India Meteorological Department

FDP STORM Bulletin No.91 (04-06-2017)

1. CURRENT SYNOPTIC SITUATION at 0300UTC of the Day:

The Northern Limit of Monsoon continues to pass through Lat.10.0°N/Long.60.0°E, Lat.10.0°N/Long.70.0°E, Kochi, Tondi, Lat. 14.0° N/ Long.87.0°E, Lat.17°N/ Long.90.0°E, Lat.20.0°N/Long 91.0°E, Agartala, William Nagar, Kokrajhar and Lat 27.0°N/Long 90.0°E.
The upper air cyclonic circulation over eastcentral Arabian sea off Maharashtra coast now lies over westcentral Arabian sea & neighbourhood between 1.5 km & 4.5 km above mean sea level.
The upper air cyclonic circulation over southeast Bay of Bengal & adjoining eastcentral Bay of Bengal now lies over westcentral Bay of Bengal & neighbourhood between 3.1 & 4.5 Km above mean sea level.
The trough at mean sea level from northwest Uttar Pradesh to Assam across north Uttar Pradesh & north Bihar now runs from northwest Uttar Pradesh to south Bangladesh across East Uttar Pradesh, northern parts of Jharkhand & Gangetic West Bengal and extends upto 0.9 km above mean sea level.
The western disturbance as a trough in mid-tropospheric westerlies with its axis at 3.1 km above mean sea level roughly along Longitude 57.0°E and north of latitude 32.0°N, now runs roughly along Longitude 58.0°E and north of latitude 32.0°N.

SATELLITE OBSERVATIONS during past 24hrs and current observation:

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

CONVECTIVE ACTIVITY: -

Cell No	Date/time (UTC)	Location/Area	MIN CTT (-DEG C)	Movement	Remarks
1	04/0900	Exterior South Madhya Pradesh	72	--	--

Clouds Description:-

Isolated low/medium clouds were seen over J & K, North Himachal Pradesh and North Uttarakhand.
Isolated low /medium clouds with embedded moderate to intense convection were seen over Central Chhattisgarh and Bay islands.
Scattered low/medium clouds with embedded weak to moderate convection were seen South Chhattisgarh, South Odisha, Arunachal Pradesh, South Manipur and Mizoram.
Scattered low/medium clouds with embedded intense to very intense convection were seen over Exterior South Madhya Pradesh.
Scattered low /medium clouds were seen over Southeast Rajasthan, Gujarat, rest Madhya Pradesh and rest India.

Arabian Sea:
Scattered low/medium clouds with embedded intense to very intense convection were seen over WC Arabian Sea. Scattered low /medium clouds with embedded moderate to intense convection were seen over Southeast adjoining EC Arabian Sea.
Bay of Bengal & Andaman Sea:
Scattered low/medium clouds with embedded moderate to intense convection were seen over SE adjoining EC Bay Andaman Sea and Tenasserim coast.

RADAR and RAPID Observation:

DWR Composite at 1300hrs IST indicated significant convection over Rayalaseema, Tamilnadu and in RAPID RGB Satellite imagery of 1200hrs IST indicated significant convective clouds over East Rajasthan, Maharashtra, East Madhya Pradesh, Central Chhattisgarh, Rayalaseema, Lakshadweep, Andaman & Nicobar Islands.

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

Not available.

2. NWP MODEL GUIDANCE:

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

1. Weather Systems: 00 UTC analysis shows the trough along Haryana region extending across Madhya Pradesh, Chhattisgarh and WB. The off-shore trough from south Maharashtra coast to Kerala coast is also seen in the analysis and is seen persisting till day 5.
2. Location of jet and jet core at 500 hPa:-500 hPa Jet core (>60kt): No presence of jet core over the Indian region for the next 5 days.
3. Low level Vorticity:-Positive Vorticity 850hPa (>12 x 10^{-1}/s): Analysis shows low level positive vorticity **(>-12 x 10^{-5}/s)** mainly over isolated pockets in UP, SHWB, Chhattisgarh and along the north eastern states. The high vorticity belts are mainly confined over regions of Punjab, UP, WB and Chhattisgarh region.
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): Forecast shows high threshold values over Bihar, along coastal region of Odisha, WB and AP for the next 2 to 5 days.
Lifted Index (< -2): The areas with index less than -2 lies along Bihar, Chhattisgarh, GWB and major regions of AP and TN along with Gujarat and Rajasthan for the next 2 to 3 days.
Sweat Index (> 400): 00UTC shows significant values over major parts over Bihar, GWB, Odisha and AP and is expected to persist for the next 4 to 5 days.
CAPE (> 1000): Mostly over Bihar, GWB, Odisha, and AP and other regions over the east coast, and over few pocket in Gujarat during the next 3 to 4 days.
CINE (50-150): based on 00 analysis maximum CIN values are found in areas over east UP, Bihar, GWB, Odisha, AP and TN and along with major pockets in the Maharashtra, Gujarat and Rajasthan region for the next 2-3 days.
5. Rainfall and thunderstorm activity:
10-40 mm rainfall is forecasted tomorrow over few pockets in the Kerala region and AP region. Day 2 to day 5 shows rainfall over isolated pockets in the south peninsular region, Central India and along the foothills of the Himalayas.

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

1. Model Reflectivity (Max. dBz):

15-40 dBZ: over isolated pockets in the Kerala Coast, AP and the North-East region till today.
15-40 dBz: over isolated pockets in the North West J&K region tomorrow.
15-40 dBz: over major regions of North West J&K and Bihar during day2.

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

CAPE (> 1000): Mostly along Bihar, GWB, Odisha, AP and along major regions bordering the west coast, along with few pockets in Gujarat, MP and adjoining regions of Central India during next 2 to 3 days.
CINE (50-150): Higher values over Rajasthan, WB, east coast and Odisha during next three days.

3. Rainfall and thunderstorm activity:

40-70 mm over North-east region, some pockets of Kerala and adjoining west coast of country based on 00 analysis it seen persisting for the next 3 days along with few pockets over the Himalayan foothills from day 2 to day3.

3. IOP ADVISORY FOR 24 and 48Hrs:

Summary and Conclusions:

Day-1 & Day-2:

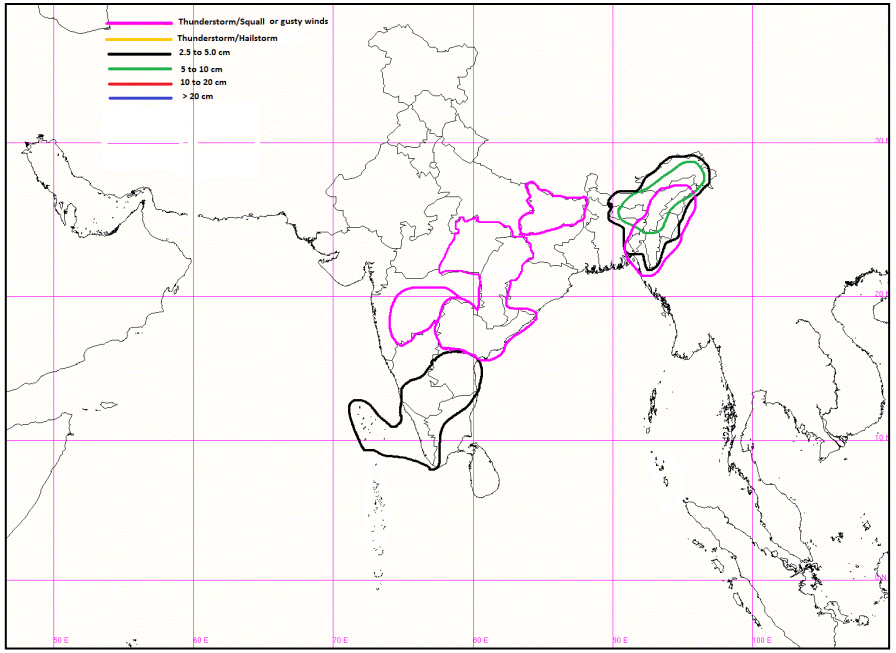
Presently, the trough at mean sea level from northwest Uttar Pradesh to south Bangladesh across East Uttar Pradesh, northern parts of Jharkhand & Gangetic West Bengal and extends upto 0.9 km above mean sea level. The upper air cyclonic circulation over southeast Bay of Bengal & adjoining east central Bay of Bengal now lies over west central Bay of Bengal & neighbourhood between 3.1 & 4.5 Km above mean sea level. This system will give rise to very heavy rainfall over Arunachal Pradesh, Assam and Meghalaya on Day-1. The thunderstorm with gusty wind possibility is very likely to Tripura, Nagaland, Manipur and Mizoram on Day-1.

The upper air cyclonic circulation over west central Arabian sea & neighbourhood between 1.5 km & 4.5 km above mean sea level. Based on Satellite RGB imageries and NWP model guidance, Kerala, Lakshadweep, Rayalaseema may experience some rainfall on Day-1

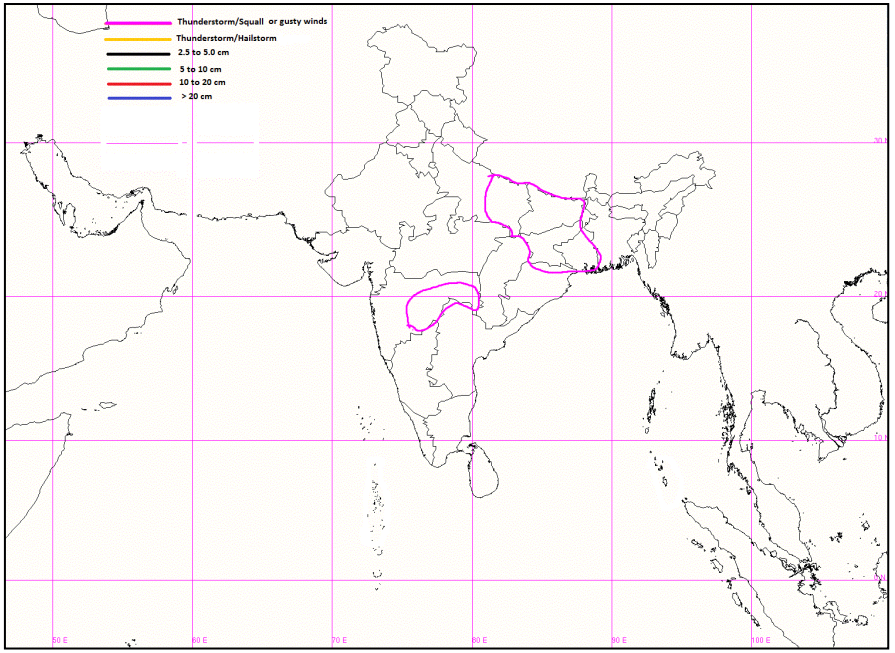
24 hour Advisory for IOP:
Arunachal Pradesh Assam Meghalaya Tripura, Nagaland, Manipur, Mizoram
Kerala, Lakshadweep, Rayalaseema, South Coastal Karnataka
Telangana, North Coastal Andhra Pradesh
Chhattisgarh, Bihar
South Madhya Maharashtra
East Madhya Pradesh

48 hour Advisory for IOP:
East UP, Bihar, Jharkhand, GWB
South Madhya Maharashtra

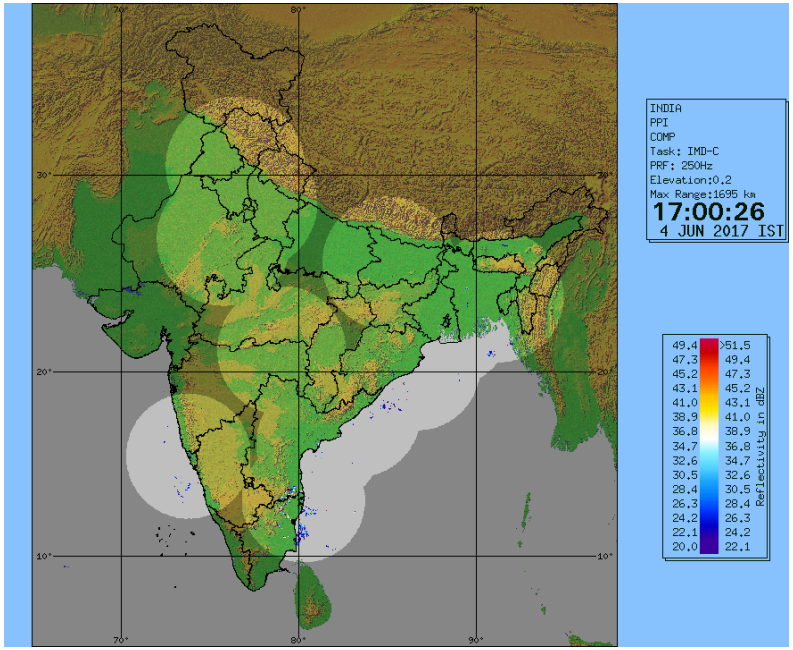
For NCMRWF NWP products:(http://www.ncmrwf.gov.in/HomePage/NEPS-prod-1.php)
For IMD NWP products:(http://nwp.imd.gov.in/diagpro new.php)
For Synoptic plotted data and charts
http://amssdelhi.gov.in/
http://www.amsskolkata.gov.in/
For RAPID tool:
http://rapid.imd.gov.in/
Low Level Winds
http://satellite.imd.gov.in/archive/INSAT-3D-IMAGER/3D-PRODUCTS/AMV/LLW/MAR 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/map skm2.html



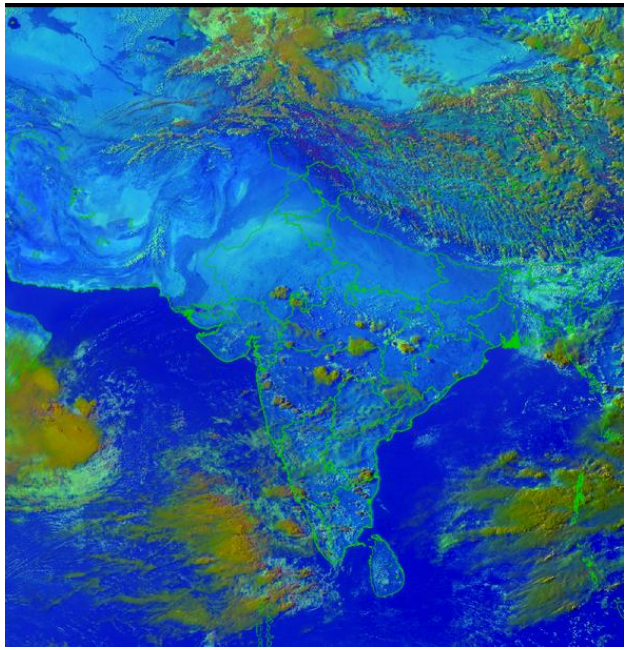
IOP Advisory for 24 hours



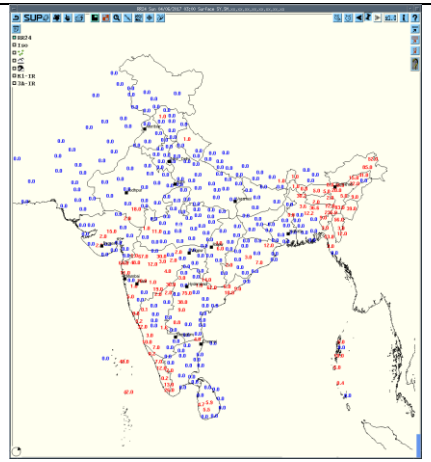
IOP Advisory for 48 hours

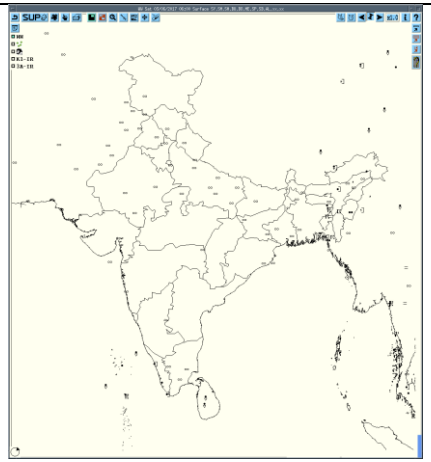
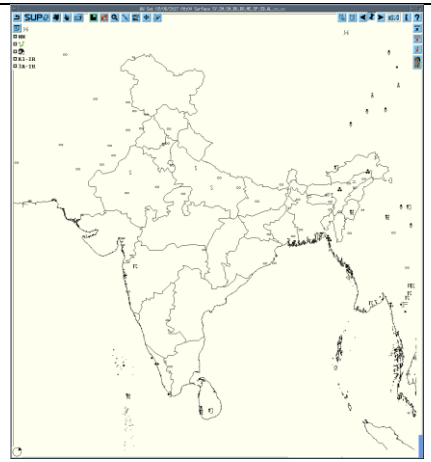
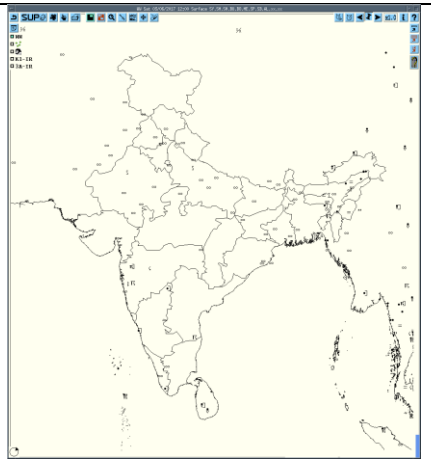
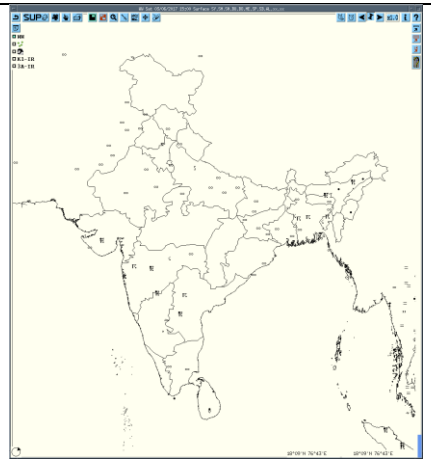
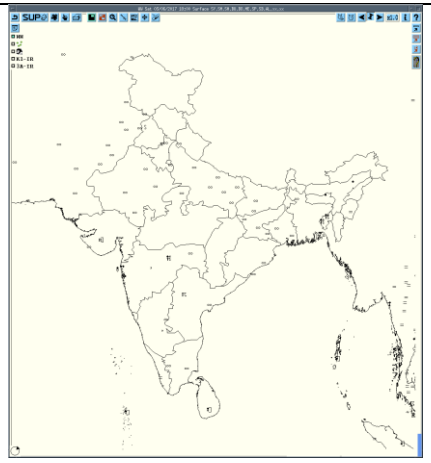
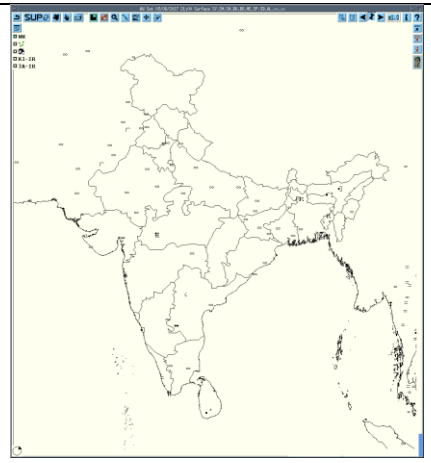
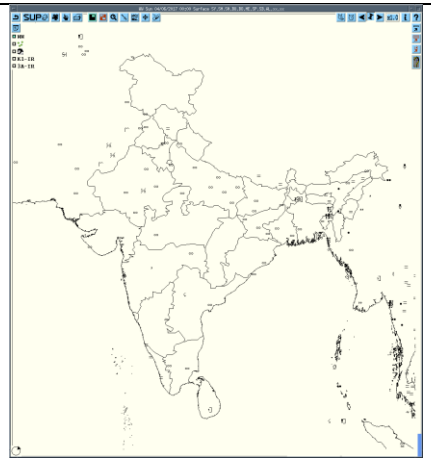
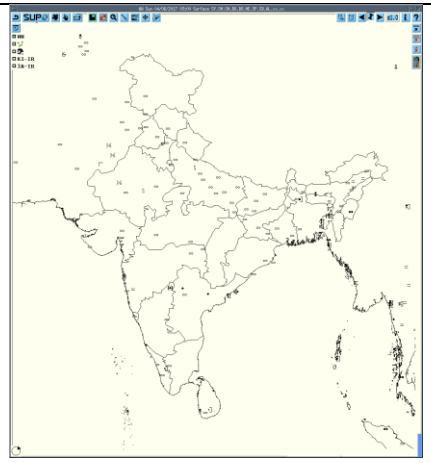


DWR Patna at 1700hrs IST of today

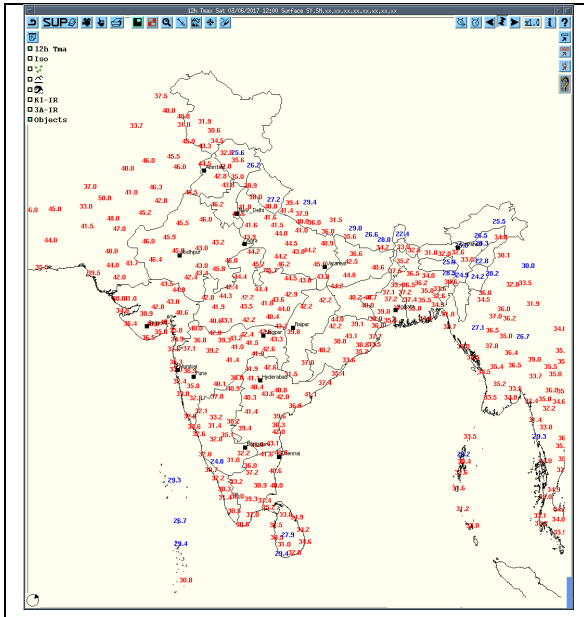
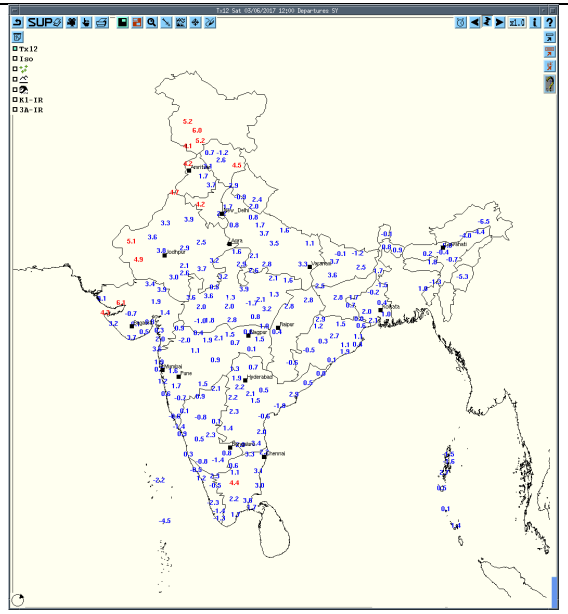
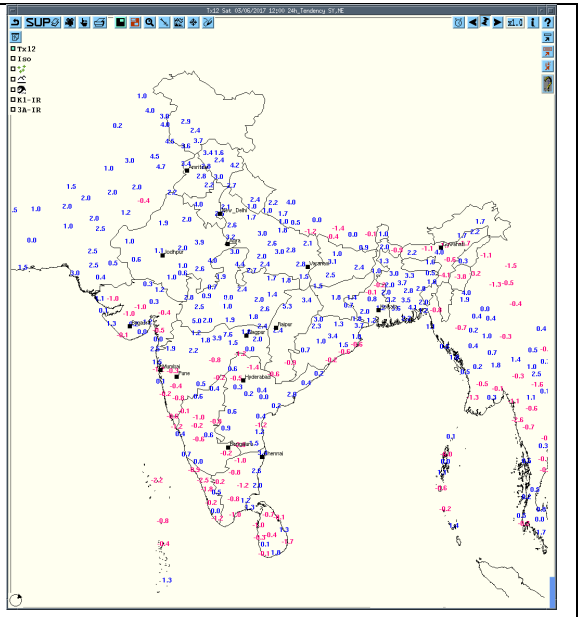
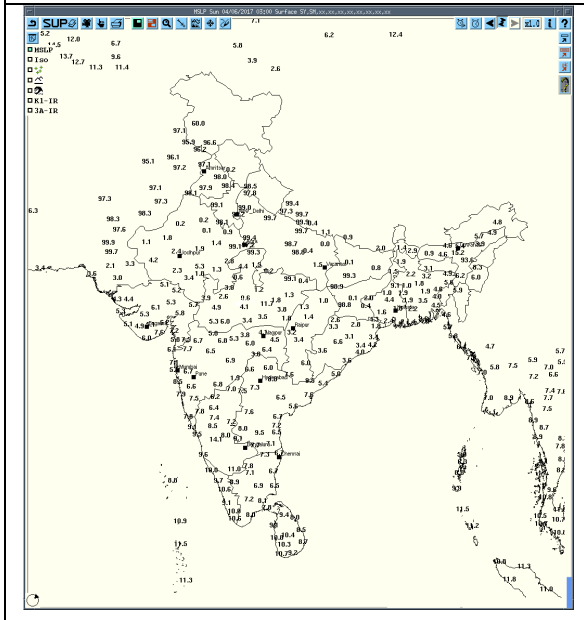
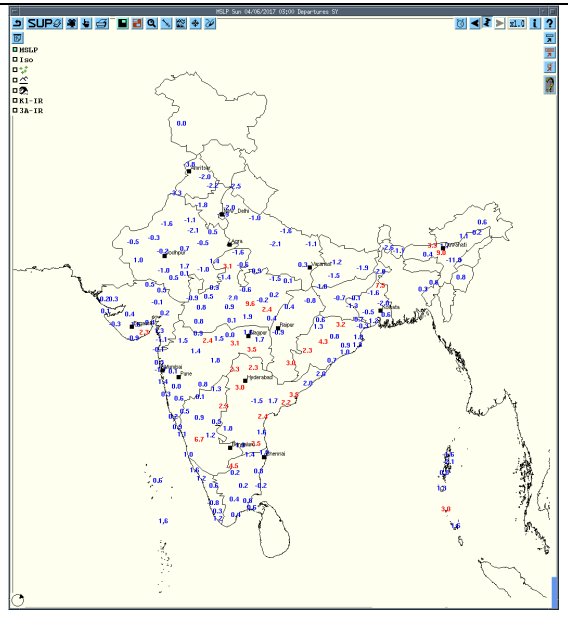
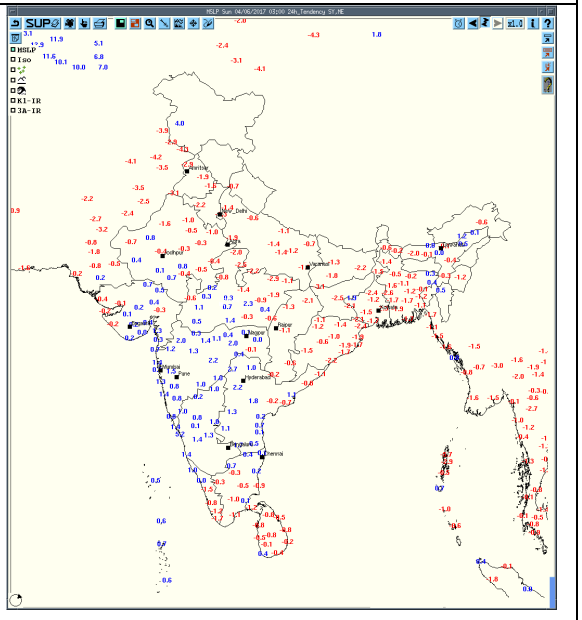


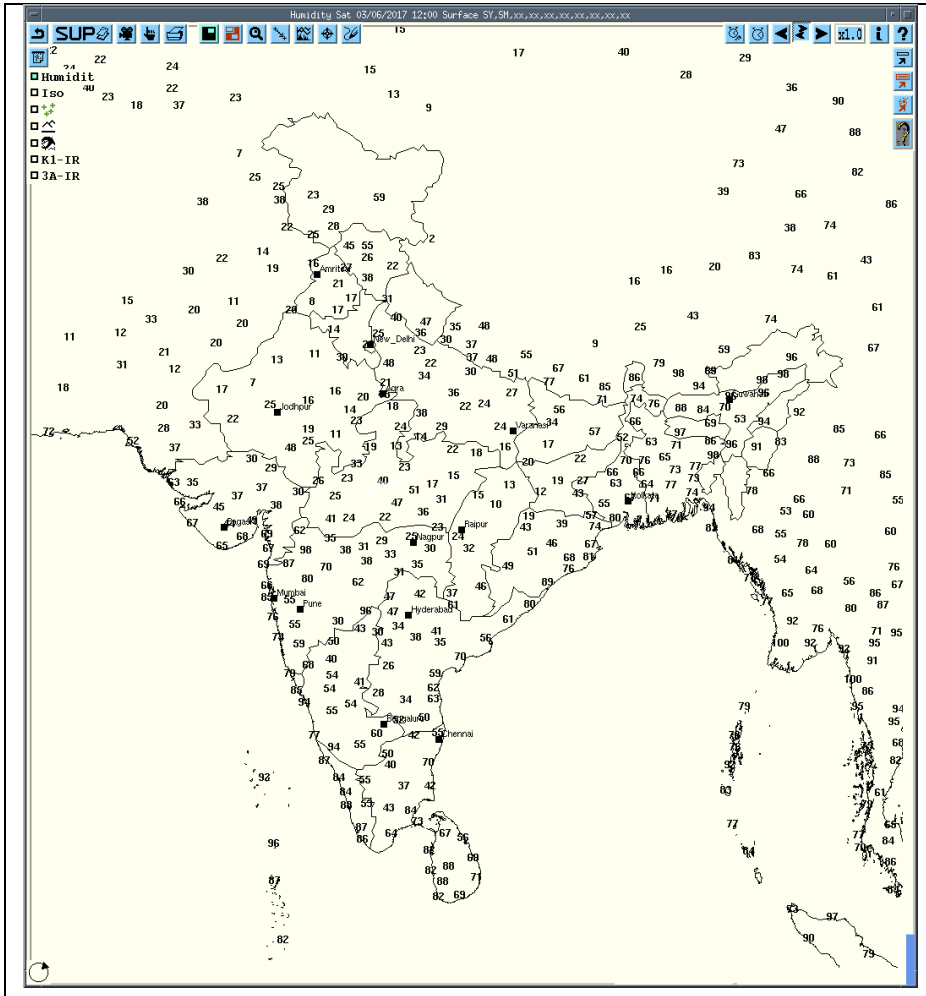
RAPID RGB Satellite Imagery at 1230 hrs IST of today

Not available	Not available	
Forecast Dust Concentration	**PM10 Forecast**	**Accumulated 24 Hour rainfall (in red) recorded at 0300UTC of today**
Not available	Not available	
IMR Rainfall	**HEM Rainfall**	

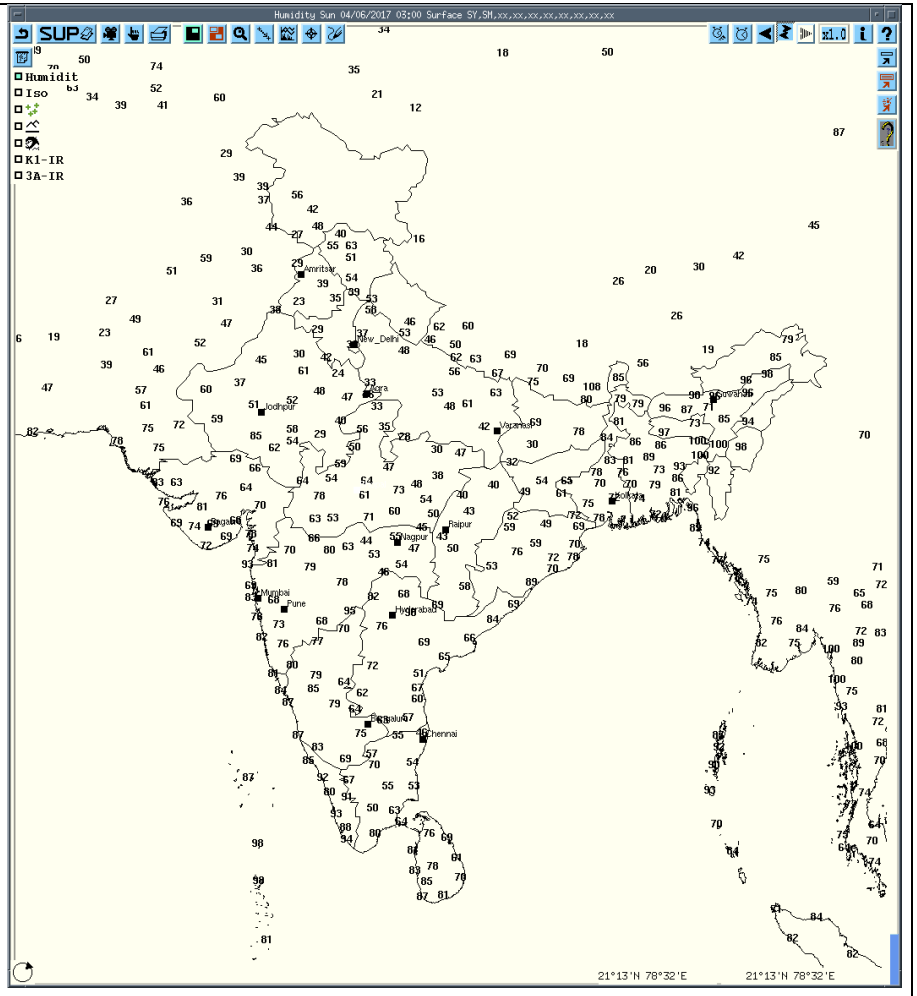









3hourly Past weather at 06, 09, 12, 15, 18, 21UTC of yesterday and 00 & 03 hrs UTC of today

		
Tmax	**Departure Tmax**	**Tendency Tmax**
		
MSLP	**Departure MSLP**	**Tendency MSLP**



RH at 12UTC yesterday



RH at 03UTC today

Realised past 24hrs TS/SQ/HS Data (reported at 0300UTC of the day):

Realized weather past 24hours (Based on SYNERGIE Products)					
Date	**Time of Reporting**	**Name of Station Reporting**	**Region**	**STATE**	**Weather Event**
03-06-17	0600UTC	Silchar	NE India	Assam	Thunderstorm
03-06-17	0900UTC	Imphal	NE India	Manipur	Thunderstorm
		Nasik	West India	Maharashtra	Thunderstorm
03-06-17	1200UTC	Kailasahar	NE India	Tripura	Thunderstorm
		Nasik, Pune	West India	Maharashtra	Thunderstorm
		Tirupathi	South India	Andhra Pradesh	Thunderstorm
03-06-17	1500UTC	Guwahati, North Lakhimpur	NE India	Assam	Thunderstorm
		Rajkot	West India	Gujarat	Thunderstorm
		Nasik, Aurangabad AP, Sholapur	West India	Maharashtra	Thunderstorm
		Hyderabad, Kurnool	South India	Andhra Pradesh	Thunderstorm
03-06-17	1800UTC	Rajkot	West India	Gujarat	Thunderstorm
		Akola	Central India	Vidarbha	Thunderstorm
		Agartala	NE India	Tripura	Thunderstorm
		Hyderabad	South India	Andhra Pradesh	Thunderstorm
03-06-17	2100UTC	Indore	Central India	Madhya Pradesh	Thunderstorm
		Kailasahar	NE India	Tripura	Thunderstorm
		Thiruvanthapuram	South India	Kerala	Thunderstorm
04-06-17	0000UTC	Kailasahar	NE India	Tripura	Thunderstorm
04-06-17	0300UTC	Tuni, Vishakhapatnam	South India	Andhra Pradesh	Thunderstorm

Realised TS/HS/SQ during past 24 hours ending at 0300UTC of today(received from RMCs/MCs)						
Name of Station Reporting	**Region**	**STATE**	**Weather Event (TS/Hail/Squall)**	**Date**	**Time of Commencement (IST)**	**Time of end (IST)**
Hyderabad	South India	Andhra Pradesh	Thunderstorm	03-06-17	2000	0100
Hyderabad	South India	Andhra Pradesh	Thunderstorm	04-06-17	0600	0630
Tuni	South India	Andhra Pradesh	Thunderstorm	04-06-17	0725	xxxx
Visakhapatnam	South India	Andhra Pradesh	Thunderstorm	04-06-17	0605	0740
Kurnool	South India	Andhra Pradesh	Thunderstorm	03-06-17	1950	2030
Tirupathi AP	South India	Andhra Pradesh	Thunderstorm	03-06-17	1530	1745

Realised TS/HS/SQ during past 24 hours ending at 0300UTC of today(received from RMCs/MCs)						
Name of Station Reporting	**Region**	**STATE**	**Weather Event (TS/Hail/Squall)**	**Date**	**Time of Commencement (IST)**	**Time of end (IST)**
Dabok	Northwest India	Uttarakhand	Thunderstorm	03-06-17	2335	0030
Akola	Central India	Vidarbha	Thunderstorm	03-06-17	2110	2315
Amravati	Central India	Vidarbha	Thunderstorm	03-06-17	1930	2100
Buldana	Central India	Vidarbha	Thunderstorm	03-06-17	1915	2000
Yeotmal	Central India	Vidarbha	Thunderstorm	03-06-17	2030	2200
Indore	Central India	Madhya Pradesh	Thunderstorm	04-06-17	0055	0500
Gangtok	East India	Sikkim	Thunderstorm	03-06-17	1445	1500
Tadong	East India	Sikkim	Thunderstorm	03-06-17	1450	1500
Port Blair	East India	Odisha	Lightening	03-06-17	2100	2145
Passighat	Northeast India	Arunachal Pradesh	Thunderstorm	03-06-17	2100	2400
Passighat	Northeast India	Arunachal Pradesh	Thunderstorm	04-06-17	0000	0220
Silchar	Northeast India	Assam	Thunderstorm	03-06-17	0840 0925 1120 1600	0900 0940 1200 1640
Silchar	Northeast India	Assam	Thunderstorm	04-06-17	0240	0250
North Lakhimpur	Northeast India	Assam	Thunderstorm	03-06-17	1950	2100
Tezpur	Northeast India	Assam	Thunderstorm	03-06-17	1750 2110 2122	1755 2122 2150
Dhubri	Northeast India	Assam	Thunderstorm	03-06-17	2030	2400
Dhubri	Northeast India	Assam	Thunderstorm	04-06-17	0000	0100
Guwahati	Northeast India	Assam	Thunderstorm	03-06-17	2020	2035
Cherrapunjee	Northeast India	Meghalaya	Thunderstorm	03-06-17	0846 2055	1020 2400
Cherrapunjee	Northeast India	Meghalaya	Thunderstorm	04-06-17	0000	0830
Imphal	Northeast India	Mizoram	Thunderstorm	03-06-17	1420	1440
Lengpui	Northeast India	Meghalaya	Thunderstorm	03-06-17	1800 2038	1900 2300
Lengpui	Northeast India	Meghalaya	Thunderstorm	04-06-17	0420	0720
Kailasahar	Northeast India	Tripura	Thunderstorm	03-06-17	1150	2400
Kailasahar	Northeast India	Tripura	Thunderstorm	04-06-17	0000	0830
Agartala	Northeast India	Tripura	Thunderstorm	03-06-17	2120	0050
Agartala	Northeast India	Tripura	Thunderstorm	04-06-17	0745	0830

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
Visakhapatnam	03/06/17	0600 UTC-0900 UTC	CB cell towards N direction with Max ht reaching 16 km with Max reflectivity of 52dBz.	CB cell is 190 Km from the Radar and moving SEly	Existing CB cell is maturing stage.	-	-
		0900 UTC-1200 UTC	Multiple CB cells towards N and NE direction with Max ht reaching 18 km with Max reflectivity of 57dBz.	CB cells are 147 Km from the Radar and moving SEly	Existing CB cells are maturing stage.	-	-
		1200 UTC-1500 UTC	Multiple CB cells towards NW and NE direction with Max ht reaching 14 km with Max reflectivity of 53dBz.	CB cells are 63 Km from the Radar and moving SEly	-	-	-
		1500 UTC-1800 UTC	An organized cell at SW with reflectivity 53 dBZ and height 10kms.	Matured stage and moving EASTERLY.	-	-	-
	04/06/17	1800 UTC-0000 UTC	Multiple cells of organized and convictive cells at NW sector with max reflectivity 56dbz with average height 17kms.	Matured stage and it movement is SOUTHERLY.	likely to be intensified	-	-
		0000 UTC-0300 UTC	Multiple cells of organized and convictive cells at NW sector with max reflectivity 56dbz with average height 18kms.	Matured stage and movement is SOUTHERLY.	likely to dissipate	-	-
Jaipur	04/06/17	03/0300 -04/0300	Nil	Nil	Nil	Nil	Nil
Patna	04/06/17	03/0300 -04/0300	Nil	Nil	Nil	Nil	Nil
Patiala	04/06/17	03/0300 -04/0300	Nil	Nil	Nil	Nil	Nil
Srinagar	04/06/17	03/0300 -04/0300	Nil	Nil	Nil	Nil	Nil
Lucknow	04/06/17	03/0300 -04/0300	Nil	Nil	Nil	Nil	Nil
Paradeep	04-06-17	03/0700-03/1300	A small isolated cell developed at 1230 IST at latitude 20.41 degree N and longitude 84.50 degree E having maximum reflectivity 36 dBZ. But it dissipated after small time . Then a convective cloud mass appeared in SSW direction at a distance of 244.5 km having maximum reflectivity 42 dBZ and this cloud moved towards SE direction with a speed of 56 km/hr and dissipated after 1830 IST.	Position of convective cloud mass:- Lat. 19.96Deg.N Long. 84.33deg.E Direction-SSW from station.	NIL	TS with slight rain.	Kandhamala, Nayagarh, Ganjam

Radar Station Name	Date	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	03-06-17	03/0311-0902	NIL	NIL	NO ECHO	NIL	NIL
		03/0911-1711	1. Single cells converted to multi celled system and later merged to a single cell with maximum reflectivity of 65.0 dBz at 1041 UTC and maximum height 16.9 km at 1011 UTC.	1. NNW/217 km moving towards ESE-ly/ at a speed of 43 kmph	1. Single cell developed at 0911 UTC in NNW/217 km from Radar Converted to multi celled system and later merged to a single cell. Matured. Dissipated at 1711 UTC in NE at a distance of 231 km from radar.	Thunderstorm / Squall / Hail / Rain	N/A
			2. Single cells converted to multi celled system and later merged to a single cell with maximum reflectivity of 62.5 dBz at 1111 UTC and maximum height more than 18 km at 1041 UTC.	2. N/249 km moving towards ESE-ly/ at a speed of 49 kmph	2. Single cell developed at 0951 UTC in N/249 km from Radar Converted to multi celled system and later merged to a single cell. Matured. Moved out of Radar range at 1501 UTC in NE.	Thunderstorm / Squall /Hail / Rain	N/A
			3. Multi celled system with maximum reflectivity of 55.5 dBz at 1331 UTC and maximum height more than 114.1 km at 1201 UTC.	3.W/206 km moving towards SE-ly/ at a speed of 41 kmph	3. Multi celled system developed at 1121 UTC in W/206 km from Radar. Not matured. Dissipated at 1501 UTC in WSW/119 km from Radar.	Thunderstorm / Squall /Hail / Rain	N/A
	04-06-17	03/1721 - 04/0300	NIL	NIL	NO ECHO	NIL	NIL
Karaikal	03.06.17	1) 1222-1632 IST 2) 1512-2142IST	1)Cluster of individual cells at NW direction at 182 km range with max reflectivity of 67dBz and average height of 10 kms 2)Cluster of cells in NNW direction at 200 km range with max reflectivity of 67dBz and Average height of 11KM	1)In NW direction moving in E ly direction with speed of 20 kmph 2)In NNW direction almost stationary	1)Cells started forming at 1222 and dissipated at 1632 IST 2)Cells started forming at 1332 and dissipated at 2022 IST	N/A	N/A
	03.06.17	1) 1222-1632 IST 2) 1512-2142IST	1)Cluster of individual cells at NW direction at 182 km range with max reflectivity of 67dBz and average height of 10 kms 2)Cluster of cells in NNW direction at 200 km range with max reflectivity of 67dBz and Average height of 11KM	1)In NW direction moving in E ly direction with speed of 20 kmph 2)In NNW direction almost stationary	1)Cells started forming at 1222 and dissipated at 1632 IST 2)Cells started forming at 1332 and dissipated at 2022 IST	N/A	N/A