



Wednesday, March 20, 2024 Time of Issue: 0800 hours IST (MORNING)

ALL INDIA WEATHER SUMMARY AND FORECAST BULLETIN

Significant Weather Features:

Weather Systems and Forecast & Warnings:

- A cyclonic circulation lies over west Vidarbha and a trough/wind discontinuity runs from South Interior Karnataka to west Vidarbha & another trough from Jharkhand to south Assam in lower tropospheric levels. The anti-cyclonic circulation lies over Westcentral & adjoining Northwest Bay of Bengal off Odisha coast in lower tropospheric levels. In addition, there is a trough in westerlies in middle and upper tropospheric levels along Long. 80°E to the north of Lat. 20°N.
- Under the influence of these systems:
 - ✓ Scattered to fairly widespread light to moderate rainfall with **thunderstorms**, **lightning & gusty winds** over Vidarbha, Chhattisgarh, Bihar and isolated light to moderate rainfall over East Madhya Pradesh on 20th March, 2024. Isolated **hailstorms** also very likely over Bihar today, the 20th March, 2024.
 - ✓ Scattered to fairly widespread light to moderate rainfall with isolated **thunderstorms, lightning & gusty winds** very likely over **Gangetic West Bengal, Jharkhand and Odisha** on 20th & 21st March, 2024.
 - ✓ Isolated **heavy rainfall** very likely over Odisha on 20th March, 2024.
 - ✓ Scattered to fairly widespread light/moderate rainfall with isolated thunderstorms & lightning very likely over Telangana and Coastal Andhra Pradesh & Yanam on 20th March, 2024. Isolated **heavy rainfall** also likely over Coastal Andhra Pradesh on 20th March, 2024.
 - ✓ Scattered to fairly widespread light/moderate rainfall with isolated thunderstorms & lightning very likely over Arunachal Pradesh, Assam & Meghalaya, Nagaland, Manipur, Mizoram & Tripura and Sub-Himalayan West Bengal & Sikkim during 20th-26th March, 2024.
 - ✓ Isolated **heavy rainfall/snowfall** very likely over Arunachal Pradesh on 20th & 23rd and over Sikkim on 23rd and isolated **heavy rainfall** over Assam & Meghalaya on 23rd March, 2024.
- ❖ A fresh Western Disturbances seen as a trough in middle tropospheric westerlies with its axis at 5.8 km above mean sea level along Long. 50°E to the north of Lat. 30°N and another western disturbance likely to affect Western Himalayan Region the night of 23rd March, 2024. Under their influence; isolated/scattered light rainfall/snowfall very likely over Jammu-Kashmir-Ladakh-Gilgit-Baltistan-Muzaffarabad during 20th-24th and over Himachal Pradesh & Uttarakhand during 21st-24th March, 2024.

Maximum temperature forecast for next 5 days:

- ❖ Gradual rise in maximum temperatures by 2-4°C very likely over Northwest & West India during next 4-5 days.
- ❖ Fall in maximum temperatures by 2-3°C very likely over East India during next 24 hours and no significant change thereafter.
- ❖ No significant change in maximum temperatures very likely over Central India during next 24 hours and rise by 2-4°C thereafter.
- ❖ No significant change in maximum temperatures very likely over rest part of the country during next 5 days.
- ❖ Hot and humid weather very likely to prevail over coastal districts of Saurashtra & Kutch during next 5 days; over Kerala & Mahe, Rayalaseema and Tamil Nadu, Puducherry & Karaikal during next 3 days.

Heat wave warning:

❖ **Heat wave conditions** very likely in isolated pockets over Saurashtra & Kutch during 20th-23rd March.





Main Weather Observations:

- ❖ Rainfall/snowfall distribution (from 0830 hours IST to 1730 hours IST of yesterday): at isolated places over Himachal Pradesh.
- ❖ Rainfall distribution (from 0830 hours IST to 1730 hours IST of yesterday): at isolated places over East Uttar Pradesh, Bihar, Jharkhand, Telangana, Gangetic West Bengal, Odisha, Vidarbha, East Madhya Pradesh and Chhattisgarh.
- ❖ Hailstorm observed (from 0830 hours IST to 1730 hours IST of yesterday): at isolated places over southeast Madhya Pradesh (Chhindwada, Balaghat), east Vidarbha (Nagpur, Wardha) and Chhattisgarh (Kabeerdham, Raipur & Pendra Road).
- ❖ Significant amount of rainfall (from 0830 hours IST to 1730 hours IST of yesterday) (in cm): Chhattisgarh: Pendra Road-2; Bihar: Patna-1; Odisha: Chandbali & Bhubaneshwar-1 each; Vidarbha: Nagpur & Chandrapur-1 each; Telangana: Adilabad-1.
- ❖ Minimum Temperature Departures (as on 19-03-2024): Minimum temperatures were above normal (1.6°C to 3.0°C) at isolated places over Bihar, Vidarbha, North Interior Karnataka, Telangana, Rayalaseema, Madhya Maharashtra, Marathwada, Sub-Himalayan West Bengal & Sikkim. They were appreciably below normal (-3.1°C to -5.0°C) at isolated places over East Rajasthan, West Madhya Pradesh, East Uttar Pradesh below normal (-1.6°C to -3.0°C) at most places over Haryana-Chandigarh-Delhi; at many places over West Uttar Pradesh; at isolated places over Gujarat state, West Rajasthan, East Madhya Pradesh, Assam & Meghalaya and near normal over rest parts of the country. Yesterday, the lowest minimum temperature of 11.3°C was reported at Karnal (Haryana) over the plains of the country.
- ❖ Maximum Temperature Departures (as on 19-03-2024): Maximum temperatures were markedly above normal (5.1°C or more) at isolated places over Jammu-Kashmir-Ladakh-Gilgit-Baltistan-Muzaffarabad and Bihar; appreciably above normal (3.1°C to 5.0°C) at isolated places over Assam & Meghalaya and Saurashtra & Kutch; above normal (1.6°C to 3.0°C) at many places over Himachal Pradesh; at a few places over Arunachal Pradesh; at isolated places over Punjab, West Rajasthan, Nagaland, Manipur, Mizoram & Tripura, Kerala & Mahe and Tamil Nadu, Puducherry & Karaikal. They were markedly below normal (-5.1°C or less) at many places over Odisha; at a few places over Chhattisgarh; appreciably below normal (-3.1°C to -5.0°C) at many places over Jharkhand; at isolated places over Gangetic West Bengal, East Madhya Pradesh and Telangana; below normal (-1.6°C to -3.0°C) at a few places over Vidarbha; at isolated places over West Madhya Pradesh and East Uttar Pradesh and near normal over rest parts of the country. Yesterday, the highest maximum temperature of 40.6°C was reported at Anantapur (Rayalaseema) over the country.





Meteorological Analysis (Based on 0530 hours IST)

- The **cyclonic circulation** over west Vidarbha & neighbourhood extending upto 1.5 km above mean sea level persists.
- The **trough/wind discontinuity** from South Interior Karnataka to the above cyclonic circulation over west Vidarbha & neighbourhood extending upto 1.5 km above mean sea level persists.
- The **cyclonic circulation** over northwest Uttar Pradesh & neighbourhood between 1.5 & 3.1 km above mean sea level persists.
- The **Western Disturbance** now seen as a trough in westerlies between 4.5 km & 12.6 km above mean sea level runs roughly along Long. 80°E to the north of Lat. 20°N.
- Another **Western Disturbance** seen as a trough in middle tropospheric westerlies with its axis at 5.8 km above mean sea level runs roughly along Long. 50°E to the north of Lat. 30°N.
- The **trough** from Jharkhand to south Assam at 0.9 km above mean sea level persists.
- The other **trough** in westerly roughly along Long. 95°E to the north of Lat. 23°N at 3.1 km above mean sea level persists.
- A fresh **Western Disturbances** is likely to affect Western Himalayan Region from the night of 23rd March, 2024.

Weather Forecast for next 7 days (Upto 0830 hours IST of 27th March, 2024)

- ❖ Meteorological sub-division wise detailed 7 days rainfall forecast is given in Table-1.
- ❖ Gradual rise in maximum temperatures by 2-4°C very likely over Northwest & West India during next 4-5 days.
- ❖ Fall in maximum temperatures by 2-3°C very likely over East India during next 24 hours and no significant change thereafter.
- ❖ No significant change in maximum temperatures very likely over Central India during next 24 hours and rise by 2-4°C thereafter.
- No significant change in maximum temperatures very likely over rest part of the country during next 5 days.

Weather Outlook for subsequent 3 days (27th-29th March, 2024)

- Scattered to fairly widespread light to moderate rainfall/snowfall likely over Northeast India.
- ❖ Isolated light rainfall likely over Bihar, Jharkhand, Gangetic West Bengal and Andaman & Nicobar Islands.
- Dry weather likely to prevail over rest parts of the country.



राष्ट्रीय मौसम पूर्वानुमान केन्द्र भारत मौसम विज्ञान विभाग पृथ्वी विज्ञान मंत्रालय



National Weather Forecasting Centre India Meteorological Department Ministry of Earth Sciences

Table-1

7 Days Rainfall Forecast								
S. No.	Subdivision	20-Mar	21-Mar	22-Mar	23-Mar	24-Mar	25-Mar	26-Mar
		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
1	ANDAMAN & NICOBAR ISLANDS	ISOL	ISOL	ISOL	DRY	DRY	DRY	ISOL
2	ARUNACHAL PRADESH	FWS	SCT	FWS	FWS	FWS	FWS	FWS
3	ASSAM & MEGHALAYA	SCT	SCT	FWS	FWS	FWS	SCT	SCT
4	NAGALAND, MANIPUR, MIZORAM & TRIPURA	SCT	SCT	FWS	FWS	FWS	SCT	SCT
5	SUB-HIMALAYAN WEST BENGAL & SIKKIM	SCT	FWS	FWS	FWS	FWS	SCT	SCT
6	GANGETIC WEST BENGAL	FWS	SCT	ISOL	DRY	DRY	DRY	DRY
7	ODISHA	FWS	ISOL	DRY	DRY	DRY	DRY	DRY
8	JHARKHAND	FWS	ISOL	DRY	DRY	DRY	DRY	DRY
9	BIHAR	FWS	ISOL	ISOL	ISOL	DRY	DRY	DRY
10	EAST UTTAR PRADESH	ISOL	DRY	DRY	DRY	DRY	DRY	DRY
11	WEST UTTAR PRADESH	DRY	DRY	DRY	DRY	ISOL	DRY	DRY
12	UTTARAKHAND	DRY	ISOL	ISOL	ISOL	ISOL	ISOL	DRY
13	HARYANA CHANDIGARH & DELHI	DRY	DRY	DRY	DRY	ISOL	DRY	DRY
14	PUNJAB	DRY	ISOL	ISOL	DRY	ISOL	DRY	DRY
15	HIMACHAL PRADESH	DRY	SCT	SCT	ISOL	SCT	DRY	DRY
16	JAMMU & KASHMIR AND LADAKH	ISOL	FWS	FWS	SCT	ISOL	ISOL	DRY
17	WEST RAJASTHAN	DRY						
18	EAST RAJASTHAN	DRY						
19	WEST MADHYA PRADESH	DRY						
20	EAST MADHYA PRADESH	ISOL	DRY	DRY	DRY	DRY	DRY	DRY
21	GUJARAT REGION	DRY						
22	SAURASHTRA & KUTCH	DRY						
23	KONKAN & GOA	DRY						
24	MADHYA MAHARASHTRA	DRY						
25	MARATHAWADA	DRY						
26	VIDARBHA	ISOL	DRY	DRY	DRY	DRY	DRY	DRY
27	CHHATTISGARH	SCT	DRY	DRY	DRY	DRY	DRY	DRY
28	COASTAL ANDHRA PRADESH & YANAM	SCT	ISOL	DRY	DRY	DRY	DRY	DRY
29	TELANGANA	SCT	DRY	DRY	DRY	DRY	DRY	DRY
30	RAYALASEEMA	ISOL	ISOL	DRY	DRY	DRY	DRY	DRY
31	TAMILNADU PUDUCHERRY & KARAIKAL	ISOL	ISOL	ISOL	ISOL	DRY	DRY	DRY
32	COASTAL KARNATAKA	DRY	ISOL	ISOL	ISOL	ISOL	DRY	DRY
33	NORTH INTERIOR KARNATAKA	ISOL	ISOL	DRY	DRY	DRY	DRY	DRY
34	SOUTH INTERIOR KARNATAKA	ISOL	ISOL	ISOL	ISOL	ISOL	DRY	DRY
35	KERALA & MAHE	ISOL	SCT	SCT	ISOL	ISOL	DRY	DRY
36	LAKSHADWEEP	DRY						

Legend Category		% Stations
WS	Widespread/Most Places	76-100
FWS	Fairly Widespread/Many Places	51-75
SCT	Scattered/ A Few Places	26-50
ISOL	Isolated Places	1-25
DRY	No Rain	0

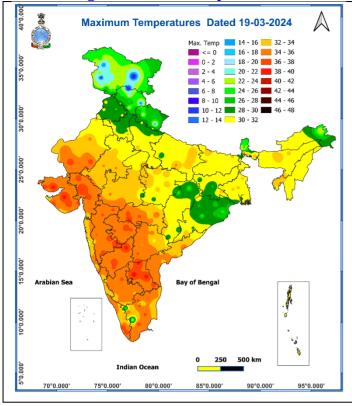


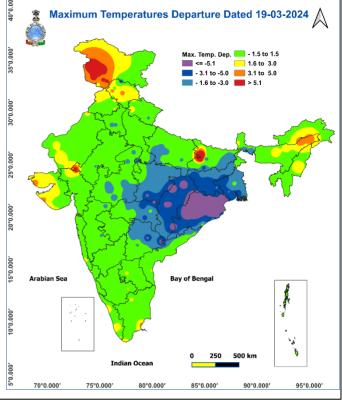


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Fig. 1: Maximum Temperatures







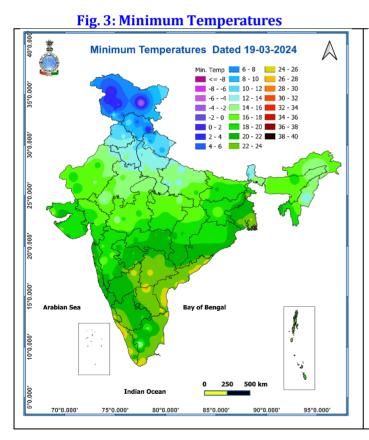


Fig. 4: Departure of Minimum Temperatures

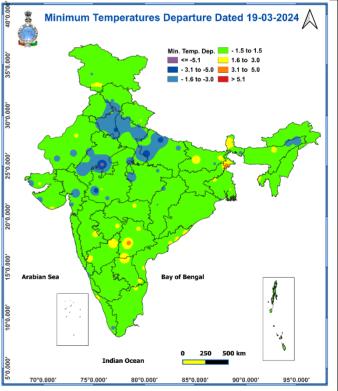
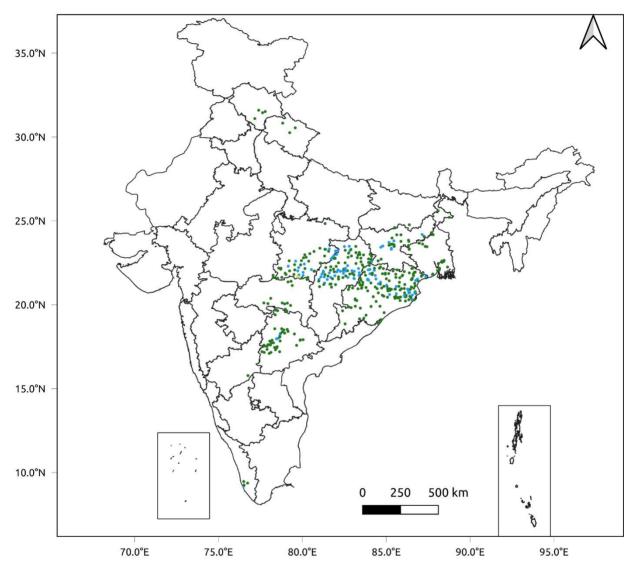




Fig. 5: Accumulated Rainfall (mm) during past 24 hours



24 Hr cumulative rainfall recorded over different stations during 0830 IST of 18-3-2024 to 0830 IST of 19-3-2024

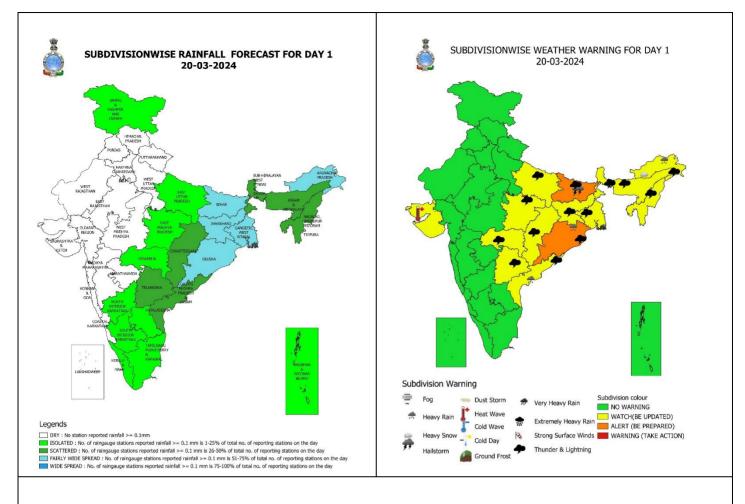


Legends

- Very Light to Light Rainfall (0.1 15.5 mm)
- Moderate Rainfall (15.6 64.4 mm)
- Heavy Rainfall (64.5 115.5 mm)
- Very Heavy Rainfall (115.6 204.4 mm)
- Extremely Heavy Rainfall (>=204.5 mm)





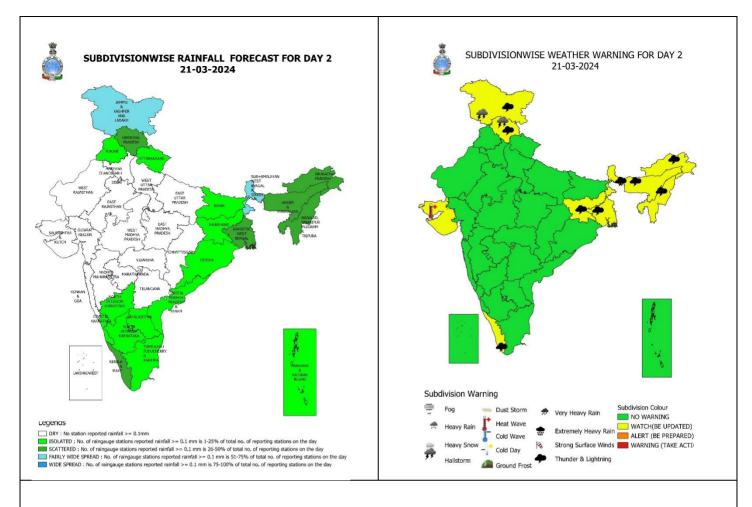


20 March (Day 1):

- Thunderstorm accompanied with lightning & hail (speed reaching 40-50 kmph) very likely at isolated places over Bihar; with lightning & gusty wind (speed reaching 40-50 kmph) very likely at isolated places over Gangetic West Bengal, Jharkhand with lightning & gusty winds (speed reaching 30-40 kmph) at isolated places over East Uttar Pradesh, East Madhya Pradesh, Vidarbha, Chhattisgarh, Odisha, Assam & Meghalaya, Telangana and with lightning at isolated places over Arunachal Pradesh, Sub-Himalayan West Bengal & Sikkim, Nagaland, Manipur, Mizoram & Tripura, Coastal Andhra Pradesh & Yanam.
- **Heavy rainfall/snowfall** very likely at isolated places over Arunachal Pradesh; **Heavy rainfall** at isolated places over Odisha, Coastal Andhra Pradesh.
- **Heat wave conditions** very likely at isolated pockets over Saurashtra & Kutch.





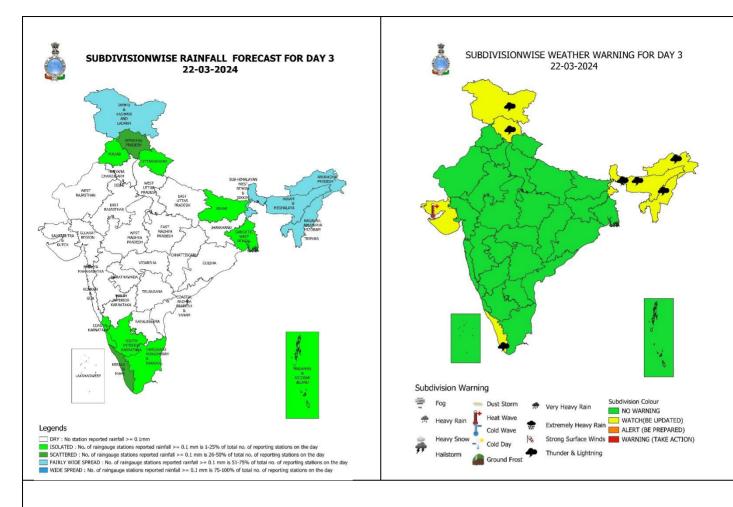


21 March (Day 2):

- ❖ Thunderstorm accompanied with lightning & hail very likely at isolated places over Jammu-Kashmir-Ladakh-Gilgit-Baltistan-Muzaffarabad, Himachal Pradesh; with lightning & gusty winds (speed reaching 30-40 kmph) at isolated places over West Bengal & Sikkim; with lightning at isolated places over Jharkhand, Arunachal Pradesh, Assam & Meghalaya, Nagaland, Manipur, Mizoram & Tripura, Kerala & Mahe.
- **\Delta Heat wave conditions** very likely at isolated pockets over Saurashtra & Kutch.





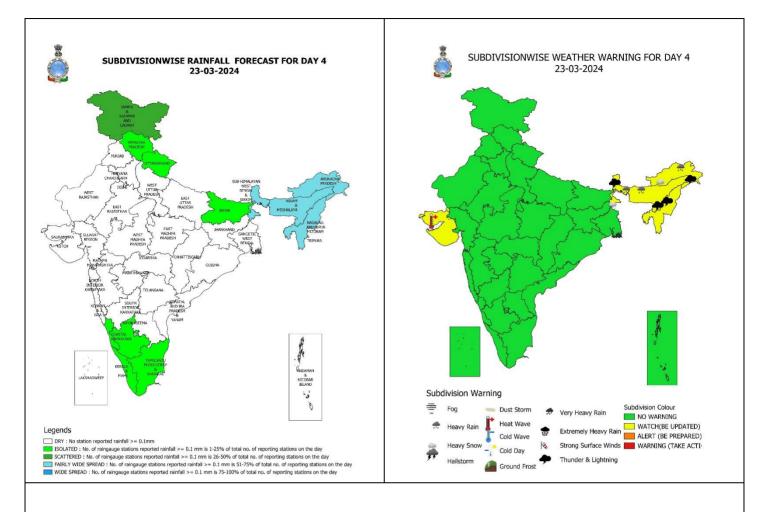


22 March (Day 3):

- * Thunderstorm accompanied with lightning & gusty winds (speed reaching 30-40 kmph) likely at isolated places over Sub-Himalayan West Bengal & Sikkim, with lightning at isolated places over Jammu-Kashmir-Ladakh-Gilgit-Baltistan-Muzaffarabad, Himachal Pradesh, Arunachal Pradesh, Assam & Meghalaya, Nagaland, Manipur, Mizoram & Tripura, Kerala & Mahe.
- **Heat wave conditions** likely at isolated pockets over Saurashtra & Kutch.





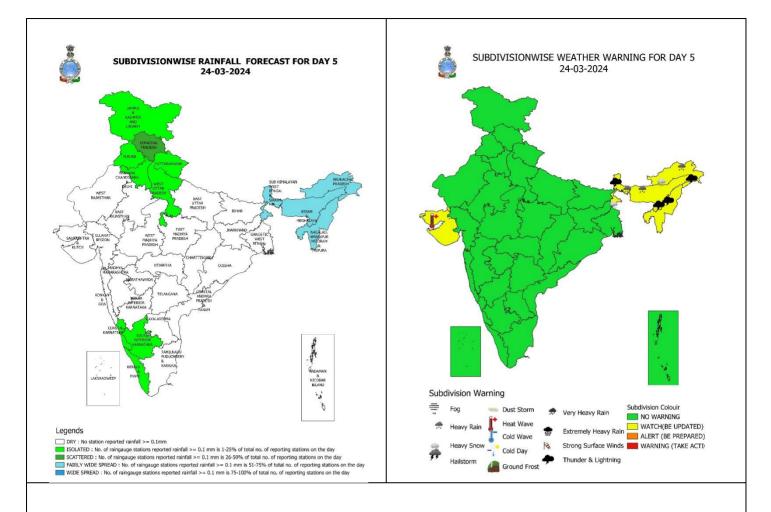


23 March (Day 4):

- ❖ Thunderstorm accompanied with lightning & gusty winds (speed reaching 30-40 kmph) likely at isolated places over Sub-Himalayan West Bengal & Sikkim, with lightning at isolated places over Arunachal Pradesh, Assam & Meghalaya, Nagaland, Manipur, Mizoram & Tripura.
- **Heavy rainfall/snowfall** likely at isolated places over Sikkim and Arunachal Pradesh; **Heavy rainfall** at isolated places over Assam & Meghalaya.
- **\Delta Heat wave conditions** likely at isolated pockets over Saurashtra & Kutch.







24 March (Day 5):

- * Thunderstorm accompanied with lightning & gusty winds (speed reaching 30-40 kmph) likely at isolated places over Sub-Himalayan West Bengal & Sikkim, with lightning at isolated places over Arunachal Pradesh, Assam & Meghalaya, Nagaland, Manipur, Mizoram & Tripura.
- **\Display Heavy rainfall/snowfall** likely at isolated places over Sikkim and Arunachal Pradesh; **Heavy rainfall** at isolated places over Assam & Meghalaya.
- **Heat wave conditions** likely at isolated pockets over Saurashtra & Kutch.







SPATIAL DISTRIBUTION (% of Stations reporting)

% Stations	Category	% Stations	Category
76-100	Widespread (WS/Most Places)	26-50	Scattered (SCT/ A Few Places)
51-75	Fairly Widespred (FWS/ Many Places)	1-25	isolated (ISOL)

WARNING

WARNING (TAKE ACTION) ALERT (BE PREPARED) WATCH (BE UPDATED) NO WARNING (NO ACTION)

Probabilistic Forecast

Terms	Probability of Occurrence (%)
Unlikely	< 25
Likely	25 - 50
Very Likely	50 - 75
Most Likely	> 75





LEGENDS Probabilistic Forecast WARNING Probability of Occurrence (%) WARNING (TAKE ACTION) Terms ALERT (BE PREPARED) Likely WATCH (BE UPDATED) Very Likely Most Likely > 75 Heavy: 64.5 to 115.5 mm/cm * Very Heavy: 115.6 to 204.4 mm/cm* Extremely Heavy: > 204.4 mm/cm Rain/ Snow When maximum temperature of a station reaches ≥40° C for plains and ≥30° C for hilly regions (a) Based on Departure from normal Heat Wave: Maximum Temperature Departure from normal 4.5° C to 6.4° C. Severe Heat Wave: Maximum Temperature Departure from normal ≥6.5° C (b). Based on Actual maximum temperature **Heat Wave** Heat Wave: When actual maximum temperature ≥45°C Severe Heat Wave: When actual maximum temperature ≥47°C (c). Criteria for heat wave for coastal stations When maximum temperature departure is >4.5°C from normal. Heat Wave may be described provided maximum temperature ≥37°C When maximum temperature remains 40°C **J+**Warm Night Warm Night: When minimum temperature departure 4.5 °C to 6.4 °C Severe Warm Night: When minimum temperature departure >6.4 °C. When minimum temperature of a station ≤10°C for plains and ≤0°C for hilly regions. (a). Based on departure Cold Wave: Minimum Temperature Departure from normal -4.5 °C to -6.4 °C. Severe Cold Wave: Minimum Temperature Departure from normal ≤ -6.5 °C (b) Based on actual Minimum Temperature (for Plains only) **Cold Wave** Cold Wave : When Minimum Temperature is ≤ 4.0 °C Severe Cold Wave: When Minimum Temperature is ≤ 2.0 °C When Minimum Temperature departure is ≤-4.5 °C & actual Minimum Temperature is ≤ 15 °C When minimum temperature of a station ≤10°C for plains and ≤0°C for hilly regions Based on departure Cold Day: Maximum Temperature Departure from normal -4.5 °C to -6.4 °C. **Cold Day** Severe Cold Day: Maximum Temperature Departure from normal ≤ -6.5 °C Phenomenon of small droplets suspended in air and the horizontal visibility < 1km Moderate Fog: When the visibility between 500-200 metres 0 Dense Fog: when the visibility between 50- 200 metres Fog Very Dense Fog: when the visibility < 50 metres 44 Sudden electrical discharges manifested by a flash of light (Lightning) and a sharp rumbling sound (thunder) Thunderstorm An ensemble of particles of dust or sand energetically lifted to great heights by a strong and **Dust/Sand** turbulent wind. Storm Ice deposits on ground 55 Air temperature ≤4°C (over Plains) Frost A strong wind that rises suddenly, lasts for atleast 1 minute. Moderate: Wind speed 52-61 kmph 4 Severe: Wind speed 62-87 kmph Squall Very Severe: Wind speed >87 kmph Effect of various waves in the sea over specific area Rough to very rough: Wind speed 41-62 kmph (22-33 knots) & Wave height 2.5-6 metre High to very high: Wind speed 63-117 kmph (34-63 knots) & Wave height 6-14 metre Sea State Phenomenal: Wind speed >117 kmph (>63 knots) & Wave height >14 metre Cyclonic Storm: Wind speed 62-87 kmph (34-47 knots) Severe Cyclonic Storm: Wind speed 88-117 kmph (48-63 knots) 9 Very Severe Cyclonic Storm: Wind speed 118-165 kmph (64 - 89 knots) Extremely Severe Cyclonic Storm: Wind speed 166-220 kmph (90 -119 knots) Cyclone Super Cyclone Strom: Wind speed >220 kmph (>119 knots)