



India Meteorological Department

FDP STORM Bulletin No. 103 (17-06-2018)

1. CURRENT SYNOPTIC SITUATION:

NWFC Inference (0300UTC of the day):

- ◆ The Northern Limit of Monsoon (NLM) continues to pass through Lat. 19°N/ Long 60°E, Lat 19°N/ Long. 70°E, Thane (including Mumbai), Ahmednagar, Buldhana, Amravati, Gondia, Titlagarh, Cuttack, Midnapore, Lat. 24°N/ Long 89°E, Goalpara, Bagdogra and Lat 27°N/ Long 87°E. Further advance of southwest monsoon is not likely during next 6-7 days due to prevalence of weak monsoon pattern.
- ◆ The Western disturbance as a trough in mid tropospheric westerlies with its axis at 5.8 km above mean sea level roughly along Long 76°E to the north of Lat 32°N persists.
- ◆ The cyclonic circulation over northwest Uttar Pradesh & neighbourhood extending upto 0.9 km above mean sea level persists.
- ◆ The cyclonic circulation over central Assam & neighbourhood extending upto 0.9 km above mean sea level persists.
- ◆ A cyclonic circulation at 7.6 km above mean sea level lies over west central Bay of Bengal & adjoining south Odisha & north Coastal Andhra Pradesh.
- ◆ The trough in westerlies at 7.6 km above mean sea level now runs from northeast Bihar to cyclonic circulation over west central Bay of Bengal & adjoining south Odisha and north Coastal Andhra Pradesh across Jharkhand.
- ◆ A trough runs from Telangana to southeast Arabian sea across south Interior Karnataka at 7.6 km above mean sea level.
- ◆ The off shore trough at mean sea level from Goa coast to Kerala coast persists.
- ◆ The cyclonic circulation over Central Pakistan and adjoining areas of northwest Rajasthan and Punjab now lies over north Punjab & neighbourhood and extends upto 1.5 km above mean sea level.
- ◆ The cyclonic circulation over south Gujarat and neighbourhood persists and now seen at 3.1 km above mean sea level.

Satellite Observations during past 24 hrs and current observation:

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

Clouds descriptions within India:

North: Scattered low/medium clouds with embedded weak convection seen over Jammu & Kashmir, Himachal Pradesh, Uttarakhand North Haryana and Northwest Uttar Pradesh. Scattered low/medium clouds over rest Haryana, Delhi and Southeast Uttar Pradesh.

East: Broken low/medium clouds with embedded intense to very intense convection seen over Meghalaya. Scattered low/medium clouds with embedded moderate to intense convection seen over West Assam, adjoining Sub-Himalayan West Bengal and Isolated low/medium clouds over South Gangetic West Bengal, Sikkim and rest Northeastern States. Scattered low/medium clouds over rest parts of the region.

West: Scattered low/medium clouds with embedded isolated weak to moderate convection seen over Konkan. Scattered low/medium clouds over rest parts of the region.

South: Broken low/medium clouds with embedded intense to very intense convection seen over Bay Islands. Scattered low/medium clouds with embedded moderate to intense convection seen over Kerala, North Tamilnadu, Lakshadweep and isolated weak convection seen over South Interior Karnataka. Scattered low/medium clouds over rest parts of the region.

Arabian Sea:

Scattered low/medium clouds with embedded moderate to intense convection seen over East-Central Southeast Arabian Sea, Comrin and Maldives.

Bay of Bengal & Andaman Sea:

Broken low/medium clouds with embedded intense to very intense convection seen over East-central adjoining Southeast Bay, Andaman Sea & Gulf of Martaban Tenasserim Coast.

Past Observation:

Convection:

Moderate to Intense convection was observed over Punjab Bihar Gangetic West Bengal Sub-Himalayan West Bengal Assam Meghalaya south Karnataka Kerala Tamilnadu Lakshadweep Bay islands.

OLR:

Up to **230** wm^{-2} was observed over J&K HP Uttarakhand north Punjab east Bihar east Jharkhand Gangetic West Bengal Sub-Himalayan West Bengal Sikkim North-East States north Andhra Pradesh south Karnataka Kerala Tamilnadu Lakshadweep Bay Islands.

Synoptic features: Westerly Trough & Jet-Stream: Westerly trough roughly along Long 76.0E to the north of lat. 32.0N.

Dynamic Features:-

Wind shear up to 05-15 Knots is observed over North and NE India, 30-40 Knots observed over Central & Peninsula India.

Positive Shear tendency is observed over north, north-east and central India.

Vorticity (850 hPa) up to 250 is observed over east Uttar Pradesh Bihar Gangetic West Bengal Sub-Himalayan West Bengal west Assam Extreme South Tamilnadu.

Positive low level convergence (5-10 Knots) observed over north-west and north-east India.

Precipitation:

IMR:

Rainfall >90 mm was observed over Lakshadweep and Andaman & Nicobar Islands.

Rainfall up-to 50mm observed over north Bihar Sub-Himalayan West Bengal west Assam central Tamilnadu.

Rainfall up-to 10-20 mm observed over Gangetic West Bengal rest Assam Meghalaya Arunachal Pradesh south Karnataka Kerala rest Tamilnadu.

DWR and RAPID Observations:

Light to Moderate multiple echoes are seen on DWR Agartala, Chennai, Delhi, Patiala, Vishakhapatnam and Light echoes are also seen on DWR Gopalpur, Hyderabad, Mohanbari, Nagpur Paradeep and Srinagar at around 1630 IST.

RAPID RGB Satellite imagery at 1530 IST indicates significant convection over Southeast Punjab adjoining Haryana, East Assam, Meghalaya, Northeast Jharkhand, Konkan Lakshadweep and Nicobar Islands.

Environmental Condition (dust etc) and its Forecast based on 00UTC of date:

Higher Dust concentration was observed over northern Africa, Arab countries and western part of India. Dust concentration is expected to decrease over IGP and north India.

Particulate matter concentration is expected to remain in poor to severe category for next 2 days in Delhi.

Delhi – SAFAR analysis & Forecast	17.06.2018	18.06.2018
PM10 (micro-g/m ³)	436	331
PM2.5 (micro-g/m ³)	109	98

2. NWP MODEL GUIDANCE:

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

1. Weather Systems:

Low level Cycirs, Troughs: 00&12UTC of Day 0-4: At 925hPaCYCIR over Punjab & adjoining Pakistan region

00 UTC of Day 0-5:At 850hPa, a trough from Bihar to Assam and Nagaland via WB, BOB and Bangladesh

00UTC of Day0-4: At 925hPa, a weak CYCIR over Bihar, Jharkhand and adjoining region.

00UTC of Day 0-2: At 500 hPa trough as a CYCIR over south east MP and moving towards further south east

Confluence & wind Discontinuity regions: 12UTC: NIL

Synoptic systems: 00 &12 UTC of Day 0-5: WD as a trough over Pakistan, north Rajasthan, Punjab and Haryana.

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

3. Convergence at 850 hPa:

Day/Index: Subdivisions with Lower Level Convergence > 15 x 10⁻⁵ /s

Day0: Assam Meghalaya,

Day1: Assam Meghalaya, Chhattisgarh,

Day2:

Day3:

Day4:

4. Low level Vorticity:-Positive Vorticity:

Day/Index: Subdivisions with Lower Level Vortex > 15 x 10⁻⁵ /s

Day0: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, East UP, Uttarakhand, TN Puducherry, Kerala,

Day1: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, Uttarakhand, TN Puducherry, Kerala,

Day2: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, Uttarakhand, Himachal Pradesh, TN Puducherry,

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

Day4: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, Gangetic WB, Uttarakhand, TN

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

Day/Index: Subdivisions with Showalter Index < -4

Day0: Arunachal Pradesh, NE NMMT, Sub Himalayan WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, Odisha, Gujarat Region, Saurashtra Kutch, Vidarbha, Coastal AP, TN Puducherry,

Day1: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Bihar, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, Odisha, West MP, Gujarat Region, Saurashtra Kutch, Madhya Maharashtra, Marathwada, Chhattisgarh, Coastal AP, TN Puducherry,

Day2: Arunachal Pradesh, Sub Himalayan WB, Bihar, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, Odisha, West MP, East MP, Gujarat Region, Saurashtra Kutch, Konkan Goa, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Coastal AP,

Day3: Arunachal Pradesh, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, Odisha, West MP, Gujarat Region, Saurashtra Kutch, Konkan Goa, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Coastal AP, Telangana, NI Karnataka,

Day4: Arunachal Pradesh, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, Odisha, Gujarat Region, Saurashtra Kutch, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Coastal AP, Telangana, NI Karnataka,

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

Day/Index: Subdivision with Total Totals Index > 52

Day0: Arunachal Pradesh, Sub Himalayan WB, Gangetic WB, Jharkhand, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, Odisha, Saurashtra Kutch,

Day1: Arunachal Pradesh, Sub Himalayan WB, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, West MP, Gujarat Region, Saurashtra Kutch,

Day2: Arunachal Pradesh, Sub Himalayan WB, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, West MP, East MP, Gujarat Region, Saurashtra Kutch, Madhya Maharashtra,

Day3: Arunachal Pradesh, Sub Himalayan WB, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, West MP, Gujarat Region, Saurashtra Kutch,

Day4: Arunachal Pradesh, Sub Himalayan WB, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, West MP, Gujarat Region, Saurashtra Kutch, Vidarbha, Chhattisgarh,

7. Spatial distribution of K Index :> 35[Very Unstable thunderstorm likely]:

Day/Index: Subdivisions with K Index > 40

Day0: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, Odisha, West MP, East MP, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Rayalaseema, TN Puducherry, NI Karnataka,

Day1: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, Odisha, West MP, East MP, Gujarat Region, Saurashtra Kutch, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Rayalaseema, TN Puducherry, NI Karnataka,

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

Day3: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, Odisha, West MP, East MP, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Rayalaseema, NI Karnataka,

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

8. Rainfall and thunder storm activity:

Day/Index: Subdivisions with Precipitation > 2 cm

Day1: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Punjab, Jammu Kashmir, West RJ, Gujarat Region, Konkan Goa, Madhya Maharashtra, Andaman Nicobar, Coastal Karnataka, Kerala,

Day2: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Jammu Kashmir, Konkan Goa, Madhya Maharashtra, Andaman Nicobar, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day3: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Konkan Goa, Madhya Maharashtra, Andaman Nicobar, Coastal Karnataka, SI Karnataka, Kerala,

Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Konkan Goa, Andaman Nicobar, TN Puducherry, Coastal Karnataka, SI Karnataka, Kerala,

Day5: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Odisha, Konkan Goa, Madhya Maharashtra, Andaman Nicobar, Telangana, TN Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

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

1. Synoptic Systems:

The analysis based on 00 UTC indicates a cyclonic circulation over Northwest Uttar Pradesh and adjoining areas in lower Troposphere (925hPa). The forecast shows it will persist till day2. Another cyclonic circulation is seen over central Assam and adjoining areas. The forecast shows it will persist till day2. The analysis shows a cyclonic circulation over North Punjab and adjoining areas in lower troposphere (850hPa). The forecast shows it will persist till day3 with Eastward shift. The analysis shows an off shore Trough extends from Goa coast to Kerala coast in lower Troposphere (925hPa). The forecast shows it will persist till day2.

2. Location of Jet and Jet Core (>60kt) at 500hPa: Although the presence of strong westerlies is found over South Peninsular and NE states but no jet core over the Indian region for the next 3 days.

3. Low Level Vorticity {850hPa Positive Vorticity ($>12 \times 10^{-1}/s$)}: Low level Positive Vorticity is seen mostly around the cyclonic circulations, from Himachal Pradesh, Uttarakhand, Foothills of Himalaya, Sikkim to NE states, GWB, SHWB, over South Peninsular India including Kerala, Tamil Nadu, Konkan and Goa during next 3 days; over some parts of Haryana and adjoining areas on day3.

4. Spatial distribution of T-storm Initiation Index, Lifted Index, Total Total Index, CAPE, CIN and Sweat Index [High potential for thunderstorm]: T

T-Storm Initiation Index (> 3): Over parts of Punjab, Haryana, Delhi, Gujarat, Rajasthan, East Uttar Pradesh, Bihar, Jharkhand, Gangetic West Bengal, SHWB, Orissa, west Madhya Pradesh, along east coast of India, coastal Andhra Pradesh, coastal Tamil Nadu, Sikkim, Assam, Tripura and adjoining areas on day 1 and 2; it remains over same region on day 3 but disappear over parts of, Haryana, Delhi and adjoining area and also appears over parts of Madhya Pradesh, west Uttar Pradesh, Chhattisgarh, Madhya Maharashtra, Marathwada, Vidharbha and Telangana, Orissa and Andhra Pradesh.

Lifted Index (< -2): over parts of J&K, Himachal Pradesh, Uttarakhand, Punjab, Haryana, Delhi, Gujarat, Rajasthan, Uttar Pradesh, Bihar, Jharkhand, Gangetic West Bengal, SHWB, Orissa, coastal Maharashtra, coastal Tamil Nadu, Telangana, Chhattisgarh, East and west Madhya Pradesh, coastal Andhra Pradesh, along east and west coast of India, Sikkim, NE states and extreme south coastal parts of the country on day 1 and 2; on day 3 it is seen over Northwest India including J&K, Himachal Pradesh, Rajasthan, Punjab, Haryana, Delhi, Gujarat, Bihar, Jharkhand, GWB, NE states, along the east coast, Madhya Pradesh, Chhattisgarh, Vidharbha, Orissa Telangana and Andhra Pradesh; significant zone with maximum negative value of the index lies over parts of Gujarat, West Rajasthan and Punjab.

Total Total Index (> 50): Higher than Threshold value of the Index is seen over parts of J&K, Himachal Pradesh, Uttarakhand, Punjab, Haryana, Rajasthan, Uttar Pradesh, Sikkim, Foothills of Himalaya and Arunachal Pradesh, Madhya Pradesh, Bihar, Jharkhand, GWB, Orissa, Chhattisgarh, Vidharbha, Telangana, Andhra Pradesh and Tamil Nadu on day 1; on day 2 and 3 it is seen mainly over North and Northwest India including J&K, Himachal Pradesh, Uttarakhand, Punjab, Haryana, Delhi, Rajasthan, Uttar Pradesh, Vidharbha, Madhya Pradesh, some parts of Orissa and Chhattisgarh, Sikkim and Arunachal Pradesh; significant zone with highest value of the index lies over parts of Punjab, Haryana, Delhi, Himachal Pradesh, West Uttar Pradesh, Gujarat, Rajasthan and Northwest Madhya Pradesh.

Sweat Index (> 300): Is seen over the sub-divisions along east and west coast, areas along foothills of Himalayas, Central India, South Peninsular India, NE states and most parts of the country during next 3 days; significant zone lies over parts of Punjab, Haryana, Rajasthan, Foothills of Himalaya, Sikkim, Arunachal Pradesh, Gujarat and adjoining areas.

CAPE (> 1000): Mostly seen over parts of coastal Gujarat, J&K, Rajasthan, parts of Punjab, Haryana, Delhi, West Uttar Pradesh, along east coast, GWB, SHWB, coastal Orissa, Bihar, East Uttar Pradesh, coastal Andhra Pradesh, coastal Tamil Nadu, North coastal Maharashtra including Mumbai, North Madhya Maharashtra, Sikkim and NE states during next 3 days; on day 3 over parts of Northwest Madhya Pradesh and adjoining areas; significant zone with highest value of the index lies over parts of GWB, SHWB, Bihar, coastal Orissa, coastal Andhra Pradesh, Gujarat, Assam, Tripura and adjoining areas.

CIN (50-150): Over sub-divisions along east and west coast of India, extreme south over Kerala, Tamil Nadu and south Peninsular India, central, North and Northwest India mainly the value of index lies in above range over most of the parts of the country on day 1; and over most of the parts of the country except J&K and northern parts of Himachal Pradesh and Uttarakhand on day 2 and 3; significant zone with highest value of the index lies over parts of West Rajasthan.

5. Rainfall Activity:

70-130 mm Rainfall: over parts of coastal Maharashtra including Mumbai on day 1; on day 2 over South coastal Maharashtra, Konkan and Goa; over some parts of Konkan and Goa on day 3.

40-70 mm Rainfall: over parts of coastal Maharashtra including Mumbai and some parts of Punjab on day 1; over parts of South coastal Maharashtra, coastal Karnataka, Konkan and Goa on day 2; over parts of South coastal Maharashtra, coastal and Interior Karnataka, Kerala, Konkan and Goa on day 3.

10-40 mm Rainfall: over parts of coastal and Interior Karnataka, Kerala, coastal Maharashtra, Konkan and Goa, Sikkim, East Bihar and NE states during next 3 days; J&K, Uttarakhand, South Gujarat, Tamil Nadu, Punjab, Haryana and Northwest Rajasthan on day 1; over parts of J&K, Uttarakhand, Madhya Maharashtra, Marathwada, Telangana and North Interior Karnataka on day 2; over some parts of Andhra Pradesh, Orissa and Central Parts of Madhya Pradesh on day 3.

Up to 10 mm rainfall: Over parts of J&K, Himachal Pradesh, Uttarakhand, Punjab, Haryana, Northwest Rajasthan, Uttar Pradesh, Foothills of Himalaya, GWB, SHWB, Sikkim, NE states, Bihar, Jharkhand, Orissa, Chhattisgarh, Madhya Pradesh, Vidharbha, Kerala, Interior Karnataka, Konkan & Goa, coastal Maharashtra including Mumbai, Gujarat, Madhya Maharashtra, Marathwada, Tamil Nadu, Telangana and Andhra Pradesh during next 3 days; over parts of Haryana, Delhi and adjoining area on day 1 and 2.

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

1. Model Reflectivity (Max. dBz):

>25 dBZ Model Reflectivity: On day 1 over parts of J&K, Himachal Pradesh, Uttarakhand, Punjab, Haryana, Delhi, Rajasthan, West Uttar Pradesh and Northwest Madhya Pradesh, Kerala, Tamil Nadu, Sikkim, SHWB, NE states, coastal Andhra Pradesh, East Bihar, coastal Maharashtra and coastal Karnataka; On day 2 over parts of Kerala, Tamil Nadu, coastal and Interior Karnataka, Konkan and Goa, coastal Maharashtra including Mumbai, South Gujarat, SHWB, J&K, Himachal Pradesh, Uttarakhand, Sikkim, Bihar and NE states; on day 3 over parts of Kerala, coastal and Interior Karnataka, Konkan and Goa, Tamil Nadu, South coastal Maharashtra, South Gujarat, Sikkim and NE states

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

Total Index (> 50): Below threshold value is observed over parts of Gujarat, Punjab, Haryana, Delhi, Rajasthan, Uttar Pradesh, coastal areas of west coast, coastal Maharashtra, Konkan & Goa, coastal areas along the east coast, South Orissa, Andhra Pradesh, Tamil Nadu, Kerala, Karnataka, North Bihar, Telangana, Rayalaseema, Madhya Maharashtra, Marathwada, Chhattisgarh, Telangana, Madhya Pradesh, Vidharbha and NE states on day 1 on day 2 and 3 it remains over same region but disappears over parts of North and North-western parts of India .

K-Index (> 35): Less than threshold value is observed over most of the part of the country during the next 3 days. Prominent values are found over parts of J&K, Himachal Pradesh, Uttarakhand, Punjab, Haryana, Delhi, Rajasthan, Madhya Pradesh, Vidharbha, coastal Maharashtra including Mumbai, Madhya Maharashtra, Marathwada, Karnataka, Telangana, Chhattisgarh, Andhra Pradesh, Kerala, Tamil Nadu, Gujarat, Orissa, Bihar, Jharkhand, Uttar Pradesh, GWB, SHWB, Foothills of Himalaya, Sikkim and NE states.

CAPE (> 1500): Greater than threshold value over parts of Gujarat, East Uttar Pradesh, Uttarakhand, Punjab, Haryana, Himachal Pradesh, Rajasthan coastal areas of west coast, coastal Maharashtra including Mumbai, Konkan & Goa, coastal Karnataka, Konkan and Goa, coastal Kerala, coastal areas along the east coast, SHWB, GWB, Orissa, coastal Andhra Pradesh, coastal Tamil Nadu, Bihar, Jharkhand and NE states during next 3 days; over parts of J&K on day 1; over parts of J&K, Haryana, Delhi and West Uttar Pradesh on day 2; on day 3 over parts of West Uttar Pradesh, west Madhya Pradesh and adjoining areas; Maximum value of the index is seen over the parts of Bihar, GWB, SHWB, coastal Orissa, coastal Andhra Pradesh, Assam, Tripura and adjoining areas.

CIN (50-150): The value of the index lies in above range over most of the parts of the country on day 1; over most of the parts of the country except coastal area along the west coast on day 2 and 3; Maximum value of the index is seen over the parts of west Rajasthan, Gujarat, West Madhya Pradesh and west Uttar Pradesh.

3. Rainfall and thunderstorm activity:

Above 200 mm Rainfall: over parts of South coastal Maharashtra adjoining North Karnataka, Konkan and Goa on day 2.

130-200 mm Rainfall: over parts of Coastal Maharashtra, coastal Karnataka, Konkan and Goa on day 2 and 3; over parts of Kerala on day 3; over parts of Meghalaya and Arunachal Pradesh on day 3.

70-130 mm Rainfall: over parts of Sikkim, Assam, Arunachal Pradesh, coastal Maharashtra, coastal and Interior Karnataka, Konkan and Goa, coastal Kerala during next 3 days; over parts of Sikkim, Assam, Meghalaya, Arunachal Pradesh and adjoining areas on day 3; over parts of coastal Maharashtra including Mumbai, adjoining Madhya Maharashtra on day 2.

40-70 mm Rainfall: over parts of Kerala, South Tamil Nadu, coastal and interior Karnataka, coastal Maharashtra including Mumbai, adjoining Madhya Maharashtra, Konkan & Goa, South Gujarat, Sikkim and NE states during next 3 days.

10-40 mm Rainfall: Over parts of J&K, Himachal Pradesh, Uttarakhand, Madhya Pradesh, Kerala, Tamil Nadu, coastal and Interior Karnataka, Konkan and Goa, coastal Maharashtra including Mumbai, Madhya Maharashtra, Gujarat, Sikkim, Foothills of Himalaya and NE states during next 3 days; over parts of Punjab, Haryana, Delhi, Rajasthan, West Uttar Pradesh, Bihar and Andhra Pradesh on day 1; over parts of Bihar and Jharkhand on day 2; over parts of Telangana and Andhra Pradesh on day 3.

Up to 10 mm Rainfall: Over parts of J&K, Himachal Pradesh, Uttarakhand, Foothills of Himalaya, Punjab, Haryana, Delhi and adjoining areas, Rajasthan, Kerala, Tamil Nadu, coastal and Interior Karnataka, Konkan and Goa, Sikkim, GWB, SHWB, Uttar Pradesh, Bihar, Jharkhand, Orissa, Telangana, Madhya Maharashtra, Marathwada, Vidharbha, coastal Maharashtra including Mumbai, Madhya Pradesh, Andhra Pradesh, Gujarat and NE states during next 3 days.

3. IOP ADVISORY FOR 24 and 48Hrs:

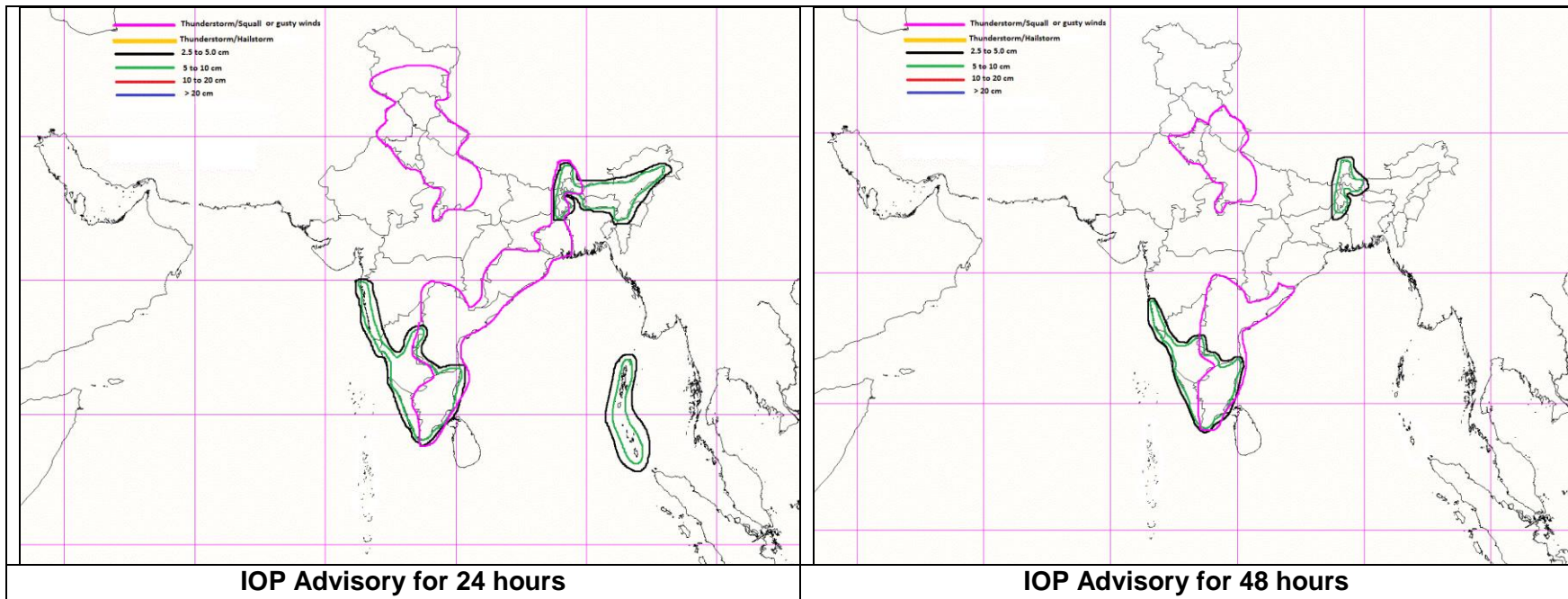
Summary and Conclusions:

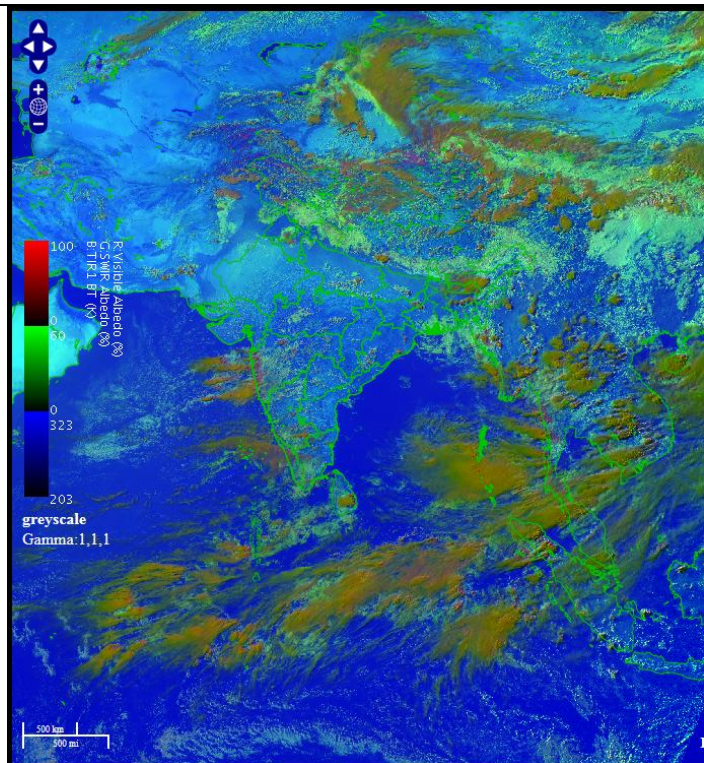
- The synoptic analysis indicates the Western disturbance as a trough in mid-tropospheric westerlies with its axis at 5.8 km above mean sea level roughly along Long. 76°E to the north of Lat. 32°N persists. In addition, cyclonic circulation over northwest Uttar Pradesh & neighbourhood extending upto 0.9 km above mean sea level persists. This situation is likely to trigger thunderstorms at isolated places accompanied with squall/guest over Northwest India except Rajasthan and East Uttar Pradesh on Day-1 and over Uttarakhand, Haryana, Chandigarh, Delhi and West Uttar Pradesh on Day-2.
- Another cyclonic circulation over central Assam & neighbourhood extending upto 0.9 km above mean sea level persists
- A cyclonic circulation at 7.6 km above mean sea level lies over west central Bay of Bengal & adjoining south Odisha & north Coastal Andhra Pradesh and trough in westerlies at 7.6 km above mean sea level from northeast Bihar to this cyclonic circulation over west central Bay of Bengal across Jharkhand is likely to generate isolated convective activity West Bengal & Sikkim & Odisha on day 1. The prevailing flow pattern is conducive for Sub Himalayan West Bengal to experience isolated heavy rainfall on both day and over Andaman & Nicobar on Day-2.
- The off shore trough at mean sea level now runs from Goa coast to Kerala coast. This system is likely to cause isolated heavy rainfall over Konkan & Goa, South Interior Karnataka, Tamilnadu and Puducherry during next 48 hours.

IOP Area for Day-1 & Day-2:

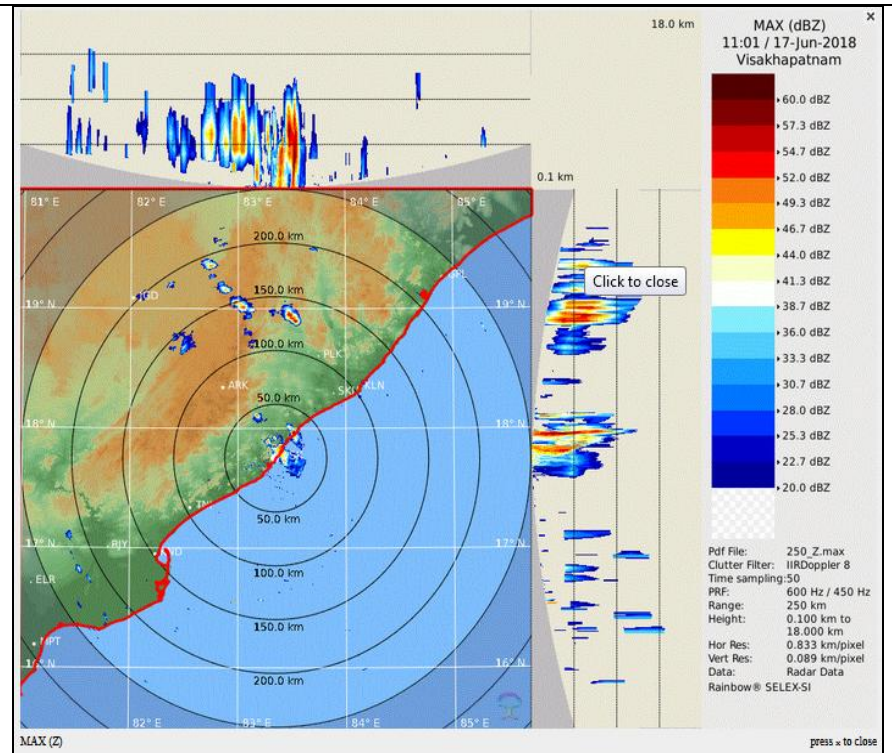
24 hour Advisory for IOP:	48 hour Advisory for IOP:
<p>Significant Rainfall: Tamilnadu & Pondicherry, Kerala, South Interior Karnataka Konkan & Goa Assam & Meghalaya, West Bengal & Sikkim Andaman & Nicobar Islands</p> <p>Thunderstorm with squall or gusty winds: Tamilnadu & Pondicherry, Telangana, Rayalaseema, North Coastal Andhra Pradesh Odisha, West Bengal & Sikkim Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Punjab, Haryana, Chandigarh, Delhi, West Uttar Pradesh</p> <p>Thunderstorm with squall and hail Nil</p> <p>Thunderstorm/Duststorm: Nil</p>	<p>Significant Rainfall: Tamilnadu & Pondicherry, Kerala, South Interior Karnataka South Konkan & Goa Assam & Meghalaya, West Bengal & Sikkim</p> <p>Thunderstorm with squall or gusty winds: Tamilnadu & Pondicherry, Telangana, Rayalaseema, North Coastal Andhra Pradesh Uttarakhand, Haryana, Chandigarh, Delhi, West Uttar Pradesh</p> <p>Thunderstorm with squall and hail Nil</p> <p>Thunderstorm/Duststorm: Nil</p>

Graphical Presentation of Potential Areas for Severe Weather:

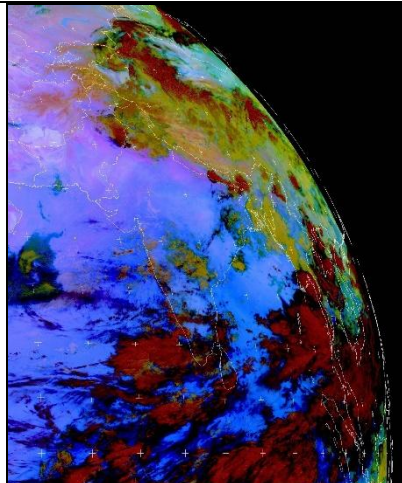
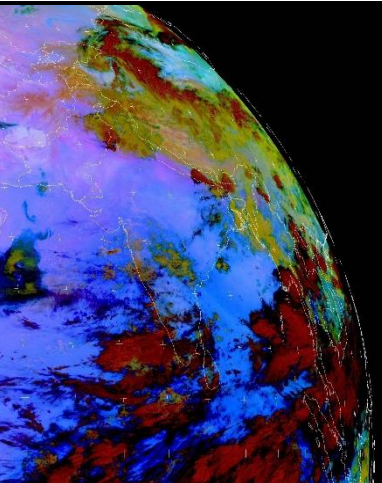
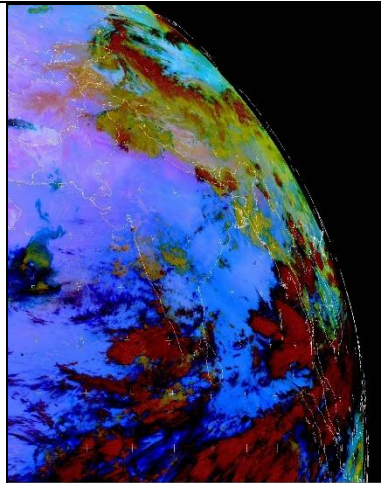
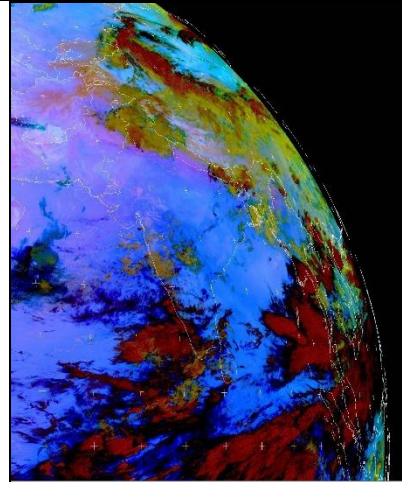
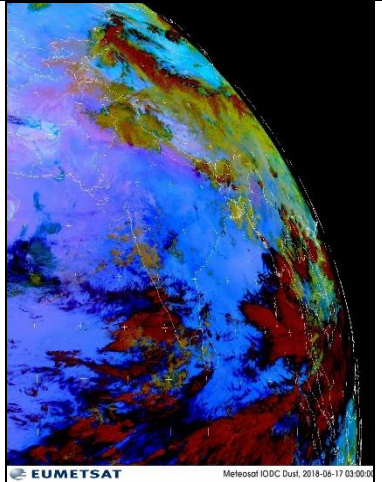
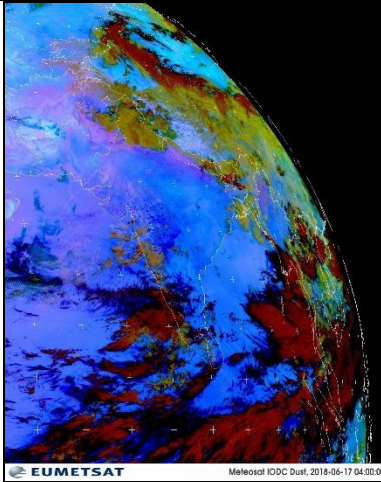




RAPID RGB Satellite Imagery at 1530 IST

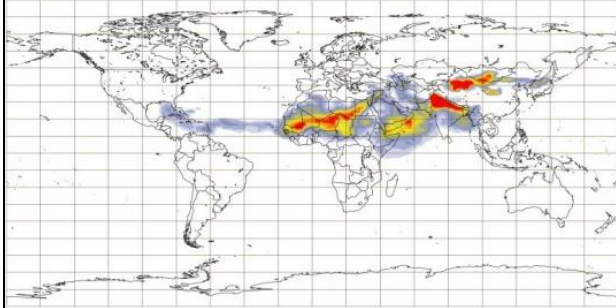


DWR Vishakhapatnam reflectivity at 1631 IST

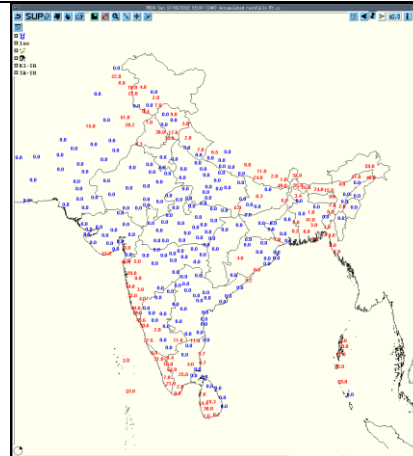


Observed Satellite Dust Images of today

Dust aerosol optical depth at 550 nm (provided by CAMS, the Copernicus Atmosphere Monitoring Service)
 Saturday 16 Jun, 00 UTC T+24 Valid: Sunday 17 Jun, 00 UTC

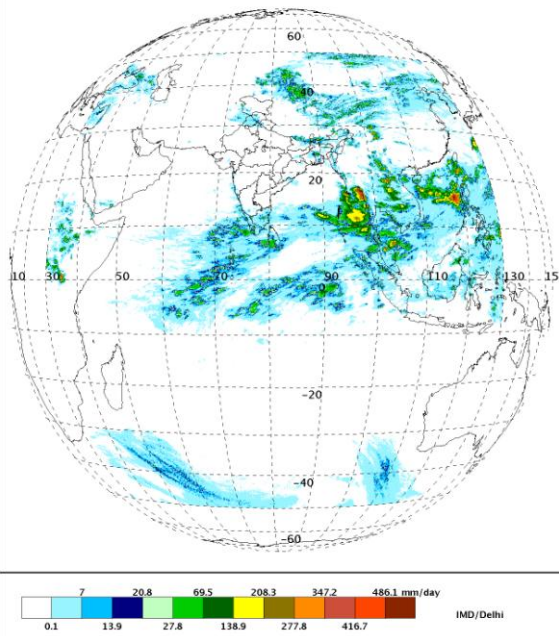


Dust Forecast



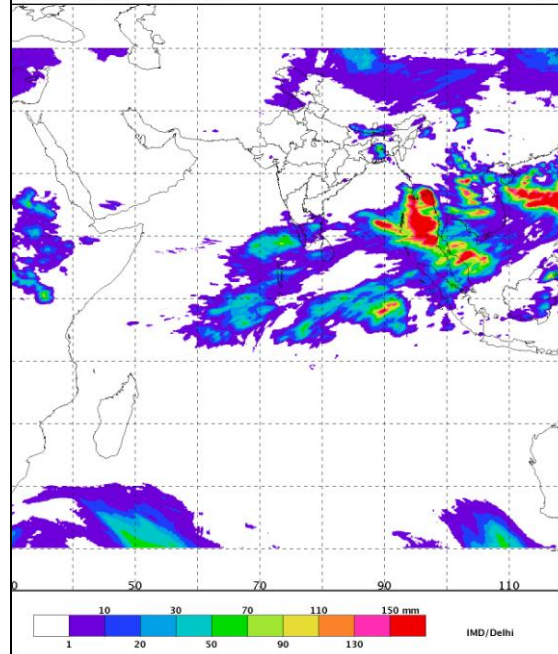
Accumulated 24 Hour rainfall (in red) recorded at 0300UTC of today

SAT :INSAT-3D IMG 16-06-2018 (03:30 GMT) to 17-06-2018 (03:00 GMT)
 Precipitation(HE) Daily
 L3B BINNED GEOPHYSICAL PARAMETER FULL DISK

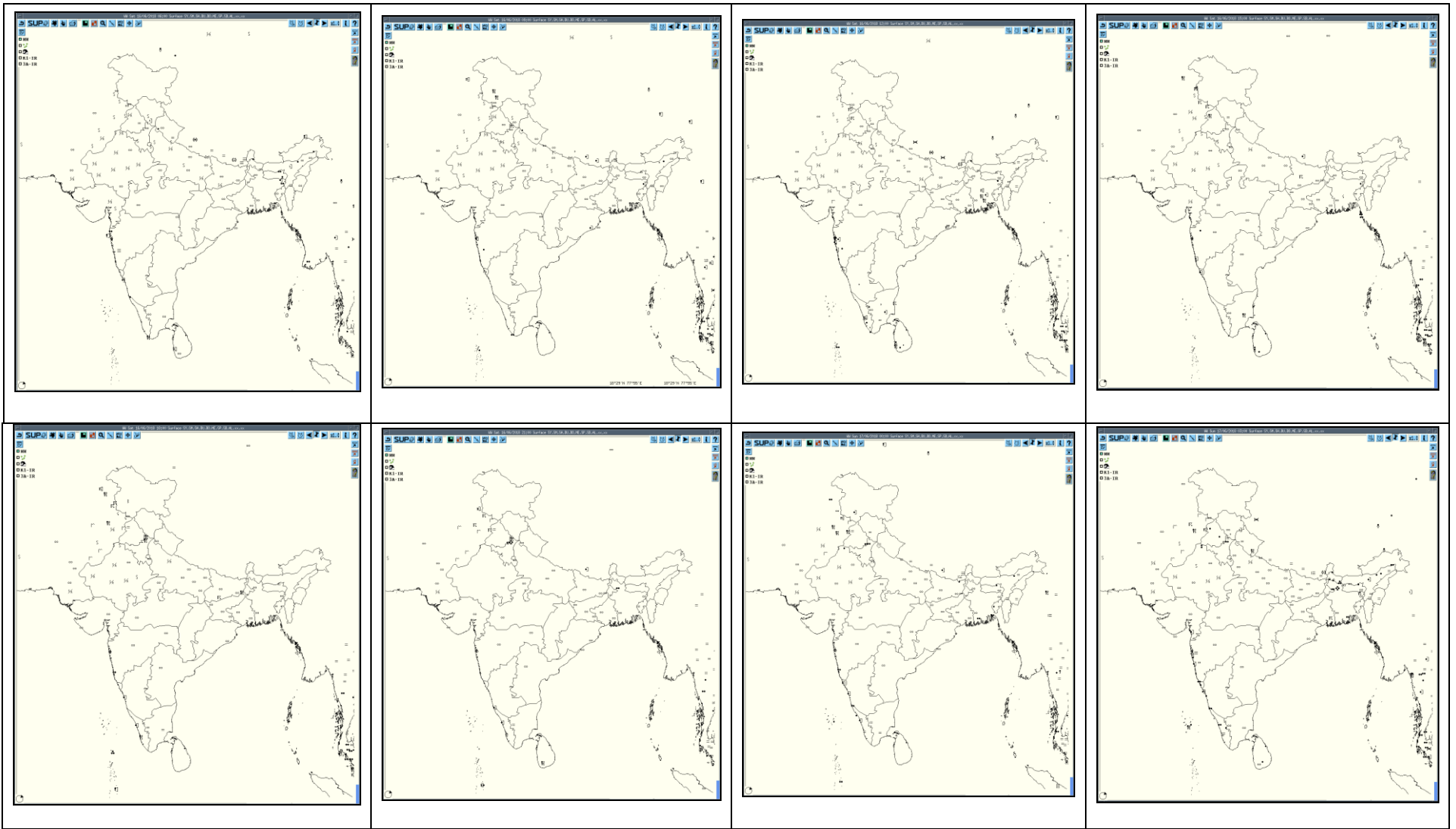


HEM

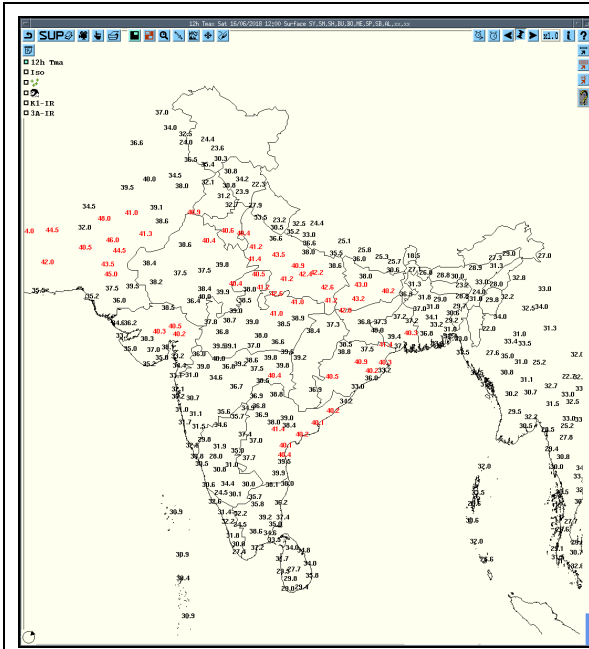
SAT :INSAT-3D IMG 16-06-2018 (03:30 GMT) to 17-06-2018 (03:00 GMT)
 INSAT Multispectral Rainfall(Daily)
 L3G BINNED GEOPHYSICAL PARAMETER GRIDDED



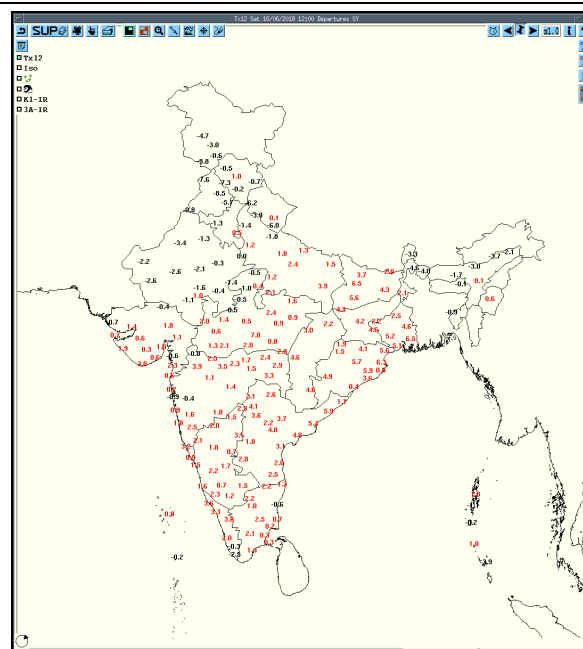
IMR



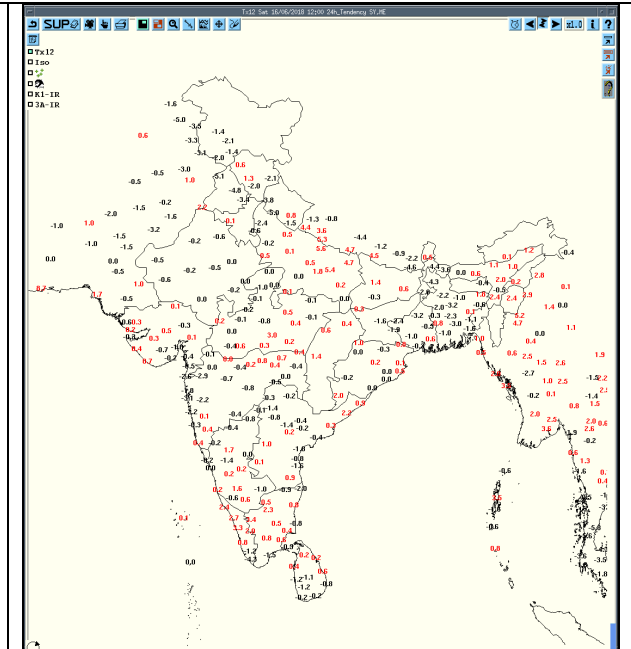
3hourly Past weather at 06, 09, 12, 15, 18, 21 UTC of yesterday and 00 & 03 hrs UTC of today



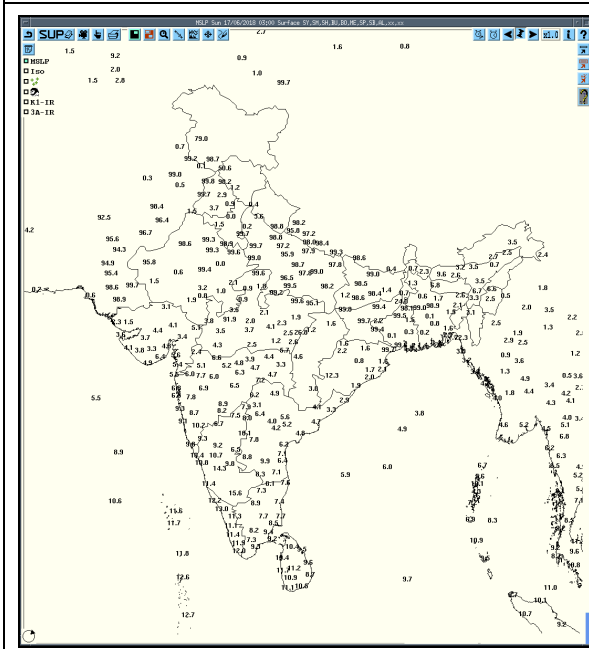
Tmax



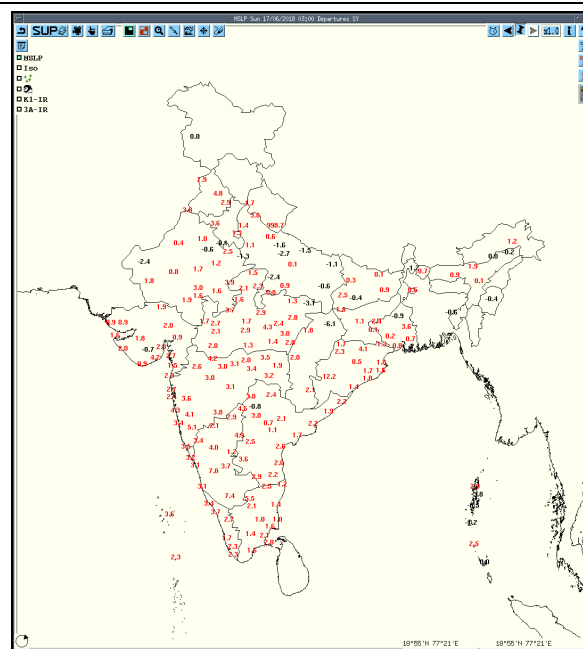
Departure Tmax



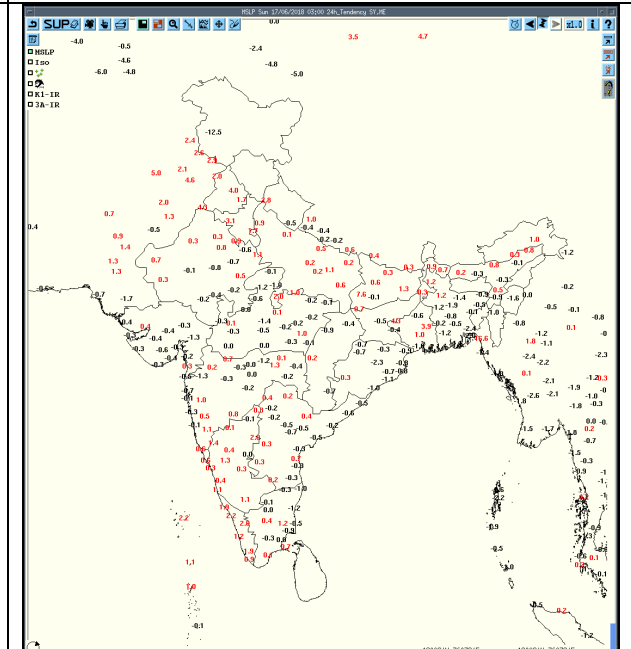
Tendency Tmax



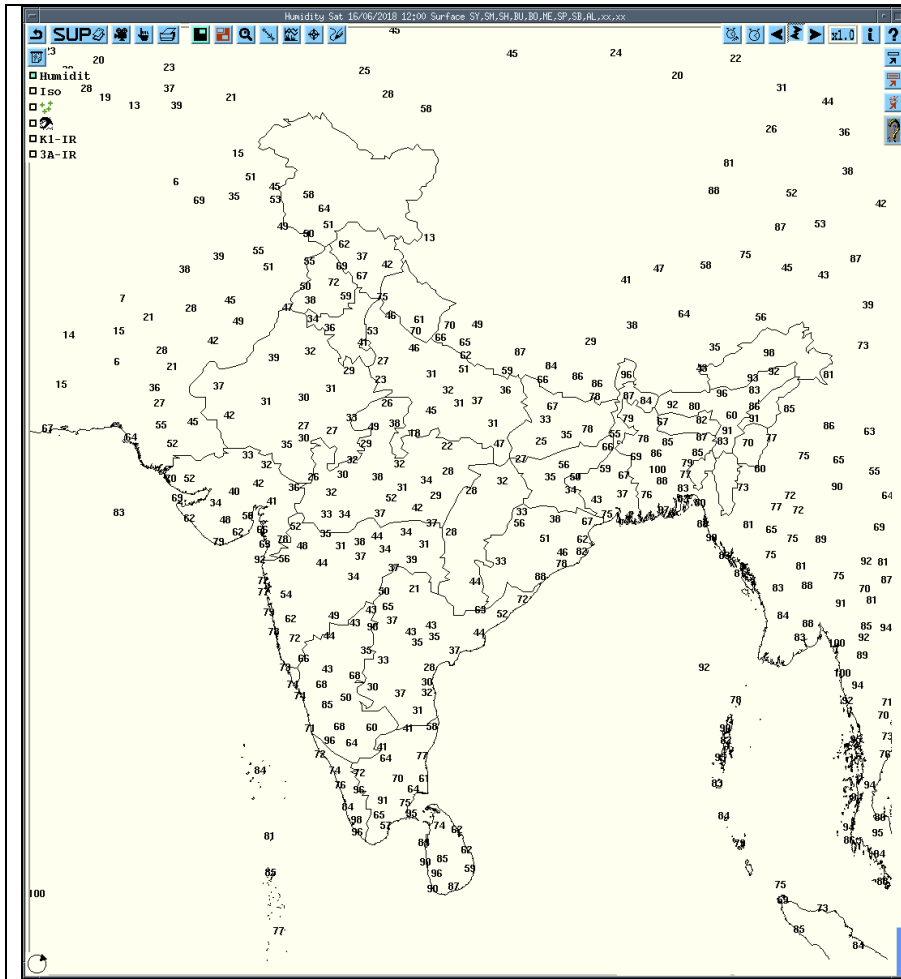
MSLP



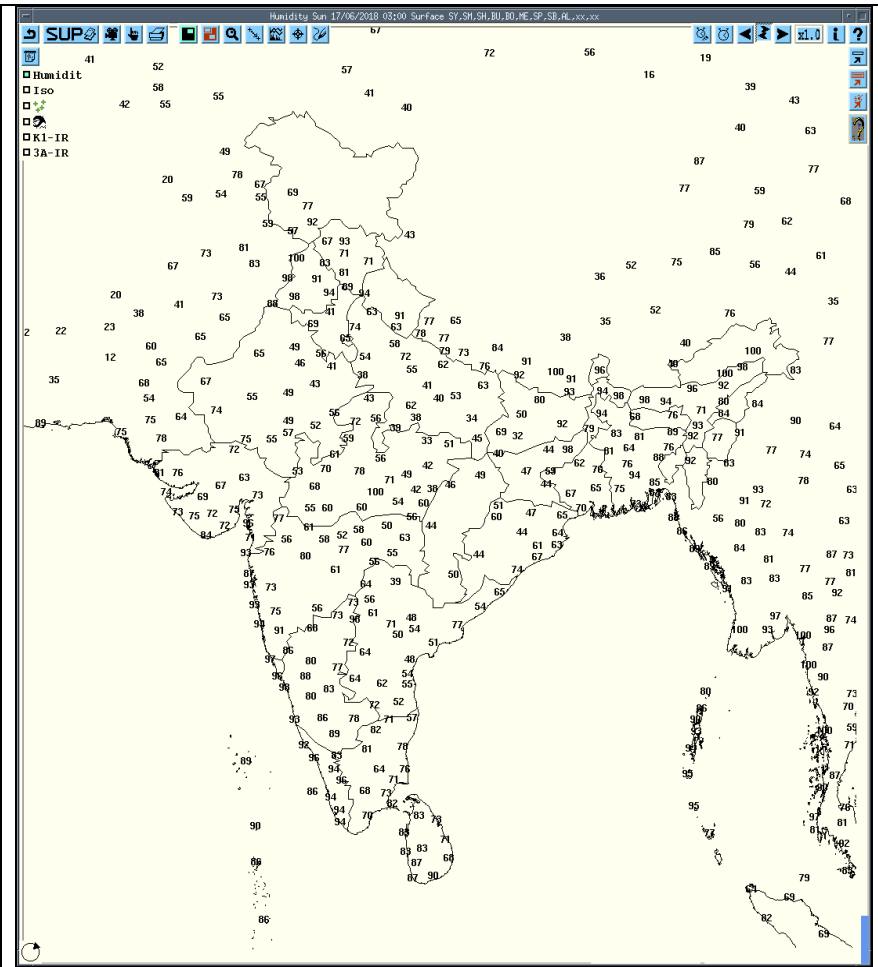
Departure MSLP



Tendency MSLP



RH at 1200UTC yesterday



RH at 0300UTC today

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	Associate d severe weather if any	Districts affected
VISAKHAPATNAM	16/06/18	0900UTC	Isolated CB cells with max. reflectivity of 58dBz and height of 9 kms	N(56 kms) NE(242 kms) moving Ely	CB cells are formed at 0751UTC and developing.		Vizianagara m Dist. (AP) Rayagada Dist. (Orissa)
VISAKHAPATNAM	16/06/18	1200UTC	Multiple cells with max. reflectivity of 59dBz and height of 10kms	N(15,81 kms) NW(180 kms) moving Ely	Since last observation CB cells are developing and matured well (59dBz) at 1101 UTC .		Visakhapatnam.Srikakulam dist. (AP) Rayagada, Gajapati and Ganjam Dist. (Orissa)
VISAKHAPATNAM	16/06/18	1500UTC	Multiple cb cells with max. reflectivity of 59dBz and height of 10kms	NW to NE with a distance of 86 km to 146 km and moving Ely	Since last observation CB cells are well developed and dissipating started from 1421 UTC	-	Visakhapatnam.Srikakulam dist. (AP) and Rayagada, Gajapati and Ganjam Dist. (Orissa)
VISAKHAPATNAM	16/06/18	1800UTC	Multiple cb cells with max. reflectivity of 62dBz and height of 10kms	NE with a distance of 126 km and moving SEly	Since last observation CB cells are formed and dissipating.	-	Rayagada (Orissa)
VISAKHAPATNAM	17/06/18	0000UTC	Isolated cb cells with max. reflectivity of 54dBz and height of 8kms	Bay of Bengal (166 km and moving Ely	-	-	-
VISAKHAPATNAM	17/06/18	0300UTC	Convective region with max. reflectivity of 49dBz and height of 5 kms	S(140 kms) moving Ely	Convective region formed in Bay of Bengal at 0211 UTC and developing.	-	Bay of Bengal
JAIPUR	17/06/18	16/0300 UTC - 170300 UTC	NIL	NIL	NIL	NIL	NIL

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
Patiala	17-06-18	16/0300 - 0600	MULTIPLE CELLS DBZ 54.5 HT. 08-10 KM	N,NE SECTORS MOVEMENT SE WARDS		RA/TS	Mukerian, Dasua, Una, B-Dam, Nalagarh, Roopnagar, Chandigarh, Nahan, Ambala, Yamunanagar And Their Adjoining Areas.
		16/0600 - 0900	MULTIPLE CELLS DBZ 55.5 HT. 08-10 KM	N,NE SECTORS MOVEMENT SE WARDS		RA/TS	Roopnagar,Nalagarh,Mirinda,Khanna,Sirhind,Chandigarh,Yamunanagar,Behat,Kalsi,Saharanpur And Their Adjoining Areas.
		16/0900-1200	MULTIPLE CELLS DBZ 56.5 HT. 08-13 KM	N,NE SECTORS MOVEMENT SE WARDS		RA/TS	Amritsar, Kapurthala, Batala, Dasua.Adampur, Jalandher, Nawasher, Moirinda, Khanna, Sirhind, Chandigarh, Ambala,Yamunanagar, Behat And Their Adjoining Areas.
		16/1200 - 1500	MULTIPLE CELLS DBZ 58.0 HT. 10-12 KM	N,NE SECTORS MOVEMENT SE WARDS		RA/TS	Ajnala.Amritsar,Kapurthal,Jallandhar,Gershanker,Ludhiana,Morinda,Khanna,Chandigarh,Ambala,Nalagarh, Roopnager,Solan,Nahan,Kalsi,Yamunanager, Behat And Their Adjoining Areas.
		16/1500 - 1800	MULTIPLE CELLS DBZ 56.0 HT. 09-10 KM	N,NE SECTORS MOVEMENT SE WARDS		RA/TS	Amritsar, Ludhiana, Jalandher, Barnal, Khanna, Chandigarh, Ambala, Patiala, Phillaur, Kapurthala And Their Adjoining Areas.
		16/1800 - 2100	MULTIPLE CELLS DBZ 60.0 HT. 09-11 KM	NW,,NE SECTORS DIRECTION SE WARDS		RA/TS	Zira,Moga,Ludhiana,Jalandher,Sirhand,Khanna,Nekoder,Patiala,Chandigarh,Ambala,Roopnager,Solan,Shimla,Yamunanager,Kalsi And Their Adjoining Areas.
		16/ 2100-0000	MULTIPLE CELLS DBZ 54.5 HT. 09-10 KM	W,NE,SW Sectors Direction E wards		RA/TS	Moga,Kothaguru,Dhuri,Nabha,Patiala,Chandigarh,Ambala,Mansa,Jind,Yamunanager,Ludhiana,Khanna,Behat,Pehowa And Their Adjoining Areas.
		17/0000-0252	MULTIPLE CELLS DBZ 54.0 HT. 09-12 KM	W,NW,SW Sectors Direction SE wards		RA/TS	Feridkot,Moga,Muktser,Sangrur,Patiala,Ludhiana,Jalandher,Ferozpur,Chandigarh,Ambala,Kaithal,Kurkshtra, Amritsar,Yamunanager,Jind,Karnal,Patran And Their Adjoining Areas.

Radar Station Name	Date	Time Interval Of Observation (UTC)	Organisation 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
Patna	17-06-18	160300-160912	NIL	NIL	NIL	NIL	NIL
		160912-161032	Single Cell Maximum Reflectivity: 46.5 dBZ Echo Top: 13 KM	Range: 80.2 KM from DWR Patna in North-East direction Movement: Westerly	NIL	Thunderstorm	Samastipur, Begusarai
		161032-161242	NIL	NIL	NIL	NIL	NIL
		161242 - 161742	Isolated Multiple Cell Maximum Reflectivity: 45 dBZ Echo Top: 9.0 KM Maximum Reflectivity: 47 dBZ Echo Top: 9.0 KM	Range: 134.8 KM from DWR Patna in North-East direction Movement: North-Westerly Range: 38.8 KM from DWR Patna in South-West direction Movement: North-Westerly	NIL	Thunderstorm	Sitamarhi, Darbhanga, Madhepura, Supaul, Patna, Jehanabad, Nalanda, Nawada
		161742-170300	NIL	NIL	NIL	NIL	NIL
Lucknow	160300 UTC - 170300UTC)	0840UTC TO 1030 UTC	Multiple cell, 50-100 Km NW from radar station. Maximum height of the cell was 8KM and Maximum reflectivity was 52dBz.	Cell formed in Hardoi, Sitapur districts at 0840 UTC and its Movement was NWWly direction.	---	TS/DS/ RA	Sitapur, Barabanki, Gonda

Realised past 24hrs TS/SQ/HS Data:

Realised TS/HS/SQ during past 24hours ending at 0300UTC of today (received from RMCs/MCs)						
Station	Region	State/Sub Division	Weather Event (TS/Hail/Squall)	Date	Time of Commencement (IST)	Time of end (IST)
Srinagar	Northwest India	Jammu & Kashmir	Thunderstorm	16-06-18	1355	1440
Qazigund	Northwest India	Jammu & Kashmir	Thunderstorm	16-06-18	2220	2320
Banihal	Northwest India	Jammu & Kashmir	Thunderstorm	16-06-18	1400 2140	1440 2355
Bhaderwah	Northwest India	Jammu & Kashmir	Thunderstorm	16-06-18	0130	0330
Gulmarg	Northwest India	Jammu & Kashmir	Thunderstorm	16-06-18	1910	2230
Dehradun	Northwest India	Uttarakhand	Thunderstorm	17-06-18	0233	0335
Mukteswar	Northwest India	Uttarakhand	Thunderstorm	16-06-18	0728	0832
Amritsar	Northwest India	Punjab	Thunderstorm	16-06-18	1700	2300
Patiala	Northwest India	Punjab	Thunderstorm	17-06-18	0010 0400	0045 0425
Ludhiana	Northwest India	Punjab	Thunderstorm	16-06-18	During Night	
Chandigarh	Northwest India	Chandigarh	Thunderstorm	16/17-06-18	1415 1810 1823 2200	1525 1820 1840 0310
Ambala	Northwest India	Haryana			2255	0025
Karnal	Northwest India	Haryana			During Night	
Churk	Northwest India	East Uttar Pradesh	Thunderstorm	16-06-18	1920	
Muzaffarnagar	Northwest India	West Uttar Pradesh	Thunderstorm	17-06-18	0230	
Dhubri	Northeast India	Assam	Thunderstorm	16/17-06-18	16/2340 17/0230	16/2345 17/0335
Guwahati	Northeast India	Assam	Thunderstorm	17-06-18	17/0255	17/0440
Cherrapunjee	Northeast India	Meghalaya	Thunderstorm	16-06-18	17/0815	17/0830

IMPORTANT LINKS:

For NCMRWF NWP products:(<http://www.ncmrwf.gov.in/HomePage/NEPS-prod-1.php>)

For IMD NWP products:(http://nwp.imd.gov.in/diagpro_new.php)

For Synoptic plotted data and charts

<http://amssdelhi.gov.in/>

<http://www.amsskolkata.gov.in/>

For RANDHRA PRADESHID tool:

http://rAndhra_Pradeshid.imd.gov.in/

Low Level Winds

http://satellite.imd.gov.in/archive/INSAT-3D-IMAGER/3D-PRODUCTS/AMV/LLW/MAR_2017/?C=M;O=D

Upper level winds

http://satellite.imd.gov.in/archive/INSAT-3D-IMAGER/3D-PRODUCTS/AMV/HLW/MAR_2017/?C=M;O=D

Past24hourHEMandIMRrainfall(upto03UTCoftoday)

IMR: http://satellite.imd.gov.in/img/3Ddaily_imr.jpg

HEM: http://satellite.imd.gov.in/img/3Ddaily_he.jpg

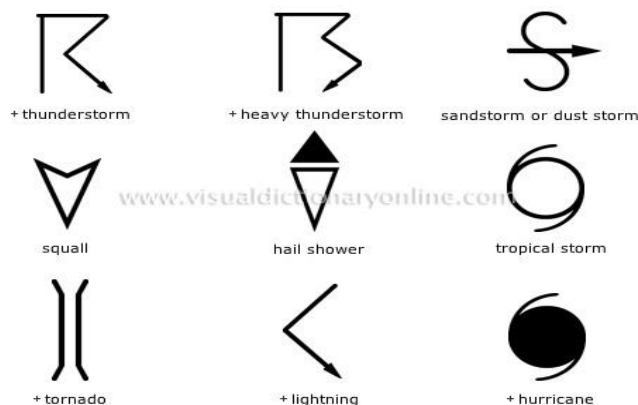
For Radar images of the past 24 hours including mosaic of images:

http://ddgmui.imd.gov.in/dwr_img/

Satellite sounder based T- Phigram

http://satellite.imd.gov.in/mAndhra_Pradesh_skm2.html

WEATHER SYMBOLS:



∞	haze
☁	smoke
☁	dust or sand storm
☁	fog
☁	drizzle
•	rain
✱	snow
▽	showers
△	hail
☁	thunderstorm
Weather Symbols	