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Web Site http://www.climate.lk

**Week of 24 - 31 Dec 2020**

# 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***

- *Dangerously heavy rainfall of 140 mm expected in Jaffna district and Heavy rainfall in Northern & Eastern Provinces during 30th Dec – 5th Jan.*

***Monitored Rainfalls***

- *Extremely high rainfall was experienced in Eastern province. Up to 214 mm max rainfall in Batticaloa in 21st Dec.*

***Monitored Wind***

- *From 15th - 21st Dec: up to 8 km/h Northeasterly winds were experienced the entire island.*

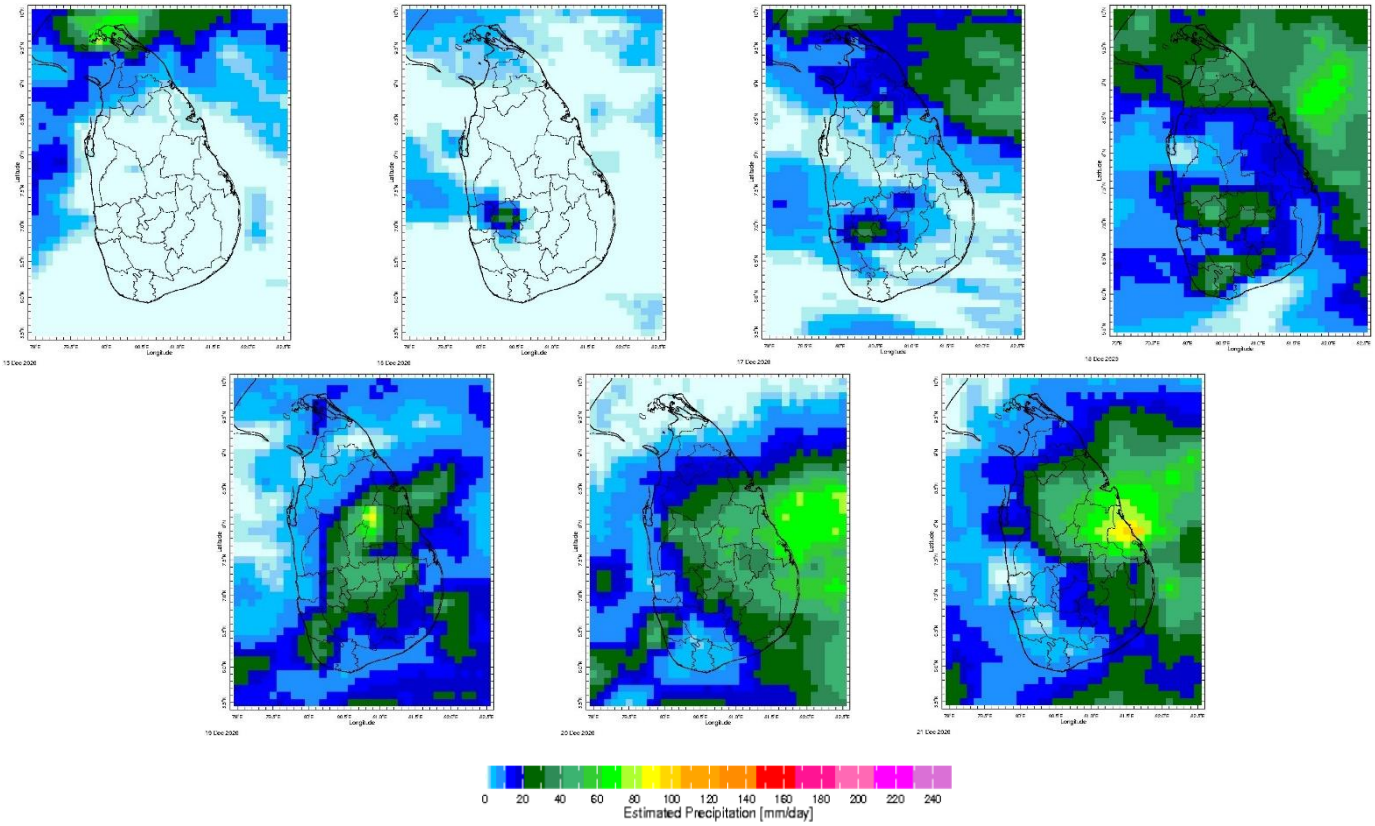
***Monitored Sea Surface***

- *Sea surface temperature was observed above 0.5 $^0$C to the West of Sri Lanka and neutral to the East.*

# Monitoring

## Rainfall

***Daily Estimates for Rainfall from 15th– 21st December***



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### *Total Rainfall for the Past Week*

The RFE 2.0 tool shows Cumulative rainfall by Districts:

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

Total rainfall Anomalies by Districts

**Rainfall Excess**

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

### *Monthly Monitoring*

The first 10 days in December 2020, there was heavy rainfall was observed in Northern and Western provinces, probably due to cyclone storm “BUREVI”.

During December; Dekadal Rainfall by Districts:

| Rainfall | Districts |
|---|---|
| 18 mm | Jaffna, Kilinochchi, Mullaitivu, Mannar, Trincomalee |
| 16 mm | Gampaha, Colombo, Kegalle, Vavuniya, Anuradhapura, Puttalam |
| 10 mm | Polonnaruwa, Kurunegala, Batticaloa, Badulla, Moneragala |
| 8 mm | Ratnapura, Matale, Kandy, Nuwara Eliya, Kalutara, Ampara |
| 5 mm | Galle, Matara, Hambantota |

## Ocean State *(Text Courtesy IRI)*

### *Pacific sea state: December 16, 2020*

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

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***Indian Ocean State***

The SST in the Indian Ocean is still warmer by 0.5 degrees than is seasonable to the West of Sri Lanka but near seasonable on the Eastern.

# Predictions

## Rainfall

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

**From 23rd – 29th December:**

Total rainfall by Provinces:

| Rainfall | Provinces |
|---|---|
| 140 mm | Northern |
| 55 mm | Eastern |
| 35 mm | North-central |
| 25 mm | Central |
| 15 mm | North-western, Western, Southern, Sabaragamuwa, Uva |

**From 30th December – 5thJanuary:**

Total rainfall by Provinces:

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

## MJO based OLR predictions

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

MJO shall slightly suppress the rainfall during 22nd – 26th Dec, neutral during 27th – 31st Dec and slightly enhance the rainfall during 1st – 5th Jan

# Interpretation

## Monitoring

***Rainfall:*** During the last two weeks, there had been high rainfall over the following provinces: Northern, North-central and Eastern.

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***Wind:*** As is typical for December the northeasterly winds prevailed. At the start of December, the Cyclone Burevi Track influenced the North-eastern and North-western coast of Sri Lanka most and there was contrasting wind directions across the islands

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

## Predictions

***Rainfall:*** During the next two weeks, extreme rainfall predicted on the Northern part and drop rainfall over the rest of the country.

***Temperatures:*** The temperature remains slightly above normal for December especially along the S-W of SL.

***Teleconnections:***

- MJO - is in phases slightly suppress the rainfall during 22nd – 26th Dec, neutral during 27th – 31st Dec and slightly enhance the rainfall during 1st – 5th Jan.
- La Nina - has set in as assessed by IRI on October 20.
  Usually, with La Nina, the rainfall from October to December is suppressed and the rainfall has been suppressed but the cyclonic storms in this period has masked some of the deficits. The rainfall from January to March is augmented as predicted. However, this is against a lower average January to March rainfall compared to October to December.

[1] International Research Institute for Climate and Society, Columbia University Water Center, Earth Institute at Columbia University, New York.

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# Weekly Climate Bulletin for Sri Lanka

## Inside This Issue



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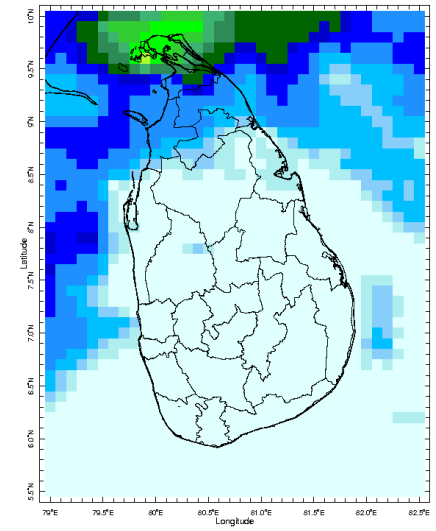
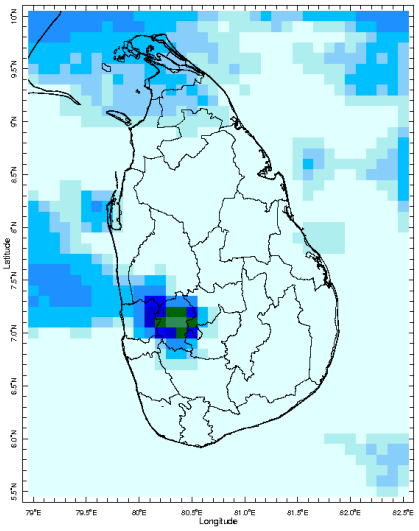
## MONITORING

### Daily Rainfall Monitoring

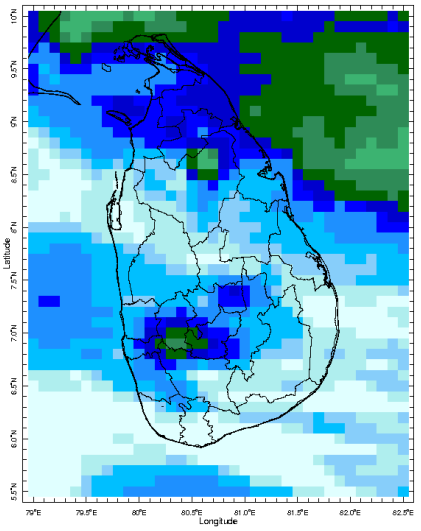
**The following figures show the satellite observed rainfall in the last 7 days in Sri Lanka.**



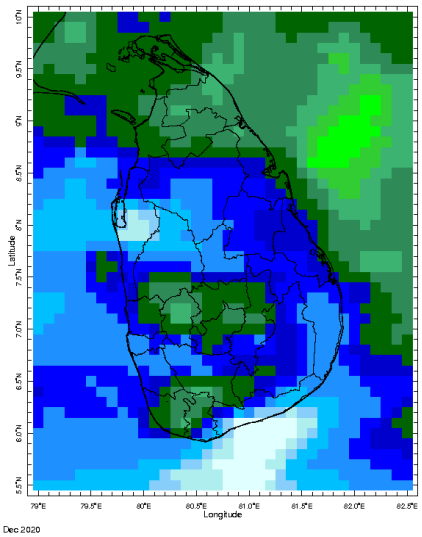
15 Dec 2020



16 Dec 2020



17 Dec 2020



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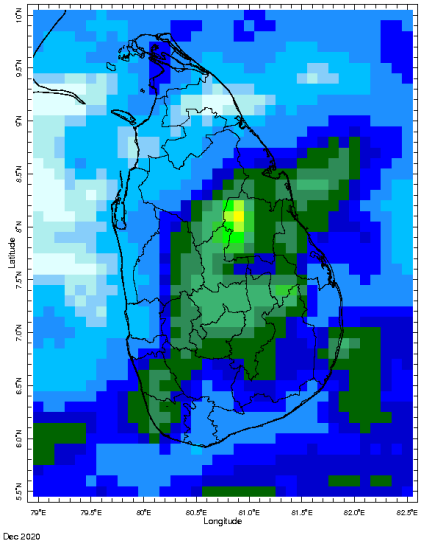
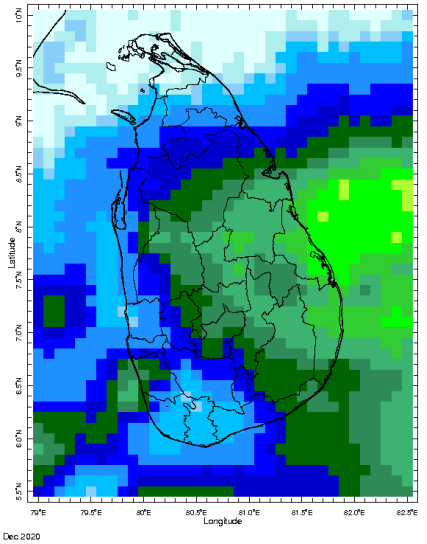
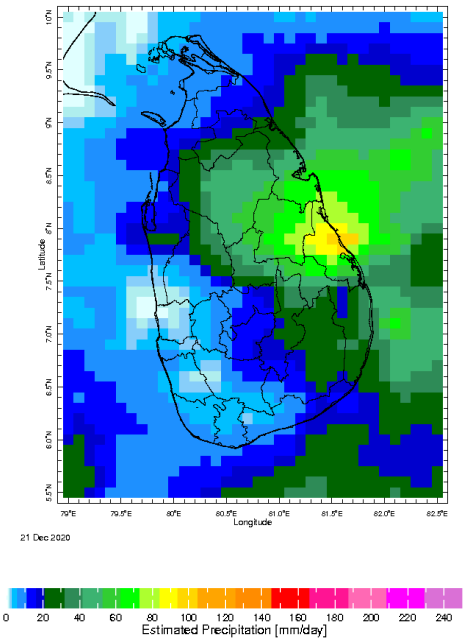


19 Dec 2020

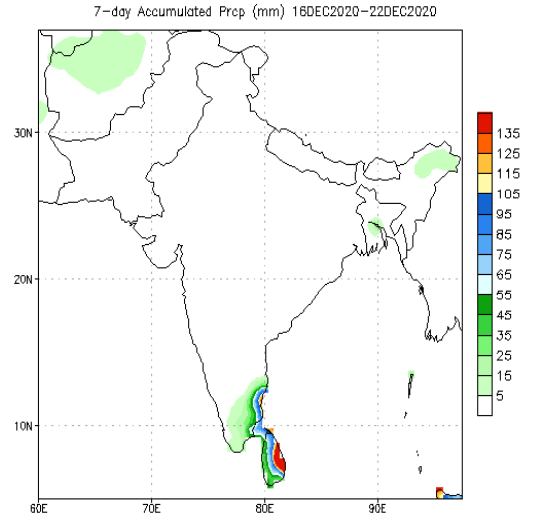


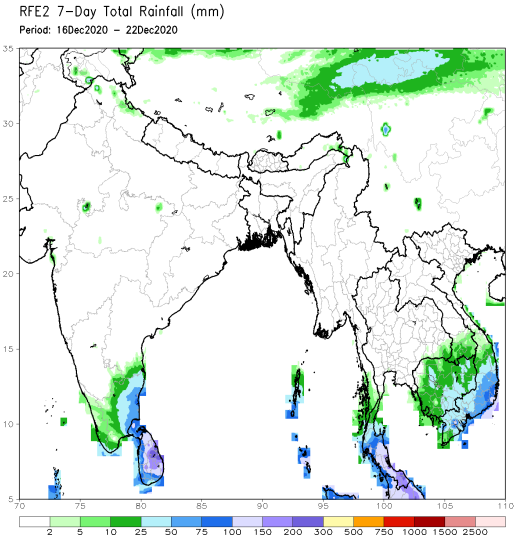
20 Dec 2020

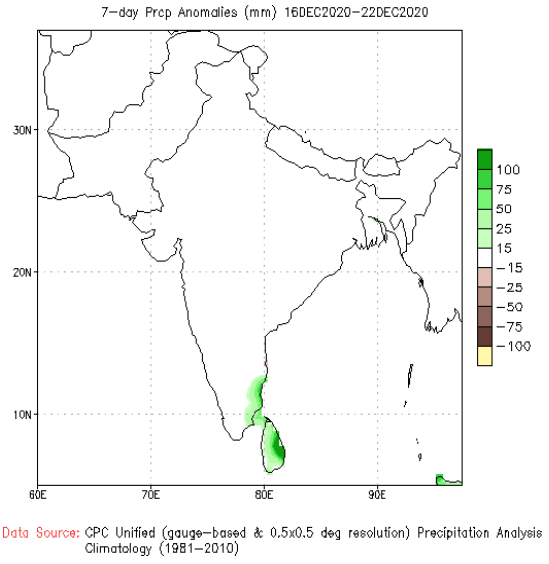


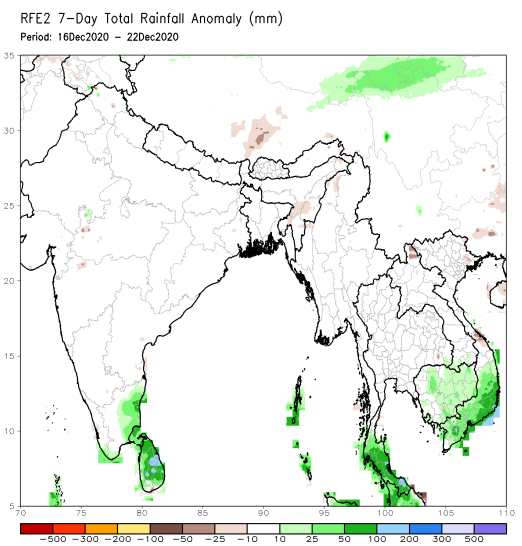

## Weekly Rainfall Monitoring

**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.**



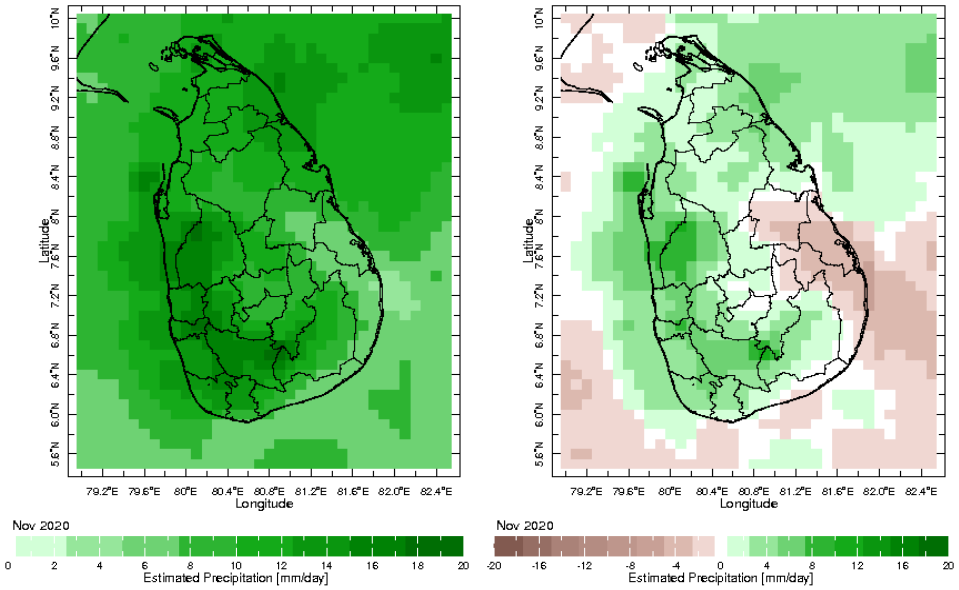



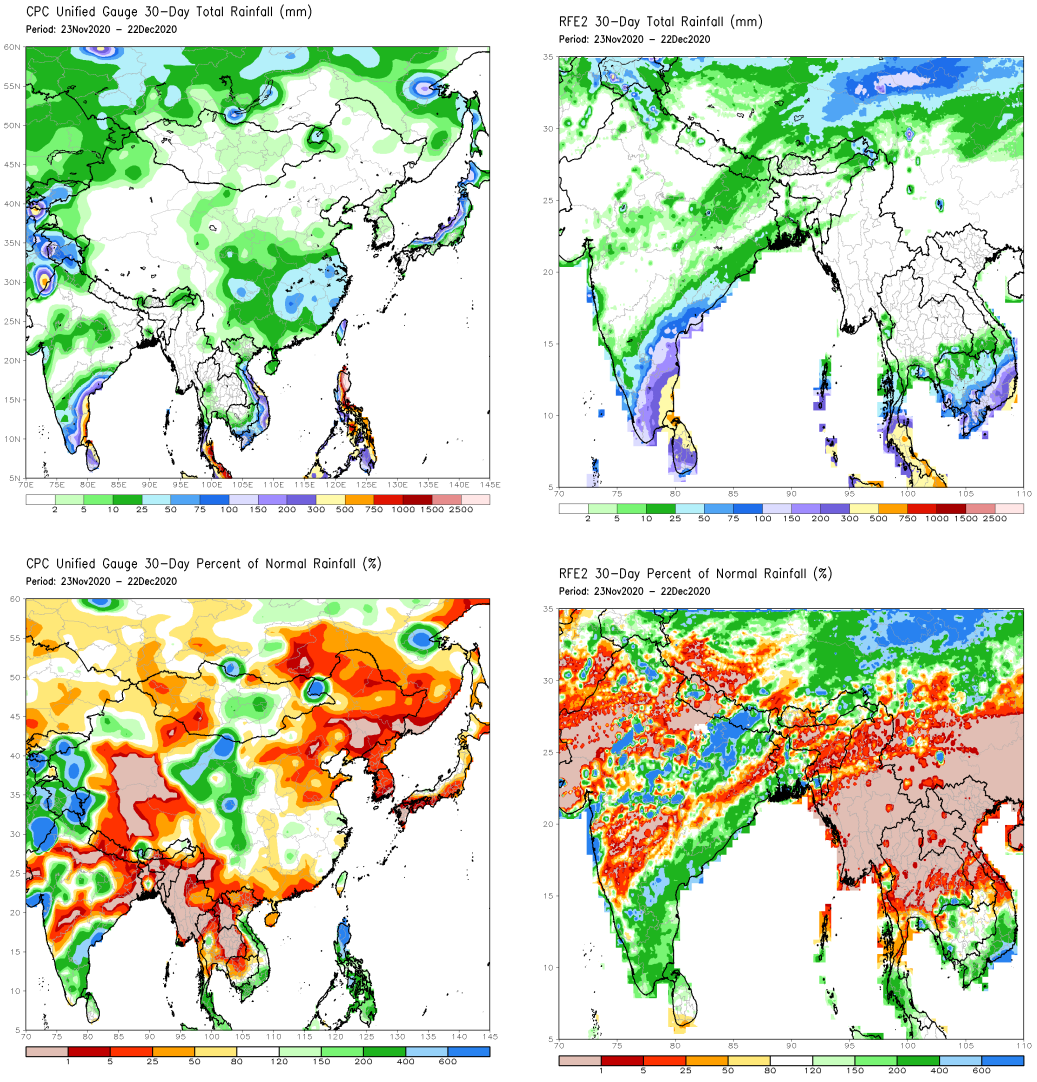
## Monthly Rainfall Monitoring

**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**

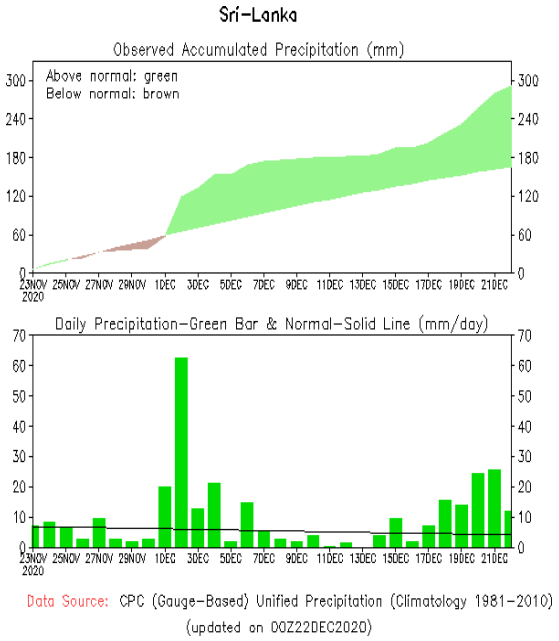



**Monthly Average** **Monthly Anomaly**

**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.**

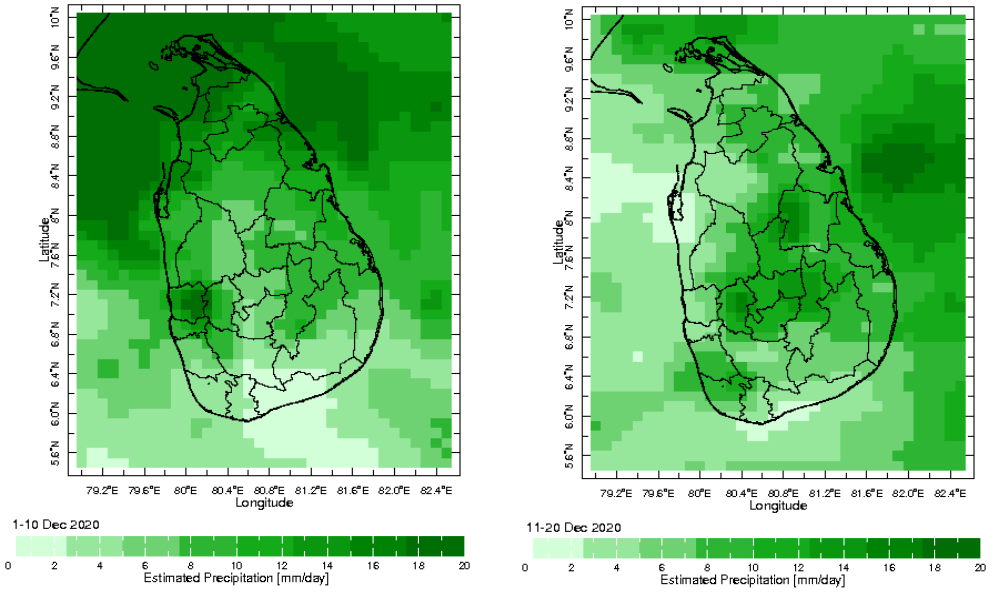


**The following figure shows the observed accumulated rainfall (top) and daily observed rainfall (bottom) in Sri Lanka in the last 30 days.**

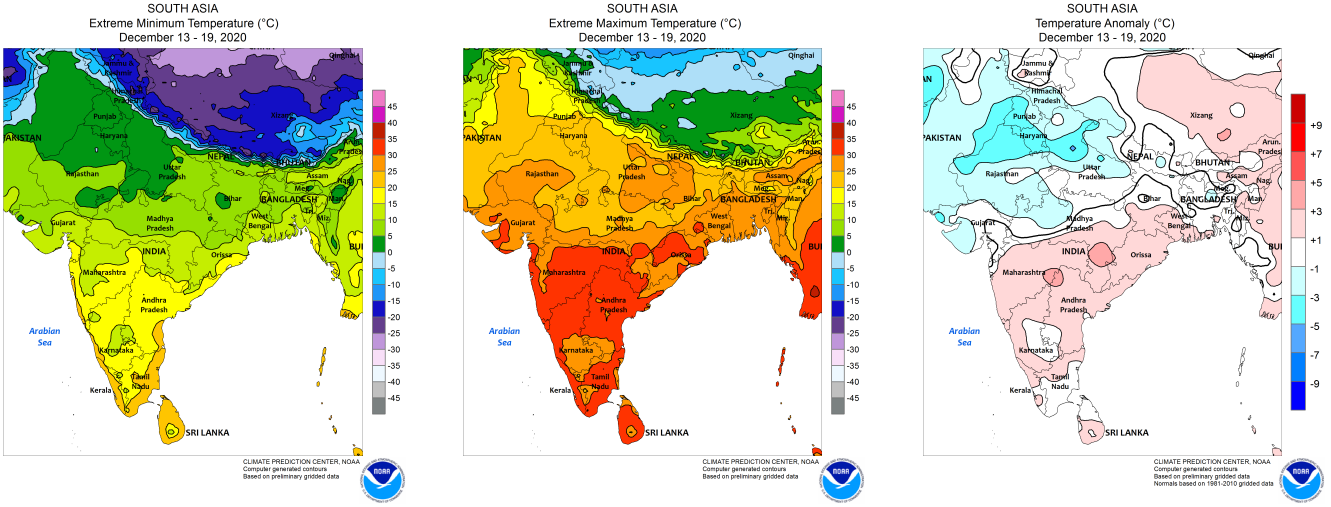



Data Source: CPC (Gauge-Based) Unified Precipitation (Climatology 1981-2010)
(updated on 00Z22DEC2020)

## Dekadal (10 Day) Satellite Derived Rainfall Estimates

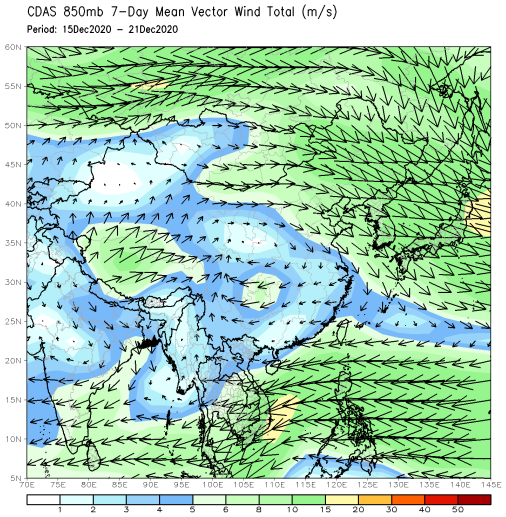


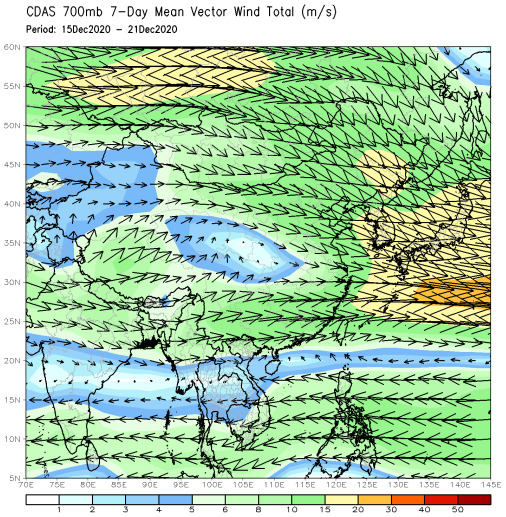

## Weekly Temperature Monitoring



## Weekly Wind Monitoring

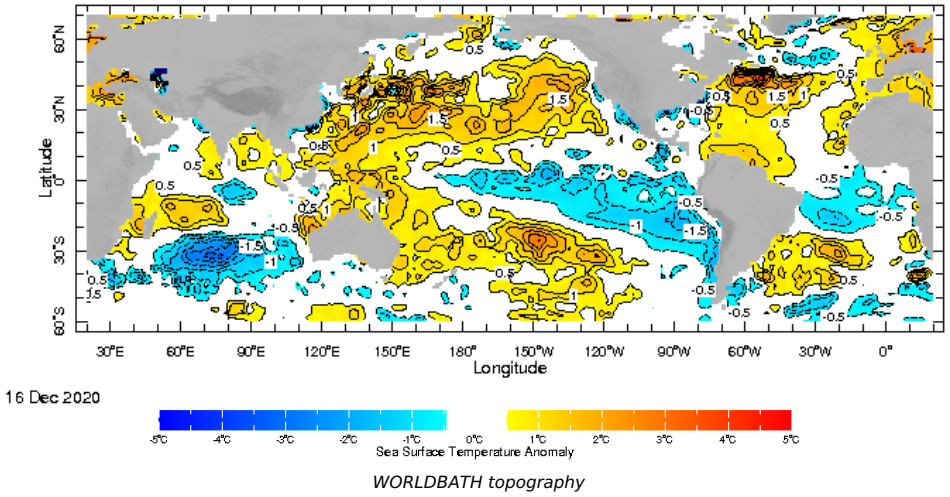
**The following figures show the mean vector wind total of the past 7 days near Sri Lanka at two levels. The figure on the left shows 850 mb (~1500 m) level and the figure on the right shows 700 mb (~3000 m) level.**



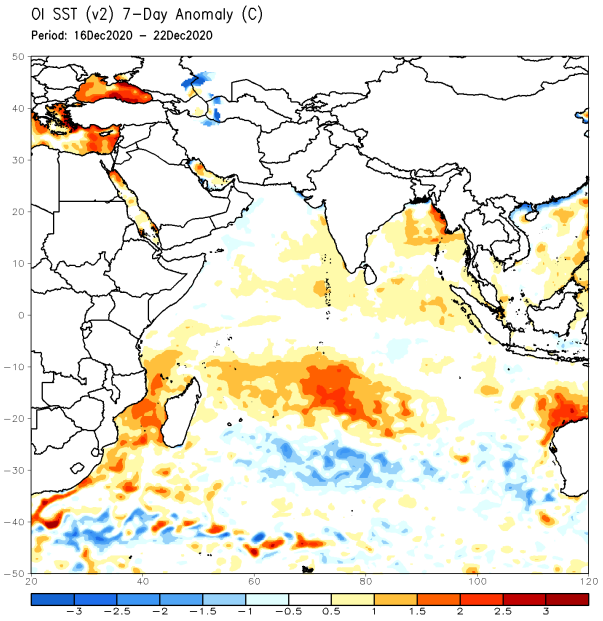




## Weekly Average SST Anomalies

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

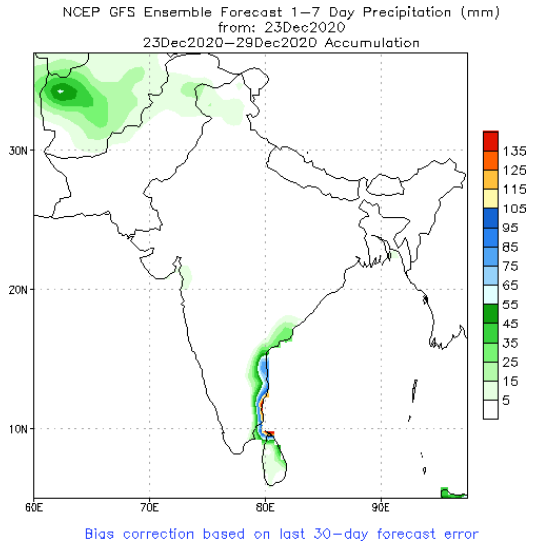


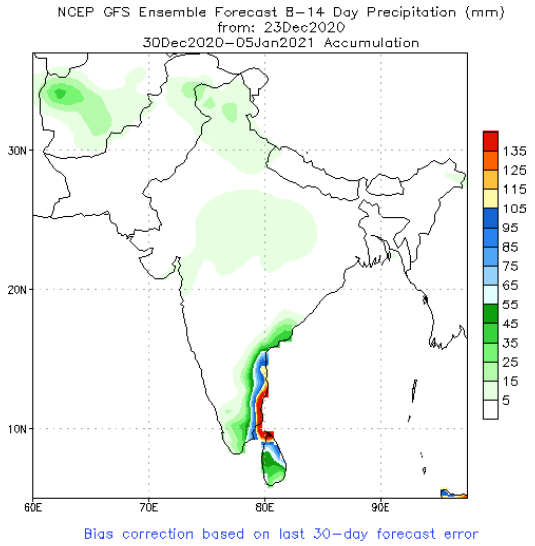

**Optimum Interpolated Sea Surface Temperature Anomaly in the Indian Ocean from NOAA CPC**



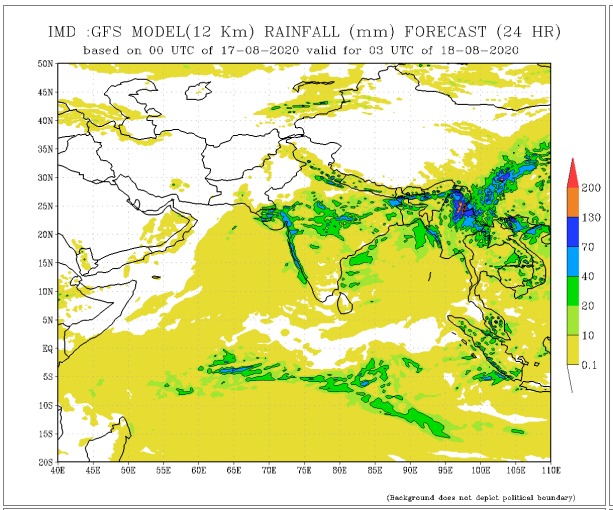
## PREDICTIONS

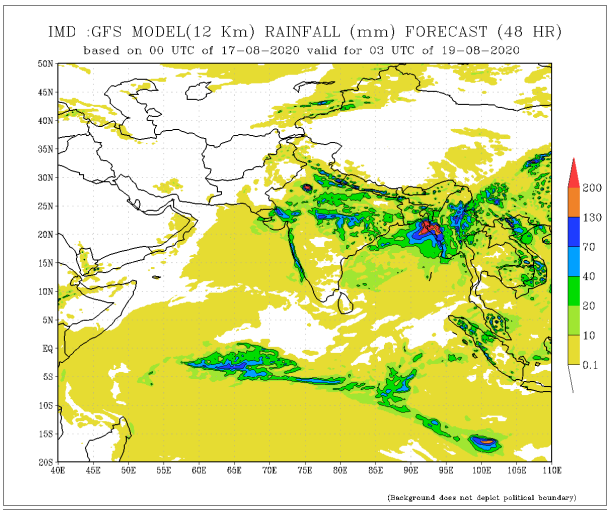
### NCEP GFS 1- 14 Day prediction

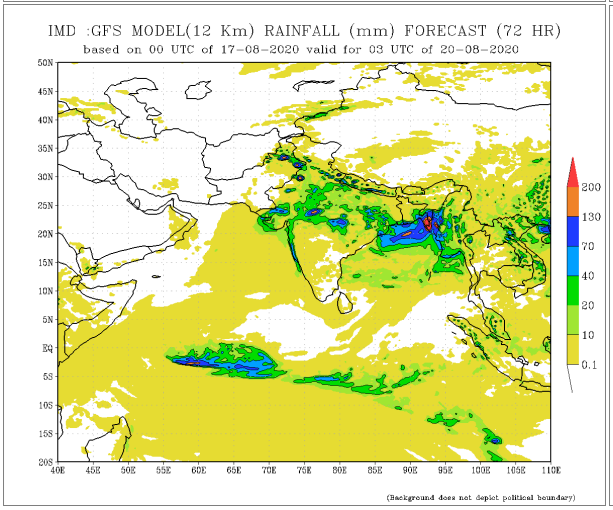


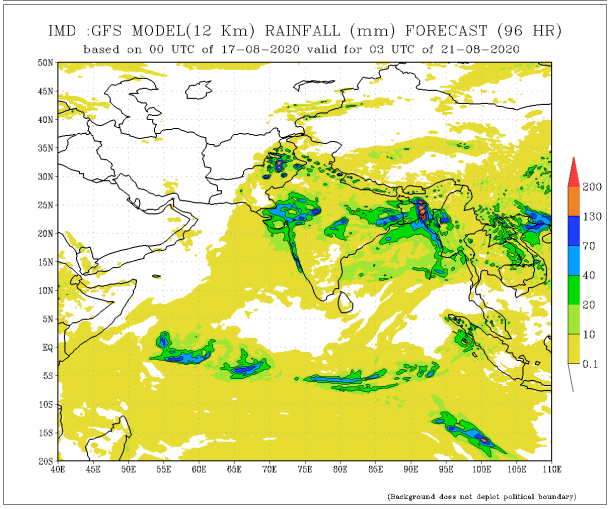



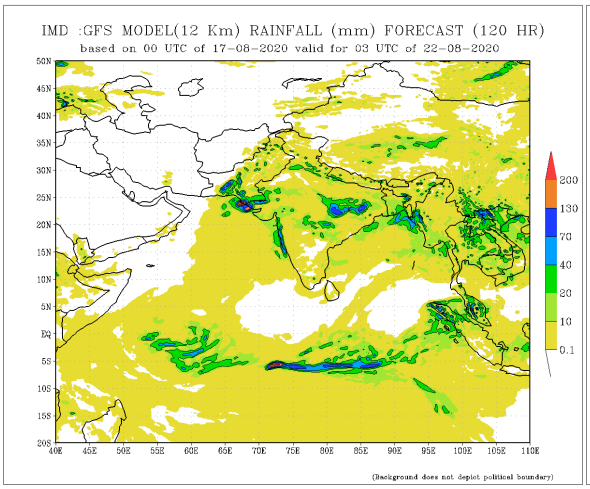

### IMD GFS (T574) Model Rainfall Forecast from RMSC New Delhi, India

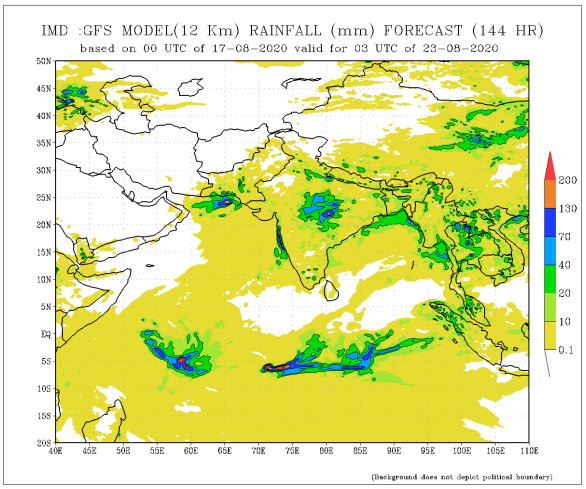


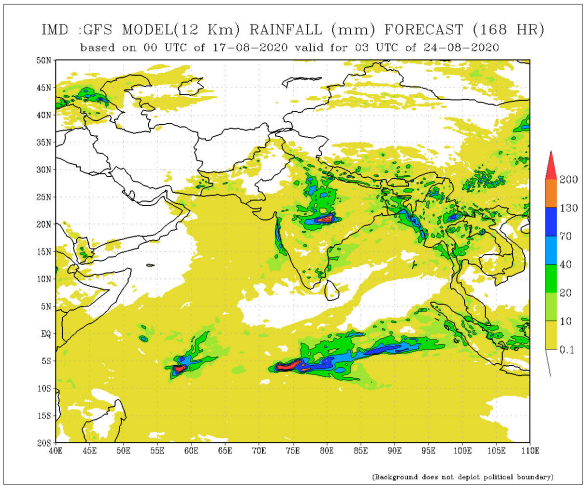



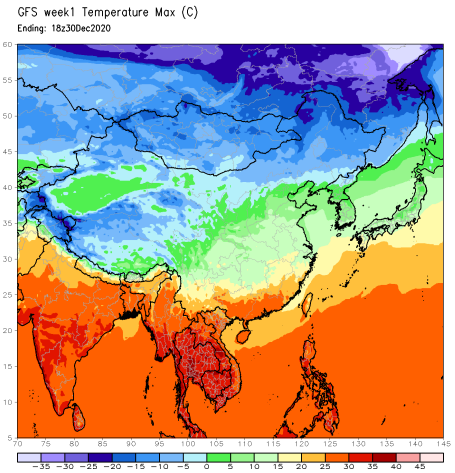


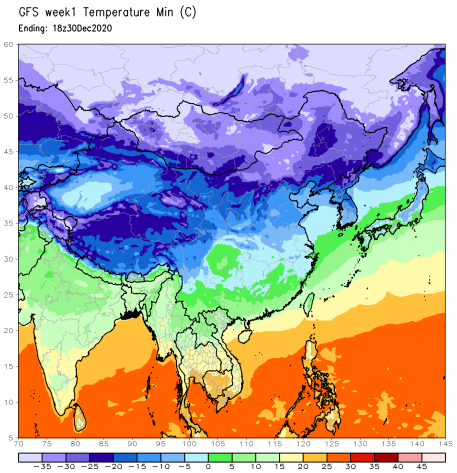




## Weekly Temperature Forecast

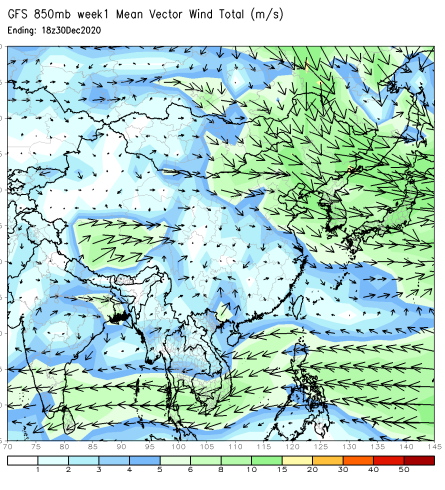
**Weekly Minimum and Maximum Temperature prediction from the GFS model (from NOAA CPC)**

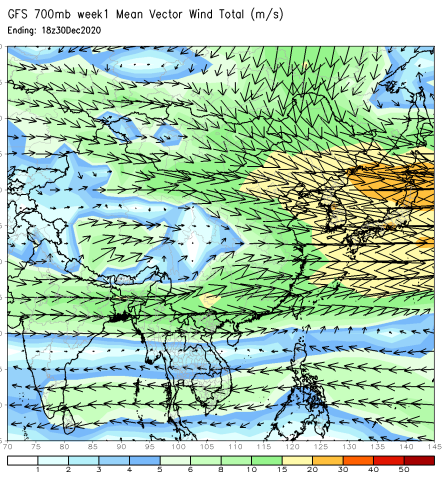



## Weekly Wind Forecast

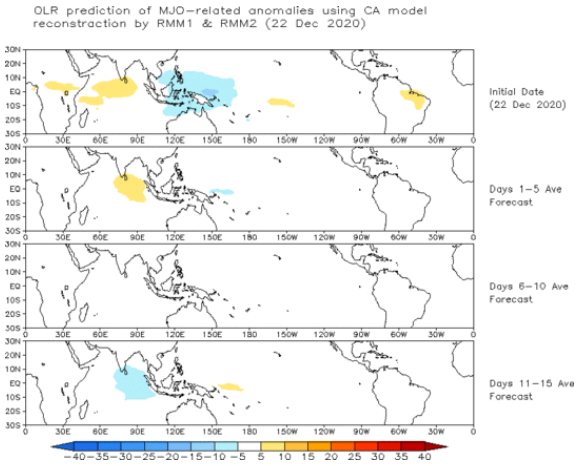
**Weekly mean vector wind total prediction from the GFS model at 850 mb (left) and 700 mb (right) levels. (from NOAA CPC)**



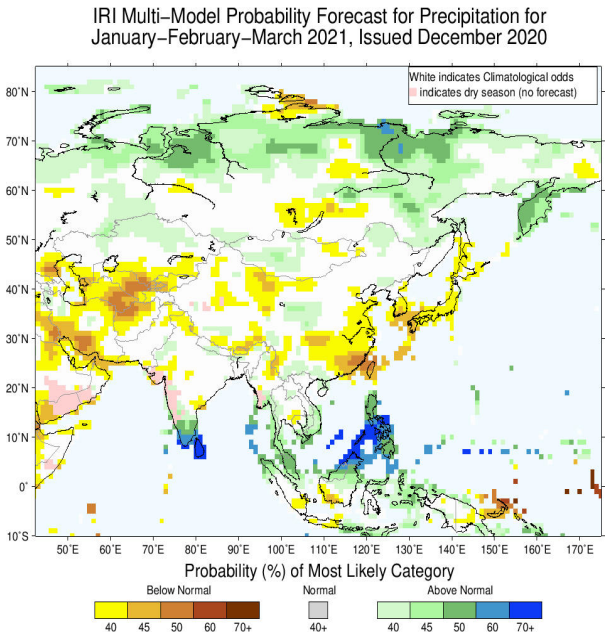
## Madden Julian Oscillation (MJO) related Outgoing Longwave Radiation (OLR) Forecast

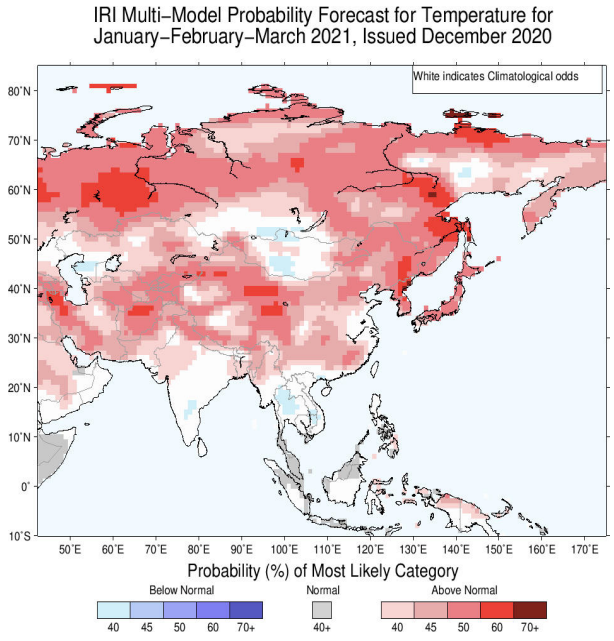
**The Outgoing Longwave Radiation (OLR) is a proxy for rainfall. This can be used to identify convective rain clouds based on the MJO phase. Violet and Blue shading indicates enhanced tropical weather and Orange shading indicates suppressed conditions. The following figure shows the forecasts of MJO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




## 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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