

Experimental Climate Monitoring and Prediction

by: Ruchira Lokuhetti, Prabodha Agalawatte, Himash Rashmika, Zeenas Yahiya,

Lareef Zubair and Michael Bell¹ (FECT and IRI¹)**6 April 2017****Highlights**

- The NOAA NCEP model predicts up to 45 mm of total rainfall in Kandy district during 5th–11th April.
- Between 28 Mar-3 Apr: highest rainfall of 90 mm was recorded on the 29th in Gampaha and Kegalla districts.
- From 26 Mar-1 Apr: minimum temperature of 15 °C was recorded from Nuwara Eliya district while Vavuniya and Anuradhapura districts recorded a maximum temperature between 30-35 °C.
- From 28 Mar-3 Apr: up to 14 km/h, southeasterly winds were experienced by the northern regions, and speeds less than 11 km/h in the central and southern regions of the island.
- 0.5 °C above average sea surface temperature was observed in the northern and eastern seas of Sri Lanka.

Monitoring
Rainfall

Weekly Monitoring: On March 28th Ratnapura district received up to 50 mm of rainfall; Kegalla and Kandy district up to 30 mm; and Puttalam, Kurunegala, Badulla, Monaragala, Nuwara Eliya, Colombo and several regions of Anuradhapura and Gampaha districts up to 20 mm. On the 29th Gampaha and Kegalla districts received up to 90 mm of rainfall; Kalutara, Galle, and Kurunegala districts up to 50 mm; Southern regions of Anuradhapura district up to 40 mm; Matale, Kandy, Badulla, Monaragala, Puttalam, Colombo and Ratnapura districts up to 30 mm; and Nuwara Eliya several regions of Polonnaruwa and Hambantota districts up to 20 mm. On the 30th Kurunegala district and Passara region of Badulla district received up to 30 mm of rainfall; and Mannar, Puttalam, Gampaha, Kegalla, Matale, Kandy, Ratnapura and Nuwara Eliya districts up to 20 mm. No significant rainfalls were recorded in any part of the island on the 31st. On April 1st Kurunegala and Kegalla districts and Medawachchiya region of Anuradhapura district received up to 50 mm of rainfall; and Gampaha and several regions of Vavuniya, Badulla and Kandy districts up to 20 mm. On the 2nd Anuradhapura district received up to 80 mm of rainfall; Puttalam, Kurunegala, Galle and Matara up to 50 mm; Vavuniya, Gampaha, Colombo, Kalutara, Hambantota and Ratnapura up to 30 mm; and Kegalla, Matale, Kandy, Nuwara Eliya, Badulla and Monaragala districts up to 20 mm. On the 3rd Puttalam, Kurunegala, Badulla, Hambantota, Matara and Galle districts received up to 30 mm of rainfall; and Anuradhapura, Matale, Kegalla, Kandy, Nuwara Eliya, Ratnapura, Colombo, Kalutara, Monaragala and Ampara districts up to 20 mm.

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

Monthly Monitoring: During March - above average rainfall conditions were experienced in the entire island except for Hambantota district, which received up to 90 mm of below average rainfall. Anuradhapura, Kurunegala and Kandy received up to 150 mm above average rainfall; and many parts of the island received up to 120 mm. Monthly average rainfall for Anuradhapura, Matale, Polonnaruwa, Kurunegala, Gampaha, Colombo, Ratnapura, Kegalla, Nuwara Eliya Kandy and Badulla districts amounted to 270 mm/month; and 180 mm/month for many parts of the island. The CPC Unified Precipitation Analysis tool shows ~500 mm of total rainfall in Kurunegala, Gampaha, Colombo, Kegalla, Kandy and Ratnapura districts; up to ~300 mm in Kandy, Anuradhapura, Polonnaruwa, Puttalam, Kalutara, Galle, Badulla, Monaragala, Nuwara Eliya and Matale districts; up to ~200 mm Vavuniya, Mannar, and Matara districts; and up to 150 mm for the rest of the island.

Ocean State (Text Courtesy IRI)

Pacific sea state: March 16, 2017

During mid-March 2017 the tropical Pacific SST anomaly was mainly in the ENSO-neutral range, but warmer than average SST was observed in the eastern one-third of the basin. Although most of the atmospheric variables across the tropical Pacific are now approximately ENSO-neutral, the pattern of cloudiness, rainfall and winds in the central and western tropical Pacific continues to suggest a borderline La Niña condition. The collection of ENSO prediction models indicates SSTs are likely to remain neutral through spring 2017, with an increasing chance for El Niño development during summer or fall.

Indian Ocean State

0.5 °C above average sea surface temperature was observed in the northern and eastern seas of Sri Lanka.

Predictions

Rainfall

14-day prediction:

NOAA NCEP models:

From 05th – 11th Apr: Total rainfall up to 45-55 mm in Kandy district; total rainfall up to 35-45 mm in Matale, Kurunegala, Kegalla, Gampaha, Colombo, Nuwara Eliya, Ratnapura, Matara, Monaragala and Badulla districts; total rainfall up to 25-35 mm in Anuradhapura, Polonnaruwa, Ampara and Hambantota districts; total rainfall up to 15-25mm in Trincomalee and Batticaloa districts. Total rainfall up to Puttalam, Mannar, Vavuniya, Kilinochchi, Mullaitivu and Jaffna.

From 12th – 18th Apr: Total rainfall up to 65-75 mm in Gampaha, Colombo, Kegalla, Kandy, Nuwara Eliya, Ratnapura, Matara, Badulla and Monaragala districts; total rainfall up to 55-65 mm in Kurunegala, Matale, Ampara, Hambantota, Galle and Kalutara districts; total rainfall up to 45-55 in Batticaloa district; total rainfall up to 35-45 mm in Puttalam, Anuradhapura, Polonnaruwa and Trincomalee districts; total rainfall up to 25-35 mm in Vavuniya district; total rainfall up to 15-25 mm in Mannar, Kilinochchi and Mullaitivu districts.

IMD WRF & IRI Model Forecast:

04th Apr: Up to 65 mm rainfall in Matale and Kandy districts; up to 36mm rainfall in Gampaha, Colombo, Kalutara, Kurunegala, Kegalla, Anuradhapura, Polonnaruwa, Nuwara Eliya, Badulla, Monaragala and Ampara districts; up to 8 mm rainfall in Ratnapura, Galle, Matara, Hambantota, Vavuniya, Mullaitivu and Trincomalee districts; up to 3 mm rainfall in Mannar district.

05th Apr: Up to 65 mm rainfall in Thanamalwila area; up to 36mm rainfall in Colombo, Kalutara, Galle, Ratnapura and Monaragala districts and some areas of Ampara, Anuradhapura and Polonnaruwa districts; up to 8 mm rainfall in Anuradhapura, Polonnaruwa, Trincomalee, Batticaloa, Matale, Kandy, Ampara, Kegalle and Gampaha; up to 3 mm rainfall in Kurunegala, Puttalam and Vavuniya districts.

Seasonal Prediction: IRI Multi Model Probability Forecast

April to June: the total 3-month precipitation shall be climatological for the whole country. The 3-month temperature has more than 60-70% likelihood in the western coastal regions and 70-80% likelihood in the rest of the island of being in the above-normal tercile.

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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/>

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Weekly Hydro- Meteorological Report for Sri Lanka

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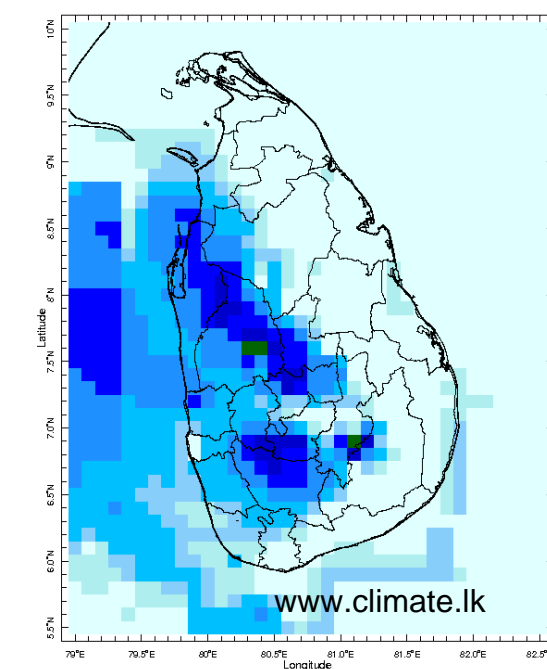
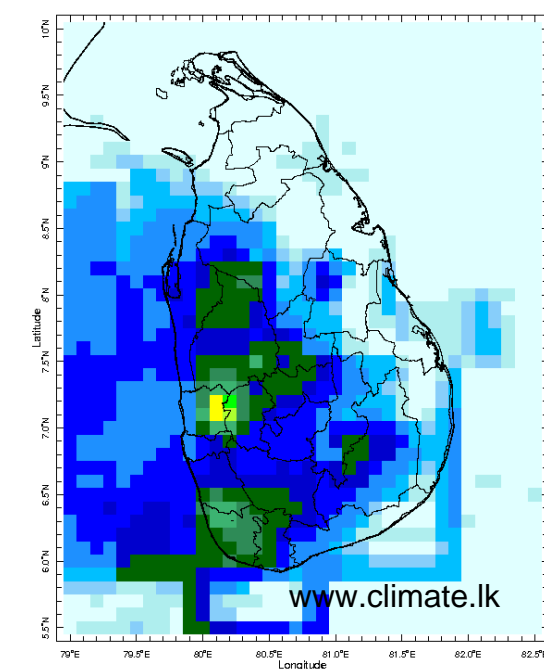
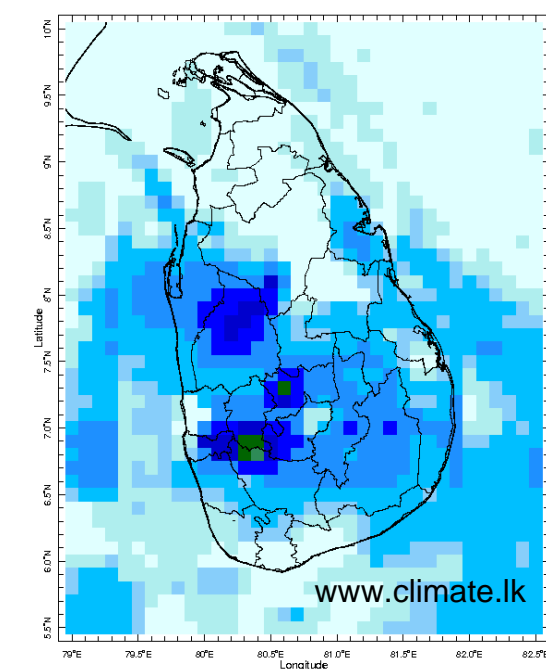
2. Predictions

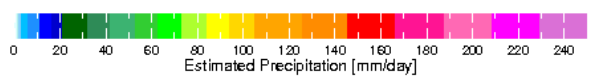
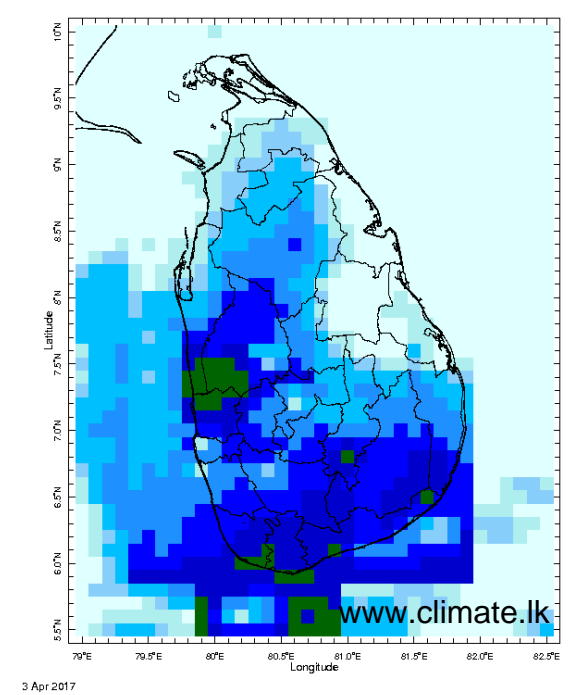
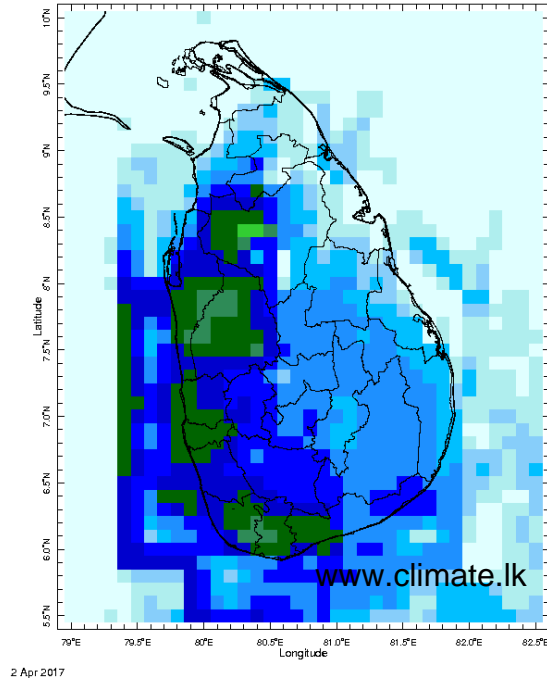
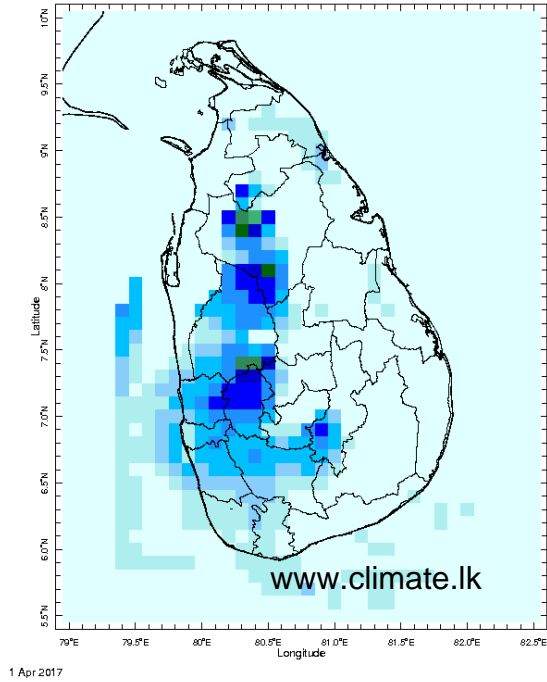
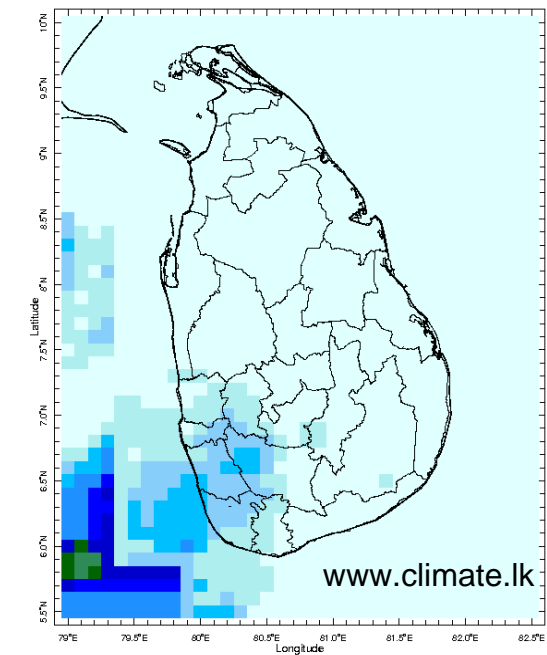
- a. NCEP GFS Ensemble 1-14 day Rainfall Predictions
- b. WRF Model Rainfall Forecast from IMD Chennai
- c. Weekly Precipitation Forecast from IRI
- d. Seasonal Predictions from IRI

MONITORING

Daily Rainfall Monitoring

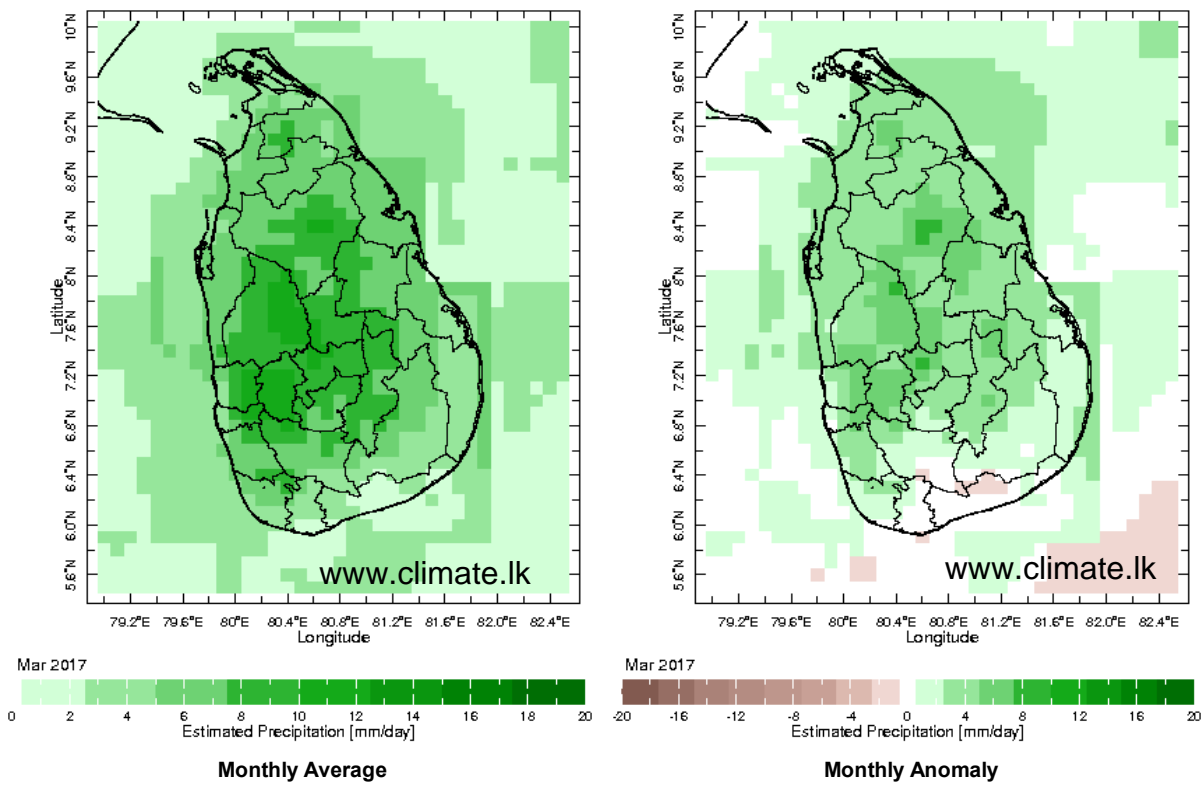
The following figures show the satellite observed rainfall in the last 7 days in Sri Lanka.



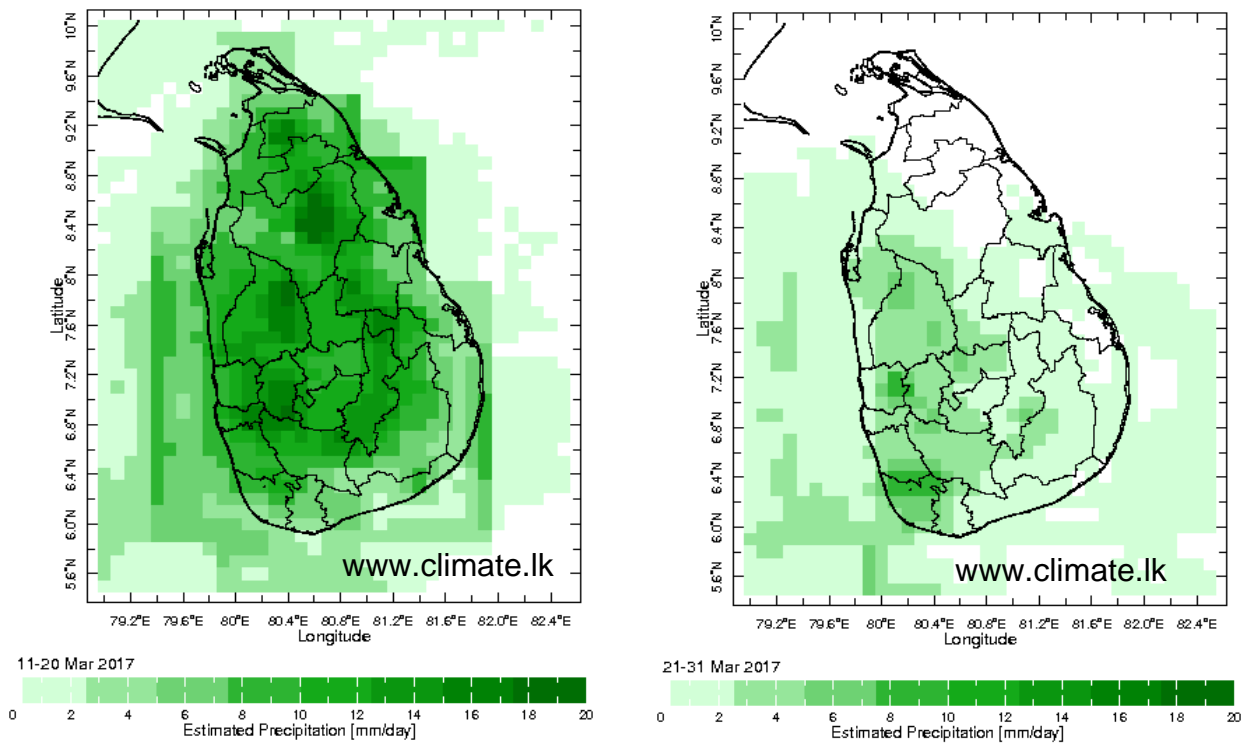


Monthly Rainfall Monitoring

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

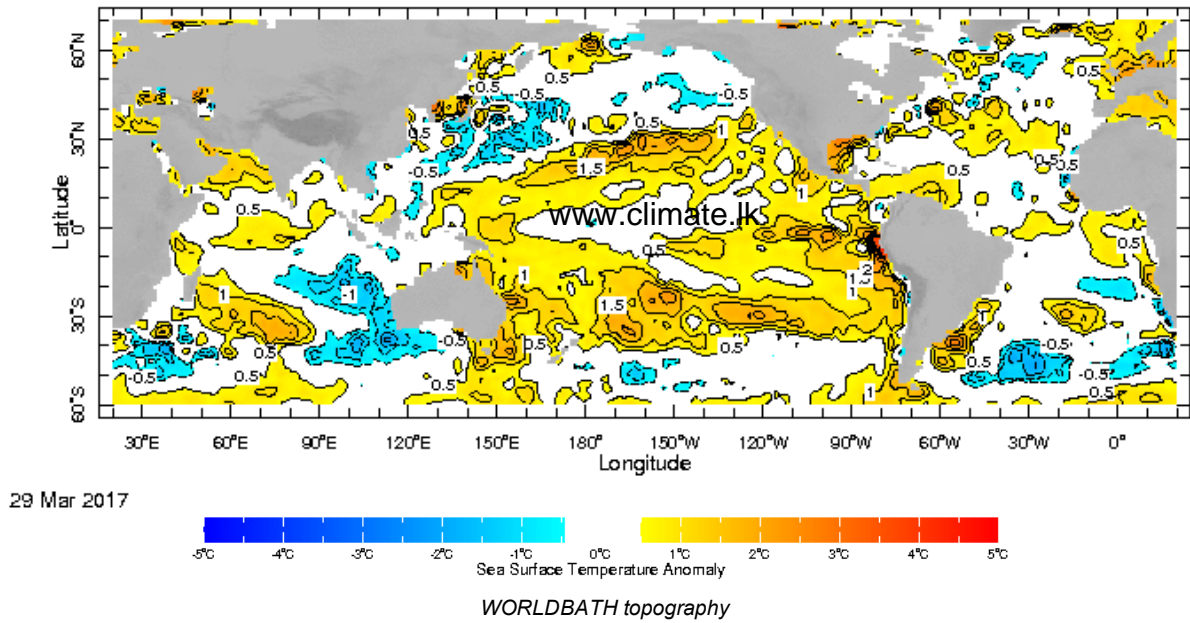


Dekadal (10 Day) Satellite Derived Rainfall Estimates

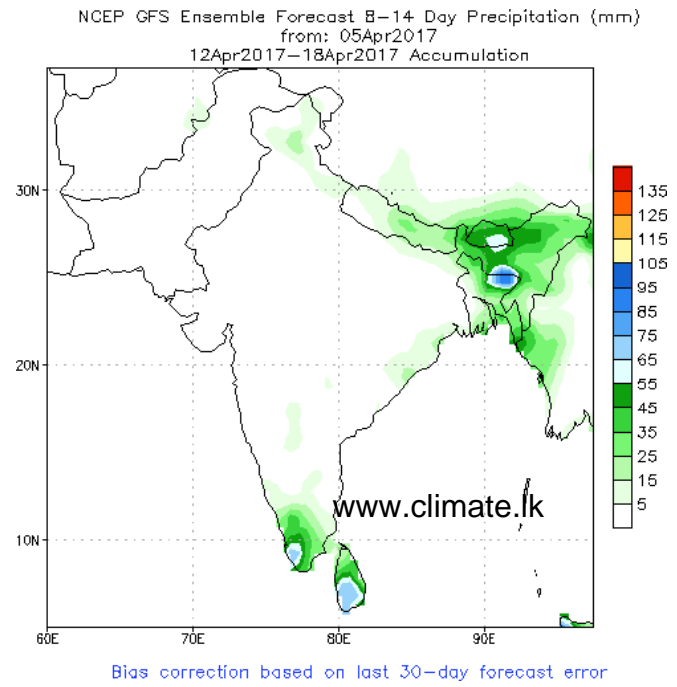
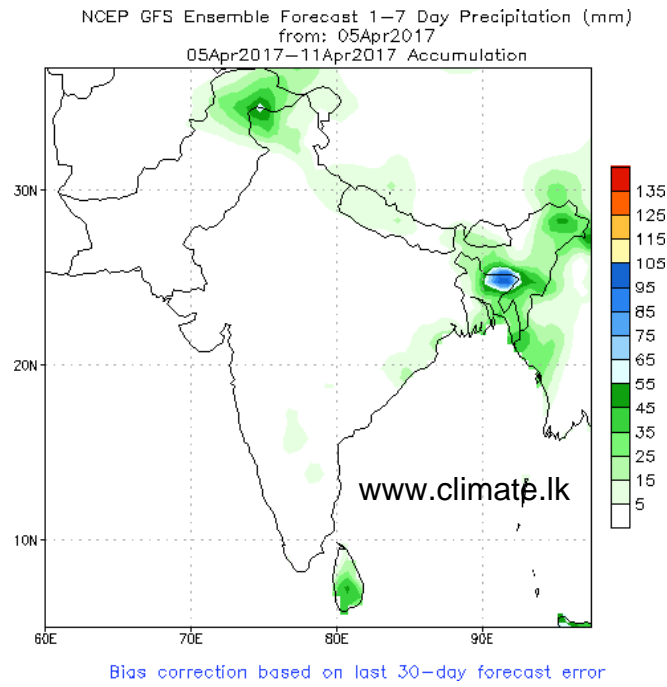


Weekly Average SST Anomalies

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

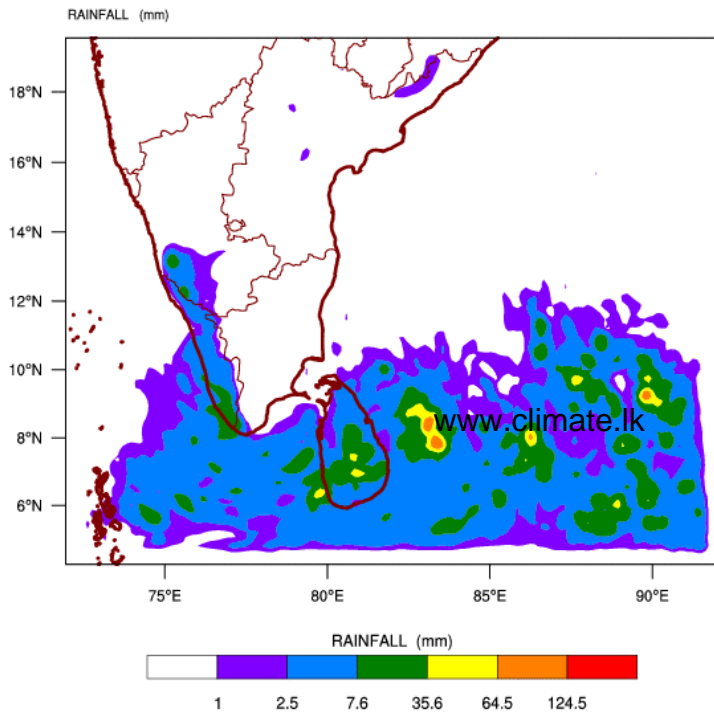


NCEP GFS 1- 14 Day prediction

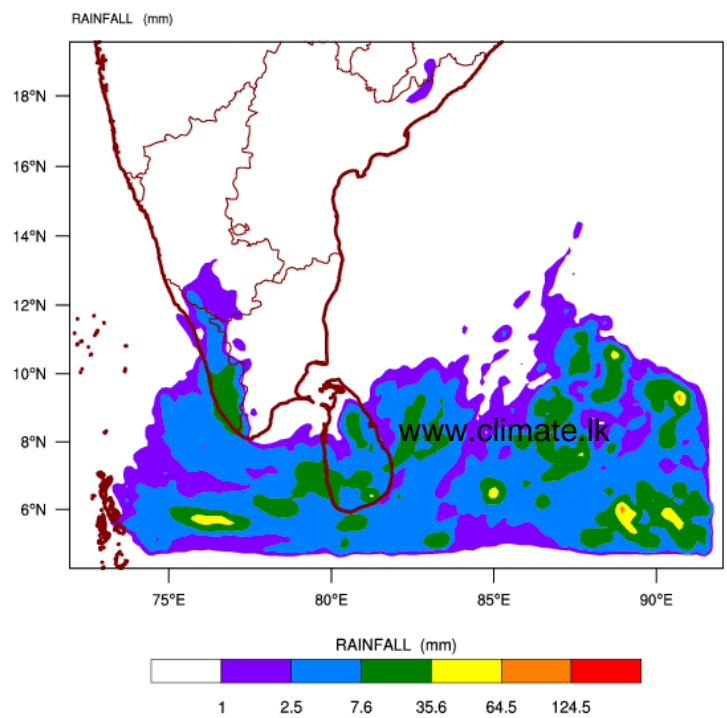


WRF Model Forecast (from IMD Chennai)

WRF MODEL FORECAST (48 HR.) RAINFALL(mm)\
based on 00 UTC of 02-04-2017 valid for 03 UTC of 04-04-2017

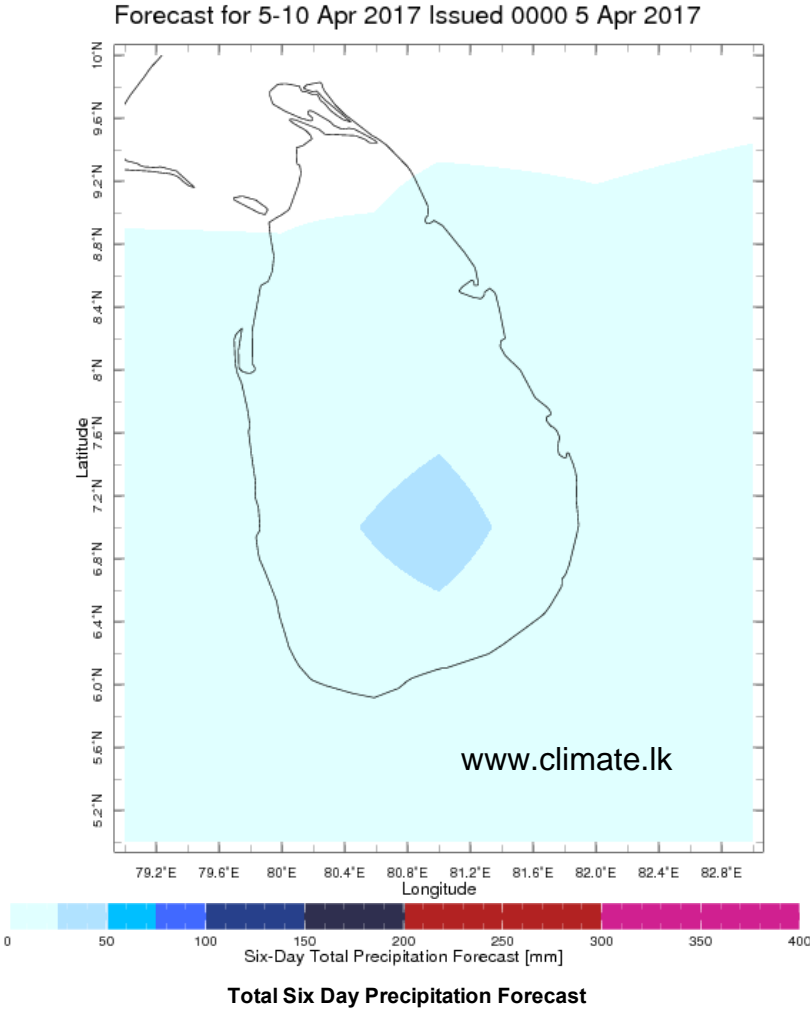
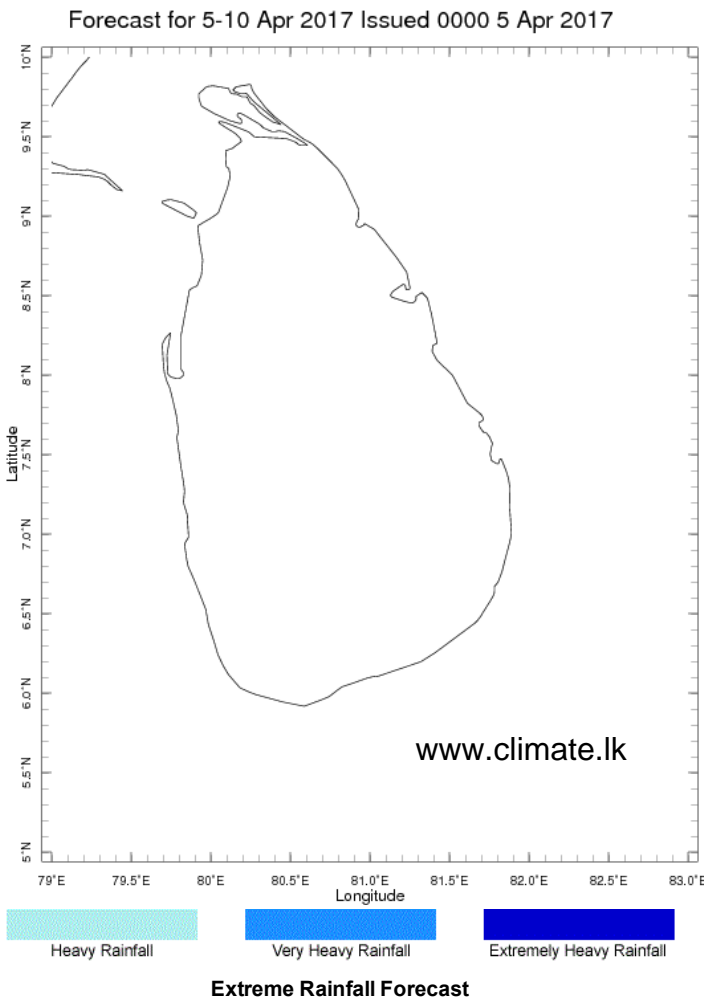


WRF MODEL FORECAST (72 HR.) RAINFALL(mm)\
based on 00 UTC of 02-04-2017 valid for 03 UTC of 05-04-2017



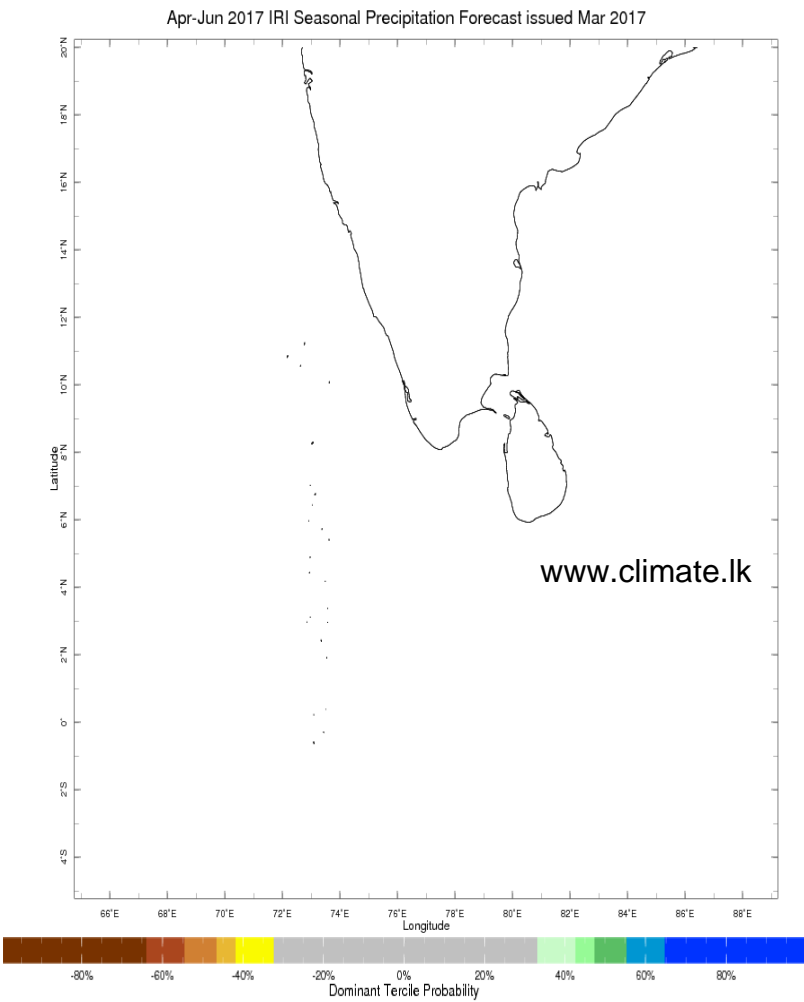
Weekly Rainfall Forecast from IRI

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.

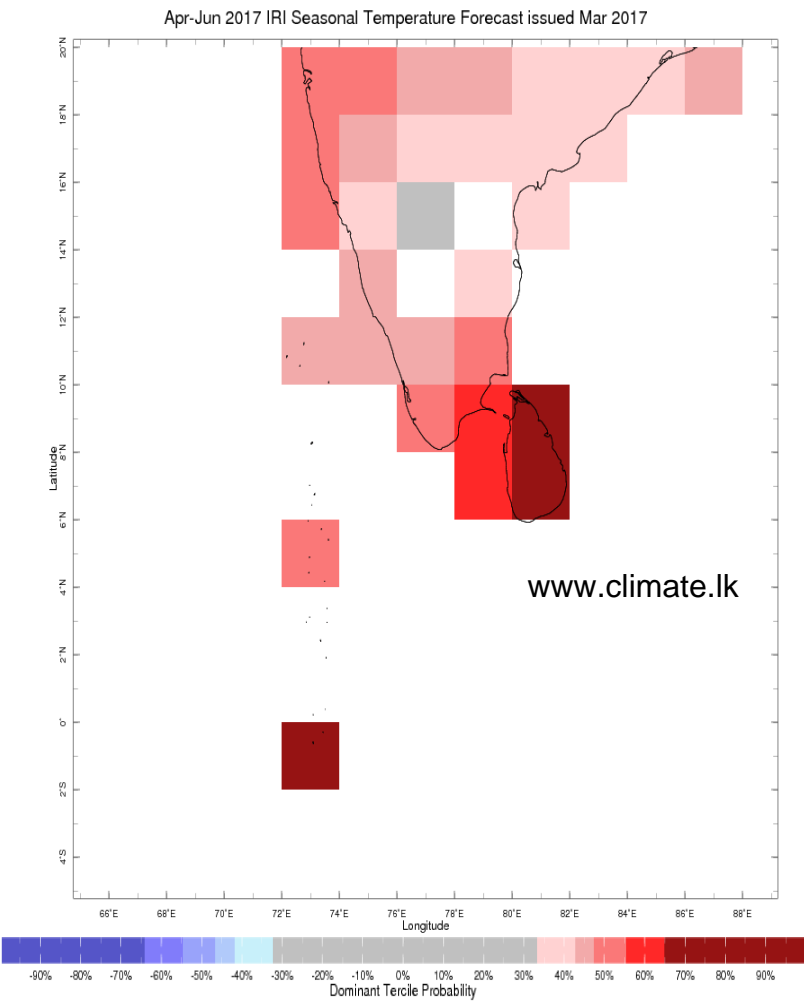


Seasonal Rainfall and Temperature Forecast

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%).



Precipitation Forecast



Temperature Forecast

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