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# Experimental Climate Monitoring and Prediction

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**7 July 2016**

## Highlights

**Dry conditions were mostly seen throughout the county in the previous week. The only recorded rainfall in the week was on the 29th June which was less than 10 mm in south-western and central regions of the country. In June 2016 the entire country received less than average rainfall with the south-western region of the country receiving 20- 50% below normal and the rest of the country receiving more than 75% below normal rainfall. Due to this, the average rainfall deficit in the entire country has increase up to 30 mm by the 5th July. Rainfall is only expected in the south western region of the country during the next week and extreme rainfall events are not expected. Strong wind is expected in the southern half of the country and the highest temperature is expected in the eastern and north-eastern regions of the country. MJO is weak.**

## Monitoring

### Rainfall

***Weekly Monitoring*:** Less than 10 mm rainfall received by south-western and central regions of the country on the 29th June. No rainfall reported in any region of the country during 30th June- 5th July 2016. Both CPC unified Precipitation analysis and RFE2 models report less than 10 mm rain in south-western and central regions during this period as well. Therefore, the rainfall received in the week (29th June- 5th July) is up to 25 mm below average in these regions.

***Monthly Monitoring*:** Less rainfall was seen during June 2016 compared to very heavy rains in the previous month. Rainfall was mostly in the south western region of the country which totaled up to 150- 200 mm in the entire month. This received precipitation amount is about 20- 50% less than what is usual in June in south western, western and central regions of the country. The rest of the country received more than 75% less than average rainfall in June 2016. Rainfall of only 7 days in the past 30 days was above normal. Due to prevailing dry conditions in the country the rainfall deficit in the entire country has increased to about 30 mm by 5th July.

### Temperature

During the week from 26th June to 2nd July, the highest temperature of 35- 40 $^0$C is recorded in the eastern and south eastern regions of the country. The lowest temperature was around Nuwara Eliya which was 15- 20 $^0$C. The south western region of the country was relatively cooler than the rest of the country in the night.

### Wind

Reduced wind speeds were seen across the country in the previous week (28th June- 4th July). 10- 15 m/s north westerly wind was seen throughout the country at both 850 mb and 700 mb levels.

### Ocean State

***Pacific seas state: June 16, 2016***

During mid-June 2016 the tropical Pacific SST anomaly was near zero, indicating ENSO-neutral conditions. The key atmospheric variables also indicate neutral ENSO condition. This includes near-average upper and lower level tropical Pacific winds, as well as near-normal cloudiness and rainfall patterns in the central and eastern equatorial Pacific. Most ENSO prediction models indicate neutral ENSO conditions during June, with likely development of La Niña (of unknown strength, but likely weak) by late July or August, lasting through fall and into winter. (*Text Courtesy IRI*)

***Indian Ocean State***

Neutral sea surface temperature anomaly was observed around Sri Lanka.

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## Predictions

### Rainfall

***14-day prediction:*** NOAA NCEP models predict up to 15 mm total rainfall during 6th- 12th July 2016 in the south-western region of the country. The rest of the country shall not receive rainfall during this period. In the following week (13- 19th July) up to 25 mm rainfall is expected in the south western region while the rest of the country shall remain dry.

***Weekly prediction:*** *IMD GFS* model predicts no rainfall in the entire country on the 7th July. Up to 10 mm rain is expected in the south western region on the 8th. Then on the 9th Colombo and Kalutara regions may receive up to 40 mm rainfall while the surrounding regions may receive up to 20 mm rainfall. The rest of the south western and western regions shall receive less than 10 mm rainfall. Less than 10 mm rain is expected in the western region of the country on 10th and 11th. The entire country shall not receive rainfall on 12th and 13th.

***IMD WRF & IRI Model Forecast****:* According to the IMD WRF model, less than 35 mm rain is expected on the 8th July in the western region of the country. Same rainfall condition is expected on the 9th as well. In addition, up to 7.5 mm rainfall is expected in Ampara/ Kalmunai regions on the 9th. No extreme rainfall events expected during 6th- 11th June.

***Seasonal Prediction:*** As per IRI Multi Model Probability Forecast for July to September, the total 3-month precipitation shall be climatological. The 3-month temperature has more than 70-80% likelihood in the entire country of being in the above-normal tercile during this period.

### Temperature

NOAA CPC GFS model predicts 35- 40 $^0$C maximum temperature along the coastal belt in the Eastern side of the country. Maximum temperature in the hill country and the Western province shall be between 25- 30 $^0$C. During the same week, minimum temperature is expected around Nuwara Eliya and Badulla to be 15- 20 $^0$C while in the northern region and Hambantota it shall be 25-30 $^0$C. The minimum temperature in the rest of the country shall be 20-25 $^0$C.

### Wind

At the 850 mb level 15- 20 m/s strong wind is expected in the southern half of the country while the northern half shall have 10-15 m/s wind. The direction of the wind shall be generally north-westerly. At the 700 mb level 10- 15 m/s westerly wind is expected throughout the country.

### MJO based OLR predictions

MJO shall not have a significant impact on 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.

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# Weekly Hydro- Meteorological Report for Sri Lanka

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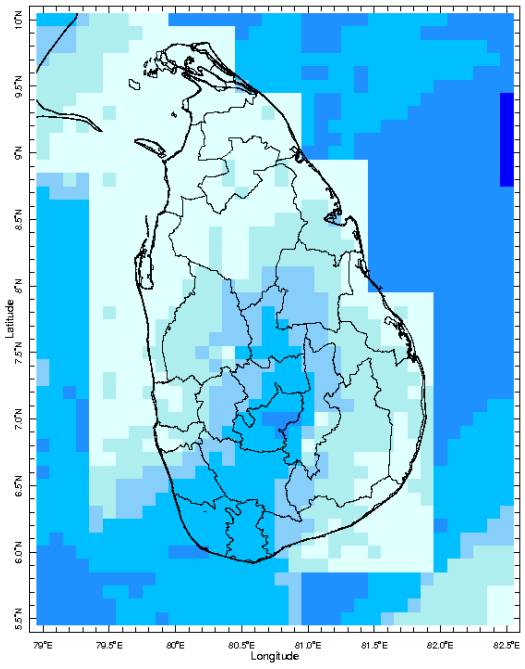
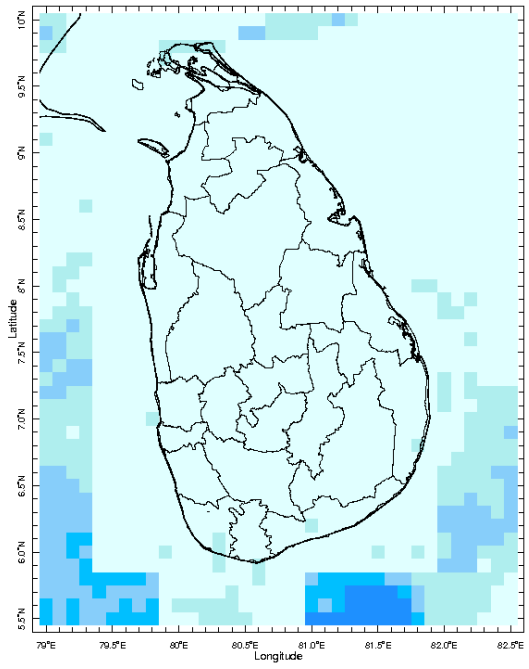
## MONITORING

### Daily Rainfall Monitoring

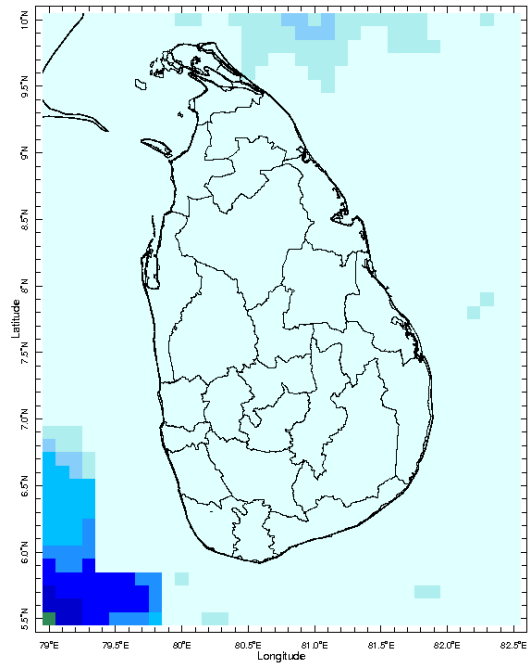
**The following figures show the satellite observed rainfall in the last 7 days in Sri Lanka.**



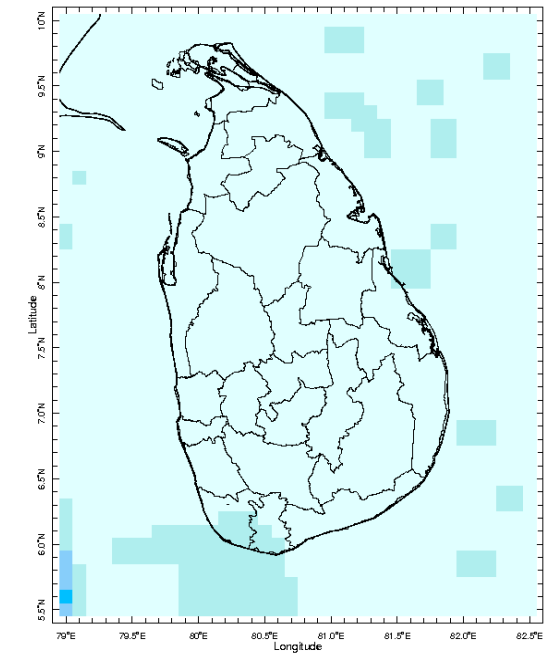

29 Jun 2016



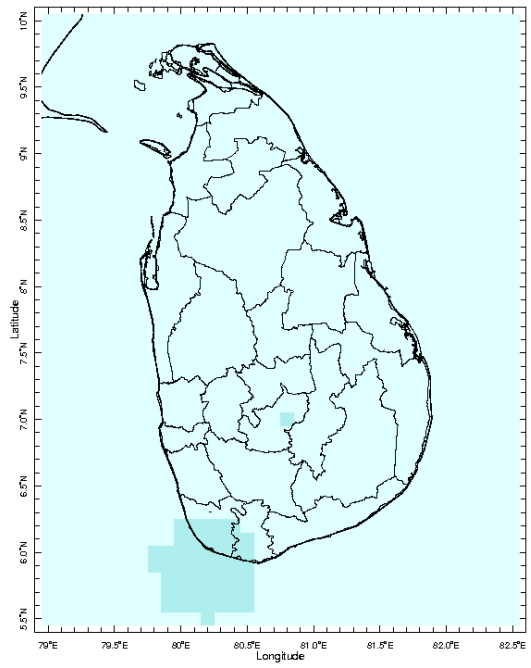

30 Jun 2016



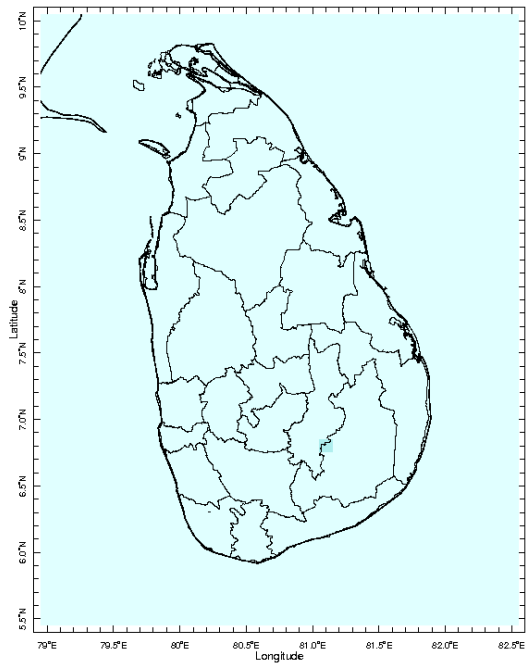

1 Jul 2016



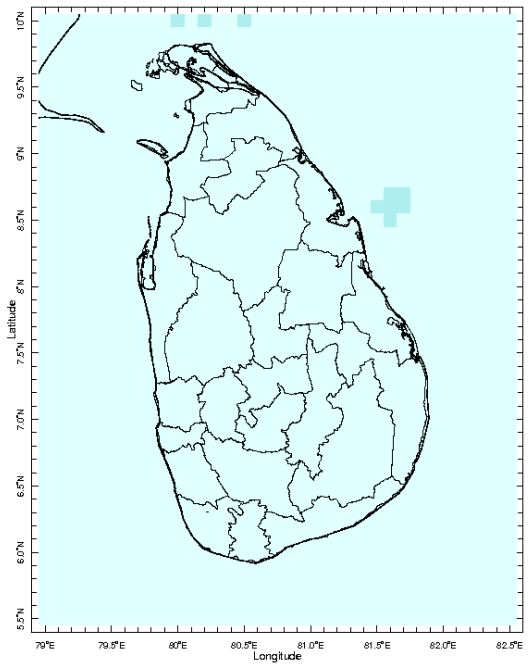

2 Jul 2016



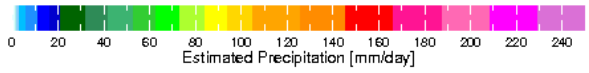

3 Jul 2016




4 Jul 2016

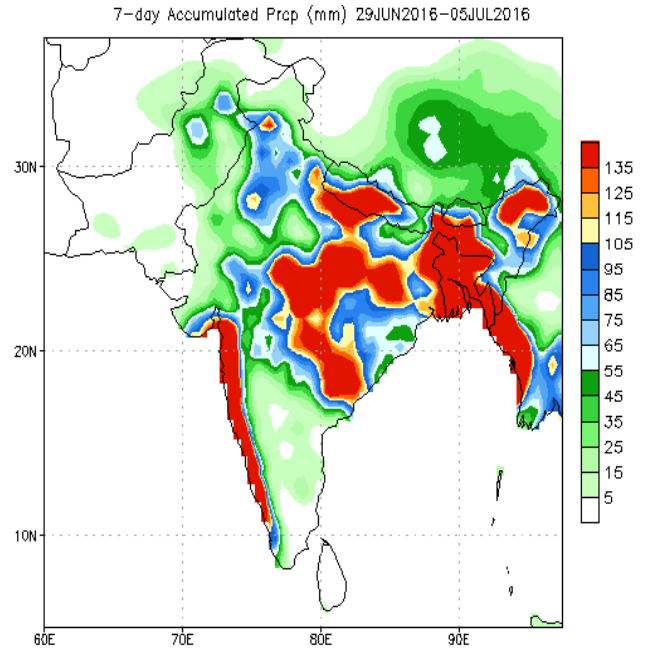



5 Jul 2016

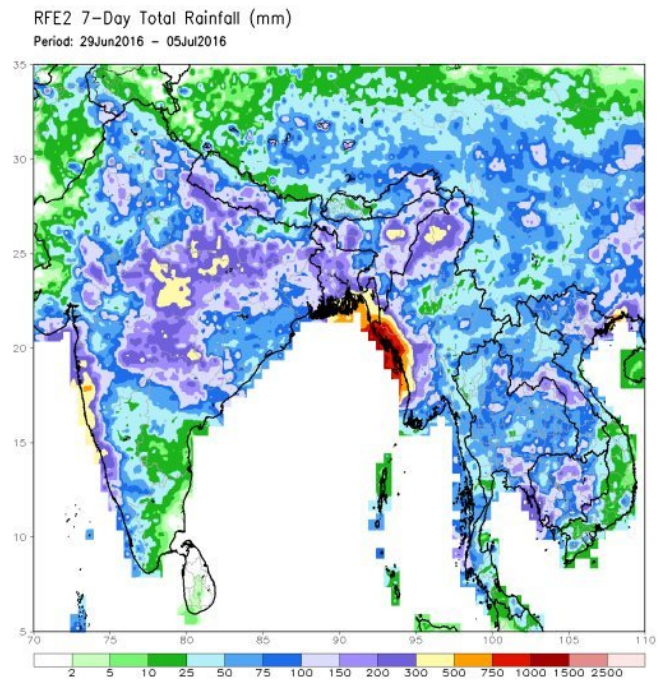


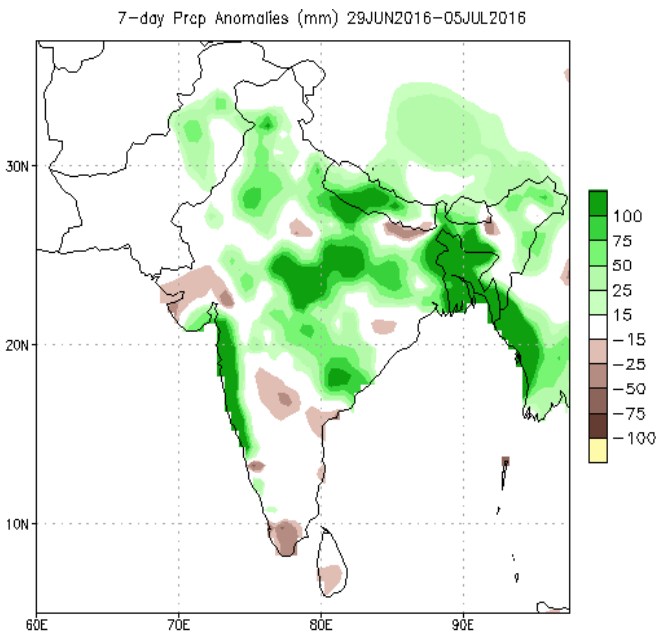
## Weekly Rainfall Monitoring

**The following figures show the total satellite observed rainfall in the last week in Sri Lanka. The figure in the left is the total 7-day rainfall from NOAA Climate Prediction Center (CPC) Unified Precipitation Analysis and the figure in the right is the total 7-day rainfall from CPC RFE 2.0 Satellite Rainfall Estimates. The bottom two figures are the respective anomalies.**

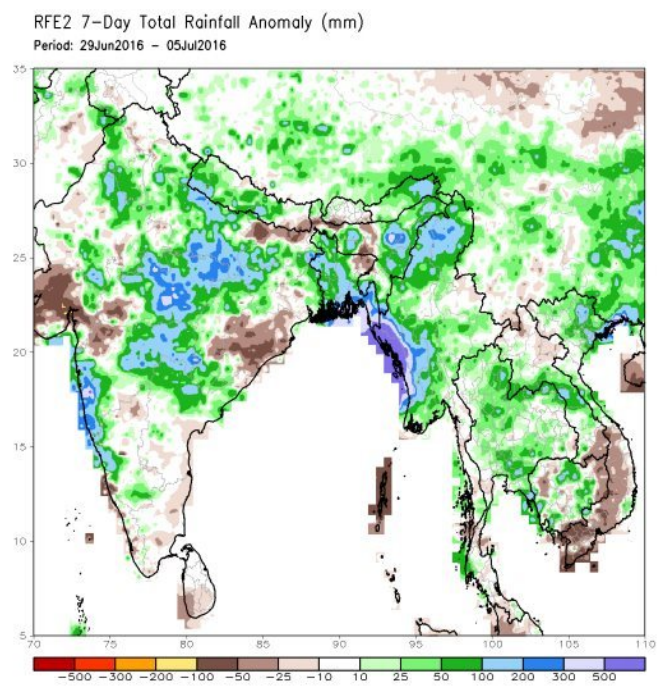



Data Source: CPC Unified (gauge-based & 0.5x0.5 deg resolution) Precipitation Analysis



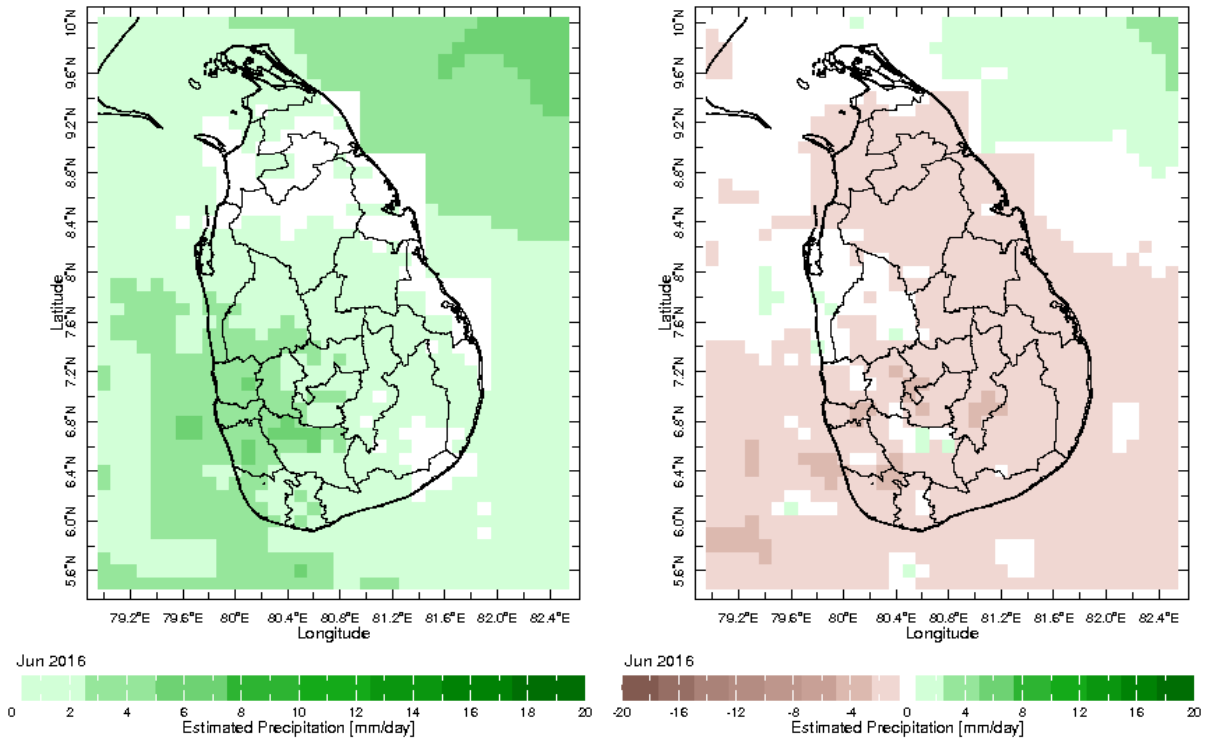




Data Source: CPC Unified (gauge-based & 0.5x0.5 deg resolution) Precipitation Analysis Climatology (1981-2010)



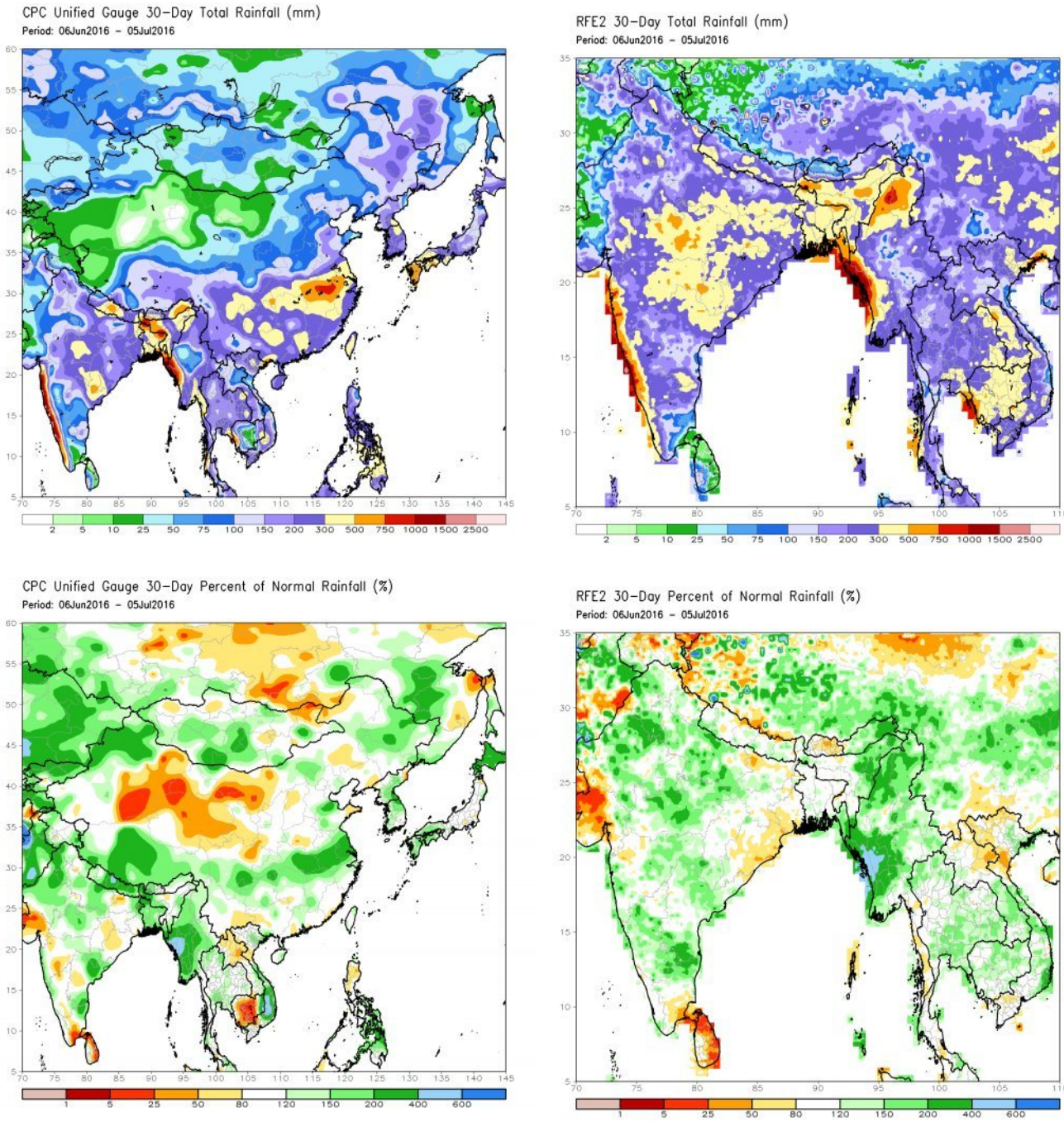
## Monthly Rainfall Monitoring

**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**

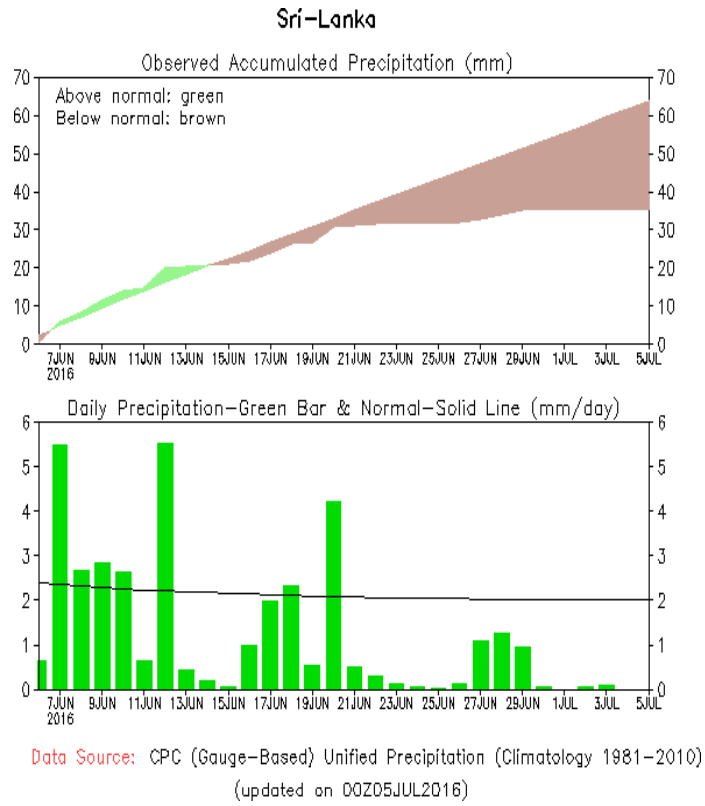



**Monthly Average** **Monthly Anomaly**

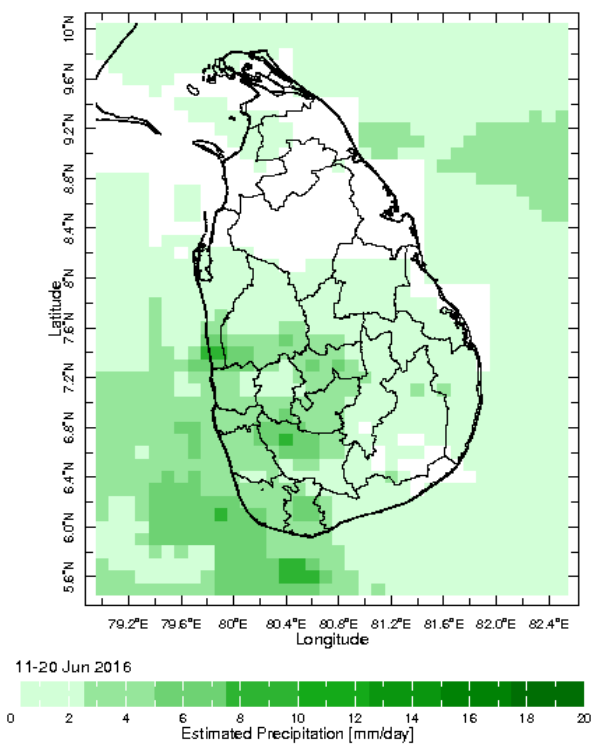
**The figure in the top-left shows the total rainfall in the past 30 days from CPC Unified Precipitation Analysis while the figure in the top-right shows the total rainfall for the same period from RFE 2.0 Satellite Rainfall Estimates. The bottom two figures show the percentage of rainfall received in the past 30 days compared to normal rainfall in this period.**

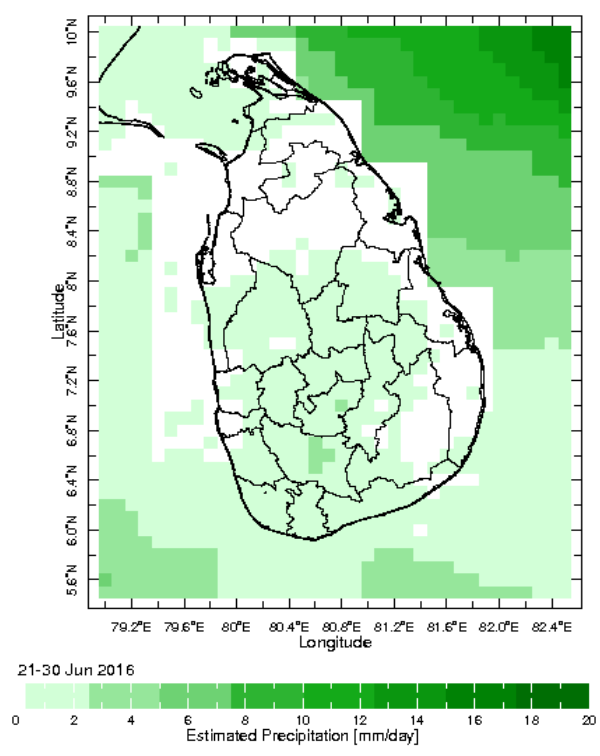


**The following figure shows the observed accumulated rainfall (top) and daily observed rainfall (bottom) in Sri Lanka in the last 30 days.**

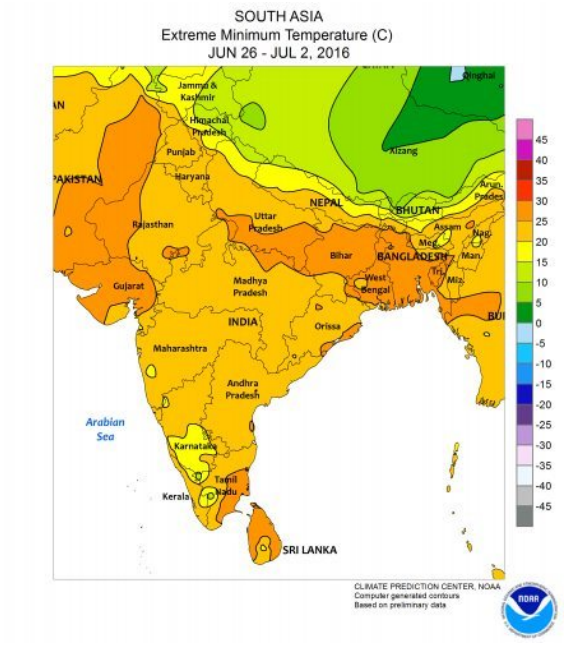


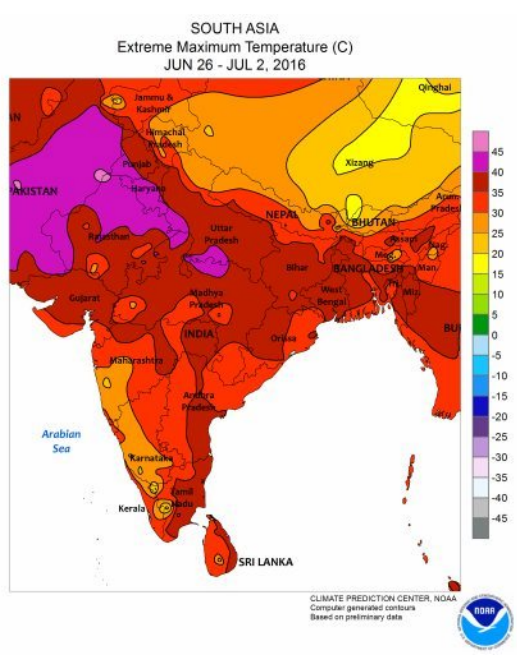

## Dekadal (10 Day) Satellite Derived Rainfall Estimates

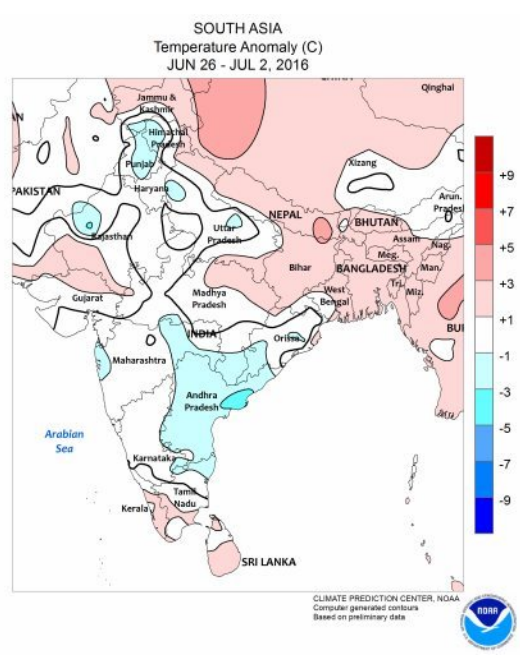


## Weekly Temperature Monitoring

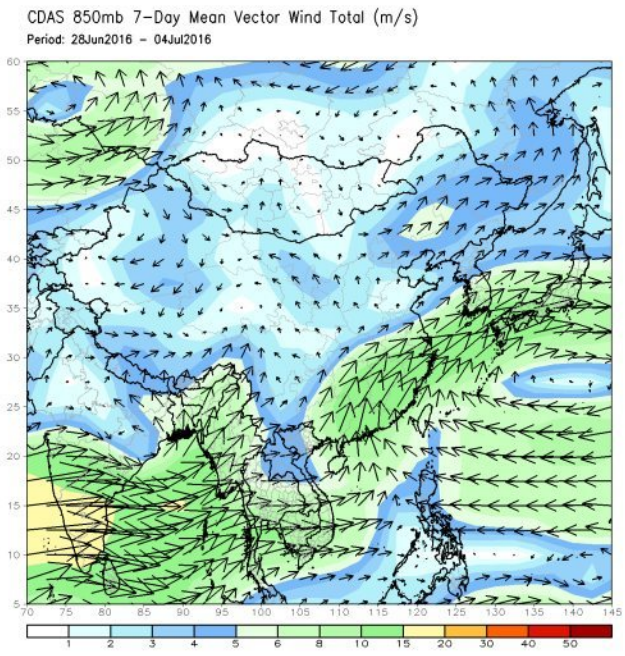


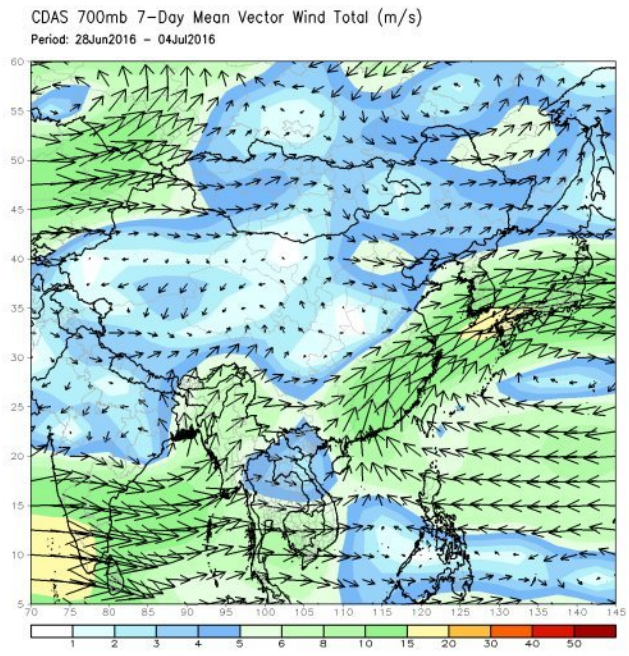




## Weekly Wind Monitoring

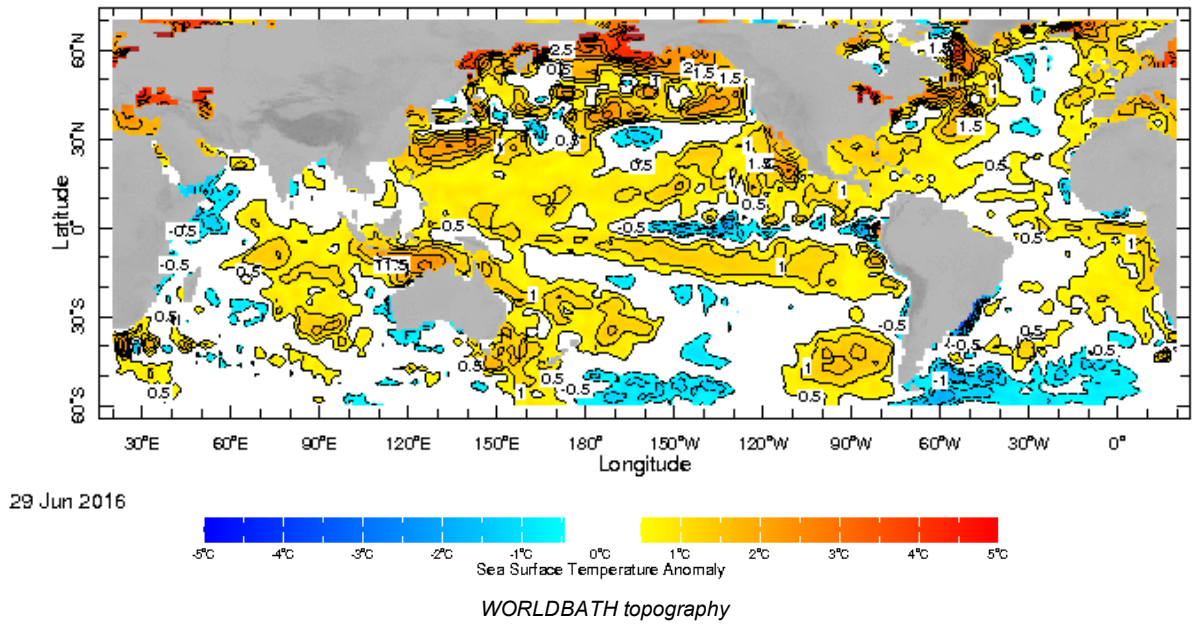
**The following figures show the mean vector wind total of the past 7 days near Sri Lanka at two levels. The figure on the left shows 850 mb (~1500 m) level and the figure on the right shows 700 mb (~3000 m) level.**



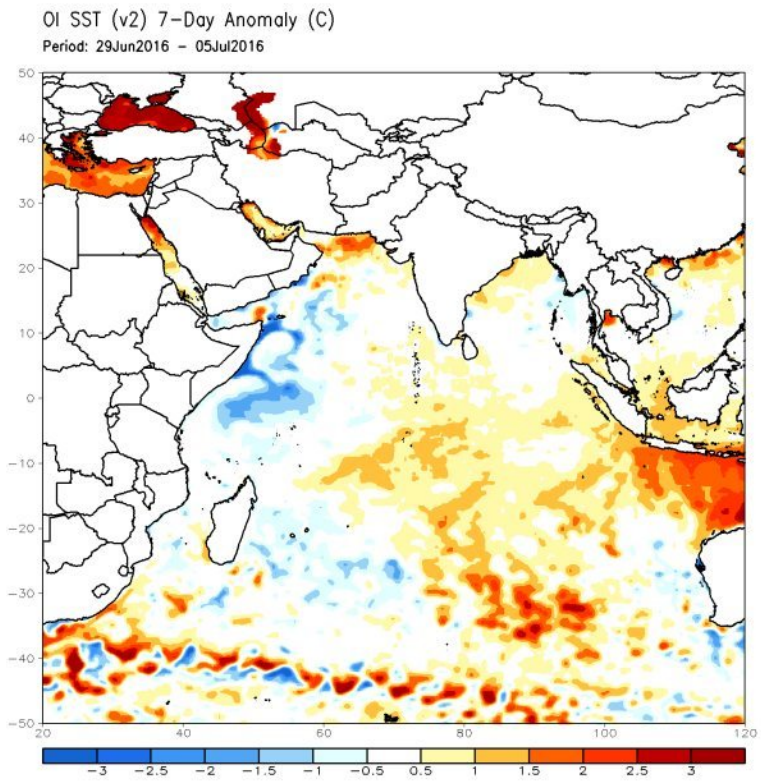




## Weekly Average SST Anomalies

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

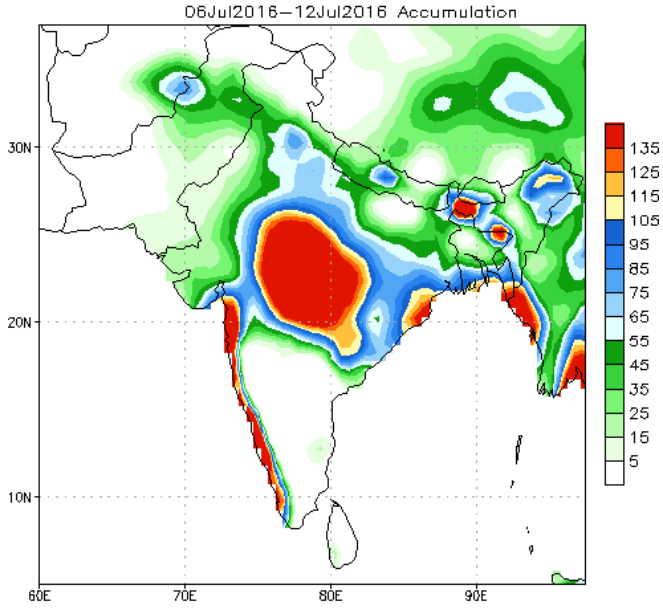


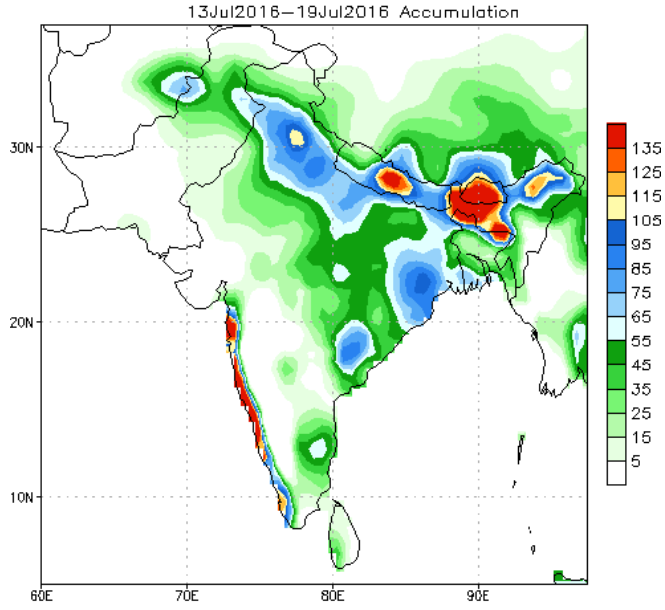
**Optimum Interpolated Sea Surface Temperature Anomaly in the Indian Ocean from NOAA CPC**



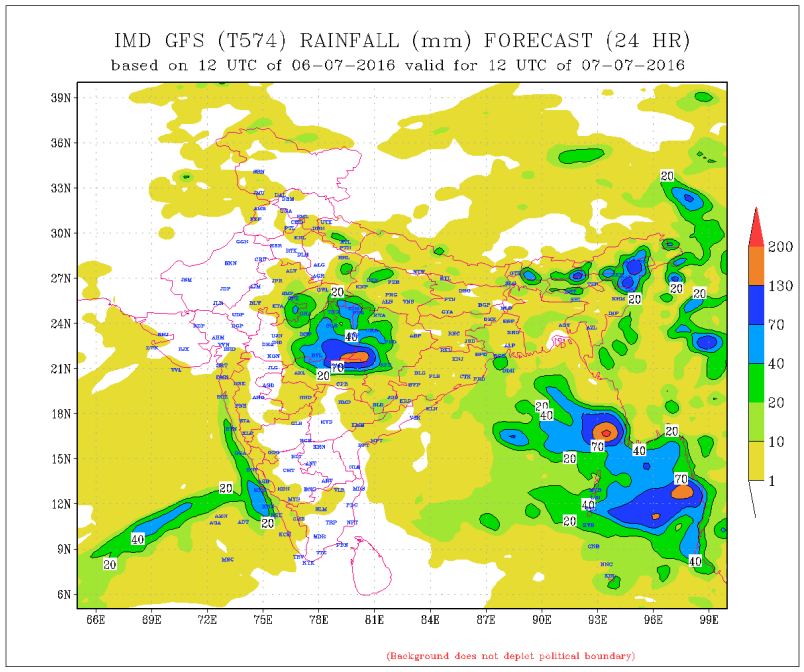

## PREDICTIONS

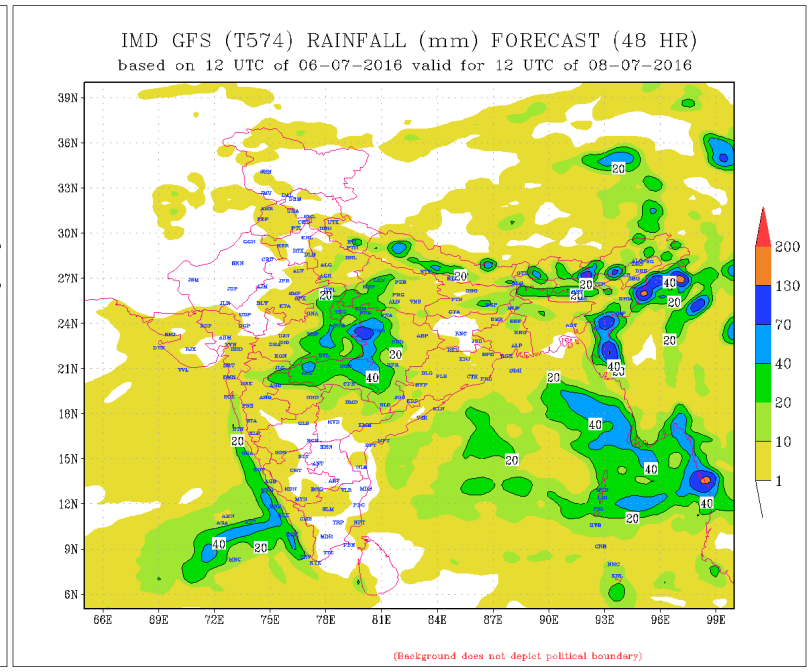
### NCEP GFS 1- 14 Day prediction

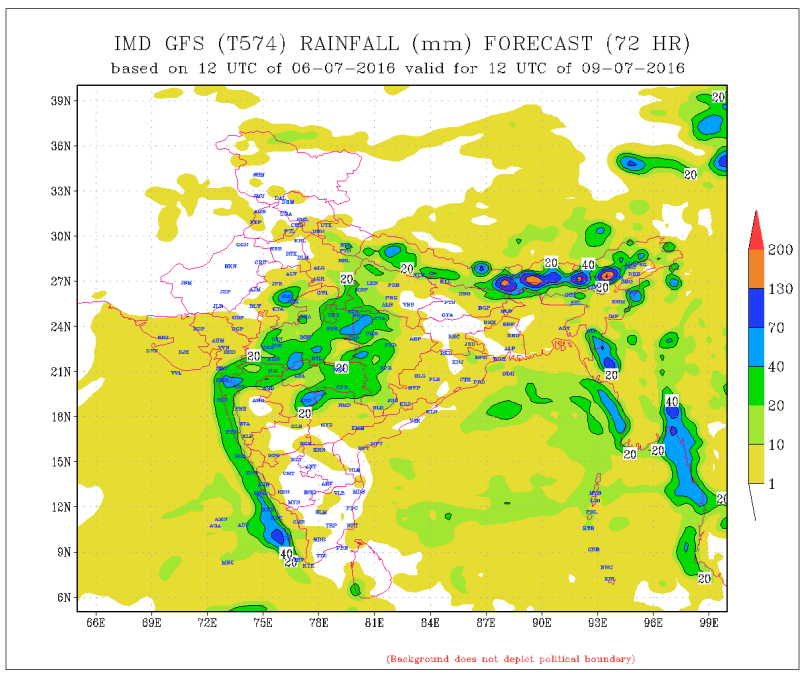


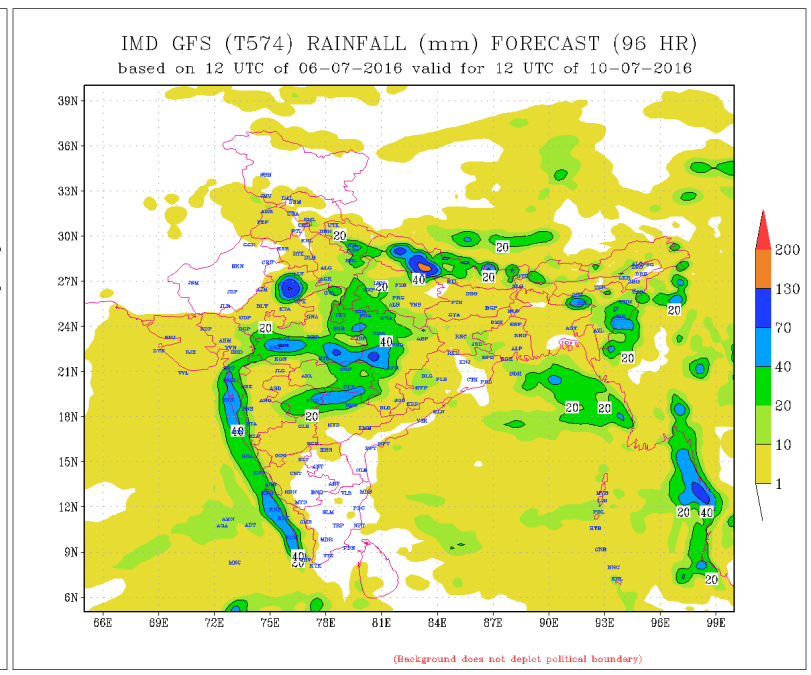



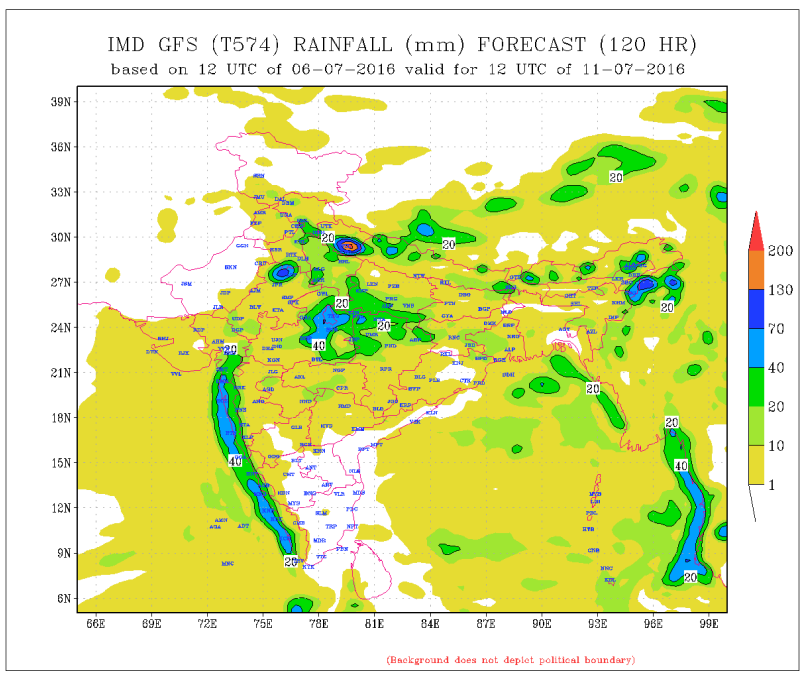
# IMD GFS (T574) Model Rainfall Forecast from RMSC New Delhi, India

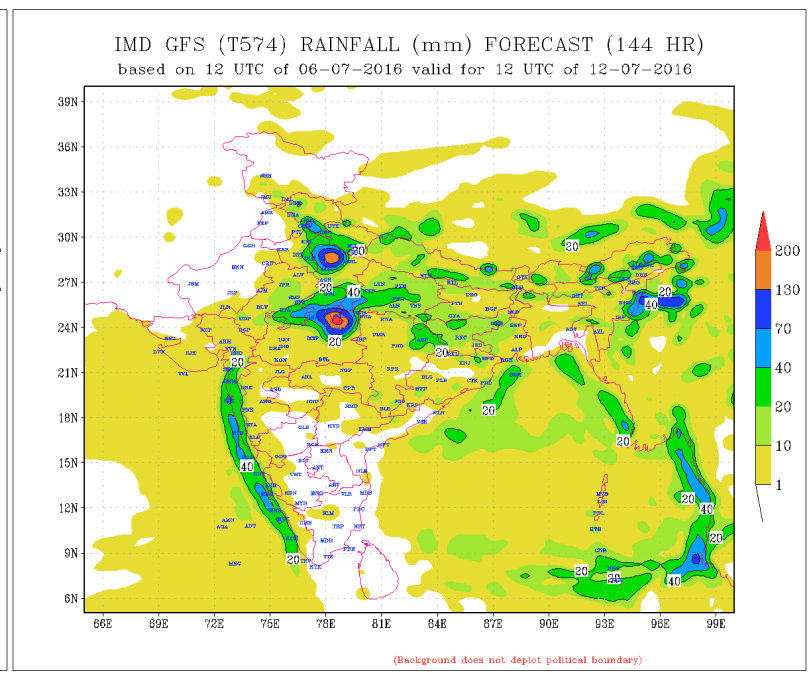


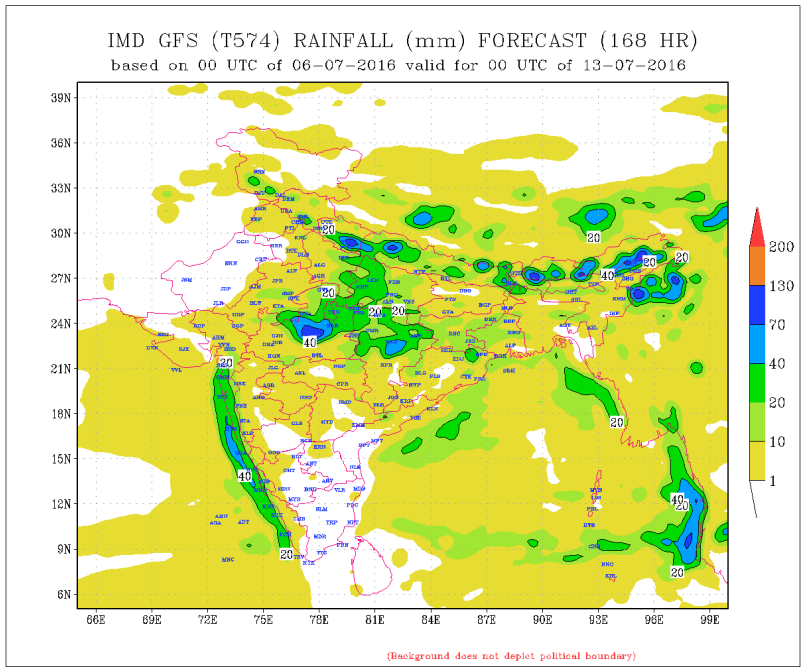



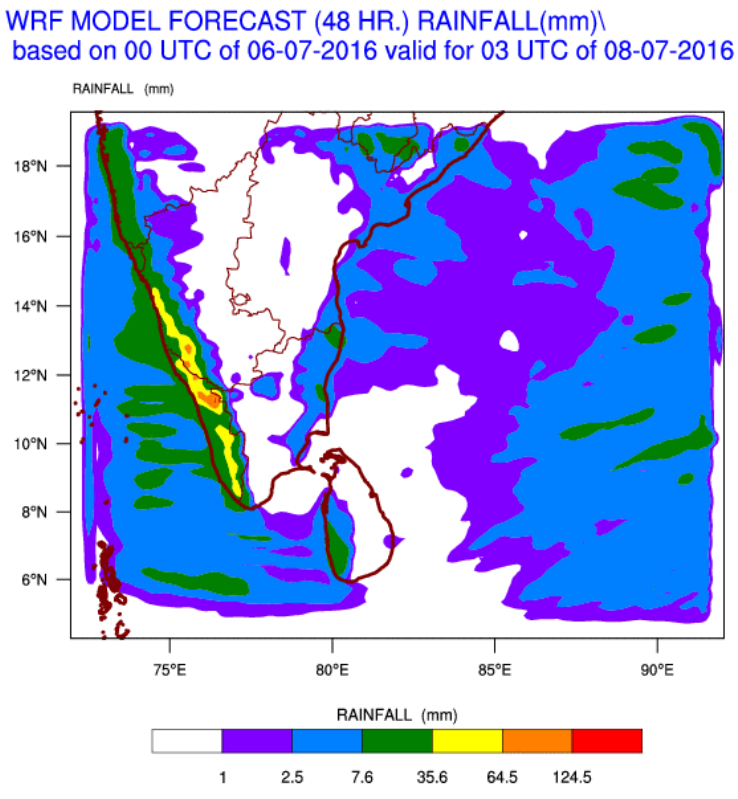



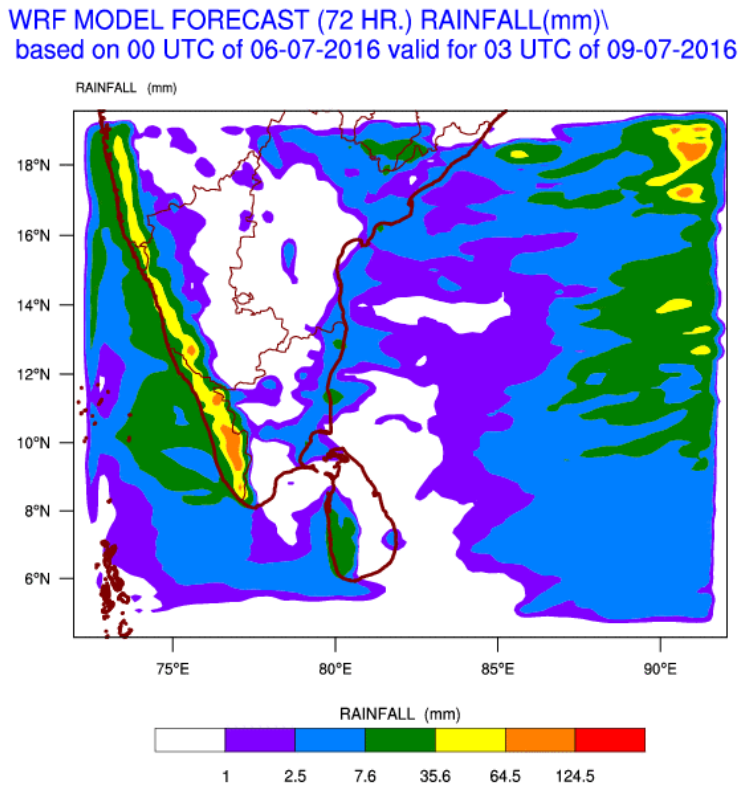





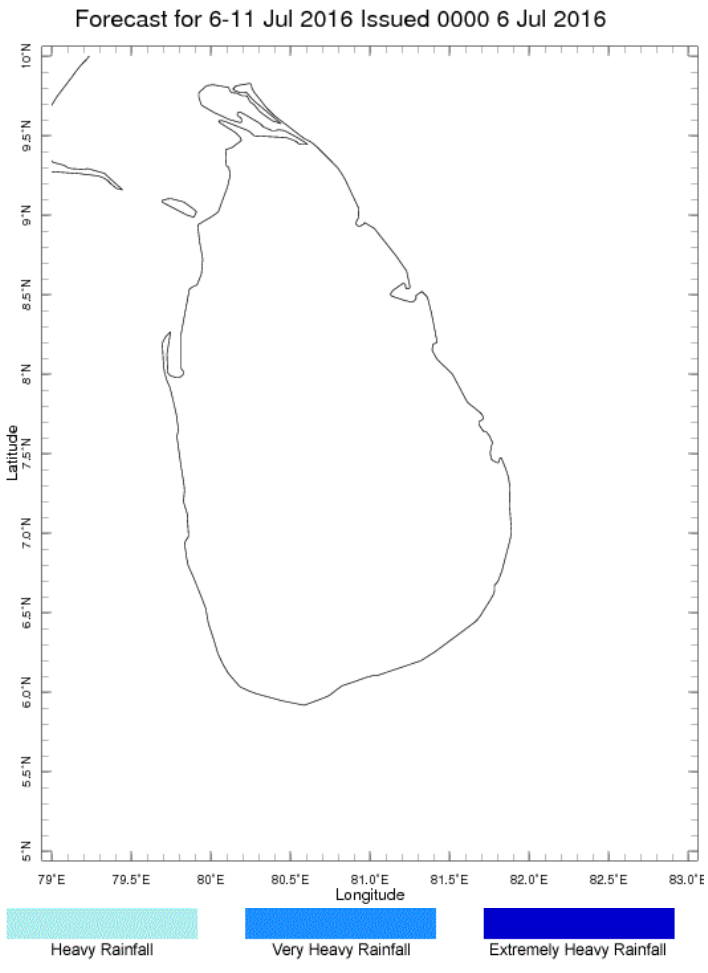

## WRF Model Forecast (from IMD Chennai)



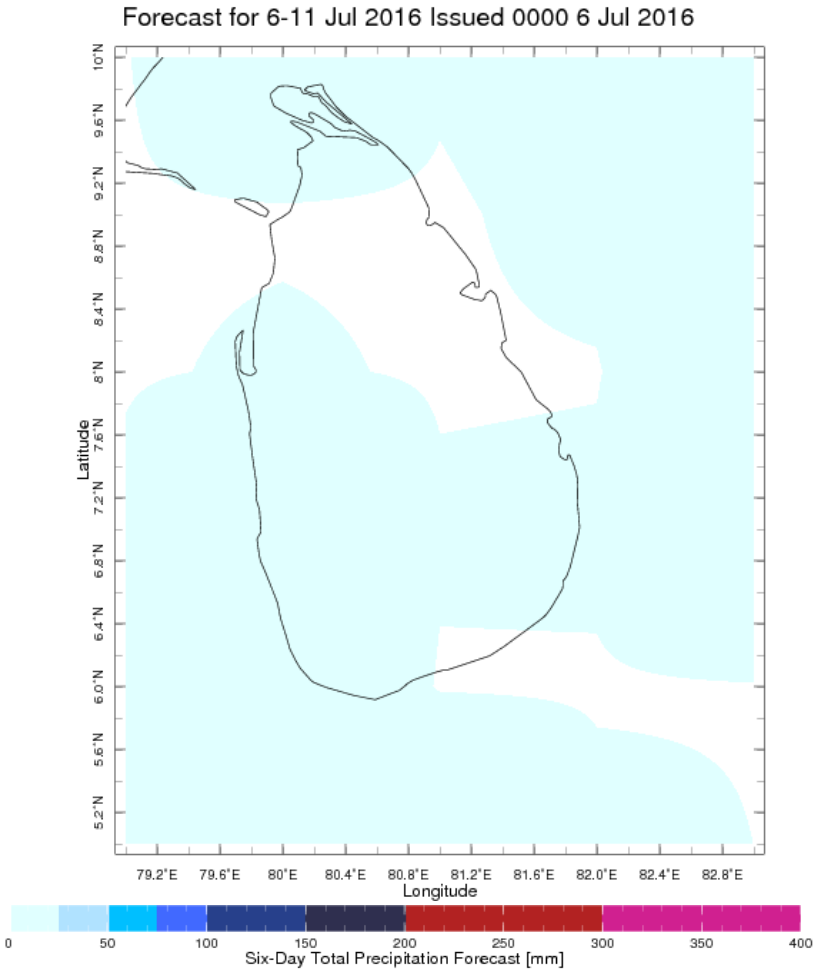



## Weekly Rainfall Forecast from IRI

**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.**



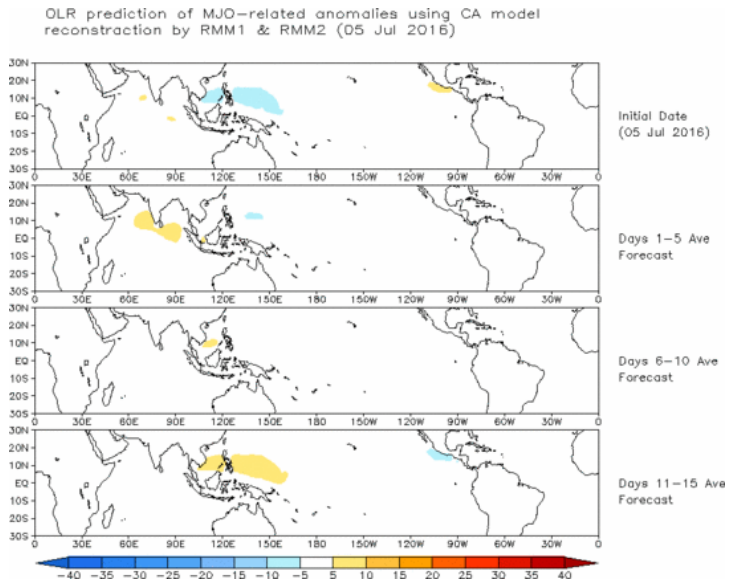

**Extreme Rainfall Forecast**




**Total Six Day Precipitation Forecast**

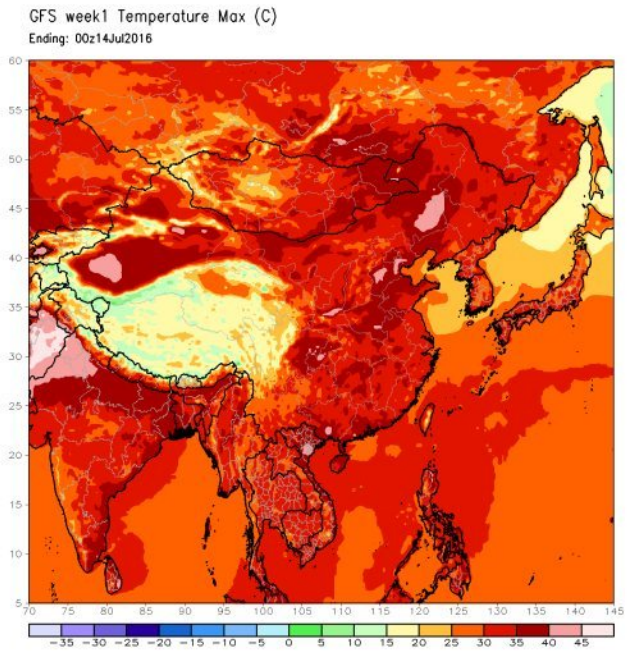
## Madden Julian Oscillation (MJO) related Outgoing Longwave Radiation (OLR) Forecast

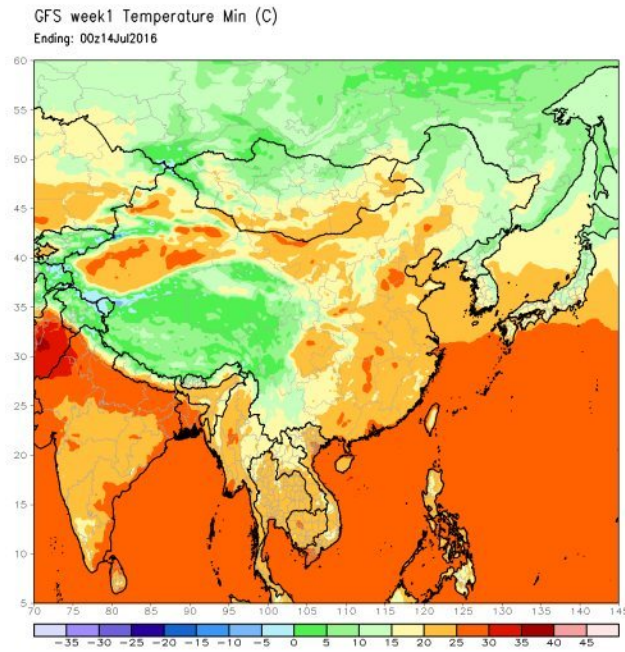
**The Outgoing Longwave Radiation (OLR) is a proxy for rainfall. This can be used to identify convective rain clouds based on the MJO phase. Violet and Blue shading indicates enhanced tropical weather and Orange shading indicates suppressed conditions. The following figure shows the forecasts of MJO associated anomolous OLR for the next 15 days from the Constructed Analogue (CA) model forecasts.**



## Weekly Temperature Forecast

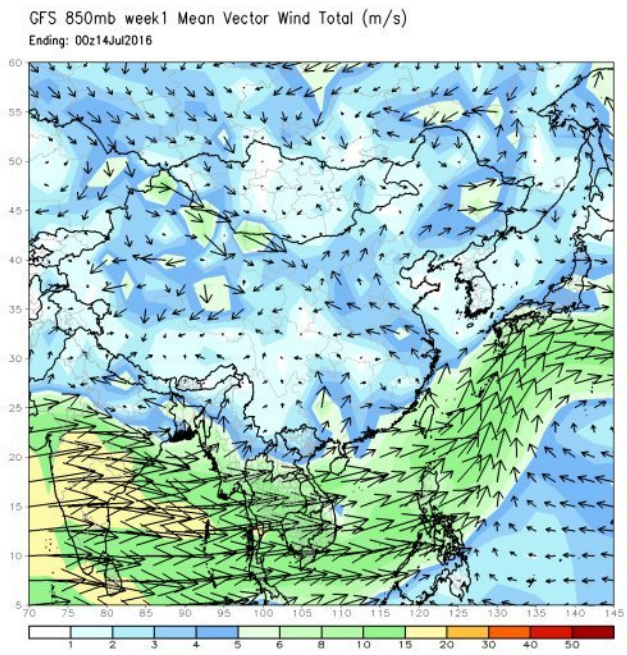
**Weekly Minimum and Maximum Temperature prediction from the GFS model (from NOAA CPC)**

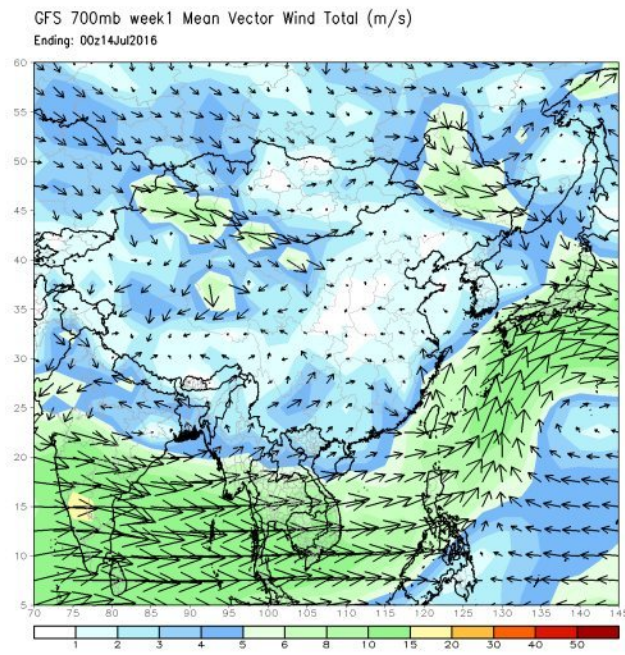



## Weekly Wind Forecast

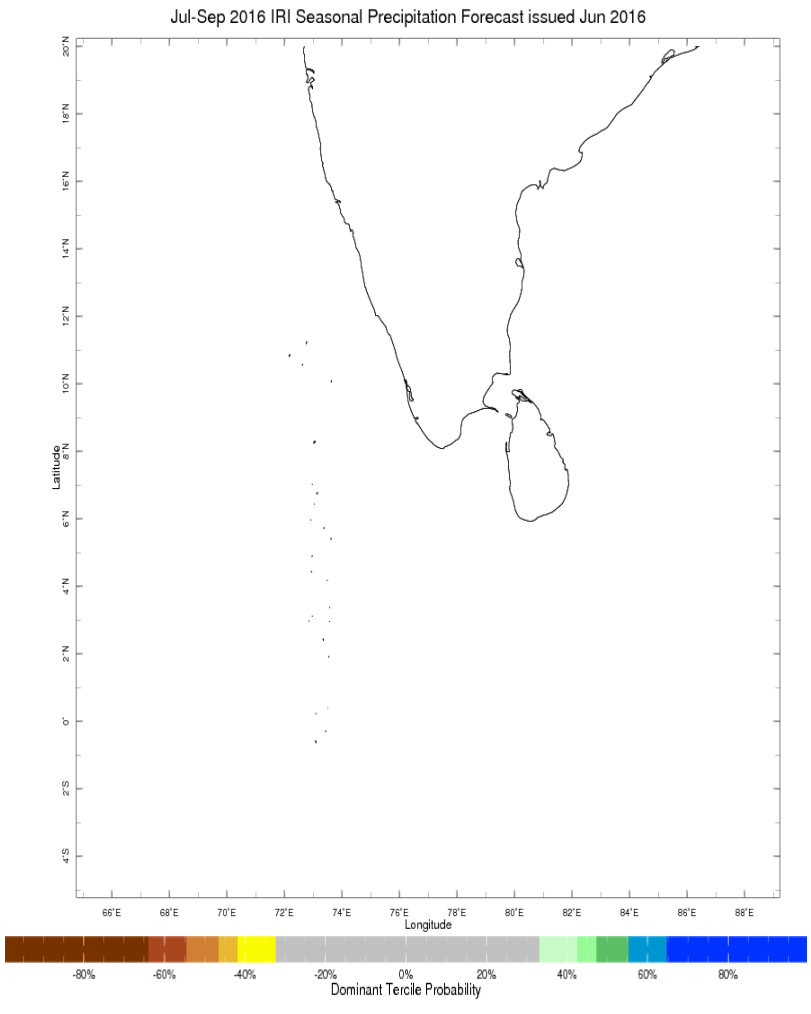
**Weekly mean vector wind total prediction from the GFS model at 850 mb (left) and 700 mb (right) levels. (from NOAA CPC)**



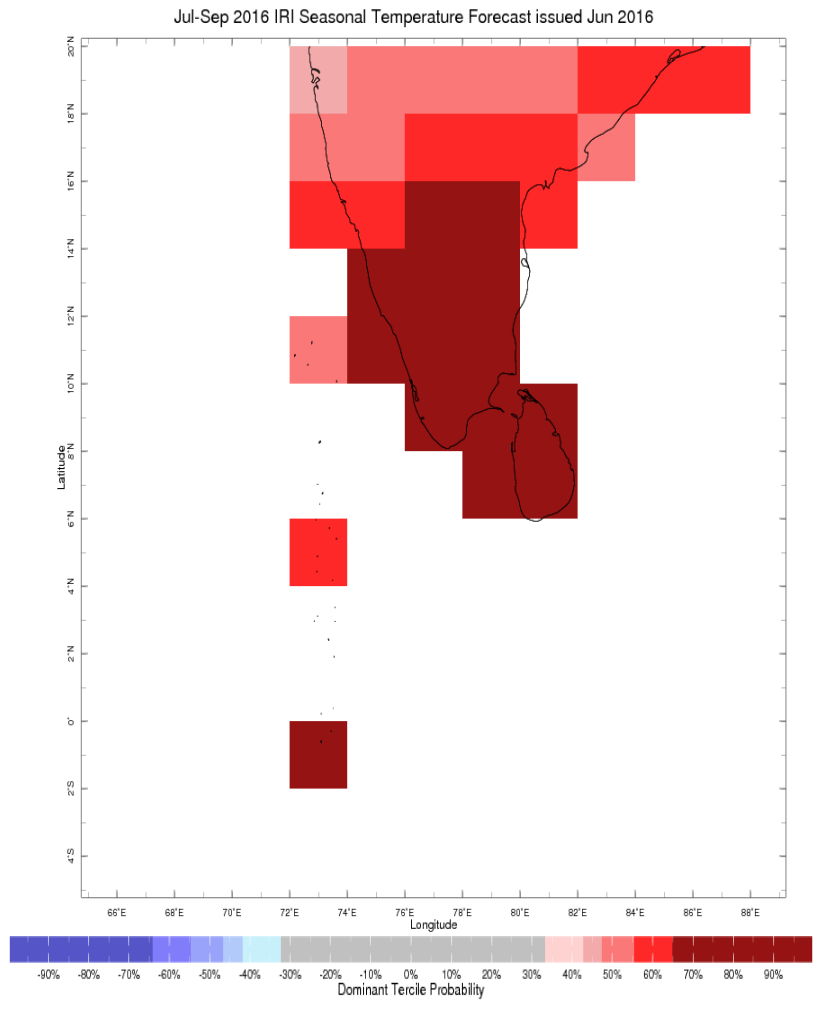



## Seasonal Rainfall and Temperature Forecast

**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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