



Government of India  
Ministry of Earth Sciences  
India Meteorological Department



Press Release  
Date: 21<sup>st</sup> July, 2024  
Time of Issue: 1330 hours IST

- Subject: 1) Under the influence of Well-marked low pressure area over interior Odisha and adjoining Chhattisgarh, Isolated extremely heavy rainfall very likely over West Madhya Pradesh during 21<sup>st</sup> -23<sup>rd</sup>; East Madhya Pradesh, Vidarbha on 21<sup>st</sup> July.**
- 2) Isolated extremely heavy rainfall also very likely over Gujarat State during next 3 days; and heavy to very heavy rainfall over Konkan & Goa, Madhya Maharashtra during next 4-5 days and over southeast Rajasthan on 21<sup>st</sup> July.**
- 3) Isolated extremely heavy rainfall likely over Uttarakhand during on 21 and 22 July and Very heavy over Himachal Pradesh on 22<sup>nd</sup> and 23<sup>rd</sup> July.**

**Realised weather during past 24 hours till 0830 hours IST of today: (details in Annexure I)**

- ✓ **Heavy to very heavy rainfall** with **extremely heavy falls at isolated** places over West Madhya Pradesh, Konkan & Goa; **Heavy to very heavy rainfall** at isolated places over Vidarbha, Chhattisgarh, East Madhya Pradesh, Madhya Maharashtra, Odisha, Saurashtra & Kutch, Telangana, Uttarakhand, Coastal Karnataka; **Heavy rainfall** at isolated places over Assam & Meghalaya, South Interior Karnataka, Punjab, Jammu-Kashmir-Ladakh-Gilgit-Baltistan-Muzaffarabad, Himachal Pradesh.

**Weather Systems**

- ✓ The **Well marked low pressure area** over interior Odisha & neighbourhood moved northwestwards and now lies over interior Odisha and adjoining Chhattisgarh at 0830 hours IST of today, the 21<sup>st</sup> July, 2024. It is likely to move northwestwards across Chhattisgarh and weaken gradually into a low-pressure area during next 12 hours.
- ✓ The Monsoon trough is active and lies south of its normal position. It is likely to move northwards during next 2 hours.
- ✓ The **shear zone** lies in lower & middle tropospheric levels along 20°N tilting southwards with height.
- ✓ The **off-shore trough** at mean sea level along South Gujarat-north Kerala coasts persists.
- ✓ A **cyclonic circulation** lies over northeast Arabian Sea adjoining Kutch at lower levels
- ✓ A **Western Disturbance** as a trough lies in middle tropospheric with its axis at 5.8 km above mean sea level roughly runs along Long. 67°E to the north of Lat. 28°N.
- ✓ A **cyclonic circulation** lies over northeast Rajasthan & neighbourhood at lower levels.

**Forecast & Warnings: (Annexure II)**

❖ **West, Central, East and South Peninsular India**

- ✓ Fairly widespread to widespread light to moderate rainfall accompanied with thunderstorm & lightning very likely over the region during next 5 days.
- ✓ **Isolated extremely heavy rainfall very likely over West Madhya Pradesh & Gujarat State during 21<sup>st</sup> -23<sup>rd</sup>; East Madhya Pradesh and Vidarbha on 21<sup>st</sup> July.**
- ✓ **Very heavy rainfall very likely at isolated places over Chhattisgarh on 21<sup>st</sup> & 22<sup>nd</sup>; Vidarbha on 22<sup>nd</sup>; Konkan & Goa & Madhya Maharashtra during 21<sup>st</sup> -24<sup>th</sup>; West Madhya Pradesh on 24<sup>th</sup>; East Madhya Pradesh on 22<sup>nd</sup> & 23<sup>rd</sup>; Gujarat State on 24<sup>th</sup> & 25<sup>th</sup> July.**

- ✓ **Heavy rainfall** very likely at isolated/some places over Sub-Himalayan West Bengal & Sikkim, Interior Karnataka & Telangana on 21<sup>st</sup>; Kerala & Mahe on 21<sup>st</sup> & 22<sup>nd</sup>; Gangetic West Bengal on 22<sup>nd</sup> & 23<sup>rd</sup>; Jharkhand during 23<sup>rd</sup> -25<sup>th</sup>; West Madhya Pradesh, Konkan & Goa & Madhya Maharashtra on 25<sup>th</sup>; Vidarbha & Chhattisgarh on 23<sup>rd</sup>; East Madhya Pradesh on 24<sup>th</sup> & 25<sup>th</sup>; and Odisha & Coastal Karnataka during next 5 days.

#### ❖ **Northwest India**

- ✓ Scattered to fairly widespread light to moderate rainfall **accompanied with thunderstorm & lightning** very likely over East Rajasthan, Haryana-Chandigarh-Delhi, Uttar Pradesh during next 5 days.
- ✓ **Isolated extremely heavy rainfall very likely over Uttarakhand on 21<sup>st</sup> & 22<sup>nd</sup> July.**
- ✓ **Isolated heavy to very heavy rainfall also likely over West Uttar Pradesh on 21<sup>st</sup> & 22<sup>nd</sup>; East Rajasthan on 21<sup>st</sup> & 23<sup>rd</sup>; Himachal Pradesh 22<sup>nd</sup> & 23<sup>rd</sup>; Uttarakhand during 23<sup>rd</sup> -25<sup>th</sup> July.**
- ✓ Isolated **heavy rainfall** very likely over Himachal Pradesh on 21<sup>st</sup>, 24<sup>th</sup> & 25<sup>th</sup>; Punjab & Haryana-Chandigarh during 21<sup>st</sup> -23<sup>rd</sup>; Uttar Pradesh during 23<sup>rd</sup>- 25<sup>th</sup>; West Rajasthan during 22<sup>nd</sup> -24<sup>th</sup>; East Rajasthan on 22<sup>nd</sup>, 24<sup>th</sup> & 25<sup>th</sup>; Jammu & Kashmir on 23<sup>rd</sup> & 24<sup>th</sup> July.

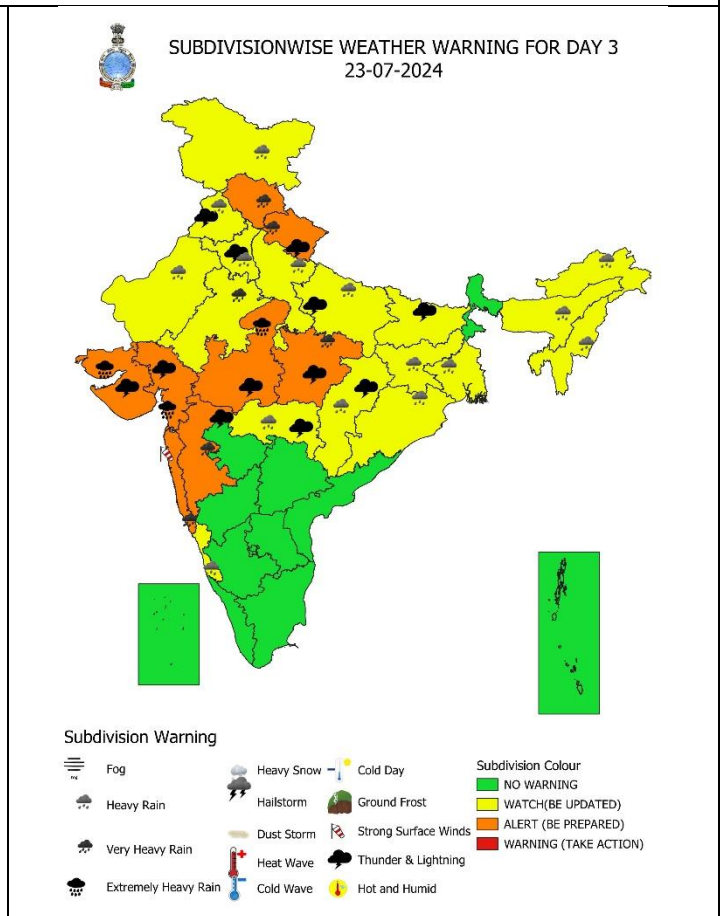
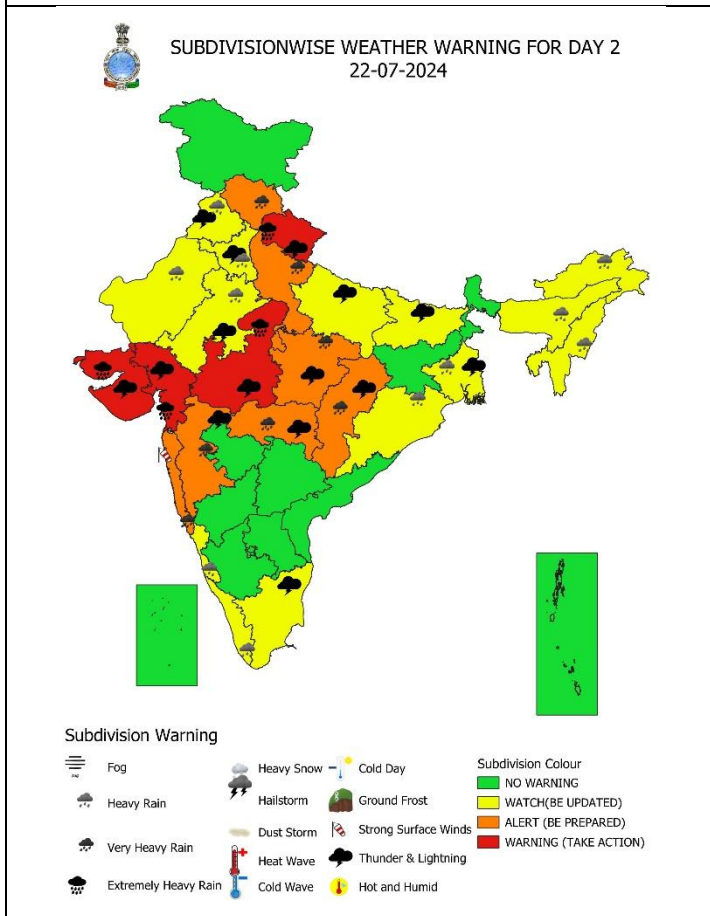
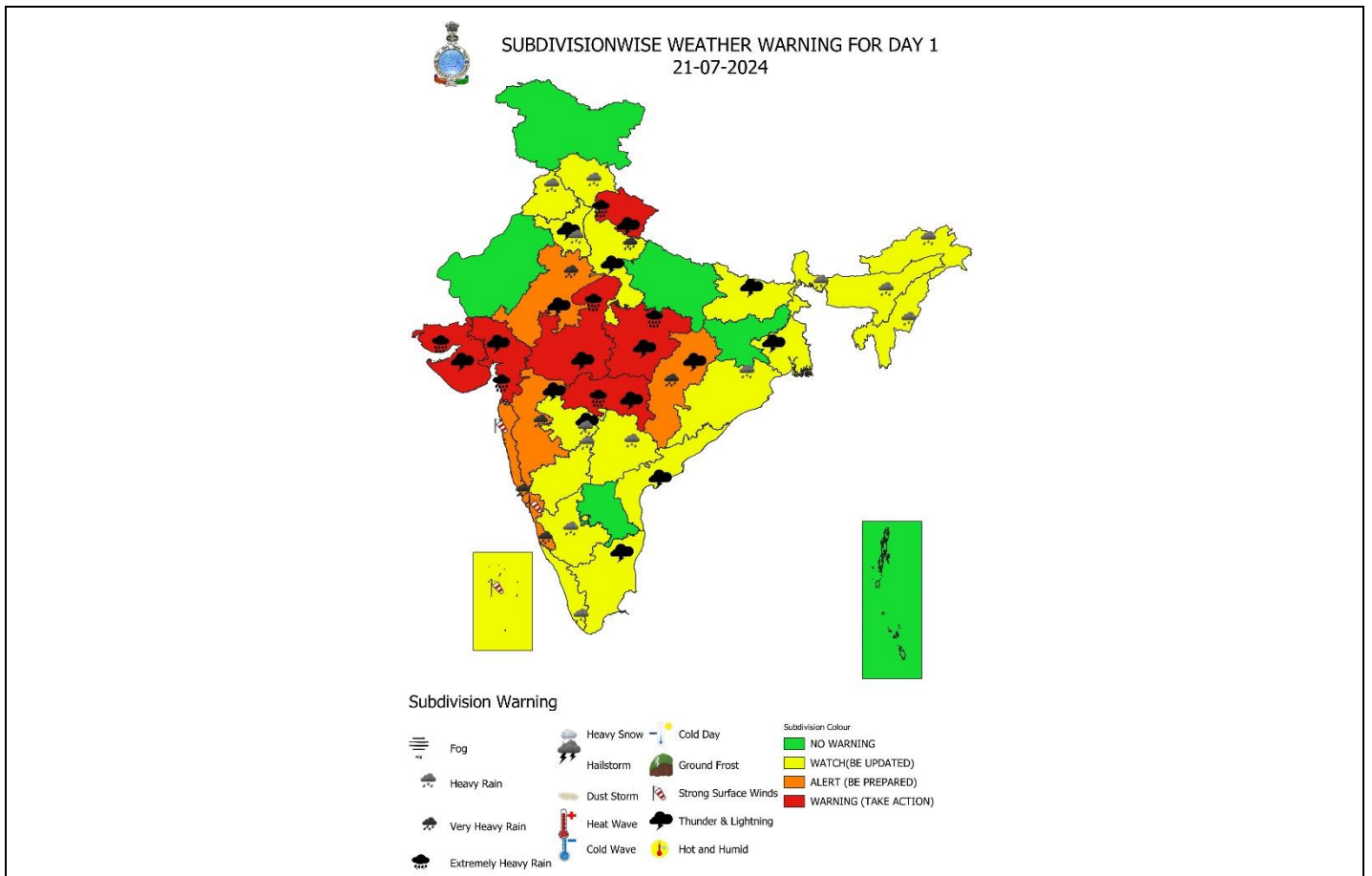
#### ❖ **Northeast India**

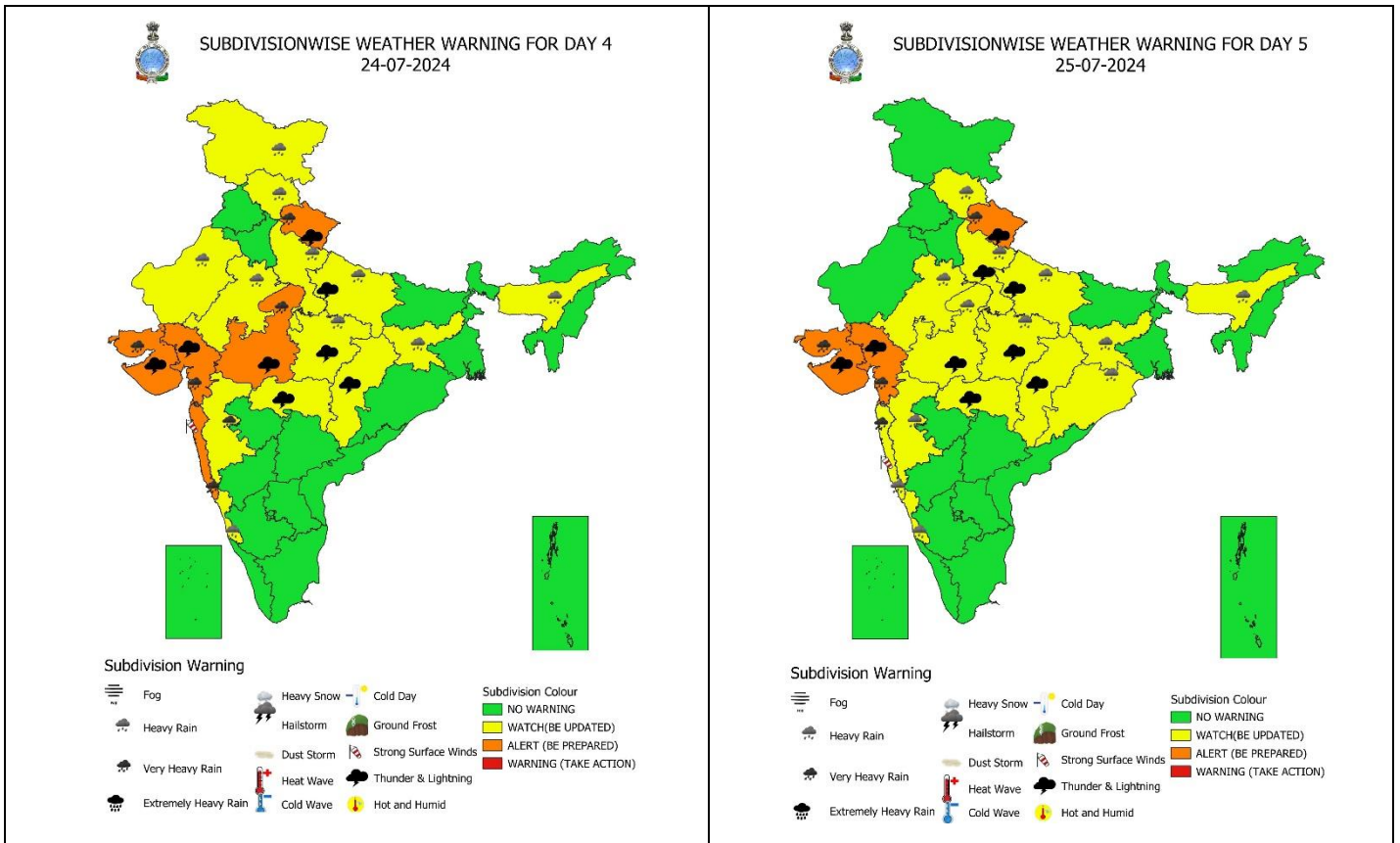
- ✓ Fairly widespread to widespread light to moderate rainfall with **isolated heavy rainfall and accompanied with thunderstorm, lightning** very likely over Northeast India during next 5 days.
- ✓ Isolated **heavy rainfall** very likely over Assam & Meghalaya during next 5 days; Arunachal Pradesh, Nagaland, Manipur, Mizoram & Tripura during 21<sup>st</sup> -23<sup>rd</sup> July.

For more details, kindly refer: [https://mausam.imd.gov.in/responsive/all\\_india\\_forecast\\_bulletin.php](https://mausam.imd.gov.in/responsive/all_india_forecast_bulletin.php)

**Significant Rainfall recorded during past 24 hours till 0830 hours IST of today (in cm):**

- ❖ **West Madhya Pradesh:** Pipariya (dist Narmadapuram) 24, Budhni (dist Sehore) 18, Itarsi (dist Narmadapuram) 17, Sohagpur (dist Narmadapuram) 16, Shahpur (dist Betul) 16, Dolariya (dist Narmadapuram) 14, Babai (makhan Nagar) (dist Narmadapuram) 14, Rehti (dist Sehore) 13, Bankhedhi (dist Narmadapuram) 13, Pachmarhi (dist Narmadapuram) 11, Bareli (dist Raisen) 11, Seoni Malwa (dist Narmadapuram) 8, Nasrullahganj (dist Sehore) 7,
- ❖ **Konkan & Goa:** Dapoli\_agri (dist Ratnagiri) 23, Mandangad (dist Ratnagiri) 21, Wakwali\_agri (dist Ratnagiri) 15, Sangameshwar Devrukh (dist Ratnagiri) 15, Ulhasnagar (dist Thane) 14, Ratnagiri - Imd Obsy (dist Ratnagiri) 13, Thane (m dist Thane) 13, Sawantwadi (dist Sindhudurg) 11, Chiplun (dist Ratnagiri) 11, Khed (dist Ratnagiri) 10, Matheran (dist Raigad) 10, Lanja (dist Ratnagiri) 10, Santacruz - Imd Obsy (dist Mumbai Suburban) 9, Palghar\_agri (dist Palghar) 9, Vaibhavwadi (dist Sindhudurg) 9, Ambernath (dist Thane) 9, Rajapur (dist Ratnagiri) 9, Bhiwandi (dist Thane) 8, Kankavli (dist Sindhudurg) 8, Mulde\_Agri (dist Sindhudurg) 8, Vasai (dist Palghar) 8, Kudal (dist Sindhudurg) 8, Panjim - Imd Obsy (dist North Goa) 7,
- ❖ **Chhattisgarh:** Bijapur (dist Bijapur) 21, Gurur (dist Balod) 16, Kutaru (dist Bijapur) 14, Rajnandgaon (dist Rajnandgaon) 14, Marri Bangla Deori (dist Balod) 12, Arjunda (dist Balod) 12, Gangalur (dist Bijapur) 12, Balod (dist Balod) 12, Gundardehi (dist Balod) 11, Bhopalpatnam (dist Bijapur) 10, Lal Bahadur Nagar (dist Rajnandgaon) 9, Bhairamgarh (dist Bijapur) 9, Usoor (dist Bijapur) 9, Dhamtari (dist Dhamtari) 9, Dongargarh (dist Rajnandgaon) 9, Nerharpur (dist Kanker) 8, Sarona (dist Kanker) 8, Dongargaon (dist Rajnandgaon) 7, Gidam (dist Dantewada) 7, Bade Bacheli (dist Dantewada) 7, Narayanpur (dist Narayanpur) 7,
- ❖ **East Madhya Pradesh:** Barghat (dist Seoni) 17, Tamia (dist Chindwara) 15, Katangi (dist Balaghat) 13, Sausar (dist Chindwara) 12, Seoni (dist Seoni) 11, Tirodi (dist Balaghat) 11, Junnardeo (dist Chindwara) 10, Kurai (dist Seoni) 9, Lalburra (dist Balaghat) 9, Pandhurna (dist Chindwara) 7, Harrai (dist Chindwara) 7, Chauri (dist Chindwara) 7,
- ❖ **Vidarbha:** Nagpur Aerodrome (dist Nagpur) 16, Gadchiroli (aws) (dist Gadchiroli) 16, Gadchiroli (dist Gadchiroli) 15, Sindewahi (dist Chandrapur) 14, Chandrapur (dist Chandrapur) 14, Pombhurna (dist Chandrapur) 11, Perseoni (dist Nagpur) 11, Hingna (dist Nagpur) 11, Bhamragad (dist Gadchiroli) 11, Bhadravati (dist Chandrapur) 10, Mauda (dist Nagpur) 10, Chamorshi (dist Gadchiroli) 9, Deoli (dist Wardha) 9, Kamptee (dist Nagpur) 9, Warora (dist Chandrapur) 9, Samudrapur (dist Wardha) 9, Ramtek (dist Nagpur) 9, Selu (dist Wardha) 8, Sironcha (dist Gadchiroli) 8, Chimur (dist Chandrapur) 8, Armori (dist Gadchiroli) 8, Wani (dist Yeotmal) 8, Saoner (dist Nagpur) 8, Zarizamni (dist Yeotmal) 8, Tumsar (dist Bhandara) 8, Wardha (dist Wardha) 8, Amgaon (dist Gondia) 7,
- ❖ **Madhya Maharashtra:** Mahabaleshwar- Imd Obsy (dist Satara) 15, Gaganbawada (dist Kolhapur) 9, Chandgad (dist Kolhapur) 9, Shahuwadi (dist Kolhapur) 8, Igatpuri (dist Nashik) 7, Ajra (dist Kolhapur) 7,
- ❖ **Saurashtra & Kutch:** Dwarka (dist Devbhoomi Dwarka) 15, Veraval (dist Gir Somnath) 10, Talala (dist Gir Somnath) 10, Junagadh (dist Junagadh) 10, Mendarda (dist Junagadh) 9, Mangrol(j) (dist Junagadh) 6,
- ❖ **Odisha:** Athmalik ( Angul) 15, Boden ( Nawapara) 14, Padampur ( Bargarh) 11, Padmapur ( Rayagada) 11, Sinapali ( Nawapara) 11, Dunguripalli ( Sonepur) 11, Nawapara ( Nawapara) 10, Bolangir ( Bolangir) 10, Bangamunda ( Bolangir) 9, Salebhatta ( Bolangir) 8, Gania ( Nayagarh) 8, Patnagarh ( Bolangir) 8, Binika ( Sonepur) 8, Kantamal ( Boudhgarh) 8, Agalpur ( Bolangir) 8, Ullunda ( Sonepur) 8, Tarva ( Sonepur) 7,
- ❖ **Telangana:** Mortad (dist Nizamabad) 14, Mallapur (dist Jagtial) 13, Metpalle (dist Jagtial) 13, Sarangapurnrl (dist Nirmal) 13, Laxmanchanda (dist Nirmal) 12, Khanpur (dist Nirmal) 12, Balkonda (dist Nizamabad) 12, Kammar Palle (dist Nizamabad) 11, Navipet (dist Nizamabad) 11, Bheemgal (dist Nizamabad) 11, Makloor (dist Nizamabad) 11, Nandipet (dist Nizamabad) 11, Velpur (dist Nizamabad) 10, Ranjal (dist Nizamabad) 10, Armur (dist Nizamabad) 10, Yeda Palle (dist Nizamabad) 10, Jannaram (dist Mancherial) 10, Nirmal (dist Nirmal) 10, Kathlapur (dist Jagtial) 9, Regonda (dist J. Bhupalpally) 9, Shayampet (dist Hanumakonda) 9, Nizamabad (dist Nizamabad) 9, Atmakurwrgl (dist Hanumakonda) 9, Jainoor (dist Kumaram Bheem) 9, Bodhan (dist Nizamabad) 8, Parkal (dist Hanumakonda) 8, Aswapuram (dist B. Kothagudem) 8, Venkatapuram (dist Mulugu) 8, Asifabad (dist Kumaram Bheem) 8, Chityal (dist J. Bhupalpally) 8, Huzurabad (dist Karimnagar) 8, Gangadhara (dist Karimnagar) 8, Dandepalle (dist Mancherial) 8, Jaipur (dist Mancherial) 8, Sirpuru (dist Kumaram Bheem) 7, Kataram (dist J. Bhupalpally) 7, Manuguru (dist B. Kothagudem) 7, Dummagudem(arg) (dist B. Kothagudem) 7,
- ❖ **Uttarakhand:** Sama (Bageshwar): 12, Loharkhet (Bageshwar): 9, Dwarahat (Almora): 5,
- ❖ **Coastal Karnataka:** Kollur (dist Udupi) 12, Kadra (dist Uttara Kannada) 7,
- ❖ **Assam & Meghalaya:** Goibargaon (dist Baksa) 11, Chauldhowaghat (dist Lakhimpur) 8, Jiagaon (dist Tinsukia) 7,
- ❖ **South Interior Karnataka:** Kottigehara (dist Chikkamagaluru) 7,
- ❖ **Punjab:** Phangota (dist Pathankot) 7, Madhopur (dist Pathankot) 5, Shahpur Kandi (dist Pathankot) 5,
- ❖ **Jammu-Kashmir-Ladakh:** Kathua Arg (dist Kathua) 7, Kathua\_kvq (dist Kathua) 6,
- ❖ **Himachal Pradesh:** Mandi (dist Mandi) 7, Kothi (dist Kullu) 5,





**IMPACT & ACTION SUGGESTED due to**

- ✓ **Isolated extremely heavy rainfall very likely over West Madhya Pradesh & Gujarat State during 21<sup>st</sup> -23<sup>rd</sup>; East Madhya Pradesh, Vidarbha on 21<sup>st</sup>; Uttarakhand on 21<sup>st</sup> & 22<sup>nd</sup> July.**
- ✓ **Very heavy rainfall very likely at isolated/some places over Chhattisgarh on 21<sup>st</sup> & 22<sup>nd</sup>; Vidarbha on 22<sup>nd</sup>; Konkan & Goa & Madhya Maharashtra during 21<sup>st</sup> -24<sup>th</sup>; West Madhya Pradesh on 24<sup>th</sup>; East Madhya Pradesh on 22<sup>nd</sup> & 23<sup>rd</sup>; Gujarat State on 24<sup>th</sup> & 25<sup>th</sup> July.**
- ✓ **Isolated heavy to very heavy rainfall also likely over West Uttar Pradesh on 21<sup>st</sup> & 22<sup>nd</sup>; East Rajasthan on 21<sup>st</sup> & 23<sup>rd</sup>; Himachal Pradesh 22<sup>nd</sup> & 23<sup>rd</sup>; Uttarakhand during 23<sup>rd</sup> -25<sup>th</sup> July.**

- Localized Flooding of roads, water logging in low lying areas and closure of underpasses mainly in urban areas of the above region.
- Occasional reduction in visibility due to heavy rainfall.
- Disruption of traffic in major cities due to water logging in roads leading to increased travel time.
- Minor damage to kutchha roads.
- Possibilities of damage to vulnerable structure.
- Localized Landslides/Mudslides/landslips/mud slips/land sinks/mud sinks.
- Damage to horticulture and standing crops in some areas due to inundation.
- It may lead to riverine flooding in some river catchments (for riverine flooding please visit Web page of CWC)

**Action Suggested**

- Check for traffic congestion on your route before leaving for your destination.
- Follow any traffic advisories that are issued in this regard.
- Avoid going to areas that face the water logging problems often.
- Avoid staying in vulnerable structure.

**Agromet advisories for Heavy Rainfall likely over various parts of the country**

- Make provision for draining out excess water from crop fields to avoid water stagnation in North Eastern States, Odisha, Himachal Pradesh, Uttarakhand, West Uttar Pradesh, Madhya Pradesh, Chhattisgarh, Vidarbha, Konkan & Goa, Ghat areas of Madhya Maharashtra, Gujarat State, Kerala, Coastal Karnataka and Telangana.
- Postpone transplanting of rice in south Gujarat and Chhattisgarh; rice, early cauliflower, tomato, chilli and brinjal in Madhya Pradesh.
- Postpone sowing of soybean, groundnut, sesame, green gram, black gram and ginger in Madhya Pradesh and soybean, red gram, green gram, black gram, kharif maize and finger millet in south Chhattisgarh.
- Provide mechanical support to horticultural crops & staking to vegetables.

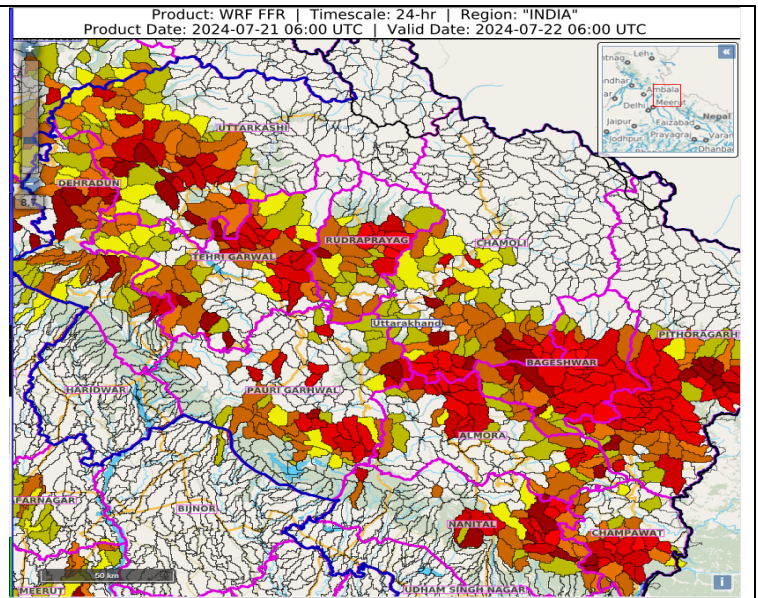
**FLASH FLOOD GUIDANCE:**

<p>24 hours Outlook for the Flash Flood Risk (FFR) till 1130 IST of 22-07-2024 :</p> <p>Low to Moderate flash flood risk likely over few watersheds &amp; neighbourhoods of Coastal Karnataka, SI Karnataka and Konkan &amp; Goa Met Sub-divisions during next 24 hours.</p> <p>Surface runoff/ Inundation may occur at some fully saturated soils &amp; low-lying areas over AoC as shown in map due to expected rainfall occurrence in next 24 hours.</p>	
<p>24 hours Outlook for the Flash Flood Risk (FFR) till 1130 IST of 22-07-2024 :</p> <p>Low to Moderate flash flood risk likely over few watersheds &amp; neighbourhoods of Chhattisgarh, East Madhya Pradesh and adjoining Vidarbha Met Sub-divisions during next 24 hours.</p> <p>Surface runoff/ Inundation may occur at some fully saturated soils &amp; low-lying areas over AoC as shown in map due to expected rainfall occurrence in next 24 hours.</p>	

24 hours Outlook for the Flash Flood Risk (FFR) till 1130 IST of 22-07-2024 :

Low to Moderate flash flood risk likely over few watersheds & neighbourhoods of Uttarakhand Met Sub-divisions during next 24 hours.

Surface runoff/ Inundation may occur at some fully saturated soils & low-lying areas over AoC as shown in map due to expected rainfall occurrence in next 24 hours.



**Legends & abbreviations:**

- ❖ **Heavy Rain:**64.5-115.5mm; **Very Heavy Rain:**115.6-204.4mm; **Extremely Heavy Rain:** >204.4mm.
- ❖ **Obsy:** Observatory; **AWS:** Automatic Weather Station; **ARG:** Automatic Rain Gauge; **dist:** District; **NH:** National Highway; **KVK:** Krishi Vigyan Kendra; **DVC:** Damodar Valley Corporation; **PTO:** Part Time Office, **Aero:** Aerodrome, **IAF:** Indian Air Force.
- ❖ **Region wise classification of meteorological Sub-Divisions:**
  - **Northwest India:** Western Himalayan Region (Jammu-Kashmir-Ladakh-Gilgit-Baltistan-Muzaffarabad, Himachal Pradesh and Uttarakhand); Punjab, Haryana-Chandigarh-Delhi; West Uttar Pradesh, East Uttar Pradesh, West Rajasthan and East Rajasthan.
  - **Central India:** West Madhya Pradesh, East Madhya Pradesh, Vidarbha and Chhattisgarh.
  - **East India:** Bihar, Jharkhand, Sub-Himalayan West Bengal & Sikkim; Gangetic West Bengal, Odisha and Andaman & Nicobar Islands.
  - **Northeast India:** Arunachal Pradesh, Assam & Meghalaya and Nagaland, Manipur, Mizoram & Tripura.
  - **West India:** Gujarat Region, Saurashtra & Kutch, Konkan & Goa, Madhya Maharashtra and Marathawada.
  - **South India:** Coastal Andhra Pradesh & Yanam, Telangana, Rayalaseema, Coastal Karnataka, North Interior Karnataka, South Interior Karnataka, Kerala & Mahe, Tamil Nadu, Puducherry & Karaikal and Lakshadweep.

<b>SPATIAL DISTRIBUTION</b> (% of Stations reporting)			
% Stations	Category	% Stations	Category
76-100	Widespread (WS/Most Places)	26-50	Scattered (SCT/ A Few Places)
51-75	Fairly Widespread (FWS/ Many Places)	1-25	Isolated (ISOL)

 Fog  
 Heavy Rain  
 Very Heavy Rain  
 Extremely Heavy Rain

 Heavy Snow  
 Hailstorm  
 Dust Storm  
 Heat Wave  
 Cold Wave

 Cold Day  
 Ground Frost  
 Strong Surface Winds  
 Thunder & Lightning  
 Hot and Humid

Subdivision Colour

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

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



## LEGENDS

### WARNING

<b>WARNING (TAKE ACTION)</b>
<b>ALERT ( BE PREPARED)</b>
<b>WATCH (BE UPDATED)</b>
<b>NO WARNING ( NO ACTION)</b>

### Probabilistic Forecast

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



**Rain/ Snow \***

Heavy: 64.5 to 115.5 mm/cm *
Very Heavy: 115.6 to 204.4 mm/cm*
Extremely Heavy: > 204.4 mm/cm *



**Heat Wave**

**When maximum temperature of a station reaches  $\geq 40^{\circ}\text{C}$  for plains and  $\geq 30^{\circ}\text{C}$  for hilly regions**

**(a) Based on Departure from normal**

Heat Wave: Maximum Temperature Departure from normal $4.5^{\circ}\text{C}$ to $6.4^{\circ}\text{C}$ .
Severe Heat Wave: Maximum Temperature Departure from normal $\geq 6.5^{\circ}\text{C}$

**(b). Based on Actual maximum temperature**

Heat Wave: When actual maximum temperature $\geq 45^{\circ}\text{C}$ .
Severe Heat Wave: When actual maximum temperature $\geq 47^{\circ}\text{C}$

**(c). Criteria for heat wave for coastal stations**

When maximum temperature departure is  $> 4.5^{\circ}\text{C}$  from normal. Heat Wave may be described provided maximum temperature  $\geq 37^{\circ}\text{C}$



**Warm Night**

**When maximum temperature remains  $40^{\circ}\text{C}$**

Warm Night: When minimum temperature departure $4.5^{\circ}\text{C}$ to $6.4^{\circ}\text{C}$ .
Severe Warm Night: When minimum temperature departure $> 6.4^{\circ}\text{C}$ .



**Cold Wave**

**When minimum temperature of a station  $\leq 10^{\circ}\text{C}$  for plains and  $\leq 0^{\circ}\text{C}$  for hilly regions.**

**(a). Based on departure**

Cold Wave: Minimum Temperature Departure from normal $-4.5^{\circ}\text{C}$ to $-6.4^{\circ}\text{C}$ .
Severe Cold Wave: Minimum Temperature Departure from normal $\leq -6.5^{\circ}\text{C}$

**(b) Based on actual Minimum Temperature (for Plains only)**

Cold Wave : When Minimum Temperature is $\leq 4.0^{\circ}\text{C}$
Severe Cold Wave: When Minimum Temperature is $\leq 2.0^{\circ}\text{C}$

**(c) For Coastal Stations**

When Minimum Temperature departure is  $\leq -4.5^{\circ}\text{C}$  & actual Minimum Temperature is  $\leq 15^{\circ}\text{C}$



**Cold Day**

**When minimum temperature of a station  $\leq 10^{\circ}\text{C}$  for plains and  $\leq 0^{\circ}\text{C}$  for hilly regions**

**Based on departure**

Cold Day: Maximum Temperature Departure from normal $-4.5^{\circ}\text{C}$ to $-6.4^{\circ}\text{C}$ .
Severe Cold Day: Maximum Temperature Departure from normal $\leq -6.5^{\circ}\text{C}$



**Fog**

**Phenomenon of small droplets suspended in air and the horizontal visibility  $< 1\text{km}$**

Moderate Fog: When the visibility between 500-200 metres
Dense Fog: when the visibility between 50-200 metres
Very Dense Fog: when the visibility $< 50$ metres



**Thunderstorm**

**Sudden electrical discharges manifested by a flash of light (Lightning) and a sharp rumbling sound (thunder)**



**Dust/Sand Storm**

**An ensemble of particles of dust or sand energetically lifted to great heights by a strong and turbulent wind.**



**Frost**

**Ice deposits on ground**

Air temperature $\leq 4^{\circ}\text{C}$ ( over Plains)
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**Squall**

**A strong wind that rises suddenly, lasts for atleast 1 minute.**

Moderate: Wind speed 52-61 kmph
Severe: Wind speed 62-87 kmph
Very Severe: Wind speed $> 87$ kmph



**Sea State**

**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
Phenomenal: Wind speed $> 117$ kmph ( $> 63$ knots) & Wave height $> 14$ metre



**Cyclone**

Cyclonic Storm: Wind speed 62-87 kmph (34-47 knots)
Severe Cyclonic Storm: Wind speed 88-117 kmph (48-63 knots)
Very Severe Cyclonic Storm: Wind speed 118-165 kmph (64 - 89 knots)
Extremely Severe Cyclonic Storm: Wind speed 166-220 kmph (90 -119 knots)
Super Cyclone Storm: Wind speed $> 220$ kmph ( $> 119$ knots)