MAUSAM, 52, 2 (April 2001), 437 - 452

Weather in India

HOT WEATHER SEASON (MARCH – MAY 2000)*

1. Introduction

Pre-monsoon thundershower activity was above normal in most parts of the country in the month of May. Season's rainfall was excess (percentage departure from normal rainfall is +20% or more) in 17, normal (percentage departure from normal rainfall is between –19 % to +19 %) in 10 and deficient (percentage departure from normal rainfall is between –20 % to –59 %) in 8 meteorological sub-divisions. No meteorological sub-division received scanty (percentage departure from normal rainfall is between – 60 % to –99 %) rainfall.

Season's rainfall was excess in Andaman & Nicobar Islands, Nagaland, Manipur, Mizoram & Tripura, Gangetic West Bengal, Bihar Plateau , Bihar Plains, east Uttar Pradesh, hills of west Uttar Pradesh, Haryana, east Rajasthan, west Madhya Pradesh, Gujarat Region, Saurashtra & Kutch, Konkan & Goa, Vidarbha, Telangana, coastal Karnataka and Lakshadweep; normal in Arunachal Pradesh, Assam & Meghalaya, Sub-Himalayan West Bengal & Sikkim, Orissa, plains of west Uttar Pradesh, Punjab, Himachal Pradesh, coastal Andhra Pradesh, Rayalaseema and south interior Karnataka and deficient in Jammu & Kashmir, west Rajasthan, east Madhya Pradesh, Madhya Maharashtra, Marathwada, Tamil Nadu, north interior Karnataka and Kerala.

Actual rainfall and its departures for each month and season as a whole are given in Table 1 and sub-divisional rainfall departures for the season March-May are shown in Fig 2.

2. Chief features

(*i*) One cyclonic storm formed in the Bay of Bengal (27-31 March 2000)

(*ii*) Cold wave conditions prevailed over some parts of northwest India in the month of March.

(*iii*) Heat wave conditions prevailed over some parts of the country during the month of April and May 2000.

(*iv*) Very good pre-monsoon thundershower activity in most parts of the country in the month of May.

(*v*) Advance of southwest monsoon into northeastern states at the end of May 2000.

3. Significant features for different months

3.1. *March*

3.1.1. *Cyclonic Storm over the Bay of Bengal (27-31 March 2000)*

A well-marked low pressure area formed over southeast Bay and adjoining Andaman Sea on 27 March and concentrated into a depression at 1200 UTC of 27 near Lat. 7.5° N/Long. 90.0° E. Moving in a northwesterly direction upto 28 and then in northeasterly direction, it intensified into a deep depression in the morning of 29 and was near Lat. 13.0° N/Long. 90.0° E at 0300 UTC of 29. At 1200 UTC of 29, it further intensified into a cyclonic storm near Lat. 14.0° N/Long. 90.0° E. It weakened into a deep depression in the afternoon of 30. Moving in a southwesterly direction, it weakened into a depression in the early morning of 31 and was near Lat. 14.5° N/Long. 87.0° E. It then weakened into a low pressure area by 0300 UTC of 31 and became less marked on 1 April 2000. As it didn't cross the coast and dissipated over the sea, no damage was caused over the Indian coast. Track of the system is given in Fig. 1.

3.1.2. *Weather and associated synoptic features*

Details of weather systems formed during the month are given in Table 2.

Rain or snow occurred on either at most places (75 % or more stations of a meteorological sub-division reporting rainfall atleast 2.5 mms) or at many places (50% to 74 % stations of a meteorological sub-division; reporting rainfall atleast 2.5 mms) on 1 to 3 days in Himachal Pradesh and Jammu & Kashmir. Rain or snow also occurred either at a few places (25% to 49 % stations from a meteorological sub-division; reporting rainfall at

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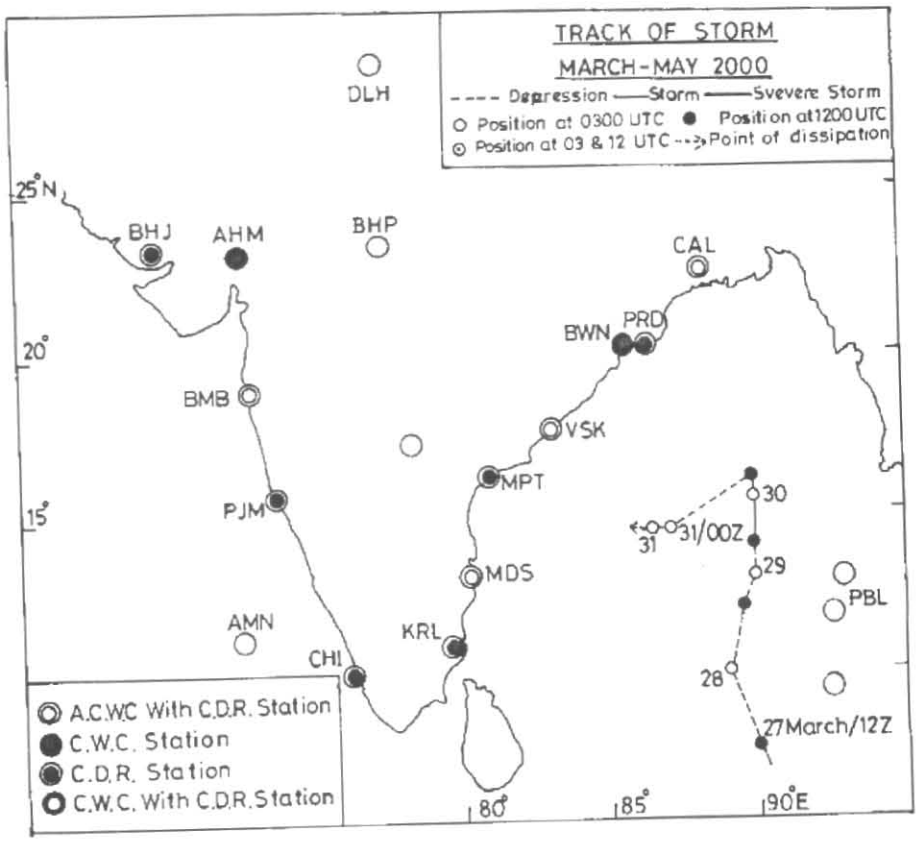

Fig. 1. Track of cyclonic strom (March to May 2000)

least 2.5 mms) or at isolated places (less than 25 % stations of a meteorological sub-division; reporting rainfall at least 2.5 mms) on 16 days in Himachal Pradesh, on 13 days in hills of west Uttar Pradesh and on 6 days in Jammu & Kashmir. Rain or thundershowers also occurred either at most places or at many places on 7 to 11 days in Arunachal Pradesh and Nagaland, Manipur, Mizoram & Tripura and on 1 to 4 days in Andaman & Nicobar Islands, Assam & Meghalaya and Punjab. Rain or thundershowers also occurred either at a few places or at isolated places on 11 to 16 days in Assam & Meghalaya, Sub-Himalayan West Bengal & Sikkim, Tamil Nadu and Kerala; on 5 to 10 days in Andaman & Nicobar Islands, Arunachal Pradesh, Nagaland, Manipur, Mizoram & Tripura, Bihar Plateau, Bihar Plains, Haryana, Punjab and Madhya Maharashtra and on 1 to 5 days in Gangetic West Bengal Orissa, east Uttar Pradesh, plains of west Uttar Pradesh, west Rajasthan, east Rajasthan, west Madhya Pradesh, east Madhya Pradesh, Marathwada, coastal Andhra Pradesh, Telangana, coastal Karnataka, north interior Karnataka, south interior Karnataka and Lakshadweep. Very heavy rain (rainfall amount more than 12.5 cms over one or two stations in the sub-division) has occurred on 1 day in Andaman & Nicobar Islands. Heavy rain also (rainfall amount from 6.5 cms to 12.4 cms over one or two stations in the sub-division) has occurred on 1 day in Tamil Nadu.

3.1.3. *Rainfall Distribution*

Month's rainfall was excess in 2; normal in 3, deficient in 6 and scanty in 20 meteorological sub-divisions. There was no rain over 4 meteorological sub-divisions. Rainfall was excess in Andaman & Nicobar Islands and Nagaland, Manipur, Mizoram & Tripura; normal in Arunachal Pradesh, Assam & Meghalaya and hills of west Uttar Pradesh and deficient in Sub-Himalayan West Bengal & Sikkim, Punjab, Himachal Pradesh, Jammu & Kashmir, Kerala and Lakshadweep and scanty in Gangetic West Bengal, Orissa, Bihar Plateau, Bihar plains, east Uttar Pradesh, plains of west Uttar Pradesh, Haryana, west Rajasthan, east Rajasthan, west Madhya Pradesh, east Madhya Pradesh, Madhya Maharashtra, Marathwada, Vidarbha, coastal Andhra

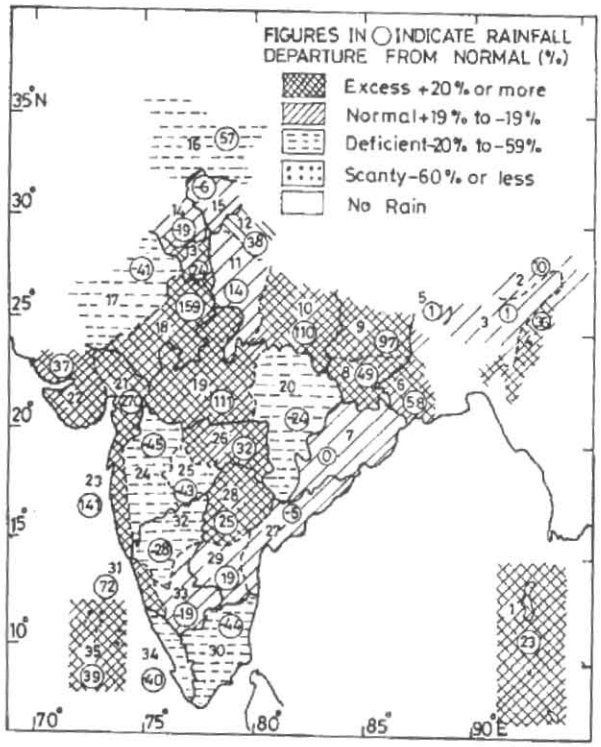

Fig. 2. Sub-divisionwise seasonal rainfall departure (%) for the period March-May 2000

Pradesh, Telangana, Tamil Nadu, coastal Karnataka, north interior Karnataka and south interior Karnataka. There was no rain in Gujarat Region, Saurashtra & Kutch, Konkan & Goa and Rayalaseema. Principal amounts of rainfall are given in Table 5.

3.1.4. *Temperature distribution*

Heat wave conditions (departure from normal temperature is +3° to + 4° C for a region where the normal maximum temperature is more than 40° C) prevailed on 1 day in west Rajasthan. Day temperatures were appreciably (departure from normal temperature is +3° C to +4° C for the regions where the normal maximum temperature is 40° C or less) to markedly (departure from normal temperature is +5° C to +6° C for the regions where the normal maximum temperature is 40° C or less) above normal on 14 days in Saurashtra & Kutch; on 5 to 10 days in Assam & Meghalaya, Bihar Plateau, Himachal Pradesh, Jammu & Kashmir, east Rajasthan, west Rajasthan, west Madhya Pradesh, east Madhya Pradesh and Gujarat Region and on 1 to 4 days in Sub-Himalayan West Bengal & Sikkim,, Orissa, plains of west Uttar Pradesh, hills of west Uttar Pradesh, Haryana, Punjab, Konkan & Goa, Madhya Maharashtra, Marathwada, Vidarbha, coastal Andhra Pradesh, Telangana, Rayalaseema, Tamil Nadu and coastal Karnataka. They were appreciably (departure from normal temperature is between –3° C to –4° C) to markedly (departure from normal temperature is –5° C to –6° C) below normal on 12 days in Assam & Meghalaya; on 5 to 8 days in Haryana, Punjab, west Madhya Pradesh, Gujarat Region and Saurashtra & Kutch and on 1 to 4 days in Tripura, Manipur, Sub-Himalayan West Bengal & Sikkim, Bihar Plateau, Bihar Plains, plains of west Uttar Pradesh, hills of west Uttar Pradesh, Himachal Pradesh, Kashmir, west Rajasthan, east Rajasthan, east Madhya Pradesh, Madhya Maharashtra, Marathwada, Telangana, north interior Karnataka and south interior Karnataka. During the month, the highest temperature of 41° C was recorded at Porbandar in Gujarat on 27, 28 and 29 March.

Cold wave conditions (departure from normal temperature is –3° to –4° C for the regions where the normal minimum temperature is less than 10° C) prevailed on 2 to 4 days in hills of west Uttar Pradesh, Punjab, Himachal Pradesh and Jammu & Kashmir. Night temperature were appreciably (departure from normal minimum temperature is –3° C to –4° C for the regions where the normal minimum temperature is 10° C or more) to markedly (departure from normal minimum temperature is -5° C to -6° C for the regions where the normal minimum temperature is 10° C or more) below normal on 19 days in Madhya Maharashtra; on 11 to 12 days in west Madhya Pradesh, Gujarat region and north interior Karnataka; on 5 to 10 days in Bihar Plains, east Uttar Pradesh, Punjab, west Rajasthan, east Rajasthan, Saurashtra & Kutch, Marathwada, Vidarbha, coastal Andhra Pradesh and Telangana. During the season, the lowest temperature of 4.8° C was recorded at Amritsar in Punjab on 7th March.

3.1.5. *Disastrous weather events and damages*

According to press reports , 4 persons died in Orissa due to Sun stroke and 3 persons died in Kerala due to lightning.

3.2. *April*

3.2.1. *Weather and associated synoptic features*

Details of weather systems formed during the month are given in Table 3.

Rain or thundershowers have occurred either at most places or at many places on 12 to 18 days in Arunachal Pradesh and Assam & Meghalaya; on 6 to 9 days in Andaman & Nicobar Islands, Nagaland, Manipur, Mizoram & Tripura and Sub-Himalayan West Bengal &

TABLE 1

Sub-divisionwise rainfall (mm) for each month and season as a whole (March-May 2000)

S. No.	Meteorological sub – divisions	March			April			May			Season		
		Actual (mm)	Normal (mm)	Dep. (%)	Actual (mm)	Normal (mm)	Dep. (%)	Actual (mm)	Normal (mm)	Dep. (%)	Actual (mm)	Normal (mm)	Dep. (%)
1.	A & N Islands	153	40	283	168	89	90	299	377	- 21	621	505	23
2.	Arunachal Pradesh	94	101	- 8	307	207	48	267	299	- 11	667	608	10
3.	Assam & Meghalaya	66	81	- 19	254	201	26	370	398	- 7	690	680	1
4.	Naga., Mani., Mizo. and Tri.	123	76	61	186	148	26	336	249	35	644	473	36
5.	Sub-Himalayan West Bengal & Sikkim	28	52	- 45	148	109	36	262	275	- 5	439	437	1
6.	Gangetic West Bengal	3	27	- 89	55	45	24	220	104	112	278	176	58
7.	Orissa	1	22	- 96	29	32	- 8	88	65	36	118	118	0
8.	Bihar Plateau	6	18	- 69	39	21	88	91	52	75	135	91	49
9.	Bihar Plains	3	11	- 72	43	14	197	91	44	106	137	69	97
10.	East Uttar Pradesh	3	9	- 63	13	6	107	50	16	212	66	31	110
11.	Plains of west Uttar Pradesh	3	13	- 79	6	6	- 3	26	11	131	35	31	14
12.	Hills of west Uttar Pradesh	49	61	- 19	29	34	- 14	128	56	131	206	150	38
13.	Haryana, Chandigarh & Delhi	4	14	- 68	2	7	- 62	33	12	177	40	32	24
14.	Punjab	13	26	- 49	2	11	- 81	25	13	90	41	50	- 19
15.	Himachal Pradesh	55	81	- 31	22	44	- 49	85	48	77	163	173	- 6
16.	Jammu & Kashmir	70	141	- 51	21	97	- 78	42	72	- 41	133	310	- 57
17.	West Rajasthan	0	5	- 91	2	3	- 2	6	7	- 22	9	15	- 41
18.	East Rajasthan	1	5	- 77	3	2	56	38	9	332	42	16	159
19.	West Madhya Pradesh	1	7	- 90	1	4	- 65	39	9	345	41	19	111
20.	East Madhya Pradesh	1	18	- 92	3	14	- 77	31	15	104	35	46	- 24
21.	Gujarat Region	0	2	- 100	0	1	- 100	39	7	419	39	10	270
22.	Saurashtra & Kutch	0	4	- 100	0	1	- 100	10	4	159	14	10	37
23.	Konkan & Goa	0	0	- 100	0	5	- 93	115	42	173	116	48	141
24.	Madhya Maharashtra	0	4	- 95	2	12	- 84	22	28	- 22	24	44	- 45
25.	Marathwada	0	7	- 98	1	10	- 94	20	20	2	21	36	- 43
26.	Vidarbha	0	15	- 99	1	12	- 96	52	13	299	52	40	32
27.	Coastal Andhra Pradesh	0	12	- 99	18	25	- 28	71	57	24	89	94	- 6
28.	Telangana	1	11	- 95	15	20	- 21	54	26	109	70	56	25
29.	Rayalaseema	0	6	- 100	19	20	- 9	74	52	42	93	78	19
30.	Tamil Nadu	4	21	- 79	32	50	- 35	42	71	- 40	79	141	- 44
31.	Coastal Karnataka	1	5	- 84	34	33	4	291	152	92	326	189	72
32.	North Interior Karnataka	0	6	- 95	13	27	- 54	49	53	- 6	62	87	- 28
33.	South interior Karnataka	0	8	- 98	54	45	21	70	102	- 31	125	154	- 19
34.	Kerala	23	40	- 42	99	114	- 13	130	262	- 51	252	416	- 40
35.	Lakshadweep	3	8	- 57	48	35	38	204	141	45	256	183	39

TABLE 2

Details of the weather systems during March 2000

S. No.	System	Duration	Place of first location	Direction of Movement	Place of Dissipation	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(A) *Cyclonic Storm*						
1.	Cyclonic Storm	27-31	Southeast Bay and neighbourhood	Initially northwesterly and then northnortheasterly	East-central Bay	A well-marked low pressure area formed over southeast Bay and adjoining Andaman Sea on 27 March and concentrated into a depression at 1200 UTC of 27 near Lat. 7.5° N/Long. 90.0° E, Moving in a northwesterly direction, upto 28 and then in northeasterly direction it intensified into a deep depression 0300 UTC of 29th and was near Lat. 13.0° N/Long. 90.0° E. At 1200 UTC of 29, it further intensified into a cyclonic storm near Lat. 14.0° N/Long. 90.0° E. It weakened into a deep depression in afternoon of 30 and moving in southwesterly direction it weakened into depression in the early morning of 31st and was near Lat. 14.5° N/Long. 87.0° E and weakened into a low pressure area by 0300 UTC of 31. It became less marked on 1 April 2000
(B) *Low pressure area*						
1.	Induced low pressure area	1-4	West Rajasthan	Easterly	Hills of west Uttar Pradesh and neighbourhood	Associated cyclonic circulation extended upto lower tropospheric levels. The cyclonic circulation became less marked on 7 It lay as a low pressure area on 4
2.	Do	10-13	Central Pakistan and adjoining area	Do	West Uttar Pradesh	Associated cyclonic circulation extended upto 2.1 kms a.s.l. It lay as a cyclonic circulation over Haryana and adjoining areas on 12. A trough from this system ran to Manipur across east Uttar Pradesh and Bihar Plains on 13
(C) *Western Disturbances*						
1.	As an upper air system	6 - 9	North Pakistan and adjoining Jammu & Kashmir	Northeasterly	Jammu and Kashmir and neighbourhood	Moved away northeastwards
2.	Do	10 – 13	Do	Do	Northern parts of Jammu & Kashmir	Do
3.	Do	13 - 16	Do	Do	Jammu & Kashmir and adjoining areas	Do
4.	Do	16 - 19	Do	Do	Do	Do
5.	Do	19 –23	Do	Do	Do	Do
6.	Do	29 Mar-1 Apr	North Pakistan and neighbourhood	Do	Jammu & Kashmir and neighbourhood	

TABLE 2 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
(D) *Induced Cyclonic Circulations*						
1.	Lower tropospheric levels	20 – 25	South Pakistan and adjoining west Rajasthan	Westerly	Bihar Plateau and adjoining areas	
2.	Lower levels	29 – 30	West Rajasthan and neighbourhood	Northeasterly	East Rajasthan	
(E) *Other cyclonic circulations*						
1.	Lower levels	1 – 4	Northwest Madhya Pradesh and neighbourhood	Southeasterly	East Madhya Pradesh and neighbourhood	It lay as trough on 5 from east Madhya Pradesh to north interior Karnataka in the lower levels
2.	Do	4 – 13	South Tamil Nadu	Stationary	*In situ*	A trough from this system to east Madhya Pradesh on 6/ to west Madhya Pradesh on 7, interior Karnataka on 8/ to Orissa on 9/ to coastal Andhra Pradesh on 10/ Vidarbha on 11/ to Marathwada on 12 and to interior Karnataka on 13
3.	Do	4 – 5	Head Bay and neighbourhood	Do	Do	
4.	Lower tropospheric levels	6 – 9	South Pakistan and adjoining areas of west Rajasthan	Southeasterly	Central parts of Madhya Pradesh	
5.	Lower levels	6 – 8	Bihar Plains and adjoining areas	Easterly	Sub-Himalayan West Bengal & Sikkim and neighbourhood	It lay as a trough over Sub-Himalayan West Bengal & Sikkim and neighbourhood on 7 and became less marked on 8
6.	Do	8 – 10	Central parts of Bihar	-	-	It lay as a trough from Arunachal Pradesh to Gangetic West Bengal in the lower levels and became less marked on 10
7.	Do	10 – 11	Bangla desh and adjoining areas	Stationary	*In situ*	
8.	Mid tropospheric levels	12 –15	Northwest Rajasthan and adjoining Punjab	Easterly	Hills of west Uttar Pradesh and adjoining Himachal Pradesh	
9.	Lower tropospheric levels	13 – 20	Northern Parts of Madhya Pradesh and adjoining Uttar Pradesh	Do	Sub-Himalayan West Bengal & Sikkim	A trough from this system extended eastwards was observed roughly along 24° N to Tripura on 13 and along 25° N to Manipur on 14 Another trough from this system extended southwards upto south Tamil Nadu across Telangana on 13 and to Tamil Nadu across Orissa and coastal Andhra Pradesh on 14 The cyclonic circulation lay as a trough from evening of 14 from Sub-Himalayan West Bengal & Sikkim to Assam and then from Sub-Himalayan West Bengal & Sikkim to Manipur from 15 to 20

TABLE 2 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
10.	Lower levels	16 – 17	South Tamil Nadu	Stationary	*In situ*	A trough from this system extended upto coastal Andhra Pradesh on 16 System lay as a trough over south Tamil Nadu on 17 extended northwards to Vidarbha /to Karnataka on 18/ to east Madhya Pradesh across Telangana on 19/ from south Tamil Nadu to Manipur across Telangana, Orissa and Gangetic West Bengal on 20 and from south Tamil Nadu to west Rajasthan on 21
11.	Mid tropospheric levels	17 – 19	Punjab and neighbourhood	Northeasterly	West Uttar Pradesh and neighbourhood	Moved away northeastwards
12.	Lower tropospheric levels	21 – 22	South Pakistan and adjoining Saurashtra & Kutch and Gujarat Region	Stationary	*In situ*	
13.	Lower tropospheric levels	22 – 27	North Pakistan and adjoining Punjab	Northeasterly	Jammu & Kashmir and adjoining areas	
14.	Do	26 – 27	Central parts of Madhya Pradesh	Stationary	*In situ*	
(F)	*Troughs in easterlies*					
1.	Lower tropospheric levels	27 – 28	East Vidarbha to south Tamil Nadu	Stationary	*In situ*	
(G)	*Troughs in westerlies*					
1.	Mid and upper tropospheric westerlies	27 – 30	East Uttar Pradesh to Telangana	Easterly	Arunachal Pradesh to northeast Bay on 30.	Moved away eastwards
(H)	*East-west trough*					
1.	21 – 28	21 – 28	Sub-Himalayan West Bengal to Assam & Meghalaya	Southsouthwesterly	West Madhya Pradesh to Assam	
2.	Lower tropospheric levels	31 Mar-1 Apr	Bihar Plains to Arunachal Pradesh	Stationary	*In situ*	
(I)	*Other troughs*					
1.	Lower levels	2 – 6	Southwest Madhya Pradesh to Kerala	Easterly	East Madhya Pradesh to south Tamil Nadu	
2.	Do	3 – 9	Southeast Bay and adjoining Andaman Sea	Westerly	Southwest Bay	
3.	Do	9 – 11	South Andaman Sea and neighbourhood	Westerly	Southeast Bay	
4.	Mid tropospheric levels	10 – 11	Bihar Plains to Sub-Himalayan West Bengal & Sikkim	Stationary	*In situ*	

TABLE 2 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
5.	Lower levels	11 – 20	South Andaman Sea	Westerly	Southeast Bay and neighbourhood	
6.	Lower tropospheric levels	14 – 17	Gangetic West Bengal to Kerala through Orissa, Telangana and south interior Karnataka	Quasi-Stationary	Gangetic West Bengal to Kerala through Orissa and coastal Andhra Pradesh	
7.	Lower levels	20 – 23	South Andaman Sea	Westerly	Southwest Bay	
8.	Do	22 –27	South Tamil Nadu to west Uttar Pradesh through interior Karnataka, Vidarbha and Madhya Pradesh	Quasi-stationary	South Tamil Nadu to central parts of Madhya Pradesh through interior Karnataka, Madhya Maharashtra and Vidarbha	
9.	Do	24 – 26	South Tamil Nadu and neighbourhood	Northwesterly	Lakshadweep areas and adjoining area	
10.	Lower tropospheric levels	28 – 29	Southeast Madhya Pradesh to coastal Karnataka	Stationary	*In situ*	

Sikkim; on 2 to 3 days in Gangetic West Bengal, Orissa, Bihar Plains and Kerala. Rain or thundershowers have also occurred either at a few places or at isolated places on 22 to 26 days in Tamil Nadu, south interior Karnataka and Kerala; on 15 to 20 days in Andaman & Nicobar Islands, Assam & Meghalaya, Sub-Himalayan West Bengal & Sikkim and Orissa; on 10 to 14 days in Arunachal Pradesh, Gangetic West Bengal, Bihar Plateau, Bihar Plains, hills of west Uttar Pradesh, coastal Karnataka and north interior Karnataka; on 5 to 9 days in Himachal Pradesh, Jammu & Kashmir, east Madhya Pradesh, Madhya Maharashtra, Rayalaseema and Lakshadweep and on 1 to 4 days in Nagaland, Manipur, Mizoram & Tripura, east Uttar Pradesh, plains of west Uttar Pradesh, Haryana, Punjab, east Rajasthan, west Madhya Pradesh, Konkan & Goa, Marathwada, Vidarbha, coastal Andhra Pradesh and Telangana. Very heavy rainfall occurred on 1 day in Sub-Himalayan West Bengal & Sikkim. Heavy rainfall also occurred on 5 days in Assam & Meghalaya and on 1 to 2 days in Arunachal Pradesh, coastal Karnataka and Kerala.

3.2.2. *Rainfall distribution*

Rainfall was excess in 12, normal in 7, deficient in 5 and scanty in 9 meteorological sub-divisions. There was no rain in remaining 2 meteorological sub-divisions.

Rainfall was excess in Andaman & Nicobar Islands, Arunachal Pradesh, Assam & Meghalaya, Nagaland, Manipur, Mizoram & Tripura, Sub-Himalayan West Bengal & Sikkim, Gangetic West Bengal, Bihar Plateau, Bihar Plains, east Uttar Pradesh, east Rajasthan, south interior Karnataka and Lakshadweep; normal in Orissa, plains of west Uttar Pradesh, Hills of west Uttar Pradesh, west Rajasthan, Rayalaseema, coastal Karnataka and Kerala; deficient in Himachal Pradesh, coastal Andhra Pradesh, Telangana, Tamil Nadu and north interior Karnataka and scanty in Haryana, Punjab, Jammu & Kashmir, west Madhya Pradesh, east Madhya Pradesh, Konkan & Goa, Madhya Maharashtra, Marathwada and Vidarbha. There was no rain in Gujarat Region and Saurashtra & Kutch. The principal amounts of rainfall (cm) are given in Table 5.

3.2.3. *Temperature distribution*

Severe heat wave (temperature from normal is + 5° C or more for the regions where the normal maximum temperature is more than 40° C and temperature from normal is + 7° C or more for the regions where the normal maximum temperature is 40° C or less) conditions prevailed on 3 days in Haryana and west Rajasthan and on 1 day each in east Uttar Pradesh, plains of west Uttar Pradesh and Punjab. Heat wave conditions also prevailed on 10 to 11 days in east Rajasthan and west Rajasthan; on 5 to 7 days in Orissa, east Madhya Pradesh, Vidarbha, coastal Andhra Pradesh and Telangana and on 1 to 4 days in Bihar Plateau, Haryana, Punjab, Himachal Pradesh,

TABLE 3

Details of the weather systems during April 2000

S. No	System	Duration	Place of first location	Direction of Movement	Place of dissipation	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(A) *Low pressure area*						
1.	Low pressure area	1 – 2	Southeast Bay and neighbourhood	*Stationary*	*In situ*	
(B) *Western disturbances*						
1.	As an upper air system	2 – 6	North Pakistan and neighbourhood	Northeasterly	Jammu & Kashmir and neighbourhood	Moved away northeastwards
2.	Do	7 – 9	North Pakistan and adjoining parts of Jammu & Kashmir	Do	Do	Do
3.	Do	24 – 30	Central Pakistan and neighbourhood	Eastnortheastwards	West Uttar Pradesh and adjoining parts of Haryana	It lay as a cyclonic circulation over west Rajasthan and adjoining Pakistan on 25; over Haryana and neighbourhood on 26 and 27 and over west Uttar Pradesh and adjoining parts of Haryana on 28 It moved away eastnortheastwards across hills of west Uttar Pradesh. A trough in the lower levels from this system to east Madhya Pradesh was observed on 26 and 27
(C) *Cyclonic circulations*						
1.	Lower tropospheric levels	2 – 5	North Vidarbha and adjoining Madhya Pradesh	Northeasterly	North coastal Orissa and neighbourhood	A trough from this system ran to coastal Karnataka on 2. It became less marked on 3
2.	Do	4 – 5	Southwest Madhya Pradesh and neighbourhood	Stationary	*In situ*	
3.	Lower levels	7 – 9	West Madhya Pradesh and neighbourhood	Do	Do	A trough from this system in the lower levels was observed to Lakshadweep on 7 and 8 and it became less marked on 9 Another trough from this system in the lower levels was seen to south Tamil Nadu on 7 & 8; from east Madhya Pradesh to south Tamil Nadu across Rayalaseema on 9, Orissa coast to south Tamil Nadu across coastal Andhra Pradesh on 10; southeast Madhya Pradesh to south Tamil Nadu across interior Karnataka on 11; southeast Madhya Pradesh to Rayalaseema from 12 to 14; southeast Madhya Pradesh to south Tamil Nadu across Rayalaseema on 15 and north Vidarbha to south Tamil Nadu from 17 to 19
4.	Do	10 – 11	Bangla desh and neighbourhood	Do	Do	
5.	Lower levels	12 – 17	Northwest Rajasthan and neighbourhood	Northeasterly	Himachal Pradesh and neighbourhood	Moved away northeastwards
6.	Lower tropospheric levels	15-20	Southeast Rajasthan and adjoining Madhya Pradesh	Northeasterly	Hills of west Uttar Pradesh and neighbourhood	A trough from this system to coastal Orissa was observed on 15 and became less marked on 16

TABLE 3 (*Contd*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
7.	Lower levels	18 – 20	North Pakistan and adjoining Jammu & Kashmir	Northeasterly	Jammu & Kashmir and neighbourhood	Moved away northeastwards
8.	Do	19 –21	South Tamil Nadu and neighbourhood	Stationary	*In situ*	
9.	Do	20 –23	West Rajasthan	Northeasterly	Punjab and adjoining parts of Haryana	Moved away across Himachal Pradesh
10	Do	22 Apr - 1 May	Andaman Sea and neighbourhood	Stationary	*In situ*	It lay as trough over the same area on 23 and 24 and as a trough of low pressure area over Andaman Sea and adjoining southeast Bay on 25. Again it lay as a cyclonic circulation over north Andaman Sea and neighbourhood from 26 to 30
12.	Do	23 – 25	Northwest Rajasthan and neighbourhood	Eastnortheastwards	Northeast Rajasthan and adjoining Haryana	Moved away northeastwards across hills of west Uttar Pradesh
13.	Do	23 – 26	Bangla desh and neighbourhood	Stationary	*In situ*	Merged with the east-west trough
14.	Do	24 Apr - 2 May	North Pakistan and neighbourhood	Northeastwards	Jammu & Kashmir and neighbourhood	Moved away northeastwards
(D) *Troughs in the westerlies*						
1.	Lower tropospheric levels	5 – 6	Sub-Himalayan West Bengal to northwest Bay	Stationary	*In situ*	
2.	Mid and upper troposphere	20 – 22	East Uttar Pradesh to interior Karnataka	Northeasterly	Bihar Plateau to north interior Karnataka	
3.	Do	22 – 23	73° E. north of 23° N	Stationary	*In situ*	
(E) *East-west troughs*						
1.	Lower levels	6 – 10	Bihar Plains to Arunachal Pradesh	Do	Do	
2.	Do	11 – 15	Bihar Plains to northeast Assam	Quasi-stationary	Bihar Plains to Nagaland	
3.	Do	26 Apr - 4 May	East Madhya Pradesh to Arunachal Pradesh across Bangla desh	Do	East Madhya Pradesh to Nagaland across Gangetic West Bengal	
(F) *Other troughs*						
1.	Lower tropospheric levels	5 – 7	Vidarbha to south Tamil Nadu	Quasi-stationary	Northwest Madhya Pradesh to south Tamil Nadu	
2.	Lower levels	10 – 18	Andaman Sea	Northerly	North Andaman Sea	
3.	Do	20 Apr - 12 May	Southwest Madhya Pradesh to south Tamil Nadu	Quasi-stationary	Southeast Madhya Pradesh to south Tamil Nadu	

TABLE 4

Details of the weather systems during May 2000

S. No	System	Duration	Place of first location	Direction of Movement	Place of dissipation	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(A) *Western disturbance*						
1.	As an upper air system	3 – 8	North Pakistan and neighbourhood	Northeasterly	Jammu & Kashmir and neighbourhood	Moved away northeastwards
2.	Do	13 – 15	Jammu & Kashmir and neighbourhood	Do	Do	Do
3.	Do	27 – 29	North Pakistan and neighbourhood	Do	North Pakistan and adjoining parts of Jammu & Kashmir	Do
4.	Do	30 May - 1 June	Do	Do	Jammu & Kashmir & neighbourhood	Do
(B) *Embedded cyclonic circulations*						
1.	Lower levels	22 – 23	Northwest Bay and neighbourhood	Stationary	*In situ*	
(C) *Other cyclonic circulations*						
1.	Lower levels	4 – 5	Southeast Madhya Pradesh and neighbourhood	Stationary	*In situ*	
2.	Do	4 – 5	West Bengal coast	Do	Do	
3.	Lower tropospheric levels	5 – 11	Southwest Rajasthan and neighbourhood	Northeasterly	Haryana and neighbourhood	Merged with cyclonic circulation (No. 3) over central parts of Uttar Pradesh A trough from this system was observed to west Madhya Pradesh from 6 to 8, to east Madhya Pradesh on 9 and to Bihar Plains and adjoining Uttar Pradesh on 10
3.	Mid tropospheric levels	11 – 13	Northeast Pakistan and neighbourhood	Easterly	Central parts of Uttar Pradesh	A trough from this system was observed from southeast Uttar Pradesh on 11 and 12
4.	Do	12 – 16	North Bay and neighbourhood	Easterly	Northeast Bay and adjoining Arakan coast	Moved away eastwards
5.	Do	13 – 15	South Pakistan	Stationary	*In situ*	Merged with cyclonic circulation (No. 6) A trough from this system in the lower levels extended southwards along Lat. 18° E, north of Long. 68° N
6.	Lower tropospheric levels	14 – 15	Arabian Sea and adjoining Saurashtra	Do	Do	It lay as a trough of low pressure area over northeast and adjoining east-central Arabian Sea on 15; north Gujarat coast to coastal Karnataka with a trough aloft on 16, north Gujarat region to Kerala coast on 17; southwest Rajasthan to Kerala coast across Maharashtra coast on 18 & 19; Saurashtra to Kerala coast on 20 and south Gujarat coast to Kerala coast on 21. It became less marked on 22

TABLE 4 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
7.	Lower levels	14 – 17	Sub-Himalayan West Bengal & Sikkim and adjoining Bihar Plains	Quasi-stationary	West Bengal and adjoining Bihar	A trough from this system to Nagaland, Manipur, Mizoram & Tripura across Bangladesh was observed on 16
8.	Lower tropospheric levels	15 – 18	North Pakistan and adjoining Jammu & Kashmir	Northeasterly	Jammu & Kashmir and neighbourhood	Moved away northeastwards across Jammu & Kashmir
9.	Do	18 – 20	North Pakistan and adjoining northwest Rajasthan	Northeasterly	Punjab and neighbourhood	
10	Mid tropospheric levels	19 – 21	Vidarbha and neighbourhood	Northwesterly	West Madhya Pradesh and adjoining parts of Madhya Maharashtra	
11.	Lower levels	20 – 23	Pakistan and neighbourhood	Northeasterly	Jammu & Kashmir and neighbourhood	Moved away northeastwards
12.	Do	20 –21	North Bangladesh and neighbourhood	Stationary	*In situ*	
13.	Lower tropospheric levels	23 – 24	East-central and adjoining northeast Bay	Stationary	*In situ*	
14.	Do	23 – 27	Central Pakistan and neighbourhood	Eastnortheasterly	Punjab and neighbourhood	A trough from this system in the lower levels to east-central Bay was observed throughout the month and also in the month of June The trough was observed with an embedded cyclonic circulation over Gangetic West Bengal
15.	Mid tropospheric levels	25 – 30	Southeast Arabian Sea off Karnataka-Goa coast	Quasi-stationary	South Konkan and adjoining parts of Maharashtra on 2	
16.	Do	25 –30	West-central Bay off south Andhra coast	Do	South Andhra coast & neighbourhood	
(D) *Other troughs*						
1.	Mid and upper troposphere	8 – 11	West Uttar Pradesh to Konkan	Southeasterly	Bihar Plains to Saurashtra across Madhya Pradesh	
(E) *Other troughs*						
1.	Lower levels	1 – 5	Southeast Bay and neighbourhood	Westerly	Southwest Bay and neighbourhood	More marked on 4.
2.	Do	3 – 6	Punjab to northeast Madhya Pradesh across south Uttar Pradesh	Quasi-Stationary	Haryana to west Madhya Pradesh	Merged with the trough associated with cyclonic circulation over southwest Rajasthan
3.	Sea level Chart	26 May	Punjab to northeast Bay	Do	Punjab to northeast Bay across south Uttar Pradesh on 31 May	It persisted even in the month of June
4.	Do	24 May	Gujarat coast to Karnataka coast	Do	South Gujarat coast to Maharashtra coast	Do
5.	Do	30 May - 1 June	Southeast Bay and adjoining Andaman Sea	Do	Southeast Bay and neighbourhood	Merged with cyclonic circulation formed over west-central Bay off south Andhra coast on 1 June

Jammu & Kashmir, west Madhya Pradesh, Gujarat region, Marathwada, Rayalaseema, Tamil Nadu, north interior Karnataka and south interior Karnataka. Day temperatures were appreciably to markedly above normal on 16 to 20 days in Himachal Pradesh, Jammu & Kashmir, west Rajasthan, east Rajasthan, west Madhya Pradesh, east Madhya Pradesh and Saurashtra & Kutch; on 11 to 15 days in east Uttar Pradesh, hills of west Uttar Pradesh, Haryana, Punjab, Gujarat region, Madhya Maharashtra, Telangana, Rayalaseema and Tamil Nadu; on 6 to 10 days in Assam & Meghalaya, Bihar Plateau, plains of west Uttar Pradesh, Marathwada, Vidarbha and coastal Andhra Pradesh and on 1 to 5 days in Sub-Himalayan West Bengal & Sikkim, Orissa, Bihar Plains, Konkan & Goa, coastal Karnataka, north interior Karnataka, south interior Karnataka and Kerala. Day temperatures were appreciably to markedly below normal on 10 to 15 days in Assam & Meghalaya, Tripura, Manipur and Bihar Plains; on 5 to 9 days in Sub-Himalayan West Bengal & Sikkim and Gangetic West Bengal and on 1 to 5 days in Orissa, Bihar Plateau, east Uttar Pradesh, hills of west Uttar Pradesh, west Madhya Pradesh, Rayalaseema, north interior Karnataka and Kerala. During the month, the highest temperature of 47.6° C was recorded at Titlagarh in Orissa on 29 and 30 April.

3.2.4. *Disastrous weather events and damages*

According to press reports, 7 people died due to squall in Assam during the month.

3.3. *May*

3.3.1. *Weather and associated synoptic features*

Details of the weather systems formed during the month are given in Table 4.

Good pre-monsoon thundershower activity was there almost all over the country during the month of May. Southwest monsoon was active (rainfall more than 1 ½ to 4 times the normal with minimum 5 cm along the west coast and 3 cm elsewhere in atleast two stations in the sub-division) on 1 to 2 days in Arunachal Pradesh and Assam & Meghalaya. Very heavy rainfall has occurred on 1 day each in Assam & Meghalaya, Sub-Himalayan West Bengal & Sikkim, Gangetic West Bengal, coastal Karnataka and Kerala. Heavy rainfall have also occurred on 4 to 8 days in Andaman & Nicobar Islands, Assam & Meghalaya, Nagaland, Manipur, Mizoram & Tripura and Sub-Himalayan West Bengal & Sikkim and on 1 to 3 days in Arunachal Pradesh, Gangetic West Bengal, Orissa, west Madhya Pradesh, coastal Karnataka, south interior Karnataka and Kerala. Rain or thundershowers have occurred either at most places or at many places on 11 to 15 days in Andaman & Nicobar Islands, Arunachal Pradesh, Assam & Meghalaya, Nagaland, Manipur, Mizoram & Tripura, Sub-Himalayan West Bengal & Sikkim, Konkan & Goa and coastal Karnataka; on 5 to 10 days in Gangetic West Bengal, Orissa, hills of west Uttar Pradesh, Himachal Pradesh, Madhya Maharashtra and Marathwada and on 1 to 4 days in east Uttar Pradesh, Haryana, Punjab, Jammu & Kashmir, west Madhya Pradesh, Gujarat region, Vidarbha, Rayalaseema, north interior Karnataka, Kerala and Lakshadweep. Rain or thundershowers have occurred either at a few places or at isolated places on 26 to 29 days in Orissa, Tamil Nadu and south interior Karnataka; on 15 to 21 days in Andaman & Nicobar Islands, Gangetic West Bengal, east Uttar Pradesh, west Madhya Pradesh, east Madhya Pradesh, Madhya Maharashtra, coastal Andhra Pradesh, north interior Karnataka and Kerala and on 5 to 14 days in Arunachal Pradesh, Assam & Meghalaya, Nagaland, Manipur, Mizoram & Tripura, Sub-Himalayan West Bengal & Sikkim, Bihar Plateau, Bihar Plains, plains of west Uttar Pradesh, hills of west Uttar Pradesh, Haryana, Punjab, Himachal Pradesh, Jammu & Kashmir, west Rajasthan, east Rajasthan, Gujarat region, Saurashtra & Kutch, Konkan & Goa, Marathwada, Vidarbha, Telangana, Rayalaseema, coastal Karnataka and Lakshadweep.

3.3.2. *Advance of southwest monsoon*

The southwest monsoon advanced over south Andaman Sea and adjoining southeast Bay of Bengal on 15 May. By the end of May, it advanced upto Commorin, Maldives area, some more parts of Bay of Bengal, Nagaland, Manipur, Mizoram & Tripura, Assam & Meghalaya and Arunachal Pradesh.

3.3.3. *Rainfall distribution*

Rainfall during May was excess in 23, normal in 5 and deficient in 7 meteorological sub-divisions. The principal amounts of rainfall are given in Table 5.

Rainfall was excess in Nagaland, Manipur, Mizoram & Tripura, Gangetic West Bengal, Orissa, Bihar Plateau, Bihar Plains, east Uttar Pradesh, plains of west Uttar Pradesh, hills of west Uttar Pradesh, Haryana, Punjab, Himachal Pradesh, east Rajasthan, west Madhya Pradesh, east Madhya Pradesh, Gujarat region, Saurashtra & Kutch, Konkan & Goa, Vidarbha, coastal Andhra Pradesh, Telangana, Rayalaseema, coastal Karnataka and Lakshadweep; normal in Arunachal Pradesh, Assam & Meghalaya, Sub-Himalayan West Bengal & Sikkim, Marathwada and north interior Karnataka and deficient in Andaman & Nicobar Islands, Jammu and Kashmir, west

TABLE 5

Principal amounts of rainfall (1 cm and above)
(March, April and May 2000)

Date	March	April	May
(1)	(2)	(3)	(4)
1	Maya Bandar & Car Nicobar 1 each	Konni 4, Dibrugarh 3, Chennai 2, North Lakhimpur, Srinagar, Cuddalore & Thiruvananthapuram 1 each	Car Nicobar, Guwahati & Imphal 4 each, Gangtok 3, Tirupattur & Kottayam 1 each
2	Imphal & Guler 2 each, Kailashahar, Gangtok & Gaya 1 each	Haripad 7, North Lakhimpur & Alapuzha 5 each, Cuddalore 4, Gangtok, Kottayam & Minicoy 3 each, Dibrugarh 2, Tezpur & Salem 1 each	Kailashahar 9, Guwahati 5, Darjeeling 3, Vellore & Bangalore 1 each
3	Imphal 3, Dibrugarh, Agartala & Gangtok 1 each	Gangtok 4, Minicoy 3, North Lakhimpur 2, Kondul & Thiruvananthapuram 1 each	Calcutta 4, Shillong 2, Kondul, Agartala & Mysore 1 each
4	Hut Bay 3, Car Nicobar & Gangtok 1 each	Dibrugarh 3, Bangalore 1	Sandheads 16, Alapuzha 10, Diamond Harbour 9, Sattenapalli 8, Rajghat 5, Chaparmukh 4, Punganur 3, Agartala, Ranchi, Gadag, Chitradurga & Coimbatore 2 each, Bhadrachalam 1
5	Katra & Srinagar 5 each, Kangra 3, Pathankot & Shimla 2 each, Chandigarh, Ludhiana & Jammu 1 each	Punalur 7, Mysore 4, Belgaum & Kodaikanal 3 each, Car Nicobar, Dibrugarh & Mandya 1 each	Saharanpur & Chandigarh 3 each, Nighasan, Ranikhet & Ghamroor 2 each, Maya Bandar, Bijapur & Adirampattinam 1 each
6	Chamba 3, Gangtok & Nalagarh 2 each	Dibrugarh 6, Tondi 2, North Lakhimpur, Uthagamandalam, Kannur & Punalur 1 each	Nizamsagar 11, Rajgarh 7, Kiroli & Mukteshwar 6 each, Chipurupalli 4, Chandigarh 3, Bangalore 2, Maya Bandar, Ludhiana & Uthagamandalam 1 each
7	Gangtok 2, Pahalgam 1	Thiruvananthapuram 5, Punalur & Amini Divi 2 each, Dibrugarh 1, Tezpur 1, Pamban, Tondi, Mangalore & Panambur 1 each	Manakpur 6, Vempalli 5, Alipingal 4, Beki Road Bridge & Gangtok 3 each, Saharanpur, Rohtak, Ajmer, Baroda, Ujjain, Pendra, Nellore & Kodaikanal 2 each, Kotdwar, Kangra & Hyderabad 1 each
8	Guwahati 1	Madurai 4, Naharkatia & Thiruvananthapuram 3 each, Khowong & Dhollabazar 2 each, Tezpur & Dibrugarh 1 each	Prathipadu 6, Puttur 5, Guna & Thalassery 4 each, Maya Bandar, Saharanpur, Parkal & Bijapur 3 each, Bolangir, Mukteshwar & Pathankot 2 each, Malda, Barsar, Kanker 1
9	Imphal 2, North Lakhimpur, Gangtok & Calcutta 1	Sibsagar 6, Naharkatia 4, Khowang 3, Tezu & Dibrugarh 1 each	Ahmednagar 5, Chickmagalur 3, Madurai 2, Maya Bandar, Shillong, Kohima, Guna, Pendra, Parbhani & Chittoor 1 each
10	Gangtok 1	Tuni & Mysore 2 each, Passighat, Guwahati & Visakhapatnam 1 each	Calcutta 4, Darjeeling & Indore 3 each, Manchela 2, Port Blair, Pendra, Chandrapur & Bhadrachalam 1 each
11	Neyyatinkara 3, Gangtok 1	Tezpur 3, Dibrugarh 2	Hut Bay 11, Jaipur, Tilakwada, Darsi & Madurai 2 each, Calcutta & Bangalore 1 each
12	Gangtok, & Punalur 1	Kozhikode 3, Malda & Calcutta 2 each, Maya Bandar, Car Nicobar, Guwahati, Silchar, Shillong, Agartala & Siliguri 1 each	Port Blair 11, Kodaikanal 6, Jamshedpur 4, Cuttack & Udaipur 3 each, Vadali & Eluru 2 each, Guna, Suryapet & Kolar Gold Field 1 each
13	Agartala 6, Bhuntar, Kumar sain 3, Shimla, Banihal 2, Chandigarh	Maya Bandar 2	Nancowry 8, Gohar 7, Sonepat 6, Dehra Dun 4, Chittorgarh & Dhrangadhra 3 each, Bareilly, Dhuri, Srinagar & Sompeta 2 each
14	Agartala 4, Nancowry 3, New Delhi 2, Dibrugarh, Shillong, Imphal & Malda 1 each	Darjeeling & Bangalore 3 each, Port Blair, Baghdogra, Paradip & Mandya 2 each, Car Nicobar, Agartala & Cooch Behar 1 each	Hut Bay 5, Churu 2, Dibrugarh, Jalpaiguri, Diamond Harbour & Kota 1 each

TABLE 5 *(Contd.)*

(1)	(2)	(3)	(4)
15	Gangtok & Cooch Behar 2 each, Guwahati 1	Williamnagar 8, Kondul, Gaya 5, Car Nicobar 3, Shillong, Bareilly, Awantipur, Srinagar & Kottayam 2 each, Bahraich, Rewari, Banihal, Visakhapatnam, Uthagamandalam, Salem & Kozhikode 1 each	Maya Bandar 7, Mandya 4, Balasore 3, Agartala & Bharatpur 2 each, Canning Town, Ranchi, Mainpuri, Jogindernagar & Bhopal 1 each
16	Nancowry 4, Dibrugarh 2, North Lakhimpur & Agartala 1 each	Kampur 5, Kondul & Mysore 4 each, Hut Bay, Miao, Balasore & Puri 3 each, Tezpur, Gangtok, Krishnanagar & Paradip 1 each	Baghdogra 10, Tezu 8, Jalpaiguri 7, Nadaun & Karwar 6 each, Chengannur 4, Car Nicobar & Guwahati 3 each, Anantpur 2, Gorakhpur, Mukerian, Jabalpur & Uthagamandalam 1 each
17	Nil	Nalbari 9, Puthimari 5, Kondul & Tuni 4 each, Khonsa & Shillong 3 each, Udaipur 2, Guwahati & Kakinada 1 each	Bokajan 8, Baghdogra, Kalingapatnam & Amini Divi 5 each, Imphal & Chengannur 4 each, Maya Bandar & Salem 3 each, Bhubaneswar, Mumbai & Mangalore 2 each, Calcutta, Valsad & Sarakundla 1 each
18	Quazi Gund & Pahalgam 4 each, Srinagar 2	Kampur 4, Miao, Khonsa, Mellabazar, Agartala, Bhubaneswar & Bangalore 3 each, Kondul, North Lakhimpur, Baghdogra & Gangtok 2 each, Nancowry, Passighat, Paradip & Raichur 1 each	Mumbai 14, Tezpur 10, Jalpaiguri 8, Mahabaleshwar & Karwar 7 each, Balasore 5, Kozhikode 4, Tezu 3, Canning Town & Vedaranyam 2 each, Port Blair, Jammu & Aurangabad 1 each
19	Nil	Bijapur 6, Nalgonda & Anantpur 3 each, Coimbatore 1	Mumbai 19, Karwar 10, Agartala 8, Minicoy 6, Gangtok, Dharampur, Panjim & Nashik 5 each, Hut Bay 4, Guwahati, Imphal, Pandoh, Shimoga 3 each, Belgaum 2, Ninghasan & Amreli 1
20	Nil	Thiruvananthapuram 4, Udaipur 2, Nancowry, Agartala, Kailashahar & Punalur 1 each	Bansda 13, Karjan 11, Shirali 7, Minicoy 6, Bhopal 5, Agartala & Gangtok 4 each, Calcutta, Deoband & Chittorgarh 3 each, Bandeh 2, Car Nicobar, Jamshedpur, Ambikapur, Panjim, Chitradurga & Alapuzha 1 each
21	Nil	Malda 4, Tezpur, Shillong, Berhampore & Punalur 3 each, Guwahati, Kalimpong & Cooch Behar 2, Khonsa, Muzaffarnagar & Kottayam 1 each	Bareilly & Kunda 7 each, Lakhipur 6, Patna 5, Nagpur 4, Chottabekra & Karwar 3 each, Balasore 2, Maya Bandar, Baghdogra, Jawaidam, Sawai Madhopur, Khajuraho, Pendra, Panjim, Agumbe, Kannanur & Minicoy 1 each
22	Chamba 4, Bhuntar 1	Kondul, Gangtok, Calcutta & Coimbatore 3 each, Uluberia 2, Khonsa, Tadong & Belgaum 1 each	Baghdogra 15, Jalpaiguri 11, Krishnanagar & Uluberia 7, Karimganj & Lucknow 5 each, Yeotmal 4, Passighat, Gopalpur, Khajuraho, Raipur & Aurangabad 3 each, Gaya & Malegaon 2, Kondul & Honavar 1 each
23	Jogindernagar 5, Bhuntar 3, Dehra Dun 2, Balachaur & Shimla 1 each	Cherrapunji 5, Dibrugarh 4, Kondul, Tezu, North Lakhimpur, Gangtok & Solan 3 each, Passighat 2, Cooch Behar, Shantiniketan, Gohar & Mount Abu 1 each	Agartala 7, Tezpur 6, Shillong & Malda 5 each, Jamshedpur 4, Calcutta, Bhubaneswar, Mishrikh & Sundernagar 2 each, Miao, Srinagar, Satna & Ramgundam 1 each
24	Kottayam 3, Kanyakumari 2, Bahraich 1	Nancowry, Cherrapunji & Baghdogra 7 each, Keonjhargarh 6, Passighat & Pachhad 4 each, Imphal 2, Quazigund, Uthagamandalam & Kochi 1 each	Calcutta 5, Balasore 4, Annapurnaghat, Chottabekra, Anantpur & Kolar Gold Field 3 each, Shirali 2, Miao, Kangra & Tondi 1 each
25	Thiruvananthapuram, Kochi & Haripad 2 each	Rajghat 6, Agartala & Uluberia 4 each, Hut Bay & Adirampattinam 3 each, Cooch Behar 2, Guwahati & Gwalior 1 each	Annapurnaghat, Dillighat & Kolar gold Field 7 each, Valparai & Devanahalli 6 each, Kurnool 5, Aurangabad 4, Jagdalpur, Khammam & Kochi 2 each, Passighat, Midnapore, Bahraich & Jogindernagar 1 each
26	Hut Bay & Car Nicobar 4 each, Konni 1	Agartala 6, Malda 5, Pamban 4 , Silchar 3, Midnapore & Ranchi 1 each	Nalbari & Beki Road Bridge 12 each, Jalpaiguri 8, Agartala 7, Cooch Behar & Hungund 6 each, Manki, Mani, Ilkal & Bangarpet 5 each, Ahmednagar & Kochi 4 each, Midnapore, Rajgarh & Uthagamandalam 3 each, Miao 2, Bahraich, Dehra Dun, Ambala, Amritsar, Vengurla, Kurnool & Minicoy 1 each

TABLE 5 (*Contd.*)

(1)	(2)	(3)	(4)
27	Hut Bay 15, Port Blair 10	Port Blair 6, Gangtok 3, Batote 2 , Agartala & Jamshedpur 1 each	Mangalore & Kota 15 each, Kailashahar 11, Manas NH X-ing 8, Nalbari, Vengurla & Bagewadi 7 each, Gangtok 6, Chickmagalur 5, Karatgi 4, Sangli 3, Miao 2
28	Kottayam 2	Guwahati 8, Port Blair 6, Barobisha 4, Gopalpur 3, Imphal, Patna & Shimla 1 each	Kailashahar 9, Karimganj 8, Dholai 7, Kolhapur 6, Gangtok, Gokarna & Bhatkal 5 each, Passighat, Chottabekra, Devadurga & Amini Divi 4 each, Aurangabad & Kalsa 3 each, Nancowry, Ratnagiri & Kannur 2 each, Bankura, Gorakpur, Shimla & Uthagamandalam 1 each
29	Hut Bay & Car Nicobar 4 each, Port Blair 3	Diana 13, Imphal 5, Mysore 3, Port Blair 2, Guwahati & Uthagamandalam 1 each	Port Blair 9, Shillong 6, Beki Mathanguri, Calcutta & Mulki 5 each, Tezu & Betul 4, Chottabekra, Panjim & Bailahongal 3 each, Jalpaiguri & Yeotmal 2, Sundernagar 1
30	Car Nicobar, Shillong & Thiruvananthapuram 1 each	Imphal 5, North Lakhimpur 4, Port Blair 3, Barobisha & Calcutta 2 each	Hut Bay 11, Nanded 8, Pandoh & Jalgaon 5 each, Tezu, Dholai, Kota & Panhanahalli 4 each, Sunnibhaji, Panjim & Visakhapatnam 3 each, Kailashahar, Jalpaiguri, Balasore, Quazigund, Junagarh & Karwar 1 each
31	Maya Bandar & Car Nicobar 2, Hut Bay 1		Hut Bay 8, Tiruchirapalli 7, Tezpur & Bangarpet 6 each, Mandya 5, Agartala, Krishnanagar & Karwar 3 each, Bahraich, Ludhiana, Bangana, Pahalgam & Belgaum 2 each, Jhansi, Naraingarh & Anantpur 1 each

Rajasthan, Madhya Maharashtra, Tamil Nadu, south interior Karnataka and Kerala.

3.3.4. *Temperature distribution*

Severe heat wave conditions prevailed on 1 to 2 days in Haryana, west Rajasthan and coastal Andhra Pradesh. Heat wave conditions also prevailed on 4 to 7 days in Haryana, Punjab, west Rajasthan, east Rajasthan and Rayalaseema and on 1 to 3 days in Orissa, east Uttar Pradesh, Himachal Pradesh, Jammu & Kashmir, west Madhya Pradesh, east Madhya Pradesh, Madhya Maharashtra, Vidarbha, coastal Andhra Pradesh, Telangana, Tamil Nadu, north interior Karnataka and south interior Karnataka. Day temperatures were appreciably to markedly above normal on 16 to 20 days in Assam & Meghalaya and Jammu & Kashmir; on 11 days in coastal Andhra Pradesh; on 6 to 10 days in Nagaland, Manipur, Mizoram & Tripura, Orissa and Himachal Pradesh and on 1 to 5 days in Sub-Himalayan West Bengal & Sikkim, Haryana, Punjab, west Rajasthan, east Rajasthan, west Madhya Pradesh, east Madhya Pradesh, Madhya Maharashtra, Vidarbha, north interior Karnataka and Kerala. Day temperatures were appreciably to markedly below normal on 16 to 20 days in Bihar Plateau, Bihar Plains, east Uttar Pradesh and Madhya Maharashtra; on 11 to 15 days in Orissa, west Madhya Pradesh, east Madhya Pradesh, Gujarat region and Vidarbha; on 6 to 10 days in Assam & Meghalaya, Nagaland, Manipur, Mizoram & Tripura, Sub-Himalayan West Bengal & Sikkim, Gangetic West Bengal, Marathwada, Telangana and north interior Karnataka and on 1 to 5 days in plains of west Uttar Pradesh, hills of west Uttar Pradesh, Punjab, Haryana, Himachal Pradesh, Jammu & Kashmir, west Rajasthan, Saurashtra & Kutch, Konkan & Goa, coastal Andhra Pradesh, Rayalaseema, coastal Karnataka and south interior Karnataka. During the month, the highest temperature of 46.1° C was recorded at Ganganagar in Rajasthan on 22nd May.

Note : *The names of following Met. Sub-divisions are changed w.e.f. 1st November 2000*

(1) Hills of west Uttar Pradesh	-	Uttaranchal
(2) Plains of west Uttar Pradesh	-	West Uttar Pradesh
(3) East Madhya Pradesh	-	East Madhya Pradesh & Chhattisgarh
(4) Bihar Plateau	-	Jharkhand
(5) Bihar Plains	-	Bihar.