

# The Climate over Sri Lanka up to the Yala of 2015

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## Summary

The rainfall from January to March leading up to the 2015 Yala season was slightly lower than normal; the rain picked up in April and May exceeding normal values. Even though the rainfall remained below normal for the rest of the season through August, the water availability was suited for irrigated cultivation such as for rice. North-central region of the country mostly received above average rainfall while south western regions which usually receive high rainfall mostly received below average rainfall. During September the entire country received above average rainfall. Heavy rainfall was observed during last two weeks of September which caused floods in several areas of the country. An El Nino event which had developed to a borderline state for many months became a fully-fledged event by July 2015. Usually during an El Nino, the rainfall is deficient from January to March and June to August. Rainfall in October to December is above normal and in May too is usually above normal. In addition, a positive Indian Ocean Dipole event took place – what this means is that the Arabian sea is warmer than normal in relation to the Bay of Bengal seas surfaces near Sumatra. In positive dipole events, usually there is a weak drop in rainfall from June to August and a significant rise from September to November. So this years, rainfall is following close to the historical averages for a combined El Nino and positive Indian Ocean Dipole event. In addition to this the amplitude of the Madden Julian Oscillation (MJO) in 2015 has been a mixture of very high amplitude events and weak events. When the amplitude is higher than 1 the rainfall is enhanced or suppressed based on the location of the MJO wave. When it is less than 1 MJO is considered to be weak and there shall not be an impact on rainfall. During March- April and June- July the MJO was strong. During February, May, August- September the MJO was mostly weak. Severe drought conditions were not observed during the early Yala season because most parts of the country observed high rainfall in April and May. Significant below average rainfall was only observed in July 2015.

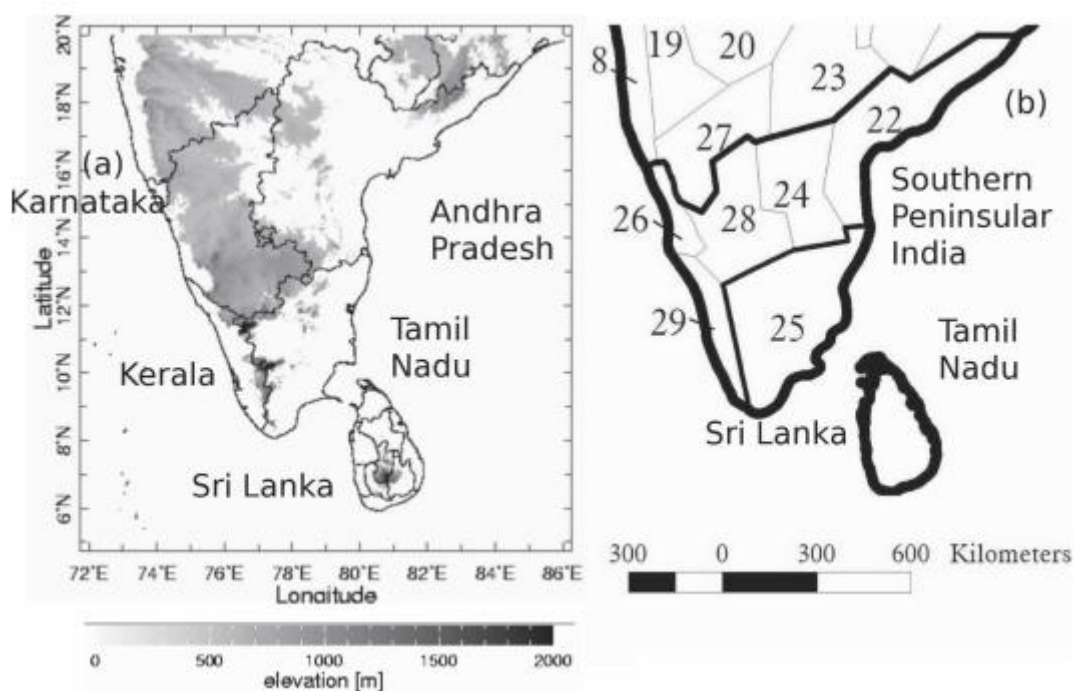
## Data

We use ground observations and satellite derived estimates. Ground observations although more accurate are not immediately available and are expensive – thus we rely largely on satellite estimated data. We have found that satellite derived data approximately follow the ground observations in the past with a systematic under-estimation of about 10-20% particularly in the hill country. This small systematic deviation is due to reasons such as double cloud cover (affecting satellite readings), wind conditions, topographical features of the region, time of measurement and possible measurement errors of ground data. Until ground readings are collated, quality controlled and made available affordably, we can use satellite data with some confidence.

## Drought Conditions across Equatorial South Asia

This year severe drought conditions were not observed in the region. Particularly Sri Lanka received above-average rainfall during the first 3 quarters of 2015. In the first quarter of the year (Jan- Mar) the south-western regions of Tamil Nadu and Andhra Pradesh as well as the sea around south India and Sri Lanka received slightly below average rainfall. This deficit of rainfall increased in the sea towards the equator. In the 2<sup>nd</sup> Quarter south India and Sri Lanka received above average rainfall. Only the northern region of Karnataka and Telangana received below average rainfall. In the 3<sup>rd</sup> Quarter the entire south Indian region received

significantly less rainfall than the historical average. The deficit in the rainfall in the western region of Maharashtra was very large compared to any other place in the equatorial South Asia.



**Figure 1: A representation of peninsular India that includes the subdivisions of Coastal Andhra Pradesh (22), Rayalseema (24), South Interior Karnataka (28), Coastal Karnataka (26), Kerala (29), and Tamil Nadu (25).**

### Island-Wide Rainfall over the last Five Years

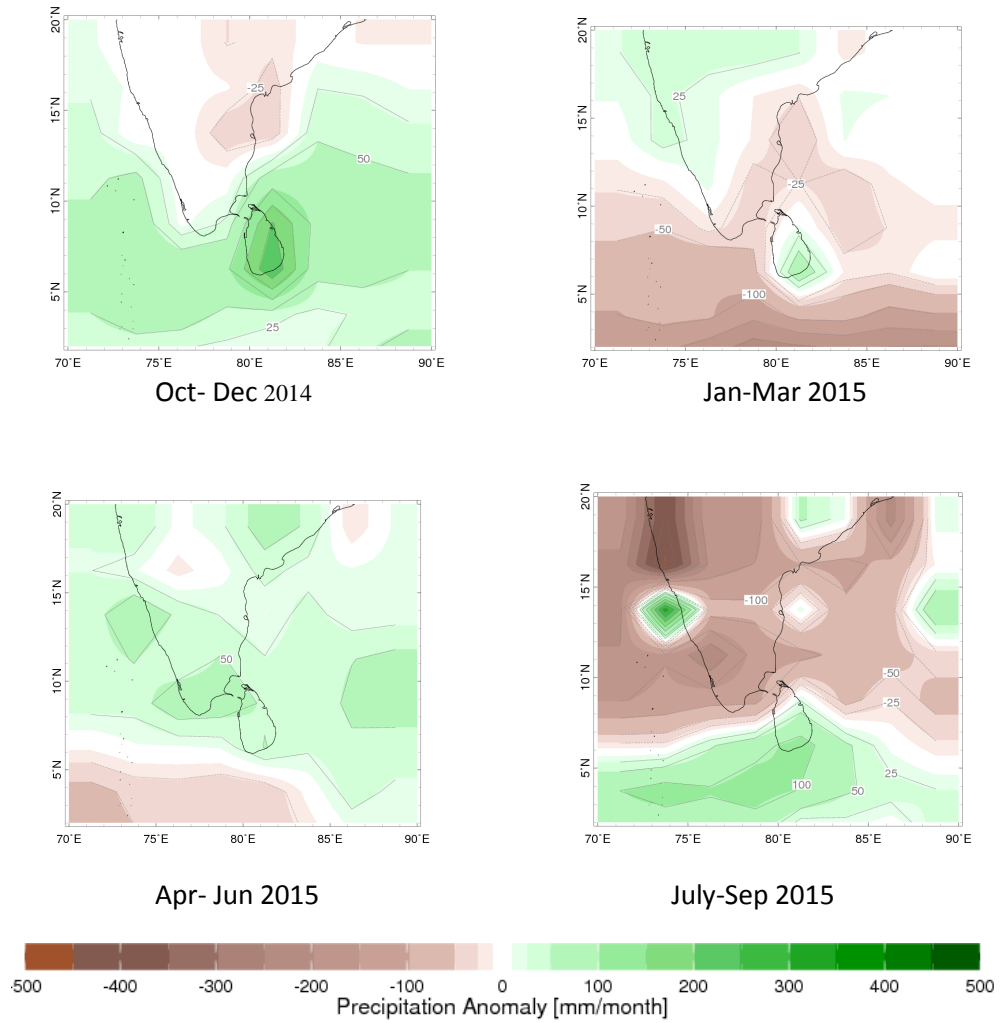
In 2015 rainfall within Sri Lanka was high at the start of the Yala season (Apr- May). Rainfall decreased at the beginning of June 2015; and low rainfall was observed during the following 3 months. Rainfall received during 2015 Yala was higher than that of 2014 but was lower compared to previous years. (Figure 2)

### Recent Rainfall Surpluses/Shortfalls

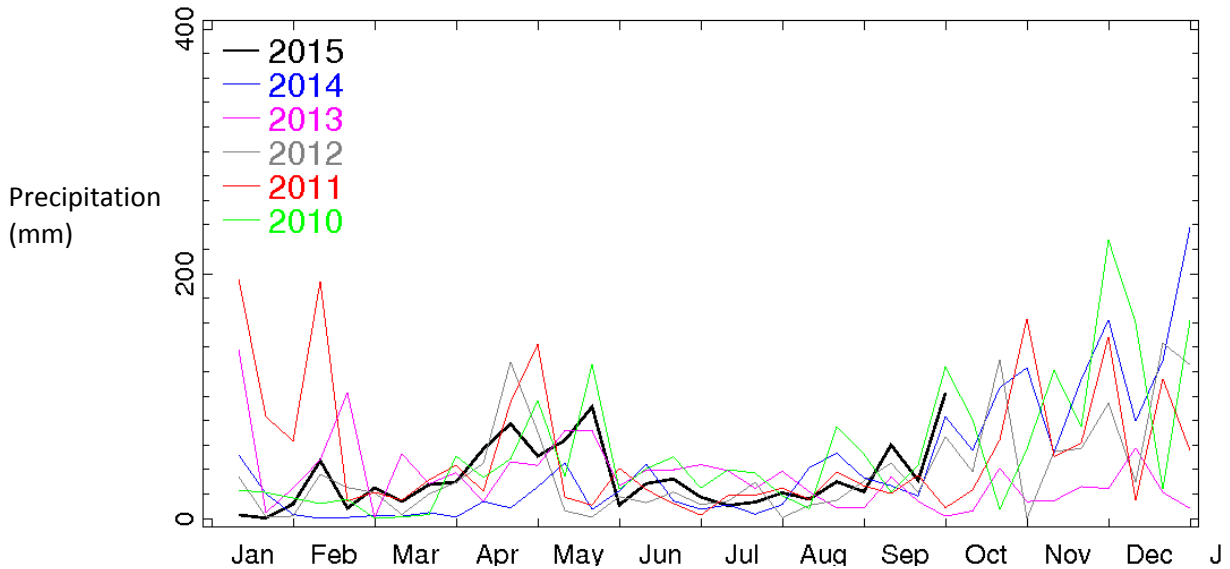
The severity of drought could be expressed in terms of rainfall-deficits and its duration. The monthly rainfall surpluses and deficits for the last three years with respect to the average for 2002 to 2013 period is shown in figure 3. In Sri Lanka above average rainfall was observed during April and May and thereafter below average rainfall was observed until September.

### Comparison of 2015 with Past

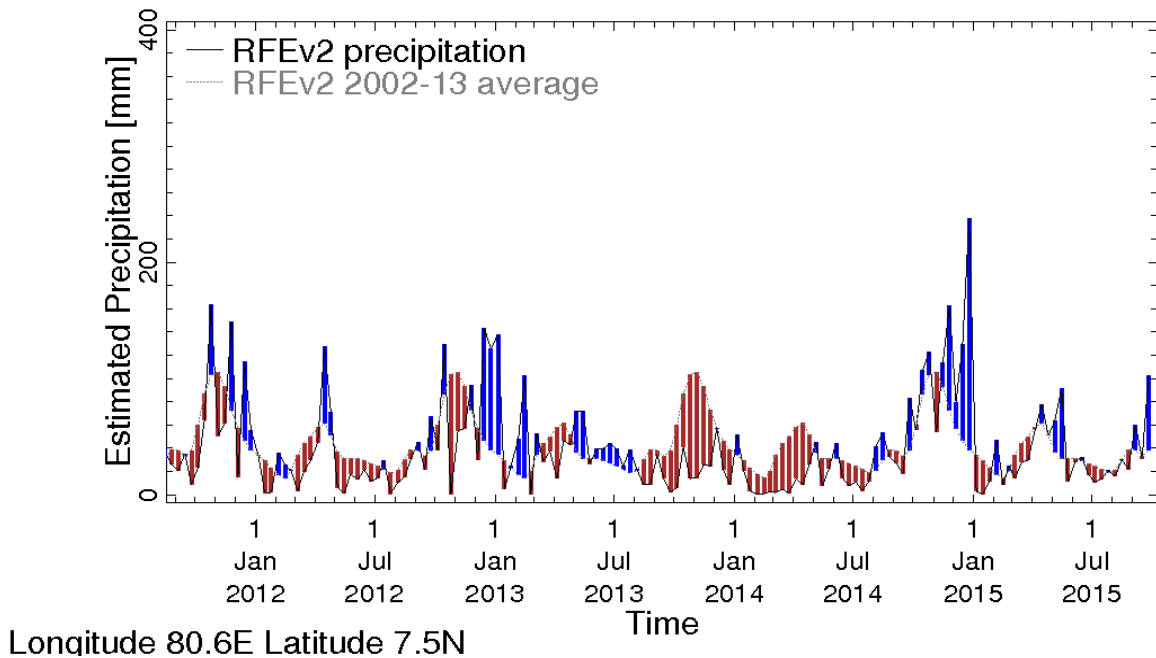
In 2015, although below average rainfall was observed during January, March, June, July and August high above-average rainfall in February, April and May modulated the rainfall deficit. In 2014 severe drought conditions were observed during Yala and very high above average rainfall was observed from October to the end of that year. In 2013 below average rainfall was observed during the early Yala season (March- April) and the deficit was compensated by above average rainfall received in May- July period. In 2012 high above average rainfall was observed during April drought conditions persisted rest of the Yala season.



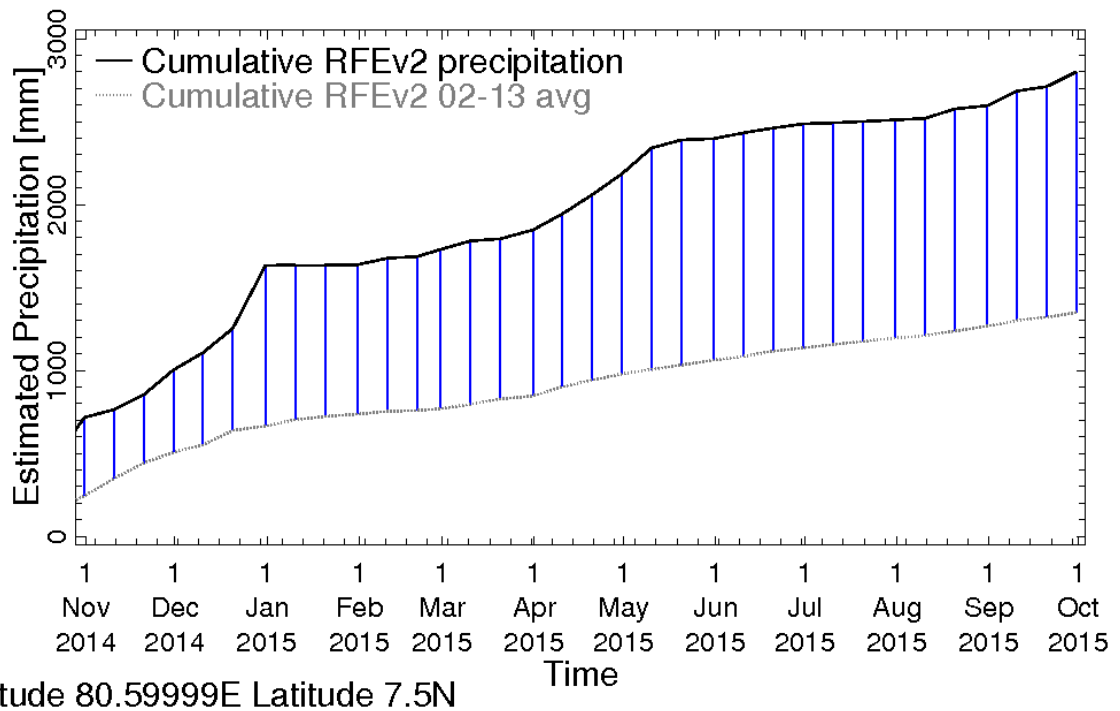
**Figure 2: Quarterly seasonal rainfall anomalies for Sri Lanka for 2015.** Rainfall anomalies for January-March (late Maha), and the first (April-June) and second (July-September) half of Yala are shown. The average rainfall is calculated for January 1979-September 2015



**Figure 3: Multi-year decadal (10-day) precipitation comparison.** The average rainfall for each dekad (roughly 10d days) over Sri Lanka estimated from satellites and ground observations is shown for the last 6 years as a line in a separate colour over a common January – December axis with 2015 in bold black.



**Figure 4: Dekadal precipitation and 2001-2015 average.** The smoother curve shows the average over 2001-2015 – this annual cycle is reproduced for each year in the above figure. The departures from this average are shown in blue when wetter and brown when dryer for each month for the last three years. A dekad refers roughly to 10 days or more accurately as each month divided into three.

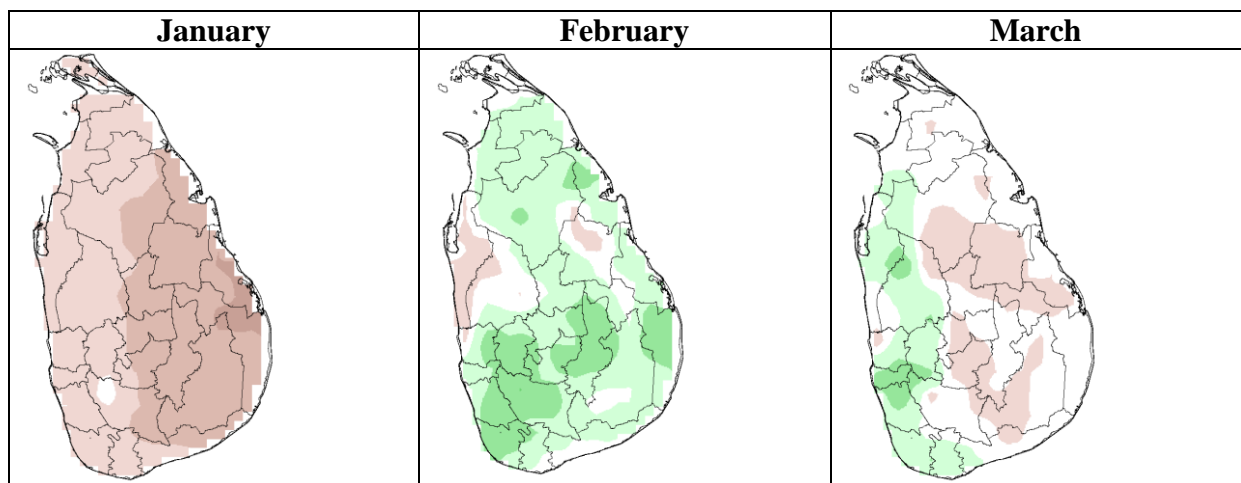


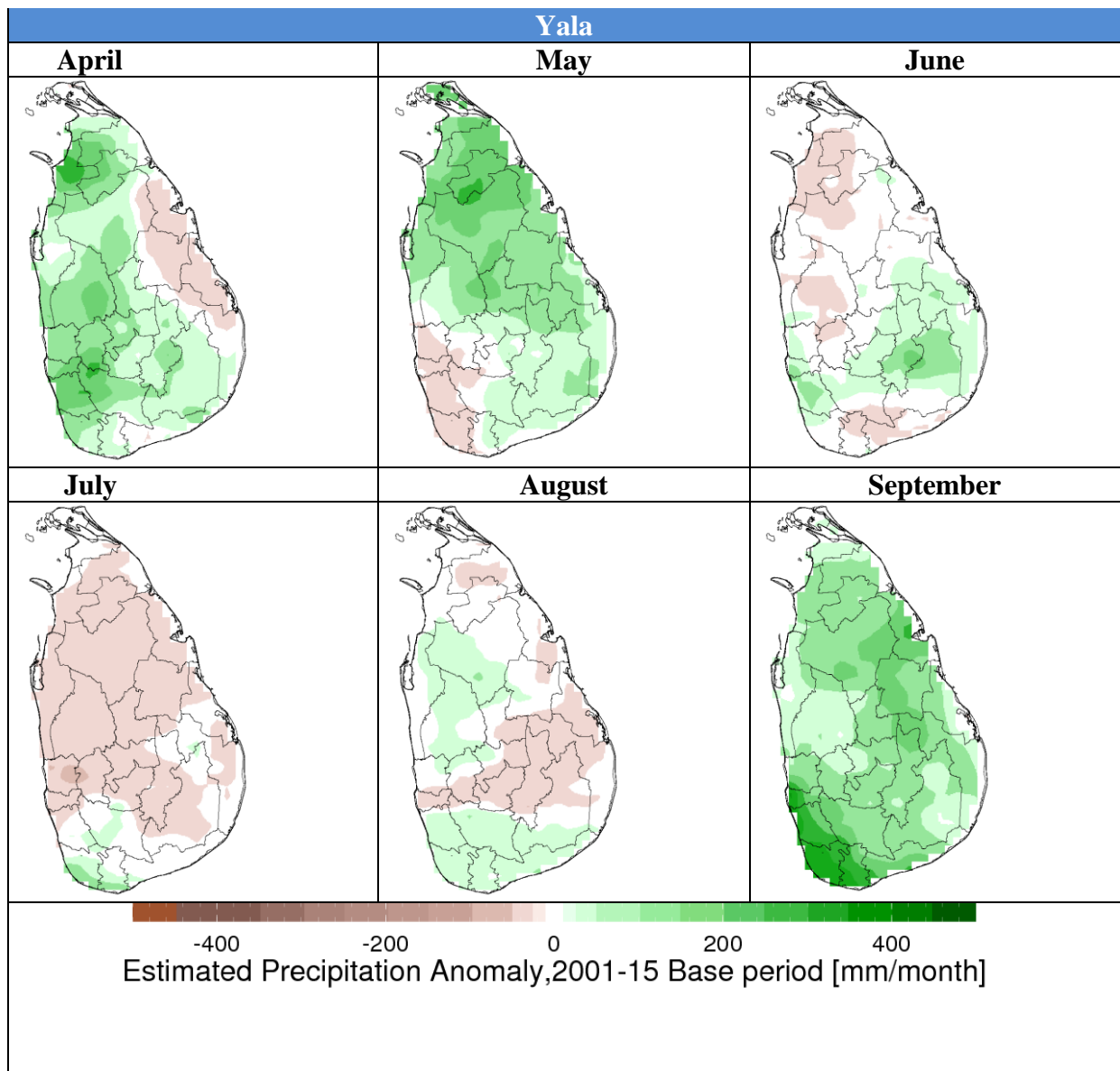
**Figure 5: Decadal Cumulative Rainfall Graph .** Cumulative decadal satellite derived estimates are shown in solid black line and the cumulative recent short term average precipitation is show in grey dotted line for the most recent 12- months period in the selected region. The blue bars are indicative of estimates that are above the short-term average.

### Monthly Rainfall by District

Anomalies – departures from the average for each month and district – are shown in **Figure 5**. The average rainfall has been calculated for the base period 2001-2015. Wetter than normal is shown in green and dryer than normal in brown.

**Figure 5: Monthly precipitation anomalies for 2015 by district**





In January the entire country received below average rainfall. During February the rainfall increased in the entire country. During April to September season the mean rainfall in the entire country was above average. This is mostly due to heavy rainfall observed in April May and September.

### **Further Information**

Technical details regards the Yala climate are provided in a series of research papers published in the International Journals cited below and available via [www.climate.lk](http://www.climate.lk). Our seasonal and weekly updates are available at <http://fectsl.blogspot.com>

## References

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