Weather Synopsis –April 2020.

Even though Inter monsoon conditions were prevailed during the month of April, vaguely suppressed convective activity was evident during first 1/3 of the month. Convective activity has enhanced particularly over southwestern parts from 10th April. All principal meteorological stations except Anuradhapura, Kurunegala and Katunayaka reported below average rainfall. Anuradhapura and Katunayaka stations reported about average rainfall while Kurunegala station reported above average rainfall (Fig 2). Most of the hydro catchment stations, except Maskeliya reported below average rainfall (Fig 3). Most of the meteorological stations reported 2-4^{0}C above average maximum temperatures (Figs 12 and 13). Minimum temperatures were above average over most of the stations. Reported maximum temperature was 38.5^{0}C at Puttalum on 02nd and reported minimum temperature was 8.7^{0}C at Nuwaraeliya on 07th.

Three deaths have been reported due to lightning at Vavunia on 08th; at Haldummulla on 19th and at Thamankaduwa on 30th April 2020. According to Disaster Management Center (DMC), several families were affected by hazards caused by convective activity such as lightning, and locally isolated strong winds probably associated with the downdrafts of cumulonimbus clouds (a downdraft is a small-scale column of air that rapidly sinks toward the ground often bringing strong winds) during April 2020 (Table 1**).**

ENSO and IOD neutral conditions were observed during Month of April 2020. Ocean Nino Index is around 0.3 during March, April and May (NOAA Climate prediction Center). Sea surface waters in tropical Indian Ocean are warmer than average (Fig. 5)

The Madden-Julian Oscillation (MJO) was strong at phase 5 to 8 from 2nd April to 12th April. It was at phase 1 from 13th to 20th , then propagated eastward into phase 2 and 3 from 21st to 29th (Fig 6).

During the month, the Inter Tropical Convergence Zone laid around Equator 50^{0}E, 04^{0}N80^{0}E and Equator120^{0}E (Fig7). ITCZ was shifted to the south of average position during first half up to 17th and then to the north of the average position for remaining days of the month.

Weather Systems

In the south Indian ocean A tropical disturbances developed in South Indian Ocean near 11.3^{0}S and 67^{0}E on 01April 2020. It was developed in to a depression on 02nd. It was upgraded to Tropical Cyclone Irondro on 3rd April after developing an intense central dense overcast and moved in south-eastward direction. Irondro peaked as an Intense Tropical Cyclone on 06th. With it's movement toward southeast direction, the cyclone weakened to a tropical storm after 6th April while traversed to a region of increasing wind shear, drier air, and diminishing oceanic heat content.

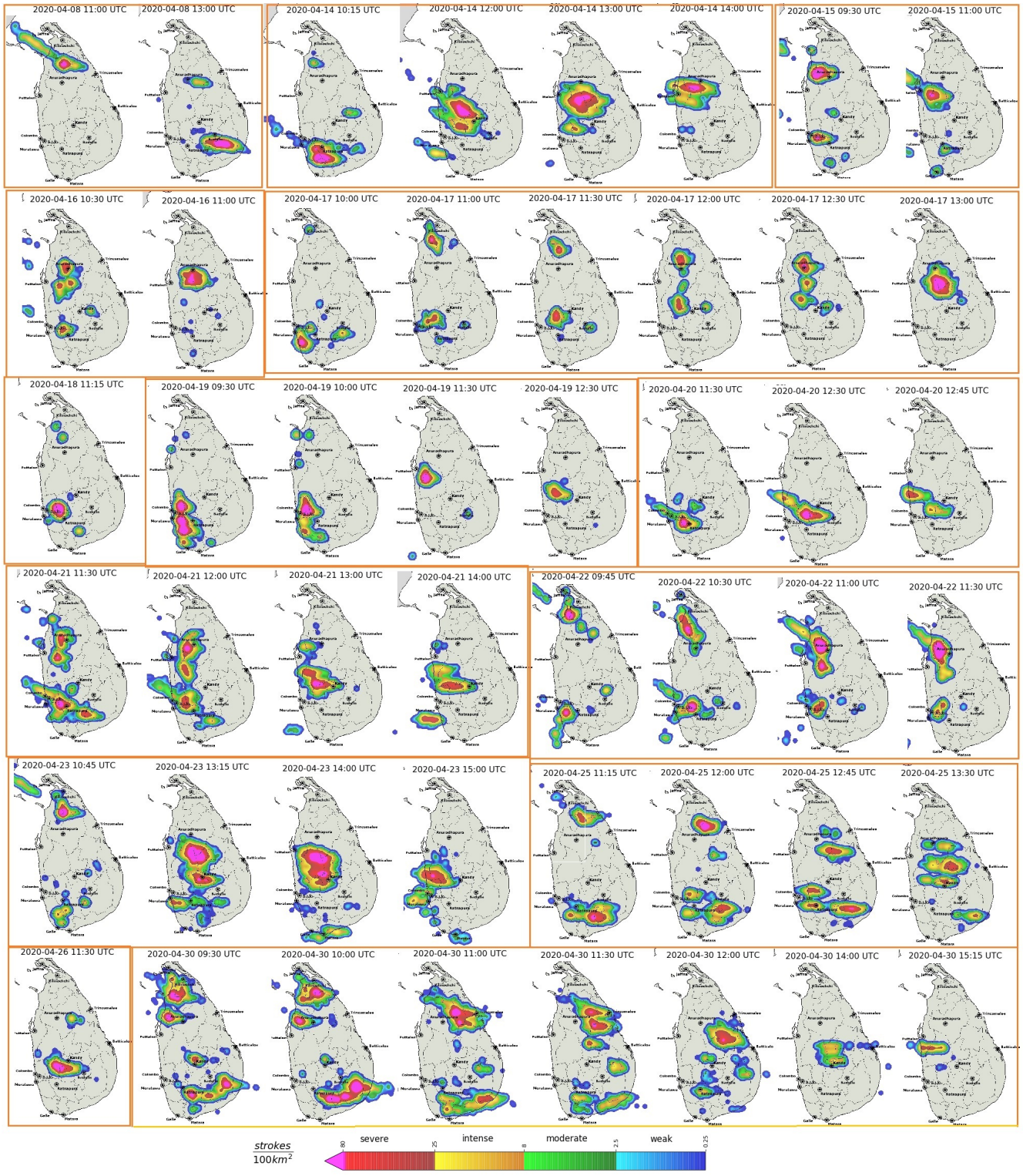

Fig 1 : GLD360 lightning stroke maps for April 2020 (Source : Finish Meteorological Institute)

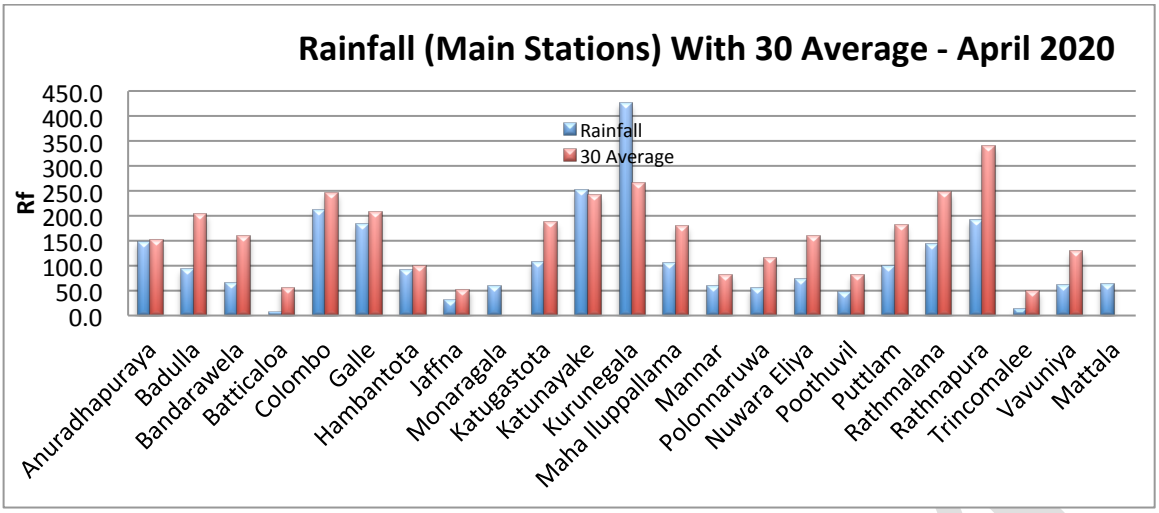

Fig 2 Monthly Total Rainfall (mm) with 30 years (1961-1990) of their averages at Main Meteorological stations areas during April 2020

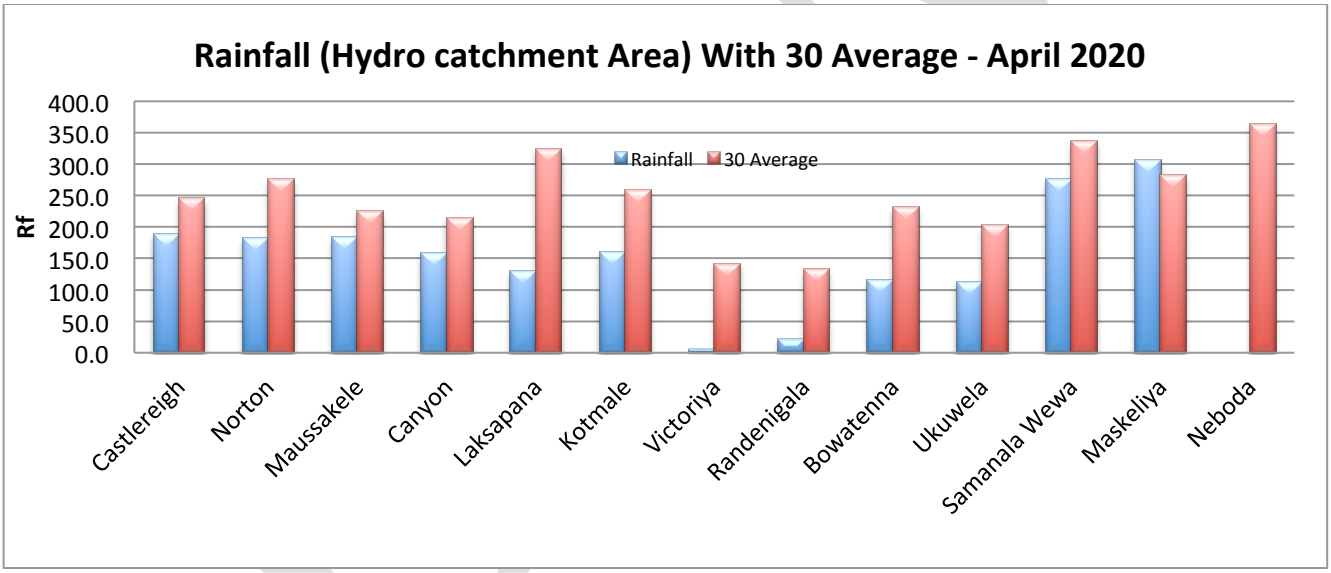

Fig 3 Monthly Total Rainfall (mm) with 30 years (1961-1990) of their averages at Hydro catchment areas during April 2020

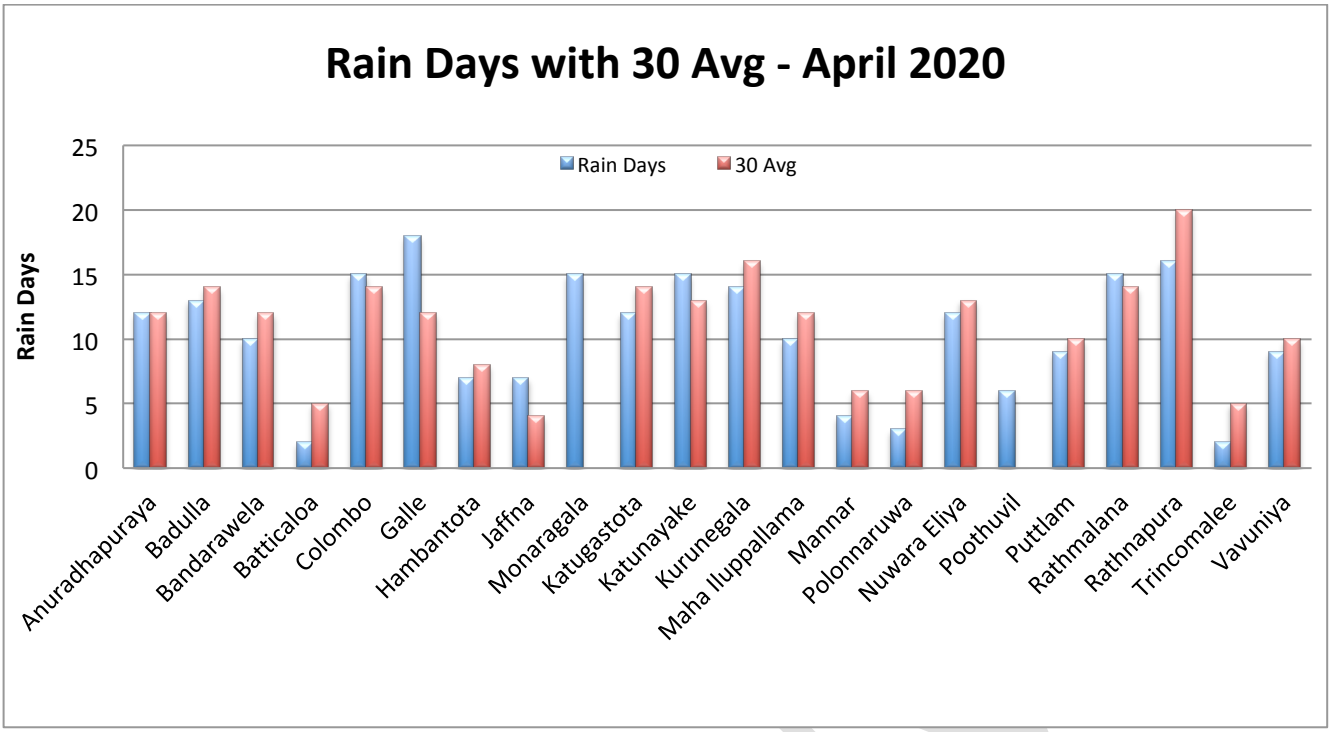

Fig 4 monthly total no of rainy days with 30 years (1961-1990) of their averages at main Meteorological stations during April 2020

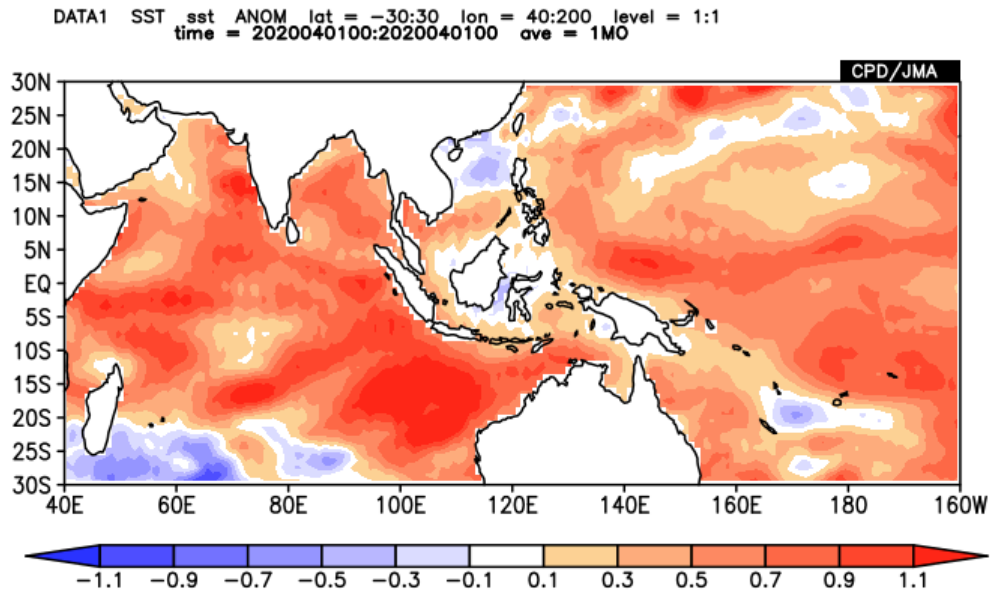

Fig 5 : SST anomaly map for April 2020

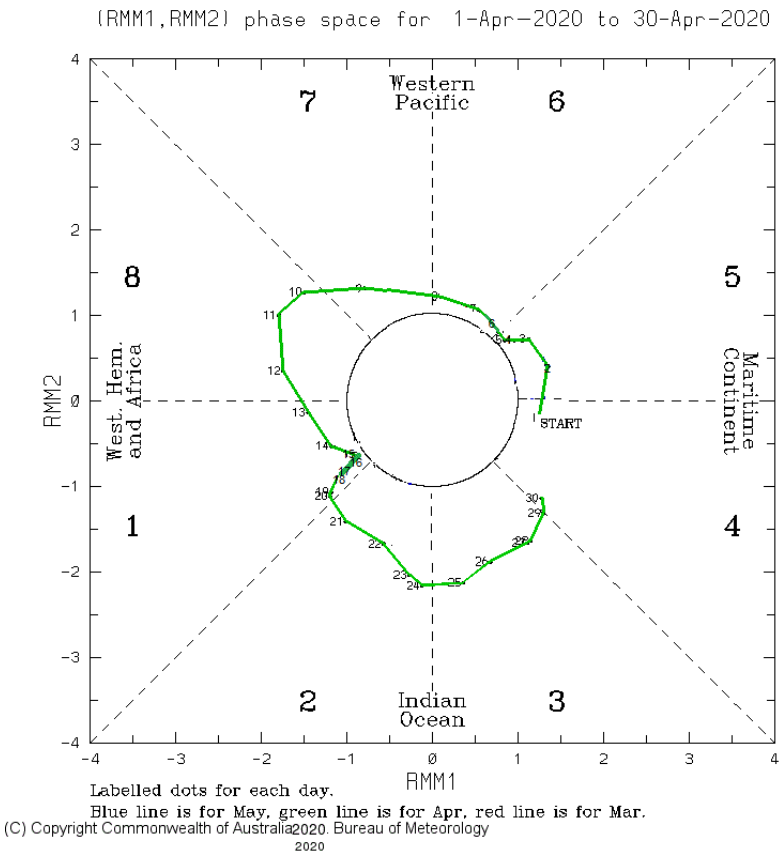

Fig 6 Phase diagram of MJO Index

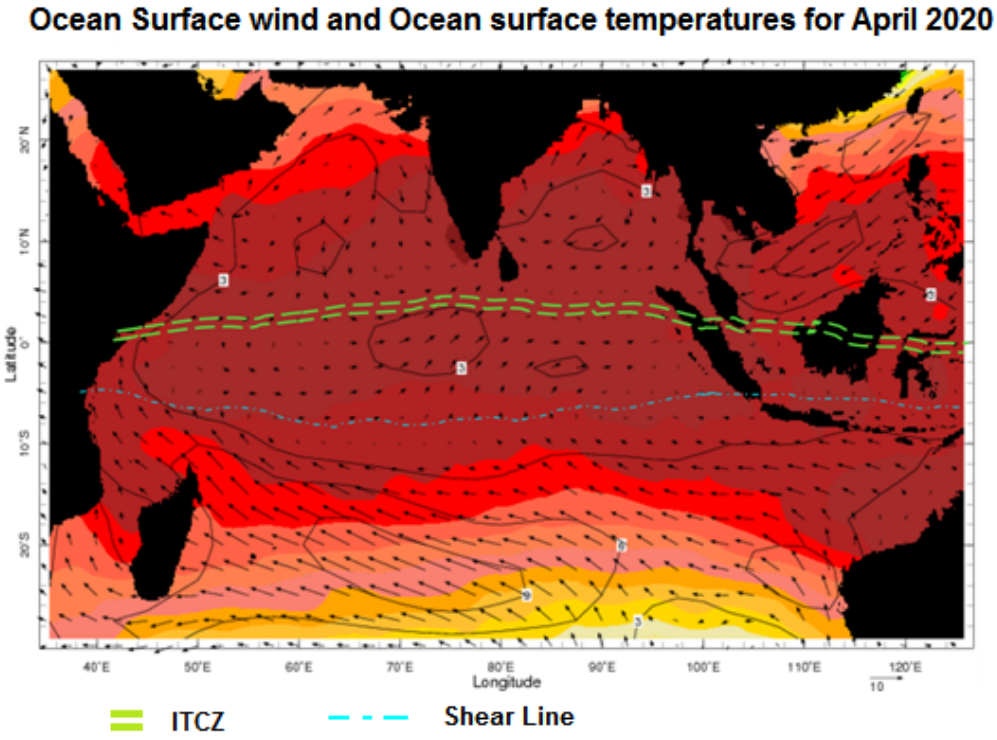

Fig 7 : Ocean Surface Winds and Ocean Surface Temperature for April 2020

Surface pressure and winds: The surface pressure was about or above average except average on 2nd and 25th April, when below average surface pressure values observed. Pressure distribution was fairly even or even.
The surface wind was predominantly calm/05kts and variable in direction .

Upper winds:

At 850hPa, North-easterly wind flow is dominated over the island. Averaged ridge axis was positioned from 25^0N40^0E, 20^0N55^0E, 16^0N70^0E, 18^0N85^0E, 15^0N100^0E, and 25^0N120^0E.

At 700 hPa, North-easterly wind flow originated from anticyclonic circulation centred at Maharashta, India, is dominated over the northern part of the island. Averaged ridge axis was positioned from15^0N40^0E, 20^0N50^0E, 20^0N70^0E, 16^0N90^0E, and 20^0N120^0E. Anomalous northeast southwest oriented trough axis appeared across Sri Lanka which may have played a role in below normal monthly rainfall for April 2020

At 500 hPa, Northeasterly wind flow dominated during the month. Averaged ridge axis was positioned to the north of Sri Lanka from 14^0N40^0E, 15^0N55^0E, 10^0N90^0E, and 15^0N120^0E. Mild cyclonic circulation appeared to south of Sri Lanka while it's associated northeast southwest oriented trough laid to the east of Sri Lanka.

The 200 hpa the upper tropospheric ridge was laid south of Sri Lanka bringing predominantly southwesterly winds across Sri Lanka.

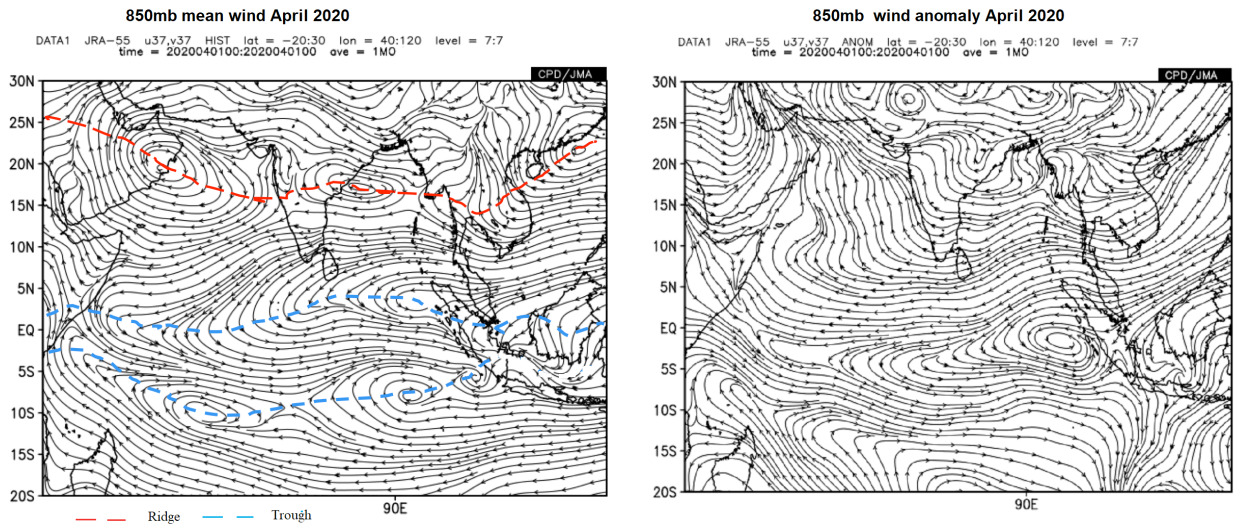

Fig 8 Monthly average wind pattern at 850hpa level during the month of April 2020 (JRA 55)

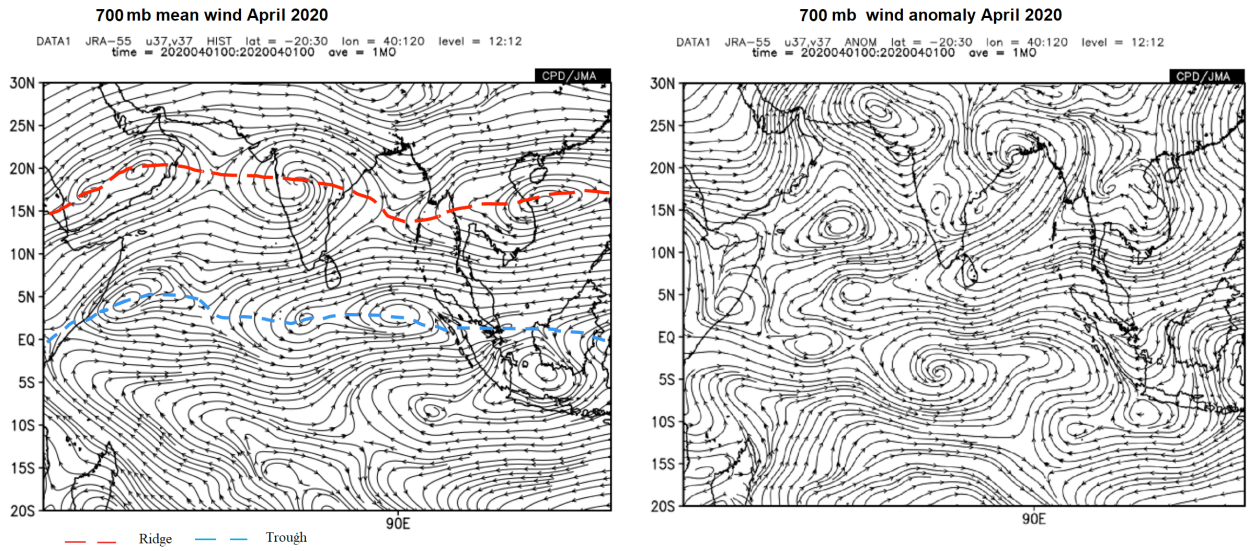

Fig 9: Monthly average wind pattern at 700hpa level during the month of April 2020 (JRA 55)

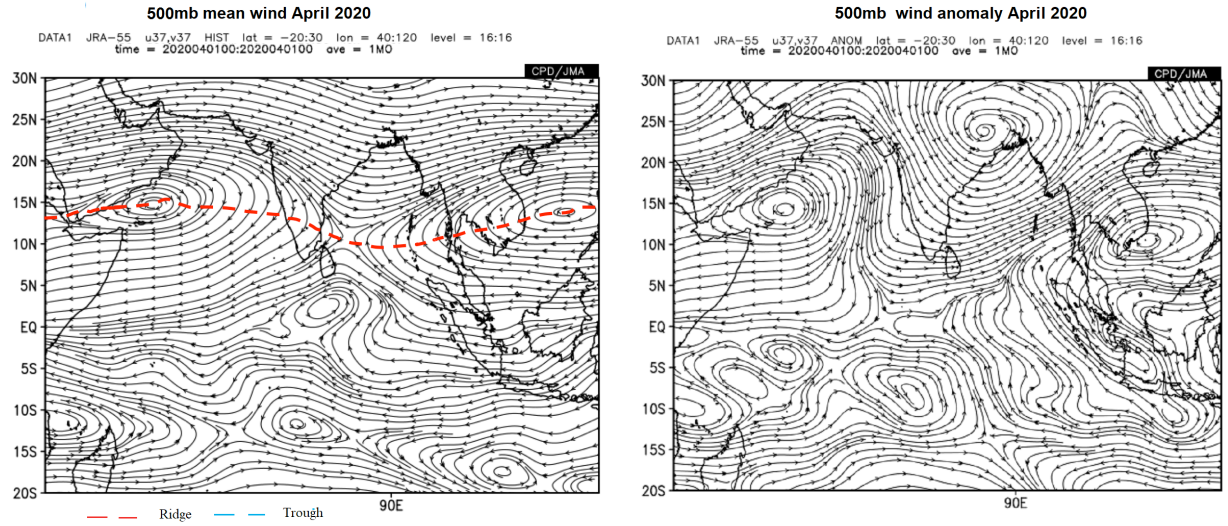

Fig. 10. Monthly average wind pattern at 500hpa level during the month of April 2020 (JRA 55)

East West Vertical cross section of pressure vertical velocity across Sri Lanka April 2020

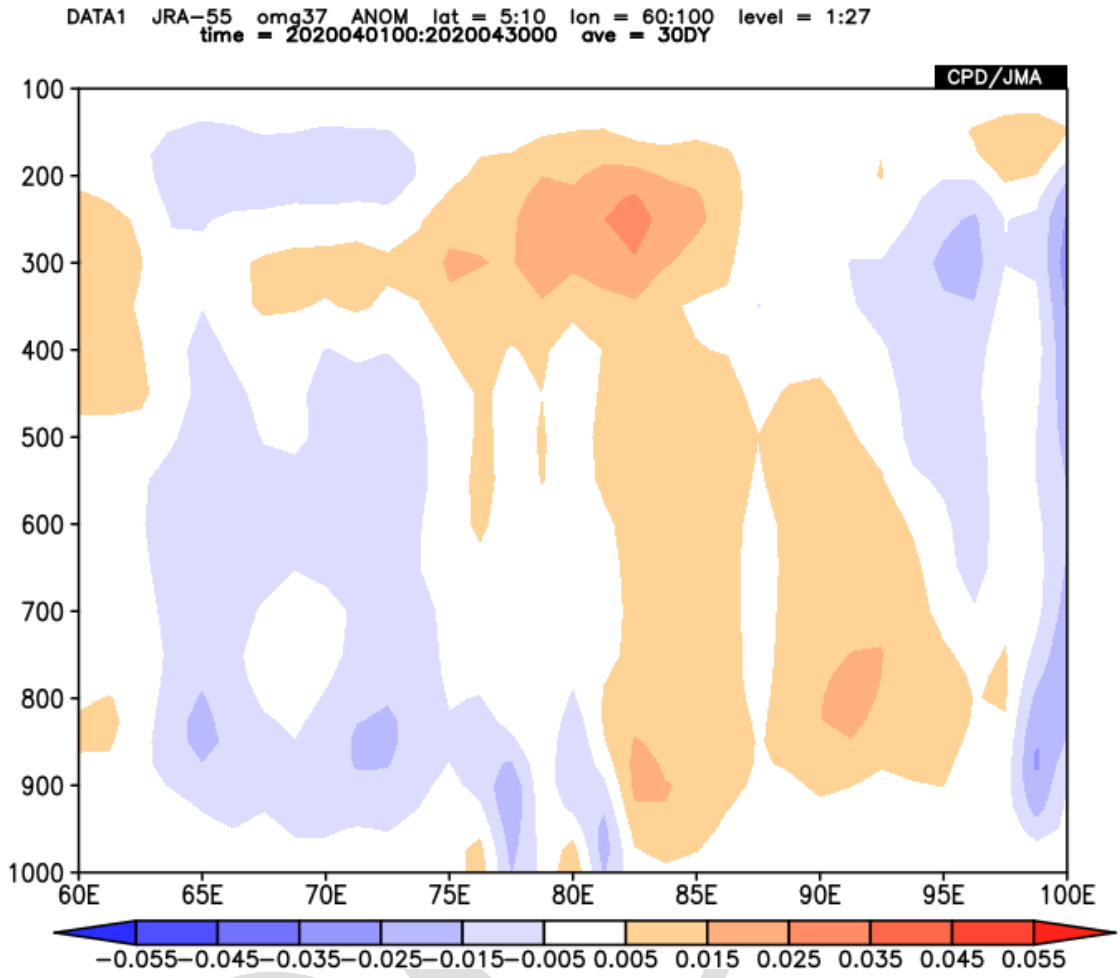

Fig 11 : Vertical cross-section of pressure vertical velocity

Temperature Field:

The maximum temperatures in the day were mostly 1-3^{0}C above normal in most places during the month. A few stations reported below normal on 22nd to 24th (Fig 12). Highest recorded maximum temperature for the month of April 2020 was 38.5^{0}C from Puttalum on 02nd.

Night minimum temperatures over most parts were abovenormal during the month. 6.50C below normal night temperatures were reported at Badulla on 02nd (Fig 13). Lowest recorded minimum temperature for the month of April 2020 was 8.7^{0}C from NuwaraEliya on 07th .

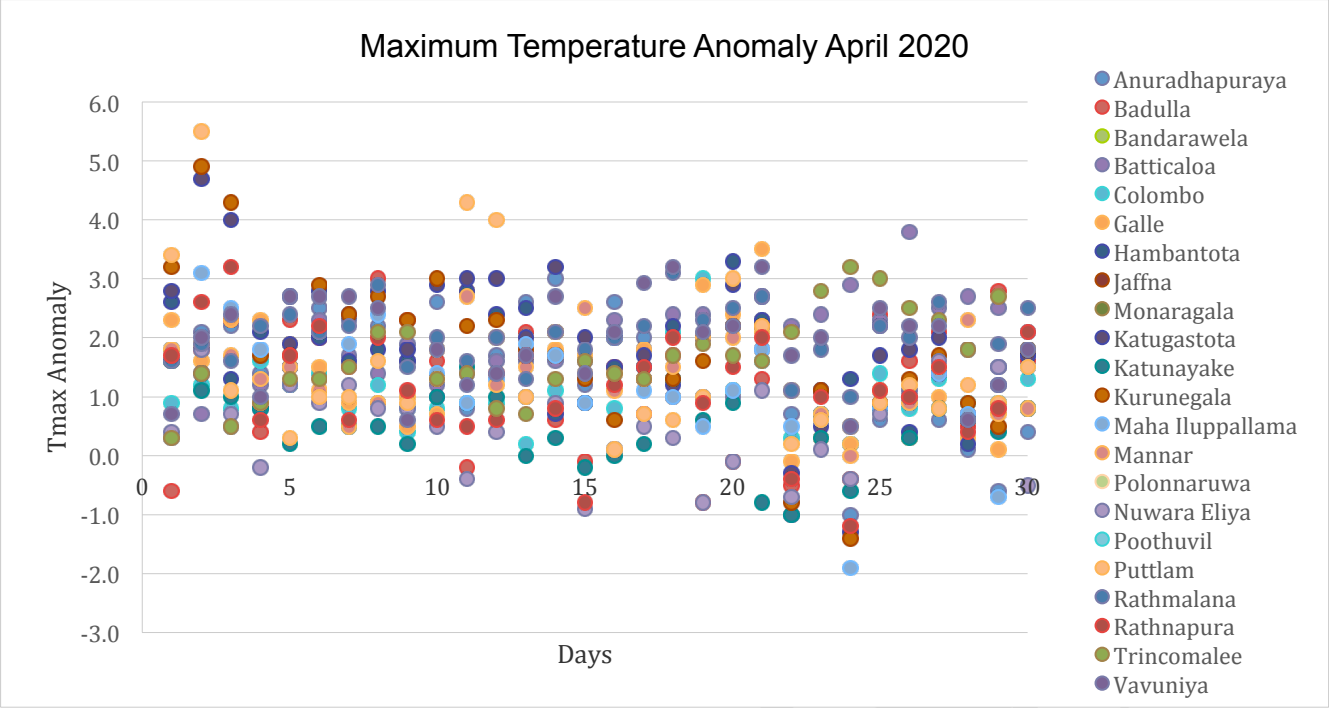

Fig 12 Maximum Temperature anomaly (^{0}C) for April 2020

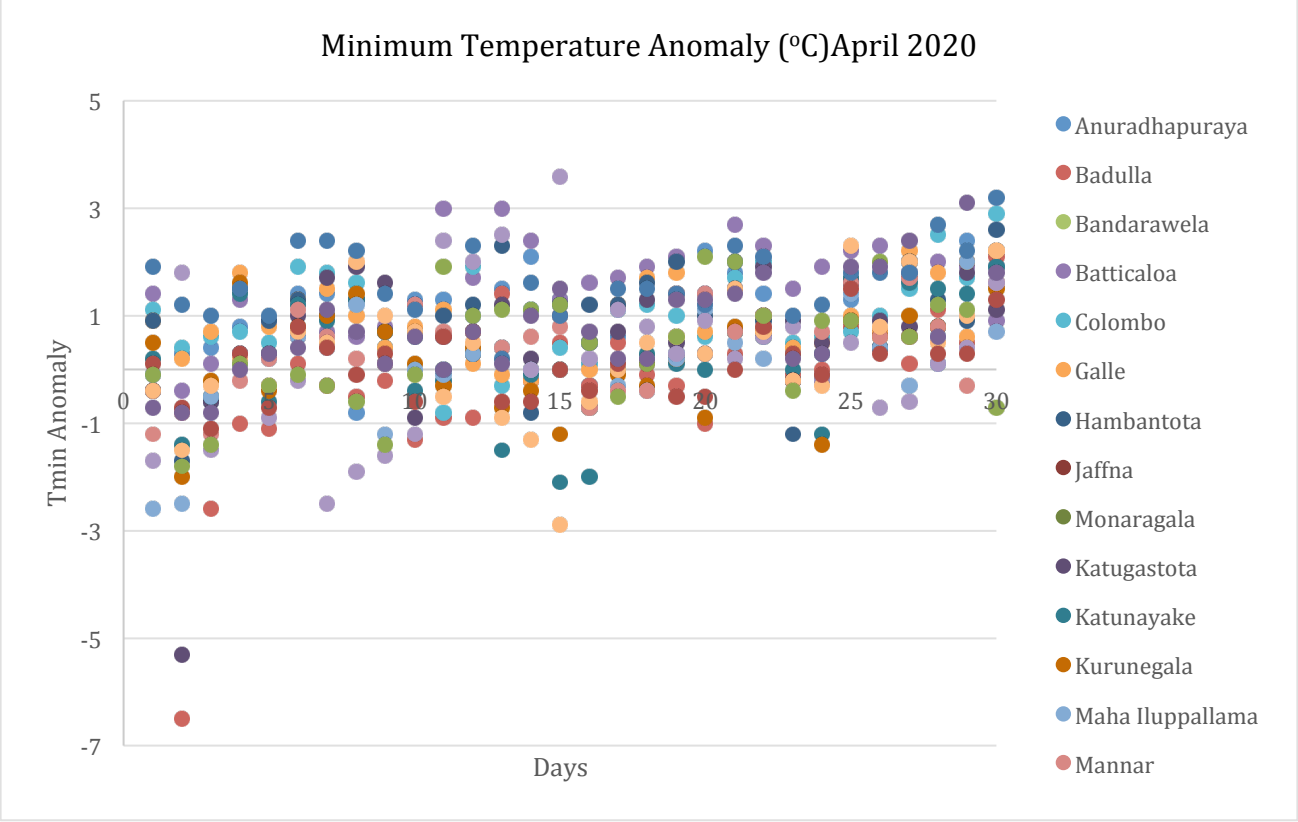

Fig 13 Minimum Temperature anomaly (^{0}C) for April 2020

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

Rainfall: All principal meteorological stations except Anuradhapura, Kurunegala and Katunayaka reported below average rainfall. Anuradhapura and Katunayaka stations reported about average rainfall while Kurunegala station reported above average rainfall. Maximum percentage were reported from Kurunegala (161.1%) while minimum from Batticoloa station in Eastern province (11.8%). Number of rainy days was about normal at Anuradhapuraya, Colombo, Katunayake, Rathmalana while above normal at Jaffna, and Galle. It is worthy mentioned that Jaffna station received only 57.8% of the climatological rainfall average but 175% of more number of rainy days than climatological average indicating more occurrence of light showers while Kurunegala received 161.2% of the climatological rainfall average within 87.5% of rainy days indicating occurrence of fairly heavy falls such as 61.8mm on 10th , 53.8mm on 14th , 87.7 mm on 17th and 76.8 mm on 23rd.

Most of the hydro catchment stations, except Maskeliya reported below average rainfall.

Highest cumulative rainfall was 459.5.0 mm at Deniyaya . Highest rainfall received during 24hours, was 105.8 mm at Undugoda at Kegalle District on the 23rd. The total rainfall and the number of rain days at the principal meteorological stations recorded in the month against the respective average and rain-days are shown in the table 2, and 3, and in the figures 2, and 4.

Table 1 hazards caused by convective activity during April 2020

date	Lightning	Strong Winds
10		Ja-Ela, Mawathagama, Weerambugedara
12		Kotawehera, Polgahawela, Mannar town
13	hihagoda	Ambanpola, Polpithigama, Pasgoda, Walasmulla
14		Ambagamuwa, Mallawapitiya, Alawwa, Mahawa, Hakmana, Wariyapola, Baddegama
15		Dehiowita, Mahakumbukkadawala, Karuwalagaswewa, Puttalam, Wanathawilluwa, Anamaduwa, Nawagaththegama, Tengalle, Walasmulla
16		Karuwalagaswewa, Puttalam, Katuwana, Talawa
17	Bulathkohupitiya	Deraniyagala, Mahakumbukkadawala, Ambanpola, Ganewatta
18	Dehiowita Galgamuwa	Ruwanwella, Warakapola, Dehiowita, Deraniyagala, Eheliyagoda, Kolonna, Mirigama, Dompe, Bulathsinhala,
19	Yatiyantota	Bulathkohupitiya, Yatiyanthota, Deraniyagala, Dompe, Baddegama,
20		Yatiyanthota, Deraniyagala, Nivithigala, Kalawana, Munuwangoaa, Dompe,
21	Arachchikattuwa	Ruwanwella, Yatiyanthota, Deraniyagala, Kiriella, Aththanagalla, Dompe,
22		Warakapola, Rambukkana, Deraniyagala, Nawagaththegama, Lunugamwehera, Hambantota, Chavakachcheriya
23	Galgamuwa, Karuwalagas wewa, Chillaw	Deraniyagala, Pallama, Dankotuwa, Udunuwara, Wennapuwa, Gangaihalakorale, Walapane, Arachchikattuwa, Naththandiya, Kurunegala, Mawathagama, Weerambugedara, Ganewatta, Polpithigama, Mallawapitiya, Alawwa, Wariyapola, Paduwasnuwara west, Narammala, Pannala, Nikawaratiya, Maaspotha, Kobeigane,
24		Deraniyagala,
25		Deraniyagala,
26	Galgamuwa	Yatiyanthota, Deraniyagala, Udapalatha

27		Udapalatha, Paathadumbara, Angunukolapelessa, Galenbundunuwewa
28		Udapalatha, Lunugamwehera
29		Elpitiya, Welioya
30		Hingurakgoda

Table-02-Monthly Total Rainfall(mm) and monthly total no of rainy days with 30 years(1961-1990) of their averages at main Meteorological stations during April 2020

	Monthly Total rainfall(mm)			Monthly Total No of rainy Days		
Meteorological station	2020-Apr	Average	%	2020-Apr	Average	%
Anuradhapuraya	148.2	151.6	97.8%	12	12	100.0%
Badulla	93.1	203.5	45.7%	13	14	92.9%
Bandarawela	66.3	158.3	41.9%	10	12	83.3%
Batticaloa	6.5	55.0	11.8%	2	5	40.0%
Colombo	212.5	245.6	86.5%	15	14	107.1%
Galle	182.5	206.8	88.2%	18	12	150.0%
Hambantota	91.8	99.6	92.2%	7	8	87.5%
Jaffna	30.7	52.3	58.7%	7	4	175.0%
Monaragala	58.6			15		
Katugastota	107.2	187.7	57.1%	12	14	85.7%
Katunayake	251.6	241.4	104.2%	15	13	115.4%
Kurunegala	426.0	264.3	161.2%	14	16	87.5%
MahaIluppallama	104.2	179.5	58.1%	10	12	83.3%
Mannar	58.7	81.4	72.1%	4	6	66.7%
Polonnaruwa	54.4	116.4	46.7%	3	6	50.0%
NuwaraEliya	72.8	158.4	46.0%	12	13	92.3%
Poothuvil	46.5	81.9	56.8%	6		
Puttlam	99.2	181.5	54.7%	9	10	90.0%
Rathmalana	142.4	246.5	57.8%	15	14	107.1%
Rathnapura	191.6	338.9	56.5%	16	20	80.0%
Trincomalee	13.8	49.2	28.0%	2	5	40.0%
Vavuniya	60.4	128.5	47.0%	9	10	90.0%
Mattala	62.2			8		

Table-03-Monthly Total Rainfall(mm) with 30 years(1961-1990) of their averages at Hydro catchment areas during April 2020

Hydro Catchment	April 2020	Average	% (percentage of average)
Castlereigh	188.8	244.8	77.1%
Norton	182.5	275.8	66.2%
Maussakele	184.5	224.5	82.2%
Canyon	158.5	214.3	74.0%
Laksapana	129.1	324.3	39.8%
Kotmale	159.5	258.9	61.6%
Victoriya	5.2	141.8	3.7%
Randenigala	22.0	132.1	16.7%
Bowatenna	115.8	232.3	49.9%
Ukuwela	113.4	202.4	56.0%
SamanalaWewa	275.5	335.7	82.1%
Maskeliya	306.7	282.3	108.6%
Neboda		363.9	

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 April 2020

	Maximum			Highest Std.Div
		Offsets		
	Value	(-)	(+)	
Value	**38.5**	1.9	5.5	1.29
Station	**Puttalam**		**Puttalam**	Puttalum
Date	2/04/2020	24/04/2020	2/04/2020	

Table 4(b) -Extremes of Minimum Temperature April 2020

	Minimum			Highest Std.Div
		Offsets		
	Value	(-)	(+)	
Value	8.7	6.5	3.6	1.49
Station	NuwaraEliya	Badulla	NuwaraEliya	Badulla
Date	7/04/2020	02/04/2020	15/04/2020	

Prepared by National Meteorological Centre(NMC)
Department of Meteorology