



**India Meteorological Department**  
**FDP STORM Bulletin No.104 (17-06-2017)**

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

The Northern Limit of Monsoon (NLM) continues to pass through Lat. 20.5°N / Long. 60.0°E, Lat. 20.5°N / Long. 70.0°E, Valsad, Nasik, Buldana, Yeotmal, Kanker, Jharsuguda, Jamshedpur, Bhagalpur and Lat. 27.0°N / Long. 86.0°E.

Favourable Conditions are developing for further advance of southwest monsoon into some more parts of Madhya Maharashtra, Vidarbha, Chhattisgarh, remaining parts of Odisha, Jharkhand and Bihar during next 3-4 days.

The upper air cyclonic circulation over Bangladesh & neighbourhood persists and now extends upto 0.9 km above mean sea level.

The trough at mean sea level from northwest Rajasthan to Assam now runs from northwest Rajasthan to Manipur across south Uttar Pradesh & Bihar and extends upto 0.9 km above mean sea level with an embedded cyclonic circulation over southwest Uttar Pradesh & neighbourhood extending upto 1.5 km above mean sea level.

A north-west trough runs from Sub-Himalayan West Bengal & Sikkim to north Bay of Bengal between 2.1 & 3.1 km above mean sea level.

The east-west shear zone runs roughly along latitude 17.0°N between 3.1 & 3.6 km above mean sea level.

The off shore trough from south Maharashtra coast to Kerala coast persists.

The upper air cyclonic circulation over Haryana & neighbourhood persists and now extends upto 0.9 km above mean sea level.

**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	17/0200	SW Haryana	62		Developing
	0300	do	67		
	0400	S Haryana	64		
	0500	S Haryana, Delhi	61		
	0600	do	54		
	0700	do	49		
	0800	do	50		
	0900	do	46		

2	17/0700	SW Punjab adjoining Rajasthan	79		
	0800	do	79		
	0900	do	74		

**Cloud Description:**

Broken low/medium clouds with embedded intense to very intense convection were seen over EC Bangladesh, E Meghalaya, SE Assam. Scattered low/medium clouds with embedded intense to very intense convection were seen over SW Punjab adjoining Rajasthan. low/medium clouds with embedded moderate to intense convection seen over S Haryana, Delhi adjoining Uttar Pradesh. Scattered low/medium clouds with embedded moderate to intense convection seen over Arunachal Pradesh, Nagaland, Manipur, Lakshadweep, South Interior Karnataka and coastal Karnataka. Scattered low/medium clouds with embedded weak to moderate convection seen over exterior Himachal Pradesh and rest NE states. Scattered low/medium clouds with embedded isolated weak to moderate convection seen over N Kerala and S Rayalaseema. Scattered low/medium clouds with embedded weak convection were seen over extreme NE Rajasthan and Goa. Scattered low/medium clouds were seen over rest parts of North, East, West and South India.

**Arabian Sea:**

Scattered low/medium clouds with embedded moderate to intense convection were seen over EC & SE Arabian Sea.

**Bay of Bengal & Andaman Sea:**

Scattered low/medium clouds with embedded moderate to intense convection seen over NE Bay, EC Bay adjoining SW Bay and Arakan coast.

**Past Weather:**

**Convection:-**

Moderate to Intense convection was observed over J&K Himachal Pradesh Punjab Haryana Delhi North-West Rajasthan North-East Uttar Pradesh Bihar Jharkhand West Bengal North East States Chhattisgarh Madhya Pradesh Maharashtra Telangana Andhra Pradesh Karnataka Kerala Tamilnadu.

**OLR:-**

Upto **200**  $\text{wm}^{-2}$  was observed over Meghalaya West Assam Nagaland Karnataka Andhra Pradesh Kerala Tamilnadu.

Upto **230**  $\text{wm}^{-2}$  was observed over East J&K Vidarbha S Marathwara Coastal Odisha Arunachal Pradesh Rest Assam Manipur Mizoram Telangana

Upto **250**  $\text{wm}^{-2}$  was observed over Himachal Pradesh Uttarakhand East Uttar Pradesh Chhattisgarh Rest Odisha Bihar Jharkhand West Bengal.

**Westerly Trough & Jet-Stream:**

No Westerly trough and Jet Stream observed over India

**Dynamic Features:**

Medium to High wind shear is observed over North & South India and Low wind shear is observed over Central India .

Positive shear tendency is observed over the India.

A Positive Vorticity field is observed over North Chhattisgarh East Madhya Pradesh and Rayalseema .

Negative low level convergence is observed over East Gujarat Coastal Karnataka and Positive low level convergence observed over rest parts of India.

**Precipitation:**

## **IMR:**

Rainfall from **90** mm was observed over East Meghalaya.

Rainfall from **50** mm was observed over West Meghalaya West Assam South Andhra Pradesh Kerala North Tamilnadu. Rainfall Up to **30** mm was observed over North West Bengal South Interior Karnataka. Rainfall Up to **20** mm was observed over Nagaland Manipur. Rainfall Up to **10** mm was observed over East Uttar Pradesh Chhattisgarh Maharashtra Madhya Pradesh Bihar Jharkhand Rest Andhra Pradesh Rest Karnataka Rest Tamilnadu Rest Assam Arunachal Pradesh

## **HEM:.**

Rainfall Up to **347** mm was observed over East Meghalaya. Rainfall Up to **70** mm was observed over West Meghalaya Nagaland Manipur Arunachal Pradesh South Interior Karnataka Kerala Rayalaseema. Rainfall Up to **14** mm was observed over Tamilnadu. Rainfall Up to **07**mm was observed over Haryana Delhi East Uttar Pradesh Maharashtra Madhya Pradesh Chhattisgarh Bihar Jharkhand Odisha North West Bengal Rest Andhra Pradesh Telangana .

## **RADAR and RAPID Observation:**

DWR composite at 1620hrs IST indicated significant convection over West Haryana adjoining Rajasthan, N Odisha adjoining Jharkhand, Gangetic West Bengal, Madhya Maharashtra and S Vidarbha.

RAPID RGB Satellite imagery at 1530hrs IST indicated convective clouds over S Punjab adjoining Punjab & Haryana, Madhya Pradesh, Jharkhand, Chhattisgarh, Odisha, Maharashtra, Assam, Meghalaya, Nagaland, Manipur, Mizoram, Tripura, Konkan & Goa, Karnataka, Telangana, N Kerala and Lakshadweep.

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

Dust concentration was observed over northern Africa and some parts of eastern Asia. Dust concentration is expected to increase over western and northern India for next five days.

High PM10 concentration was observed over north-western and northern India. PM10 concentration is expected to increase over northern India for next five days.

Particulate matter concentration expected to remain in moderate to satisfactory category for next 2 days.

## **2. NWP MODEL GUIDANCE:**

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

#### **1. Weather Systems:**

**12UTC Charts of Day 0-4** show heat low over NW India and adjoining Pakistan with MSLP values lower than 992hPa.

**12UTC charts of Day 0-2:** show a zone of wind discontinuity at 925 hPa; SW-NE extending from Madhya Pradesh to Jharkhand/Bihar

**12 UTC charts of Day 0-4:** Western Disturbance as a trough is seen over North and NW India in all the days.

**00UTC charts of Day 1:** Offshore trough over Maharashtra, Karnataka and Kerala coast. Another trough is seen off Tamilnadu, AP and Odisha coast in Day 3-5.

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

Weaker core winds at 12 UTC on all days over India.

#### **3. Convergence at 850 hPa:**

**(Day/Index : Subdivisions with Lower Level Convergence > 15 x 10<sup>-5</sup> /s)**

Day0: Assam Meghalaya,

Day1: Assam Meghalaya,

Day2: Assam Meghalaya, NE NMMT,

Day3: Punjab,

Day4: Assam Meghalaya, NE NMMT,

**4. Low level Vorticity:-Positive Vorticity (>15 x 10<sup>-5</sup>/s):**

**(Day/Index: Subdivisions with Lower Level Vortex > 15 x 10<sup>-5</sup> /s):**

Day0: Arunachal Pradesh, Assam Meghalaya, TN Puducherry,

Day1: Arunachal Pradesh, Assam Meghalaya, Himachal Pradesh, TN Puducherry,

Day2: Arunachal Pradesh, Assam Meghalaya, Uttarakhand, TN Puducherry,

Day3: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, Bihar, Uttarakhand, TN Puducherry, Kerala,

Day4: Assam Meghalaya, Sub Himalayan WB, Uttarakhand, TN Puducherry, Kerala

**5. Showalter Index: -3 to -4[Very unstable]: (Day/Index: Subdivisions with Showalter Index < -4):**

Day0: Arunachal Pradesh, Sub Himalayan WB, Gangetic WB, Jharkhand, East UP, West UP, Uttarakhand, Hry Chd Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, Odisha, West MP, Guj Reg, Saurashtra Kutch, Konkan Goa, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Telangana,

Day1: Arunachal Pradesh, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, West UP, Uttarakhand, Hry Chd Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, Odisha, West MP, Guj Reg, Saurashtra Kutch, Marathwada, Vidarbha, Chhattisgarh, Coastal AP, Telangana,

Day2: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Hry Chd Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, Odisha, Saurashtra Kutch, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Coastal AP, Telangana,

Day3: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Hry Chd Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, Odisha, West MP, Guj Reg, Saurashtra Kutch, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Coastal AP, Telangana,

Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Hry Chd Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, Odisha, West MP, East MP, Guj Reg, Saurashtra Kutch, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Coastal AP, Telangana

**6. K-Index :> 35[Very Unstable thunderstorm likely]: (Day/Index: Subdivisions with K Index > 40):**

Day0: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Hry Chd Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, Odisha, West MP, East MP, Guj Reg, Saurashtra Kutch, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Telangana, TN Puducherry,

Day1: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Hry Chd Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, Odisha, West MP, East MP, Guj Reg, Marathwada, Vidarbha, Chhattisgarh, Telangana, TN Puducherry,

Day2: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Hry Chd Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, East RJ, Odisha, West MP, East MP, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Rayalseema, TN Puducherry, NI Karnataka,

Day3: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Punjab, Himachal Pradesh, Jammu Kashmir, East RJ, Odisha, West MP, East MP, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Coastal AP, TN Puducherry,

Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Hry Chd Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, East RJ, Odisha, West MP, East MP, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Coastal AP, Telangana, TN Puducherry, SI Karnataka

**7. Spatial distribution of TTI (TTI >50 [Scattered Thunderstorms few severe): (Day/Index: Subdivision with Total Totals Index > 52):**

Day0: Arunachal Pradesh, Sub Himalayan WB, West UP, Uttarakhand, Hry Chd Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, Guj Reg, Saurashtra Kutch,

Day1: Arunachal Pradesh, Sub Himalayan WB, Uttarakhand, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ,

Day2: Arunachal Pradesh, Sub Himalayan WB, Uttarakhand, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ,

Day3: Arunachal Pradesh, Sub Himalayan WB, Jharkhand, Uttarakhand, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, Odisha,

Day4: Arunachal Pradesh, Sub Himalayan WB, Jharkhand, East UP, West UP, Uttarakhand, Hry Chd Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, Odisha, West MP, East MP, Guj Reg, Saurashtra Kutch.

**8. Rainfall and thunder storm activity: (Day/Index: Subdivisions with Precipitation > 2 cm):**

Day1: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Uttarakhand, Hry Chd Delhi, Punjab, Jammu Kashmir, Konkan Goa, Telangana, Rayalseema, TN Puducherry, Coastal Karnataka, SI Karnataka, Kerala,

Day2: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Uttarakhand, Hry Chd Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, Konkan Goa, Madhya Maharashtra, Coastal Karnataka, Kerala,

Day3: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Bihar, East UP, West UP, Uttarakhand, Hry Chd Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, Konkan Goa, Madhya Maharashtra, Coastal Karnataka, Kerala,

Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Bihar, East UP, Uttarakhand, Hry Chd Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, Odisha, Konkan Goa, Madhya Maharashtra, Coastal Karnataka, SI Karnataka, Kerala,

Day5: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Hry Chd Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, Konkan Goa, Madhya Maharashtra, TN Puducherry, Coastal Karnataka, SI Karnataka, Kerala

**\*\*Rainfall >16 cm/day over Bangladesh adjoined to Meghalaya in day 3-5**

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

**1. Weather Systems:**

The analysis based on 00 UTC shows a trough at mean sea level from Punjab to west Assam and adjoining areas. Forecasts show the persistence of the trough for all the 5 days and thereby extending along Bihar to GWB and adjoining areas.

**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 ( $>12 \times 10^{-1}/s$ ):**

The high vorticity belts are mainly over Punjab, UP, Haryana, Gangetic plains, foot hills of Himalaya, parts of Central India, NE states, south peninsula along with isolated pockets over the east coast 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 ( $>4$ ):** Above threshold values are mostly over Gujarat, Rajasthan, isolated pockets of Bihar, GWB and Odisha Coast during next 5 days.

**Lifted Index ( $< -2$ ):** Less than threshold value over most parts of the country except J&K, HP, Uttarakhand, UP, parts of central India, NE states and over major parts of the south peninsula during next 5 days.

**Total Total Index ( $> 50$ ):** Greater than threshold value over isolated pockets of northwest India, Delhi and adjoining areas during next 5 days.

**Sweat Index ( $>300$ ):** Higher than threshold value almost all over the country except parts of NW India and isolated pockets over Delhi, UP, Bihar, MP and isolated pockets in the South peninsula.

**CAPE ( $> 1000$ ):** Mostly over parts of northwest India, central parts of India, West Bengal, Bihar, isolated pockets of Odisha and regions bordering the east coast of the county.

**CIN (50-150):** Mostly all over the country except J&K, NE states and isolated pockets over the south peninsula region..

### **5. Rainfall and thunderstorm activity:**

20-70 mm rainfall over major regions of Delhi, UP, foothills of the Himalayas, Maharashtra, Odisha, the east coast and west coast and over major regions of the NE states during the next 5 days. 20-70 mm rainfall over parts of Maharashtra, GWB, Odisha, Chhattisgarh and isolated pockets of coastal Andhra Pradesh during next 5 days.

40-70 mm rainfall and more over SHWB, NE states, GWB, Konkan coast, Vidarba and along the foothills of the Himalayas during the next 5 days and along Delhi and adjoining areas from day4.

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

#### **1. Model Reflectivity (Max. dBz):**

15-35 dBZ Model reflectivity over AP, Odisha and major regions of the South peninsula and over NE states valid for today. 15-40 dBz model reflectivity over major regions of NE states and along the foothills of the Himalayas for the next 2 days.

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

**Total Total Index ( $> 50$ ):** Above threshold value over major regions of northwest and central parts of India, Gangetic plain and isolated pockets over the east coast during next 72 hours.

**K-Index ( $> 35$ ):** Less than threshold value over the entire country during the next 72 hours.

**CAPE ( $> 1000$ ):** Mostly over the foothills of the Himalayas, Gujarat, central India, east UP, Bihar, Delhi, Punjab, NE states and major regions bordering the east coast of the country during next 3 days.

**CIN (50-150):** Over north west parts of India, east UP, Bihar, parts of central India and south peninsula during next three days.

#### **3. Rainfall and thunderstorm activity:**

70-130 mm and more over SHWB, and NE states for the next 72 hours.

20-70 mm over the foothills of the Himalayas, NE states, west coast, Odisha coast, and parts of Central India for the next 72 hours

### 3. IOP ADVISORY FOR 24 and 48Hrs:

#### Summary and Conclusions:

##### Day-1 & Day-2:

The decrease in intensity of the low pressure system and its northeastward movement, has decreased the moisture flow into north-east India. Consequently, the associated rainfall over the region is likely to decrease hereafter. However, due to the in-situ moisture still over the region, very heavy rainfall is expected at isolated places of Meghalaya on day 1.

In association with the east-west shear zone in the middle troposphere, which runs roughly along latitude 17.0°N, thunderstorms are expected over central India on day 1 and 2. There is also an upper air cyclonic circulation over Haryana & neighbourhood, and this will cause the thunderstorm belt to extend northward into North India.

In association with the off shore trough from south Maharashtra coast to Kerala coast, heavy rainfall is likely over the central part of the west peninsular coast of India on day 1, which is likely to continue on day 2.

#### 24 hour Advisory for IOP:

##### Rainfall:

Assam, Meghalaya,  
Nagaland, Manipur, Mizoram and Tripura  
Coastal Karnataka, Coastal Andhra Pradesh  
South Konkan and Goa

##### Thunderstorm with associated phenomena:

Punjab, Haryana, West Uttar Pradesh  
Madhya Maharashtra, Marathawada  
Madhya Pradesh, Vidarbha  
Jharkhand

#### 48 hour Advisory for IOP:

##### Rainfall:

South Konkan and Goa

##### Thunderstorm with associated phenomena:

Himachal Pradesh, Uttarakhand,  
Punjab, Haryana, Uttar Pradesh, Bihar, Jharkhand  
Marathawada, Madhya Pradesh, Vidarbha

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](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](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](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](http://satellite.imd.gov.in/img/3Ddaily_imr.jpg)

HEM: [http://satellite.imd.gov.in/img/3Ddaily\\_he.jpg](http://satellite.imd.gov.in/img/3Ddaily_he.jpg)

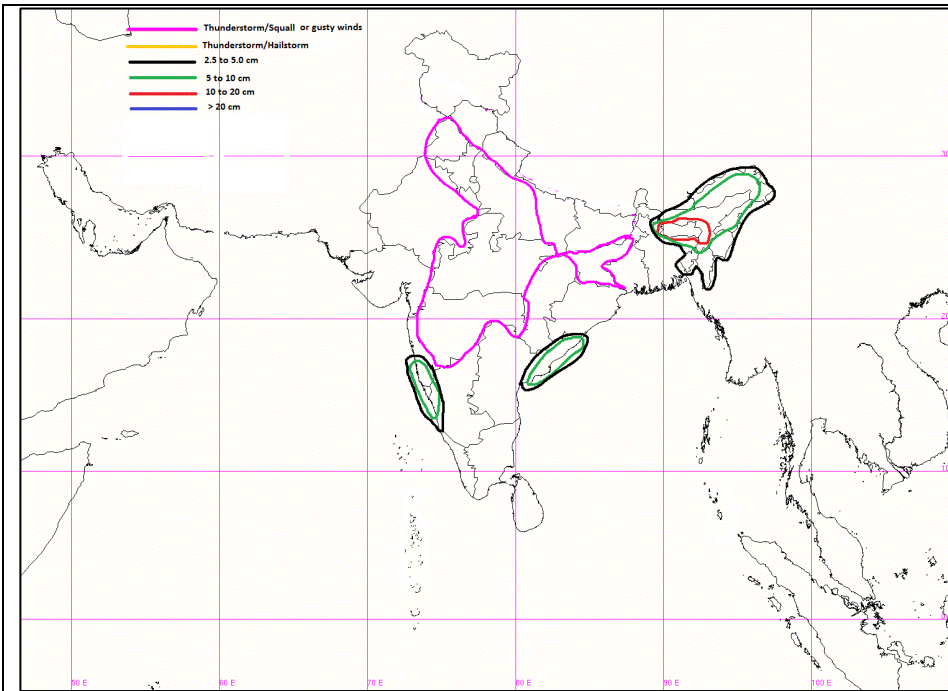
ForRadarimagesofthepast24hoursincludingmosaicofimages:

[http://ddgmui.imd.gov.in/dwr\\_img/](http://ddgmui.imd.gov.in/dwr_img/)

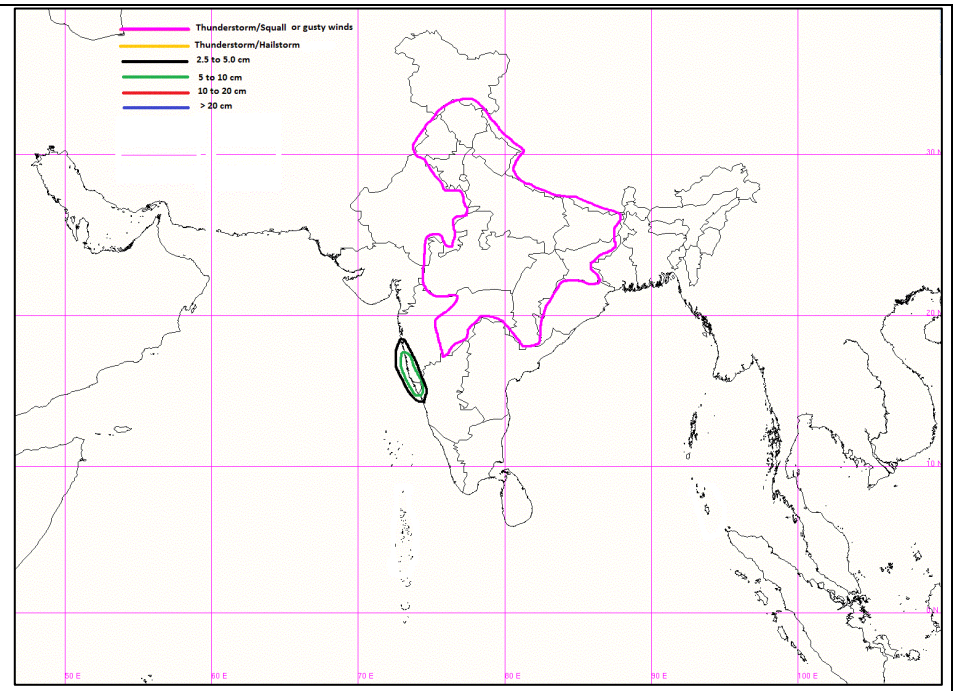
Satellite sounder based T- Phigram

[http://satellite.imd.gov.in/map\\_skm2.html](http://satellite.imd.gov.in/map_skm2.html)

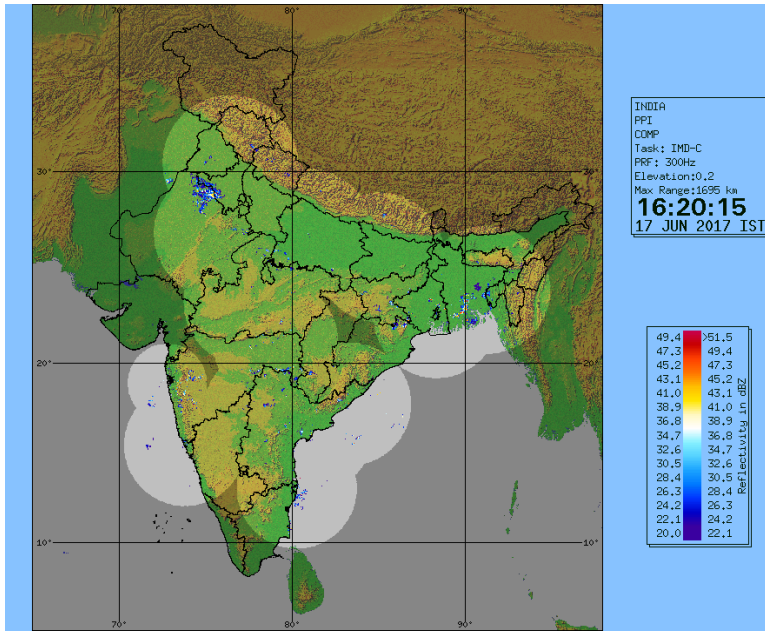




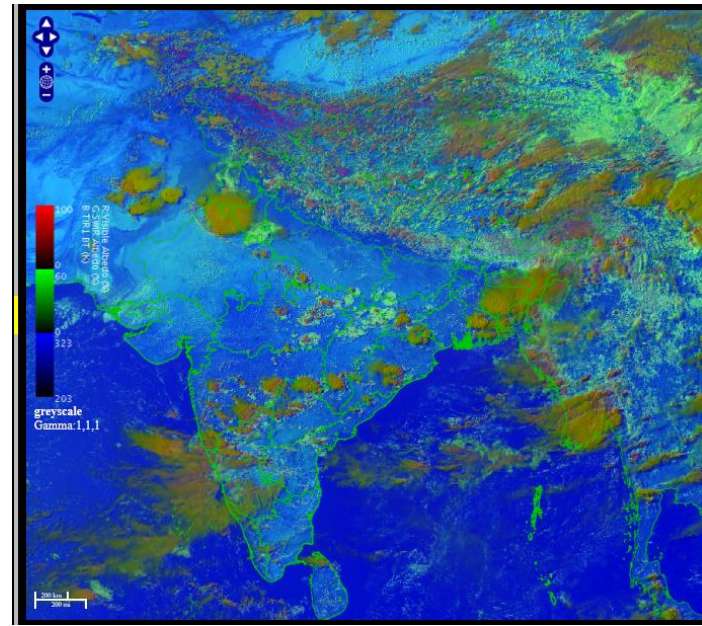
**IOP Advisory for 24 hours**



**IOP Advisory for 48 hours**

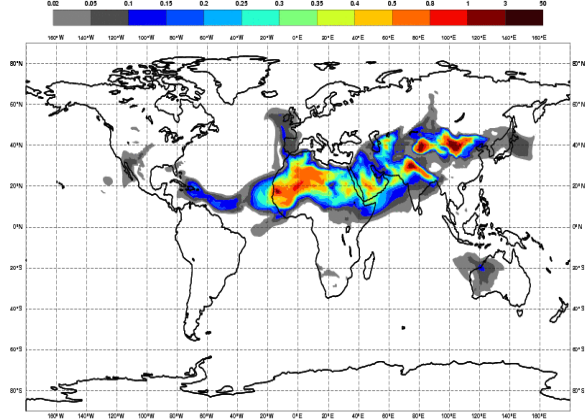


**DWR Composite at 1620 hrs IST**



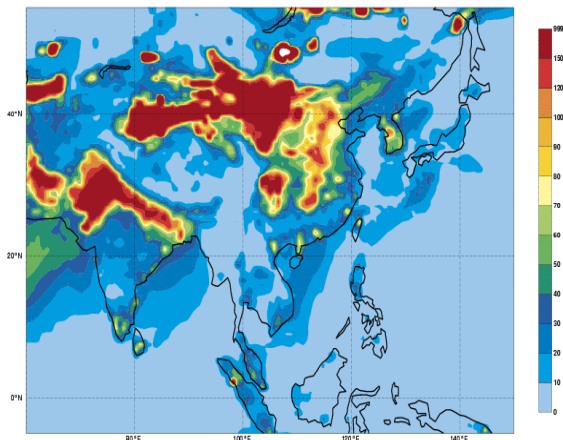
**RAPID RGB Satellite Imagery at 1530 hrs IST of today**

Friday 16 June 2017 00UTC CAMS Forecast (+120 VT: Wednesday 21 June 2017 00UTC  
Dust Aerosols Optical Depth at 550 nm

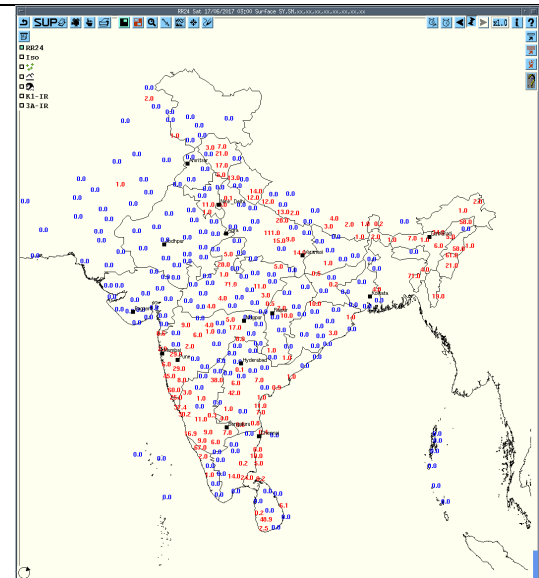


**Forecast Dust Concentration for 00UTC of 21<sup>th</sup> June**

Friday 16 June 2017 00UTC CAMS Forecast (+120 VT: Wednesday 21 June 2017 00UTC  
Surface PM10 [ug/m3]

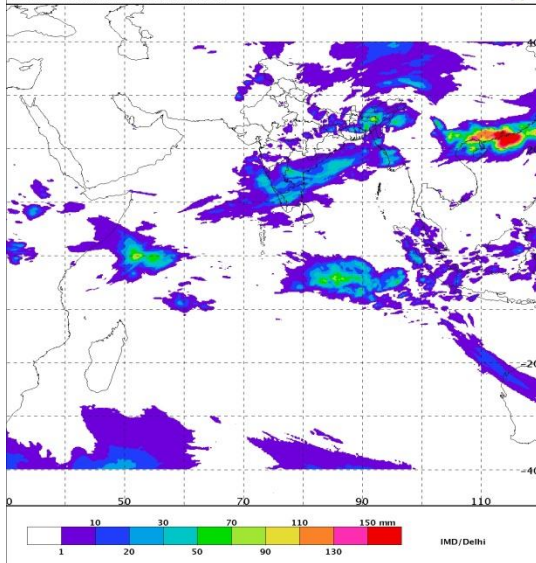


**PM10 Forecast for 00UTC of 21<sup>th</sup> June**



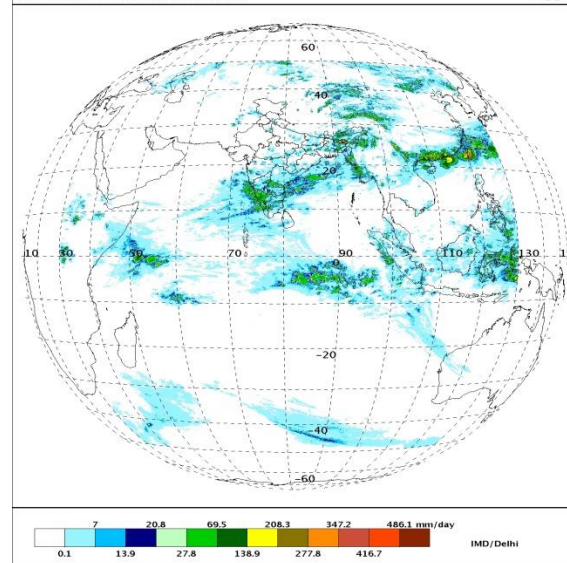
**Accumulated 24 Hour rainfall (in red) recorded at 0300UTC of today**

SAT :INSAT-3D IMG 16-06-2017 (03:30 GMT) to 17-06-2017 (03:00 GMT)  
INSAT Multispectral Rainfall(Daily)  
L3B BINNED GEOPHYSICAL PARAMETER GRIDDED

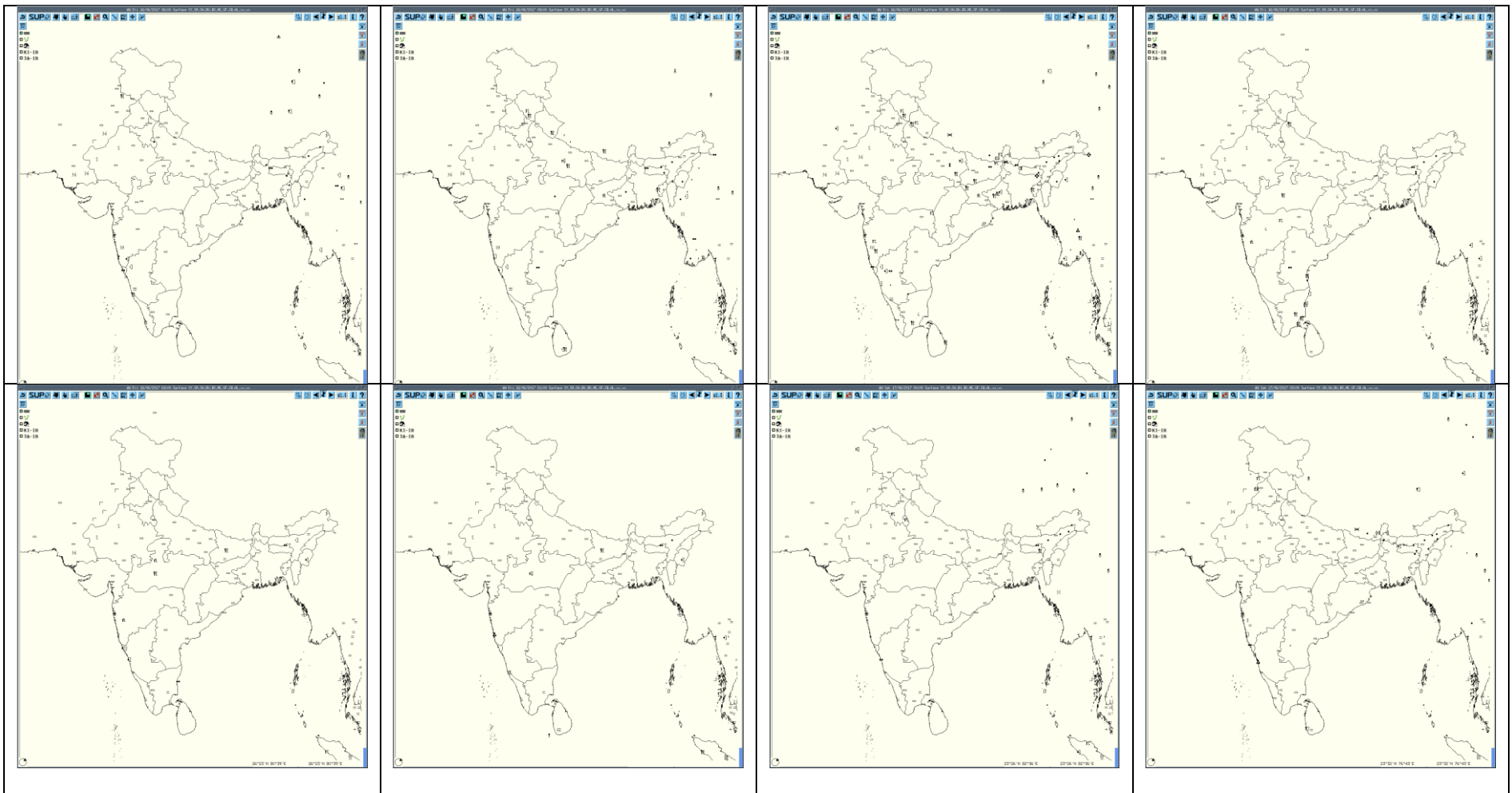


**IMR Rainfall**

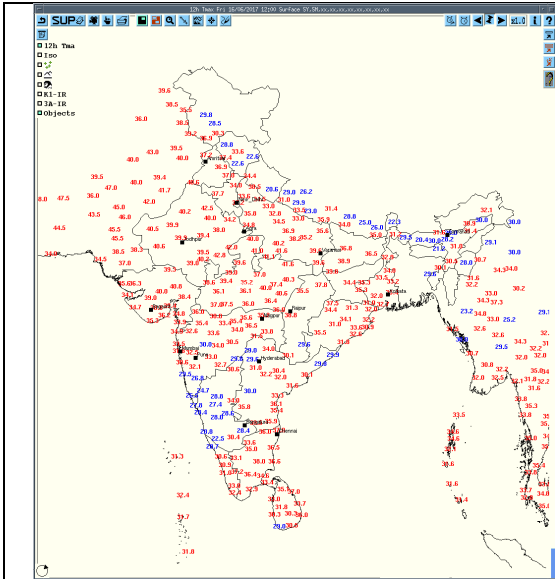
SAT :INSAT-3D IMG 16-06-2017 (03:30 GMT) to 17-06-2017 (03:00 GMT)  
Precipitation(HE) Daily  
L3B BINNED GEOPHYSICAL PARAMETER FULL DISK



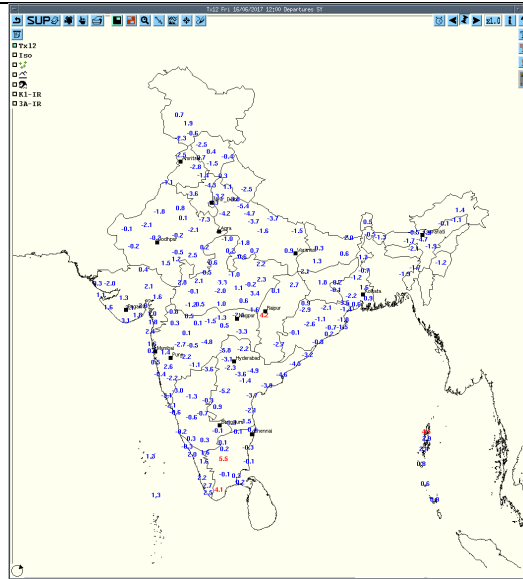
**HEM Rainfall**



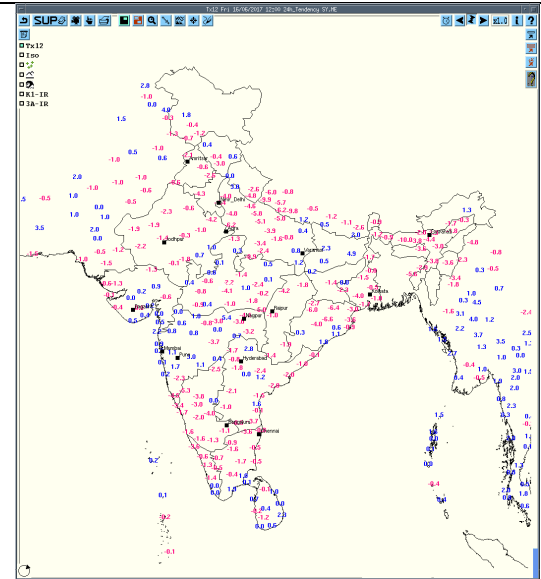
**3hourly Past weather at 06, 09, 12, 15, 18, 21UTC of yesterday and 00 & 03 hrs UTC of today**



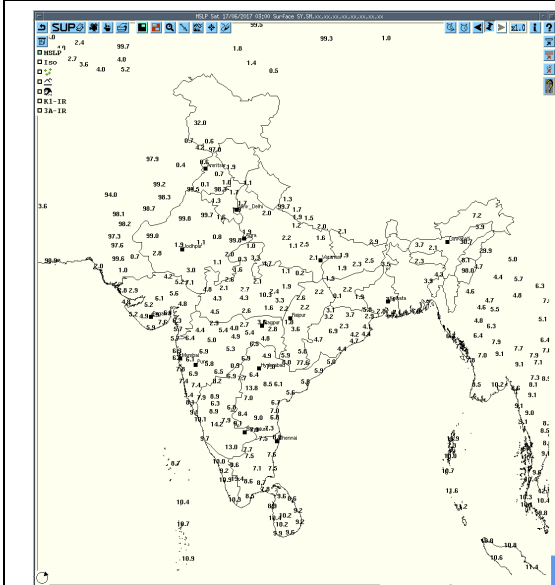
Tmax



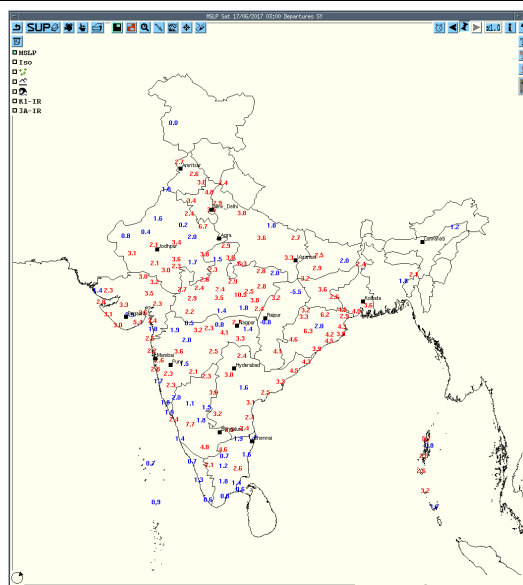
Departure Tmax



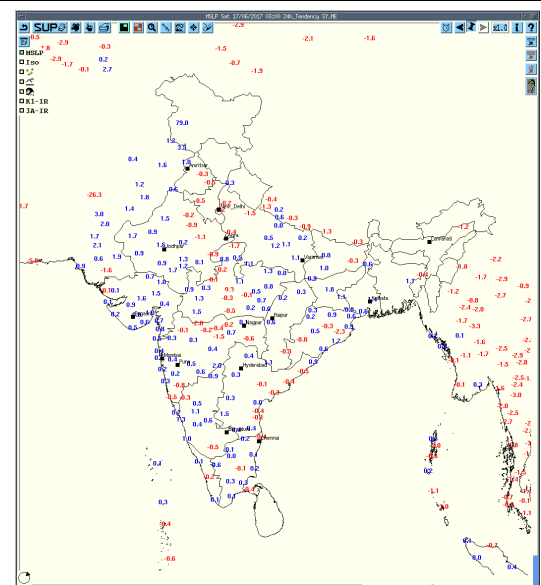
Tendency Tmax



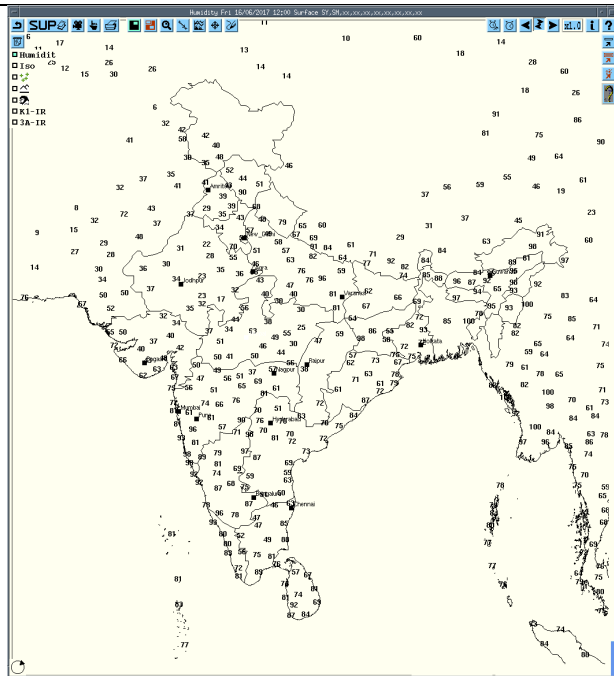
MSLP



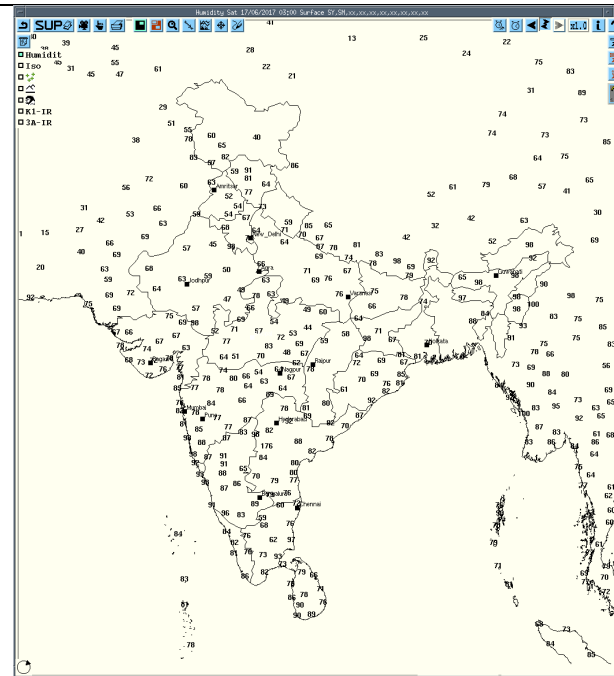
Departure MSLP



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
16-06-17	0600UTC	Bajpe	S India	Karnataka	Thunderstorm
		<b>Cochin</b>	<b>S India</b>	<b>Kerala</b>	<b>Thunderstorm with Hail</b>
16-06-17	0900UTC	Sundernagar, Shimla	NW India	Himachal Pradesh	Thunderstorm
		Mukteshwar	NW India	Uttarakhand	Thunderstorm
		Lucknow, Fursatganj	NW India	Uttar Pradesh	Thunderstorm
		<b>Ranchi</b>	<b>E India</b>	<b>Jharkhand</b>	<b>Thunderstorm with Hail</b>
		Agartala	NE India	Tripura	Thunderstorm
16-06-17	1200UTC	Sundernagar, Shimla	NW India	Himachal Pradesh	Thunderstorm
		Dehradun, Tehri	NW India	Uttarakhand	Thunderstorm
		Gorakhpur, Varanasi	NW India	Uttar Pradesh	Thunderstorm
		Gaya	E India	Bihar	Thunderstorm
		Daltonganj	E India	Jharkhand	Thunderstorm
		<b>Ranchi</b>	<b>E India</b>	<b>Jharkhand</b>	<b>Thunderstorm with Hail</b>
		Panagarh, Bankura	E India	West Bengal	Thunderstorm
		Agartala	NE India	Tripura	Thunderstorm
		Pune, Satara	W India	Maharashtra	Thunderstorm
		Gondia	C India	Maharashtra (Vidarbha)	Thunderstorm
		Tiruchirappalli	S India	Tamilnadu	Lightening
		Madurai	S India	Tamilnadu	Thunderstorm
16-06-17	1500UTC	Dehradun	NW India	Uttarakhand	Thunderstorm
		Bhopal	C India	Madhya Pradesh	Thunderstorm
		Aurangabad	W India	Maharashtra	Lightening
		<b>Pune</b>	<b>W India</b>	<b>Maharashtra</b>	<b>Thunderstorm with Hail</b>
		Akola	C India	Maharashtra (Vidarbha)	Thunderstorm
		Kavali	S India	Andhra Pradesh	Thunderstorm
		Puducherry, Cuddalore, Tiruchirappalli, Atirampattinam, Tondi	S India	Tamilnadu	Thunderstorm
		Nagapattinam	S India	Tamilnadu	Lightening
Ambikapur	C India	Chhattisgarh	Lightening		
16-06-17	1800UTC	Patna	E India	Bihar	Thunderstorm
		Bhopal	C India	Madhya Pradesh	Thunderstorm
		<b>Guna</b>	<b>C India</b>	<b>Madhya Pradesh</b>	<b>Thunderstorm with Hail</b>
		<b>Pune</b>	<b>W India</b>	<b>Maharashtra</b>	<b>Thunderstorm with Hail</b>
16-06-17	2100UTC	Patna	E India	Bihar	Thunderstorm
		Bhopal	C India	Madhya Pradesh	Thunderstorm

17-06-17	0000UTC	Hisar	NW India	Haryana	Thunderstorm
		Safdarjung	NW India	Delhi	Thunderstorm
		Palam	NW India	Delhi	Lightening
		Shillong	NE India	Meghalaya	Thunderstorm
17-06-17	0300UTC	Palam	NW India	Delhi	Lightening
		Ayanagar	NW India	Delhi	

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)
Guna	C India	Madhya Pradesh	Thunderstorm	16-06-17	1605 2105	1630 2330
Jabalpur	C India	Madhya Pradesh	Thunderstorm	16-06-17	1325	1355
Agartala	NE India	Tripura	Thunderstorm	16-06-17	1340 1720	1540 2020
Hisar	NW India	Haryana	Thunderstorm		0510	0625
Dehradun	NW India	Uttarakhand	Thunderstorm	16-06-2017	1545	2130
Mukteshwar	NW India	Uttarakhand	Thunderstorm	16-06-2017	1345	1440
Tehri	NW India	Uttarakhand	Thunderstorm	16-06-2017	1530	1800
Goa	W India	Goa	Thunderstorm	16-06-17	1010	1020
Shimla	NW India	Himachal Pradesh	Thunderstorm	16-06-17	1415	1600
Sundernagar	NW India	Himachal Pradesh	Thunderstorm	16-06-17	1410	1835
Gorakhpur	NW India	Uttar Pradesh (East)	Thunderstorm	16-06-17	1510	1740
Varanasi	NW India	Uttar Pradesh (East)	Thunderstorm	16-06-17	1650	2030
Varanasi	NW India	Uttar Pradesh (East)	Thunderstorm	16-06-17	1615	1706
Ghazipur	NW India	Uttar Pradesh (East)	Thunderstorm	16-06-17	1800	1830
Churk	NW India	Uttar Pradesh (East)	Thunderstorm	16-06-17	1525	1605
Bahraich	NW India	Uttar Pradesh (East)	Thunderstorm	16-06-17	1210	1430
Sultanpur	NW India	Uttar Pradesh (East)	Thunderstorm	16-06-17	1550	1620
Allahabad	NW India	Uttar Pradesh (East)	Thunderstorm	16-06-17	1645	1810
Kheri	NW India	Uttar Pradesh (East)	Thunderstorm	16-06-17	1100	1130
Lucknow	NW India	Uttar Pradesh (East)	Thunderstorm	16-06-17	1310	1410
Palam	NW India	Delhi	Thunderstorm	17-06-17	0440	0805
Safdarjung	NW India	Delhi	Thunderstorm	16/17-06-17	162300 170530	170200 170700
Tezpur	NE India	Assam	Thunderstorm	16-06-17	1245	1320



Shillong	NE India	Meghalaya	Thunderstorm	17-06-17	0500	0615
Cherrapunjee	NE India	Meghalaya	Thunderstorm	17-06-17	0503	0527
Bankura	E India	West Bengal(GWB)	Thunderstorm	16-06-17	1640	1915
			Lightening	16-06-17	1915	2000
Patna	E India	Bihar	Thunderstorm & Lightening	16/17-06-17	162250	170245
Gaya	E India	Bihar	Thunderstorm & Lightening	16-06-17	1600	1750
Daltonganj	E India	Jharkhand	Thunderstorm	16-06-17	1440	1900
Ranchi	E India	Jharkhand	Thunderstorm	16-06-17	1310	1840
Bajpe	S India	Karnataka	Thunderstorm	16-06-17	0855	0955
				16-06-17	1120	1257
				17-06-17	0538	0720

### Past 24 hours DWR Report:

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
Lucknow	17-06-17	160302-160742	Isolated Cells with average height of 10 km and maximum reflectivity of 45.5dbZ	NE(50km) moving in E'ly direction at speed of 43.2kmph.	Cells started forming at 0302UTC at NE(50km) from Radar.	-	-
		160352-XXXX	Isolated Cells with average height of 12 km and maximum reflectivity of 56dbZ	NW(140km) moving in SE'ly direction at speed of 43.2kmph.	Cells started forming at 0352UTC at NW(140km) from Radar. Subsequently matured and multiple cells formed with maximum reflectivity between 0652 UTC to 0712 UTC.	TS/SQUALL	-
Vishakhapatnam	17-06-17	160300-160600	Squally line cb cells from S to East with max reflectivity 50 dbz and average height 10kms.	Squally line of cb cells are continued since last observation and moving Easterly.	Max reflectivites on the squally line of cb cells are reduced .	- thunderst orms.	-

		161800-170000	Isolated single cells with max. reflectivity of 46dBz and average ht. of 8 km.	SSE(200KM) & SSW(100KM) moving NEly	CB cells are forming in BOB and not developed well and start dissipating.	-	-
		170000-170300	Isolated single cell with max. reflectivity of 51dBz and average ht. of 9 km.	SSEly at about 80kms from radar moving NEly.	Dissipated as it moves NEly	-	-
Karaikal	17-06-17	160300-170300			DWR U/S		
Jaipur	17-06-17	170102-170300 and remaining continue	Multiple cell with average height of 4.0 km & maximum reflectivity 48.0 dBZ	Multiple cell develop from 0102 UTC of 17/06/2017 towards North-East of jaipur and moved to SE Wards at speed 20-24 km/hr	Cell starts forming from 0102 UTC of 17/06/2017 at NE of Jaipur and reaches maximum relectivity during 0142-0232UTC and remaining continues.	Thunderstorm/rain at few places	ALWAR,JH UNJHUNU districts.
Srinagar	17-06-107	160300-170300	Nil	--	--	--	--
Kolkata	17-06-17	160321-160712	1.Small Isolated multiple cells developed with maximum reflectivity of 59.5 dBz at 0411 UTC and maximum height 09.05 km at 0401 UTC	1. ESE (46.6 km) to E (158.8 km) moving ENE-ly	1. Isolated single/multi cells started forming from ESE (46.6 km) to E (158.8 km) from radar in between from 0321 UTC to 0422 UTC, Matured, dissipated in ENE at 0712 UTC at a distance of 154.9 km from radar.	Thunderstorm/Rain	N/A
		160501-161211	2.Small Isolated multiple cells developed with maximum reflectivity of 55.5 dBz at 0721 UTC and maximum height 11.02 km at 0702 UTC	2. N (171.9 km) to NNE (136.3 km) moving ESE-ly	2. Isolated single/multi cells started forming from N (171.9 km) to NNE (136.3 km) from radar at 0501 UTC, Merged with cell no.3 at 0752 UTC, dissipated in NNE at 1211 UTC at a distance of 71.6 km from radar.	Thunderstorm/Rain	N/A

		160632-161211	3.Small Isolated multiple cells developed with maximum reflectivity of 59.0 dBz at 0642 UTC and maximum height 12.72 km at 0702 UTC	3.NE (61.9 km) moving NE-ly	3. Isolated single/multi cells started forming in NE at 0632 UTC at a distance of 61.9 km from radar merged to form a multi cell system at 0752 UTC, matured, dissipated in NNE at 1211 UTC at a distance of 71.6 km from radar.	Thunderstorm Hail/Rain	N/A
		160721-161211	4.Small Isolated multiple cells developed with maximum reflectivity of 56.5 dBz at 0802 UTC and maximum height 15.23 km at 0802 UTC	4. NNW (151.6 km) and NNW (107.8 km) moving SE-ly	4. Isolated single/multi cells started forming In between NNW (151.6 km) and NNW (107.8 km) from radar at 0721 UTC, merged with cell no. 2 & 3 at 0911 UTC, dissipated in NNE at 1211 UTC at a distance of 71.6 km from radar.	Thunderstorm /Rain	N/A
		160752-161011	5.Small Isolated cells developed with maximum reflectivity of 55.5 dBz at 0852 UTC and maximum height 08.24 km at 0902 UTC	5. NW (186.6 km) moving SSE-ly	5. Isolated single/multi cells started forming in NW (186.6 km) from radar at 0752 UTC, Matured, dissipated in NW at 1011 UTC at a distance of 142.2 km from radar.	Thunderstorm /Rain	N/A
		161011-161241	6.Small Isolated cells developed with maximum reflectivity of 59.0 dBz at 1051 UTC and maximum height 12.72 km at 1051 UTC	6. NW (139.9) km moving SSE-ly	6. Isolated single/multi cells started forming in NW (139.9 km) from radar at 1011 UTC, Matured, dissipated in NW at 1241 UTC at a distance of 109.5 km from radar.	Thunderstorm /Rain	N/A
		170000-170300	NIL	NIL	NO SIGNIFICANT ECHO	NIL	NIL
Agartala	17-06-17	160312-170302	Multiple cells formed all around OF DWR Agartala SW at a distance of 200km with Maximum cell Height 14 km at 0732 and maximum reflectivity 49.50 dBZ at 0732 UTC	Formed all around of DWR Agartala of SW at a distance of 200km and moves SW wards direction with around 40 kmph.	Persists over Meghalaya & Assam	Thunder Storm with Moderate to Heavy Rain	All distt of Tripura,

Machilipatnam	17-06-17	160941-161101	Isolated Multiple cells average height of 4.5km with maximum reflectivity of 52.0dBZ.	WSW(91.0Km) and moving E ly direction with average speed of 17.0kmph	Cell started forming at 0941 UTC, at WSW(91.0 km) from Radar the maximum reflectivity during 0941 UTC to 1101 UTC and died down at 1111 UTC	Possibility of Thunder storm with rain and winds.	Guntur district..
		161001-161101	Isolated Multiple cells average height of 6.5 km with maximum reflectivity of 51.5dBZ.	WNW(237Km) and moving E ly direction with average speed of 20.0kmph	Cell started forming at 1001UTC, at WNW (237 km) from Radar the maximum reflectivity during 1001UTC to 1101 UTC and died down at 1111.	Possibility of Thunder storm with rain and winds.	Nalgonda, Surypet districts.
		161111-161451	Isolated Multiple cells average height of 6.6 km with maximum reflectivity of 52.0dBZ.	WSW (243KM) and moving E ly direction with average speed of 28.5kmph	Cell started forming at 1111UTC, at WSW (243km) from Radar the maximum reflectivity during 1111UTC to 1451 UTC and died down at 1501 UTC	Possibility of Thunder storm with rain and winds.	Nellore, Prakasam Districts.
		161011-161131	Isolated Multiple cells average height of 4.7 km with maximum reflectivity of 51.5BZ.	WNW (127KM) and moving E ly direction with average speed of 25.0kmph	Cell started forming at 1011UTC, at WNW (127km) from Radar the maximum reflectivity during 1011UTC to 1131 UTC and died down at 1141 UTC .	Possibility of Thunder storm with rain and winds.	Guntur District .
		161111-161211	Isolated Multiple cells average height of 6.3 km with maximum reflectivity of 47.0BZ.	W (200KM) and moving E ly direction with average speed of 25.0kmph	Cell started forming at 1111UTC, at W (200km) from Radar the maximum reflectivity during 1111UTC to 1211 UTC and died down at 1221 UTC .	Possibility of Thunder storm with rain and winds.	Kurnool, Guntur Districts .
Nagpur	17-06-17	160302-160332 160512-160532 160702-160932 162112-162132 162312-162352	Multiple Single Multiple Multiple Multiple Multiple	185km NW dir  66 km Nw direction 100 km N , moving towards NE dir 206 km NW direction . 136 km S direction  152 km S direction	Max Z=43 ht of cloud= 4.0-6.0 km. Max =35 ht of cloud 1.2-5.8km  Max Z=52 ht of cloud 1.5-7.0 km Max Z=37 ht.of cloud 4.7-7.0km Max Z=39 ht.of cloud 2.5-4.7km  Max Z=39 ht.of cloud 2.5-4.7km	Hail storm warning 1242 in NWE dir 140 km. away from radar.  Thunder storm Warning started at 0752 - 0852 in N-NE	Rainfall Many places in Amraoti , Akola, Bramhapuri , Chandrapur , , Pusad , Yeatmal , washim , Wardha, Hinanghat, Gadchiroli, Bhandara , Katol

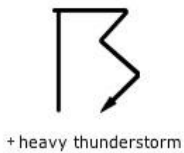
		170002-170252				direction 100 km away from radar. 0912 - 1332 in NE direction 225 km. away from Radar. 1132 - 1152 in NW direction 240 km away from Radar. 1402 - 1552 in W-SW direction. 150 km away from Radar.	Adilabad, Nandad, Hingoli, etc.
Patiala	17-06-17	160300-160600	Multiple cells Max dbz=48.0 Ht.= 8-9 KMS	16 JUNE 0300 UTC-TO 0600 UTC	Multiple cells Max dbz=48.0 Ht.= 8-9 KMS	16 JUNE 0300 UTC-TO 0600 UTC	Multiple cells Max dbz=48.0 Ht.= 8-9 KMS
		160600-160900	Multiple cells Max dbz=47.5 Ht.= 8-11 KMS	16 JUNE 0600 UTC-TO 0900 UTC	Multiple cells Max dbz=47.5 Ht.= 8-11 KMS	16 JUNE 0600 UTC-TO 0900 UTC	Multiple cells Max dbz=47.5 Ht.= 8-11 KMS

		1600900-161200	Multiple cells Max dbz=50.5 Ht.= 10-12 KMS	16JUNE 0900 UTC-TO 1200 UTC	Multiple cells Max dbz=50.5 Ht.= 10-12 KMS	16JUNE 0900 UTC-TO 1200 UTC	Multiple cells Max dbz=50.5 Ht.= 10-12 KMS
		161200-161500	Multiple cells Max dbz=56.5 Ht.= 8-10 KMS	16 JUNE 1200 UTC TO 1500 UTC	Multiple cells Max dbz=56.5 Ht.= 8-10 KMS	16 JUNE 1200 UTC TO 1500 UTC	Multiple cells Max dbz=56.5 Ht.= 8-10 KMS
		161500-161800	ISOLATED cell Max dbz=46.5 Ht.= 5 KMS	16 JUNE 1500 UTC-TO 1800 UTC	ISOLATED cell Max dbz=46.5 Ht.= 5 KMS	16 JUNE 1500 UTC-TO 1800 UTC	ISOLATED cell Max dbz=46.5 Ht.= 5 KMS
		161800-162100	NO SIGNIFICANT CELLS	-----		-----	----- ----- --
		162100-170000	Multiple cells Max dbz=55.0 Ht.= 10 KMS	SSE, S AND SSW SECTORS.	-----	RA/TS	NIRWANA, JIND, ROHTAK,B HIWANI, PANIPAT AND ADJOININ G AREAS
		170000-170252	Multiple cells Max dbz=56.0 Ht.= 10-11 KMS	SSE, S AND SSW SECTORS.	-----	RA/TS	BHIWANI, ROHTAK, NIRWANA, PANIPAT, JIND, HISSAR AND ADJ. AREAS.
Bhuj	17-06-17	160430-161200	Nil	Nil	--	--	--

Patna	17-06-17	160300 - 160450	SINGLE CELL. Maximum Reflectivity : 40 dBZ Echo Top : 09.3 KM	Range: 125 KM from DWR Patna in NORTH direction. Movement- SOUTH-WEST	Warning E-mail and Fax sent to State Disaster management Authority and Concern DMs	N/A	WEST CHAMPAR AN, EAST CHAMPAR AN, SHEOHAR, SITAMARH I
		160450 - 161350	NIL	NIL	N/A	N/A	N/A
		161350 - 161808	MULTIPLE CELL. Maximum Reflectivity : 44.5 dBZ Echo Top : 11.6 KM	Range: 055 KM from DWR Patna in SOUTH direction. Movement- NORTH-EAST	Warning E-mail and Fax sent to State Disaster management Authority and Concern DMs	THUNDE R-STOTM WITH RAIN	JEHANABA D, AURANGA BAD ROHTAS, BHABUA, BUXAR, BHOJPUR, GAYA, NAWADA, NALANDA, PATNA, SARAN & VAISHALI.
		161808 - 170300	NIL	NIL	N/A	N/A	N/A
Paradeep	17-06-17	160300- 170300	----	---	DWR U/S		



+ thunderstorm



+ heavy thunderstorm



sandstorm or dust storm



squall



hail shower



tropical storm

www.visualdictionaryonline.com



+ tornado



+ lightning



+ hurricane



haze



smoke



dust or sand storm



fog



drizzle



rain



snow



showers



hail



thunderstorm

### Weather Symbols