Federation for Environment, Climate and Technology

c/o, Maintenance Office, Mahaweli Authority, Digana Village, Rajawella, Sri Lanka.
Phone (+94) 81-2376746, (+94) 81-2300415 E mail: fectsl@gmail.com
Web Site http://www.climate.lk

Week of 23 - 30 July 2021

CLIMATE MONITORING AND PREDICTION FOR SRI LANKA

By: Nipuni Alahakoon, Ushan Adithya, Azra Munas, Tuan Hadgie, Lareef Zubair and Michael Bell[1] (FECT and IRI[1])

HIGHLIGHTS

Rainfall Prediction

- *Fairly heavy rainfalls are predicted in Western, Southern Sabaragamuwa, North central & Central provinces during 21st-27th July.*

Monitored Rainfalls

- *Fairly heavy rainfalls were experienced in the Eastern province with max of 50.5 mm in Trincomalee district on 18th July.*

Monitored Wind

- *From 13th- 19th July: up to 15 km/h from the southwesterly were experienced over the island.*

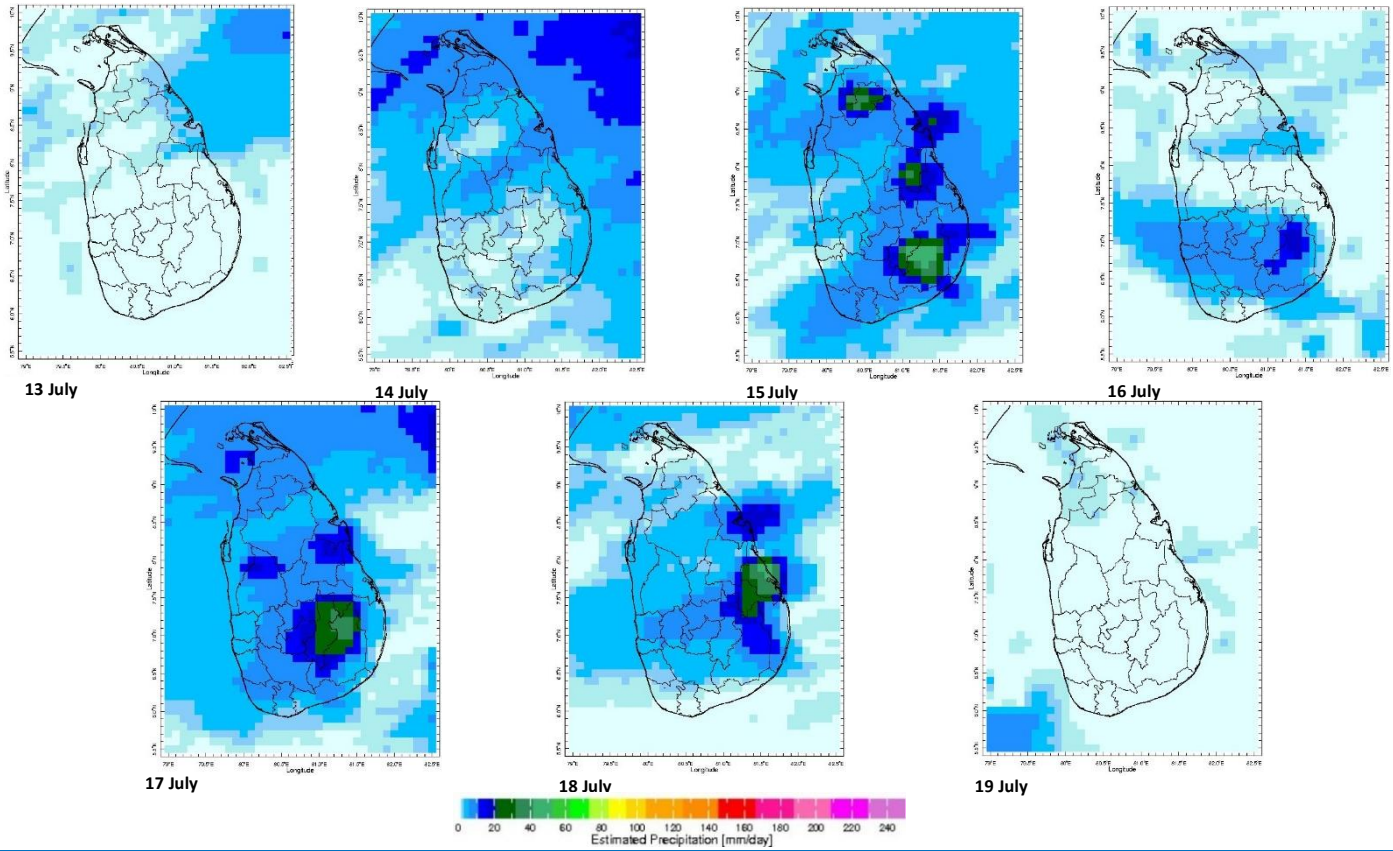
Monitored Sea Surface

- *Sea surface temperature was observed above 0.5℃ to the east of Sri Lanka and neutral to the west.*

Monitoring

Rainfall

Daily Estimates for Rainfall from 13th – 19th July



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

Weekly Rainfall Anomalies by Districts:

Rainfall Excess

Rainfall	Districts
50 – 100 mm	Moneragala, Badulla, Nuwara Eliya, Ratnapura, Polonnaruwa, Anuradhapura, Trincomalee, Kilinochchi, Mullaitivu, Mannar, Jaffna
25 – 50 mm	Gampaha, Galle, Matara, Hambantota, Ampara, Batticaloa, Kegalle, Kandy, Matale, Kurunegala, Puttalm, Vavuniya
10 – 25 mm	Colombo, Kalutara

Monthly Monitoring

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

21st– 30th June:

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

1st– 10th July:

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

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Ocean State *(Text Courtesy IRI)*

Pacific sea state: July 14, 2021

Equatorial SSTs were below average in parts of the eastern Pacific Ocean and near average across the rest of the Pacific Ocean in mid-July 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 east of Sri Lanka and neutral to the west.

Predictions

Rainfall

14-day prediction: NOAA NCEP models

From 21st – 27th July:

Total rainfall by Provinces:

Rainfall	Provinces
75 mm	Sabaragamuwa
65 mm	Western, Southern
55 mm	North central, Central
45 mm	Uva, North western
25 mm	Eastern
15 mm	Northern

From 28th July – 3rd August:

Total rainfall by Provinces:

Rainfall	Provinces
45 mm	Western, Sabaragamuwa, North central, Southern
35 mm	Central, North western
25 mm	Uva
15 mm	Northern, Eastern

MJO based OLR predictions

For the next 15 days:

MJO shall slightly suppress the rainfall during 20th - 29th Jul; and significantly suppress during 30th Jul – 3rd Aug.

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Interpretation

Monitoring

Rainfall: During the last two weeks, there had been Fairly heavy rainfall over the following province: Easten

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

Temperatures: The temperature anomalies were near neutral during last week.

Predictions

Rainfall: During the next week (21st–27th July) Fairly heavy rainfall are predicted for Western, Central and Sabaragamuwa provinces; and in Galle and Matara districts.

Temperatures: The temperature remains slightly normal for July. During 23rd–31st July, the temperature remains high especially the Eastern and Uva provinces.

Teleconnections:
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.

Understanding the forecast

Light showers	- Rainfall is less than 12.5mm
Light to Moderate	- Rainfall is in between 12.5mm and 25 mm
Moderate	- Rainfall is in between 25mm and 50 mm
Fairly heavy	- Rainfall is in between 50mm and 100 mm
Heavy	- Rainfall is in between 100mm and 150 mm
Very Heavy	- Rainfall is more than 150mm

(During 24 hours of period)

Tropical Climate Guarantee, Federation of Environment, Climate and Technology, Columbia University Water Center, [1] 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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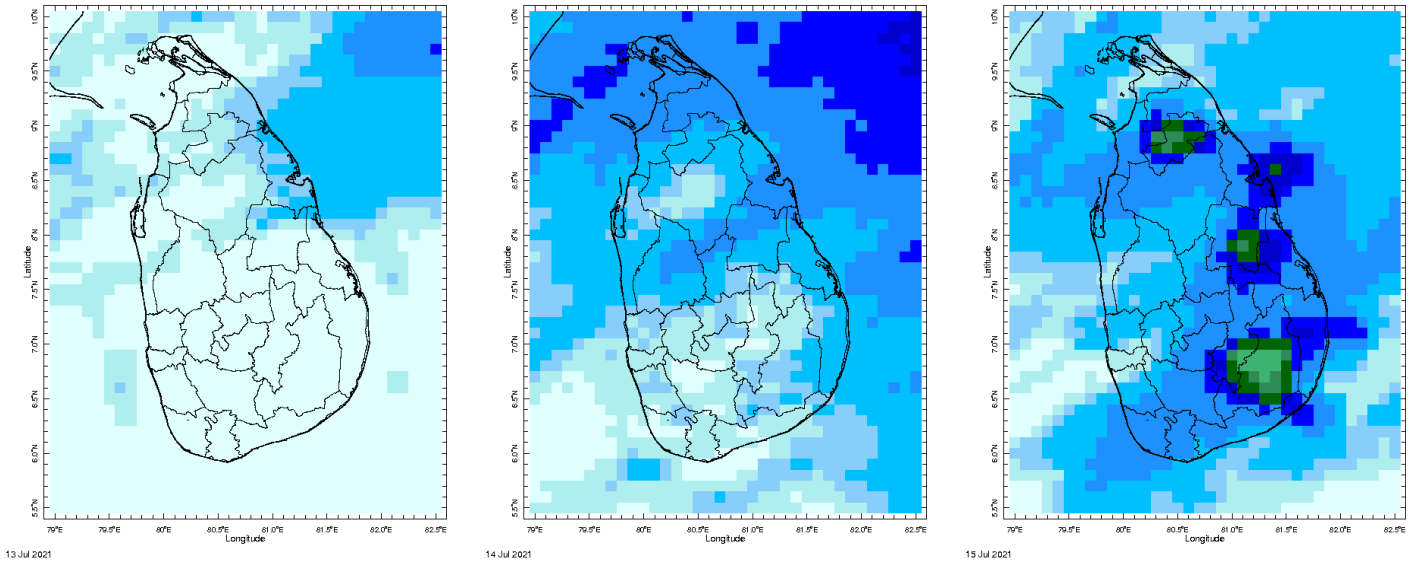
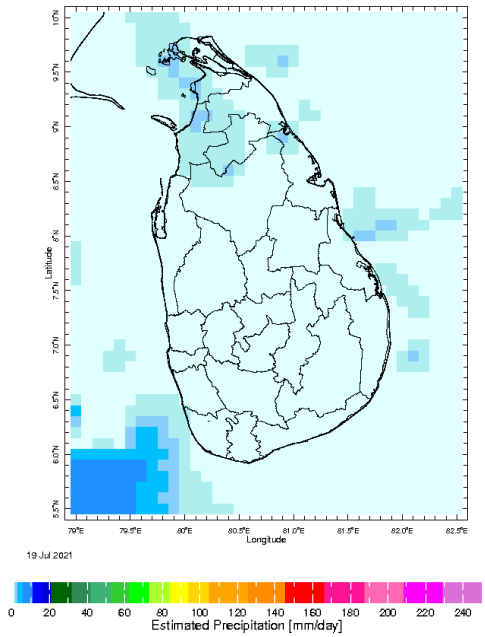
MONITORING

Daily Rainfall Monitoring

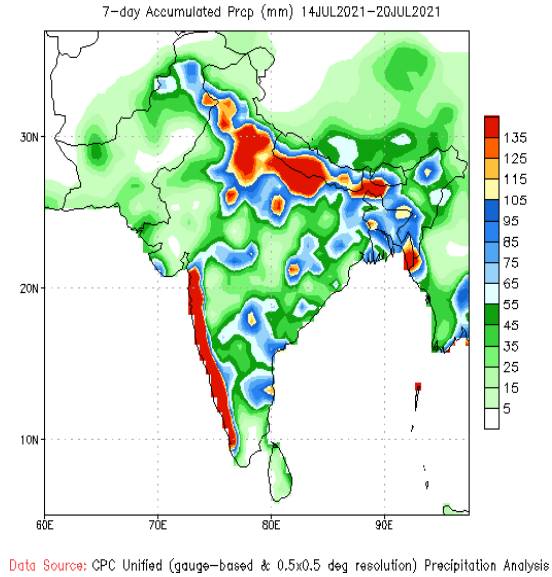
The following figures show the satellite observed rainfall in the last 7 days in Sri Lanka.



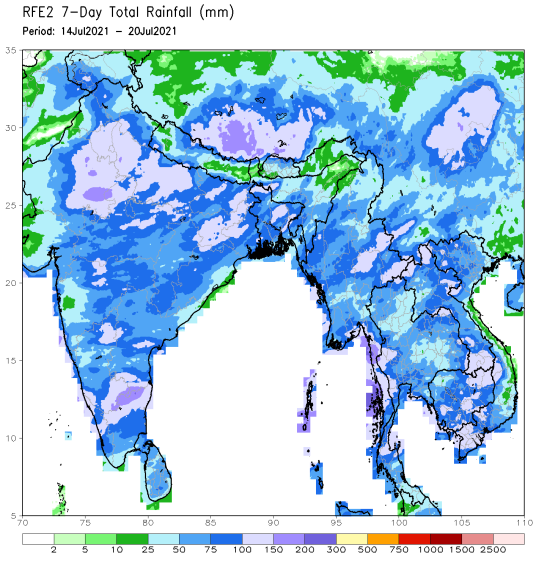


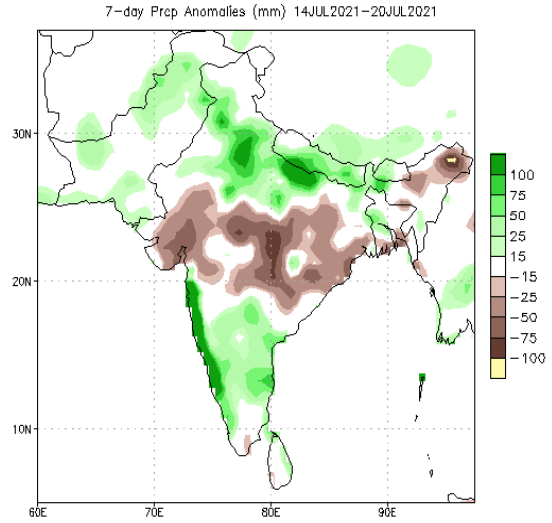
Weekly Rainfall Monitoring

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.

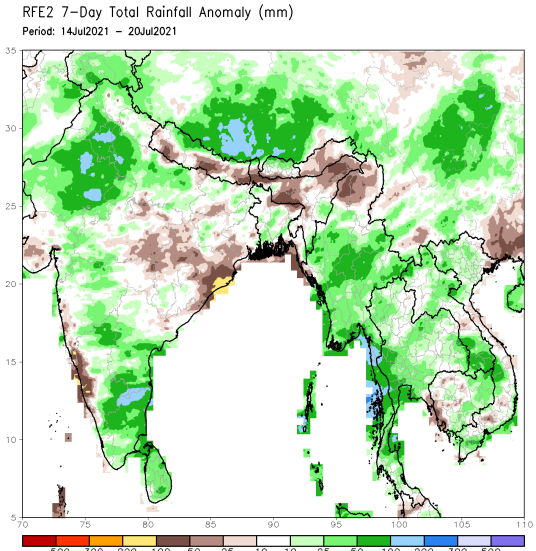


Data Source: CPC Unified (gauge-based & 0.5x0.5 deg resolution) Precipitation Analysis



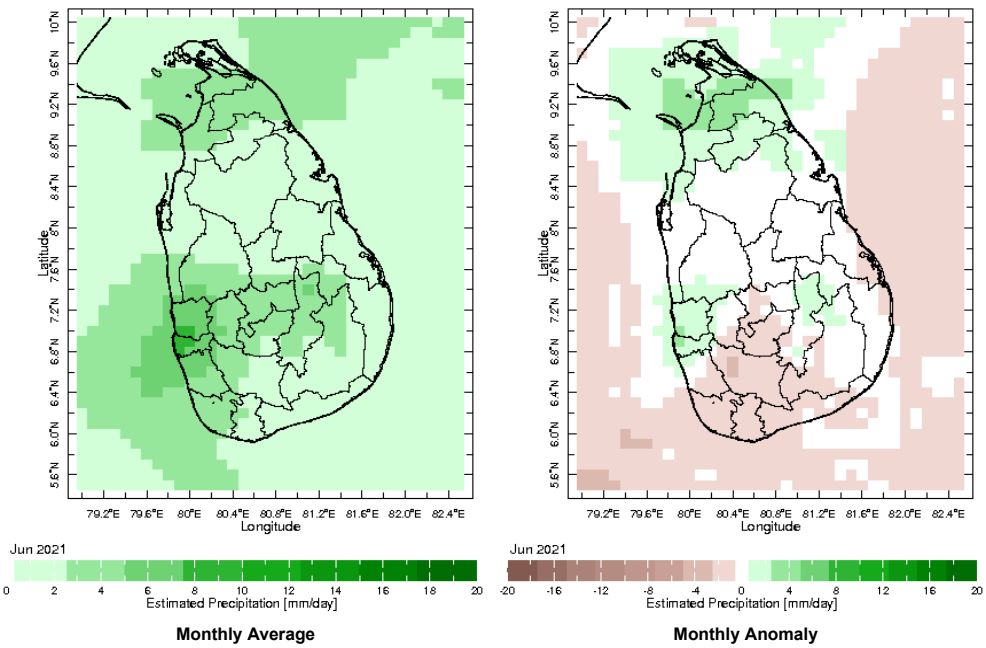


Data Source: CPC Unified (gauge-based & 0.5x0.5 deg resolution) Precipitation Analysis Climatology (1991-2020)



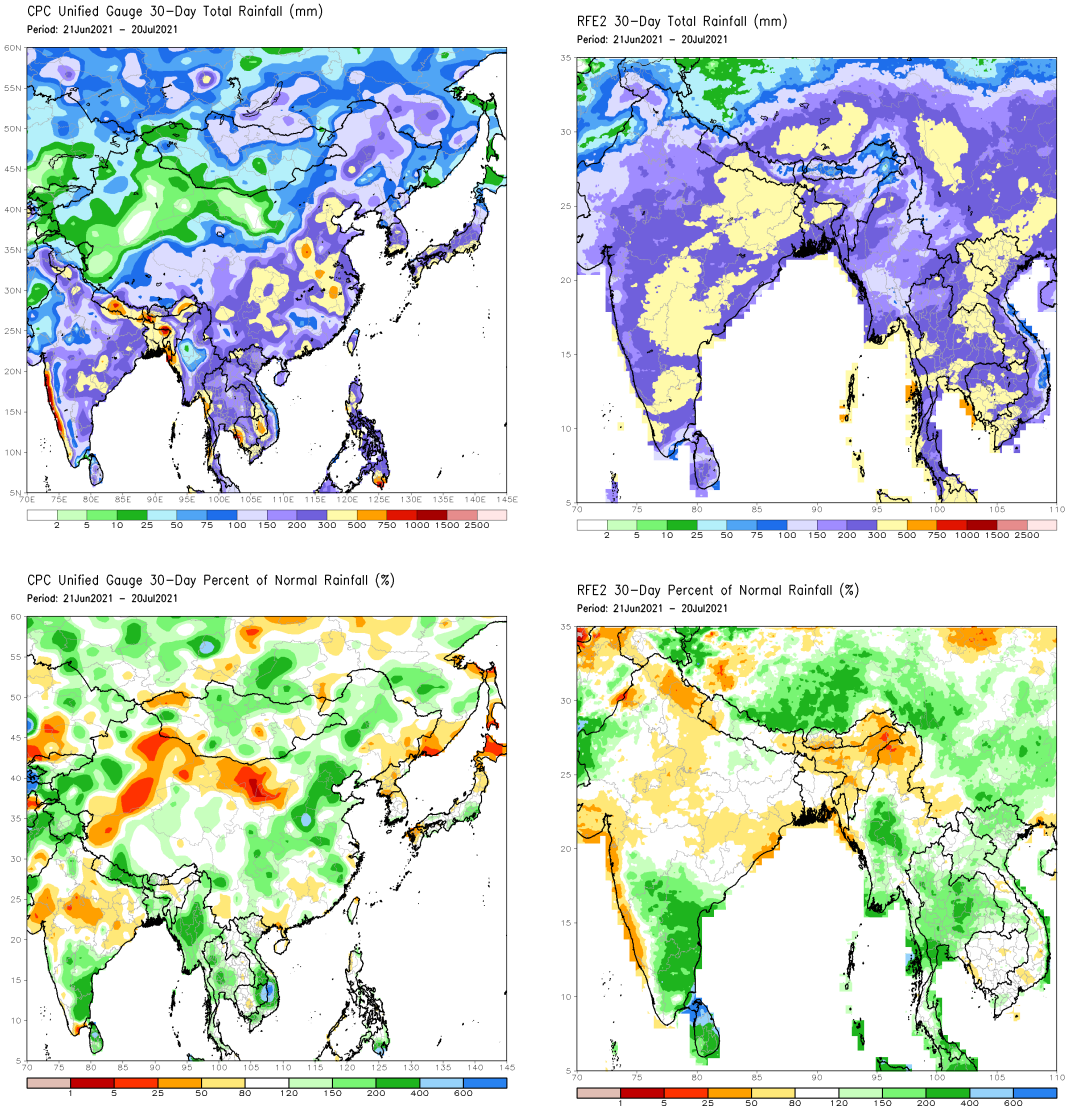
Monthly Rainfall Monitoring

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

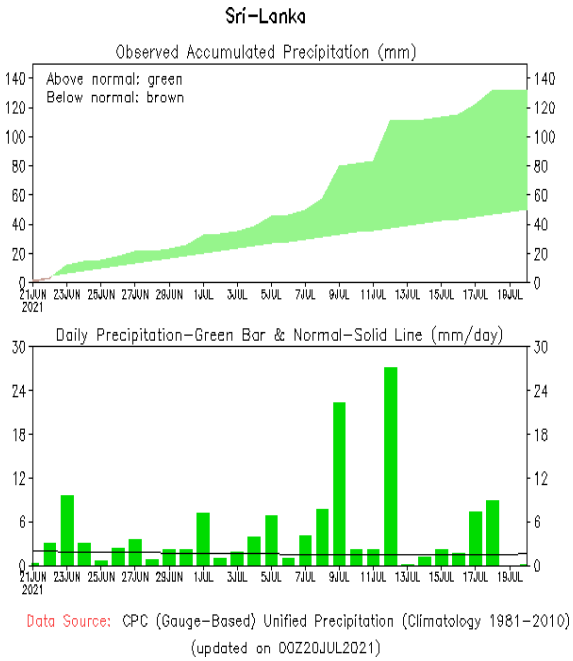


Monthly Average **Monthly Anomaly**

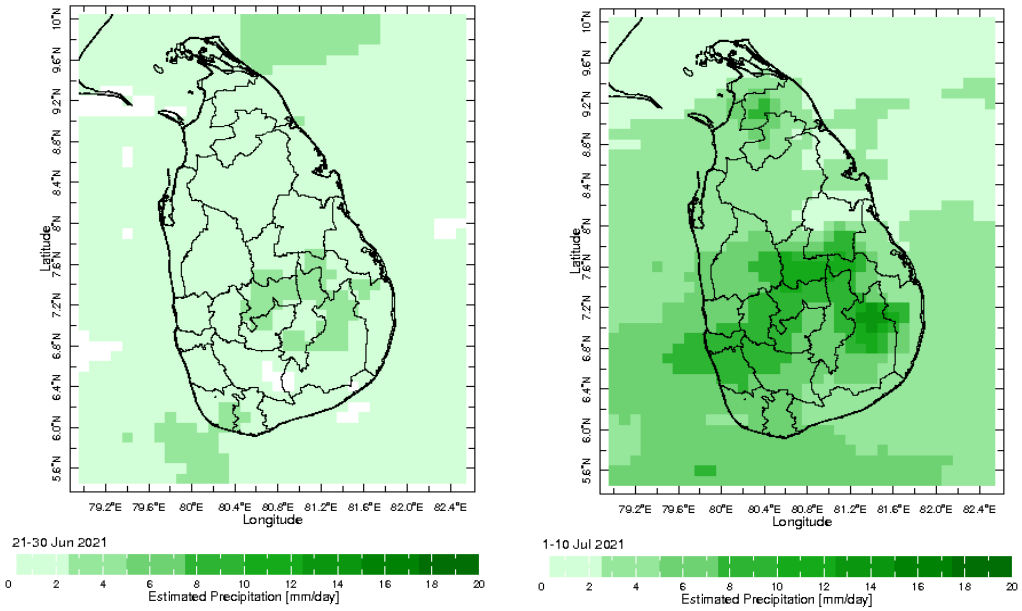
The figure in the top-left shows the total rainfall in the past 30 days from CPC Unified Precipitation Analysis while the figure in the top-right shows the total rainfall for the same period from RFE 2.0 Satellite Rainfall Estimates. The bottom two figures show the percentage of rainfall received in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



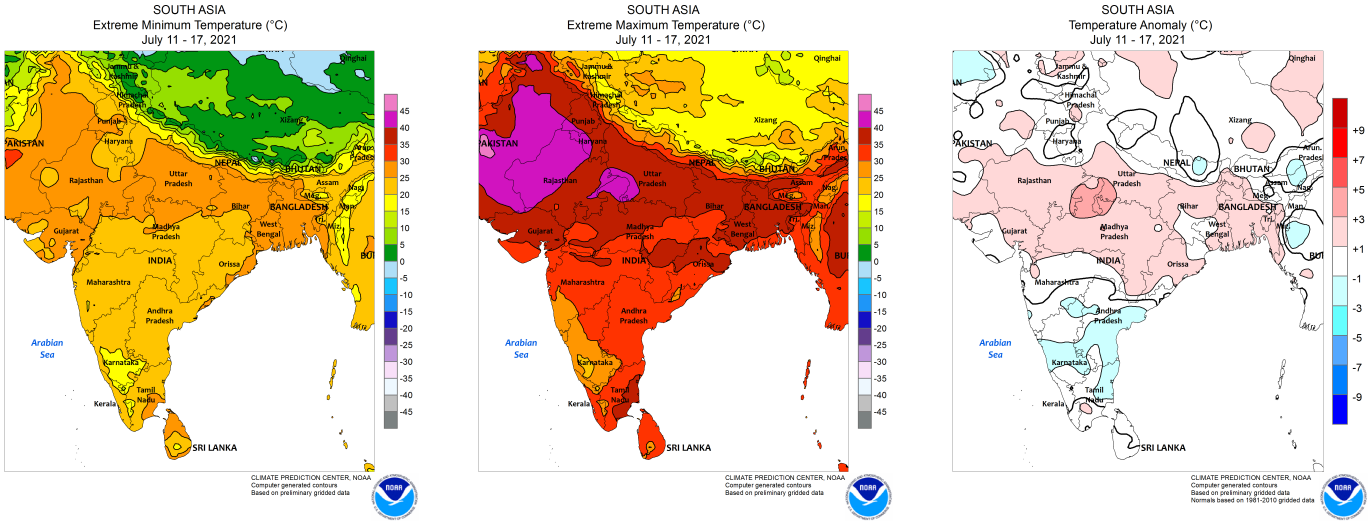
The following figure shows the observed accumulated rainfall (top) and daily observed rainfall (bottom) in Sri Lanka in the last 30 days.



Dekadal (10 Day) Satellite Derived Rainfall Estimates

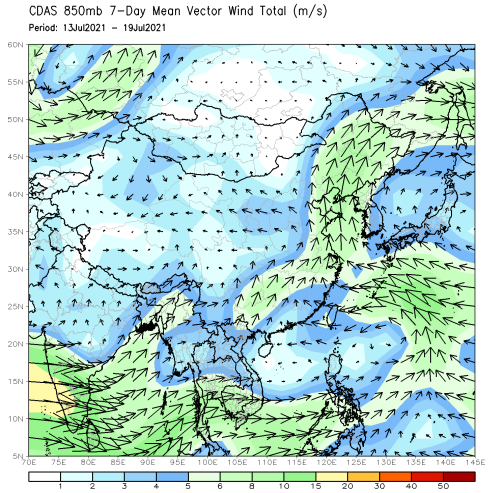


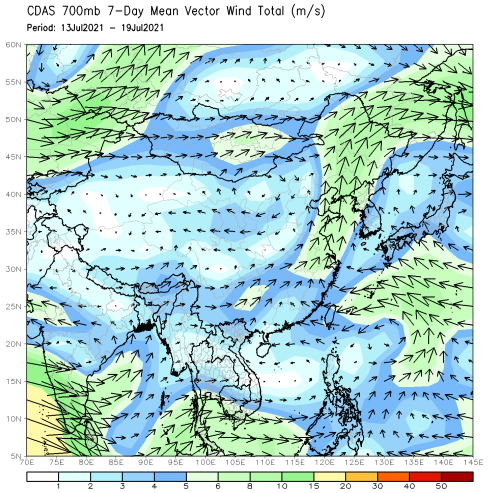
Weekly Temperature Monitoring



Weekly Wind Monitoring

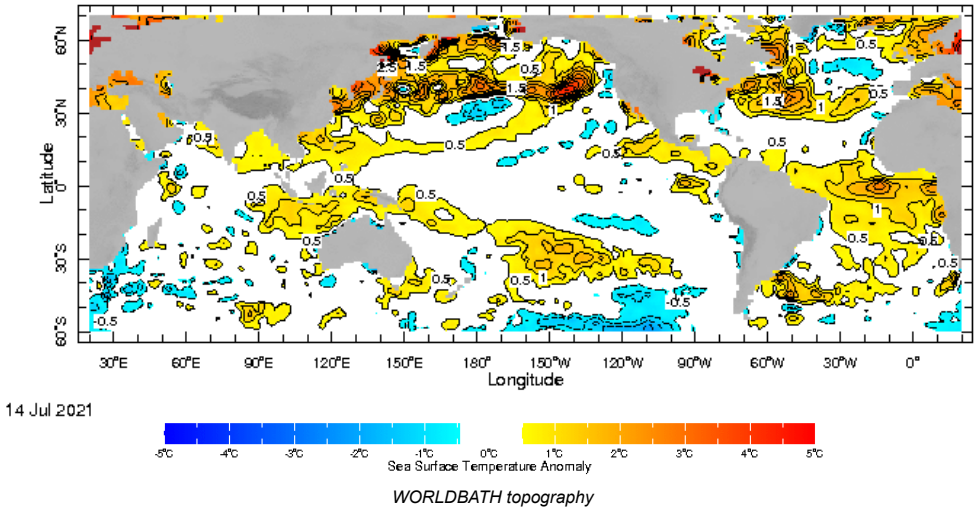
The following figures show the mean vector wind total of the past 7 days near Sri Lanka at two levels. The figure on the left shows 850 mb (~1500 m) level and the figure on the right shows 700 mb (~3000 m) level.



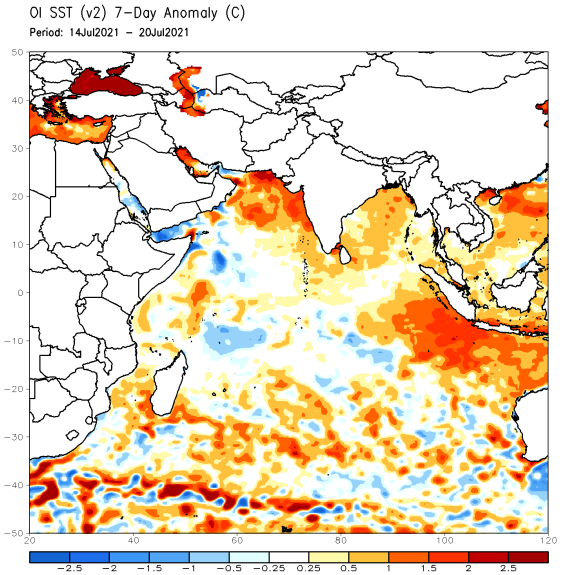


Weekly Average SST Anomalies

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

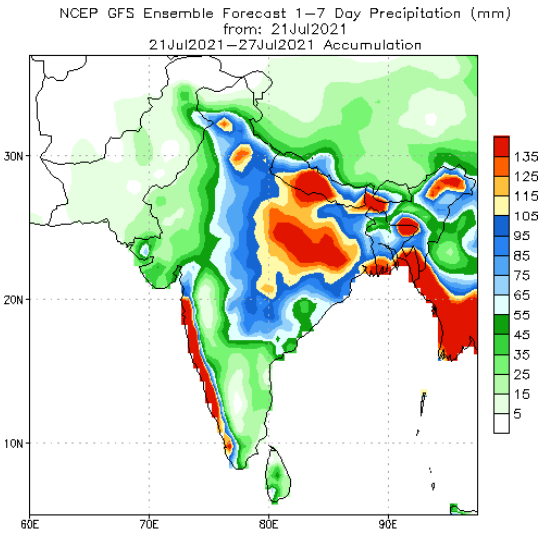


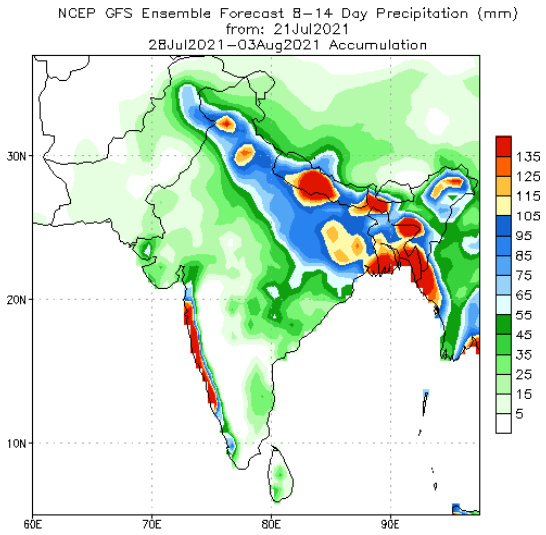
Optimum Interpolated Sea Surface Temperature Anomaly in the Indian Ocean from NOAA CPC



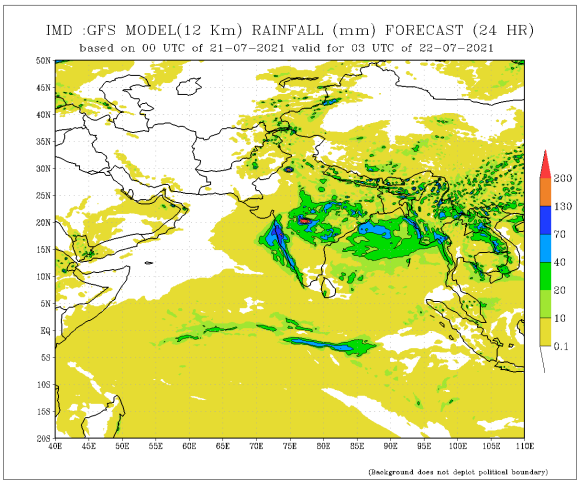
PREDICTIONS

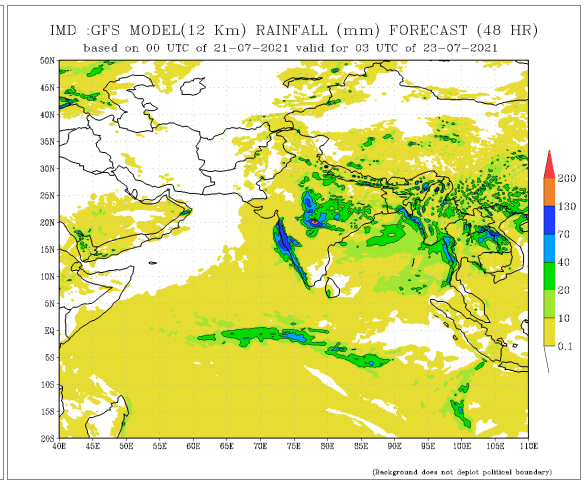
NCEP GFS 1- 14 Day prediction

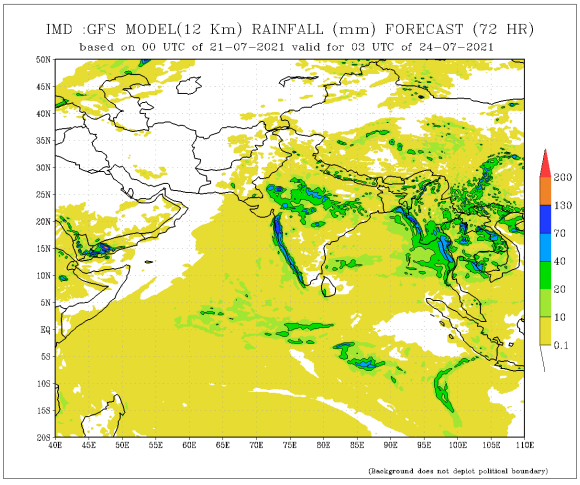


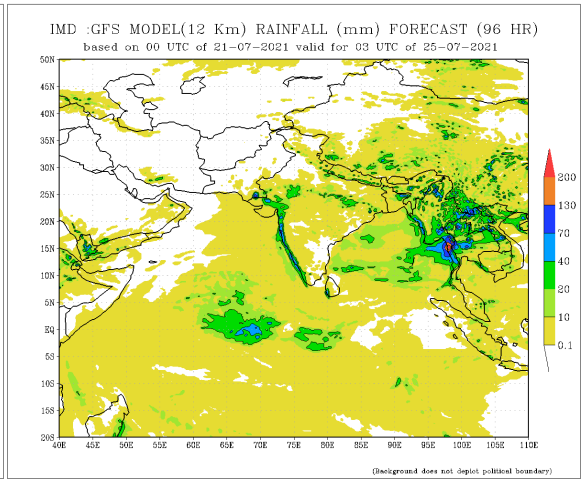


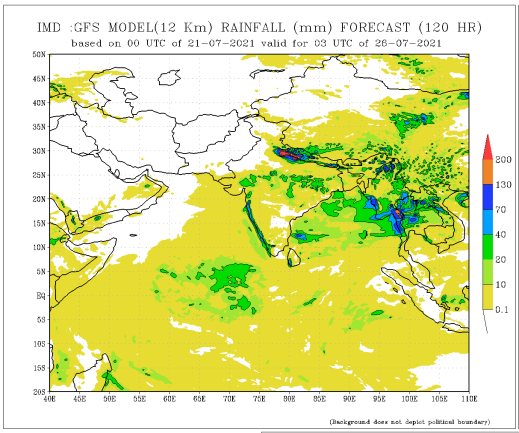
IMD GFS (T574) Model Rainfall Forecast from RMSC New Delhi, India

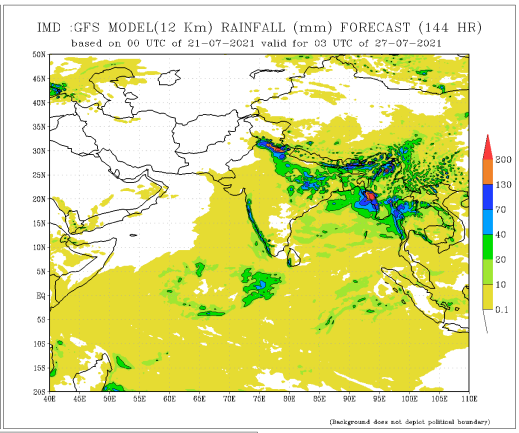


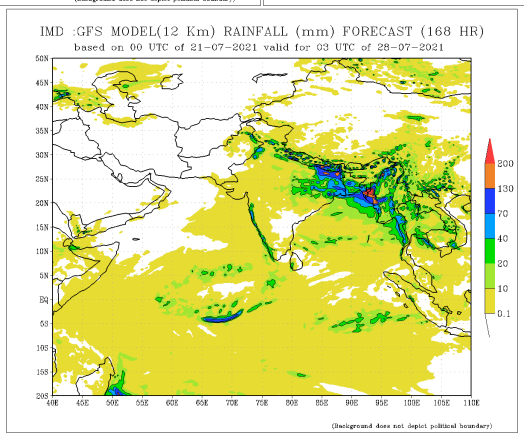






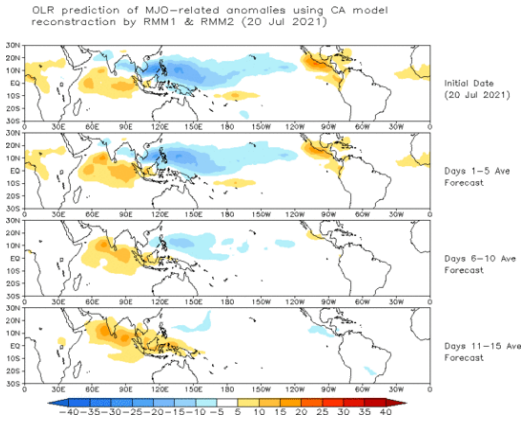






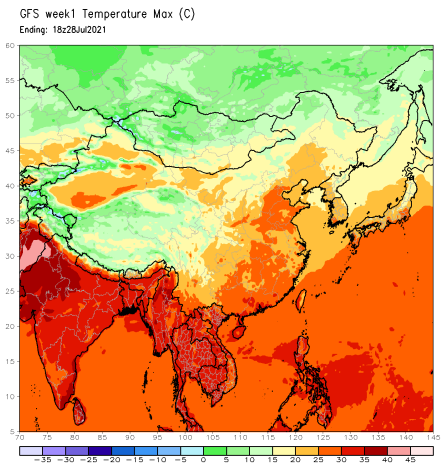
Madden Julian Oscillation (MJO) related Outgoing Longwave Radiation (OLR) Forecast

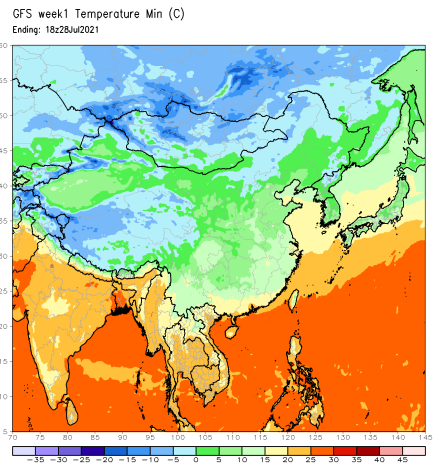
The Outgoing Longwave Radiation (OLR) is a proxy for rainfall. This can be used to identify convective rain clouds based on the MJO phase. Violet and Blue shading indicates enhanced tropical weather and Orange shading indicates suppressed conditions. The following figure shows the forecasts of MJO associated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



Weekly Temperature Forecast

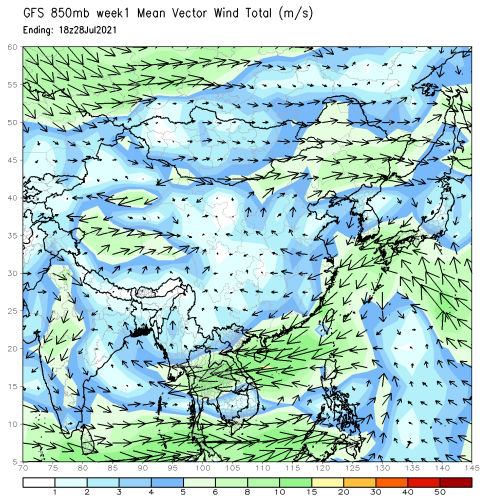
Weekly Minimum and Maximum Temperature prediction from the GFS model (from NOAA CPC)

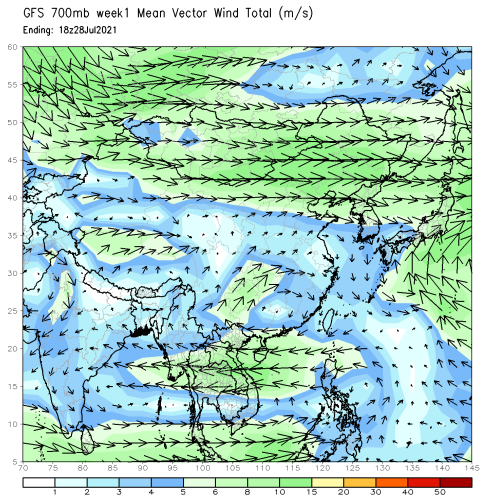




Weekly Wind Forecast

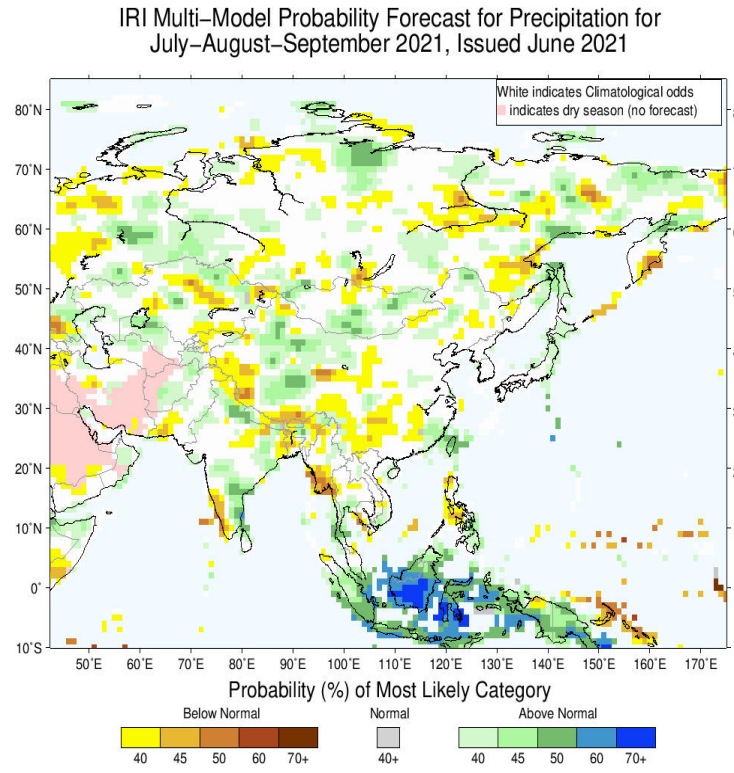
Weekly mean vector wind total prediction from the GFS model at 850 mb (left) and 700 mb (right) levels. (from NOAA CPC)

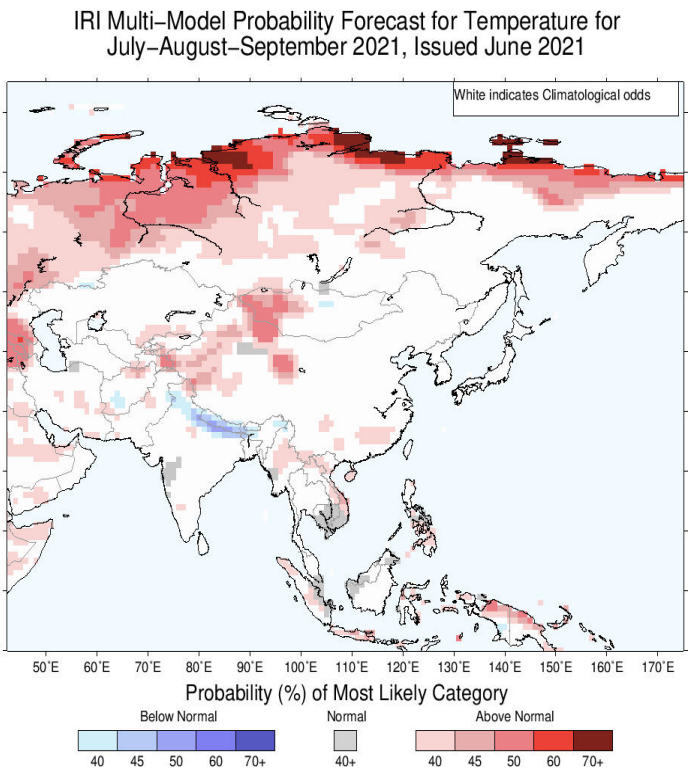




Seasonal Rainfall and Temperature Forecast

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%).





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