

## 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>)

18 July 2019

### Highlights

- The IRI weekly rainfall forecast predicts up to 220 mm of total rainfall in southwestern regions of the island during 17 – 22 Jul.
- Between 10 – 16 Jul: up to 50 mm of rainfall was recorded in Ampara and Polonnaruwa districts on the 14<sup>th</sup>.
- From 9 – 15 Jul: up to 36 km/h, northwesterly 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 July 10<sup>th</sup>, Monaragala district received up to 40 mm of rainfall; Kurunegala, Batticaloa and Ampara districts up to 30 mm of rainfall; and Puttalam, Gampaha, Badulla and Hambantota districts up to 20 mm. On the 11<sup>th</sup>, Vavuniya district received up to 20 mm of rainfall. On the 12<sup>th</sup>, Polonnaruwa, Matale, Ampara, Kandy and Badulla districts received up to 30 mm of rainfall; and Vavuniya, Anuradhapura, Trincomalee, Kurunegala, Kegalle, Nuwara Eliya, Ratnapura, Kalutara, Galle and Matara districts up to 20 mm. On the 13<sup>th</sup>, Ratnapura and Nuwara Eliya districts received up to 20 mm of rainfall. On the 14<sup>th</sup>, Ampara and Polonnaruwa districts received up to 50 mm of rainfall; Puttalam and Badulla districts up to 30 mm; and Kurunegala, Gampaha, Colombo, Ratnapura, Kalutara, Matale and Monaragala districts. No significant rainfalls were recorded in any part of the island on the 15<sup>th</sup>. On the 16<sup>th</sup>, Kalutara and Ratnapura districts received up to 20 mm of rainfall.

**Total Rainfall for the Past Week:** The RFE 2.0 tool shows total up to 50-75 mm in Ampara Badulla and Monaragala districts; 25-50 mm in Puttalam, Kurunegala, Matale, Kandy, Nuwara Eliya, Kegalle, Ratnapura, Gampaha, Colombo and Kalutara districts; and up to 25 mm in most parts of the island. Above average rainfall up to 25-50 mm is shown for Badulla, Monaragala and Ampara districts; and up to 10-25 mm in Puttalam, Kurunegala, Matale, Kandy and Ampara districts. Below average rainfall up to 10-25 mm is shown for Vavuniya, Mannar, Trincomalee and Galle districts.

**Monthly Monitoring:** During June – Above average rainfall conditions up to 60 mm were experienced by Puttalam, Kurunegala, Gampaha, Kalutara, Galle and southern parts of the Ratnapura district. Below average rainfall conditions up to 150 mm were experienced by Kandy and Nuwara Eliya districts; and up to 90 mm in Mannar, Vavuniya, Mullaitivu, Anuradhapura, Polonnaruwa, Batticaloa, Matale, Ampara, Badulla, Monaragala, Hambantota, Kegalle and Colombo districts. The CPC Unified Precipitation Analysis tool shows up to 200 mm of total rainfall in Puttalam, Gampaha, Colombo, Kalutara, Ratnapura and Galle districts; up to 150 mm in Kurunegala, Kegalle, Nuwara Eliya and Matara districts; up to 100 mm in Badulla and Ampara districts; and up to 75 mm in Batticaloa, Hambantota, Monaragala, Matale and Kandy districts.

#### Ocean State (Text Courtesy IRI)

##### Pacific sea state: July 11, 2019

SSTs in the central Pacific maintained at a weak El Niño level during June and early July, while temperature anomalies of subsurface waters cooled to near-average. Some patterns in the atmosphere continue to show El Niño conditions intermittently. Collective model forecasts show a likely transition from weak El Niño conditions to ENSO-neutral by late summer. The official CPC/IRI outlook, still with an El Niño advisory, calls for a 60% chance of ENSO-neutral by Jul-Sep, and neutral remains the most likely category through fall and winter.

##### Indian Ocean State

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

## Predictions

### Rainfall

#### 14-day prediction:

##### NOAA NCEP models:

From 17<sup>th</sup> – 23<sup>rd</sup> Jul: Total rainfall up to 135 mm Colombo, Kegalle, Ratnapura, Galle and Matara districts; up to 115-125 mm in Puttalam, Kurunegala, Gampaha and Hambantota districts; 105-115 mm in Kandy and Nuwara Eliya districts; up to 95-105 mm in Kandy, Badulla and Monaragala districts; up to 85-95 mm in Matale and Ampara districts; up to 75-85 mm in Mannar and Anuradhapura districts; and up to 65-75 mm in most parts of the island.

From 24<sup>th</sup> – 30<sup>th</sup> Jul: Total rainfall up to 55 mm in Jaffna districts; up to 35-45 mm Kilinochchi and Mullaitivu districts; up to 25-35 mm in Mannar, Vavuniya, Anuradhapura and Trincomalee districts; and up to 15 mm in rest of the island.

##### IMD NCMWRF Forecast:

19<sup>th</sup> Jul: Not Available

20<sup>th</sup> Jul: Not Available

##### IRI Model Forecast:

From 17<sup>th</sup> – 22<sup>nd</sup> Jul: Total rainfall up to 220 mm is expected in Gampaha, Kegalle, Colombo, Ratnapura, Kalutara and Galle districts; up to 200 mm in Puttalam, Kurunegala and Matara districts; up to 150 mm in Kandy, Nuwara Eliya and Hambantota districts; up to 100 mm in Matale district; up to 75 mm in Badulla, Mullaitivu and Trincomalee districts; and up to 50 mm in rest of the island.

### MJO based OLR predictions

#### For the next 15 days:

MJO shall enhance the rainfall in Sri Lanka.

<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

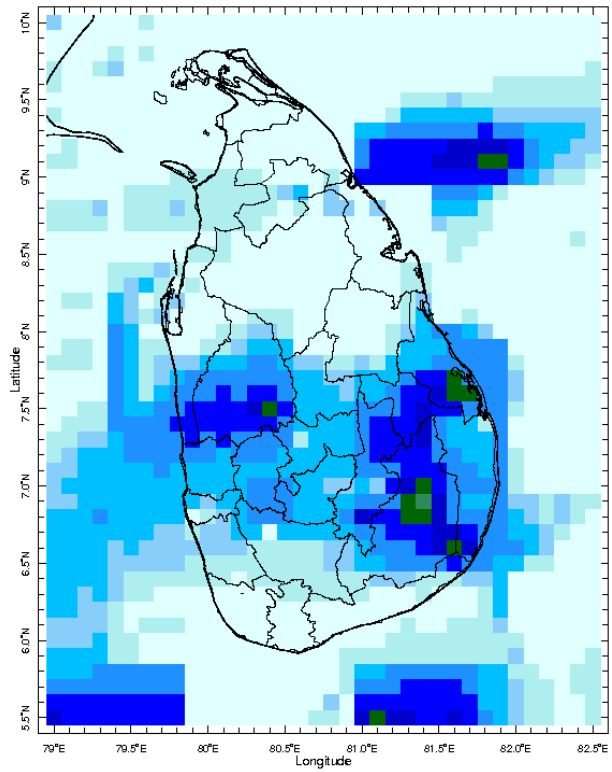
- a. NCEP GFS Ensemble 1-14 day Rainfall Predictions
- b. WRF Model Rainfall Forecast from IMD Chennai
- c. Weekly Precipitation Forecast from IRI
- d. Seasonal Predictions from IRI

## MONITORING

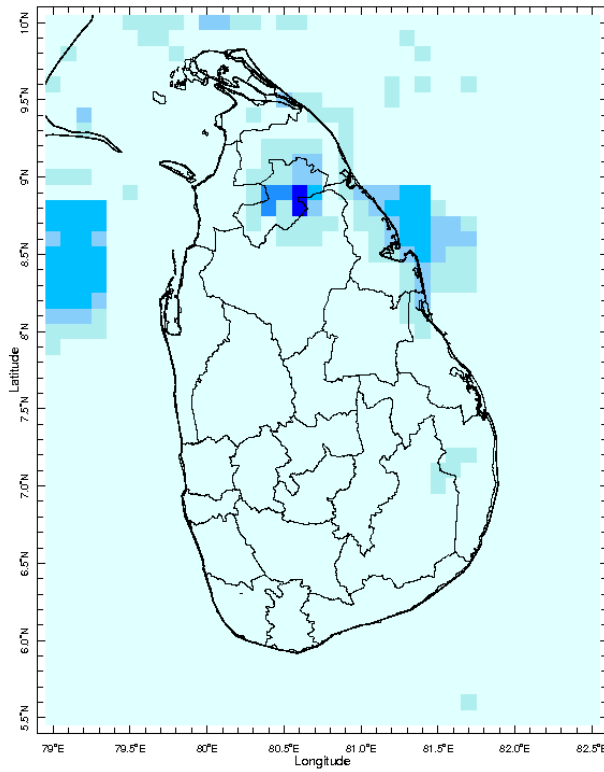
### Daily Rainfall Monitoring

---

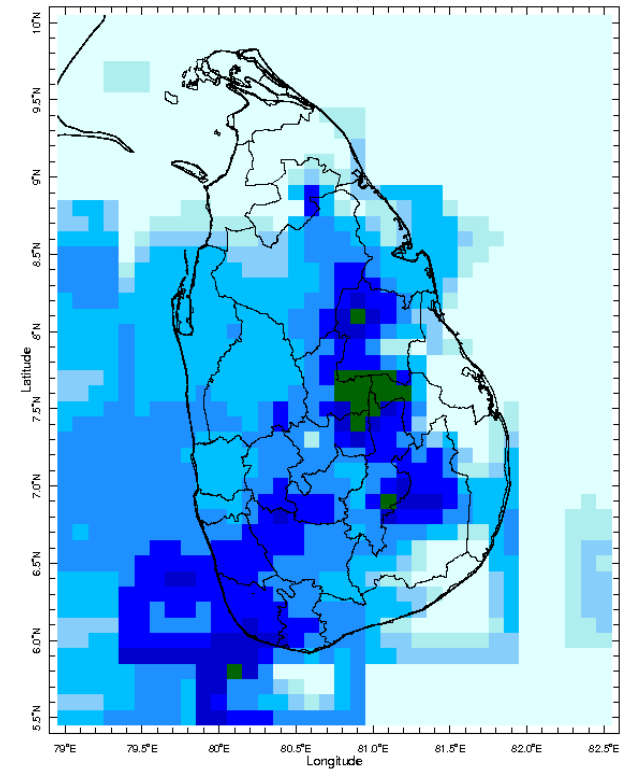
The following figures show the satellite observed rainfall in the last 7 days in Sri Lanka.



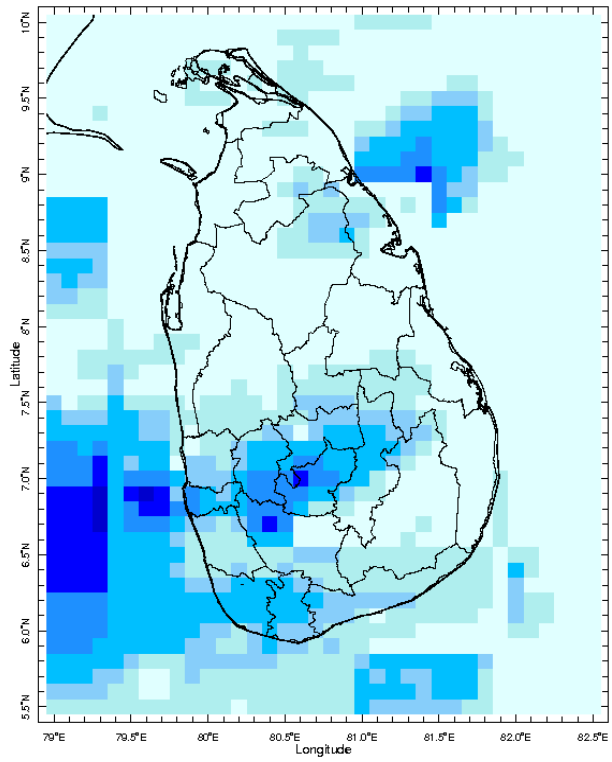
10 Jul 2019



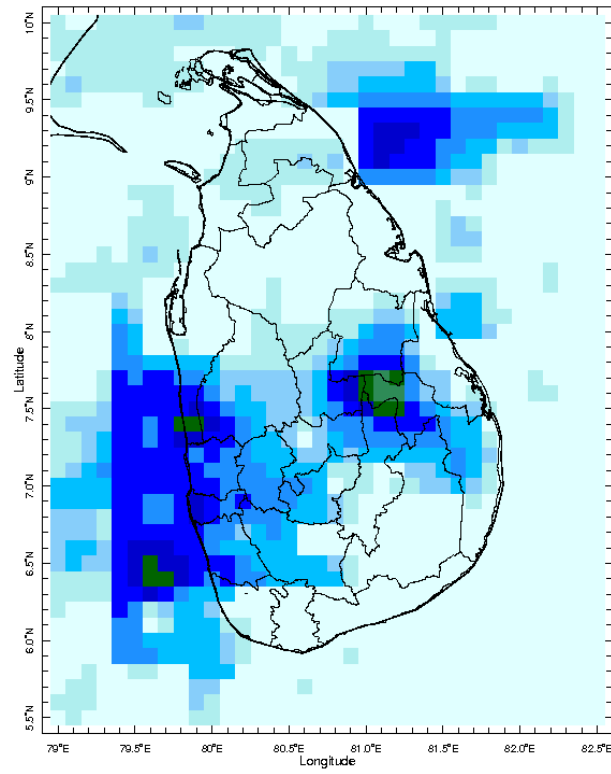
11 Jul 2019



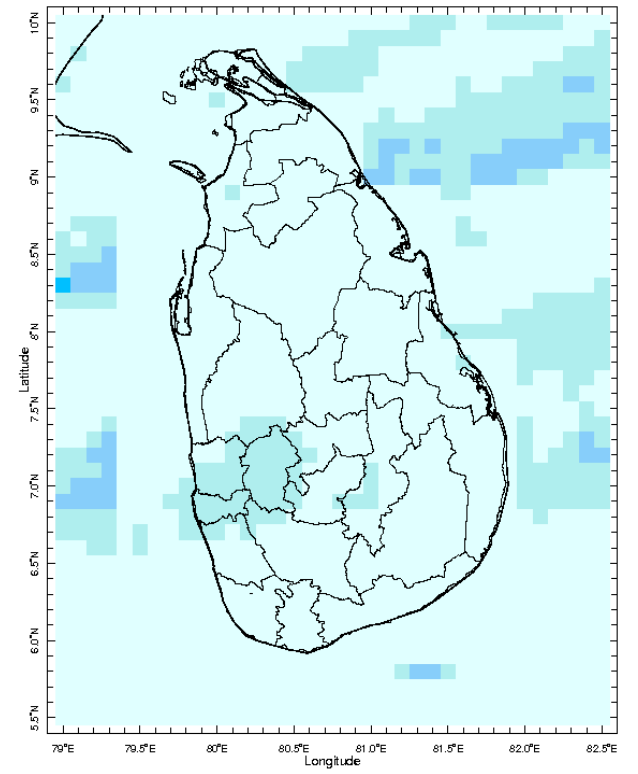
12 Jul 2019



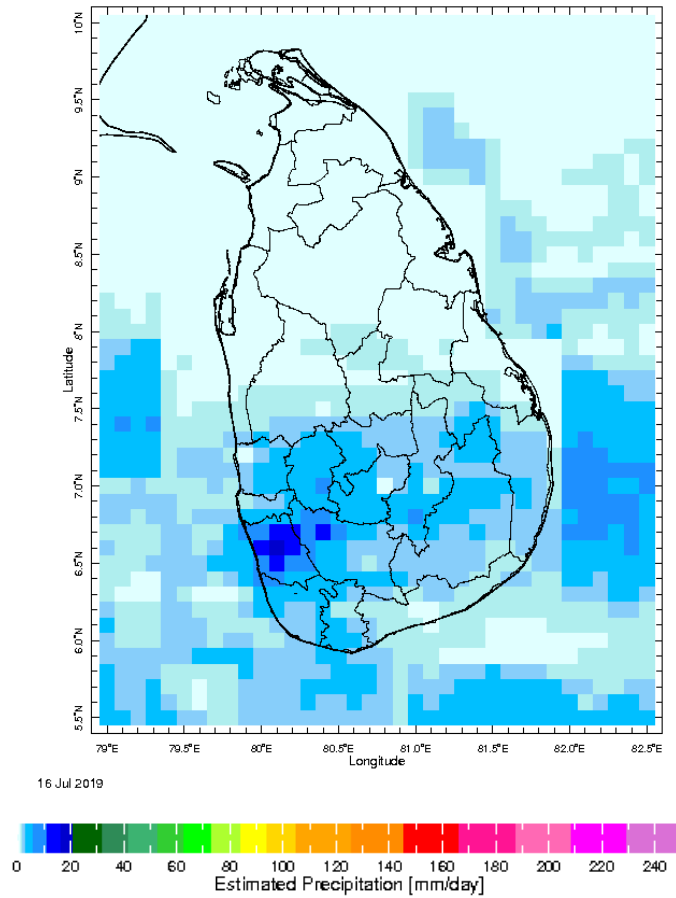
13 Jul 2019



14 Jul 2019

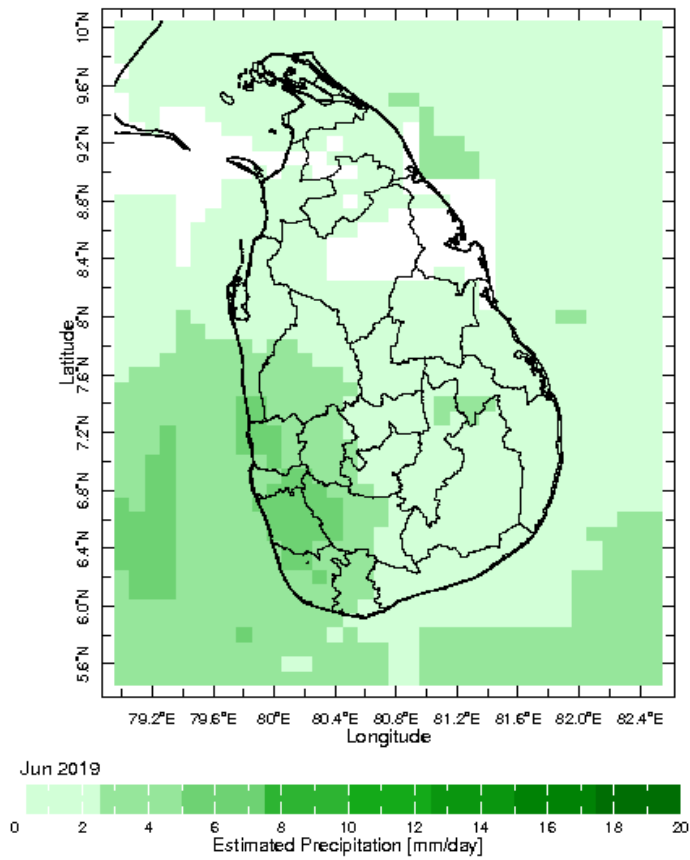


15 Jul 2019

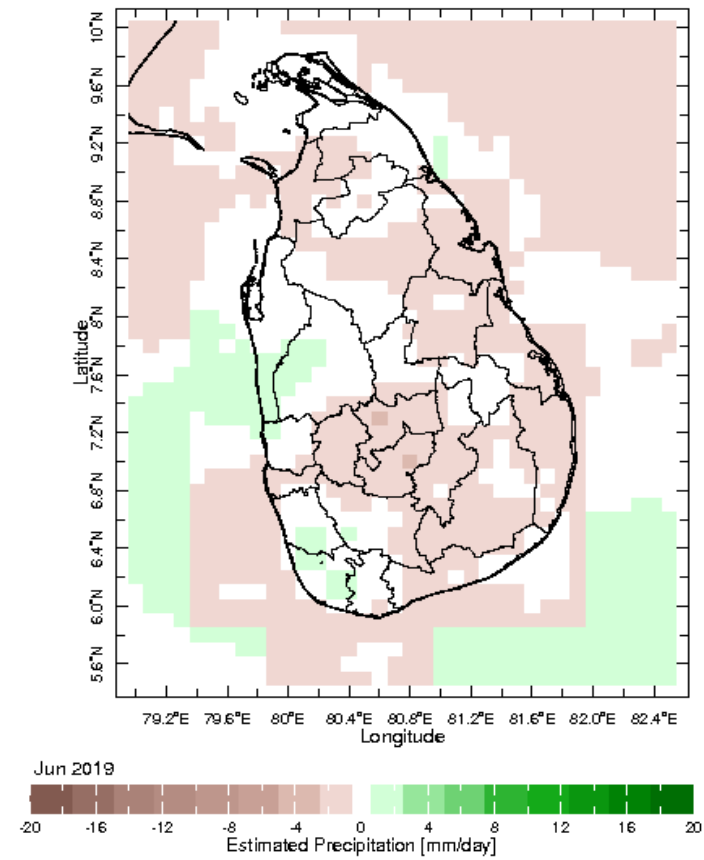


## Monthly Rainfall Monitoring

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

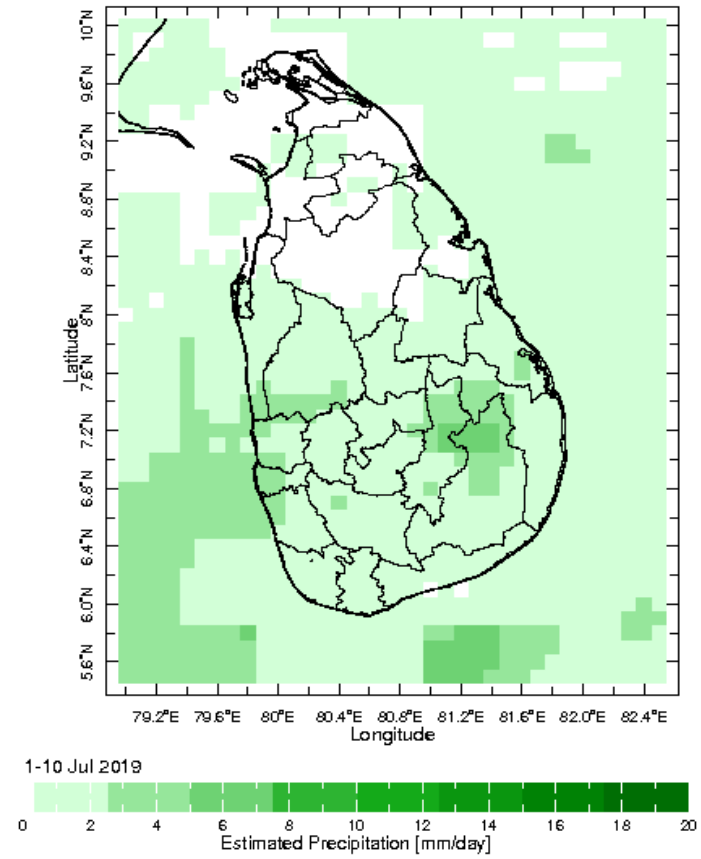
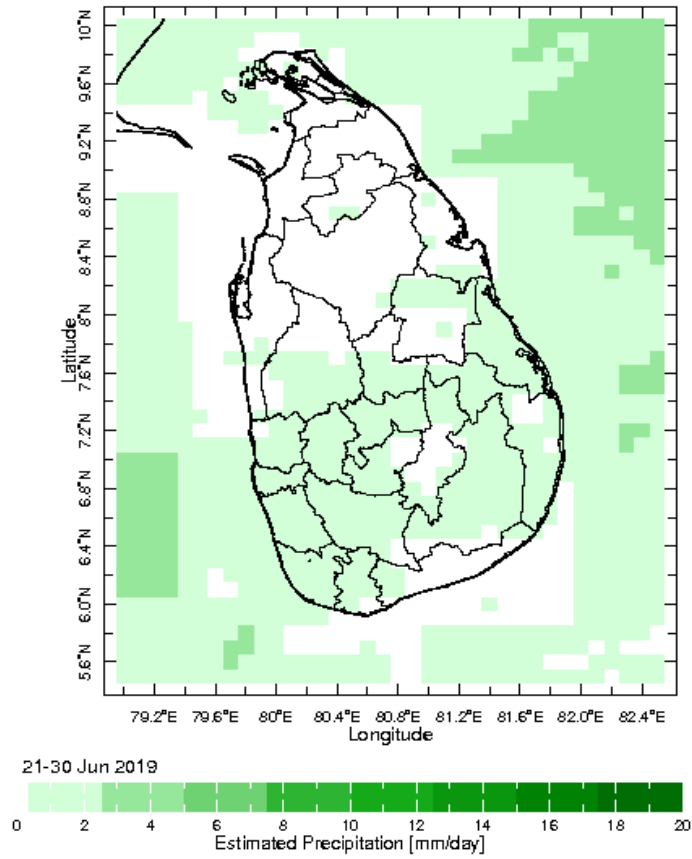


**Monthly Average**



**Monthly Anomaly**

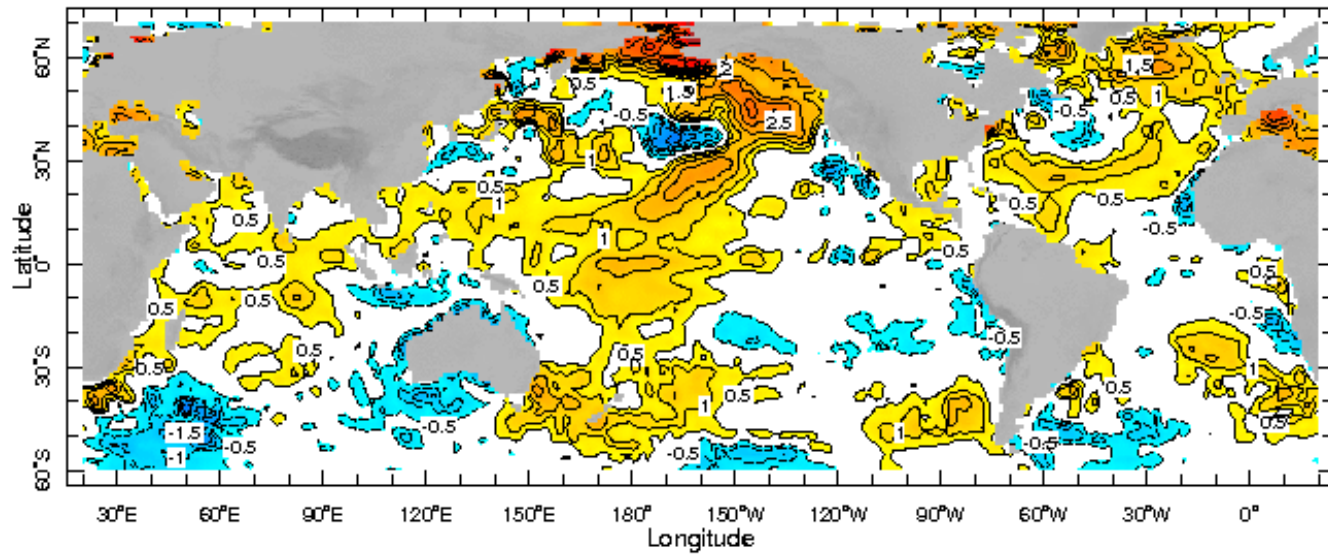
**Dekadal (10 Day) Satellite Derived Rainfall Estimates**



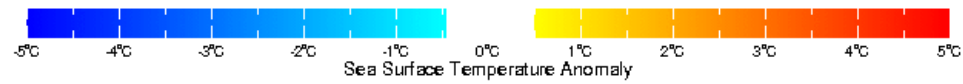
## Weekly Average SST Anomalies

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





10 Jul 2019

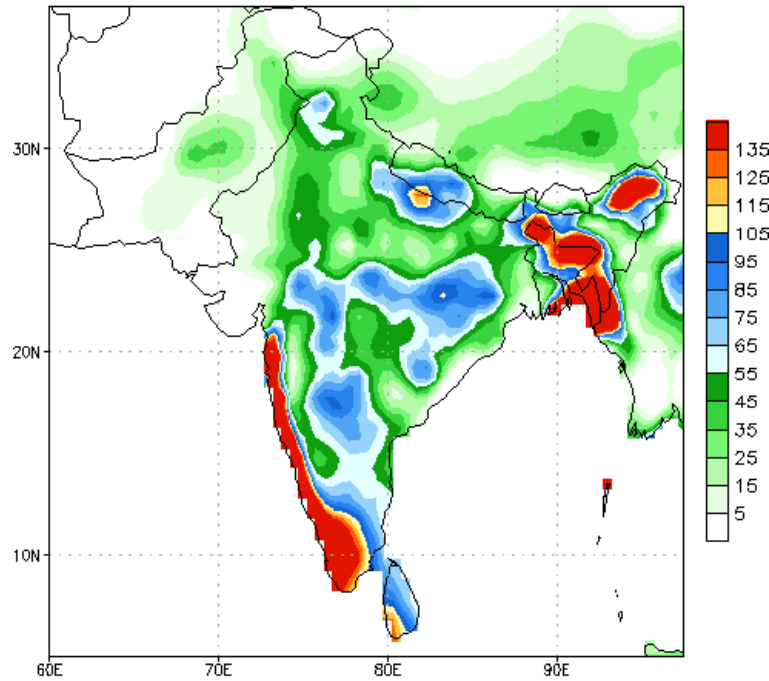


*WORLDBATH topography*

## PREDICTIONS

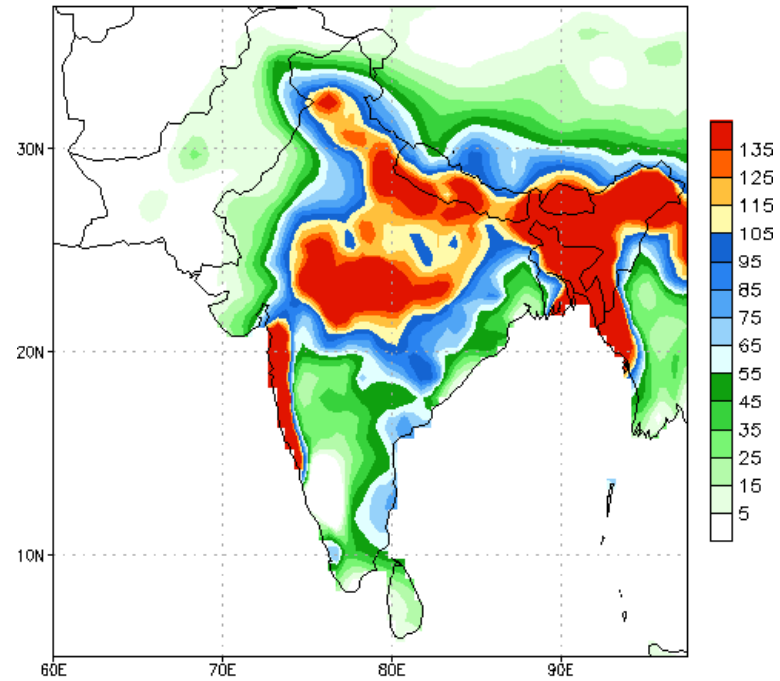
NCEP GFS 1- 14 Day prediction

NCEP GFS Ensemble Forecast 1-7 Day Precipitation (mm)  
from: 17Jul2019  
17Jul2019-23Jul2019 Accumulation



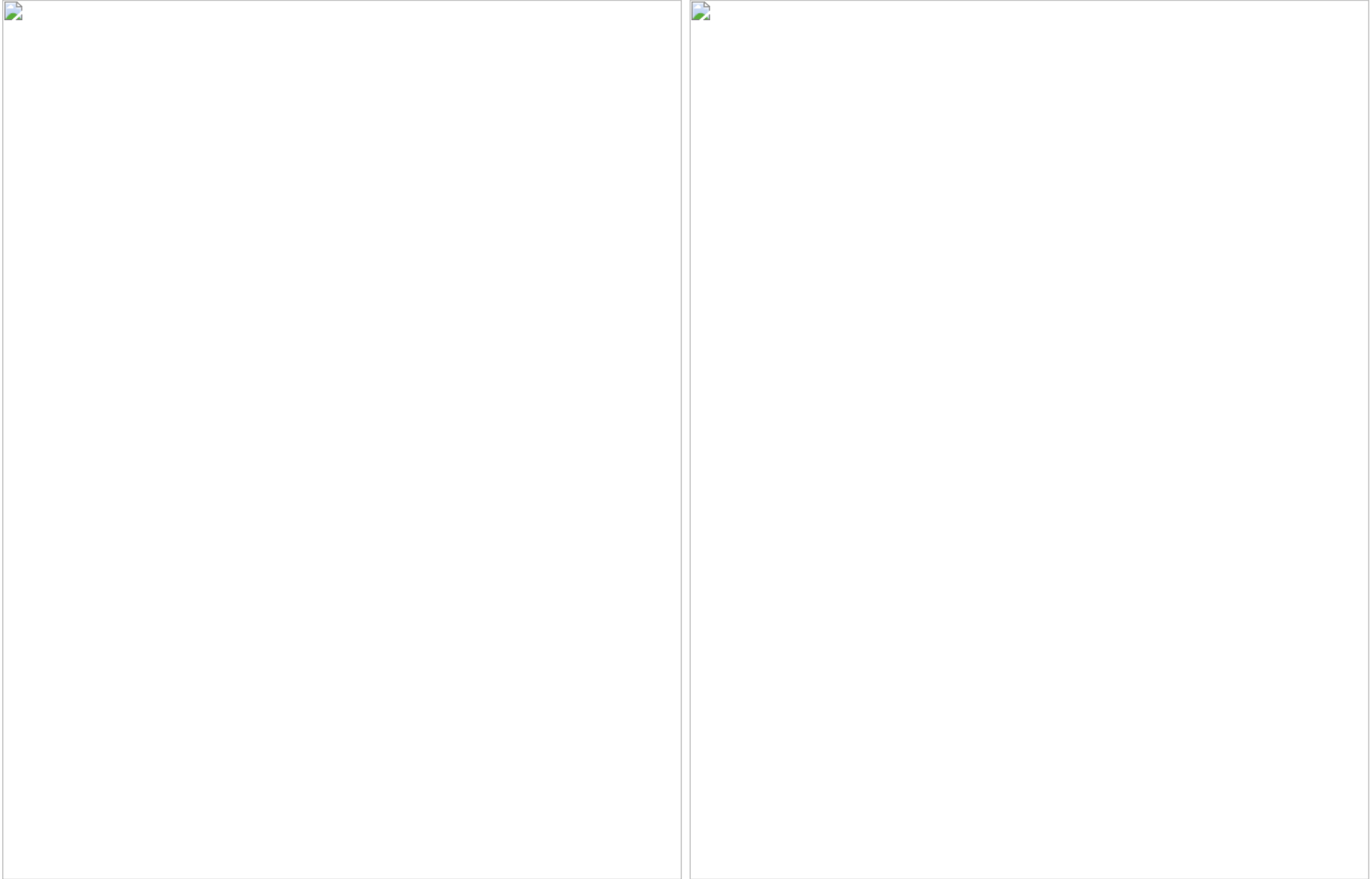
Bias correction based on last 30-day forecast error

NCEP GFS Ensemble Forecast 8-14 Day Precipitation (mm)  
from: 17Jul2019  
24Jul2019-30Jul2019 Accumulation



Bias correction based on last 30-day forecast error

## 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.

