

**Week of  
22 - 29 January  
2021**

## CLIMATE MONITORING AND PREDICTION FOR SRI LANKA

By: Nipuni Alahakoon, 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 of 135 mm expected in Eastern province during 20<sup>th</sup> – 26<sup>th</sup> Jan & dangerously heavy rainfall expected in Batticaloa during 27<sup>th</sup> Jan - 2<sup>nd</sup> Feb.

### Monitored Rainfalls



• Heavy rainfall was experienced in Sabaragamuwa, Western, Eastern & Southern provinces. Up to 135 mm max in Ratnapura on 16<sup>th</sup>

### Monitored Wind



• From 12<sup>th</sup> - 18<sup>th</sup> Jan: up to 8 km/h Northeasterly winds were experienced by the entire island.

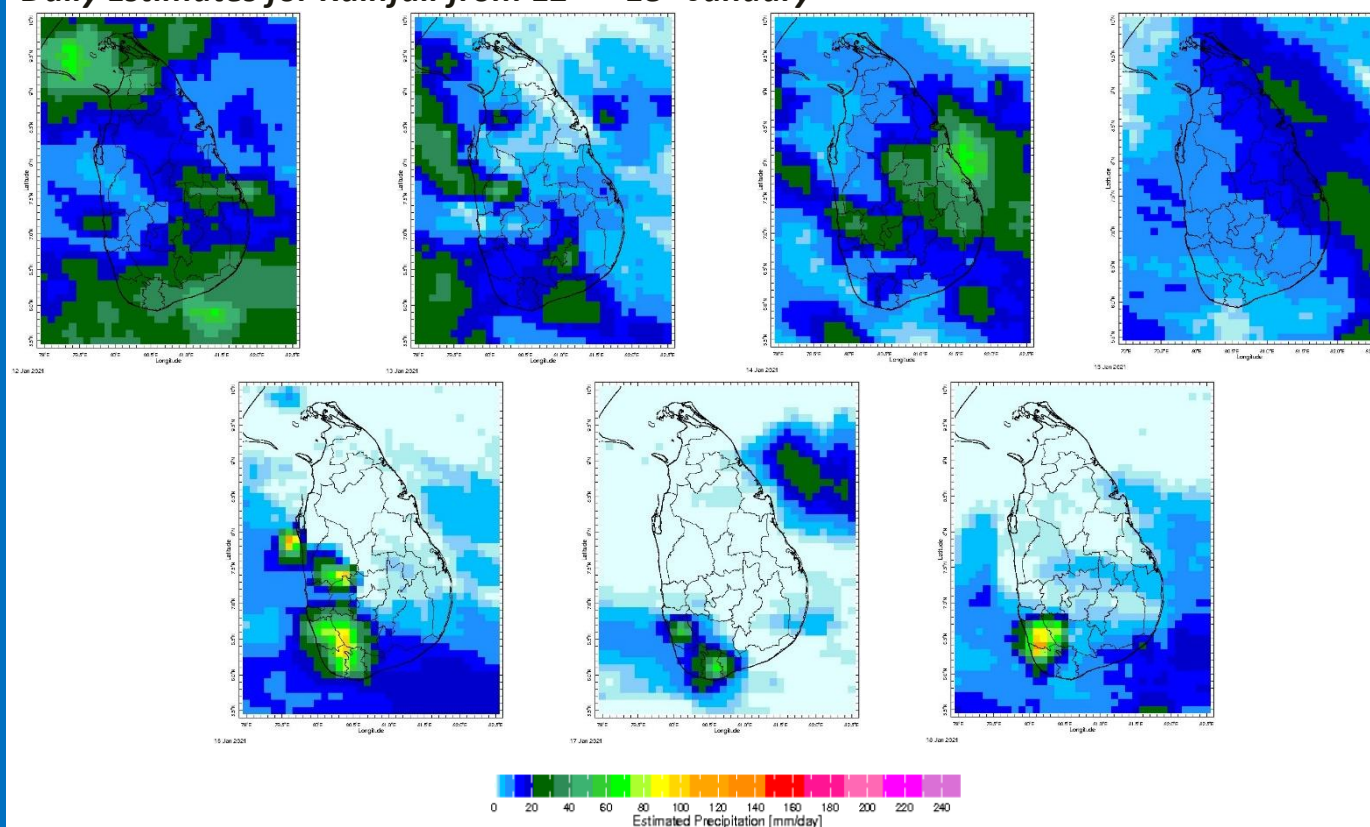
### Monitored Sea Surface



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

## Monitoring Rainfall

### Daily Estimates for Rainfall from 12<sup>th</sup> – 18<sup>th</sup> January





## 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](mailto:fectsl@gmail.com)

Web Site <http://www.climate.lk>

### **Total Rainfall for the Past Week**

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

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

Weekly Rainfall Anomalies by Districts:

#### **Rainfall Excess**

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

### **Monthly Monitoring**

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

#### **21<sup>st</sup> – 31<sup>st</sup> December:**

Rainfall	Districts
16 mm	Batticaloa, Polonnaruwa, Colombo, Gampaha
14 mm	Ampara, Matale, Trincomalee
12 mm	Anuradhapura, Kalutara, Badulla
10 mm	Vavuniya, Ratnapura, Galle, Matara
8 mm	Kegalle, Hambantota, Moneragala, Kandy, Kurunegala, Mannar, Mullaitivu

#### **1<sup>st</sup> – 10<sup>th</sup> January:**

Rainfall	Districts
16 mm	Batticaloa, Polonnaruwa, Anuradhapura, Ampara, Matale, Trincomalee, Kandy, Kurunegala, Kegalle, Badulla, Moneragala, Vavuniya, Mannar, Gampaha



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14 mm	Hambantota, Nuwara Eliya, Colombo, Puttalam, Mullaitivu
12 mm	Kalutara, Ratnapura, Galle
10 mm	Matara, Kilinochchi
8 mm	Jaffna

### Ocean State (Text Courtesy IRI)

#### **Pacific sea state: January 13, 2021**

Equatorial Eastern Pacific SST reached La Niña threshold in mid-January, and the atmospheric variables were either ENSO-neutral or indicative of weak La Niña conditions.

#### **Indian Ocean State**

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

## Predictions

### Rainfall

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

##### **From 20<sup>th</sup> – 26<sup>th</sup> January:**

Total rainfall by Provinces:

Rainfall	Provinces
135 mm	Eastern
55 mm	Northern
35 mm	North-central
15 mm	Western, Uva, Central

##### **From 27<sup>th</sup> January – 2<sup>nd</sup> February:**

Total rainfall by Provinces:

Rainfall	Provinces
140 mm	Eastern
105 mm	Northern
95 mm	North-central, Uva
75 mm	Central
65 mm	Western
55 mm	Sabaragamuwa, North-western, Southern



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### MJO based OLR predictions

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

MJO shall significantly suppress the rainfall during 19<sup>th</sup> Jan– 2<sup>nd</sup> Feb.

## Interpretation

### Monitoring

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

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

**Temperatures:** Cooled from November – still the temperature anomalies were slightly above normal for the southern half of the island the last – driven by the warm SST's

### Predictions

**Rainfall:** During the next week (20<sup>th</sup> – 26<sup>th</sup> Jan), heavy rainfall is predicted for the Eastern coastal region. A drop in rainfall is predicted over the rest of the country. During the second week (27<sup>th</sup> Jan - 2<sup>nd</sup> Feb). Up to 140 mm rainfall is expected in Batticaloa city and surroundings in this week. The amount of rainfall is significantly high and thus caution is warranted.

**Temperatures:** The temperature remains slightly above normal for January.

#### **Teleconnections:**

- MJO shall significantly suppress the rainfall during 19<sup>th</sup> Jan– 2<sup>nd</sup> Feb.
- 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.

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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- Weekly Wind Monitoring
- Weekly Average SST Anomalies

#### 2. Predictions

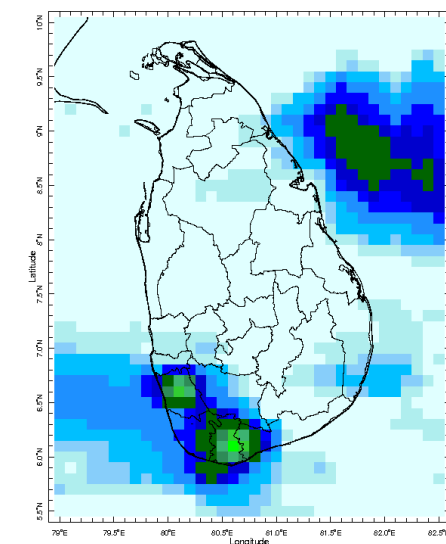
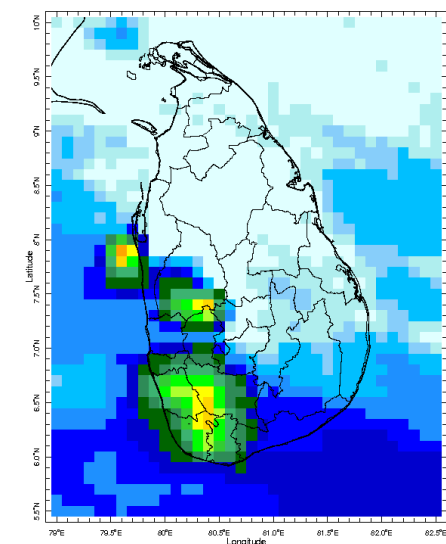
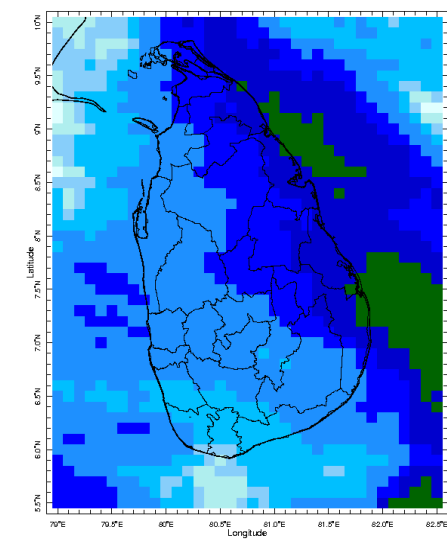
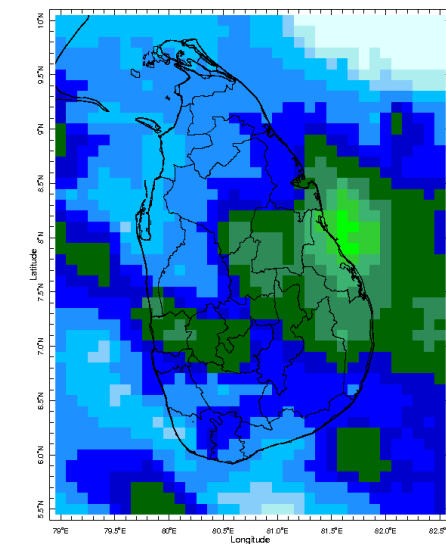
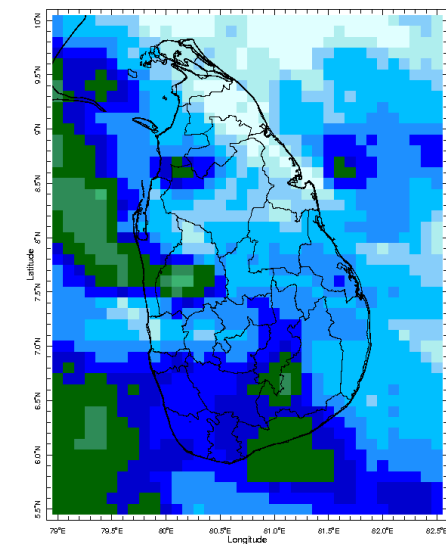
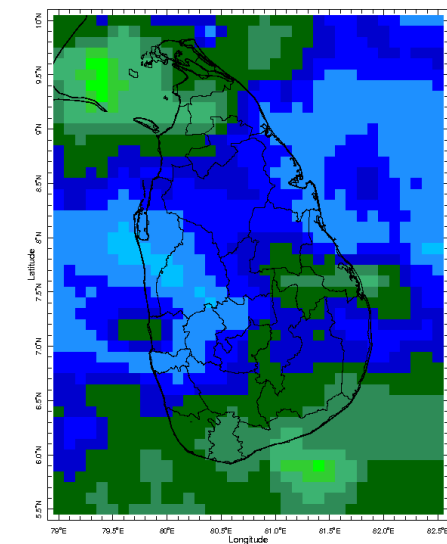
- NCEP GFS Ensemble 1-14 day Rainfall Predictions
- GFS (T574) Model Rainfall Forecast from RMSC New Delhi
- MJO Related OLR Forecast
- Weekly Temperature Forecast
- Weekly Wind Forecast
- Seasonal Predictions from IRI

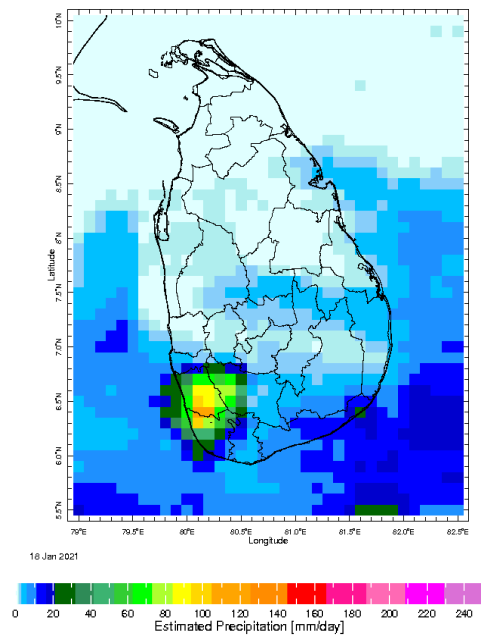


### MONITORING

#### Daily Rainfall Monitoring

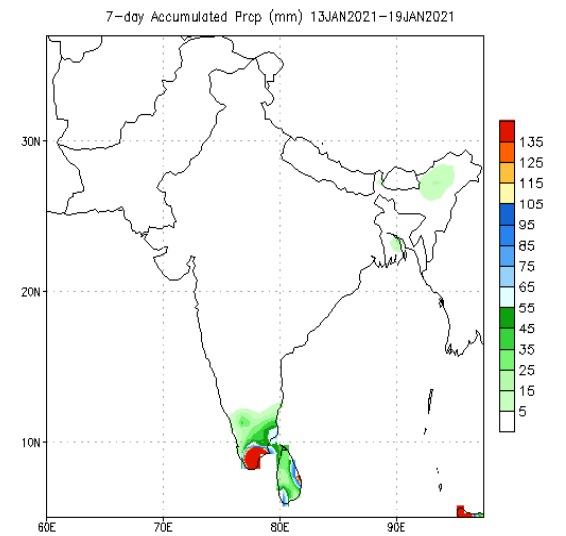
The following figures show the satellite observed rainfall in the last 7 days in Sri Lanka.



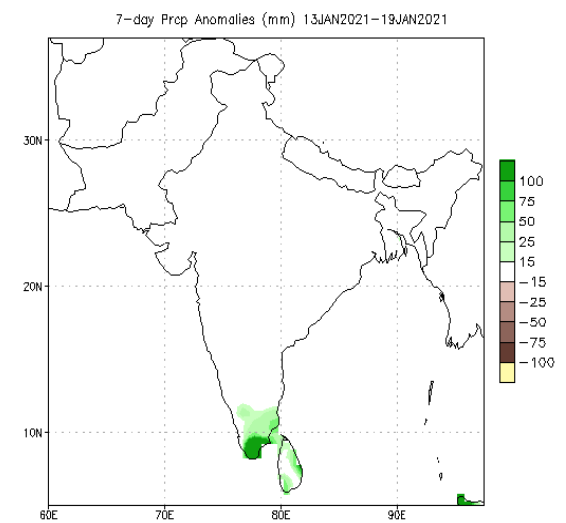
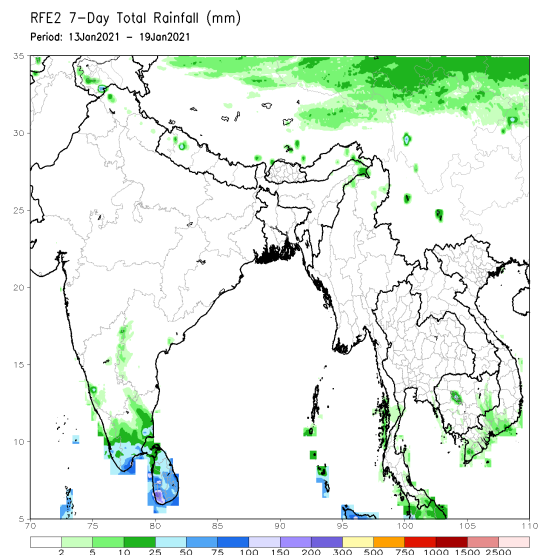


## Weekly Rainfall Monitoring

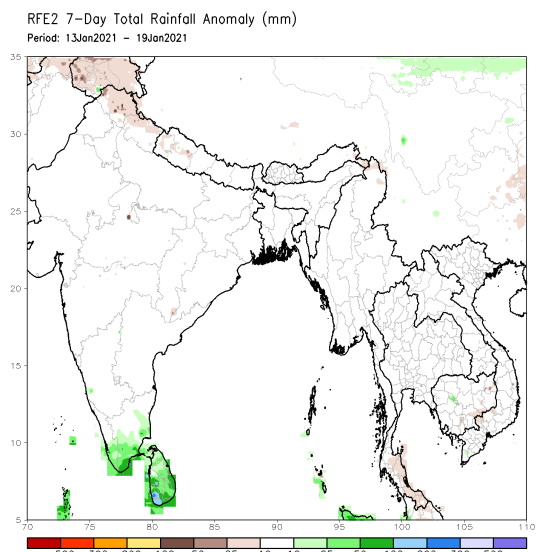
The following figures show the total satellite observed rainfall in the last week in Sri Lanka. The figure in the left is the total 7-day rainfall from NOAA Climate Prediction Center (CPC) Unified Precipitation Analysis and the figure in the right is the total 7-day rainfall from CPC RFE 2.0 Satellite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



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

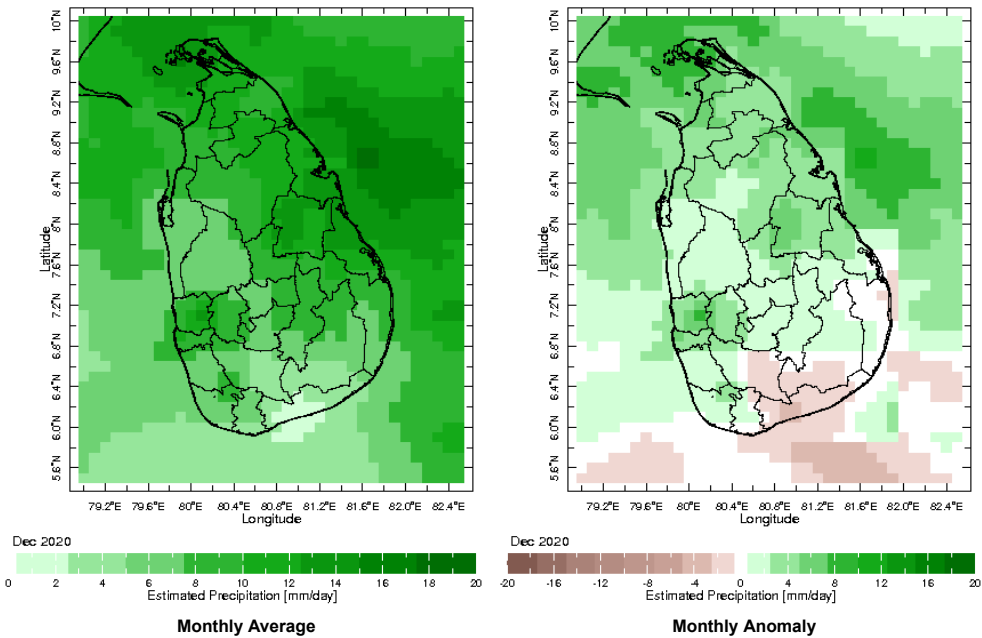


Data Source: CPC Unified (gauge-based & 0.5x0.5 deg resolution) Precipitation Analysis  
Climatology (1981-2010)

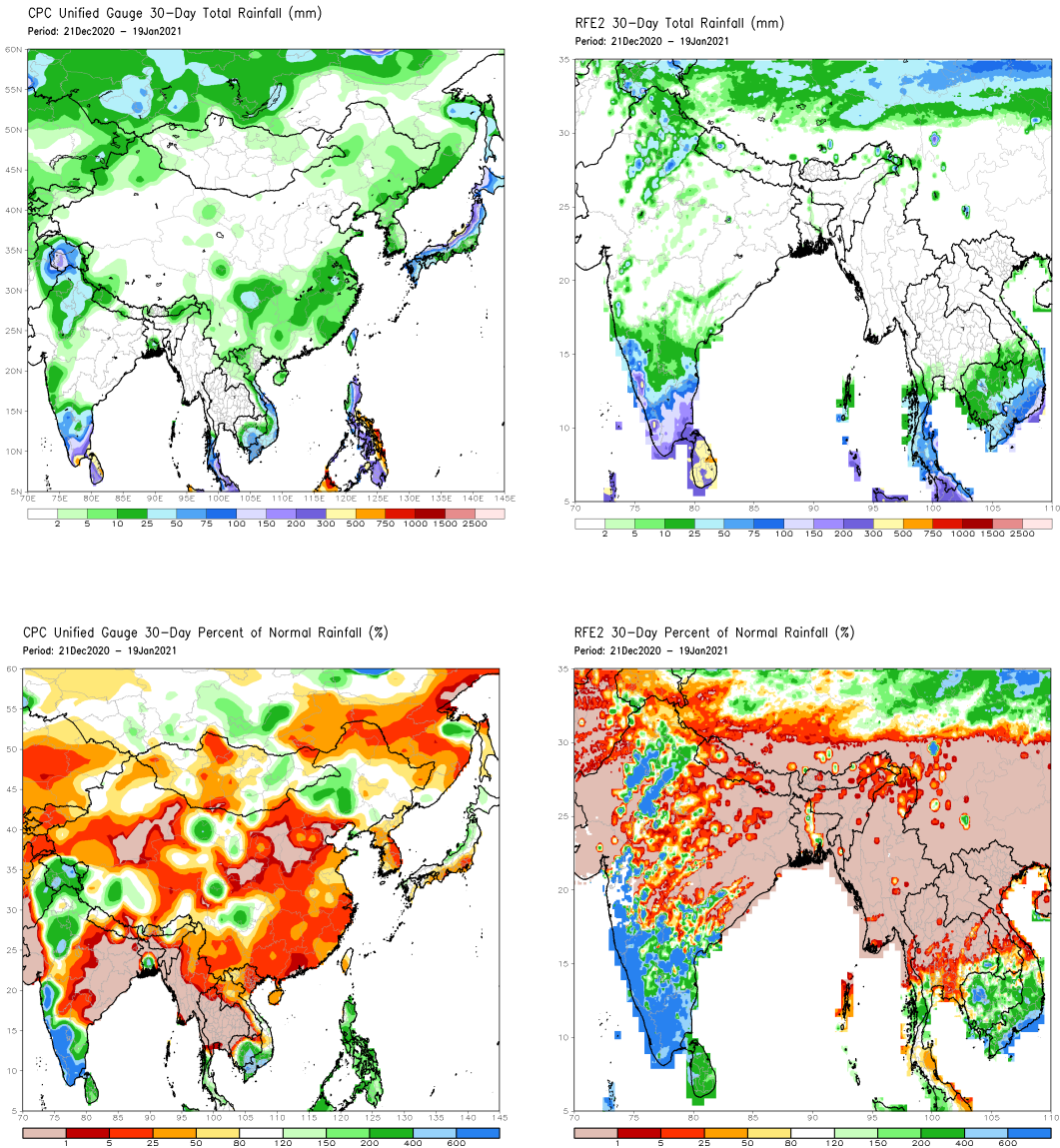


Monthly Rainfall Monitoring

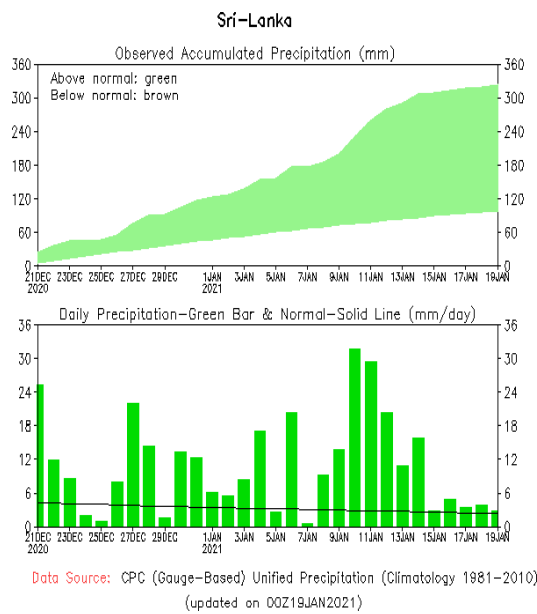
The figure in the left shows the average observed rainfall in the previous month. The rainfall anomaly in the previous month is shown in the figure to the right. The brown color in the anomaly figure shows places which received less rainfall than the historical average while the green color shows places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



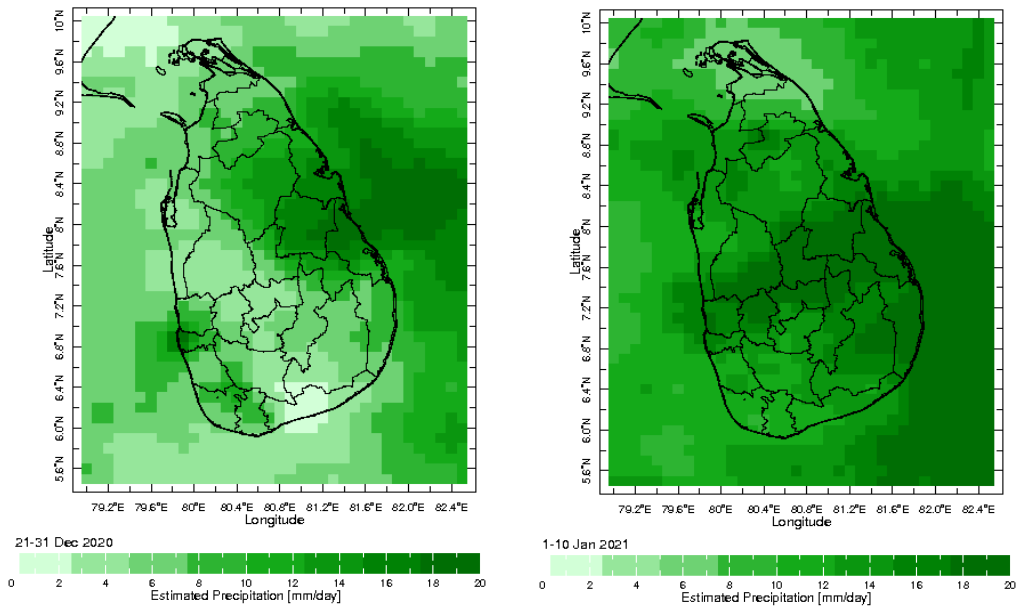
The figure in the top-left shows the total rainfall in the past 30 days from CPC Unified Precipitation Analysis while the figure in the top-right shows the total rainfall for the same period from RFE 2.0 Satellite Rainfall Estimates. The bottom two figures show the percentage of rainfall received in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



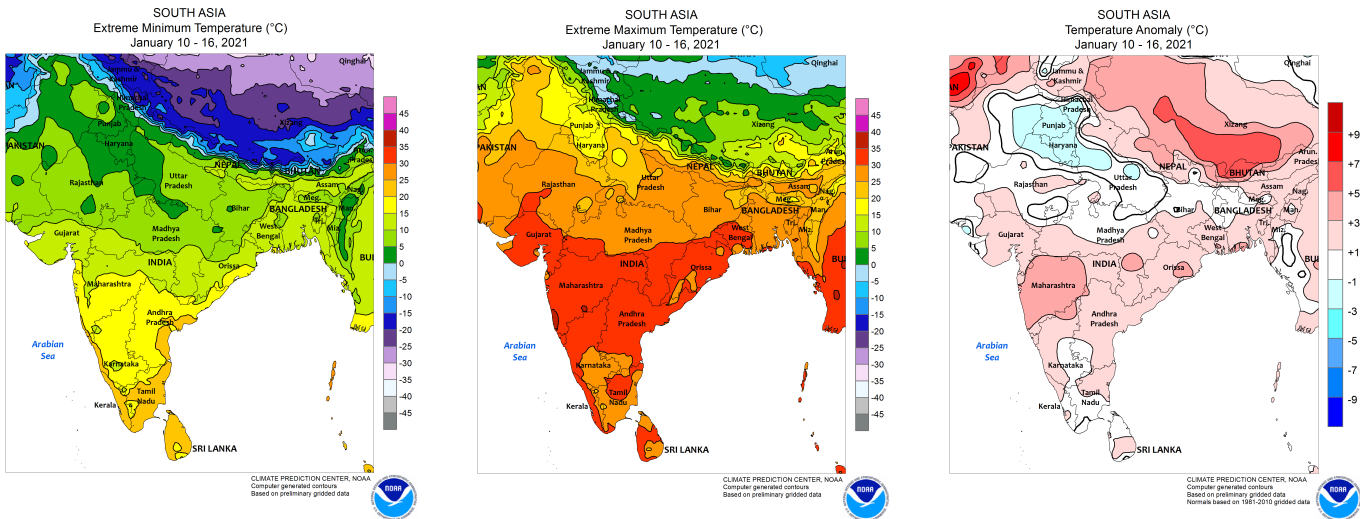
The following figure shows the observed accumulated rainfall (top) and daily observed rainfall (bottom) in Sri Lanka in the last 30 days.



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

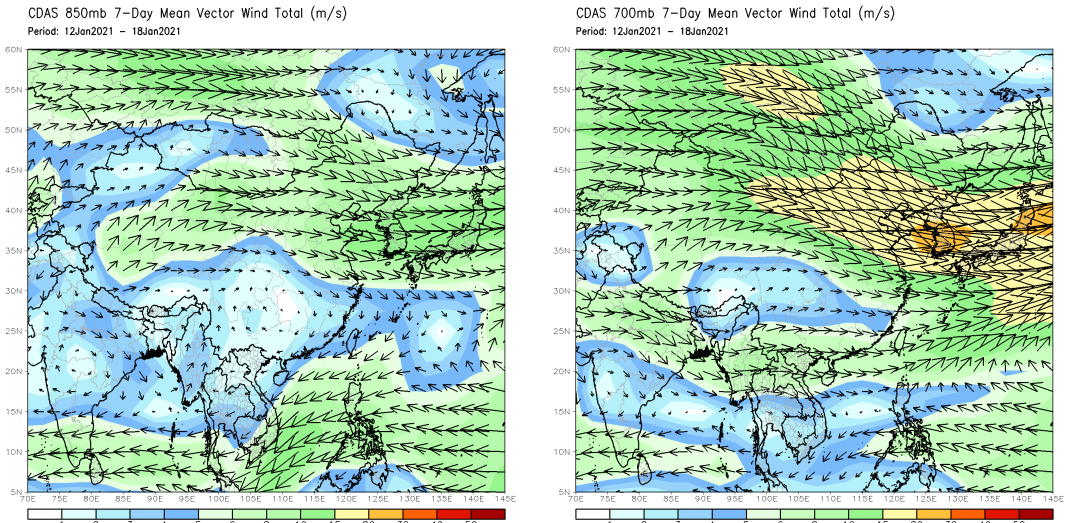


**Weekly Temperature Monitoring**



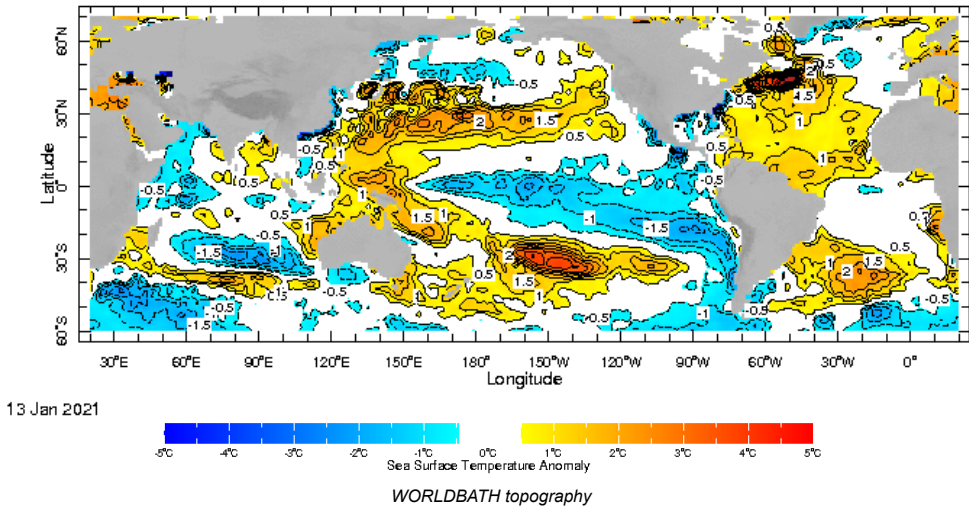
Weekly Wind Monitoring

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.

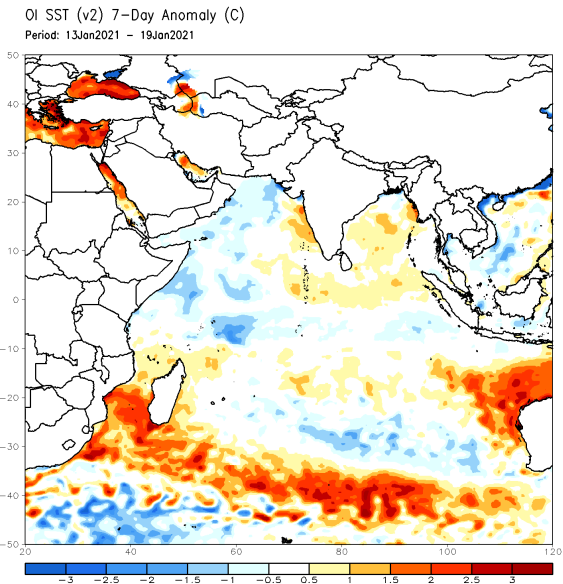


Weekly Average SST Anomalies

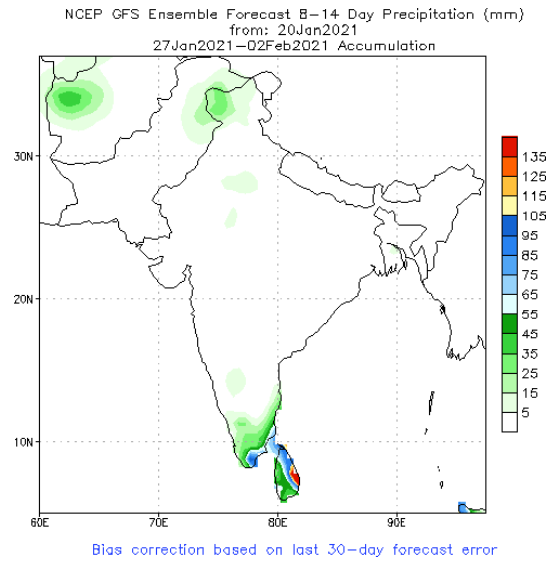
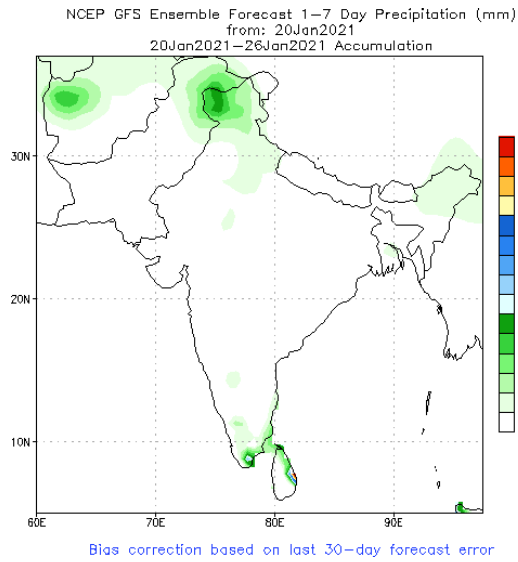
Weekly average Sea Surface Temperature (SST) anomaly in the world from NOAA NCEP



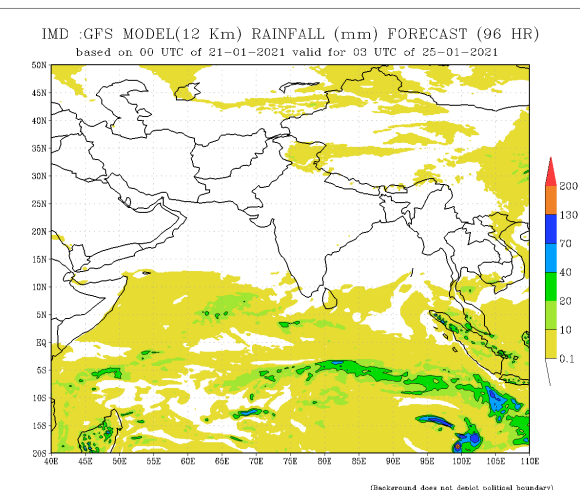
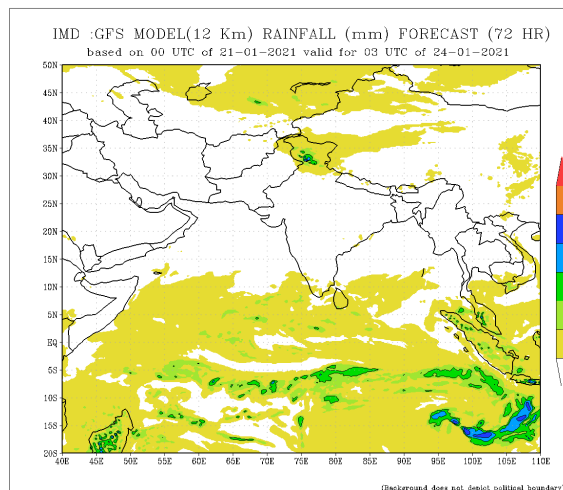
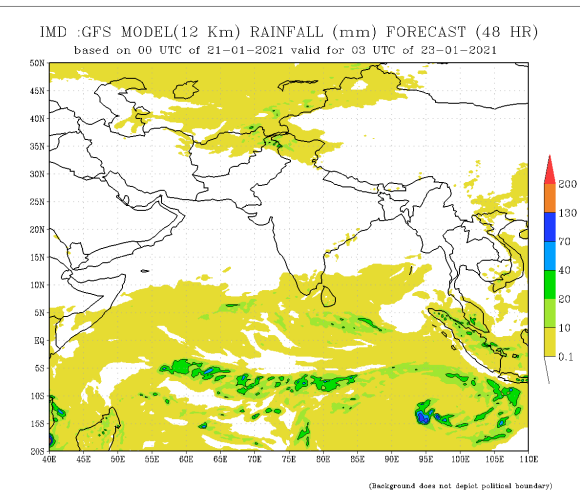
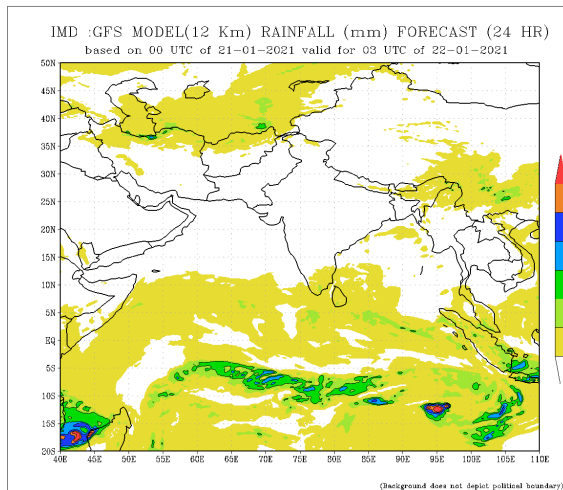
Optimum Interpolated Sea Surface Temperature Anomaly in the Indian Ocean from NOAA CPC

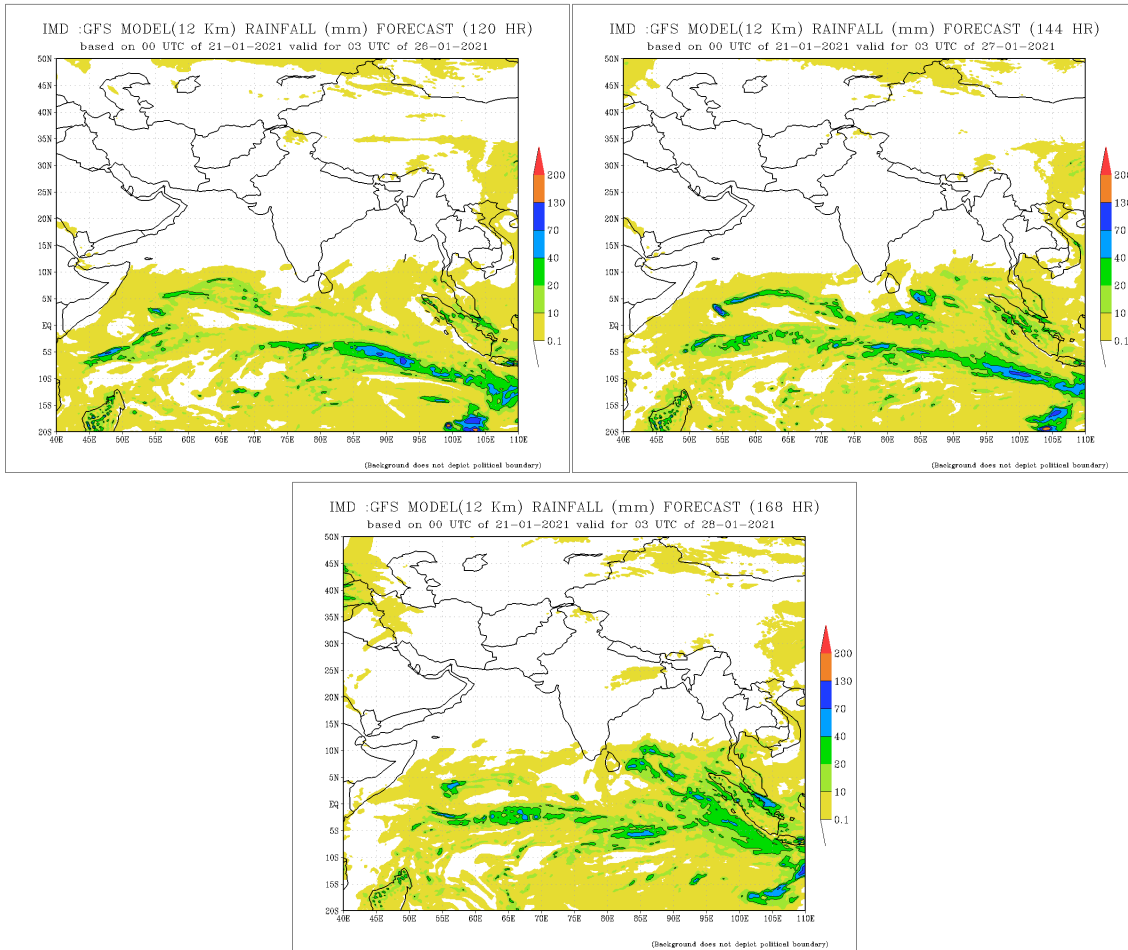


## NCEP GFS 1- 14 Day prediction



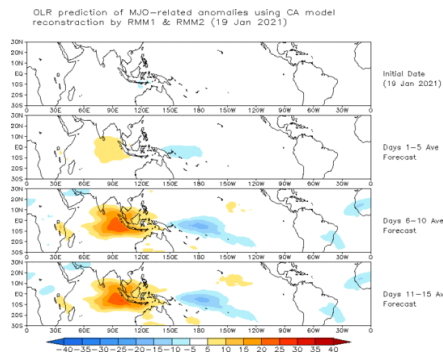
## IMD GFS (T574) Model Rainfall Forecast from RMSC New Delhi, India





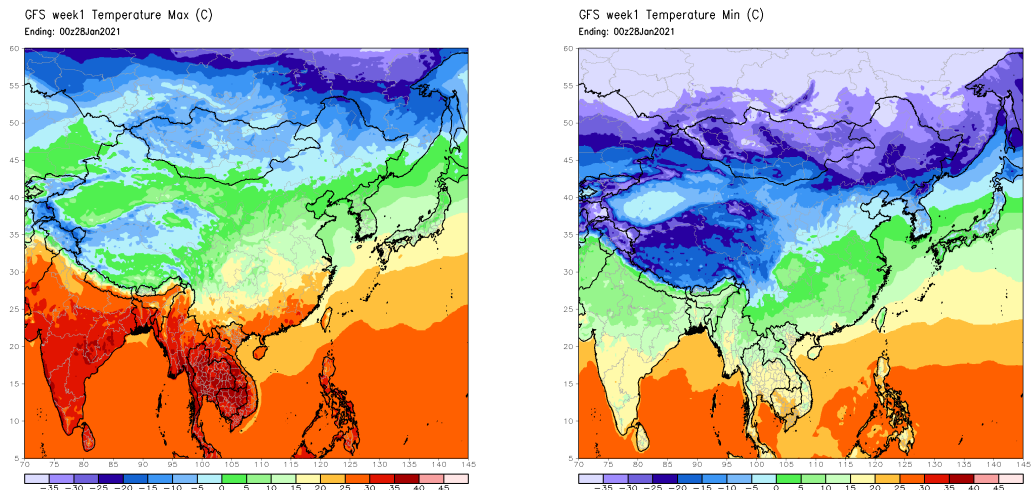
## Madden Julian Oscillation (MJO) related Outgoing Longwave Radiation (OLR) Forecast

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.



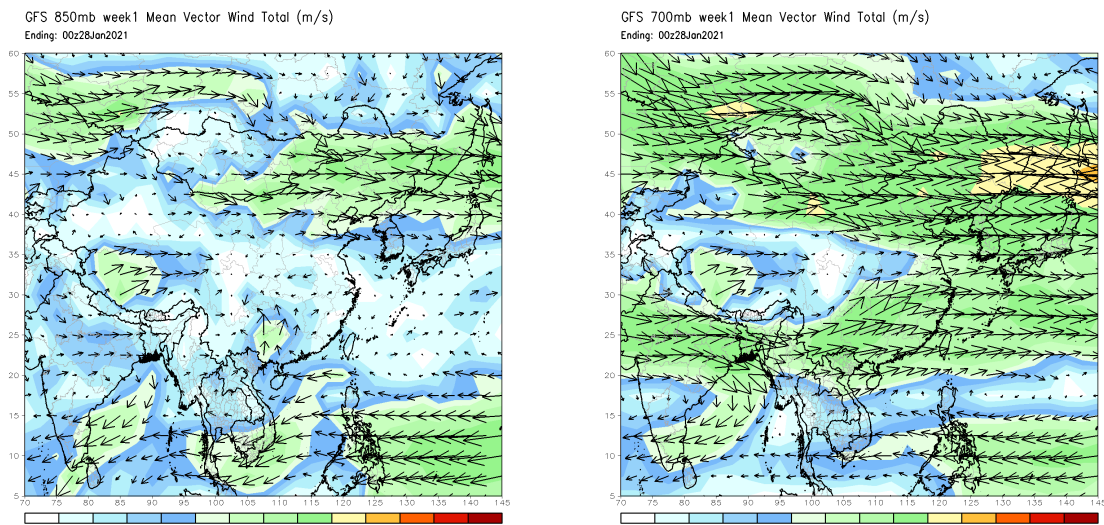
## Weekly Temperature Forecast

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



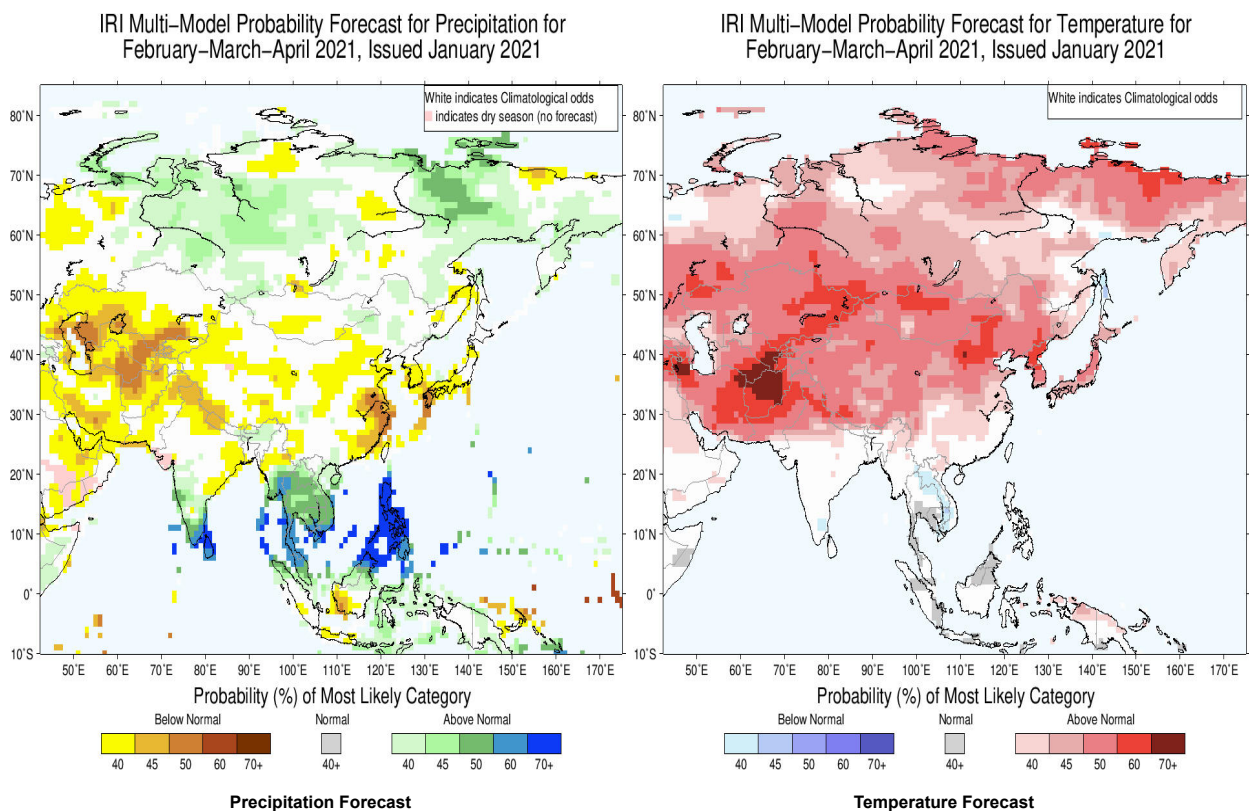
## Weekly Wind Forecast

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%).



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