

## Experimental Climate Monitoring and Prediction

by: Ruchira Lokuhetti, Chalani Malge, Janan Visvanathan,  
Lareef Zubair and Michael Bell<sup>1</sup> (FECT and IRI<sup>1</sup>)

10 October 2019

### Highlights

- The IRI weekly rainfall forecast predicts up to 200 mm of total rainfall in Badulla district during 9 – 14 Oct.
- Between 1 - 8 Oct: up to 120 mm of rainfalls were recorded in Anuradhapura district on the 6<sup>th</sup>.
- From 1 – 7 Oct: up to 10 km/h, southeasterly winds were experienced by the entire island.
- 0.5 °C above average sea surface temperature was observed in the seas around Sri Lanka.

#### Monitoring

##### Rainfall

**Weekly Monitoring:** On October 1<sup>st</sup> Puttalam, Anuradhapura and Kurunegala districts received up to 20 mm of rainfall; and Colombo, Kalutara, Ratnapura, Badulla and Monaragala districts up to 10 mm. On the 2<sup>nd</sup>, Kalutara district received up to 20 mm of rainfall; and Ratnapura, Galle and Batticaloa districts up to 10 mm. On the 3<sup>rd</sup>, Kegalle and Colombo districts received up to 50 mm of rainfall; Anuradhapura, Kurunegala, Gampaha, Kalutara, Ratnapura, Kandy and Nuwara Eliya districts up to 30 mm; and Mannar, Puttalam, Galle, Matara, Badulla, Monaragala and Matale districts up to 10 mm. On the 4<sup>th</sup>, Matale, Kandy, Ratnapura, Colombo and Monaragala districts received up to 50 mm; Vavuniya, Anuradhapura, Kegalle, Nuwara Eliya, Kalutara, Matara and Hambantota districts up to 30 mm; and Mannar, Polonnaruwa, Gampaha and Galle districts up to 20 mm. On the 5<sup>th</sup> Kurunegala district received up to 70 mm; Kegalle and Badulla districts up to 50 mm; Ratnapura, Kandy, Monaragala and Nuwara Eliya districts up to 30 mm; and Matale, Puttalam, Gampaha, Colombo and Kalutara districts up to 20 mm. On the 6<sup>th</sup>, Anuradhapura district received up to 120 mm of rainfall; Mullaitivu, Vavuniya, Mannar and Kurunegala districts up to 70 mm; Puttalam, Ratnapura, Nuwara Eliya, Badulla, Polonnaruwa and Ampara districts up to 50 mm; Kilinochchi, Trincomalee, Matale, Kandy, Kegalle, Gampaha, Colombo, Kalutara and Monaragala districts up to 30 mm; and rest of the island up to 20 mm. On the 7<sup>th</sup>, Matale and Polonnaruwa districts received up to 70 mm of rainfall; Ratnapura, Matara and Galle districts up to 60 mm; Gampaha, Kegalle, Nuwara Eliya, Colombo, Kalutara, Monaragala, Ampara and Hambantota districts up to 50 mm; Puttalam, Kurunegala, Kandy and Badulla districts up to 30 mm; and Anuradhapura and Batticaloa districts up to 20 mm. On the 8<sup>th</sup>, Mullaitivu and Vavuniya districts received up to 50 mm of rainfall; Mannar and Anuradhapura districts up to 30 mm; and Trincomalee, Kurunegala, Kandy and Nuwara Eliya districts up to 20 mm.

**Total Rainfall for the Past Week:** The RFE 2.0 tool shows total up to 100-150 mm in Anuradhapura, Kurunegala, Kegalle, Ratnapura, Colombo, Kalutara, Polonnaruwa and Matale districts; up to 75-100 Puttalam, Vavuniya, Galle, Matara, Nuwara Eliya, Kandy and Badulla districts; and up to 50-75 mm Mannar, Monaragala and Hambantota districts. Above average rainfall up to 100-200 mm is shown for in Anuradhapura, Matale and Ratnapura districts; up to 50-100 mm Mullaitivu, Vavuniya, Puttalam, Kurunegala, Kegalle, Colombo, Kalutara, Matara, Badulla, Nuwara Eliya and Kandy districts; and up to 25-50 mm in most parts of the island.

**Monthly Monitoring:** During August – Above average rainfall conditions up to 450 mm were experienced by Gampaha district; up to 360 mm in Puttalam, Colombo, Kalutara, Galle, Matara, Hambantota, Monaragala and Ratnapura districts; up to 240 mm in Kurunegala, Kegalle, Jaffna, Kilinochchi, Vavuniya, Anuradhapura, Trincomalee, Polonnaruwa, Batticaloa, Badulla, Ampara, Kandy and Nuwara Eliya districts; and up to 120 mm in rest of the island. The CPC Unified Precipitation Analysis tool shows up to 750 mm of total rainfall in Gampaha, Colombo, Kalutara and Galle districts; up to 500 mm in Kurunegala, Puttalam, Kegalle, Ratnapura, Matara, Hambantota and Monaragala districts; up to 300 mm in Nuwara Eliya and Badulla districts; and up to 200 mm in Kandy, Matale, Ampara and Batticaloa districts.

#### Ocean State (Text Courtesy IRI)

##### Pacific sea state: October 10, 2019

SSTs in the east-central Pacific maintained ENSO-neutral levels during September and early October, despite some warming in October. Patterns in most of the key atmospheric variables are also showing ENSO-neutral conditions. Model forecasts generally favor ENSO-neutral through autumn, winter and into spring, with slightly higher chances for El Niño than La Niña. The official CPC/IRI outlook is consistent with these model forecasts.

## Predictions

### Rainfall

#### 14-day prediction:

#### NOAA NCEP models:

From 9<sup>th</sup> – 15<sup>th</sup> Oct: Total rainfall up to 125 mm in Gampaha district; up to 105-115 mm in Colombo, Kalutara, Ratnapura and Galle districts; and up to 85-95 mm in Puttalam, Kurunegala, Kegalle and Matara districts.

From 16<sup>th</sup> – 22<sup>nd</sup> Oct: Total rainfall more than 135 mm in Puttalam, Kurunegala, Gampaha, Colombo, Kegalle, Ratnapura, Galle and Matara districts; up to 105-115 mm Hambantota district; and up to 85-95 mm in Mannar, Matale, Kandy and Nuwara Eliya districts.

#### IRI Model Forecast:

From 9<sup>th</sup> – 14<sup>th</sup> Sep: Total rainfall up to 200 mm is expected in Badulla district; up to 150 mm in Polonnaruwa, Ampara, Monaragala, Ratnapura, Nuwara Eliya, Kandy and Matale districts; and up to 100 mm in Trincomalee, Anuradhapura, Batticaloa, Kegalle and Kurunegala districts.

### MJO based OLR predictions

#### For the next 15 days:

MJO shall not have an impact on the rainfall of Sri Lanka in next 5 days and shall enhance in the following 10 days.

<sup>1</sup> 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.

### FECT BLOG

Past reports available at <http://fectsl.blogspot.com/> and <http://fectsl.wordpress.com/>

### FECT WEBSITES

<http://www.climate.lk> and <http://www.tropicalclimate.org/>



[www.fb.com/fectsl](http://www.fb.com/fectsl)



[@climatelk](https://twitter.com/climatelk)



## Weekly Hydro- Meteorological Report for Sri Lanka

### Inside This Issue

---

#### 1. Monitoring

- a. Daily Rainfall Monitoring
- b. Monthly Rainfall Monitoring
- c. Dekadal (10 Day) Satellite Derived Rainfall Estimates
- d. Weekly Average SST Anomalies

#### 2. Predictions

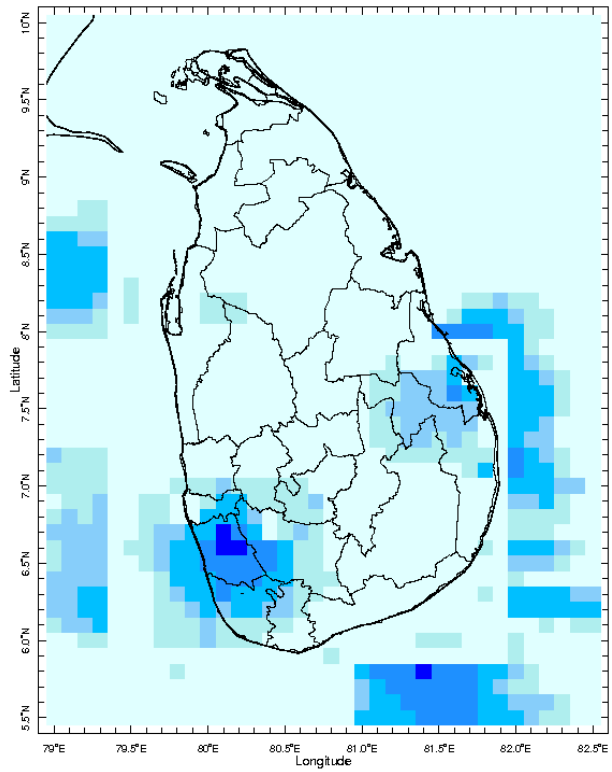
- a. NCEP GFS Ensemble 1-14 day Rainfall Predictions
- b. WRF Model Rainfall Forecast from IMD Chennai
- c. Weekly Precipitation Forecast from IRI
- d. Seasonal Predictions from IRI

## MONITORING

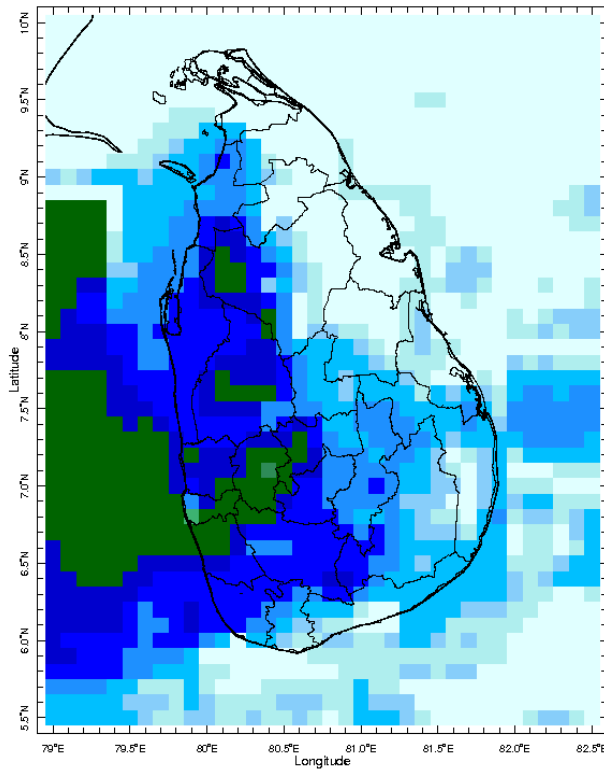
### Daily Rainfall Monitoring

---

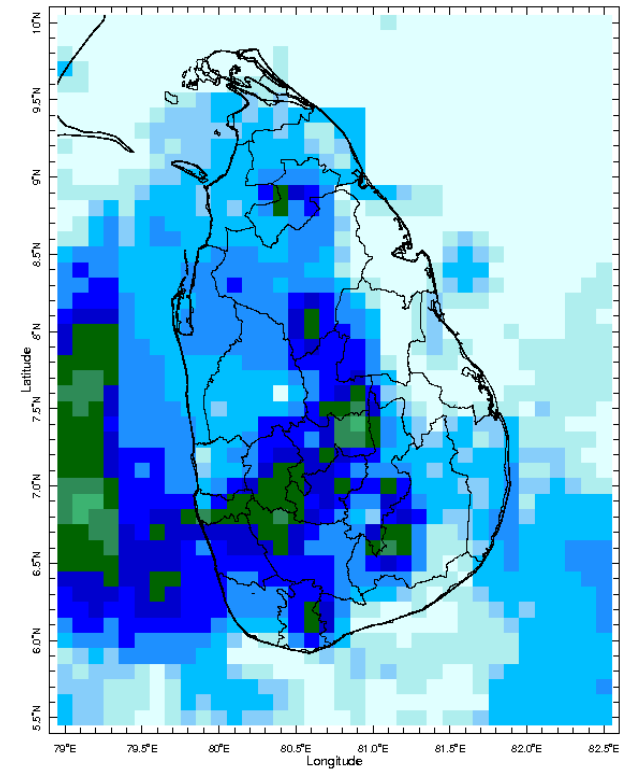
The following figures show the satellite observed rainfall in the last 7 days in Sri Lanka.



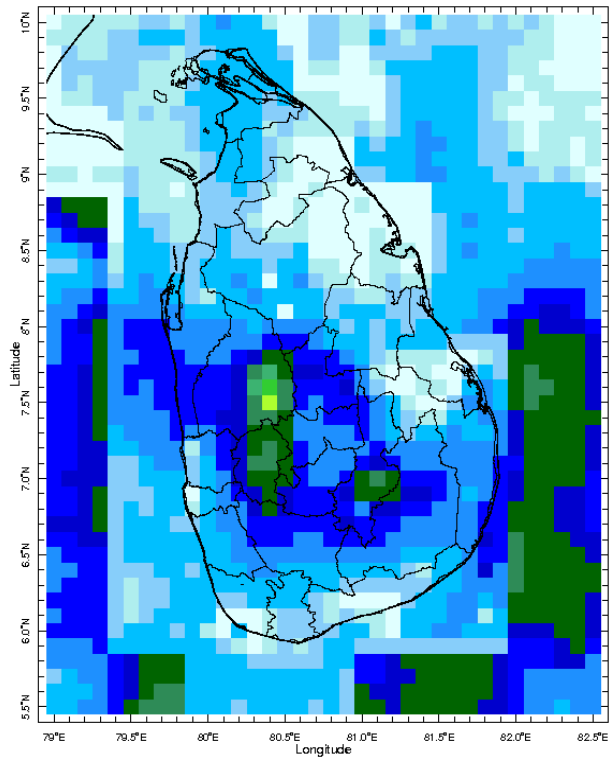
2 Oct 2019



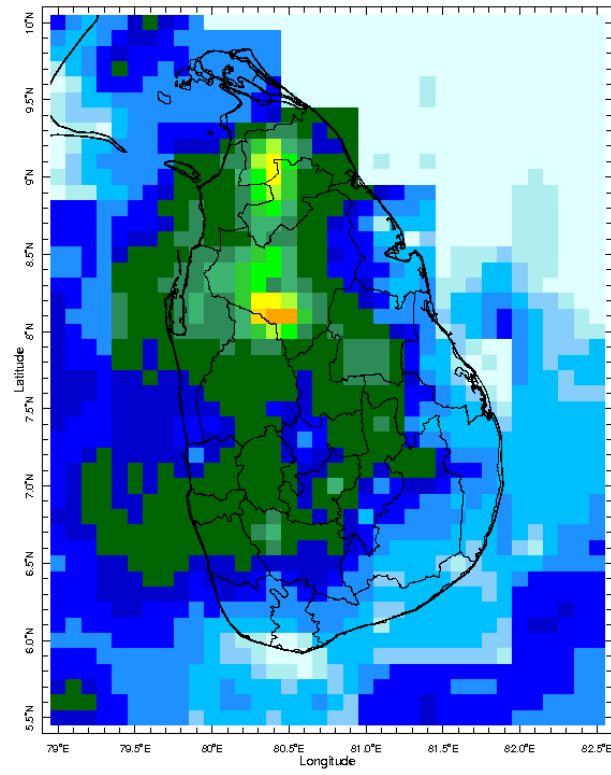
3 Oct 2019



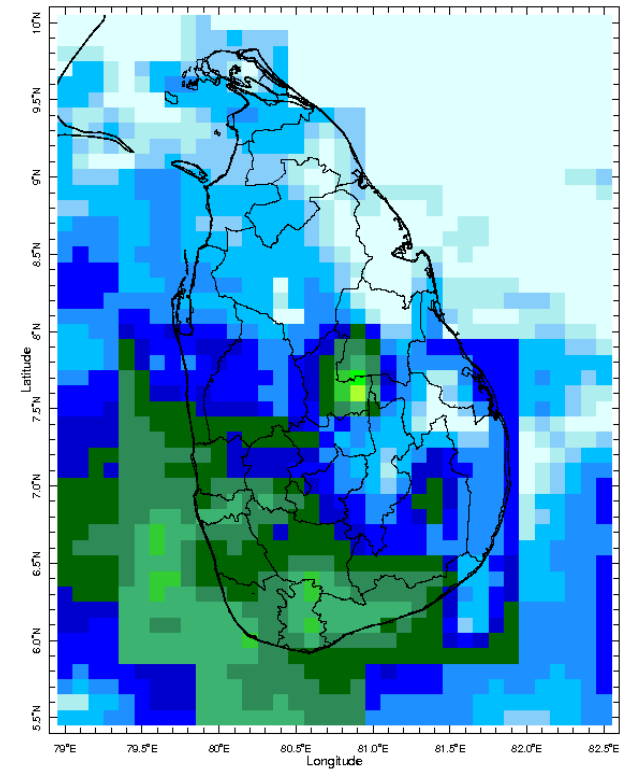
4 Oct 2019



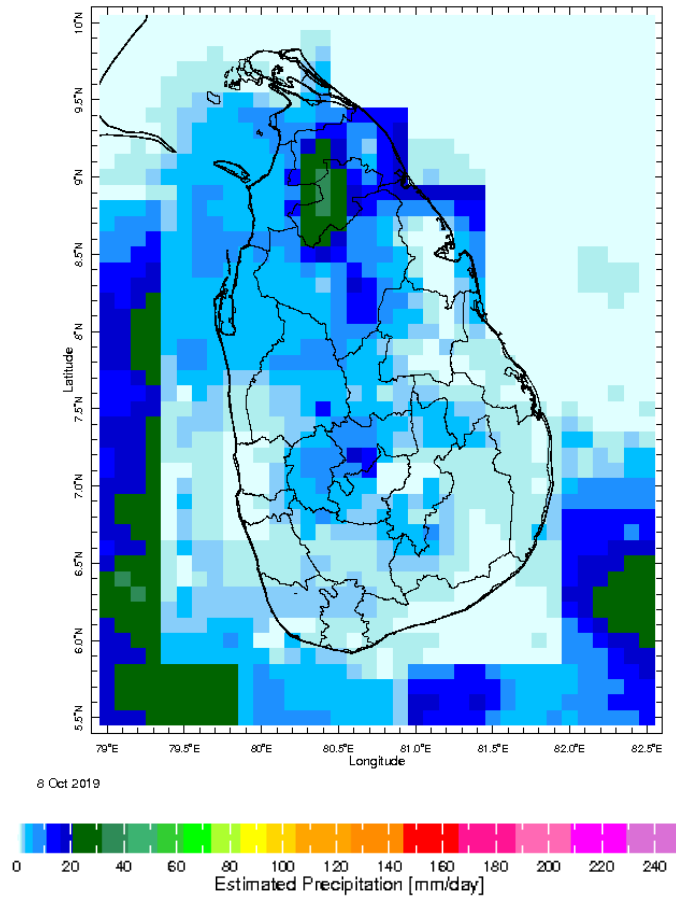
5 Oct 2019



6 Oct 2019

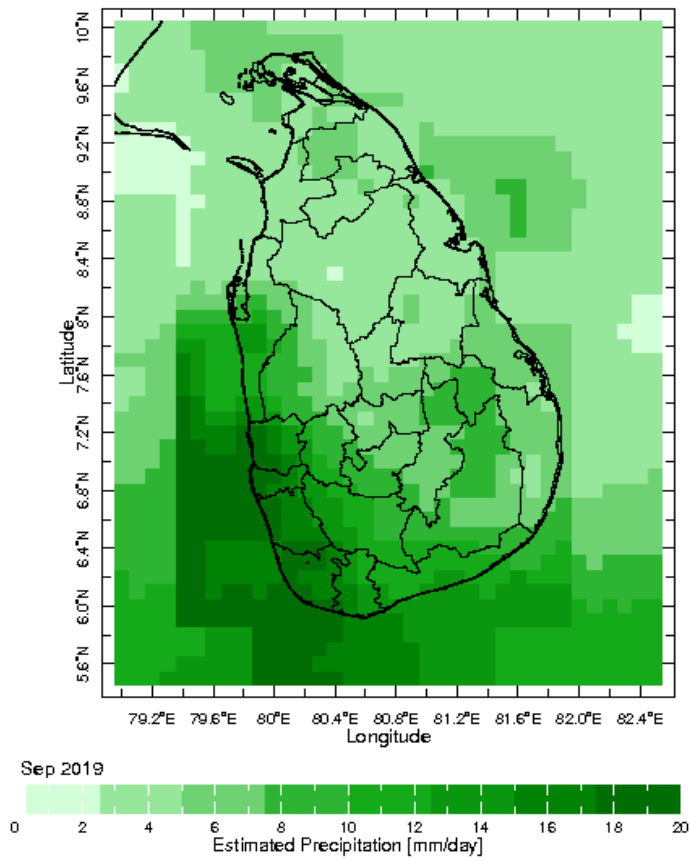


7 Oct 2019

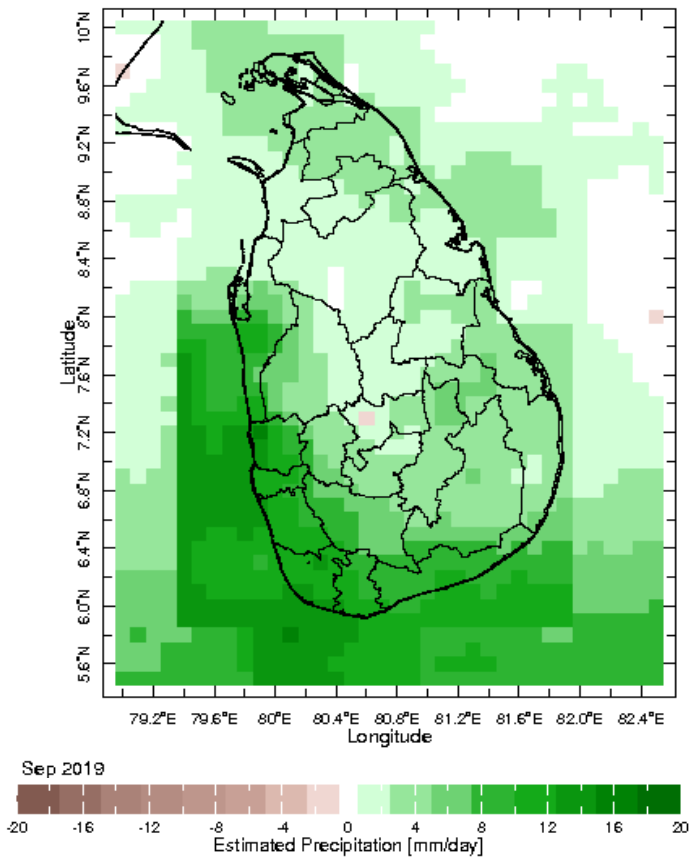


## Monthly Rainfall Monitoring

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

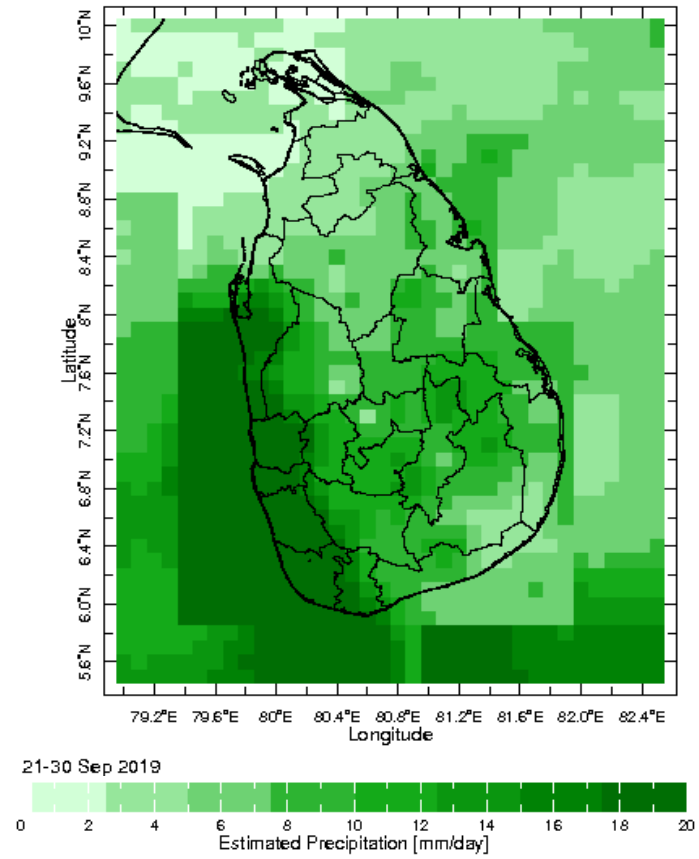
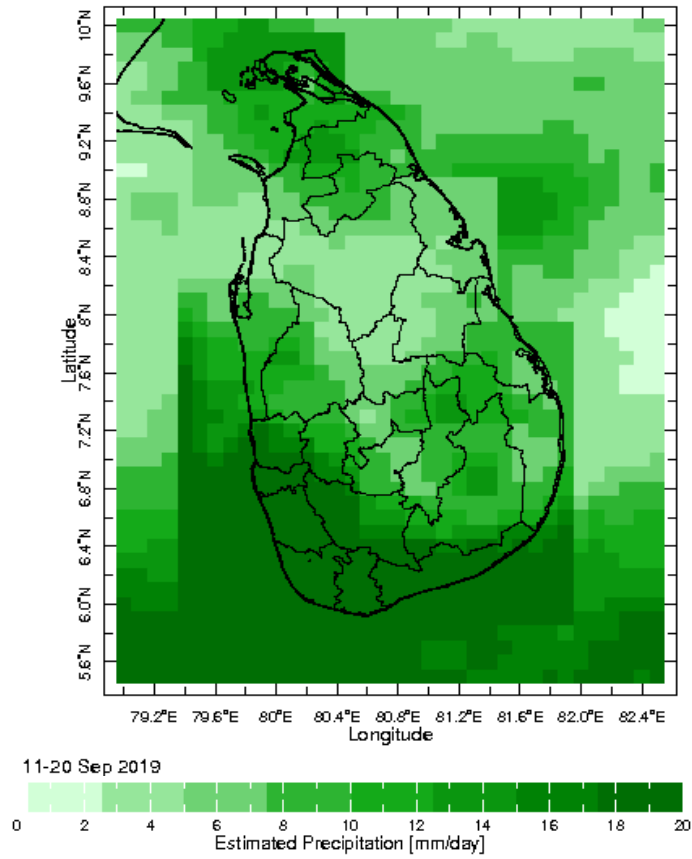


**Monthly Average**



**Monthly Anomaly**

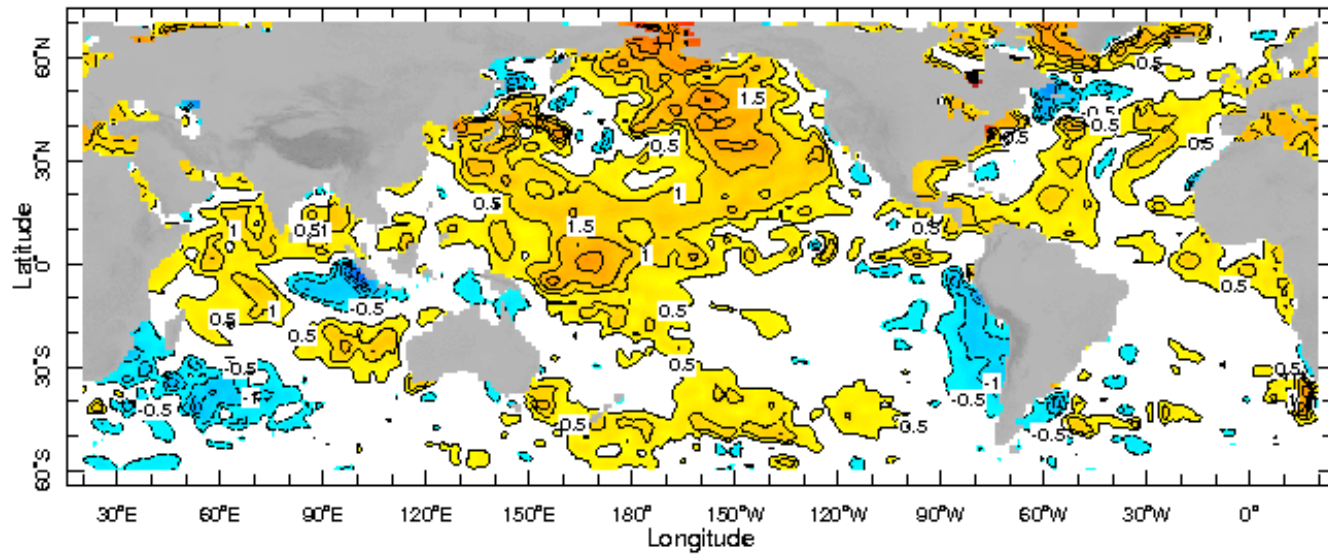
**Dekadal (10 Day) Satellite Derived Rainfall Estimates**



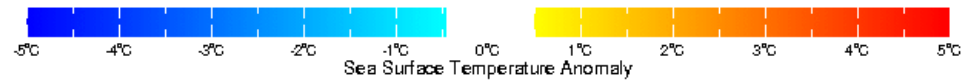
## Weekly Average SST Anomalies

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





2 Oct 2019

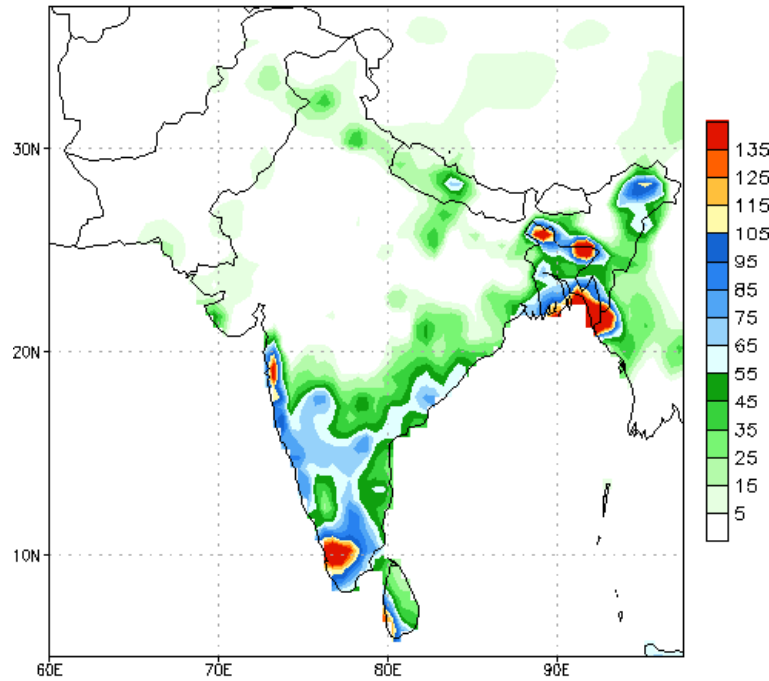


*WORLDBATH topography*

## PREDICTIONS

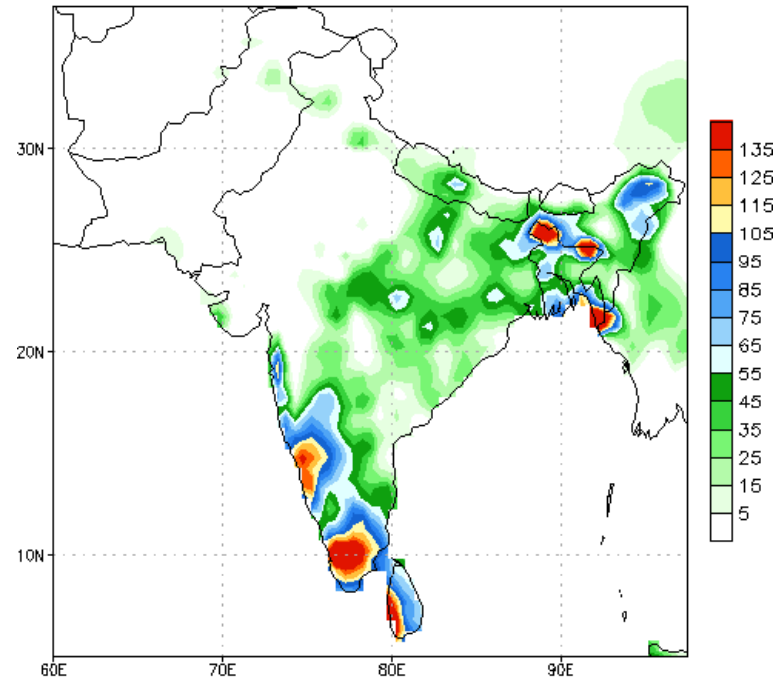
NCEP GFS 1- 14 Day prediction

NCEP GFS Ensemble Forecast 1-7 Day Precipitation (mm)  
from: 09Oct2019  
09Oct2019-15Oct2019 Accumulation



Bias correction based on last 30-day forecast error

NCEP GFS Ensemble Forecast 8-14 Day Precipitation (mm)  
from: 09Oct2019  
16Oct2019-22Oct2019 Accumulation



Bias correction based on last 30-day forecast error

## WRF Model Forecast (from IMD Chennai)

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.

