

भारत सरकार
Government of India
पृथ्वी विज्ञान मंत्रालय (एम. ओ. ई. एस.)
Ministry of Earth Sciences (MoES)



भारत मौसम विज्ञान विभाग
INDIA METEOROLOGICAL DEPARTMENT
Climate Research and Services (CRS)

Climate Summary for the month of AUGUST 2024

1. Monthly Rainfall Scenario (01st to 31st August 2024)

Rainfall over the country as a whole for the month of August 2024 was 293.9 mm which is 15% more than its Long Period Average (LPA) of 254.9 mm.

Daily variation of the rainfall over the country as a whole during the month of August 2024 with normal based on data of 1971-2020 is presented in Fig. 1(a). The all India rainfall percentage departure from normal for August during 1901-2024 is presented in Fig. 1(b).

Rainfall over All India (293.9 mm) was 20th highest since 1901 and 3rd highest since 2001 presented in Fig. 1(c).

Rainfall over homogeneous region of Northwest India (256.4 mm) was 21st highest since 1901 and highest since 2001 presented in Fig. 1(d).

Rainfall over homogeneous region of Central India (359.6 mm) was 30th highest since 1901 and 6th highest since 2001 presented in Fig. 1(e).

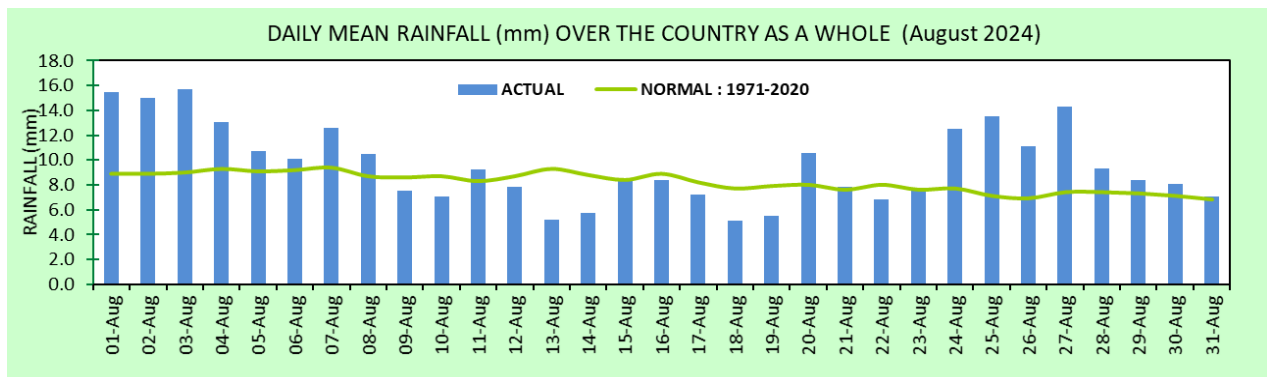


Fig. 1(a): Daily variation of rainfall over the country as a whole during August 2024

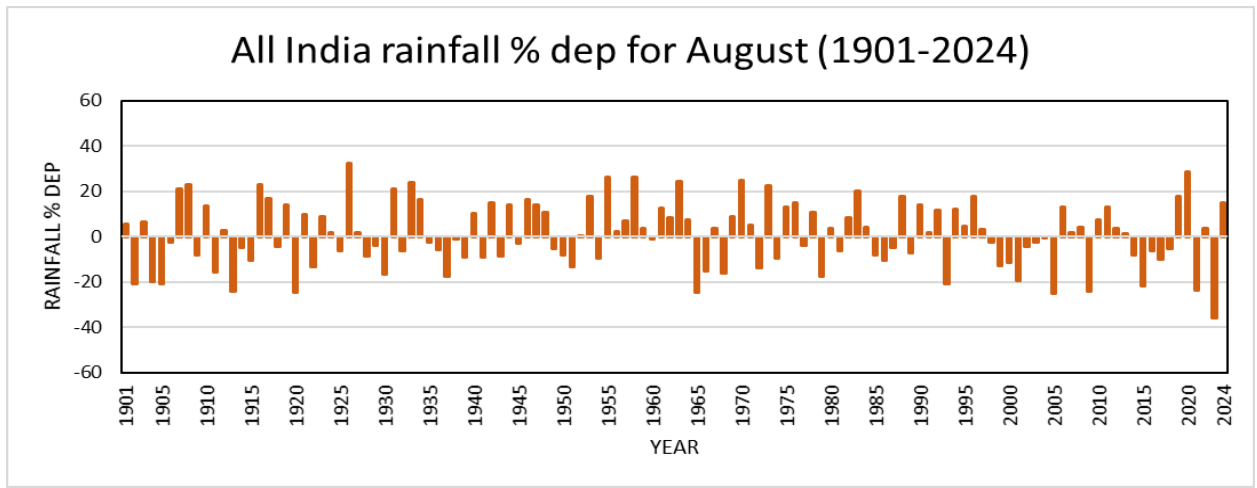


Fig. 1(b): All India monthly rainfall percentage departure from normal (1971-2020) for August for 1901-2024

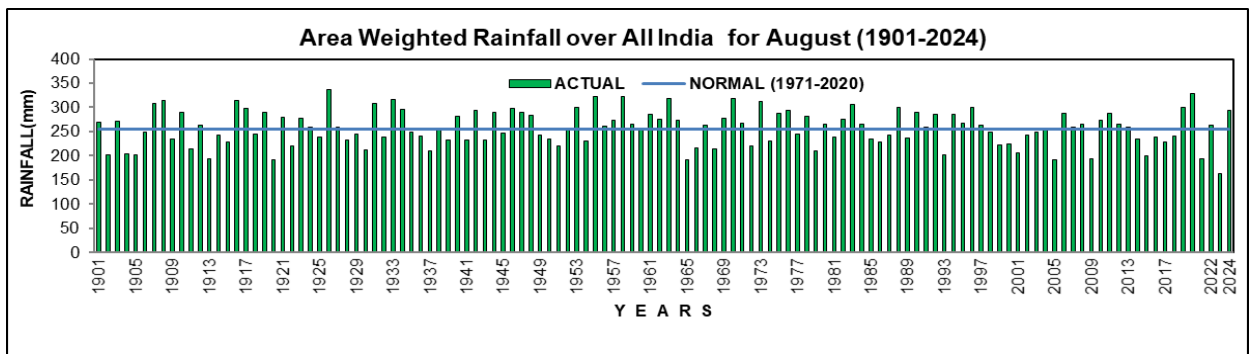


Fig. 1(c): Time series of area weighted rainfall over All India for August (1901 – 2024)

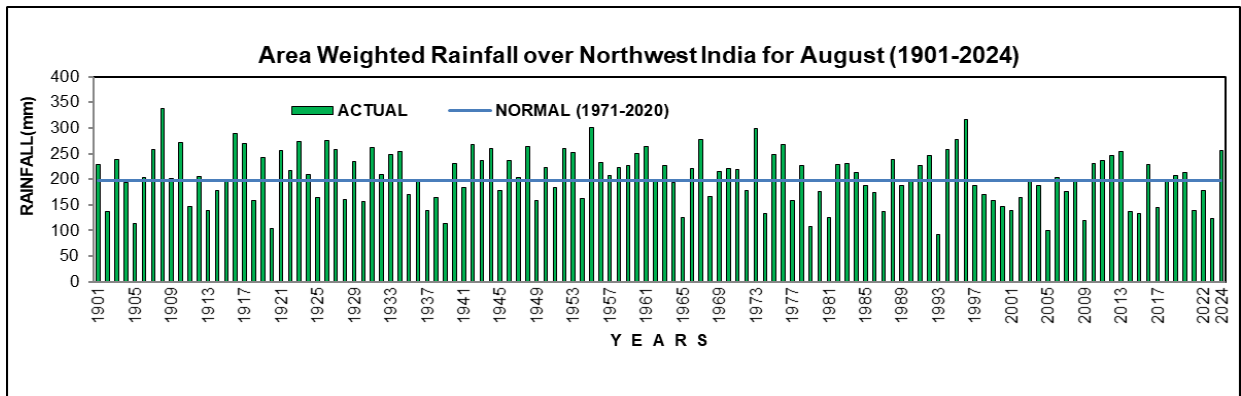


Fig. 1(d): Time series of area weighted rainfall over Northwest India for August (1901 – 2024)

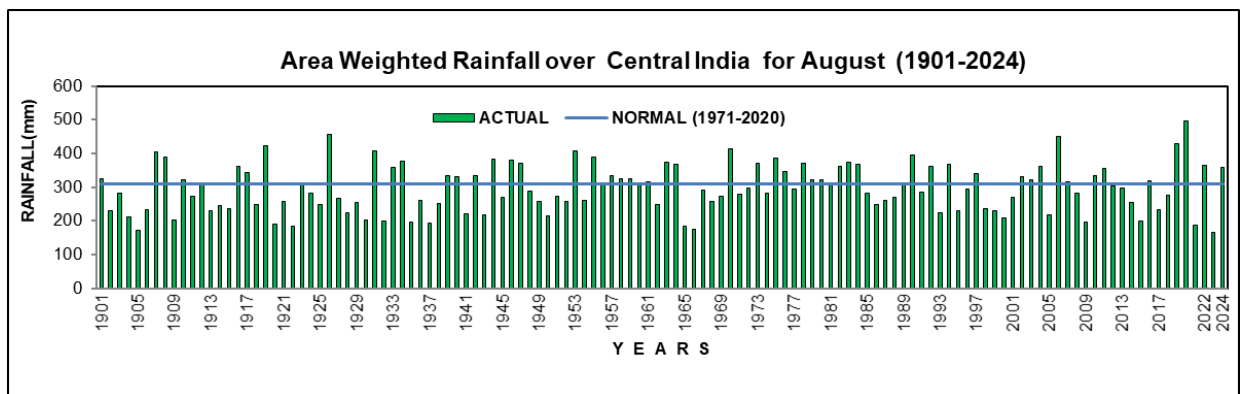


Fig. 1(e): Time series of area weighted rainfall over Central India for August (1901 – 2024)

The monthly rainfall for August 2024 is given in the table below:

Regions	Actual Rainfall (mm)	Normal Rainfall (mm)	% Departure from LPA
Country as a whole	293.9	254.9	15.3
Northwest India	256.4	197.1	30.1
Central India	359.6	308.8	16.5
South Peninsula	203.4	190.7	6.6
East & northeast India	338.8	332.0	2.0

During this month, 5 sub-divisions received large excess, 8 received excess, 18 received normal, 5 received deficient rainfall (Fig. 2).

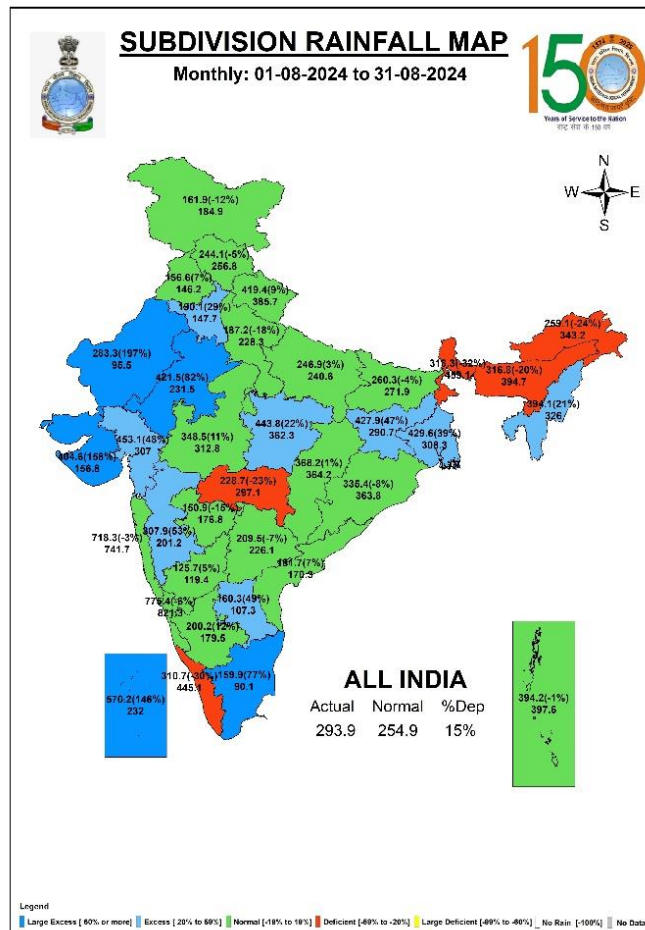


Fig. 2: Subdivision-wise rainfall distribution for August 2024

The observed spatial distribution of rainfall during August 2024, normal rainfall based on data of 1971 to 2020 and rainfall departures from normal during August 2024 are shown in Figure 3.

(CLIMATE MONITORING AND PREDICTION GROUP)

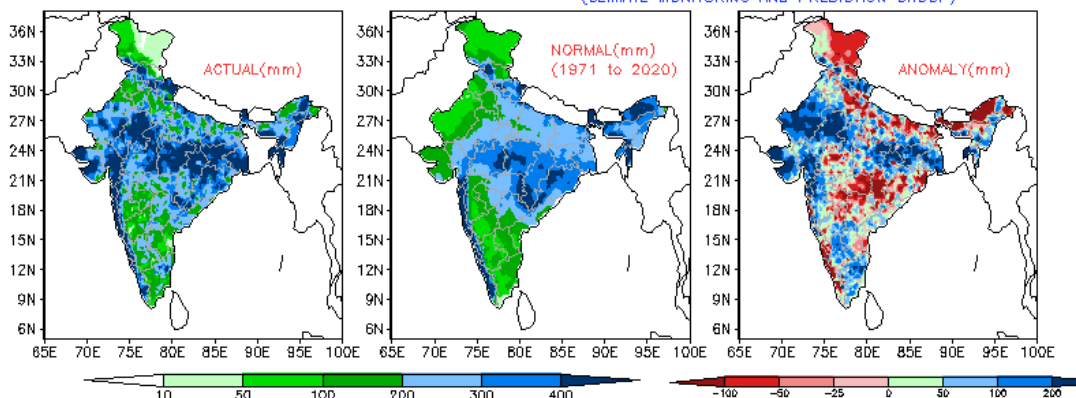


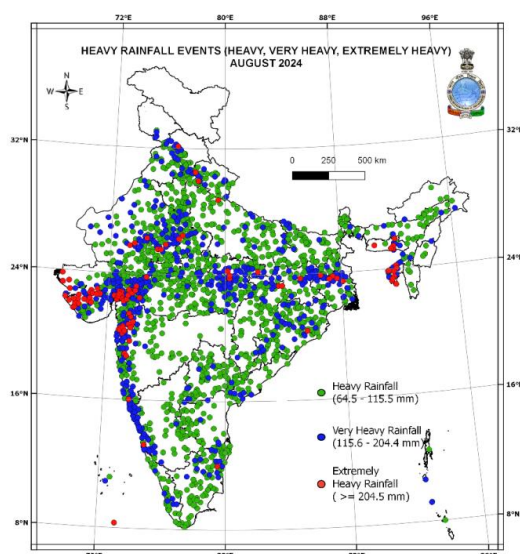
Fig. 3: Observed spatial Rainfall pattern for the month August 2024 over India and their anomaly from normal (1971 to 2020) period (anomaly = actual rainfall - normal rainfall)

2. Frequency of Heavy Rainfall events, thunderstorms and tornado

August 2024 witnessed Extremely very heavy rainfall events (≥ 204.4 mm) mainly Gujarat Region, Saurashtra & Kutch, Assam & Meghalaya, Tripura, East Rajasthan, Gangetic West Bengal, Uttarakhand and Konkan & Goa, very heavy rainfall events (115.6 – 204.4 mm) along west coast, over many parts from central India, Tamilnadu, Puducherry & Karaikal and heavy rainfall events (64.5 – 115.5 mm) were observed mainly over most parts of India except Ladakh and Jammu & Kashmir.

The location of occurrences of heavy, very heavy and extremely heavy rainfall events is shown in the Figure 4.

Out of total 1926 occasions, 105 were extremely heavy rainfall (≥ 204.4 mm), 526 were very heavy rainfall (115.6 to 204.4 mm) and 1295 were heavy rainfall (64.5 to 115.5 mm) categories during this month.



(Only highest category of rainfall event is considered for a station)

Fig. 4: The location of occurrences of heavy and very heavy rainfall events in the month of August 2024

The top 5 Stations with highest 24 hours rainfall records along with their dates reported are given in the table below:

STATION	24 HOUR RECORD RAINFALL IN August	DATE	PREVIOUS RAINFALL RECORD (mm)	DATE
	2024 (mm)			
CHURU	124.8	1	99	10-8-1964
PHALODI	112.8	6	112	4-8-1966
NALIYA	301.2	29	294	12-8-1979
NARSAPURAM	140.7	31	93.4	22-8-1989
K. PARAMATHI	110.4	15	80.2	26-8-2006

3. Chief Synoptic weather features observed during August 2024

During August 2024 six low-pressure systems formed {2 low pressure areas (one over land during 3- 5 August, one over Arabian Sea during 22 - 24 August), 1 well marked low pressure area over Bay of Bengal during 25 - 28 August, 1 Depression over Bay of Bengal during 29 August – 2 September, 1 land Deep depression during 2 - 5 August and one cyclonic storm “ASNA” over Bay of Bengal during 16 August - 2 September}. Tracks of these systems are presented in figure 5. The summary of Low-Pressure systems formed over the North Indian Ocean is given below.

Year	Cyclonic Storm	Depression	LPS	total	Low-pressure days
2017	-	-	2	2	8
2018	-	2	2	4	8
2019	-	1	4	4	21
2020	-	-	6	6	26
2021	-	-	2	2	15
2022	-	4	-	4	19 (days till 25th)
2023	-	1	1		9 (days till 24th)
2024	1	2	3 (1 WML)	6	21
climatology	-	1.6	3.7	5.38	16.3

The Wester Disturbance (WD) activities were very weak during the month and no major interaction of WDs with tropical Easterly. Only three WDs (20-21, 23-28, 28-30 Aug) were observed during August, but located over north of 30 degree North. So it did not help for rainfall activity over the north India region

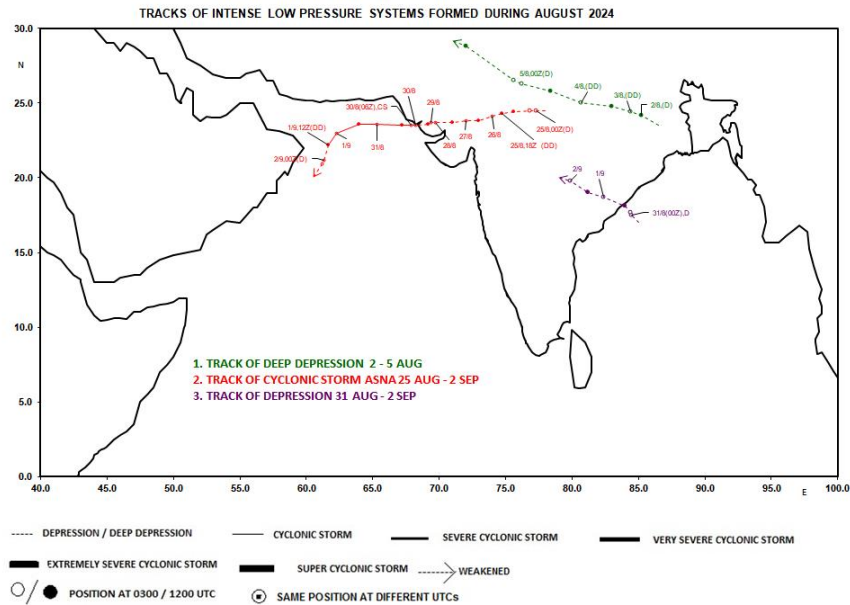


Fig. 5: Tracks of intense low pressure systems formed during August 2024

4. Characteristics of Temperatures for the month of August 2024

The average maximum, average minimum and mean temperature for the country as a whole during August 2024 were 31.31°C, 24.27°C and 27.79°C respectively, against the normal of 31.01°C, 23.68°C and 27.34°C based on data of 1991-2020. Thus, the average maximum, average minimum and mean temperature were above normal with departure from normal of 0.30°C, 0.59°C and 0.45°C respectively for the country as a whole. The daily variation of maximum and minimum temperature departure from normal over the country as a whole for August 2024 is shown in the figure 6(a) and (b) respectively.

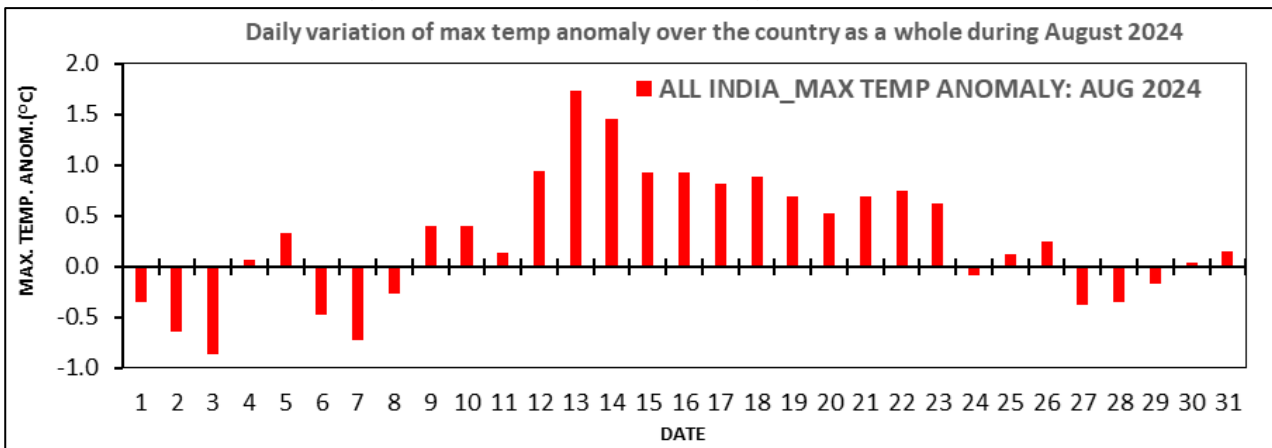


Fig. 6(a): Daily variation of maximum temperature anomaly (departure from normal) over the country as a whole for August 2024

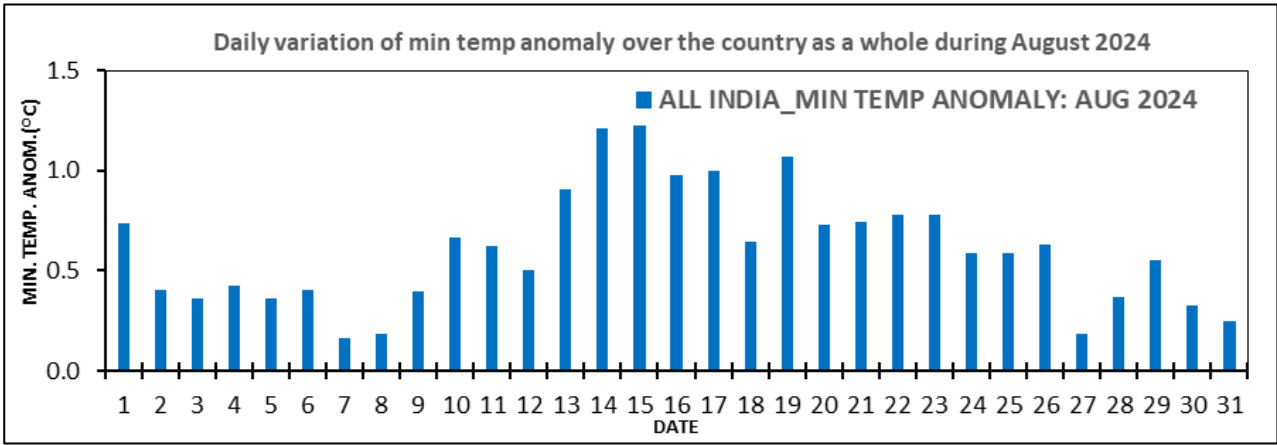


Fig 6(b): Daily variation of minimum temperature anomaly (departure from normal) over the country as a whole for August 2024

Figure 7 shows the time series of monthly average maximum, average minimum and mean temperature over the country as a whole for the month of August 1901-2024. Over the country during August, the average maximum temperature was 31.31°C with departure from normal of 0.30°C (10th highest since 1901). The average minimum temperature was highest at 24.27°C since 1901 against the earlier record of 24.16°C in 2020. The mean temperature was 4th highest (27.79°C with departure from normal of 0.45°C) after the years 2023(28.01°C), 2009(27.85°C) and 1987(27.83°C) since 1901.

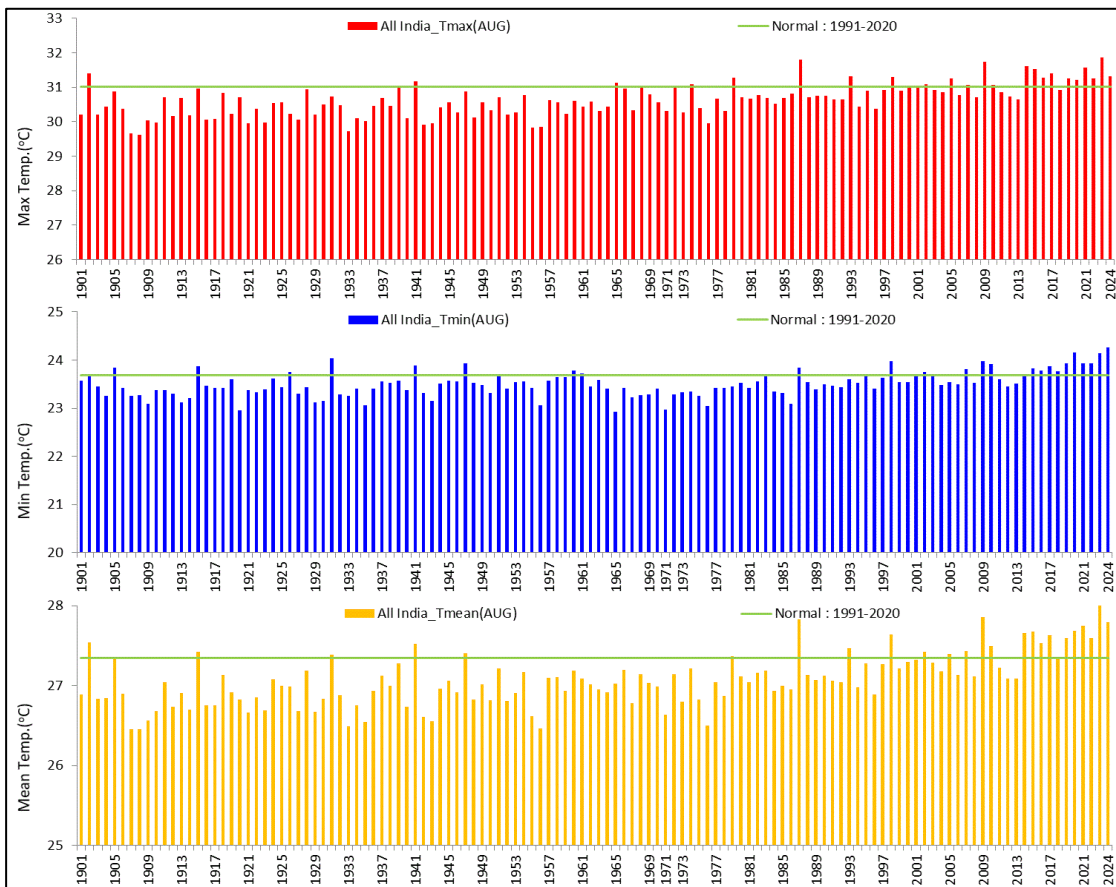


Fig. 7: Time series of monthly average maximum, average minimum and mean temperature over the country as a whole for the month of August 1901-2024

Figure 8 shows the time series of average maximum, average minimum and mean

temperature over the East & Northeast India for the month of August 1901-2024. Over East & Northeast India during August, the average maximum temperature was 5th highest (31.73°C with departure from normal of 0.67°C) after the years 2019(32.50°C), 2022(32.38°C), 2016(32.21°C) and 2020(31.91°C) since 1901. The average minimum temperature was 4th highest (24.98°C with departure from normal of 0.53°C) after the years 2022(25.19°C), 2019(25.09°C) and 2020(25.08°C) since 1901. The mean temperature was 5th highest (28.36°C with departure from normal of 0.60°C) after the years 2019(28.79°C), 2022(28.78°C), 2016(28.50°C) and 2020(28.49°C) since 1901.

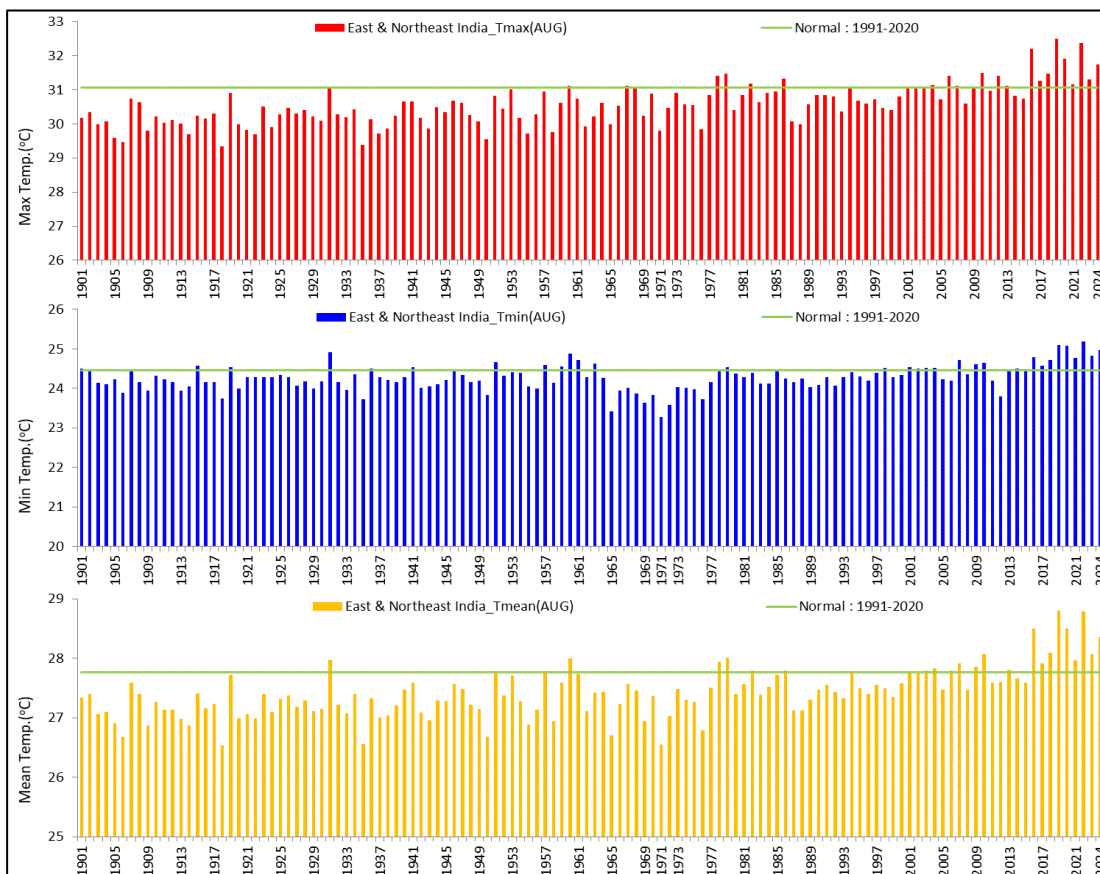


Fig. 8: Time series of monthly average maximum, average minimum and mean temperature over East & Northeast India for the month of August 1901-2024

Figure 9 shows the time series of average minimum and mean temperature over the South Peninsular India for the month of August 1901-2024. Over South Peninsular India during August, the average minimum temperature was 2nd highest (24.09°C with departure from normal of 0.68°C) after the year 2023(24.12°C) since 1901. The mean temperature was 4th highest (27.87°C with departure from normal of 0.67°C) after the years 2023(28.50°C), 2016(27.94°C), 2015(27.91°C) since 1901.

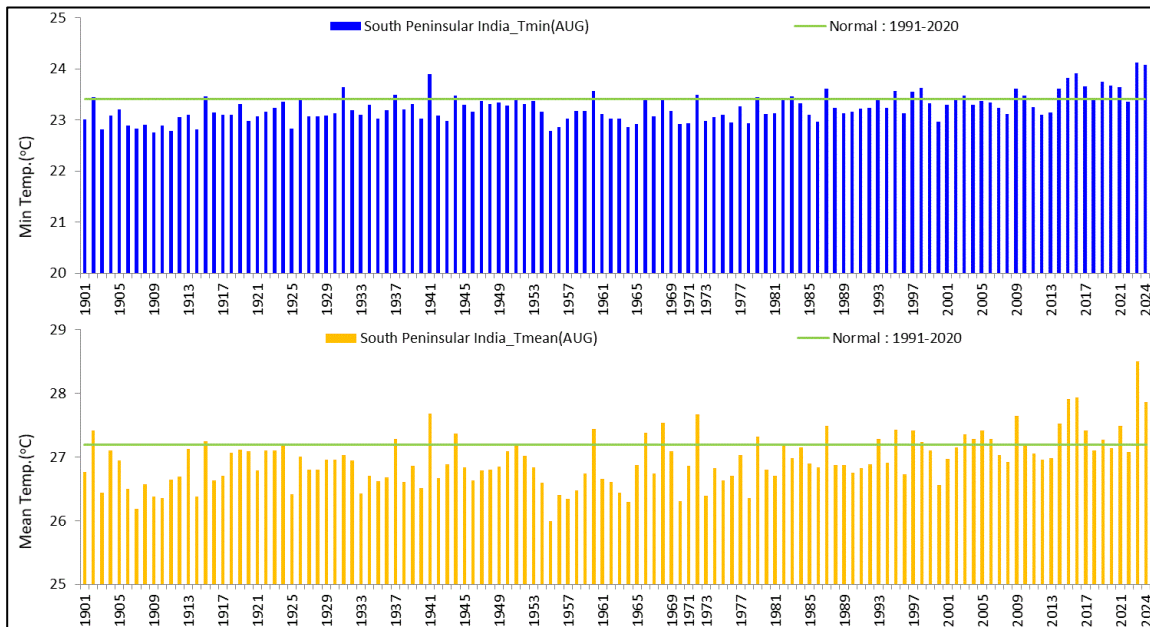


Fig. 9: Time series of monthly average minimum and mean temperature over South Peninsular India for the month of August 1901-2024

Figure 10 shows the time series of average minimum temperature over the Central India for the month of August 1901-2024. Over Central India during August, the average minimum temperature was highest at 24.26°C since 1901 against the earlier record of 24.21°C in 2009.

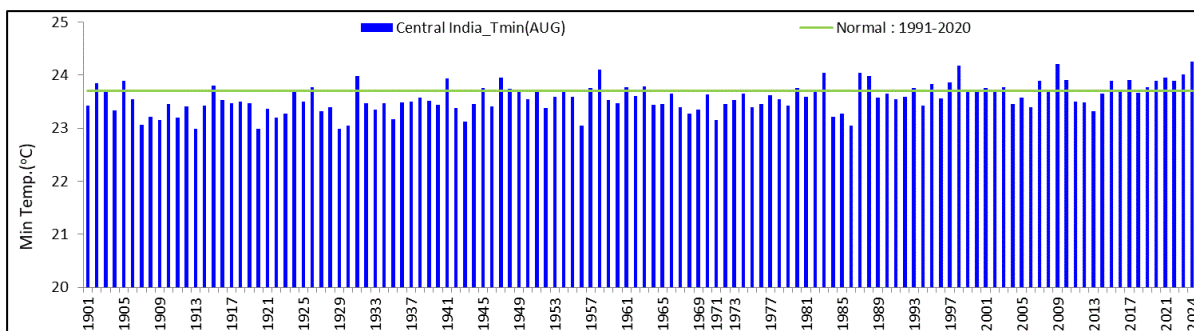


Fig. 10: Time series of monthly average minimum temperature over Central India for the month of August 1901-2024

Figure 11 shows the time series of average minimum temperature over the Northwest India for the month of August 1901-2024. Over Northwest India during August, the average minimum temperature was 4th highest (23.98°C with departure from normal of 0.62°C) after the years 2020(24.23°C), 1947(24.10°C) and 1905(24.07°C) since 1901.

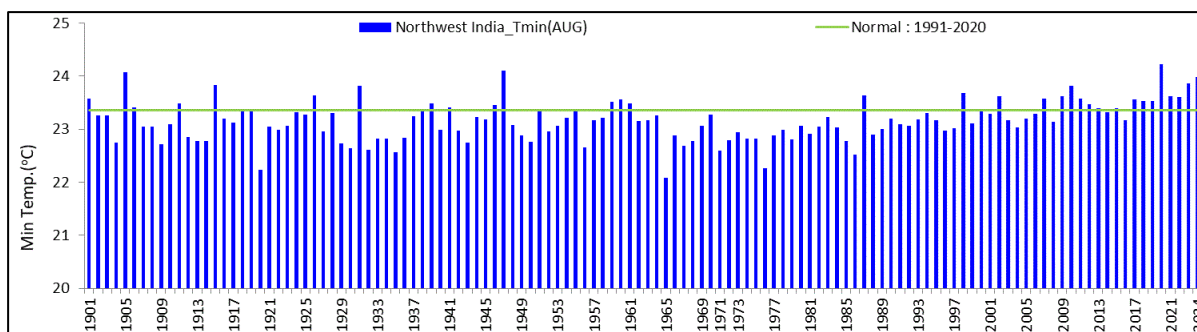


Fig. 11: Time series of monthly average minimum temperature over Northwest India for the month of August 1901-2024

The Temperatures during August 2024 for all India and homogeneous regions with its top ranks since 1901 are given below:

AUG 2024		Max Temp (°C)	Min Temp (°C)	Mean Temp (°C)
ALL INDIA	ACTUAL	31.31	24.27	27.79
	NORMAL	31.01	23.68	27.34
	ANOMALY	0.30	0.59	0.45
	Rank since 1901	10	1	4
NORTHWEST INDIA	ACTUAL	31.36	23.98	27.67
	NORMAL	31.68	23.36	27.52
	ANOMALY	-0.32	0.62	0.15
	Rank since 1901	61	4	22
EAST & NORTHEAST INDIA	ACTUAL	31.73	24.98	28.36
	NORMAL	31.06	24.45	27.76
	ANOMALY	0.67	0.53	0.60
	Rank since 1901	5	4	5
CENTRAL INDIA	ACTUAL	30.76	24.26	27.51
	NORMAL	30.33	23.71	27.02
	ANOMALY	0.43	0.55	0.49
	Rank since 1901	13	1	8
SOUTH PENINSULAR INDIA	ACTUAL	31.65	24.09	27.87
	NORMAL	30.99	23.41	27.20
	ANOMALY	0.66	0.68	0.67
	Rank since 1901	6	2	4

Note: Values are rounded off to the nearest two decimals.

The five highest temperature records with corresponding top ranks since 1901 along with year of occurrence for East & Northeast India (Tmax, Tmin, Tmean), All India, South Peninsular India (TMin, TMean) and Central India, Northwest India (TMin) are given in the table below:

All India (August 2024)					East & Northeast India (August 2024)					South Peninsular India (August 2024)				
Year	TMin	Normal	Anomaly	Rank	Year	TMax	Normal	Anomaly	Rank	Year	TMin	Normal	Anomaly	Rank
2024	24.27	23.68	0.59	1	2019	32.50	31.06	1.44	1	2023	24.12	23.41	0.71	1
2020	24.16		0.49	2	2022	32.38		1.32	2	2024	24.09		0.68	2
2023	24.14		0.46	3	2016	32.21		1.15	3	2016	23.92		0.51	3
1931	24.03		0.36	4	2020	31.91		0.85	4	1941	23.90		0.49	4
2009	23.97		0.30	5	2024	31.73		0.67	5	2015	23.82		0.41	5

All India (August 2024)					East & Northeast India (August 2024)					South Peninsular India (August 2024)				
Year	TMean	Normal	Anomaly	Rank	Year	TMin	Normal	Anomaly	Rank	Year	TMean	Normal	Anomaly	Rank
2023	28.01	27.34	0.66	1	2022	25.19	24.45	0.74	1	2023	28.50	27.20	1.30	1
2009	27.85		0.51	2	2019	25.09		0.64	2	2016	27.94		0.74	2
1987	27.83		0.48	3	2020	25.08		0.63	3	2015	27.91		0.71	3
2024	27.79		0.45	4	2024	24.98		0.53	4	2024	27.87		0.67	4
2021	27.75		0.41	5	1931	24.92		0.47	5	1941	27.68		0.48	5

Northwest India (August 2024)					East & Northeast India (August 2024)					Central India (August 2024)				
Year	TMin	Normal	Anomaly	Rank	Year	TMean	Normal	Anomaly	Rank	Year	TMin	Normal	Anomaly	Rank
2020	24.23	23.36	0.86	1	2019	28.79	27.76	1.04	1	2024	24.26	23.71	0.55	1
1947	24.10		0.74	2	2022	28.78		1.03	2	2009	24.21		0.50	2
1905	24.07		0.71	3	2016	28.500		0.74	3	1998	24.18		0.47	3
2024	23.98		0.62	4	2020	28.497		0.74	4	1958	24.10		0.39	4
2023	23.86		0.49	5	2024	28.36		0.60	5	1983	24.05		0.34	5

The observed spatial temperature pattern of monthly average maximum, average minimum and mean temperature over India and their departures from normal (1991 to 2020) period for the month of August 2024 is given in Figure 12.

TEMPERATURE & ITS ANOMOLY FOR THE MONTH AUGUST 2024

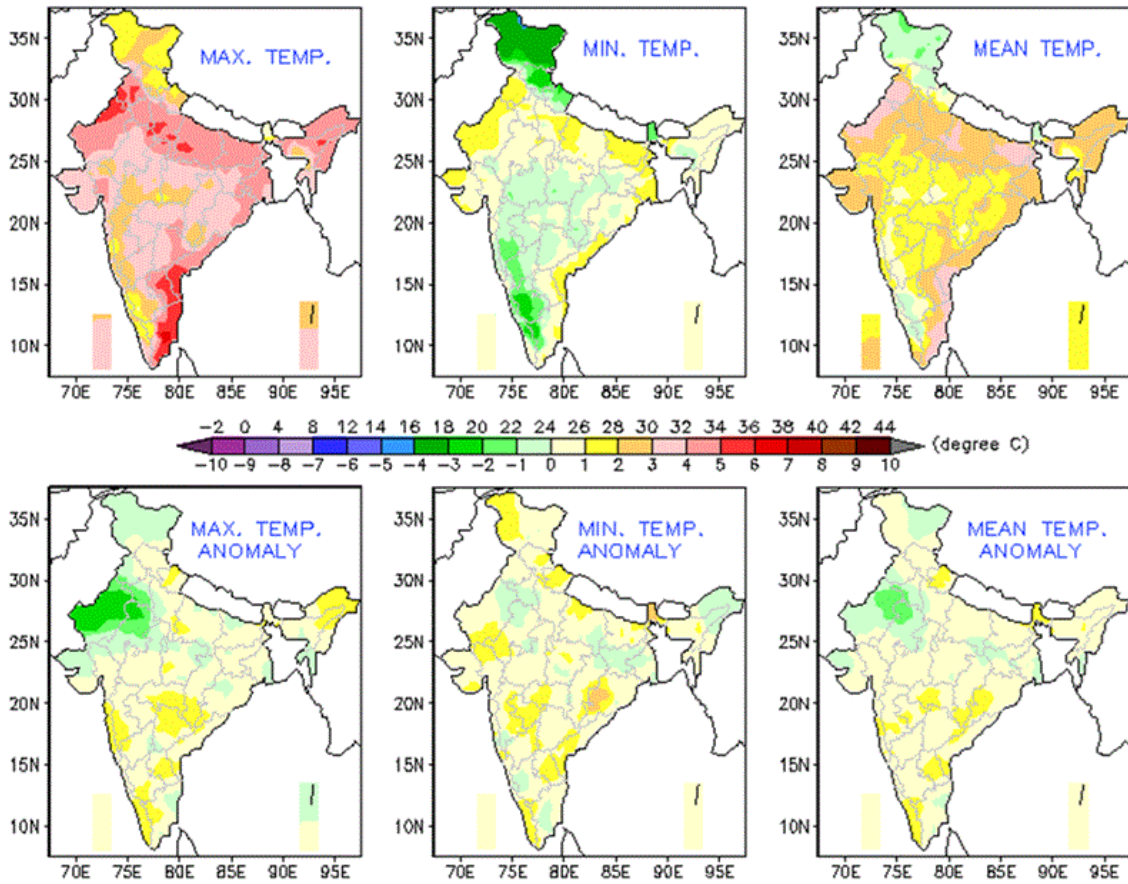


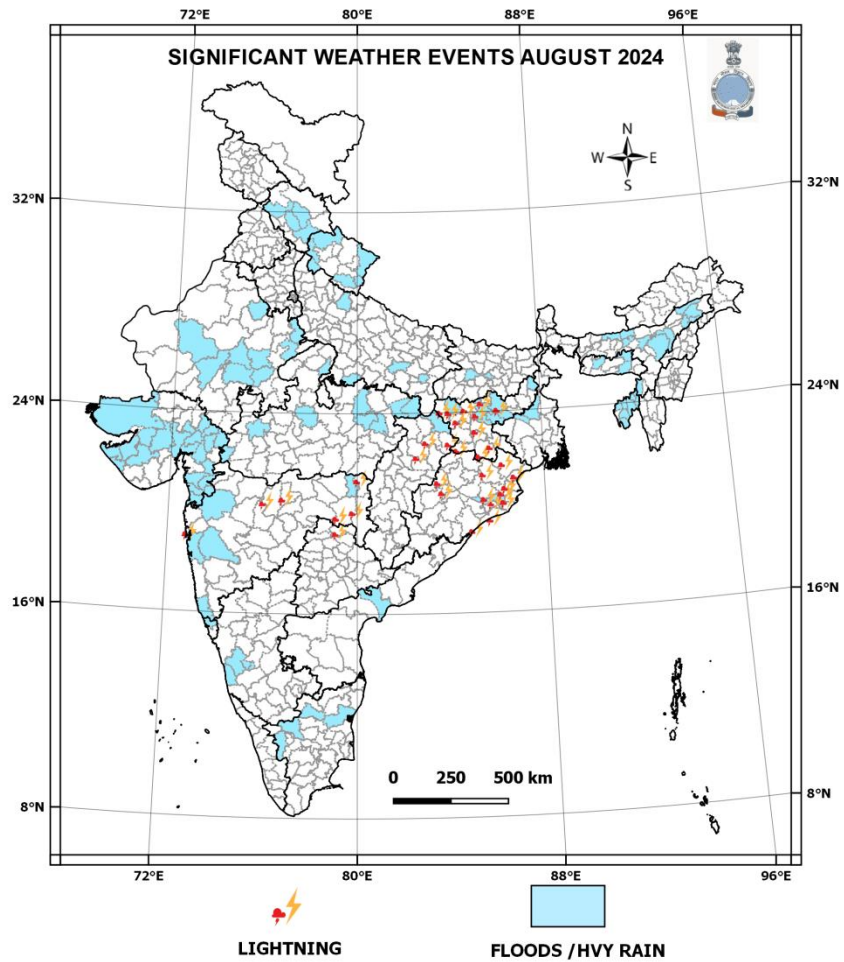
Fig. 12: Observed spatial temperature pattern of monthly average maximum, average minimum and mean temperature over India (top three from left to right) and their departure from normal (1991 to 2020 period) for August 2024 (lower three from left to right)

5. Significant Weather Events:

During August, a total of more than 175 people reportedly died, more than 110 were injured, about 30 were reportedly missing, and more than 70 livestock perished, as per the media report. The details of event-wises casualties are given below. However, the actual data on casualties and damages may be available to concerned state governments.

Event	Number of human deaths
Monsoon related Heavy Rains, Floods & Landslide	112 (Mainly Himachal Pradesh, Gujarat, Tripura, Rajasthan, Assam, Uttarakhand, Andhra Pradesh, Maharashtra)
Lightning	65 (Mainly Jharkhand, Odisha, Maharashtra, Chhattisgarh, Telangana)

There was also damage reported from different states as mentioned above due to above hazards.



**Fig. 13: Deaths and damages due to significant weather events during August 2024
(Based on real time media reports)**