

Experimental Climate Monitoring and Prediction

by: Ruchira Lokuhetti, Chalani Malge, Janan Visvanathan,

Lareef Zubair and Michael Bell¹ (FECT and IRI¹)**15 March 2018****Highlights**

- *The IRI weekly forecast predicts total rainfall between 50-75 mm in Kegalle, Kandy, Nuwara Eliya and Badulla districts during 14th-20th Mar.*
- *Between 7- 13 Mar: up to 100 mm of rainfall was recorded in Ampara district on the 11th.*
- *From 4- 10 Mar: minimum temperature of 15 °C was recorded from Nuwara Eliya district while Kurunegala and Puttalam districts recorded a maximum temperature between 35-40 °C.*
- *From 6- 12 Mar: up to 36 km/h, easterly 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: No significant rainfalls were recorded in any part of the island on March 7th. On the 8th, Batticaloa and Ampara districts received up to 20 mm of rainfall; and Gampaha, Colombo, Kalutara, Galle, Matara, Ratnapura, Monaragala, Badulla, Hambantota, Matale, Kandy and Polonnaruwa districts up to 10 mm. On the 9th, Batticaloa and Ampara districts received up to 30 mm of rainfall; Polonnaruwa, Monaragala, Nuwara Eliya, Gampaha and Colombo districts up to 20 mm of rainfall; and most regions of the central and southern parts of the island up to 10 mm. On the 10th, Galle and Hambantota districts received up to 30 mm of rainfall; Batticaloa, Badulla, Monaragala, Ampara, Ratnapura and Matara districts up to 20 mm; and Gampaha, Kalutara, Colombo, Kegalla, Kandy and Nuwara Eliya districts up to 10 mm. On the 11th, Ampara district received up to 100 mm of rainfall; Monaragala district up to 90 mm; Badulla and Batticaloa district up to 70 mm; Polonnaruwa, Nuwara Eliya and Hambantota districts up to 50 mm; Matale, Kandy, Ratnapura, Galle, Kalutara, Matara and Kegalla districts up to 30 mm; and Kilinochchi, Mullaitivu, Vavuniya, Kurunegala, Anuradhapura and Trincomalee districts up to 20 mm. On the 12th, Anuradhapura, Badulla and Monaragala districts received up to 50 mm of rainfall; Kurunegala, Matale and Ampara districts up to 30 mm; Trincomalee, Puttalam, Batticaloa, Polonnaruwa, Kandy, Nuwara Eliya, Hambantota, and Colombo districts up to 20 mm; and rest of the island up to 10 mm. On the 13th, Kilinochchi district received up to 90 mm of rainfall; Mullaitivu and Jaffna districts up to 30 mm; and Mannar and Galle districts up to 20 mm.

Total Rainfall for the Past Week: The RFE 2.0 tool shows total rainfall of 75-100 mm in Batticaloa, Badulla, Monaragala, Hambantota and Ampara districts; up to 50-75 mm in Polonnaruwa, Nuwara Eliya, Ratnapura and Galle districts; and up to 25-50 mm in Anuradhapura, Matale, Kandy, Kegalla, Colombo, Matara and Kalutara districts. It also shows above average rainfall up to 100-200 mm in Ampara district; and up to 50-100 mm in Kilinochchi, Batticaloa, Badulla, Monaragala and Hambantota districts. Below average rainfall up to 25-50 mm is shown for Puttalam, Kurunegala and Gampaha districts; and up to 10-25 mm in Mullaitivu, Mannar, Kegalla, and Colombo districts.

Monthly Monitoring: During February - below average rainfall conditions were mainly experienced by northern and southeastern regions of the island. Jaffna, Vavuniya, Mullaitivu, Mannar, Trincomalee, Anuradhapura, Kandy, Nuwara Eliya and southern regions of Badulla, Monaragala and Ampara districts received up to 150 mm below average rainfall. Above average rainfall up to 150 mm was received by northern regions of Ampara, Badulla and Monaragala districts; and up to 120 mm by Gampaha, Batticaloa and Matara districts. The CPC Unified Precipitation Analysis tool shows ~100 mm of total rainfall in Matara, Ratnapura, Nuwara Eliya, Kegalla, Kurunegala, Polonnaruwa, Matale, Kandy, Badulla, Monaragala, Ampara and Gampaha districts; and up to ~75 mm in Mullaitivu, Anuradhapura, Puttalam, Colombo and Hambantota districts.

Ocean State (Text Courtesy IRI)**Pacific sea state: March 8, 2018**

In early March 2018, the east-central tropical Pacific still reflected weak La Niña conditions. Many of the key atmospheric variables, however, no longer show patterns suggestive of La Niña, and the east Pacific subsurface water temperature has warmed back to average. The official CPC/IRI outlook calls for La Niña continuing through at least early spring, followed by a likely return to neutral conditions by the March-May season. The latest forecasts of statistical and dynamical models support this scenario.

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 14th - 20th Mar: Total rainfall between 25-35 mm in Trincomalee, Batticaloa and Galle districts; between 15-25 mm in Polonnaruwa, Ampara, Colombo, Matara and Ratnapura districts; between 5-15 mm in Jaffna, Mullaitivu, Vavuniya, Mannar, Anuradhapura, Puttalam, Matale, Badulla, Monaragala, Gampaha, Kegalle, Nuwara Eliya and Hambantota districts; Up to 5 mm total rainfall rest of the island.

From 21st – 27th Mar: Total rainfall between 35-45 mm in Batticaloa and Ampara districts; between 25-35 mm in Trincomalee and Polonnaruwa districts; between 15-25 mm in Monaragala and Galle districts; between 5-15 mm in Colombo, Ratnapura, Matara, Anuradhapura, Matale, Kandy and Badulla districts; Up to 5 mm total rainfall rest of the island.

IMD WRF Forecast:

16th Mar: Up to 7.6 mm of rainfall in Anuradhapura, Monaragala and Hambantota districts; Up to 2.5 mm in Jaffna, Kilinochchi, Mullaitivu, Mannar, Vavuniya, Puttalam, Kurunegala, Trincomalee, Polonnaruwa, Batticaloa, Ampara, Colombo and Kalutara districts.

17th Mar: Up to 7.6 mm of rainfall in Anuradhapura, Ampara, Monaragala and Hambantota districts; Up to 2.5 mm in Jaffna, Kilinochchi, Mullaitivu, Mannar, Vavuniya, Puttalam, Kurunegala, Matale, Kandy, Trincomalee, Polonnaruwa, Batticaloa, Gampaha, Colombo, Kalutara, Galle and Matara districts.

IRI Model Forecast:

From 14th -19th Mar: Total rainfall between 50-75 mm in Kegalle, Kandy, Nuwara Eliya and Badulla districts; between 25-50 mm in Puttalam, Kurunegala, Anuradhapura, Polonnaruwa, Matale, Batticaloa, Ampara, Monaragala, Ratnapura, Kalutara, Colombo, Gampaha districts; Up to 25 mm total rainfall rest of the island.

MJO based OLR predictions

For the next 15 days:

MJO shall enhance the rainfall in Sri Lanka in the next 5 days; shall not have an effect on the following 5 days; and shall suppress the rainfall in the next 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.

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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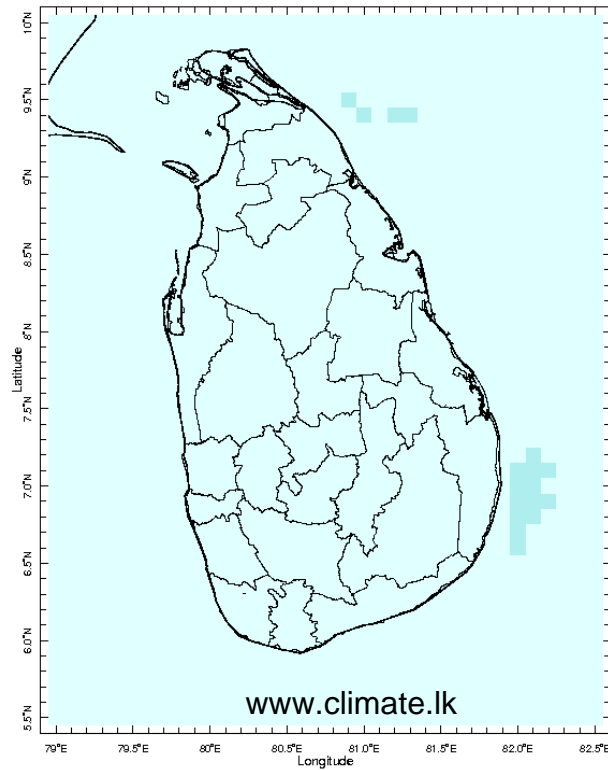
2. Predictions

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- b. WRF Model Rainfall Forecast from IMD Chennai
- c. Weekly Precipitation Forecast from IRI
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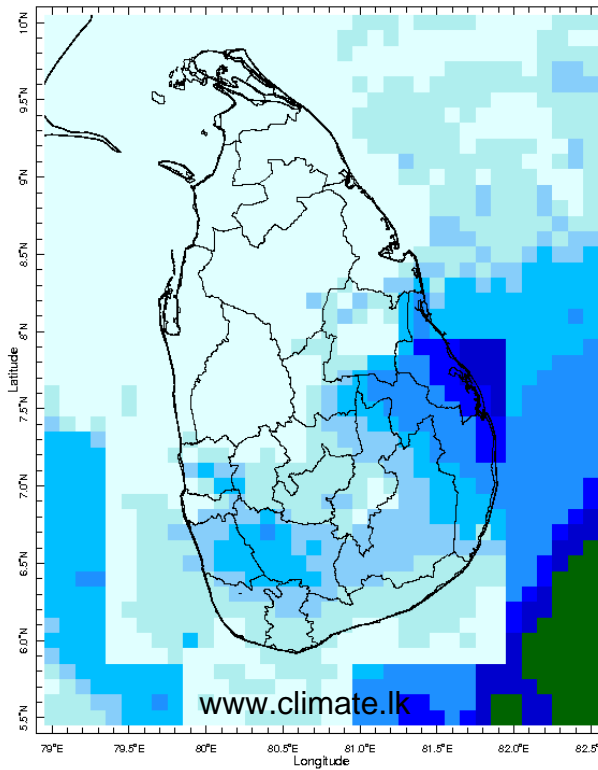
MONITORING

Daily Rainfall Monitoring

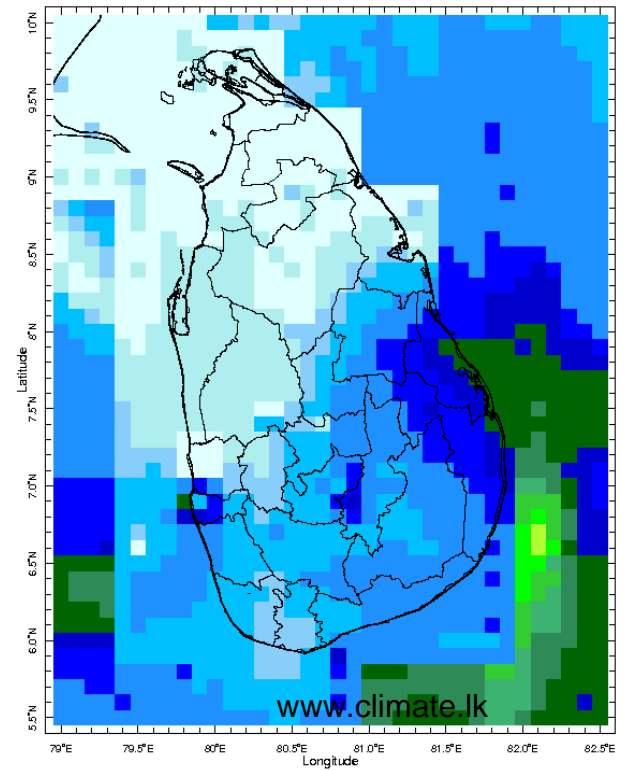
The following figures show the satellite observed rainfall in the last 7 days in Sri Lanka.



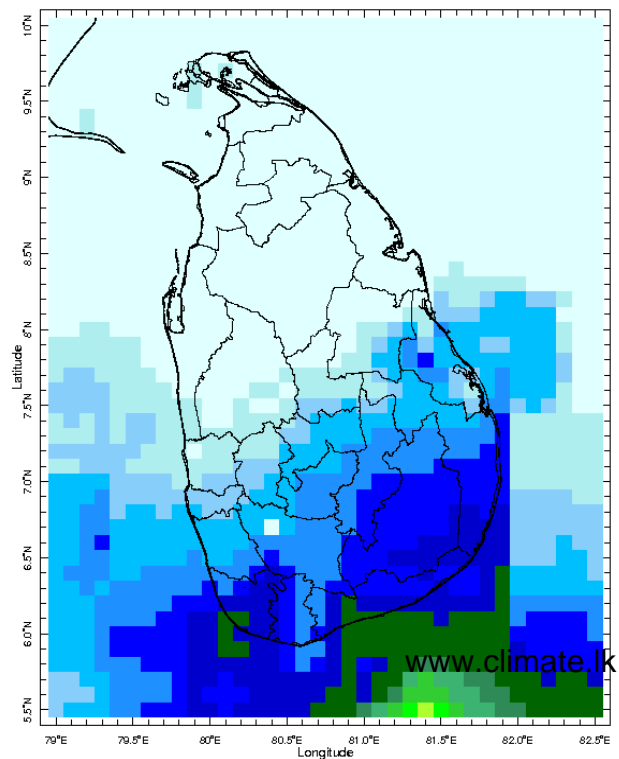
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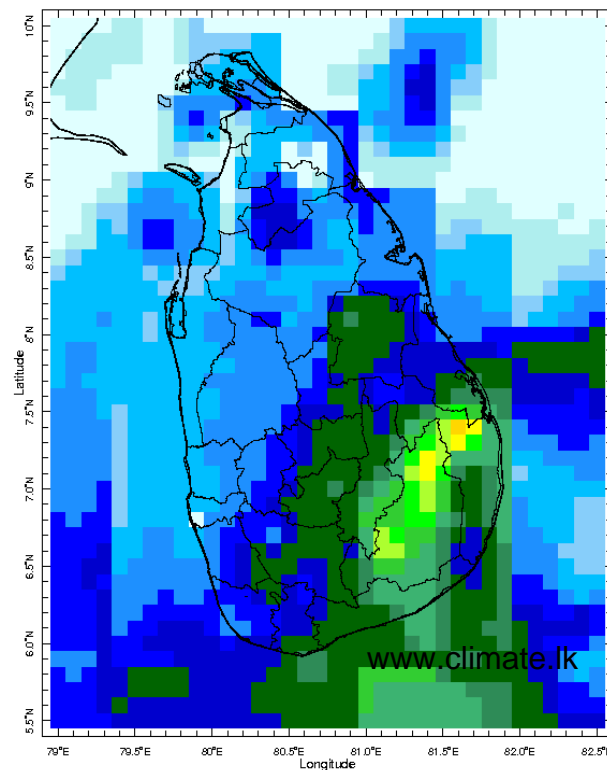
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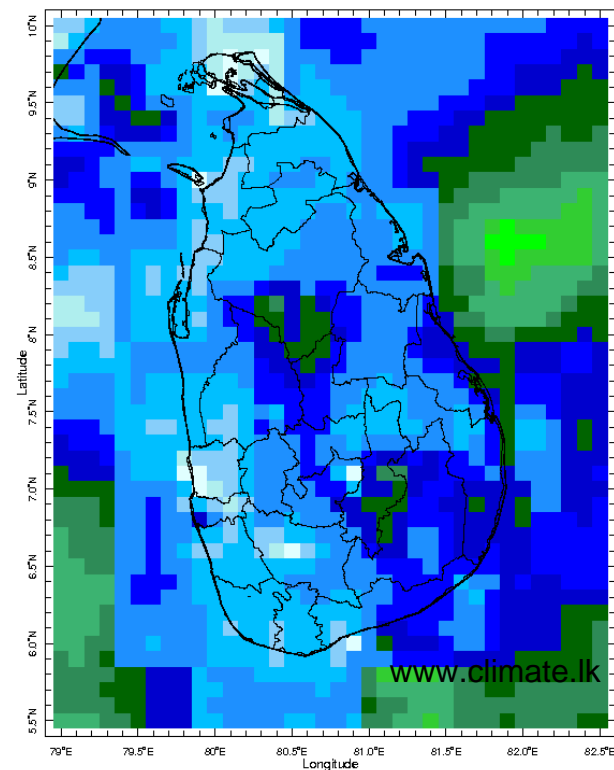
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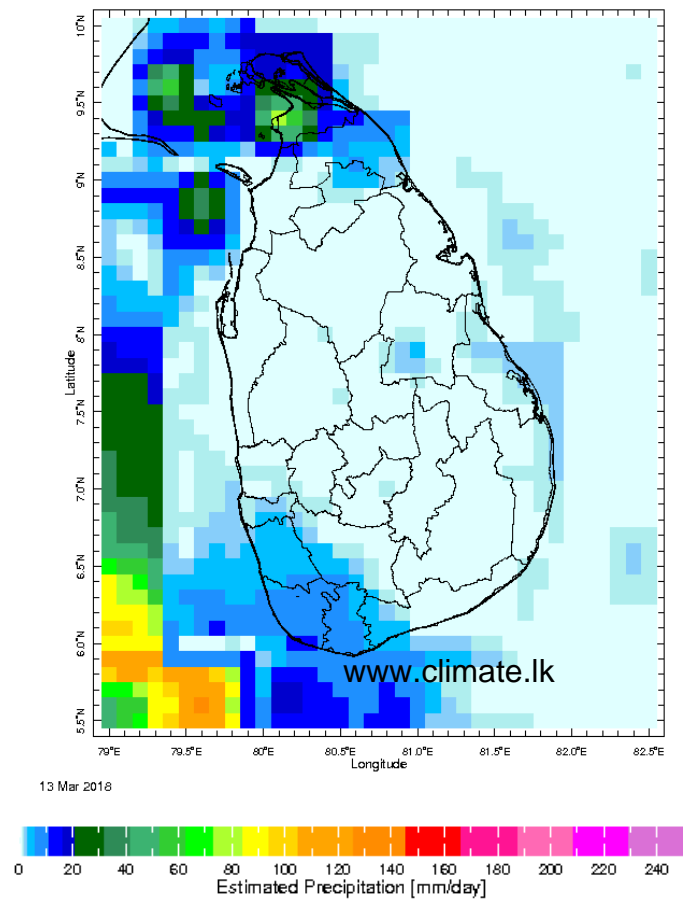
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11 Mar 2018

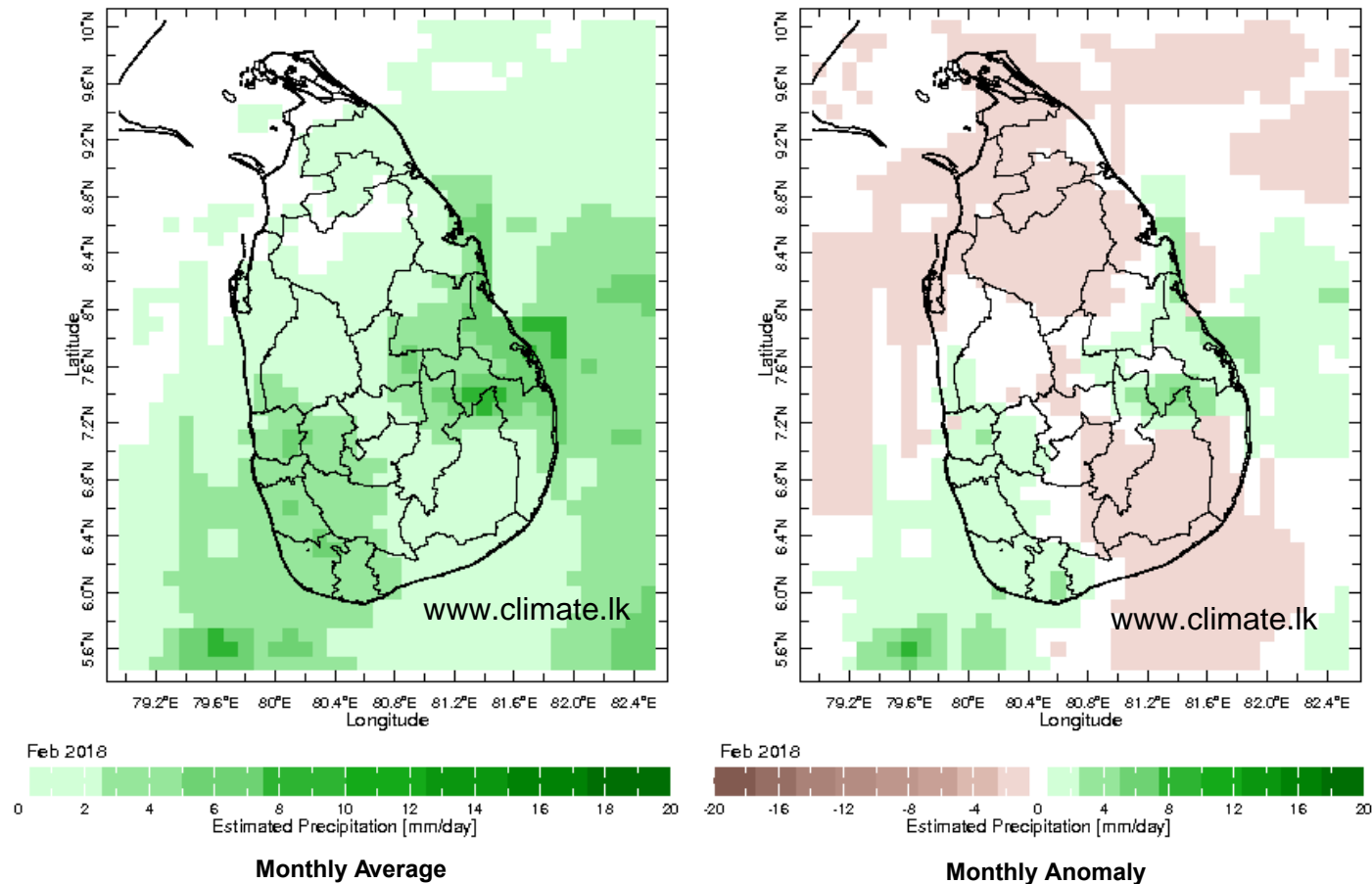


12 Mar 2018

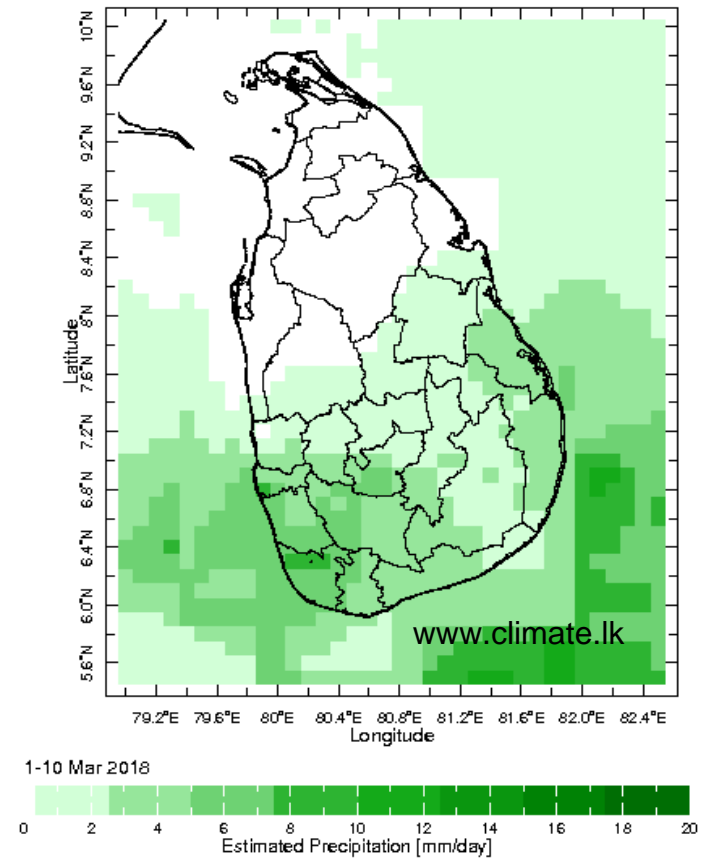
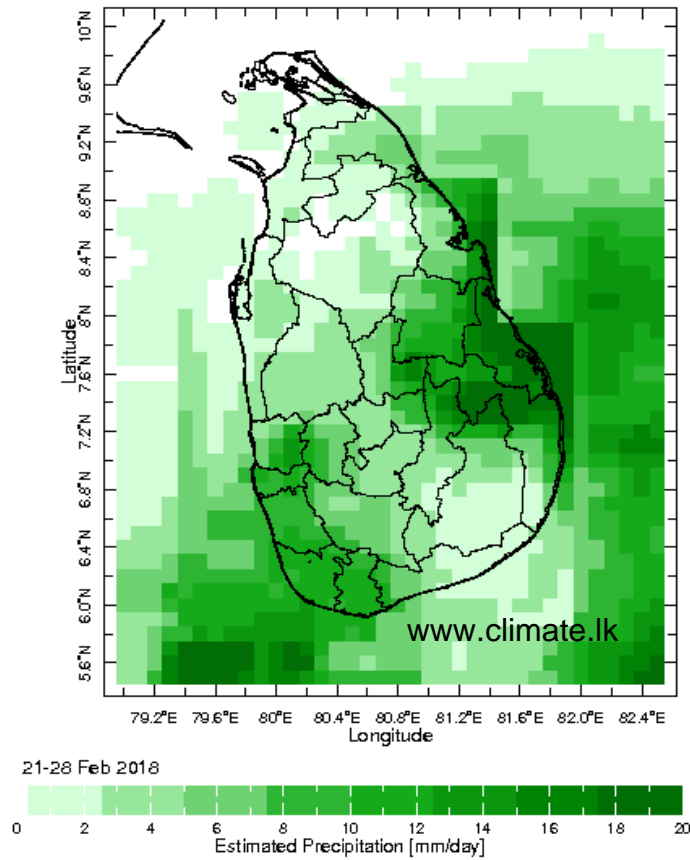


Monthly Rainfall Monitoring

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

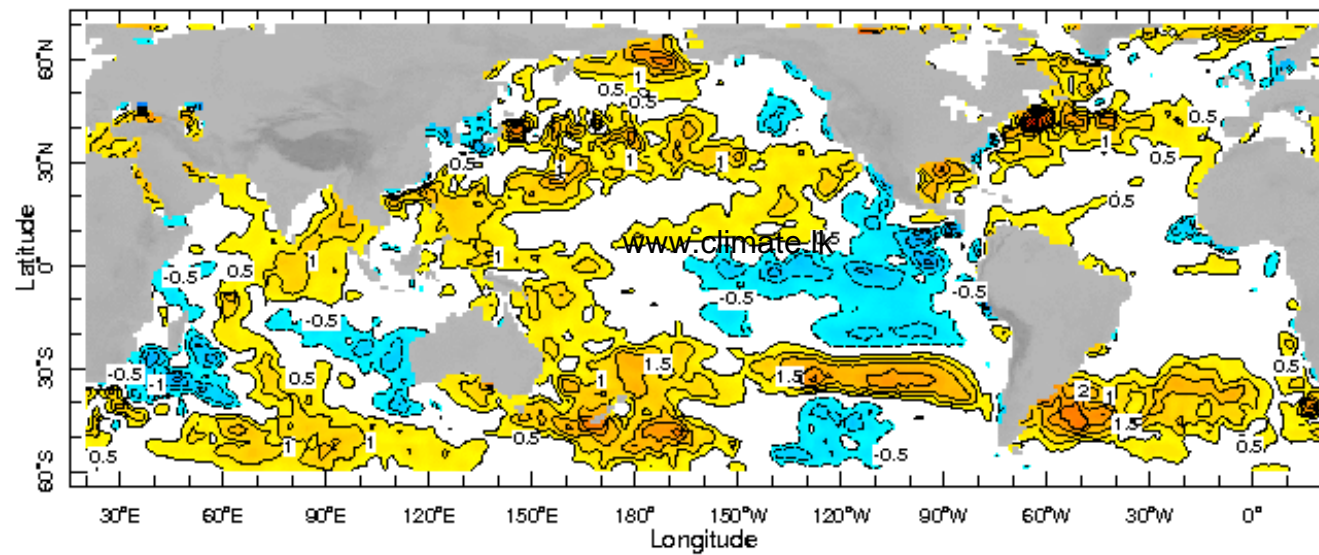


Dekadal (10 Day) Satellite Derived Rainfall Estimates

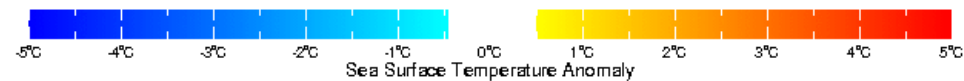


Weekly Average SST Anomalies

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



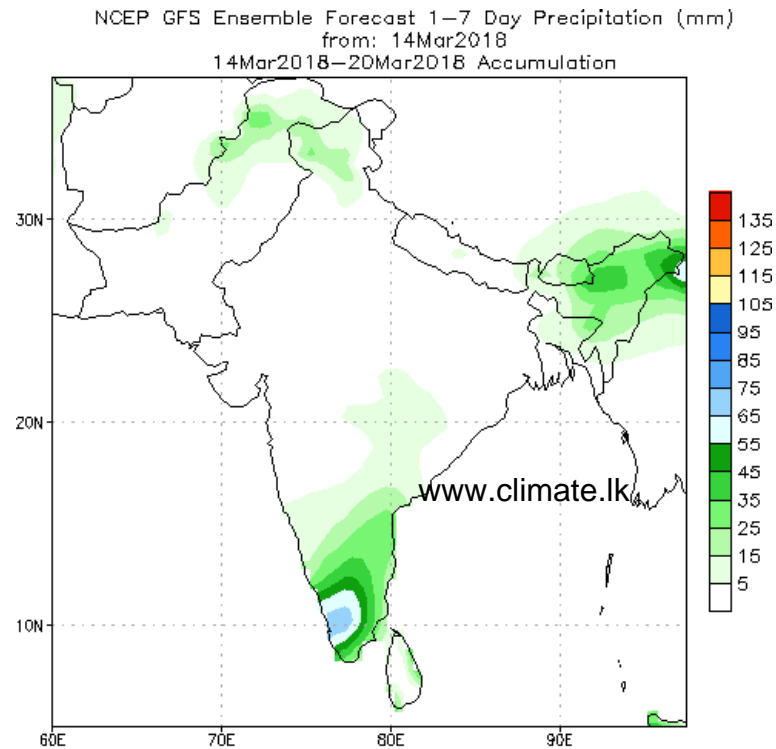
7 Mar 2018



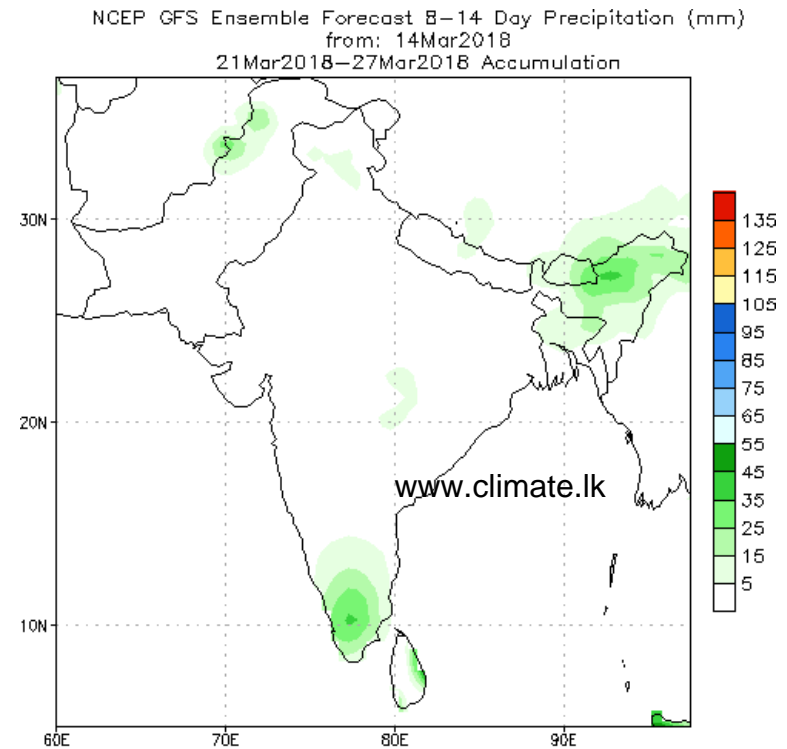
WORLD BATH topography

PREDICTIONS

NCEP GFS 1- 14 Day prediction



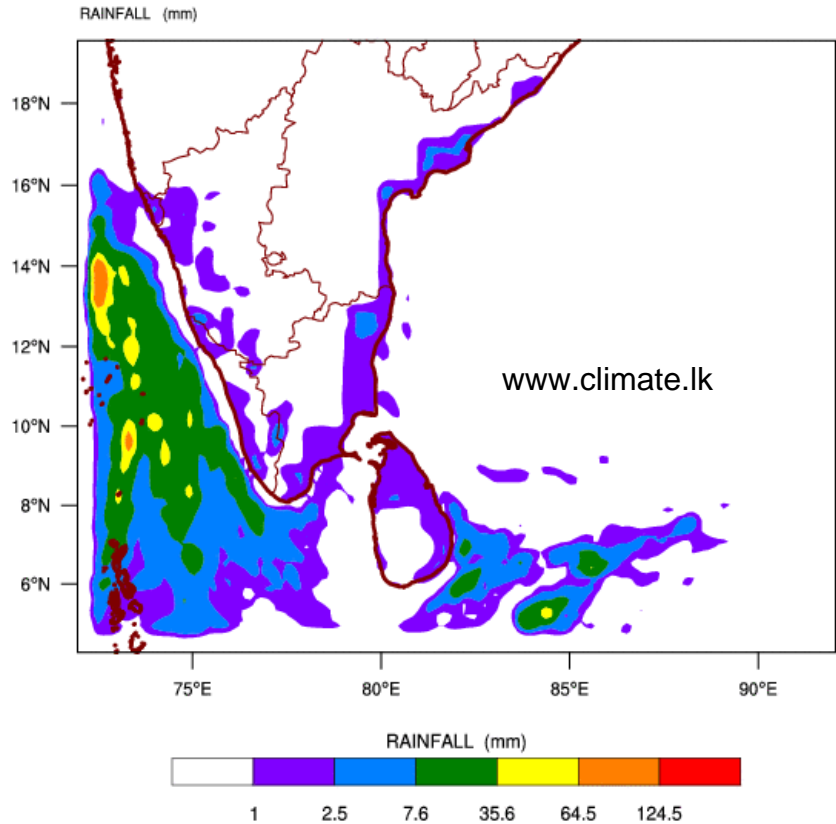
Bias correction based on last 30-day forecast error



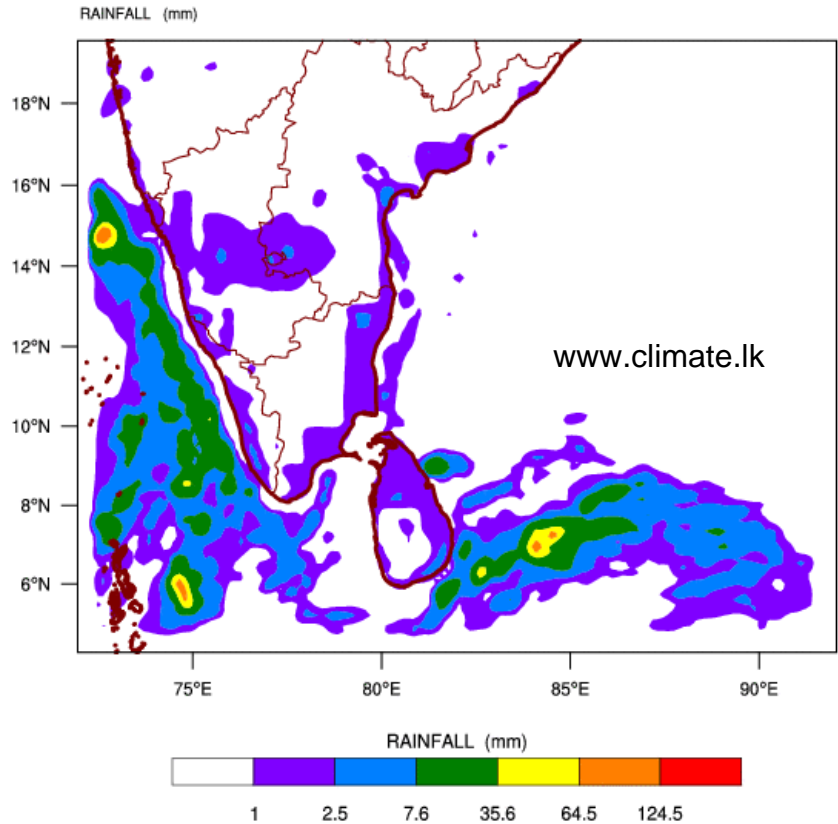
Bias correction based on last 30-day forecast error

WRF Model Forecast (from IMD Chennai)

WRF MODEL FORECAST (48 HR.) RAINFALL(mm)\
based on 00 UTC of 14-03-2018 valid for 03 UTC of 16-03-2018

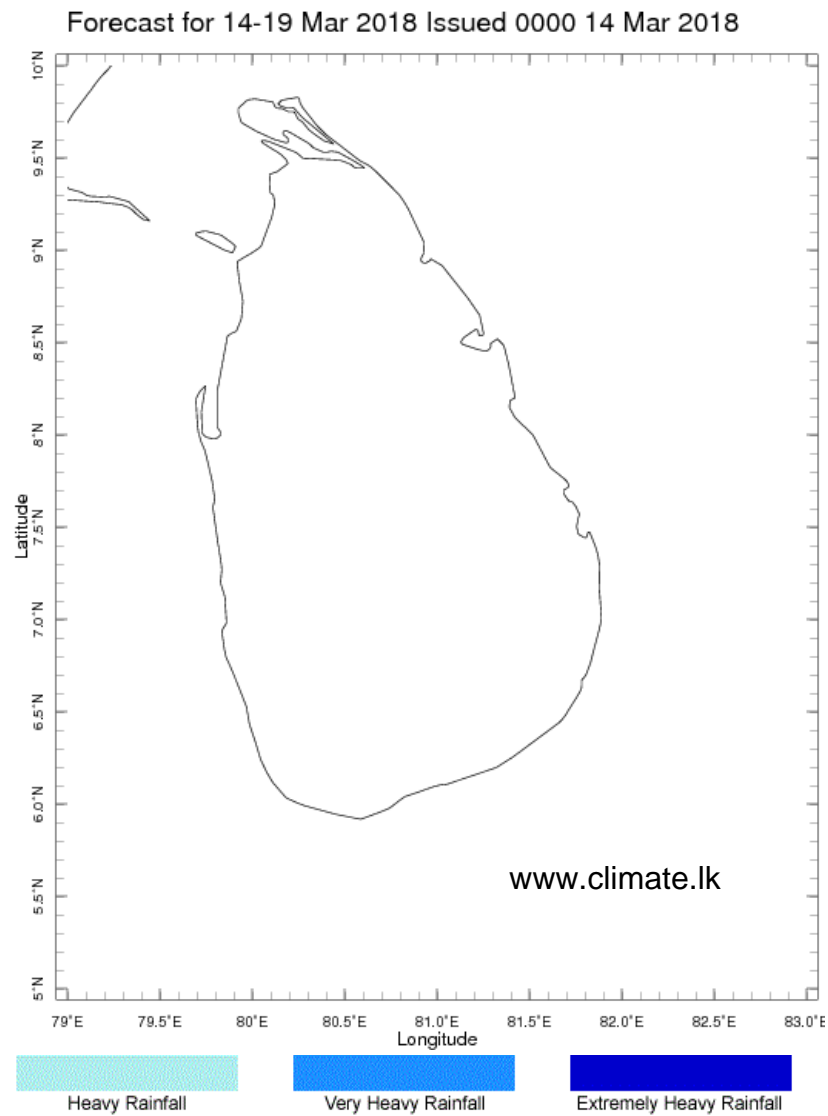


WRF MODEL FORECAST (72 HR.) RAINFALL(mm)\
based on 00 UTC of 14-03-2018 valid for 03 UTC of 17-03-2018

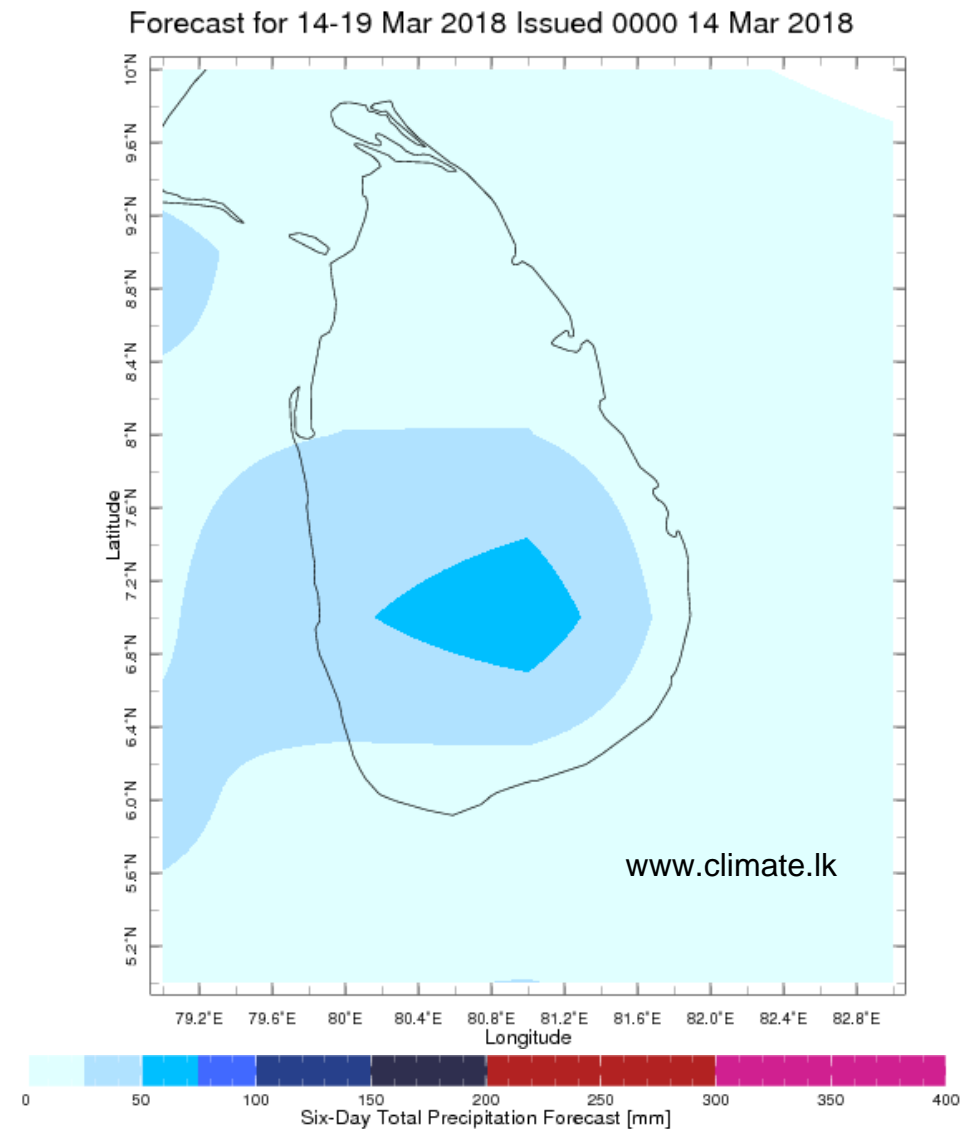


Weekly Rainfall Forecast from IRI

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