

Weather Synopsis – March 2024

1.0 Rainfall distribution over month of March 2024:

Northeast monsoon conditions were prevailed at the beginning of the month and gradually tern to inter-monsoon conditions. Below normal rainfall was reported at almost all of the principal meteorological stations except in the Batticaloa, Katunayaka, Mannar and Rathmalana where above normal rainfall was reported (Fig 1, 2). Maximum percentage was reported from Mannar (173.8%) while minimum from Puttalam station (0.7 %) (Table 1).

Below normal rainfall was reported from most of the hydro catchment stations except Randenigala where 133% above normal rainfall was reported (Fig 3, Table 2).

Highest cumulative rainfall was **495.0 mm** at Hiniduma. More than 100 mm 24 hours rainfall were reported from ten rainfall stations and highest rainfall received during 24 hours was 115.0 mm from station at Karagala on 8th and from Deegawapi on 22nd March (Table 3). Mainly dry weather was reported from 1st to 08th, from 10th to 14st and from 17th to 20th of the March. Rainfall activity considerably enhanced over the island from 21st to 23rd. The number of rainy days was below normal at most of the principal meteorological stations, except in Galle where normal was reported (Fig 4, Table 1).

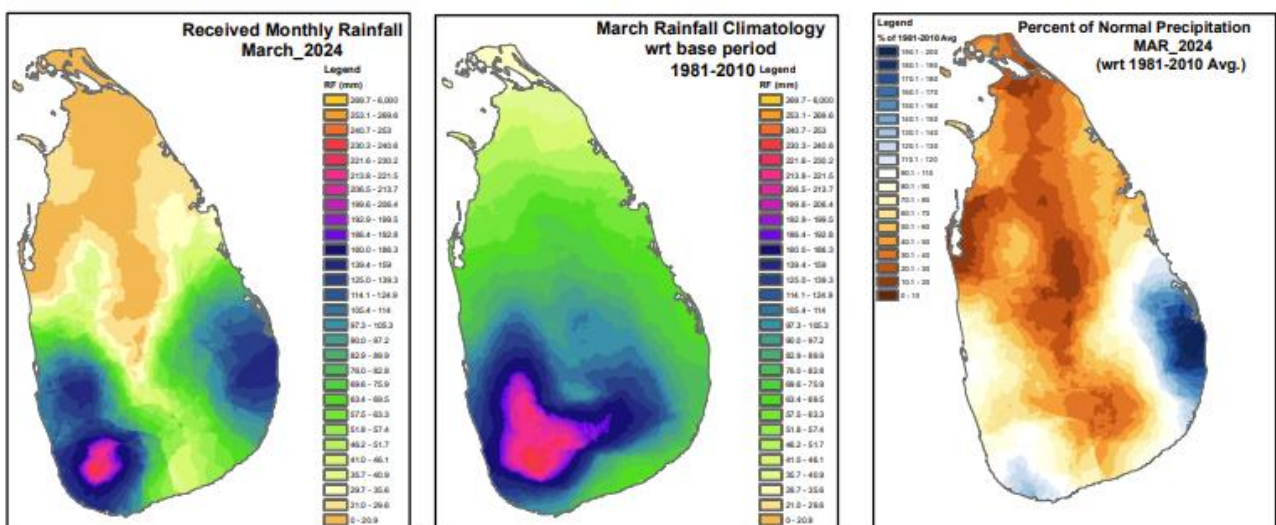


Fig 1: Observed rainfall, 30-year climatology and percent of normal (%) rainfall with respect to the (1981-2010) base period for March 2024.

Table 01: Total rainfall and the number of rain days at the principal meteorological stations recorded in the month against the respective averages (1991-2020). Note that the meteorological day in this text is reckoned as the 24hr period from 08.30hrs to 08.30hrs following day.

Meteorological station	Monthly Total rainfall(mm)			Monthly Total No of rainy Days		
	2024-Mar	30 years Average	%	2024-Mar	30 years Average	%
Anuradhapuraya	29.0	62.1	46.7%	3	6	50%
Badulla	21.9	87.6	25.0%	6	9	67%
Bandarawela	39.4	137.6	28.6%	6	13	46%
Batticaloa	84.7	70.3	120.5%	5	6	83%
Colombo	63.6	102.6	62.0%	6	9	67%
Galle	64.7	89.9	72.0%	8	8	100%
Hambantota	42.4	47.0	90.2%	3	5	60%
Jaffna	29.2	44.7	65.3%	2	5	40%
Monaragala	64.2	108.3	59.3%	3	8	38%
Katugastota	31.0	97.6	31.8%	3	8	38%
Katunayake	157.8	105.0	150.3%	6	8	75%
Kurunegala	13.7	136.1	10.1%	2	8	25%
Maha Iluppallama	10.1	63.2	16.0%	2	6	33%
Mannar	65.0	37.4	173.8%	2	4	50%
Polonnaruwa	35.2	66.8	52.7%	4	7	57%
Nuwara Eliya	19.9	72.2	27.6%	5	8	63%
Poothuvil	67.4	66.1	102.0%	4	6	67%
Puttlam	0.4	56.9	0.7%	1	5	20%
Rathmalana	112.0	101.0	110.9%	5	9	56%
Rathnapura	155.2	204.1	76.0%	11	14	79%
Trincomalee	7.3	54.8	13.3%	4	5	80%
Vavuniya	36.5	44.7	81.7%	3	4	75%
Mattala	59.5	NA	NA	4	NA	NA

Table 02: Monthly Total Rainfall (mm) with 30 years (1991-2020) of their averages at Hydro catchment areas

Hydro Catchment	Feb 2024	30 years Average	% (percentage of average)
Castlereigh	54.2	143.4	37.8%
Norton	45.9	NA	NA
Maussakele	66.0	121.1	54.5%
Canyon	69.8	130.0	53.7%
Laksapana	72.5	157.2	46.1%
Kotmale	10.4	95.9	10.8%
Victoriya	3.7	67.7	5.5%
Randenigala	108.1	81.3	133.0%
Bowatenna	14.5	128.6	11.3%
Ukuwela	29.5	82.1	35.9%
Samanala Wewa	180.5	NA	NA

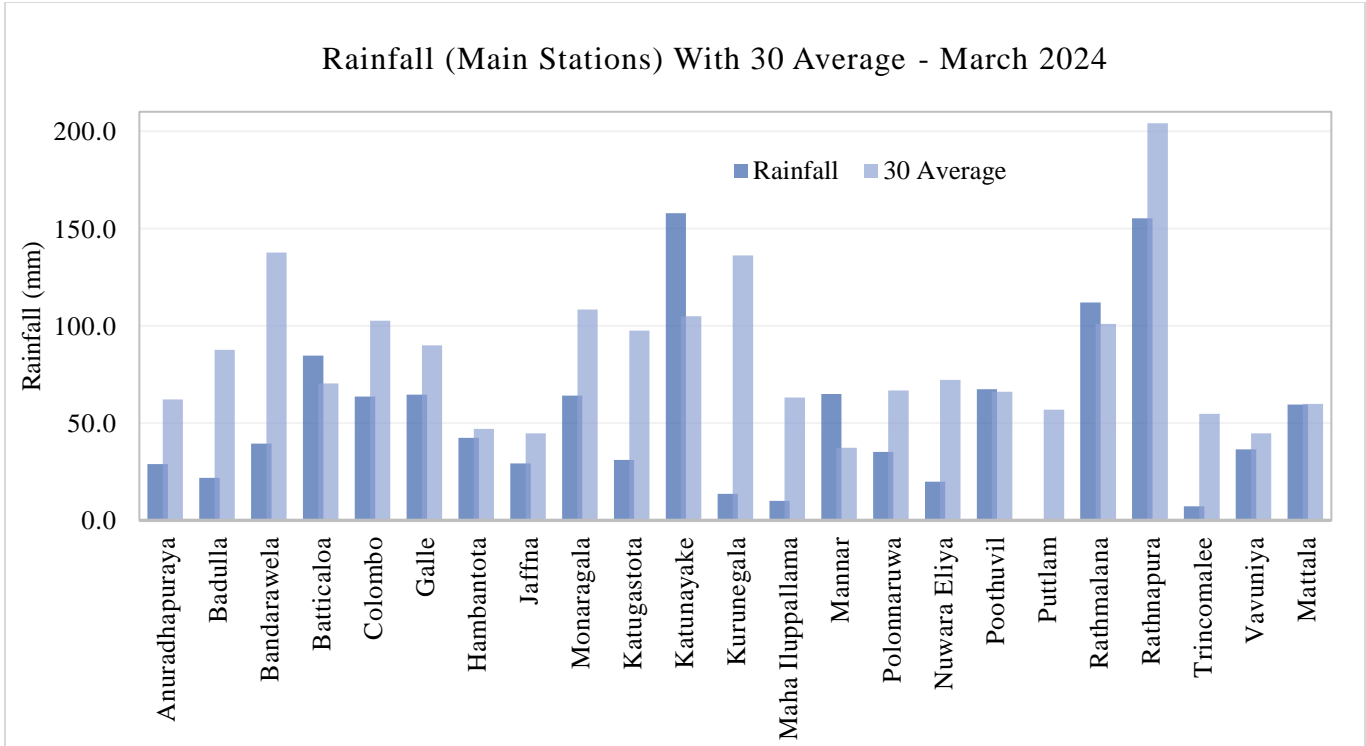


Fig 2: Monthly Total Rainfall (mm) with 30 years (1991-2020) of their averages at Main Meteorological stations March 2024

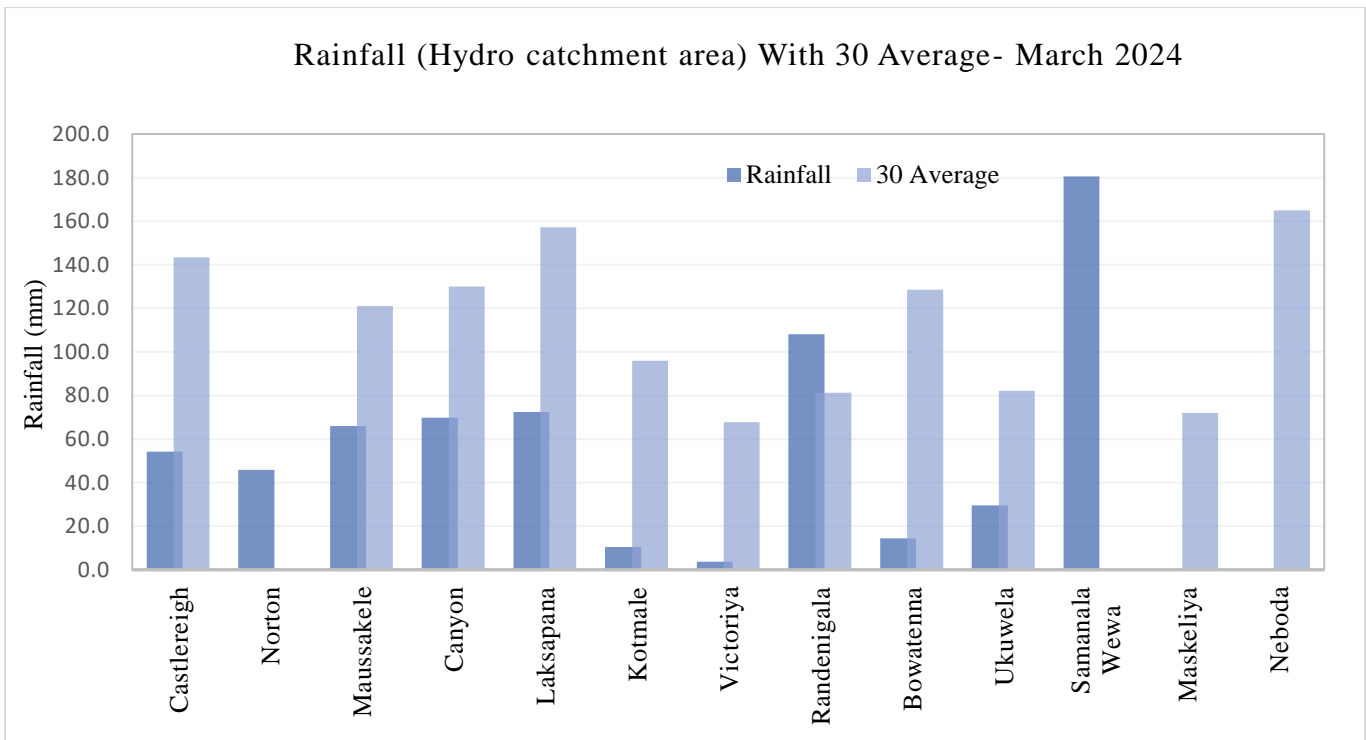
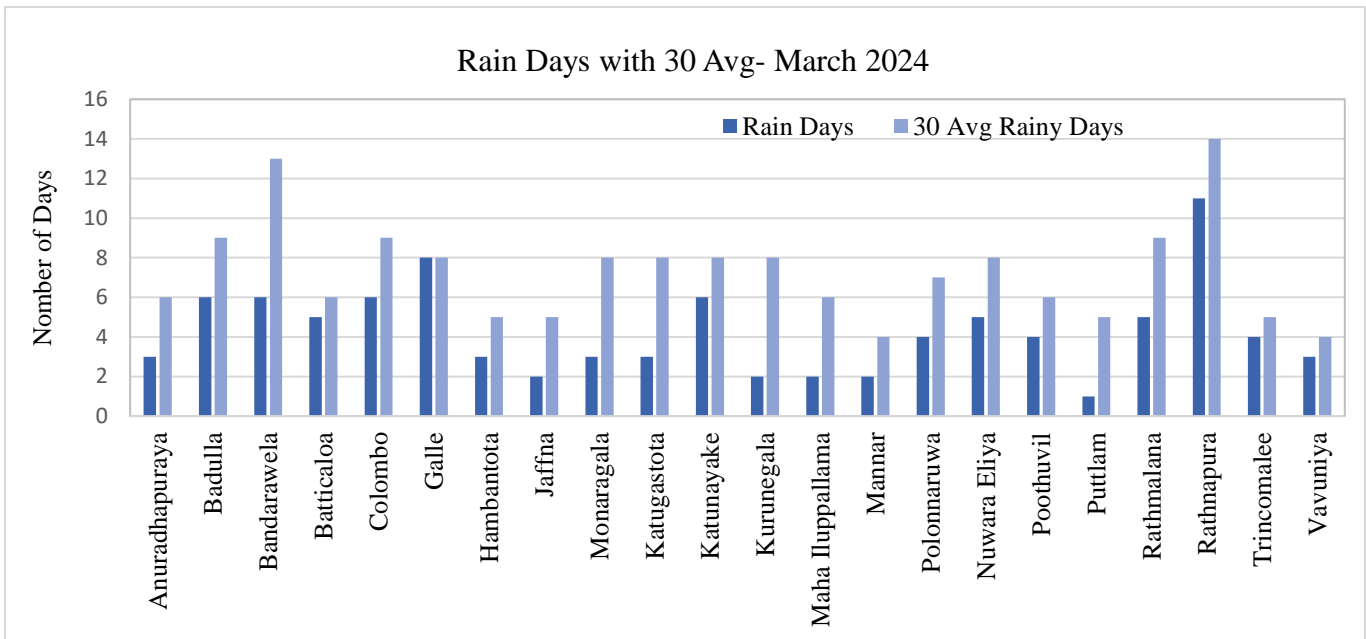


Fig 3: Monthly Total Rainfall (mm) with 30 years (1991-2020) of their averages at Hydro catchment areas during March 2023

Table 3: Stations received above 100 mm per day rainfall during March 2024

Date	Station	24-hour Rainfall (mm)
08-March 2024	Rathnapura	106.9
08-March 2024	Karagala	115.0
18-March 2024	Hiniduma	101.5
21-March 2024	Unnichchai	105.0
21-March 2024	Mahaoya	102.3
22-March 2024	Pannalgama	108.3
22-March 2024	Deegavapi	115.0
22-March 2024	Illukkuchchanai	104.0
22-March 2024	Dehiwala	110.1
24-March 2024	Ketendola	111.0

**Fig 4:** Monthly total no of rainy days with 30 years (1991-2020) of their averages at main Meteorological stations during March 2024

2.0 Lightning:

Higher Lightning density was reported in Warakapola, Galigamuwa, Ruwanwella, Yatiyantota, Dehiovita, Deraniyagala, Eheliyagoda, Horana, Kuruwita, Ayagama, Elapatha, Bulathsinhala, Nivithigala, Agalawatta, Thawalama and Nagoda, areas during month of January (Fig 5).

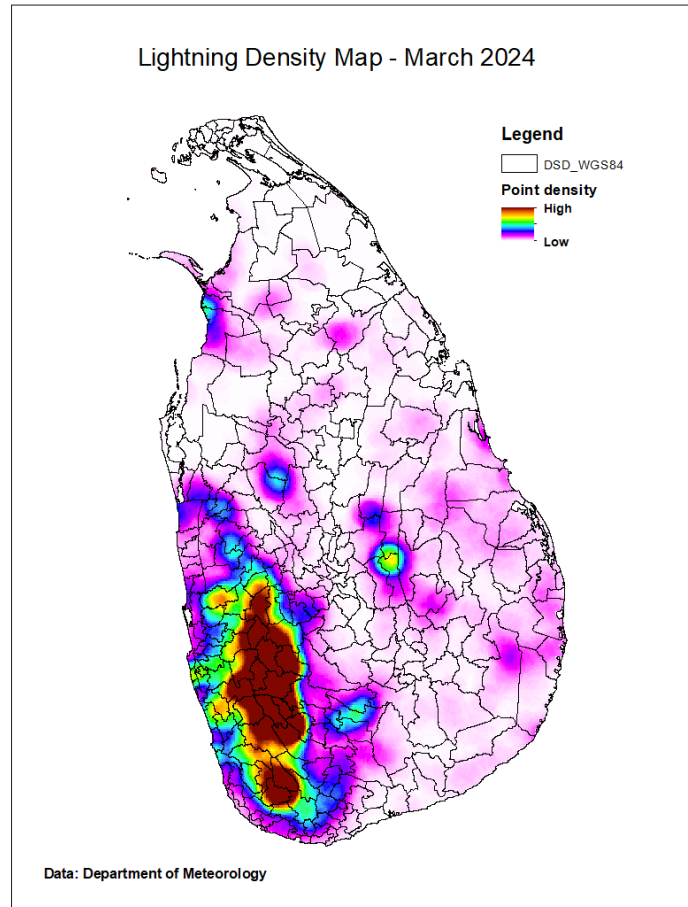


Fig 5: Lightning density map for March 2024

3.0 Synoptic Situation:

3.1 Surface pressure and winds

The surface pressure was about average until the 9th of March, and above normal for the rest of the days except 22nd where below average surface pressure was recorded. The surface wind over the island was northeasterly with a speed of 00-15 knots from 1st to 3rd, It was northeasterly or variable with a speed of 0-10 knots from the 4th to 5th, 12th to 13th, and from 25th to 31st. Surface wind was variable in direction with a speed of 0-10 knots on the 6th to 11th. Calm or variable wind observed from 14th to 20th. Easterly or variable surface winds were observed in other days of the month.

3.2 Upper winds:

At 850hPa, Northeasterly wind flow is dominated over the island. (Fig 6). Anomalous northeasterly winds across Sri Lanka indicate strengthening of northeasterly flow at 850 mb level.

At 700 hPa, Northeasterly wind flow is dominated over the island. Anomalous trough axis observed over the island (Fig 7).

At 500 hPa Easterly wind flow is dominated over the island at 500mb level (Fig 8).

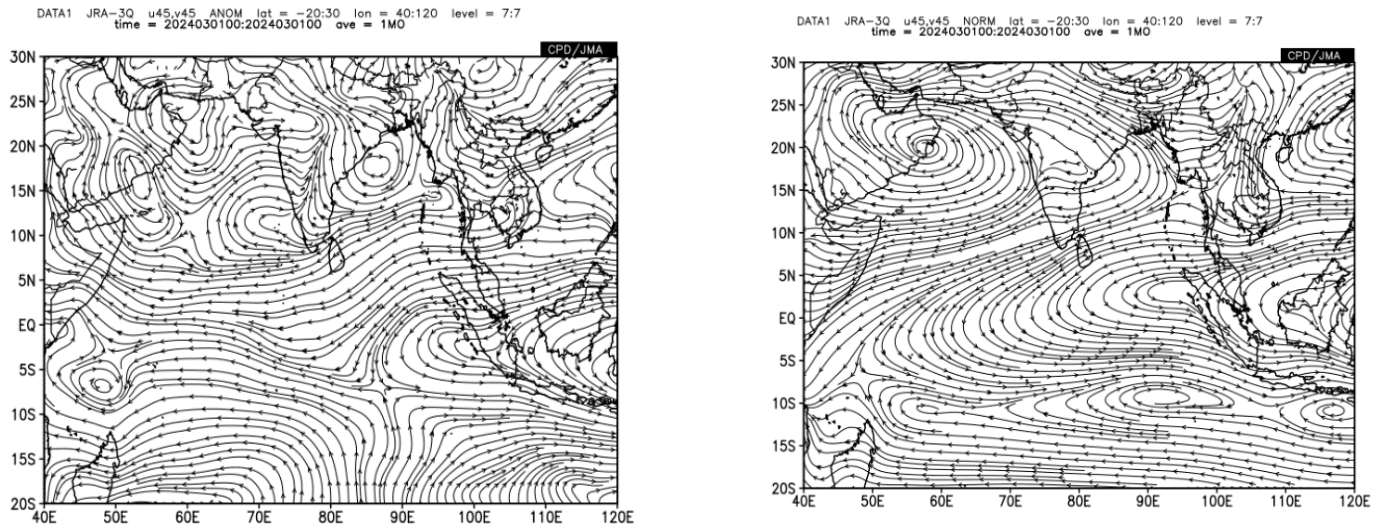


Fig 6: Monthly average wind pattern at 850 hpa level during the month of March2024 (JRA3Q)

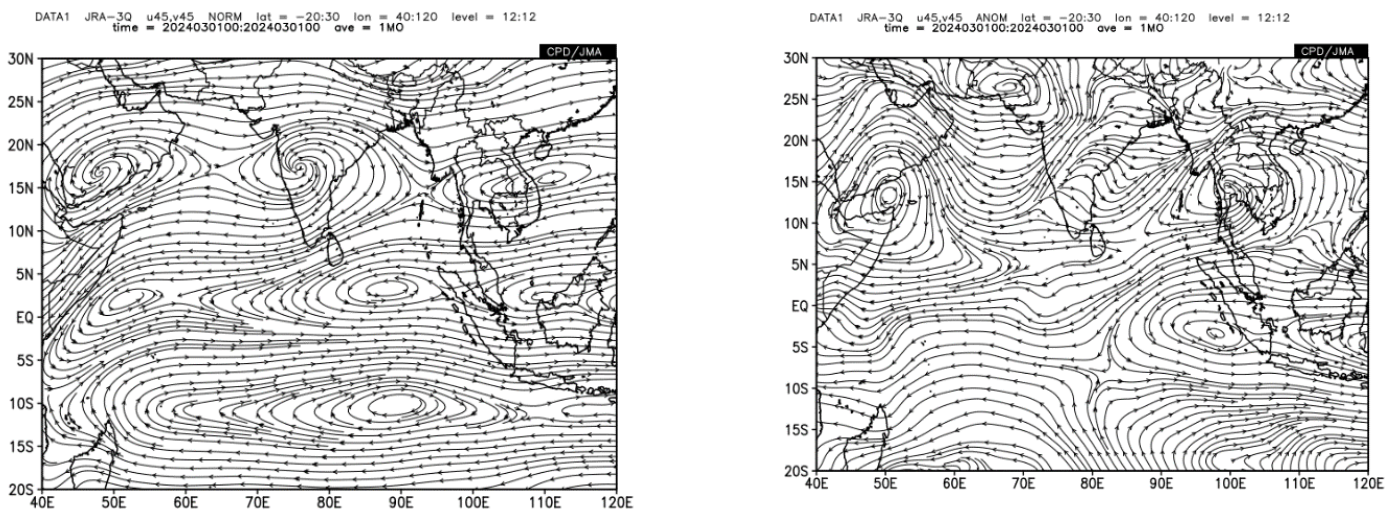


Fig 7: Monthly average wind pattern at 700hpa level during the month of March2023 (JRA3Q)

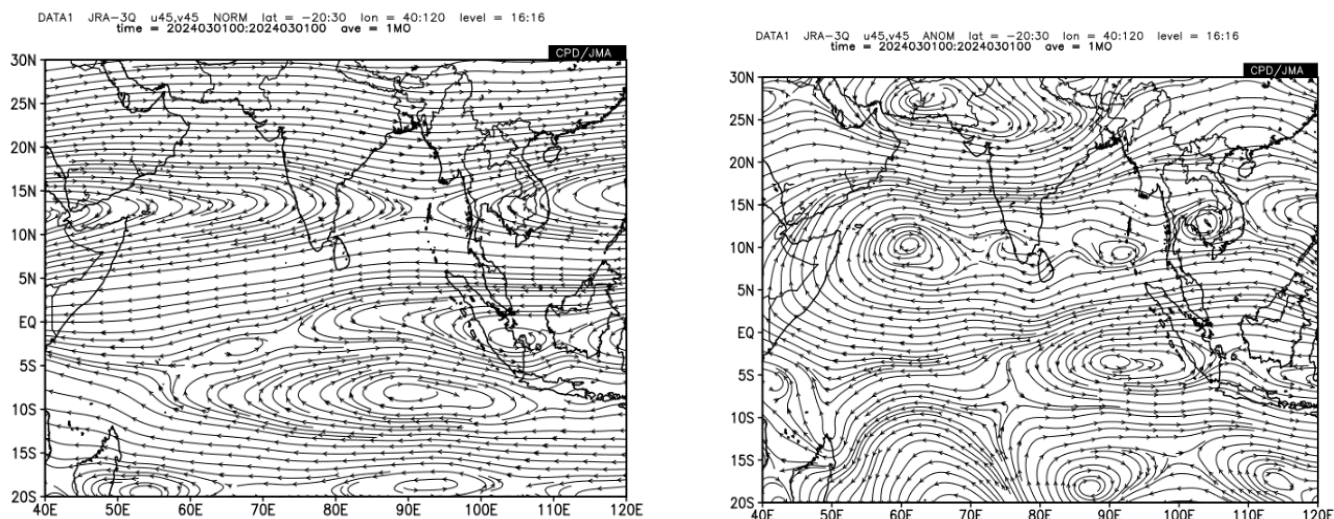


Fig 8: Monthly average wind pattern at 500hpa level during the month of March 2024 (JRA3Q)

4.0 Temperature Field

4.1 Maximum Temperature

The highest recorded maximum temperature for the month of March 2024 was 38.5°C in Kurunegala on the 17th. Maximum temperatures during the day were more than +1°C above normal in most of the principal meteorological stations from the 10th to 31st of March except 21st and 22nd. Exceptionally high temperatures were reported from Monaragala on 8th, 9th and 13th and from Polonnaruwa on 16th. Considerably high temperatures were reported from Monaragala on the 10th, 14th to 20th and 30th to 31st, from Polonnaruwa 8th to 10th, 12th to 15th, 17th, 20th, 26th, 29th, 31st, and from Puttalam 12th and 25th (Fig 9 and Table 4(a)).

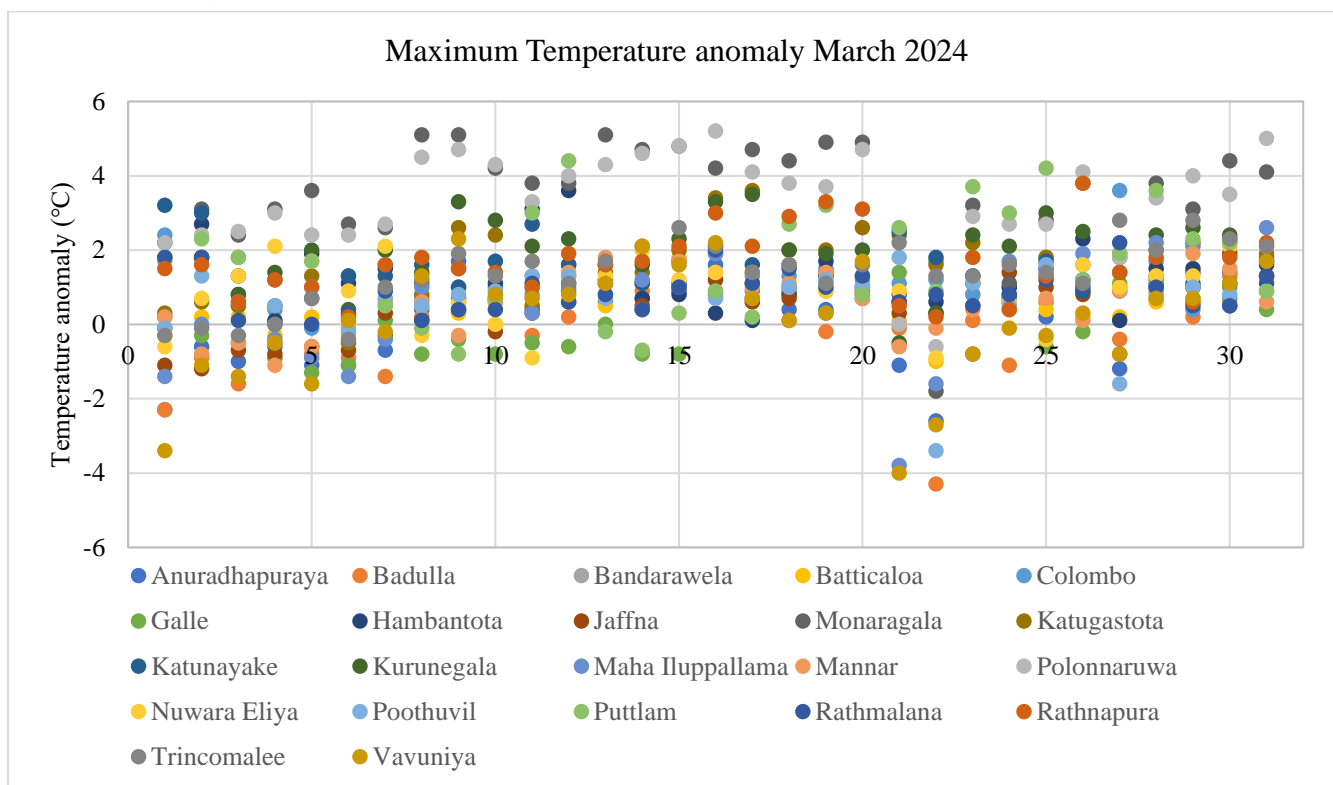


Fig 9: Maximum Temperature anomaly (°C) for March 2024

Table 4(a): Extremes of Maximum Temperatures of March 2024

	Max Temperature	Min offset (-)	Max offset (+)	Highest Std. Div.
Value	38.5°C	4.3°C	5.2°C	1.55
Station	Kurunegala	Badulla	Polonnaruwa	Vavunia
Date	17/03	22/03	16/03	

Table 4(b): Extremes of Maximum Temperatures of March 2024

	Min Temperature	Min offset (-)	Max offset (+)	Highest Std. Div.
Value	7.5°C	3.3°C	4.8°C	2.12
Station	Nuwara Eliya	Nuwara Eliya	Nuwara Eliya	Nuwara-Eliya
Date	04/03	04/03	11/03	

4.2 Minimum Temperature

The lowest recorded minimum temperature for March 2024 was 7.5 °C, observed in Nuwara Eliya on the 4th. Most principal stations experienced minimum temperatures exceeding +1°C above normal levels on 16th, 21st to 29th and 31st. Exceptionally above-normal minimum temperatures were not recorded any station, while considerably above-normal readings were noted in Nuwara Eliya on the 11th, 22nd and in Vavunia on the 27th (Fig 10 and Table 4(b)).

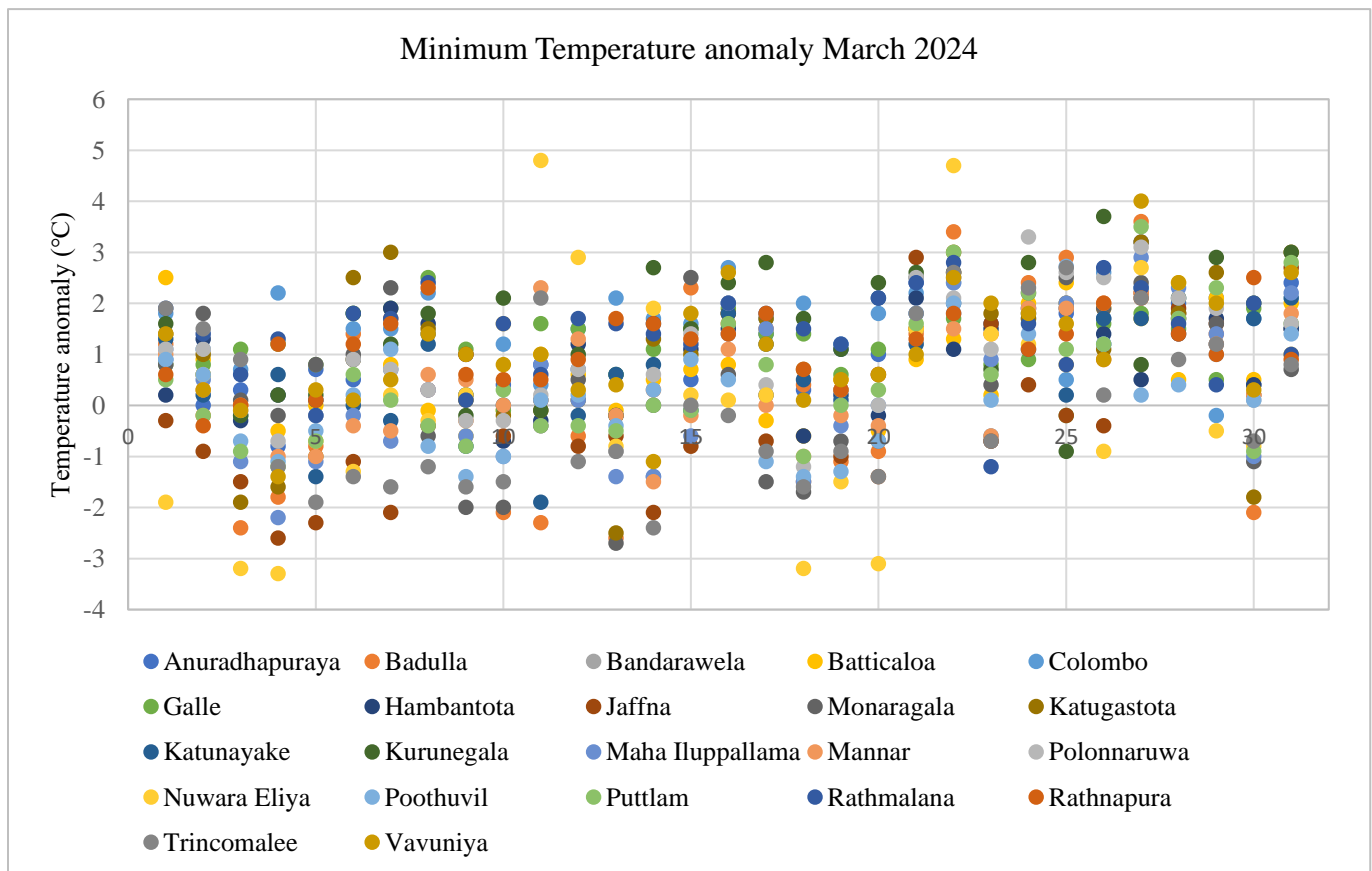


Fig 10: Minimum Temperature anomaly (°C) for March 2024

4.3 Heat Index

Heat Index is the measurement of the feels like temperature. In this March heat index was exceeded 39 °C in 81% of the days at Puttalam; 77% of days at Rathmalana; 61% of days at Rathnapura; 58% of days from Galle; and 52% at Mannar. It was less than 50% in the other principal stations. The number of days exceed 39 °C of heat index limit was zero in Badulla, Jaffna and Mullaitivu. Heat index values were not exceeded 52°C at any location in this month. (Table 5, Fig 11). More than 50% of the stations exceed 39 °C of heat index limit from 23rd to 31st except on 27th and 29th. Furthermore, maximum percentage of the stations (83%) exceeded 39 °C on 31st day.

(Note: Heat index limits 27-38 °C is Normal, 39- 45 °C is Caution, 46-52 °C is Extreme caution, and over 52°C is Danger)

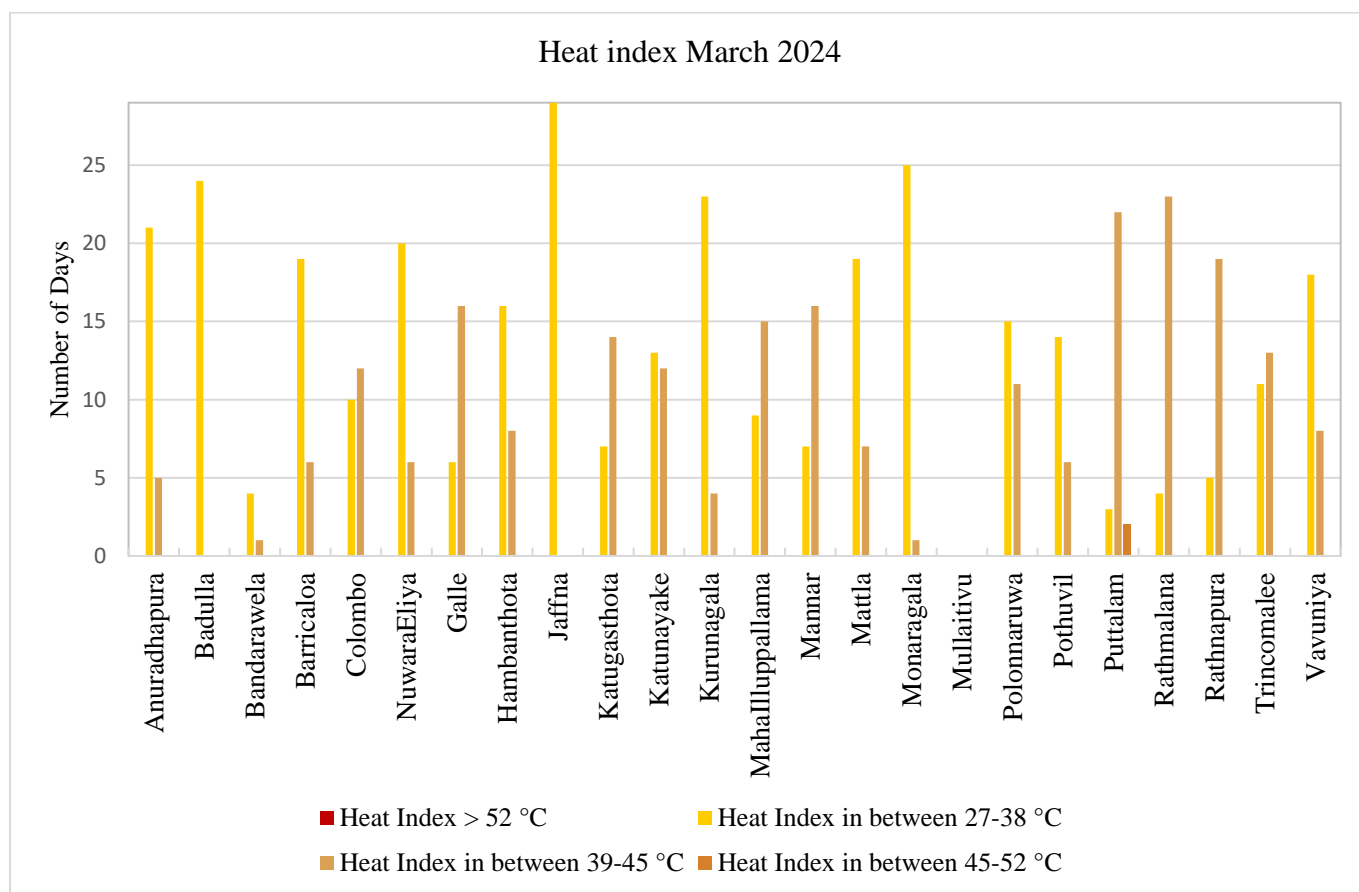


Fig 11: Heat index in the principal stations March 2024

Table 05: Heat Index at the main Meteorological stations and the percentage of number of days which Heat Index greater than 39 °C in the month of March 2024

Meteorological station	Number of days Heat Index > 39 °C	% (percentage of number of days which Heat Index > 39 °C)
Anuradhapura	5	16%
Badulla	0	0%
Bandarawela	1	3%
Barricaloa	6	19%
Colombo	13	42%
NuwaraEliya	6	19%
Galle	18	58%
Hambanthota	8	26%
Jaffna	0	0%
Katugasthota	14	45%
Katunayake	12	39%
Kurunagala	4	13%
MahaIlluppallama	15	48%
Mannar	16	52%
Mattla	7	23%
Monaragala	1	3%
Mullaitivu	0	0%
Polonnaruwa	11	35%
Pothuvil	7	23%
Puttalam	25	81%
Rathmalana	24	77%
Rathnapura	19	61%
Trincomalee	13	42%
Vavuniya	8	26%

5.0 Global condition

Above-normal temperatures were observed in many areas worldwide in March 2024. This marked the warmest March on record in history, with the global surface temperature reaching 1.35°C above the 20th-century average of 12.7°C for this month (NOAA, Climate Prediction Center). The sea surface temperature (SST) in the NINO.3 region was above normal with a deviation of $+1.2^{\circ}\text{C}$, which fell by 0.6°C from February 2024. Above-normal SST was observed in the equatorial Pacific mainly in the central part. Easterly winds in the lower troposphere over the central equatorial Pacific were near normal. El Niño conditions in the equatorial Pacific gradually weakening. The area-averaged SST in the tropical western Pacific (NINO.WEST) region was below normal in March (Tokyo Climate Center). The Indian Ocean Dipole (IOD) condition was in a neutral phase (BoM, Australia). Sea surface waters in the tropical Indian Ocean were nearly in the limit of its average (Fig. 12).

The average position of the shear line was situated between $04^{\circ}\text{S } 60^{\circ}\text{E}$, $01^{\circ}\text{S } 80^{\circ}\text{E}$, and $05^{\circ}\text{N } 100^{\circ}\text{E}$. The Intertropical Convergence Zone (ITCZ) was in southern latitudes at the beginning of the month and gradually moved northward towards the equator. The average position of the Inter-Tropical Convergence Zone (ITCZ) was located between $13^{\circ}\text{S } 50^{\circ}\text{E}$, $12^{\circ}\text{S } 80^{\circ}\text{E}$, and $05^{\circ}\text{S } 100^{\circ}\text{E}$ (Fig. 13). Madden-Julian Oscillation (MJO) was in phase 3 at the beginning of the month and propagated to phase 4 while getting stronger. It was in phase 4 until the 11th of March, then propagated to phase 5, phase 6, phase 7, phase 8 and phase 1 respectively with strong signal in the entire month. (Fig. 14).

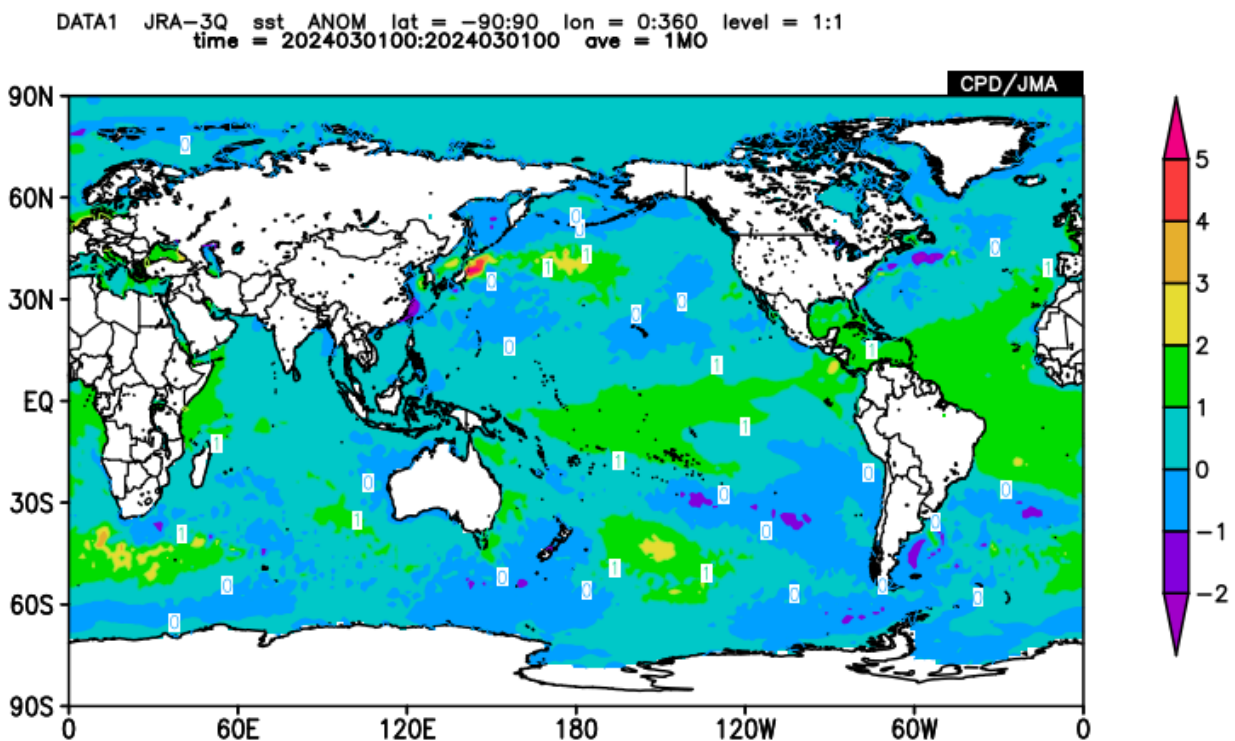


Fig 12: Sea Surface Temperature anomalies for March 2024 (JMA)

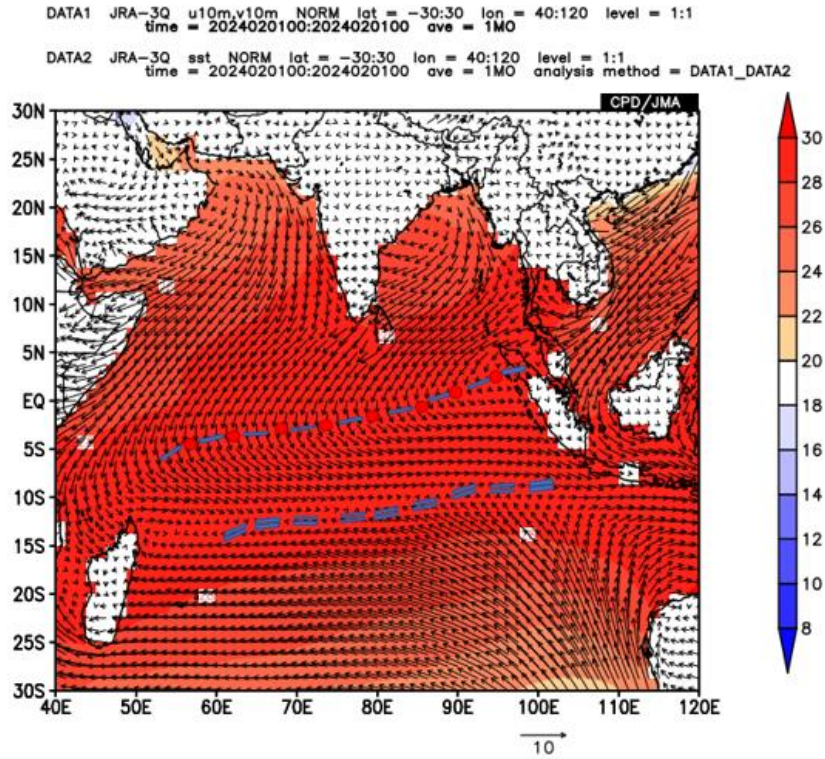


Fig 13: Ocean Surface Winds and Ocean Surface Temperature for March 2024

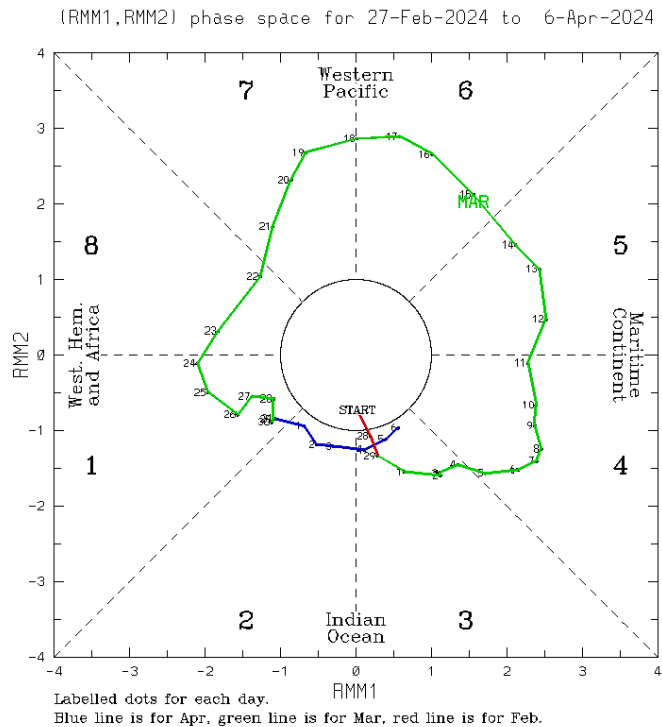


Fig 14: Phase diagram of MJO, Green line for March (BOM)

5.1 Weather Systems

In this month, three cyclonic events were recorded in the South Indian Ocean, whereas no cyclonic systems were reported in the North Indian Ocean. These events included Severe Tropical Storm “Filipo” (March 10-14), Severe Tropical Cyclone “Neville” (March 11-24), and Tropical Cyclone “Gamane” (March 26-28), as depicted in Figure 15.

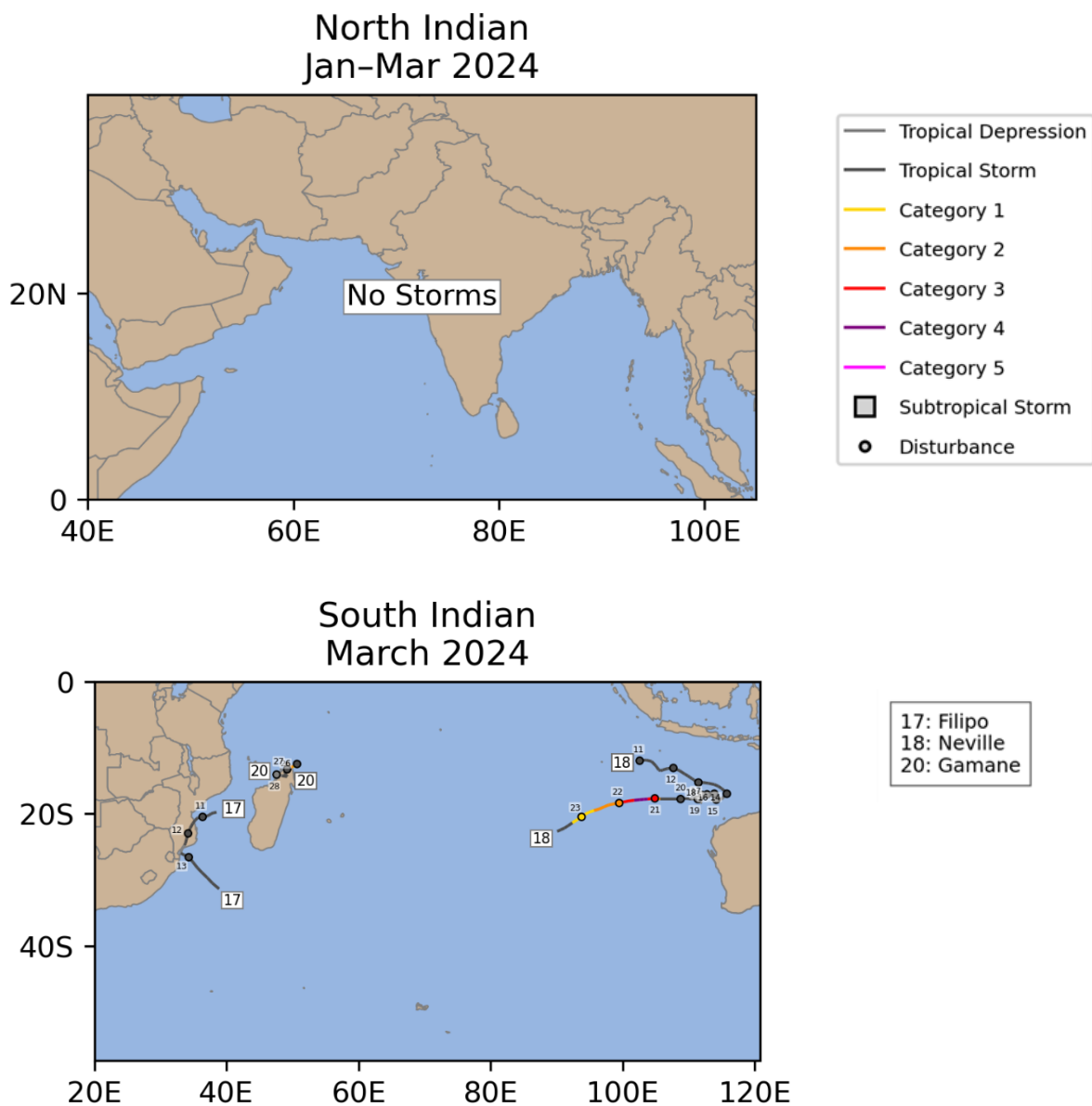


Fig 15: Track of Tropical cyclone systems reported in March 2024 (NOAA)

6.0 Special events reported in Sri Lanka area during month of March.

Coastal inundation was reported in coastal areas of Galle to Ambalangoda via Hikkaduwa on 30th and 31st of the month. The sea wave period was considerably high during the above days and it can clearly identify from Fig 16. Further, high tide also was at 31st at the locations triggered the situation (fig 17).

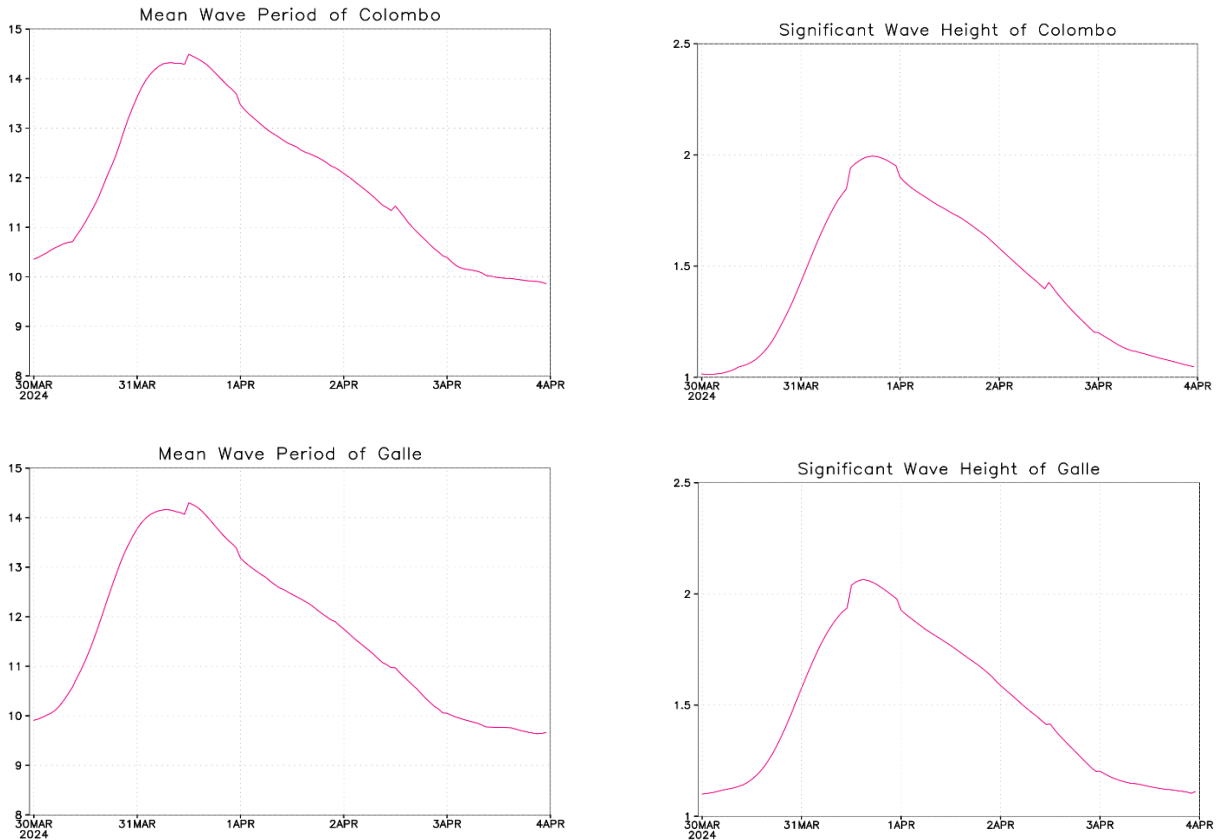


Fig 16: Variation of Sea wave period and wave height at Colombo and Galle at the end of March 2024 (ECMWF hourly data)

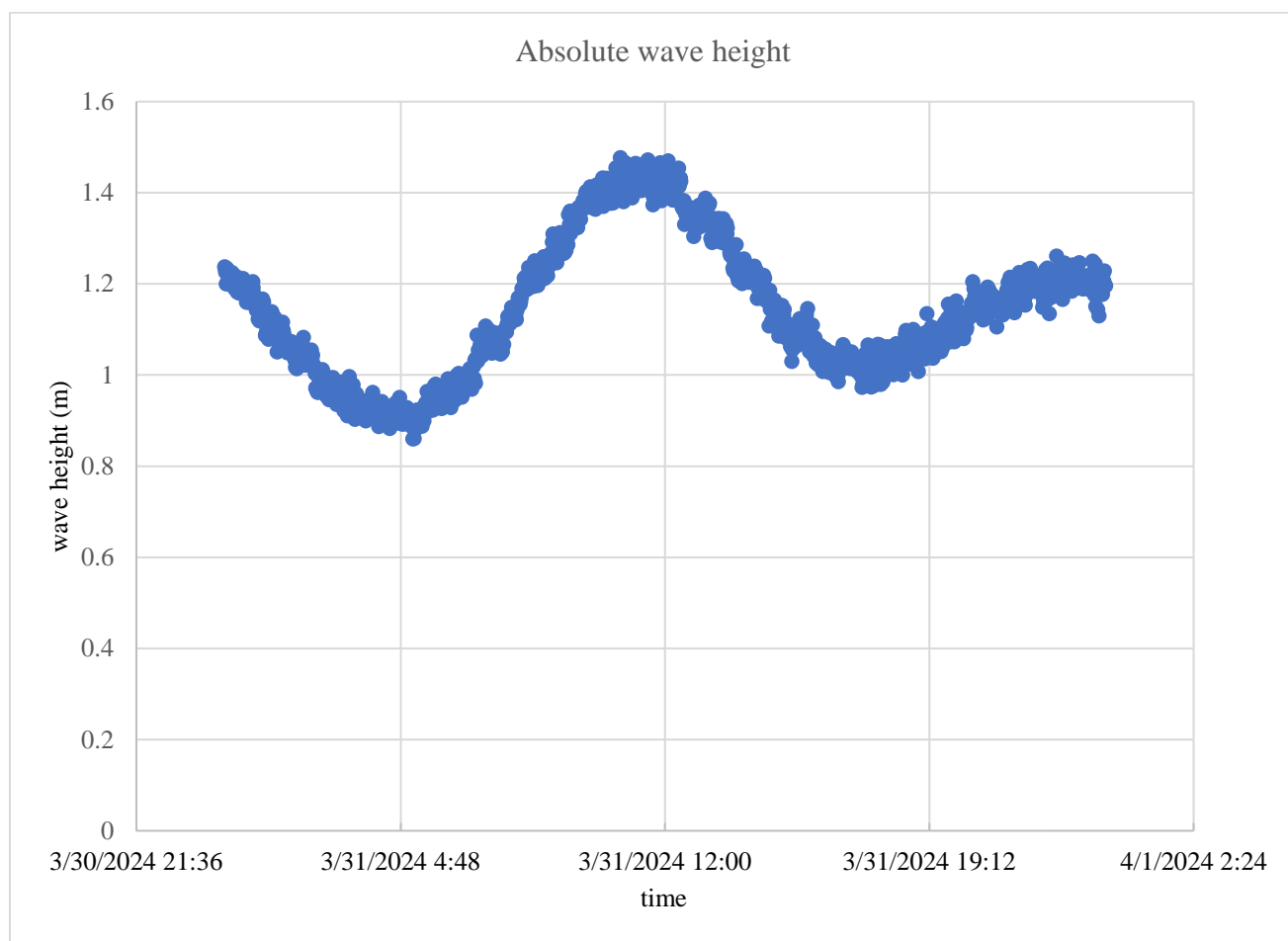


Fig 17: Variation of absolute Sea level at Colombo 31st March 2024 (Observation from Colombo tide gauge)