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Climate Research and Services (CRS)

Climate Summary for the month of November 2022

1. Monthly Rainfall Scenario (01 to 30 November 2022)

Rainfall over the country as a whole for the month of November 2022 shows that it has recorded 18.7 mm, which is 37% less than its Long Period Average (LPA) of 29.7 mm.

Rainfall over the homogeneous region of East & Northeast India (0.4 mm) was the lowest since 1901. Rainfall over the homogeneous region of Central India (0.4 mm) was the fifth lowest since 1901. Prior lowest rainfall years are 2011 (0.1mm), 1954(0.2mm), 1920(0.3mm), 1970(0.3mm), and 1952(0.4mm).

The monthly rainfall for November 2022 is given in the table below:

Regions	Actual Rainfall (mm)	Normal Rainfall (mm)	% Departure from LPA
Country as a whole	18.7	29.7	-37.0
Northwest India	15.2	12.1	26.0
Central India	0.4	14.0	-97.0
South Peninsula	70.2	89.8	-22.0
East & northeast India	0.4	22.6	-98.0

During this month, 1 sub-division received large excess, 3 normal, 6 deficient, and 17 received largely deficient rainfall and 9 subdivisions did not receive any rain.

The observed spatial rainfall, normal rainfall (period 1971 to 2020), and its departures from normal for the month of November 2022 are given in Figure 1.

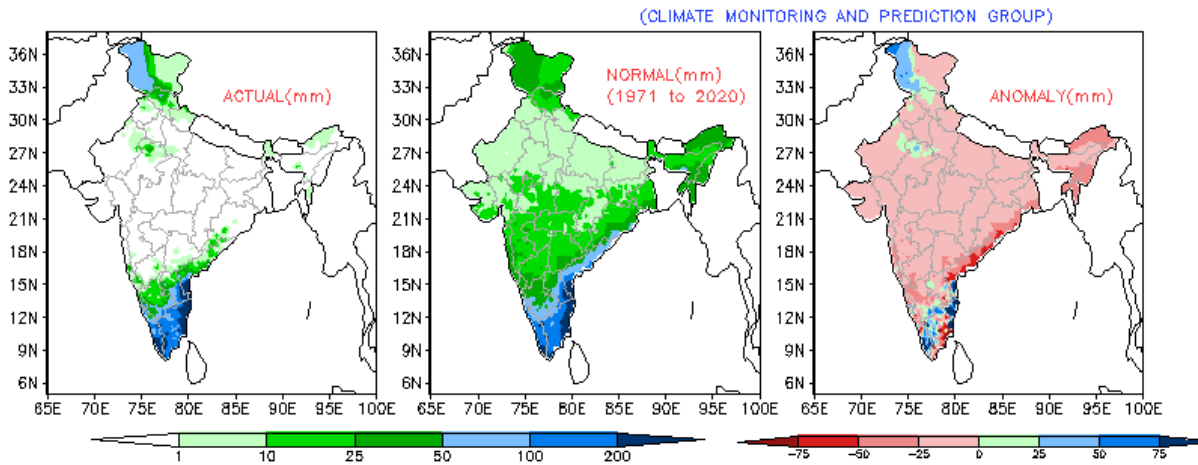
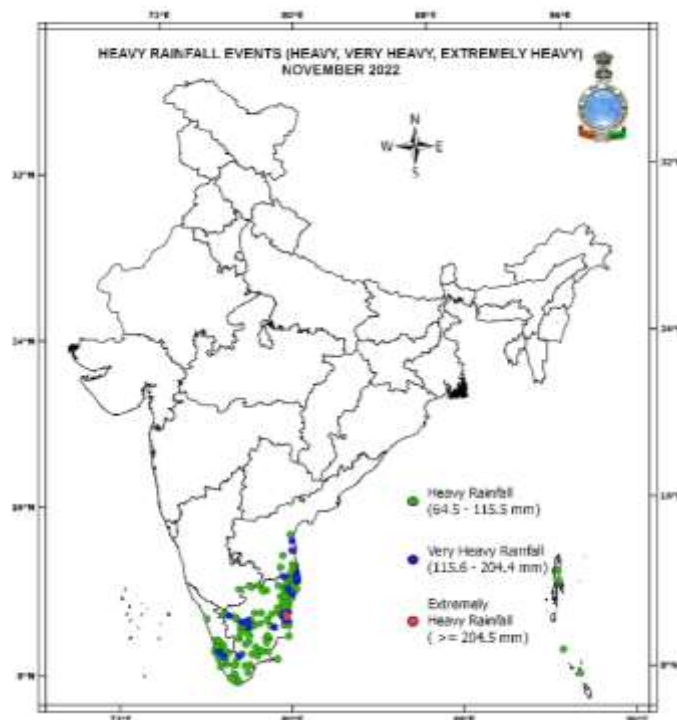


Fig 1: Observed spatial Rainfall pattern for the month of November 2022 over India and their departure from normal (1971 to 2020 period).

2. Frequency of Heavy Rainfall events

November 2022 witnessed extremely heavy rainfall events mainly over Tamil Nadu, Puducherry & Karaikal, Kerala & Mahe, and Coastal Andhra Pradesh. The location of occurrences of heavy, very heavy, and extremely heavy rainfall events is shown in Figure 2. Out of the total of 131 stations, 2 stations reported extremely heavy rainfall (>204.5 mm), 22 stations reported very heavy rainfall (115.6 to 204.4 mm) and 107 stations reported heavy rainfall (64.5 to 115.5 mm of rainfall) during this month.



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

Fig 2: The location of occurrences of heavy rainfall events in the month of November 2022.

Chief synoptic features during November 2022.

3. Depressions and Western Disturbance formed over Indian Region

During the month, one depression formed over the Bay of Bengal during the period 20 - 22 November. Besides this depression, a well-marked low-pressure area formed over the Bay during 9 -14 November. The track of depression is shown in figure 3. During November month there were five Western Disturbances (WDs) which cause good rainfall over the north Indian region. Out of these, 2 WDs(2-5 and 6-9 Nov) impacted north India and caused isolated to scattered rain or snowfall over the Western Himalayan region and rainfall over adjoining areas. The remaining three systems were feeble (13-15,18-21 and 22-24 Nov) and located over north of 30° N and did not affect the region.

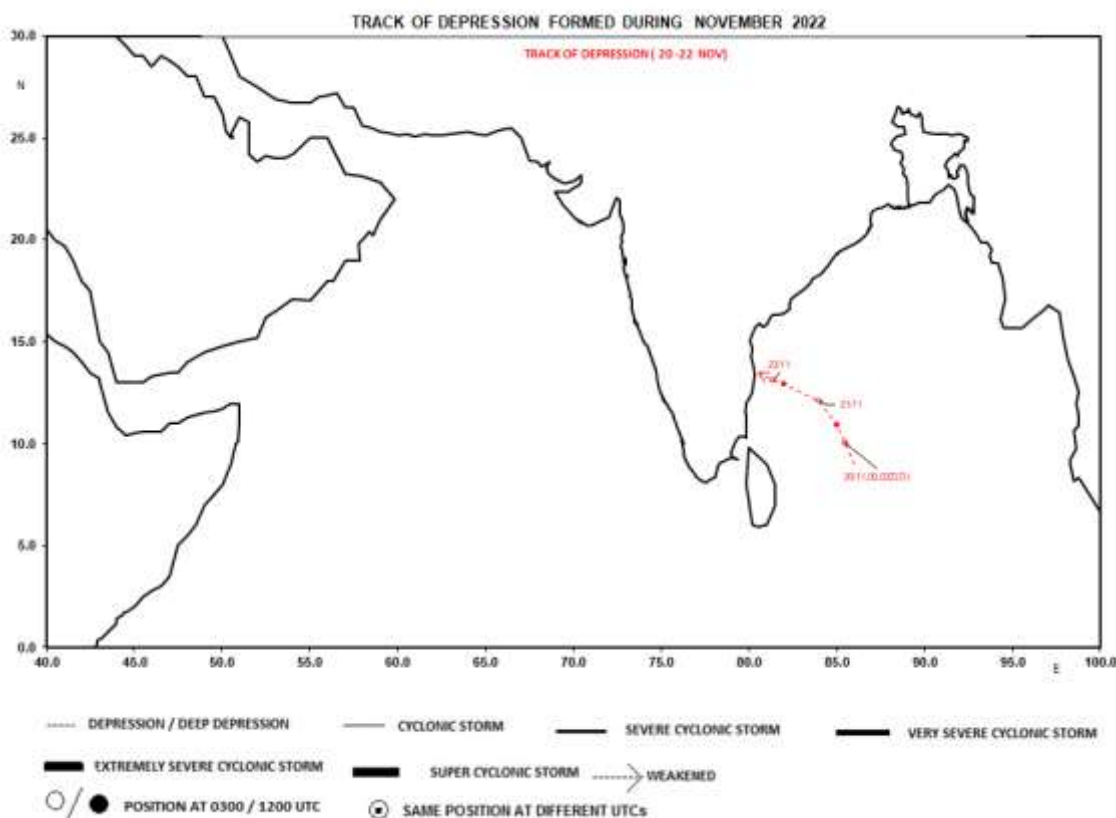


Fig 3: Track of depression formed during November 2022.

4. Characteristics of Temperatures for the month of November 2022

The observed average maximum, average minimum and mean temperature for the country as a whole during November 2022 are 29.37 °C, 17.69 °C, and 23.53 °C respectively, against the normal of 29.03 °C, 17.40 °C and 23.22 °C based on period 1981-2010. Thus, the average maximum temperature, average minimum temperature and mean temperature are above normal by 0.34 °C, 0.29 °C, and 0.31 °C respectively for the country as a whole. The climatological data based on the period of 1981 to 2010 are used to calculate the normal and hence the anomaly (Actual average temperature in 2022 - normal temperature based on data of 1981-2010). Figure 4 shows the time series of monthly average maximum, average minimum, and mean temperature over all India for the month of November 1901-2022.

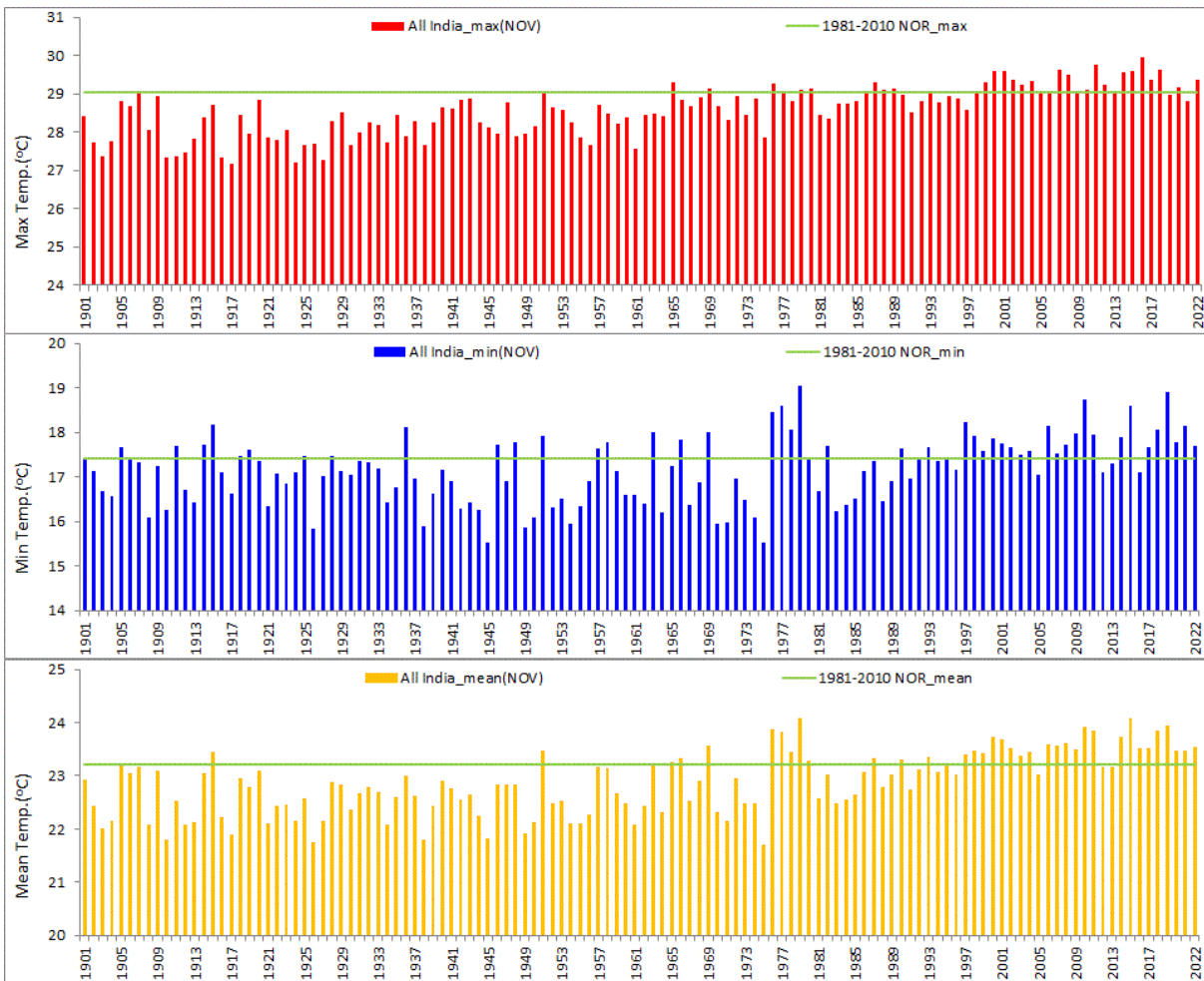


Fig 4: Time series of monthly average maximum, average minimum and mean temperature over all India for the month of November 1901-2022.

Figure 5 shows the time series of monthly average maximum temperature over East & Northeast India for the month of November 1901-2022. Over East & Northeast India during November, the average maximum temperature is ever highest at 29.06 °C since 1901 and it has broken the earlier ever-highest record of 29.04 °C that was in 1979 for the month of November for the same period.

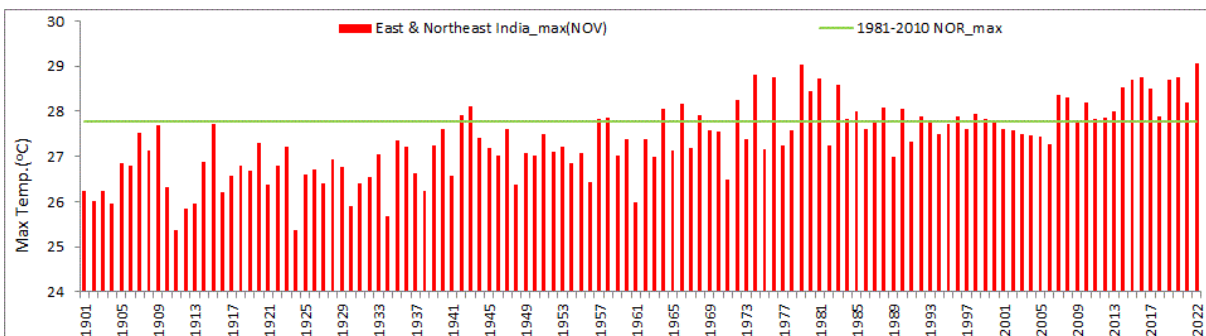


Fig 5: Time series of monthly average maximum temperature over East & Northeast India for the month of November 1901-2022.

The Temperatures during November 2022 for all India and homogeneous regions with its ranks since 1901 are given below;

NOV 2022		Max Temp (°C)	Min Temp (°C)	Mean Temp (°C)
ALL INDIA	ACTUAL	29.37	17.69	23.53
	NORMAL	29.03	17.40	23.22
	ANOMALY	0.34	0.29	0.31
	TOP RANK	12	31	16
NORTHWEST INDIA	ACTUAL	25.65	11.80	18.72
	NORMAL	25.74	10.75	18.24
	ANOMALY	-0.10	1.06	0.48
	TOP RANK	51	12	19
EAST & NORTHEAST INDIA	ACTUAL	29.06	15.68	22.37
	NORMAL	27.79	15.58	21.68
	ANOMALY	1.27	0.10	0.69
	TOP RANK	1	40	8
CENTRAL INDIA	ACTUAL	31.32	17.35	24.34
	NORMAL	31.14	17.60	24.37
	ANOMALY	0.18	-0.25	-0.03
	TOP RANK	28	56	47
SOUTH PENNINSULAR INDIA	ACTUAL	30.63	22.54	26.59
	NORMAL	30.37	22.34	26.36
	ANOMALY	0.26	0.20	0.23
	TOP RANK	19	49	21

Note: Values are rounded off to the nearest two decimal

The five highest temperature records with corresponding ranks since 1901 along with year occurrence for East & Northeast India (TMax) are given in the table below;

East & Northeast India (November 2022)				
Year	TMax	Normal	Anomaly	Rank
2022	29.06	27.79	1.27	1
1979	29.04		1.25	2
1974	28.81		1.02	3
2020	28.77		0.98	4
2016	28.76		0.98	5

The observed spatial temperature pattern of monthly average maximum, average minimum and mean temperature over India and their departures from normal (1981 to 2010 period) for the month of November 2022 is given in Figure 6.

TEMPERATURE & ITS ANOMOLY FOR THE MONTH NOV 2022

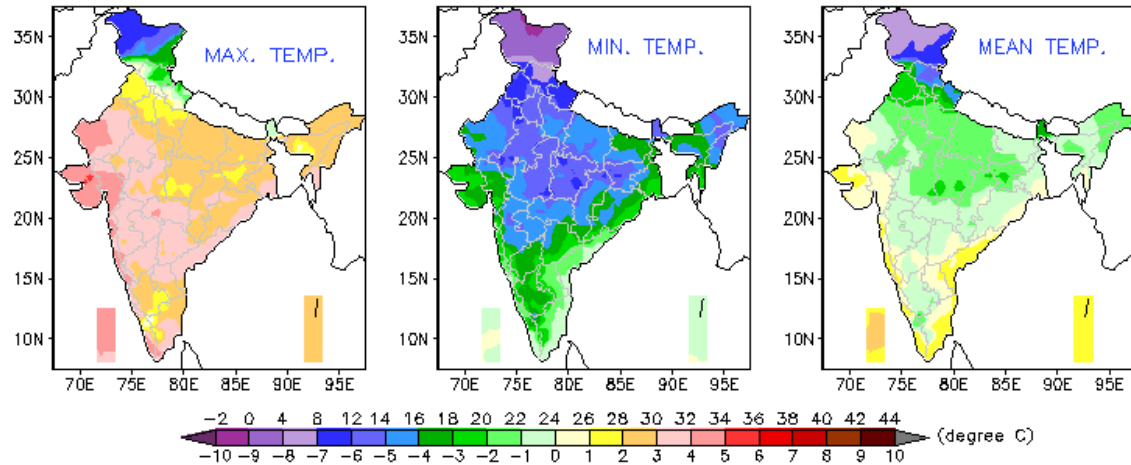


Fig 6: Observed spatial temperature pattern of monthly average maximum, average minimum and mean temperature over India (top three from left to right) and their departure from normal (1981 to 2010 period) for November 2022 (lower three from left to right).

5. Significant Weather Events for the month of November 2022:

During November, a total of 11 persons were reportedly claimed dead. The details of casualties are given below, which are based on real-time media reports and other state government agencies.

Fig.7 shows significant weather events during the month. (Based on real-time media reports.)

Floods, Heavy Rains & Landslides: A total of 3 persons reportedly claimed dead during November, due to Floods, Heavy Rains & landslides. The details of the area affected by the events are summarized and given in the table below;

DATE	DEATH	DISTRICT (STATE/UT) AFFECTED
1 Nov.	2	Chennai (Tamil Nadu)
15 Nov.	1	Doda (Jammu & Kashmir)

Lightning: A total of 4 persons reportedly claimed dead during November, because of Lightning. The details of the area affected by the events are summarized and given in the table below;

DATE	DEATH	DISTRICT (STATE/UT) AFFECTED
14 Nov.	3	Pudukottai (Tamil Nadu)
14 Nov.	1	Dakshina Kannada (Karnataka)

SNOWFALL: Three Indian Army personnel 56 Rashtriya Rifles reportedly claimed dead due to a snow avalanche in the Kupwara district of Jammu & Kashmir on 18th November.

Cold Wave: One person reportedly claimed dead due to the cold wave in the Prabhani district of Maharashtra on 21st November.

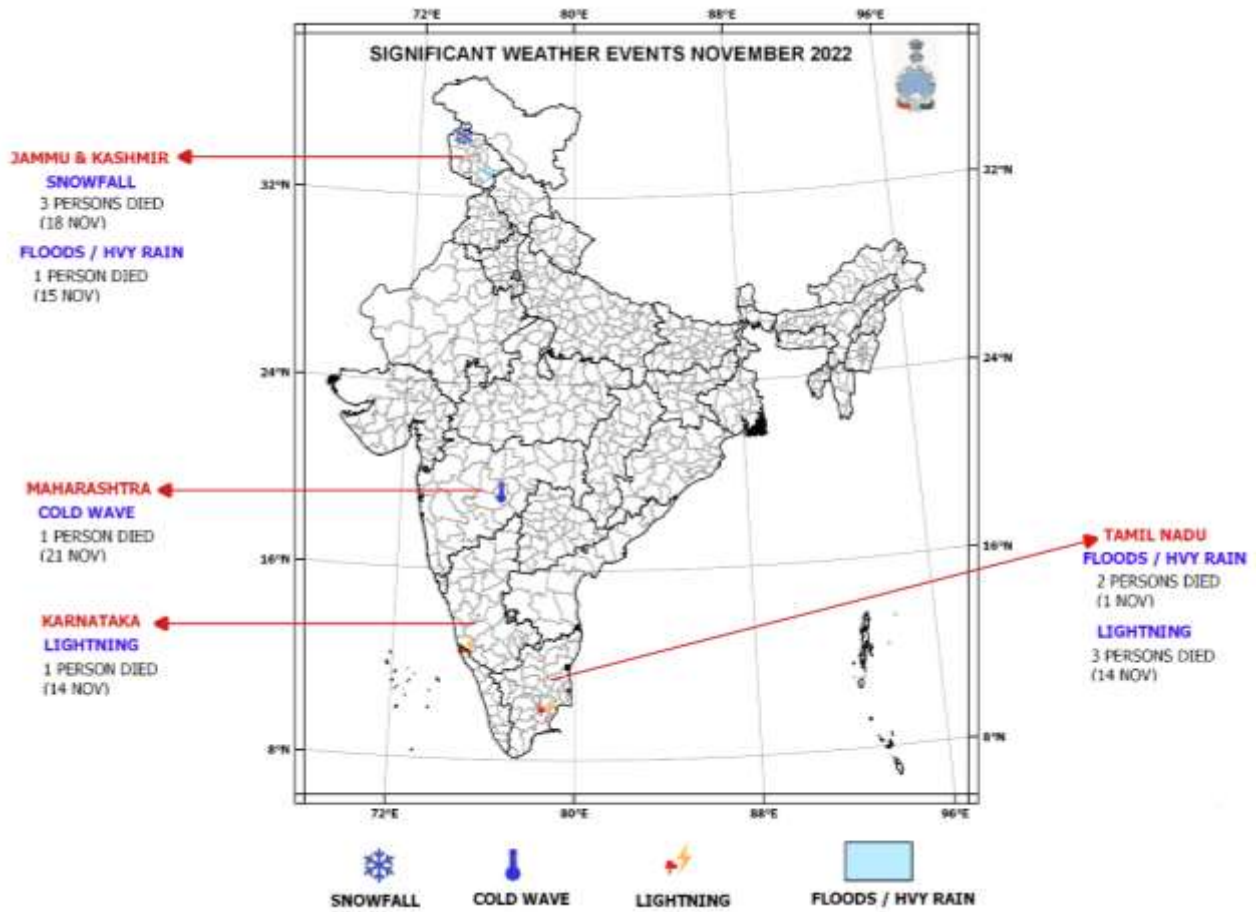


Fig 7: Significant weather events during November 2022 (Based on real-time media report)