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Experimental Climate Monitoring and Prediction

by: Ruchira Lokuhetti, Chalani Malge, Janan Visvanathan, Lareef Zubair and Michael Bell[1] (FECT and IRI[1])

7 June 2018

Highlights

- ***The IRI weekly rainfall forecast predicts total rainfall between 100-150 mm in Gampaha, Colombo, Kalutara, Galle and Matara districts during 6th -11th June.***
- ***Between 30 May-5 Jun: up to 50 mm of rainfalls were recorded in several parts of the country.***
- ***From 27 May–2 Jun: minimum temperature of 20 ºC was recorded from Nuwara Eliya and Badulla districts while Ampara and Batticaloa districts recorded a maximum temperature between 35-40 ºC.***
- ***From 29 May-4 Jun: up to 36 km/h, northwesterly winds were experienced by the entire island.***
- ***Average sea surface temperature was observed in the seas around Sri Lanka.***

Monitoring

Rainfall

***Weekly Monitoring*:** On May 30th, Morawaka region in Matara district and Middeniya in Hambantota district received up to 20 mm of rainfall. On the 31st, Chilaw, Padukka and Ingiriya regions received up to 50 mm of rainfall; Avissawella and Eheliyagoda areas up to 30 mm; and Negambo and several areas of Kurunegala district up to 20 mm. On June 1st, Kegalla and Ratnapura districts received up to 50 mm of rainfall; Nuwara Eliya, Gampaha, Colombo and Kalutara districts up to 30 mm; Puttalam, Kurunegala and Galle districts up to 20 mm. On the 2nd, Kurunegala, Kegalla, Kandy, Gampaha, Colombo, Nuwar Eliya and Ratnapura districts received up to 50 mm; Ampara and Kalutara district up to 30 mm; and Puttalam, Matale, Galle, Matara and Monaragala districts up to 20 mm. On the 3rd, Ratnapura district received up to 50 mm of rainfall; Kegalla, Kandy, Nuwara Eliya, Colombo and Kalutara districts up to 30 mm; and Puttalam, Kurunegala, Gampaha and Galle up to 20 mm. On the 4th, Trincomalee district received up to 50 mm of rainfall; and Ampara district up to 30 mm. On the 5th, Ratnapura district received up to 20 mm of rainfall.

Total Rainfall for the Past Week: The RFE 2.0 tool shows total rainfall 75-100 mm of total rainfall in, Gampaha, Kegalla, Nuwara Eliya, Ratnapura, Colombo and Kalutara districts; up to 50-75 mm in Puttalam, Kurunegala and Kandy districts; and 25-50 mm in Batticaloa, Ampara, Galle and Matara districts. Above average rainfall up to 100-200 mm is shown for Ratnapura district; up to 50-100 mm Kegalla, Nuwara Eliya, Puttalam, Colombo and Kalutara districts.

***Monthly Monitoring*:** During May - above average rainfall conditions were experienced by the entire island. Puttalam, Kurunegala, Anuradhapura, Matale and Polonnaruwa districts received up to 360 mm above average rainfall; Vavuniya, Trincomalee, Gampaha, Colombo, Kegalla, Ratnapura, Galle, Matara, Kandy, Badulla and Ampara districts up to 300 mm; and rest of the country up to 120 mm. The CPC Unified Precipitation Analysis tool shows ~750 mm of total rainfall in Kurunegala, Kegalla, Colombo, Kalutara and Ratnapura districts; up to 500 mm PuttalamGampaha, Galle, Matara, Hambantota, Nuwara Eliya, Kandy, Matale, Anuradhapura, Polonnaruwa, Ampara, Badulla and Monaragala districts; up to ~300 mm Mullaitivu and Trincomalee districts; and up to 200 mm in rest of the country.

Ocean State (*Text Courtesy IRI*)

Pacific sea state: May 18, 2018

In mid-May 2018, the east-central tropical Pacific waters reflected ENSO-neutral conditions. Most key atmospheric variables also indicated neutral conditions, although the upper level wind anomalies show remnants of La Niña. The subsurface water temperature continued to be above-average. The official CPC/IRI outlook calls for neutral conditions through the September-Novemeber season, with a nearly 50% chance of El Niño development by year's end. The latest forecasts of statistical and dynamical models collectively favor weak El Niño development by year's end, but forecasters hedge on this due to low confidence at this time of year.

Indian Ocean State

Average sea surface temperature was observed in the seas around Sri Lanka.

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Predictions

Rainfall

14-day prediction:

NOAA NCEP models:

From 06th -12th Jun: Total rainfall between 105-115 mm in Kegalle, Colombo, Ratnapura, Kalutara and Galle districts; between 95-105 mm in Puttalam, Kurunegala and Gampaha districts; between 85-95 mm in Matale, Kandy, Nuwara Eliya and Matara districts; between 65-75 mm in Anuradhapura, Polonnaruwa, Badulla, Monaragala and Hambantota districts.

From 13th -19th Jun: Total rainfall between 105-115 mm in Kegalle, Colombo, Ratnapura, Kalutara and Galle districts; between 95-105 mm in Kurunegala and Gampaha districts; between 85-95 mm in Puttalam, Matale, Kandy, Nuwara Eliya and Matara districts; between 65-75 mm in Anuradhapura, Polonnaruwa, Badulla, Monaragala and Hambantota districts.

IMD NCMWRF Forecast:

8th Jun: Up to 80 mm of rainfall in Puttalam, Kurunegala, Matale, Kandy, Kegalle and Gampaha districts; Up to 40 mm in Anuradhapura and Polonnaruwa districts; Up to 20 mm in Trincomalee, Ampara, Monaragala and Hambantota districts.

9th Jun: Up to 40 mm of rainfall in Mannar, Anuradhapura, Puttalam and Kurunegala districts; Up to 20 mm in Mullaitivu, Vavuniya, Trincomalee, Polonnaruwa and Matale districts; Up to 10 mm in Batticaloa, Ampara, Gampaha, Badulla and Ratnapura districts.

IRI Model Forecast:

From 6th -11th Jun: Total rainfall between 100-150 mm in Gampaha, Colombo, Kalutara, Galle, Matara and Ratnapura districts; between 75-100 mm in Kurunegala and Kegalle districts; between 50-75 mm in Puttalam, Kandy, Nuwara Eliya and Hambantota districts; between 25-50 mm in Matale and Badulla districts; Up to 25 mm total rainfall 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 in the following 5 days.

[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.

FOUNDATION FOR ENVIRONMENT, CLIMATE AND TECHNOLOGY

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Weekly Hydro- Meteorological Report for Sri Lanka

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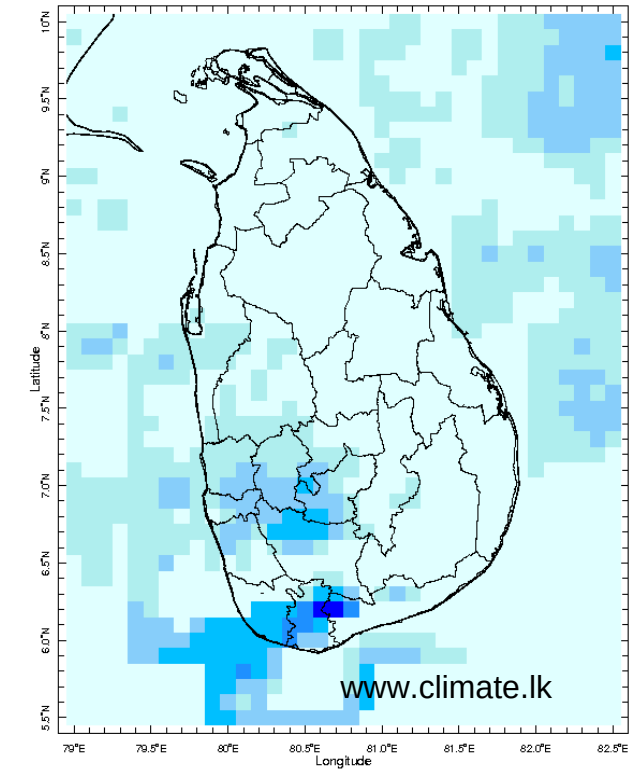
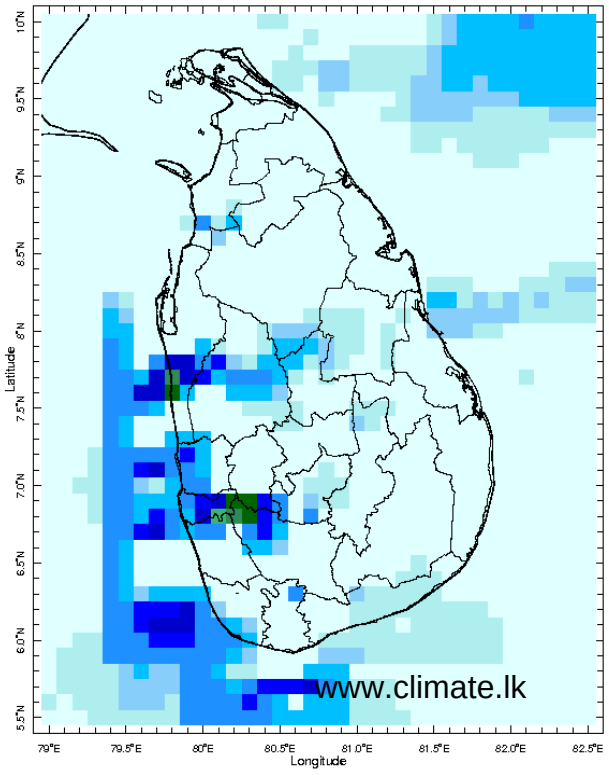
MONITORING

Daily Rainfall Monitoring

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



30 May 2018



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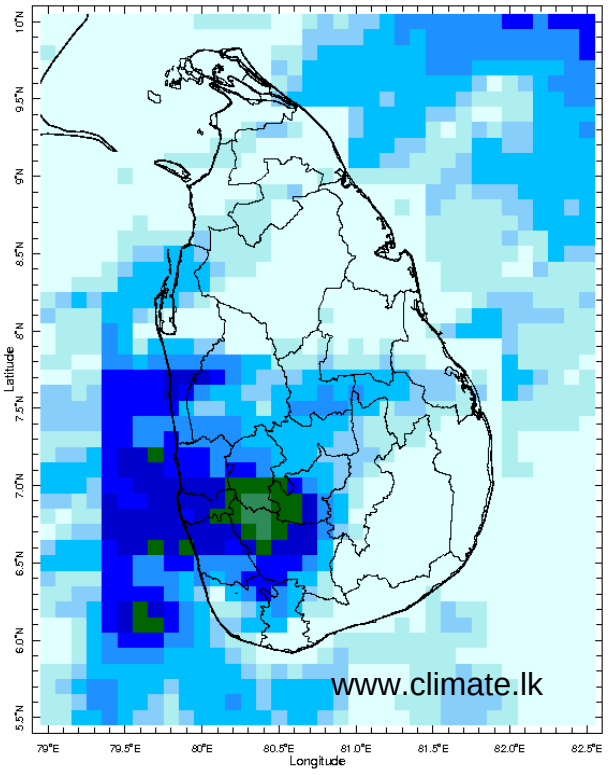

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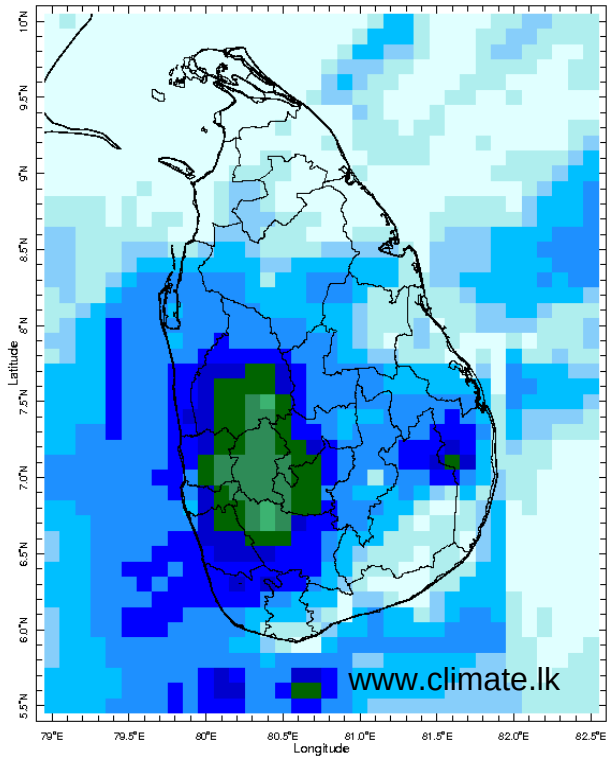

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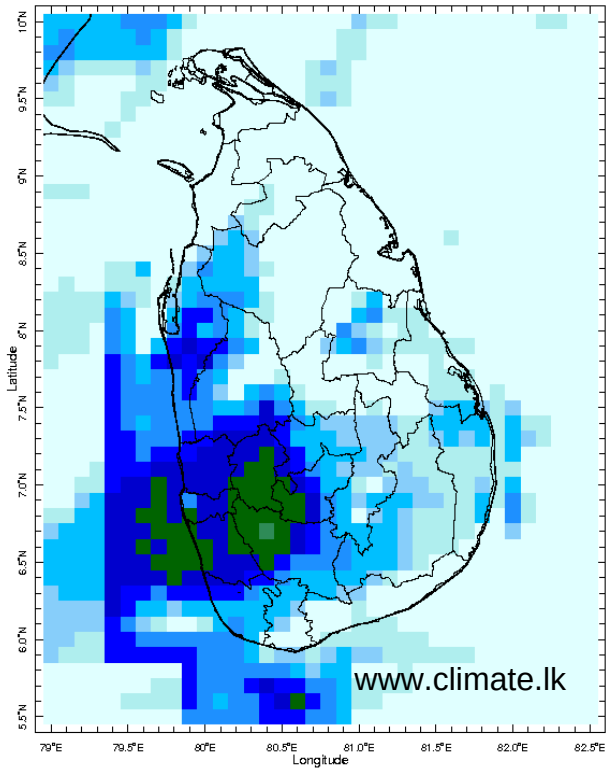

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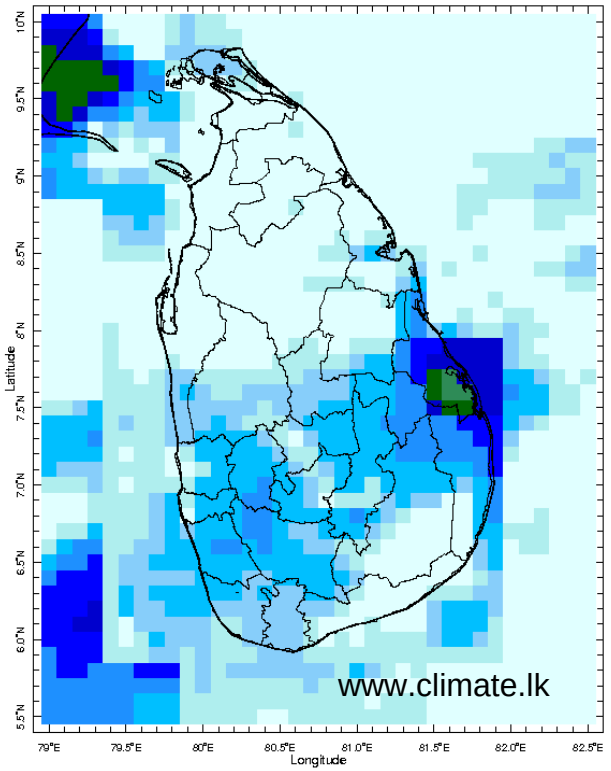

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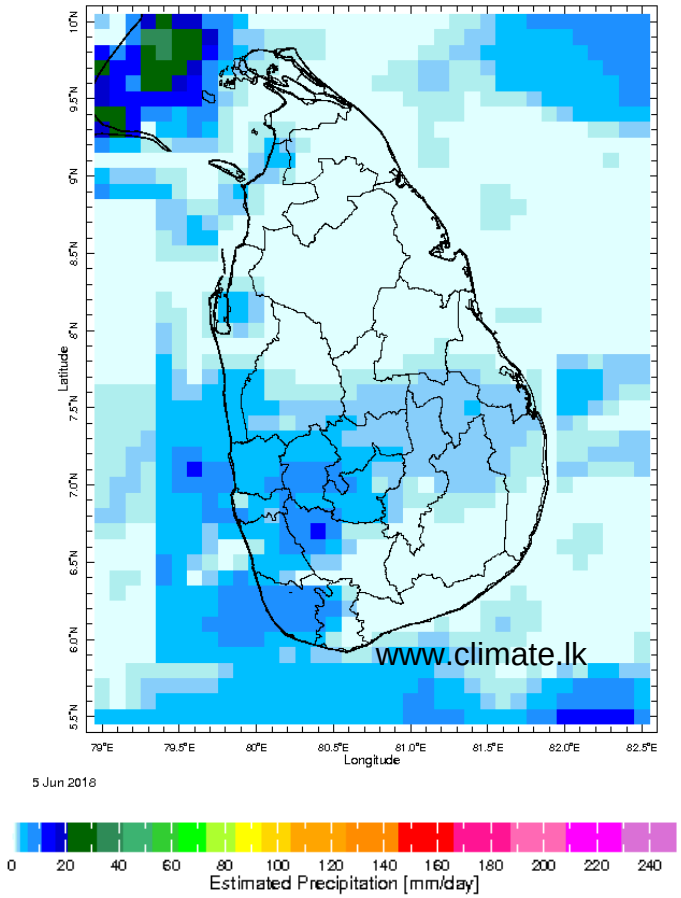
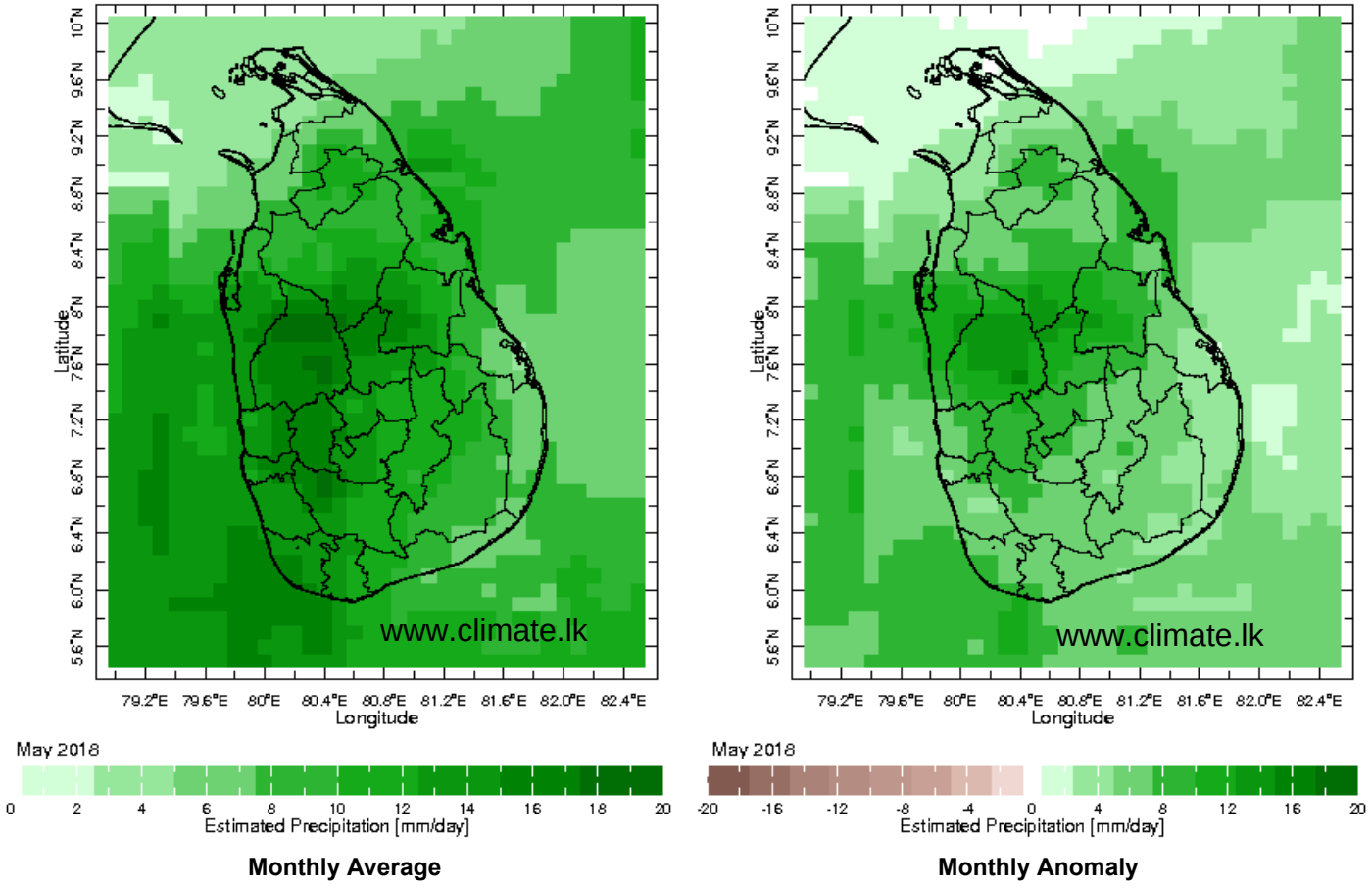

10°N
9.5°N
9°N
8.5°N
8°N
7.5°N
7.0°N
6.5°N
6.0°N
5.5°N
Latitude
79°E
79.5°E
80°E
80.5°E
81.0°E
81.5°E
82.0°E
82.5°E
Longitude
www.climate.lk
5 Jun 2018
0
20
40
60
80
100
120
140
160
180
200
220
240
Estimated Precipitation [mm/day]

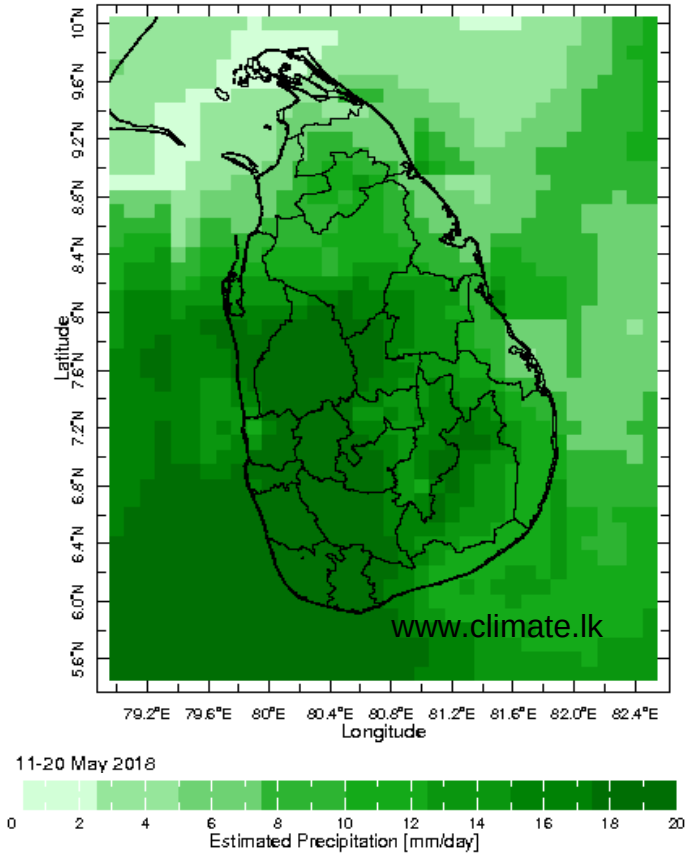
Monthly Rainfall Monitoring

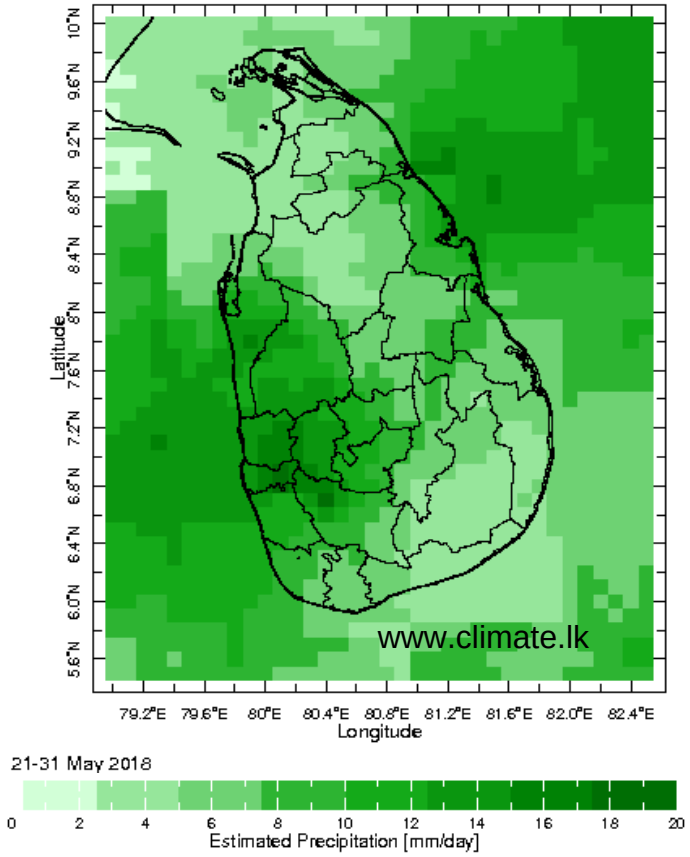
The figure in the left shows the average observed rainfall in the previous month. The rainfall anomaly in the previous month is shown in the figure to the right. The brown color in the anomaly figure shows places which received less rainfall than the historical average while the green color shows places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



Monthly Average **Monthly Anomaly**

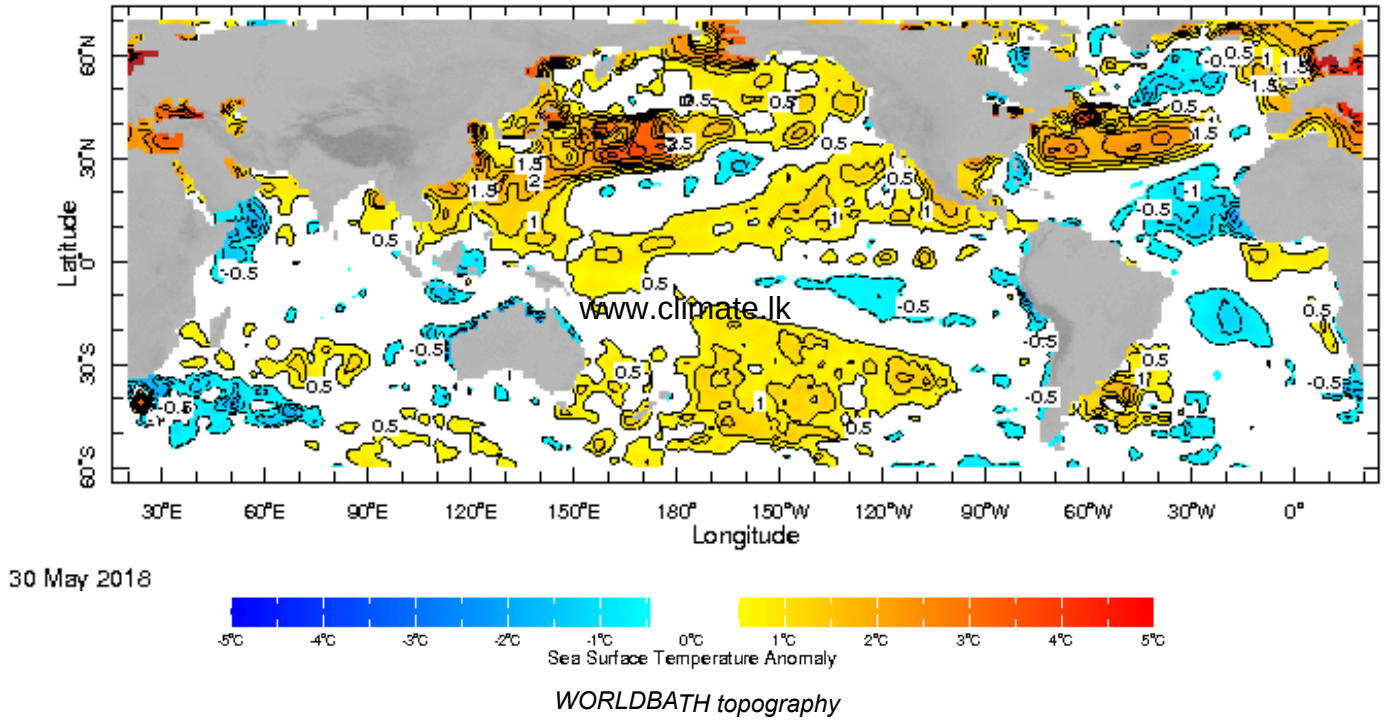
Dekadal (10 Day) Satellite Derived Rainfall Estimates





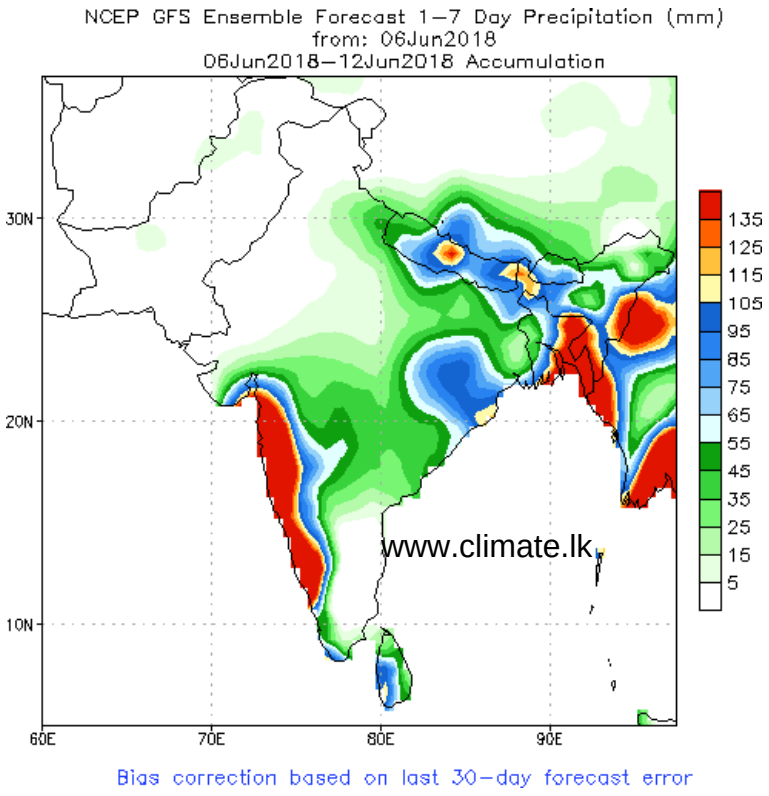
Weekly Average SST Anomalies

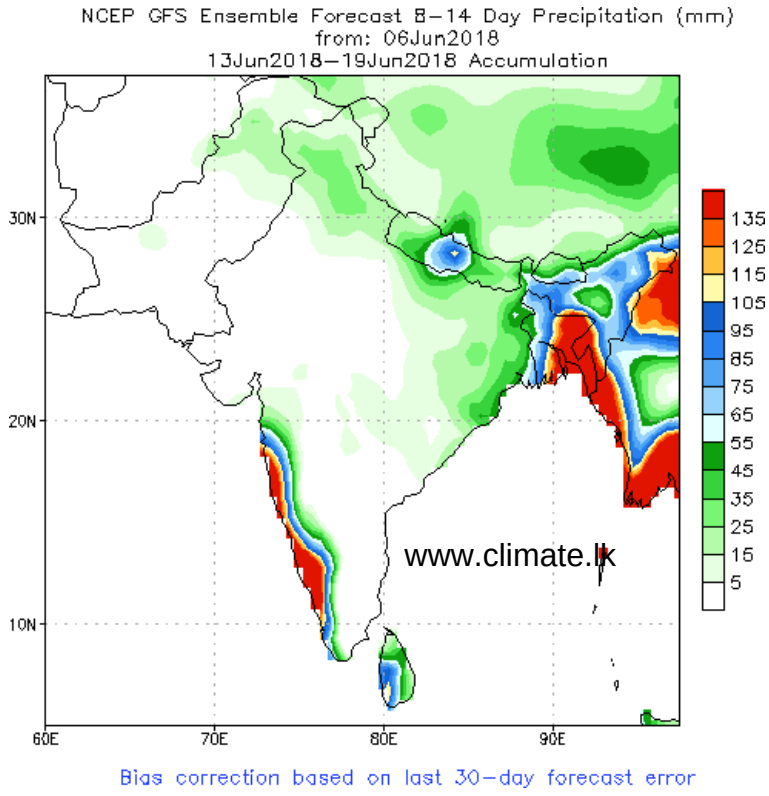
Weekly average Sea Surface Temperature (SST) anomaly in the world from NOAA NCEP



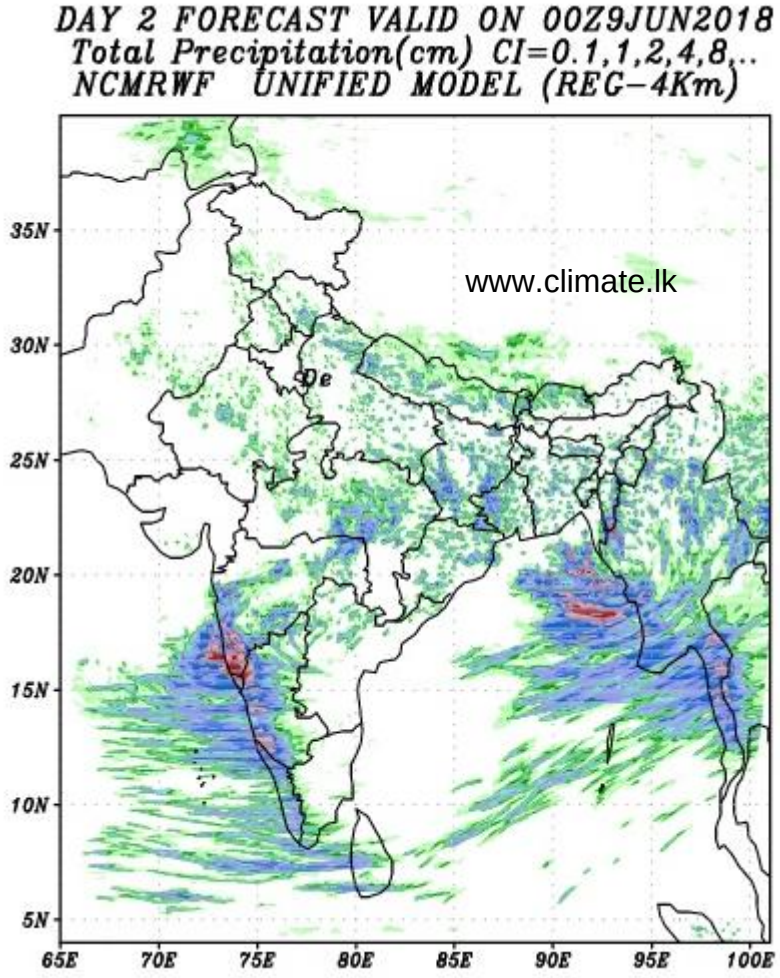
PREDICTIONS

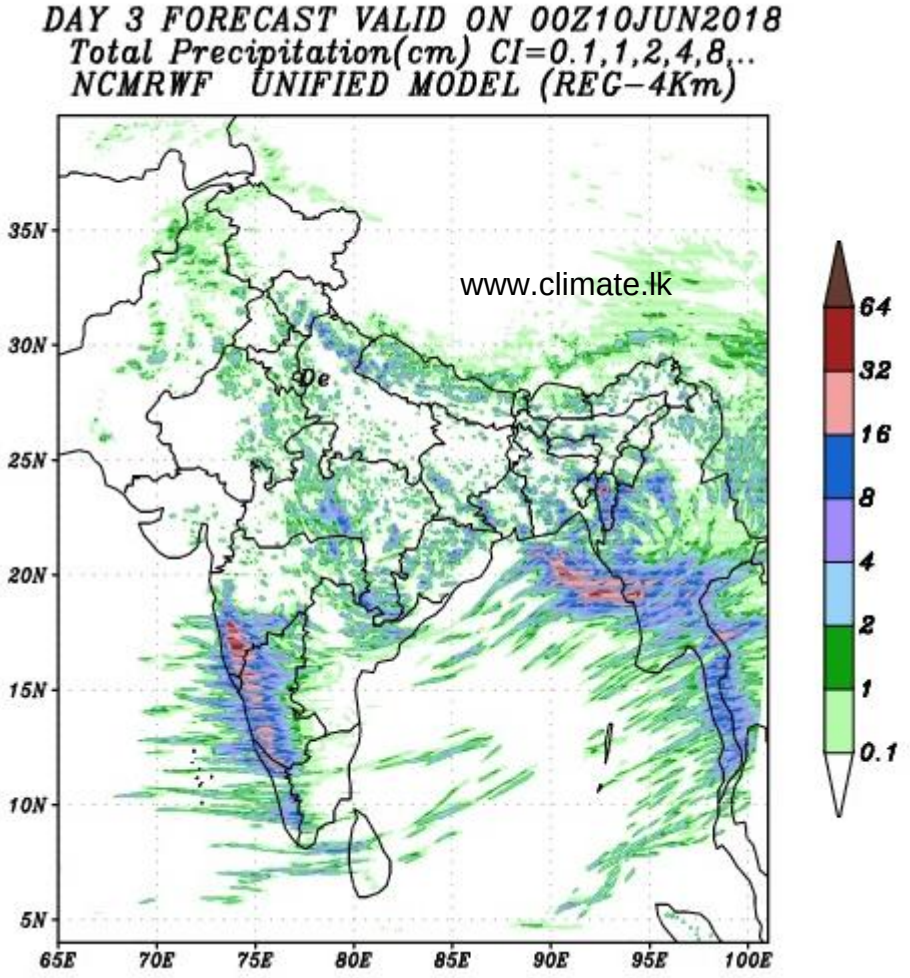
NCEP GFS 1-14 Day prediction





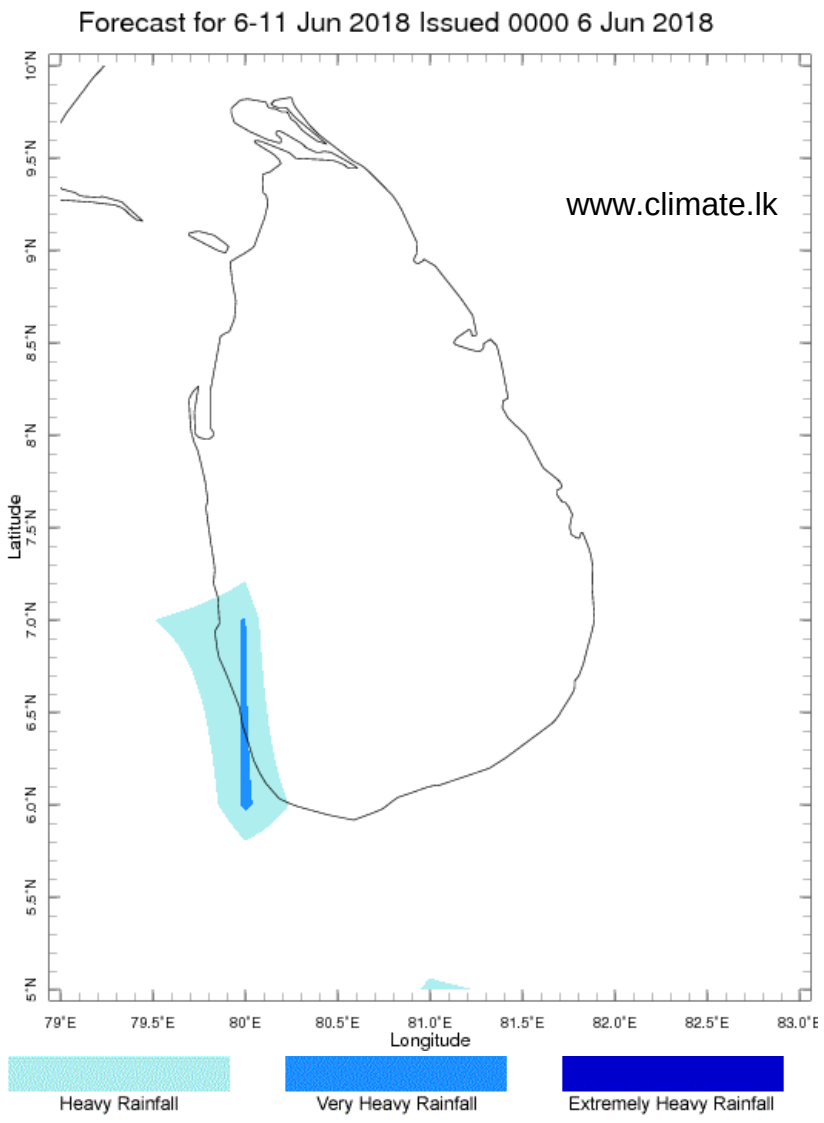
NCMWRF Model Forecast (from IMD)



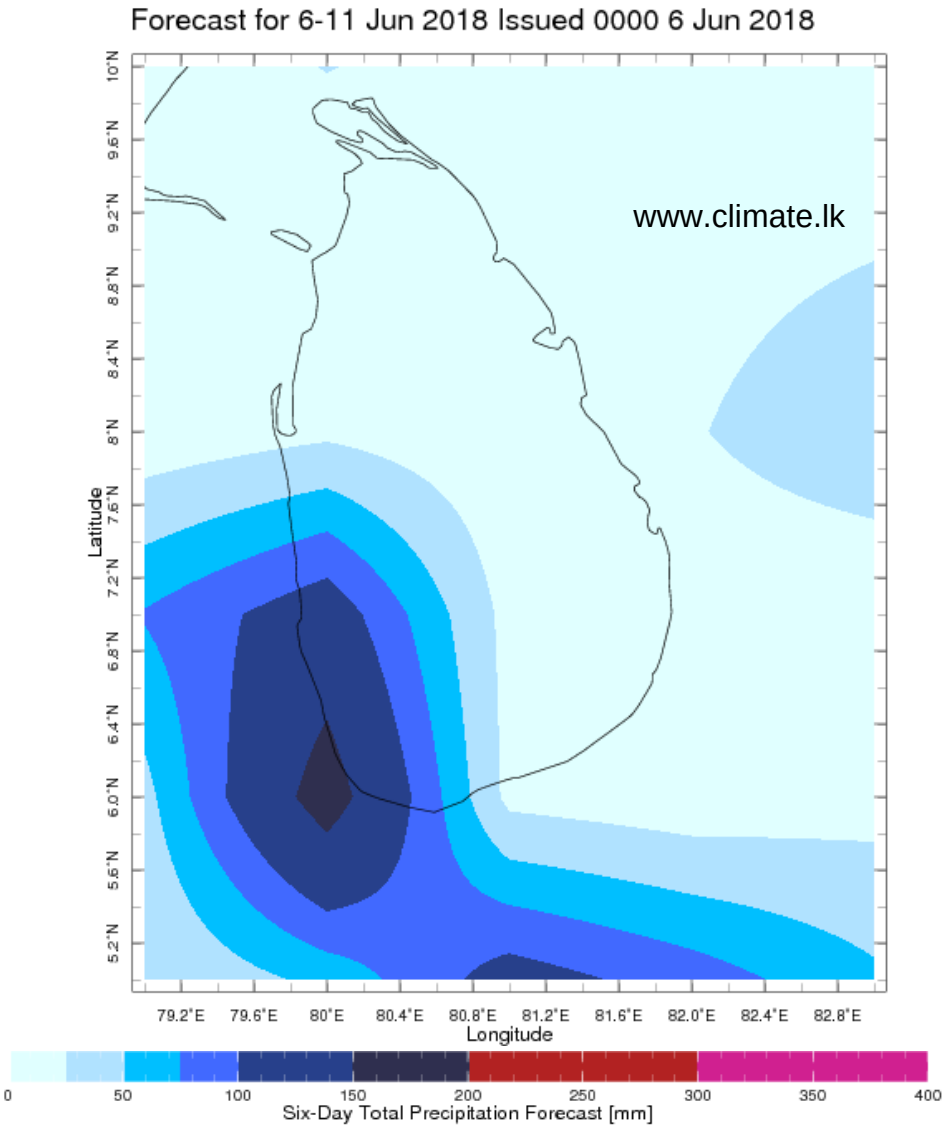


Weekly Rainfall Forecast from IRI

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