**Federation for Environment, Climate and Technology**

c/o, Maintenance Office, Mahaweli Authority, Digana Village, Rajawella, Sri Lanka.
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Web Site http://www.climate.lk

**27 AUGUST 2020**

# EXPERIMENTAL CLIMATE MONITORING AND PREDICTION

By: Chethana Chandrasiri, Chayana Gunathilake, Piushani Ellegala, Nipuni Alahakoon, Lareef Zubair and Michael Bell[1] (FECT and IRI[1])

# HIGHLIGHTS

***Rainfall Forecast***

- *The NOAA weekly rainfall forecast predicts up to 75 mm Monaragala, Ampara, Kandy, Nuwara Eliya and Badulla district during 27th August -1st September.*

***Monitored Rainfalls***

- *Between 20th - 26th August: up to 50 mm of rainfall was recoreded in Moneragala district on 26th August.*

***Monitored Wind***

- *From 19th- 25th August: up to 8 km/h, northwesterly winds were experienced by the entire island.*

***Monitored Sea Surface***

- *1$^0$C above average sea surface temperature was observed in the seas around Sri Lanka.*

# Monitoring

## Rainfall

### *Weekly Monitoring*

| Date | Rainfall |
|---|---|
| **20th August** | Up to 10 mm in Jaffna district. |
| **21st August** | Up to 2.5 mm in Moneragala district. |
| **22nd August** | Up to 5 mm in Badulla, Colombo, Gampaha, Kaluthara, Kegalle, Kurunegala, Matale, Moneragala, Nuwara Eliya and Ratnapura districts. |
| **23rd August** | up to 30 mm in Matale and Polonnaruwa districts; up to 20 mm in Ampara, Badulla and Monaragala districts; up to 15 mm in Kandy districts; up to 10 mm in Kurunegala and Kegalle districts; and up to 5 mm in Gampaha, Puttalam and Batticaloa districts. |
| **24th August** | Up to 20 mm in Badulla district; up to 15 mm in Nuwara Eliya, Kandy and Ampara districts; and up to 5 mm in Kegalle, Monaragala, Gampaha, Matale and Polonnaruwa districts. |
| **25th August** | Up to 40 mm in Monaragala and Badulla districts; up to 30 mm in Batticaloa and Kandy districts; up to 20 mm in Matale district; up to 15 mm in Polonnaruwa district; and up to 10 mm in Nuwara Eliya and Ratnapura districts. |

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| Date | Rainfall |
|---|---|
| **26th August** | Up to 50 mm in Ampara and Monaragala districts; up to 40 mm in Badulla and Anuradhapura districts; up to 30 mm in Vavuniya and Kandy districts; up to 20 mm in Matale and Batticaloa districts; up to 15 mm in Kurunegala, Polonnaruwa and Nuwara Eliya districts; and up to 10 mm in Gampaha, Colombo, Kegalle, Ratnapura and Trincomalee districts. |

### *Total Rainfall for the Past Week*

The RFE 2.0 tool shows total up to 75 mm in Ampara and Badulla districts; up to 50 mm in Kandy, Nuwara Eliya, Monaragala and Matale districts; and up to 25 mm in Gampaha, Colombo, Kegalle, Kurunegala, Ratnapura, Vavuniya, Anuradhapura, and Polonnaruwa districts; and up to 10 mm in Puttalam, Kalutara, Batticaloa and Trincomalee districts.

Above rainfall average up to 50 mm in Badulla district and up to 25 mm in Monaragala and Ampara districts. Below rainfall average up to 50 mm in Ratnapura, Vavuniya, Anuradhapura, Trincomalee, Mannar and Mullaitivu districts; and up to 25 mm in Jaffna, Kilinochchi, Polonnaruwa, Matale, Puttalam, Kurunegala, Gampaha, Colombo, Kalutara, Galle, Matara, Hambantota, Nuwara Eliya, Kandy, Kegalle and Batticaloa districts.

### *Monthly Monitoring*

During July – Above average rainfall conditions up to 8 mm were experienced by Anuradhapura, Matale, Polonnaruwa and Vavuniya districts; up to 6 mm in Ampara, Badulla, Hambantota, Jaffna, Kandy, Kilinochchi, Kurunegala, Mannar, Moneragala, Mullaitivu, Nuwara Eliya, Puttalam, Ratnapura, and Trincomalee districts; and up to 4 mm in Batticaloa, Colombo, Galle, Gampaha, Kalutara, Kegalle, and Matara districts.

## Ocean State *(Text Courtesy IRI)*

### *Pacific sea state: August 19, 2020*

SSTs in the east-central and central Pacific decreased to near the La Niña threshold in mid-august, and the atmospheric variables were either ENSO-neutral or indicative of weak La Niña conditions. The average of the forecasts of many models just short of the borderline of weak La Niña SST conditions through fall, becoming slightly weaker beginning in early winter. The official CPC/IRI outlook is somewhat similar to these model forecasts, calling for a likely continuation of ENSO-neutral in summer, with approximately equal chances of ENSO-neutral or La Niña for fall and winter.

### *Indian Ocean State*

1 $^0$C above average sea surface temperature was observed in the seas around Sri Lanka.

# Predictions

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## Rainfall

### *14-day prediction: NOAA NCEP models*

**From 27th August – 2nd September:** Total rainfall up to 75 mm in Galle, Kalutara and Matara districts; up to 65 mm in Ratnapura and Monaragala districts; up to 55 mm in Gampaha, Colombo, Kegalle, Kandy, Nuwara Eliya, Monaragala and Badulla districts; and up to 45 mm in Kurunegala, Matale and Hambantota districsts; up to 35 mm in Puttalam, Matale and Ampara districts; up to 25 mm in Polonnaruwa and Batticaloa districts; and up to 15 mm in Anuradhapura district.

**From 03rd September – 09th September:** Total rainfall up to 125 mm in Galle, district; up to 115 mm in Kalutara and Matara districts; up to 105 mm in Ratnapura and Hambantota districts; up to 95 mm in Kegalle, Nuwara Eliya and Badulla districts; up to 85 mm in Gampaha, Kandy and Monaragala districts; up to 75 mm in Ampara and Kegalle districts; and up to 65 mm in Kurunegala and Matale districts; up to 55 mm in Puttalam district; up to 45 mm in Polonnaruwa and Batticaloa districts; up to 35 mm in Jaffna district; up to 25 mm in Anuradhapura district and up to 15 mm in Kilinochchi, Mannar, Mullaitivu and Vavuniya districts.

### *NOAA Model Forecast*:

**From 27th August – 1st September:** Total rainfall up to 75 mm in Moneragala, Ampara, Kandy, Nuwara Eliya and Badulla districts; and up to 50 mm in Mullaitivu, Vavuniya, Anuradhapura, Trincomalee, Polonnaruwa, Batticaloa, Matale, Kurunegala, Gampaha, Colombo, Kalutara, Galle, Matara, Kegalle, Ratnapura and Hambantota districts.

## MJO based OLR predictions

### *For the next 15 days:*

MJO shall slightly enhance rainfall during 26th -30th August and significantly enhance rainfall during 31st August – 9th September.

[1] International Research Institute for Climate and Society, Earth Institute at Columbia University, New York.
Official hydro-meteorological statements are provided by the Sri Lanka Department of Meteorology and Department of Irrigation.

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# Weekly Hydro- Meteorological Report for Sri Lanka

## Inside This Issue



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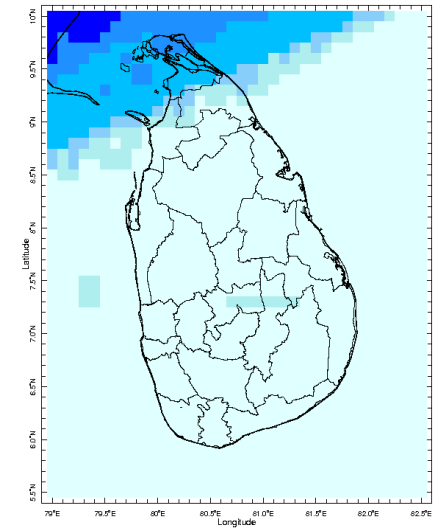
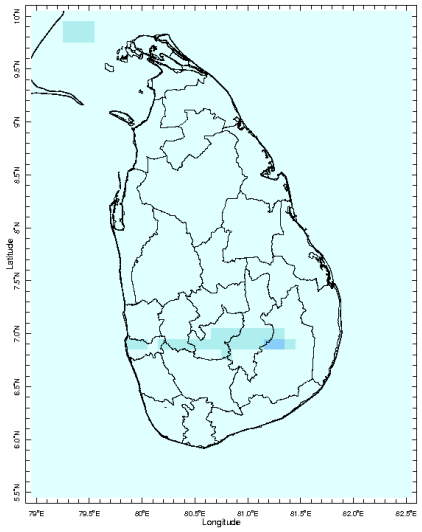
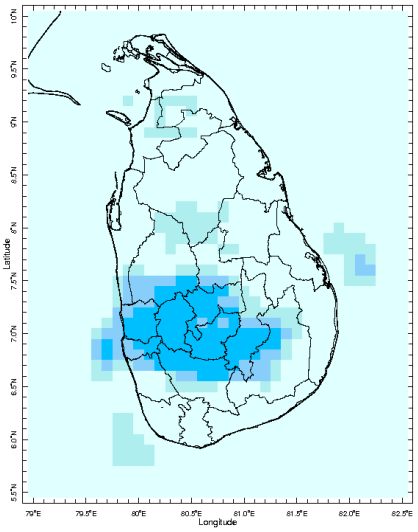
## MONITORING

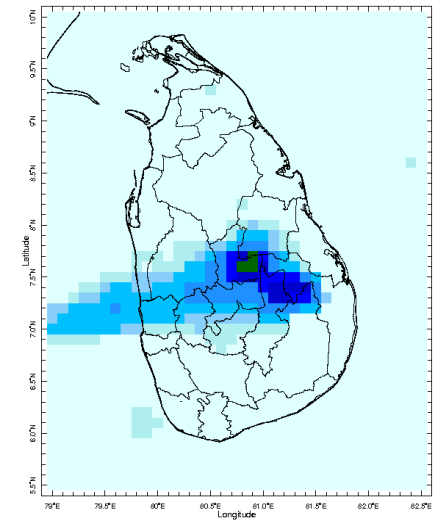
### Daily Rainfall Monitoring

**The following figures show the satellite observed rainfall in the last 7 days in Sri Lanka.**

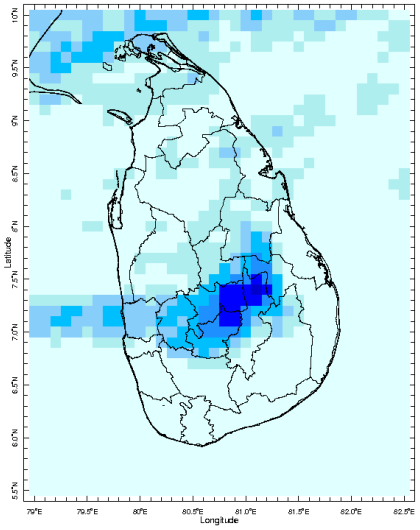


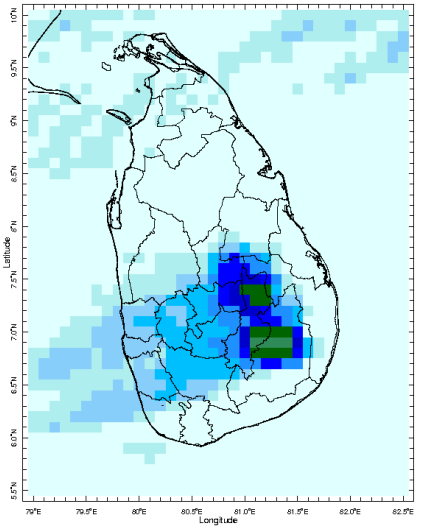





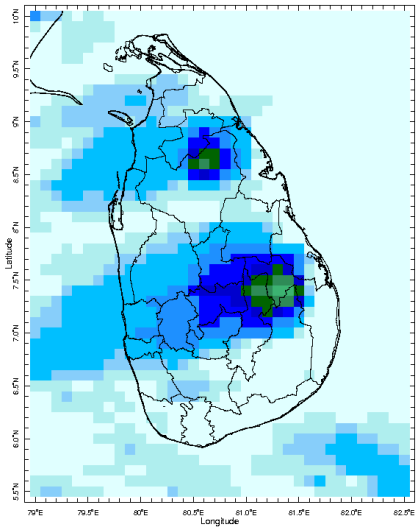

23 Aug 2020



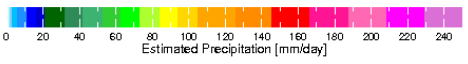

24 Aug 2020




25 Aug 2020

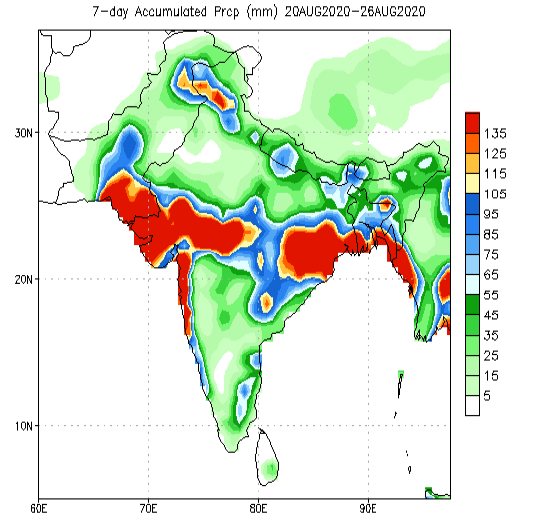



26 Aug 2020

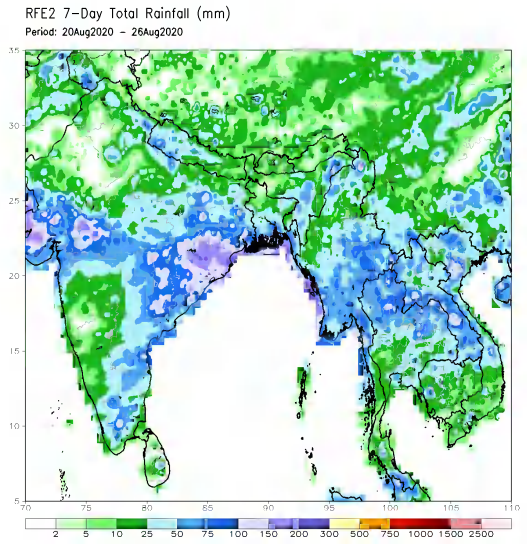


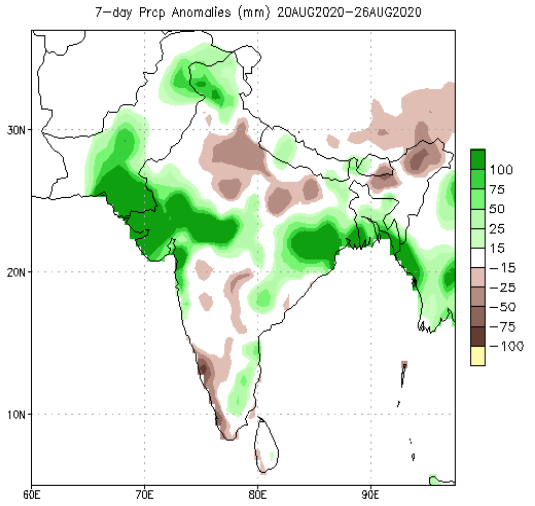

## Weekly Rainfall Monitoring

**The following figures show the total satellite observed rainfall in the last week in Sri Lanka. The figure in the left is the total 7-day rainfall from NOAA Climate Prediction Center (CPC) Unified Precipitation Analysis and the figure in the right is the total 7-day rainfall from CPC RFE 2.0 Satellite Rainfall Estimates. The bottom two figures are the respective anomalies.**

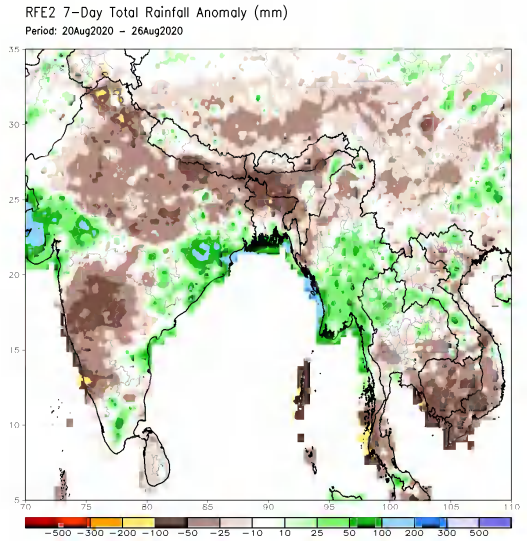



Data Source: CPC Unified (gauge-based & 0.5x0.5 deg resolution) Precipitation Analysis



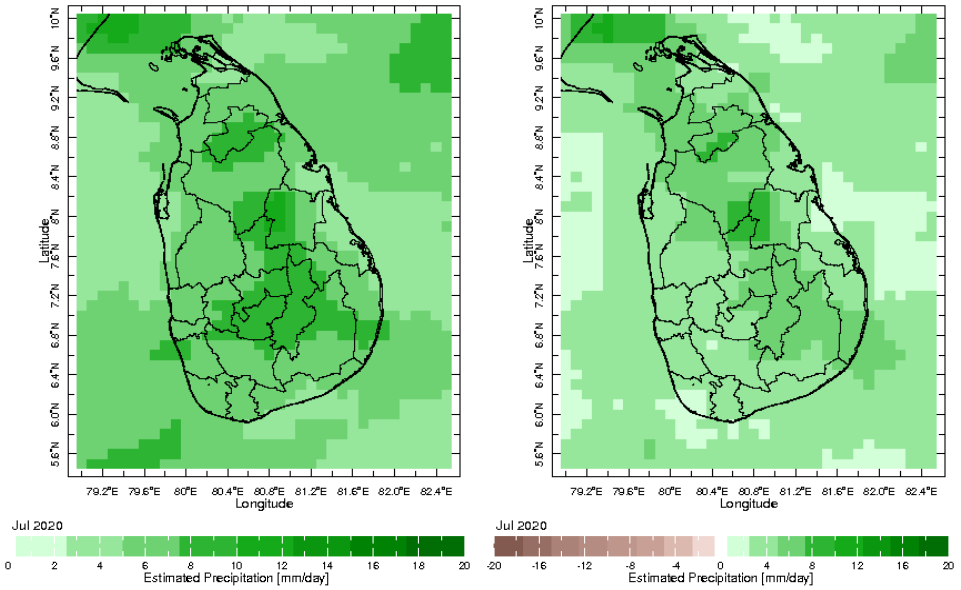




Data Source: CPC Unified (gauge-based & 0.5x0.5 deg resolution) Precipitation Analysis Climatology (1981-2010)



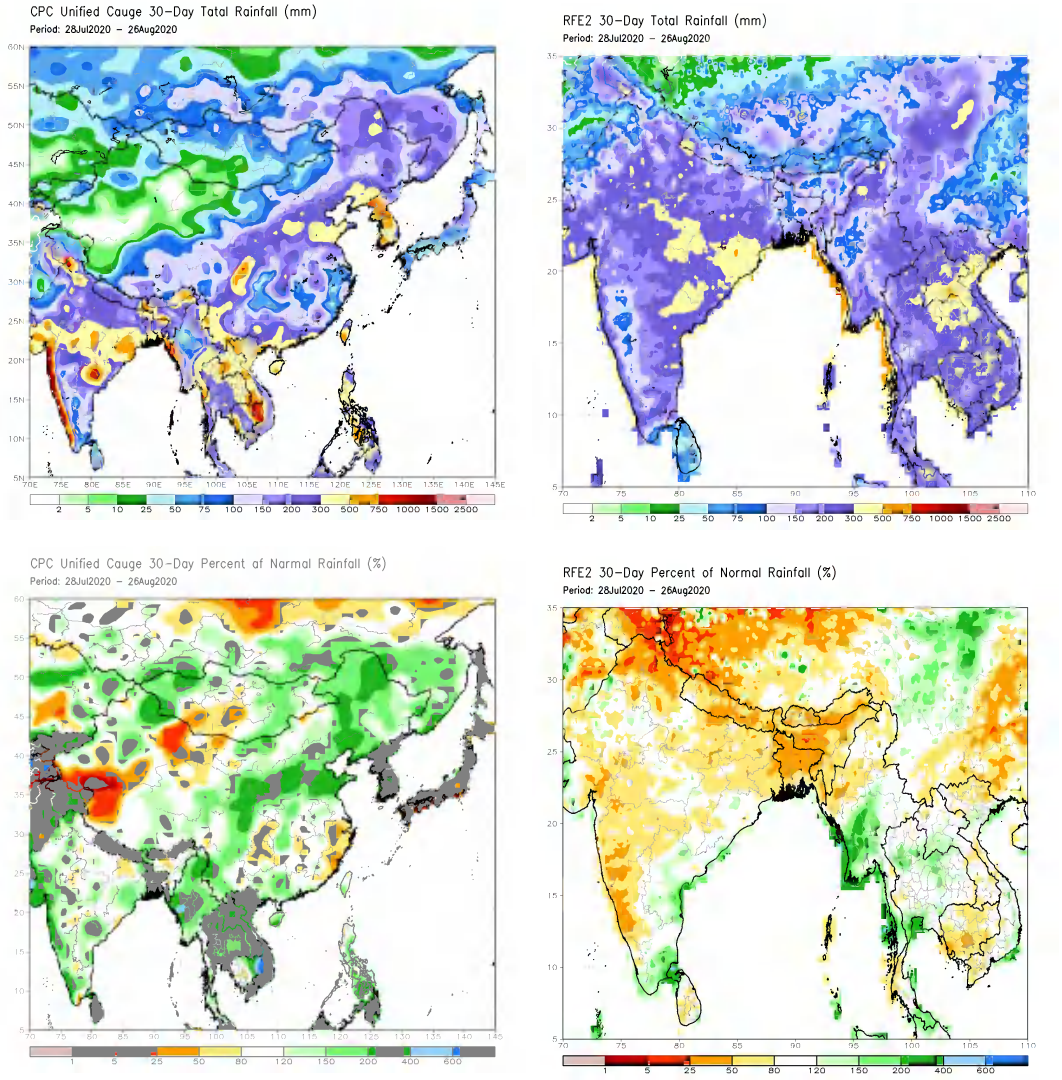

## Monthly Rainfall Monitoring

**The figure in the left shows the average observed rainfall in the previous month. The rainfall anomaly in the previous month is shown in the figure to the right. The brown color in the anomaly figure shows places which received less rainfall than the historical average while the green color shows places with above average rainfall. Darker shades show higher magnitudes in rainfall**

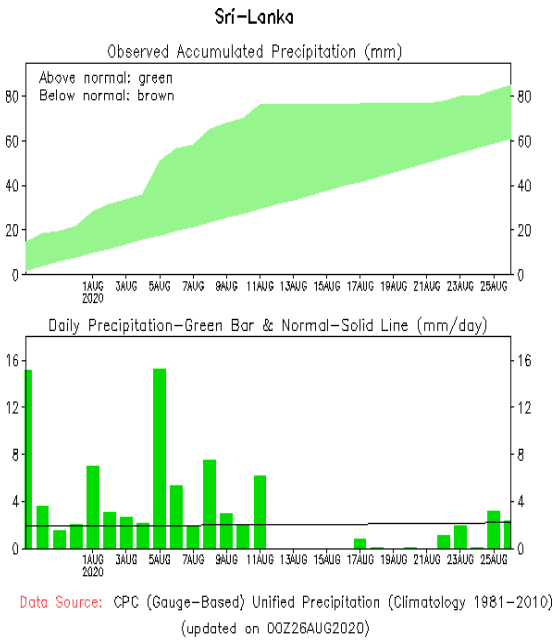



**Monthly Average** **Monthly Anomaly**

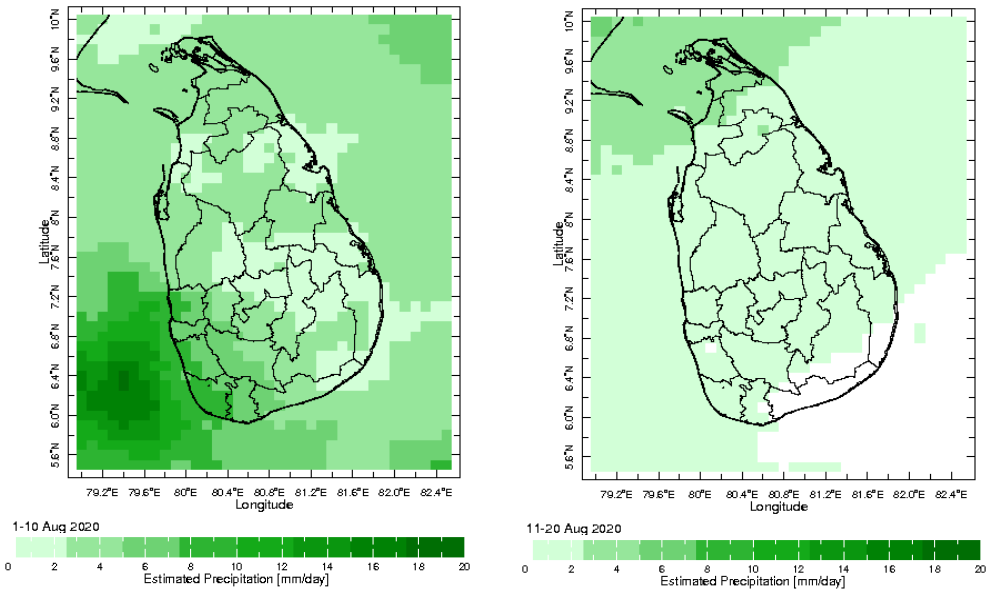
**The figure in the top-left shows the total rainfall in the past 30 days from CPC Unified Precipitation Analysis while the figure in the top-right shows the total rainfall for the same period from RFE 2.0 Satellite Rainfall Estimates. The bottom two figures show the percentage of rainfall received in the past 30 days compared to normal rainfall in this period.**



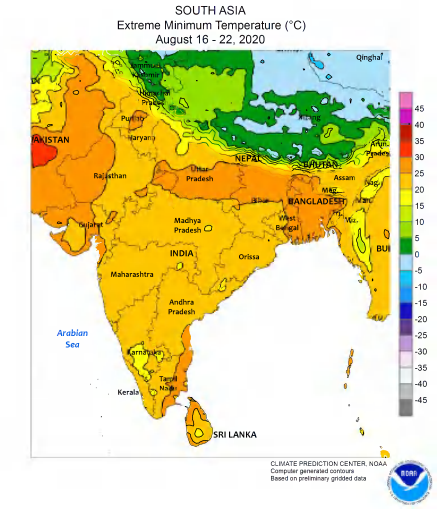

**The following figure shows the observed accumulated rainfall (top) and daily observed rainfall (bottom) in Sri Lanka in the last 30 days.**

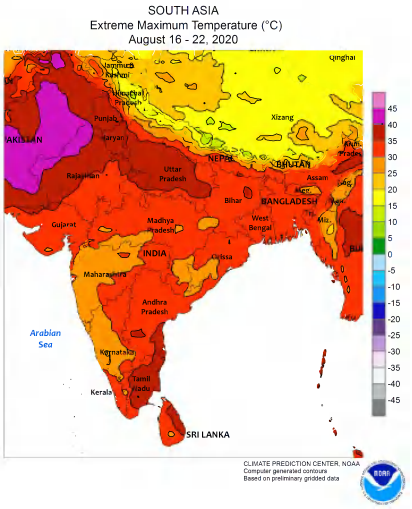


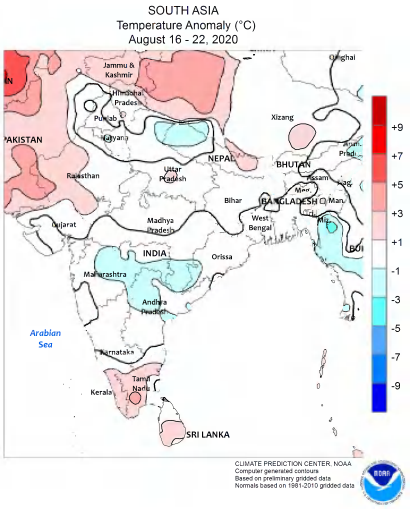

## Dekadal (10 Day) Satellite Derived Rainfall Estimates




## Weekly Temperature Monitoring

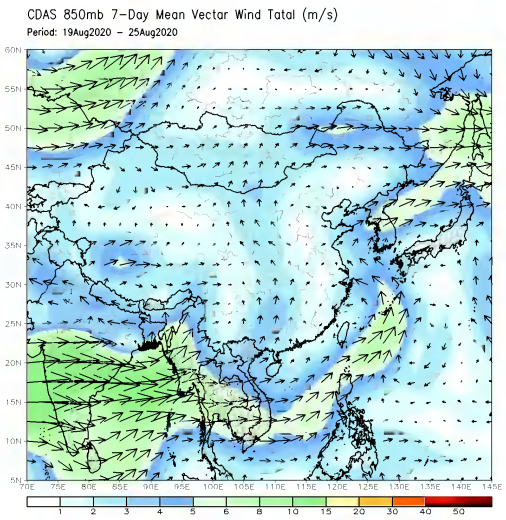


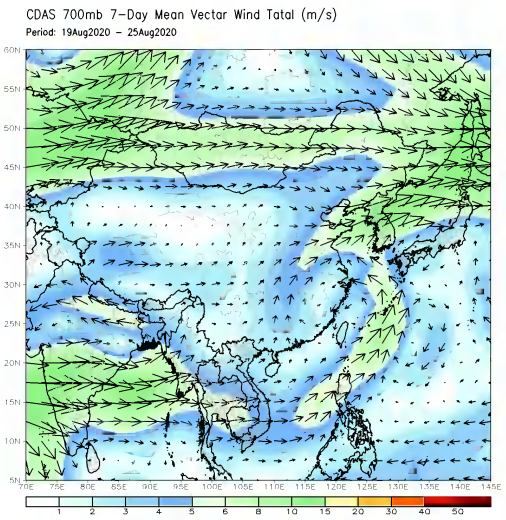




## Weekly Wind Monitoring

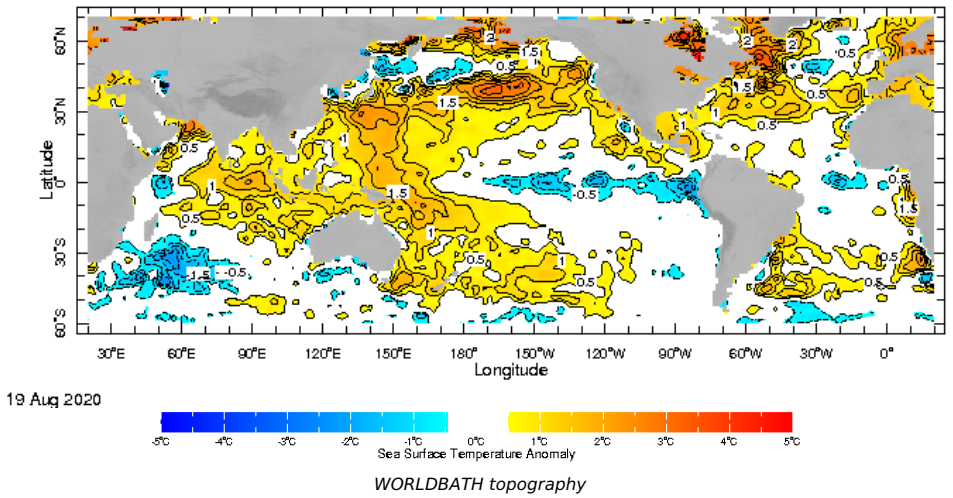
**The following figures show the mean vector wind total of the past 7 days near Sri Lanka at two levels. The figure on the left shows 850 mb (~1500 m) level and the figure on the right shows 700 mb (~3000 m) level.**



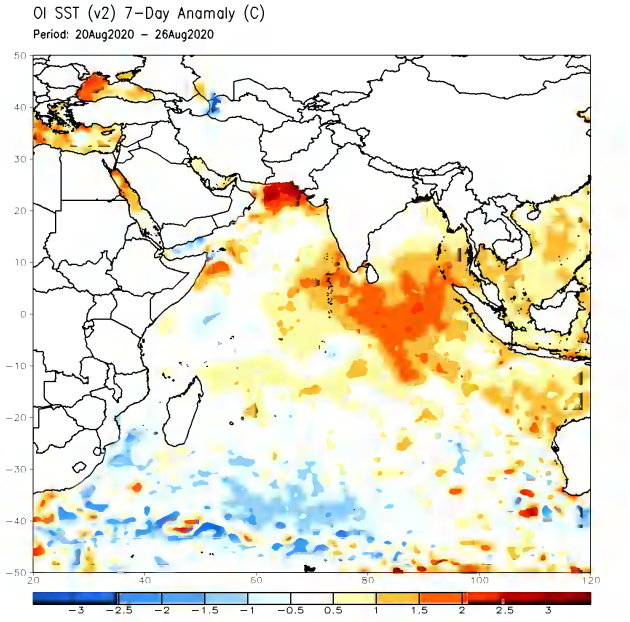

## Weekly Average SST Anomalies

**Weekly average Sea Surface Temperature (SST) anomaly in the world from NOAA NCEP**



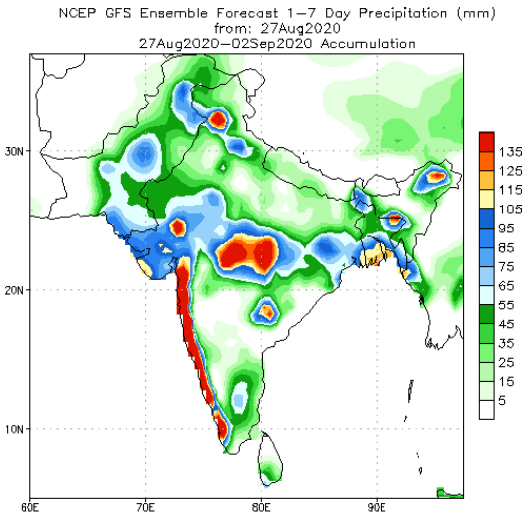

*WORLDBATH topography*

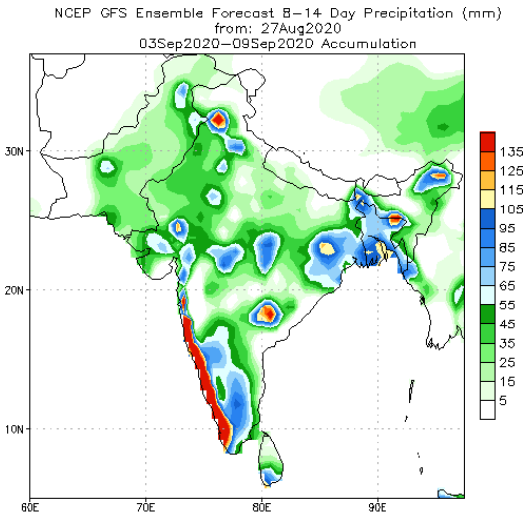
**Optimum Interpolated Sea Surface Temperature Anomaly in the Indian Ocean from NOAA CPC**



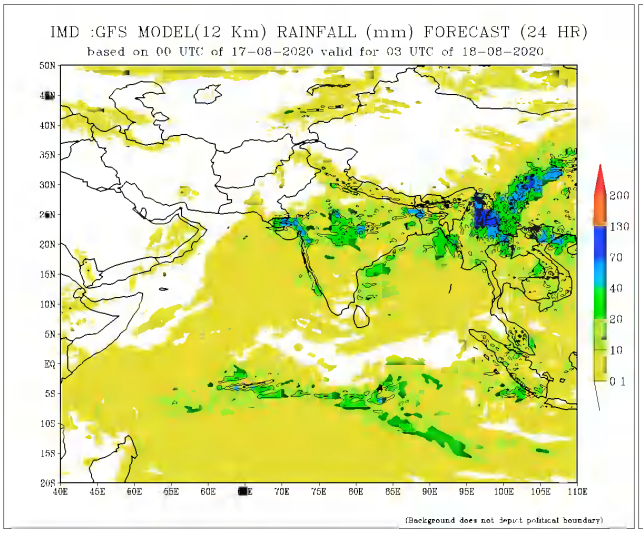

## PREDICTIONS

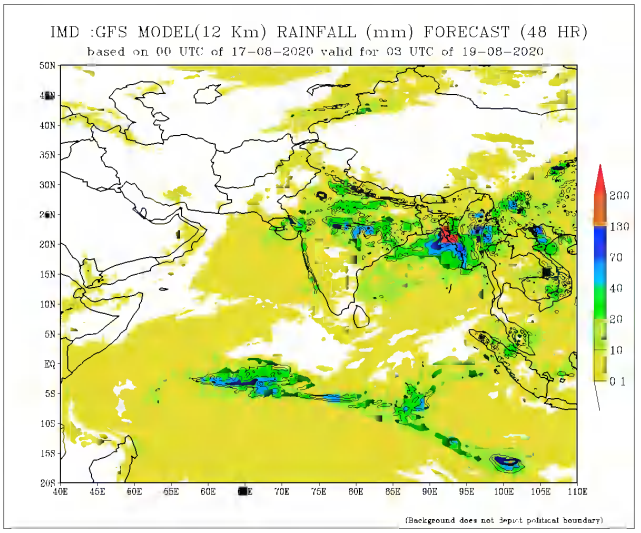
### NCEP GFS 1- 14 Day prediction

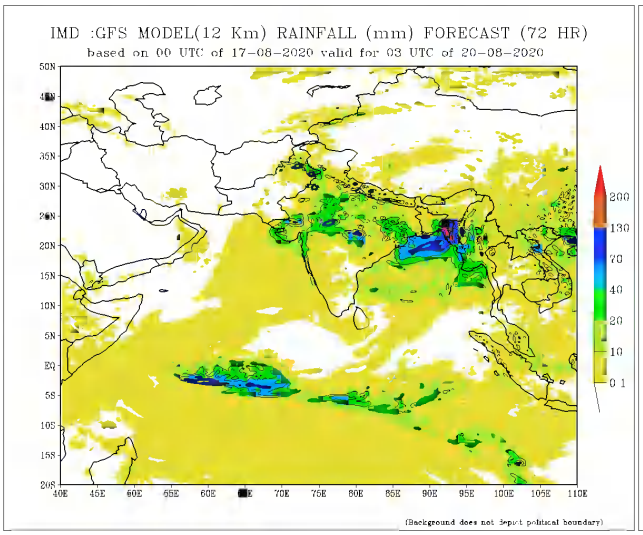


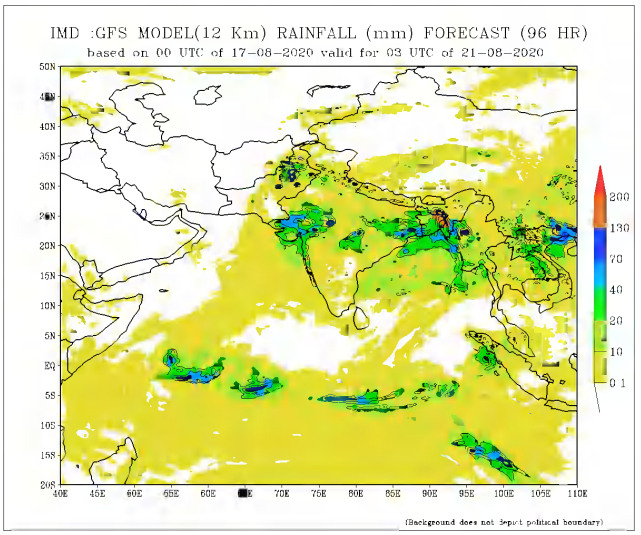



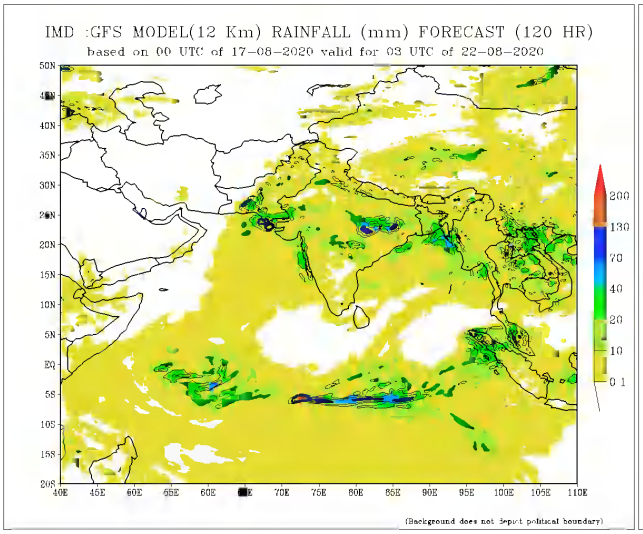

### IMD GFS (T574) Model Rainfall Forecast from RMSC New Delhi, India

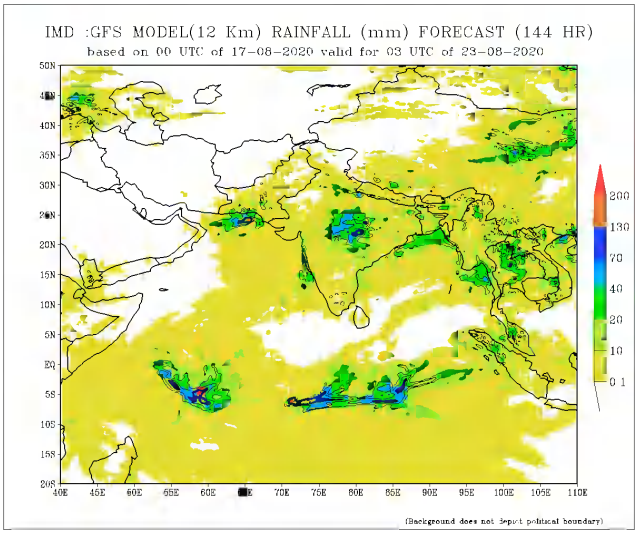

IMD :GFS MODEL(12 Km) RAINFALL (mm) FORECAST (24 HR)
based on 00 UTC of 17-08-2020 valid for 03 UTC of 18-08-2020
200
130
70
40
20
10
0.1
(Background does not depict political boundary)


IMD :GFS MODEL(12 Km) RAINFALL (mm) FORECAST (48 HR)
based on 00 UTC of 17-08-2020 valid for 03 UTC of 19-08-2020
200
130
70
40
20
10
0.1
(Background does not depict political boundary)

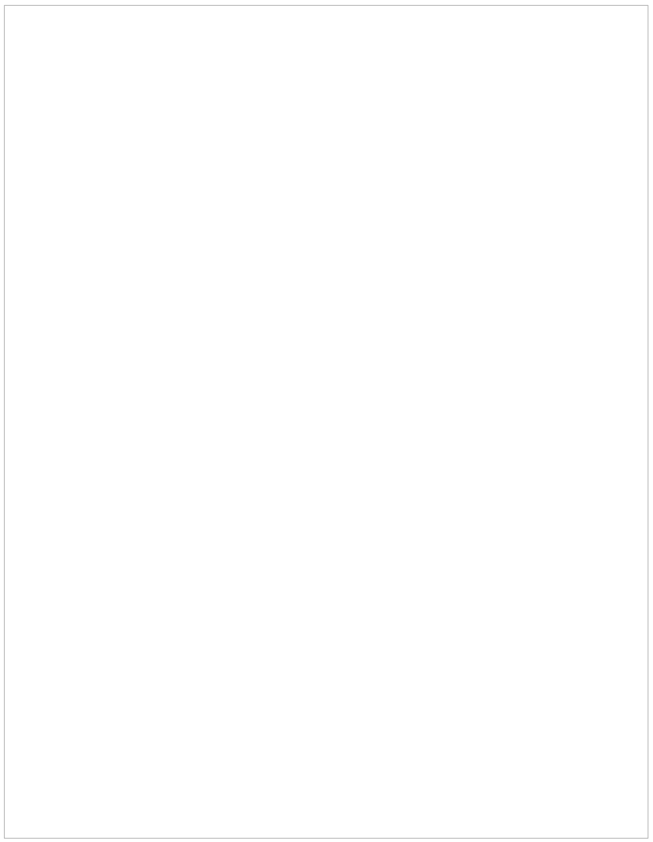

IMD :GFS MODEL(12 Km) RAINFALL (mm) FORECAST (72 HR)
based on 00 UTC of 17-08-2020 valid for 03 UTC of 20-08-2020
200
130
70
40
20
10
0.1
(Background does not depict political boundary)

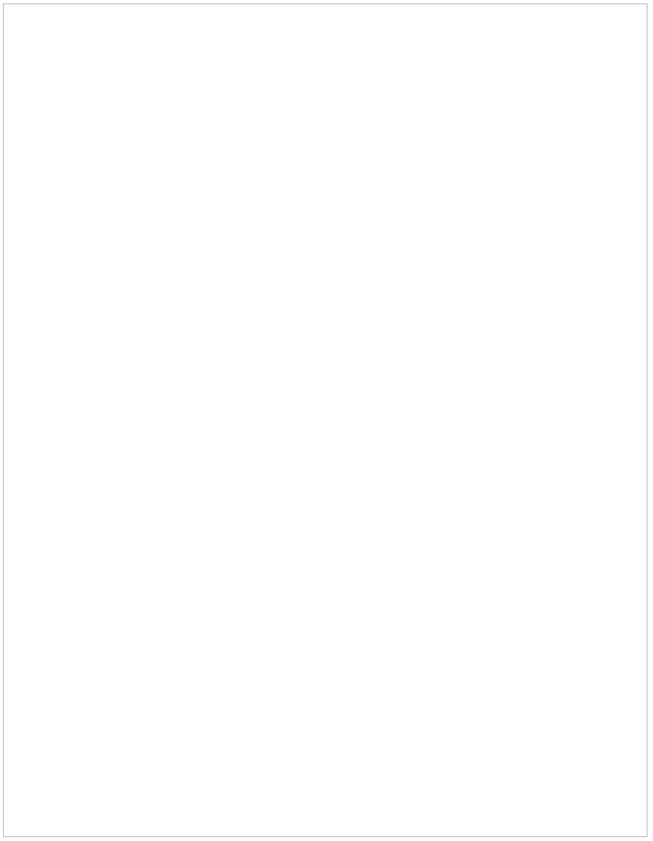

IMD :GFS MODEL(12 Km) RAINFALL (mm) FORECAST (96 HR)
based on 00 UTC of 17-08-2020 valid for 03 UTC of 21-08-2020
200
130
70
40
20
10
0.1
(Background does not depict political boundary)


IMD :GFS MODEL(12 Km) RAINFALL (mm) FORECAST (120 HR)
based on 00 UTC of 17-08-2020 valid for 03 UTC of 22-08-2020
200
130
70
40
20
10
0.1
(Background does not depict political boundary)


IMD :GFS MODEL(12 Km) RAINFALL (mm) FORECAST (144 HR)
based on 00 UTC of 17-08-2020 valid for 03 UTC of 23-08-2020
200
130
70
40
20
10
0.1
(Background does not depict political boundary)

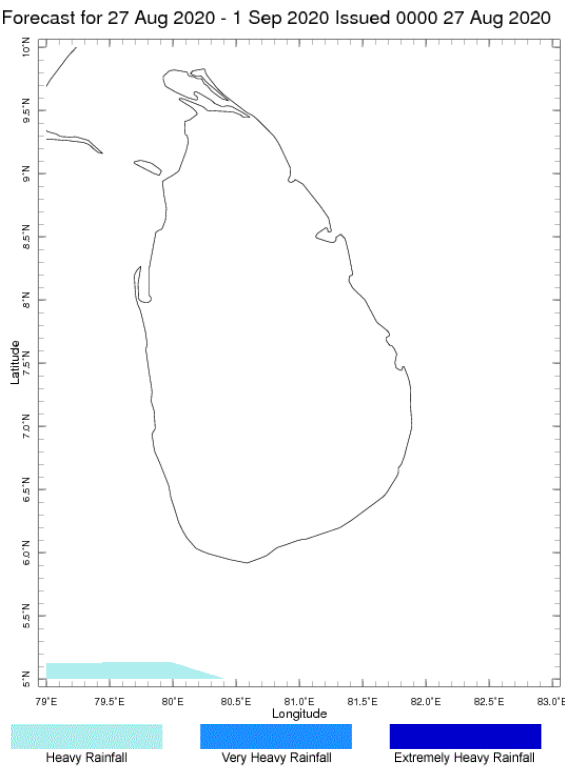
## WRF Model Forecast (from IMD Chennai)



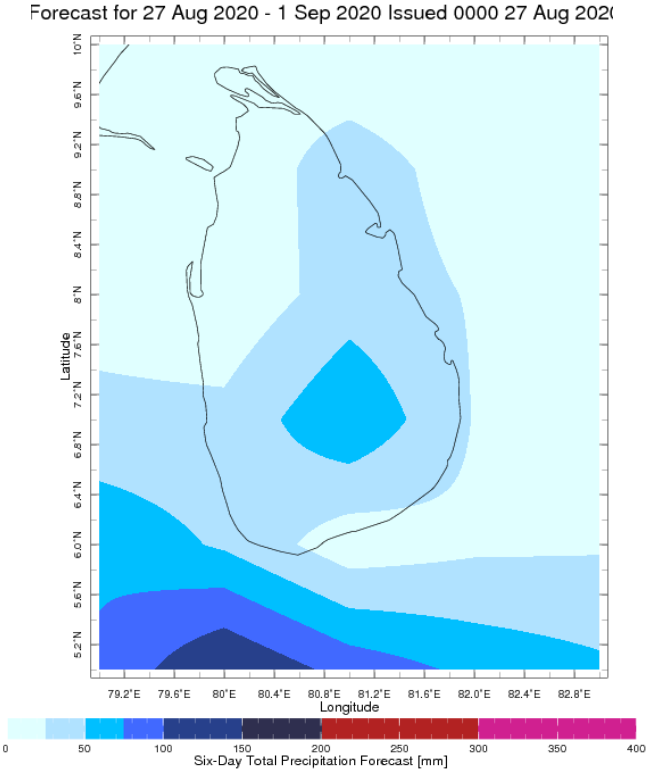


## Weekly Rainfall Forecast from IRI

**Total rainfall forecast from the IRI for next six days is provided in figures below. The figure to the left shows the expectancy of heavy rainfall events during these six days while the figure to the right is the prediction of total rainfall amount during this period.**



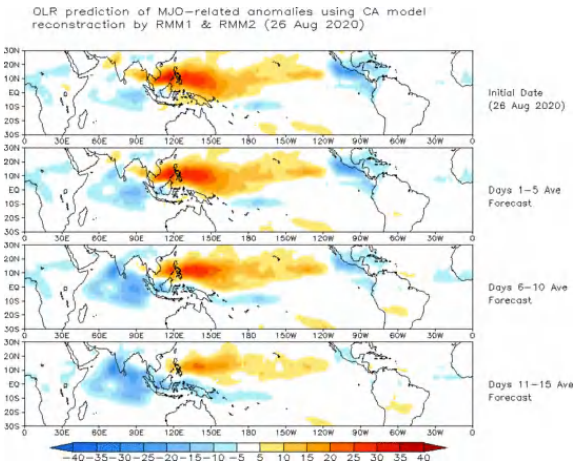

**Extreme Rainfall Forecast**




**Total Six Day Precipitation Forecast**

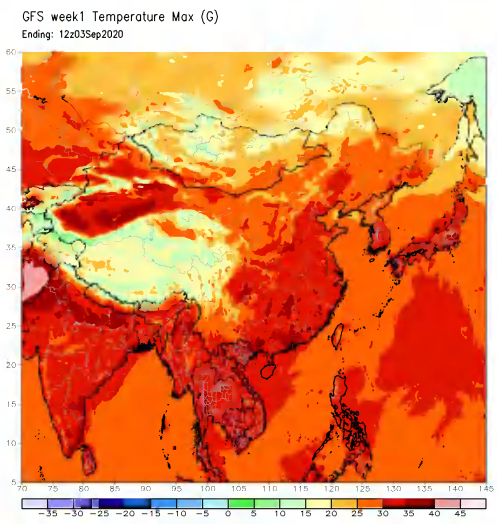
## Madden Julian Oscillation (MJO) related Outgoing Longwave Radiation (OLR) Forecast

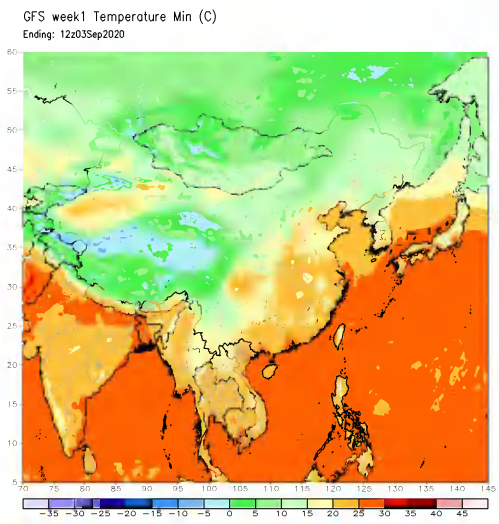
**The Outgoing Longwave Radiation (OLR) is a proxy for rainfall. This can be used to identify convective rain clouds based on the MJO phase. Violet and Blue shading indicates enhanced tropical weather and Orange shading indicates suppressed conditions. The following figure shows the forecasts of MJO associated anomolous OLR for the next 15 days from the Constructed Analogue (CA) model forecasts.**




## Weekly Temperature Forecast

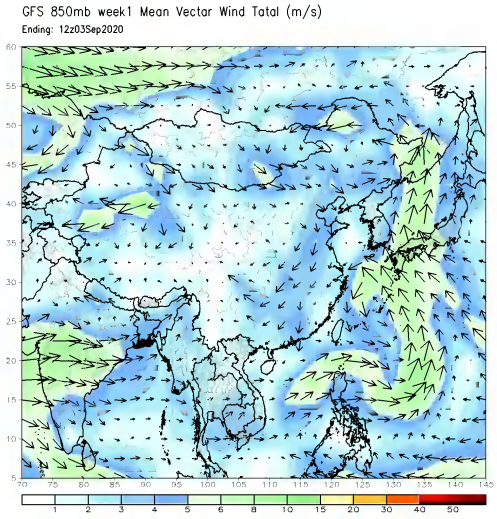
**Weekly Minimum and Maximum Temperature prediction from the GFS model (from NOAA CPC)**

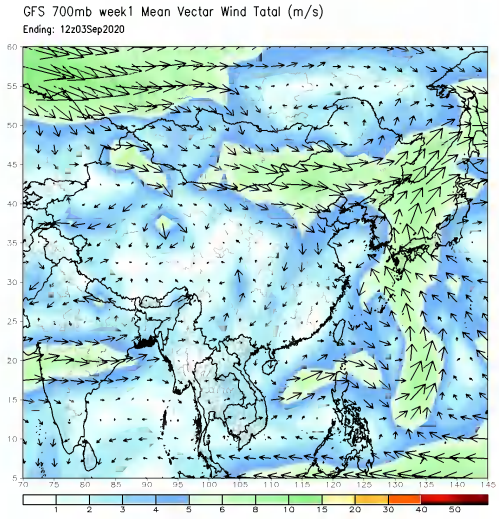



## Weekly Wind Forecast

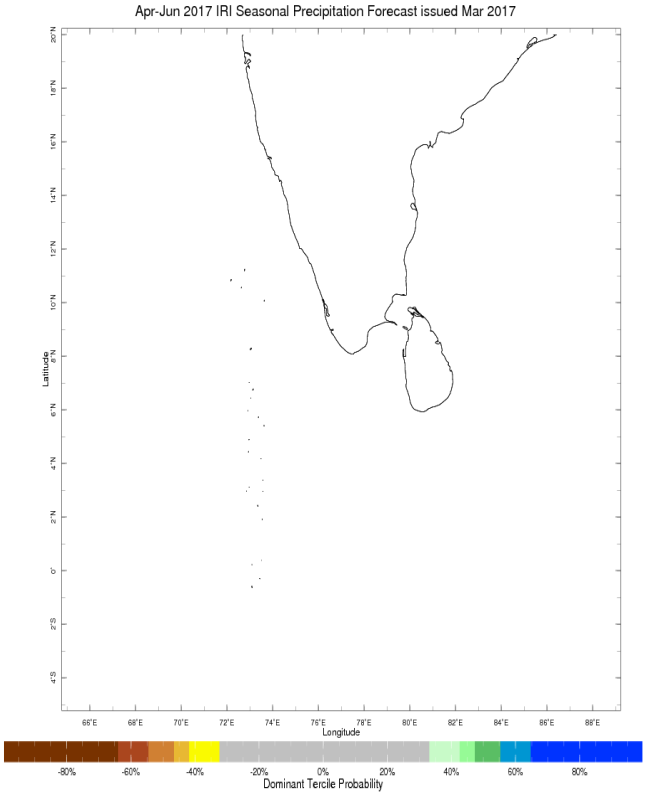
**Weekly mean vector wind total prediction from the GFS model at 850 mb (left) and 700 mb (right) levels. (from NOAA CPC)**



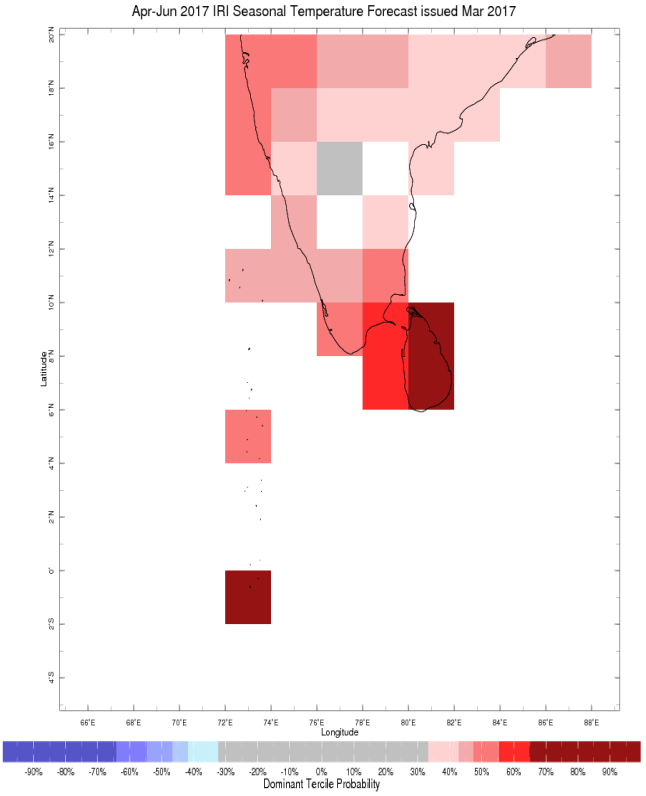




## Seasonal Rainfall and Temperature Forecast

**Following is the latest seasonal precipitation and temperature prediction for the next 3 months by the IRI. The color shading indicates the probability of the most dominant tercile -- that is, the tercile having the highest forecast probability. The color bar alongside the map defines these dominant tercile probability levels. The upper side of the color bar shows the colors used for increasingly strong probabilities when the dominant tercile is the above-normal tercile, while the lower side shows likewise for the below-normal tercile. The gray color indicates an enhanced probability for the near-normal tercile (nearly always limited to 40%).**




**Precipitation Forecast**




**Temperature Forecast**

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