

# HIGHLIGHTS

**Rainfall Prediction**



- High probability of heavy rainfall (> 100 mm) is predicted for Sabaragamuwa, Northern provinces and fairly heavy rainfall is predicted for Central, Uva, North Western provinces during 15 - 21 Dec.

**Monitored Rainfalls**



- During the last week, average daily rainfall over Sri Lanka was 10.4 mm and hydro catchment was 16.5 mm.
- Extreme rainfall (> 150 mm/day) was in Badulla.
- The rainfall of last week was twice as normal.

**Monitored & Predicted Wind**



- From 4 - 10 Dec, up to 4 m/s of south westerly winds were at 850 mb (1.5 km).
- During 14 - 20 Dec, up to 8 m/s of easterly winds are expected at 850 mb (1.5 km).

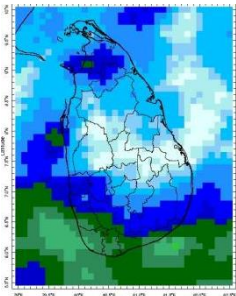
**Monitored Sea & Land Temp**



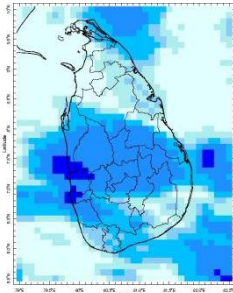
- Sea surface temperature around Sri Lanka was 0.25 - 1.5°C above normal.
- From 7 - 13 Dec, maximum daily temperature was recorded in Moneragala (34.3°C) and Ratnapura (33.8°C).

## Monitoring Rainfall

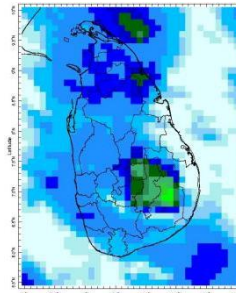
### Daily Estimates for Rainfall from 4<sup>th</sup> December - 11<sup>th</sup> December 2023



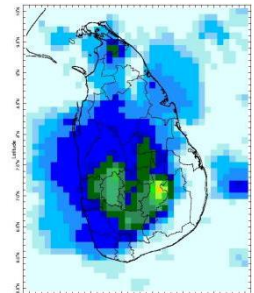
4 December



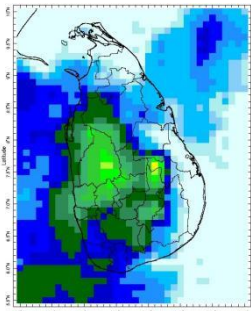
5 December



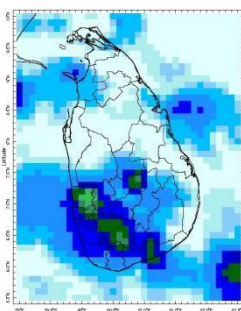
6 December



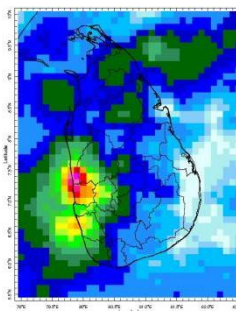
7 December



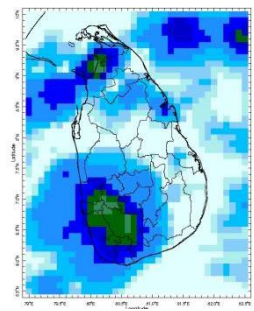
8 December



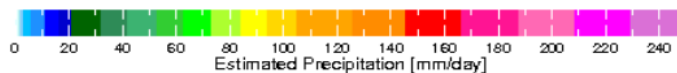
9 December



10 December



11 December



Federation for  
Environment, Climate  
& Technology

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## Ocean State *(Text Courtesy IRI)*

### **Pacific sea state: December 11, 2023**

El Niño Mode has set in according to NOAA since 8<sup>th</sup> of June. Equatorial sea surface temperatures (SSTs) are above average across the central and eastern Pacific Ocean mid-December. El Niño is anticipated to continue through the Northern Hemisphere spring (with a 62% chance during April-June 2024).

### **Indian Ocean State**

Sea surface temperature around Sri Lanka was 0.5°C above normal to the country in 21<sup>st</sup> - 27<sup>th</sup> November, 2023. A positive Dipole Mode has set in across the Indian Ocean since 8<sup>th</sup> of June.

## Predictions

### Rainfall

#### **1 - 7 Day prediction: IMD GFS models**

**From 15<sup>th</sup> December - 21<sup>st</sup> December:**

Total rainfall by Provinces:

Rainfall (mm)	Provinces
> 130	Sabaragamuwa
70 - 130	Northern
40 - 70	Central, Uva, North Western
20 - 40	Western, Southern, Eastern, North Central

### MJO based OLR predictions

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

MJO shall moderately suppress the rainfall during 13<sup>th</sup> - 22<sup>nd</sup> December and slightly suppress the rainfall during 23<sup>rd</sup> - 27<sup>th</sup> December for Sri Lanka.

## Interpretation

### Monitoring

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

Daily Average Rainfall in the Met stations for previous week of (6<sup>th</sup> December - 13<sup>th</sup> December) = 10.4 mm

Maximum Daily Rainfall: 94.9 mm & Minimum Daily Rainfall: 0.0 mm.

Region	Average rainfall for last 8 days (mm)	Average temperature for last 8 days (°C)	
		Maximum	Minimum
Northern plains	8.9	30.8	24.7
Eastern hills	8.1	25.5	18.6
Eastern plains	11.6	30.9	24.3

Western hills	11.5	27.7	19.3
Western plains	13.6	31.4	24.4
Southern plains	7.0	31.2	24.4

Region	Average rainfall for last 8 days (mm)	Daily maximum rainfall for last 8 days (mm)	Daily minimum rainfall for last 8 days (mm)
Hydro catchment	16.5	119.9	0.0

**Wind:** South westerly winds prevailed in the sea area and around the island last week.

**Temperatures:** The temperature anomalies were above normal for the country driven by the warm SST's.

## Predictions

**Rainfall:** During the next week (15<sup>th</sup> December - 21<sup>st</sup> December), heavy rainfall is predicted for the Sabaragamuwa, Northern provinces and fairly heavy rainfall is predicted for the Central, Uva, North Western provinces and less rainfall is predicted for rest of the country.

**Temperatures:** The temperature will remain seasonably near normal for the country during 14<sup>th</sup> December - 20<sup>th</sup> December.

**Teleconnections:** A positive Dipole Mode has set in across the Indian Ocean since 8<sup>th</sup> of June. MJO shall moderately suppress the rainfall during 13<sup>th</sup> - 22<sup>nd</sup> December and slightly suppress the rainfall during 23<sup>rd</sup> - 27<sup>th</sup> December for Sri Lanka.

**Seasonal Precipitation:** The precipitation forecast for the December-January-February, 2024 season shows near normal precipitation.

### 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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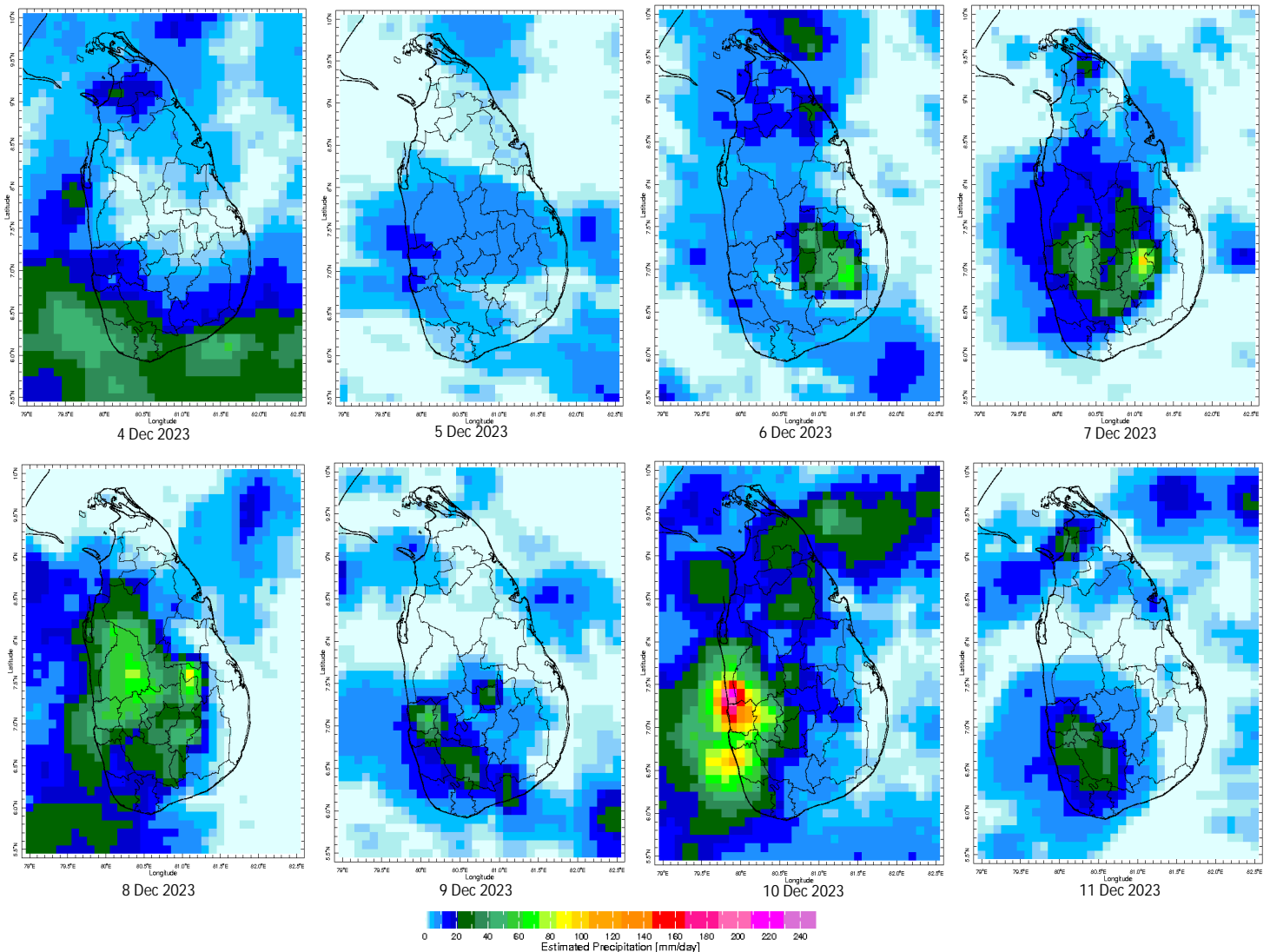
#### 2. Predictions

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### MONITORING

#### Daily Rainfall Monitoring

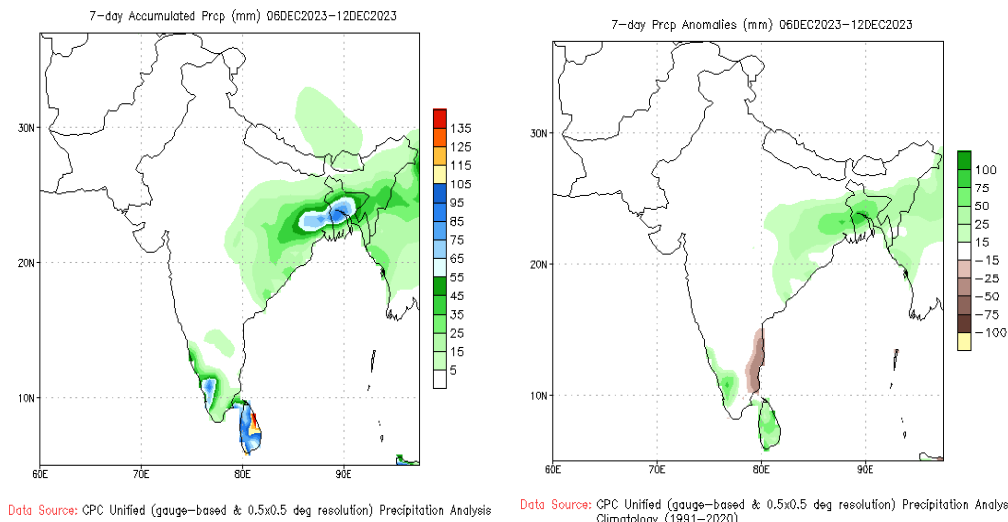
The following figures show the satellite observed rainfall in the last 7 days in Sri Lanka.





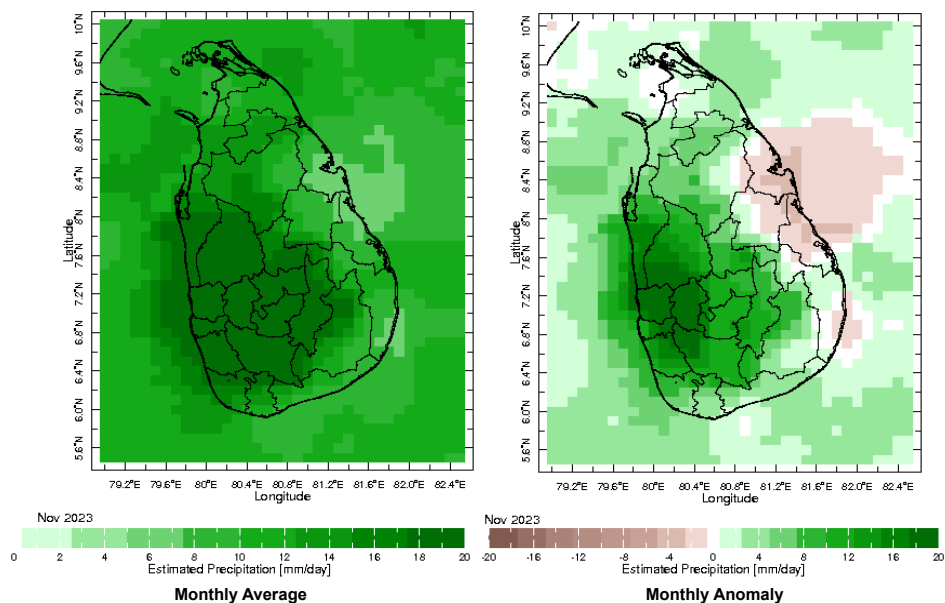
## Weekly Rainfall Monitoring

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.

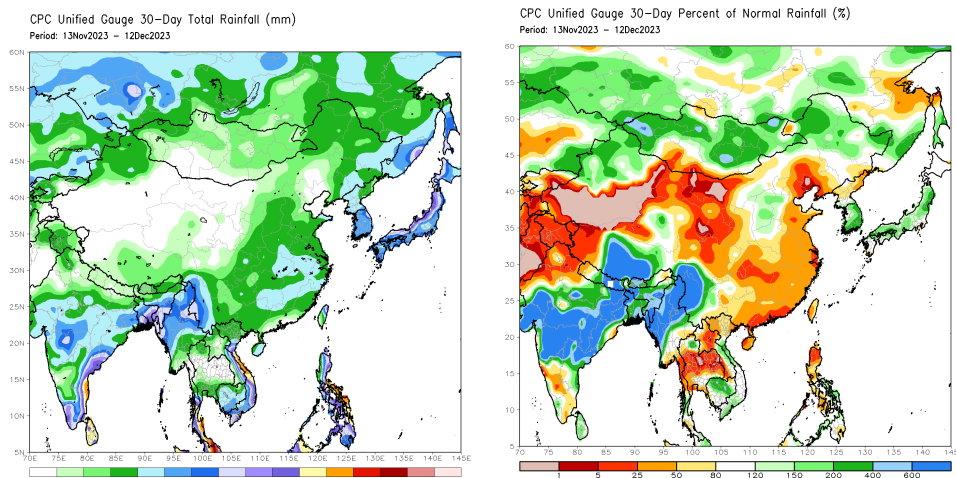


## Monthly Rainfall Monitoring

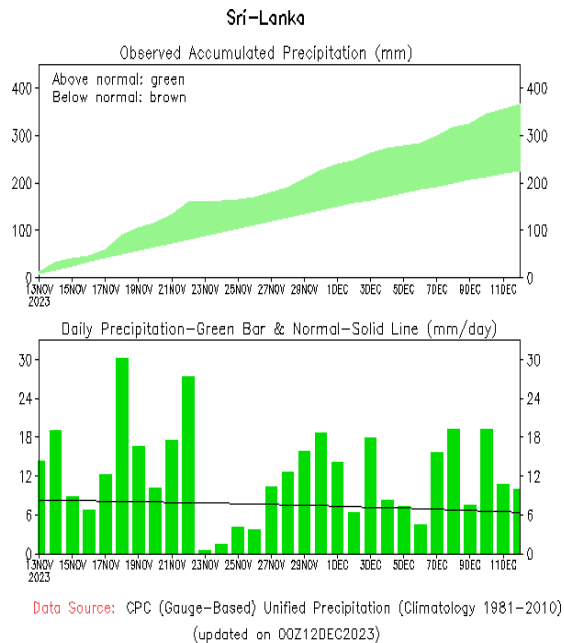
The figure in the left shows the average observed rainfall in the previous month. The rainfall anomaly in the previous month is shown in the figure to the right. The brown color in the anomaly figure shows places which received less rainfall than the historical average while the green color shows places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



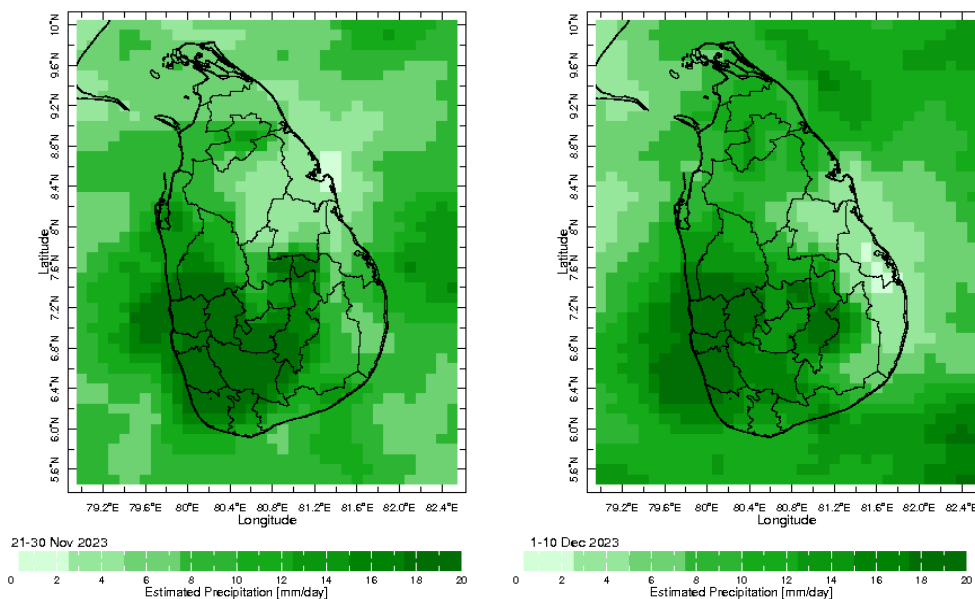
The figure in the top-left shows the total rainfall in the past 30 days from CPC Unified Precipitation Analysis while the figure in the top-right shows the total rainfall for the same period from RFE 2.0 Satellite Rainfall Estimates. The bottom two figures show the percentage of rainfall received in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



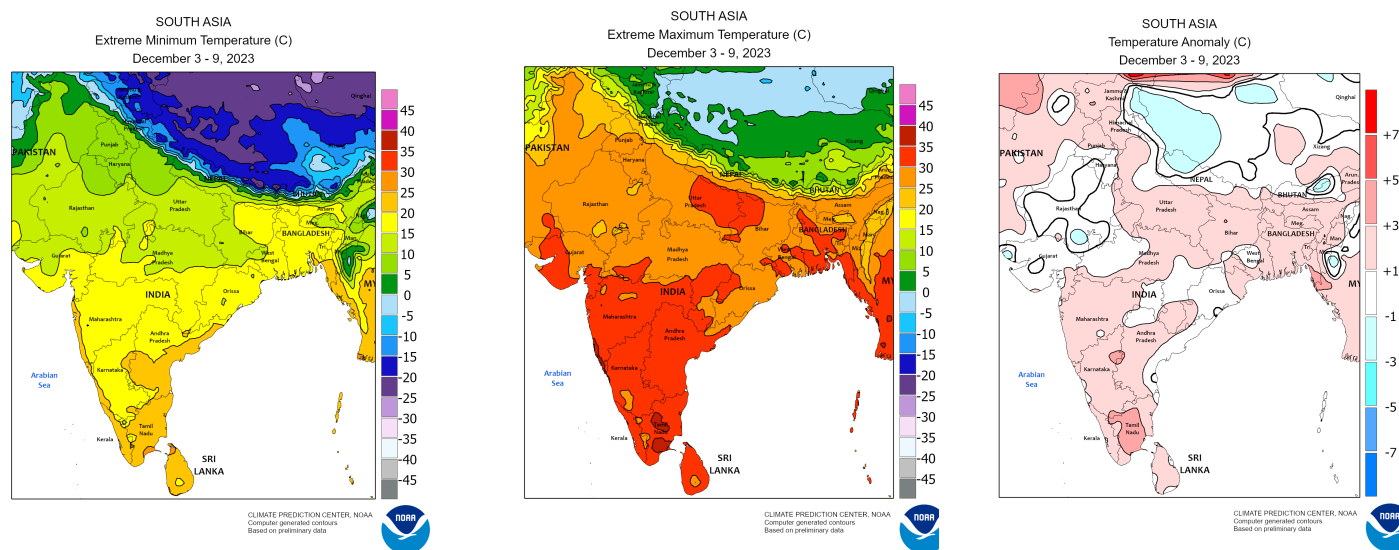
The following figure shows the observed accumulated rainfall (top) and daily observed rainfall (bottom) in Sri Lanka in the last 30 days.



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

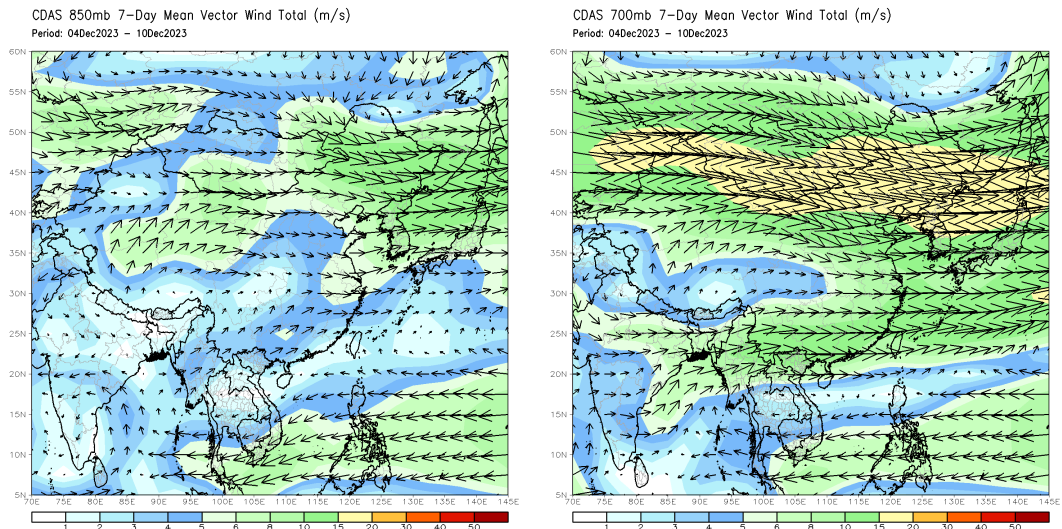


**Weekly Temperature Monitoring**



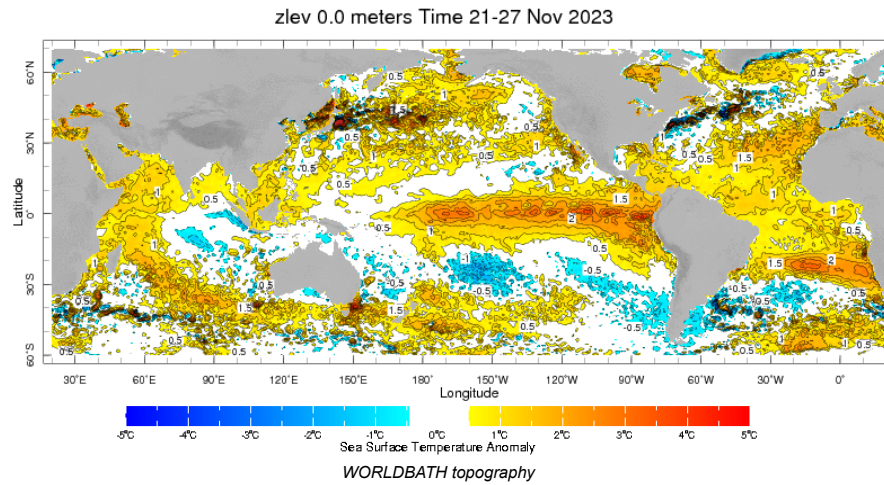
## Weekly Wind Monitoring

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.

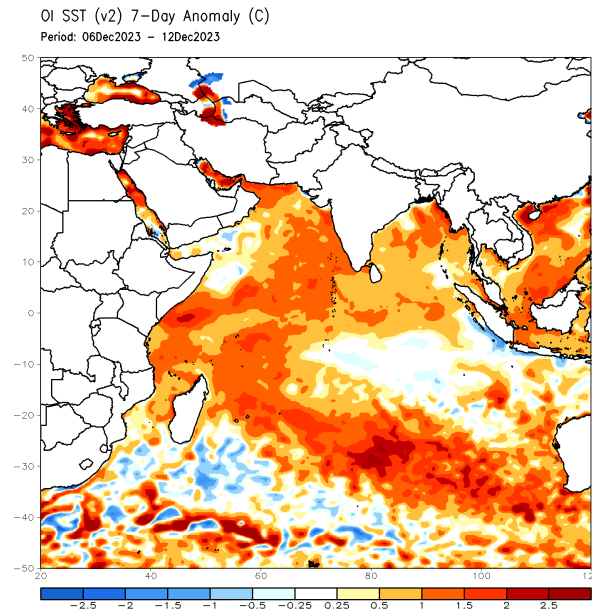


## Weekly Average SST Anomalies

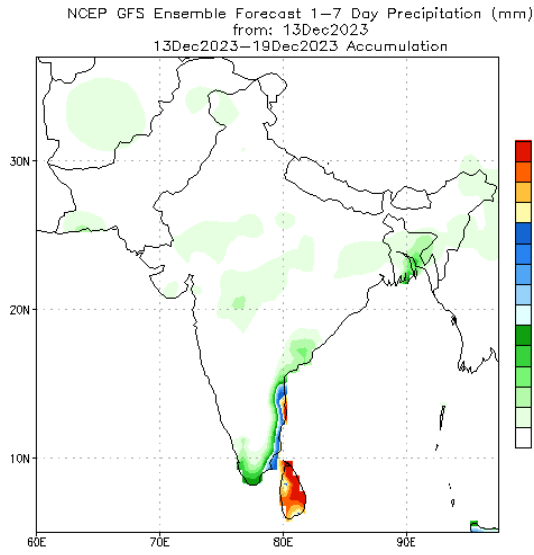
Weekly average Sea Surface Temperature (SST) anomaly in the world from NOAA NCEP



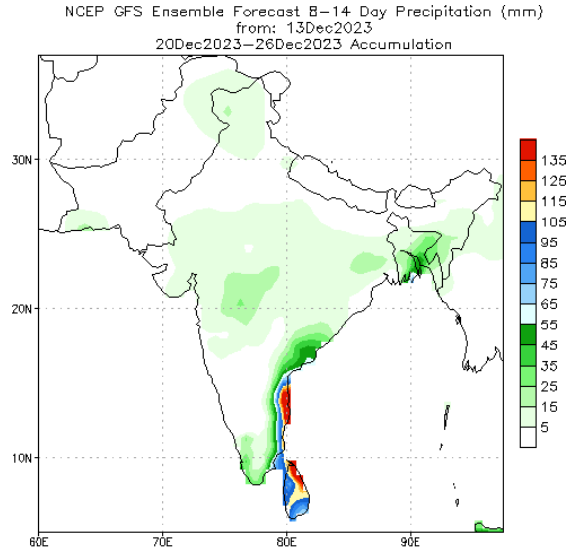
Optimum Interpolated Sea Surface Temperature Anomaly in the Indian Ocean from NOAA CPC



**NCEP GFS 1- 14 Day prediction**

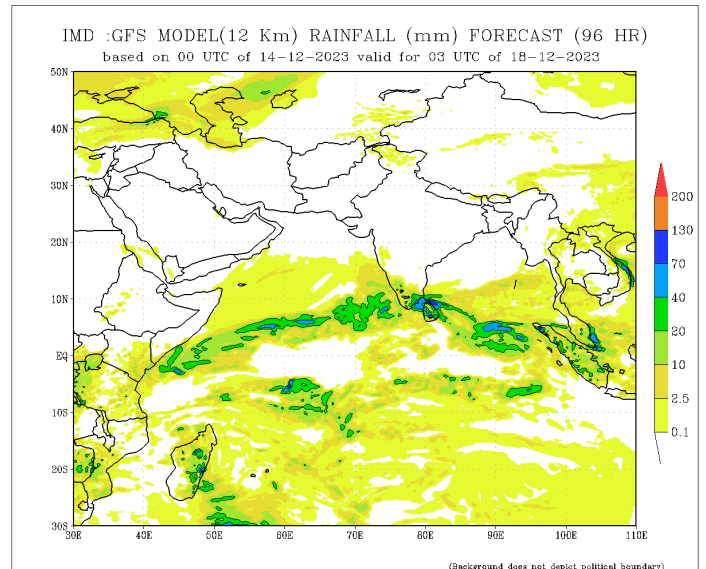
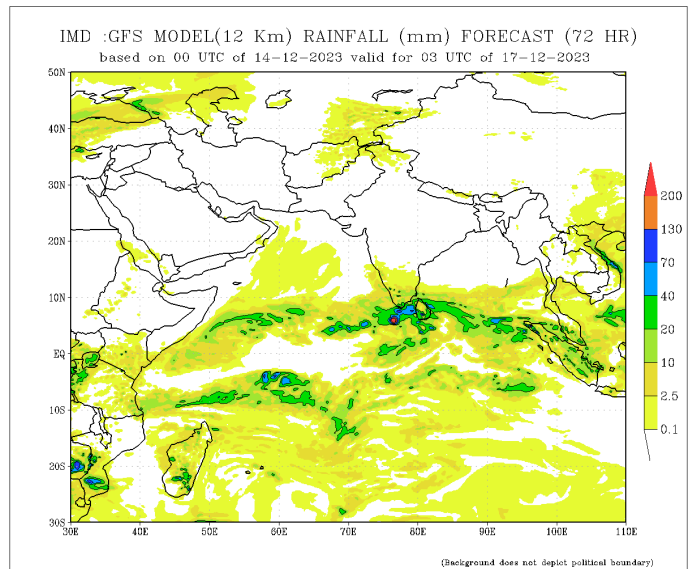
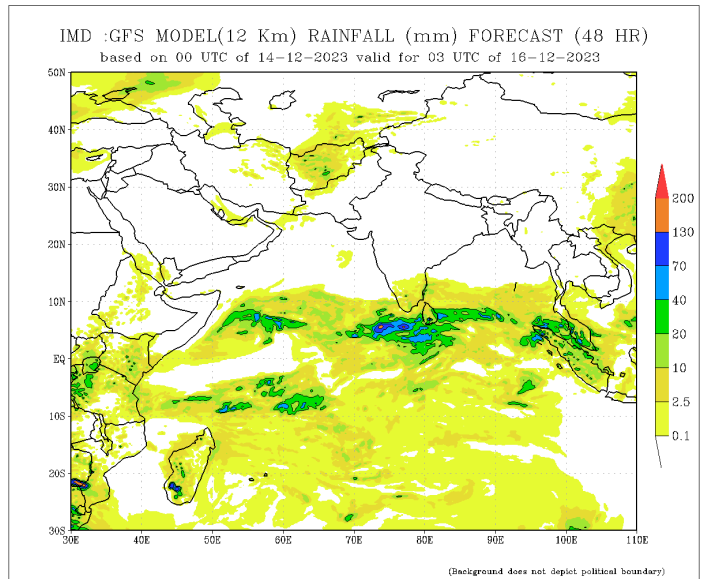
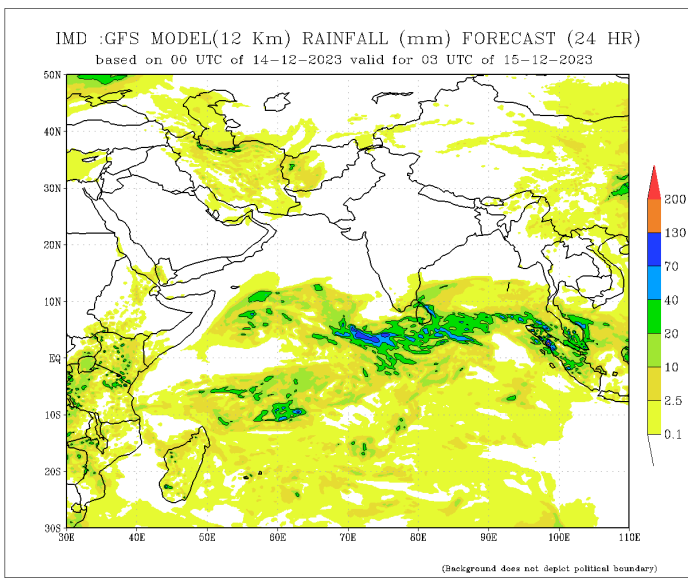


Bias correction based on last 30-day forecast error

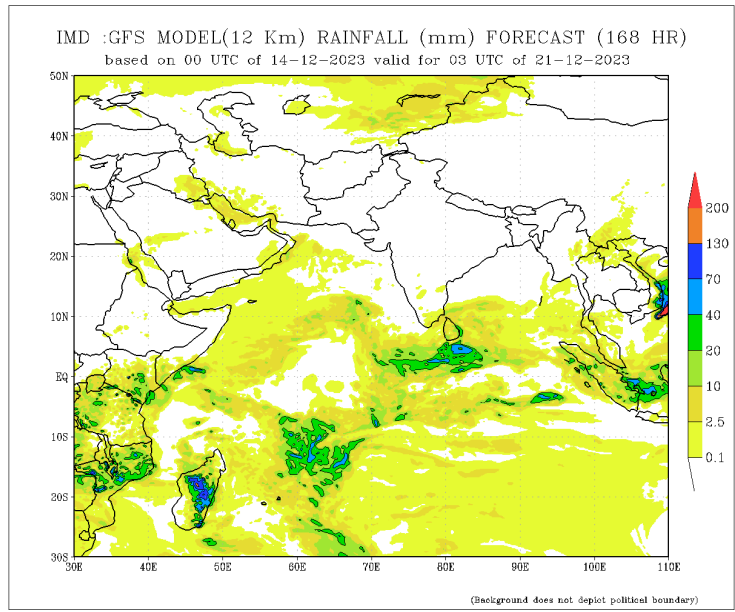
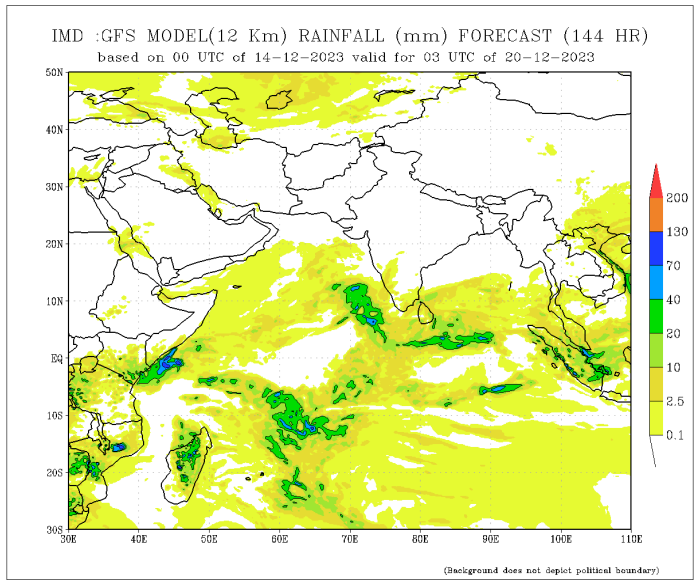
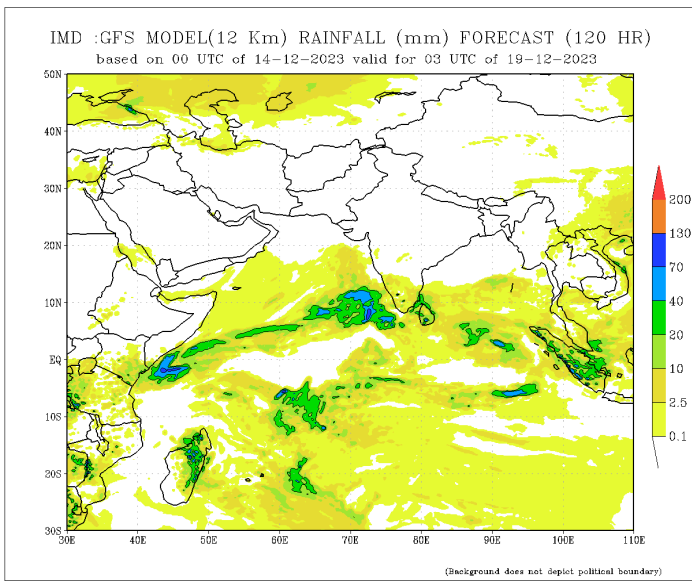


Bias correction based on last 30-day forecast error

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



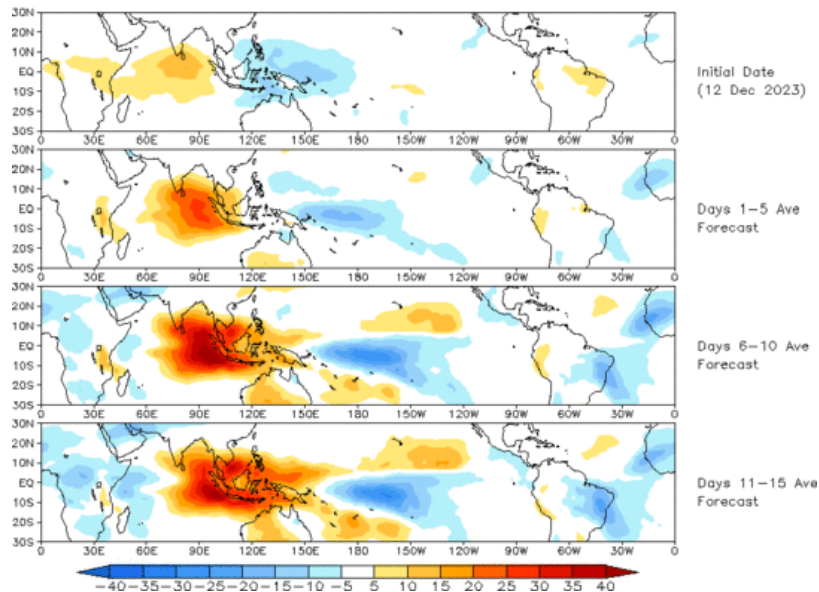




### Madden Julian Oscillation (MJO) related Outgoing Longwave Radiation (OLR) Forecast

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 anomalous 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 (12 Dec 2023)

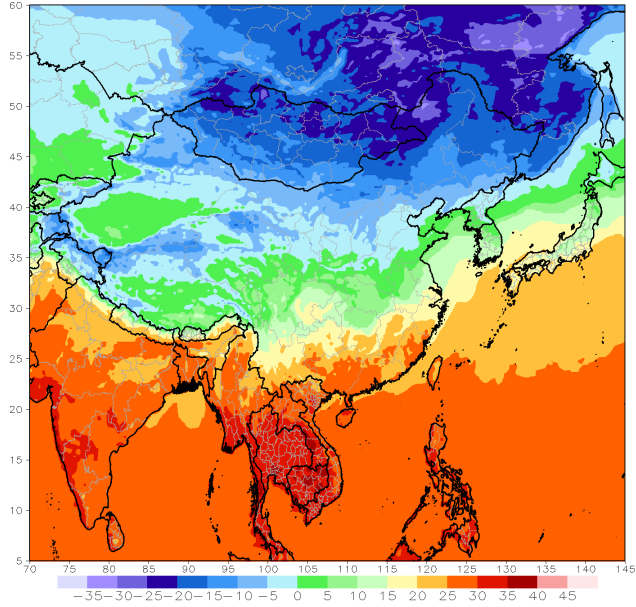




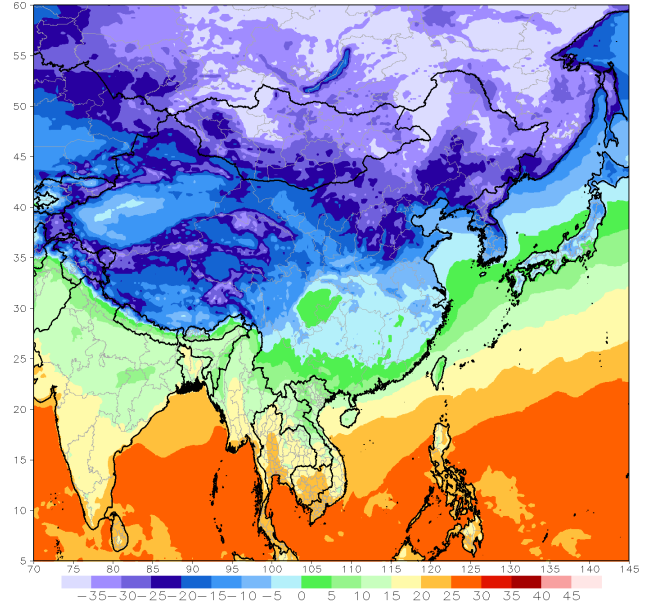
## Weekly Temperature Forecast

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

GFS week1 Temperature Max (C)  
Period: 18z14Dec2023 - 18z20Dec2023



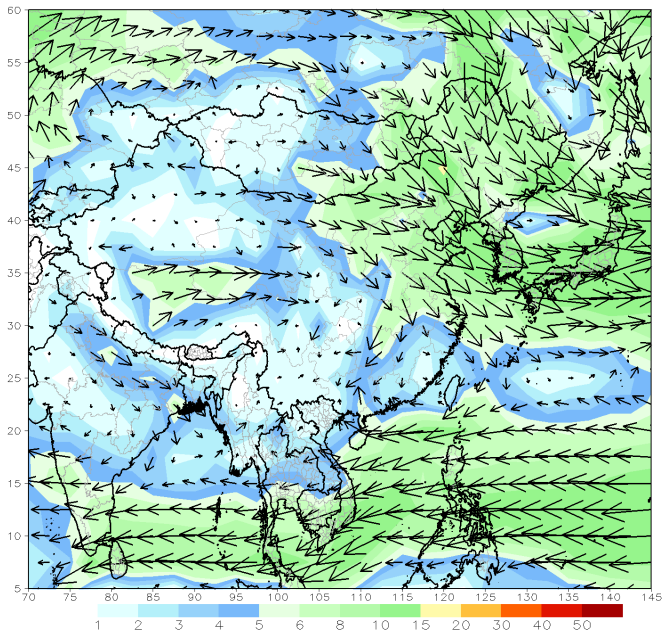
GFS week1 Temperature Min (C)  
Period: 18z14Dec2023 - 18z20Dec2023



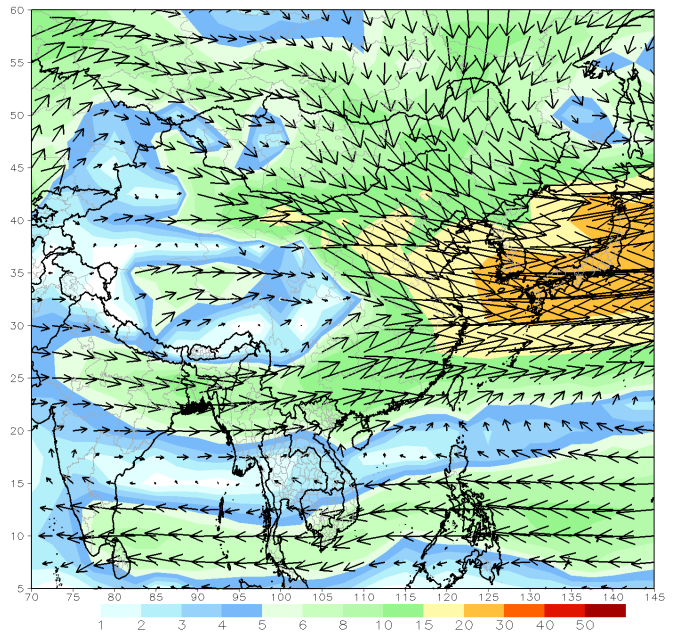
## Weekly Wind Forecast

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)  
Period: 18z14Dec2023 - 18z20Dec2023



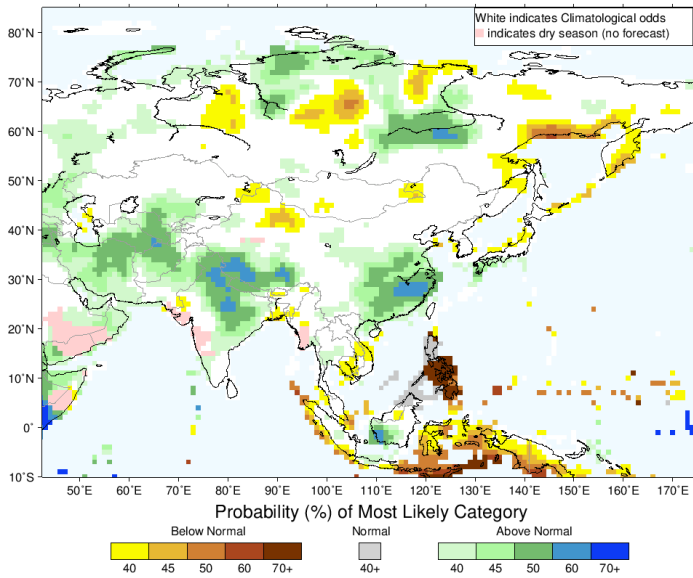
GFS 700mb week1 Mean Vector Wind Total (m/s)  
Period: 18z14Dec2023 - 18z20Dec2023



## Seasonal Rainfall and Temperature Forecast

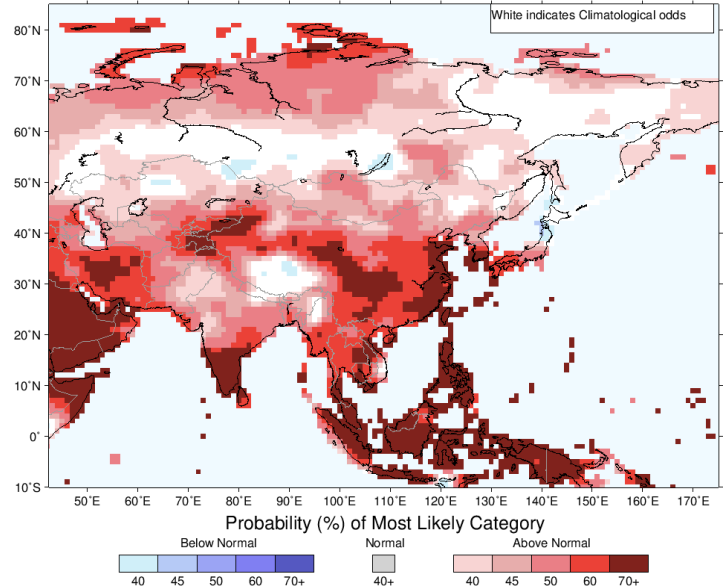
Following is the latest seasonal precipitation and temperature prediction for the next 3 months by the IRI. The color shading indicates the probability of the most dominant tercile -- that is, the tercile having the highest forecast probability. The color bar alongside the map defines these dominant 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 2024, Issued November 2023



Precipitation Forecast

IRI Multi-Model Probability Forecast for Temperature for December-January-February 2024, Issued November 2023



Temperature Forecast

### 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.

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