

Weather Synopsis –July 2023

Below normal rainfall was reported over most of meteorological stations except Bandarawela, Jaffna and NuwaraEliya where about or above average rainfall was reported (Fig 4). Maximum percentage was reported from Bandarawela (158.3%) while no rain was reported from Anuradhapura, Vavuniya and Polonnarowa (0%)(Table 3).

Most of the hydro catchment stations, except Castlereigh reported below average rainfall. Castlereigh reported about average rainfall. (Fig. 3).

Highest cumulative rainfall was 696.9 mm at Watawala . Highest rainfall received during 24hours, was 157.1 mm at Laksapana on the 02nd July.

Windy and showery conditions were enhanced over south-western parts during the first week of July (table 1) with strengthening of southwest monsoon flow across Sri Lanka . Isolated afternoon thunderstorms were reported at Eastern and Uva provinces and in Vavuniya and Mulaitive districts on 11th and 16th. Mainly fair weather reported during the last week of the month except on 25th.

Table 1 stations received above 100mm rainfall during July 2023		
Rain gauge Station	24 hour Rainfall (mm)	Date
Laksapana	157.1	July 02, 2023
Norton	151.4	July 02, 2023
Watawala	124.6	July 02, 2023
Canyon	119.5	July 02, 2023
Kotagala Rosita	110.5	July 02, 2023
Castlereigh	108.5	July 02, 2023
Kotagala Rosita	115.8	July 03, 2023
Canyon	105.8	July 04, 2023
Moralioya	119.8	July 05, 2023

Figure 4 depicted lightning flash density map for July 2023. Lightning activity was reported from Badulla, Monaragala, Ampara, Batticaloa, Trincomalee, Vavuniya and Mullaitivu districts.

Mostly above normal day temperature and night temperatures were experienced during the month of July 2023. Highest recorded maximum temperature was 38.5°C at Monaragala on 29th July 2023, while the lowest recorded minimum temperature was 12.7°C at NuwaraEliya on 02nd , 10th and 31st July 2023.

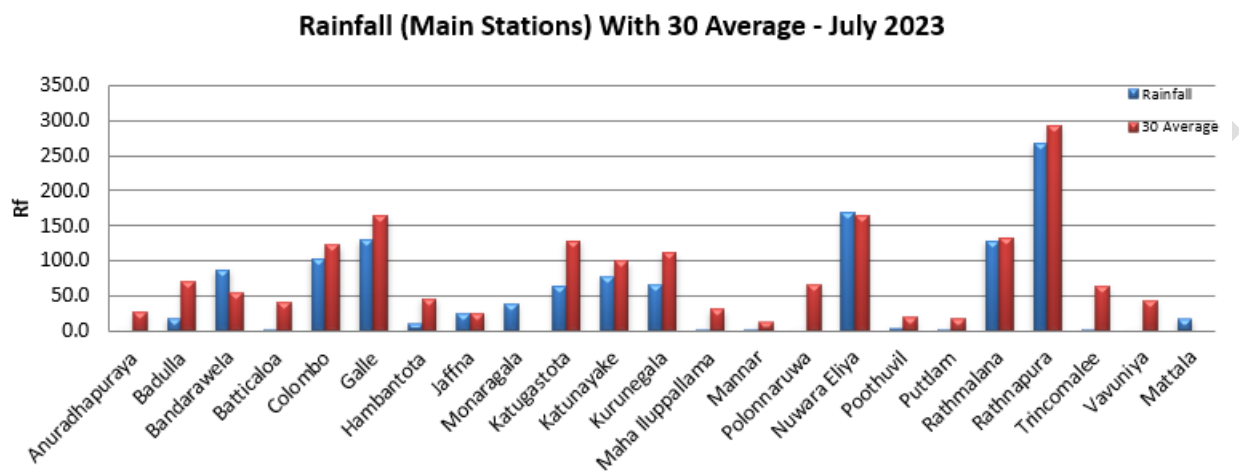


Fig 1: Monthly Total Rainfall(mm) with 30 years (1961-1990) of their averages at Main Meteorological stations areas during July 2023

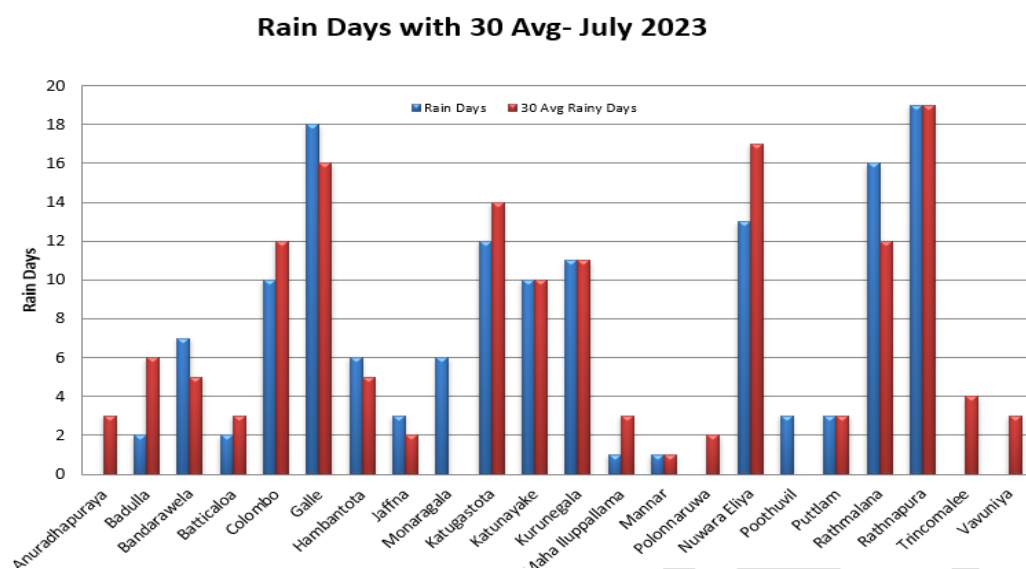


Fig 2: monthly total no of rainy days with 30 years (1961-1990) of their averages at main Meteorological stations during July 2023

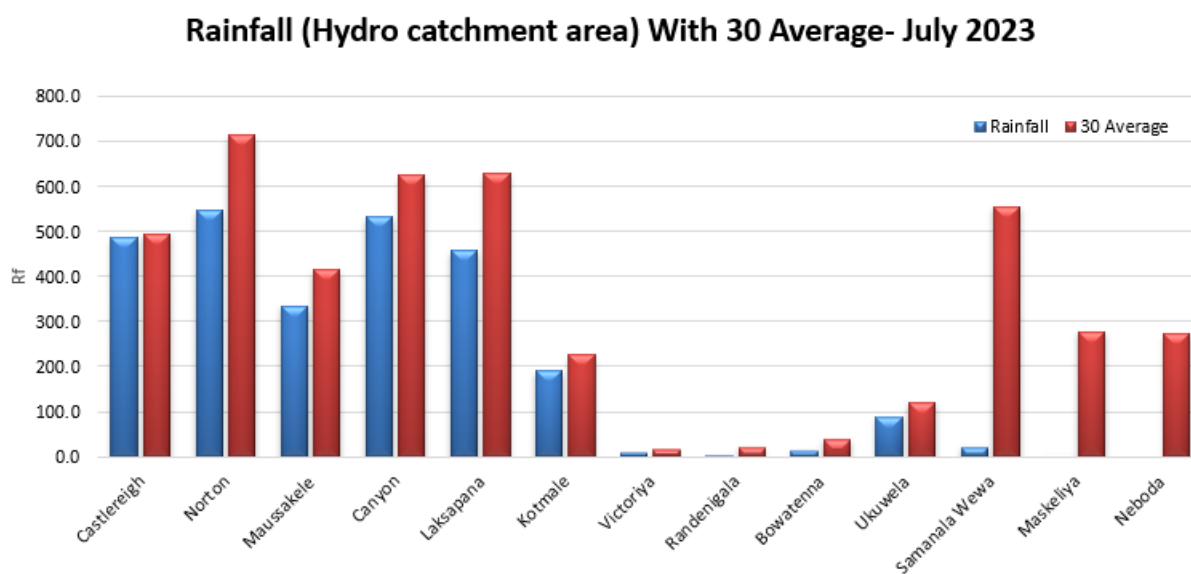


Fig 3: Monthly Total Rainfall(mm) with 30 years (1961-1990) of their averages at Hydro catchment areas during July 2023

During July 2023, sea surface temperatures (SSTs) were above-average in much of the equatorial Pacific . The latest monthly Nino indices such as Niño-3.4 was +1.1°C, Niño-3 was +1.8°C, and Niño1+2 was +3.4°C . Tropical atmospheric anomalies were also consistent with El Niño. Starting in mid-July, low-level winds were anomalously westerly over the western equatorial Pacific, while anomalous easterlies prevailed over the eastern Pacific. Oceanic and atmospheric anomalies were

consistent with El Nino conditions.. Ocean Nino Index is 0.5 during April to June (AMJ) , 0.8 May to July (Source, CPC, NOAA). Neutral IOD was observed during July 2023 (BoM, Australia).

Sea surface waters in Bay of Bengal are warmer than average (Fig. 8)

Strong Madden-Julian Oscillation (MJO) was at the phase 1 during the first week of July, then weakened during remaining days of July 2023 (Fig.9).

The average position of the shear line was laid between 01°N and Equator from 40°E to 60°E, about Equator from 60°E to 80°E, between Equator and 03°N and from 80°E to 120°E (Fig 7). It fluctuated about 02-03 ° north and south of average position.

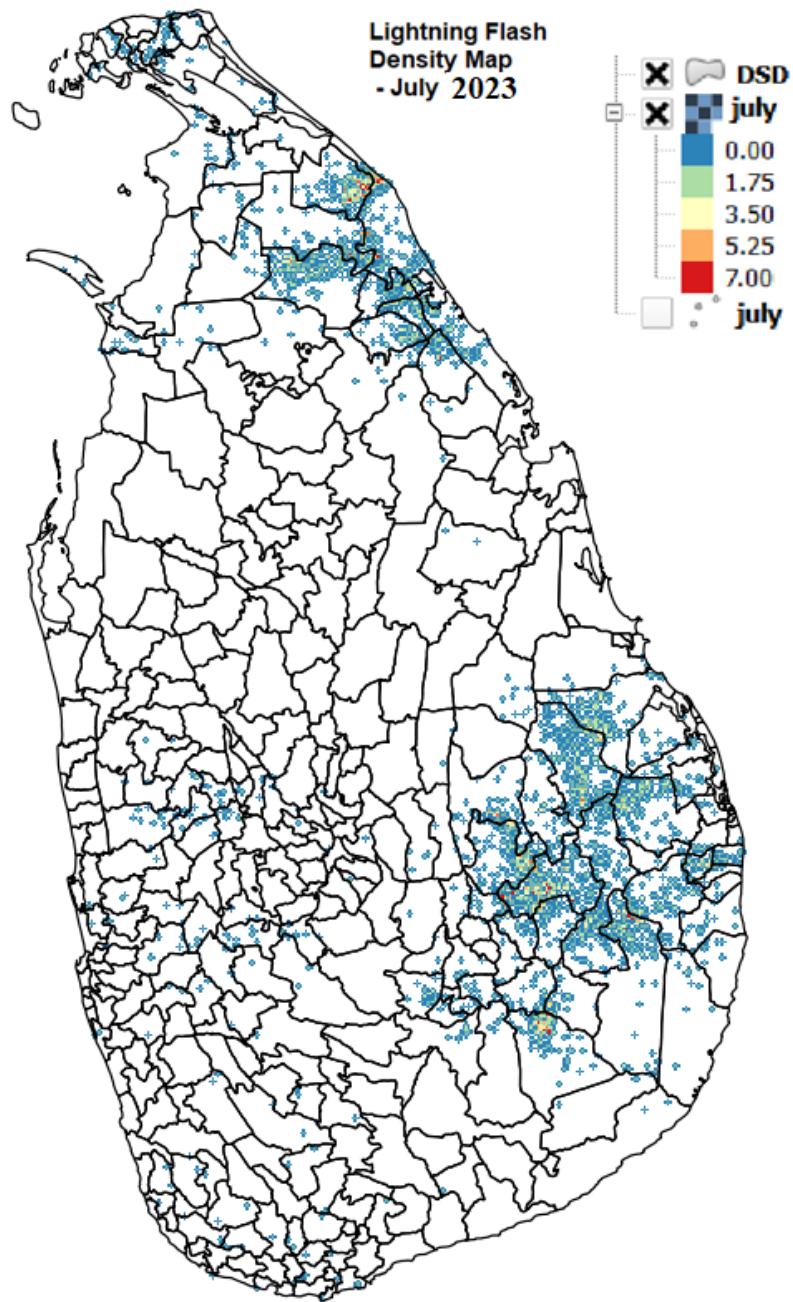


Fig 4: Lightning flash density map for July 2023

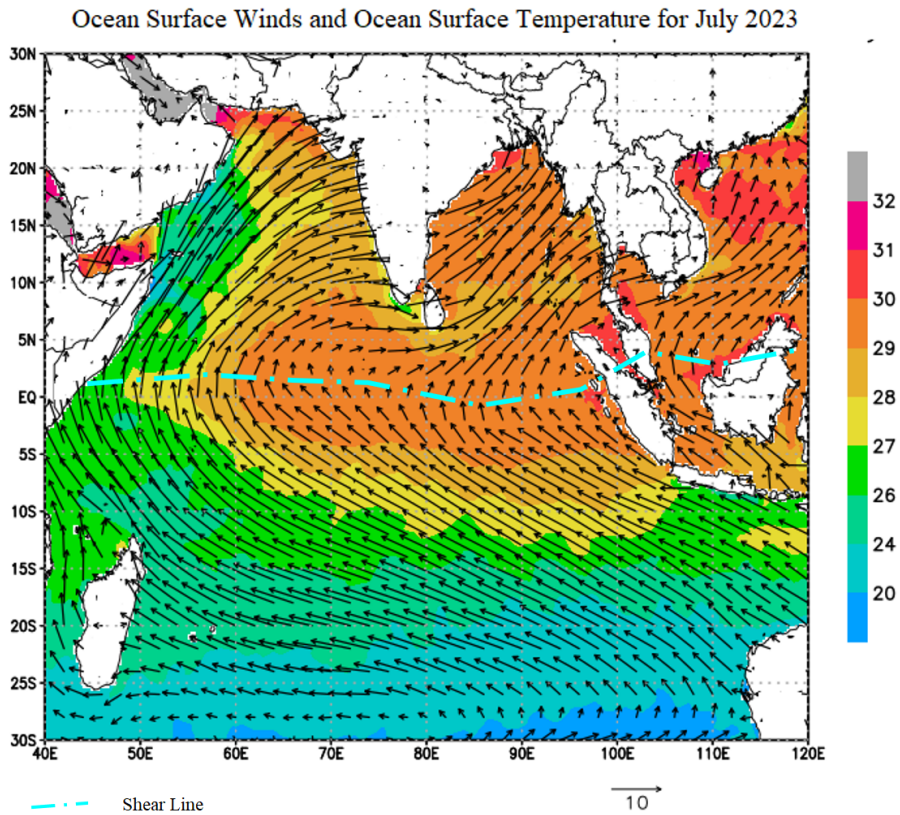


Fig 5: Ocean Surface Winds and Ocean Surface Temperature for July 2023

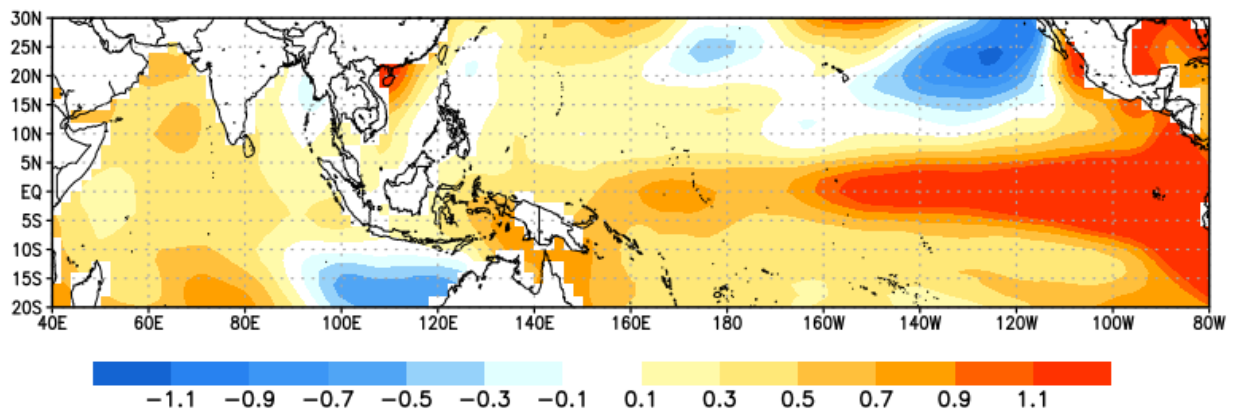
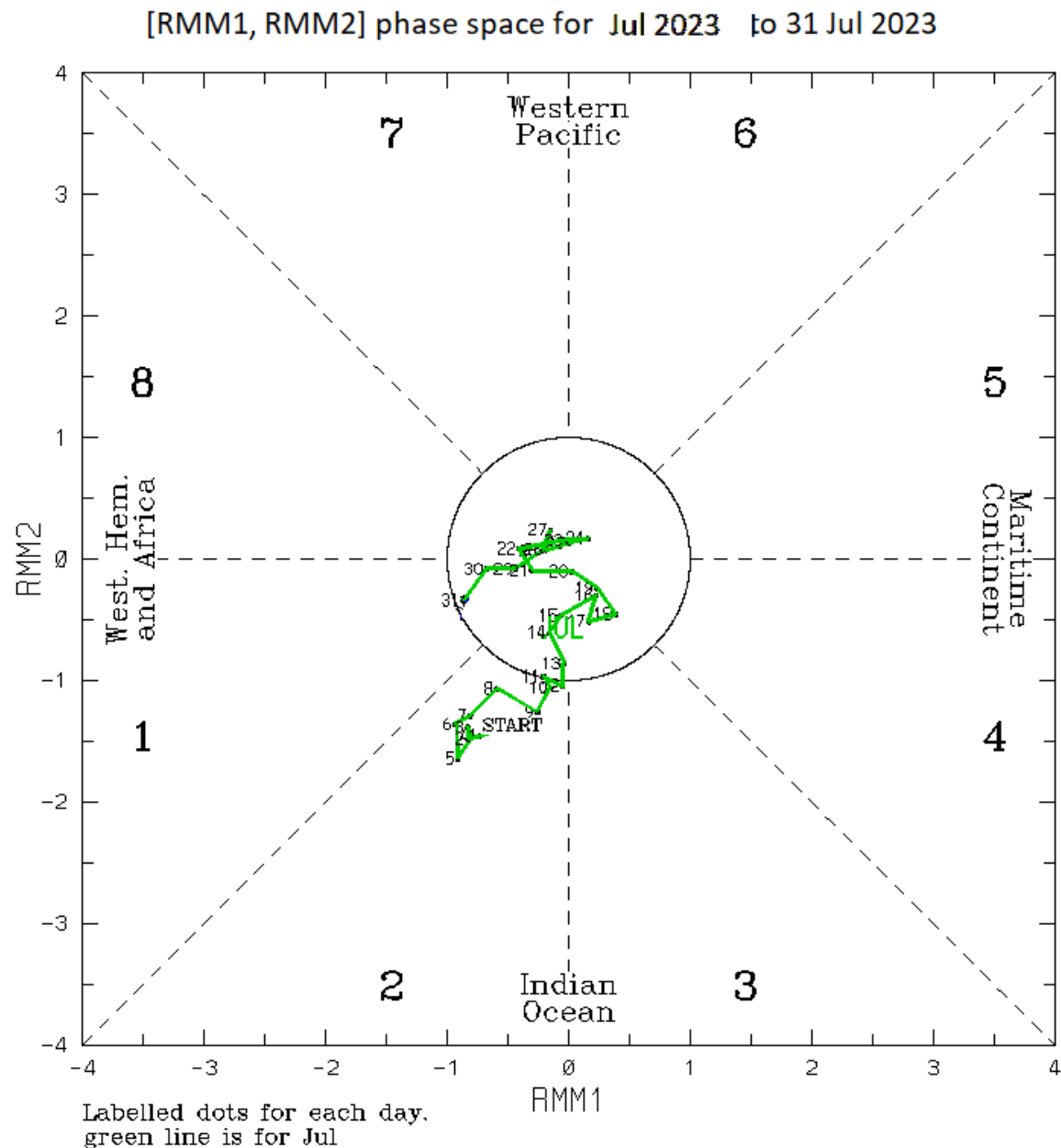


Fig 6: Sea Surface Temperature anomalies for July 2023



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2023

Fig 7: Phase diagram of MJO Index

Surface pressure and winds: The surface pressure was above average except from 4th to 5th, 19th to 20th and on 27th when it was below average. Southwesterly pressure gradient was mild on 09th, from 11th to 12th; moderate from 01st to 03rd to 04th, on 07th, on 08th, on 10th, from 13th to 16th, and from 20th to 26th and from 28th to 31st; steep from 04th to 06th, and from 17th to 19th.

The surface wind was from westerly to Southwesterly direction and speed varied within 05-15kts.

Upper winds:

At 850hPa, Westerly wind flow is dominated over the island. Anomalous northwest-southeast ridge over southern part of Sri Lanka indicates rainfall suppression. (Fig 8).

At 700 hPa, Westerly to northwesterly wind flow is dominated over the island. Anomalous north-westerly flow apparent at 700 mb. Anomalous northwest-southeast ridge to the south of Sri Lanka indicates rainfall suppression. (Fig 9)

At 500 hPa, Westerly to northwesterly wind flow is dominated over the island. Anomalous north-westerly flow apparent at 500 mb. (Fig 10) .

The 200 hpa the upper tropospheric ridge was laid from 29⁰N40⁰E to 26⁰N100⁰E . Tropical easterly jet was appeared in the vicinity of Sri Lanka.

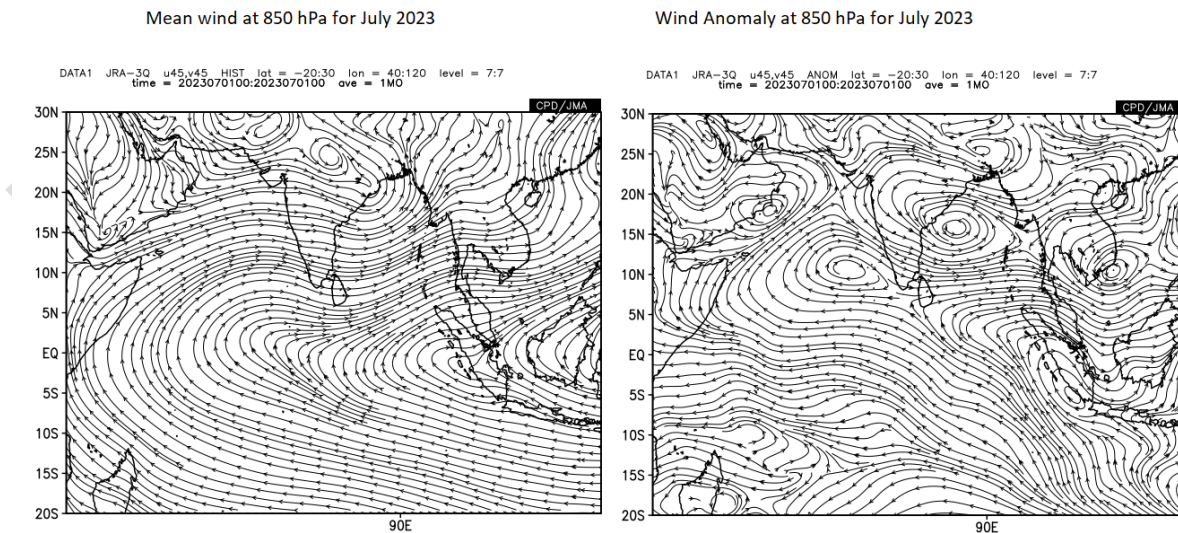


Fig. 8 Monthly average wind pattern at 850hpa level during the month of July2023 (JRA55)

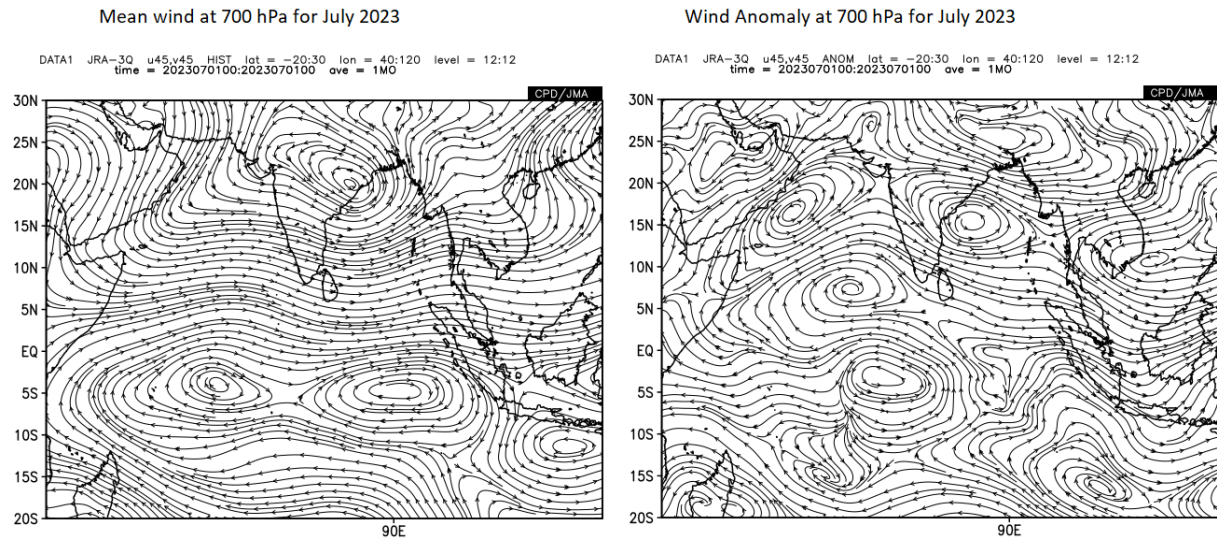


Fig. 9 Monthly average wind pattern at 700hpa level during the month of July 2023 (JRA55)

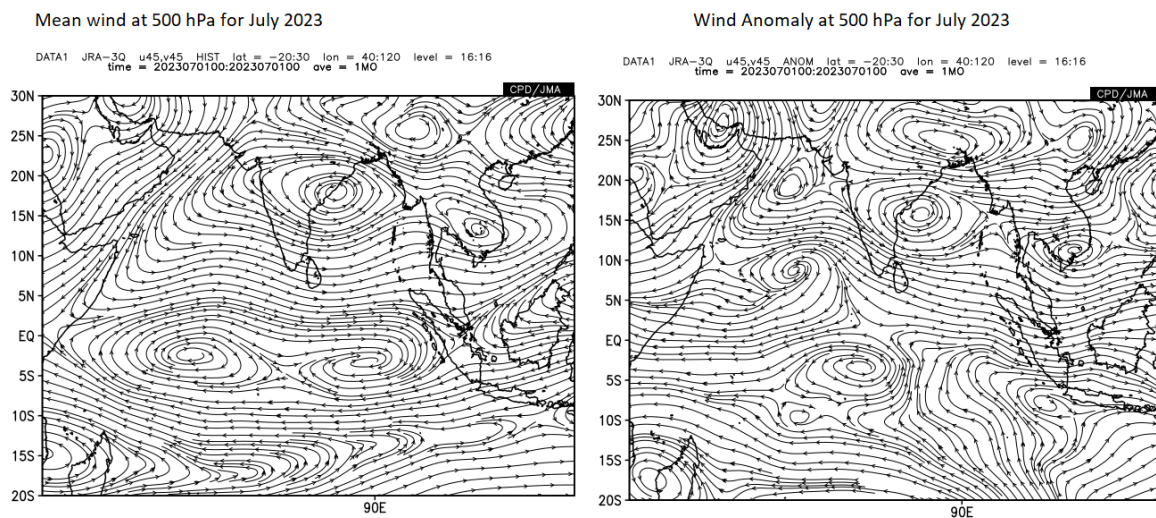


Fig. 10 Monthly average wind pattern at 500hpa level during the month of July 2023 (JRA55)

Temperature Field:

The maximum temperatures in the day were mostly above normal in most places during the month of July 2023. Day temperatures were exceptionally above normal at Hambantota from 21st to 23rd (Fig.11). Highest recorded maximum temperature for the month of July 2023 was 38.5°C at Monaragala on 29th (Table4a).

Night minimum temperatures over most parts were above normal during the month (Fig 12). Lowest recorded minimum temperature for the month of July 2023 was 12.7°C at NuwaraEliya on 02nd, 10th and 31st (Table 4b).

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

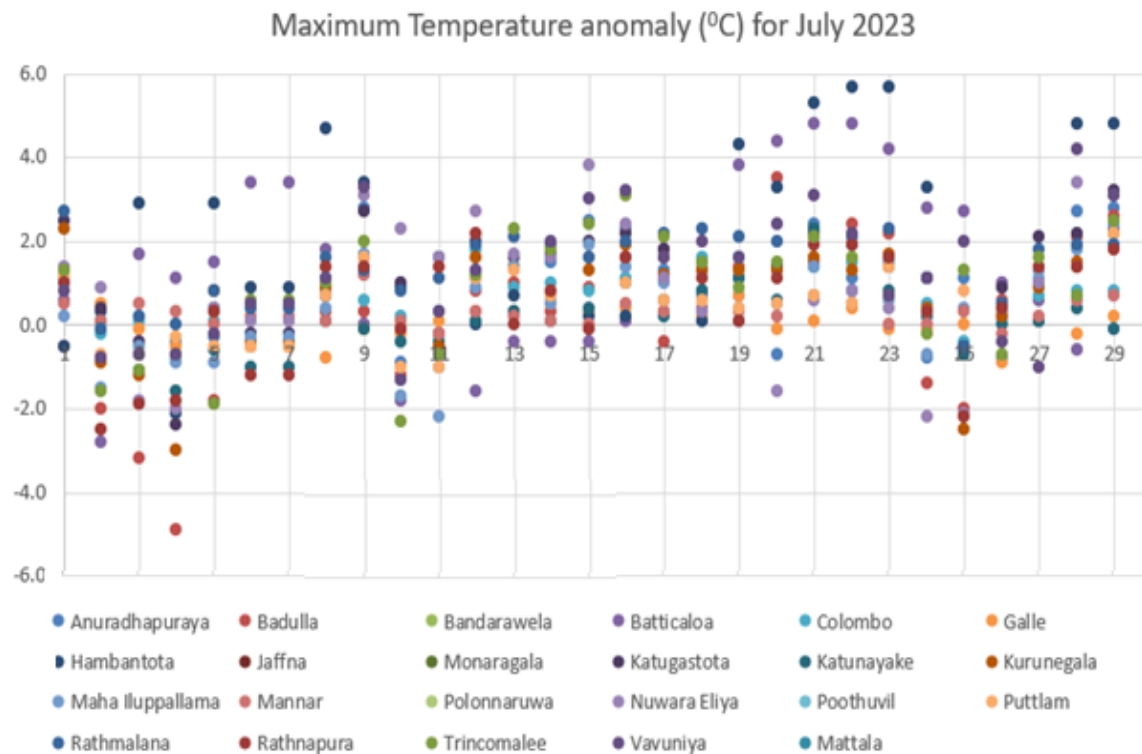


Fig 11 Maximum Temperature anomaly (°C) for July 2023

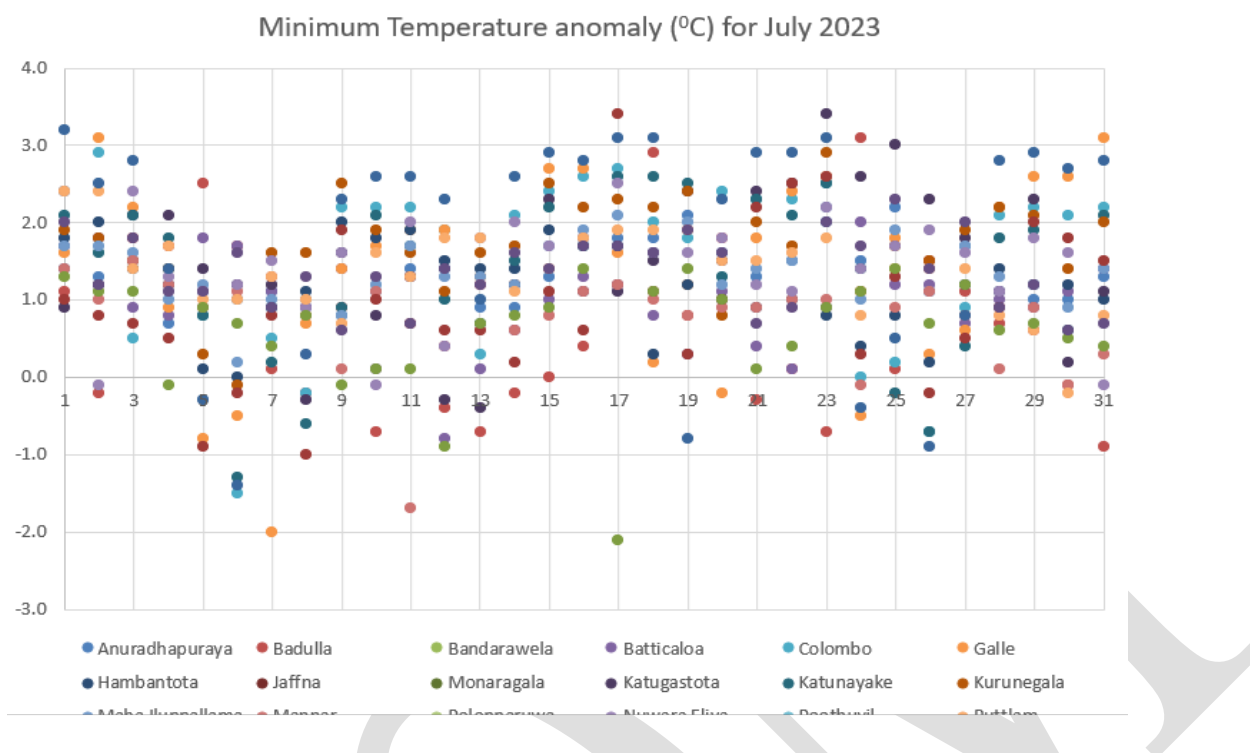


Fig 12 Minimum Temperature anomaly ($^{\circ}\text{C}$) for July2023

Below normal rainfall was reported over most of meteorological stations except Bandarawela, Jaffna and NuwaraEliya. Bandarawela meteorological station reported above normal rainfall (158.3%) while about normal rainfall was reported at Jaffna (100%) and NuwaraEliya (101.7%). No rain was reported from Anuradhapura, Vavuniya and Polonnarowa (Table 3).

Most of the hydro catchment stations, except Castlereigh reported below average rainfall. Castlereigh reported about average (98%) rainfall. (Fig. 3).

Highest cumulative rainfall was 696.9 mm at Watawala . Highest rainfall received during 24hours, was 157.1 mm at Laksapanaon the 02nd July.

The monthly total rainfall and the number of rain days at the principal meteorological stations, total rainfall at hydro catchment areas, are shown in tables 2 and 3.

Table-02-Monthly Total Rainfall (mm) with 30 years (1961-1990) of their averages at Hydro catchment areas

Hydro Catchment	July 2023	Average	% (percentage of average)
Castlereigh	485.4	495.1	98.0%
Norton	545.9	714.0	76.5%
Maussakele	333.5	415.2	80.3%
Canyon	532.3	623.9	85.3%
Laksapana	457.0	629.3	72.6%
Kotmale	190.6	225.2	84.6%
Victoriya	8.0	15.5	51.6%
Randenigala	0.6	21.1	2.8%
Bowatenna	13.3	38.2	34.8%
Ukuwela	87.8	120.5	72.9%
Samanala Wewa	21.5	554.1	3.9%
Maskeliya	0.0	277.1	0.0%
Neboda		272.6	

Note that the meteorological day in this text is reckoned as the 24hr period from 08.30hrs to 08.30hrs following day
Table-03- 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-July	Average	%	2023-July	Average	%
Anuradhapuraya	0.0	27.1	0.0%	0	3	0.0%
Badulla	17.8	69.3	25.7%	2	6	33.3%
Bandarawela	86.6	54.7	158.3%	7	5	140.0%
Batticaloa	2.3	41.4	5.6%	2	3	66.7%
Colombo	102.4	121.9	84.0%	10	12	83.3%
Galle	129.4	163.2	79.3%	18	16	112.5%
Hambantota	10.2	45.5	22.4%	6	5	120.0%
Jaffna	25.1	25.1	100.0%	3	2	150.0%
Monaragala	38.3			6		
Katugastota	64.2	128.1	50.1%	12	14	85.7%
Katunayake	77.1	99.2	77.7%	10	10	100.0%
Kurunegala	64.8	111.2	58.3%	11	11	100.0%
Maha Iluppallama	2.4	31.0	7.7%	1	3	33.3%
Mannar	1.8	12.4	14.5%	1	1	100.0%
Polonnaruwa	0.0	65.6	0.0%	0	2	0.0%
Nuwara Eliya	167.7	164.9	101.7%	13	17	76.5%
Poothuvil	3.7	18.9	19.6%	3	na	#VALUE!
Puttlam	2.1	16.8	12.5%	3	3	100.0%
Rathmalana	128.0	132.7	96.5%	16	12	133.3%
Rathnapura	267.4	292.8	91.3%	19	19	100.0%
Trincomalee	0.4	63.8	0.6%	0	4	0.0%
Vavuniya	0.0	43.5	0.0%	0	3	0.0%
Mattala	16.3			4		

Table 4(a) - Extremes of Maximum Temperatures July 2023				
	Maximum			Highest Std.Div
	Value	Offsets		
		(-)	(+)	
Value	38.5 ⁰ C	4.9	5.7	6.62
Station	Monaragala	Badulla	Hambantota	Mullaitiv
Date	29/07/2023	04/07/2023	22 & 23 July 2023	
Table 4(b) -Extremes of Minimum Temperature July 2023				
	Minimum			Highest Std. Div
	Value	Offsets		
		(-)	(+)	
Value	12.7 ⁰ C	2	3.4	4.88
Station	NuwaraEliya	Galle	Ratnapura , Katugastota	Mullaitiv
Date	2 & 10 July 2023	07/07/2023	17/07/2023 & 23/07/2023	

Prepared by National Meteorological Centre(NMC)
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