

## Experimental Climate Monitoring and Prediction

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1 December 2016

### Highlights

- The IMD WRF model predicts very heavy rainfall (up to 125 mm) on 2<sup>nd</sup> December for Jaffna, Kilinochchi and Mullaitivu districts.
- A Significant decrease in rainfall events was experienced throughout the island during 23–28 November, with the highest recorded rainfall of 60 mm on the 23<sup>rd</sup> in Mannampitiya region.
- From 20-26 November, 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 22-28 November, up to 18 km/h north easterly winds were experienced in the northern and southern regions of the country while the central regions received up to 22 km/h wind in the same direction.

### Monitoring

#### Rainfall

**Weekly Monitoring:** On November 23<sup>rd</sup> surrounding areas of Mannampitiya received rainfall up to 60 mm; coastal areas of Puttalam and adjacent western sea received rainfall up to 30 mm; Talawa and Galnawa in Anuradhapura district, Siyambalanduwa in Monaragala district, Lahugala in Ampara district and Punani in Batticaloa district received rainfall up to 20 mm. No significant rainfalls were recorded on the 24<sup>th</sup>. On 25<sup>th</sup> Panadura and Kalawana regions received rainfall up to 20 mm; south eastern sea adjacent to the island received up to 120 mm rainfall. During 26<sup>th</sup>-28<sup>th</sup> no significant rainfalls were recorded in any part of the island; south eastern sea adjacent to the island received rainfall up to 70 mm and 60 mm on 26<sup>th</sup> and 27<sup>th</sup> respectively. For the past week, the RFE 2.0 tool shows total rainfall up to 85 mm in Mannampitiya region; up to 55 mm for Colombo, Kalutara, Galle, Matara, Monaragala, Talawa and Galnawa regions; and below average rainfall of 50-100 mm in most parts of the island.

**Monthly Monitoring:** Below average rainfall conditions were experienced in the entire island in the month of October except for coastal regions of Galle district, where monthly average rainfall amounted to 450 mm/month. Rainfall did not exceed 210 mm/month for the rest of the island. The CPC Unified Precipitation Analysis tool shows ~100 mm of total rainfall in Gampaha, Colombo, Ratnapura, Galle, Matara, Anuradhapura, Mannar, Vavuniya,, Matale, Kandy and Nuwara Eliya districts ; and ~25 mm of total rainfall in Ampara, Badulla, Monaragala, Kegalla and Jaffna districts.

#### Ocean State

##### **Pacific sea state: November 17, 2016**

During mid-November 2016 the tropical Pacific SST anomaly was slightly cooler than -0.5C, the threshold for weak La Niña. Also, most of the atmospheric variables across the tropical Pacific have been consistent with weak La Niña conditions. The upper and lower atmospheric winds have been suggestive of a strengthened Walker circulation, and the cloudiness and rainfall have also been consistent with weak La Niña conditions. The collection of ENSO prediction models indicates SSTs near or slightly cooler than the threshold of La Niña during the remainder of fall, persisting through mid-winter, then weakening to cool-neutral by later winter. (Text Courtesy IRI)

##### **Indian Ocean State**

0.5 °C above average sea surface temperature was observed in the southern sea of Sri Lanka.

### Predictions

#### Rainfall

**14-day prediction:** From 30<sup>th</sup> November - 6<sup>th</sup> December, the NOAA NCEP models predicts total rainfall up to 55 mm for coastal regions of Colombo, Galle and Matara districts; 45-55 mm in Jaffna and Mullaitivu districts; 35-45 mm in Gampaha, Puttalam, Kilinochchi and Vavuniya districts. From 7<sup>th</sup>-13<sup>th</sup> December total rainfall between 85-95 mm is expected in Galle and Matara regions; 75-85 mm in Ratnapura; 45-55 mm in Colombo, Kegalla, Nuwara Eliya and Badulla regions.

**IMD WRF & IRI Model Forecast:** According to the IMD WRF model, more than 125 mm of rainfall is expected on the 2<sup>nd</sup> in Jaffna district; up to 125 mm of rainfall in Kilinochchi and Mullaitivu districts; and up to 35 mm in Mannar and Vavuniya districts. On the 3<sup>rd</sup>, up to 35 mm of rainfall in Gampaha, up to 7mm of rainfall in rest of the western region of the island; and a decreasing tendency of rainfall is expected throughout the country.

**Seasonal Prediction:** As per IRI Multi Model Probability Forecast for December to February 2017, the total 3-month precipitation shall be climatological for the whole island. The 3-month temperature has more than 70-80% likelihood in the entire country of being in the above-normal tercile during this period.

#### **MJO based OLR predictions**

MJO shall enhance the rainfall in Sri Lanka during the next 5 days and shall suppress the rainfall for 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/>



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## Weekly Hydro- Meteorological Report for Sri Lanka

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#### 1. Monitoring

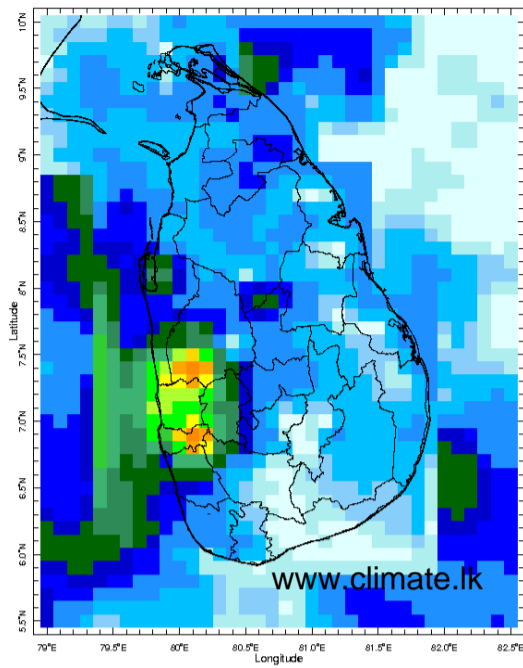
- a. Daily Rainfall Monitoring
- b. Monthly Rainfall Monitoring
- c. Dekadal (10 Day) Satellite Derived Rainfall Estimates
- d. Weekly Average SST Anomalies

#### 2. Predictions

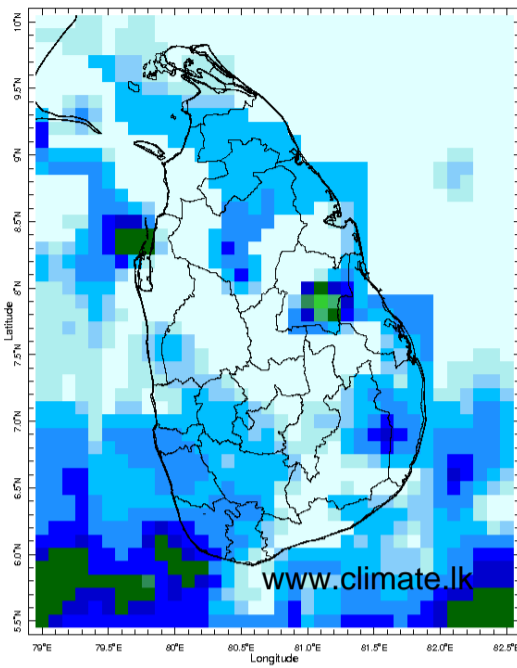
- a. NCEP GFS Ensemble 1-14 day Rainfall Predictions
- b. WRF Model Rainfall Forecast from IMD Chennai
- c. Weekly Precipitation Forecast from IRI
- d. Seasonal Predictions from IRI

Daily Rainfall Monitoring

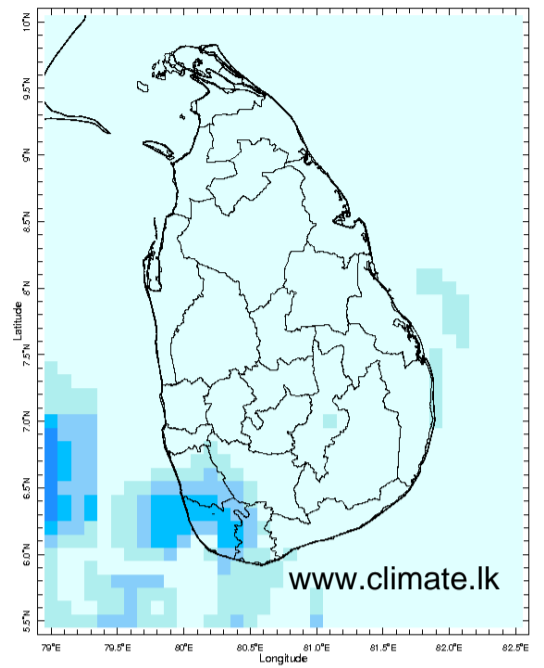
The following figures show the satellite observed rainfall in the last 7 days in Sri Lanka.



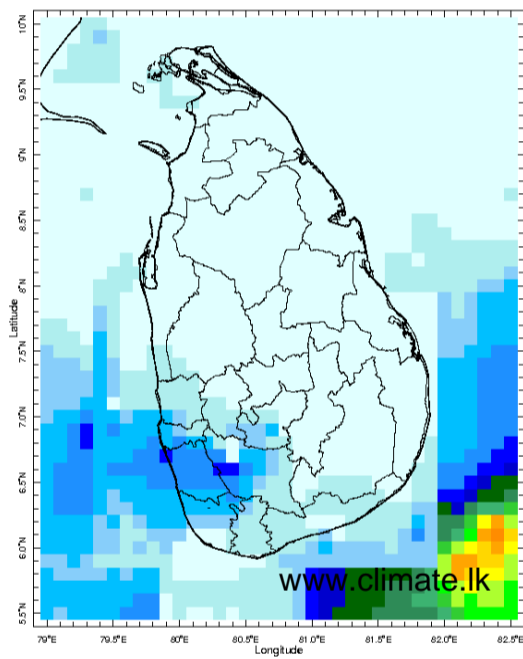
22 Nov 2016



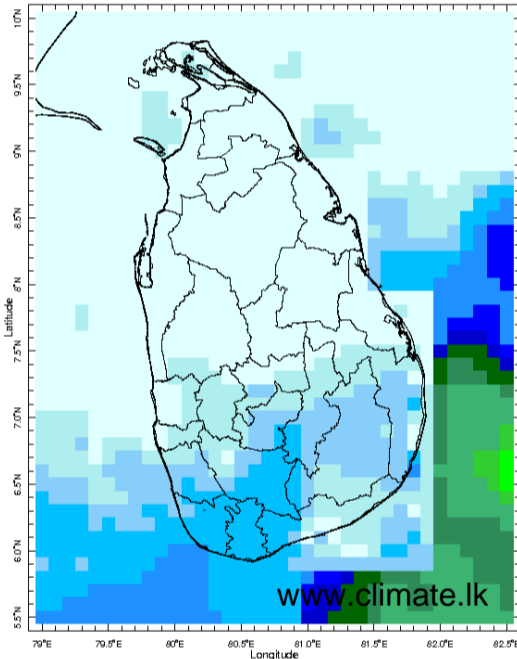
23 Nov 2016



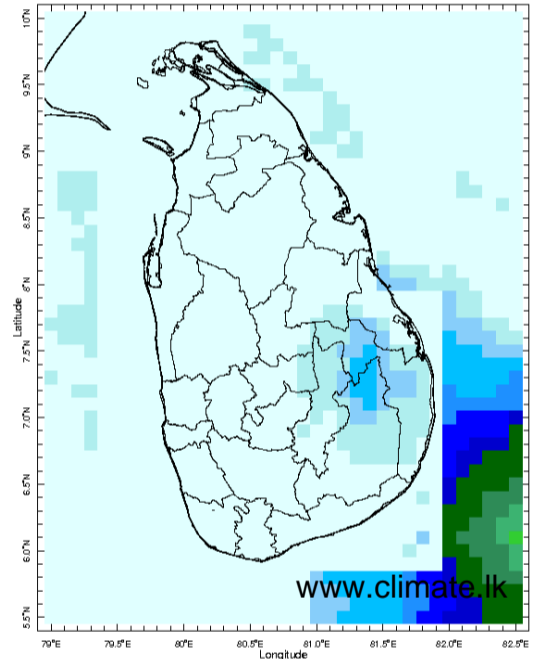
24 Nov 2016



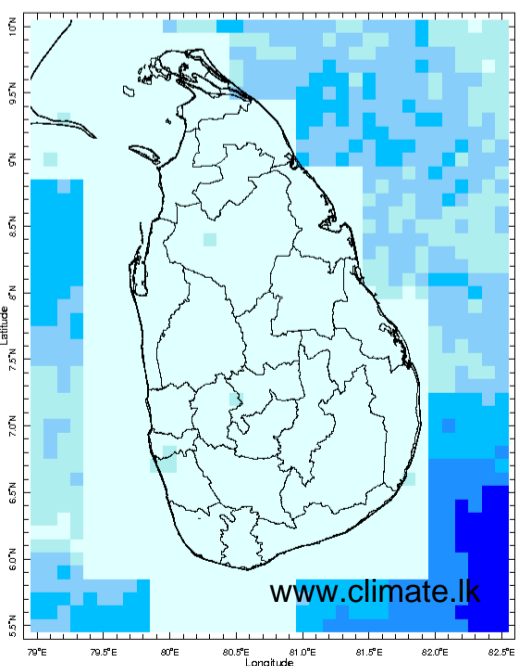
25 Nov 2016



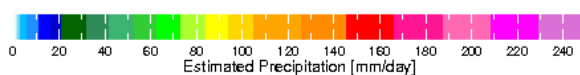
26 Nov 2016



27 Nov 2016

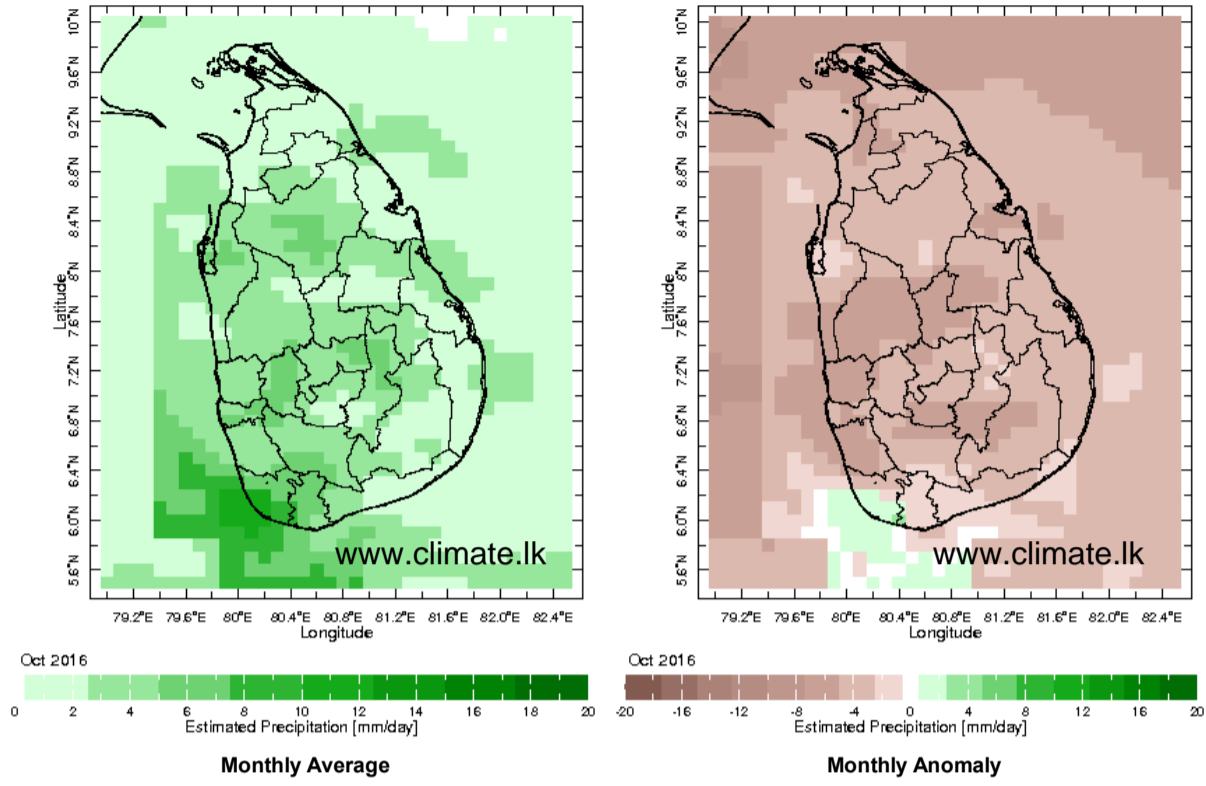


28 Nov 2016

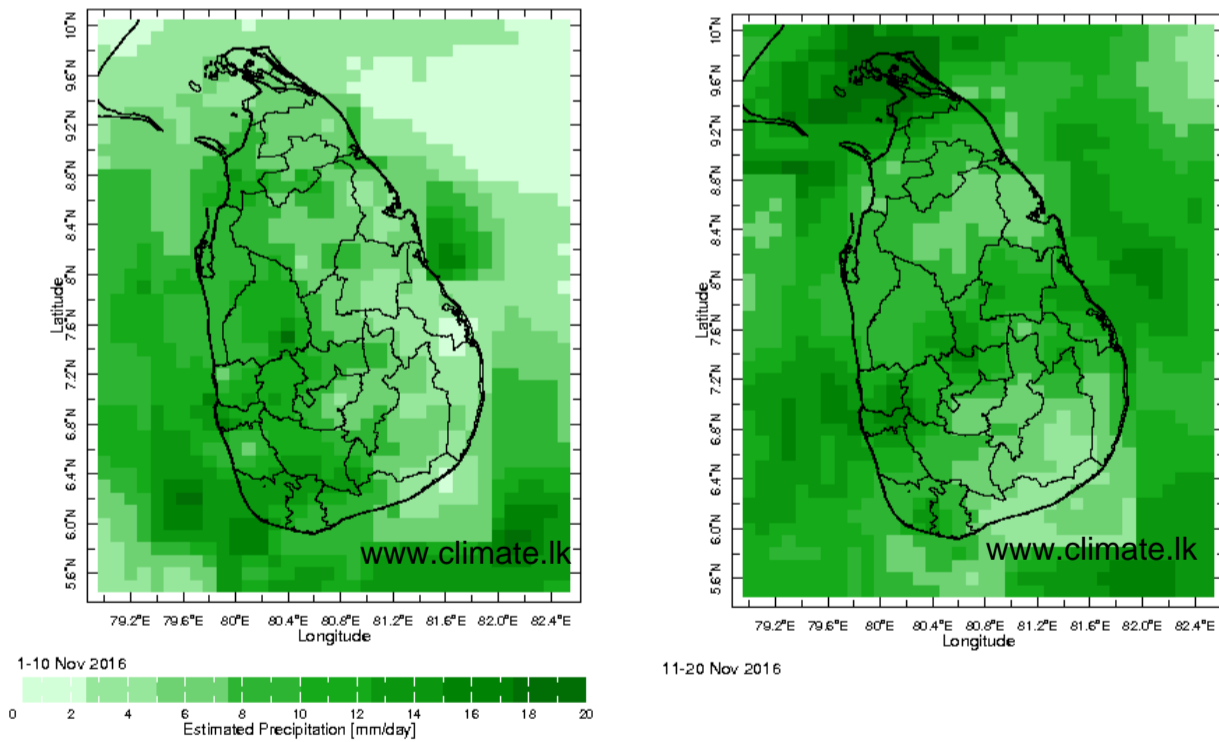


## Monthly Rainfall Monitoring

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

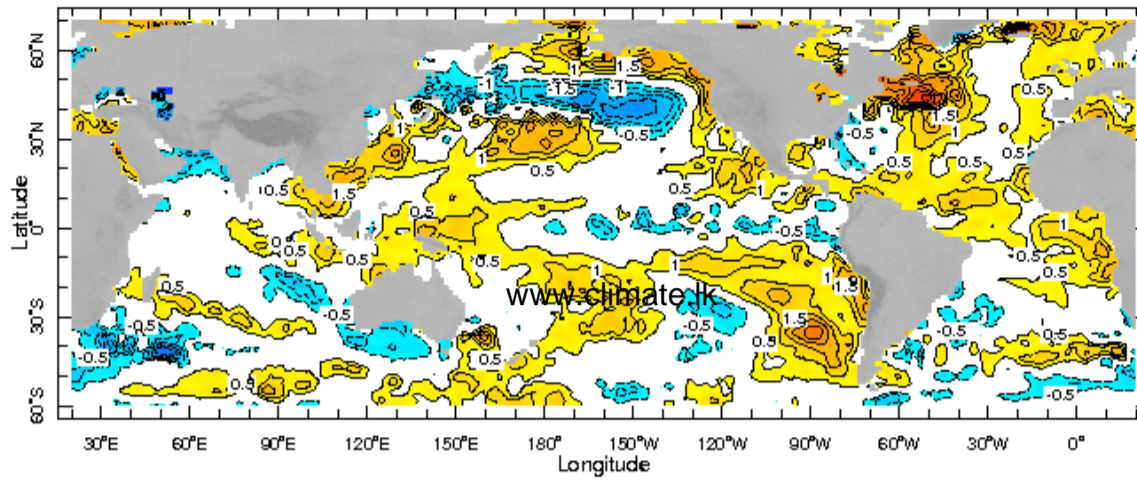


## Dekadal (10 Day) Satellite Derived Rainfall Estimates

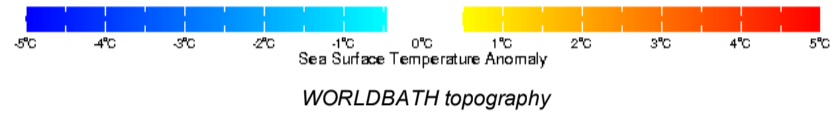


## Weekly Average SST Anomalies

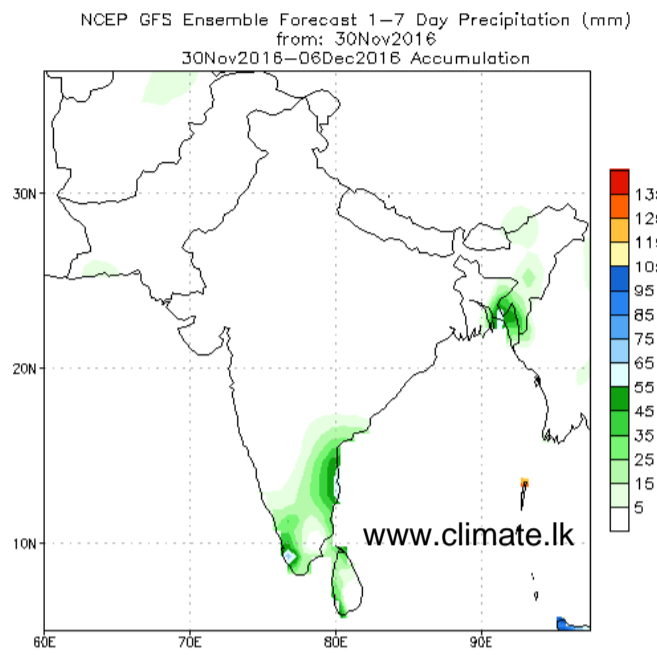
Weekly average Sea Surface Temperature (SST) anomaly in the world from NOAA NCEP



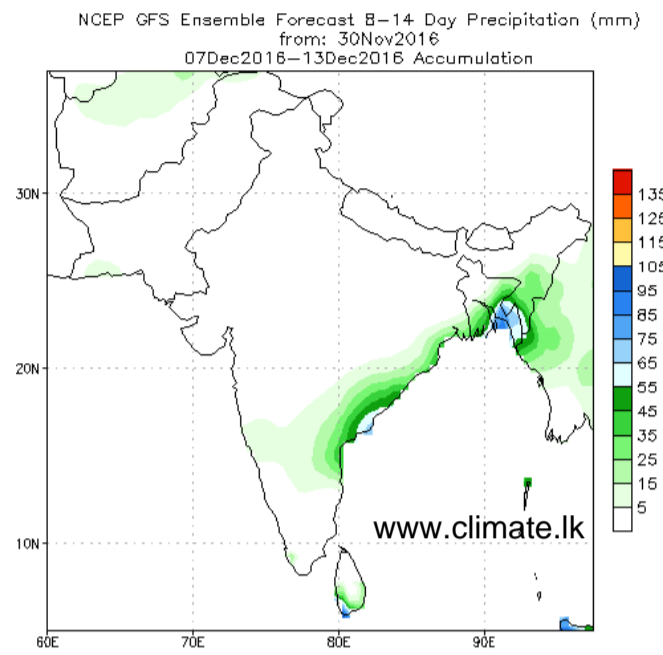
23 Nov 2016



**NCEP GFS 1- 14 Day prediction**



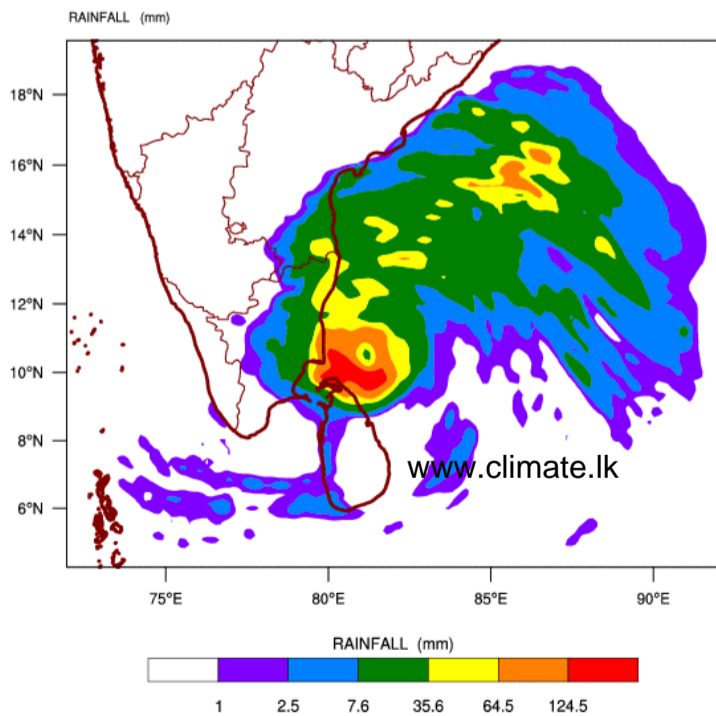
Bias correction based on last 30-day forecast error



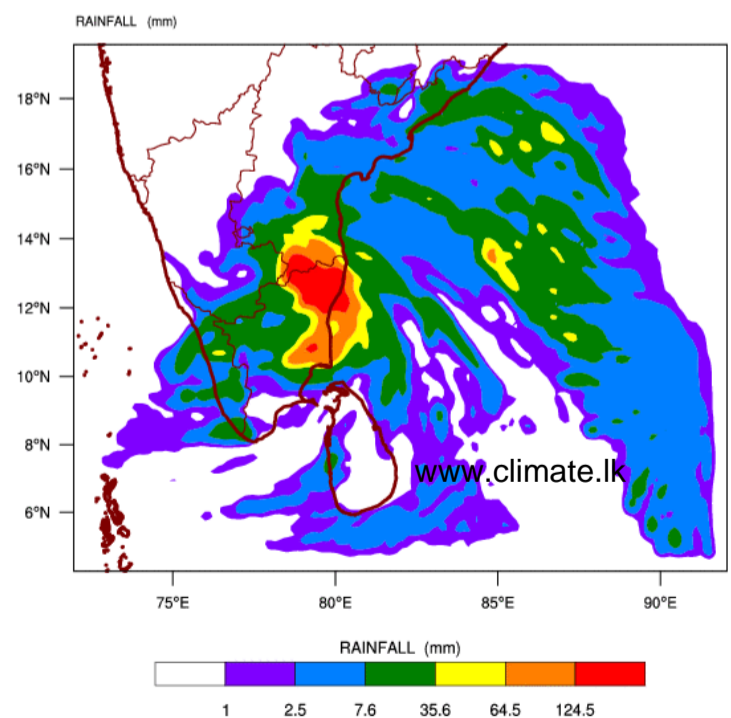
Bias correction based on last 30-day forecast error

**WRF Model Forecast (from IMD Chennai)**

WRF MODEL FORECAST (48 HR.) RAINFALL(mm)  
based on 00 UTC of 30-11-2016 valid for 03 UTC of 02-12-2016



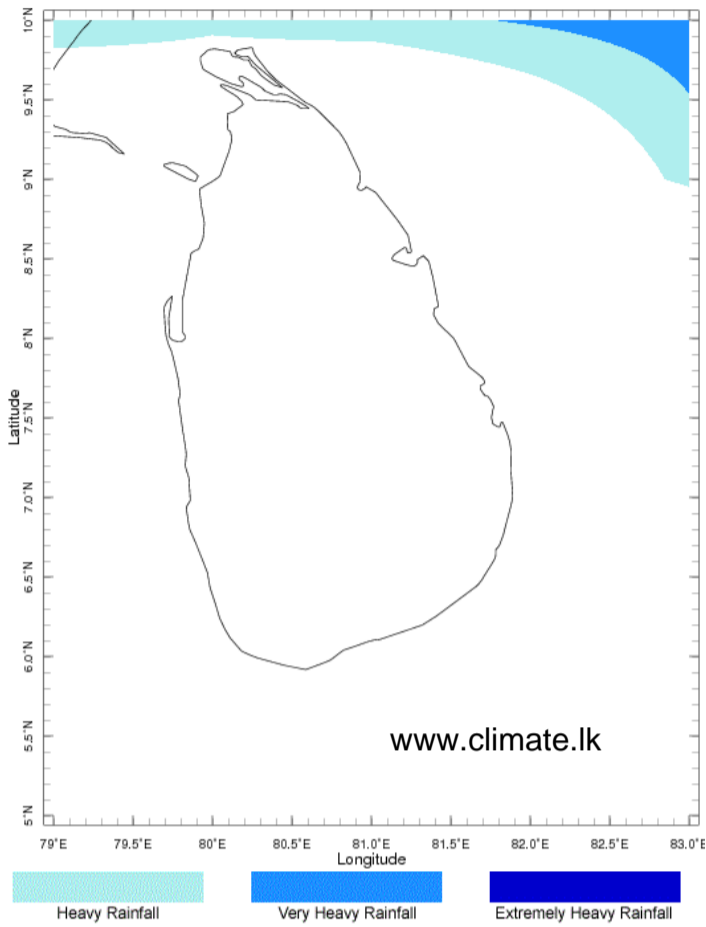
WRF MODEL FORECAST (72 HR.) RAINFALL(mm)  
based on 00 UTC of 30-11-2016 valid for 03 UTC of 03-12-2016



## Weekly Rainfall Forecast from IRI

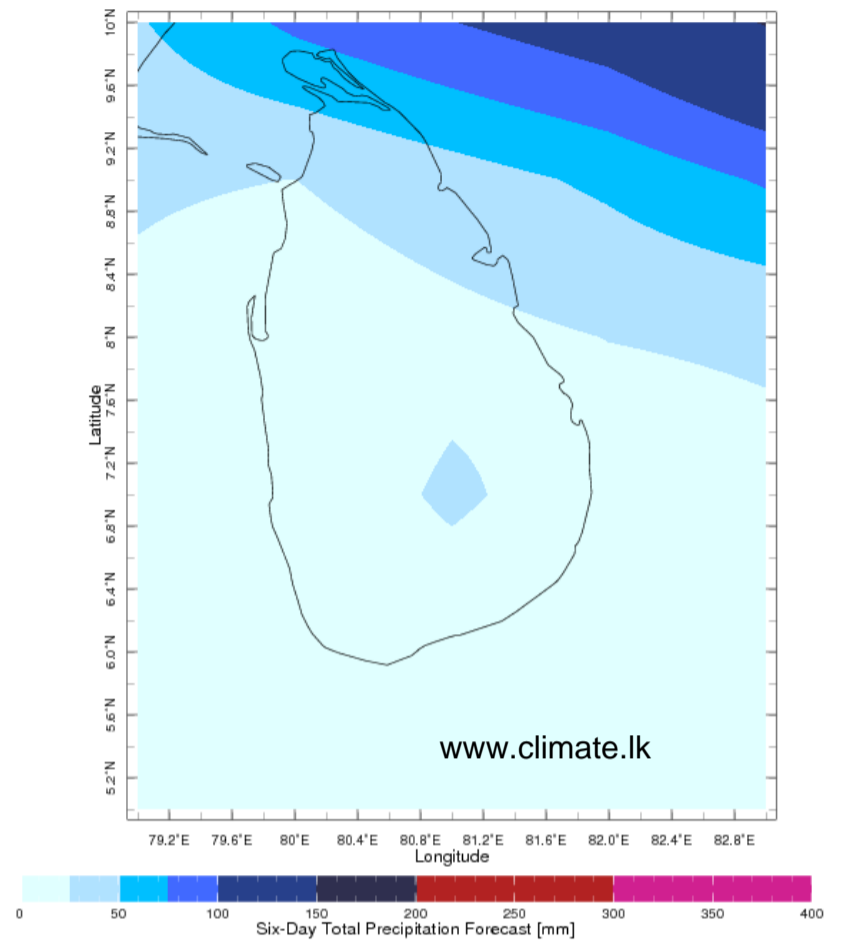
Total rainfall forecast from the IRI for next six days is provided in figures below. The figure to the left shows the expectancy of heavy rainfall events during these six days while the figure to the right is the prediction of total rainfall amount during this period.

Forecast for 30 Nov 2016 - 5 Dec 2016 Issued 0000 30 Nov 2016



Extreme Rainfall Forecast

Forecast for 30 Nov 2016 - 5 Dec 2016 Issued 0000 30 Nov 2016



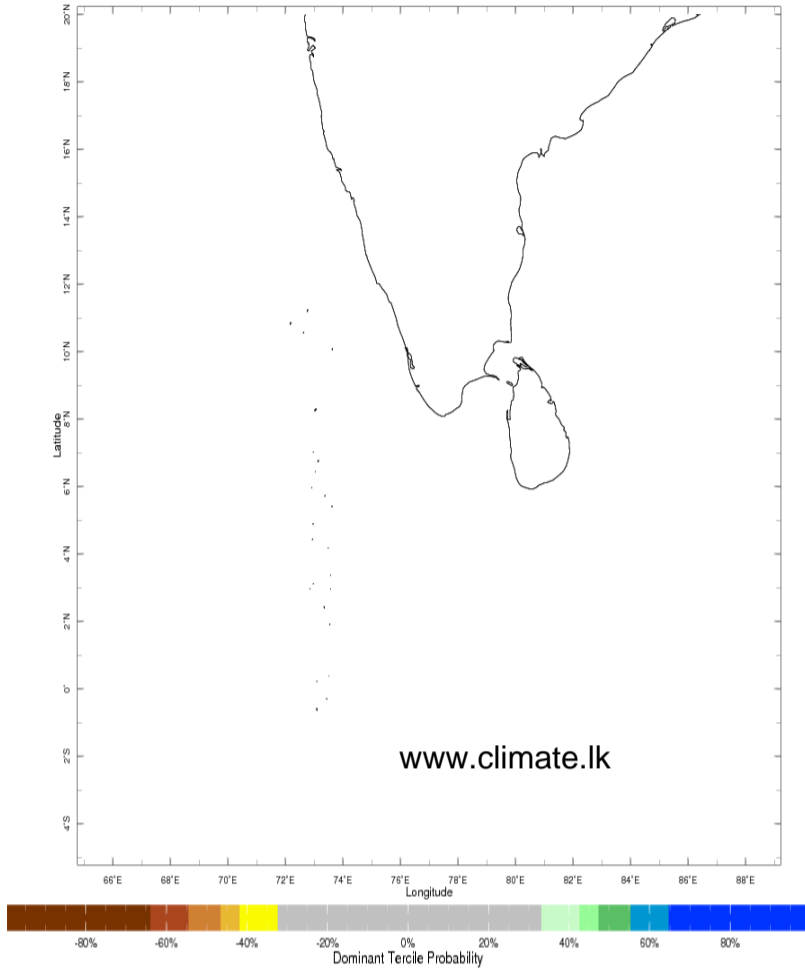
Total Six Day Precipitation Forecast



## Seasonal Rainfall and Temperature Forecast

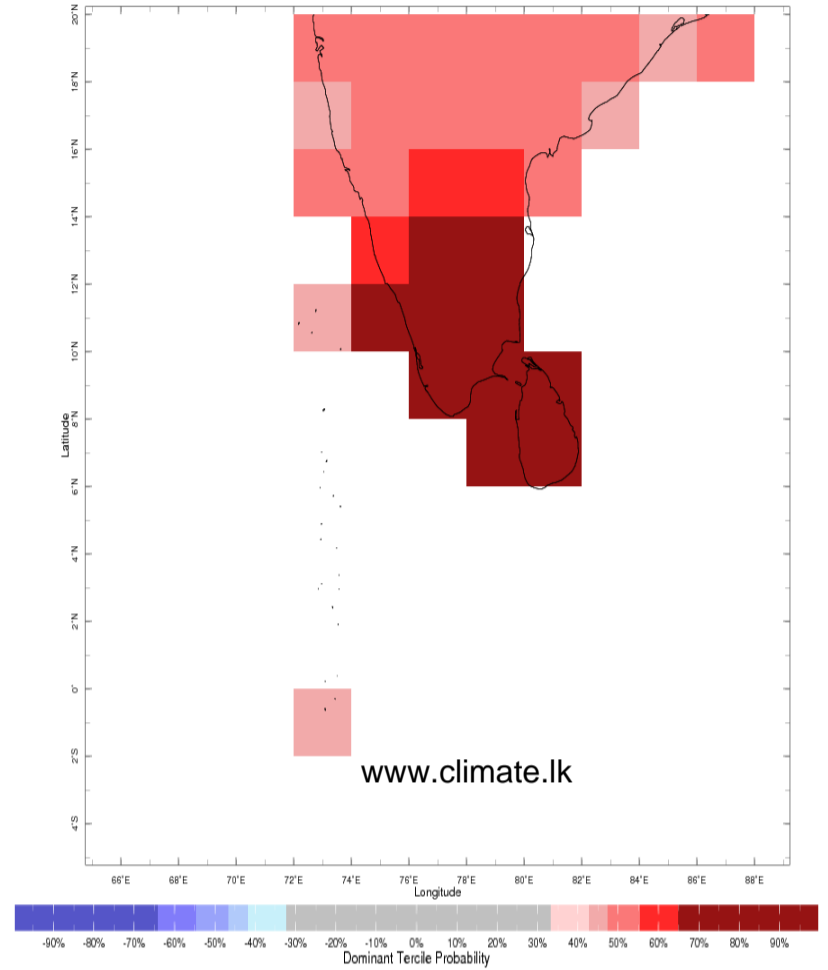
Following is the latest seasonal precipitation and temperature prediction for the next 3 months by the IRI. The color shading indicates the probability of the most dominant tercile -- that is, the tercile having the highest forecast probability. The color bar alongside the map defines these dominant 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%).

Dec 2016 - Feb 2017 IRI Seasonal Precipitation Forecast issued Nov 2016



Precipitation Forecast

Dec 2016 - Feb 2017 IRI Seasonal Temperature Forecast issued Nov 2016



Temperature Forecast

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