Federation for Environment, Climate and Technology

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**Week of
12 Mar ‐ 19 Mar
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 55 mm expected in Eastern and Southern province during 13th - 16th Mar. A drop in rainfall over the rest of the country.*

Monitored Rainfalls
- *Heavy rainfall was experienced in Western, Central & Sabaragamuwa provinces. Up to 108 mm max in Kandy on 6th Mar.*

Monitored Wind
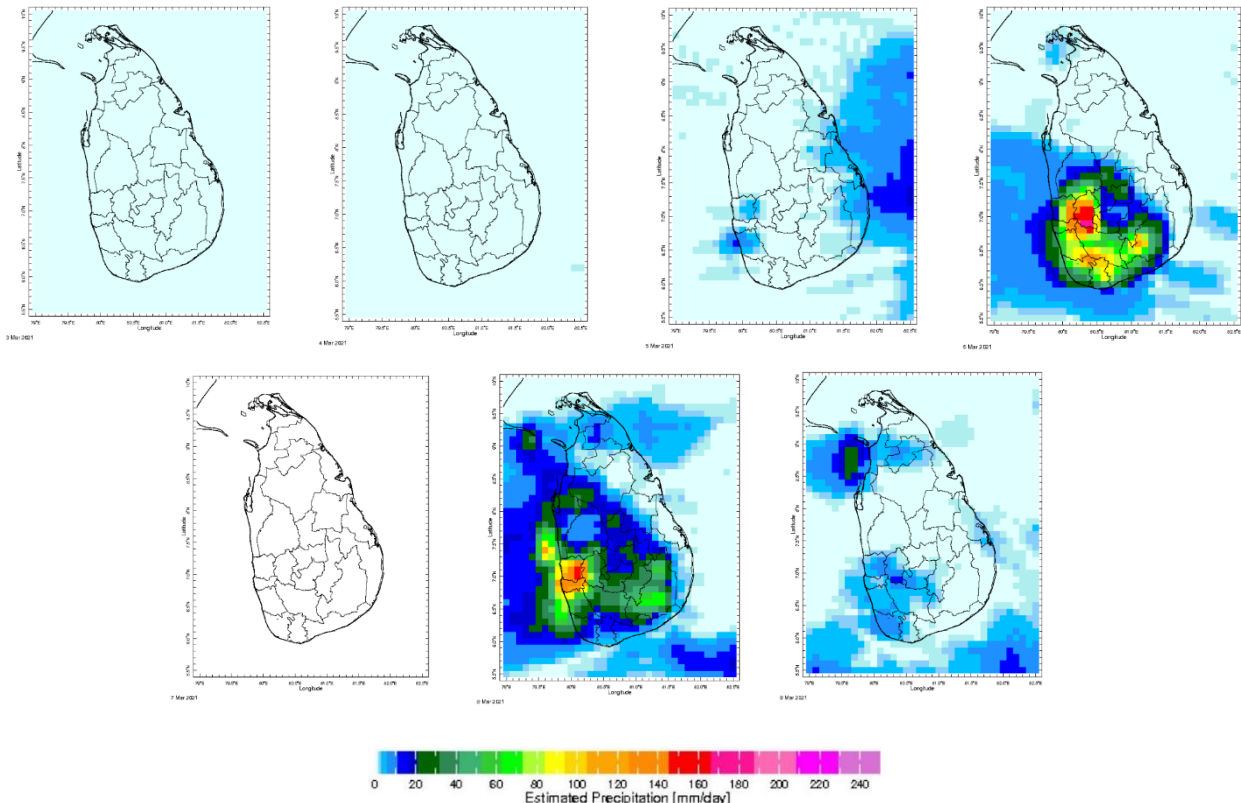- *From 2th - 8th March: up to 6 km/h Northeasterly winds were experienced around along Sri Lanka.*

Monitored Sea Surface
- SST was observed around 1.5°C above average in Southern and some parts of the North-West Indian Ocean.

Monitoring
Rainfall

Daily Estimates for Rainfall from 3rd – 9th March

Total Rainfall for the Past Week

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

Rainfall	Districts
300 – 500 mm	Kegalle, Gampaha,
200 – 300 mm	Ratnapura, Colombo, Kalutara, Galle
150 – 200 mm	Kurunegala, Kandy, Nuwara Eliya, Matara, Badulla, Moneragala
100 – 150 mm	Puttalam, Hambanthota
50 – 75 mm	Anuradhapura, Polonnaruwa, Matale
10 – 25 mm	Kilinochchi, Mullaitivu, Vavuniya, Mannar, Ampara
5 – 10 mm	Batticaloa
2 – 5 mm	Jaffna, Trincomalee

There was no rainfall throughout the week in the remaining districts.

Weekly Rainfall Anomalies by Districts:

Rainfall Excess

Rainfall	Districts
200 – 300 mm	Kegalle, Ratnapura, Gampaha, Colombo, Kalutara
100 – 200 mm	Kurunegala, Kandy, Nuwara Eliya, Galle, Matara, Hambanthota, Badulla, Moneragala
50 – 100 mm	Anuradhapura, Puttalam
25 – 50 mm	Polonnaruwa, Matale
10 – 25 mm	Mannar, Ampara

Rainfall Deficit

Rainfall	Districts
10 – 25 mm	Vavuniya, Trincomalee, Batticaloa

There was no rainfall throughout the week in the remaining districts.

Monthly Monitoring

During late January and early February, Dekadal Rainfall (mm/day) by Districts:

11th– 20th February:

Rainfall	Districts
6 mm	Kilinochchi, Mullaitivu, Mannar
4 mm	Badulla, Moneragala, Nuwara Eliya, Matara, Hambantota, Kegalle, Ratnapura
2 mm	Jaffana, Vavuniya, Polonnaruwa, Batticaloa, Ampara, Matale, Kandy, Colombo, Kalutara, Galle

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21ˢᵗ – 28ᵗʰ February:

Rainfall	Districts
6 mm	Kalutara, Galle, Ratnapura
4 mm	Nuwara Eliya, Colombo, Matara, Kegalle
2 mm	Puttalam, Kurunegala, Ampara, Badulla, Moneragala, Matale, Kandy, Gampaha, Hambantota

Ocean State *(Text Courtesy IRI)*

Pacific sea state: March 3, 2021

Equatorial SSTs were mostly below average from the west-central to the eastern Pacific Ocean in early March 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 around 1.5℃ above average in Southern and some parts of the North-West Indian Ocean.

Predictions

Rainfall

14-day prediction: NOAA NCEP models

From 13ᵗʰ – 16ᵗʰ March:

Total rainfall by Provinces:

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

From 17ᵗʰ – 23ʳᵈ March:

Total rainfall by Provinces:

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

MJO based OLR predictions

For the next 15 days:

MJO shall Neutral the rainfall during 9th – 13rd Mar, slightly Enhanced during 8th– 17th Mar and Neutral again during 19th – 23rd Mar.

Interpretation

Monitoring

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

Wind: As is typical for March the Northeasterly winds prevailed in the sea area and around the island.

Temperatures: The temperature anomalies were slightly above normal for the Western, Southern & Sabaragamuwa provinces the last – driven by the warm SST's.

Predictions

Rainfall: During the next week (13th – 17th March), showers is predicted for the Eastern coastal and Southern region. A drop in rainfall is predicted over the rest of the country.

Temperatures: The temperature remains slightly above normal for March. During 13th–18th Mar, the temperature remains high especially the Western, Northern, Sabaragamuwa, North central, and North western provinces.

Teleconnections:

- MJO shall Neutral the rainfall during 9th – 13rd Mar, slightly Enhanced during 8th– 17th Mar and Neutral again during 19th – 23rd Mar.
- La Nina - The SST forecast is for La Nina conditions to continue through April weakening through June. So, the La Niña is expected to be moderate to strong in coming seasons.

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Weekly Climate Bulletin for Sri Lanka

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   b. GFS (T574) Model Rainfall Forecast from RMSC New Delhi
   c. MJO Related OLR Forecast
   d. Weekly Temperature Forecast
   e. Weekly Wind Forecast
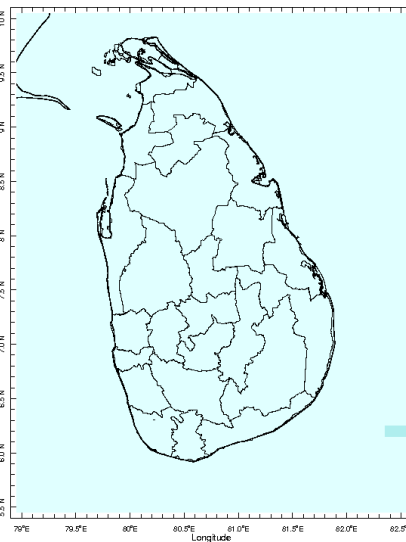   f. Seasonal Predictions from IRI

[Download]
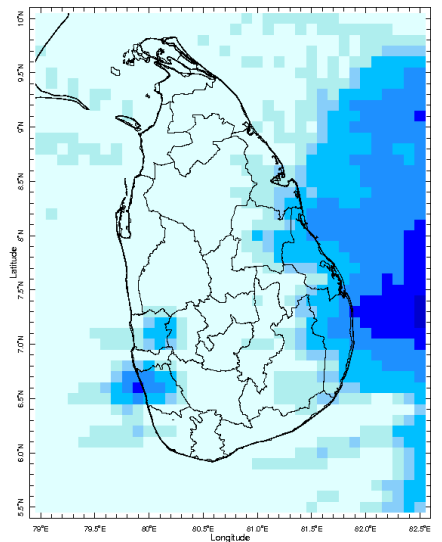
MONITORING

Daily Rainfall Monitoring

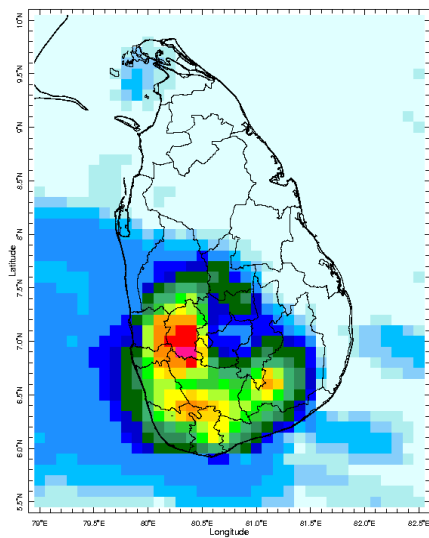The following figures show the satellite observed rainfall in the last 7 days in Sri Lanka.
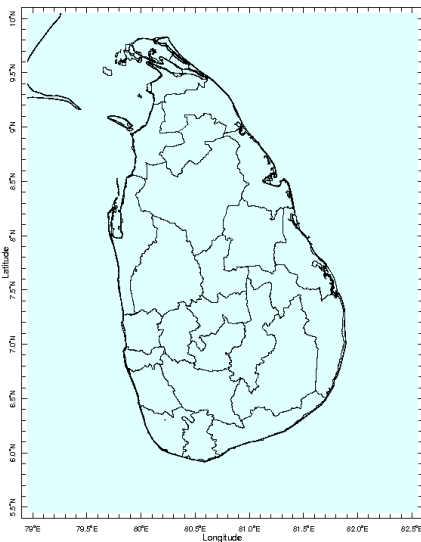
3 Mar 2021
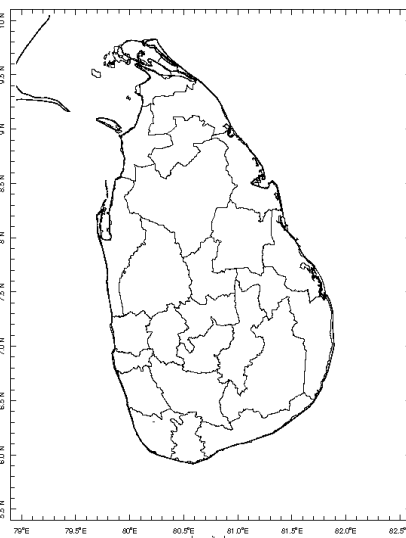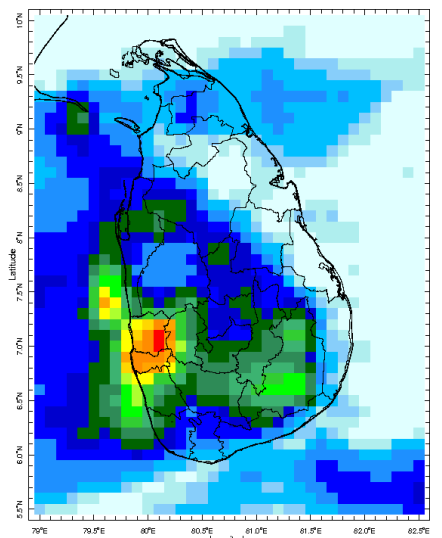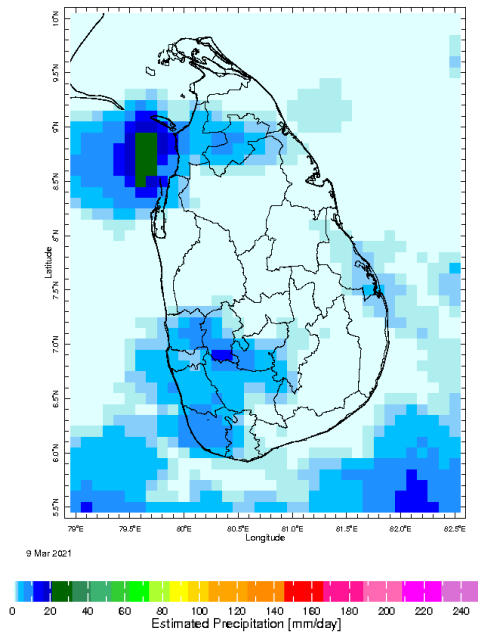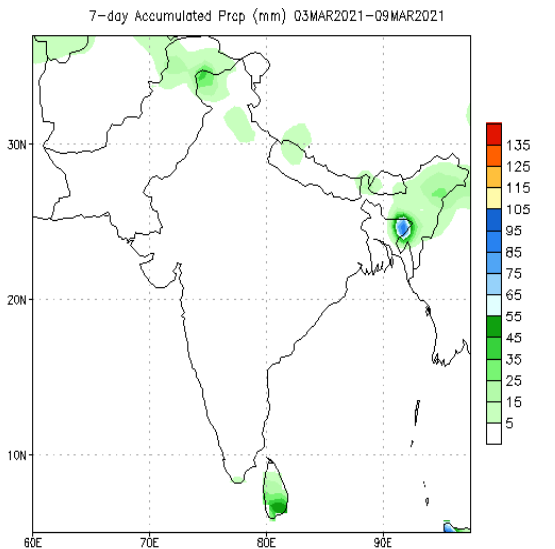

4 Mar 2021

5 Mar 2021

6 Mar 2021

7 Mar 2021

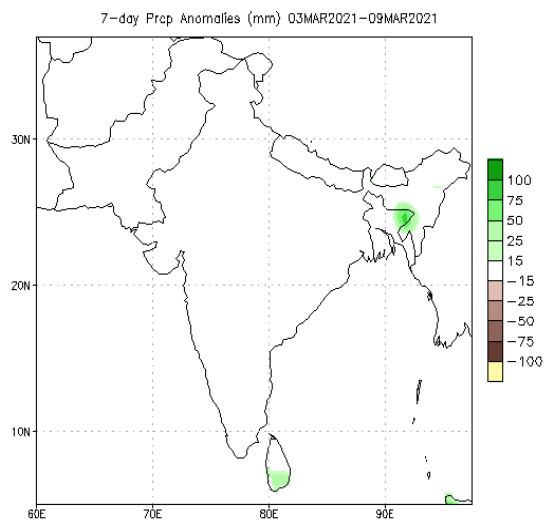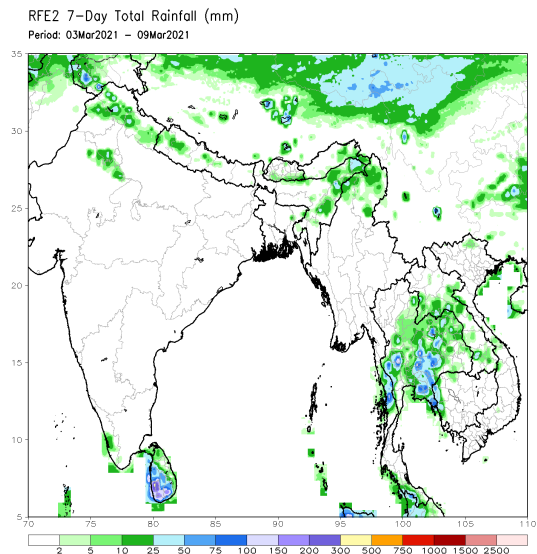

8 Mar 2021

9 Mar 2021

Estimated Precipitation [mm/day]

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.

7-day Accumulated Prcp (mm) 03MAR2021-09MAR2021

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

RFE2 7-Day Total Rainfall (mm)
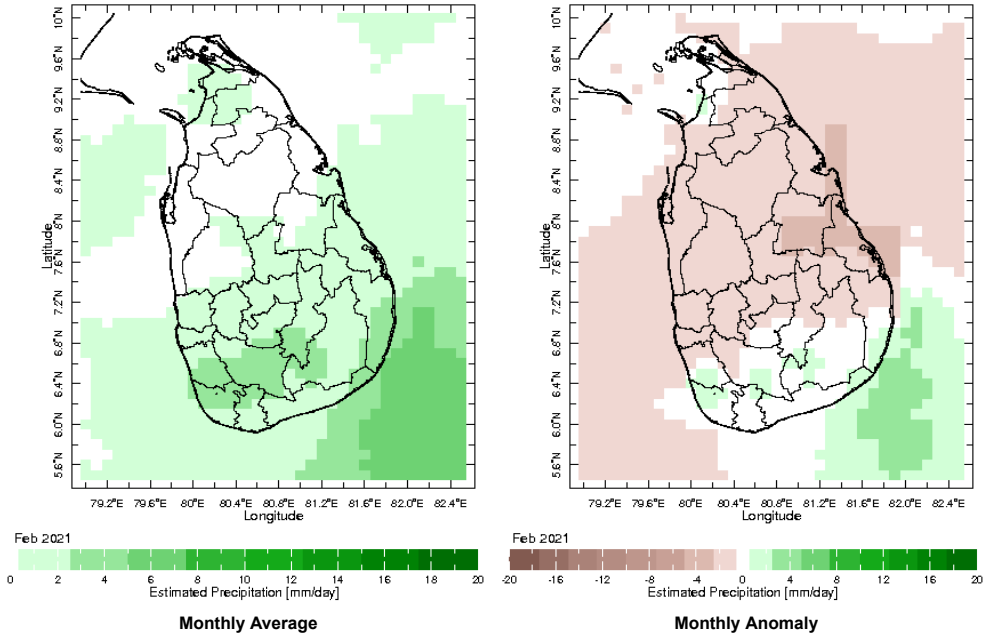Period: 03Mar2021 – 09Mar2021

7-day Prcp Anomalies (mm) 03MAR2021-09MAR2021

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

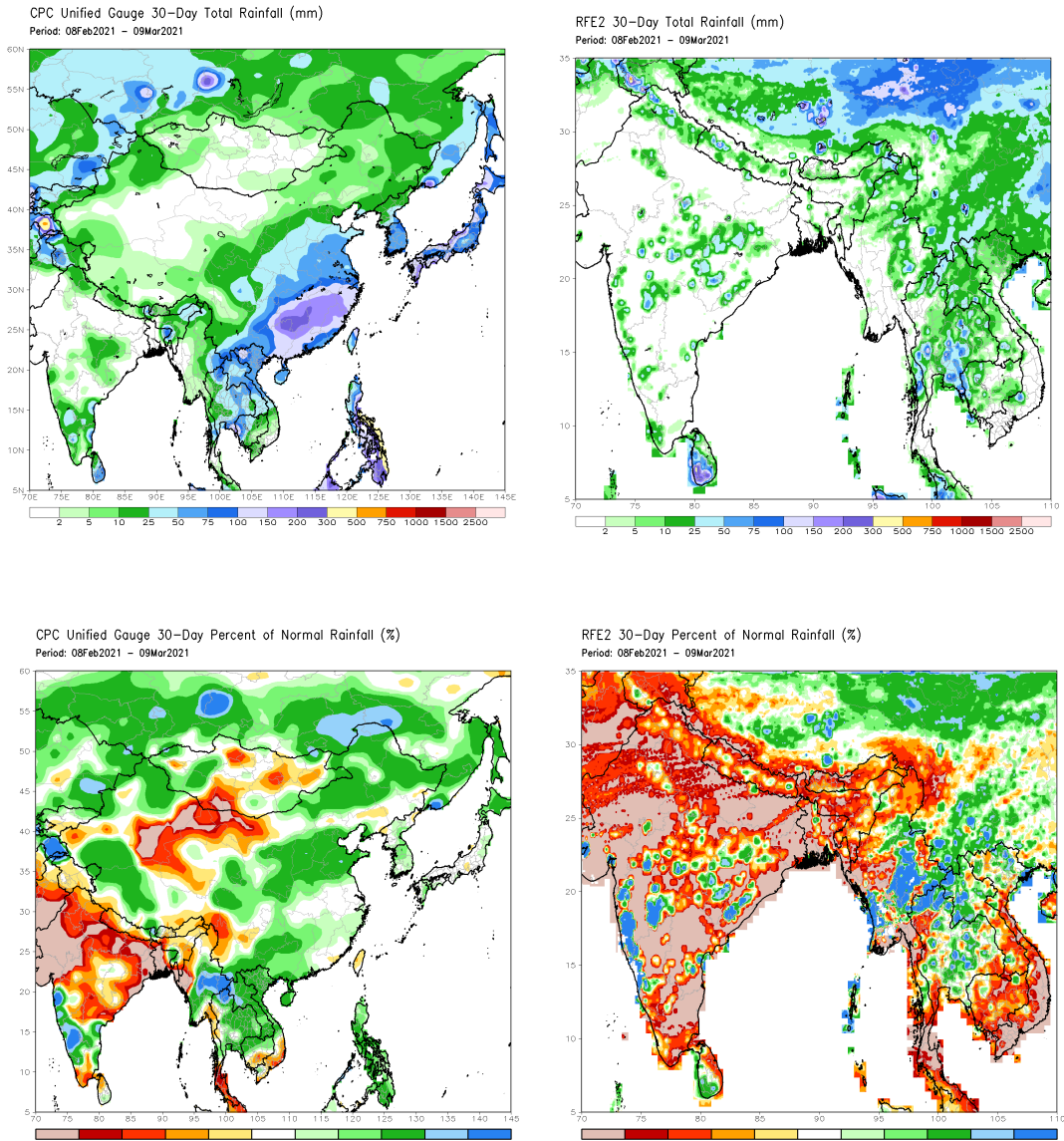RFE2 7-Day Total Rainfall Anomaly (mm)
Period: 03Mar2021 – 09Mar2021
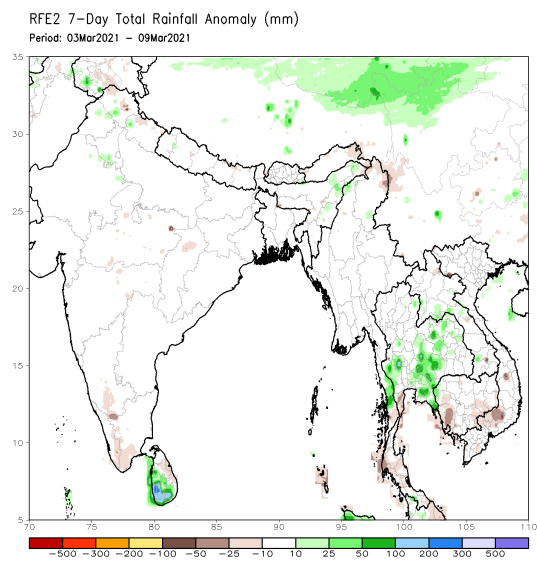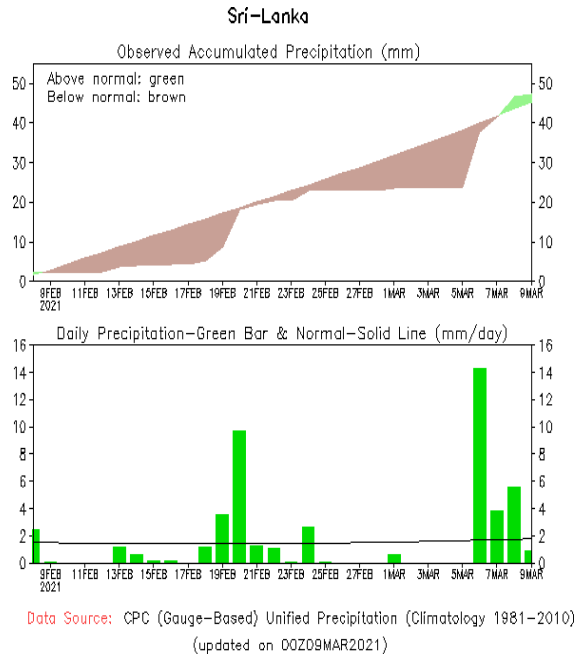
Monthly Rainfall Monitoring

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

Feb 2021
Estimated Precipitation [mm/day]

Monthly Average

Feb 2021
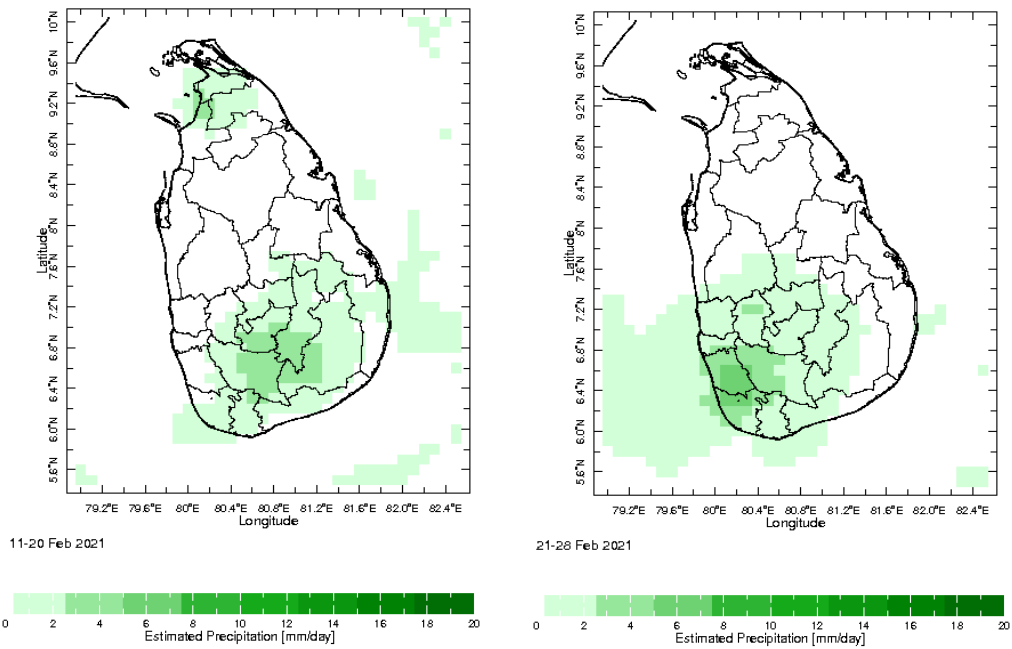Estimated Precipitation [mm/day]

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.

CPC Unified Gauge 30-Day Total Rainfall (mm)
Period: 08Feb2021 – 09Mar2021

RFE2 30-Day Total Rainfall (mm)
Period: 08Feb2021 – 09Mar2021

CPC Unified Gauge 30-Day Percent of Normal Rainfall (%)
Period: 08Feb2021 – 09Mar2021

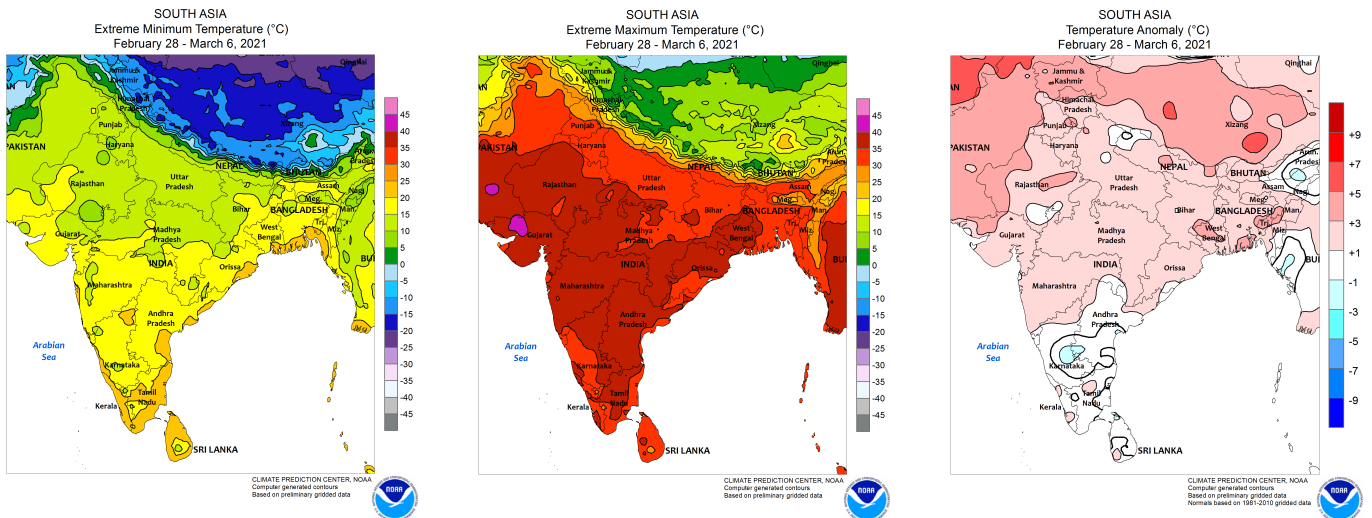RFE2 30-Day Percent of Normal Rainfall (%)
Period: 08Feb2021 – 09Mar2021

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

Sri-Lanka

Data Source: CPC (Gauge-Based) Unified Precipitation (Climatology 1981-2010)
(updated on 00Z09MAR2021)

Dekadal (10 Day) Satellite Derived Rainfall Estimates
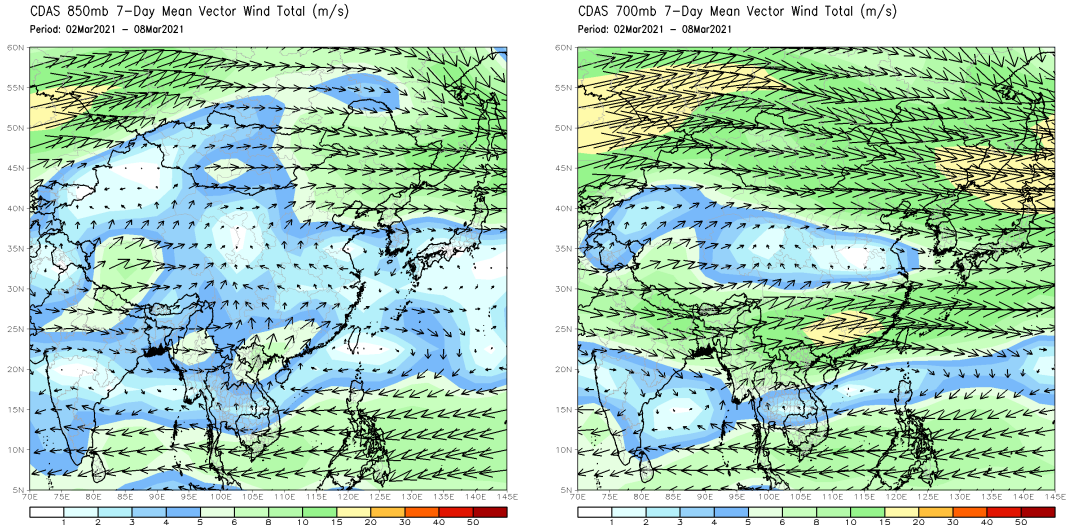

11-20 Feb 2021

21-28 Feb 2021

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.

CDAS 850mb 7-Day Mean Vector Wind Total (m/s)
Period: 02Mar2021 – 08Mar2021

CDAS 700mb 7-Day Mean Vector Wind Total (m/s)
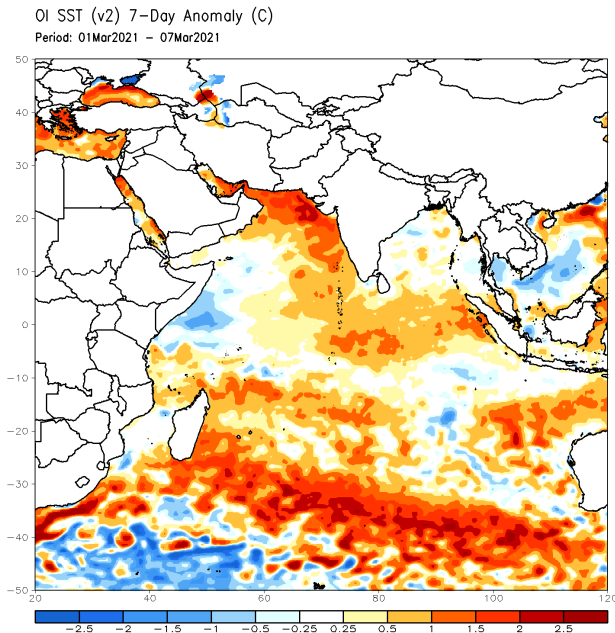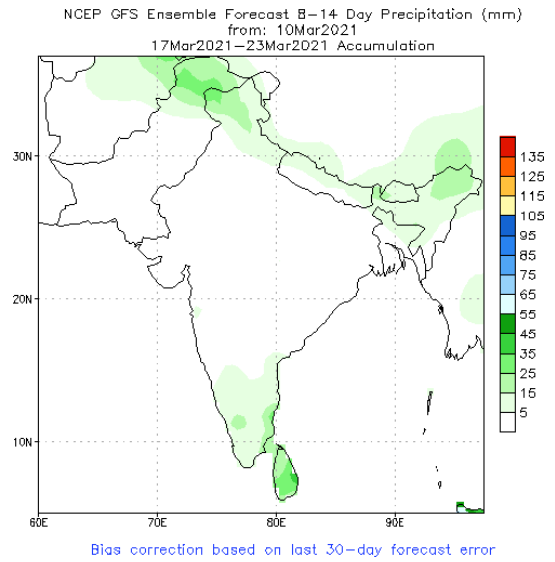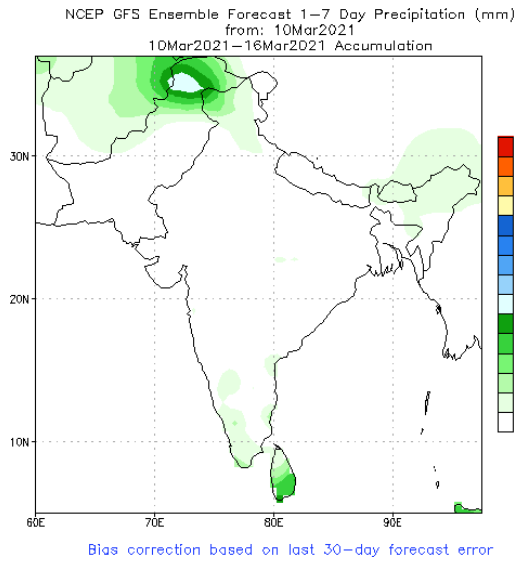Period: 02Mar2021 – 08Mar2021

Weekly Average SST Anomalies

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

3 Mar 2021

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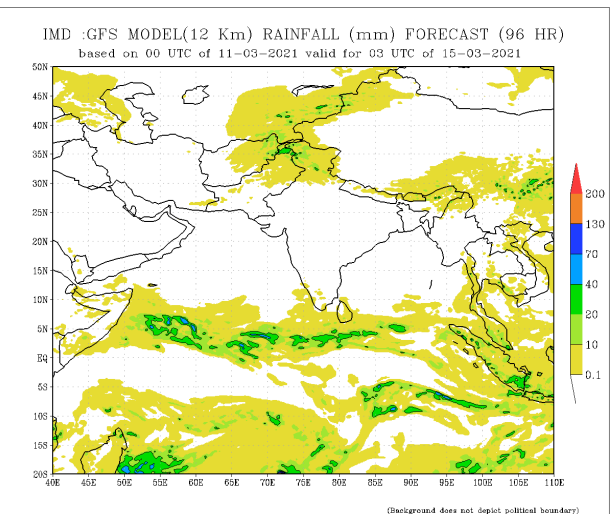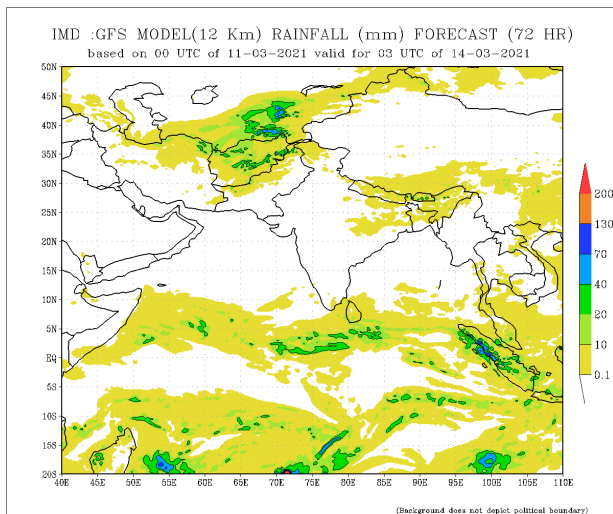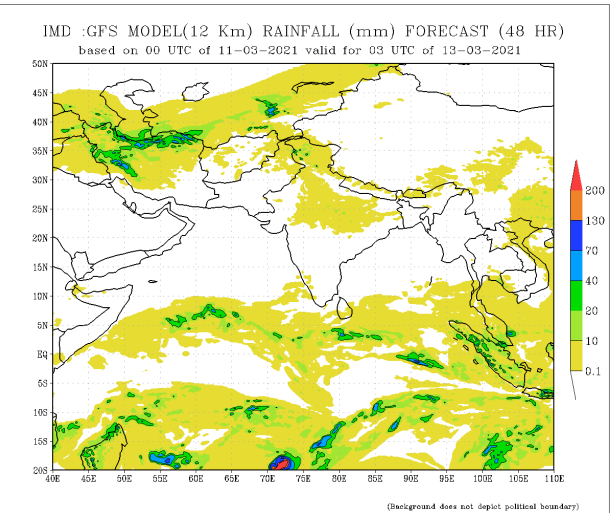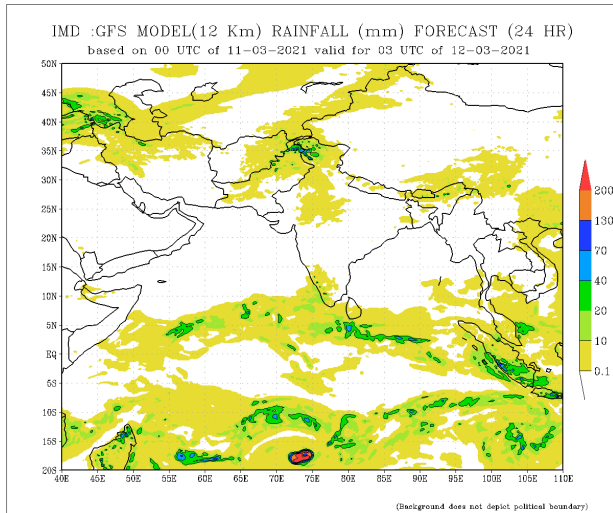
WORLDBATH topography
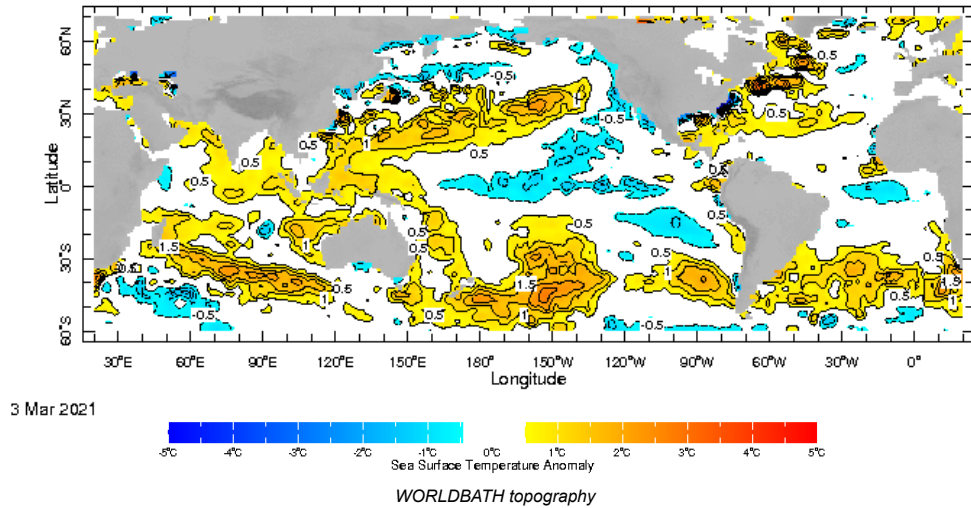
Optimum Interpolated Sea Surface Temperature Anomaly in the Indian Ocean from NOAA CPC

OI SST (v2) 7-Day Anomaly (C)
Period: 01Mar2021 – 07Mar2021

NCEP GFS 1- 14 Day prediction

NCEP GFS Ensemble Forecast 1-7 Day Precipitation (mm)
from: 10Mar2021
10Mar2021—16Mar2021 Accumulation

Bias correction based on last 30-day forecast error

NCEP GFS Ensemble Forecast 8-14 Day Precipitation (mm)
from: 10Mar2021
17Mar2021—23Mar2021 Accumulation

Bias correction based on last 30-day forecast error

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

IMD :GFS MODEL(12 Km) RAINFALL (mm) FORECAST (24 HR)
based on 00 UTC of 11-03-2021 valid for 03 UTC of 12-03-2021

(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) RAINFALL (mm) FORECAST (48 HR)
based on 00 UTC of 11-03-2021 valid for 03 UTC of 13-03-2021

(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) RAINFALL (mm) FORECAST (72 HR)
based on 00 UTC of 11-03-2021 valid for 03 UTC of 14-03-2021

(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) RAINFALL (mm) FORECAST (96 HR)
based on 00 UTC of 11-03-2021 valid for 03 UTC of 15-03-2021

(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) RAINFALL (mm) FORECAST (120 HR)
based on 00 UTC of 11-03-2021 valid for 03 UTC of 16-03-2021

IMD :GFS MODEL(12 Km) RAINFALL (mm) FORECAST (144 HR)
based on 00 UTC of 11-03-2021 valid for 03 UTC of 17-03-2021

IMD :GFS MODEL(12 Km) RAINFALL (mm) FORECAST (168 HR)
based on 00 UTC of 11-03-2021 valid for 03 UTC of 18-03-2021

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.
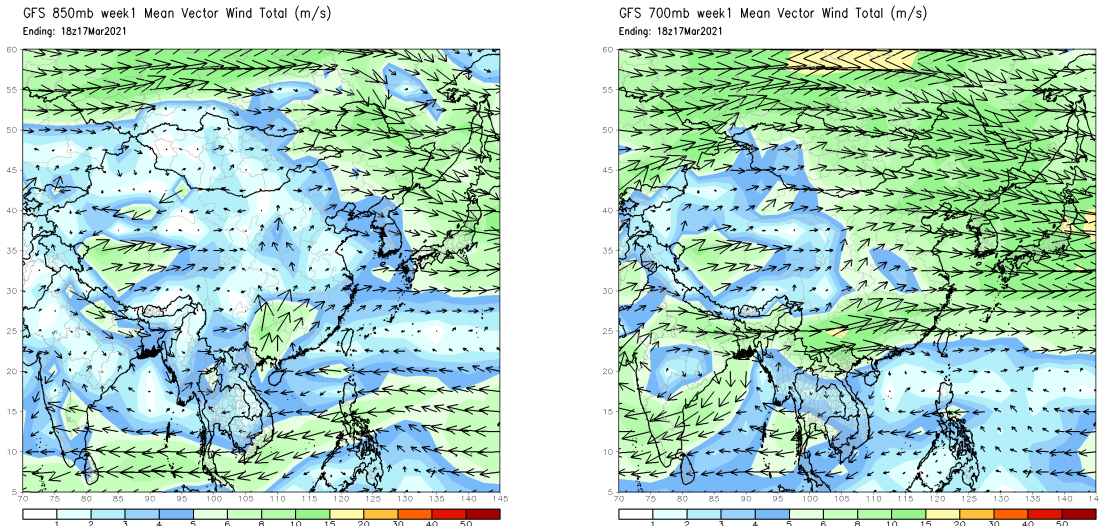

OLR prediction of MJO-related anomalies using CA model reconstruction by RMM1 & RMM2 (09 Mar 2021)
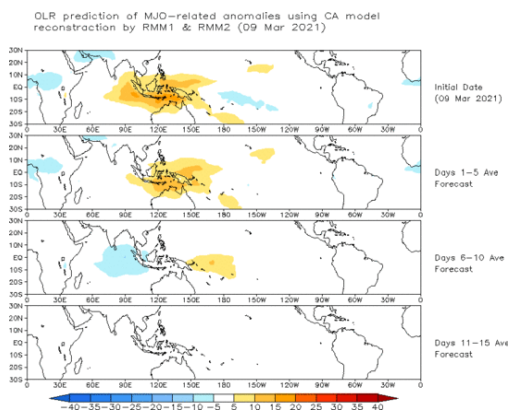
Weekly Temperature Forecast

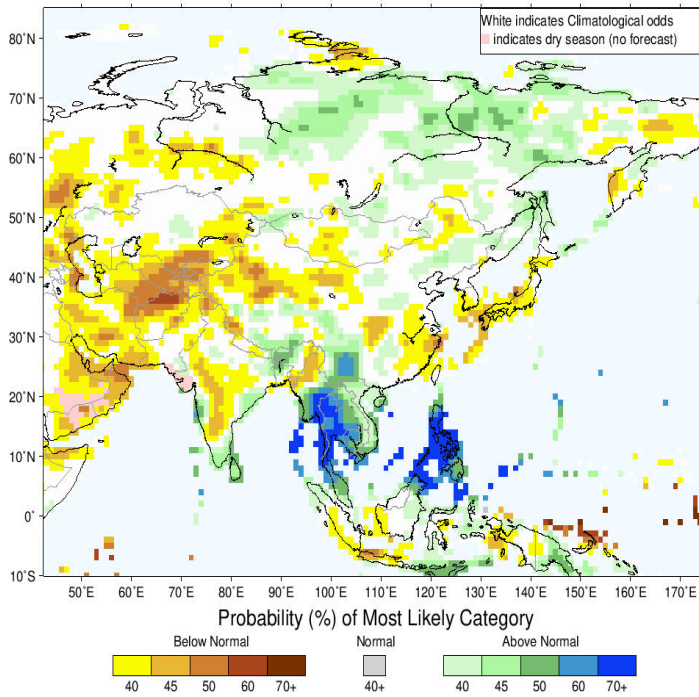Weekly Minimum and Maximum Temperature prediction from the GFS model (from NOAA CPC)

GFS week1 Temperature Max (C)
Ending: 18z17Mar2021

GFS week1 Temperature Min (C)
Ending: 18z17Mar2021
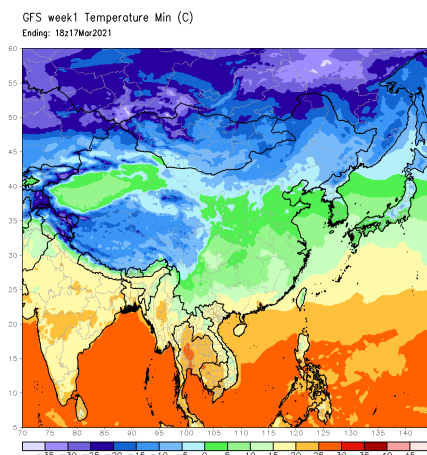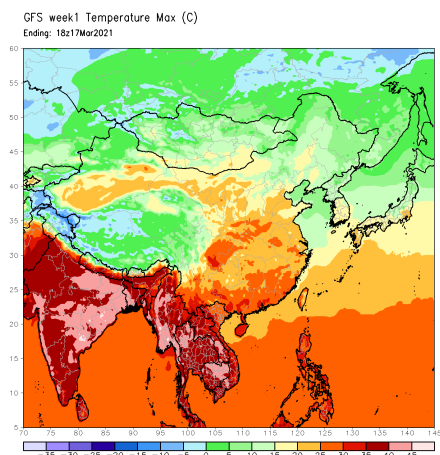
Weekly Wind Forecast

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

GFS 850mb week1 Mean Vector Wind Total (m/s)
Ending: 18z17Mar2021

GFS 700mb week1 Mean Vector Wind Total (m/s)
Ending: 18z17Mar2021

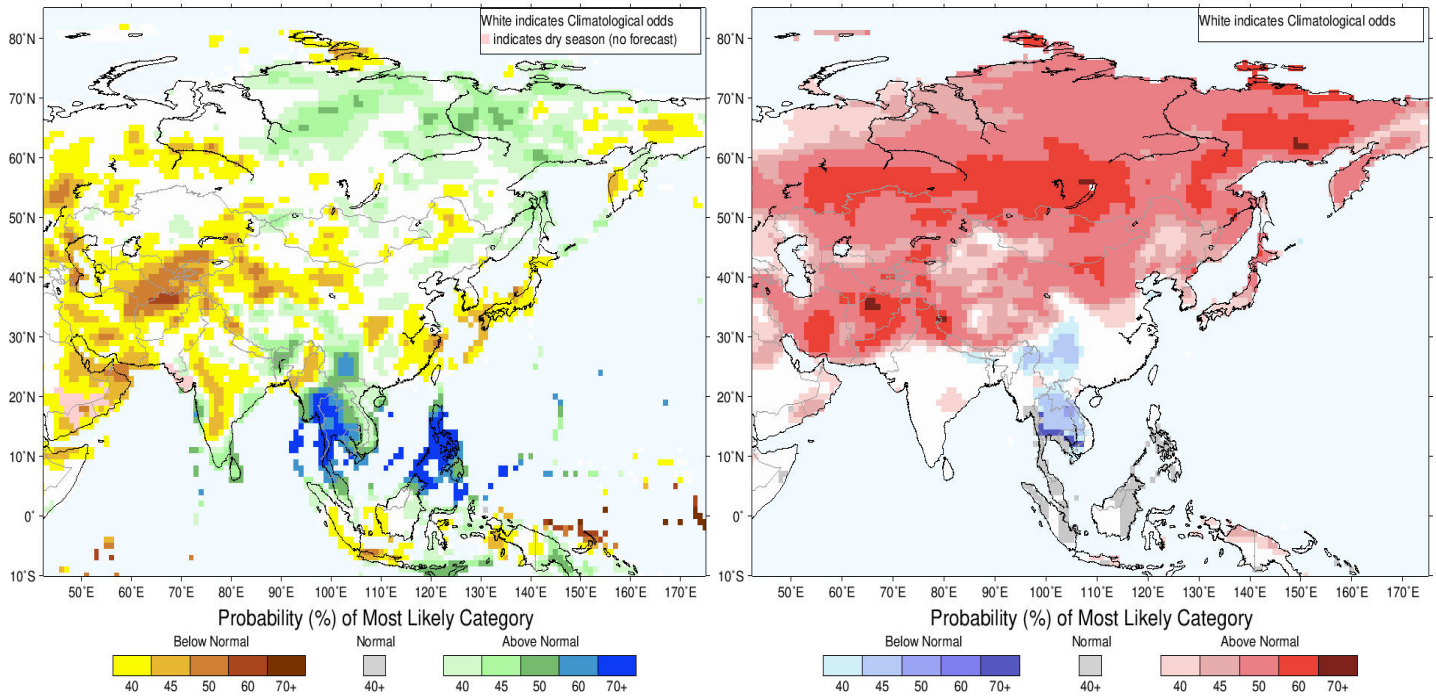## Seasonal Rainfall and Temperature Forecast

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 March–April–May 2021, Issued February 2021

White indicates Climatological odds
indicates dry season (no forecast)

Probability (%) of Most Likely Category

Below Normal   Normal   Above Normal
40 45 50 60 70+   40+   40 45 50 60 70+

Precipitation Forecast

IRI Multi–Model Probability Forecast for Temperature for March–April–May 2021, Issued February 2021

White indicates Climatological odds

Probability (%) of Most Likely Category

Below Normal   Normal   Above Normal
40 45 50 60 70+   40+   40 45 50 60 70+

Temperature Forecast