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Experimental Climate Monitoring and Prediction

by: Ruchira Lokuhetti, Prabodha Agalawatte, Manusha Lakmali, Zeenas Yahiya, Lareef Zubair and Michael Bell[1] (FECT and IRI[1])

19 January 2017

Highlights

- ***The WRF model predicts up to 124 mm in Polonnaruwa district and up to 34 mm in many parts of the island on January 21st.***
- ***Between 10-16 Jan: No rainfalls were recorded in any part of the island.***
- ***From 8-14 Jan: minimum temperature of 15 ^{o}C was recorded from Nuwara Eliya district while many parts of the island recorded a maximum temperature between 30-35 ^{o}C.***
- ***From 10-16 Jan: up to 14 km/h north easterly winds were experienced by the entire island.***

Monitoring

Rainfall

***Weekly Monitoring*:** No rainfalls were recorded within the island during the period 10th - 16th.

Total Rainfall for the Past Week: The RFE 2.0 tool shows total rainfall up to 2 mm for the entire island. It shows below average rainfall 25-50 mm for Batticaloa, Ampara, Polonnaruwa, Hambantota, Badulla, Monaragala, Kandy, Nuwara Eliya and Ratnapura districts and 10-25 mm for many parts of the island.

***Monthly Monitoring*:** During December – below average rainfall conditions were experienced by the entire island. Eastern regions of the island received up to 240 mm below average rainfall; and up to 150 mm in rest of the country. Monthly average rainfall for Colombo, Kalutara, Galle and Ratnapura amounted to 360 mm/month; and 180 mm/month for many parts of the island. The CPC Unified Precipitation Analysis tool shows ~200 mm of total rainfall in the coastal regions of Colombo district; ~100 mm in Kalutara, Galle, Ratnapura, Kegalla, Kandy, Matale, Ampara, Badulla and Monaragala districts; and ~50 mm in rest of the island.

Ocean State (*Text Courtesy IRI*)

Pacific sea state: January 12, 2017

During early January 2016 the tropical Pacific SST anomaly was near -0.5C, the threshold for weak La Niña. Many of the atmospheric variables across the tropical Pacific have also remained consistent with weak La Niña conditions, although some have become only weakly so. The upper and lower atmospheric winds have continued to be weakly suggestive of a strengthened Walker circulation, and the cloudiness and rainfall have remain suggestive of La Niña conditions. The collection of ENSO prediction models indicates SSTs, now near the threshold of La Niña, will dissipate to neutral levels by February.

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 18th – 24th Jan: Total rainfall between 115-125 mm in Jaffna, Kilinochchi, and Mullaitivu districts; 105-115 mm in Mannar, Vavuniya, Anuradhapura, Polonnaruwa, Trincomalee, Batticaloa, and Ampara districts; 85-95 mm Puttalam, Kurunegala, Matale, Badulla and Monaragala districts; 75-85 mm in Kandy district; 65-75 mm in Gampaha, Kegalla, Nuwara Eliya and Ratnapura districts; and 45-55 mm in Galle, Matara and Hambantota districts.

From 25th – 31st Jan: Total rainfall between 15-25 mm in Jaffna, Kilinochchi, Mannar, Puttalam and Colombo districts.

IMD WRF & IRI Model Forecast:
20th Jan: Up to 35 mm in Mullaitivu, Trincomalee, Polonnaruwa, Batticaloa, Badulla and Ampara districts; and up to 7 mm in Jaffna, Mannar, Vavuniya, Anuradhapura, Monaragala and Matale districts.

21st Jan: Up to 124 mm Polonnaruwa district; up to 64 mm in Trincomalee, Anuradhapura, Batticaloa, Matale, Kandy and Hambantota districts; and up to 35 mm in many parts of the island.

Seasonal Prediction: IRI Multi Model Probability Forecast
February to April: 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.

MJO based OLR predictions

For the next 15 days:
MJO shall not have a significant impact on the rainfall of Sri Lanka in next 5 days and shall enhance the rainfall in the following 10 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.

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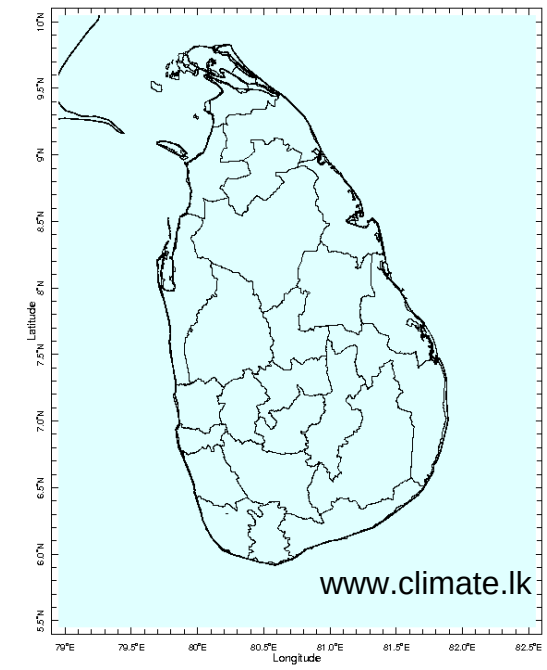
Weekly Hydro- Meteorological Report for Sri Lanka

Inside This Issue

Daily Rainfall Monitoring

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



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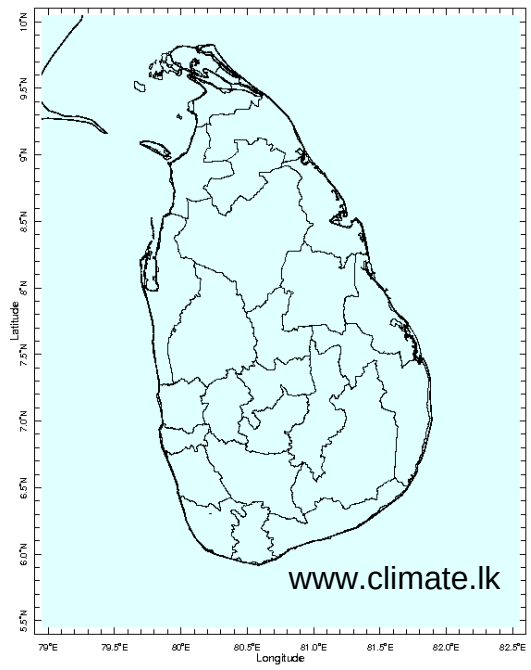
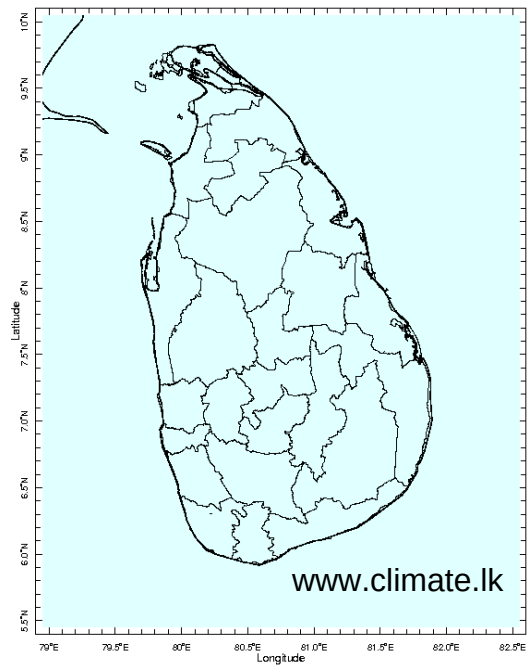


11 Jan 2017



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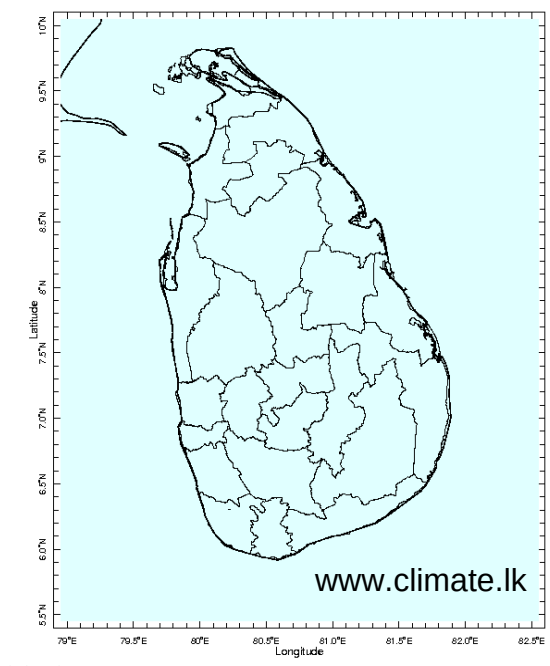

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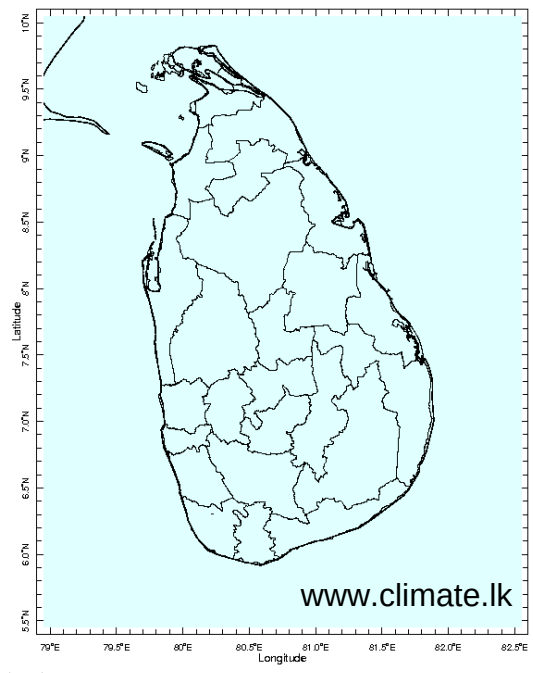

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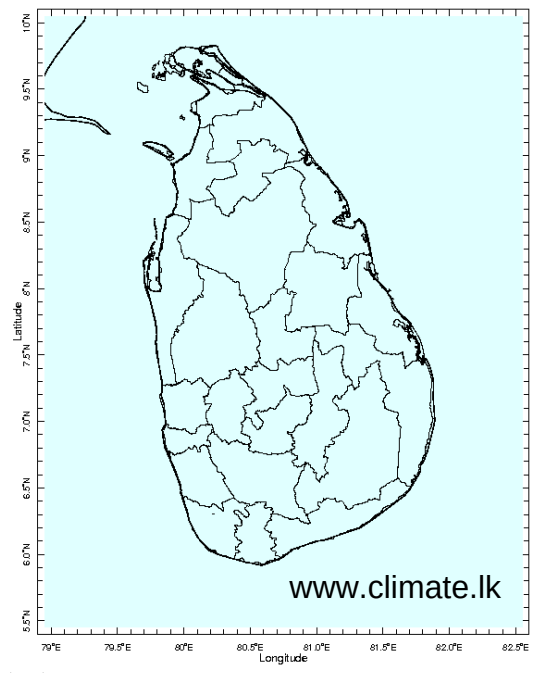

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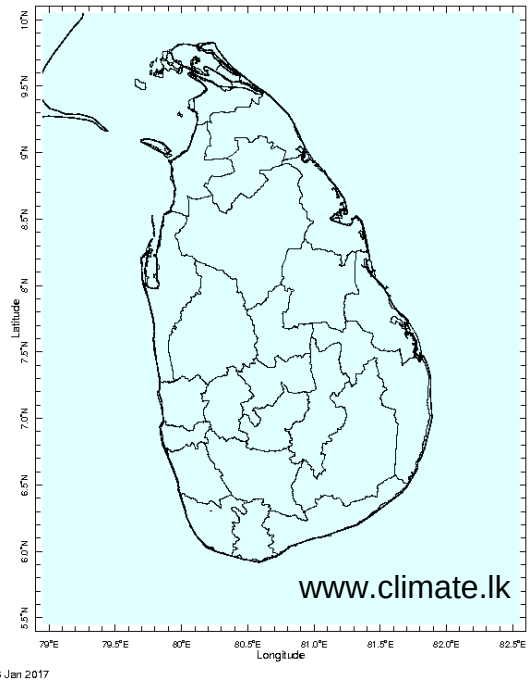
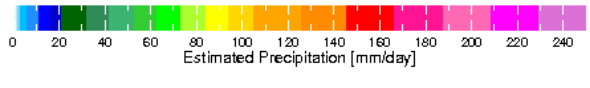
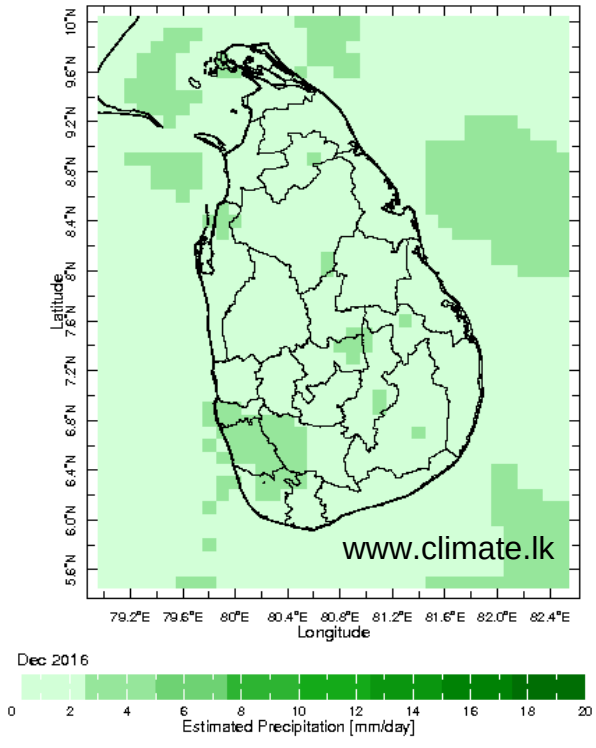


16 Jan 2017

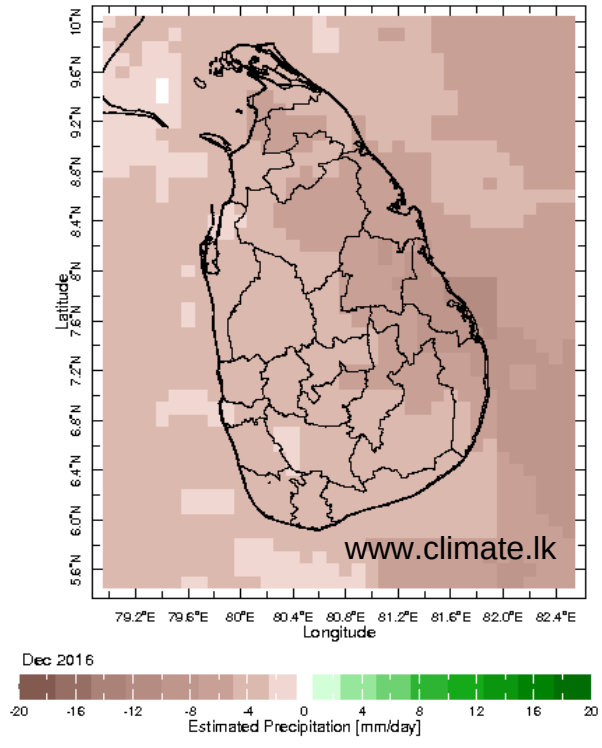


Monthly Rainfall Monitoring

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

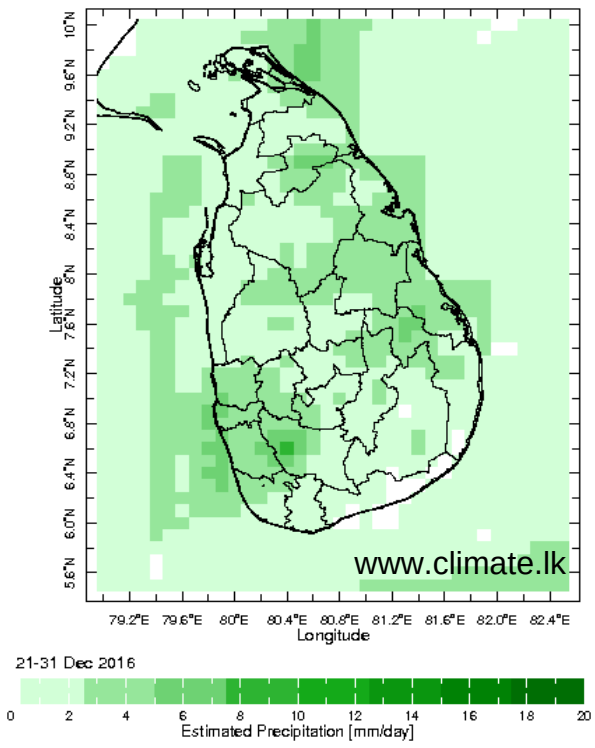


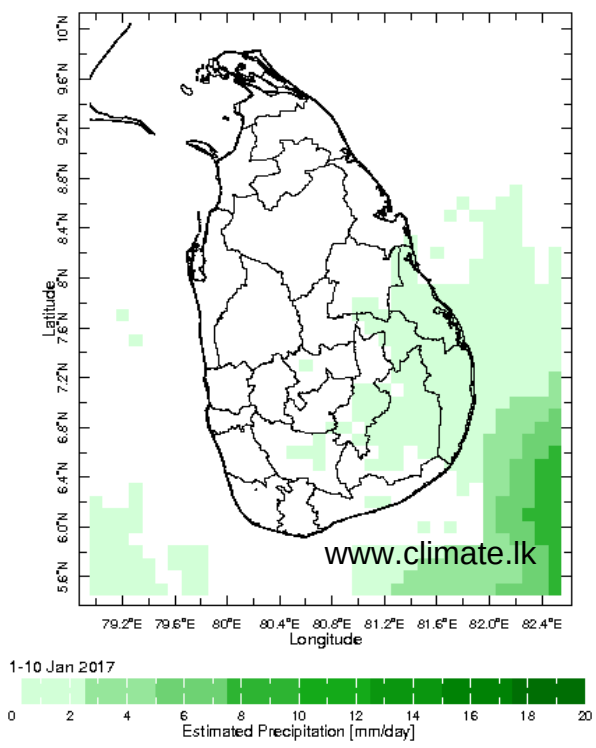
Monthly Average



Monthly Anomaly

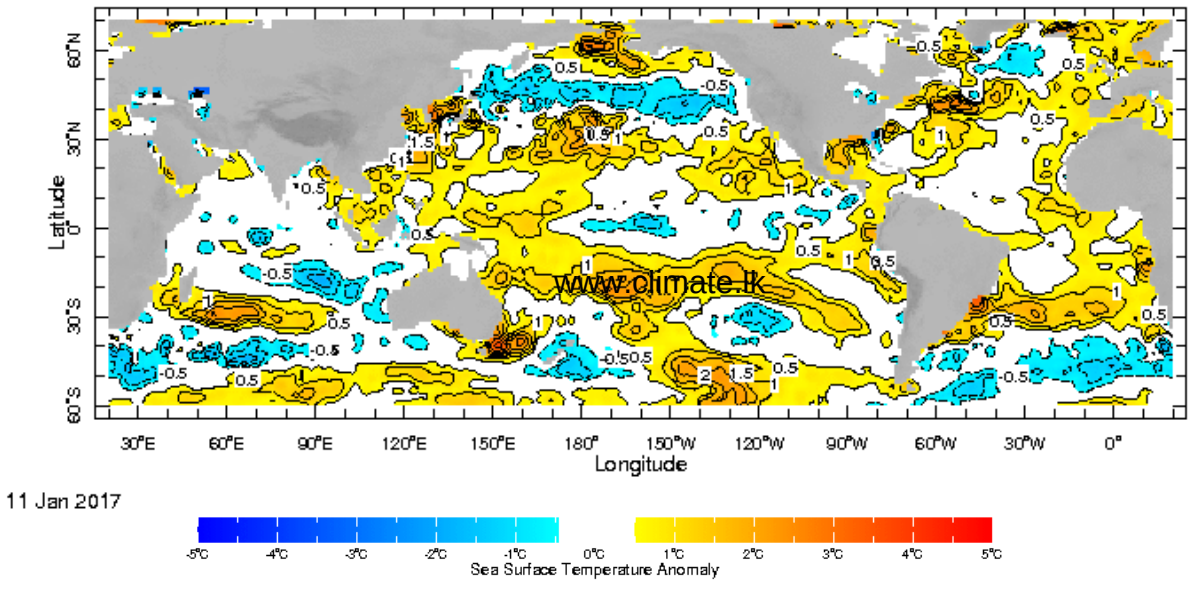
Dekadal (10 Day) Satellite Derived Rainfall Estimates





Weekly Average SST Anomalies

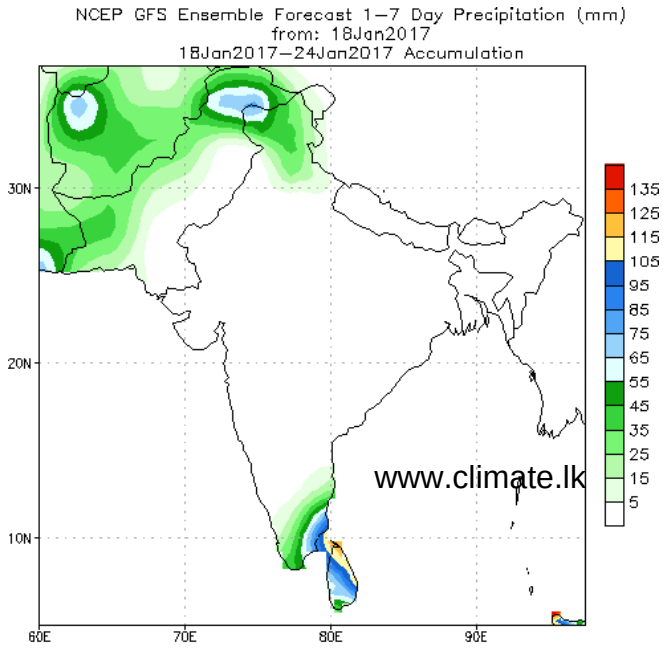
Weekly average Sea Surface Temperature (SST) anomaly in the world from NOAA NCEP

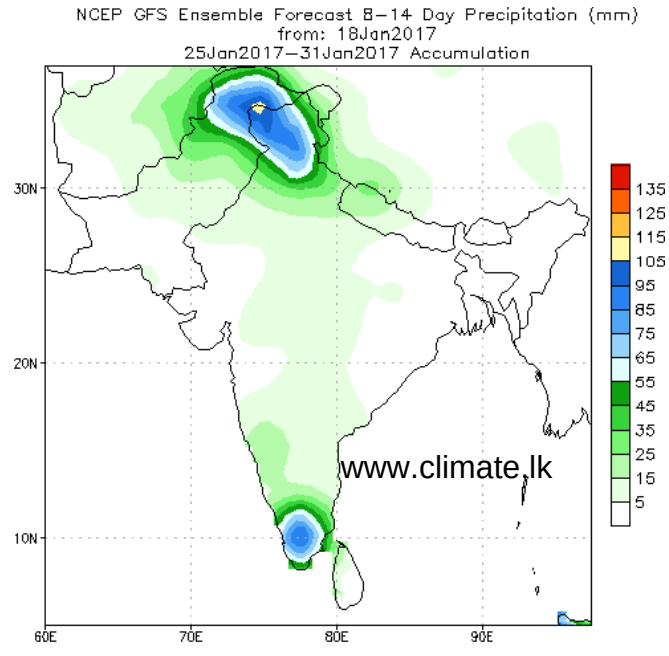


WORLDBATH topography

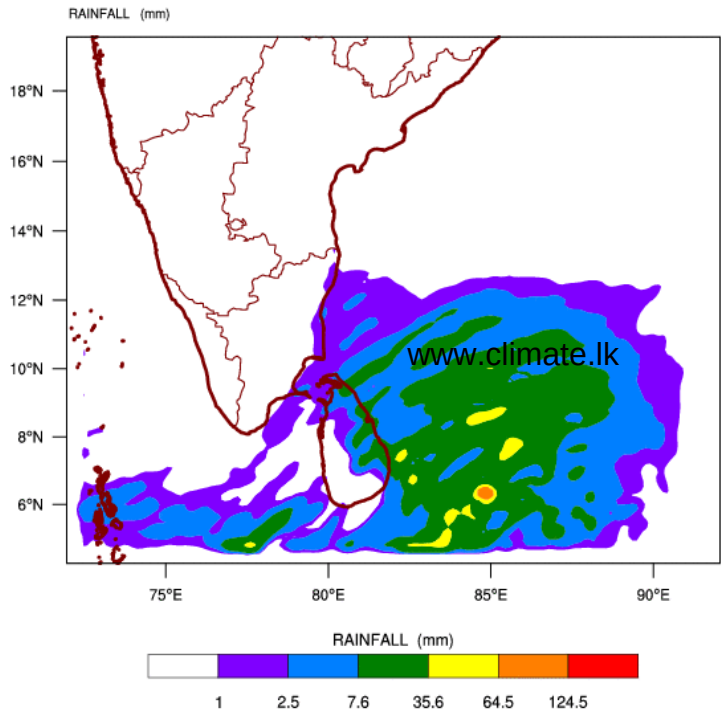
PREDICTIONS

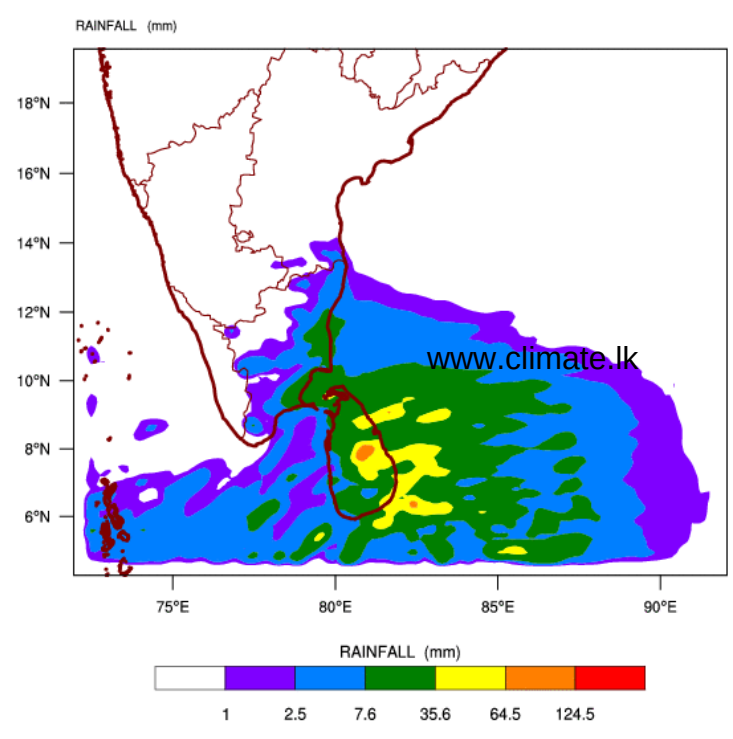
NCEP GFS 1- 14 Day prediction





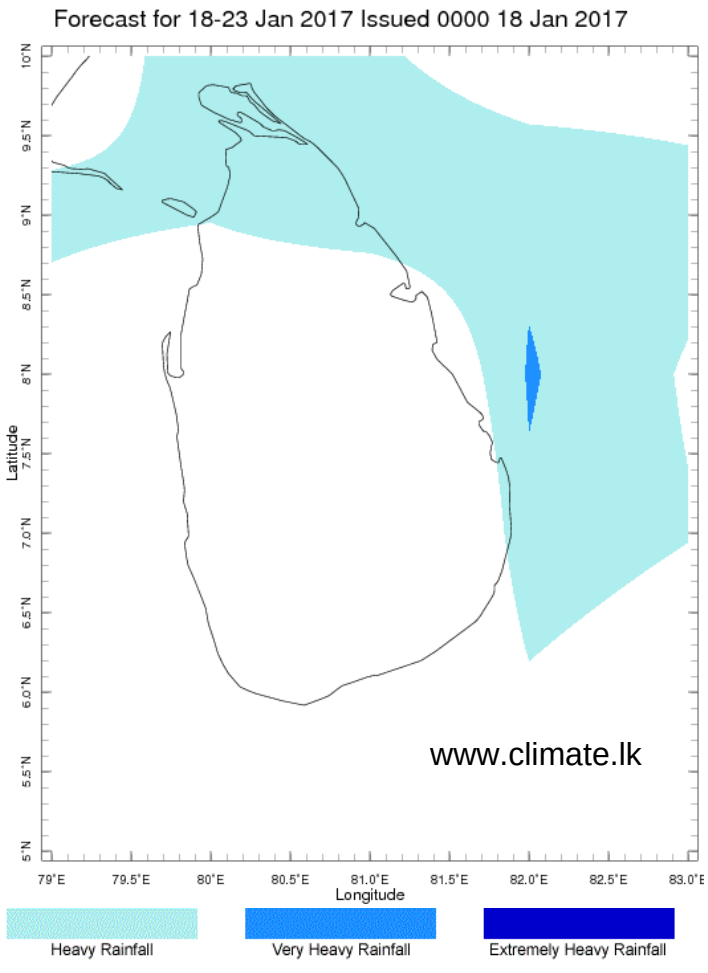
WRF Model Forecast (from IMD Chennai)



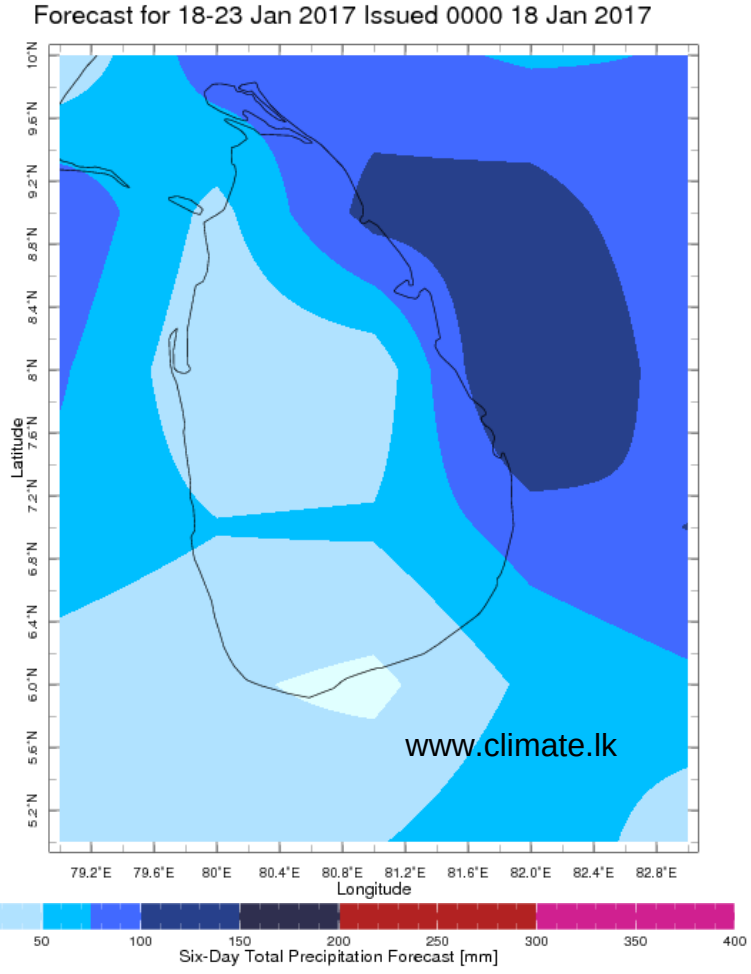


Weekly Rainfall Forecast from IRI

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.



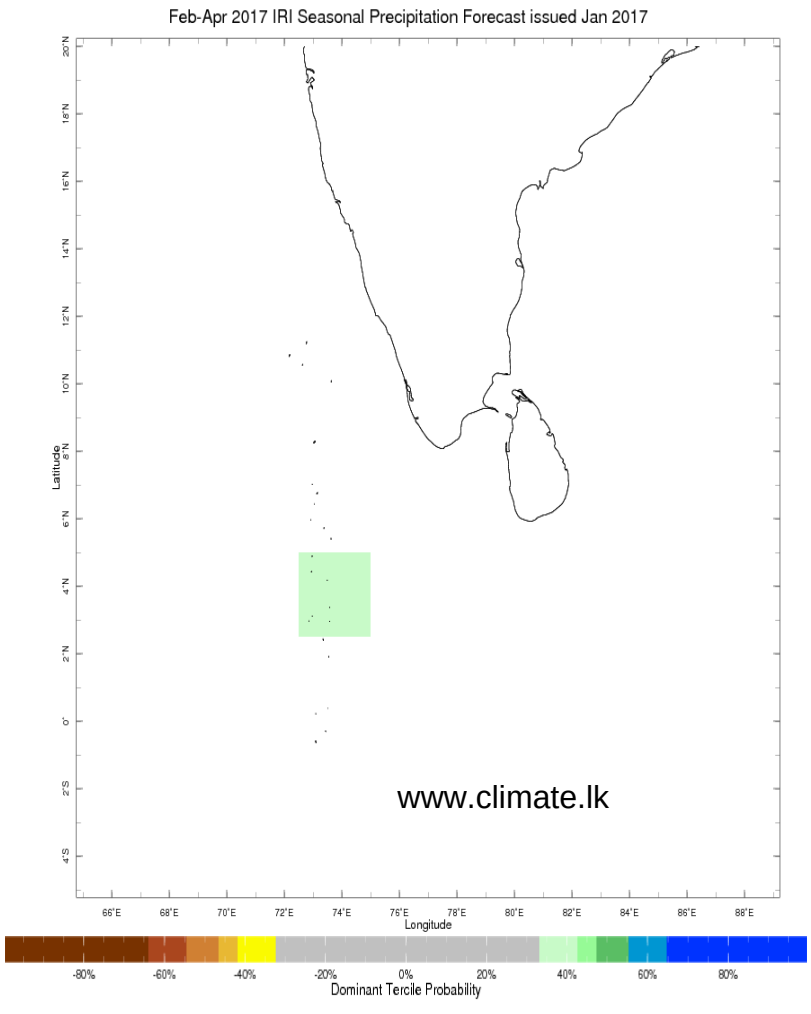
Extreme Rainfall Forecast



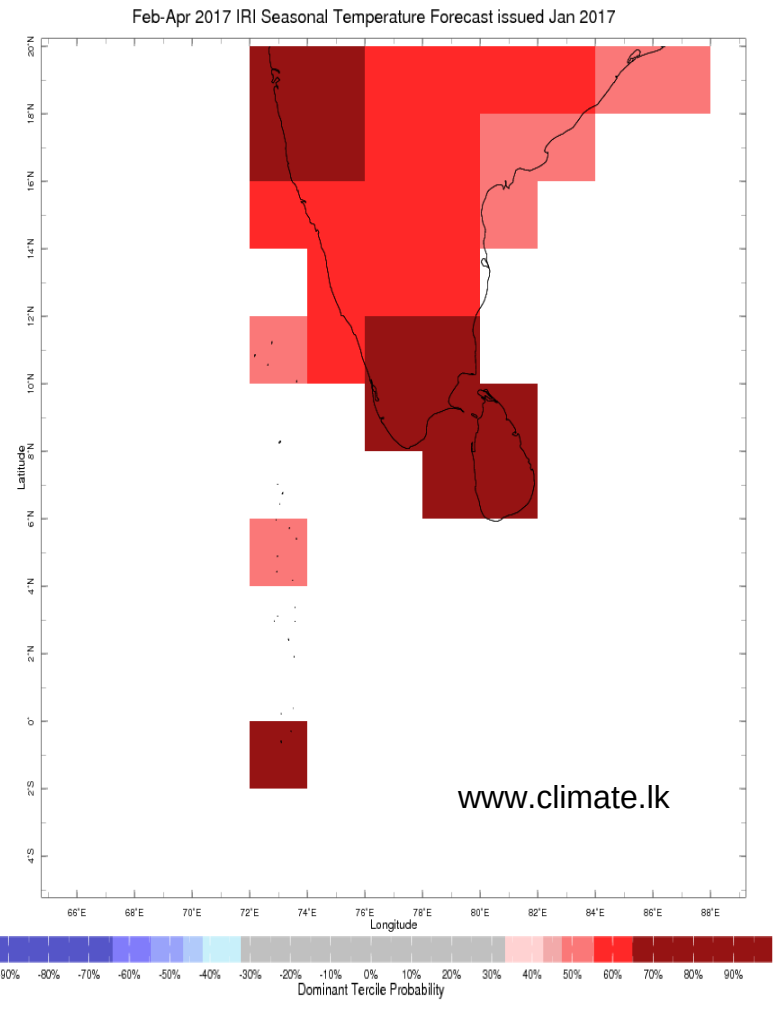
Total Six Day Precipitation Forecast

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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