

Thursday, December 12, 2024
Time of Issue: 0800 hours IST
(MORNING)

ALL INDIA WEATHER SUMMARY AND FORECAST BULLETIN

Significant Weather Features:

Weather Systems:

- ❖ The **well marked low pressure** area over gulf of Mannar & neighbourhood. The associated upper air cyclonic circulation extends up to mid-tropospheric levels. The system is very likely to continue to move west-northwestwards towards South Tamil Nadu and weaken gradually during the next 12 hours.
- ❖ A **Western disturbance** as a trough in middle tropospheric westerlies lies roughly along Long. 70°E to the north of Lat. 33°N.

Forecast & Warnings (upto 7 days):

- ❖ **Tamil Nadu, Puducherry & Karaikal: Heavy to very heavy rainfall** at isolated places very likely on 12th December. Isolated heavy rainfall is also very likely on 13th, 16th & 17th December.
- ❖ **Kerala & Mahe, Coastal Andhra Pradesh & Yanam and Rayalaseema: Heavy rainfall** at isolated places very likely on 12th December.
- ❖ **South Interior Karnataka: Heavy rainfall** at isolated places very likely on 12th December.
- ❖ **Lakshadweep: Heavy rainfall** at isolated places very likely on 13th December.
- ❖ **Andaman & Nicobar Islands: Heavy rainfall** at isolated places very likely on 13th & 14th December.
- ❖ Light to moderate rainfall at a few places accompanied with isolated thunderstorm & lightning very likely over Tamil Nadu, Puducherry & Karaikal on 12th & 13th; Kerala & Mahe, Coastal Andhra Pradesh & Yanam & Rayalaseema and South Interior Karnataka on 12th December.

ii. Temperature, Cold Wave and Fog Forecast:

Forecast of temperature:

- ❖ No significant change in minimum temperatures likely over Northwest & Central India during next 4-5 days.
- ❖ Gradual fall in minimum temperatures by 2-3°C likely over East India during next 2 days and no significant change thereafter.
- ❖ Gradual rise in minimum temperatures by 2-3°C likely over West India during next 2-3 days.

Cold Wave Warnings:

- ❖ **Cold wave** conditions very likely in isolated pockets over Rajasthan during 12th-16th; in some parts of Punjab during 12th-16th, in isolated pockets of Haryana- Chandigarh, Uttar Pradesh and Madhya Pradesh during 12th-16th, Saurashtra & Kutch on 12th, Delhi on 12th & 13th; Jammu-Kashmir-Ladakh-Gilgit-Baltistan-Muzaffarabad during 13th-16th December.

Cold Day Warnings:

- ❖ **Cold Day** conditions very likely in isolated pockets over Rajasthan on 12th and Madhya Pradesh on 12th & 13th December.

Dense Fog Warnings:

- ❖ **Dense fog conditions** very likely to prevail during late night/early morning hours in isolated pockets of East Uttar Pradesh till 12th, Sub-Himalayan West Bengal & Sikkim, Bihar till 13th, Assam & Meghalaya and Nagaland, Manipur, Mizoram & Tripura till 14th December morning hours.

Ground Frost Warnings:

- ❖ **Ground Frost** conditions very likely in isolated pockets over Uttarakhand on 12th December.

Weather forecast (during 12th Dec. to 14th Dec. 2024) over Delhi/NCR

12.12.2024: Mainly clear sky with cold wave conditions at isolated places. The predominant surface wind is likely to be from northwest direction with speed less than 08 kmph during morning hours. Smog/mist is likely in the morning. The wind speed will increase thereafter becoming less than 16 kmph from northwest direction during afternoon. It will decrease thereafter becoming less than 08 kmph from northwest direction during evening and night. Smog/mist is likely in the evening/night.

13.12.2024: Mainly clear sky with cold wave conditions at isolated places. The predominant surface wind is likely to be from northwest direction with speed less than 08 kmph during morning hours. Smog/mist is likely in the morning. The wind speed will gradually increase becoming 10-12 kmph from northwest direction during afternoon. It will decrease thereafter becoming less than 08 kmph from northwest direction during evening and night. Smog/mist is likely in the evening/night.

14.12.2024: Mainly clear sky. The predominant surface wind is likely to be from northwest direction with wind speed less than 08 kmph during morning hours. Smog/mist is likely in the morning. The wind speed will increase thereafter becoming 10-12 kmph from northwest direction during afternoon. It will gradually decrease becoming less than 08 kmph from northwest direction during evening and night. Smog/mist is likely in the evening/night.

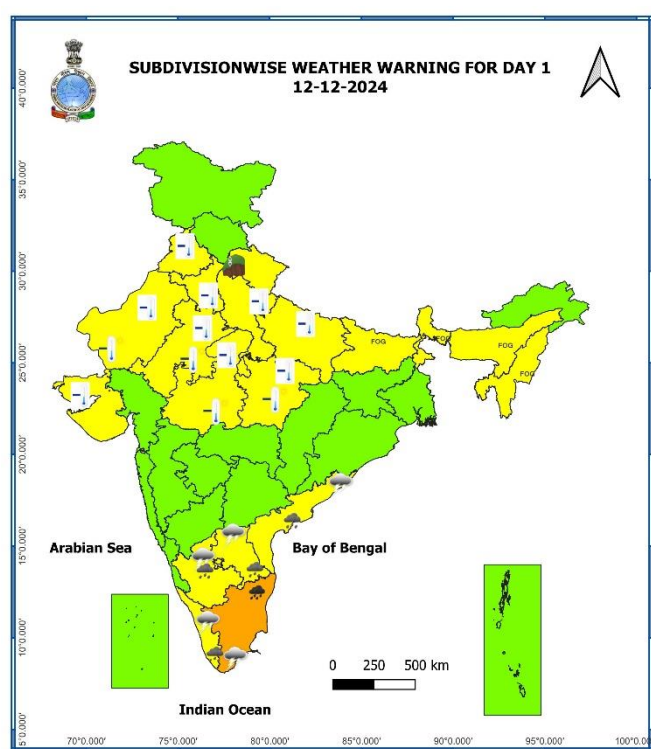
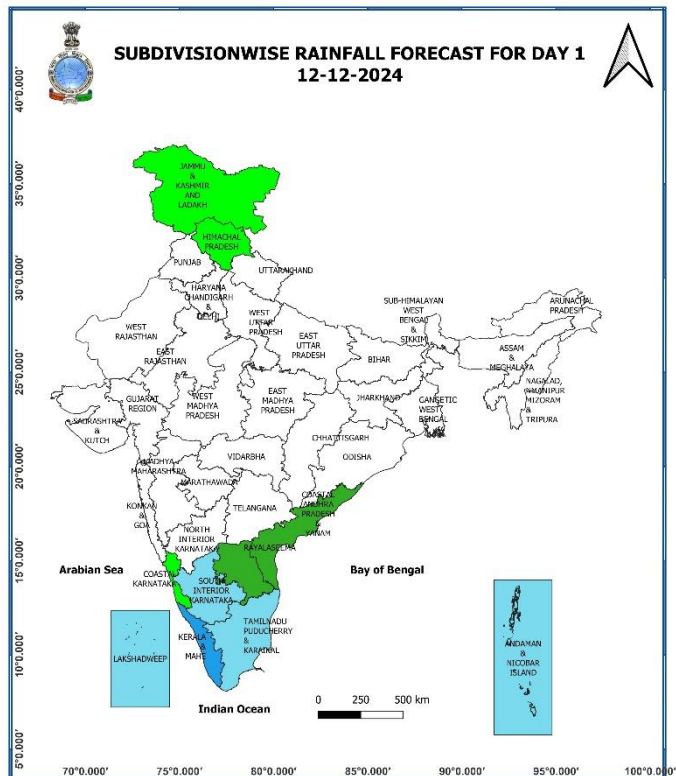
Main Weather Observations:

- ❖ **Rainfall distribution** (from 0830 hours IST to 1730 hours IST of yesterday): **at isolated** places over Tamil Nadu, Puducherry & Karaikal, Coastal Andhra Pradesh & Yanam, Rayalaseema, Lakshadweep, Kerala & Mahe, Jammu-Kashmir-Ladakh-Gilgit-Baltistan-Muzaffarabad.
- ❖ **Significant amount of rainfall** (from 0830 hours IST to 1730 hours IST of yesterday) (in cm): **Tamil Nadu:** Parangipettai 3, Nagapattinam, Karaikal, Pondicherry 2 each.
- ❖ **Fog Condition Observed** (at 0530 hours IST of today): **Dense to very dense fog** in isolated pocket of Tripura; **Shallow to moderate fog** in isolated pockets of Bihar, Assam & Meghalaya, West Bengal & Sikkim.
- ❖ **Visibility reported** (at 0530 hours IST of today) (≤ 500 m): **Tripura:** Agartala 00, Kailashahar 200; **Bihar:** Purnea 200, Bhagalpur 500; **Assam & Meghalaya:** Jorhat_IAF 200; **Sub-Himalayan West Bengal & Sikkim:** Bagdogra_IAF 500; **Gangetic West Bengal:** Panagarh_IAF & Kalaikunda_IAF 500 each.
- ❖ **Minimum Temperatures Departures (as on 11-12-2024):** Minimum temperatures were **appreciably above normal (3.1°C to 5.0°C)** at many places over Coastal Andhra Pradesh & Yanam and Rayalaseema; at isolated places over Madhya Maharashtra, North Interior Karnataka, Telangana and Tamil Nadu, Puducherry & Karaikal; **above normal (1.6°C to 3.1°C)** at most places over Kerala & Mahe; at many places over Coastal & South Interior Karnataka; at isolated places over Bihar and Odisha. These were **markedly below normal (-5.1°C or less)** at a few places over West Madhya Pradesh; at isolated places over Haryana-Chandigarh-Delhi, Rajasthan, East Madhya Pradesh and Saurashtra & Kutch; **appreciably below normal (-3.1°C to -5.0°C)** at a few places over Jammu-Kashmir-Ladakh-Gilgit-Baltistan-Muzaffarabad, East Uttar Pradesh and Vidarbha; at isolated places over Himachal Pradesh, Uttarakhand, West Uttar Pradesh and Assam & Meghalaya; **below normal (-1.6°C to -3.0°C)** at a few places over Gangetic West Bengal; at isolated places over Gujarat region, Konkan & Goa and Chhattisgarh and near normal over rest parts of the country. Yesterday, **the lowest minimum temperature of 1.5°C** was reported at **Sikar (East Rajasthan)** over the plains of the country. (Fig.4)
- ❖ **Maximum Temperature Departures (as on 11-12-2024):** Maximum temperatures were **above normal (1.6°C to 3.0°C)** at isolated places over Konkan & Goa, Kerala & Mahe, Lakshadweep. These were **markedly below normal (-5.1°C or less)** at isolated places over East Rajasthan, West Madhya Pradesh; **appreciably below normal (-3.1°C to -5.0°C)** at many places over Saurashtra & Kutch; at a few places over Gujarat Region; at isolated places over East Madhya Pradesh, Gangetic West Bengal, Delhi, Tamil Nadu, Puducherry & Karaikal; **below normal (-1.6°C to -3.0°C)** at isolated places over Jammu-Kashmir-Ladakh-Gilgit-Baltistan-Muzaffarabad, Punjab, Assam & Meghalaya, Nagaland, Manipur, Mizoram & Tripura, Odisha, Vidarbha, Madhya Maharashtra, West Rajasthan and near normal over rest parts of the country. Yesterday, **the highest maximum temperature of 35.6°C** was reported at **Mumbai Santacruz (Konkan) & Kannur Airport (Kerala & Mahe)** over the plains of the country. (Fig. 2)

Meteorological Analysis (Based on 0530 hours IST)

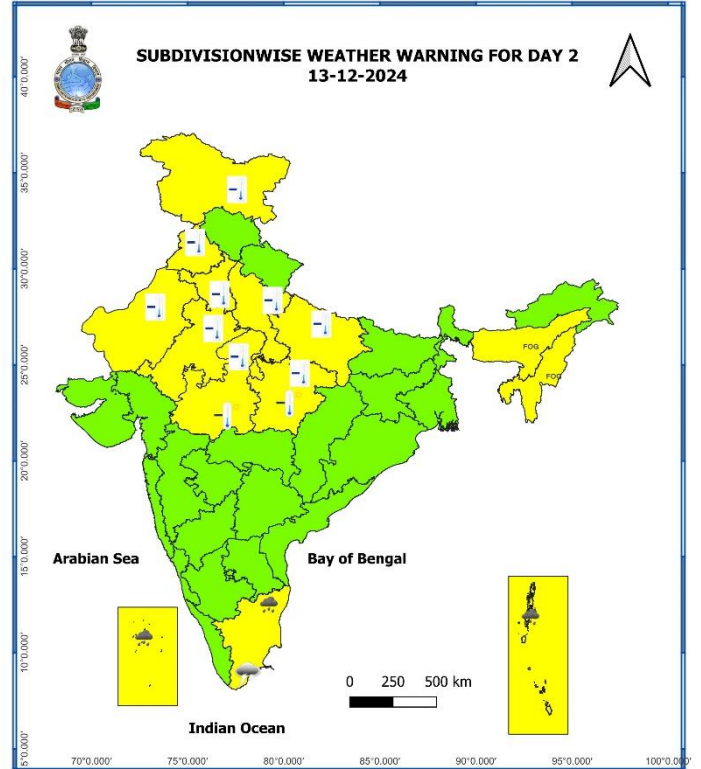
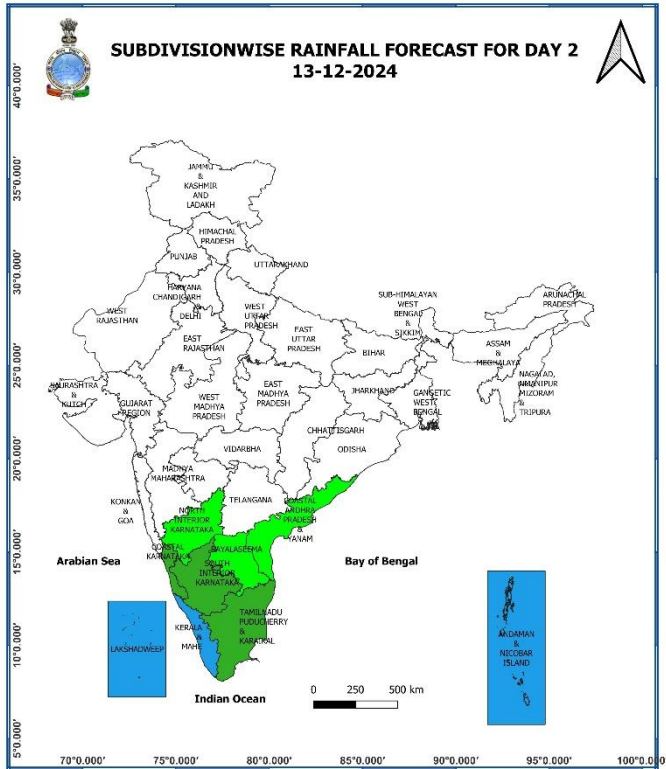
- ❖ The **well marked low pressure** area over southwest Bay of Bengal off Sri Lanka coast now lies over gulf of Mannar & neighbourhood. The associated upper air cyclonic circulation extends up to mid-tropospheric levels. The system is very likely to continue to move west-northwestwards towards South Tamil Nadu and weaken gradually during the next 12 hours.
- ❖ The **Western disturbance** as a trough in middle tropospheric westerlies with its axis at 5.8 km above mean sea level now runs roughly along Long. 72°E to the north of Lat. 33°N.
- ❖ The **cyclonic circulation** over Tripura & neighbourhood upto 1.5 km above mean sea level persists.
- ❖ **Subtropical westerly Jet Stream with core winds** of the order upto 150 knots at 12.6 km above mean sea level continue to prevail over Northwest India.

Weather Forecast & Warnings for next 7 days (Upto 0830 hours IST of 19th December, 2024)



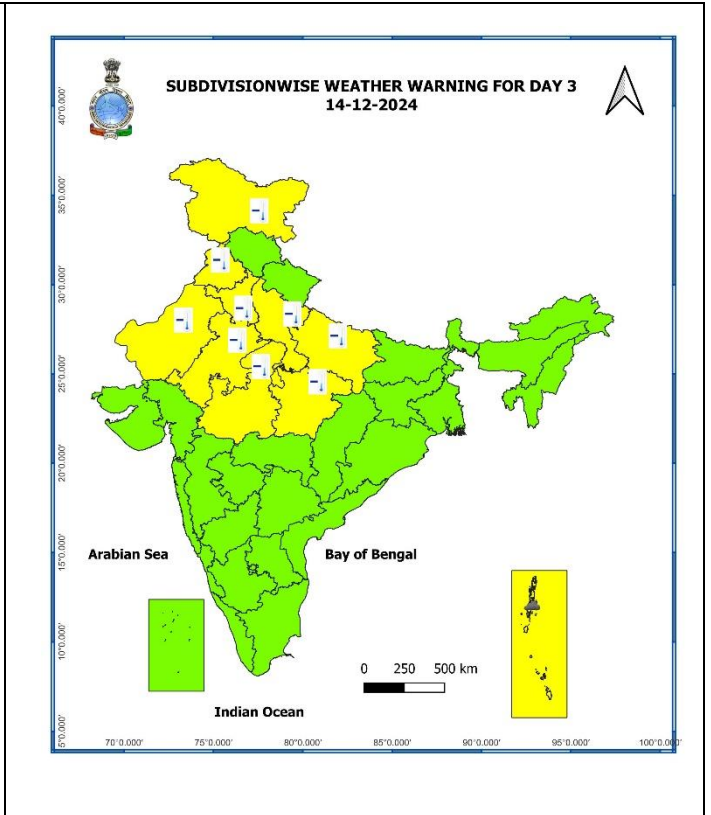
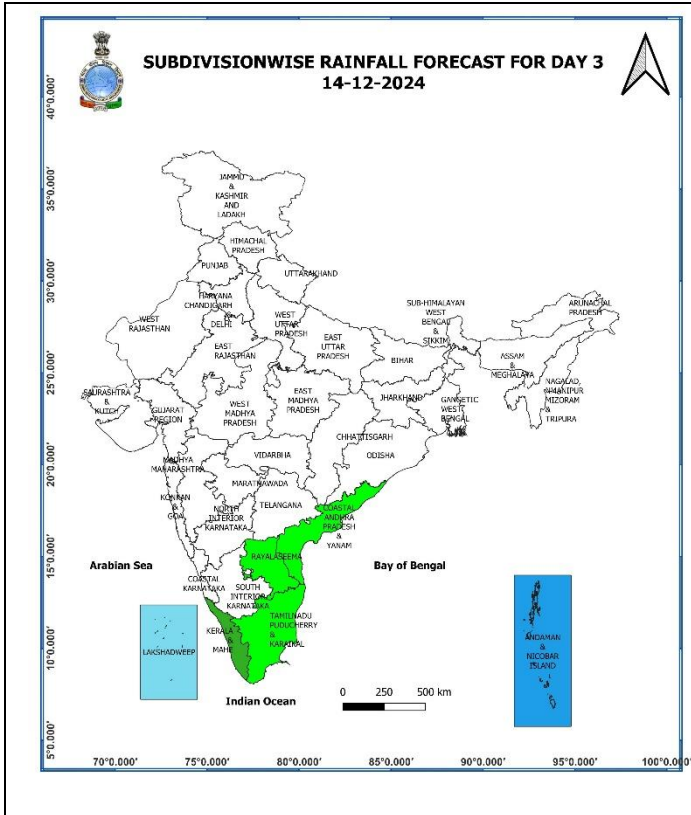
12 December (Day 1):

- ❖ **Heavy to very Heavy rainfall (≥12 cm)** very likely at isolated places over Tamil Nadu, Puducherry & Karaikal; **Heavy rainfall (≥7 cm)** at isolated places over Kerala & Mahe, South Interior Karnataka, Rayalaseema and Coastal Andhra Pradesh & Yanam.
- ❖ **Thunderstorm accompanied lightning & gusty winds (speed 30-40 kmph)** very likely at isolated places over Kerala & Mahe; **accompanied with lightning** at isolated places over Tamil Nadu, Puducherry & Karaikal, Kerala & Mahe, South Interior Karnataka, Coastal Andhra Pradesh & Yanam and Rayalaseema.
- ❖ **Dense fog** very likely in isolated pockets of Sub-Himalayan West Bengal & Sikkim, Bihar, Assam & Meghalaya and Nagaland, Manipur, Mizoram & Tripura in night/morning hours.
- ❖ **Cold Wave Conditions** very likely in some parts of Punjab; in isolated pockets of Haryana-Chandigarh, Uttar Pradesh, Rajasthan, Madhya Pradesh and Saurashtra & Kutch.
- ❖ **Cold Day Conditions** very likely in isolated pockets of Rajasthan and Madhya Pradesh.
- ❖ **Ground Frost Conditions** very likely at isolated places over Uttarakhand.
- ❖ **Squally weather with wind speed 35 kmph to 45 kmph gusting to 55 kmph** is likely to prevail over Kerala coast, Comorin area, gulf of Mannar, parts of southwest bay of Bengal, along and off Sri Lanka and Tamil Nadu coasts. Fishermen are advised not to venture into these areas.



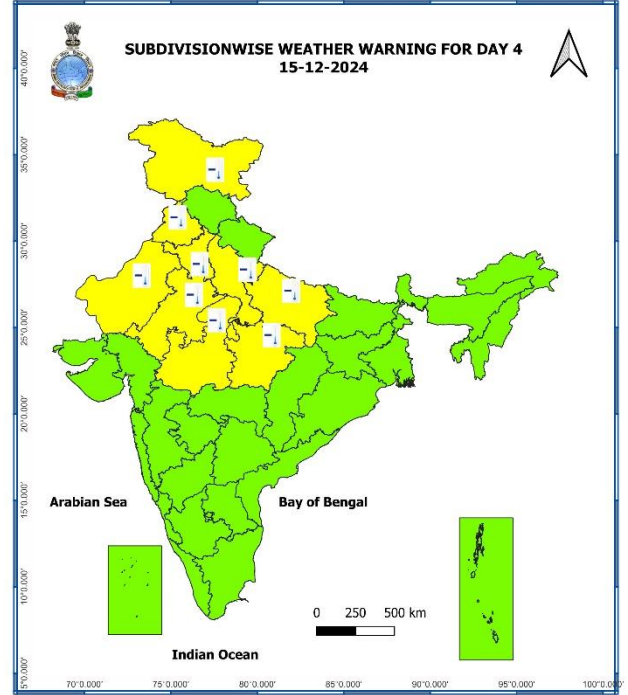
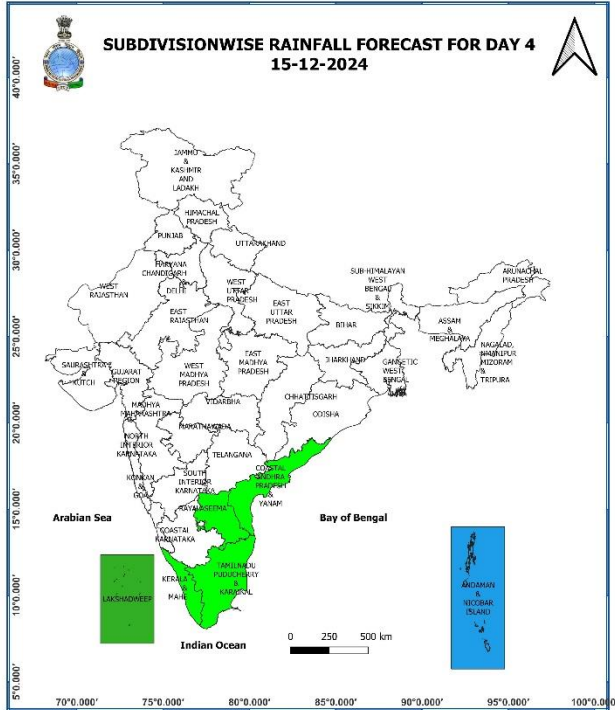
13 December (Day 2):

- ❖ **Heavy rainfall (≥ 7 cm)** very likely at isolated places over Andaman & Nicobar Islands, Tamil Nadu, Puducherry & Karaikal and Lakshadweep.
- ❖ **Thunderstorm accompanied with lightning** very likely at isolated places over Tamil Nadu, Puducherry & Karaikal.
- ❖ **Dense fog** very very likely in isolated pockets of Assam & Meghalaya and Nagaland, Manipur, Mizoram & Tripura in night/morning hours.
- ❖ **Cold Wave Conditions** very likely in some parts of Punjab; in isolated pockets of Jammu-Kashmir-Ladakh-Gilgit-Baltistan-Muzaffarabad, Haryana-Chandigarh, Uttar Pradesh, Rajasthan and Madhya Pradesh.
- ❖ **Cold Day Conditions** very likely in isolated pockets of Madhya Pradesh.
- ❖ **Squally weather with wind speed 35 kmph to 45 kmph gusting to 55 kmph** is likely to prevail along and off Kerala coast, Lakshadweep, Comorin areas, gulf of Mannar, along and off Tamil Nadu coast. Fishermen are advised not to venture into these areas.



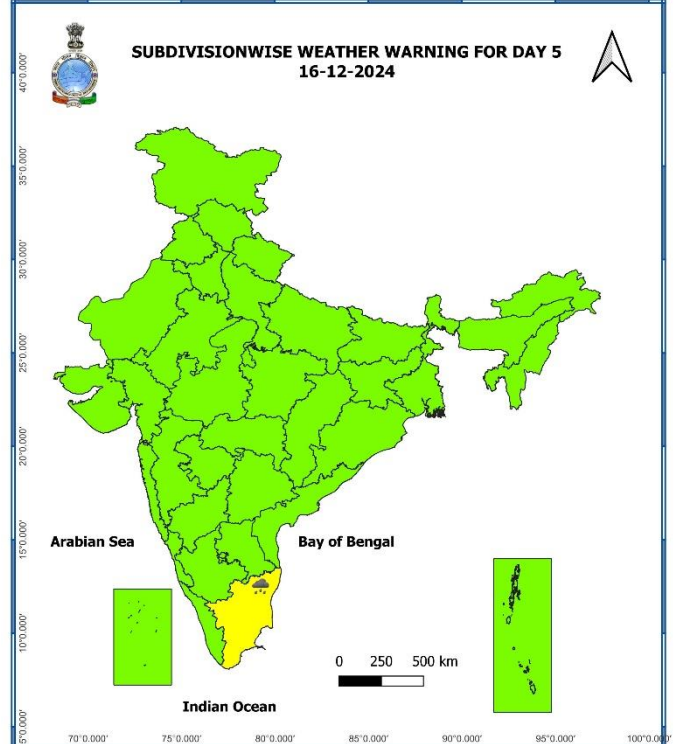
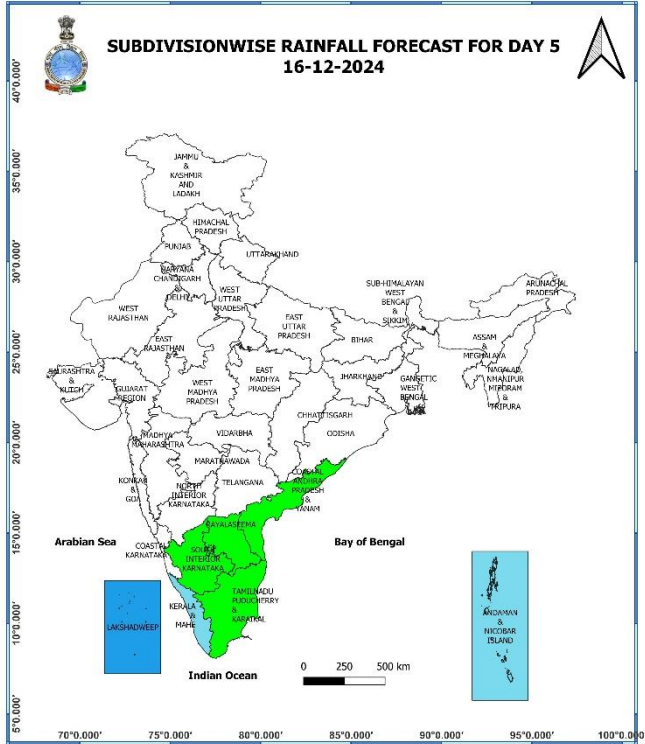
14 December (Day 3):

- ❖ **Heavy rainfall (≥ 7 cm)** likely at isolated places over Andaman & Nicobar Islands.
- ❖ **Cold Wave Conditions** likely in some parts of Punjab; in isolated pockets of Jammu-Kashmir-Ladakh-Gilgit-Baltistan-Muzaffarabad, Haryana-Chandigarh, Uttar Pradesh, Rajasthan and Madhya Pradesh.
- ❖ **Squally weather with wind speed 35 kmph to 45 kmph gusting to 55 kmph** is likely to prevail along and off Kerala coast, Lakshadweep area. Fishermen are advised not to venture into these areas.



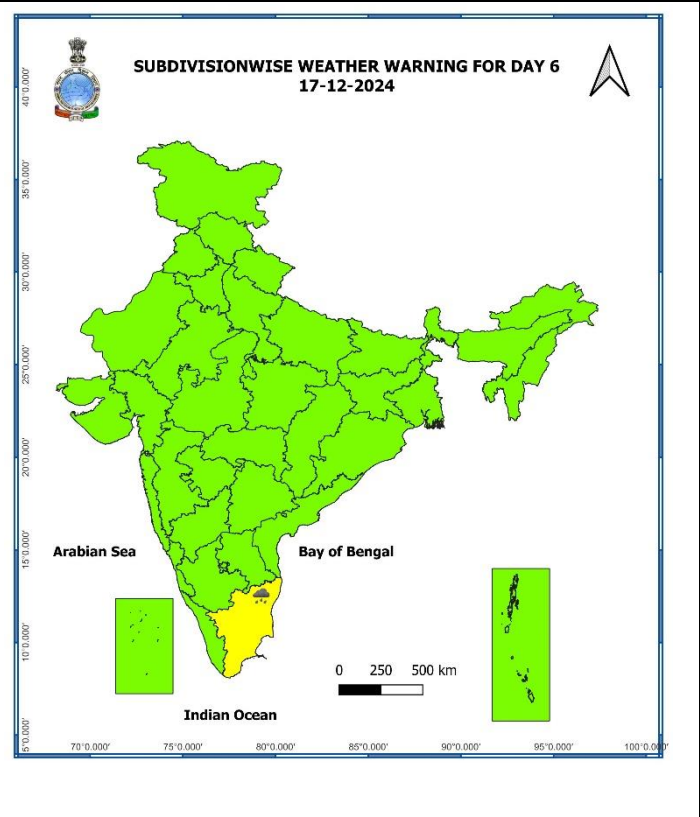
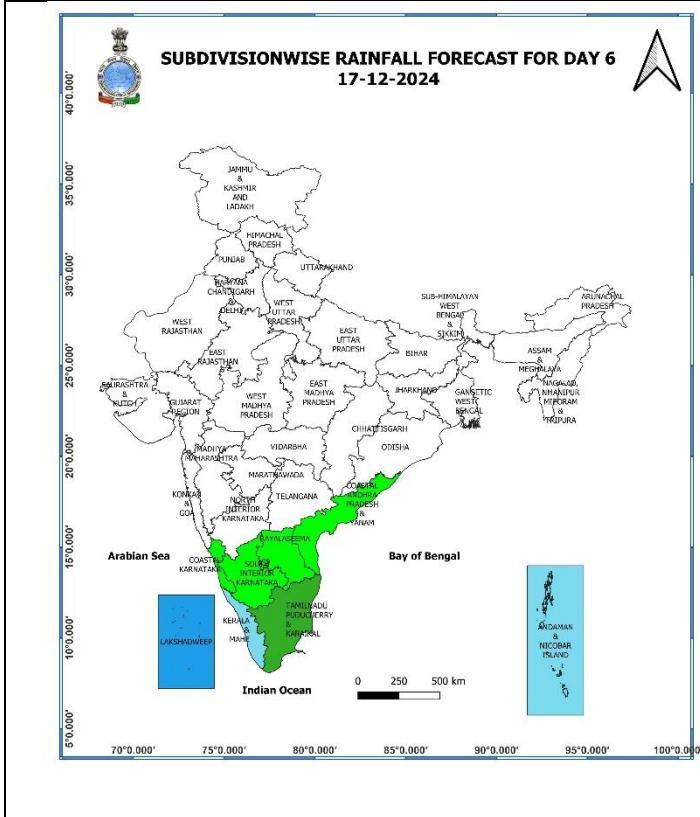
15 December (Day 4):

- ❖ **Cold Wave Conditions** likely in some parts of Punjab; in isolated pockets of Jammu-Kashmir-Ladakh-Gilgit-Baltistan-Muzaffarabad, Haryana-Chandigarh, Uttar Pradesh, Rajasthan and Madhya Pradesh.



16 December (Day 5):

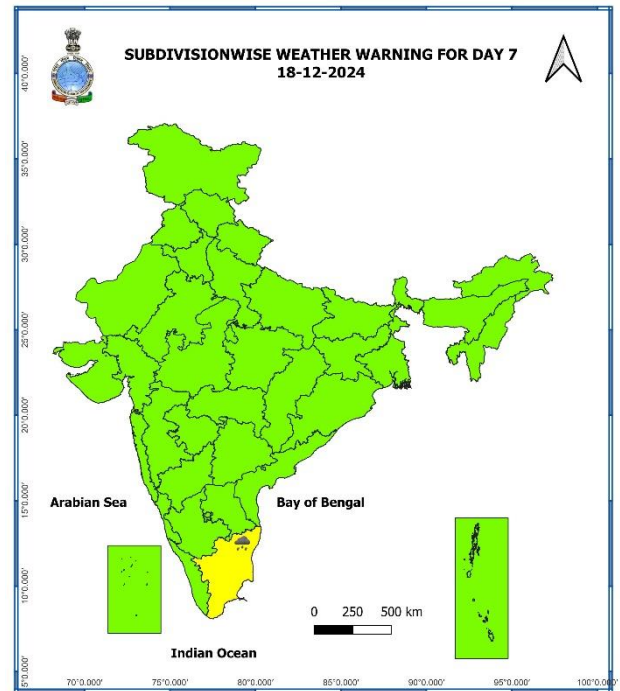
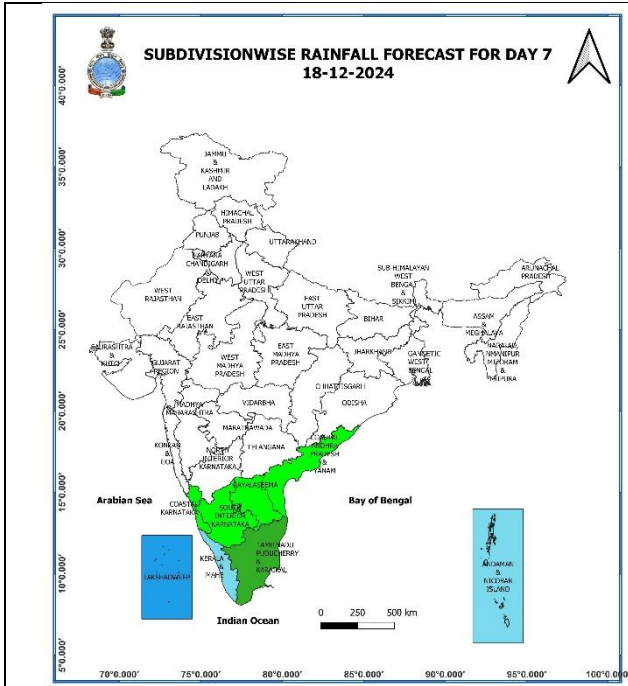
- ❖ **Heavy rainfall (≥ 7 cm)** likely at isolated places over Tamil Nadu, Puducherry & Karaikal.



17 December (Day 6):

❖ **Heavy rainfall (≥ 7 cm)** likely at isolated places over Tamil Nadu, Puducherry & Karaikal.

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18 December (Day 7):

❖ Heavy rainfall (≥ 7 cm) likely at isolated places over Tamil Nadu, Puducherry & Karaikal.

Weather Outlook for subsequent 3 days (During 19th December – 20th December, 2024)

- ❖ Isolated to Scattered to light to moderate rainfall likely over some parts of south peninsular India and light rainfall over Jammu-Kashmir-Ladakh-Gilgit-Baltistan-Muzaffarabad.
- ❖ Mainly dry weather will prevail over rest parts of country.

- Action may be taken based on **ORANGE AND RED COLOUR** warnings.
- Vulnerable regions likely urban and hilly areas action may be initiated for heavy rainfall warning.
- As the lead period increases forecast accuracy decreases.

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Impact due to very heavy rainfall:

- **Isolated heavy to very heavy rainfall** very likely over Tamil Nadu, Puducherry & Karaikal on 12th December.
- **Low to Moderate flash flood risk** likely over few watersheds & neighbourhoods of Tamil Nadu, Puducherry & Karaikal on 12th December. **(ANNEXURE I)**

Impact Expected

- 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 and roadways due to water logging in roads leading to increased travel time. ✓ Minor damage to kutcha 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 and wind.
- It may lead to riverine flooding in some river catchments (for riverine flooding please visit Web page of CWC).

Action Suggested

- Judicious regulation of surface transports including railways and roadways.
- 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.

Impact expected due to dense fog in the night /morning hour:

❖ Transport and Aviation:

- May affect some airports, highways and railway routes in the areas of met- sub-division.
- Difficult driving conditions with slower journey times.
- Unless taken precautionary measures, it may lead to some road traffic collisions.

❖ Power Sector:

- Chances of Tripping of Power lines in the very dense fog routes.

❖ Human Health:

- Lung related health impacts: Dense fog contains particulate matter and other pollutants and in case exposed it gets lodged in the lungs, clogging them and decreasing their functional capacity which increases episodes of wheezing, coughing and shortness of breath.
- Impact on people having asthma bronchitis: Long time exposure to dense fog may cause respiratory problem for people having asthma bronchitis and other lung related health problems.
- Eye Irritation: Dense fog contains pollutions of various types and these Pollutants in the air if exposed may tend to irritate the membranes of the eye causing various infections leading to redness or swelling of the eye.

Action suggested:

❖ Transport and Aviation:

- Be careful while driving or outing through any transport.
- Use fog lights during driving.
- Be in touch with airlines, railways and state transport for schedule of your journey.

❖ Power Sector:

- To keep ready Maintenance Team
- Human Health: To avoid outing until unless emergency and to cover the face.

Impact expected due to cold wave/severe cold wave conditions:

- An increased likelihood of various illnesses like flu, running/ stuffy nose or nosebleed, which usually set in or get aggravated due to prolonged exposure to cold.
- Do not ignore shivering. It is the first sign that the body is losing heat. Get Indoors.
- Frostbite can occur due to prolonged exposure to cold. The skin turns pale, hard and numb and eventually black blisters appear on exposed body parts such as fingers, toes, nose and or earlobes. Severe frostbite needs immediate medical attention and treatment.
- Impact on agriculture, crop, livestock, water supply, transport and power sector at some places.

Action suggested:

- Wear several layers of loose fitting, light weight; warm woolen clothing.
- Cover your head, neck, hands and toes adequately as majority of heat loss occurs through these body parts. Wear several layers of loose fitting, light weight; warm woolen clothing rather than one layer of heavy cloth.
- Eat vitamin-C rich fruits & vegetable and drink sufficient fluids preferably warm fluids to maintain adequate immunity.
- Avoid or limit outdoor activities.
- Keep dry, if wet, change cloths immediately to prevent loss of body heat. Wear insulated/waterproof shoes.
- Warm the affected area of the body slowly with lukewarm water; do not rub the skin vigorously.
- If the affected skin area turns black, immediately consult a doctor.
- Maintain ventilation while using Heaters to avoid inhaling toxic fumes.
- Take safety measures while using electrical and gas heating devices.
- Extreme care needed for vulnerable people.
- Seek medical attention as soon as possible for someone suffering from frostbite/ Hypothermia.
- Protect livestock from cold weather.

Agromet advisories for Heavy Rainfall / Cold Wave likely over Tamil Nadu, Kerala, South Interior Karnataka, Andhra Pradesh, North-West India and Madhya Pradesh:

- In Tamil Nadu, Kerala, South Interior Karnataka and Andhra Pradesh, provide adequate drainage facilities for removal of excess water from standing crop fields and fruit orchards. Keep the harvested produce in safer places or cover the produce with tarpaulin sheets in the fields. Provide mechanical support to horticultural crops and staking to vegetables.
- In North-West India and Madhya Pradesh, apply light and frequent irrigation to the standing crops in the evening to protect the crops from low temperature stress or cold injuries. Use mulching and cover vegetable nurseries and young fruit plants with straw / polythene sheets to maintain optimum soil temperature.

Livestock and Fishery

- Keep the animals inside the shed during heavy rainfall and provide balanced feed.
- Store the feed and fodder at safer place to avoid spoilage from rainfall.
- Construct an outlet with proper netting around the pond to drain out excess rain water, thereby preventing fishes/fingerlings from escaping in case of overflowing.
- Check and repair dykes around the ponds to avoid entry of runoff water from the catchment areas.
- Keep cattle inside the sheds during night and provide dry bedding to protect them from cold.
- Keep the chicks warm by providing artificial light in the poultry sheds.

Flash Flood Guidance:

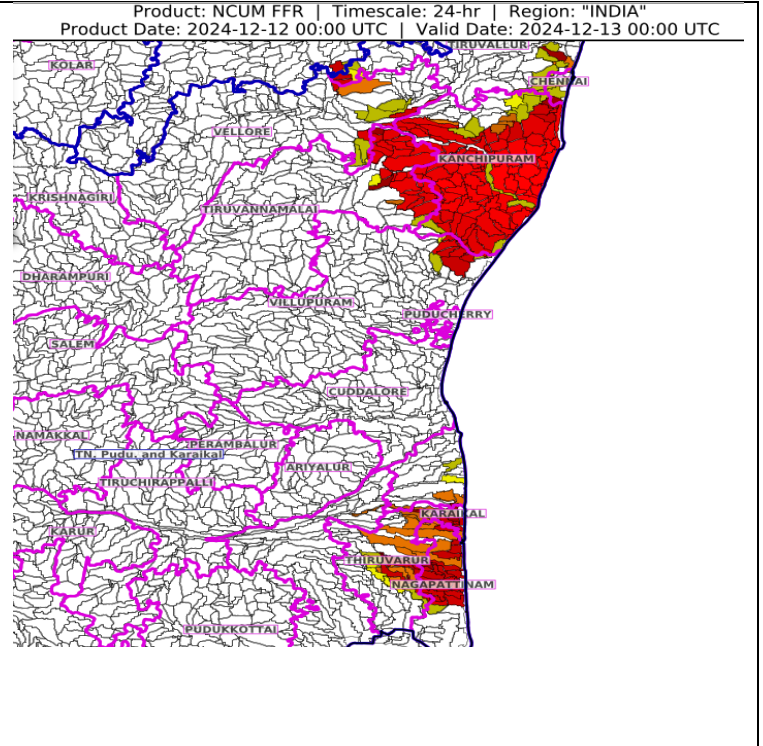
ANNEXURE I

24 hours Outlook for the Flash Flood Risk (FFR) till 0530 IST of 13-12-2024:

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

Tamil Nadu - Puducherry & Karaikal - Chennai, Kallakurichi, Kanchipuram, Nagapattinam, Thiruvarur, Vellore and Villupuram districts.

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



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Fig. 1: Maximum Temperatures

Fig. 2: Departure of Maximum Temperatures

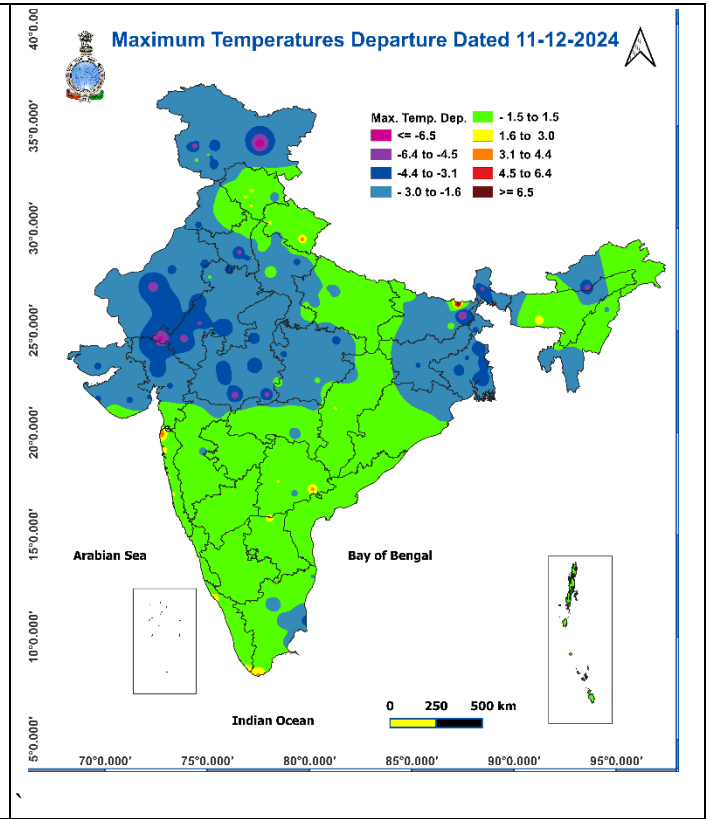
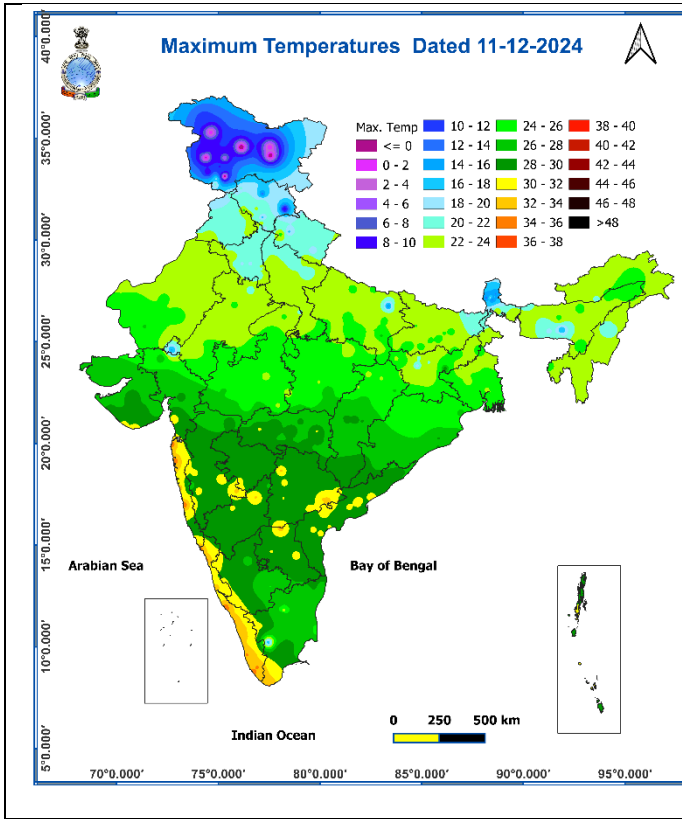


Fig. 3: Minimum Temperatures

Fig. 4: Departure of Minimum Temperatures

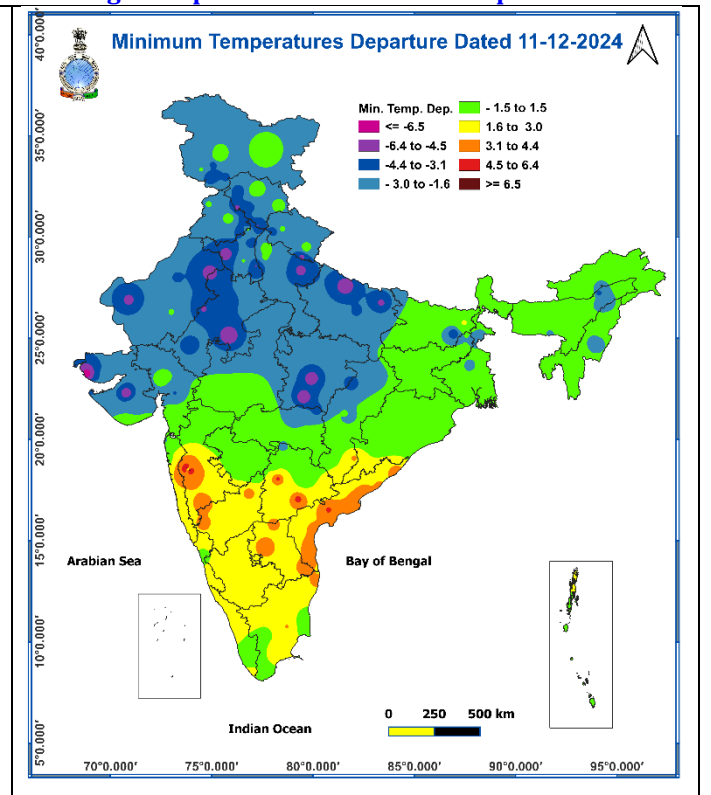
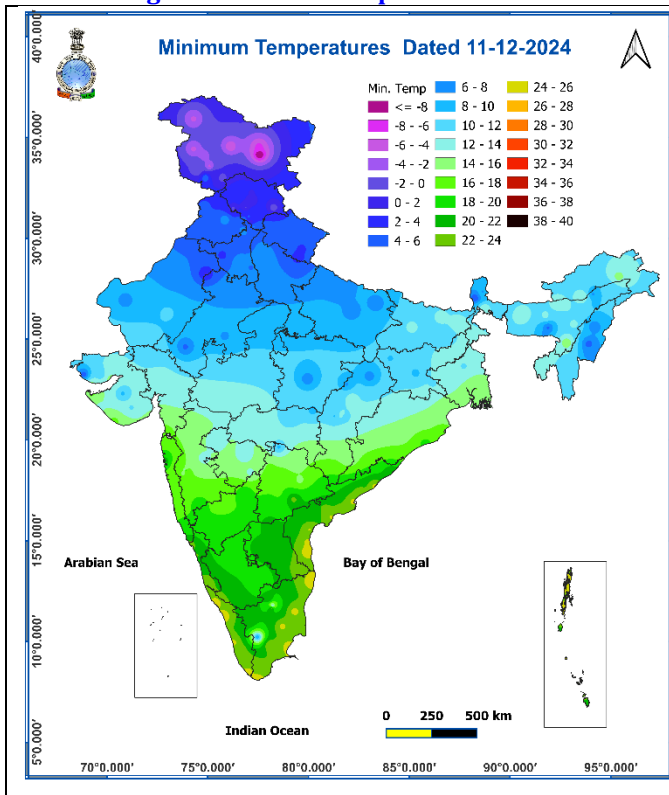
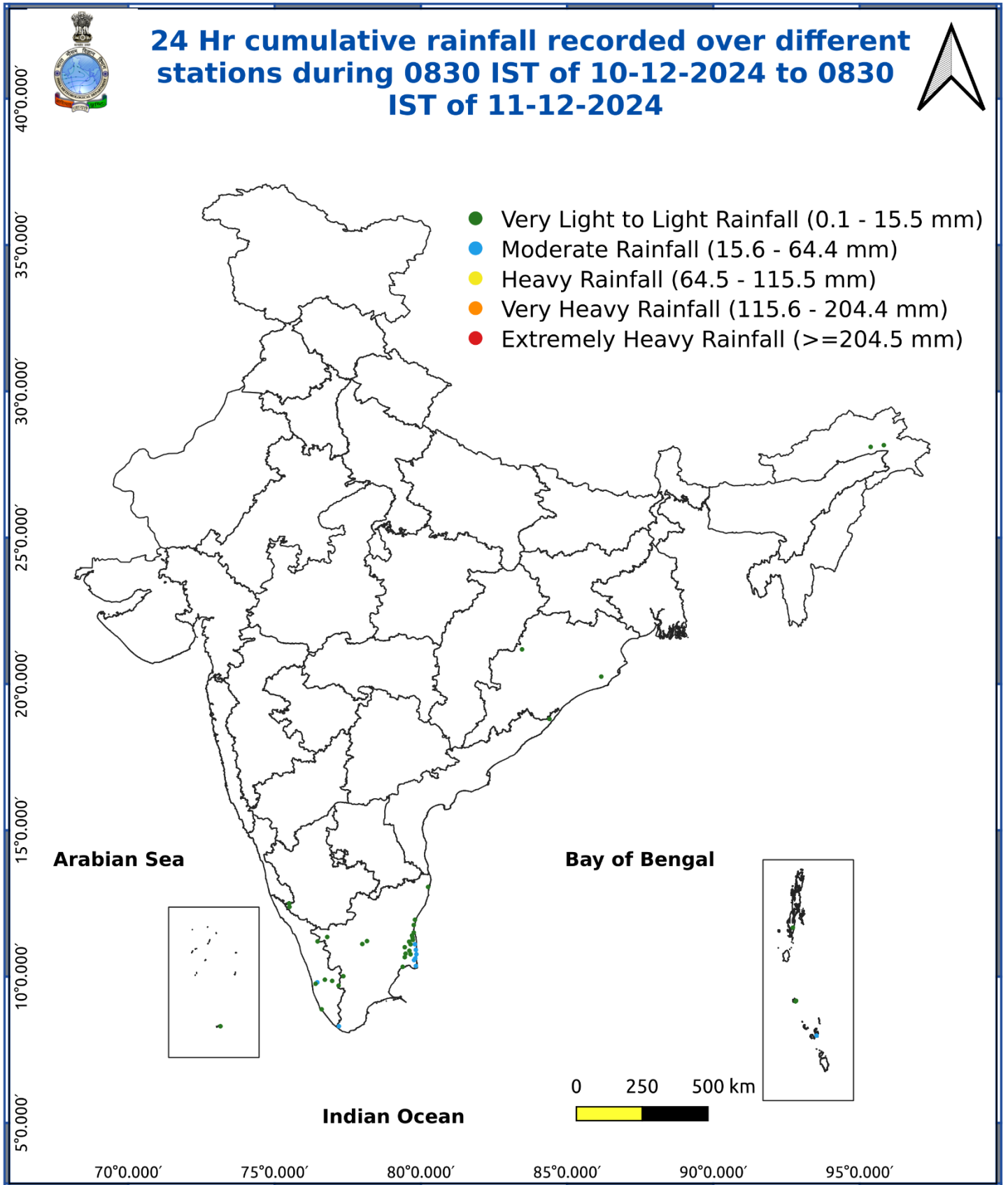
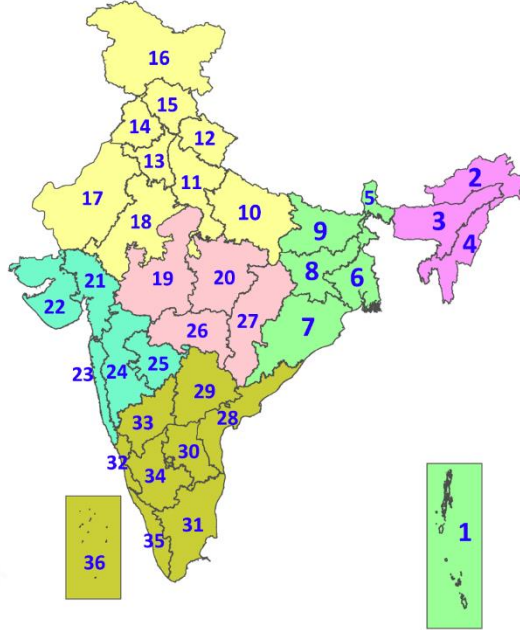


Fig. 5: Accumulated Rainfall (mm) during past 24 hours



LEGENDS

1. अंडमान और निकोबार द्वीपसमूह
2. अरुणाचल प्रदेश
3. असम और मेघालय
4. नागालैंड, मणिपुर, मिजोरम और त्रिपुरा
5. उप-हिमालयी पश्चिम बंगाल और सिक्किम
6. गंगीय पश्चिम बंगाल
7. ओडिशा
8. झारखंड
9. बिहार
10. पूर्वी उत्तर प्रदेश
11. पश्चिम उत्तर प्रदेश
12. उत्तराखंड
13. हरियाणा, चंडीगढ़ और दिल्ली
14. पंजाब
15. हिमाचल प्रदेश
16. जम्मू और कश्मीर और लद्दाख
17. पश्चिम राजस्थान
18. पूर्वी राजस्थान
19. पश्चिम मध्य प्रदेश
20. पूर्वी मध्य प्रदेश
21. गुजरात
22. सौराष्ट्र
23. कोंकण और गोवा
24. मध्य महाराष्ट्र
25. मराठवाड़ा
26. विदर्भ
27. छत्तीसगढ़
28. तटीय आंध्र प्रदेश और यनम
29. तेलंगाना
30. रायलसीमा
31. तमिलनाडु, पुडुचेरी और कराईकल
32. तटीय कर्नाटक
33. आंतरिक उत्तरी कर्नाटक
34. आंतरिक दक्षिणी कर्नाटक
35. केरल और माहे
36. लक्षद्वीप



1. Andaman & Nicobar Islands
2. Arunachal Pradesh
3. Assam & Meghalaya
4. Nagaland, Manipur, Mizoram & Tripura
5. Sub-Himalayan West Bengal & Sikkim
6. Gangetic West Bengal
7. Odisha
8. Jharkhand
9. Bihar
10. East Uttar Pradesh
11. West Uttar Pradesh
12. Uttarakhand
13. Haryana, Chandigarh & Delhi
14. Punjab
15. Himachal Pradesh
16. Jammu & Kashmir and Ladakh
17. West Rajasthan
18. East Rajasthan
19. West Madhya Pradesh
20. East Madhya Pradesh
21. Gujarat
22. Saurashtra
23. Konkan & Goa
24. Madhya Maharashtra
25. Marathwada
26. Vidarbha
27. Chhattisgarh
28. Coastal Andhra Pradesh & Yanam
29. Telangana
30. Rayalaseema
31. Tamilnadu, Puducherry & Karaikal
32. Coastal Karnataka
33. North Interior Karnataka
34. South Interior Karnataka
35. Kerala & Mahe
36. Lakshadweep

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 Widespread (FWS/Many Places)	1-25	Isolated (ISOL)

- | | | |
|----------------------|----------------------|--------------|
| Fog | Heavy Snow | Cold Wave |
| Heavy Rain | Dust Storm | Cold Day |
| Very Heavy Rain | Heat Wave | Ground Frost |
| Extremely Heavy Rain | Warm Night | |
| Thunder & Lightning | Hot Day | |
| Hailstorm | Hot & Humid | |
| Dust Raising Winds | Strong Surface Winds | |

COLOUR CODED WARNING

No Warning (No Action)
Watch (Be Aware)
Alert (Be Prepared To Take Action)
Warning (Take Action)

Probabilistic Forecast

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

DEFINITION/CRITERIA

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°C to 6.4°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°C

Warm Night: When minimum temperature departure 4.5°C to 6.4°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°C to -6.4°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°C to -6.4°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)

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 Strom: Wind speed >220 kmph (>119 knots)