

**Week of  
11 - 18 June  
2021**

## CLIMATE MONITORING AND PREDICTION FOR SRI LANKA

By: Nipuni Alahakoon, Sanduni Gammanpila, Ushan Adithya, Azra Munas, Tuan Hadgie, Lareef Zubair and Michael Bell<sup>1</sup> (FECT and IRI<sup>1</sup>)

## HIGHLIGHTS

### Rainfall Prediction



- Heavy rainfall is predicted for North-Western province during 1st week period. And dangerously heavy rainfall in the 2nd week for the same region.

### Monitored Rainfalls



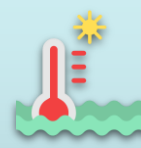
- Dangerously heavy rainfall was experienced in Northwestern, Western & Sabaragamuwa provinces with a max of 346 mm in Dummalasooriy on 3<sup>rd</sup> June.

### Monitored Wind



- From 2<sup>nd</sup> - 8<sup>th</sup> June: up to 10 km/h from the West and South were experienced.

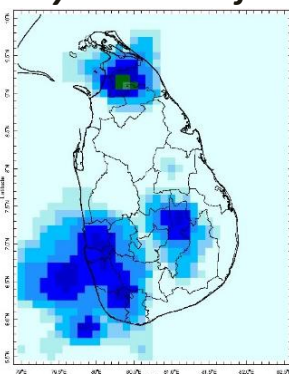
### Monitored Sea Surface



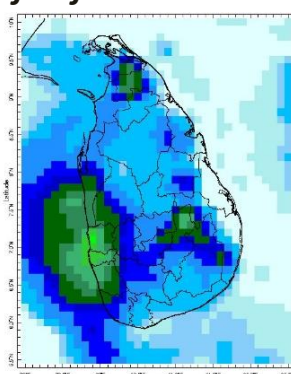
- SST was observed above 0.5 °C to the south of SL and neutral to the north. The Indian Ocean is showing an emerging negative Indian Ocean Dipole pattern.

## Monitoring Rainfall

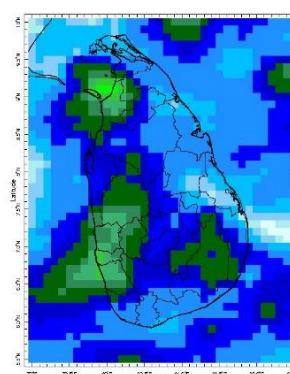
### Daily Estimates for Rainfall from 2<sup>nd</sup> – 8<sup>th</sup> June



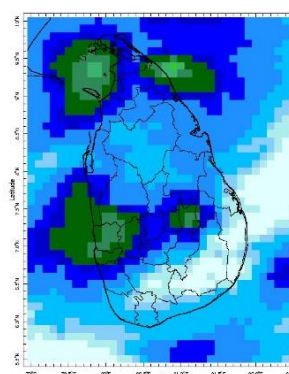
2 June



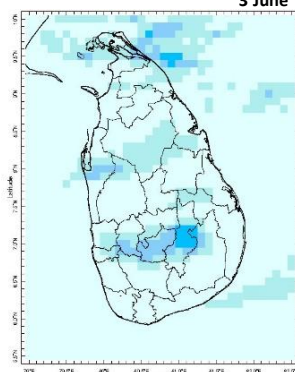
3 June



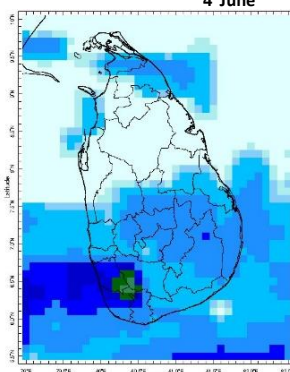
4 June



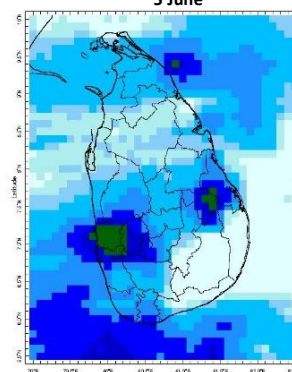
5 June



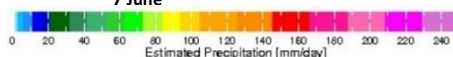
6 June



7 June



8 June





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### Total Rainfall for the Past Week

The RFE 2.0 tool shows 7-day total Cumulative rainfall by Districts:

Rainfall	Districts
150 – 200 mm	Gampaha, Colombo, Kalutara, Puttalam, Kurunegala, Kegalle
100 – 150 mm	Kandy, Galle, Ratnapura
75 – 100 mm	Nuwara Eliya, Kilinochchi, Mullaitivu, Mannar, Jaffna, Badulla
50 – 75 mm	Vavuniya, Anuradhapura, Trincomalee, Polonnaruwa, Matale, Ampara, Moneragala, Matara, Hambantota
25 – 50 mm	Batticaloa

Weekly Rainfall Anomalies by Districts:

#### Rainfall Excess

Rainfall	Districts
100 – 200 mm	Gampaha, Colombo, Kalutara, Puttalam, Kurunegala, Kegalle
50 – 100 mm	Kandy, Galle, Ratnapura, Nuwara Eliya, Matale, Badulla, Vavuniya, Kilinochchi, Mullaitivu, Mannar, Jaffna, Anuradhapura, Trincomalee,
25 – 50 mm	Polonnaruwa, Ampara, Batticaloa, Hambantota, Moneragala, Matara

### Monthly Monitoring

During early and middle of the May, Dekadal Rainfall (mm/day) by Districts:

#### 11<sup>th</sup>– 20<sup>th</sup> May:

Rainfall	Districts
14 mm	Puttalam, Kurunegala, Gampaha, Colombo
12 mm	Kalutara, Ratnapura, Kegalle
10 mm	Galle, Matara
8 mm	Jaffna, Kilinochchi, Polonnaruwa, Trincomalee, Batticaloa, Ampara, Badulla, Moneragala, Kandy, Nuwara Eliya, Hambantota
6 mm	Mullaitivu, Vavuniya, Anuradhapura, Matale
4 mm	Mannar

#### 21<sup>st</sup>– 31<sup>st</sup> May:

Rainfall	Districts
12 mm	Puttalam, Kurunegala, Gampaha, Colombo, Kurunegala, Kegalle, Ratnapura,
10 mm	Galle, Matara, Nuwara Eliya, Kandy,
6 mm	Badulla, Moneragala, Hambantota, Matale, Jaffna, Kilinochchi
4 mm	Polonnaruwa, Anuradhapura, Ampara, Batticaloa



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### Ocean State (Text Courtesy IRI)

#### **Pacific sea state: May 26, 2021**

Equatorial SSTs were below average in parts of the eastern Pacific Ocean and near average across the rest of the Pacific Ocean in late May and most key atmospheric variables were ENSO –Neutral condition. A large majority of the model forecasts predict ENSO-neutral likely to continue through the Northern Hemisphere summer.

#### **Indian Ocean State**

Sea surface temperature was observed above 0.5°C to the south of Sri Lanka and neutral to the north. The Indian Ocean is showing an emerging negative Indian Ocean Dipole pattern.

## Predictions

### Rainfall

#### **14-day prediction: NOAA NCEP models**

##### **From 10<sup>th</sup> – 16<sup>th</sup> June:**

Total rainfall by Provinces:

Rainfall	Provinces
115 mm	Western, Sabaragamuwa
85 mm	North western, Central
55 mm	Southern
25 mm	Uva

##### **From 17<sup>th</sup> – 23<sup>rd</sup> June:**

Total rainfall by Provinces:

Rainfall	Provinces
145 mm	Western, Sabaragamuwa
125 mm	North western
105 mm	Southern, Central
55 mm	Uva
25 mm	North Central, Eastern, Northern

### MJO based OLR predictions

#### **For the next 15 days:**

MJO shall slightly suppress the rainfall during 11<sup>th</sup>– 18<sup>th</sup> June and neutral during 19<sup>th</sup>–23<sup>rd</sup> June.



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## Interpretation

### Monitoring

**Rainfall:** During the last two weeks, there had been extremely heavy rainfall over the following provinces: Western and Sabaragamuwa

**Wind:** West and South winds prevailed in the sea area and around the island during last week.

**Temperatures:** The temperature anomalies were slightly above normal for the northern and Eastern provinces the last – driven by the warm SST's.

### Predictions

**Rainfall:** During the next week (10<sup>th</sup> – 16<sup>th</sup> June) very heavy rainfall are predicted for Western, and Sabaragamuwa provinces. And showers will occur North-western and central provinces; and in Galle and Matara districts.

**Temperatures:** The temperature remains slightly normal for June. During 11<sup>th</sup>-19<sup>th</sup> June, the temperature remains high especially the Eastern and Uva provinces and Hambantota District.

#### Teleconnections:

- MJO shall slightly suppress the rainfall during 11<sup>th</sup>– 18<sup>th</sup> June and neutral during 19<sup>th</sup>–23<sup>rd</sup> June.
- La Nina -The SST forecast indicates that the La Niña event has transitioned to ENSO-neutral and will likely remain so through the boreal summer.

Tropical Climate Guarantee, Federation of Environment, Climate and Technology, Columbia University Water Center, <sup>1</sup> International Research Institute for Climate and Society, , Earth Institute at Columbia University, New York.



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## Weekly Climate Bulletin for Sri Lanka

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#### 2. Predictions

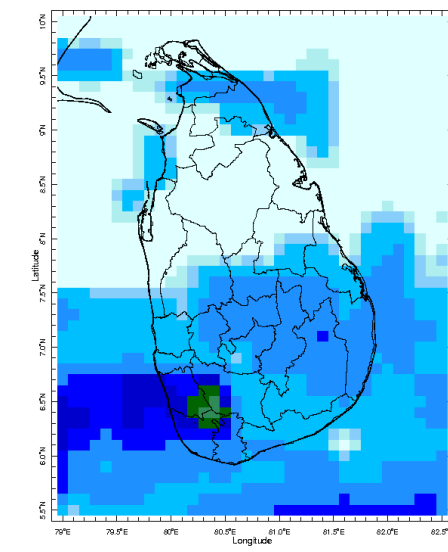
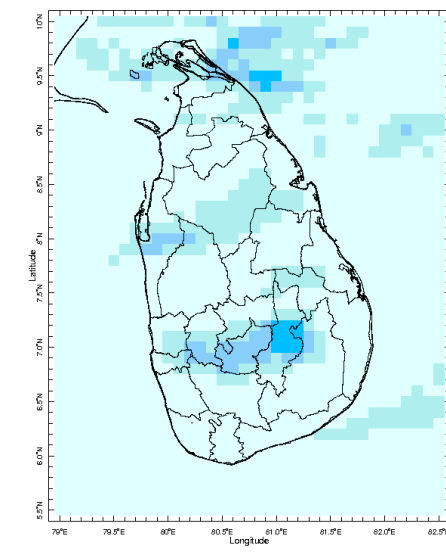
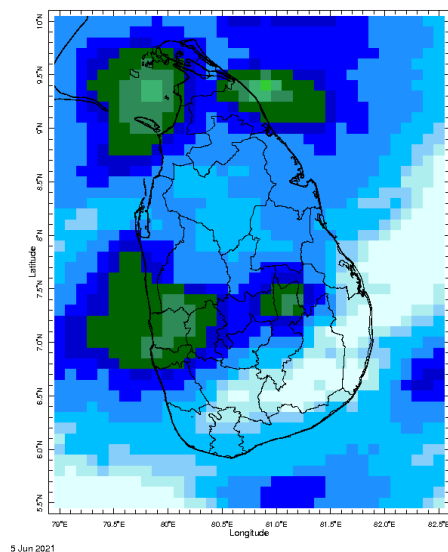
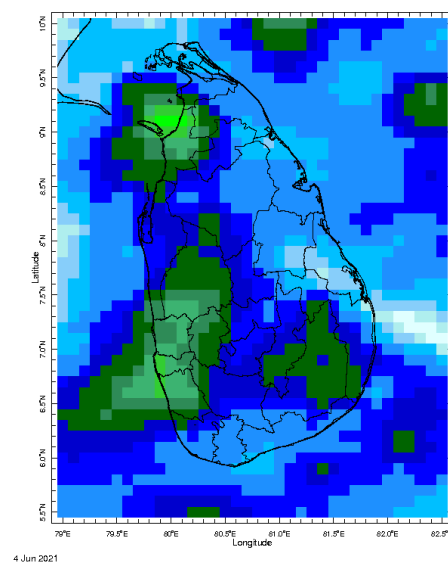
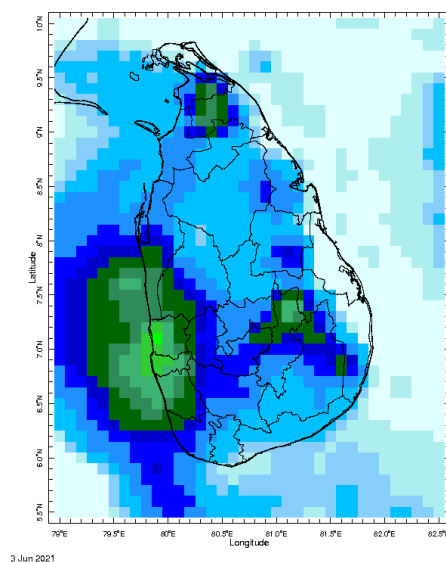
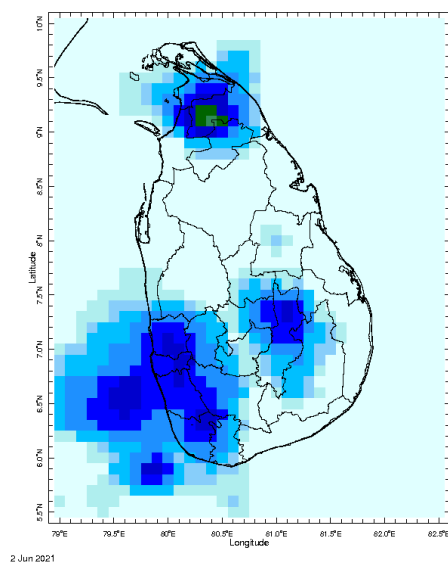
- NCEP GFS Ensemble 1-14 day Rainfall Predictions
- GFS (T574) Model Rainfall Forecast from RMSC New Delhi
- MJO Related OLR Forecast
- Weekly Temperature Forecast
- Weekly Wind Forecast
- Seasonal Predictions from IRI



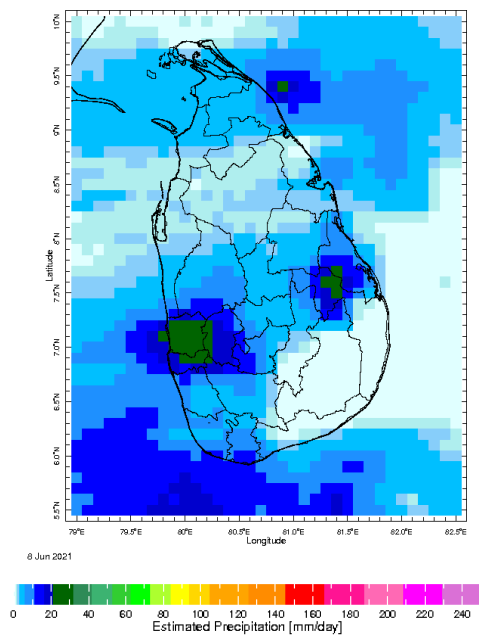
### MONITORING

#### Daily Rainfall Monitoring

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

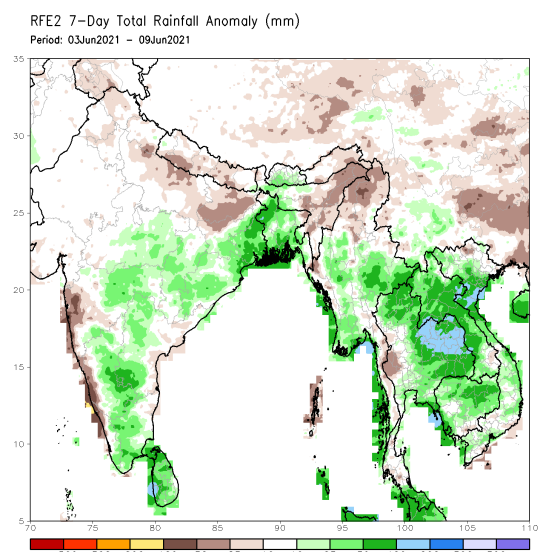
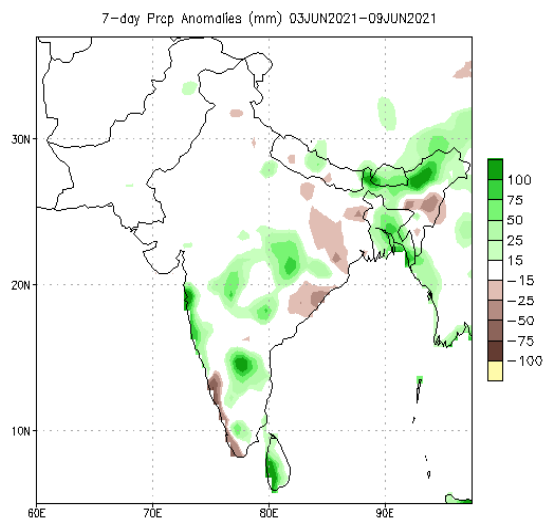
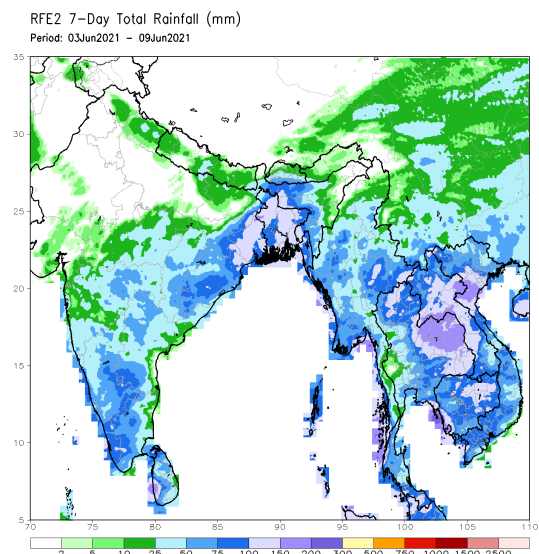
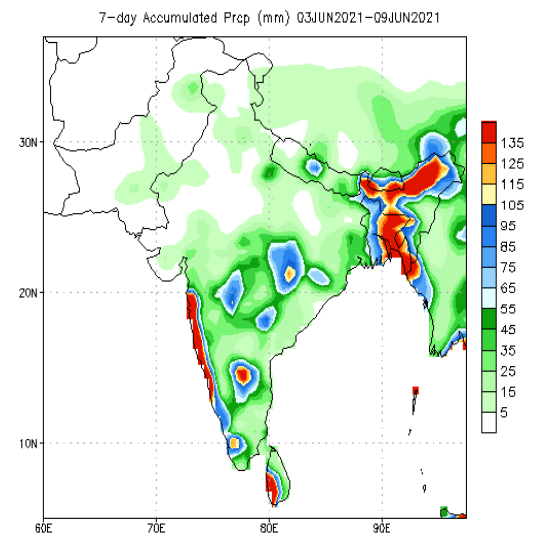






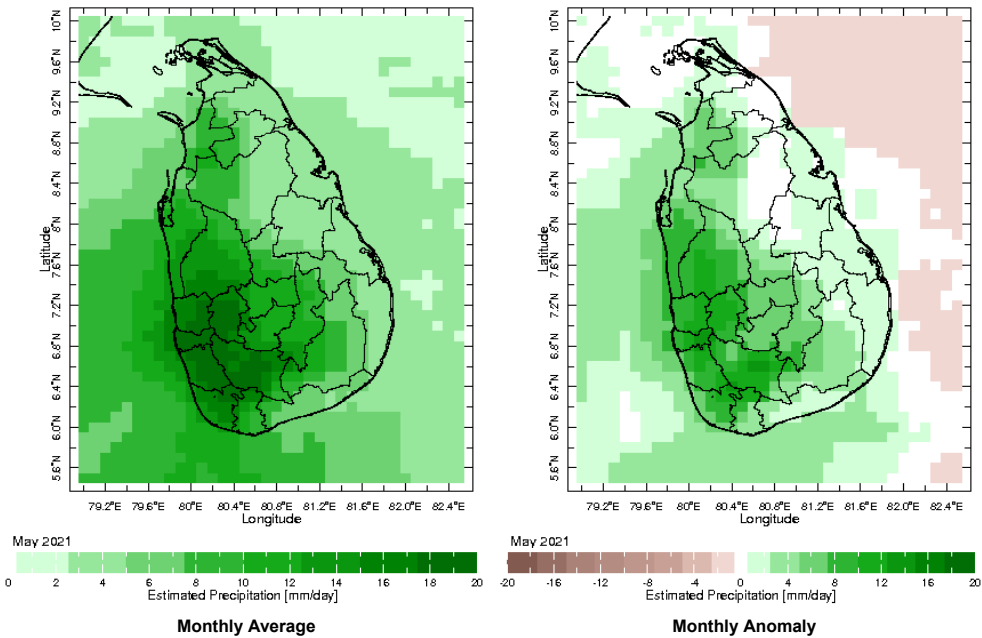
## Weekly Rainfall Monitoring

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.

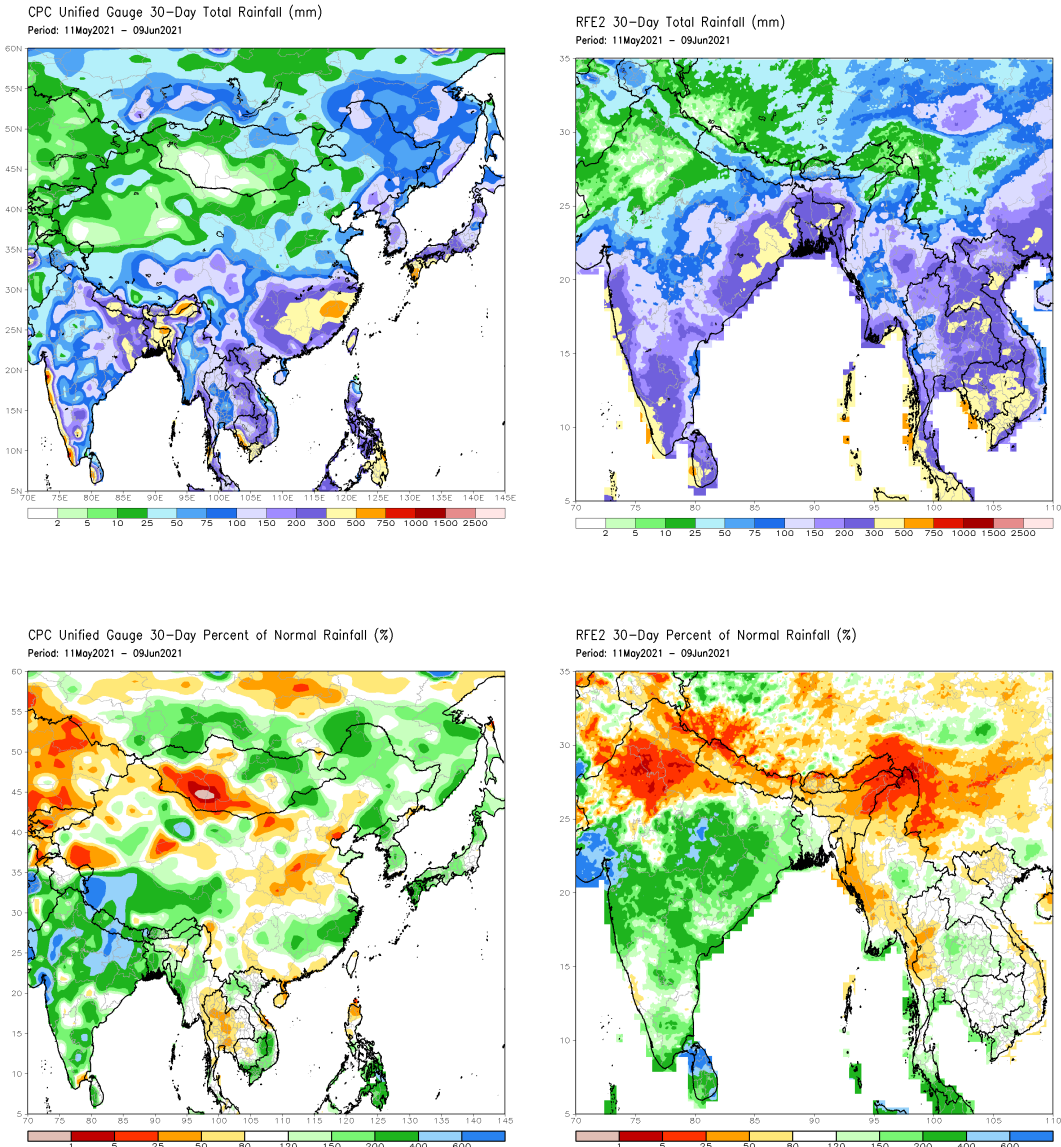


Monthly Rainfall Monitoring

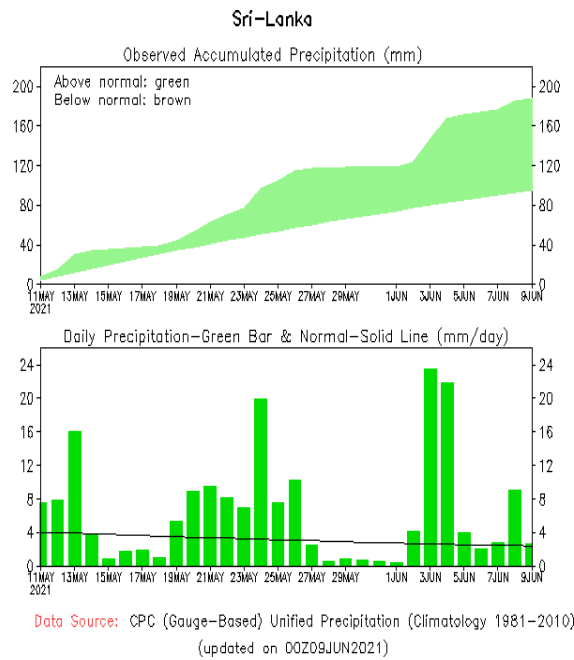
The figure in the left shows the average observed rainfall in the previous month. The rainfall anomaly in the previous month is shown in the figure to the right. The brown color in the anomaly figure shows places which received less rainfall than the historical average while the green color shows places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



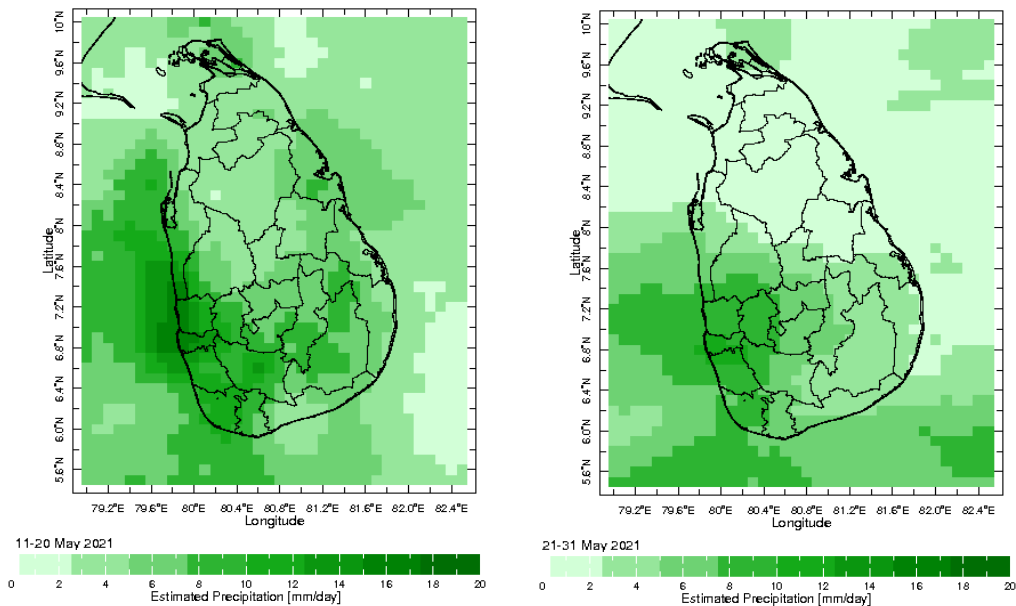
The figure in the top-left shows the total rainfall in the past 30 days from CPC Unified Precipitation Analysis while the figure in the top-right shows the total rainfall for the same period from RFE 2.0 Satellite Rainfall Estimates. The bottom two figures show the percentage of rainfall received in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



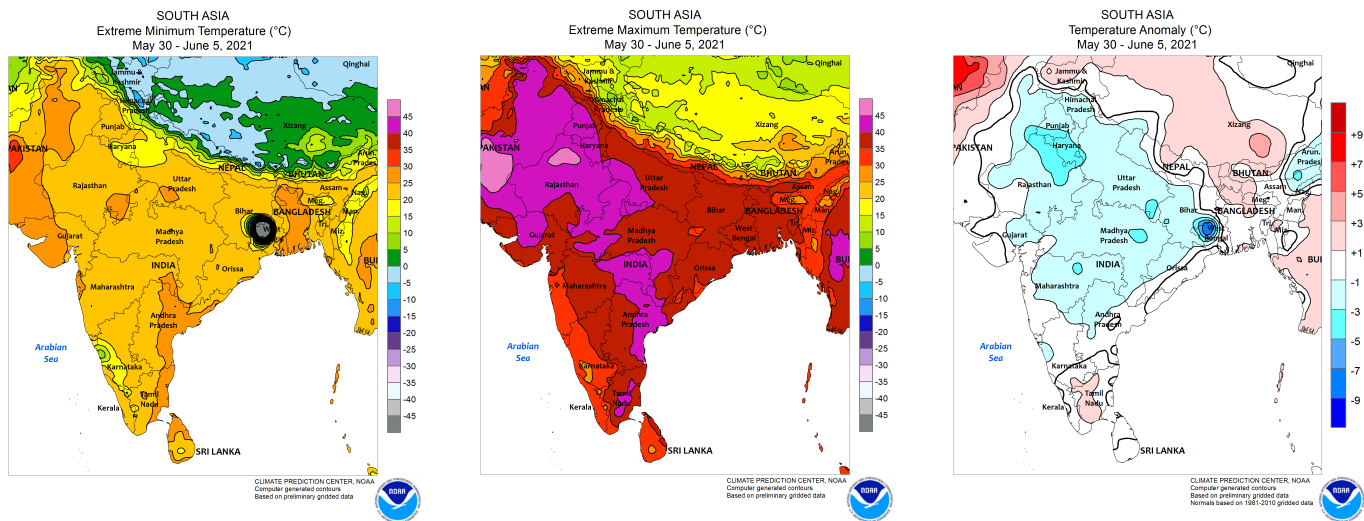
The following figure shows the observed accumulated rainfall (top) and daily observed rainfall (bottom) in Sri Lanka in the last 30 days.



**Dekadal (10 Day) Satellite Derived Rainfall Estimates**



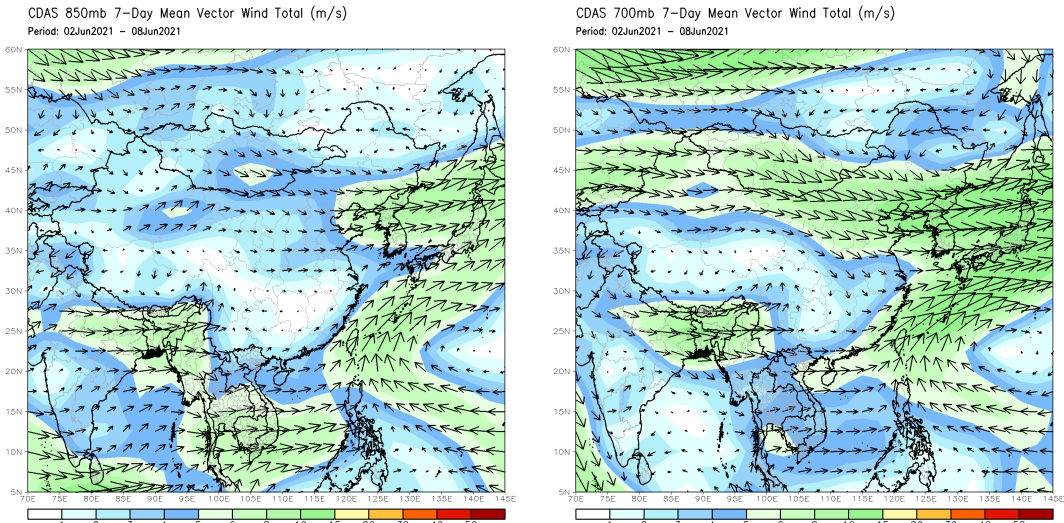
**Weekly Temperature Monitoring**





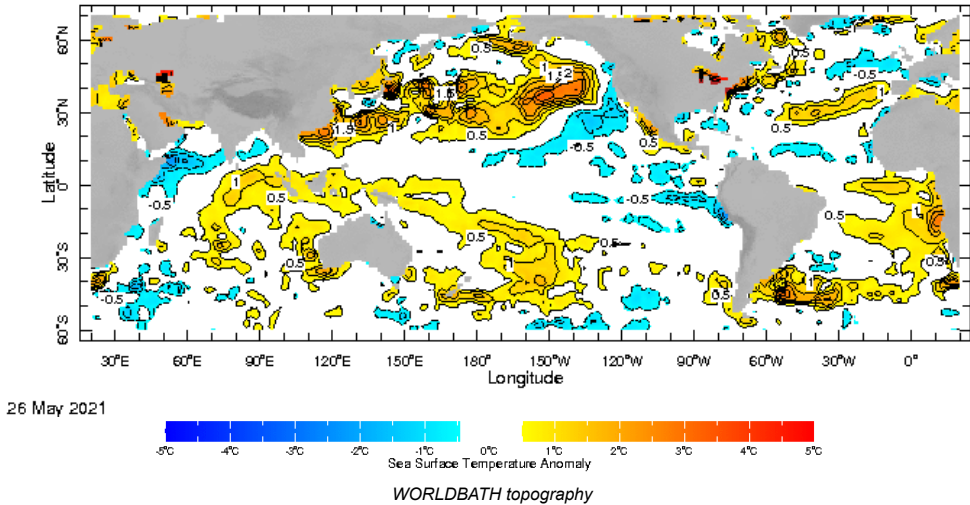
Weekly Wind Monitoring

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.

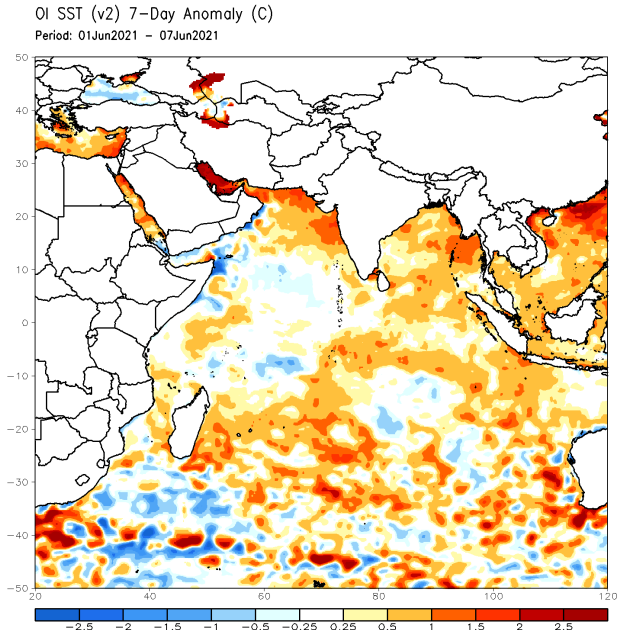


Weekly Average SST Anomalies

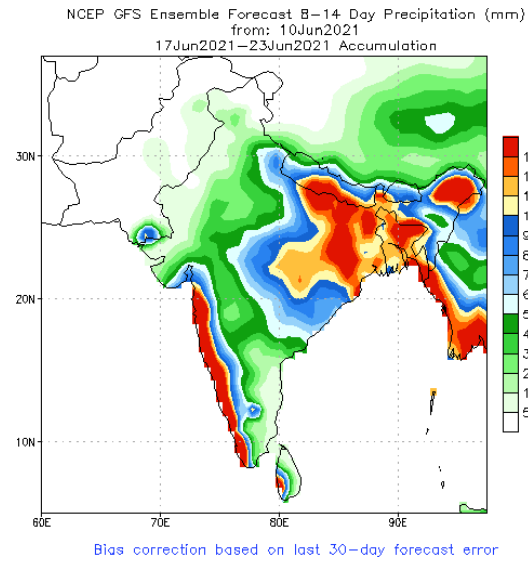
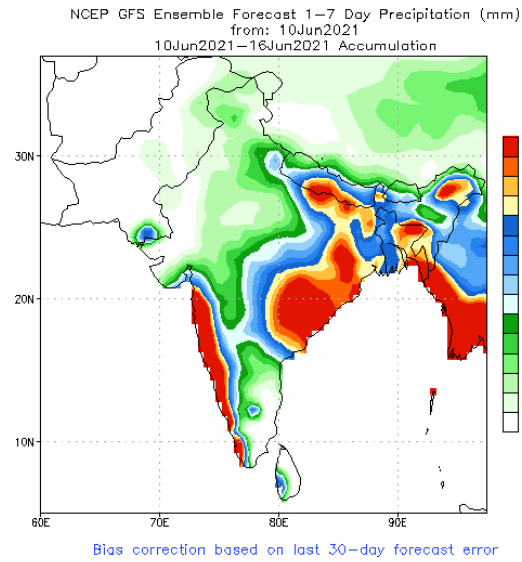
Weekly average Sea Surface Temperature (SST) anomaly in the world from NOAA NCEP



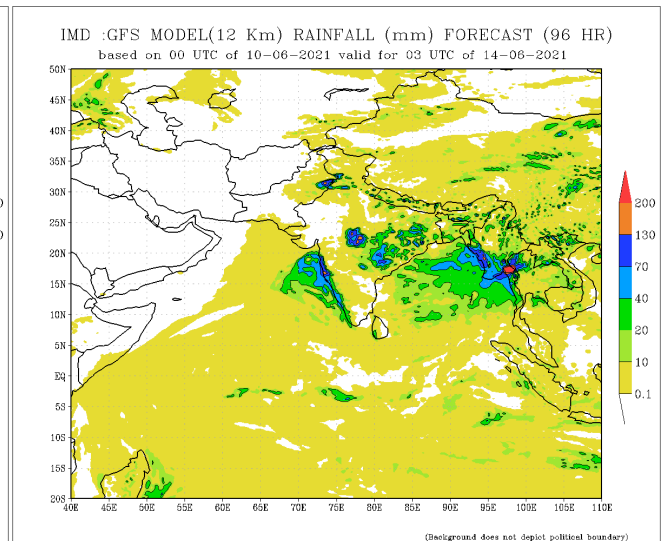
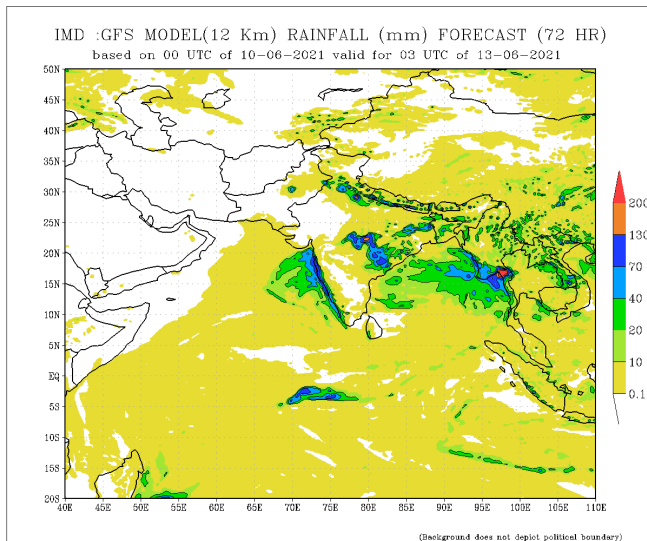
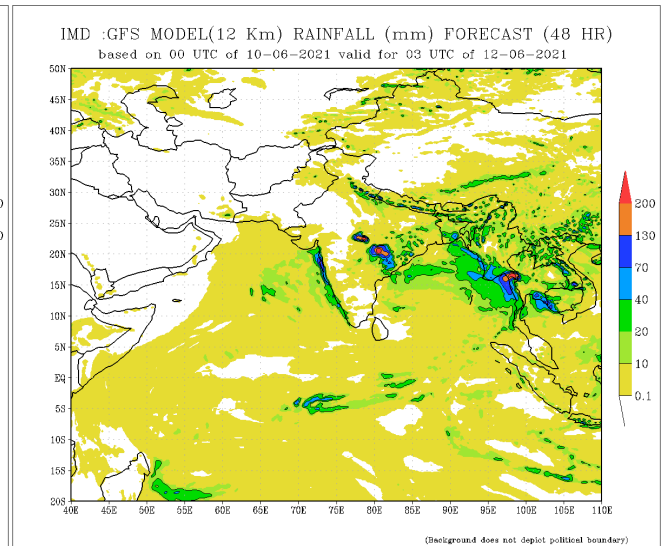
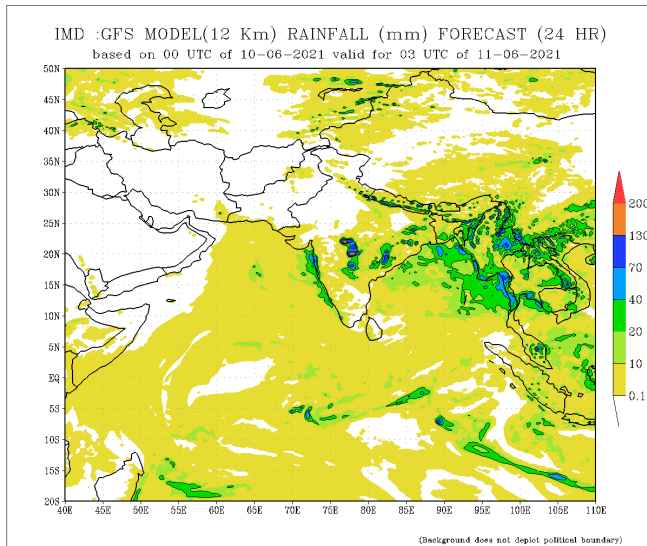
Optimum Interpolated Sea Surface Temperature Anomaly in the Indian Ocean from NOAA CPC

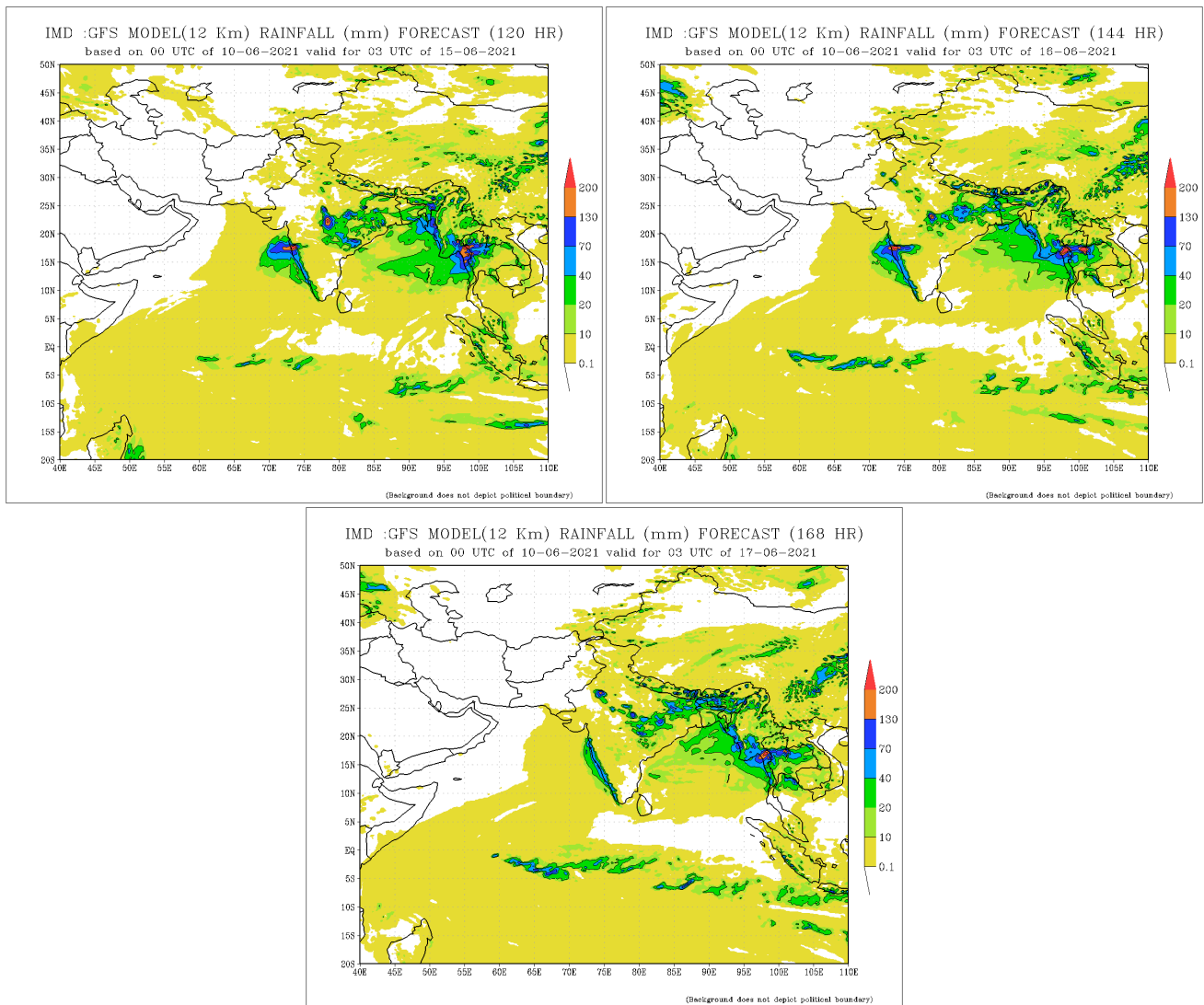


## NCEP GFS 1- 14 Day prediction



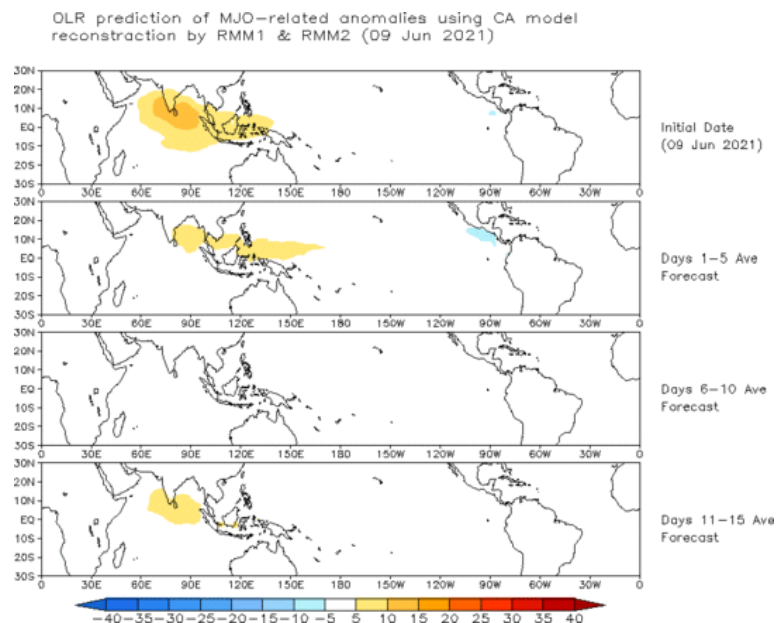
## IMD GFS (T574) Model Rainfall Forecast from RMSC New Delhi, India





## 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.

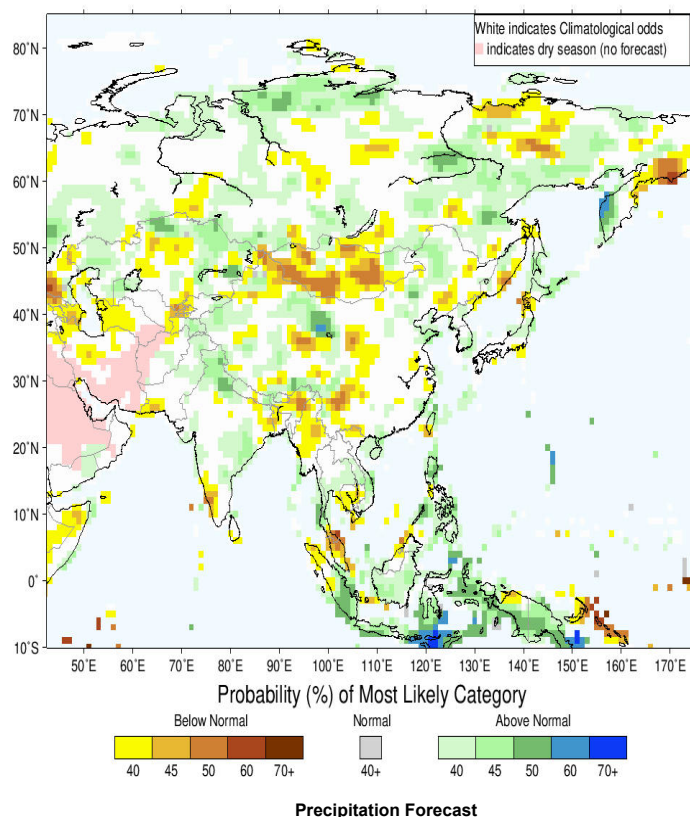




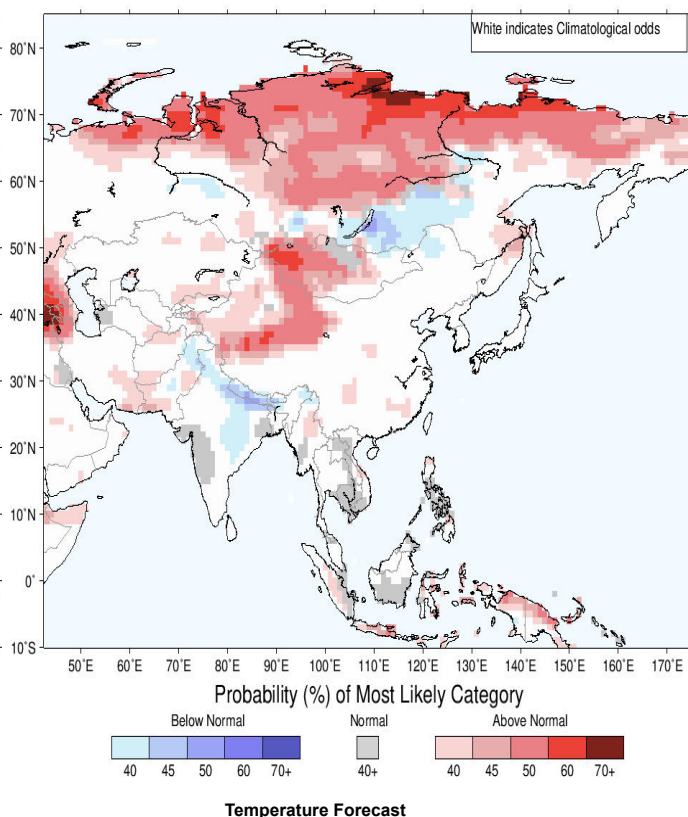
## Seasonal Rainfall and Temperature Forecast

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%).

IRI Multi-Model Probability Forecast for Precipitation for June-July-August 2021, Issued May 2021



IRI Multi-Model Probability Forecast for Temperature for June-July-August 2021, Issued May 2021



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