

Weather Synopsis –May 2023

Above normal rainfall was reported over Northern, Northeastern and Eastern parts of the country and below average rainfall was reported from central and southwestern parts of the country (Fig 2). Most of the meteorological stations reported above normal rainy days except Colombo, Hambantota, Katugastota, Kurunegala, Nuwara Eliya, Ratmalana and Ratnapura (Fig. 3). Maximum percentage was reported from Mannar (365.5%) while minimum from Ratmalana station (60.2%)

Highest cumulative rainfall was **943.7** mm at Hiniduma . Highest rainfall received during 24hours, was **227.5**mm at Bandaragama on the 04th.

Figure 5 depicted lightning flash density map for April 2023. Lightning flashes were reported from most parts of the island except northeastern, eastern and southeastern coastal belt. High lightning density was reported from Poonakary, Oddusudan, Vavuniya North, Vavuniya South, Welioya, Padawiya,, Madhu, Manthai, Kabithigollawa, Rambewa, Galnewa, Ehetuwawa, Nochchiyagama, Kekirawa, Dambulla, Siyabalanduwa, Buttala, Lahugala, Hingurakgoda, Dimbulagala, Lankapura, Medirigiriya, Kantalai, Yatinuwara, Warakapola, Thibirigasyaya, Homagama, Dompe, Elpitiya, Thanamalwila,

With the formation of low-pressure area subsequent cyclonic storm "Mokha" in the Southeast Bay of Bengal and adjoining west-central Bay of Bengal from 09th to 14th May, southwesterly flow has temporarily established across Sri Lanka at low levels till 14th May (Fig 1B). Except for few showers mainly fair weather dominated across the island during 3rd and 04th weeks of the month. Thunderstorm activity was enhanced over the inland areas on 29th . Showery conditions were enhanced over southern parts of the country during last 2 days of the month. Northern limit of monsoon flow was established to south of Sri Lanka by 31st (Fig 1A).

Table 1: Significant Rainfall amounts (24 hour) received in May 2023

Date	Rainguage Station	24 Rainfall (mm)
01 May 2023	Palugasdamana	112.5
01 May 2023	Ekgaloya Tank	104.0
03 May 2023	Colombo Fort	112.7
04 May 2023	Bandaragama	227.5
04 May 2023	Katunayake	171.1
04 May 2023	Angamedilla	127.0
04 May 2023	Negombo	105.0
05 May 2023	SHETTIKULAM	128.0
06 May 2023	Anamaduwa	162.4
06 May 2023	Kuliyapitiya	148.0
06 May 2023	Kamandaluwa	140.2
06 May 2023	WATER RESOURCE BOARD	117.4
06 May 2023	Jaffna irrigation	107.5
06 May 2023	Hindawa	102.8
11 May 2023	Kalatuwawa	225.5
11 May 2023	Labugama	199.2
11 May 2023	Hiniduma	162.5
11 May 2023	BATUWANAGALA	159.0
11 May 2023	Hanwella	152.2
11 May 2023	PODDIWELA FARM	112.4
12 May 2023	Padukka Estate	126.8
13 May 2023	BATUWANAGALA	122.1
13 May 2023	Bandaragama	101.0
14 May 2023	BATUWANAGALA	127.9
14 May 2023	Hiniduma	115.7
14 May 2023	Deniyaya	114.0
19 May 2023	KETENDOLA	131.5
19 May 2023	Bentotawatte	125.3
29 May 2023	Handapanagala	170.4
30 May 2023	Upper kotmalee	107.2
30 May 2023	Rathnapura	103.5
31 May 2023	Hiniduma	185.5

Most of the meteorological stations reported below average maximum temperatures during the first two weeks of the month. Most of the meteorological stations reported above average temperatures during last two weeks of May (Fig.12).

Minimum temperatures were below average over most of the stations especially during the first week of the month and above average during 2nd week onwards (Fig.13). Reported maximum temperature was 38.0 °C at Mullaitiv on 28th May and reported minimum temperature was 11.2°C at NuwaraEliya on 16th May (Table 4).

During May 2023, sea surface temperatures (SSTs) were above-average in much of the equatorial Pacific . The latest monthly Nino indices were +2.0C for the Nino 1+2 region, +0.5C for the Nino 3.4 region and +0.9C for the Nino 3 region. Ocean Nino Index is 0.5 during April to June (AMJ) . Oceanic and atmospheric anomalies were consistent with El Ni o conditions (NOAA Climate prediction Center). Neutral IOD was observed during May 2023 (BoM, Australia).

During May 2023, warm sea surface temperatures (SSTs) were apparent over the sea areas surrounding the island. Sea surface waters in north Arabian sea are much warmer than average (Fig. 06).

The average position of the shear line laid around 03N 40⁰E, 02⁰S80⁰E and 02⁰S90⁰E and 02⁰N120⁰E (Fig 07).

The Madden-Julian Oscillation (MJO) was strong at the phase during first week , propagated to phase 5 from 07th to 10th , stagnated in phase 6 11th to 21st , propagated to phase 7 from 22nd to 27th , then to phase 8 during last 4 days of the month (Fig. 8).

Weather Systems

A Cyclonic Circulation formed over the Southeast Bay of Bengal (BoB) on 6th May, 2023. Under its influence a Low Pressure Area formed over southeast BoB and adjoining south Andaman Sea on 8th May 2023. It concentrated into a Depression in the on 09th. It initially moved west-northwestwards and intensified into a Deep Depression in the early morning of 10th May 2023 over southeast BoB . The

system intensified into a Cyclonic Storm (CS) “Mocha” p in the early morning of 11th May 2023 over southeast BoB and intensified into a Severe Cyclonic Storm (SCS) in the evening of 11th May over the same region. Thereafter, it gradually started recurving north-northeastwards and intensified into a Very severe Cyclonic Storm (VSCS) in the early morning of 12th May over central BoB. Moving further north-northeastwards, it intensified into an Extremely Severe Cyclonic Storm (ESCS) in the midnight of 12th May over eastcentral BoB. It crossed north Myanmar-southeast Bangladesh coasts

between Kyaukpyu (Myanmar) and Cox’s Bazar (Bangladesh) close to north of Sittwe (Myanmar) near latitude 20.3°N and longitude 92.8°E as an ESCS during 0700 UTC to 0900 UTC of 14th May (Fig 1B).

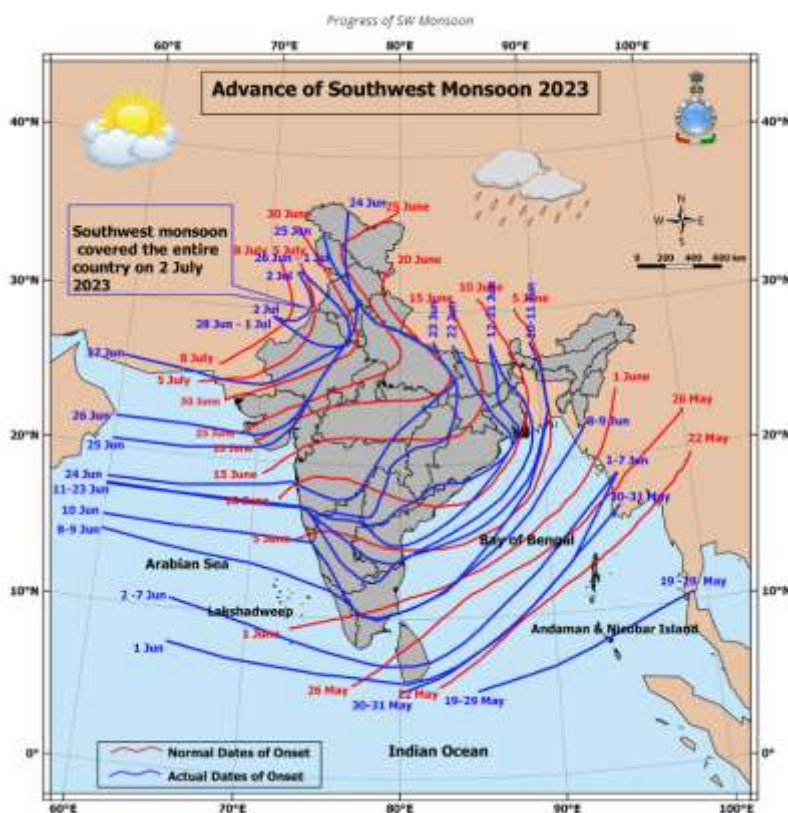


Fig 1: Monsoon onset isochrones for May 2023 (Source : IMD)

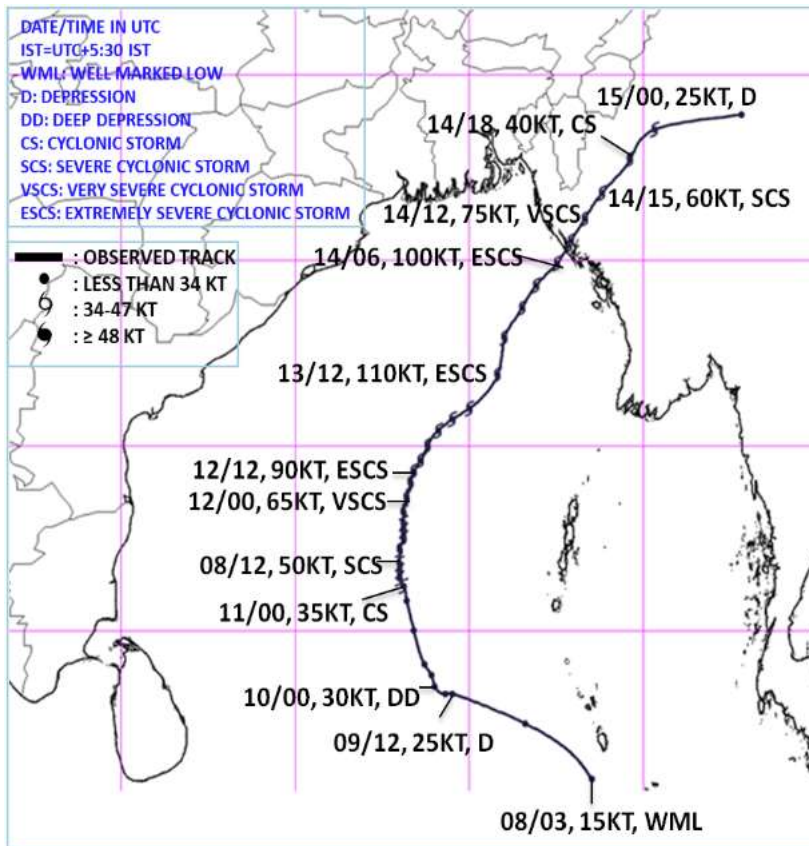


Fig 1: Observed Track of Mokha (Source : IMD)

Surface pressure and winds: The surface pressure was above average except on 01st, on 06th, from 09th to 12th, on 14th, on 28th. There were even or fairly even pressure distribution on 01st, from 03rd to 06th, on 23rd, and on 29th. Southwesterly pressure gradient for the rest of the month. The pressure gradient was steep on 12th and 14th associated with very severe cyclonic storm Mokha. It was moderate on 11th, on 13th, on 15th, on 21st and from 25th to 26th; The pressure gradient was mild on 02nd, from 09th to 10th, from 16th to 20th, on 22nd, on 24th, from 27th to 31st.

The surface wind was predominantly westerly to South-westerly for the month and speed varied within 05-10kts..

Upper winds:

At 850hPa, Westerly wind flow was dominated over the island . Anomalous northeasterly flow evident across of Sri Lanka indicate weakening of monsoonal flow over the island. (Fig 9).

At 700 hPa, Northerly to northwesterly wind flow was dominated over the island. Anomalous anti-cyclonic circulation evident to the southwest of Sri Lanka suppressed the rainfall during May (Fig 10)

At 500 hPa, Northerly to northwesterly wind flow was dominated over the island. Anomalous easterly wind flow evident across Sri Lanka weaken the monsoonal flow across Sri Lanka (Fig 11)

The 200 hpa the upper tropospheric ridge was laid from 10⁰N40⁰E to 14⁰N80⁰E and 18⁰N100⁰E bringing predominantly southeasterly winds across Sri Lanka.

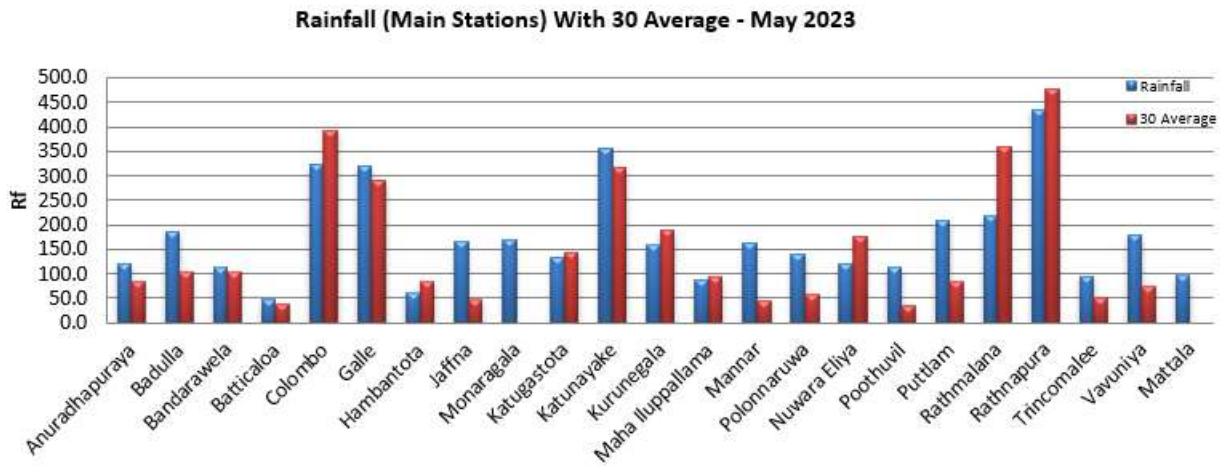


Fig 2: Monthly Total Rainfall(mm) with 30 years (1961-1990) of their averages at Main Meteorological stations areas during May2023

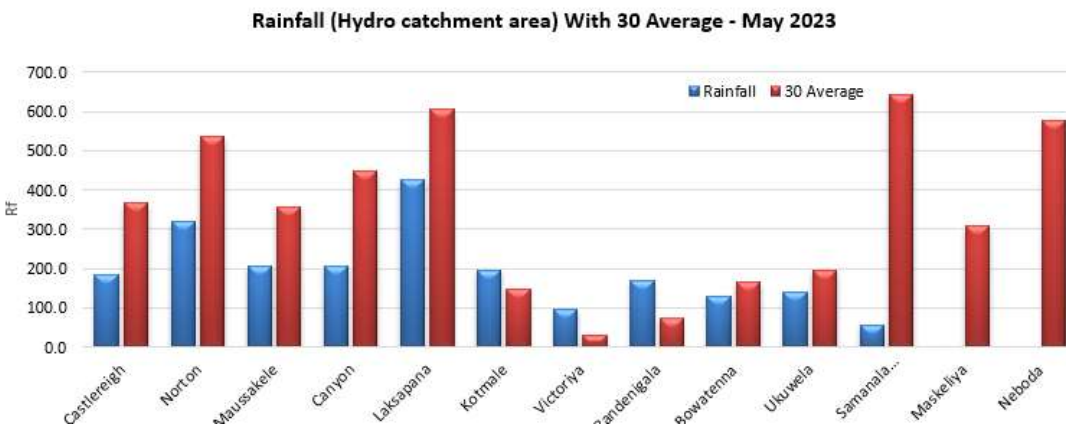


Fig 3: Monthly Total Rainfall(mm) with 30 years (1961-1990) of their averages at Hydro catchment areas during May2023

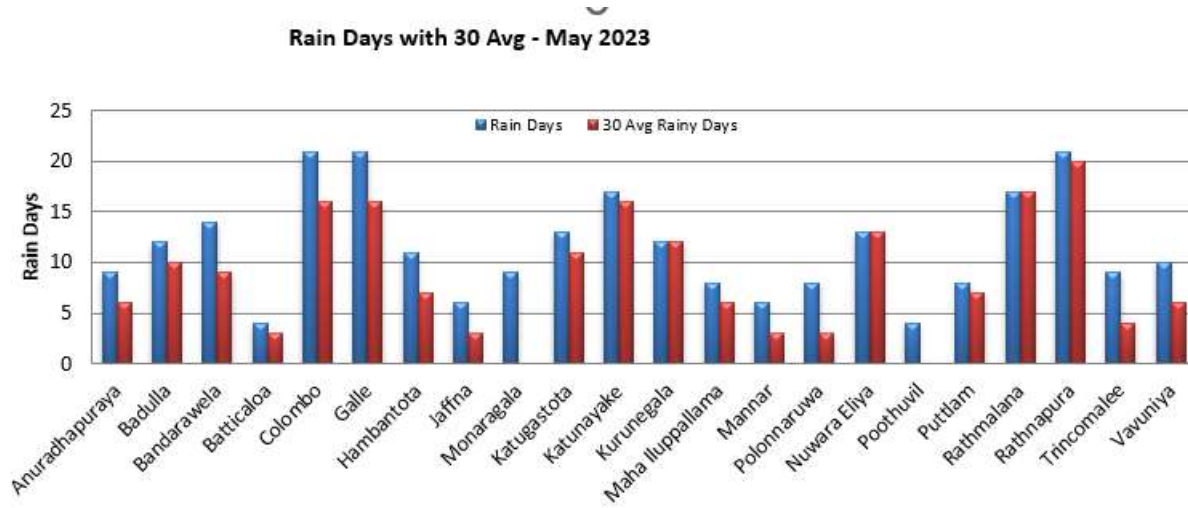


Fig 4: monthly total no of rainy days with 30 years(1961-1990) of their averages at main Meteorological stations during May 2023

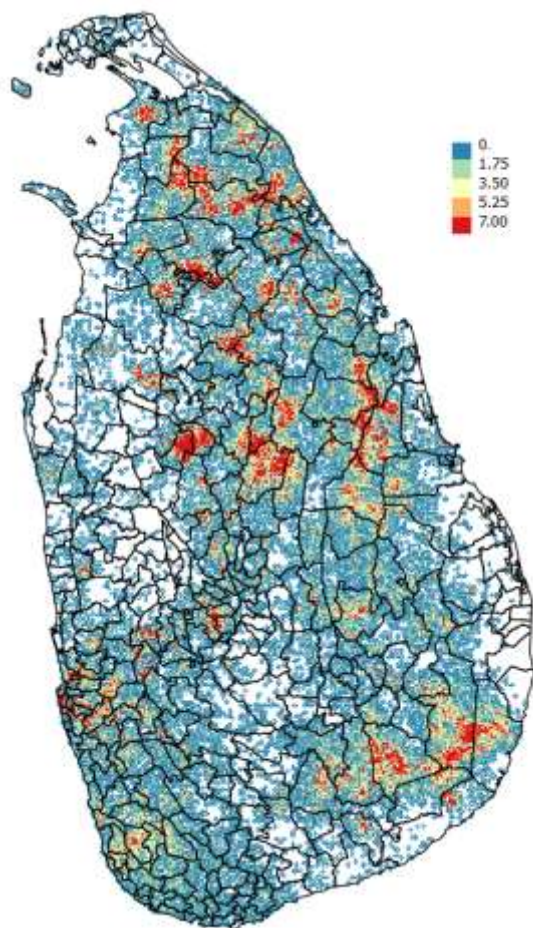


Fig 5: Lightning flash density map for May 2023

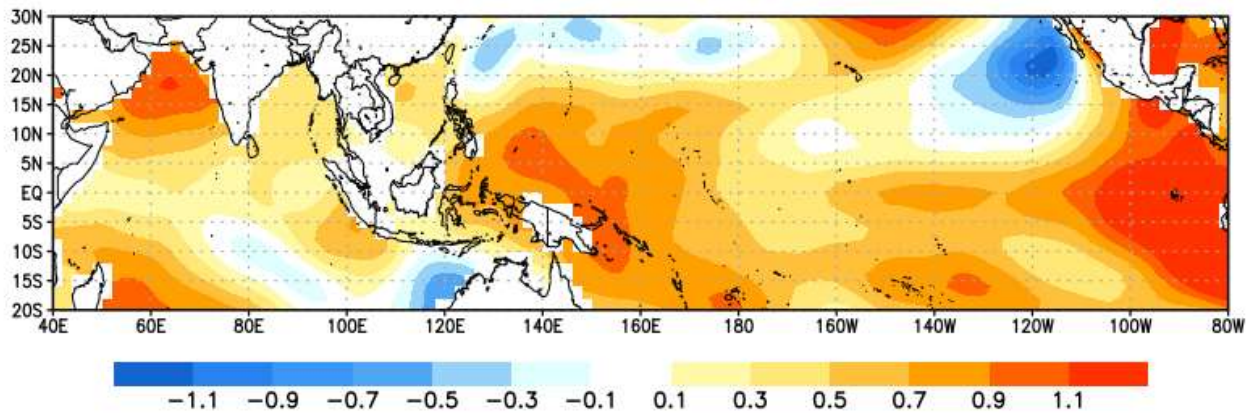


Fig 6: SST anomaly map for May 2023

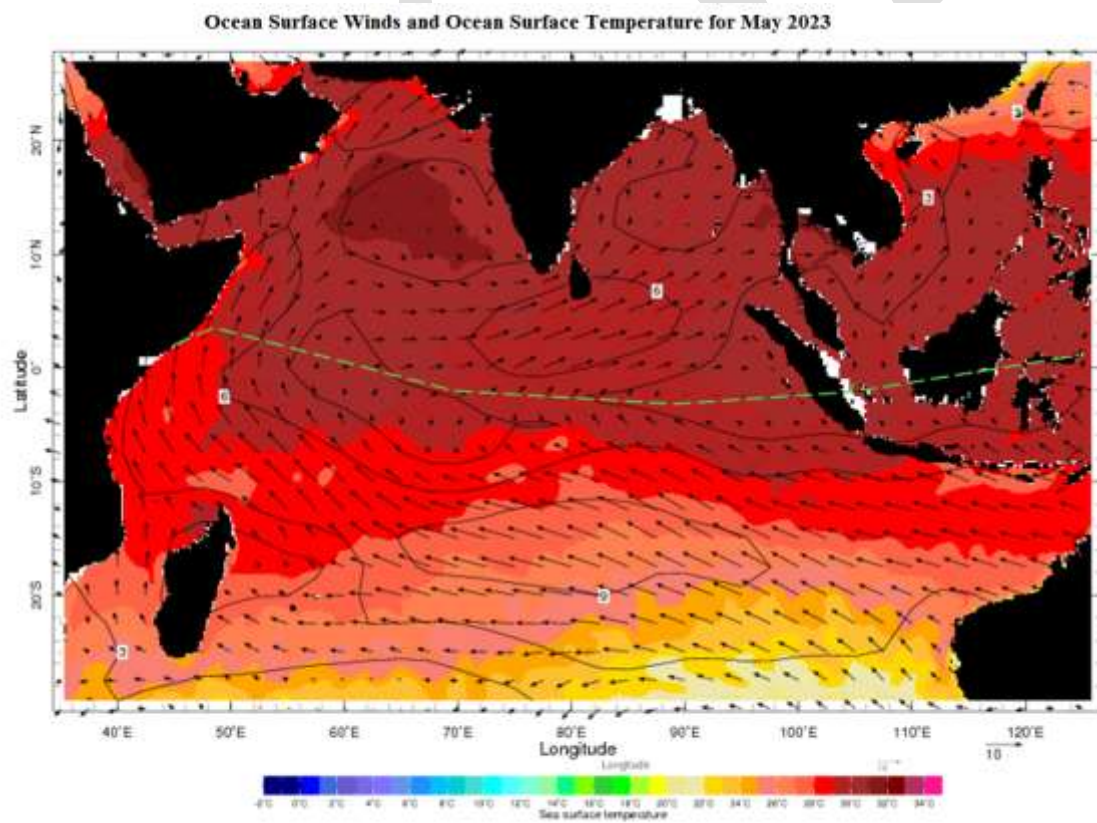


Fig 07: Ocean Surface Winds and Ocean Surface Temperature for May 2023

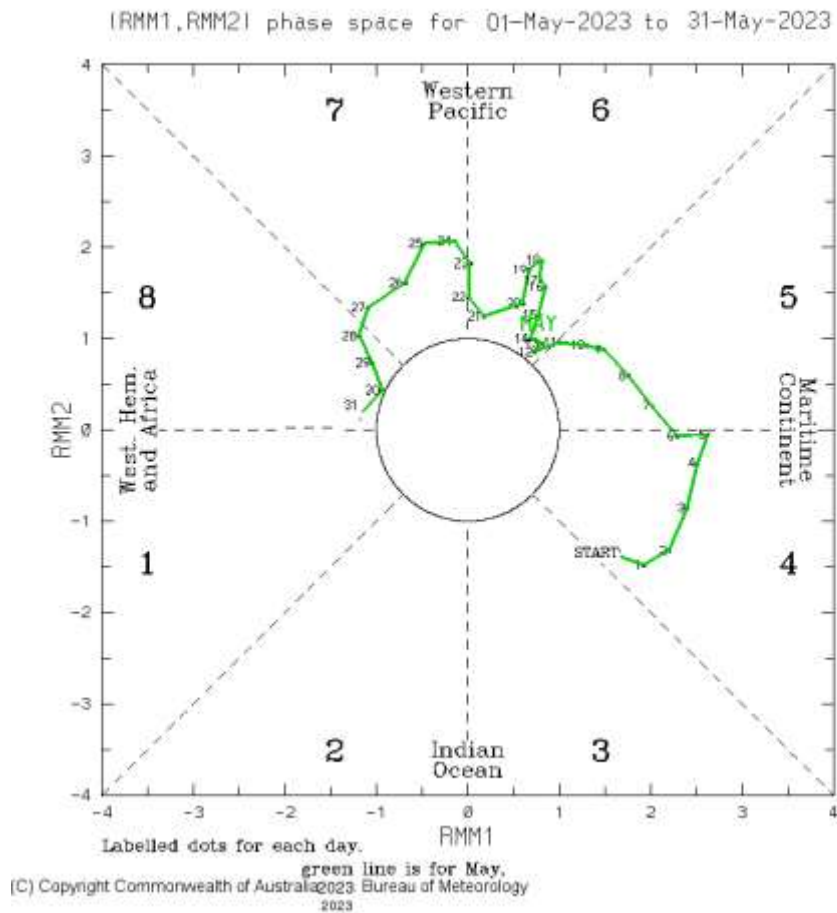


Fig 8 Phase diagram of MJO Index

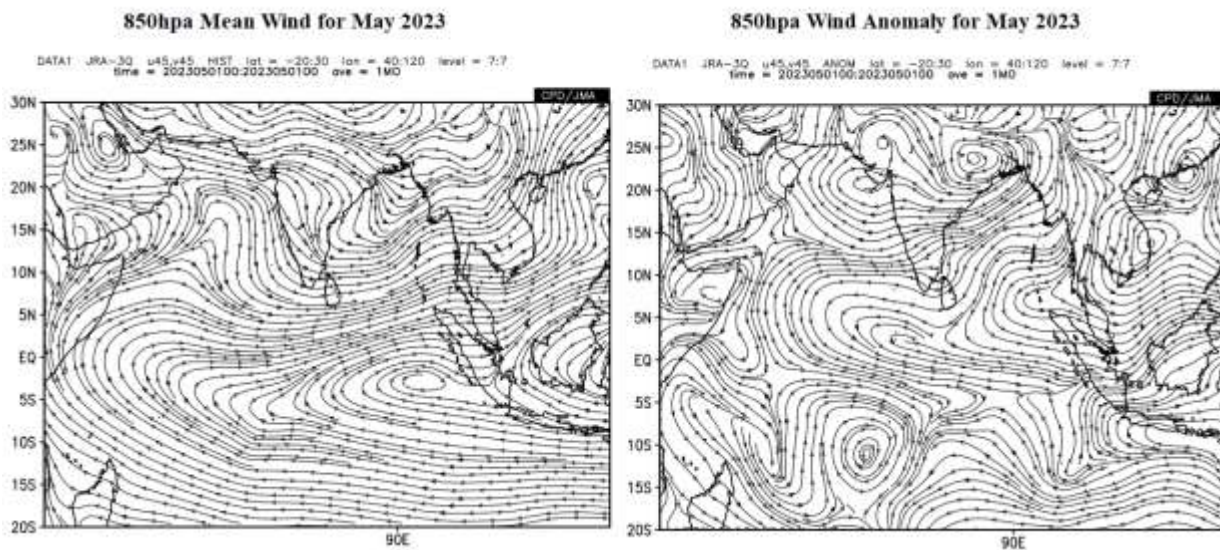


Fig. 9 Monthly average wind pattern at 850hpa level during the month of May2023 (JRA55)

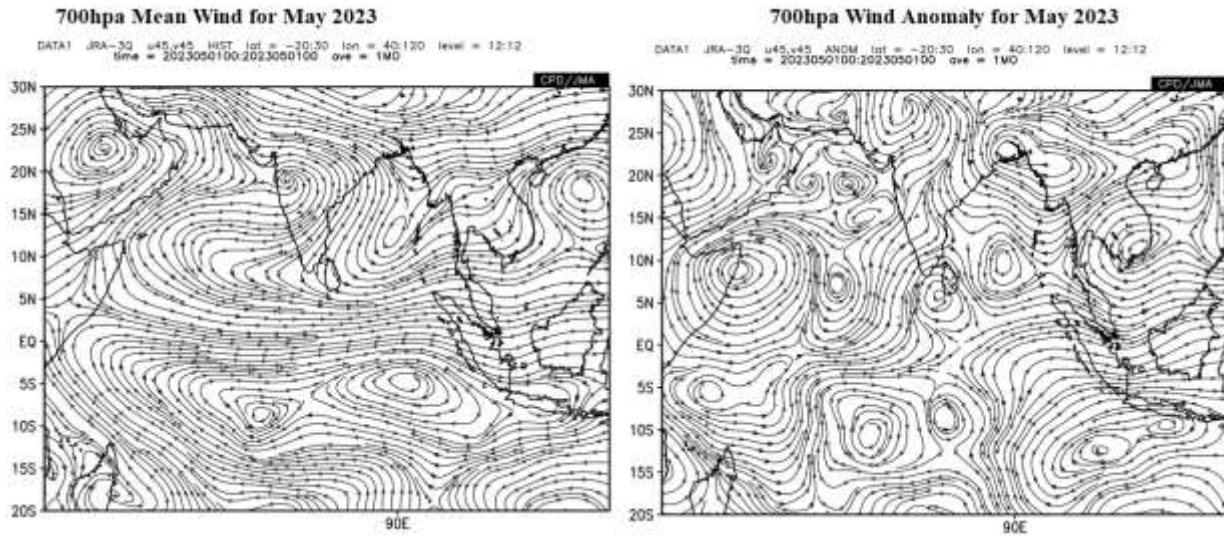


Fig. 10 Monthly average wind pattern at 700hpa level during the month of May2023 (JRA55)

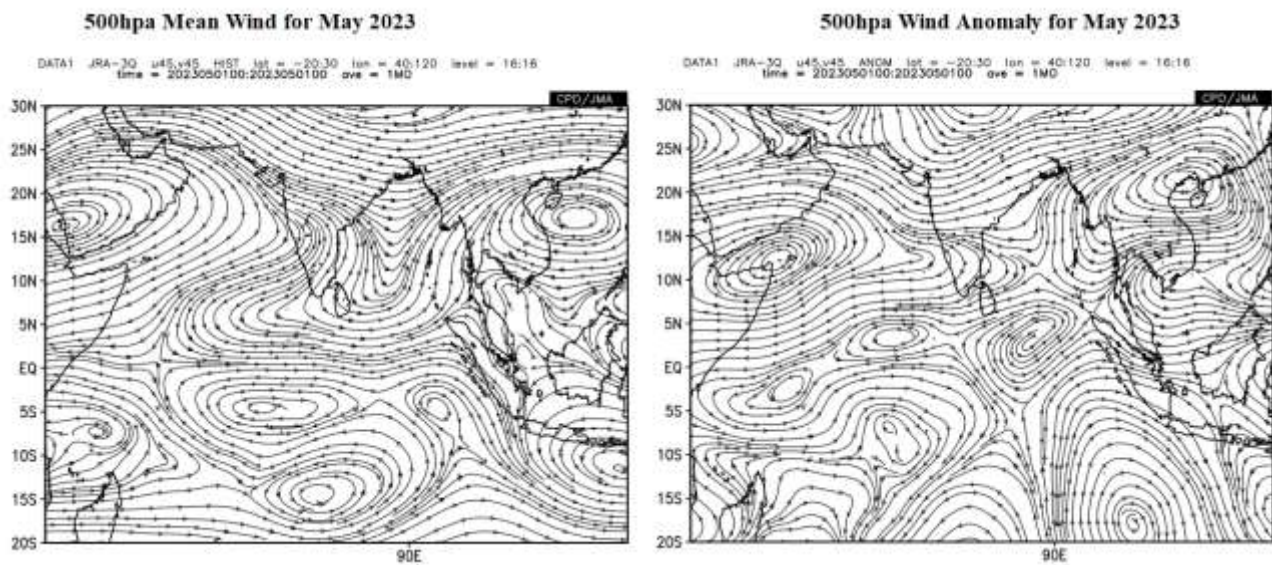


Fig. 11 Monthly average wind pattern at 500hpa level during the month of May2023 (JRA55)

Maximum Temperature anomaly ($^{\circ}\text{C}$) for May 2023

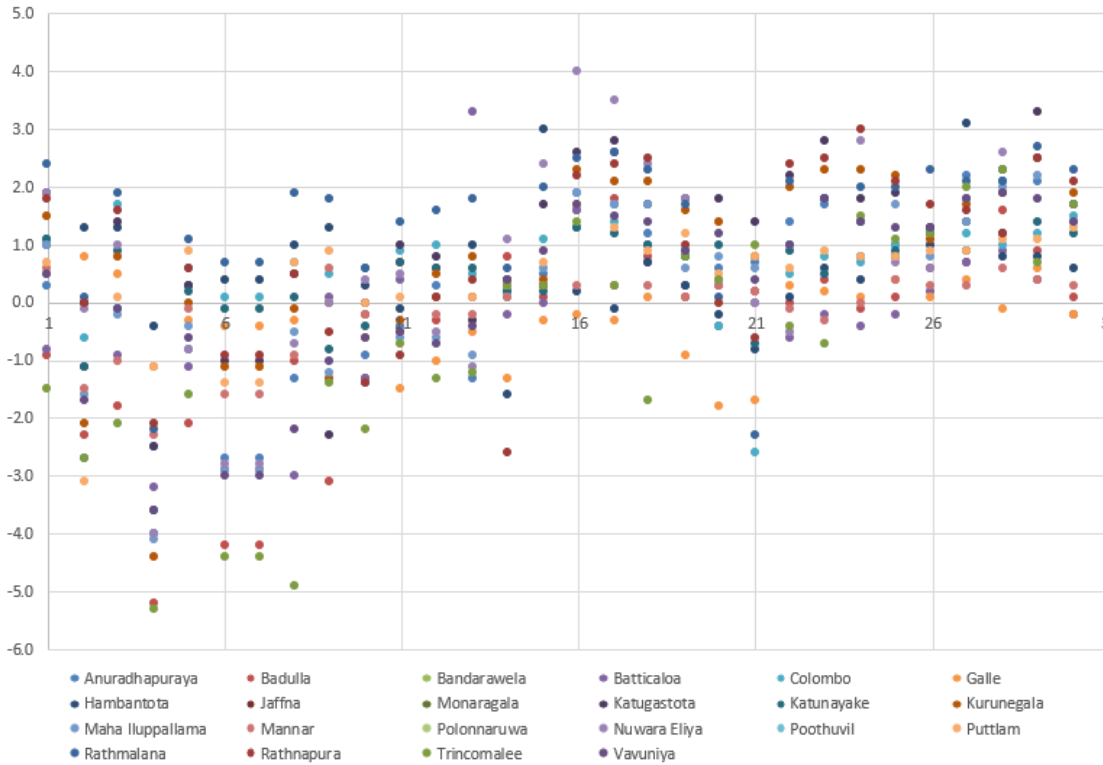


Fig 12 Maximum Temperature anomaly ($^{\circ}\text{C}$) for May 2023

Minimum Temperature anomaly ($^{\circ}\text{C}$) for May 2023

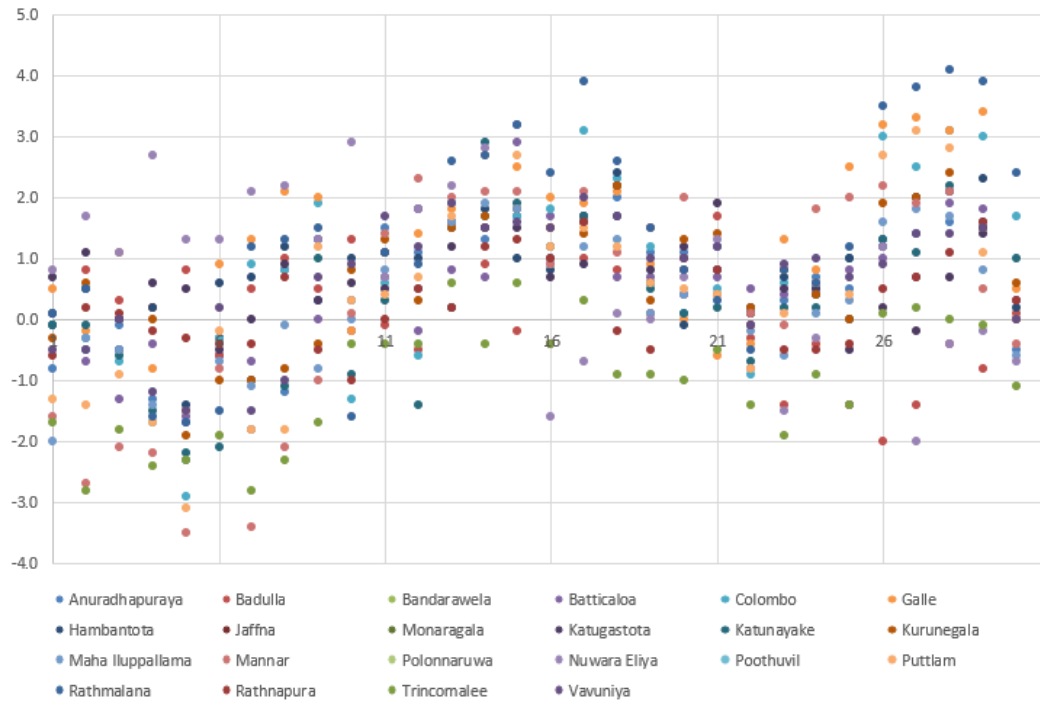


Fig 13 Minimum Temperature anomaly ($^{\circ}\text{C}$) for May 2023

Temperature Field:

Most of the meteorological stations reported above average maximum temperatures during the last two weeks of the month. Several meteorological stations reported below or near average temperatures during the first week of May (Fig.12). Highest recorded maximum temperature for the month of May 2023 was 38.0 °C at Mullaitiv on 28th (Table 4a).

Minimum temperatures were mostly below average during the first week and above average over most of the stations especially during the last three weeks of the month (Fig.13). Lowest recorded minimum temperature for the month of May 2023 was 11.2^oC at NuwaraEliya on 16th May (Table 4b).

Maximum and Minimum departures from normal day/night temperature were shown in table 4.

Rainfall: With the formation of low-pressure area subsequent cyclonic storm "Mokha" in the Southeast Bay of Bengal and adjoining west-central Bay of Bengal southwesterly flow has temporarily established across Sri Lanka at low levels during first two weeks of May bringing rain over southwestern parts of the country. Mainly fair weather dominated across the island during 3rd and 04th weeks of the month except during last 2 days of the month.

Above normal rainfall was reported over Northern, Northeastern and Eastern parts of the country and below average rainfall was reported from central and southwestern parts of the country (Fig 2). Most of the meteorological stations reported above normal rainy days except Colombo, Hambantota, Katugastota, Kurunegala, Nuwara Eliya, Ratmalana and Ratnapura (Fig.4).. Maximum percentage was reported from Mannar (365.5%) while minimum from Ratmalana station (60.2%) Most of the hydro catchment stations, except Randenigala ,Victoria and Kothmale reported below average rainfall (Fig. 3). Most of the hydro catchment stations received about 40-60% .

Highest cumulative rainfall was **943.7** mm at Hiniduma . Highest rainfall received during 24hours, was **227.5mm** at Bandaragama on the 04th.

Table-02- total rainfall and the number of rain days at the principal meteorological stations recorded in the month against the respective averages (1961-1990).

Meteorological station	Monthly Total rainfall(mm)			Monthly Total No of rainy Days		
	2023-May	Average	%	2023-May	Average	%
Anuradhapuraya	121.2	84.3	143.8%	9	6	150.0%
Badulla	185.6	104.0	178.5%	12	10	120.0%
Bandarawela	111.6	104.2	107.1%	14	9	155.6%
Batticaloa	46.8	39.3	119.1%	4	3	133.3%
Colombo	322.0	392.4	82.1%	21	16	131.3%
Galle	320.6	290.4	110.4%	21	16	131.3%
Hambantota	61.8	85.1	72.6%	11	7	157.1%
Jaffna	164.6	46.7	352.5%	6	3	200.0%
Monaragala	168.3			9		
Katugastota	134.2	144.0	93.2%	13	11	118.2%
Katunayake	355.9	317.6	112.1%	17	16	106.3%
Kurunegala	157.5	188.3	83.6%	12	12	100.0%
Maha Iluppallama	88.7	93.0	95.3%	8	6	133.3%
Mannar	163.4	44.7	365.5%	6	3	200.0%
Polonnaruwa	140.7	57.9	243.0%	8	3	266.7%
Nuwara Eliya	121.0	175.9	68.8%	13	13	100.0%
Poothuvil	111.9	35.1	318.9%	4	na	#VALUE!
Puttlam	206.7	84.3	245.2%	8	7	114.3%
Rathmalana	217.0	360.6	60.2%	17	17	100.0%
Rathnapura	434.3	475.9	91.3%	21	20	105.0%
Trincomalee	95.0	50.2	189.3%	9	4	225.0%
Vavuniya	178.9	74.8	239.2%	10	6	166.7%
Mattala	95.6			8		

Table-03-Monthly Total Rainfall (mm) with 30 years (1961-1990) of their averages at Hydro catchment areas

Castlereigh	184.8	366.2	50.5%
Norton	321.3	534.4	60.1%
Maussakele	205.5	358.0	57.4%
Canyon	205.9	449.0	45.9%
Laksapana	426.2	604.3	70.5%
Kotmale	196.1	148.7	131.9%
Victoriya	96.7	31.9	302.8%
Randenigala	168.0	72.6	231.3%
Bowatenna	130.0	165.0	78.8%
Ukuwela	139.0	195.5	71.1%
Samanala Wewa	57.5	642.3	9.0%
Castlereigh	184.8	366.2	50.5%

Note that the meteorological day in this text is reckoned as the 24hr period from 08.30hrs to 08.30hrs following day

Table 4(a) - Extremes of Maximum Temperatures				May	2023
	Maximum			Highest Std.Div	
	Value	Offsets			
		(-)	(+)		
Value	38.0 °C	5.3	4	2.46	
Station	Mullaitiv	Trincomalee	NuwaraEliya	Mulathivu	
Date	28/05/2023	04/05/2023	16/05/2023		
Table 4(b) -Extremes of Minimum Temperature May2023					
	Minimum			Highest Std.Div	
	Value	Offsets			
		(-)	(+)		
Value	11.2°C	3.5	4.1	1.86	
Station	NuwaraEliya	Mannar	Ratmalana	Mannar	
Date	16/05/2023	05/05/2023	28/05/2023		

Prepared by National Meteorological Centre(NMC)
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