

Experimental Climate Monitoring and Prediction

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Highlights

The entire country received below average rainfall during the previous week except the south-western region of the country. During the previous week maximum temperature of 35-40°C was seen along the eastern coastal belt while the minimum temperature of 20°C was recorded in Nuwara Eliya. NOAA NCEP models predict up to 55mm total rainfall in the western province in the next week while other regions shall have up to 45mm rainfall. NOAA CPC GFS model predicts 35- 40 °C maximum temperature along the coastal region in the eastern side of the island. Higher wind speed (up to 20 m/s) is expected throughout the country and the surrounding sea. MJO shall enhance rainfall conditions up to 10 days ahead and thereafter shall suppress. ENSO is neutral and therefore the impact on the rainfall is minimal. La Nina conditions are expected to develop by late June which shall slightly enhance rainfall in the country during July and August.



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Monitoring

Rainfall

Weekly Monitoring: No rainfall received on the 15th and on the 16th in the country except up to 10 mm rain in Kurunegala District. Up to 30mm of rainfall was received on the 17th by Matara, Galle and adjacent sea. No rainfall was received by the entire island on the 18th except up to 30 mm of rainfall seen in Ampara district and the north eastern sea. The entire country did not receive any rain on the 19th. The south-western and central regions of the country received up to 50 mm of rainfall on the 20th. On the 21st, no rainfall was received by the entire island. Based on the CPC Unified Precipitation Analysis, a total precipitation of up to 45mm was seen in south western region of the country where as the total precipitation of western and central regions of the country went only up to about 25mm. According to the RFE 2.0 model, Galle, Matara and Ratnapura districts received up to 75 mm total rain, which was above average, while western, south-eastern and central region received up to 25 mm total rainfall. The models show 25 mm of total rainfall anomaly in Matara district and the Southern sea close to it.

Monthly Monitoring: Entire country received more rainfall than the historical average during May 2016. The districts in western, north western and north central provinces received up to ~450mm monthly excess rainfall than the historical average. CPC Unified Precipitation Analysis and RFE 2.0 model (during 23rd May- 21st June) recorded up to 500 mm total rainfall in Kalutara and Colombo Districts while 150-300 mm total rainfall was recorded in the rest of western region. A total precipitation of 75-100 mm was recorded in the central region of the country while the total precipitation adds up to 25mm in the rest of the country. Western and north western provinces received 2 times more rainfall than the normal level. However the northern and the eastern regions received only about 5% of the normal rainfall. During 23rd May- 21st June, highest precipitation was received on 27th of May.

Temperature

During the week from 12th to 18th highest maximum temperature was seen as 35-40 °C along the eastern and north eastern coastal band of the island. Nuwara Eliya region experienced low maximum temperature as 20 °C while the maximum temperature in the rest of the country was between 30- 35 °C during the week. The minimum temperature of 20 °C was recorded in Nuwara Eliya. The mean temperature during this week was 1- 3 °C above average in the entire southern half as well as the north-western region of the country.

Wind

Entire country experienced 15 m/s total westerly wind at the 850 mb level during the previous week while northern region received up to 10 m/s wind in north westerly direction at the 700 mb level and 6-10 m/s in the rest of the country.

Ocean State

Pacific seas state: June 7, 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

0.5°C above average sea surface temperature was observed around Sri Lanka.

¹ International Research Institute for Climate and Society, Earth Institute at Columbia University, New York.

Predictions

Rainfall

14-day prediction: NOAA NCEP models predict up to 65mm total rainfall in the western province while the north western and central provinces may experience between 35-45mm total rainfall during 22nd – 28th June. There will be less than 25 mm rainfall in the Jaffna region. The total rainfall shall continue to remain the same over the course of next seven days starting from the 28th except for the Jaffna region.

Weekly prediction: IMD GFS model predicts up to 40mm rainfall in the western region of the country on the 24th and up to 20 mm during 25th-26th June. The rest of country would not be experiencing considerable amount of rainfall during that period. On 27th and 28th less than 10 mm rain is expected in the south- western region of the country. Up to 40mm rainfall is expected around Kalutara and Colombo districts during 29th- 30th June.

IMD WRF & IRI Model Forecast: According to the IMD WRF model, there shall be up to 65mm rainfall near Ratnapura and Kegalle districts while western, north central and central regions shall receive up to 35 mm rainfall on 25th& 26th of June. No extreme rainfall conditions are experienced over the next week. Colombo district will receive a total precipitation of 50mm along with the Jaffna region during the coming week. Up to 200 mm of total rainfall shall experience in the north eastern sea region during 22nd- 27th 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 °C maximum temperature along the coastal belt in the Eastern side of the country as well as in Ampara and Monaragala Districts. The remaining northern part of the country will experience a maximum temperature of between 30- 35 °C. Maximum temperature in the hill country and the Western province shall be between 20- 25 °C. During the same week, minimum temperature is expected around Nuwara Eliya and Badulla to be 15- 20 °C while in Batticaloa and Hambantota it shall be 25-30 °C. The minimum temperature in the rest of the country shall be 20-25°C.

Wind

The wind speed shall increase up to 20 m/s in the entire country as well as the surrounding sea during 22nd – 29th June in both 850 mb and 700 mb levels.

MJO based OLR predictions

MJO shall be in the Indian ocean in the next 10 days. There shall be a strong enhancement of rainfall conditions due to the MJO in the next 5 days and the enhancement shall be less during day 6- 10 in the future. Thereafter the MJO shall move to the Maritime Continent after the 10th day and therefore there shall be slight suppression in rainfall conditions.

FECT BLOG

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FECT WEBSITES

<http://www.climate.lk> and <http://www.tropicalclimate.org/>

Weekly Hydro- Meteorological Report for Sri Lanka

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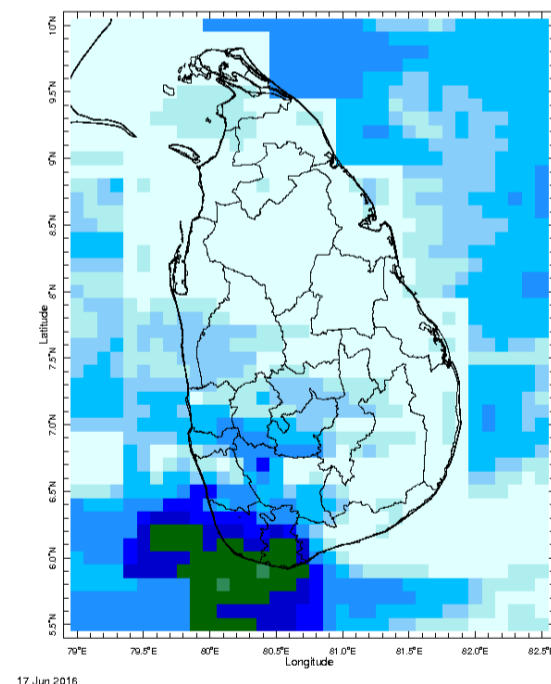
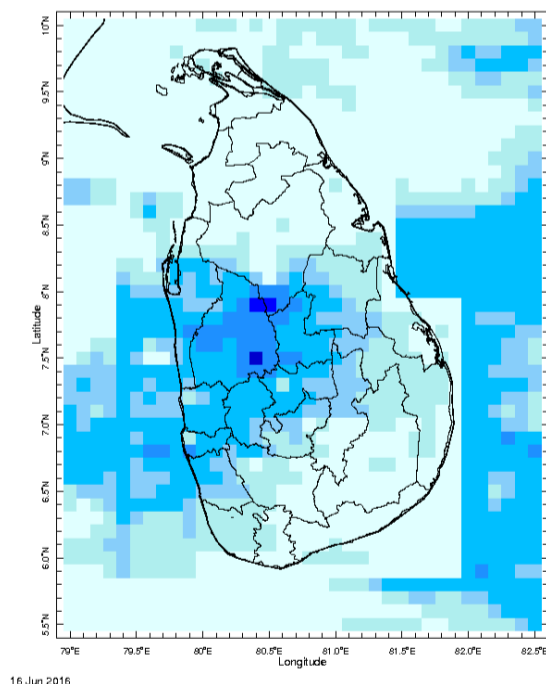
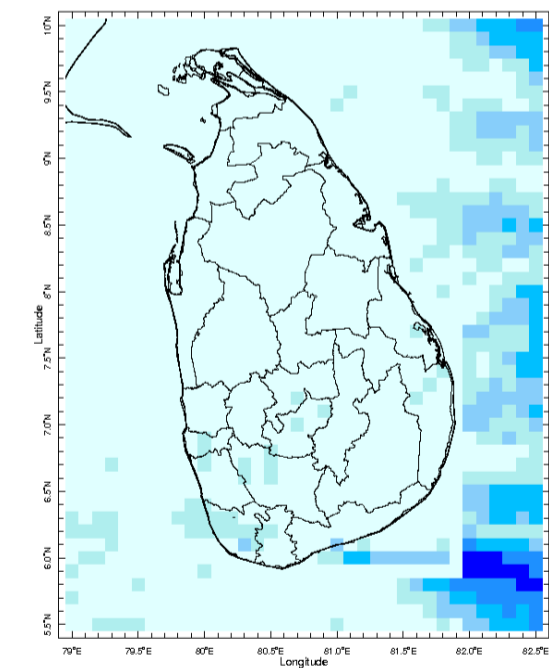
2. Predictions

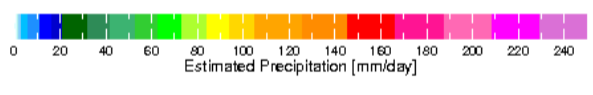
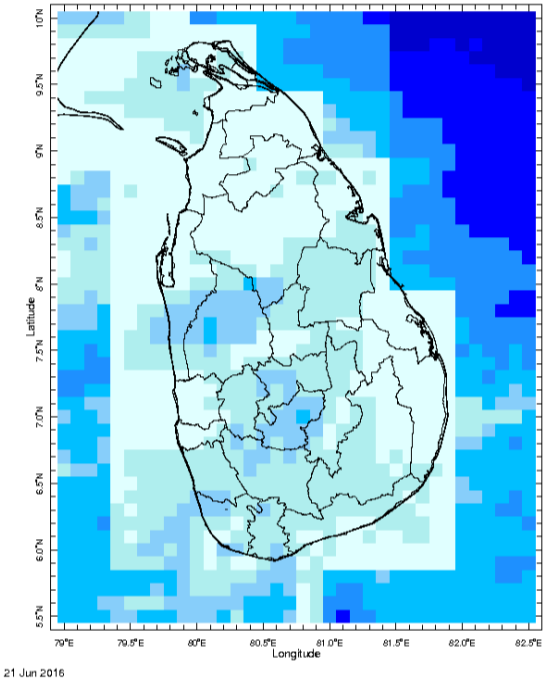
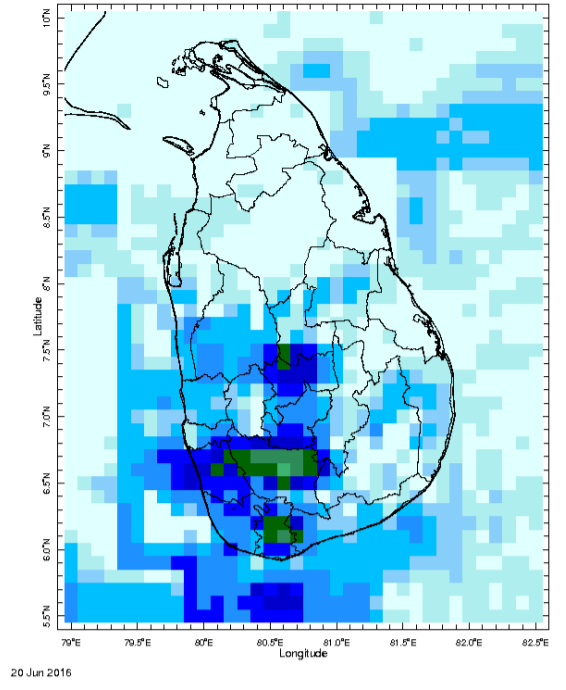
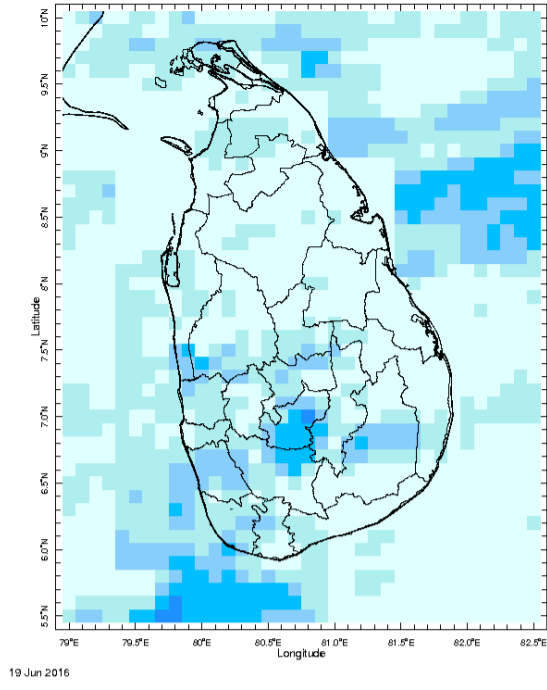
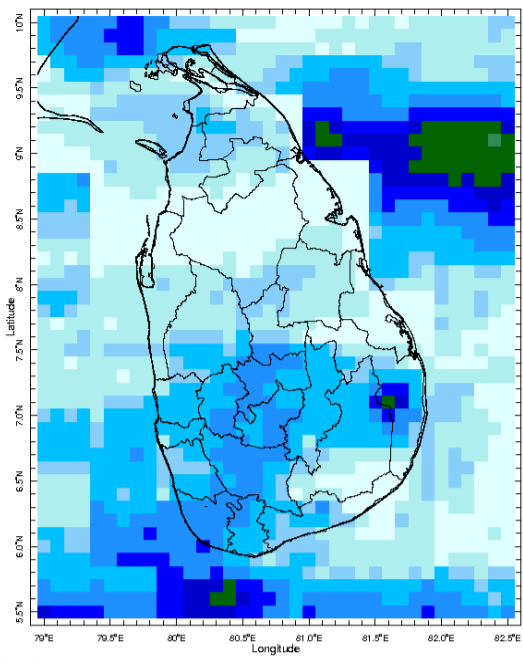
- a. NCEP GFS Ensemble 1-14 day Rainfall Predictions
- b. GFS (T574) Model Rainfall Forecast from RMSC New Delhi
- c. WRF Model Rainfall Forecast from IMD Chennai
- d. MJO Related OLR Forecast
- e. Weekly Precipitation Forecast from IRI
- f. Weekly Temperature Forecast
- g. Weekly Wind Forecast
- h. Seasonal Predictions from IRI

MONITORING

Daily Rainfall Monitoring

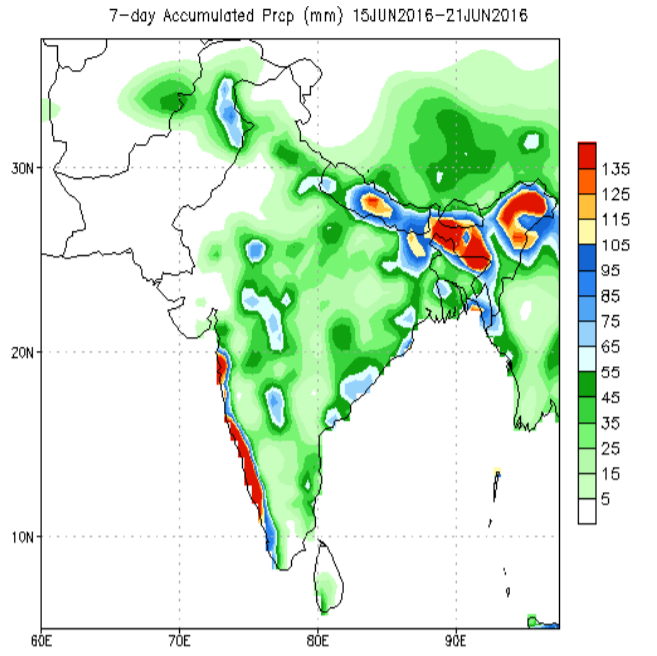
The following figures show the satellite observed rainfall in the last 7 days in Sri Lanka.



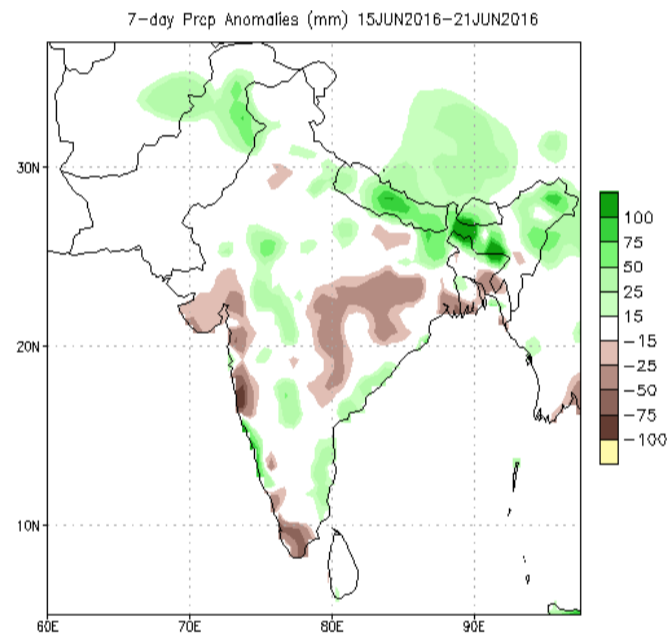
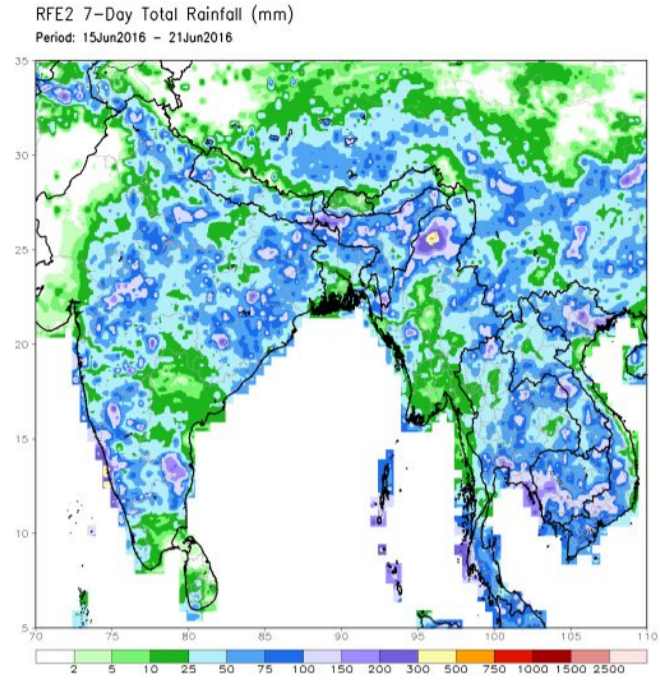


Weekly Rainfall Monitoring

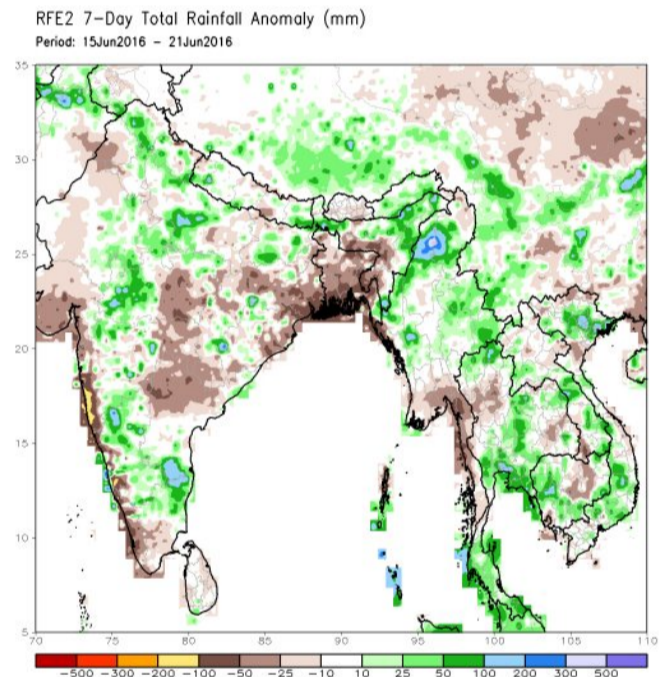
The following figures show the total satellite observed rainfall in the last week in Sri Lanka. The figure in the left is the total 7-day rainfall from NOAA Climate Prediction Center (CPC) Unified Precipitation Analysis and the figure in the right is the total 7-day rainfall from CPC RFE 2.0 Satellite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



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

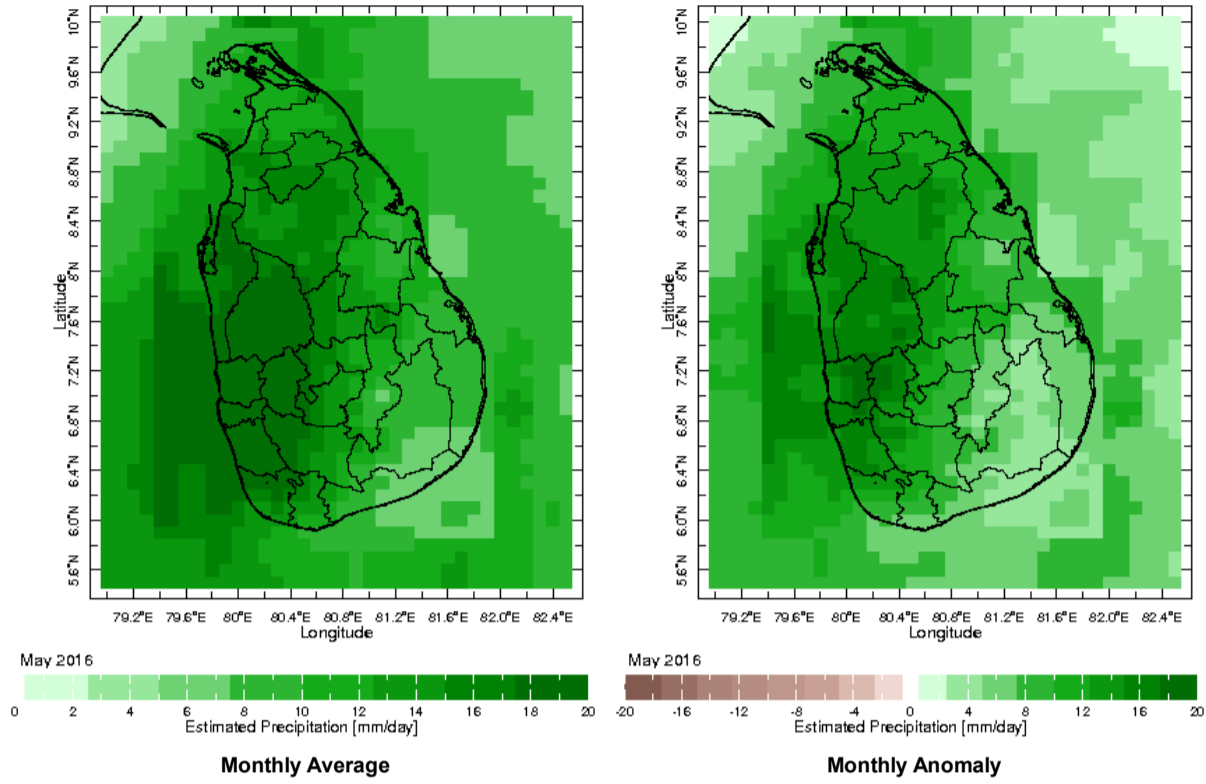


Data Source: CPC Unified (gauge-based & 0.5x0.5 deg resolution) Precipitation Analysis
Climatology (1981-2010)

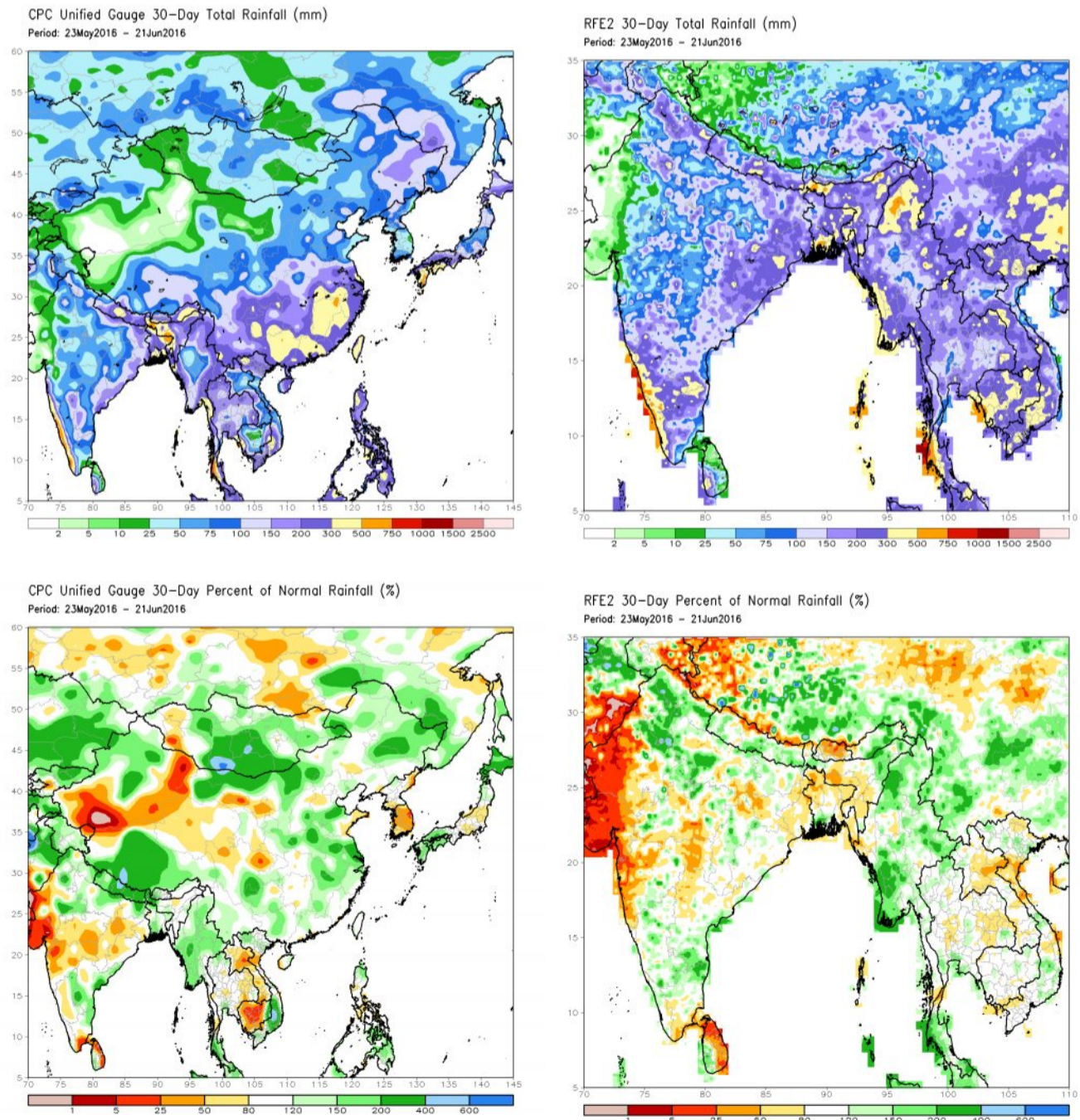


Monthly Rainfall Monitoring

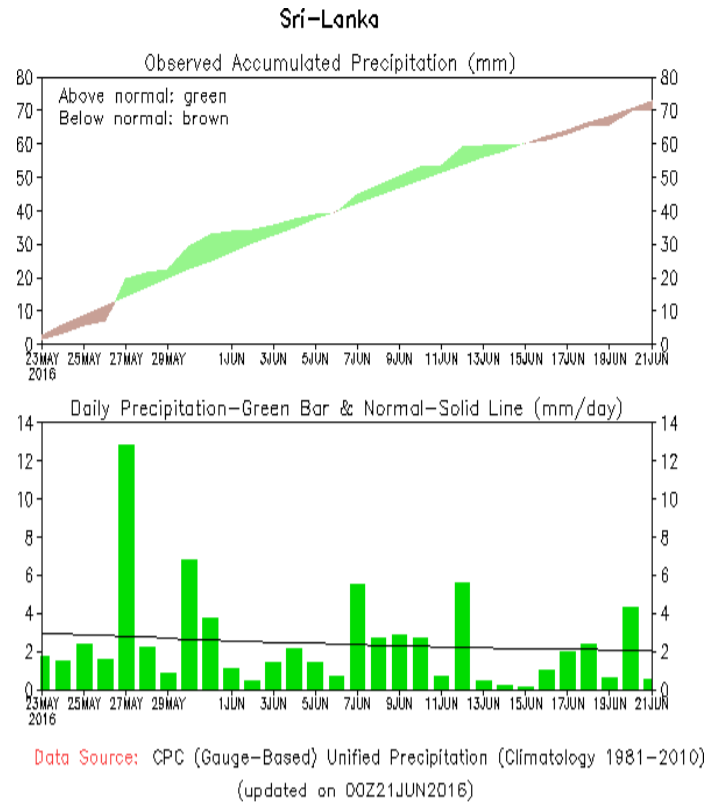
The figure in the left shows the average observed rainfall in the previous month. The rainfall anomaly in the previous month is shown in the figure to the right. The brown color in the anomaly figure shows places which received less rainfall than the historical average while the green color shows places with above average rainfall. Darker shades show higher magnitudes in rainfall



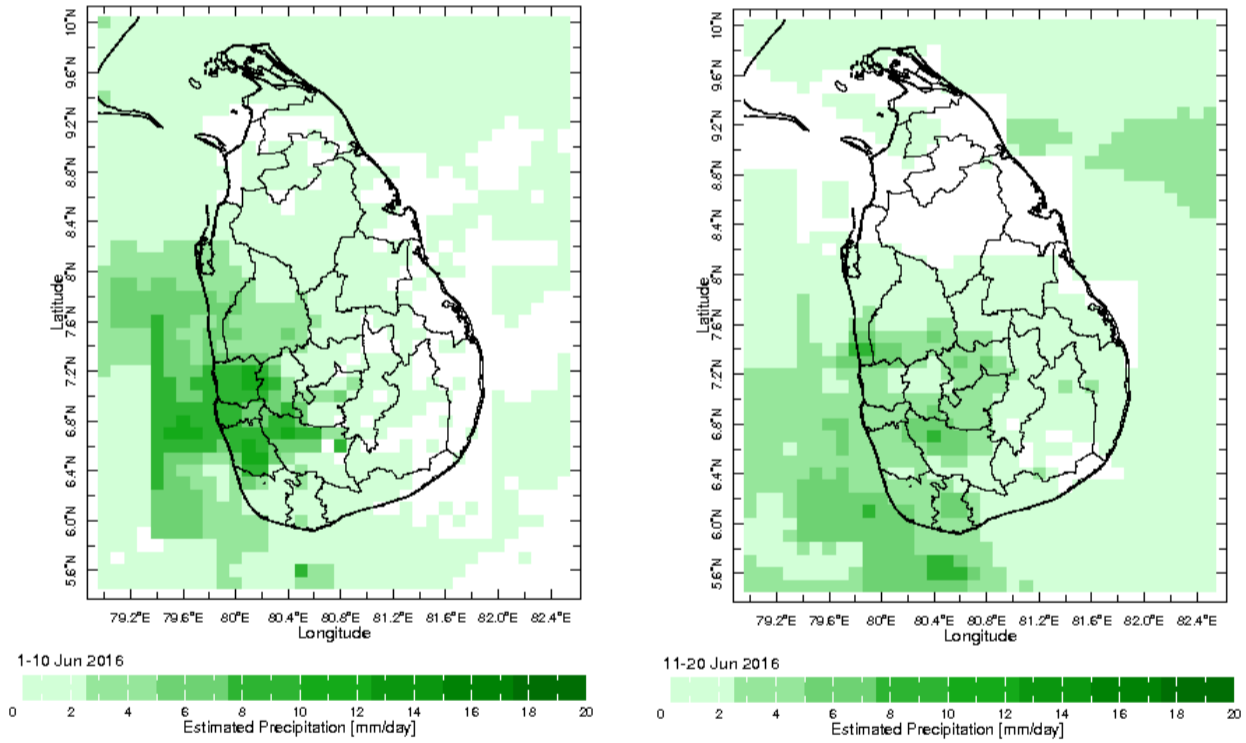
The figure in the top-left shows the total rainfall in the past 30 days from CPC Unified Precipitation Analysis while the figure in the top-right shows the total rainfall for the same period from RFE 2.0 Satellite Rainfall Estimates. The bottom two figures show the percentage of rainfall received in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



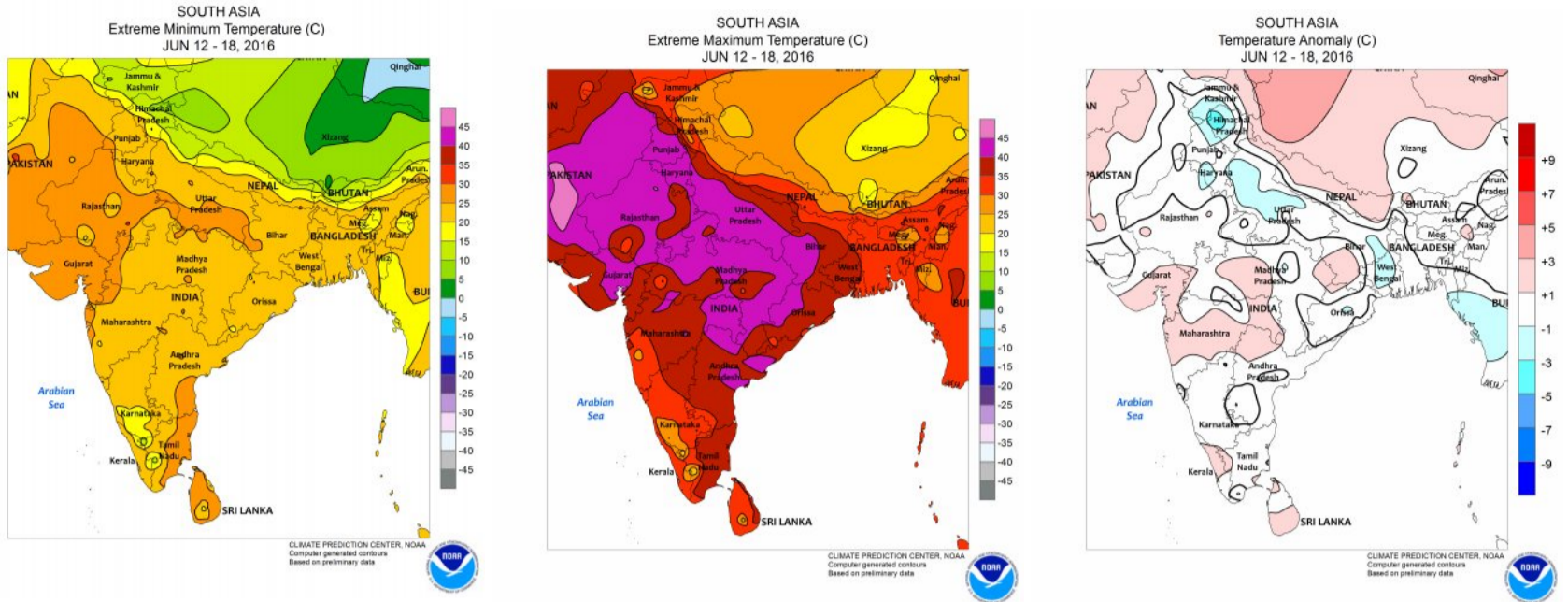
The following figure shows the observed accumulated rainfall (top) and daily observed rainfall (bottom) in Sri Lanka in the last 30 days.



Dekadal (10 Day) Satellite Derived Rainfall Estimates

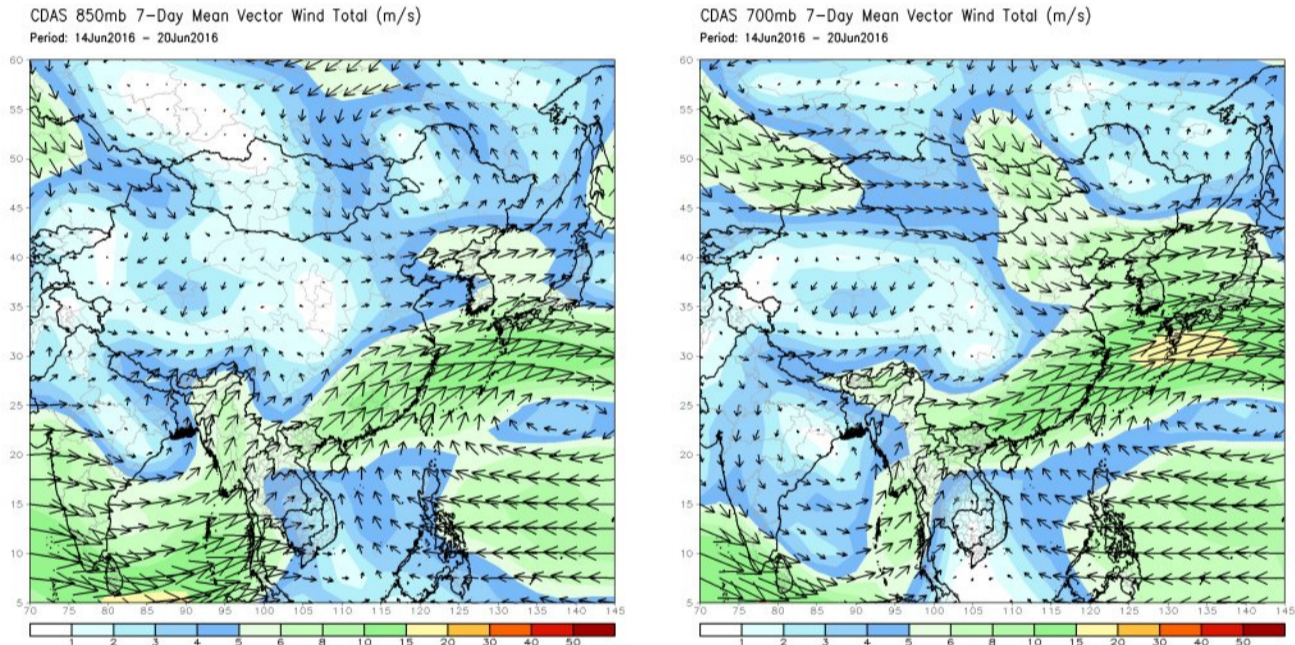


Weekly Temperature Monitoring



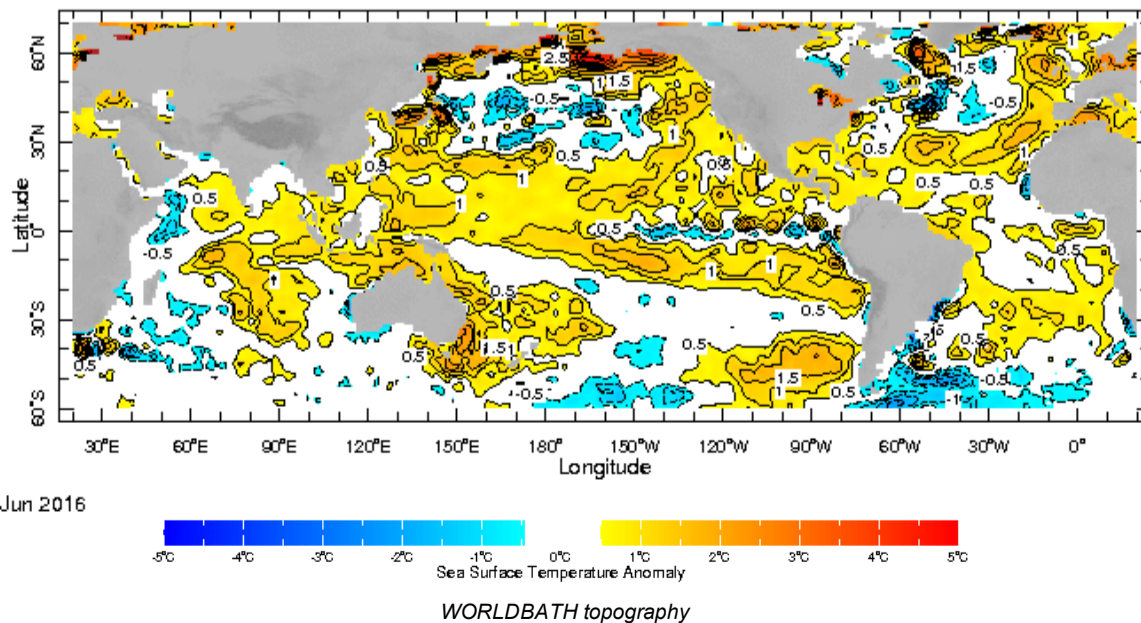
Weekly Wind Monitoring

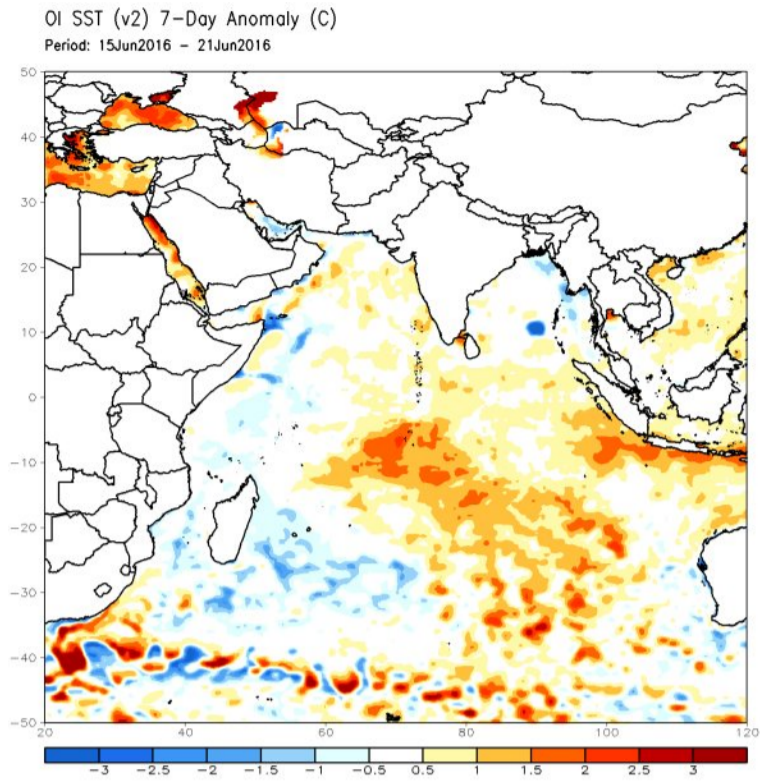
The following figures show the mean vector wind total of the past 7 days near Sri Lanka at two levels. The figure on the left shows 850 mb (~1500 m) level and the figure on the right shows 700 mb (~3000 m) level.



Weekly Average SST Anomalies

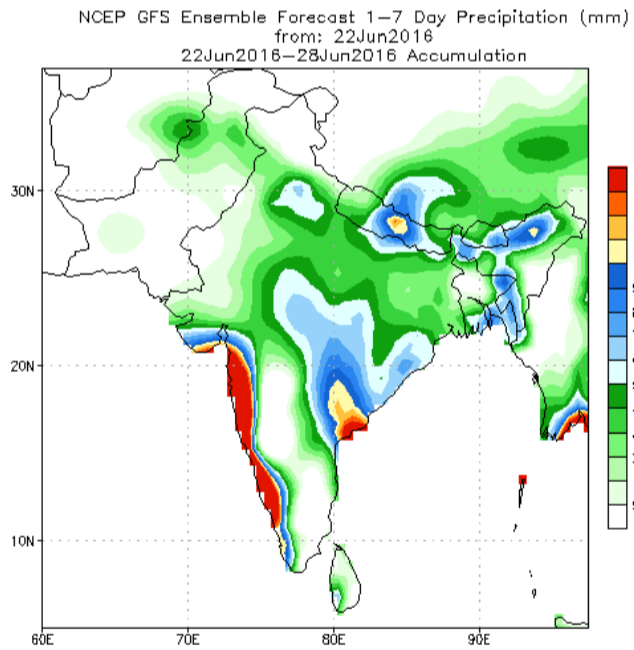
Weekly average Sea Surface Temperature (SST) anomaly in the world from NOAA NCEP



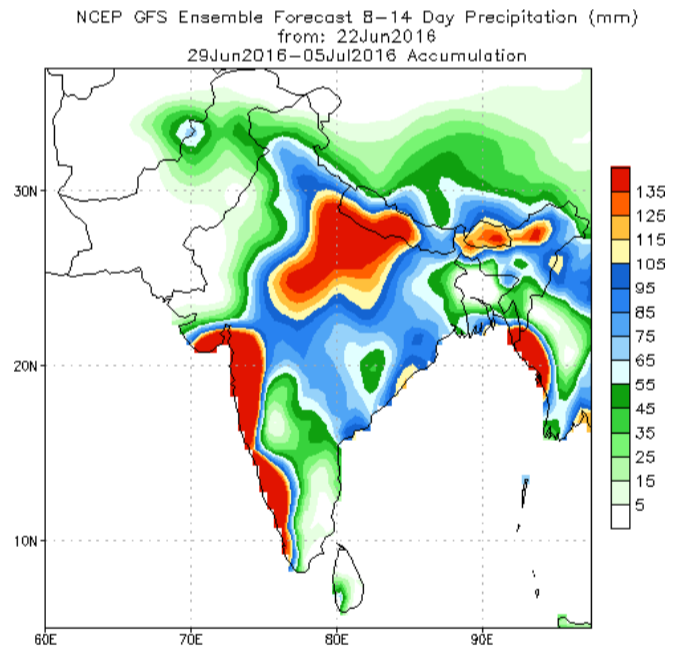


PREDICTIONS

NCEP GFS 1- 14 Day prediction

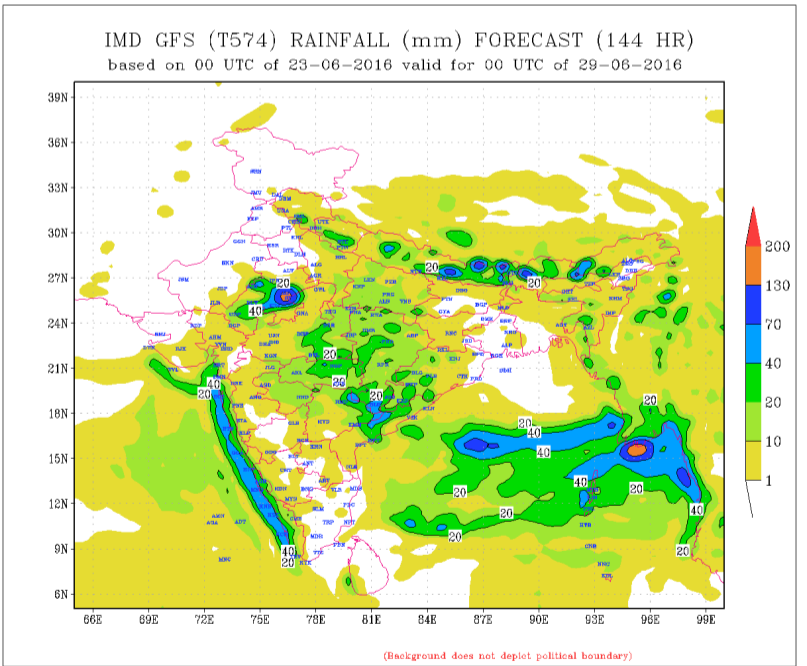
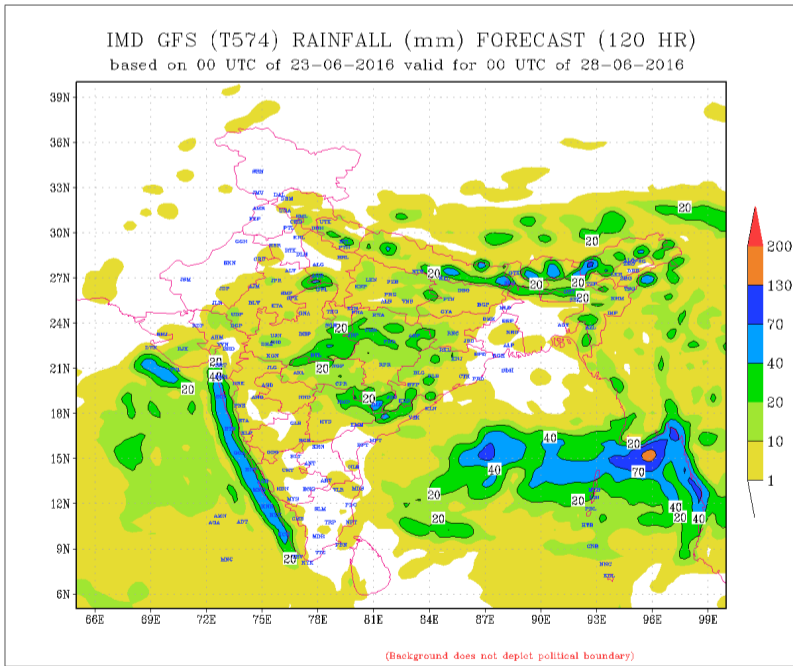
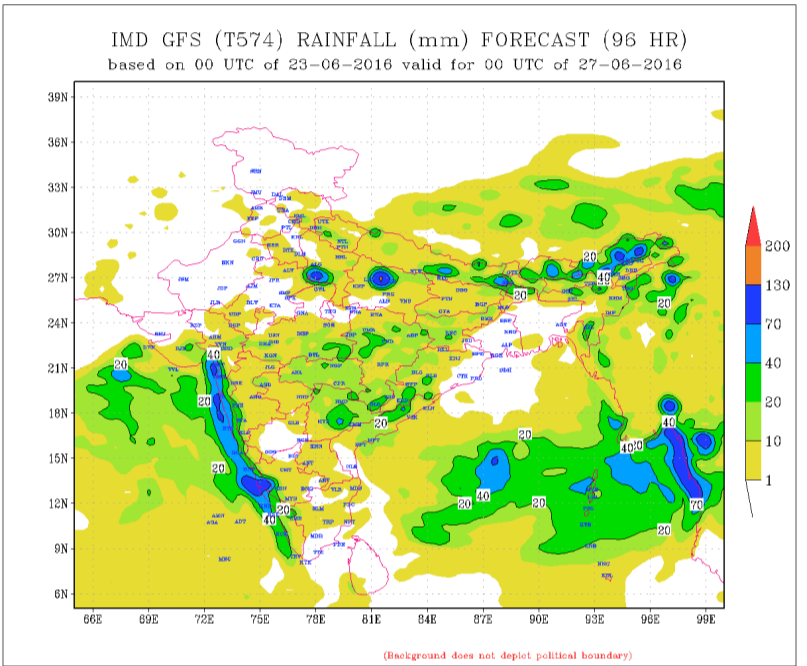
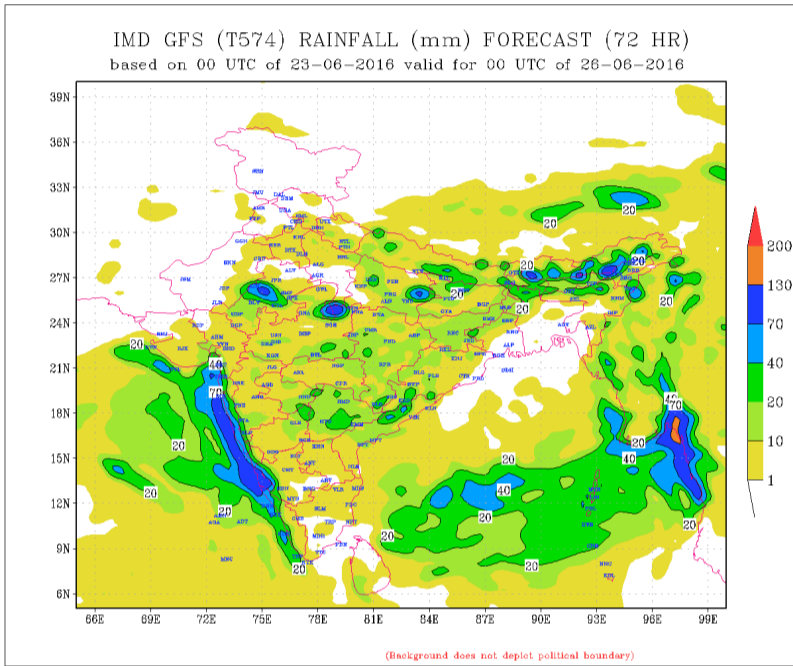
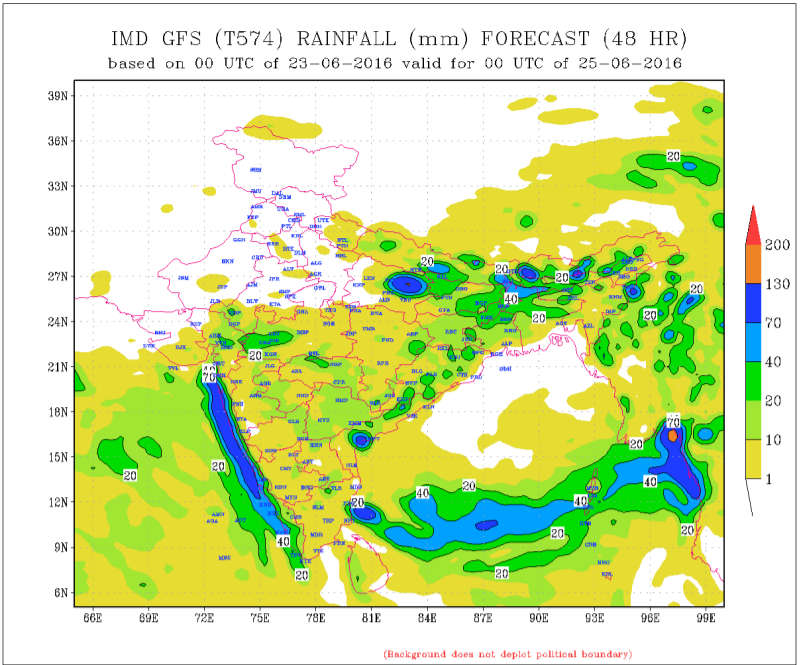
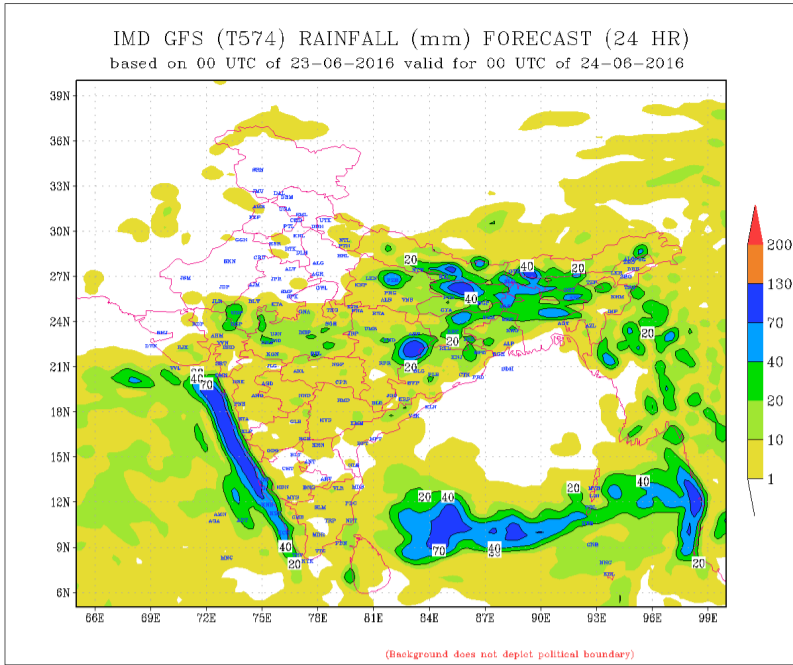


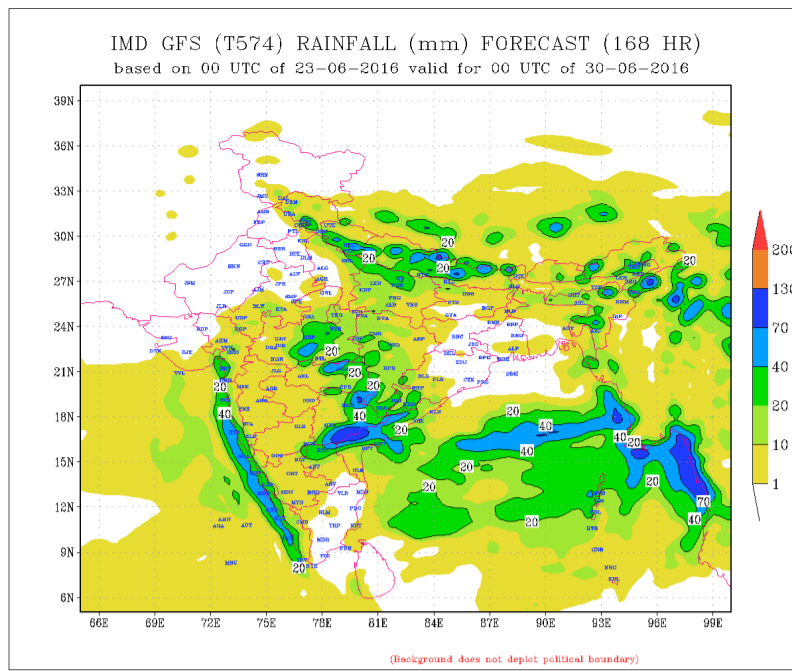
Bias correction based on last 30-day forecast error



Bias correction based on last 30-day forecast error

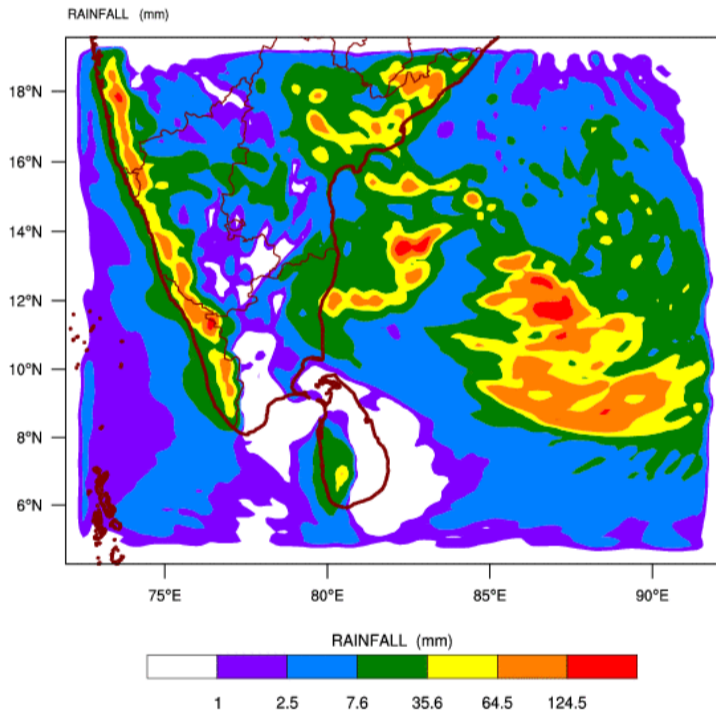
IMD GFS (T574) Model Rainfall Forecast from RMSC New Delhi, India



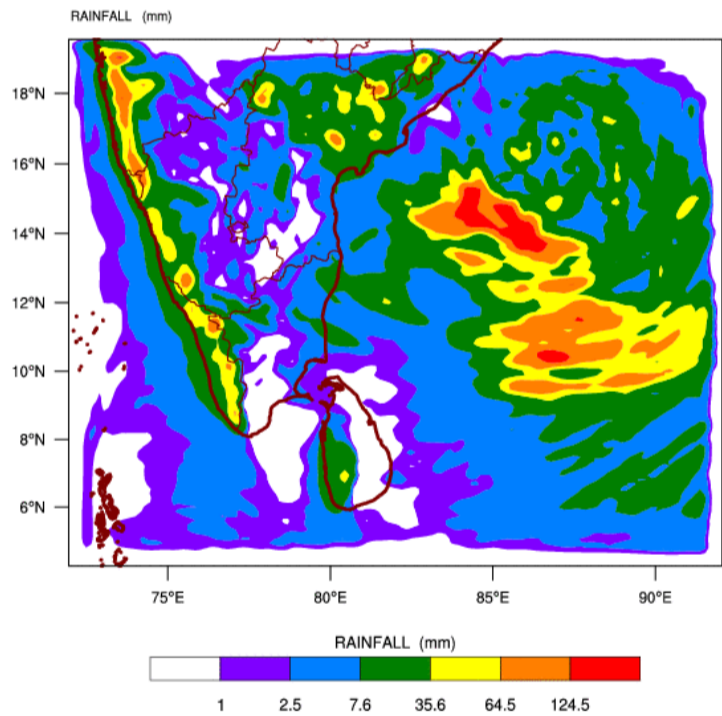


WRF Model Forecast (from IMD Chennai)

WRF MODEL FORECAST (48 HR.) RAINFALL(mm)\
 based on 00 UTC of 23-06-2016 valid for 03 UTC of 25-06-2016

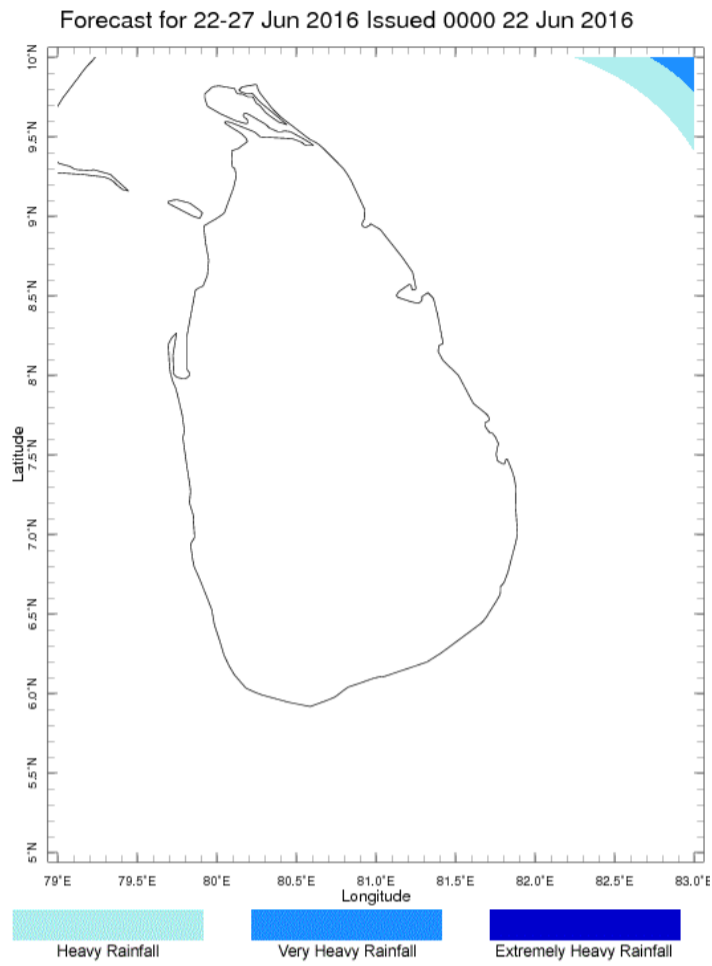


WRF MODEL FORECAST (72 HR.) RAINFALL(mm)\
 based on 00 UTC of 23-06-2016 valid for 03 UTC of 26-06-2016

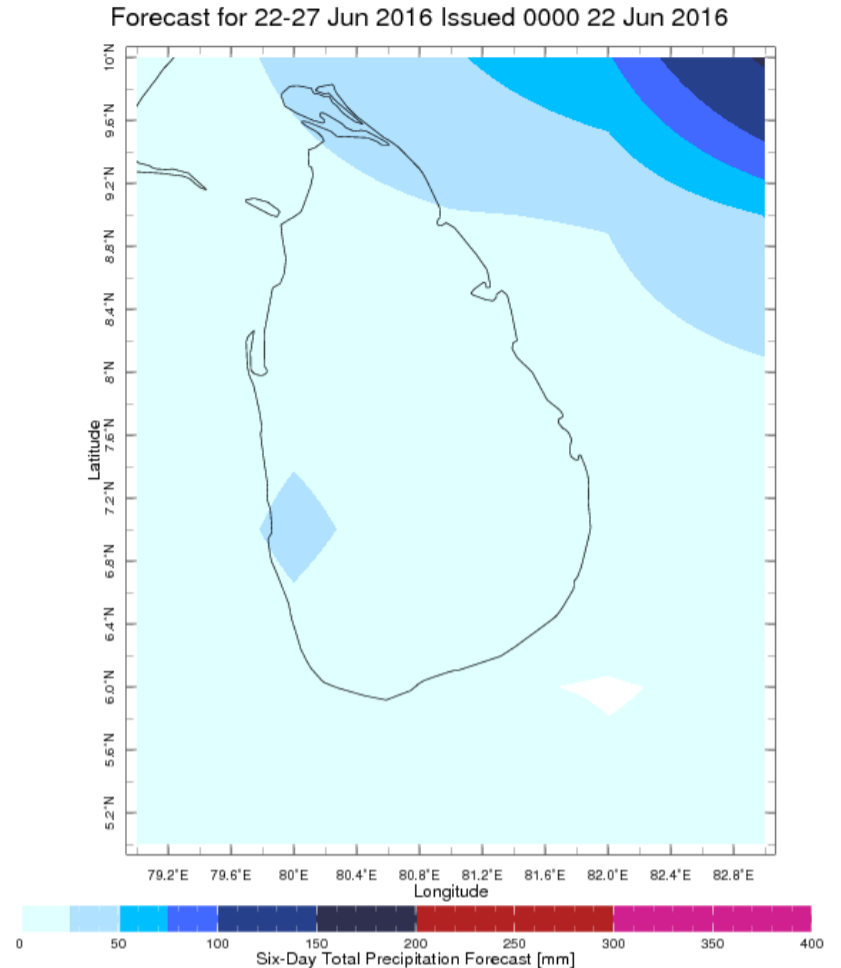


Weekly Rainfall Forecast from IRI

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.



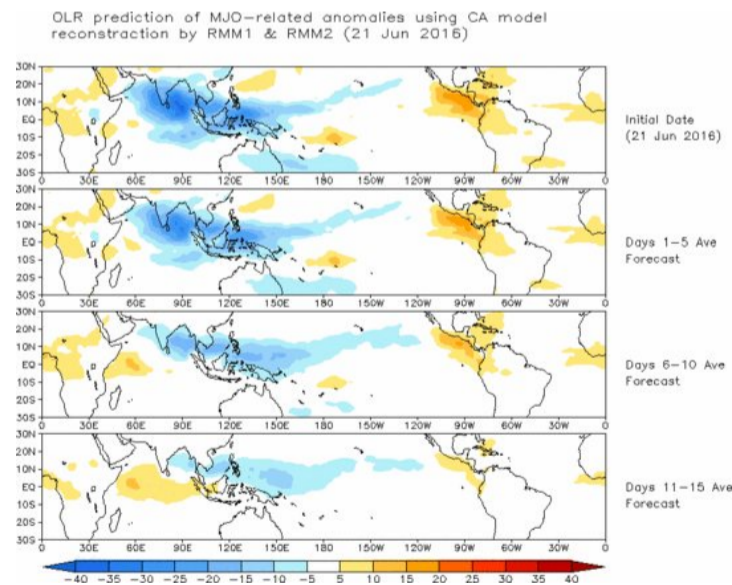
Extreme Rainfall Forecast



Total Six Day Precipitation Forecast

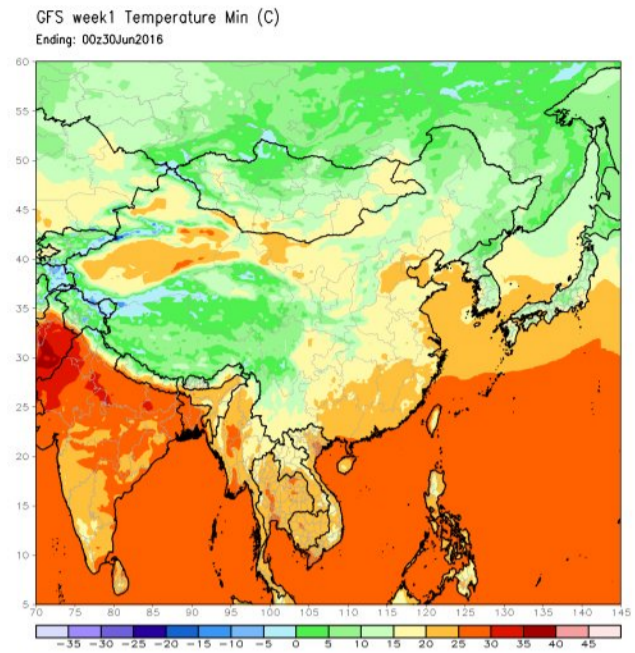
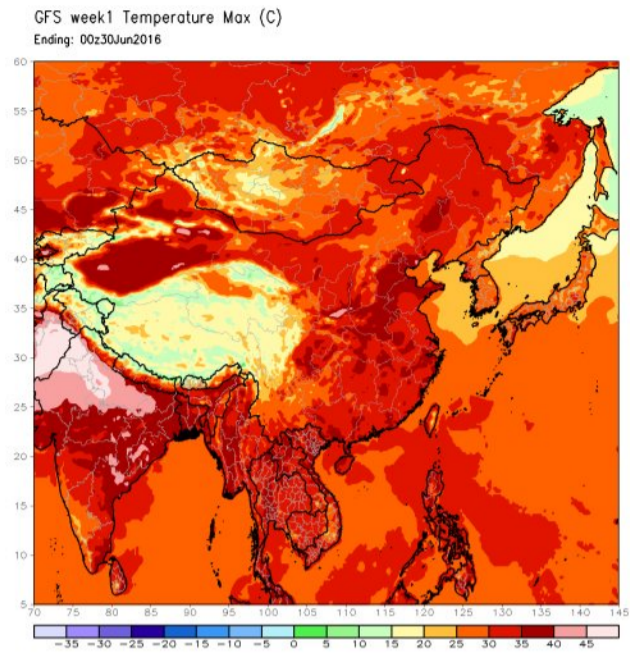
Madden Julian Oscillation (MJO) related Outgoing Longwave Radiation (OLR) Forecast

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 anomalous OLR for the next 15 days from the Constructed Analogue (CA) model forecasts.



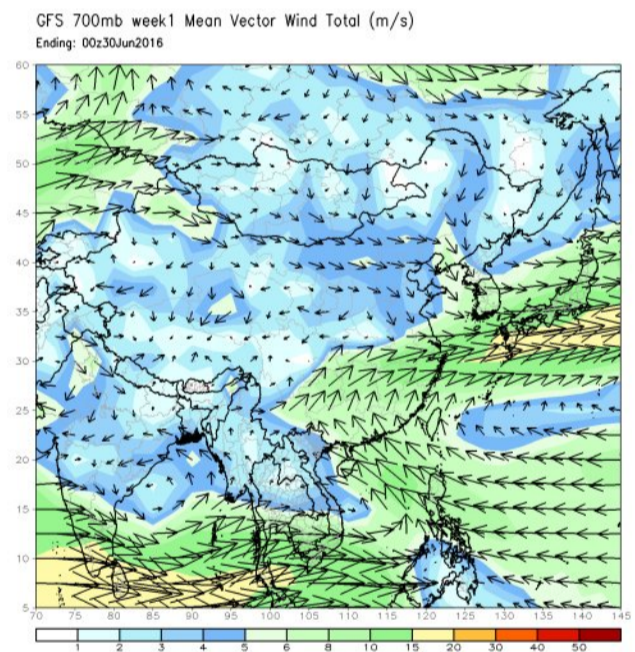
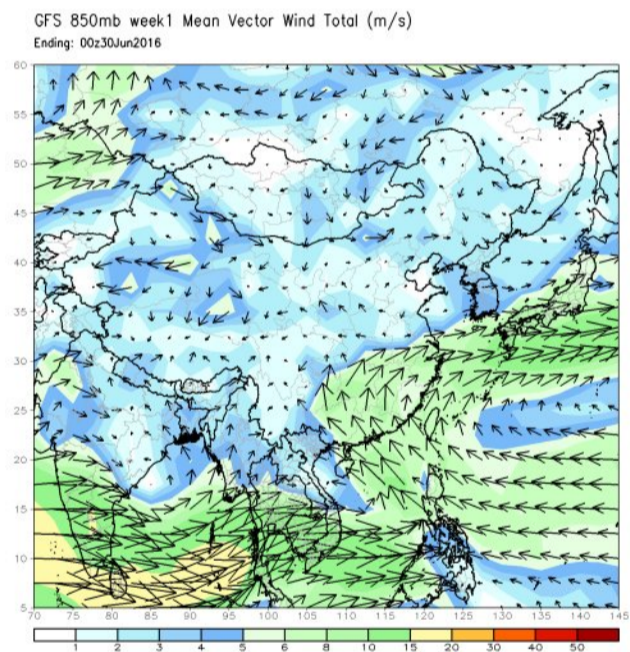
Weekly Temperature Forecast

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



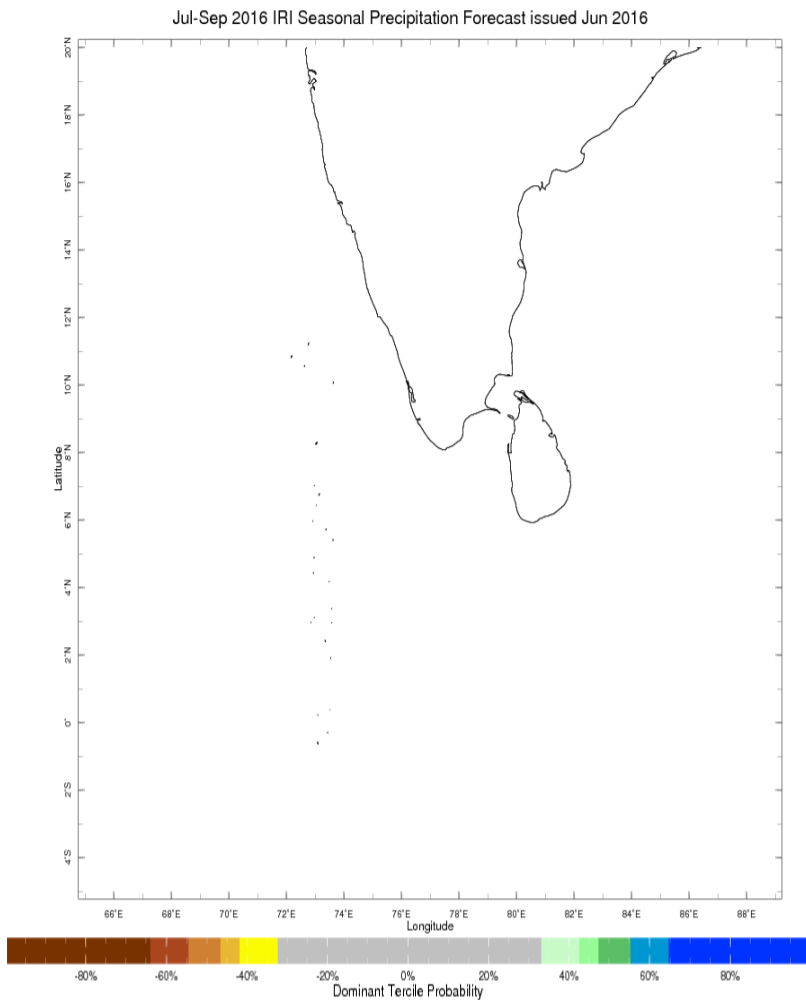
Weekly Wind Forecast

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

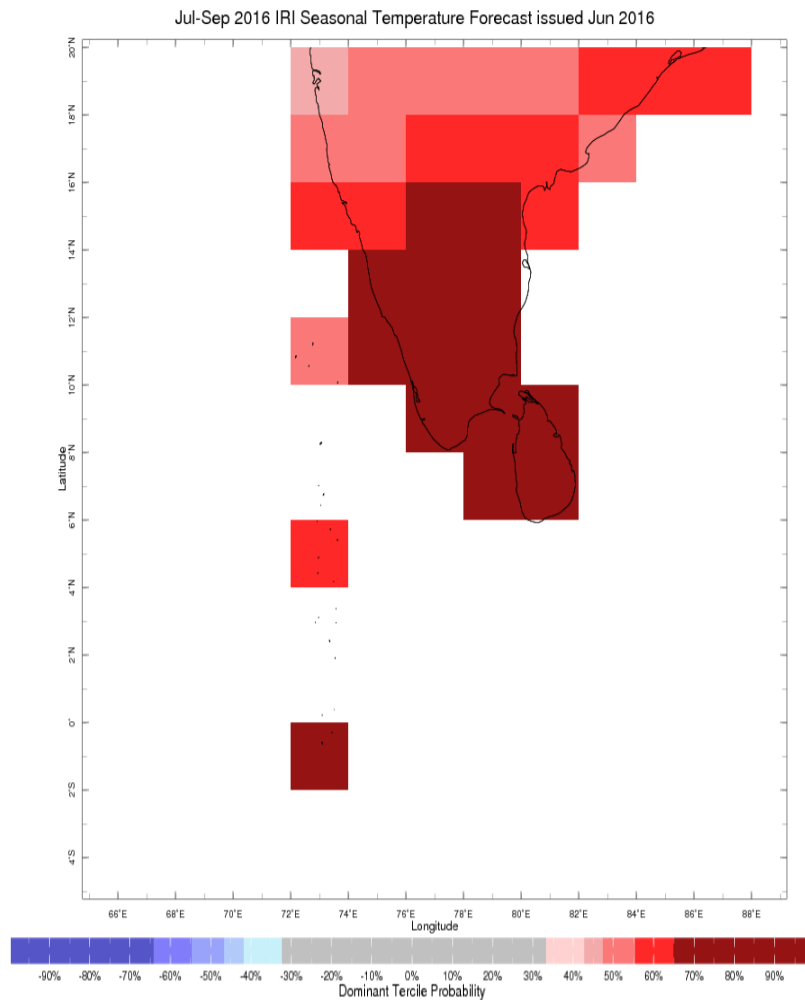


Seasonal Rainfall and Temperature Forecast

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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