MAUSAM, **64**, 2 (April 2013), 385-396

Weather in India

HOT WEATHER SEASON (MARCH–MAY 2012)†

1. Chief features

(*i*) The hot weather season of 2012 remained to be mild as the country experienced an extension of cold season into March. The severity of heating manifested only during the later part of May.

(*ii*) No intense low pressure system formed over the Indian Seas during the pre-monsoon cyclone season, as in the recent past years *viz.*, 2011, 2005 & 1993.

(*iii*) April had been wetter than normal while March and May remained drier than normal. Hence, the all India rainfall deficiency with respect to Long Period Average (LPA) for the season had been – 31%.

(*iv*) Southwest Monsoon advanced over the southeast Bay of Bengal and south Andaman Sea on 23rd May.

(*v*) A massive dust storm occurred over the southwest Asian region on 17th March. Dust plume reached and spread over major parts of the country reducing the visibility during 20th - 25th March.

2. Seasonal rainfall

The sub-division wise rainfall and its departure from normal for each month and season as a whole are given in Table 1. The sub-divisional rainfall departures for the season March-May 2012 are also depicted in Fig. 1.

The seasonal rainfall was in general *deficient/scanty** over the most part of India except over Andaman & Nicobar Islands, Rajasthan, Rayalaseema, south interior Karnataka and Kerala, where it was *excess/normal*.

3. Significant features during various months

3.1. *March*

3.1.1. *Weather and associated synoptic features*

The details of the weather systems during the month are summarised in Table 2 and the principal amounts of rainfall are given in Table 5.

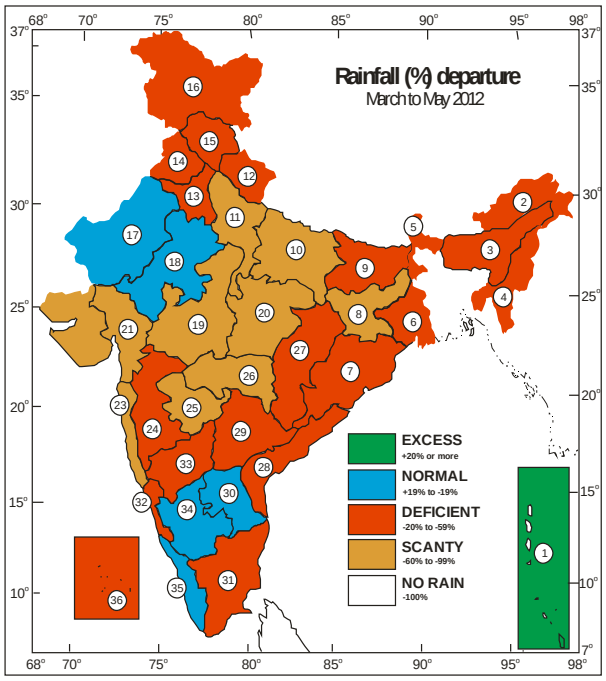

Fig. 1. Sub-divisionwise seasonal rainfall departure from normal (%) for hot weather season (March to May 2012). Sub-divisions are indicated by number on the map & bold letters in legend. The rainfall anomaly values for these 36 sub-divisions are indicated below :

1	35	**7**	-44	**13**	-49	**19**	-62	**25**	-74	**31**	-30
2	-20	**8**	-65	**14**	-57	**20**	-83	**26**	-83	**32**	-51
3	-34	**9**	-39	**15**	-51	**21**	-99	**27**	-43	**33**	-25
4	-28	**10**	-67	**16**	-31	**22**	-94	**28**	-41	**34**	12
5	-21	**11**	-68	**17**	4	**23**	-98	**29**	-43	**35**	-18
6	-31	**12**	-44	**18**	-2	**24**	-40	**30**	10	**36**	-57

Passage of active western disturbances gave rise to precipitation over northwest India during the first week of the month. Thereafter, the precipitation activity decreased over the area. Northeast India experienced thundershower activity at *a few/one or two places* on a few days of the month. Like last year, the easterly wave activity remained subdued over the near equatorial region.

3.1.2. *Temperature distribution*

(*i*) *Minimum temperatures*

The cold wave conditions of winter extended into the entire March.

* *Definition of words in italics other than the subtitles is given in Appendix.*

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TABLE 1

Sub-division wise rainfall (mm) for each month and season as a whole (March-May 2012)

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	29.6	25.0	18	58.5	81.5	–28	538.1	358.5	50	626.2	465.0	35
2.	Arunachal Pradesh	131.4	179.7	–27	288.4	278.8	3	182.0	291.9	–38	601.8	750.4	–20
3.	Assam & Meghalaya	19.4	77.7	–75	209.6	181.2	16	158.6	331.3	–52	387.6	590.2	–34
4.	Naga., Mani., Mizo. and Tri.	32.8	76.8	–57	196.4	149.4	31	124.6	267.9	–53	353.8	494.1	–28
5.	Sub-Himalayan West Bengal & Sikkim	35.7	63.6	–44	156.1	123.7	26	168.7	269.8	–37	360.6	457.1	–21
6.	Gangetic West Bengal	4.3	28.0	–85	60.6	42.1	44	48.8	94.7	–49	113.7	164.8	–31
7.	Orissa	0.6	27.0	–98	51.3	37.5	37	23.3	70.2	–67	75.4	134.7	–44
8.	Jharkhand	1.9	17.1	–89	15.1	18.4	–18	11.2	43.9	–74	28.1	79.4	–65
9.	Bihar	6.5	10.1	–35	23.3	16.3	43	17.5	51.1	–66	47.3	77.5	–39
10.	East Uttar Pradesh	5.4	9.1	–40	4.6	5.6	–18	0.5	17.0	–97	10.5	31.7	–67
11.	West Uttar Pradesh	2.5	11.3	–78	6.5	4.6	42	0.4	13.2	–97	9.4	29.1	–68
12.	Uttaranchal	30.8	57.6	–46	46.6	33.3	40	10.7	65.1	–84	88.1	156.0	–44
13.	Haryana, Chandigarh & Delhi	0.3	12.7	–98	13.6	7.5	81	3.6	14.0	–74	17.4	34.2	–49
14.	Punjab	1.9	25.3	–92	20.2	12.5	61	0.8	15.7	–96	22.9	53.5	–57
15.	Himachal Pradesh	43.2	114.2	–62	64.1	65.4	–2	11.5	65.3	–82	118.8	244.9	–51
16.	Jammu & Kashmir	53.3	151.9	–65	112.5	97.5	15	60.1	76.6	–22	225.8	326.0	–31
17.	West Rajasthan	0.0	3.8	–100	8.5	4.2	103	11.3	11.1	2	19.8	19.1	4
18.	East Rajasthan	0.0	3.7	–100	4.2	2.9	44	12.8	10.8	19	17.0	17.4	–2
19.	West Madhya Pradesh	0.0	4.6	–100	1.0	2.0	–52	4.2	6.9	–39	5.2	13.5	–62
20.	East Madhya Pradesh	1.0	12.5	–92	1.5	5.5	–73	1.7	7.1	–76	4.2	25.1	–83
21.	Gujarat region	0.0	1.0	–100	0.1	0.3	–79	0.0	5.1	–100	0.1	6.4	–99
22.	Saurashtra & Kutch	0.0	1.2	–100	0.2	0.2	–18	0.1	2.5	–97	0.2	3.9	–94
23.	Konkan & Goa	0.0	0.3	–100	0.6	2.7	–77	0.2	34.3	–99	0.8	37.3	–98
24.	Madhya Maharashtra	0.0	2.7	–100	11.9	8.9	34	10.9	26.2	–59	22.8	37.8	–40
25.	Marathawada	0.0	5.7	–100	3.1	6.5	–52	4.7	18.1	–74	7.9	30.3	–74
26.	Vidarbha	0.0	12.0	–100	2.4	7.7	–68	3.0	11.2	–74	5.4	30.9	–83
27.	Chattisgarh	0.4	13.3	–97	18.3	13.8	33	6.9	18.1	–62	25.6	45.2	–43
28.	Coastal Andhra Pradesh	2.0	11.1	–82	20.0	21.8	–8	35.3	64.1	–45	57.3	97.0	–41
29.	Telangana	0.3	9.4	–96	18.3	16.5	11	13.7	30.9	–56	32.3	56.8	–43
30.	Rayalaseema	3.0	6.5	–54	49.5	19.9	149	37.8	55.6	-32	90.3	82.0	10
31.	Tamil Nadu	4.4	18.3	–76	38.6	42.3	–9	44.6	67.5	–34	89.1	128.1	–30
32.	Coastal Karnataka	0.4	4.1	–90	69.0	28.1	145	17.5	146.6	–88	86.8	178.8	–51
33.	North interior Karnataka	0.0	5.2	–100	46.5	25.6	82	17.3	54.3	–68	63.9	85.1	–25
34.	South interior Karnataka	1.8	8.5	–84	113.5	43.8	159	47.2	92.9	–49	162.1	145.2	12
35.	Kerala	29.6	30.4	–2	197.5	109.5	80	83.8	239.8	–65	310.9	379.7	–18
36.	Lakshadweep	1.7	11.8	–86	76.8	48.9	57	21.0	171.7	–88	99.5	232.4	–57

TABLE 2

Details of the weather systems during March 2012

S. No.	System	Duration	Place of first location	Direction of movement	Place of final location	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(**A**)	*Western disturbances/eastward moving systems*					
(*i*)	*On the mean sea level chart*					
1.	Low pressure area	20	Jammu & Kashmir and neighbourhood	Northeast	Eastern parts of Jammu & Kashmir	It was seen over northeast Afghanistan and neighbourhood as an upper air cyclonic circulation from 12 to 19 and again on 21 and moved away on 22
2.	Induced low pressure area	5 - 6	Central parts of Pakistan and adjoining areas of northwest Rajasthan and Punjab	Eastnortheast	West Uttar Pradesh and adjoining Uttarakhand	Less marked on 6 evening. Associated cyclonic circulation extended upto lower tropospheric levels. It lay over east Uttar Pradesh and neighbourhood on 7 and became less marked in the evening
(*ii*)	*As upper air cyclonic circulations*					
1.	upto 4.5 kms a.s.l.	1 - 6	Northeast Afghanistan and neighbourhood	Eastnortheast	Eastern parts of Jammu & Kashmir	Moved away on 7
2.	Do	7 - 8	Jammu & Kashmir & neighbourhood	Do	Northern parts of Jammu & Kashmir	Moved away on 9
3.	Do	8 - 14	Northeast Afghanistan and adjoining Pakistan	Do	Eastern parts of Jammu & Kashmir	Moved away on 15
4.	Do	21 - 26	Do	Do	Jammu & Kashmir	Moved away on 27
5.	Do	27 - 28	North Pakistan and adjoining Jammu & Kashmir	Do	Do	Moved away on 29
6.	Do	29 Mar - 4 Apr	North Afghanistan and neighbourhood	Do	Eastern parts of Jammu & Kashmir	Moved away on 5 April
(*iii*)	*As an induced cyclonic circulations*					
1.	Lower tropospheric levels	28	West Rajasthan and neighbourhood	Stationary	*In situ*	Less marked on 29
(*iv*)	*As a trough in westerlies*					
1.	Lower levels	1 - 2	Sub-Himalayan West Bengal & Sikkim to northwest Bay of Bengal	East	Assam & Meghalaya to northeast Bay of Bengal	It was seen as a cyclonic circulation extending upto lower tropospheric levels over Assam & Meghalaya and adjoining Nagaland-Manipur-Mizoram-Tripura from 3 to 6 and became less marked on 7
2.	Mid & upper tropospheric levels	13	Long. 65° E, to the north of Lat. 24° N (at 7.6 km a.s.l.)	Northeast	Long. 65° E, to the north of Lat. 24 ° N	Moved away on 14
3.	Feeble trough (Mid & upper tropospheric levels)	28	Long. 71° E, to the north of Lat. 25° N	Do	Long. 71° E, to the north of Lat. 25° N	Moved away on 29
(**B**)	*Other upper air cyclonic circulations*					
1.	Mid tropospheric levels	17 - 19	Gangetic West Bengal & neighbourhood	Stationary	*In situ*	Less marked on 20
2.	Up to 3.1 kms a.s.l.	18 - 21	Assam & Meghalaya and adjoining Nagaland-Manipur-Mizoram-Tripura	Stationary	*In situ*	Less marked on 22

TABLE 2 (*Contd*.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
3.	Upto 2.1 kms a.s.l.	26	Eastern parts of Gangetic West Bengal and neighbourhood	Stationary	*In situ*	Less marked on 27
(**C**)	*Troughs in easterlies*					
1.	Trough of low at mean sea level	2 - 7	South Andaman Sea and neighbourhood	West	Equatorial Indian Ocean and adjoining southeast Bay of Bengal	Less marked on 8
2.	Do	8 - 15	South Andaman Sea and adjoining Tenasserim coast	Do	Comorin-Maldives areas to Lakshadweep area	Less marked on 16
3.	Do	24 Mar - 2 Apr	Equatorial Indian Ocean and adjoining south Andaman Sea	Do	Equatorial Indian Ocean and adjoining southwest Bay of Bengal	Became unimportant on 3 April
(**D**)	*Trough/wind discontinuity*					
1.	Lower tropospheric levels	27	Bihar to south Tamil Nadu across Jharkhand, Orissa and coastal Andhra Pradesh	Sstationary	*In situ*	Less marked on 28
2.	Do	30 - 31	Chhattisgarh to Kerala across Telangana, Rayalaseema and Tamil Nadu	Oscillatory	Jharkhand to north coastal Tamil Nadu across Orissa & Andhra Pradesh.	It persisted in next month

Severe cold wave conditions prevailed on 1 to 2 days in some parts of Madhya Pradesh and Madhya Maharashtra. *Cold wave* conditions prevailed on 1 to 4 days in some parts of Sub-Himalayan West Bengal & Sikkim, east Uttar Pradesh, Uttarakhand, Haryana, Jammu & Kashmir, west Rajasthan, Madhya Pradesh and Madhya Maharashtra.

The month's and the season's lowest minimum temperature over the plains was 5.4° C, recorded at Jawai Dam (east Rajasthan) on 3 March 2012. Mumbai (Santacruz) recorded minimum temperature of 13.4° C on 1 March 2012, breaking the all time lowest minimum temperature of 13.8° C for the month of March, recorded on 30 March 1968 over the place.

(*ii*) *Maximum temperatures*

Heat wave conditions prevailed on 1 to 2 days in some parts of Assam & Meghalaya, Odisha, Rajasthan, east Madhya Pradesh and Saurashtra & Kutch.

Day temperatures were generally *above/appreciably above normal* almost in all sub-divisions on most of the days of the month.

The month's highest maximum temperature over the plains was 42.5° C, recorded at Bhira (Konkan & Goa) on 15 & 21 March 2012.

3.1.3. *Disastrous weather events and damage*

According to media and other disaster reports, avalanche killed 5 people in Kashmir valley. Also, strong winds disrupted power supply and damaged over 15,000 buildings injuring 17 people in Kashmir valley. Thunderstorm/lightning/ heavy rain/Gusty wind related incidents claimed 3 lives in Jharkhand and 2 in Karnataka. Four deaths due to heat wave were reported from Andhra Pradesh.

3.2. *April*

3.2.1. *Weather and associated synoptic features*

The details of the weather systems during the month are given in Table 3 and the principal amounts of rainfall are given in Table 5.

Widespread thundershower activity occurred in northeastern parts of India almost throughout the month.

TABLE 3

Details of the weather systems during April 2012

S. No.	System	Duration	Place of first location	Direction of movement	Place of final location	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(**A**)	*Low pressure area*					
1.	Low pressure area	21 and on 24 & 25	Southwest Bay of Bengal and neighbourhood	West	Commorin area and neighbourhood	It was first observed as a cyclonic circulation extending upto lower tropospheric level over south Andaman Sea and neighbourhood on 16. Moving westward, it lay over southwest Bay of Bengal and neighbourhood on 20 It lay as a trough of low at mean sea level over southwest Bay of Bengal off south Tamil Nadu coast with a cyclonic circulation aloft extending upto mid tropospheric levels during 22-23. The low pressure area became less marked on 26, however, the associated cyclonic circulation extended upto mid tropospheric levels lay over Lakshadweep area and adjoining Kerala-Karnataka coasts during 27-29
(**B**)	*Western disturbances/eastward moving systems*					
(*i*)	*As upper air cyclonic circulations*					
1.	Mid tropospheric levels	3 - 12	Central Pakistan and adjoining Afghanistan	Northeast	Jammu & Kashmir and neighbourhood	Moved away on 13
2.	Do	12 - 17	Northeast Afghanistan and neighbourhood	Do	Eastern parts of Jammu & Kashmir	Moved away on 18
3.	Do	18 - 19	North Pakistan and neighbourhood	Do	Northern parts of Jammu & Kashmir	Moved away on 20
4.	Do	20 - 25	Central Pakistan and adjoining Afghanistan	Do	Eastern parts of Jammu & Kashmir	Moved away on 25 evening
5.	Do	25 Apr - 2 May	Northeast Afghanistan and neighbourhood	Do	Jammu & Kashmir and neighbourhood	Moved away on 3 May
(*ii*)	*As induced cyclonic circulation*					
1.	Lower tropospheric levels	1 - 4	South Pakistan and adjoining west Rajasthan	Northeast	Northern parts of Uttar Pradesh and neighbourhood	Moved away on 4 evening
2.	Do	13 - 15	Punjab and adjoining Haryana	Do	Northern parts of Haryana and neighbourhood	Moved away on 16
(*iii*)	*Troughs in westerlies*					
(1)	Between 1.5 & 3.1 kms a.s.l.	4	Bihar to Gangetic West Bengal across Jharkhand	–	–	Less marked on 5
(**C**)	*Other upper air cyclonic circulations*					
1.	Upto lower tropospheric levels	5 - 6	East Madhya Pradesh and adjoining Chhattisgarh	Stationary	*In situ*	Less marked on 7
2.	Do	5 - 7	Assam & Meghalaya and neighbourhood	Do	Do	Less marked on 8
3.	Upto 3.1 kms a.s.l.	17 - 18	Haryana and neighbourhood	Do	Do	Less marked on 19

TABLE 3 (*Contd*.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
4.	Upto lower tropospheric levels	27 Apr - 6 May	Assam & Meghalaya and neighbourhood	Stationary	*In situ*	Less marked on 7 May
5.	do	29 Apr - 2 May	West Uttar Pradesh and neighbourhood	Do	Do	Less marked on 3 May
6.	Upto mid tropospheric levels	30 Apr - 5 May	South Tamil Nadu and neighbourhood	West	Lakshadweep and neighbourhood	Less marked on 6 May
(**D**)	*Troughs in easterlies*					
1.	At mean sea level	15 - 16	Southwest Bay of Bengal off Sri Lanka coast	Stationary	*In situ*	Less marked on 17
(**E**)	*Troughs / wind discontinuity*					
1.	Lower tropospheric levels	1 - 4	West Madhya Pradesh to south Tamil Nadu across Marathwada and interior Karnataka	Oscillatory	Vidarbha to south interior Karnataka across Marathwada and north interior Karnataka	Less marked on 5
2.	Do	6 - 24	West Bengal & Sikkim to north interior Karnataka across Jharkhand, Chhattisgarh, Vidarbha and Telangana	Do	Chhattisgarh to Kerala across Telangana, Rayalaseema and south interior Karnataka	Less marked on 25
3.	Do	25 - 30	Jharkhand to Kerala across Chhattisgarh, Telangana, Rayalaseema and south interior Karnataka	Do	Jharkhand to south Tamil Nadu across Odisha and coastal Andhra Pradesh	Ppersisted in next month

Passage of western disturbances gave precipitation at *scattered/isolated places* over western Himalayan region and adjoining states of Punjab and Haryana. North-South troughs/wind discontinuities gave rise to rain or thundershowers at *scattered/isolated places* over central and peninsular India (outside Gujarat State and Konkan & Goa) almost throughout the month.

3.2.2. *Temperature distribution*

Severe heat wave conditions occurred on one day in some parts of west Rajasthan. *Heat wave* conditions prevailed on 7 days in some parts of west Rajasthan and on 1 to 4 days in some parts of Arunachal Pradesh, Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, Odisha, Uttar Pradesh, Jammu & Kashmir, east Rajasthan, Madhya Pradesh and Gujarat State. *Hot day* conditions occurred on 1 to 3 days in some parts of west Uttar Pradesh, Rajasthan, east Madhya Pradesh, Madhya Maharashtra, Marathwada and Vidarbha.

Widespread nor'wester activity caused day maximum temperatures to remain below normal over the east and northeast India during the first half of April. Also, thundershowers caused the temperatures over northwest India to remain in the comfortable range towards the end of the month.

The month's highest maximum temperature over the plains was 45.7° C recorded at Motihari (Bihar) on 22 April 2012.

3.2.3. *Disastrous weather events*

According to media and other disaster reports, thunderstorm/thundersquall/lightning/ hailstorm/heavy rain claimed 213 lives in Assam, 49 in West Bengal, 35 in Odisha, 25 in Uttar Pradesh, 24 in Andhra Pradesh, 13 in Bihar, 10 in Karnataka, 9 in Kerala, 4 in Rajasthan, 3 each in Tripura and Tamil Nadu, 2 each in Madhya Pradesh and Mizoram and 1 each in Uttarakhand, Himachal Pradesh,

TABLE 4

Details of the weather systems during May 2012

S. No.	System	Duration	Place of first location	Direction of movement	Place of final location	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(**A**)	*Western disturbances / eastward moving systems*					
(*i*)	*As upper air cyclonic circulations*					
1.	Mid -tropospheric levels	3 - 9	North Pakistan and neighbourhood	Northeast	Jammu & Kashmir and neighbourhood	Moved away on 10
2.	Do	9 - 14	Afghanistan and adjoining Rajasthan	Do	Eastern parts of Jammu & Kashmir	Moved away on 15
3.	Do	16 - 19	North Pakistan and adjoining Jammu & Kashmir	Do	Jammu & Kashmir and neighbourhood	Moved away on 20
4.	Do	20 - 22	North Pakistan and neighbourhood	Do	Do	Moved away on 23
5.	Do	23 eve - 26	Do	Do	Do	Moved away on 27
6.	Do	29 May - 2 Jun	Do	Do	Northern parts of Jammu & Kashmir	Moved away on 3 June
(*ii*)	*As induced cyclonic circulations*					
1.	Lower tropospheric levels	2 - 7	Rajasthan and neighbourhood	Northeast	Haryana and neighbourhood	Moved away on 8
2.	Upto 2.1 kms a.s.l.	21 - 22	Central Pakistan and adjoining northwest Rajasthan	Do	Northern parts of Rajasthan and neighbourhood	Less marked on 23
(*iii*)	*Troughs in westerlies*					
1.	Mid and upper tropospheric levels	14 - 15	Long. 70° E to the north of Lat. 25° N	Northeast	Long. 80° E to the north of Lat. 22° N	Moved away on 16
(**B**)	*Other cyclonic circulations*					
1.	Lower tropospheric levels	10 - 11	Jharkhand and neighbourhood	West	East Uttar Pradesh and neighbourhood	Less marked on 12
2.	Mid tropospheric levels	11 - 14	South Tamil Nadu and neighbourhood	Do	Lakshadweep area and neighbourhood	Less marked on 15
3.	Do	12 - 13	Assam & Meghalaya and neighbourhood	Stationary	*In situ*	Less marked on 14
4.	Lower tropospheric levels	16 - 23	Do	Do	Do	Less marked on 24
5.	Mid and upper tropospheric levels	26 May - 1 Jun	Southwest Bay of Bengal and neighbourhood	Northeast	North Bay of Bengal and neighbourhood	Less marked on 2 May
6.	Upto lower tropospheric levels	26 May - 2 Jun	Odisha and neighbourhood	Stationary	*In situ*	Less marked on 3 June
7.	Mid tropospheric levels	27 May - 2 Jun	Assam & Meghalaya and neighbourhood	Do	Do	Less marked on 3 June
8.	Between 1.5 & 5.8 kms a.s.l.	31 May - 1 Jun	West central Arabian Sea and neighbourhood	Do	Do	Less marked on 2 June
(**C**)	*Trough/wind discontinuity*					
1.	Lower tropospheric levels	1 - 25	East Madhya Pradesh to south Tamil Nadu across Vidarbha, Telangana and Rayalaseema	Oscillatory	Jharkhand to Tamil Nadu across Chhattisgarh Vidarbha, Telangana and Rayalaseema	Less marked on 26

TABLE 5

Some representative amounts of rainfall in cm for the months March, April and May 2012 (3 cm and above)

Date	March	April	May
1	Tuting 8, Naharkatia, Gund, Majitar, Tadong, Aizwal & Chandel 1 each	Purihansa 4, Kuppady & Phulberia 3 each, Mavelikara 2, Baripada & Uthagamandalam 1 each	Cherrapunjee & Vriddhachalam 7 each, Maya Bandar 5, Hut Bay, Tirupathi & Kolar 4 each, Alipurduar & Kailashahar 3 each, Baripada, Aluva, Trichy town, Perumbavur & Gund 2 each
2	Tuting & Chhamonu 2 each, Dholai, Gharmura & Udaipur 1 each	Ottappalam 5, Karipur 3, Gunupur & Shrivaikuntam 1 each	Karur & Sivaganga 10 each, Bangalore & Port Blair 7 each, Trichy town 5, Hasimara, Jaipatna, Tangla & Kailashahar 3 each, Maya Bandar & Chinsura 2 each, Nandigama & Banihal 1 each
3	Dholai 7, Amraghat 5, Tuting 3, Deomali, Mangan & Kollam 2 each, Belonia, Lengpui, Kanjirappally & Chandbali 1 each	Konni 3, Tadong 2, Chengannur, Srivaikuntam & Thalavadi 1 each	MM Hills & Car Nicobar 7 each, Krishnanagar & Lengpui 6 each, Tadong 4, Mancompu, Chaparmukh & Kalingapatnam 3 each, Deomali & Kodaikanal 2 each
4	Aizwal & Itanagar 2 each, Kupwara, Mangan, Nancowry, Keylong, Gulmarg & Majbat 1 each	Darjeeling 6, Jalpaiguri 5, Gossaigaon, Bahalpur, Datia, CIAL Kochi & Mandi 2 each, Tehri & Kozha 1 each	Jia Bharali NT Xing 7, Hasimara & Kumargram 6 each, Maya Bandar, Kottayam & Bhuban 5 each, Tantloi, Gossaigaon & Kailashahar 3 each, Atru & KR Nagara 2 each, Seppa & Rajgarh 1 each
5	Manali 7, Poonch, Saloni, Pahalgam & Batote 6 each, Badarwah 5, Seobagh, Kalpa, Keylong & Banihal 4 each, Khairi & Srinagar 3 each	Cherrapunjee 8, Barapani 6, Burdwan 3, Kiravatti 3, Thodupuzha 3, Kundagol, Kalasa, Panagarh, Tadong, Sholapur & Alipurduar 2 each, Ajmer & Tezu 1 each	Kayamkulam 19, Kollam 17, Maya Bandar 8, Kodavasal 7, Kendrapara 5, Kalingpatnam & Damthang 3 each, Purihansa 2, Maharajganj, Dudda, Saiha & Ranchi 1 each
6	Silchar & Tehri 7 each, Purola & Kasol 5 each, Dholai & Joshimath 4 each, Lakhipur, Dharampur, Dunda, Shimla & Kalpa 3 each, Imphal & Batote 2 each	Cherrapunjee 14, Jia Bharali N. H. Xing 9, Kuppady 4, Kolkata & Gajoldoba 6 each, Champasari 5, Maya Bandar 4, Barrakpur, Khairamal, Tuting & Phek 3 each	Port Blair 13, Alappuzha 5, Tanjavur, Sahada, Narsapur & Satyamangalam 2 each, Indore, Sidhi & Badarwah 1 each
7	Cherrapunjee 10, Silchar 5, Haflong & Bhuntar 3 each, Lakhipur, Dehra Dun, Mangan & Varkala 2 each, Mukteshwar & Champawat 1 each	Kochi & Thodupuzha 7 each, Cherrapunjee 5, Tuting, Nagrakata & Purnea 4 each, Bishalgarh, Malda, Anini & Belur 3 each, Car Nicobar & Mellabazar 2 each, Seoni 1	Jowai, Vijaywada & Kodaikanal 5 each, Machilipatnam 3, Jagdalpur & Maya Bandar 2 each, Indore, Rampurhat & Nathdwara 1 each
8	Kollam & Anini 7 each, Kanjirappally 5, Passighat 3, Gund, Dholai, Matijuri & Panisagar 2 each, Kupwara, Tezu, Kohima & Kailashahar 1 each	Balehonnur & Rangia 8 each, Silchar 6, Canning & Tuting 5 each, Balasore, Kurnool & Phek 4 each, Teliamura, Anini, Kalasa & Chandipur 3 each, Kuppady 2	Nimbahera 5, Mandana 4, Ratlam 3, Munnar & Kodaikanal 2 each, Kembhavi, Anantpur, Hoshangabad & Panagarh 1 each
9	Uttarkashi, Anini, Katra, Gharmura, Panisagar & Kohima 1 each	Soro 9, Remuna 7, Jia Bharali N. H. Xing 7, Serchip, Sonamura, Guwahati & Domohani 5 each, Barobhisha & Punalur 4 each, Kalaikunda, Simula, Bomdila & Belthangady 3 each	Kalasa 7, Kumbhalgarh 6, Alur & Kumargram 5 each, Dindori, Madurai, Dambal & Rashmi 4 each, Satna & Salem 3 each, Munnar, Bhatwari & Degana 2 each, Sagar & Gadag 1 each
10	Nancowry 2, Raidighi & Anini 1 each	Ponnani 6, Teliamura 5, Manas N. H. Xing, Kokrajhar & Sonamura 4 each, Forbesganj, Gajoldoba, Basirhat, Namehi & Sedam 3 each, Srinagar, Nancowry & Canning 2 each	Vijaywada 13, Rampura 8, Gajoldoba 6, Nuagada & Tuni 5 each, Banki, Gaya & Kothagudam 4 each, Panhala 3, Jamshedpur, Munnar, Maya Bandar, Kotda SR & Bankura 2 each

TABLE 5 (*Contd.*)

Date	March	April	May
11	Car Nicobar 3, Punalur, Thiruvananthapuram & Hut Bay 1 each	Katipada 12, Nimapara 6, Sonamura, Digha & Basirhat 5 each, Lengpui, Nagrakata, Dholai, Kudachi, Amraghat & Chepan 4 each, Port Blair, Jammu & Mangalore 3 each	Trichy town 12, Aurad & Yegati 7 each, Saiha 5, Satana 4, Dharmasthala & Williamnagar 3 each, Parambikulam, Kishngarhwas, Taranagar, Ratlam & Munsyari 2 each, Machilipatnam 1
12	Aryankavu 2, Kayamkulam 1	Karwar 7, Bijapur & Tezu 5 each, Aluva, Dehri, Valparai, Mirzapur, Kalingapatnam & Mandi 4 each, Aska, Chandigarh, Gangtok, Kottur & Kurnool 3 each, Dehra Dun & Jalesar 2 each	Kochi 12, Enamackel 12, NR Para 8, Dharwad 6, Jhunjhunu, Balurghat, Panisagar & Shirol 5 each, Banihal, Kukernag, Joshipur & Dharmasthala 3 each, Rampurhat 2, Munsyari 1
13	Parangipettai, Dharamsala, Meerath & Nazibabad 3 each, Mukteswar, Gund & Varanasi 2 each, Gaya, Kathua, Ballia, Tehri, New Delhi & Rewa 1 each	Matijuri 7, Hasimara, Sangli, Tuting & Piravom 5 each, Agartala, Hukkeri & Uchangidurg 4 each, Anantpur 3, Nancowry & Gund 2 each, Dum Dum, Mehbubnagar & Rairangnagar 1 each	Rongo 10, Nahar Katia 9, Mulki, Bellary & Dillighat 7 each, Alwar 6, Peermade 5, Mohana & Deomali 4 each, Churu, Narnaul, Kurnool & Akkalkot 3 each, Awantipur, Kharidwar & Nellore 2 each
14	Coonoor 4, Gorakhpur, Madapura, Irinjalakuda, Mannarkad, Vijaywada & Tusuma 2 each, Purnea, Chalakudy, Bhagamandala & Bankura 1 each	NH 31 Bridge, Tuting & Sibsagar 8 each, Soro & Tadong 5 each, Koppa & Tezu 4 each, Arai SR & Phulberia 3 each, Jaisalmer, Katra, Tusuma & Visakhapatnam 2 each, Aryankavu & Chandel 1 each	Deomali 11, Dillighat & Margherita 8 each, Bikaner & Lengpui 6 each, Hanagal 5, Ammathi 4, Munnar, Rongo, Tezu & Haliyal 3 each, Ajmer 2, Gadhinglaj 1
15	Tuticorin 7, Mavelikara 5, Anini & Sathankulam 4 each, Haripad 3, Kuppady & Kanyakumari 2 each	Piravom & Tuting 5 each, Laikeria 4, Bhadrachalam 3, Dalhousie, Nagarkata, Raipur, Shirahatti & Thanjavur 2 each, Champa, Jagalbet, Pali & Karnal 1 each	Passighat 16, N. Lakhimpur & Dhemaji 10 each, Hanagal & Minicoy 6 each, K. Nuagaon 4, Kailashahar, Poonch & Nagarkata 3 each
16	Mangan 9, Sathankulam 7, Tiruchendur 6, Anini 3, Passighat 2, Roing & Tezu 1 each	Tuting 12, Matijuri 9, Kanjirappally 8, Chenganur 7, Kailashahar & Kosani 4 each, Mangan & Talaguppa 3 each, Hissar, Londa & Siddapura 2 each, Car Nicobar & Khen 1 each	Tuting14, Cherrapunjee 8, Chamrajanagar 8, Kollam, N Lakhimpur & Lawngtlai 5 each, Kottayam & Arogyvaram 3 each, Gheropara & Mangan 2 each, Rudraprayag & Sangla 1 each
17	Kanjirappally 8, Cherthala, Kottayam & Kozha 4 each, Napoklu & Tirtol 1 each	Tuting 7, Gangtok 6, Amraghat, Kailashahar, Kushtagi, Odagaon & Yelandur 4 each, Munnar & Panhala 3 each, Suratgarh & Haliyal 2 each, Deoband & Car Nicobar 1 each	Chepan & Beky Road Bridge 7 each, Tuting 6, Bikaner, Chandel, Port Blair, Gadag, Belur & Thiruvananthapuram 2 each
18	Idukki & Cherrapunji 1 each	Cherrapunji 14, Nelamangala 6, Mangan, Ramgarhshekhatan & Thodupuzha 3 each, Gokarna, Hirekerur, Sardarshahar & Tezu 2 each, Banpur & Kodaikanal 1 each	Long Islands 8, Korei 4, Kailashahar 3, Sikar, Sujangarh, Gulmarg R. S., Namthang & Sukinda 2 each, Berhampore, Tuting & Cherrapunjee 1 each
19	Nil	Hosanagara 10, Tinsukia & Khowang 8 each, Minicoy & Byadgi 7 each, Tadong & Gokarna 6 each, Gangtok & Tezu 5 each, Bhalukpong & Quilandy 4 each, Bhadrak 3, Tirupattur & Osmanabad 1 each	Silchar 7, Kollengode, Jamsolaghat, Long Islands, Maya Bandar & Salem 3 each, Kishangarh & Joshipur 2 each, Seoni, Gund, Bilara, Gokulpur & Jamshedpur 1 each
20	Kupwara & Quazigund 1 each	Chidambaram 10, Tadong 7, Bihubar 5, Gangtok & Jorhat 4 each, Mahendragarh & Paud 3 each, Junnar 2, Perumbavur, Port Blair & Kailashahar 2 each	Nancowary 6, Port Blair 4, Mahendragarh, Dharmatal & Kamalpur 3 each, Darjeeling, HD Kote & Gunpur 2 each, Purnea, Rampurhat, Kakinada & Tuni 1 each
21	Lakhipur & Quazigund 1 each	Dharmasthala 8, Tadong, Idukki & Kollam 6 each, Ammathi & Shirol 5 each, Gossaigaon, Banihal & Arundhutinagar 4 each, Quazigund, R. Udaigiri & Belgaum 3 each, Satara 2, Mandi 1	Kampur 6, Midnapore, Deomali, Agartala & Vellore 4 each, Car Nicobar & Bangiriposi 3 each, Vallabhnagar & Balimundali 2 each, Gund & Munnar 1 each

TABLE 5 (*Contd.*)

Date	March	April	May
22	Jorhat 3, Tadong, Tezu, Bihubar, Sibsagar, Rangiya & Tezpur 2 each, Gangtok, Arasalu & Itanagar 1 each	Puthimari 5, Sundernagar 4, Namchi, Sedam, Darjeeling, Naharlagun & Zunheboto 3 each, Poonch, Bhuntar & Similiguda 2 each, Shevgaon, Uttarkashi & Chargharia 1 each	Chauldhowaghat& Valparai 8 each, Falakata, Karipur & Ottappalam 5 each, Car Nicobar 4, Tezu, Gulmarg & Chamarajanagar 3 each, Binjharpur, Bellati & M M Hills 2 each
23	Shenkottai 4, Tenkasi & Tuting 3 each, Alappuzha, Mavelikara & Haripad 2 each, Tezu, Naharkatia, Margherita & Gangtok 1 each	Cherrapunjee 11, Daspalla 8, Anini & Lakhipur 7 each, Bari 6, Shiggaon 5, Subramanya 4, Hosanagara 3, Gund, Anantpur, Gulmarg, Alapuzha & Jamshedpur 2 each	Cherrapunjee 16, Car Nicobar 15, Cooch Behar 13, Pedong, Dhemaji & Passighat 8 each, Gund, Tirupattur & H. D. Kote 2 each
24	Nil	Cherrapunjee 25, Matijuri & Punalur 9 each, Watrap 8, Ponnampet 6, Subramanya 5, Tuting & Bimalkhed 4 each, Lawngtai & Rohru 3 each, Gund & Mangan 2 each, Gulmarg 1	Passighat 8, Naharlagun, Dayang RF & Dhekiajuli 7 each, Hut Bay & Nancowry 6 each, Chhamonu 5, Kumargram 4, Khowai 3, Tirumangalam & Kalingapatnam 2 each, Alappuzha 1
25	Nil	Aluva 13, Thogamalai 12, Chengannur 11, Shenkottah 10, Bihubar 7, Matijuri & Kolasib 6 each, Tezu & Remuna 5 each, Kolkata &Virajpet 3 each, Mangan, Siddapura & Haveri 2 each	Cherrapunjee 18, Nancowry 8, Maya Bandar & Silchar 7 each, Cooch Behar 6, Dayang RF 5, Udaipur 3, Tuting, Mavelikara & Kodungallur 2 each, Tezu 1
26	Kupwara & Tissa 1 each	Bagepalli, Cherthala & Thodupuzha 10 each, Dharapuram 9, Kosagumda 5, Gohar, Daringibadi, Mudibidre & Ranebennur 4 each, Cherrapunji & Sonamura 3 each, Muktsar 2	Gyalsing 6, Majitar 5, Berhampore & Car Nicobar 2 each, Port Blair, Pahalgam, Kukernag, AIE NH Xing, Tawang & Kajolgaon 1 each
27	Cherrapunji 3, Gund 2, Tezu, Kukernag & Poonch 1 each	Kavaratti 11, Panchapatti & Aruppukottai 10 each, Aluva 8, Madhabarida & Kagal 7 each, Somawarpet 6, Cherrapunji 5, Carnicobar, Gangtok, Kothagudam & Kolhapur 3 each	Port Blair & Kodungallur 6 each, Gharmura 4, Sabour & Long Island 3 each, Baghdogra, Gokulpur & Kakadwip 2 each, Similiguda & Tawang 1 each
28	Piravom 6, Vaikom, Coonoor, Neyyattinkara, Passighat, Chauldhowaghat, Sibsagar, Mangan & Dibrugarh 2 each, Naharlagun, Gund & Kochi 1 each	Chintamani 12, Mannarkad 11, Ranebennur 10, CIAL Kochi & Penukonda 9 each, Tangla 6, Mulki & Valparai 5 each, Minicoy 4, Kavaratti & Parvatipuram 3 each, Ranchi 2	Chauldhowaghat 8, Sonamura 7, Matijuri 6, Maya Bandar, Agartala, Kolkata & Gangtok 5 each, Kottayam 3, Cherthala & Haveri 2 each, Guttal & Madhabarida 1 each
29	Tuting 10, Anini 6, Mangan 5, Piravom, Thodupuzha & Valparai 3 each, Badatighat & Naharkatia 1 each	Paralakhemundi 10, Pathapatnam 7, Poonch & Kailashahar 5 each, Palasa & Tangla 4 each, Tarikere & Irinjalakuda 3 each, Bhatwari, Pundibari, Kochi A.P. & Arogyavaram 2 each	Gajoldoba 14, Long Island & NH 31 Bridge 12 each & Maya Bandar 5 each, Panisagar 3, Medak, Mahanga, Kendrapara, Gharmura & Lengpui 2 each, Afzalpur & Sedam 1 each
30	Konni 6, Piravom & Anini 5 each, Tawang & Nancowry 4 each, Tadong & Mohanbari 1 each	Cherrapunjee 16, Silchar 9, Kochi A.P. & Chintamani 7 each, Karipur 6, Malkangiri 5, Jagdalpur 4, Poonch, Nancowary, Kalaikunda & Khanitar 3 each, Dunda & Vijaywada 2 each	Kailashahar & Maya Bandar 9 each, Long Island 7, Golaghat 6, Mathabhanga 5, Aluva, Falakata & Bishalgarh 3 each, Miao, Tezu & Haripad 2 each
31	Car Nicobar 7, Sholagiri 3, Bhavani Patna, Nancowry, Pavagada & Kolar 2 each, Adirampattinam, Tezu, Chikkanahalli & Koraput 1 each	Nil	Balurghat 8, Guwahati 6, Bhalukpong 5, Phek 4, Amarpur & Maya Bandar 3 each, Piravom 2

Jammu & Kashmir and Maharashtra. Also, 1 person died due to Sunstroke in Maharashtra.

3.3. *May*

3.3.1. *Weather and associated synoptic features*

(*i*) *Advance of southwest monsoon*

Southwest monsoon advanced over some parts of southeast Bay of Bengal and of Andaman Sea on 23 May. It further advanced into most parts of Andaman Sea and southeast Bay of Bengal and some parts of southwest & east central Bay of Bengal on 25 and into some parts of Maldives-Comorin areas and some more parts of southwest Bay of Bengal on 26.

(*ii*) *Other synoptic features and rainfall*

The details of weather systems during the month are given in Table 4 and the principal amounts of rainfall are given in Table 5.

Major parts of the country experienced scattered to fairly widespread thundershowers except during the third week of the month.

3.3.2. *Temperature distribution*

Severe heat wave conditions prevailed on 1 to 4 days in some parts of West Bengal & Sikkim and coastal Andhra Pradesh. *Heat wave* conditions prevailed on 18 days in some parts of coastal Andhra Pradesh; 11 to 14 days in some parts of Odisha, Vidarbha and Tamil Nadu; 5 to 10 days in some parts of Jharkhand, Bihar, east Uttar Pradesh, west Rajasthan, east Madhya Pradesh and Chhattisgarh and on 1 to 4 days in some parts of Arunachal Pradesh, Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, West Bengal & Sikkim, west Uttar Pradesh, Uttarakhand, Haryana, Himachal Pradesh, Jammu & Kashmir, east Rajasthan, west Madhya Pradesh, Saurashtra & Kutch and Telangana.

The month's as well as the season's highest maximum temperature of 48.7° C was recorded at Churu (west Rajasthan) on 31 May 2012.

3.3.3. *Disastrous weather events and damage*

According to media and other disaster reports, hailstorm / thunderstorm / lightning / duststorm related incidents claimed 37 lives in West Bengal, 29 in Odisha, 27 in Maharashtra, 18 in Assam, 11 in Bihar, 9 in Karnataka, 2 each in Kerala, Tripura and Tamil Nadu. Heat wave claimed 30 lives in Odisha, 11 in West Bengal, 7 in Jharkhand, 3 in Chhattisgarh and 1 each in Chandigarh and Andhra Pradesh. Intense convective activity termed as cloud burst by media claimed 3 lives in Jammu & Kashmir.

Appendix

Definitions of the terms given in '*Italics*'

Temperatures

(a) *Maximum/ day temperatures*

According to the criteria being followed since 1st March 2002, Heat Wave will be declared only when the maximum temperature of a station reaches at least 40° C for plains and at least 30° C for Hilly regions.

Severe heat wave - Departure of maximum temperature from normal is + 6° C or more for the regions where the normal maximum temperature is more than 40° C and departure of maximum temperature from normal is + 7° C or more for the regions where the normal maximum temperature is 40° C or less.

Heat wave conditions - Departure of maximum temperature from normal is between + 4° C to + 5° C or more for the regions where the normal maximum temperature is more than 40° C and departure of maximum temperature from normal is +5° to + 6° C for the regions where the normal maximum temperature is 40° C or less.

Hot day conditions - Whenever the maximum temperature remains 40° C or more and minimum remains 5° C or more above normal, provided, it is not satisfying the heat wave criteria.

(b) *Minimum/night temperatures*

Severe cold wave conditions Departure of WCTn from normal minimum temperature is –7° C or less for the regions where normal minimum temperature is > 10° C and –6° C or less elsewhere.

Cold wave conditions	- Departure of WCTn from normal minimum temperature is from –5° C to –6° C where normal minimum temperature is ≥10° C and from –4° C to –5° C elsewhere. Also cold wave is declared when WCTn is ≤0° C irrespective of the normal minimum temperature for those stations.

Rainfall

Excess	- Percentage departure from normal is + 20 % or more.
Normal	- Percentage departure from normal is –19 % to + 19 %.
Deficient	- Percentage departure from normal is –20 % to –59 %.
Scanty	- Percentage departure from normal is –60 % to –99 %.