

Experimental Climate Monitoring and Prediction

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

Lareef Zubair and Michael Bell¹ (FECT and IRI¹)

2 March 2017

Highlights

- The WRF model predicts up to 65 mm of rainfall in Ampara district on the 3rd.
- Between 22-28 Feb: highest rainfall of 90 mm was recorded on the 28th in Hambantota district.
- From 19-25 Feb: minimum temperature of 15 °C was recorded from Nuwara Eliya district while many parts of the island recorded a maximum temperature between 30-35 °C.
- From 21-27 Feb: up to 18 km/h north easterly winds were experienced by the entire island.
- 0.5 °C below average sea surface temperature was observed in the northern and western seas of Sri Lanka.

Monitoring

Rainfall

Weekly Monitoring: No significant rainfalls were recorded on the 22nd and 23rd. On the 24th Puttalam, Gampaha, Kalutara and Galle districts received up to 10 mm of rainfall. On the 25th Badulla, Monaragala and Hambantota districts received up to 30 mm of rainfall; Ratnapura district up to 20 mm; Gampaha and Colombo districts up to 10 mm; and adjacent south eastern sea up to 50 mm of rainfall. On the 26th Kandy, Kurunegala, Nuwara Eliya, Badulla, Hambantota and Galle districts received up to 20 mm of rainfall; and adjacent south eastern sea received up to 60 mm of rainfall. On the 27th Polonnaruwa, Kurunegala and Kegalla districts received up to 30 mm of rainfall; and Gampaha, Batticaloa, Kandy and Badulla districts up to 20 mm of rainfall. On the 28th Hambantota district received up to 90 mm of rainfall; Puttalam and Kurunegala districts up to 40 mm; Matale, Kandy, Nuwara Eliya and Badulla districts up to 20 mm; Ratnapura, Ampara Galle and Matara districts up to 20 mm; and adjacent southern sea received up to 120 mm of rainfall.

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

Monthly Monitoring: During February - above average rainfall conditions were experienced in Jaffna, Badulla, Hambantota and several regions of Kilinochchi, Vavuniya, and Anuradhapura districts. These regions received up to 90 mm above average rainfall. Batticaloa district received below average rainfall up to 150 mm; and many parts of the island received up to 120 mm below average rainfall. Monthly average rainfall for Anuradhapura, Vavuniya, Kandy, Nuwara Eliya, Badulla, Monaragala and Hambantota districts amounted to 150 mm/month; and 90 mm/month for many parts of the island. The CPC Unified Precipitation Analysis tool shows ~100 mm of total rainfall in Vavuniya, Anuradhapura, Matale, Kurunegala, Nuwara Eliya, Badulla, Monaragala and Hambantota districts; up to ~75 mm in Kandy, Ratnapura, Ampara, Polonnaruwa, Kalutara and Matara districts; and up to ~50 mm Puttalam, Gampaha, Colombo, Kegalla, Galle and Batticaloa districts.

Ocean State (Text Courtesy IRI)

Pacific sea state: February 16, 2017

During mid-February 2017 the tropical Pacific SST anomaly was close to 0.0C, in the ENSO-neutral range. Although most of the atmospheric variables across the tropical Pacific are now approximately ENSO-neutral, one or two still show a weak La Niña pattern. In particular, the pattern of cloudiness and rainfall in the central and western tropical Pacific remains indicative of a weak La Niña condition. The collection of ENSO prediction models indicates SSTs are likely to remain neutral through May 2017, with a chance for El Niño development later in the year.

Indian Ocean State

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

Predictions

Rainfall

14-day prediction:

NOAA NCEP models:

From 1st – 7th Mar: Total rainfall between 25-35 mm in Jaffna, Kilinochchi, Vavuniya, Mannar, Mullaitivu, Puttalam, Ampara and Anuradhapura districts; and between 15-25 mm in Kurunegala, Polonnaruwa, Trincomalee, Badulla, Monaragala and Matale districts.

From 8th – 14th Mar: Total rainfall between 5-15 mm in Jaffna, Kilinochchi, Mullaitivu, Vavuniya, Mannar, Anuradhapura, Kurunegala, Puttalam and Matale districts.

IMD WRF & IRI Model Forecast:

3rd Mar: Rainfall up to 65 mm in Ampara district; up to 36 mm of rainfall in Batticaloa, Polonnaruwa, Badulla and Monaragala districts; up to 8 mm of rainfall in Trincomalee, Hambantota, Gampaha, Colombo and Kalutara districts.

4th Mar: Rainfall up to 65 mm rainfall in Trincomalee, Batticaloa, Ampara, Colombo, Gampaha and Kegalla districts; and up to 36 Anuradhapura, Polonnaruwa, Puttalam, Galle, Hambantota, Badulla, and Monaragala districts; and up to 8 mm in many parts of the island.

Seasonal Prediction: IRI Multi Model Probability Forecast

March to May: the total 3-month precipitation shall be climatological for the whole island. The 3-month temperature has more than 70-80% likelihood in the southern region and 60-70% likelihood in the northern region of being in the above-normal tercile

MJO based OLR predictions

For the next 15 days:

MJO shall enhance the rainfall in Sri Lanka.

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/>



www.fb.com/fectsl



[@climatelk](https://twitter.com/climatelk)



Weekly Hydro- Meteorological Report for Sri Lanka

Inside This Issue

1. Monitoring

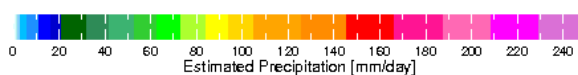
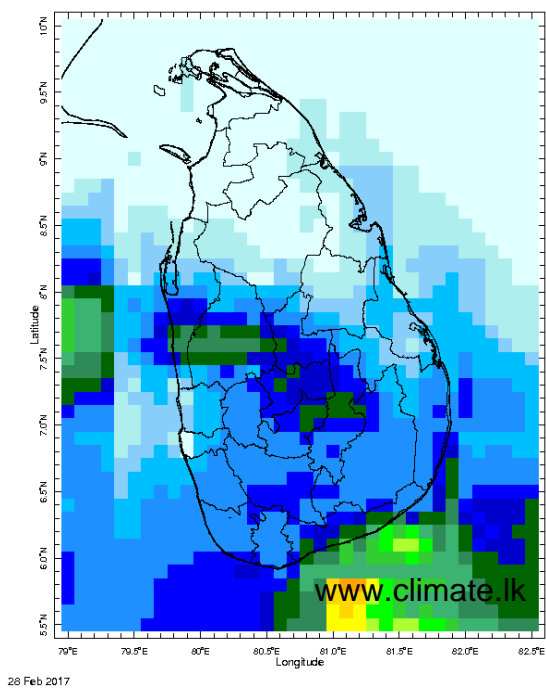
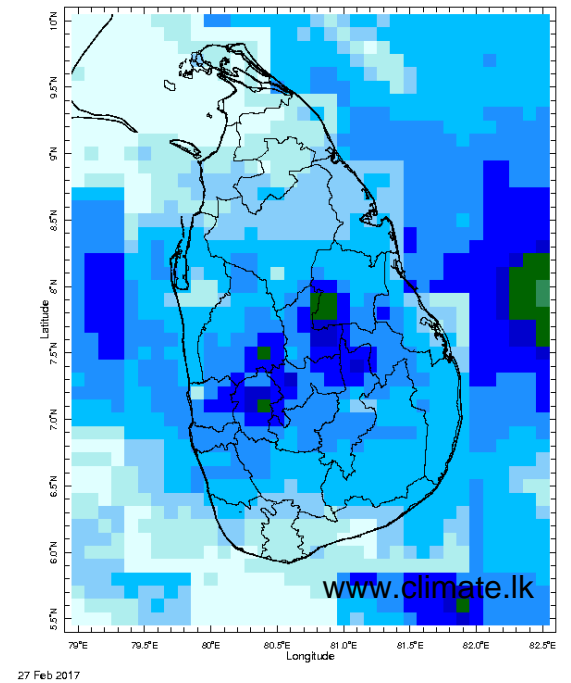
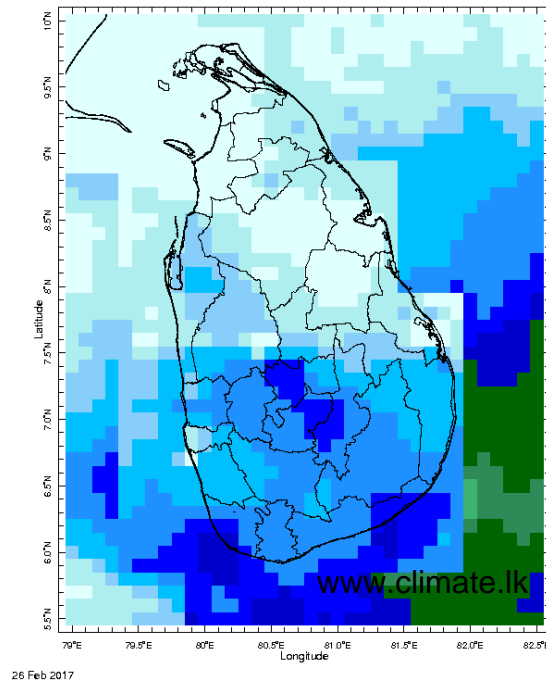
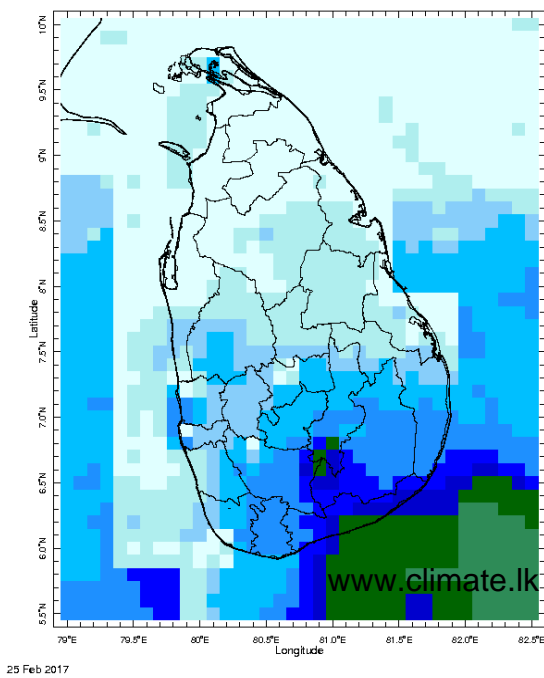
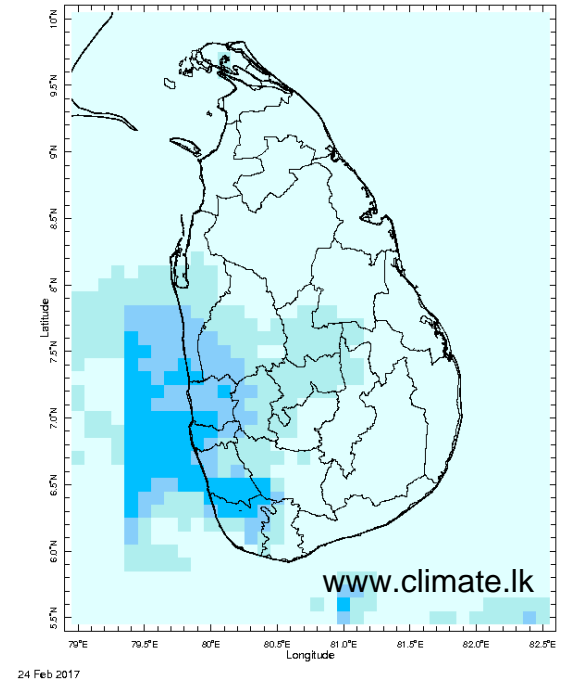
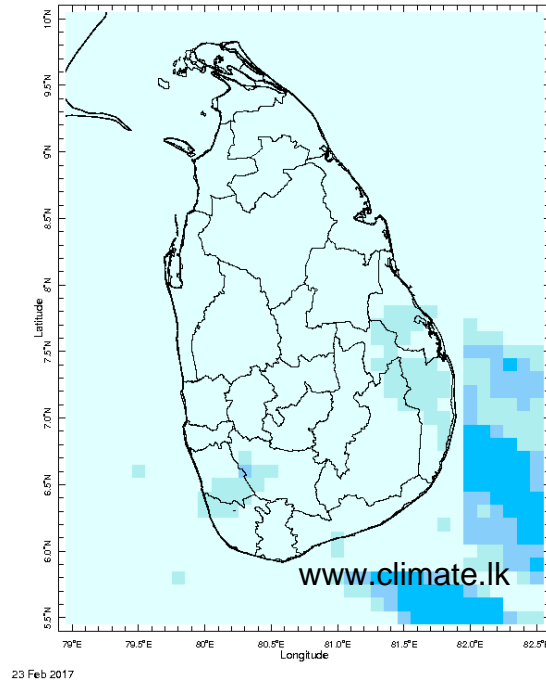
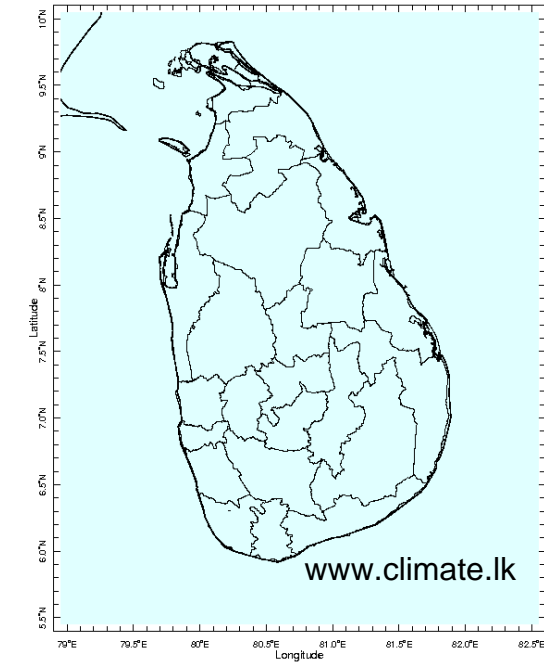
- a. Daily Rainfall Monitoring
- b. Monthly Rainfall Monitoring
- c. Dekadal (10 Day) Satellite Derived Rainfall Estimates
- d. Weekly Average SST Anomalies

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

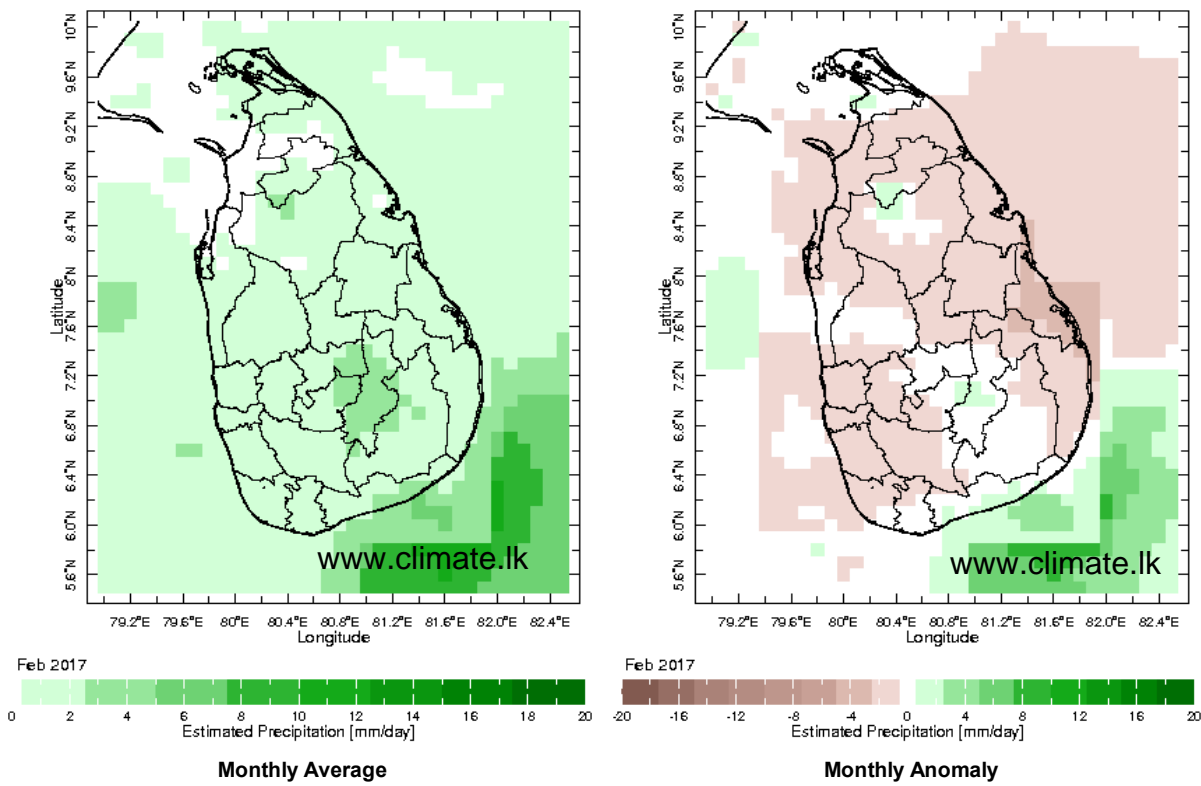
Daily Rainfall Monitoring

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

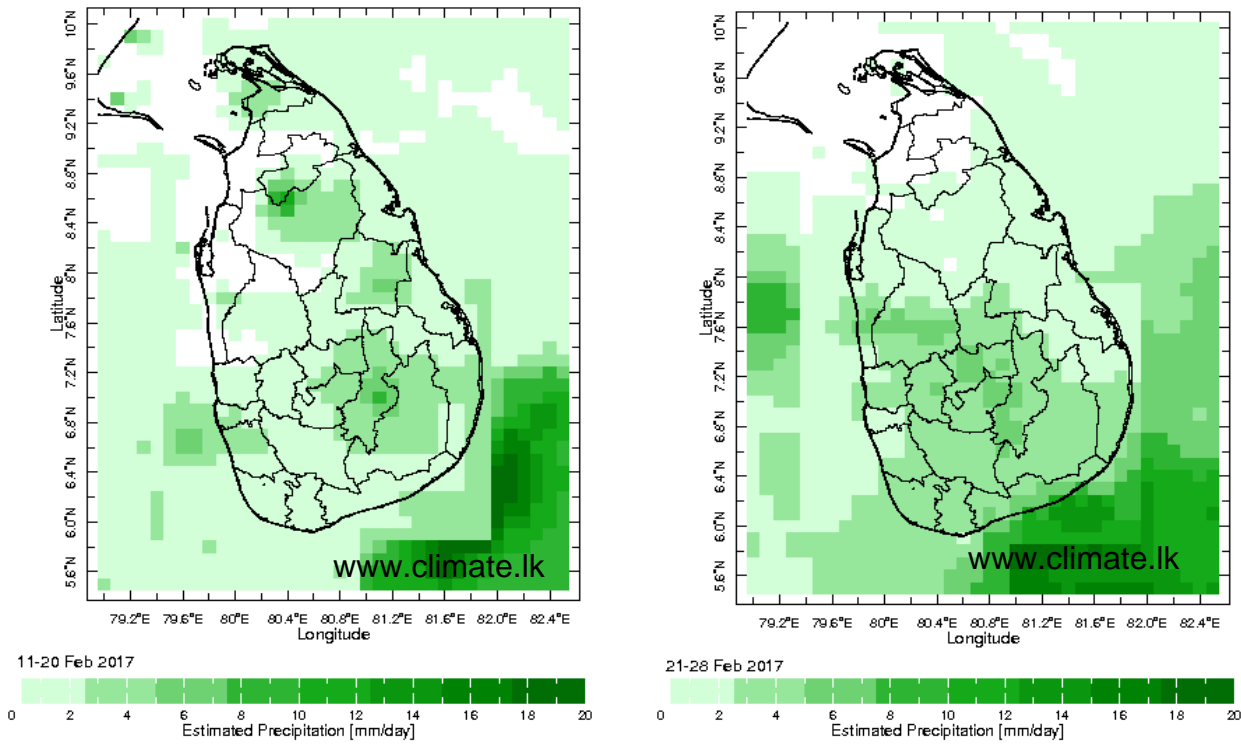


Monthly Rainfall Monitoring

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

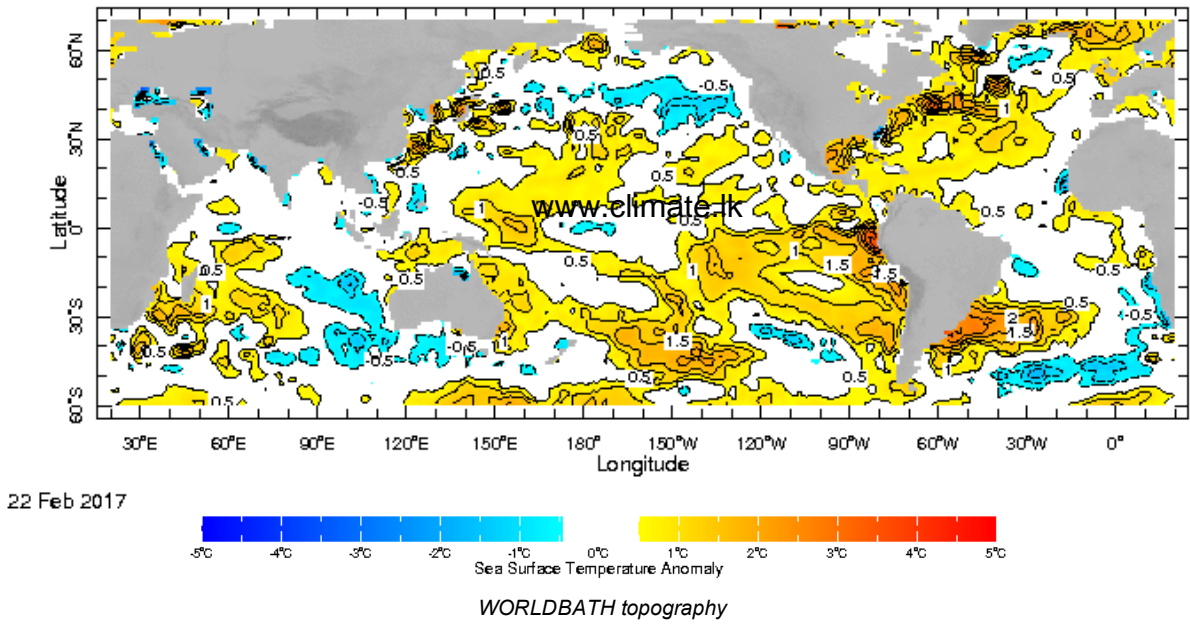


Dekadal (10 Day) Satellite Derived Rainfall Estimates



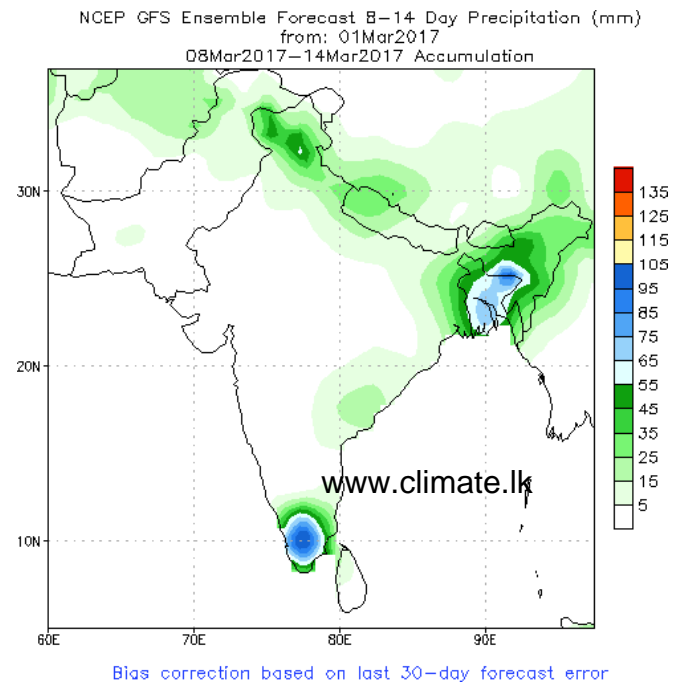
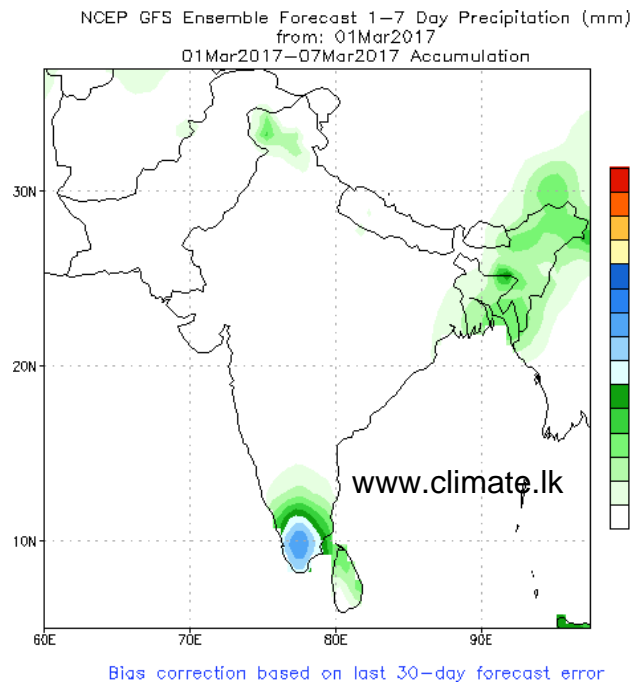
Weekly Average SST Anomalies

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



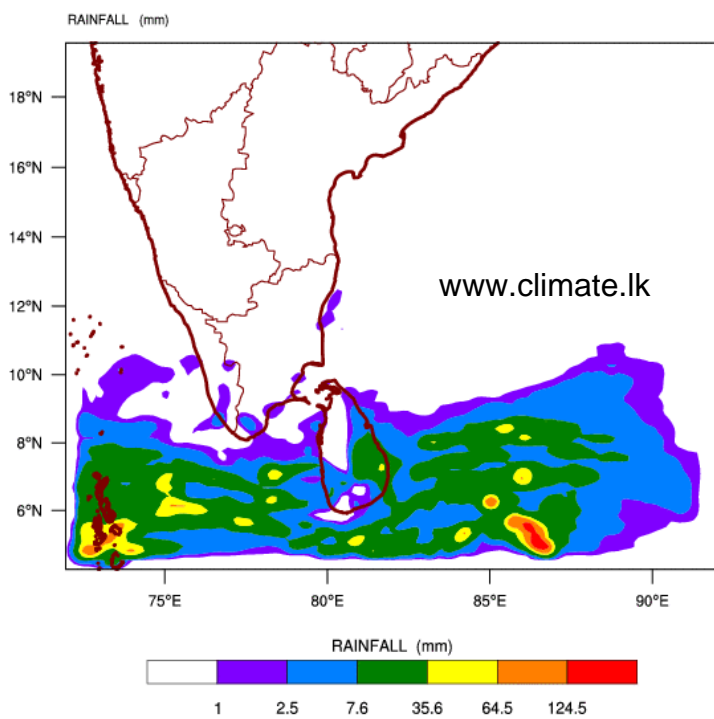
PREDICTIONS

NCEP GFS 1- 14 Day prediction

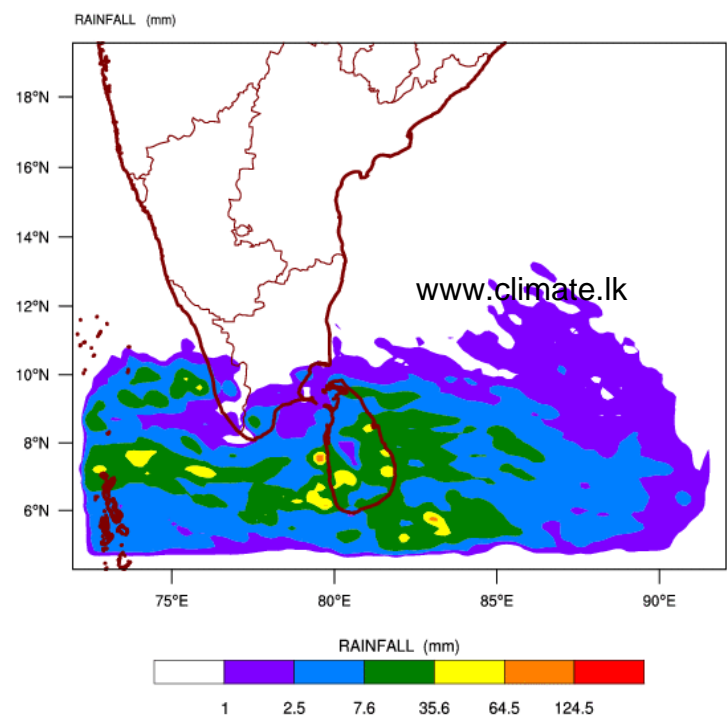


WRF Model Forecast (from IMD Chennai)

WRF MODEL FORECAST (48 HR.) RAINFALL(mm)\
based on 00 UTC of 01-03-2017 valid for 03 UTC of 03-03-2017

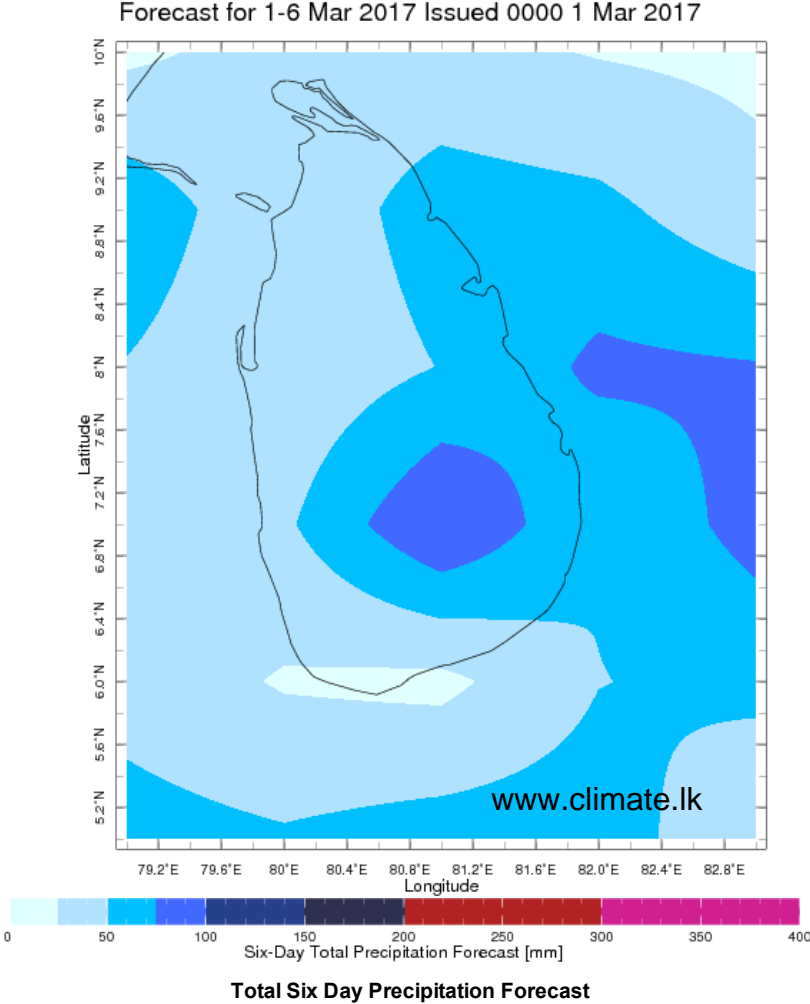
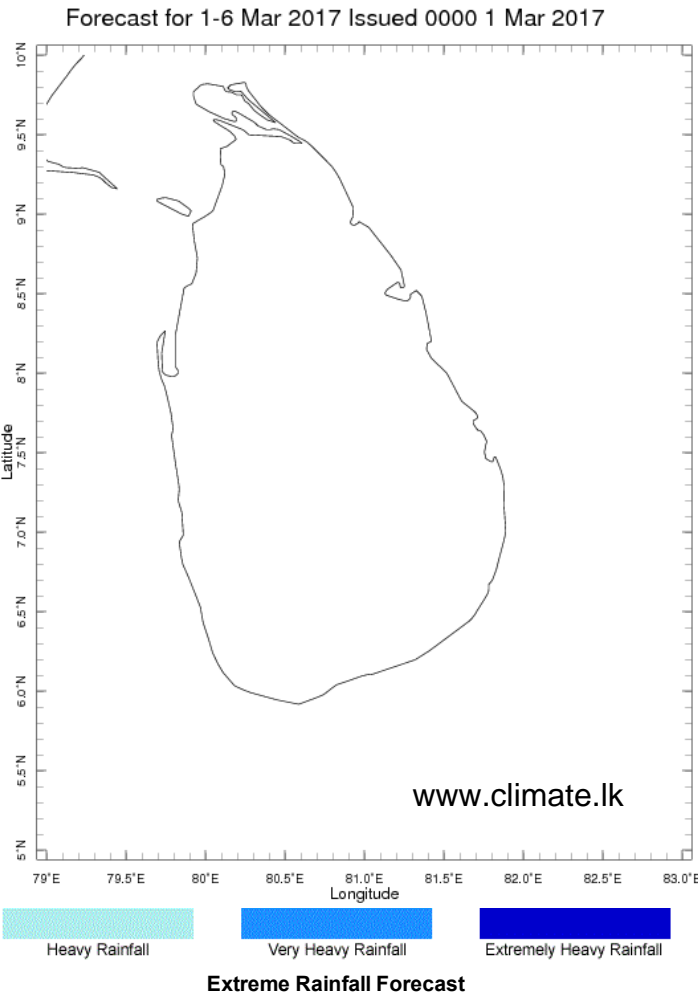


WRF MODEL FORECAST (72 HR.) RAINFALL(mm)\
based on 00 UTC of 01-03-2017 valid for 03 UTC of 04-03-2017



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%).

