

## Experimental Climate Monitoring and Prediction

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21 December 2017

### Highlights

- The WRF rainfall forecast predicts up to 36 mm of rainfall in Ampara district on December 22<sup>nd</sup>.
- Between 12 - 18 Dec: Rainfall up to 80 mm was recorded in Badulla and Monaragala districts on December 13<sup>th</sup>.
- From 10- 16 Dec: minimum temperature of 15 °C was recorded from Nuwara Eliya district while most parts of the island recorded a maximum temperature between 30-35 °C.
- From 12- 18 Dec: up to 36 km/h, northeasterly winds were experienced by the central and southern regions of the island and up to 18 km/h in northern regions.
- 0.5 °C above average sea surface temperature was observed in the seas around Sri Lanka.

### Monitoring

#### Rainfall

**Weekly Monitoring:** On December 12<sup>th</sup>, Kegalla and eastern regions of Kurunegala districts received up to 60 mm of rainfall; Kandy, Vavuniya and Anuradhapura districts up to 50 mm; northern regions of Puttalam district up to 30 mm; and several regions of Mullaitivu, Polonnaruwa, Matale and Monaragala districts up to 20 mm. On the 13<sup>th</sup> Badulla and Monaragala districts received up to 80 mm of rainfall; Kalutara, Galle, Ratnapura, Puttalam, Kurunegala and Anuradhapura districts up to 60 mm; Gampaha and Hambantota districts up to 50 mm; Polonnaruwa, Trincomalee, Ampara and Nuwara Eliya districts up to 30 mm; and Colombo, Kegalla, Kandy, Matara and Batticaloa districts up to 20 mm. On the 14<sup>th</sup>, Colombo district received up to 60 mm of rainfall; Gampaha and Kalutara districts up to 50 mm; Puttalam, Kurunegala, Kegalla, Ratnapura and Galle districts up to 30 mm; and Anuradhapura, Kandy, Nuwara Eliya, Matara and Hambantota districts up to 20 mm. On the 15<sup>th</sup>, Badulla district received up to 50 mm of rainfall; Kandy, Nuwara Eliya, Monaragala, Ampara and Hambantota districts up to 30 mm; and Gampaha, Colombo, Kalutara, Kegalla and Matale districts up to 20 mm. No significant rainfalls were recorded in any part of the island during 16<sup>th</sup>-18<sup>th</sup>.

**Total Rainfall for the Past Week:** The RFE 2.0 tool shows total rainfall of 75-100 mm in Trincomalee, Anuradhapura, Kurunegala, Gampaha, Kalutara, Galle, Badulla, Monaragala and Hambantota districts; up to 50-75 mm in Puttalam, Colombo, Ratnapura, Matale, Kandy, Nuwara Eliya and Ampara districts; up to 25-50 mm Jaffna, Mannar, Polonnaruwa and Matara districts. It shows above average rainfall up to 50-100 mm in Badulla and Monaragala districts; and up to 25-50 mm in Gampaha, Kalutara, Galle and Hambantota districts. It also shows below average rainfall up to 50-100 mm in Trincomalee, Polonnaruwa, Batticaloa and Ampara districts; and up to 25-50 mm in Jaffna, Mannar, Mullaitivu, Matale, Kandy, Matara, Ratnapura, central regions of Anuradhapura, and western regions of Kurunegala districts.

**Monthly Monitoring:** During November - below average rainfall conditions were experienced in the western and central regions of the island and above average rainfall in northern, southern and eastern regions. Kurunegala, Puttalam, Anuradhapura, Polonnaruwa, Matale, and Vavuniya districts received up to 180 mm below average rainfall. Galle, Matara, Ratnapura, Hambantota, Badulla, Monaragala and Ampara districts received up to 180 mm of above average rainfall. The CPC Unified Precipitation Analysis tool shows ~500 mm of total rainfall in Colombo, Ratnapura, Galle, Matara, Hambantota, Badulla, Monaragala and Ampara districts; up to ~300 mm in Jaffna, Trincomalee, Matale, Kandy, Nuwara Eliya, Kegalla and Polonnaruwa districts.

#### Ocean State (Text Courtesy IRI)

#### Pacific sea state: December 19, 2017

In mid-December 2017, the tropical Pacific reflected La Niña conditions, with SSTs in the east-central tropical Pacific in the range of weak to moderate La Niña and all atmosphere variables showing patterns suggestive of La Niña conditions. The collection of latest ENSO prediction models indicates weak, but not far from threshold of moderate, La Niña as the most likely scenario for the Northern Hemisphere winter, lasting into spring. The official CPC/IRI outlook favors continuation of La Niña through middle or late spring.

## **Indian Ocean State**

0.5 °C above average sea surface temperature was observed in the seas around Sri Lanka.

## **Predictions**

### **Rainfall**

#### **14-day prediction:**

##### **NOAA NCEP models:**

From 20<sup>th</sup>– 26<sup>th</sup> Dec: Total rainfall more than 135 mm in Monaragala, Ampara and Hambantota districts; between 115-125 mm in Batticaloa, Badulla and Matara districts; between 105-115 mm in Galle, Ratnapura and Nuwara Eliya districts; between 95-105 mm in Batticaloa, Polonnaruwa, Kandy and Kegalla districts; between 65-75 mm in Polonnaruwa, Matale and Gampaha districts; and up to 45-55 mm in Trincomalee, Anuradhapura, Kurunegala and Puttalam districts.

From 27<sup>th</sup> Dec- 2<sup>nd</sup> Jan : Total rainfall between 115-125 mm in Ampara district; between 95-105 mm in Batticaloa, Monaragala and Hambantota districts; between 85-95 mm in Badulla district; between 75-85 mm in Matara and Ratnapura districts; between 65-75 mm in Nuwara Eliya district; and up to 45-55 mm in Trincomalee, Polonnaruwa, Matale, Kandy and Kegalla districts.

##### **IMD WRF Forecast:**

22<sup>nd</sup> Dec: Up to 36 mm of rainfall in Ampara districts; and up to 8 mm in Jaffna. Mannar, Vavuniya, Kilinochchi, Mullaitivu, Anuradhapura, Trincomalee, Polonnaruwa, Batticaloa, Badulla, Monaragala and Hambantota districts.

23<sup>rd</sup> Dec: Up to 36 mm of rainfall in Ampara and Batticaloa districts; and up to 8 mm in Kilinochchi, Vavuniya, Anuradhapura, Polonnaruwa, Trincomalee, Badulla, Monaragala and Hambantota districts.

##### **IRI Model Forecast:**

20<sup>th</sup> – 25<sup>th</sup> Dec: Total rainfall between 100-150 mm in Batticaloa and Ampara districts; between 75-100 mm in Trincomalee, Badulla, Monaragala and Hambantota districts; between 50-75 mm in Puttalam, Kurunegala, Kegalle, Kandy, Nuwara Eliya, Polonnaruwa, Ratnapura, Galle, Matara, Kalutara, Colombo and Gampaha districts; and up to 50 mm total rainfall for the rest of the island.

### **MJO based OLR predictions**

#### **For the next 15 days:**

MJO shall suppress the rainfall in Sri Lanka in the next 10 days and shall enhance the rainfall in following 5 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)



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## Weekly Hydro- Meteorological Report for Sri Lanka

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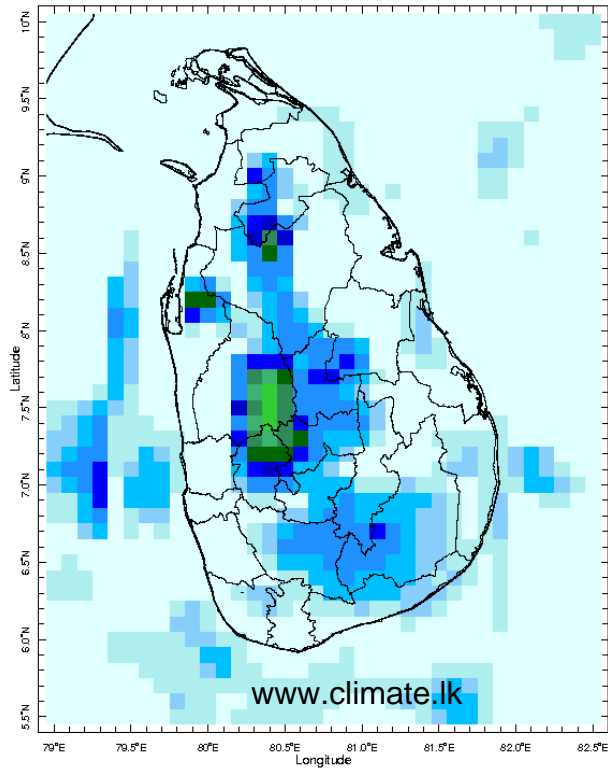
#### 2. Predictions

- a. NCEP GFS Ensemble 1-14 day Rainfall Predictions
- b. WRF Model Rainfall Forecast from IMD Chennai
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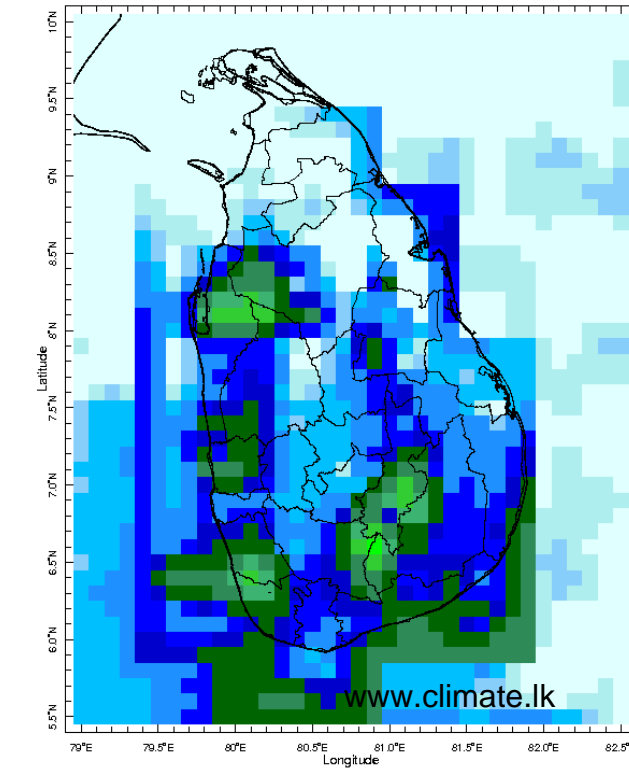
## MONITORING

### Daily Rainfall Monitoring

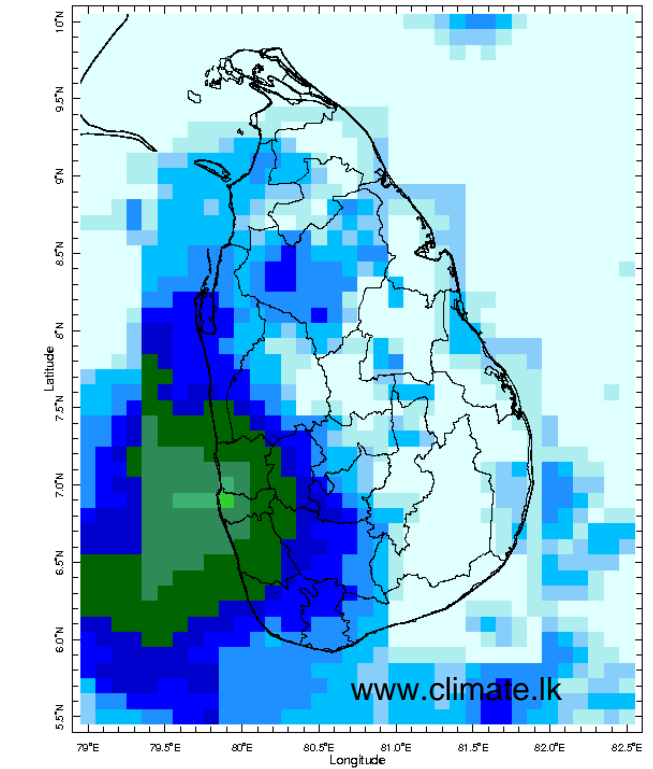
The following figures show the satellite observed rainfall in the last 7 days in Sri Lanka.



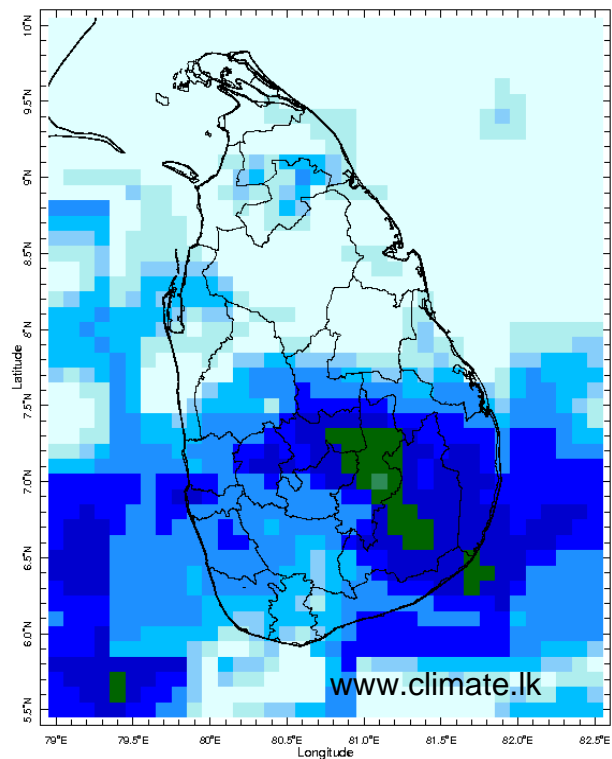
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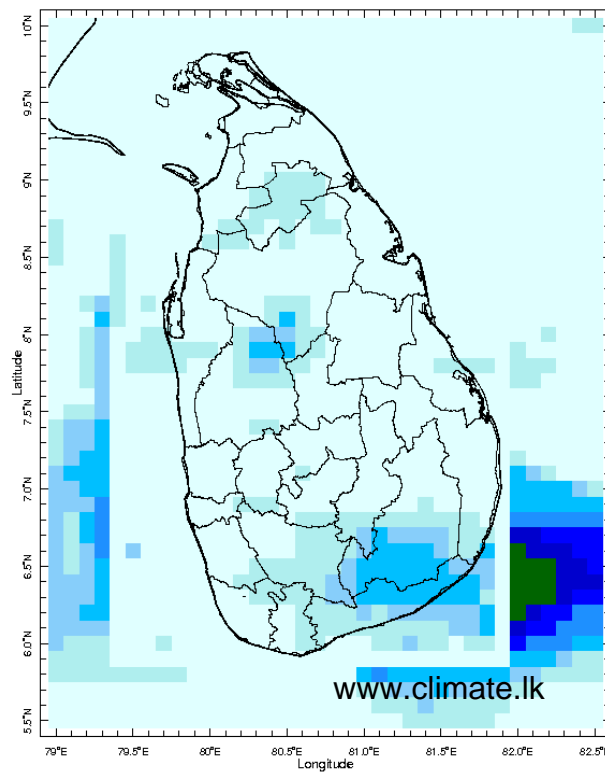
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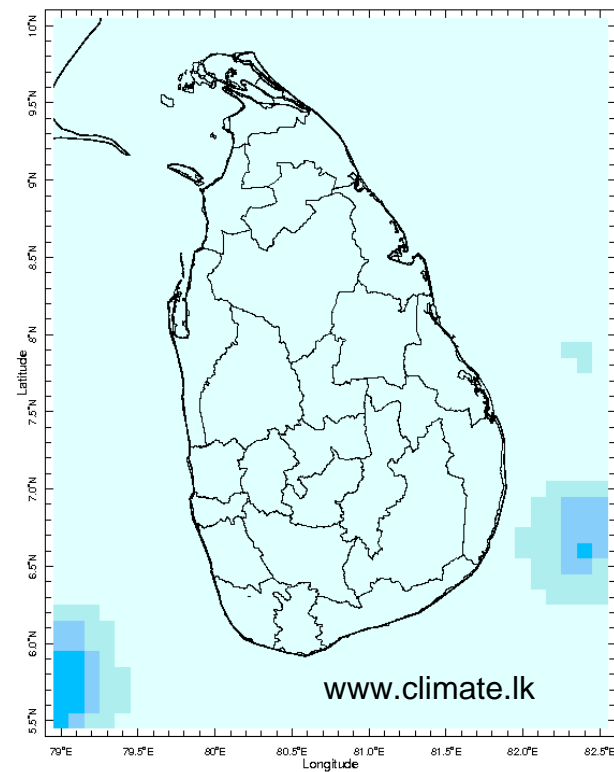
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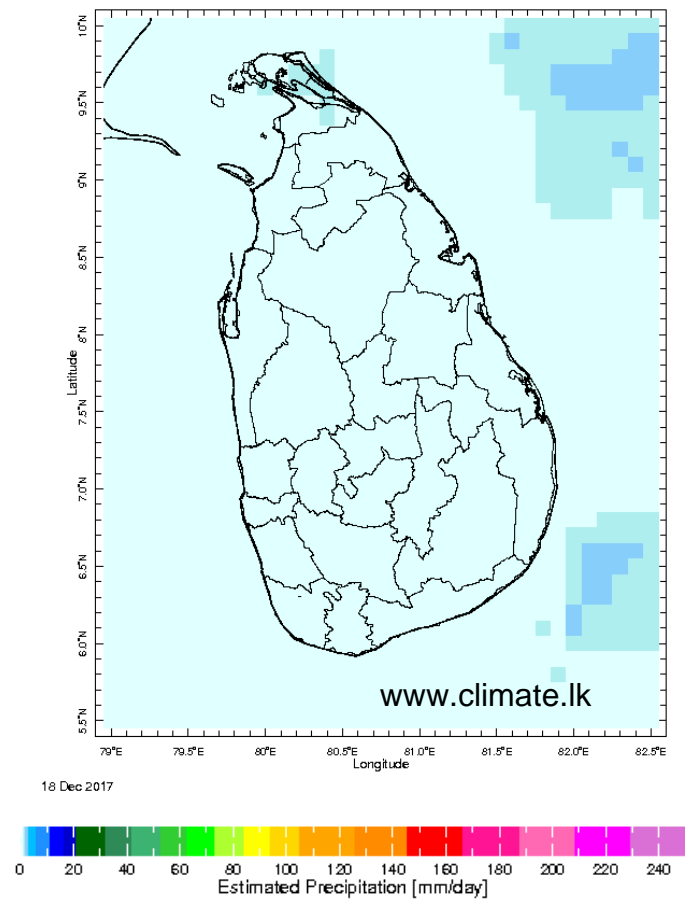
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16 Dec 2017

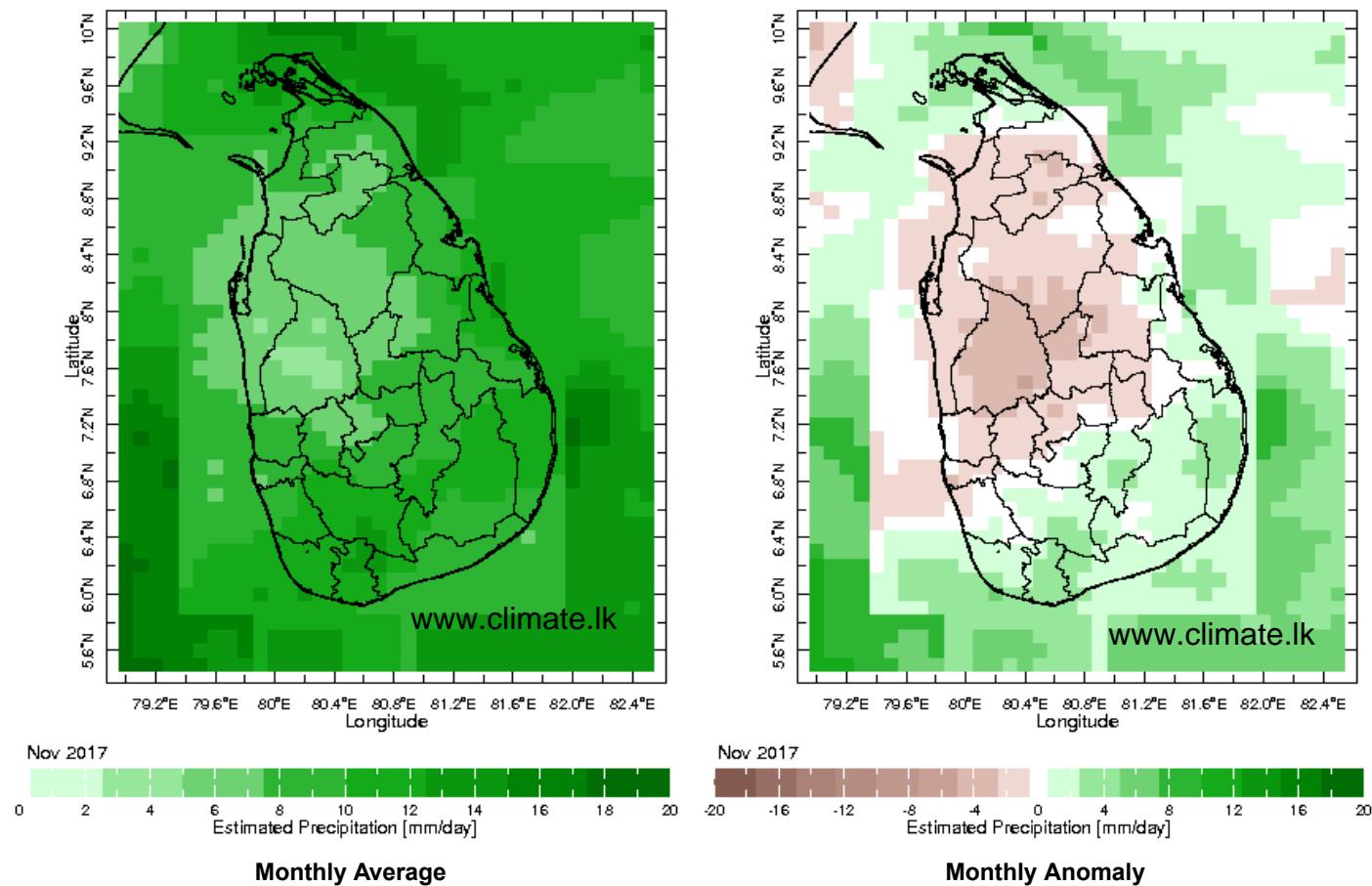


17 Dec 2017

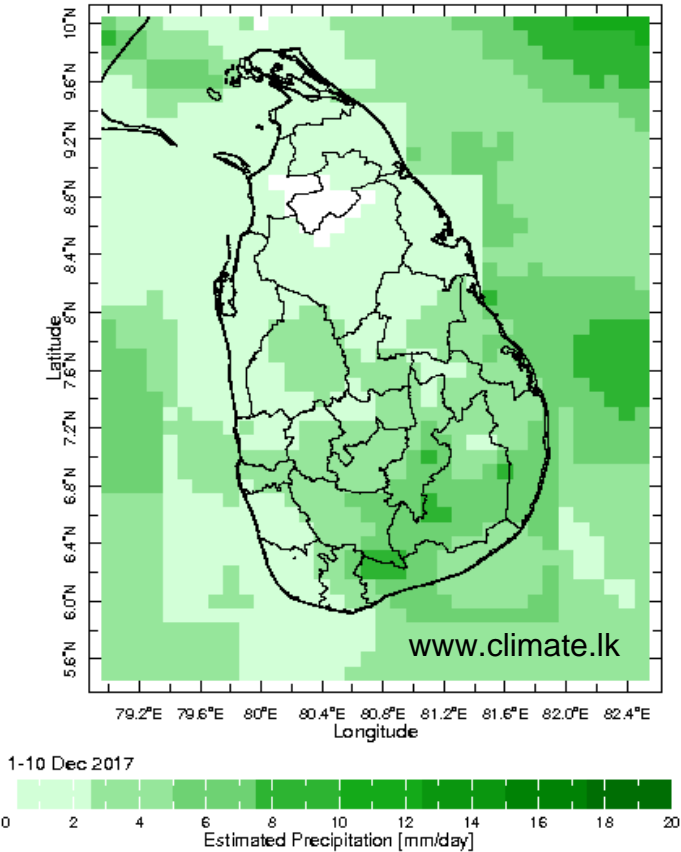
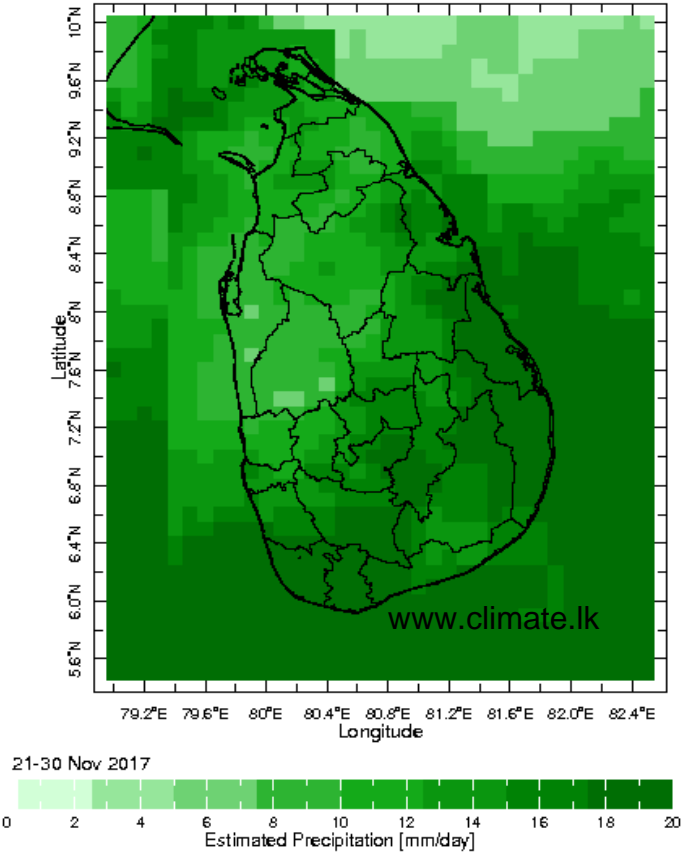


## Monthly Rainfall Monitoring

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



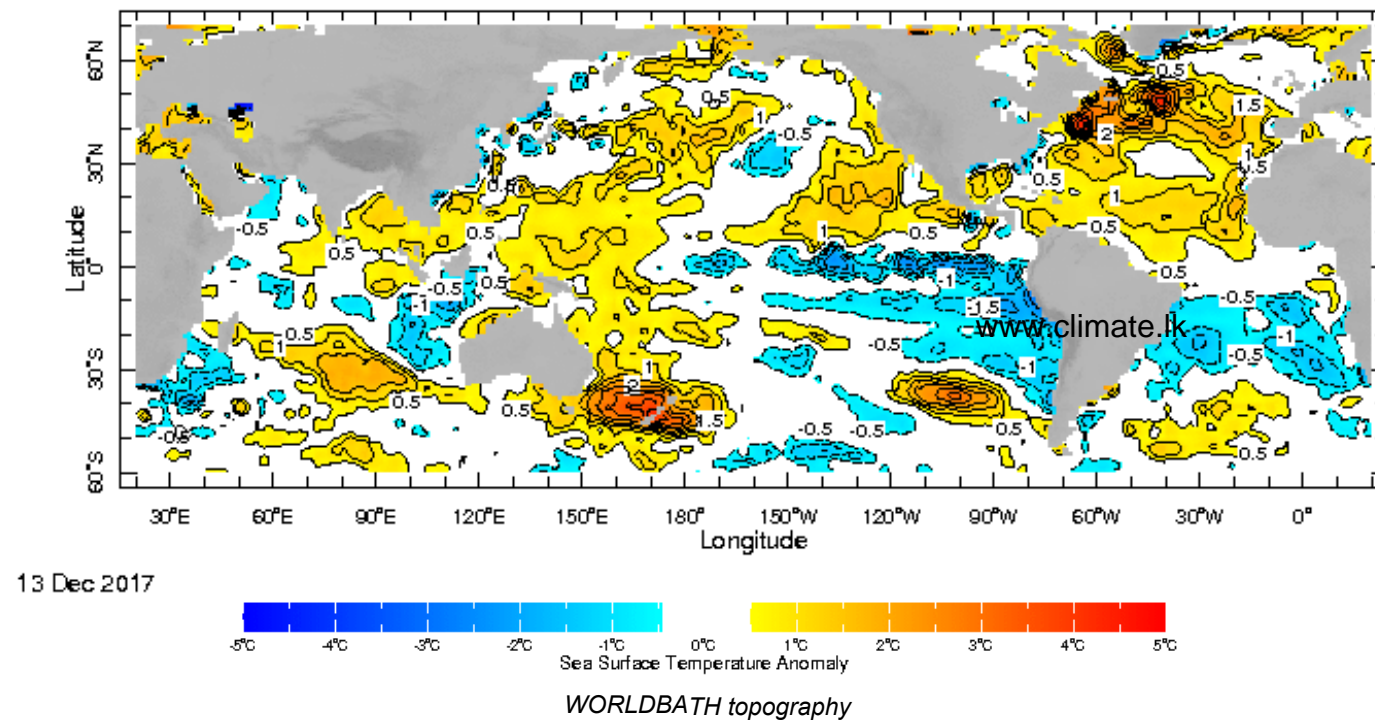
**Dekadal (10 Day) Satellite Derived Rainfall Estimates**





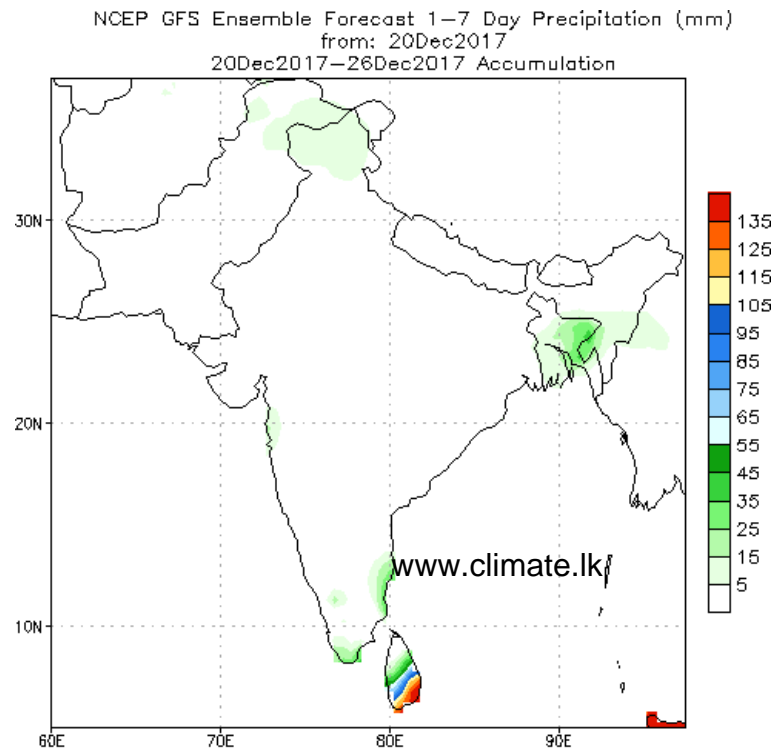
## Weekly Average SST Anomalies

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

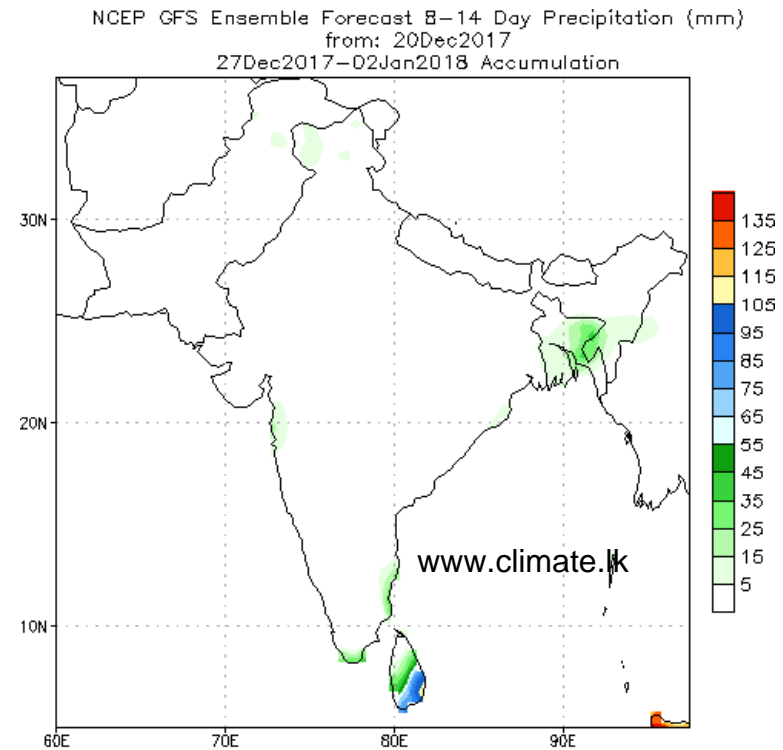


## PREDICTIONS

### NCEP GFS 1- 14 Day prediction



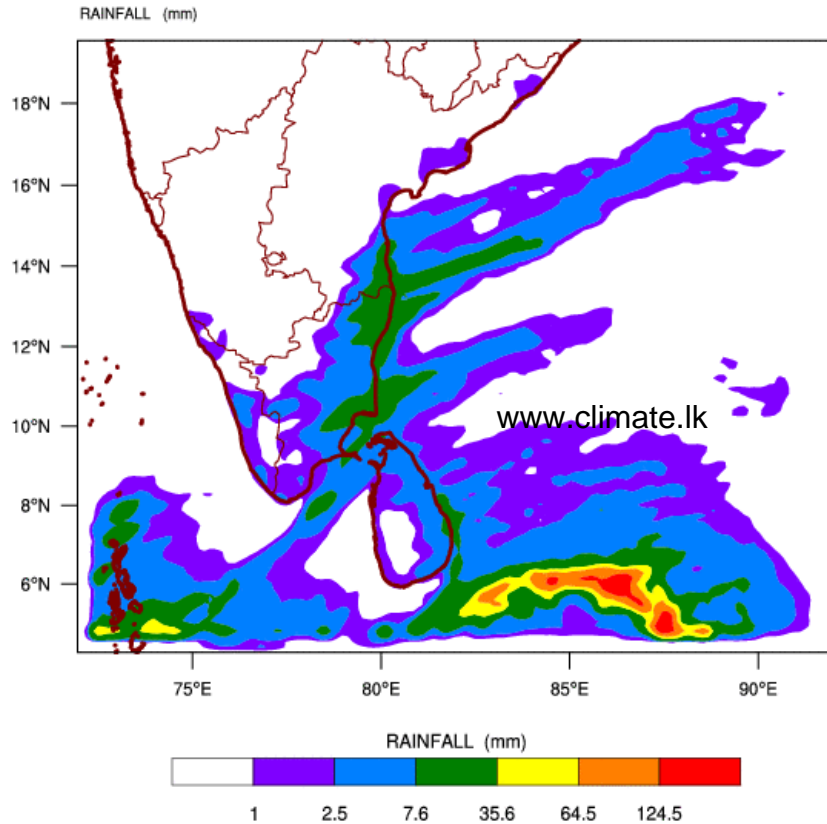
Bias correction based on last 30-day forecast error



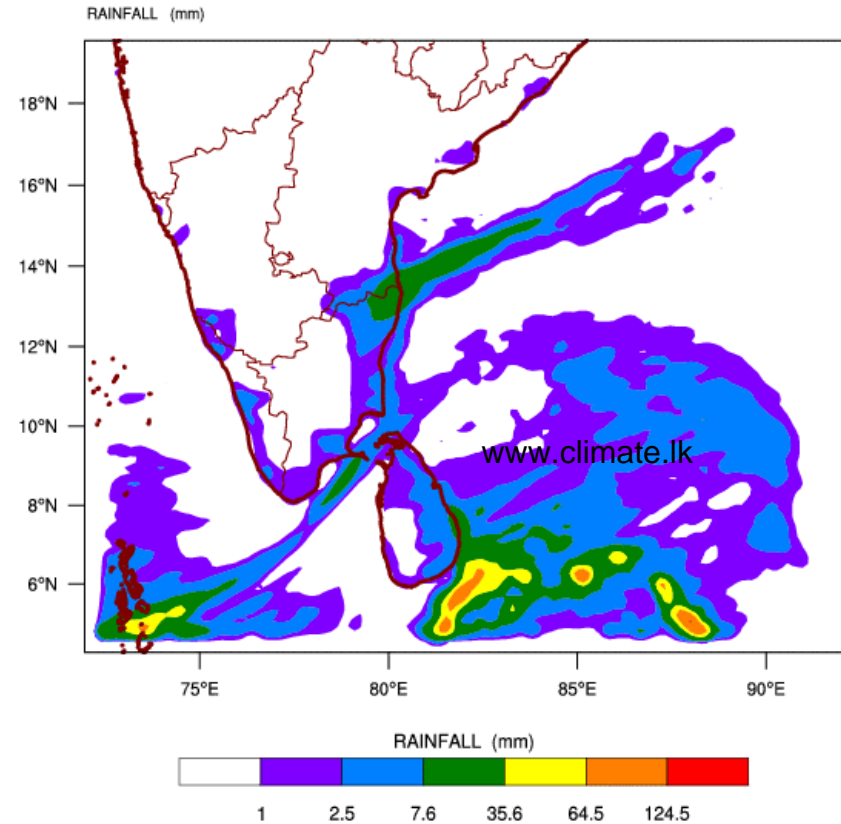
Bias correction based on last 30-day forecast error

## WRF Model Forecast (from IMD Chennai)

WRF MODEL FORECAST (48 HR.) RAINFALL(mm)\  
based on 00 UTC of 20-12-2017 valid for 03 UTC of 22-12-2017

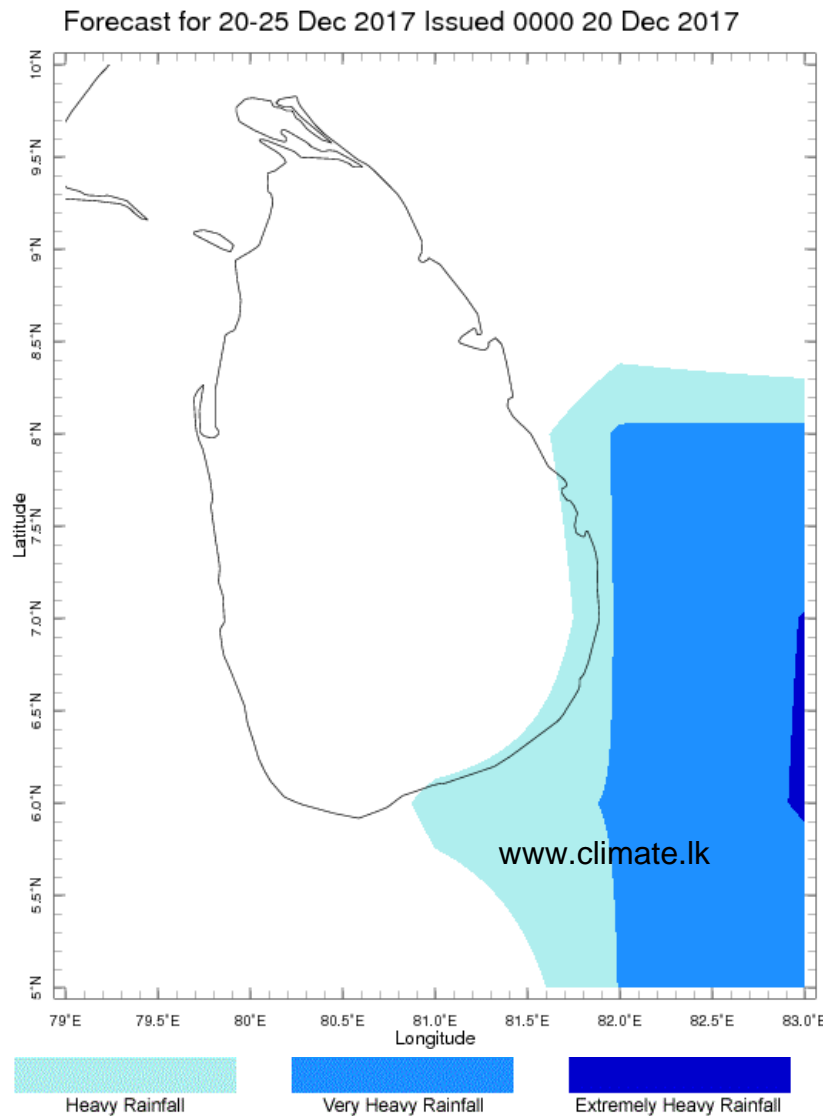


WRF MODEL FORECAST (72 HR.) RAINFALL(mm)\  
based on 00 UTC of 20-12-2017 valid for 03 UTC of 23-12-2017

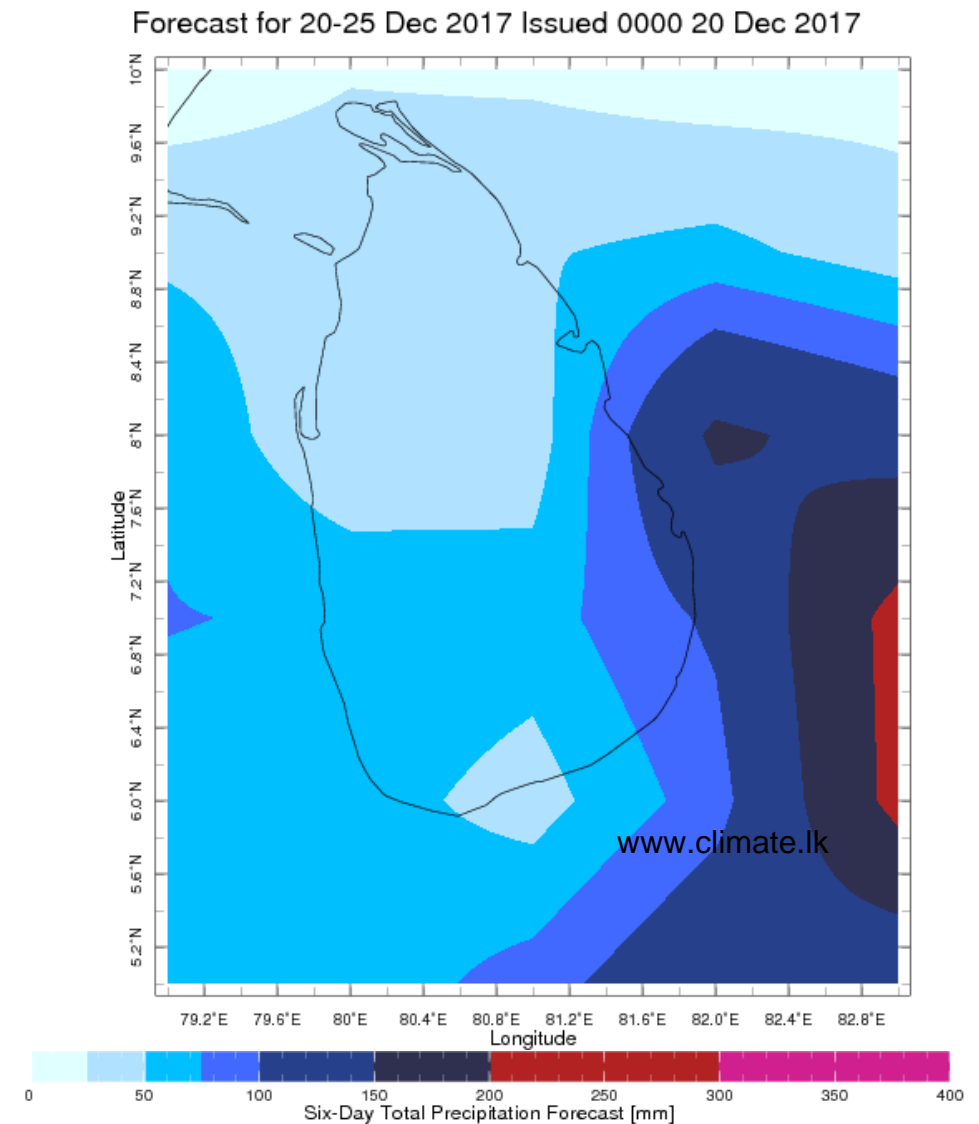


## Weekly Rainfall Forecast from IRI

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