Government of India
Ministry of Earth Sciences
India Meteorological Department

Press Release
Date:03rd January 2026
Time of Issue: 1430 hours IST

Subject: Forecast Performance of IMD for Severe Weather events during 2025

During the year, a comprehensive suite of operational weather bulletins, advisories, outlooks, and specialized forecasts were issued by National Weather Forecasting Centre (NWFC) on a daily, weekly, and event-based basis to support disaster management, maritime safety, defence operations, mountaineering expeditions, aviation, media, and the general public.

a) **Statistics of bulletins issued during 2025**

1. **All India Weather Bulletins** were issued four times daily throughout the year, totalling **1,460 bulletins**, ensuring continuous national-scale weather monitoring.
2. **All India Severe Weather Warning Bulletins** were issued four times daily, amounting to **1,460 warnings**, supporting early warning dissemination across the country.
3. **All India Weekly Weather Reports** were issued regularly, totalling **52 reports** during the year.
4. **All India Extended Range Forecasts** for the next two weeks were issued regularly every Thursday, totalling **52 bulletins** during the year.
5. **Severe Weather Advisory / Nowcast Guidance Bulletins** were issued daily during active weather periods, totalling **365 advisories** to Meteorological Centres for real-time nowcasting.
6. **Forecast Development Programme – Severe Thunderstorm Observations and Regional Modelling (FDP STORM) Bulletins** were issued on a daily basis, contributing **365 bulletins** annually.
7. **Mountain Weather Bulletins** for the Western and Central Himalayan Region were issued daily, totalling **740 bulletins**.
8. **More than 400 Expedition Forecast Bulletins** were issued in support of national mountaineering and defence expeditions, covering major Himalayan peaks and expeditions.
9. **Daily bilingual (Hindi and English) press releases** were issued proactively during significant weather events, totalling **365 releases**, ensuring timely communication with the public and media.
10. **Special Bulletins and Special Messages** for disaster managers, media, and senior government officials were issued during severe weather and cyclonic events, totalling **160 bulletins**, including special briefings to senior officials by the Director General, IMD.
11. **Daily and weekly weather video messages**, in both Hindi and English, were prepared and disseminated through IMD's social media platforms, including **YouTube, Facebook, X, Instagram, and WhatsApp**.

12. **Online press conferences** were organized either at the beginning or end of the issuance of monthly and seasonal weather outlooks. The presentations during these conferences were delivered by the Director General, IMD.
13. **Special press releases** were issued by IMD in connection with events organized as part of the **celebration of 150 years of IMD**, including the Foundation Day Programme (14–15 January), Run for Weather Marathon, Stakeholders' Workshop, Women's Conference, Youth Conference, Meteorological Olympiad, and celebrations marking 75 years of the Mausam Journal, among others.
14. **Monthly Weather Summaries** for each month were issued around the **5th of the following month**.
15. The **Annual Climate Summary**, issued in **January 2025**, documented major severe weather events, climate variability, and the impacts of climate change on extreme weather.

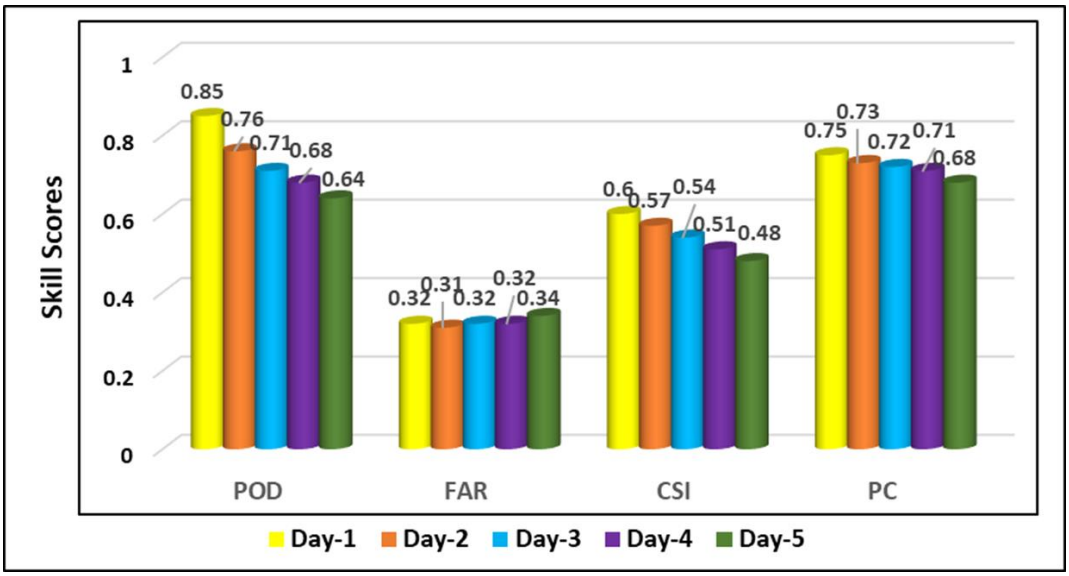
The National Weather Forecasting Centre (NWFC) utilized all means of communication for transmission of these bulletins and advisories including email, websites, social networking platforms (facebook, X, whatsapp to national & international users), SMS etc., Application Programming Interface (API), Common Alert Protocol (CAP), Global Multi-hazard Alert System (GMAS).

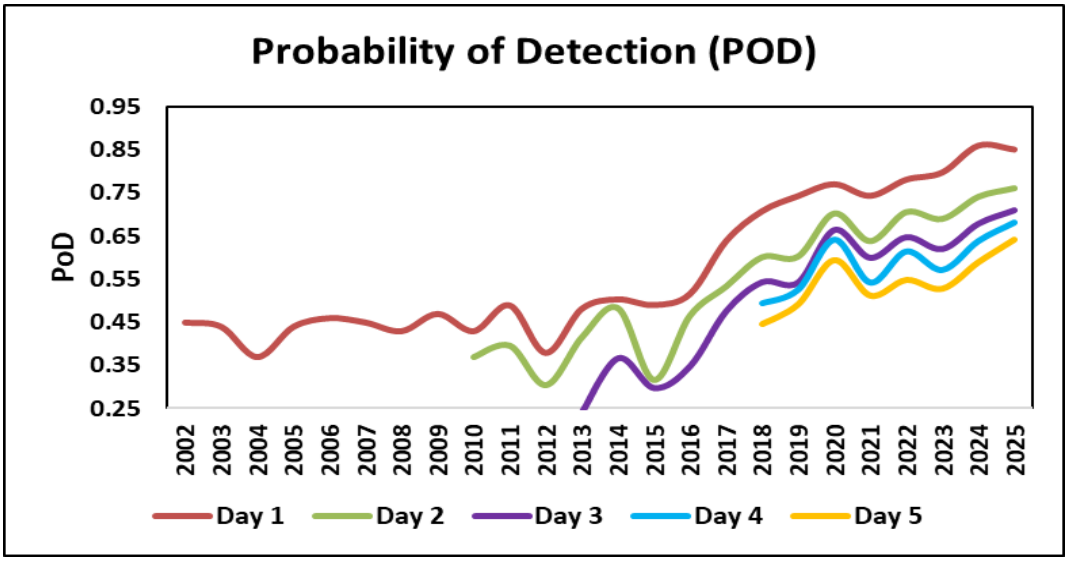
All these measures enabled the disaster managers and general public to manage the disaster associated with the severe weather.

b) Forecast Performance during the year 2025

1. Heavy rainfall Forecast Performance at Meteorological Subdivision level:

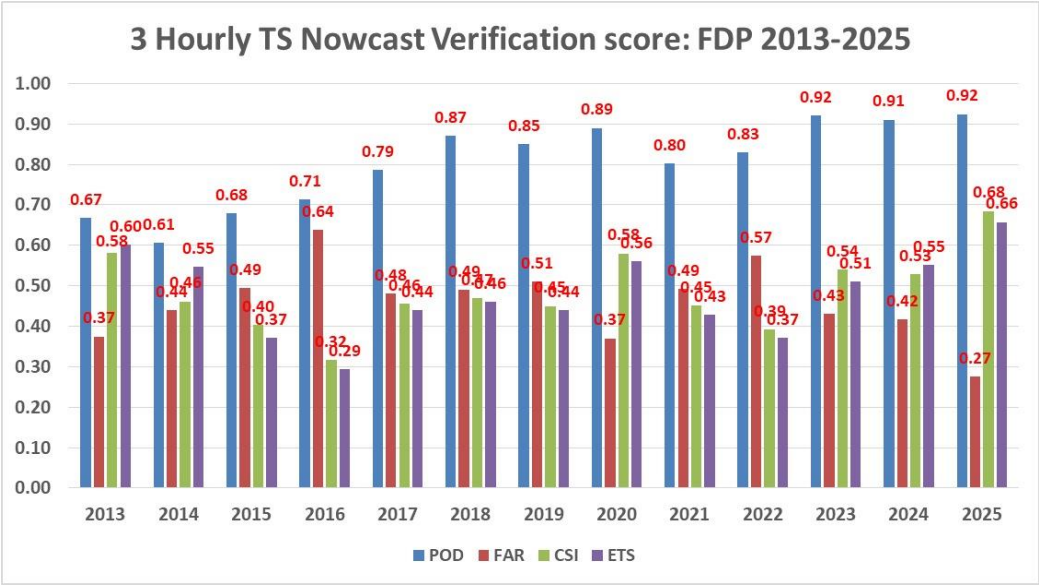
In 2025, the heavy rainfall forecast demonstrated high skill, with Probability of Detection of 0.85, Critical Success Index of 0.60, and Percent Correct of 0.75 on Day-1, indicating better detection and overall accuracy. Forecast skill decreased gradually with increasing lead time but remained operationally useful up to Day-5, with Probability of Detection of 0.64, Critical Success Index of 0.48, and Percent Correct of 68%. The False Alarm Ratio remained low and stable across all forecast days (approximately 0.31–0.34), reflecting reliable and well-calibrated forecasts.



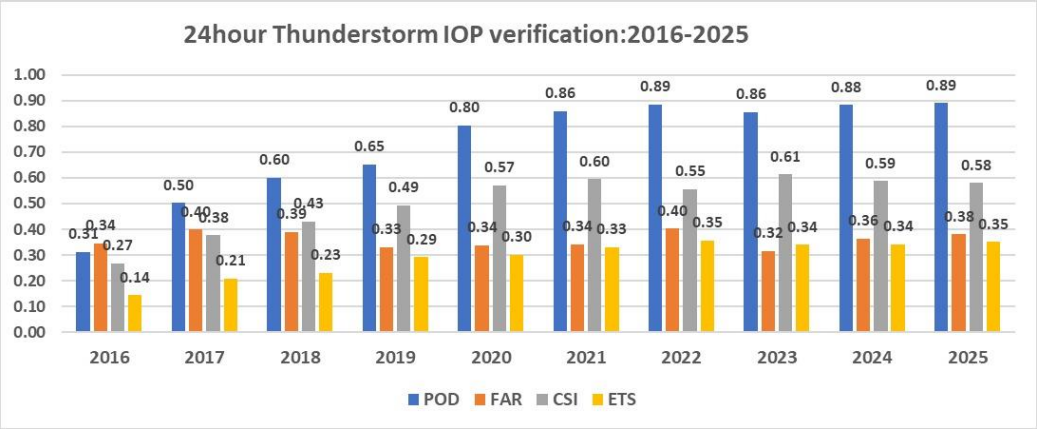


2. **Thunderstorm Nowcast Forecast Performance at Meteorological Subdivision level:**

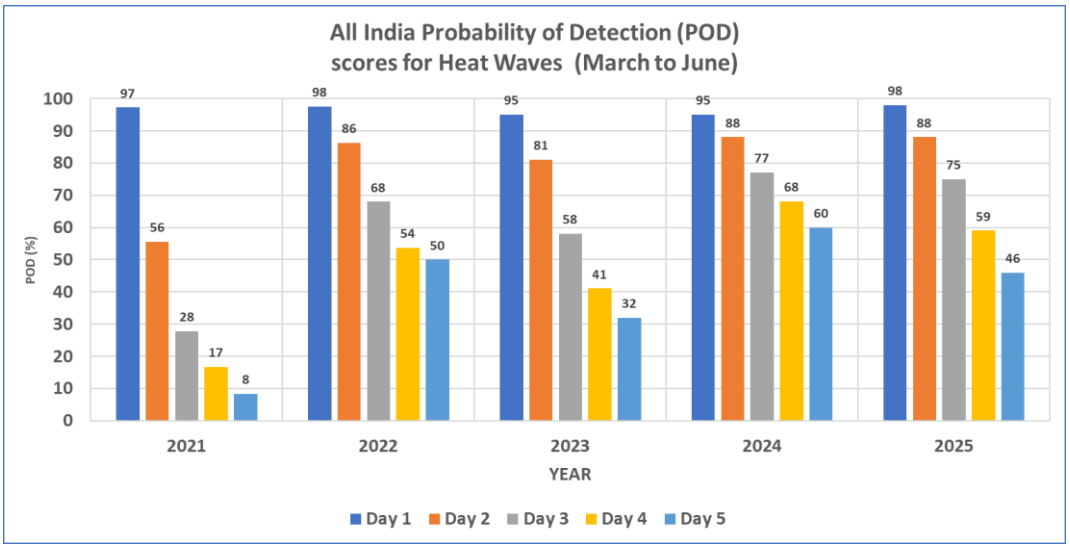
The 3-hourly thunderstorm (TS) nowcast (March–June), skill showed a clear long-term improvement, with the Probability of Detection increasing from about 0.67 in 2013 to about 0.92 in 2025, while the False Alarm Ratio reduced from 0.37 to 0.27. At the same time, the Critical Success Index improved from 0.58 to 0.68 and the Equitable Threat Score from 0.60 to 0.66, indicating substantially enhanced accuracy and reliability of short-range nowcasts of severe weather like thunderstorm.



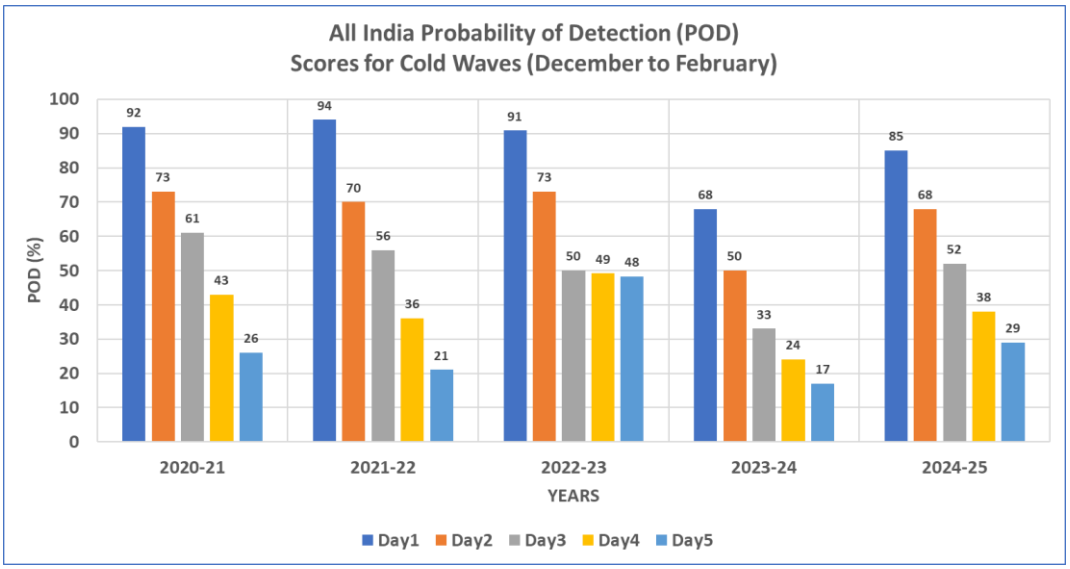
For 24-hour thunderstorm forecasts, the Probability of Detection improved markedly from 0.31 in 2016 to 0.89 in 2025, with a relatively controlled False Alarm Ratio around 0.38 in 2025. The Critical Success Index increased from 0.34 to 0.58, and the Equitable Threat Score from 0.14 to 0.35, demonstrating significant strengthening of day-ahead thunderstorm forecast skill over the period.



3. **Heat Wave Forecast Performance at Meteorological Subdivision level:**
   For heat wave forecasts (March–June), the Probability of Detection remained very high for short lead times, with Day-1 values consistently between 95–98% during 2021–2025, indicating excellent detection capability. Forecast skill decreased with increasing lead time, but showed clear improvement in recent years, with Probability of Detection 3 days ahead increasing to 75% and to 46% 5 days ahead in 2025, compared to much lower values in 2021. Overall, the results indicate strong short-range performance and progressively improving medium-range heat wave forecast capability.



4. **Cold Wave Forecast Performance at Meteorological Subdivision level:**
   For cold wave forecasts (December–February), the Probability of Detection remained high at short lead times, with Day-1 values ranging from about 85–94% across recent winters, indicating strong capability to detect cold wave events. Forecast skill decreased with increasing lead time, with 5 days ahead Probability of Detection typically below 30%, though 2022–23 showed relatively better medium-range performance compared to other years.


All India Probability of Detection (POD)
Scores for Cold Waves (December to February)
POD (%)
100
90
80
70
60
50
40
30
20
10
0
92
73
61
43
26
94
70
56
36
21
91
73
50
49
48
68
50
33
24
17
85
68
52
38
29
2020-21
2021-22
2022-23
2023-24
2024-25
YEARS
Day1
Day2
Day3
Day4
Day5

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 ≥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:** 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

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 °C.

Cold Wave

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 :** When Minimum Temperature is ≤ 4.0 °C
- **Severe Cold Wave:** When Minimum Temperature is ≤ 2.0 °C

(c) For Coastal Stations

When Minimum Temperature departure is ≤-4.5 °C & actual Minimum Temperature is ≤ 15 °C

Cold Day

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.
- **Severe Cold Day:** Maximum Temperature Departure from normal ≤ -6.5 °C

Fog

Phenomenon of small droplets suspended in air and the horizontal visibility < 1km

- **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 ≤4°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)

* Red colour warning does not mean "Red Alert", Red colour warning means "Take Action".

Forecast and Warning for any day is valid from 0830 hours IST of day till 0830 hours IST of next day.

For more details, kindly visit https://mausam.imd.gov.in or contact: 011-2434-4599

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