

23 DECEMBER  
2022

CLIMATE MONITORING AND PREDICTION FOR SRI LANKA

## HIGHLIGHTS

### Rainfall Prediction



- Due to the low pressure area over southwest Bay of Bengal, fairly heavy rainfall is predicted for the Eastern, Sabaragamuwa, and Western provinces during 22<sup>nd</sup> - 28<sup>th</sup> December.
- Seasonal forecast shows higher tendency for above normal precipitation to the country for January - March, 2023.

### Monitored Rainfalls



- During the last week, maximum daily rainfall over Sri Lanka was 106.6 mm & hydro catchment areas received 83.0 mm on maximum and the highest average rainfall (10.1 mm) was received Eastern plains of the country.

### Monitored Wind



- From 13<sup>th</sup> - 19<sup>th</sup> Dec, up to 8m/s of north easterly winds were experienced at 850 mb level over the island.
- Strong winds and rough seas are expected for following days due to the effect of low pressure area in vicinity of the country.

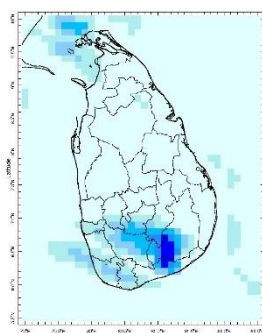
### Monitored Sea & Land Temp



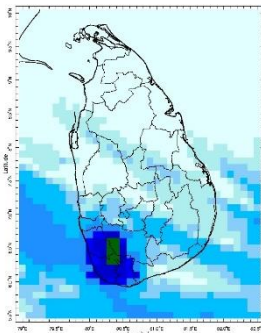
- Sea surface temperature around Sri Lanka was above normal to the western, eastern, and southern half of the country.
- Land surface temperature remained near normal.

## Monitoring Rainfall

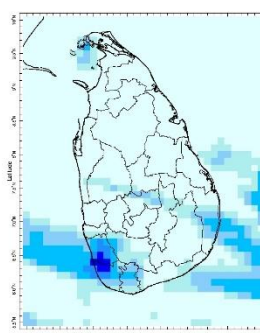
### Daily Estimates for Rainfall from 13<sup>th</sup> December – 20<sup>th</sup> December 2022



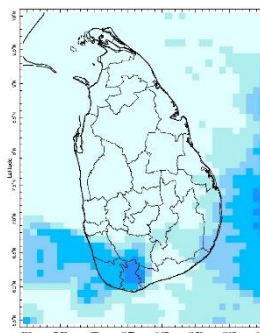
13 December



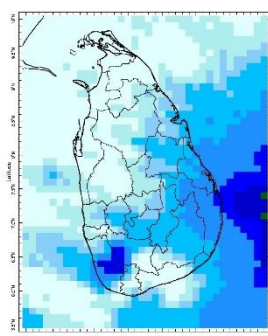
14 December



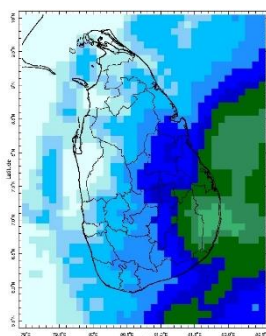
15 December



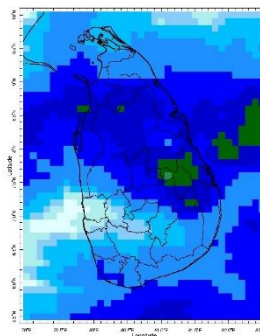
16 December



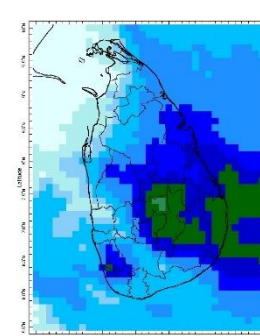
17 December



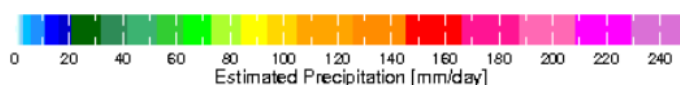
18 December



19 December



20 December



Estimated Precipitation [mm/day]



Federation for  
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### Federation for Environment, Climate and Technology

c/o, Maintenance Office, Mahaweli Authority, Digana Village, Rajawella, Sri Lanka.

Phone (+94) 81-2376746, (+94) 81-2300415

Web Site: [www.fect.lk](http://www.fect.lk)

E mail: [info@fect.lk](mailto:info@fect.lk)

LI: [www.linkedin.com/in/fectlk](https://www.linkedin.com/in/fectlk)

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## Ocean State *(Text Courtesy IRI)*

### ***Pacific sea state: December 19, 2022***

Equatorial sea surface temperatures (SSTs) are below average across most of the Pacific Ocean mid - December. The tropical Pacific atmosphere is consistent with La Niña. A large majority of the models indicate La Niña is favored to continue into the winter, with equal chances of La Niña and ENSO-neutral during January-March 2023. In February-April 2023, there is a 71% chance of ENSO-neutral.

### ***Indian Ocean State***

Sea surface temperature around Sri Lanka was above 0.5°C to the western, eastern, and southern half of the country in 30<sup>th</sup> November, 2022. Across the Indian Ocean, a classical negative Indian Ocean Dipole prevails as is typical during a La Niña.

## Predictions

### Rainfall

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

**From 22<sup>nd</sup> December – 28<sup>th</sup> December:**

Total rainfall by Provinces:

| Rainfall | Provinces  |
|----------|--|
| 55 mm    | Eastern, Western, Sabaragamuwa                                 |
| 45 mm    | Northern, Central, Southern, North Western, North Central, Uva |

**From 29<sup>th</sup> December – 4<sup>th</sup> January:**

Total rainfall by Provinces:

| Rainfall | Provinces   |
|----------|---|
| 35 mm    | Eastern   |
| 25 mm    | Western, North Central, Northern                    |
| ≤ 15 mm  | Southern, Sabaragamuwa, Central, North Western, Uva |

### **MJO based OLR predictions**

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

MJO shall near neutral the rainfall during 22<sup>nd</sup> December – 26<sup>th</sup> December, and moderately suppress the rainfall during 27<sup>th</sup> December – 5<sup>th</sup> January for Sri Lanka.

## Interpretation

### Monitoring

***Rainfall:*** During the last two weeks, there had been very heavy rainfall over the following area: Trincomalee

Daily Average Rainfall in the Met stations for previous week of (13<sup>th</sup> December – 20<sup>th</sup> December) = 7.7 mm

Rmax: 106.6 mm & Rmin: 0.0 mm.

| Region          | Average rainfall for the Last 8 days |
|-----------------|--------------------------------------|
| Northern Plains | 7.5 mm                               |
| Eastern         | 10.1 mm                              |
| Western         | 6.0 mm                               |
| Southern Plains | 3.8 mm                               |

The Hydro Catchment Areas recorded 8.1 mm of average rainfall for the last week

Rmax: 83.0 mm & Rmin: 0.0 mm.

**Wind:** North easterly winds prevailed in the sea area and around the island last week.

**Temperatures:** The temperature anomalies were below normal for some parts of the North Western, North Central, and Central provinces, driven by the warm SST's.

## Predictions

**Rainfall:** During the next week (22<sup>nd</sup> Dec – 28<sup>th</sup> Dec), fairly heavy rainfall is predicted for the Eastern, Western, and Sabaragamuwa provinces; and  $\geq 45$  mm rainfall is expected for the rest of the country.

**Temperatures:** The temperature will remain below normal for some parts of the Central, Uva, and Sabaragamuwa provinces during 23<sup>rd</sup> – 29<sup>th</sup> December.

**Teleconnections:** La Niña is favored to continue into the winter, with equal chances of La Niña and ENSO-neutral during January-March 2023.

MJO shall near neutral the rainfall during 22<sup>nd</sup> December – 26<sup>th</sup> December, and moderately suppress the rainfall during 27<sup>th</sup> December – 5<sup>th</sup> January for Sri Lanka.

**Seasonal Precipitation:** The precipitation forecast for the January-February-March 2023 season shows a higher tendency for above-normal precipitation to the country.

## Terminology for Rainfall Ranges

|                   | Rainfall (During 24 hours of period) |
|-------------------|--------------------------------------|
| Light Showers     | Less than 12.5 mm                    |
| Light to Moderate | Between 12.5 mm and 25 mm            |
| Moderate          | Between 25 mm and 50 mm              |
| Fairly Heavy      | Between 50 mm and 100 mm             |
| Heavy             | Between 100 mm and 150 mm            |
| Very Heavy        | More than 150 mm                     |

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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#### 2. Predictions

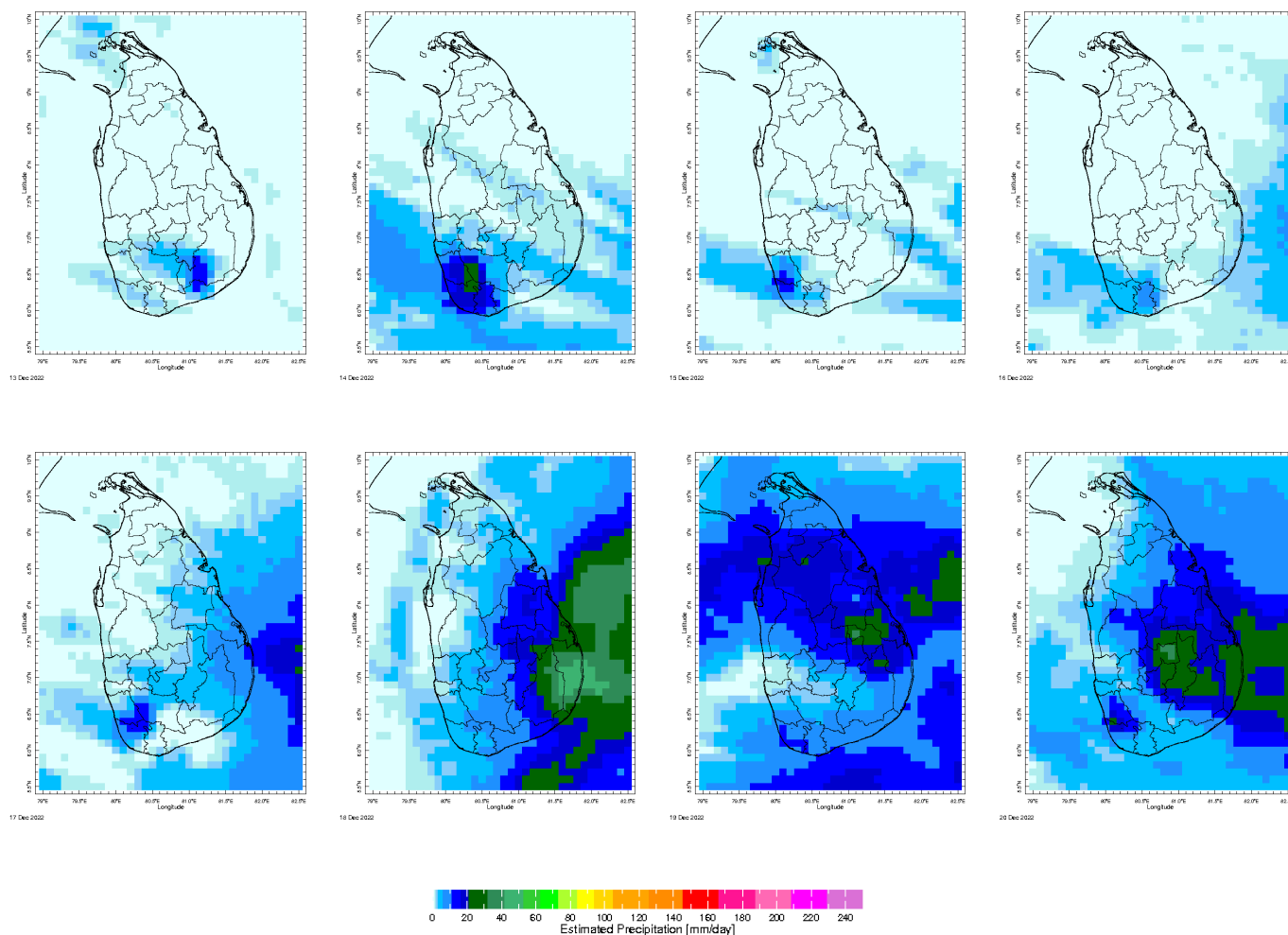
- NCEP GFS Ensemble 1-14 day Rainfall Predictions
- GFS (T574) Model Rainfall Forecast from RMSC New Delhi
- MJO Related OLR Forecast
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### MONITORING

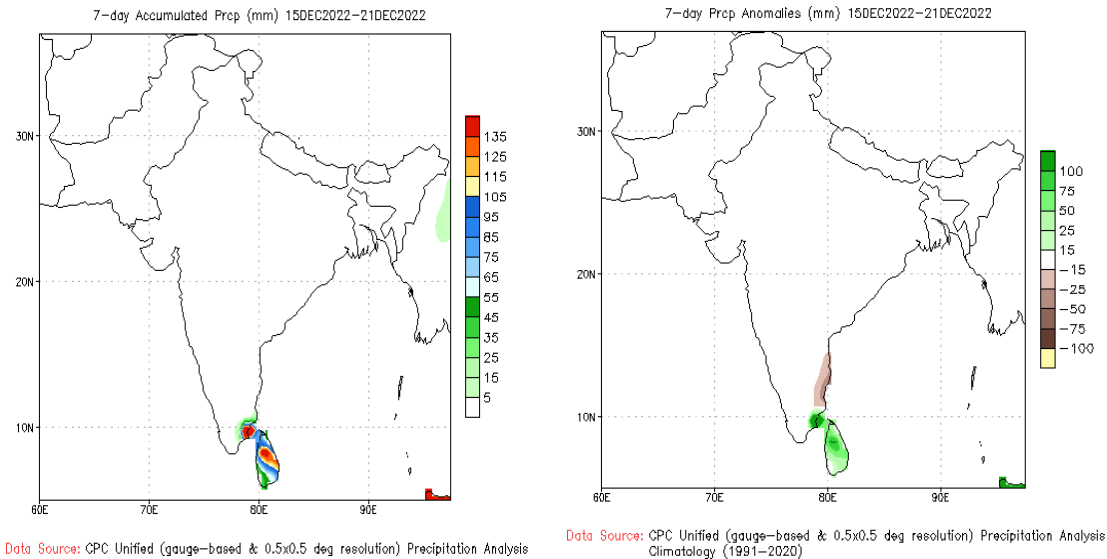
#### Daily Rainfall Monitoring

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



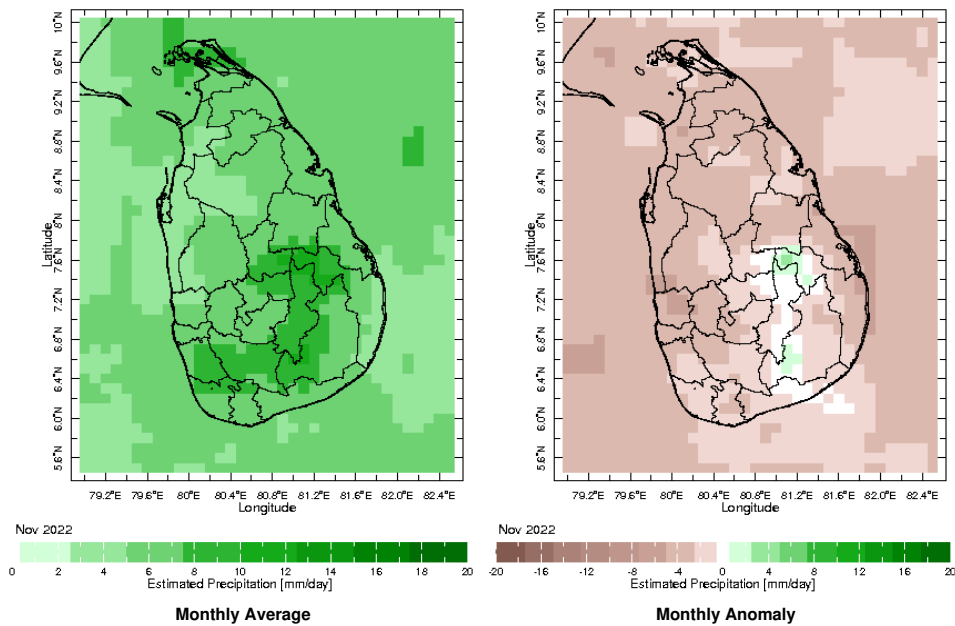
Weekly Rainfall Monitoring

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.

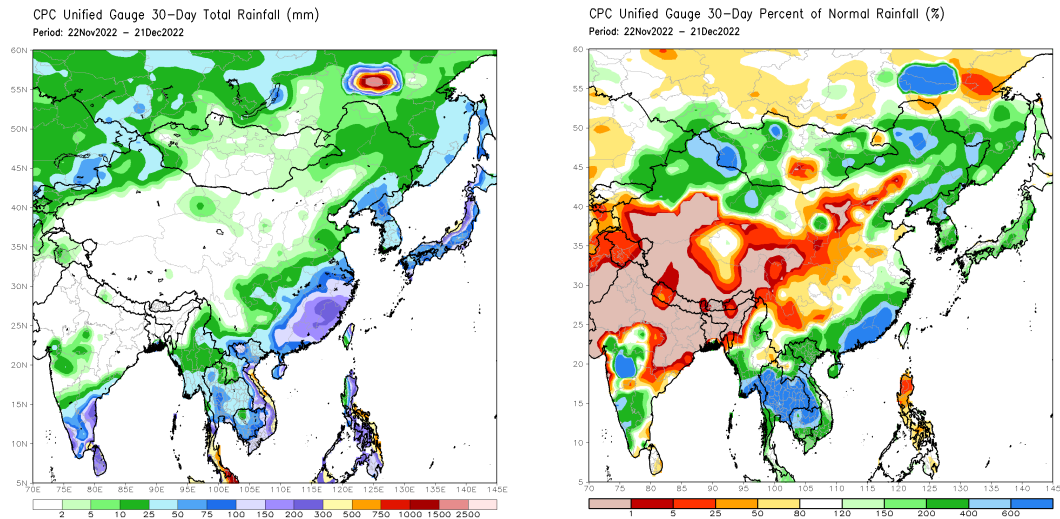


Monthly Rainfall Monitoring

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

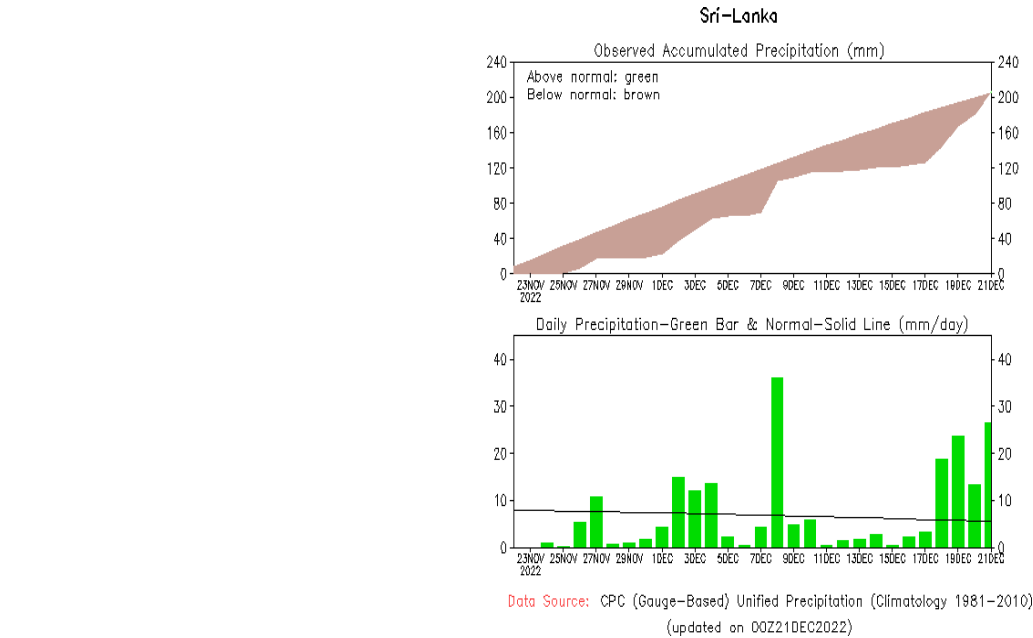


The figure in the top-left shows the total rainfall in the past 30 days from CPC Unified Precipitation Analysis while the figure in the top-right shows the total rainfall for the same period from RFE 2.0 Satellite Rainfall Estimates. The bottom two figures show the percentage of rainfall received in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

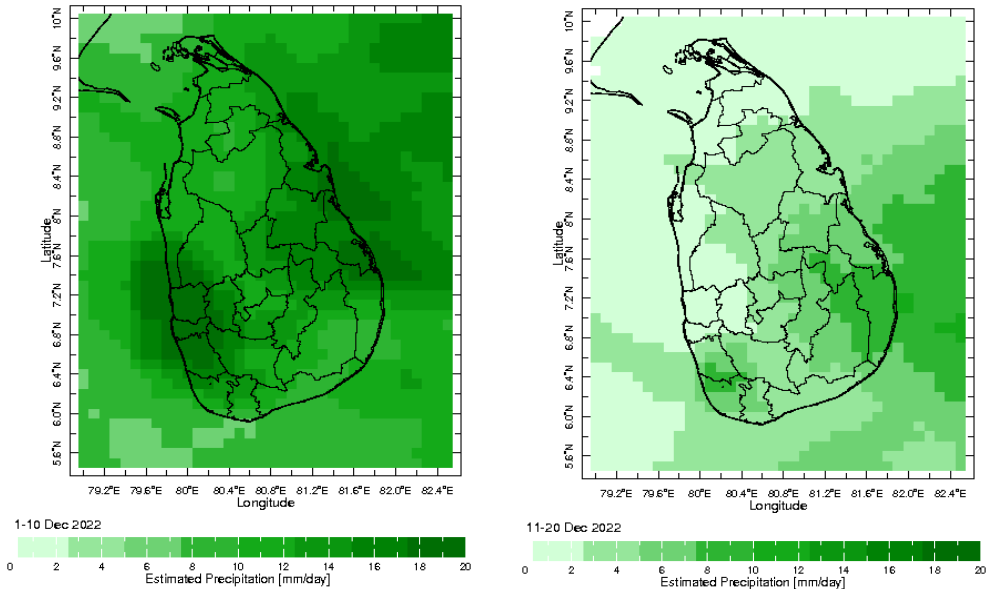




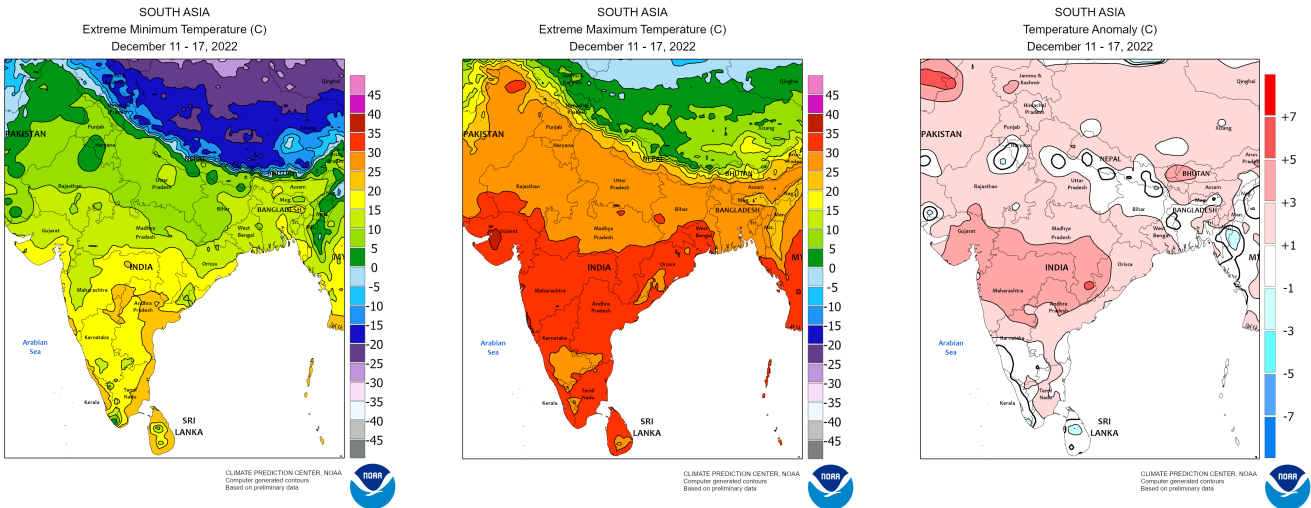
The following figure shows the observed accumulated rainfall (top) and daily observed rainfall (bottom) in Sri Lanka in the last 30 days.



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

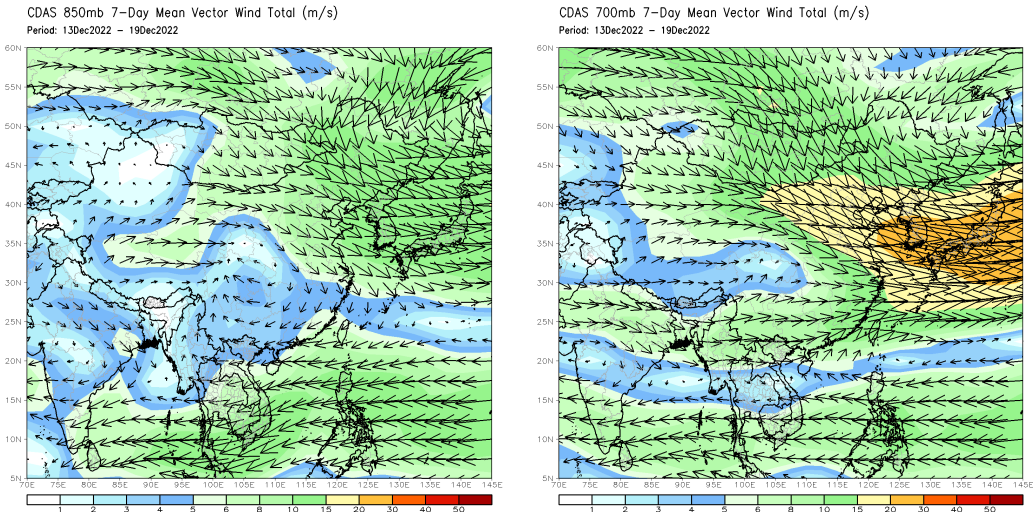


**Weekly Temperature Monitoring**



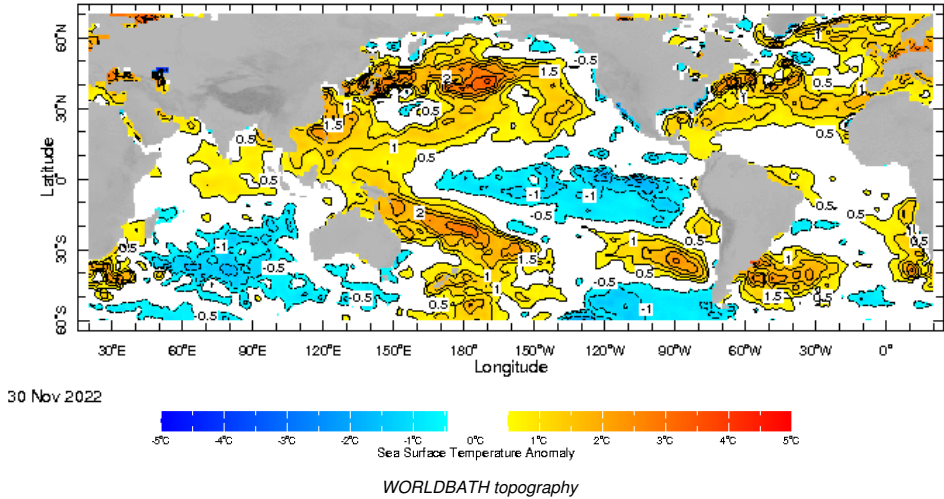
Weekly Wind Monitoring

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.

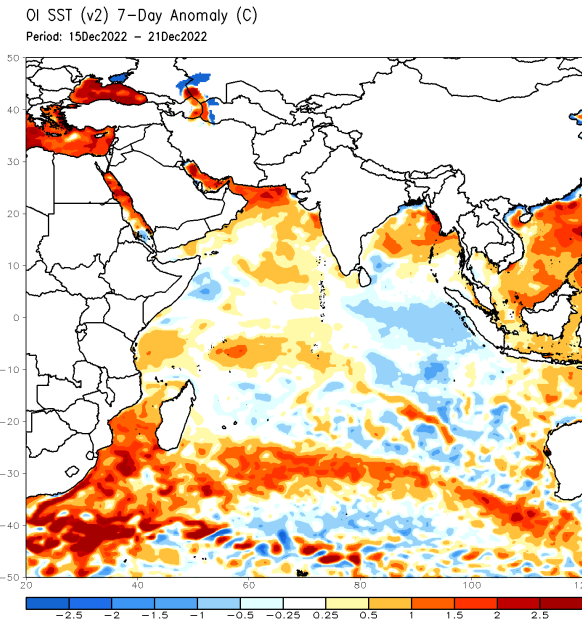


Weekly Average SST Anomalies

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

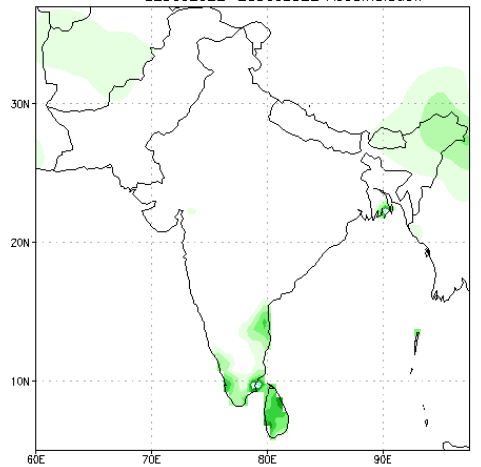


Optimum Interpolated Sea Surface Temperature Anomaly in the Indian Ocean from NOAA CPC



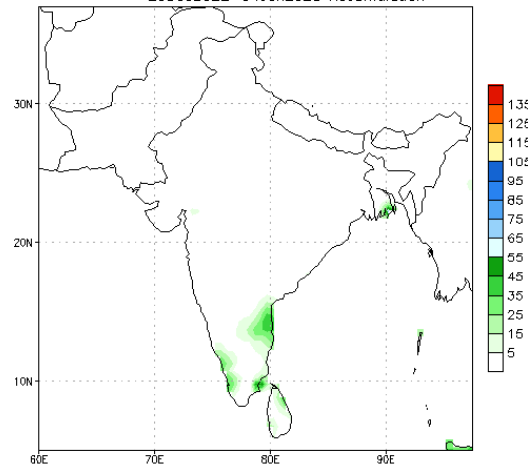
## NCEP GFS 1- 14 Day prediction

NCEP GFS Ensemble Forecast 1-7 Day Precipitation (mm)  
from: 22Dec2022  
22Dec2022-28Dec2022 Accumulation



Bias correction based on last 30-day forecast error

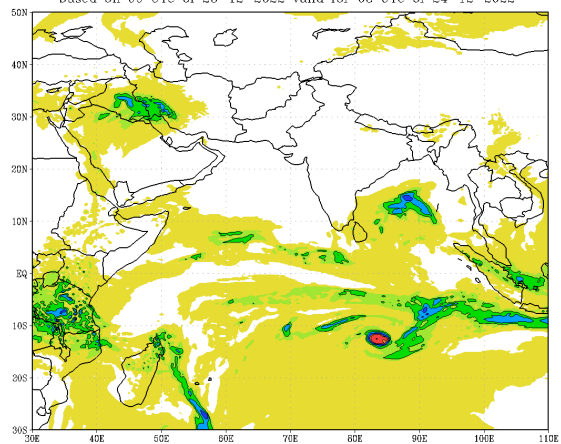
NCEP GFS Ensemble Forecast 8-14 Day Precipitation (mm)  
from: 22Dec2022  
29Dec2022-04Jan2023 Accumulation



Bias correction based on last 30-day forecast error

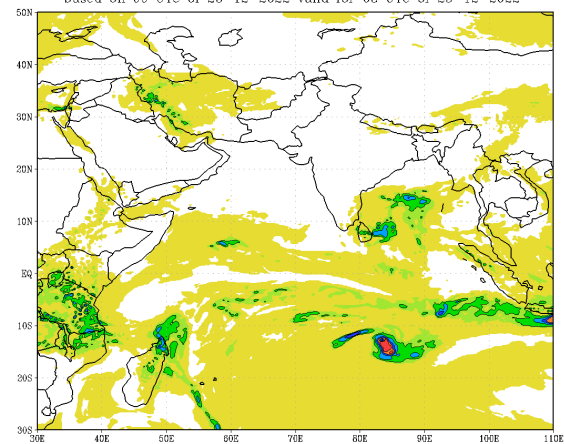
## IMD GFS (T574) Model Rainfall Forecast from RMSC New Delhi, India

IMD :GFS MODEL(12 Km) RAINFALL (mm) FORECAST (24 HR)  
based on 00 UTC of 23-12-2022 valid for 03 UTC of 24-12-2022



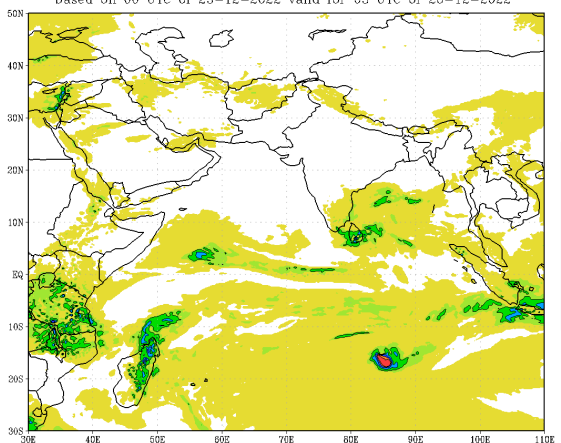
(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) RAINFALL (mm) FORECAST (48 HR)  
based on 00 UTC of 23-12-2022 valid for 03 UTC of 25-12-2022



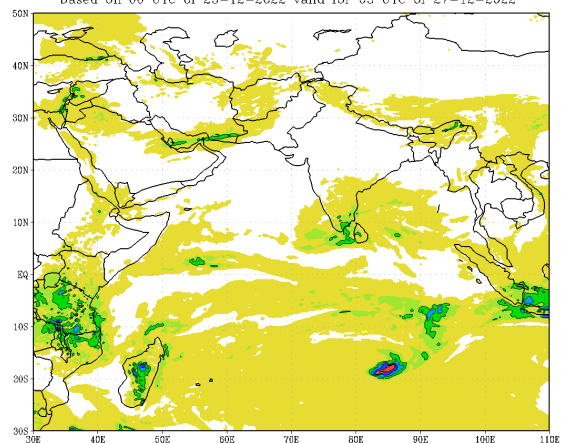
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IMD :GFS MODEL(12 Km) RAINFALL (mm) FORECAST (72 HR)  
based on 00 UTC of 23-12-2022 valid for 03 UTC of 26-12-2022



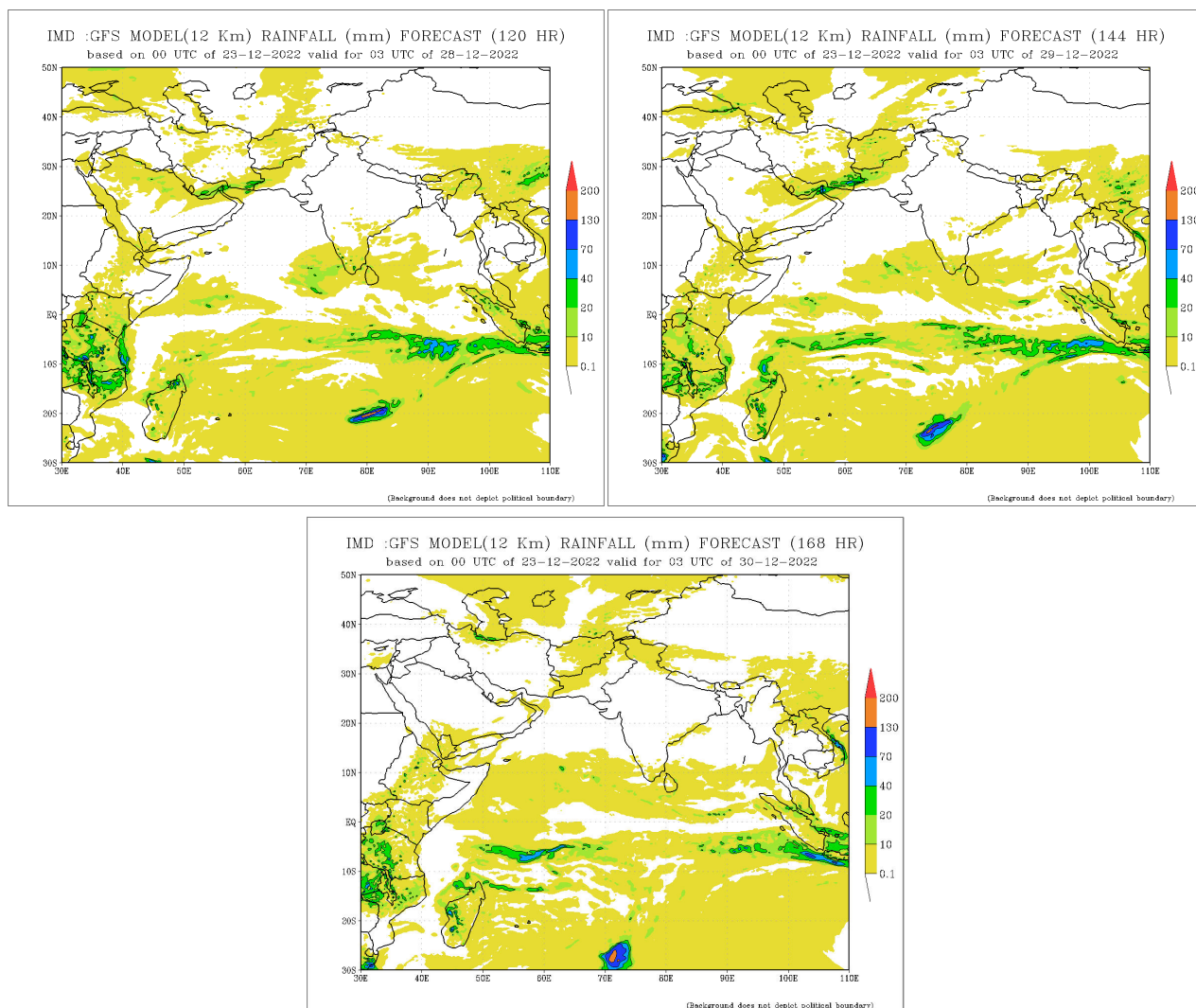
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IMD :GFS MODEL(12 Km) RAINFALL (mm) FORECAST (96 HR)  
based on 00 UTC of 23-12-2022 valid for 03 UTC of 27-12-2022



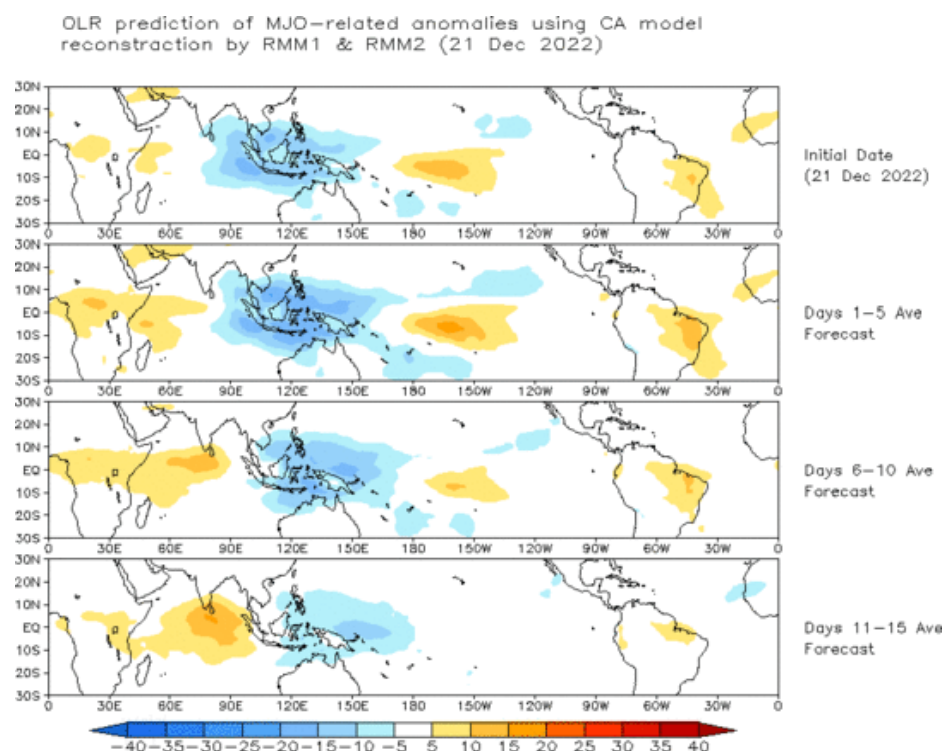
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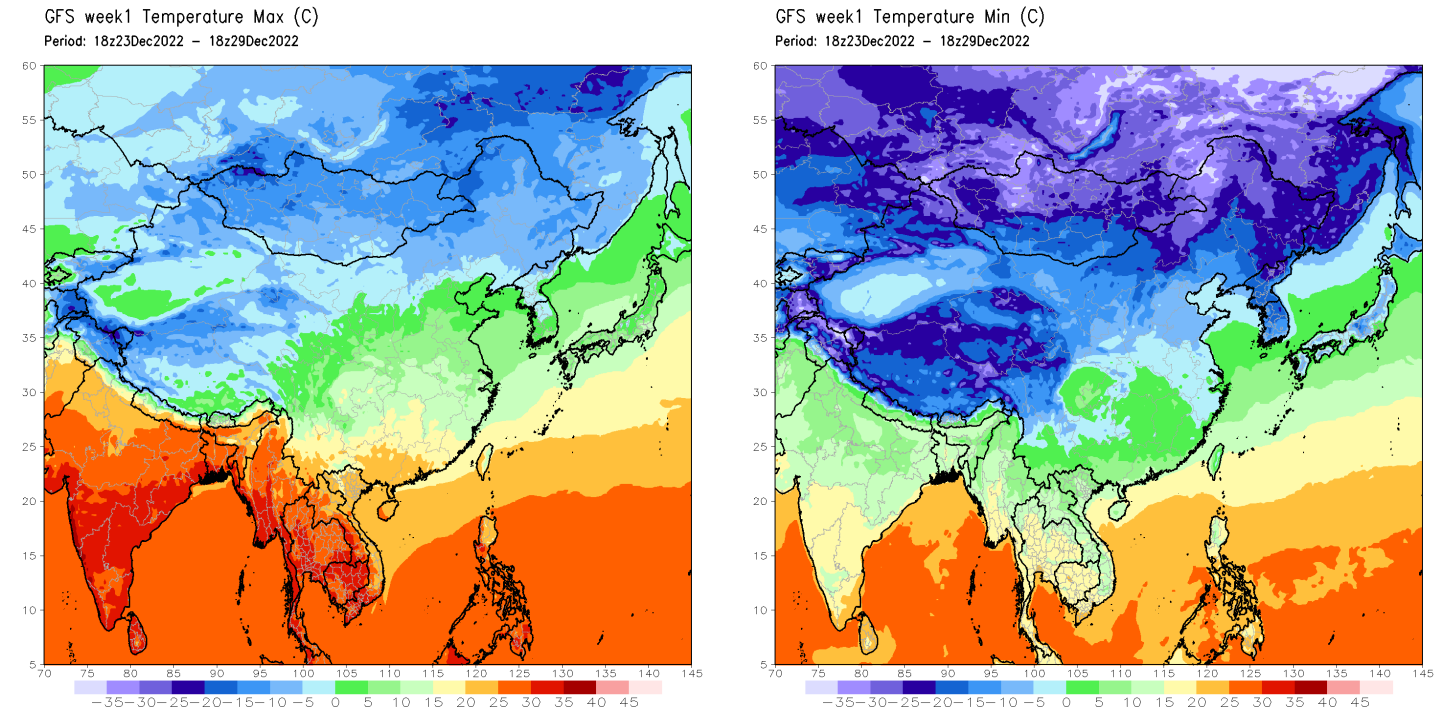
## Madden Julian Oscillation (MJO) related Outgoing Longwave Radiation (OLR) Forecast

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 anomalous OLR for the next 15 days from the Constructed Analogue (CA) model forecasts.



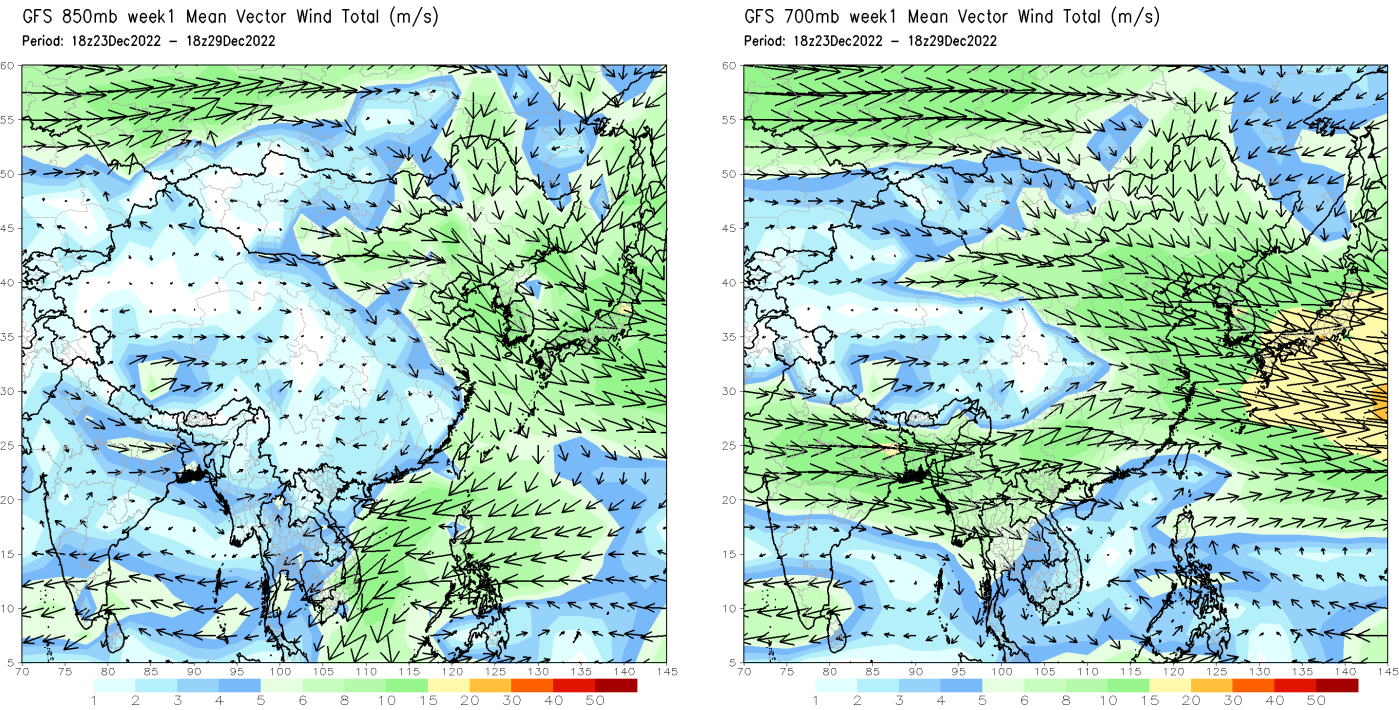
Weekly Temperature Forecast

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



Weekly Wind Forecast

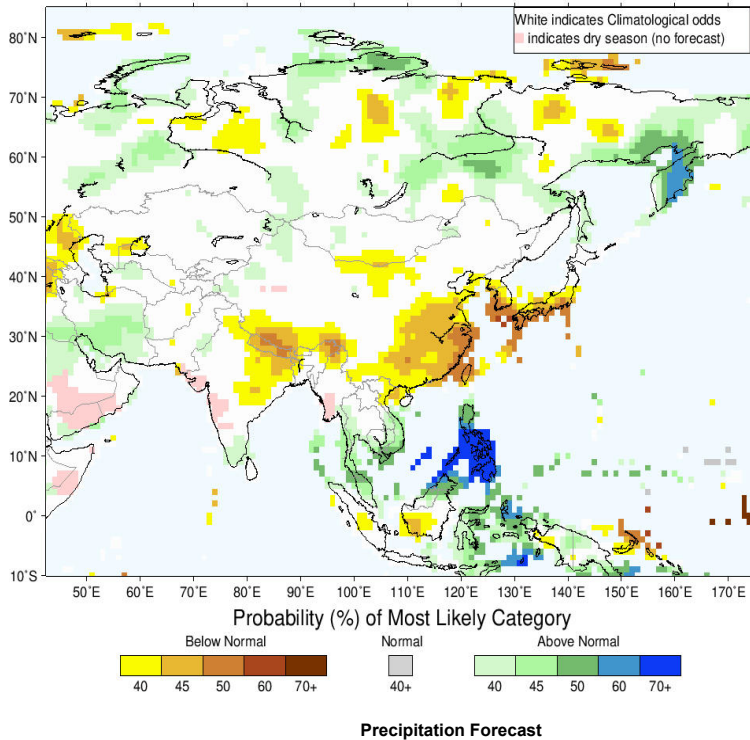
Weekly mean vector wind total prediction from the GFS model at 850 mb (left) and 700 mb (right) levels. (from NOAA CPC)



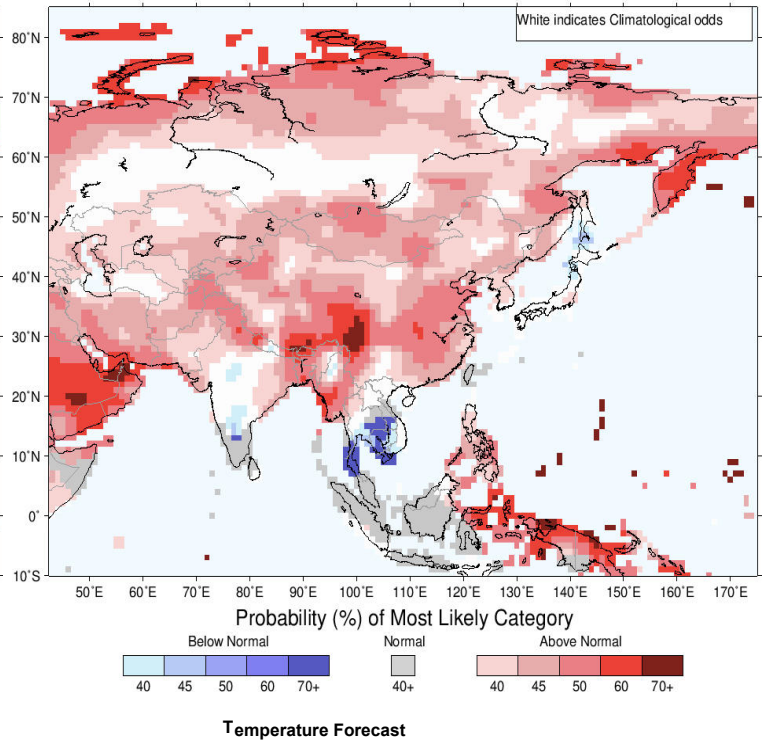
## Seasonal Rainfall and Temperature Forecast

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%).

IRI Multi-Model Probability Forecast for Precipitation for December-January-February 2023, Issued November 2022



IRI Multi-Model Probability Forecast for Temperature for December-January-February 2023, Issued November 2022



### About us

FECT is a federation of 7 organizations registered in four countries which works in countries across the Indian Ocean Islands and its littoral. Over the last 20 years, we have had operations in Africa, South Asia, South-East Asia but now it is mostly in the Indian Ocean Islands.

### Contact us

Federation for Environment, Climate & Technology  
76/2 Matale Road, Akurana  
Kandy  
KY20850  
SRI LANKA

email: [info@fect.lk](mailto:info@fect.lk)  
phone: (+94) 81 2376746

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