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Ministry of Earth Sciences (MoES)



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

Climate Summary for the month of April 2024

1. Monthly Rainfall Scenario (01 to 30 April 2024)

Rainfall over the country as a whole for the month of April 2024 was 31.4 mm which is 20% less than its Long Period Average (LPA) of 39.3 mm. Daily variation of the rainfall over the country as a whole during the month of April 2024 with normal based on data of 1971-2020 is presented in Fig 1 (a). The all India rainfall percentage departure from normal for April during 1901-2024 is presented in Fig 1(b). Rainfall over All India (31.4 mm) was 27th lowest since 1901 and 4th lowest since 2001. The other lowest rainfall month in the recent years were 2014 (23.8 mm), 2009 (25.6 mm), 2016 (31.2 mm) and 2019 (31.4 mm) presented in fig 1(c).

Rainfall over homogeneous region of South peninsula (12.6 mm) was 5th lowest since 1901. The other lowest rainfall years were 1983 (4.6 mm), 1906 (7.3 mm), 2016 (7.3 mm) and 1950 (10.7 mm) presented in fig 1(d). Rainfall over homogeneous region of East and northeast India (75.2 mm) was 14th lowest since 1901 and 5th lowest since 2001. The other recent lowest rainfall years were 2014 (41.1 mm), 2023 (63.8 mm), 2021 (65.6 mm) and 2009 (70.5 mm) presented in fig 1(e). Rainfall over homogeneous region of central India (15.1 mm) was 25th highest since 1901 and 5th highest since 2001. The other highest rainfall month in the recent years were 2023 (30 mm), 2015(25.7mm), 2020(23.9 mm),

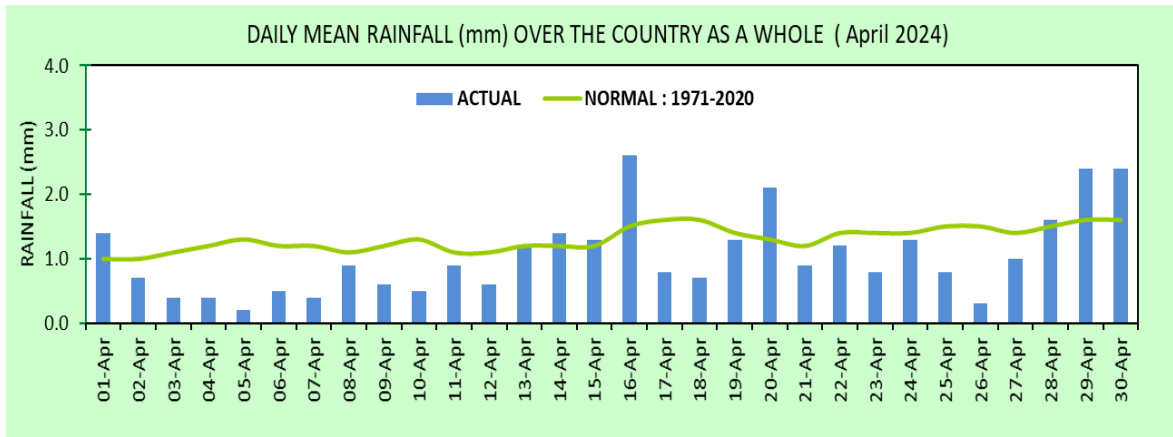


Fig.1 (a): Daily variation of rainfall over the country as a whole during April 2024.

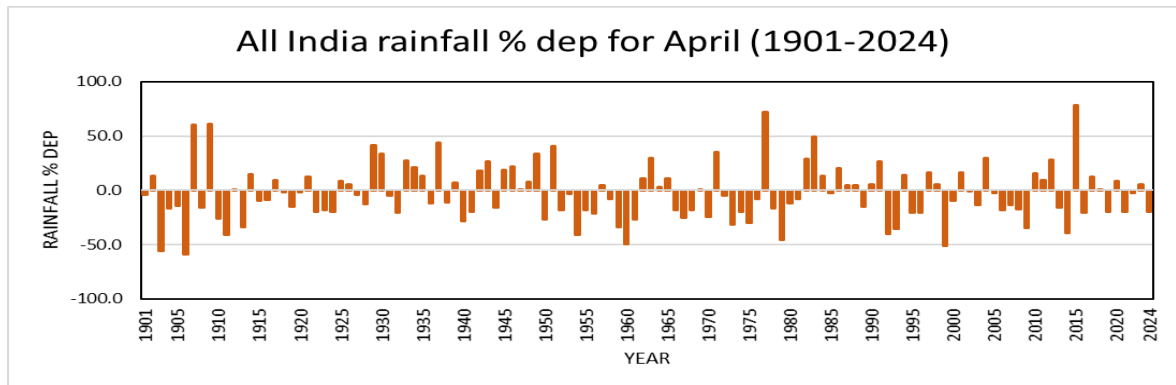


Fig. 1(b): All India monthly rainfall percentage departure from normal (1971-2020) for April from 1901 to 2024.

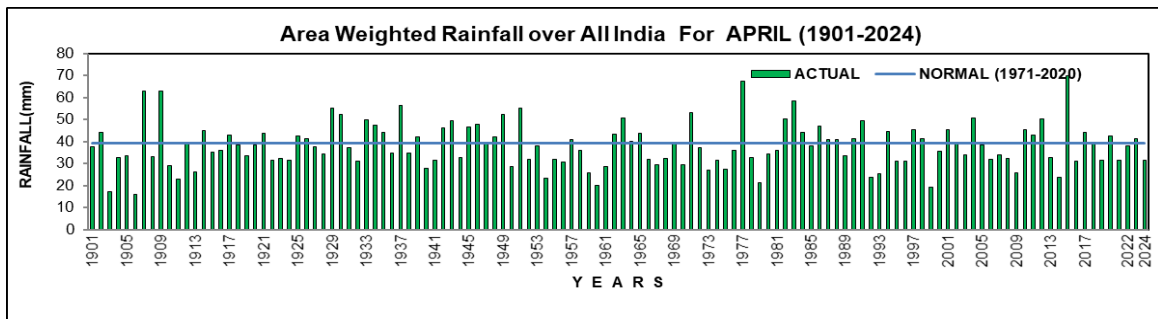


Fig. 1(c): Time series of area weighted rainfall over All India for April from 1901 to 2024.

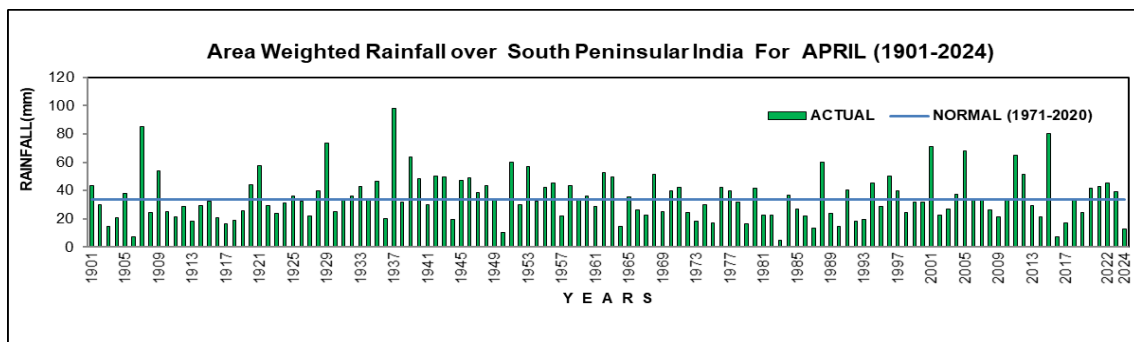


Fig. 1(d): Time series of area weighted rainfall over South Peninsular India for April from 1901 to 2024.

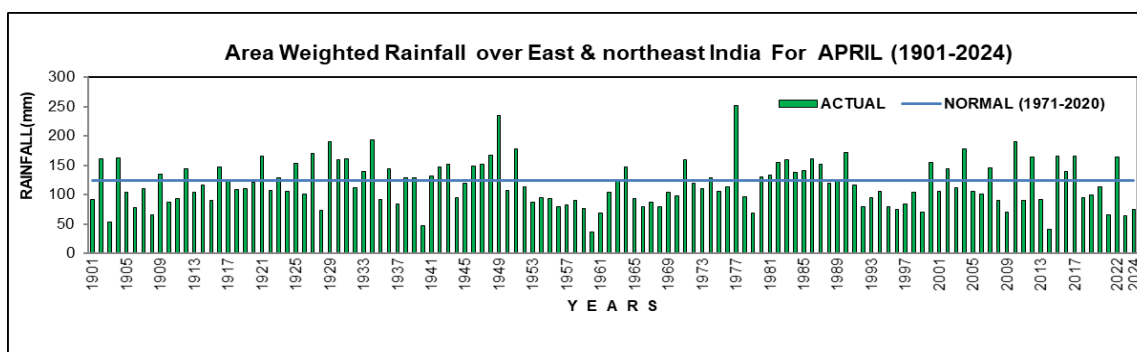


Fig. 1(e): Time series of area weighted rainfall over East and northeast India for April from 1901 to 2024.

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

Regions	Actual Rainfall (mm)	Normal Rainfall (mm)	% Departure from LPA
Country as a whole	31.4	39.3	-20.0
Northwest India	38.7	31.9	21.0
Central India	15.1	9.2	64.0
South Peninsula	12.6	33.9	-63.0
East & northeast India	75.2	123.5	-39.0

During this month, 6 sub-divisions received large excess, 2 received excess, 5 received normal, 11 received deficient and 12 received large deficient rainfall (Fig 2).

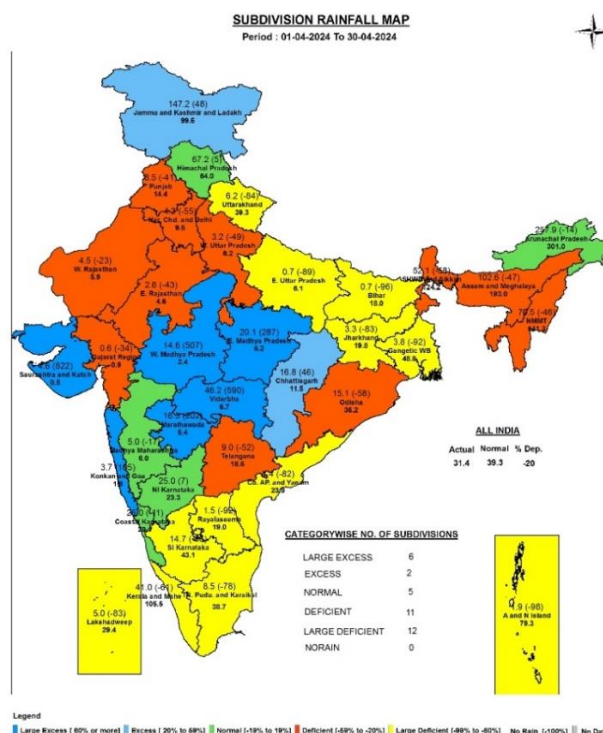


Fig. 2: Subdivision-wise rainfall distribution for April 2024.

The observed spatial distribution of rainfall during April 2024, normal rainfall

based on data of 1971-2020 and rainfall departures from normal during April 2024 are shown in Fig.3.

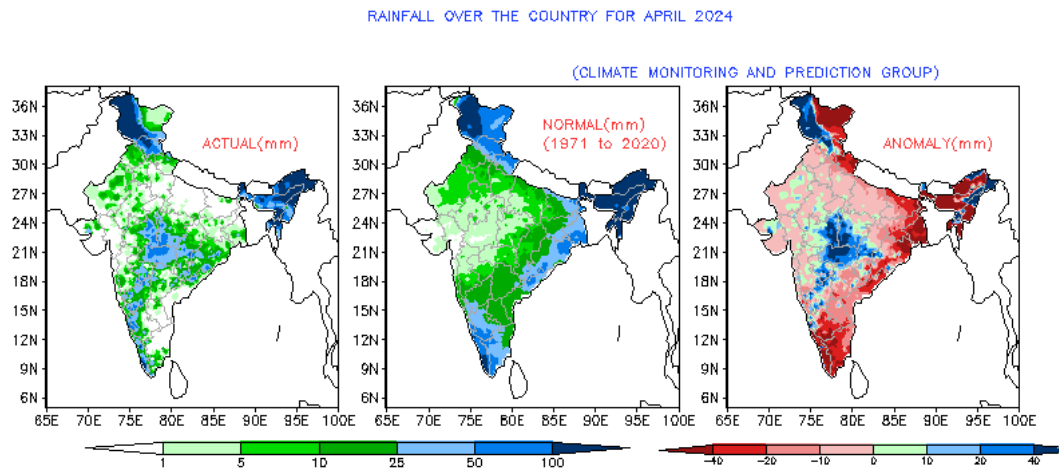
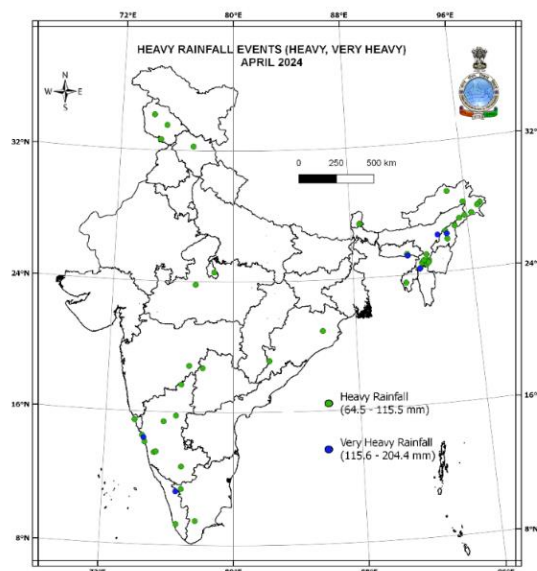


Fig. 3: Observed spatial Rainfall pattern for the month April 2024 over India and their departure from normal (1971 to 2020 period).

2. Frequency of Heavy Rainfall events

April 2024 witnessed very heavy rainfall events (115.6 to 204.4 mm) mainly over Assam & Meghalaya, Nagaland, Manipur, Mizoram & Tripura, Coastal Karnataka and Tamil Nadu, Puducherry & Karaikal and heavy rainfall events (64.5 – 115.5 mm) were observed mainly over Odisha, Arunachal Pradesh, Sub Himalayan West Bengal & Sikkim, Jammu & Kashmir, South and North Interior Karnataka. The location of occurrences of heavy and very heavy rainfall events is shown in the Figure 4. Out of total 49 occasions, 6 were very heavy rainfall (115.6 to 204.4 mm) and 43 were heavy rainfall (64.5 to 115.5 mm) categories during this month.



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

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

3. Chief Synoptic weather features observed during April 2024

A total of five Western Disturbances (WDs) (1-8, 9-12, 11-17, 17-21 & 24-29 April) caused rain/snow over western Himalayan states (Jammu-Kashmir-Ladakh-Gilgit-Baltistan-Muzaffarabad, Himachal Pradesh and Uttarakhand) and adjoining plains of India for 2-4 days. Isolated heavy rain/snow also reported for 3-5 days in the month. 4 of these WDs were very slow moving and these WDs also caused rain/thundershowers and hail storm over plains of north and central India at regular intervals. They also caused rain/Thunderstorms and hail storm over plains of north and central India at regular intervals(refer Table below). Lower level winds with moisture incursions from north Bay of Bengal, caused heavy rainfall over Arunachal Pradesh, Assam & Tripura during some dates in the month.

4. Characteristics of Temperatures and Heat Wave conditions for the month of April 2024

The average maximum, average minimum and mean temperature for the country as a whole during April 2024 were 35.67°C, 22.45°C and 29.06°C respectively, against the normal of 35.02°C, 21.57°C and 28.29°C based on data of 1991-2020. Thus, the average maximum, average minimum and mean temperature were above normal with departure from normal of 0.65°C, 0.88°C and 0.76°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 April 2024 is shown in the figure 5(a) and (b) respectively.

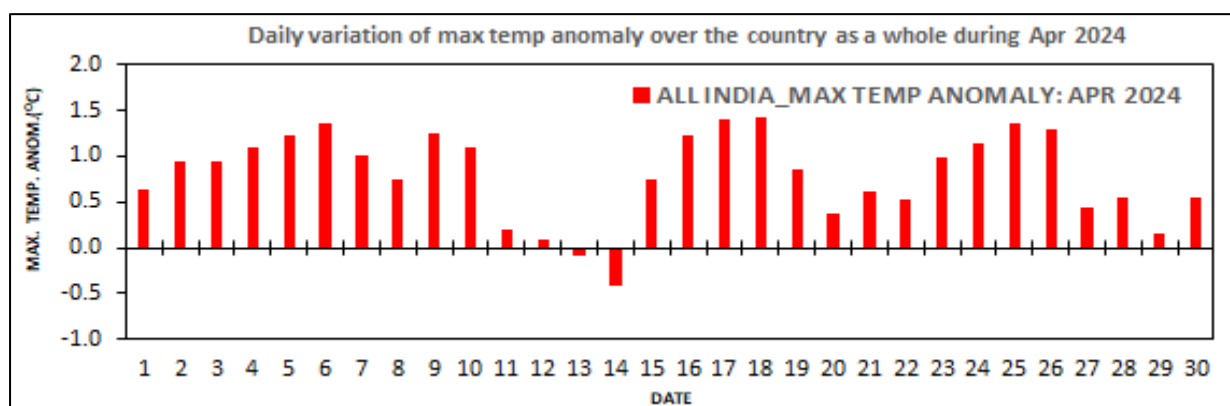


Fig. 5(a): Daily variation of maximum temperature anomaly (departure from normal) over the country as a whole for April 2024.

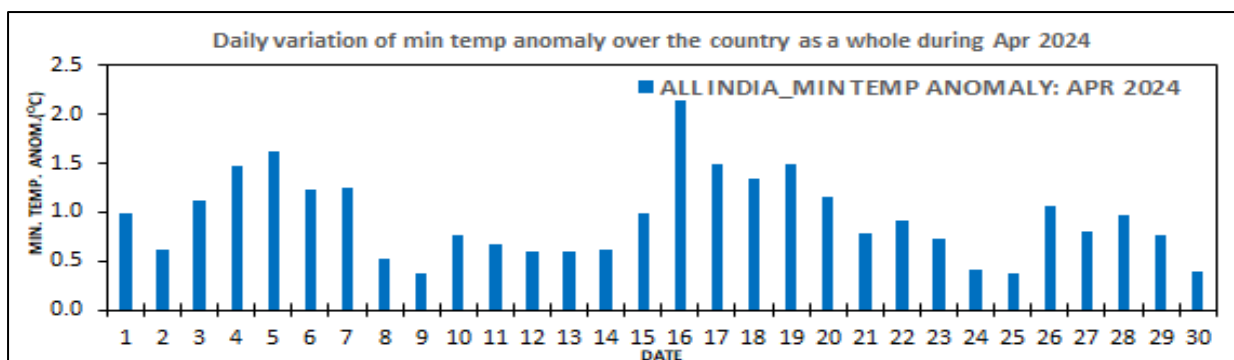


Fig. 5(b): Daily variation of minimum temperature anomaly (departure from normal) over the country as a whole for April 2024.

Figure 6 shows time series of monthly average maximum, average minimum and mean temperature over the country as a whole for the month of April 1901-2024. Over the country during April, the average maximum temperature was 35.67°C with departure from normal of 0.65°C (11th highest since 1901). The average minimum temperature was 22.45°C with departure from normal of 0.88°C (6th highest since 1901). The mean temperature was 29.06°C with departure from normal of 0.76°C (8th highest since 1901).

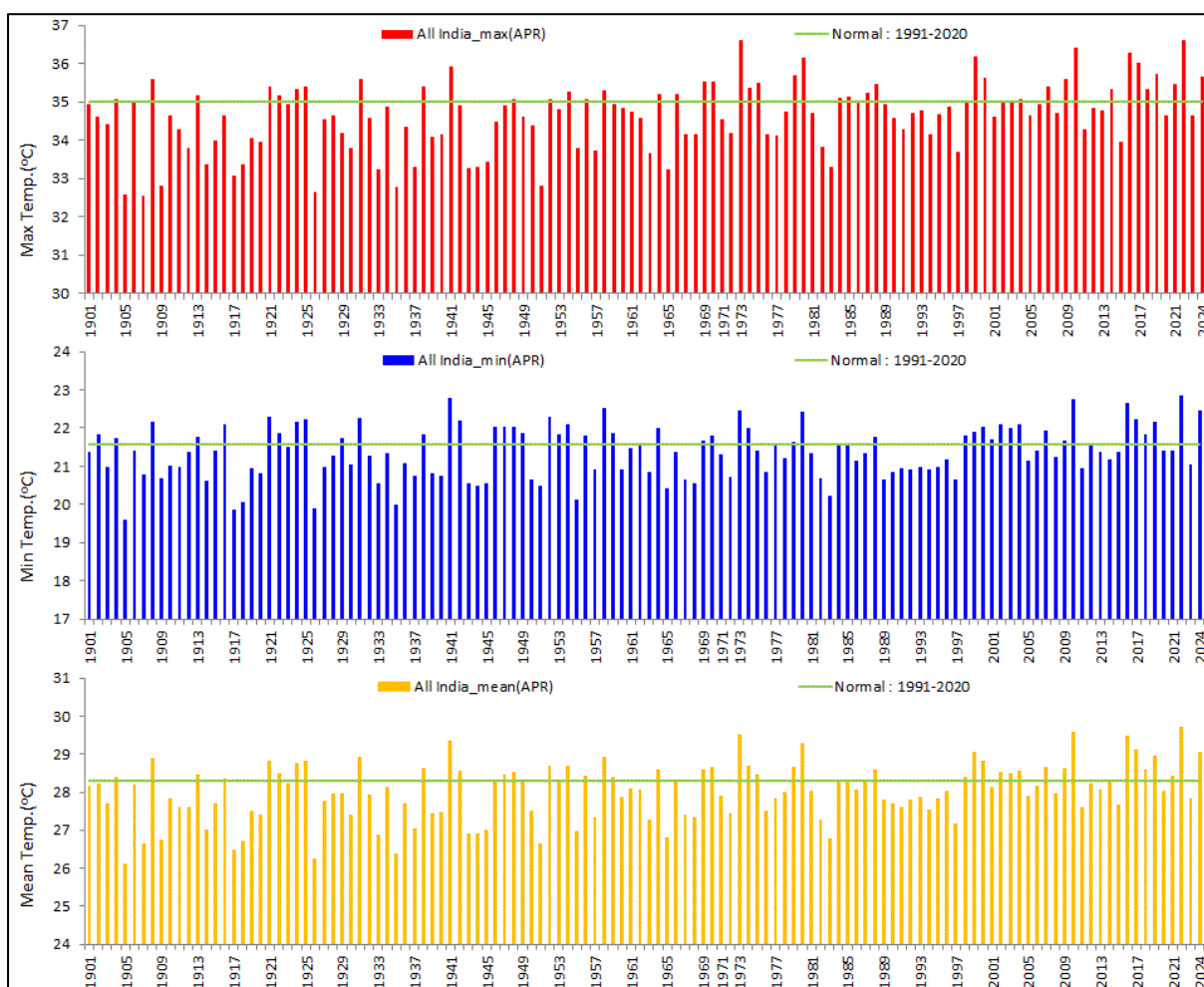


Fig. 6: Time series of monthly average maximum, average minimum and mean temperature over the country as a whole for the month of April 1901-2024.

Figure 7 shows time series of average maximum, average minimum and mean temperature over the South Peninsular India for the month of April 1901-2024. Over South Peninsular India during April, the average maximum temperature was 2nd highest (37.25°C with departure from normal of 1.35°C) after the year 2016 (37.57°C) since 1901. The average minimum temperature was also 2nd highest (25.53°C with departure from normal of 1.09°C) after the year 2016 (25.80°C) since 1901. The mean temperature was 2nd highest (31.39°C with departure from normal of 1.22°C) after the year 2016 (31.68°C) since 1901.

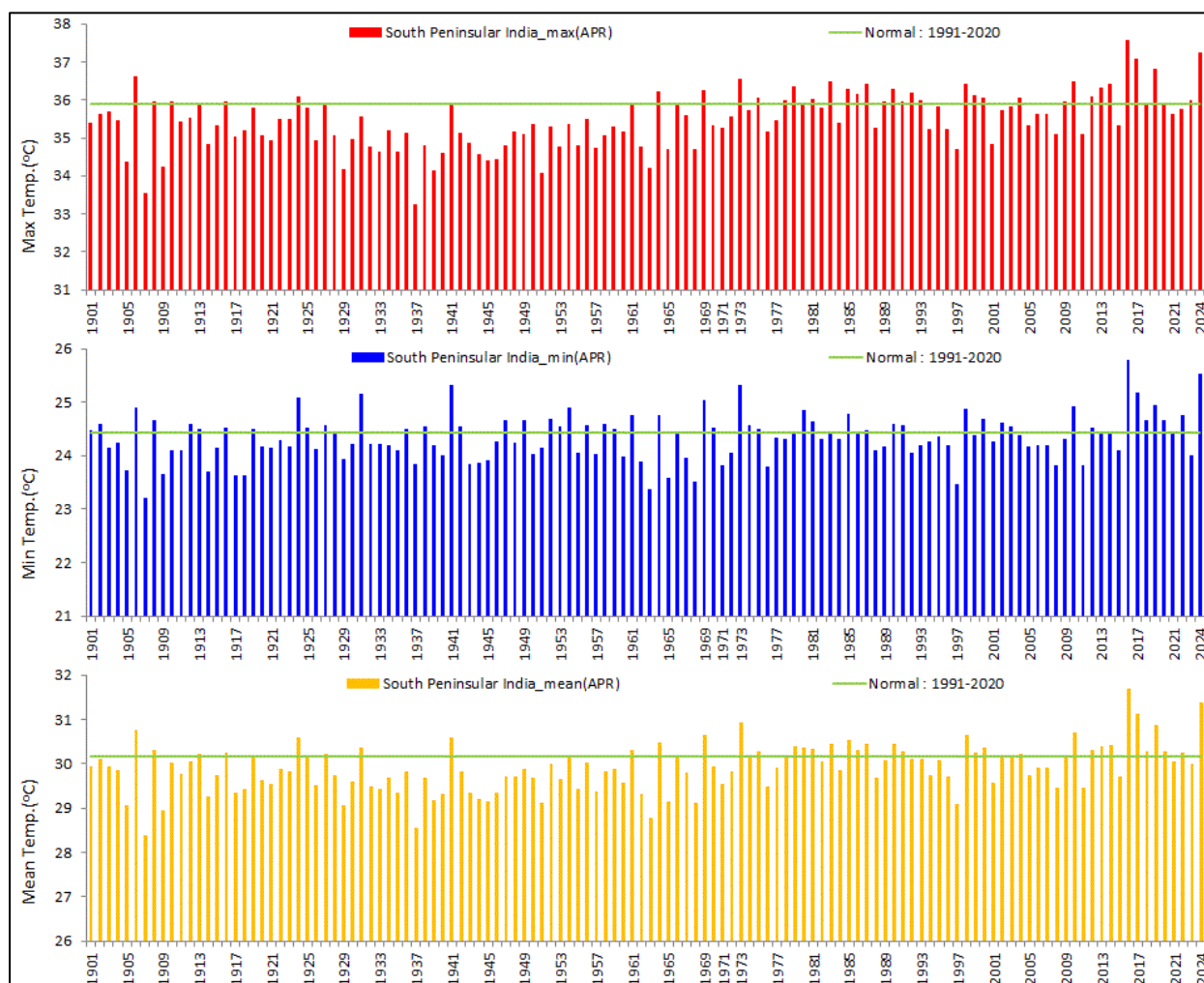


Fig. 7: Time series of monthly average maximum, average minimum and mean temperature over South Peninsular India for the month of April 1901-2024.

Figure 8 shows time series of average maximum, average minimum and mean temperature over the East & Northeast India for the month of April 1901-2024. Over East & Northeast India during April, the average maximum temperature was 9th highest (34.05°C with departure from normal of 2.25°C) since 1901. The average minimum temperature was highest at 22.19°C since 1901 against the earlier record of 21.99°C in 2022. The mean temperature was highest at 28.12°C since 1901 against the earlier record of 28.09°C in 1908.

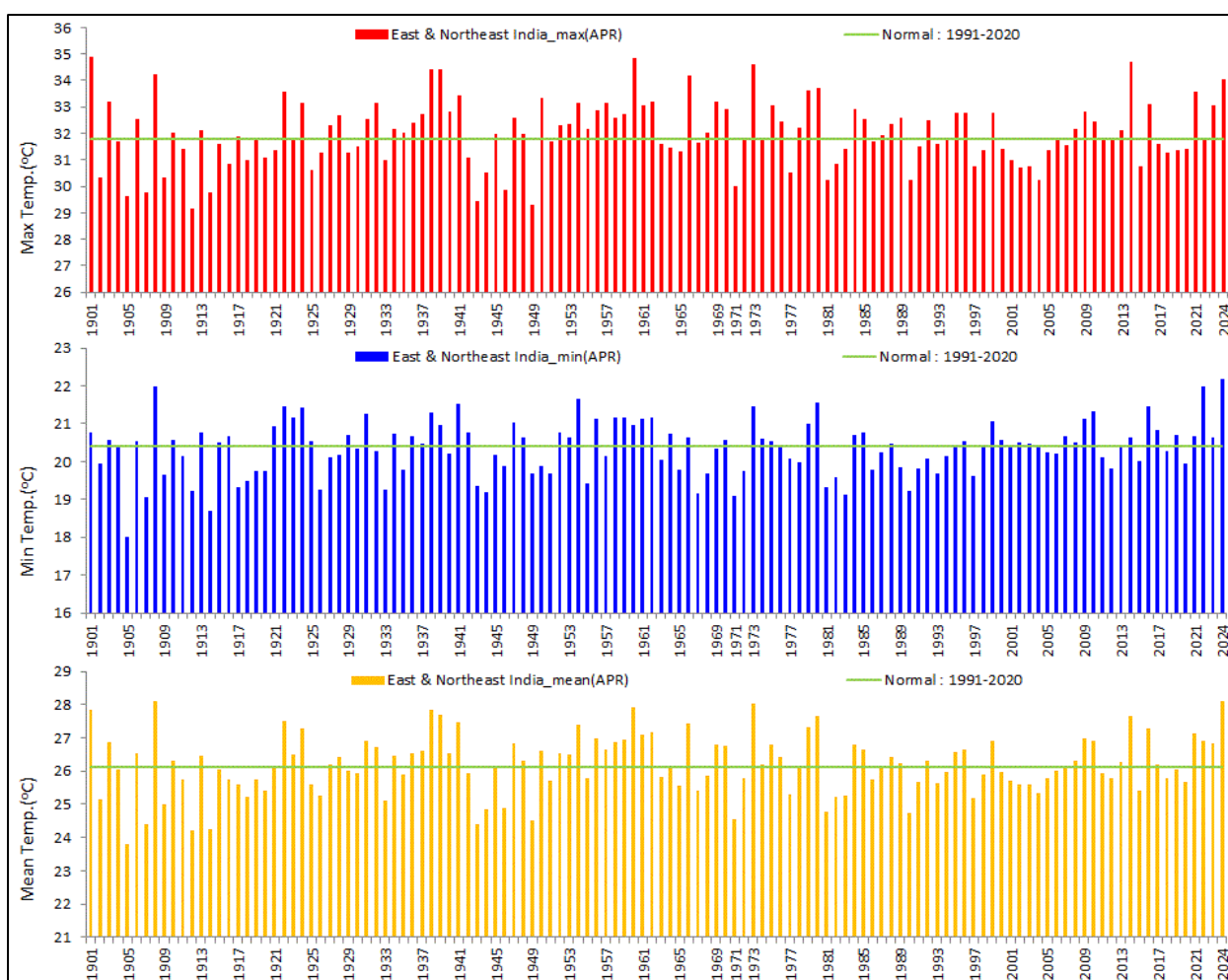


Fig. 8: Time series of monthly average maximum, average minimum and mean temperature over East & Northeast India for the month of April 1901-2024.

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

APR 2024		Max Temp (°C)	Min Temp (°C)	Mean Temp (°C)
ALL INDIA	ACTUAL	35.67	22.45	29.06
	NORMAL	35.02	21.57	28.29
	ANOMALY	0.65	0.88	0.76
	Rank since 1901	11	6	8
NORTHWEST INDIA	ACTUAL	33.25	18.86	26.06
	NORMAL	33.45	18.54	26.00
	ANOMALY	-0.20	0.32	0.06
	Rank since 1901	48	33	43
EAST & NORTHEAST INDIA	ACTUAL	34.05	22.19	28.12
	NORMAL	31.80	20.41	26.11
	ANOMALY	2.25	1.78	2.01
	Rank since 1901	9	1	1
CENTRAL INDIA	ACTUAL	37.88	23.87	30.87
	NORMAL	37.90	23.17	30.54
	ANOMALY	-0.03	0.70	0.34
	Rank since 1901	49	12	26
SOUTH PENINSULAR INDIA	ACTUAL	37.25	25.53	31.39
	NORMAL	35.89	24.43	30.16
	ANOMALY	1.35	1.09	1.22
	Rank since 1901	2	2	2

Note: Values are rounded off to nearest two decimals.

The five highest temperature records with corresponding top ranks since 1901

along with year of occurrence for East & Northeast India (TMin, TMean) and South Peninsular India (TMax, TMin, TMean) are given in the table below:

East & Northeast India (April 2024)					South Peninsular India (April 2024)				
Year	TMin	Normal	Anomaly	Rank	Year	TMax	Normal	Anomaly	Rank
2024	22.19	20.41	1.78	1	2016	37.57	35.89	1.68	1
2022	21.99		1.58	2	2024	37.25		1.35	2
1908	21.97		1.56	3	2017	37.07		1.18	3
1954	21.64		1.23	4	2019	36.80		0.91	4
1980	21.57		1.16	5	1906	36.63		0.74	5

East & Northeast India (April 2024)					South Peninsular India (April 2024)				
Year	TMean	Normal	Anomaly	Rank	Year	TMin	Normal	Anomaly	Rank
2024	28.12	26.11	2.01	1	2016	25.80	24.43	1.36	1
1908	28.09		1.98	2	2024	25.53		1.09	2
1973	28.03		1.93	3	1973	25.32		0.88	3
1960	27.91		1.81	4	1941	25.31		0.88	4
1938	27.86		1.75	5	2017	25.17		0.74	5

South Peninsular India (April 2024)				
Year	TMean	Normal	Anomaly	Rank
2016	31.68	30.16	1.52	1
2024	31.39		1.22	2
2017	31.12		0.96	3
1973	30.93		0.77	4
2019	30.87		0.71	5

Maximum temperature was above normal by 4.4°C mainly over most parts of south peninsular India, east & northeast India, north India and east cost of central India. Figure 9 shows the stations with number of days, which were above normal (>4.4 °C) maximum temperatures.

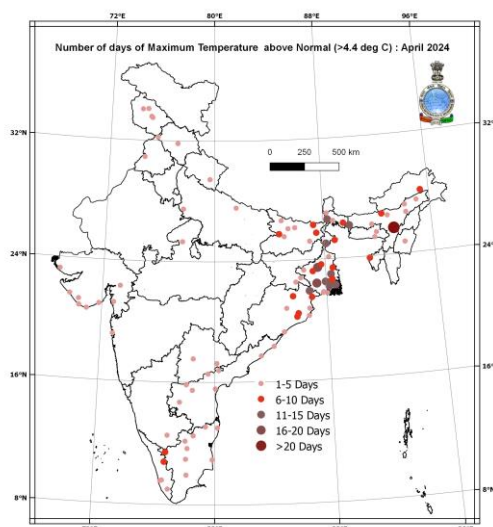


Fig. 9: Number of days with maximum temperature above normal (>4.4 °C) over the country for April 2024.

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 April 2024 is given in Figure 10.

TEMPERATURE & ITS ANOMOLY FOR THE MONTH APRIL 2024

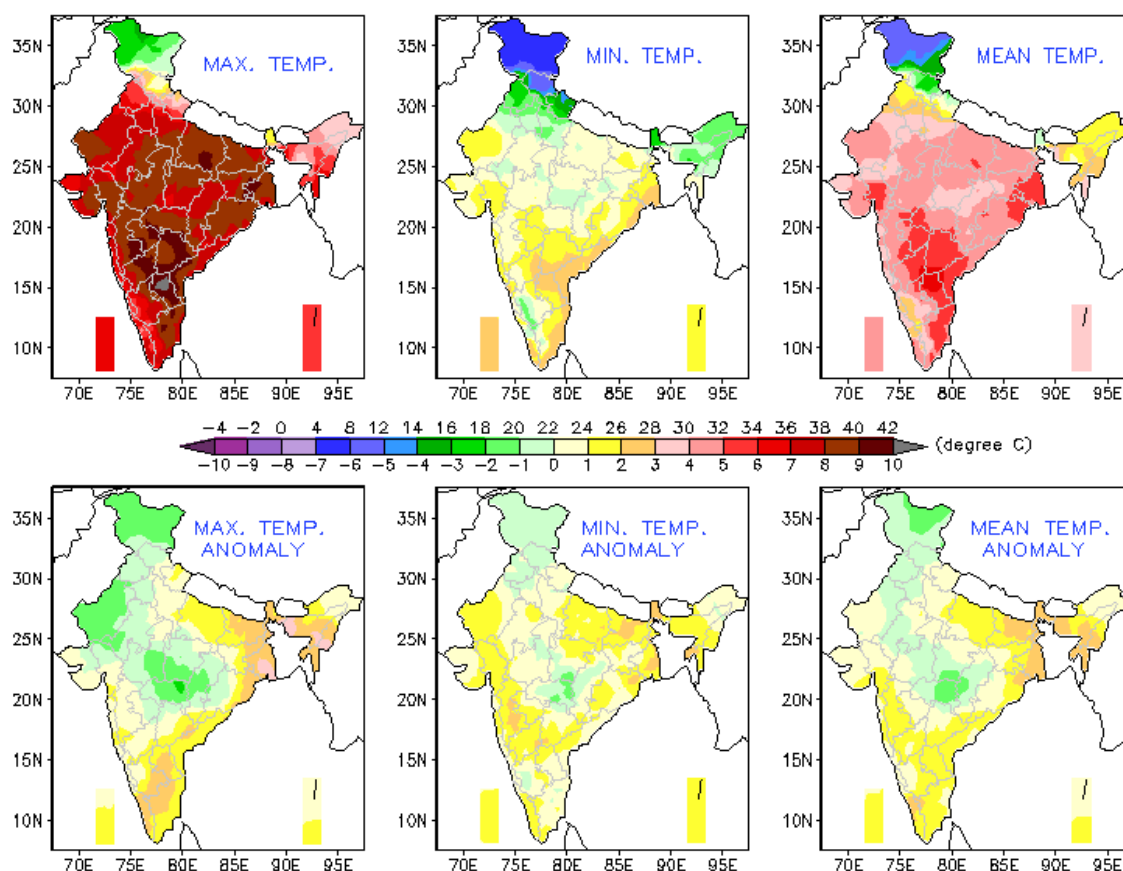


Fig. 10: Observed spatial temperature pattern of monthly average maximum, average minimum, and mean temperature over India (top three from left to right) and their departure from normal (1991 to 2020 period) for April 2024 (lower three from left to right).

India experienced two major spells of heat waves during April: (i) 5-7 April over eastern India and southeast Peninsular India and (ii) 15-30 April over Odisha and West Bengal. Heat waves were intensified and expanded to Bihar Jharkhand, Southeast Peninsular India and interior Karnataka from 24 April and continued to remain till 30 April. However, no heat wave was observed over north & central India during April 2024 due to WDs moved from far west. **Main reasons for such longer spell of Heat wave over respective areas were i) longer dry spell with absence of Thunderstorm/Rain ii) Anticyclone persisted in most dates at lower levels over west central Bay and adjoining Eastern coasts of India, which caused Sea breeze Cut-Off over Odisha and West Bengal in most dates.** Fig 11 shows meteorological sub-division-wise total number of Heat wave days and severe heat wave days as observed over India during the month of the April 2024.

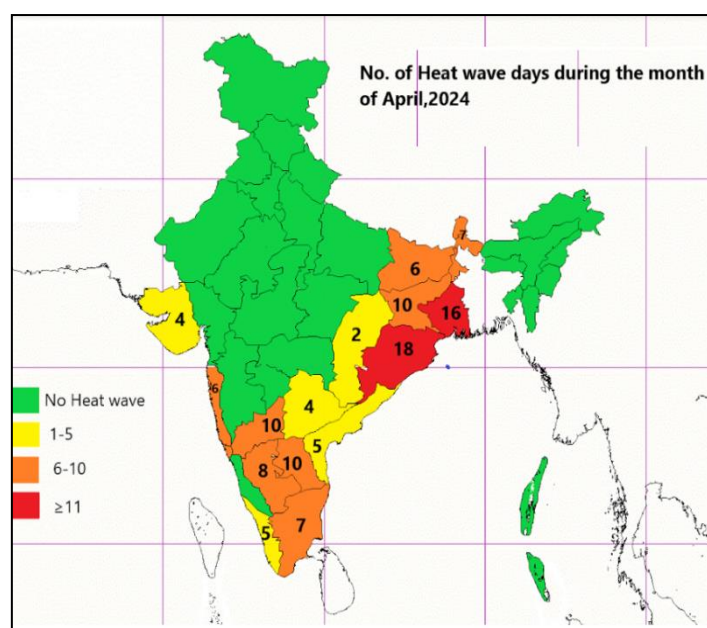


Fig 11: Total number of Heat wave days and severe heat wave days over different meteorological sub-division as observed over India during the month of the April 2024

5. Significant Weather Events:

During April, total 32 persons reportedly died & 30 livestock perished. The details of casualties given below are based on real time media reports. Fig. 11 shows significant weather events during April 2024. (Based on real time media reports.)

Heat Wave: Total 9 persons reportedly died during April, because of Heat Wave. The details of the area effected by the events are summarized and given in the table below:

DATE	DEATH	DISTRICT (STATE) AFFECTED
April month including 14, 15 Apr.	5	Balasore, Boudh, Cuttack, Puri, Sambalpur (Odisha)
23, 24 Apr.	2	Banka, Vaishali (Bihar)
28 Apr.	2	Kannur, Palakkad (Kerala)

Lightning: Total 17 persons reportedly died & 28 livestock perished in the month of April due to lightning. The details of the area effected by the events are summarized and given in the table below:

DATE	DEATH	LIVESTOCK	DISTRICT (STATE) AFFECTED
11, 20 Apr.	4		Bijapur/Vijayapura. Gulbarga/ Kalaburagi, Udupi (Karnataka)
16 Apr.	4		Kendrapara (Odisha)

1, 9, 17 Apr.	3		Hailakandi (Assam)
6 Apr.	2		Hooghly, North 24 Parganas (West Bengal)
19 Apr.	1	28	Nandyal (Andhra Pradesh)
24 Apr.	1		Jind (Haryana)
15 Apr.	1		Pune (Maharashtra)
12 Apr.	1		Nagarkurnool (Telangana)

Thunderstorm: Total 4 persons reportedly died & 2 livestock perished during April, because of Thunderstorm. The details of the area effected by the events are summarized and given in the table below:

DATE	DEATH	LIVESTOCK	DISTRICT (STATE) AFFECTED
17 Apr.	3	2	Bongaigaon, Udalguri (Assam)
31 Mar. to 2 Apr.	1		Aizawl, Champhai, Kolasib, Saitual, Serchhip (Mizoram)

While, Chandrapur, Chhatrapati Sambhajinagar/Aurangabad, Dharashiv/Osmanabad, Jalna, Latur, Nagpur, Nanded, Parbhani, Wardha districts of Maharashtra were affected on 10 Apr.; Chirang, Golaghat, Hailakandi, Jorhat, Karbi Anglong districts of Assam on 17 Apr.; Unakoti district of Tripura affected on 27 Apr due to Thunderstorm activity.

Heavy Rains & Landslide: Total 2 persons reportedly died during April, because of Landslide. The details of the area effected by the events are summarized and given in the table below:

DATE	DEATH	DISTRICT (STATE) AFFECTED
28 Apr.	2	Shimla (Himachal Pradesh)

While, Dibang valley district of Arunachal Pradesh affected on 25 Apr. due to Landslide and Akola, Buldhana, Jalgaon, Washim districts of Maharashtra affected on 10 Apr. due to Heavy Rains.

Hailstorm: Damage to crops reported in Amaravati district of Maharashtra on 10 Apr. and Karnal district of Haryana 19 Apr. due to Hailstorm.

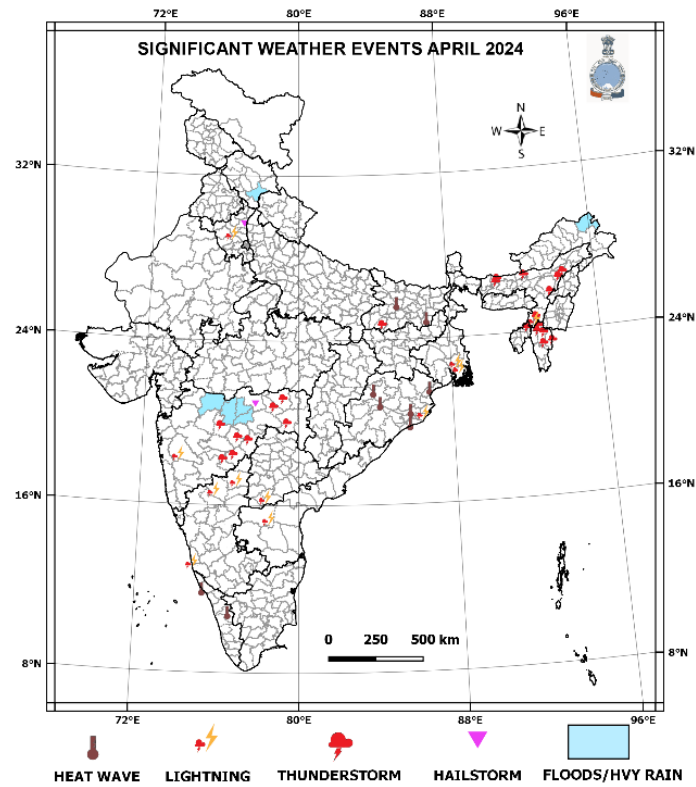


Fig. 11: Deaths and damages due to significant weather events during April 2024. (Based on real time media reports.)
