Federation for Environment, Climate and Technology

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Week of 16 - 23 April 2021

CLIMATE MONITORING AND PREDICTION FOR SRI LANKA

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

HIGHLIGHTS

Rainfall Prediction

- *Showers of 75 mm expected in Western & Sabaragamuwa provinces during 16th - 21st April with a drop in rainfall elsewhere.*

Monitored Rainfalls

- Dangerously heavy rainfall was experienced in Western,Southern & Sabaragamuwa provinces.Up to 135mm max in Matara on 10th

Monitored Wind

- *From 6th - 12th Apr: up to 8 km/h Northeasterly winds were experienced by northern half of the island.*

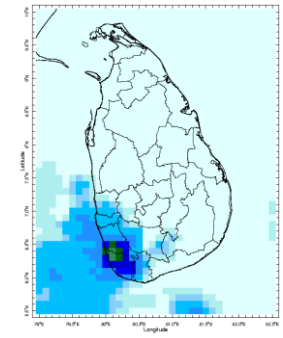
Monitored Sea Surface

- Sea surface temperature was observed neutral around along Sri Lanka.

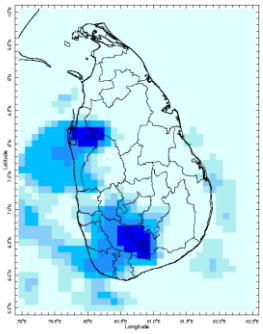
Monitoring

Rainfall

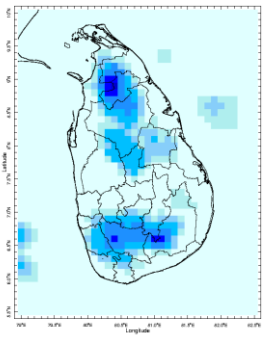
Daily Estimates for Rainfall from 6th – 12th April



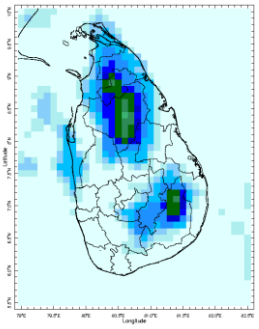
6th April



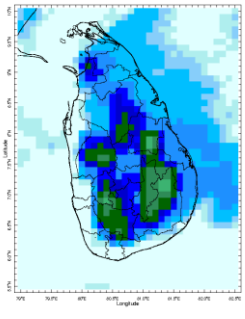
7th April



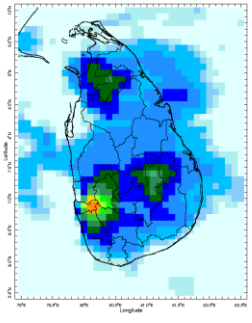
8th April



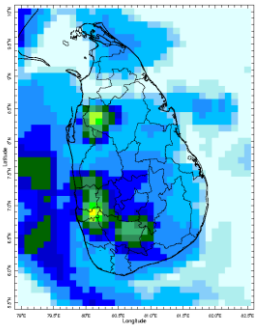
9th April



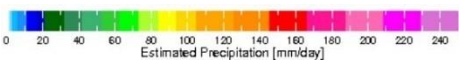
10th April



11th April



12th April



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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
200 – 300 mm	Gampaha, Colombo, Kalutara, Kegalle, Ratnapura
150 – 200 mm	Anuradhapura
100 – 150 mm	Vavuniya, Mannar, Nuwara Eliya, Badulla, Moneragala
75 – 100 mm	Mullaitivu, Ampara, Kurunegala, Kandy, Matara
50 – 75 mm	Batticaloa, Polonnaruwa, Puttalam, Matale, Galle, Hambantota
25 – 50 mm	Trincomalee, Kilinochchi
10 – 25 mm	Jaffna

Weekly Rainfall Anomalies by Districts:

Rainfall Excess

Rainfall	Districts
100 – 200 mm	Anuradhapura, Gampaha, Colombo, Kalutara, Ratnapura
50 – 100 mm	Vavuniya, Mannar, Moneragala, Kegalle
25 – 50 mm	Mullaitivu, Ampara, Nuwara Eliya, Badulla, Puttalam, Kurunegala
10 – 25 mm	Kilinochchi, Polonnaruwa, Kandy

Rainfall Deficit

Rainfall	Districts
50 – 100 mm	Galle
25 – 50 mm	Batticaloa, Matale, Matara, Hambantota
10 – 25 mm	Jaffna, Trincomalee

Monthly Monitoring

During middle and late March, Dekadal Rainfall (mm/day) by Districts:

21st– 31st March:

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

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1st– 10th April:

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

Ocean State *(Text Courtesy IRI)*

Pacific sea state: April 7, 2021

Equatorial SSTs were mostly below average from the east to the Middle West Pacific Ocean in early-April and most key atmospheric variables were either ENSO –Neutral or consistent with continued La Niña conditions. A large majority of the model forecasts predict SSTs to be cooler than the threshold of La Niña SST conditions through the winter, dissipating during spring.

Indian Ocean State

Sea surface temperature was observed neutral around along Sri Lanka.

Predictions

Rainfall

14-day prediction: NOAA NCEP models

From 16th – 20th April:

Total rainfall by Provinces:

Rainfall	Provinces
75 mm	Western, Sabaragamuwa
65 mm	North Western, Southern
55 mm	Central, Uva
45 mm	Eastern
35 mm	Northern, North Central

From 21st– 27th April:

Total rainfall by Provinces:

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

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MJO based OLR predictions

For the next 15 days:

MJO shall significantly suppress the rainfall during 13th – 17th Apr, slightly suppress during 18th– 22nd Apr and slightly enhance during 23rd – 27th Apr.

Interpretation

Monitoring

Rainfall: During the last two weeks, there had been high rainfall over the following provinces: Western, Southern and Sabaragamuwa.

Wind: Northeasterly winds prevailed in the sea area and around the island.

Temperatures: The temperature anomalies were slightly above normal for the Sabaragamuwa province the last – driven by the warm SST's.

Predictions

Rainfall: During the next week (16th – 21st Apr), heavy rainfall is predicted for the Western and Sabaragamuwa region. A drop in rainfall is predicted over the rest of the country.

Temperatures: The temperature remains slightly above in Northern, North Central and Eastern provinces.

Teleconnections:

- MJO shall significantly suppress the rainfall during 16th – 17th Apr, slightly suppress during 18th– 22nd Apr and slightly enhance during 23rd – 27th Apr.
- La Nina - The SST forecast is for La Nina conditions to continue through April weakening through June. A transition to Neutral from La Nina is expected in the 2nd season (May-June-July)

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

Inside This Issue

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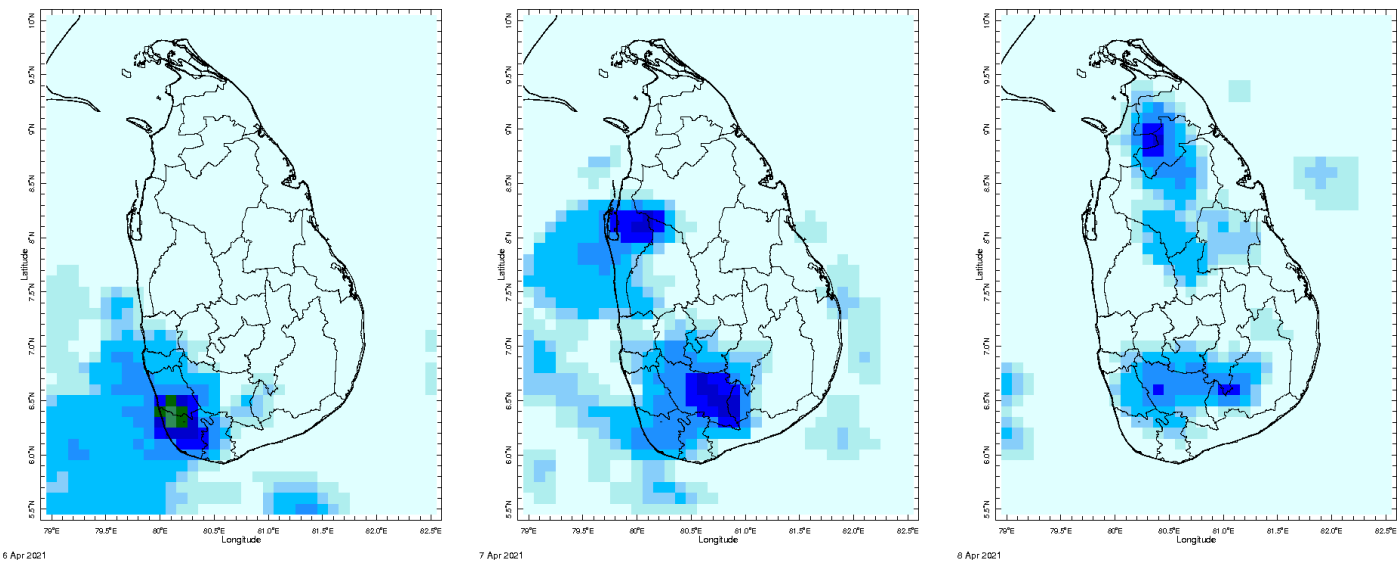
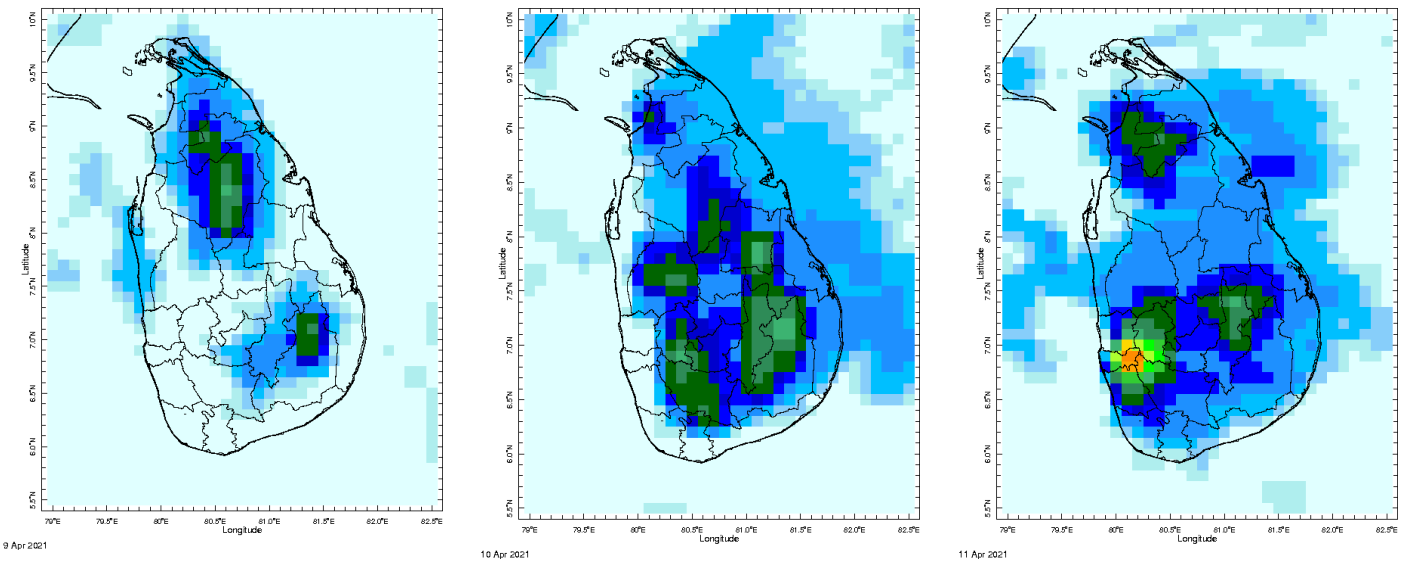
MONITORING

Daily Rainfall Monitoring

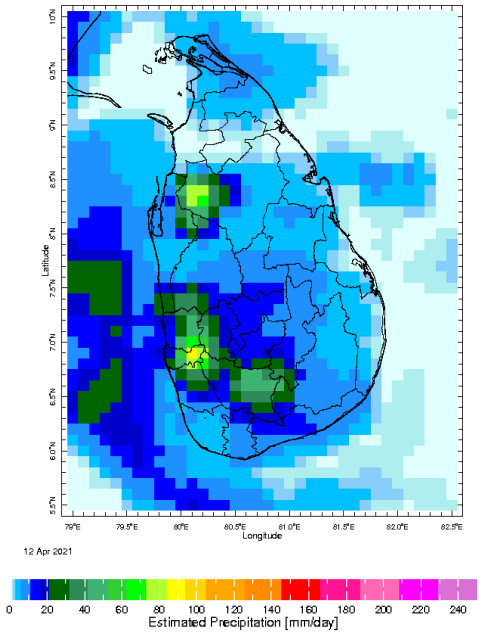
The following figures show the satellite observed rainfall in the last 7 days in Sri Lanka.



6 Apr 2021 | 7 Apr 2021 | 8 Apr 2021

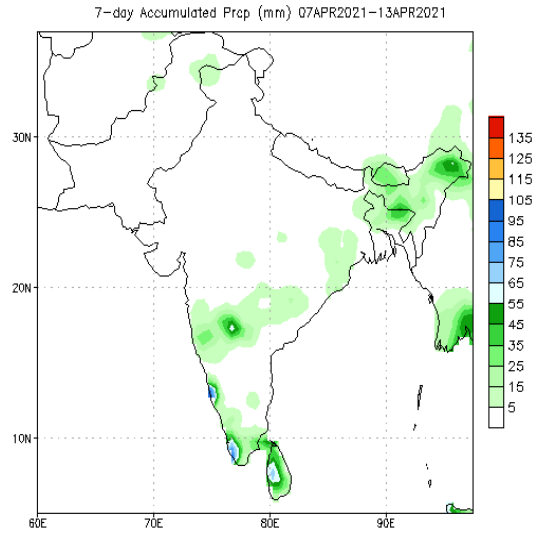


9 Apr 2021 | 10 Apr 2021 | 11 Apr 2021

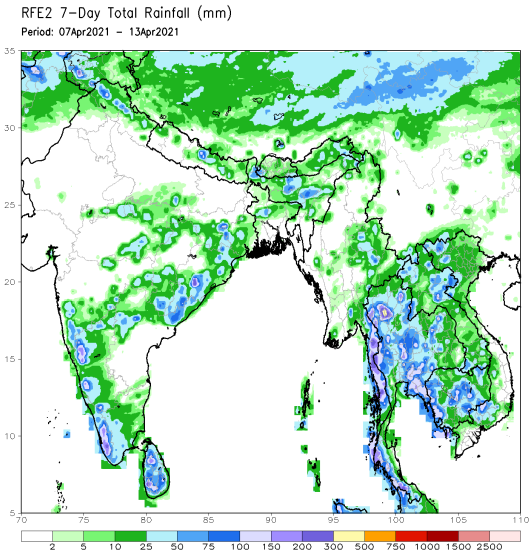


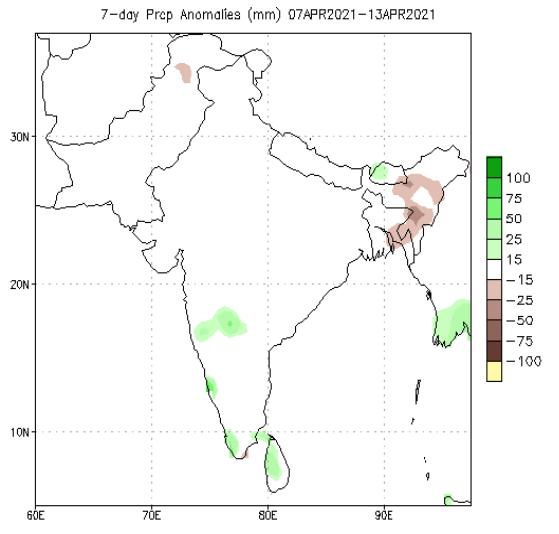
Weekly Rainfall Monitoring

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.

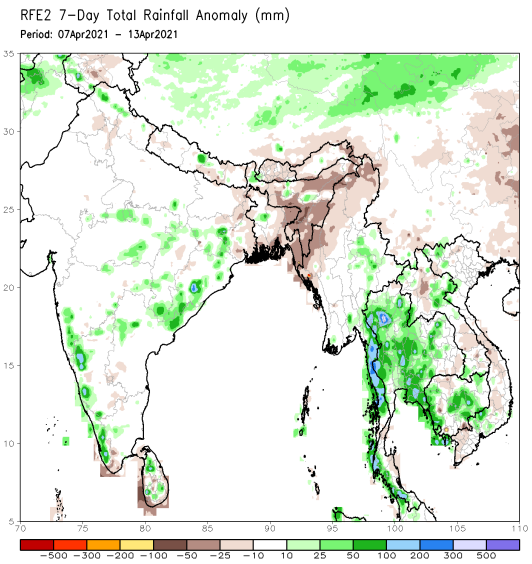


Data Source: CPC Unified (gauge-based & 0.5x0.5 deg resolution) Precipitation Analysis



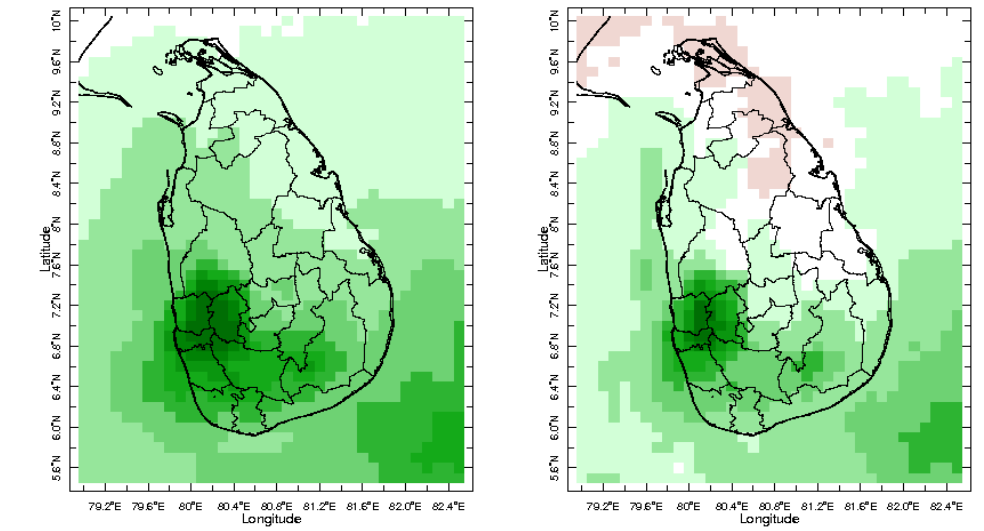


Data Source: CPC Unified (gauge-based & 0.5x0.5 deg resolution) Precipitation Analysis Climatology (1981-2010)



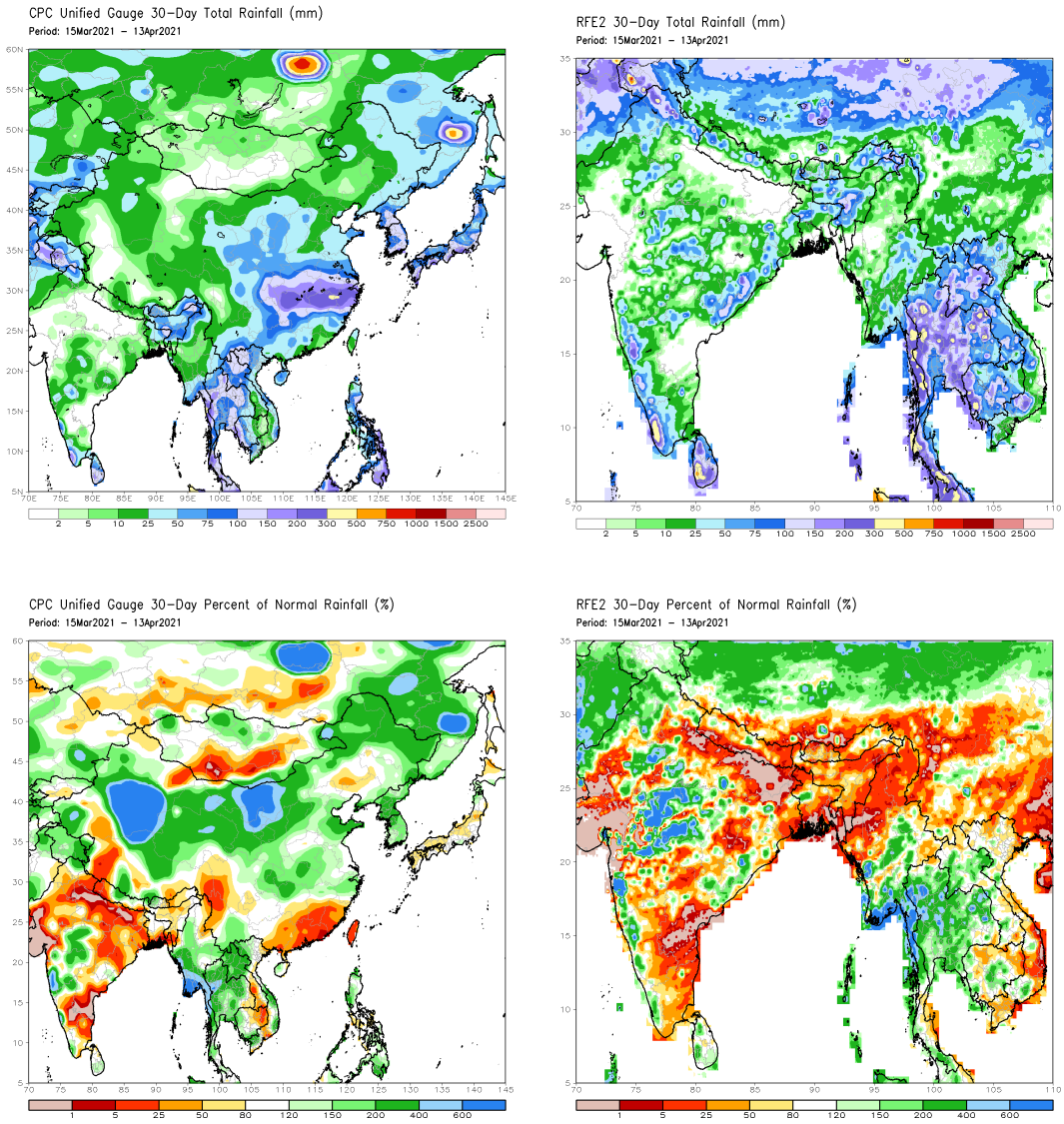
Monthly Rainfall Monitoring

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

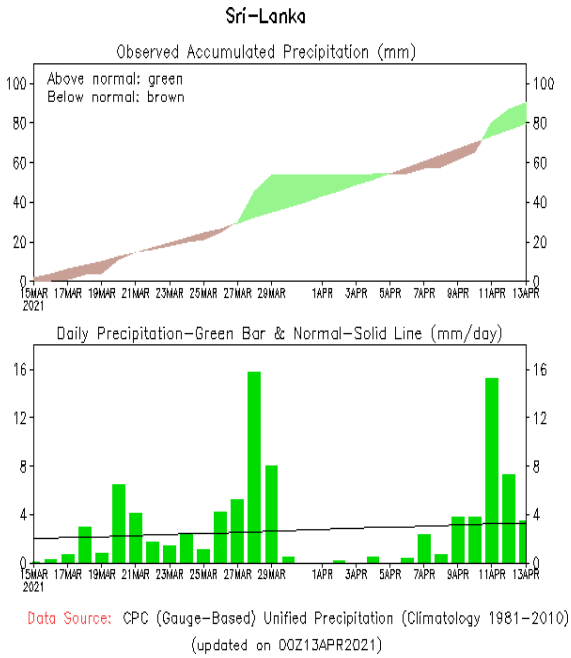


Monthly Average **Monthly Anomaly**

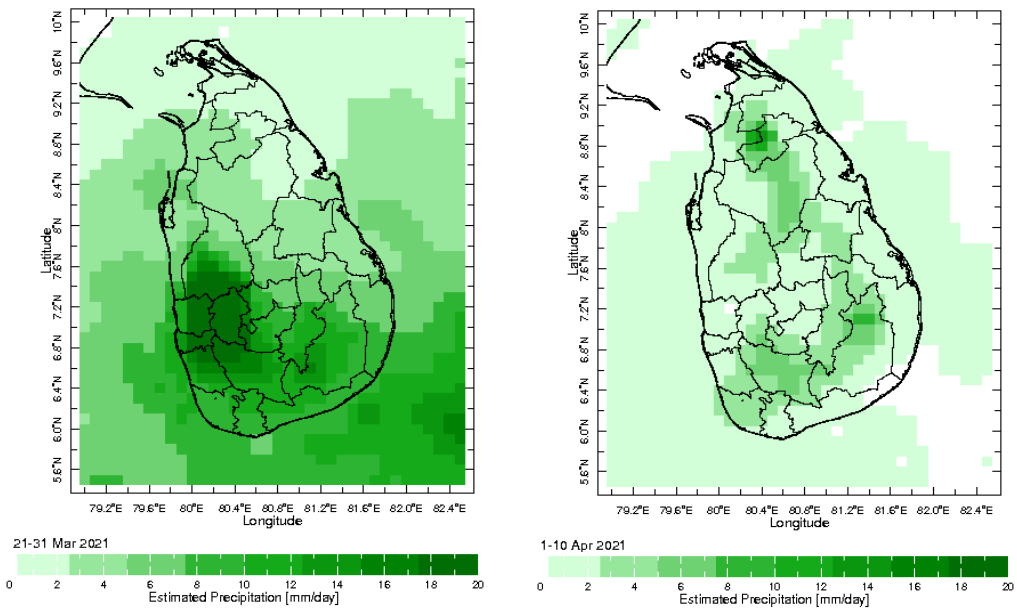
The figure in the top-left shows the total rainfall in the past 30 days from CPC Unified Precipitation Analysis while the figure in the top-right shows the total rainfall for the same period from RFE 2.0 Satellite Rainfall Estimates. The bottom two figures show the percentage of rainfall received in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



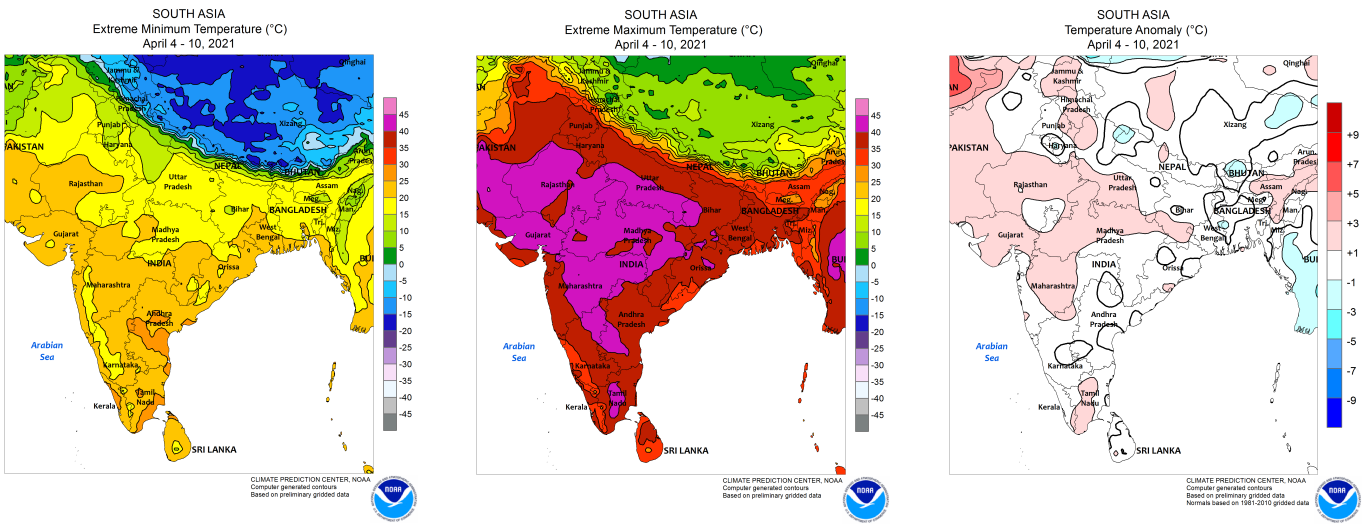
The following figure shows the observed accumulated rainfall (top) and daily observed rainfall (bottom) in Sri Lanka in the last 30 days.



Dekadal (10 Day) Satellite Derived Rainfall Estimates

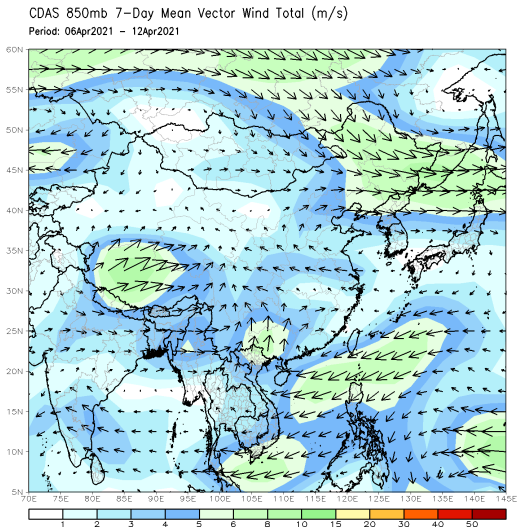


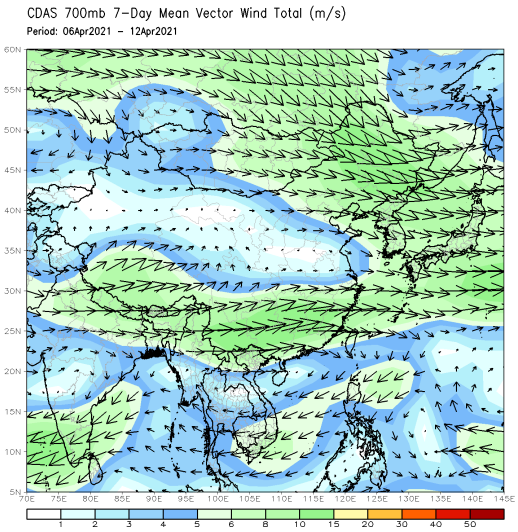
Weekly Temperature Monitoring



Weekly Wind Monitoring

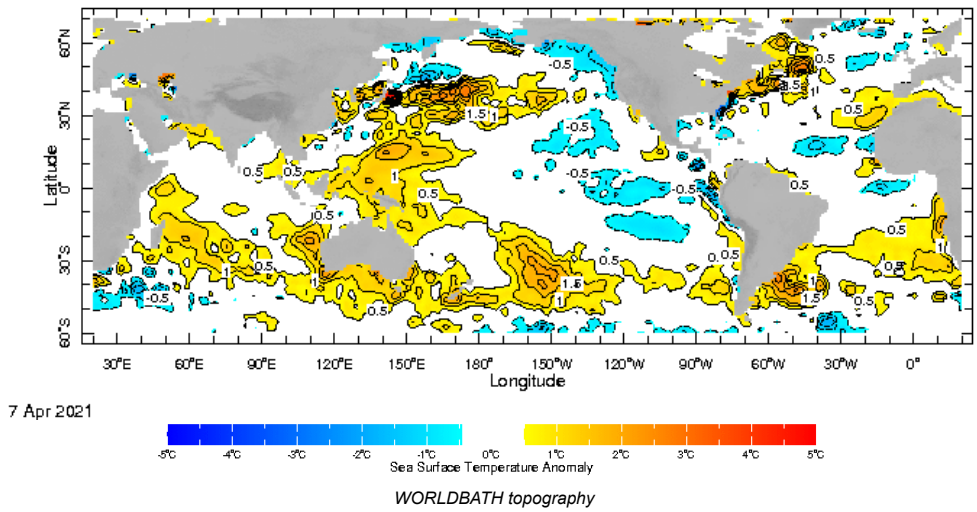
The following figures show the mean vector wind total of the past 7 days near Sri Lanka at two levels. The figure on the left shows 850 mb (~1500 m) level and the figure on the right shows 700 mb (~3000 m) level.



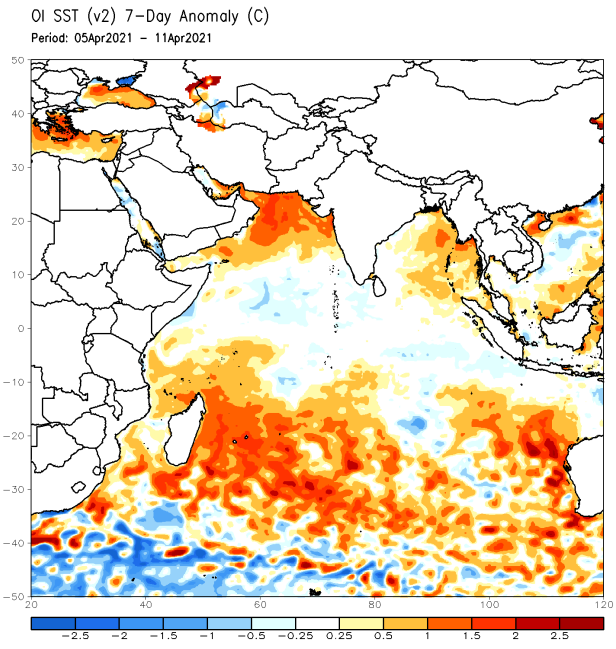


Weekly Average SST Anomalies

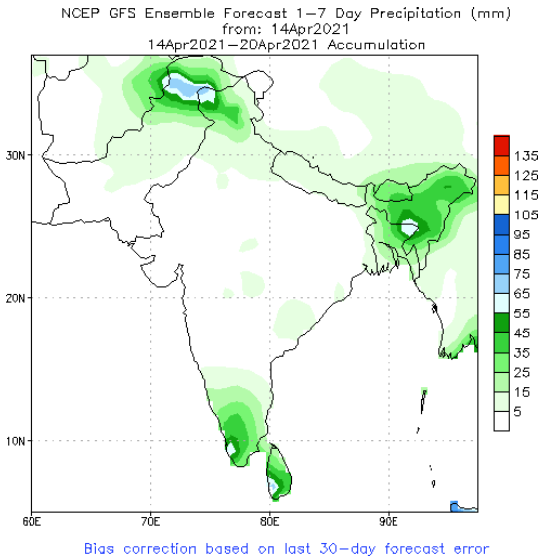
Weekly average Sea Surface Temperature (SST) anomaly in the world from NOAA NCEP

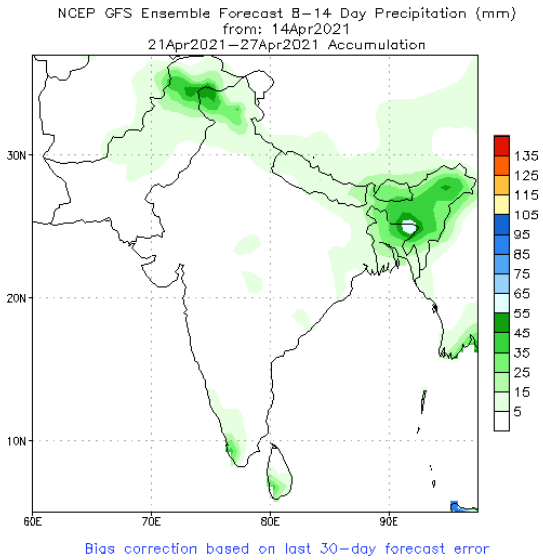


Optimum Interpolated Sea Surface Temperature Anomaly in the Indian Ocean from NOAA CPC

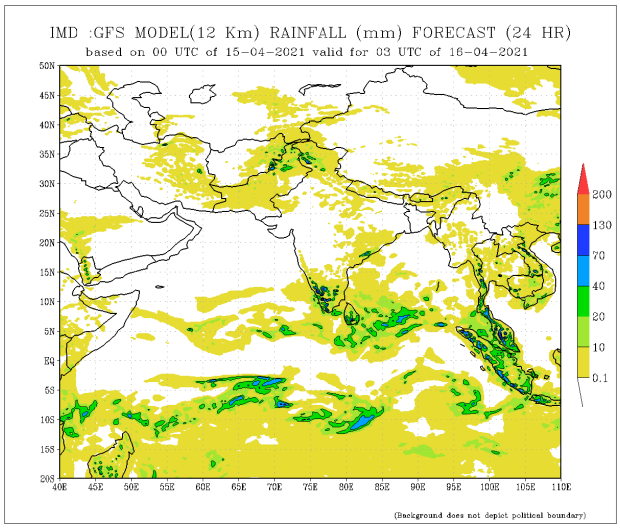


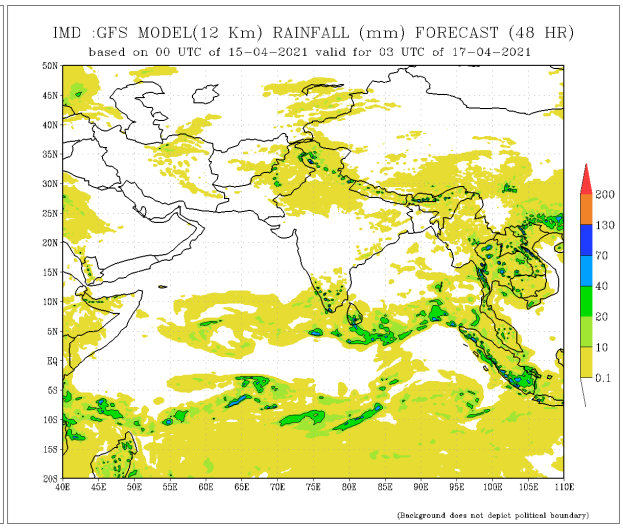
NCEP GFS 1- 14 Day prediction

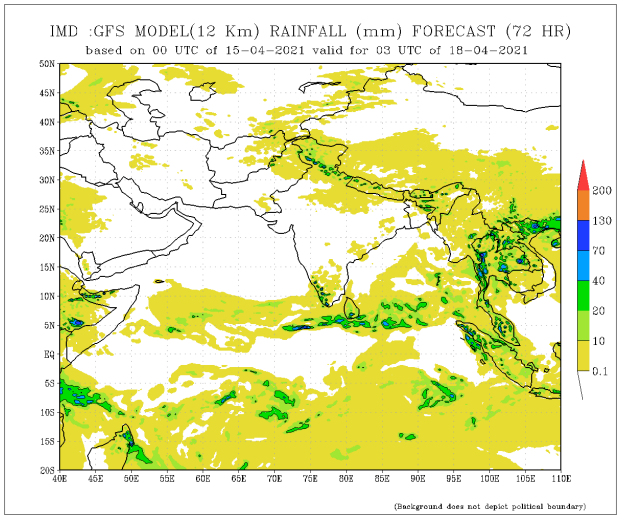


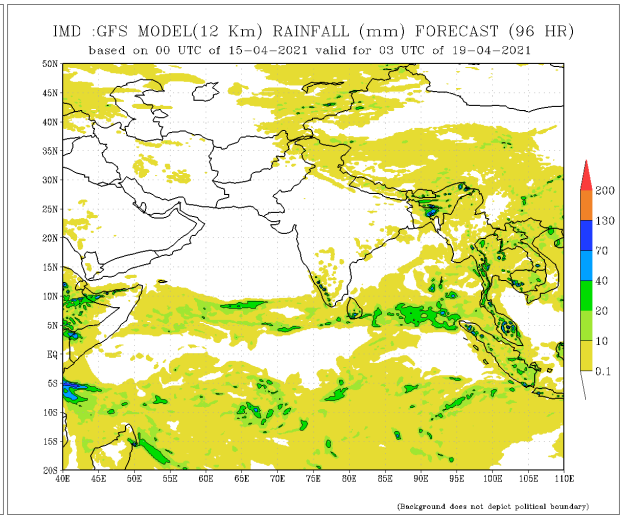


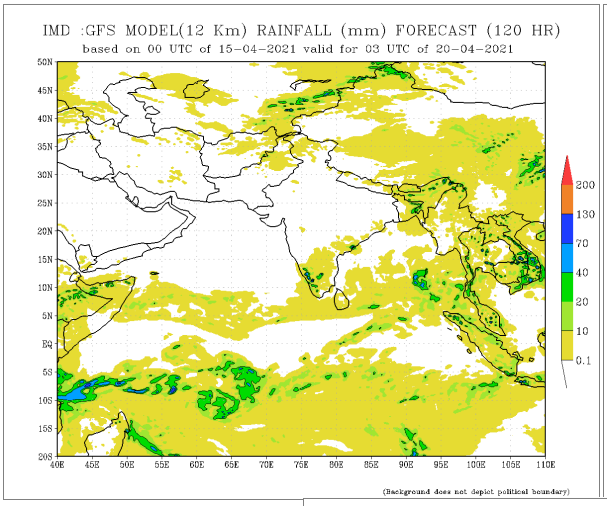
IMD GFS (T574) Model Rainfall Forecast from RMSC New Delhi, India

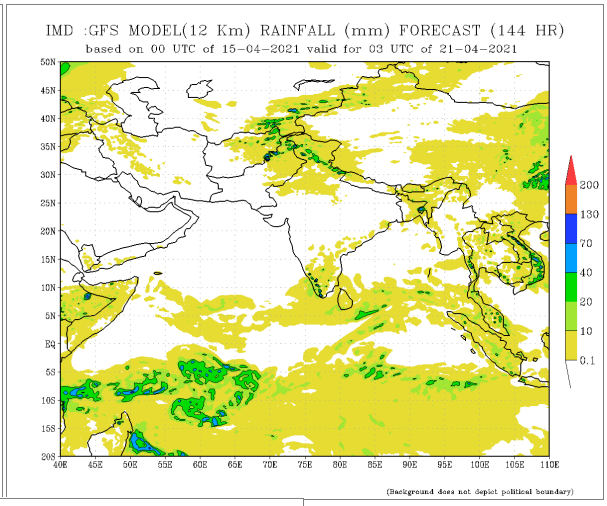


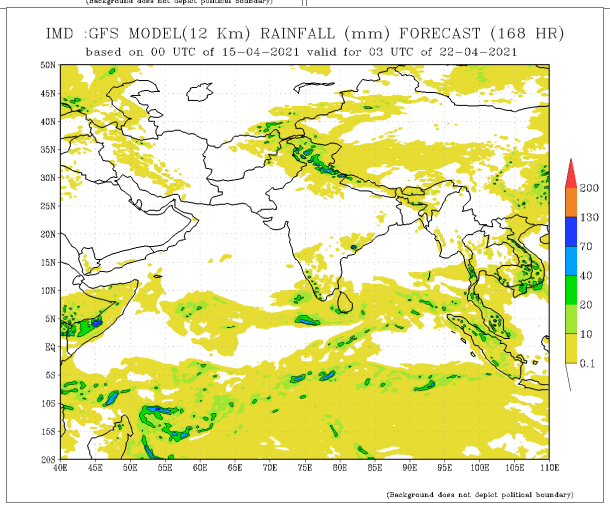






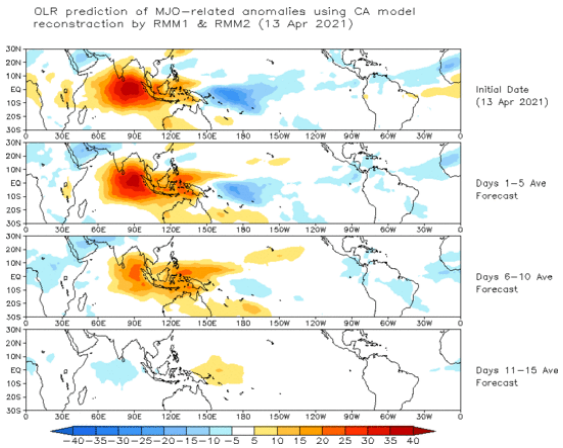






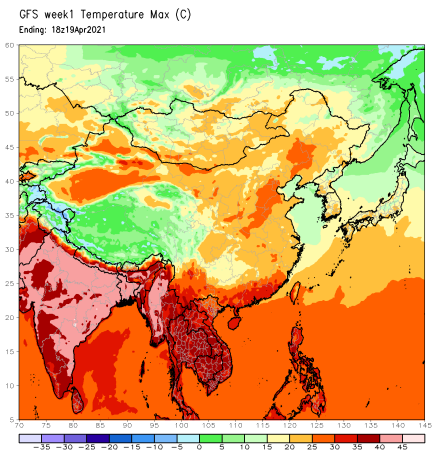
Madden Julian Oscillation (MJO) related Outgoing Longwave Radiation (OLR) Forecast

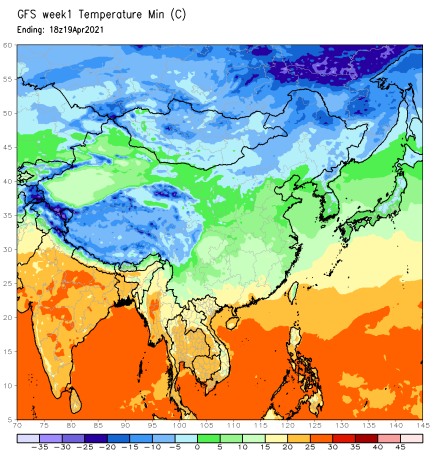
The Outgoing Longwave Radiation (OLR) is a proxy for rainfall. This can be used to identify convective rain clouds based on the MJO phase. Violet and Blue shading indicates enhanced tropical weather and Orange shading indicates suppressed conditions. The following figure shows the forecasts of MJO associated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



Weekly Temperature Forecast

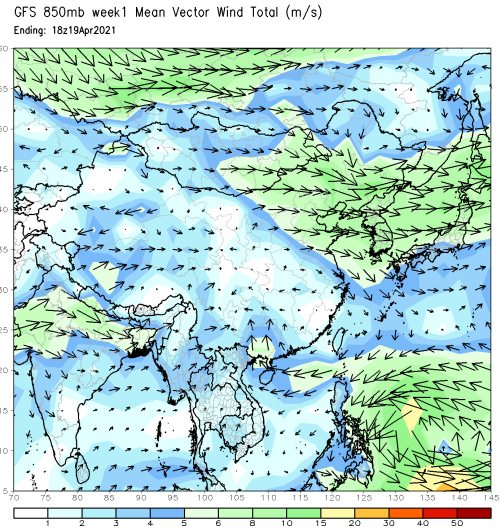
Weekly Minimum and Maximum Temperature prediction from the GFS model (from NOAA CPC)

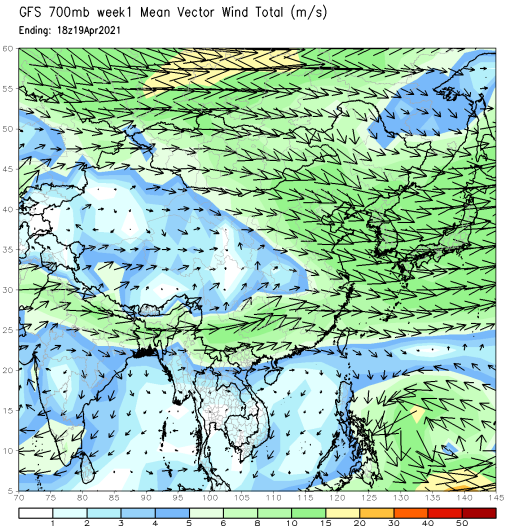




Weekly Wind Forecast

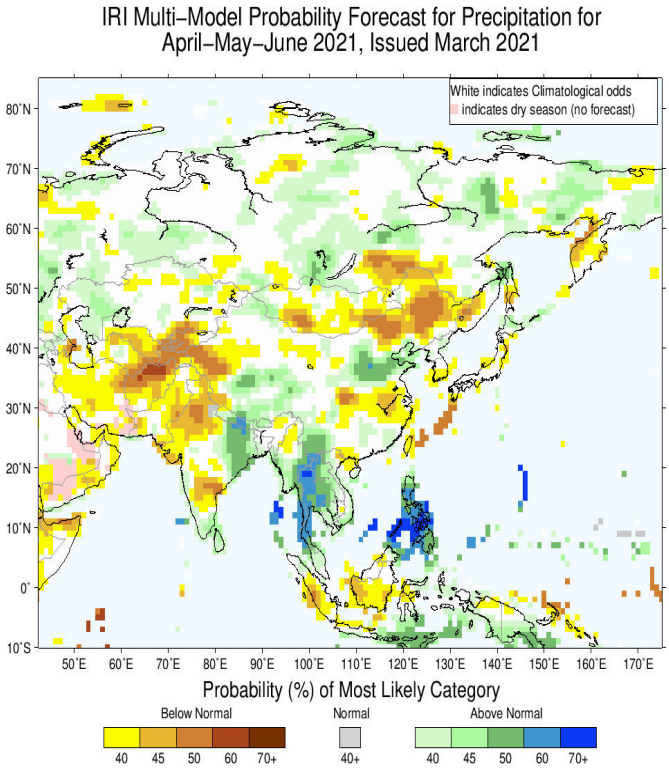
Weekly mean vector wind total prediction from the GFS model at 850 mb (left) and 700 mb (right) levels. (from NOAA CPC)



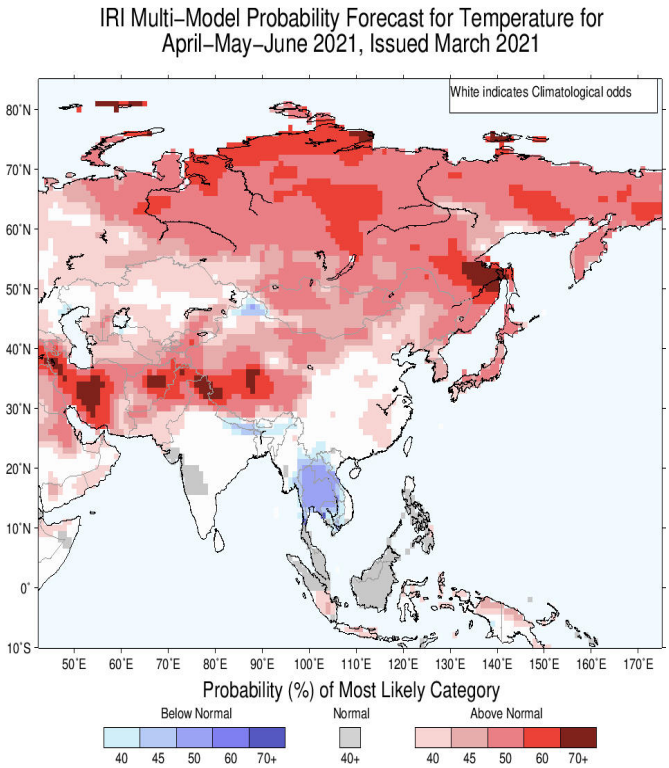


Seasonal Rainfall and Temperature Forecast

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%).



Precipitation Forecast



Temperature Forecast

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