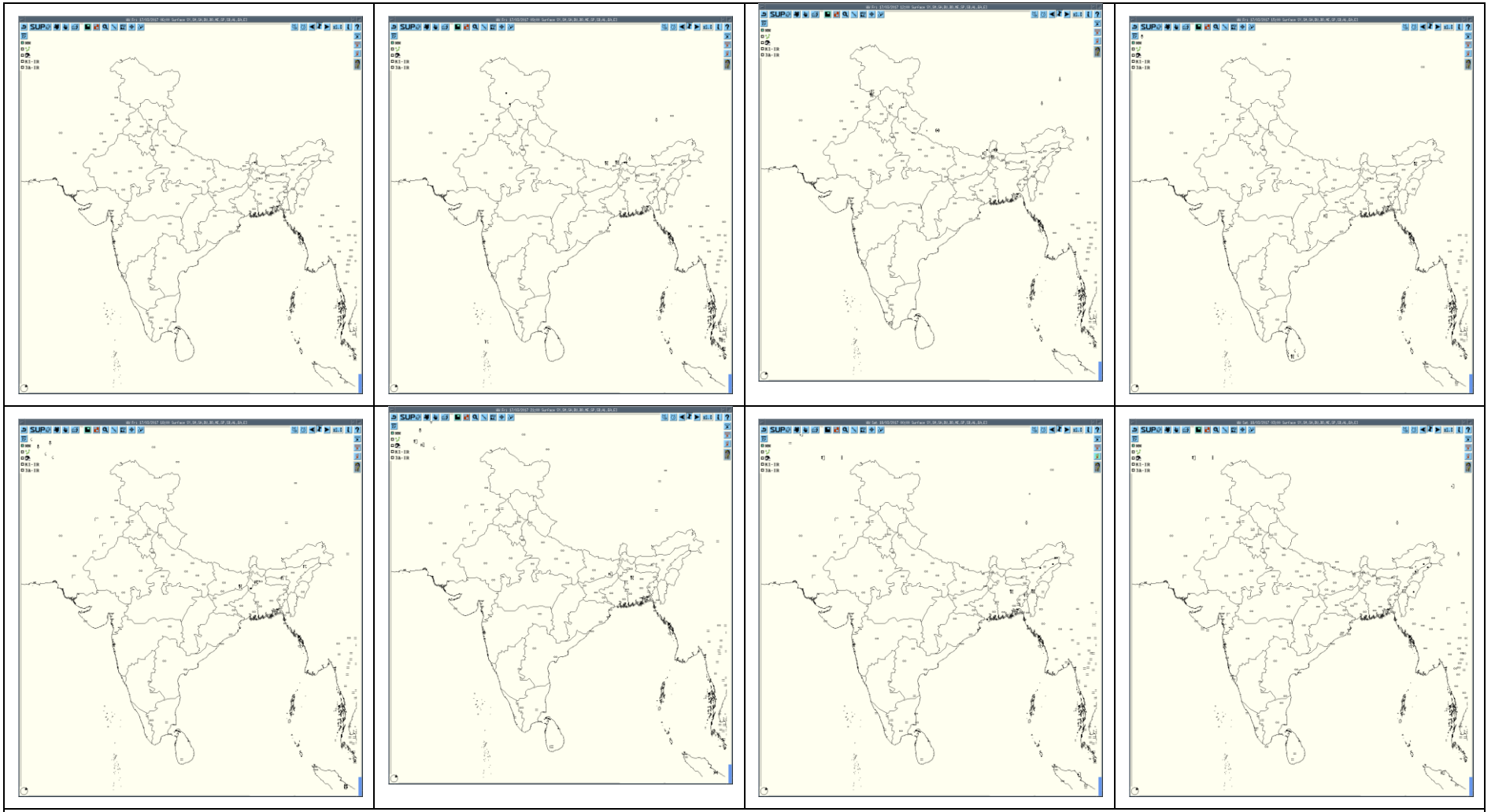
RGB Image of INSAT3D at 1600 IST of today



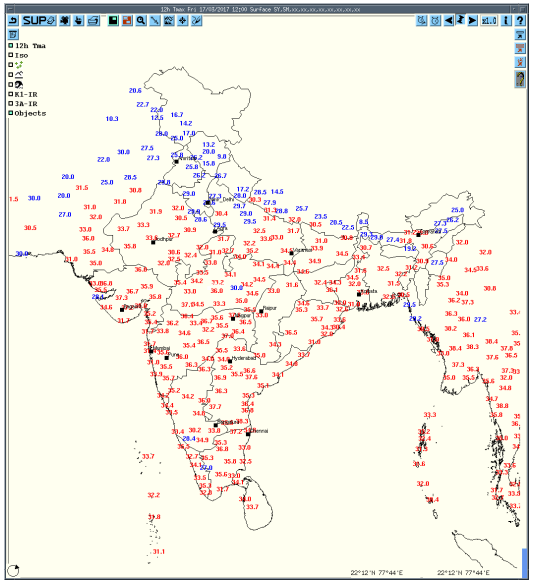
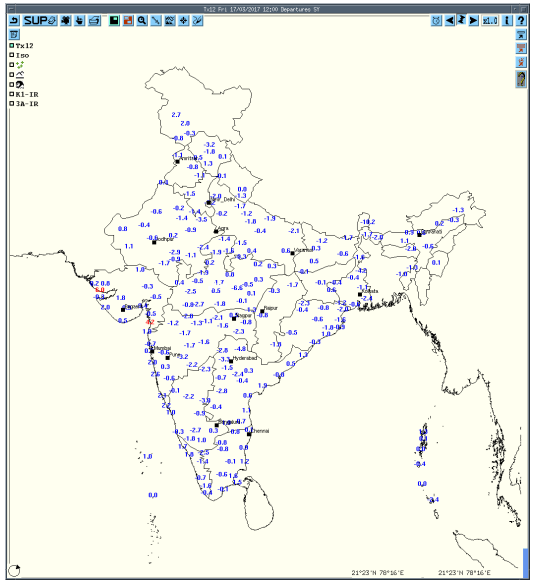
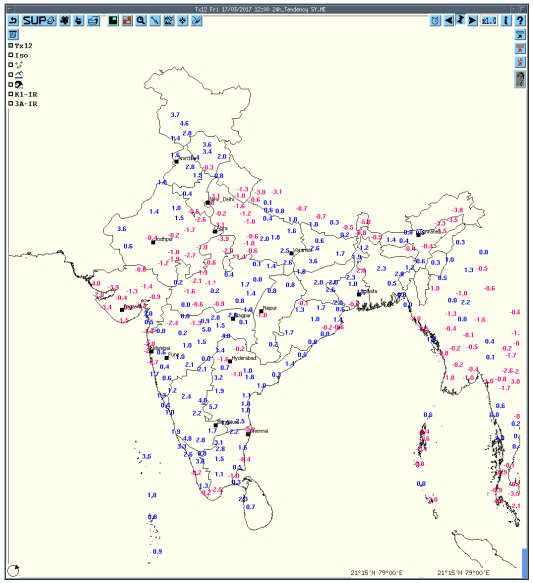
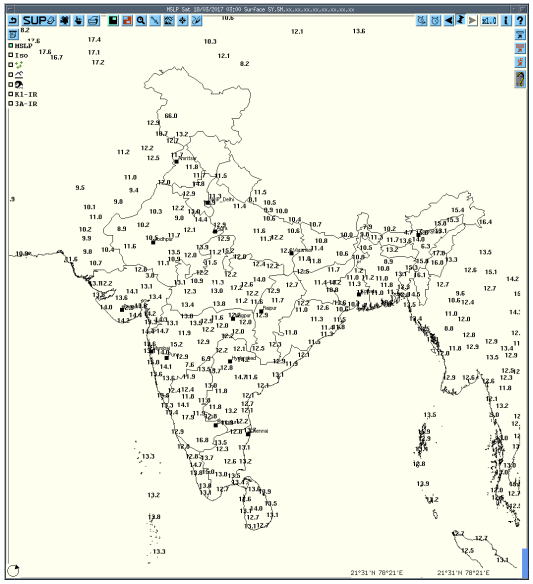
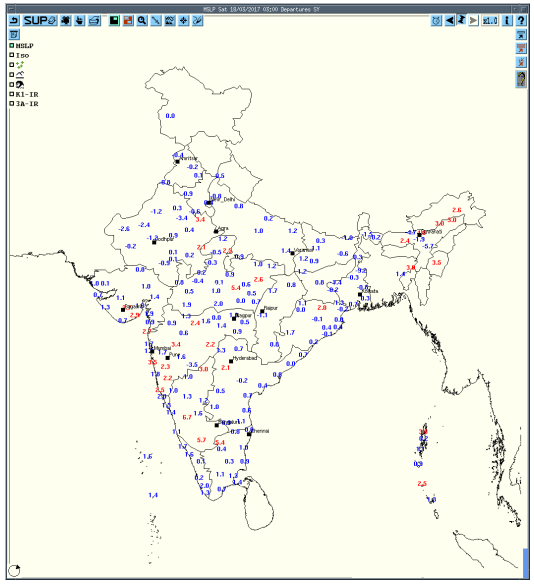
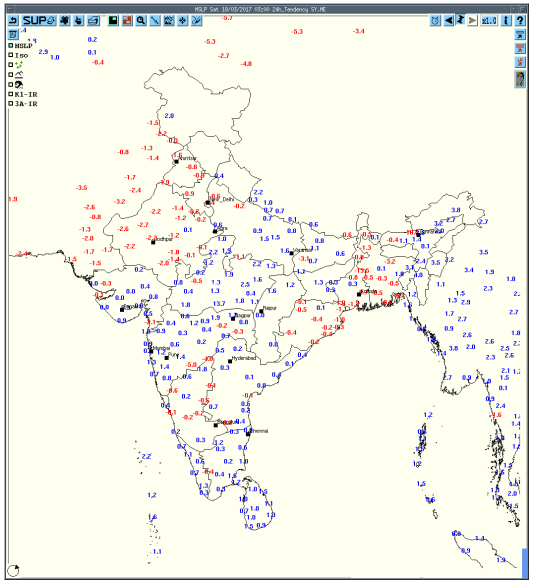
Forecast Dust Concentration at 00UTC of 21st March



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



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

		
Tmax	**Departure Tmax**	**Tendency Tmax**
		
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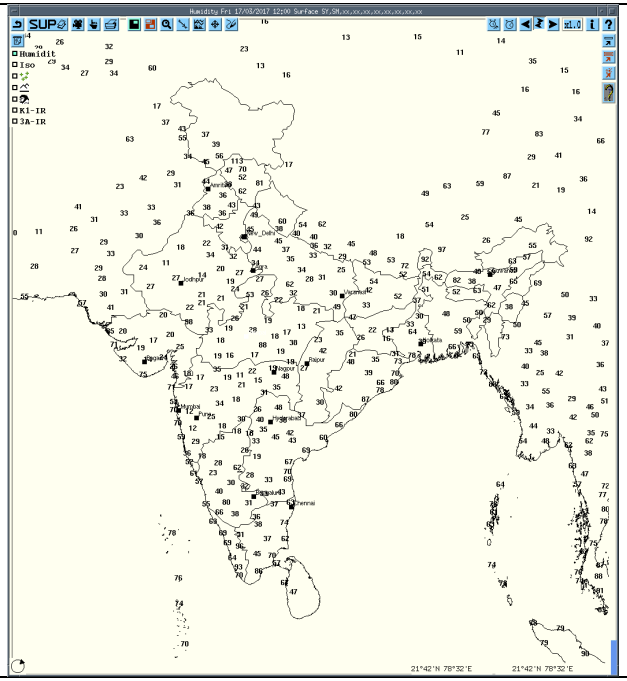
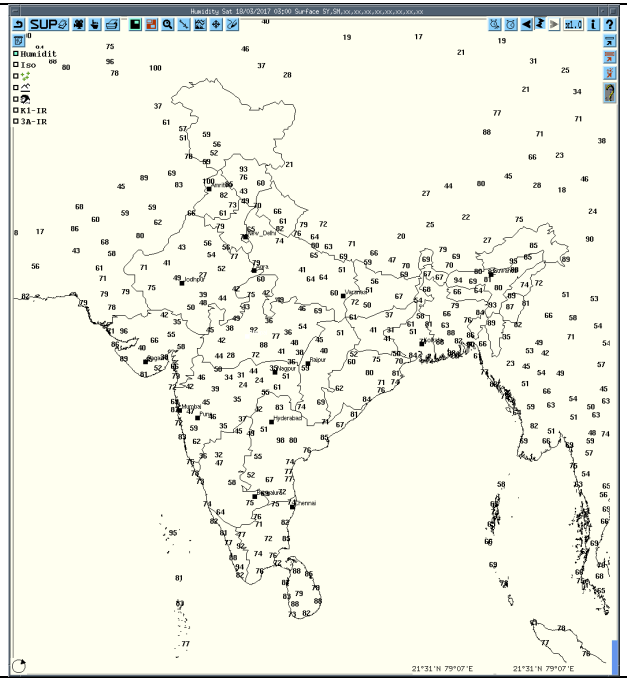
	
RH 12 UTC yesterday	**RH 03 UTC today**

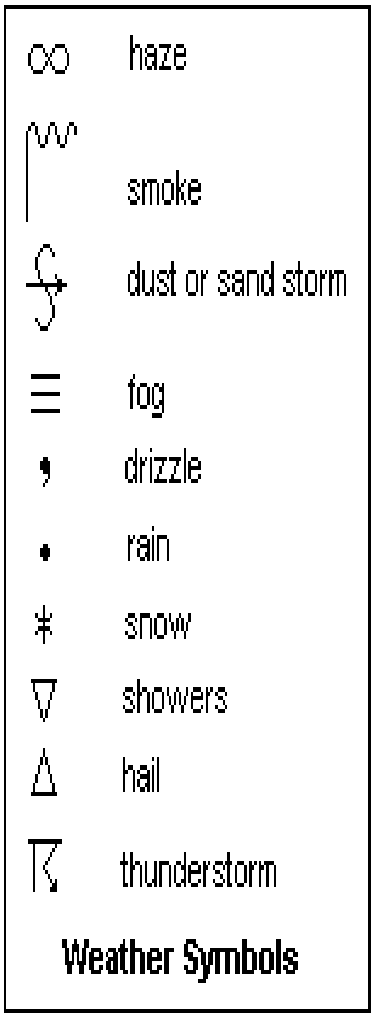
Realized weather past 24 hours					
Date	**Time of Reporting**	**Name of Station Reporting**	**Region**	**STATE**	**Weather Event**
17-03-2017	0600UTC	Nil	Nil	Nil	Nil
17-03-2017	0900UTC	Minicoy	South India	Lakshadweep & Minicoy	Thunderstorm
		Dibrugarh	Northeast India	Assam	Duststorm
17-03-2017	1200UTC	Jammu, Katra	Northwest India	J & K	Thunderstorm
		Sundernagar	Northwest India	Himachal Pradesh	Thunderstorm
		Punalar	South India	Kerala	Thunderstorm
		Gangtok	East India	Sikkim	Thunderstorm
		Bagdogra	Northeast India	Assam	Thunderstorm
17-03-2017	1500UTC	Jharsuguda	East India	Odisha	Thunderstorm
		North Lakhimpur	Northeast India	Assam	Thunderstorm
		Coimbatore	South India	Tamilnadu	Lightening
17-03-2017	1800UTC	Bhagalpur	East India	Bihar	Thunderstorm
17-03-2017		Guwahati	Northeast India	Assam	Thunderstorm with hail
17-03-2017	2100UTC	Bhagalpur	East India	Bihar	Thunderstorm
18-03-2017	0000UTC	Silchar	Northeast India	Assam	Thunderstorm
		Kailasahar	Northeast India	Tripura	Thunderstorm
18-03-2017	0300UTC	Silchar	Northeast India	Assam	Thunderstorm

Severe Weather warning based on DWR observation	
Name of issuing Radar station	**DWR Patna**
Geo-coordinates of issuing Station(Lat, Long,Alt)	---
Date and time of issue in UTC (yyyyMMddhhmm)	201703180600UTC
Nature of severe weather expected	Nil
Name of issuing Radar station	**DWR KARAIKAL**
Geo-coordinates of issuing Station(Lat, Long,Alt)	Lat:10.91381N,Long:79.84141E/Alt:25masl
Date and time of issue in UTC (yyyyMMddhhmm)	----
Nature of severe weather expected	
Name of issuing Radar station	**DWR NAGPUR**
Geo-coordinates of issuing Station(Lat, Long,Alt)	Lat:21.1458°N,Long:79.0882°E
Date and time of issue in UTC (yyyyMMddhhmm)	-
Nature of severe weather expected	-
Name of issuing Radar station	**DWR MUMBAI**
Geo-coordinates of issuing Station(Lat, Long,Alt)	Lat–18˚54'04", Long-72˚48'32"/HeightAMSL–3.22meters.
Date and time of issue in UTC (yyyyMMddhhmm)	201703180700 UTC
Nature of severe weather expected	Nil
Name of issuing Radar station	**DWR HYDERABAD**
Geo-coordinates of issuing Station(Lat, Long,Alt)	Lat–17.2562°NLong-78.7656°E
Date and time of issue in UTC (yyyyMMddhhmm)	201703180635
Nature of severe weather expected	Nil
Name of issuing Radar station	**DWR AGARTALA**
Geo-coordinates of issuing Station(Lat, Long,Alt)	23.89°N,91.25°E,16mabovemsl
Date and time of issue in UTC (yyyyMMddhhmm)	201703180630
Nature of severe weather expected	Thunderstorm with Light rain
Districts/ Talukas/ Mandals/ Blocks likely to be impacted.	South Tripura District
Name of issuing Radar station	**DWR KOLKATA**
Geo-coordinates of issuing Station(Lat, Long,Alt)	22.5705° N / 88.353° E, 7m above msl
Date and time of issue in UTC (yyyyMMddhhmm)	201703180611UTC
Nature of severe weather expected	Nil

Name of issuing Radar station	**DWR Machilipatnam**
Geo-coordinates of issuing Station(Lat, Long,Alt)	LAT: 16.12’ LONG: 81.09’ ALT: 3.05m.
Date and time of issue in UTC (yyyyMMddhhmm)	201703180601**UTC**
Nature of severe weather expected	Rain
Districts/ Talukas/ Mandals/ Blocks likely to be impacted	Nalgonda district

Past 24 hours DWR Report:

Radar Station name	Date	Time interval of observation (UTC)	Organization of the 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
NAGPUR	17/03/17	0312-1452 UTC	Nil	Nil	No Echoes	Nil	Nil
	17/3/2017	1502 -2352 UTC	Nil	Nil	Radar U/S	Nil	Nil
	18/3/2017	0002-0132 UTC	Nil	Nil	Radar U/S	Nil	Nil
	18/3/2017	0142-0300	Nil	Nil	No Echoes	Nil	Nil



Weather Symbols