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Climate Research and Services (CRS)

Climate Summary for the month of October 2022

1. Monthly Rainfall Scenario (01 to 31 October, 2022)

Rainfall over the country as a whole for the month of October 2022 shows that it has recorded 110.8 mm, which is 47% more than its Long Period Average (LPA) 75.4 mm.

Rainfall over homogeneous region of Northwest India (64.3 mm) was 7th highest since 1901 after the years 1956 (149.9 mm), 1955 (148.5 mm), 1917 (102.2 mm), 1985 (92.7 mm), 1903 (72.7 mm) and 2021 (66.5 mm)

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

Regions	Actual Rainfall (mm)	Normal Rainfall (mm)	% Departure from LPA
Country as a whole	110.8	75.4	47.1
Northwest India	64.3	21.6	197.7
Central India	93.2	57.0	63.6
South Peninsula	170.1	152.3	12.0
East & northeast India	164.5	123.2	33.5

During this month, 12 sub-divisions received large excess, 10 excess, 9 normal, 3 deficient and 2 received large deficient rainfall.

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

RAINFALL OVER THE COUNTRY FOR OCTOBER 2022

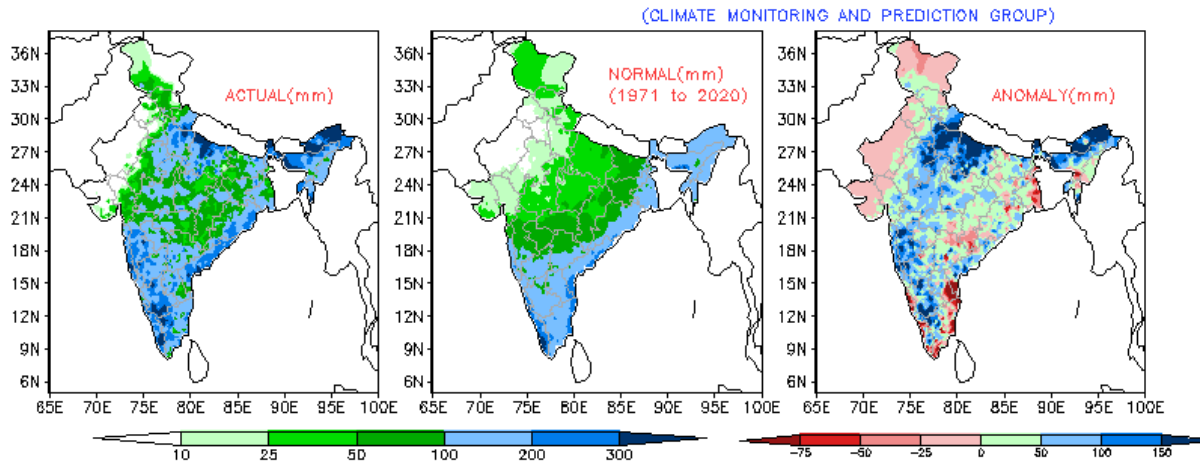


Fig 1: Observed spatial Rainfall pattern for the month of October 2022 over India and their departure from normal (1971 to 2020 period).

2. Withdrawal of southwest monsoon over the country

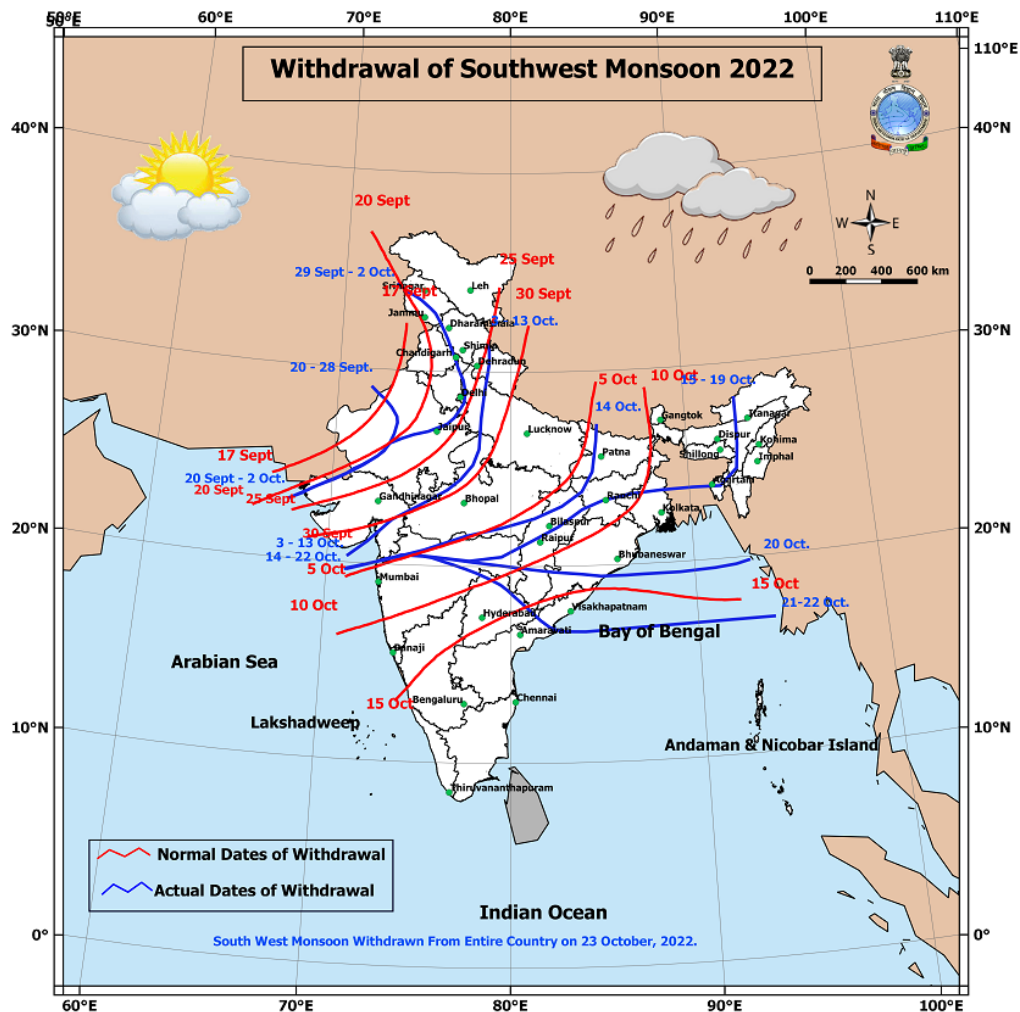


Fig.2 Withdrawal of Southwest Monsoon 2022.

Southwest Monsoon has withdrawn from entire country on 23rd October 2022 against its normal date of withdrawal of 15th October. The normal date of withdrawal and its actual date is shown in Fig.2. There is a delay in withdrawal of southwest monsoon from the Northwest India and withdrawal from entire country. The figure 3 shows the withdrawal date from west Rajasthan with reference to 1st September and withdrawal from entire country for the period 1975 to 2022. It can be seen that there is an increasing trend in withdrawal dates.

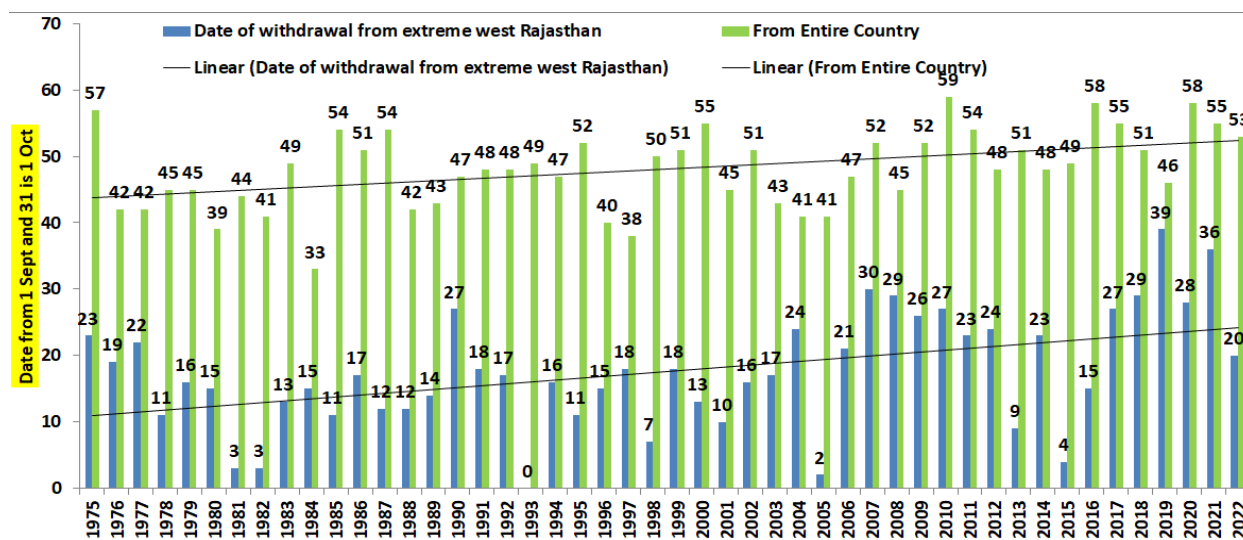
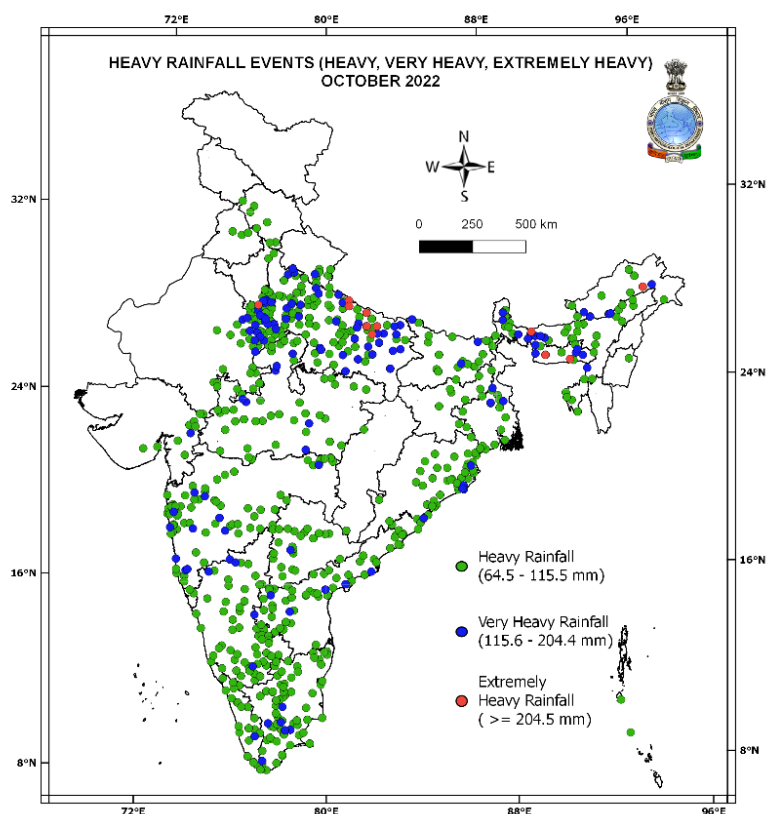


Fig.3 Trends in Withdrawal of southwest monsoon from West Rajasthan and from Entire India during 1975-2022

3. Frequency of Heavy Rainfall events

The October 2022 witnessed extremely heavy rainfall events mainly over East Uttar Pradesh, Assam & Meghalaya, Arunachal Pradesh, East Rajasthan and Sub Himalayan West Bengal & Sikkim. The location of occurrences of heavy, very heavy and extremely heavy rainfall events is shown in the Figure 4. Out of total 725 stations, 12 stations reported extremely heavy rainfall (>204.5 mm), 122 station reported very heavy rainfall (115.6 to 204.4 mm) and 591 stations reported heavy rainfall (64.5 to 115.5 mm of rainfall) during this month.



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

Fig 4: The location of occurrences of heavy rainfall events in the month October 2022.

Some stations received record rainfall (24 hour). The table below shows stations received 24-hour record rainfall and its previous record.

STATION	24 hours record rainfall in October 2022(mm)#	DATE	Previous rainfall record(mm)	DATE
ZIRO	82	25	49	24-10-1970
ITANAGAR	135.4	10	94.1	08-10-2009
BOMDILA	122.4	25	80.8	10-10-1975
ALIGARH	162.8	9	76.6	01-10-1977
BASTI	116	6	90.2	05-10-1996
NAJIBABAD	174	10	114.5	11-10-1983
BUDAUN	98	9	93	04-10-2013
ETAWAH	91	8	46.6	19-10-1987
GONDA	357.6	6	259.6	06-10-1970
HAMIRPUR	108	10	81.5	10-10-1985
FURSATGANJ	87.2	6	73	14-10-2014
NARNAUL	57	9	33.4	10-10-1974
SANGRUR	26.5	11	24.1	09-10-1980
PALAM	63.9	9	52	03-10-2004
ALWAR	98	9	40.5	07-10-1985
SHIVPURI	124	8	83	09-10-1985
CHAMARAJANAGAR	78.4	14	62	23-10-2005
MANDYA	171.8	15	112.5	02-10-2000

based on real time available data

Chief synoptic features during October 2022

During the month, one cyclonic storm “Sitrang” formed over Bay of Bengal during the period 22 - 25 October. Track of cyclonic storm “Sitrang” is shown in figure 5.

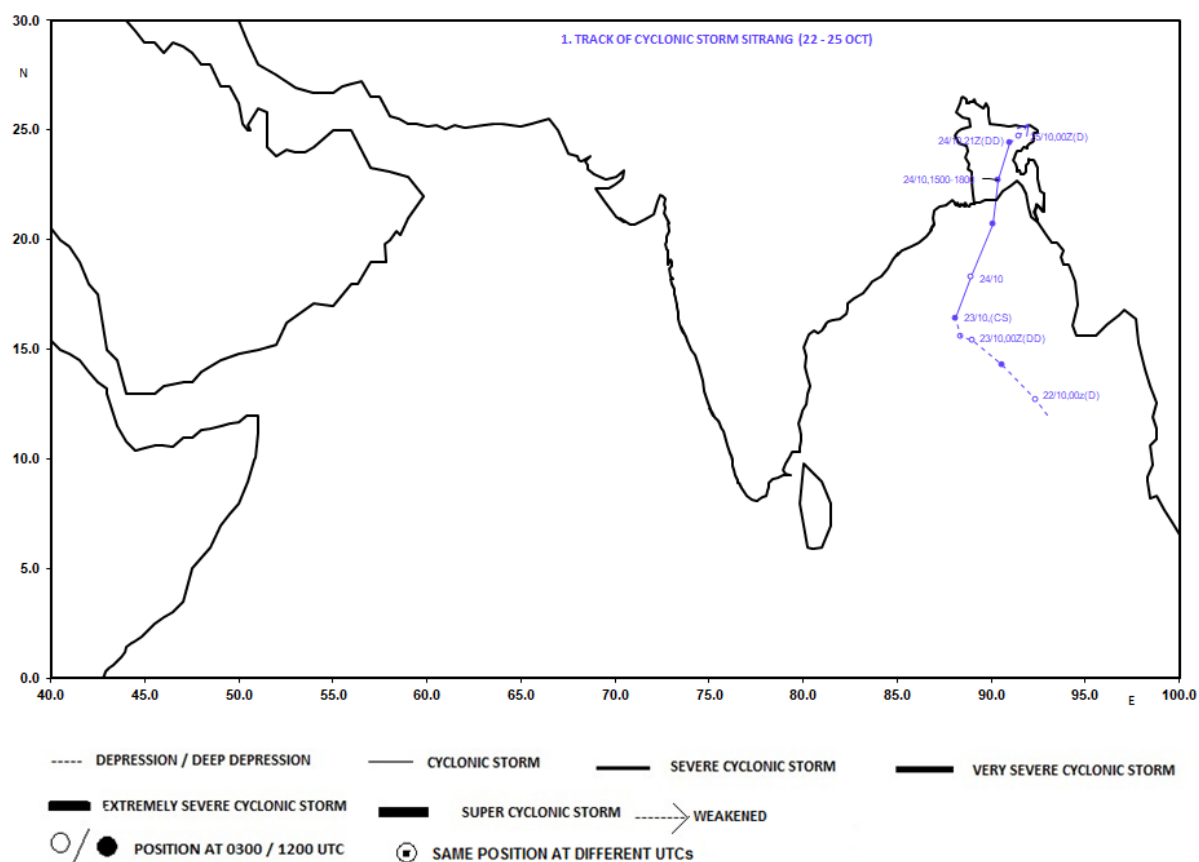


Fig 5: Track of cyclonic storm formed during October 2022.

4. Characteristics of Temperatures for the month of October 2022

The observed average maximum, average minimum and mean temperature for the country as a whole during October 2022 is 31.14 °C, 21.38 °C and 26.26 °C respectively, against the normal of 31.16 °C, 20.88 °C and 26.02 °C based on period 1981-2010. Thus, the average minimum temperature and mean temperature are above normal by 0.49 °C, 0.23 °C respectively except the average maximum temperature is normal by -0.03 °C 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 6 shows time series of monthly average maximum, average minimum and mean temperature over All India for the month of October during 1901-2022.

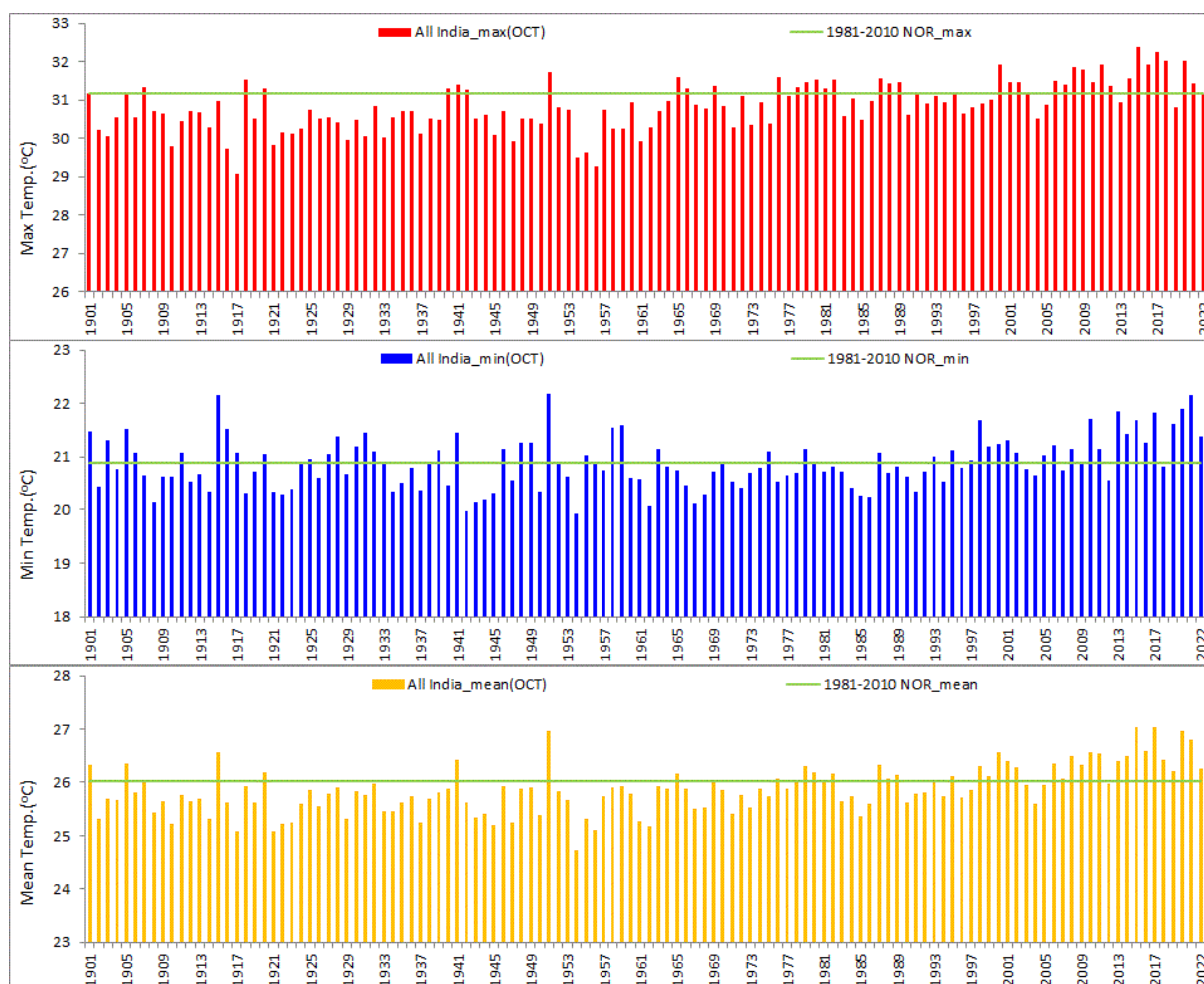


Fig 6: Time series of monthly average maximum, average minimum and mean temperature over all India for the month of October during 1901-2022.

The Temperatures during October 2022 for All India and four homogeneous regions with its ranks since 1901 are given below:

OCT 2022		Max Temp (°C)	Min Temp (°C)	Mean Temp (°C)
ALL INDIA	ACTUAL	31.14	21.38	26.26
	NORMAL	31.16	20.88	26.02
	ANOMALY	-0.03	0.49	0.23
	TOP RANK	41	20	25
	BOT RANK	82	103	98
NORTHWEST INDIA	ACTUAL	30.02	16.99	23.51
	NORMAL	30.33	16.06	23.19
	ANOMALY	-0.30	0.93	0.31
	TOP RANK	65	19	33
	BOT RANK	58	104	90
EAST & NORTHEAST INDIA	ACTUAL	31.17	21.75	26.46
	NORMAL	30.58	20.87	25.72
	ANOMALY	0.60	0.88	0.74
	TOP RANK	14	18	9
	BOT RANK	109	105	114
CENTRAL INDIA	ACTUAL	32.20	21.77	26.99
	NORMAL	32.69	21.47	27.08
	ANOMALY	-0.49	0.30	-0.09
	TOP RANK	67	31	45
	BOT RANK	56	92	78
SOUTH PENINSULAR INDIA	ACTUAL	31.15	23.74	27.44
	NORMAL	31.02	23.60	27.31
	ANOMALY	0.13	0.14	0.14
	TOP RANK	27	41	24
	BOT RANK	96	82	99

Note : Values are rounded off to nearest two decimal

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 October 2022 is given in Figure 7.

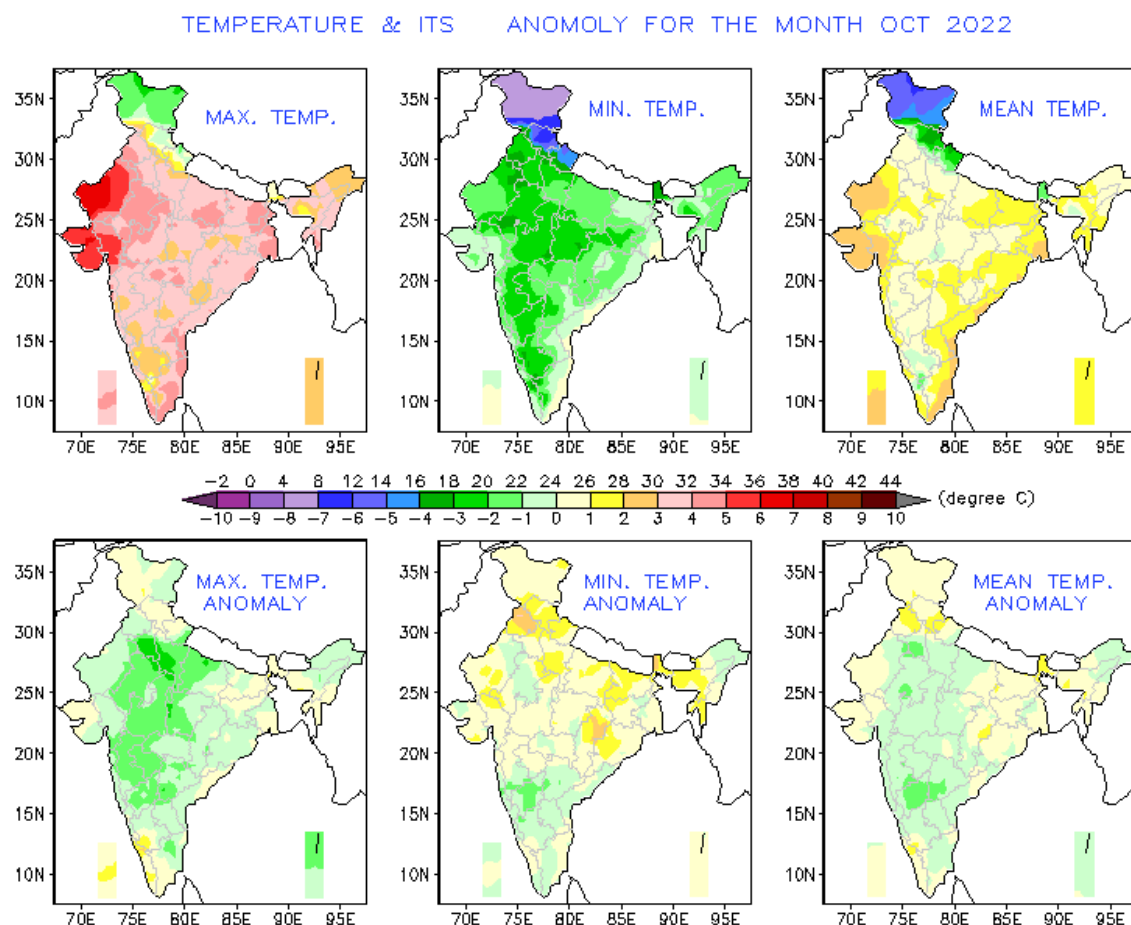


Fig 7: Observed spatial temperature pattern of monthly average maximum, average minimum, and mean temperature over India (top three from left to right) and their departure from normal (1981 to 2010 period) for October 2022 (lower three from left to right).

4. Significant Weather Events for the month of October 2022:

Total 69 persons reportedly claimed dead, more than 75 persons injured, more than 15 persons missing & 16 livestock perished during this month. The details of casualties given below, which are based on real time media reports and other state government agencies.

Fig. 8 shows significant weather events during the month. (Based on real time media reports.)

Floods, Heavy Rains & Landslide: Total 28 persons reportedly claimed dead & more than 28 persons injured, during October, due to Floods, Heavy Rains & Landslide. The details of the area effected by the events are summarized and given in the table below;

DATE	DEATH	INJURED	MISSING	LIVESTOCK	DISTRICT (STATE/UT) AFFECTED
5 Oct.	8	15	Several		Jalpaiguri (West Bengal)
1,11 Oct.	6	3			Bangalore Urban, Koppal (Karnataka)
9 Oct.	5	Several			Bulandshahr, Gautam Buddha Nagar, Ghaziabad,

					Gorakhpur (Uttar Pradesh)
17,18, 20 Oct.	5	1			Pune, Beed (Maharashtra)
9 Oct.	3	9			Central Delhi (Delhi)
21 Oct.	1				Erode (Tamil Nadu)

Lightning: Total 25 persons reportedly claimed dead, 50 persons injured & 16 livestock perished, during October, because of Lightning. The details of the area effected by the events are summarized and given in the table below;

DATE	DEATH	INJURED	MISSING	LIVESTOCK	DISTRICT (STATE/UT) AFFECTED
9,10 Oct.	9	12			Etawah, Hardoi, Jhansi, Sitapur (Uttar Pradesh)
4, 9 Oct.	5	24			Balasore, Jajpur, Sundergarh (Odisha)
18,20 Oct.	5	7			Beed, nanded (Maharashtra)
8 Oct.	4	7			Chittorgarh, Pali (Rajasthan)
20 Oct.	1				Tiruchirappalli (Tamil nadu)
1 Oct.	1				South Tripura (Tripura)
19 Oct.				16	Gulbarga (Karnataka)

Snowfall: 16 persons reportedly claimed dead & 15 others missing due to a snow avalanche in Uttarkashi district of Uttarakhand on 4th October.

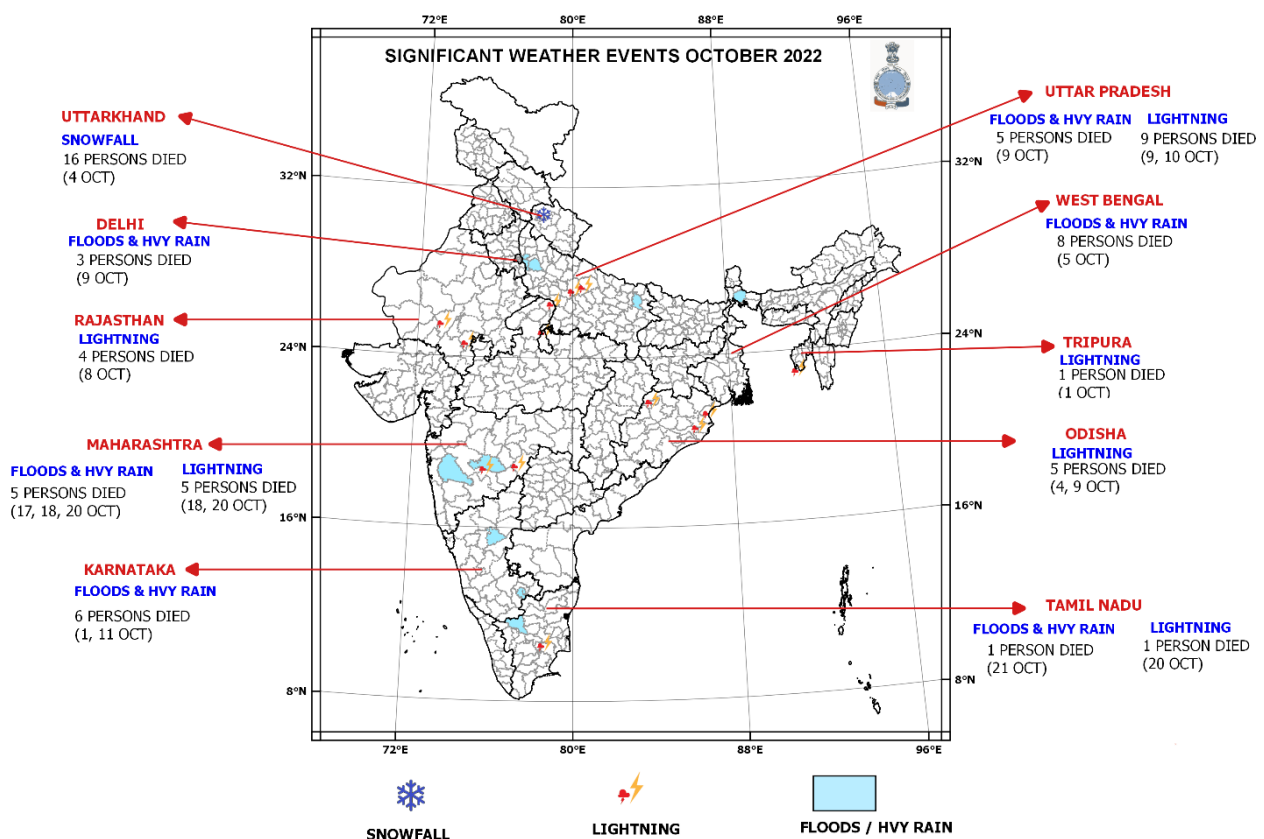


Fig 8: Significant weather events during October 2022 (Based on real-time media report)