

HIGHLIGHTS

Rainfall Prediction



- High likelihood of fairly heavy rainfall is predicted for Northern, Eastern, North Central, Southern, Sabaragamuwa, Uva, Central provinces during 20 - 26 Dec.
- Extreme rainfall is predicted during following week.

Monitored Rainfalls



- During the last week, average daily rainfall over Sri Lanka was 20.9 mm and hydro catchment was 21.9 mm.
- Extreme rainfall (> 150 mm/day) was in Northern province.
- The rainfall of last week was twice as normal.

Monitored & Predicted Wind



- From 11 - 17 Dec, up to 8 m/s of easterly winds were at 850 mb (1.5 km).
- During 21 - 27 Dec, up to 8 m/s of north easterly winds are expected at 850 mb (1.5 km).

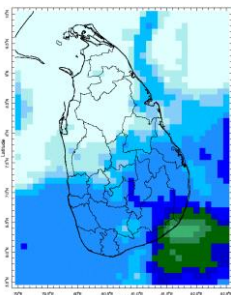
Monitored Sea & Land Temp



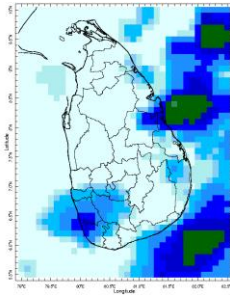
- Sea surface temperature around Sri Lanka was 0.25 - 1.5°C above normal.
- Strong EL Nino patterns sustain.

Monitoring Rainfall

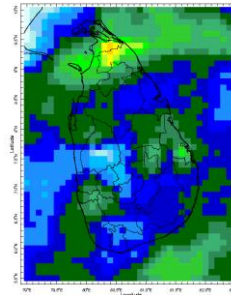
Daily Estimates for Rainfall from 12th December - 19th December 2023



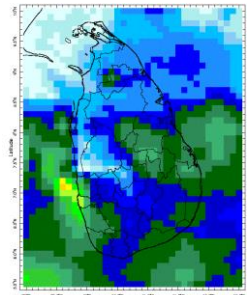
12 December



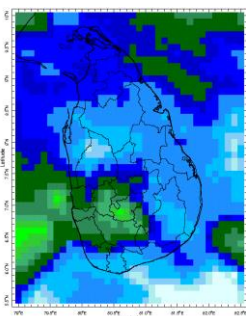
13 December



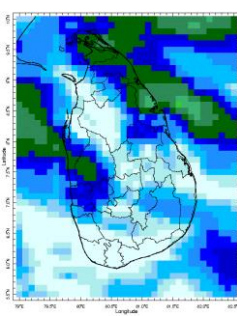
14 December



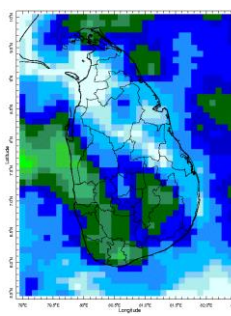
15 December



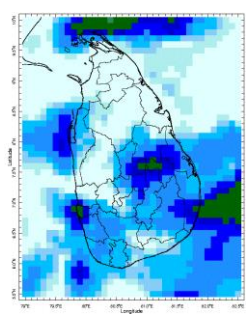
16 December



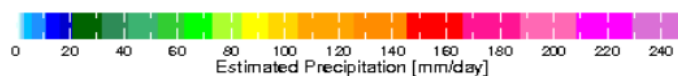
17 December



18 December



19 December



Federation for
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Ocean State *(Text Courtesy IRI)*

Pacific sea state: December 18, 2023

El Niño Mode has set in according to NOAA since 8th of June. Equatorial sea surface temperatures (SSTs) are above average across the central and eastern Pacific Ocean mid-December. El Niño is expected to continue through the Northern Hemisphere winter, with a transition to ENSO-neutral favored during April-June 2024 (60% chance).

Indian Ocean State

Sea surface temperature around Sri Lanka was 0.5°C above normal to the Northern, Southern, and Eastern half of the country in 28th November - 4th December 2023. A positive Dipole Mode has set in across the Indian Ocean since 8th of June.

Predictions

Rainfall

1 - 7 Day prediction: NCEP GFS models

From 20th December - 26th December:

Total rainfall by Provinces:

| Rainfall (mm) | Provinces |
|---------------|--------------------------------------|
| 85 | Northern, Eastern |
| 75 | North Central |
| 55 | Southern, Sabaragamuwa, Uva, Central |
| 45 | Western |
| 35 | North Western |

MJO based OLR predictions

For the next 15 days:

MJO shall near normal the rainfall during 20th - 24th December, slightly enhance the rainfall during 25th - 29th December and near normal the rainfall during 30th December - 3rd January for Sri Lanka.

Interpretation

Monitoring

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

Daily Average Rainfall in the Met stations for previous week of (13th December - 20th December) = 20.9 mm

Maximum Daily Rainfall: 153.3 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 | 25.7 | 28.7 | 24.4 |

| | | | |
|-----------------|------|------|------|
| Eastern hills | 14.9 | 24.6 | 19.4 |
| Eastern plains | 27.5 | 29.2 | 24.4 |
| Western hills | 15.6 | 26.8 | 19.9 |
| Western plains | 12.3 | 31.0 | 24.5 |
| Southern plains | 26.6 | 30.3 | 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 | 21.9 | 103.2 | 0.0 |

Wind: Easterly winds prevailed in the sea area and around the island last week.

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

Predictions

Rainfall: During the next week (20th December - 26th December), fairly heavy rainfall is predicted for the Northern, Eastern, North Central, Southern, Sabaragamuwa, Uva, Central provinces and less rainfall is predicted for rest of the country.

Temperatures: The temperature will remain seasonably near normal for the country during 21st December - 27th December.

Teleconnections: A positive Dipole Mode has set in across the Indian Ocean since 8th of June. MJO shall near normal the rainfall during 20th - 24th December, slightly enhance the rainfall during 25th - 29th December and near normal the rainfall during 30th December - 3rd January for Sri Lanka.

Seasonal Precipitation: The precipitation forecast for the January-February-March, 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, ¹ 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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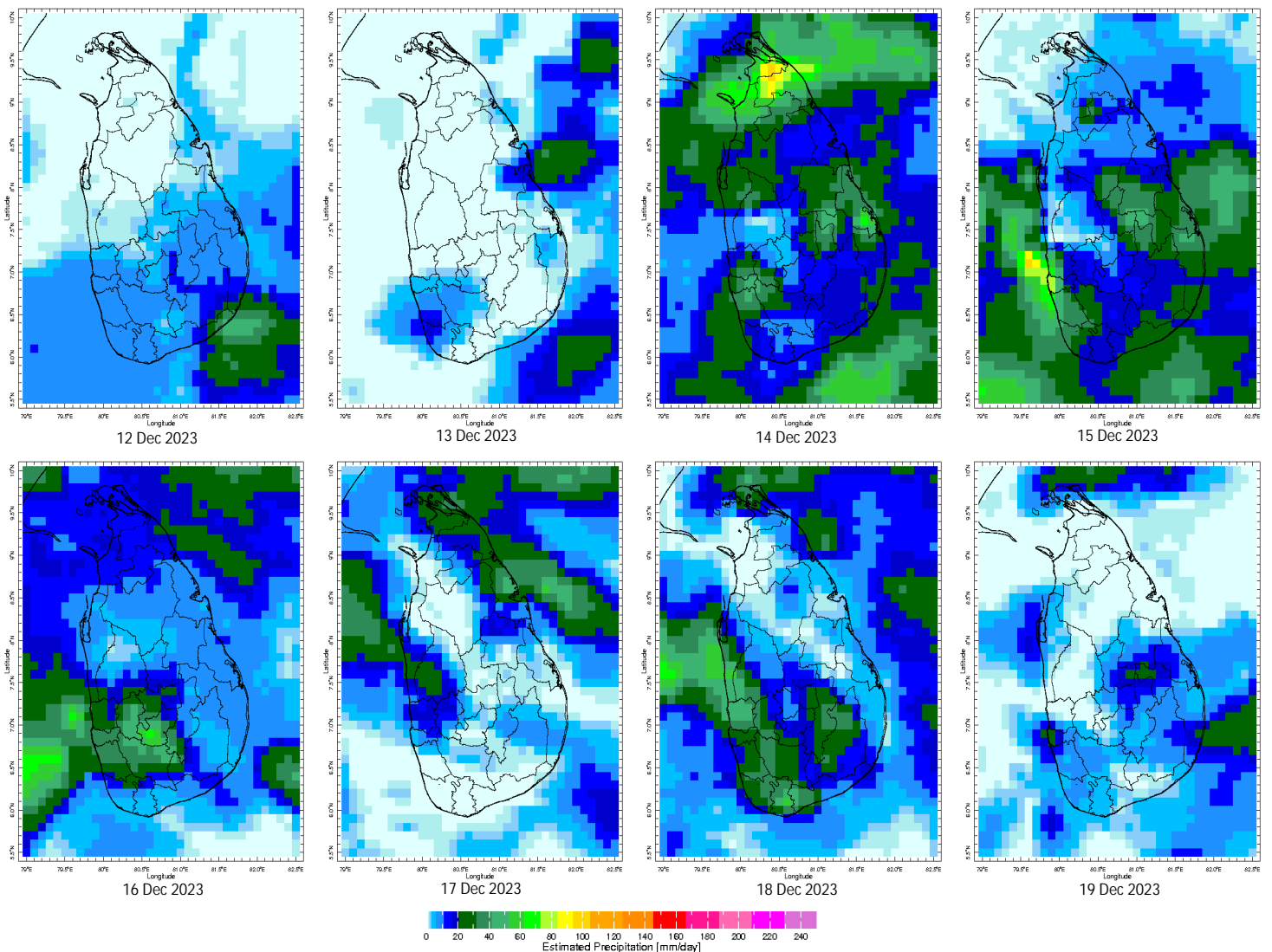
2. Predictions

- a. NCEP GFS Ensemble 1-14 day Rainfall Predictions
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MONITORING

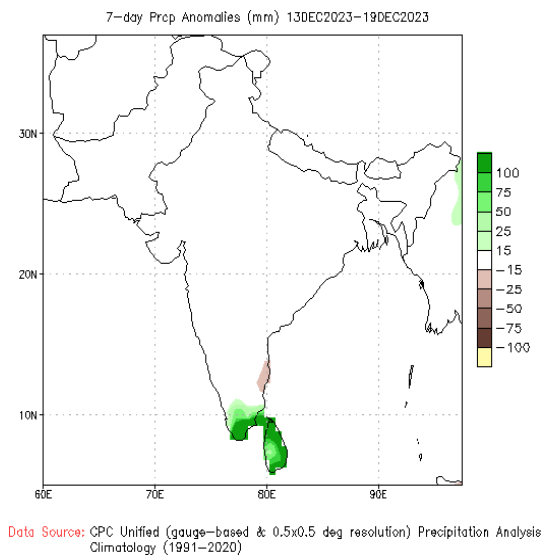
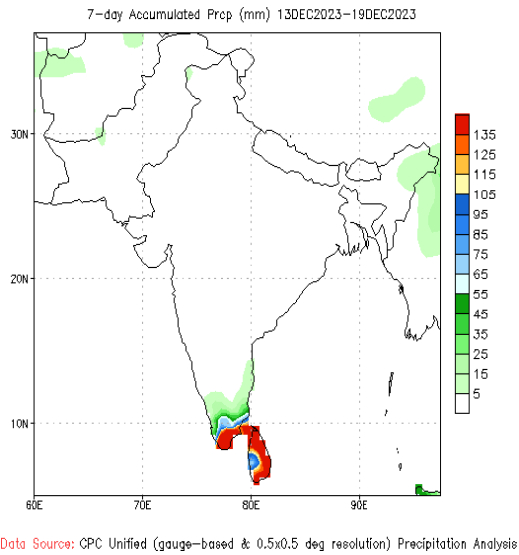
Daily Rainfall Monitoring

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



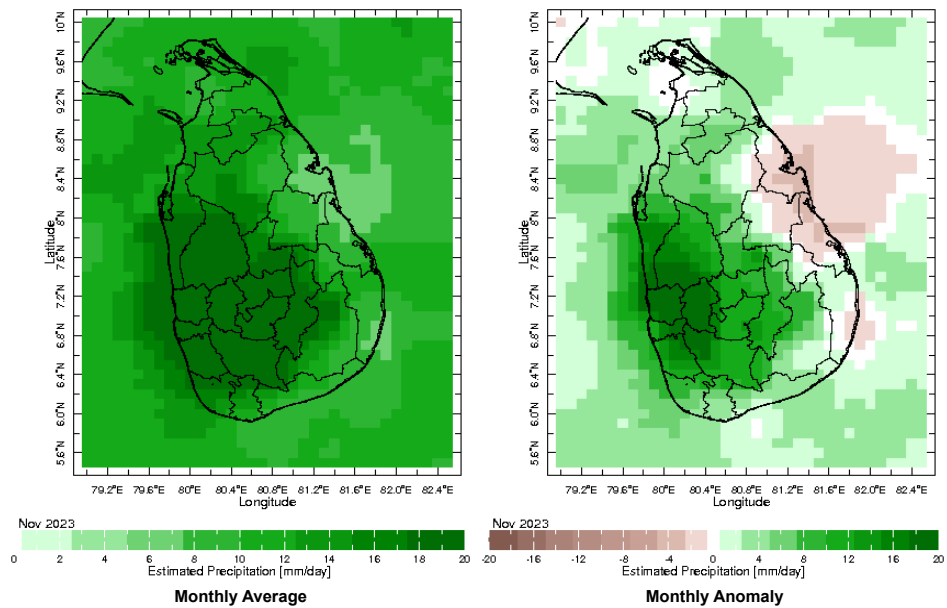
Weekly Rainfall Monitoring

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.

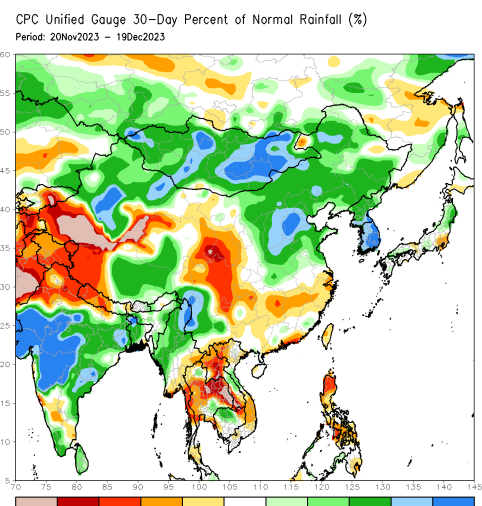
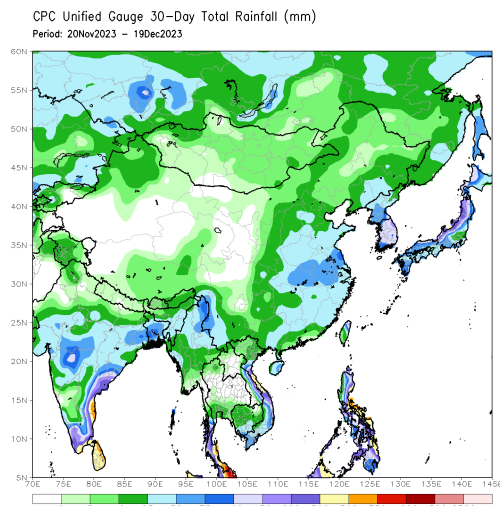


Monthly Rainfall Monitoring

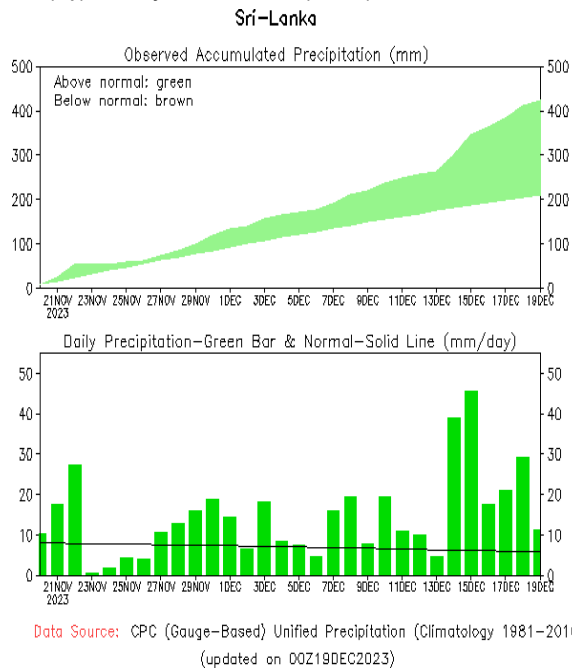
The figure in the left shows the average observed rainfall in the previous month. The rainfall anomaly in the previous month is shown in the figure to the right. The brown color in the anomaly figure shows places which received less rainfall than the historical average while the green color shows places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



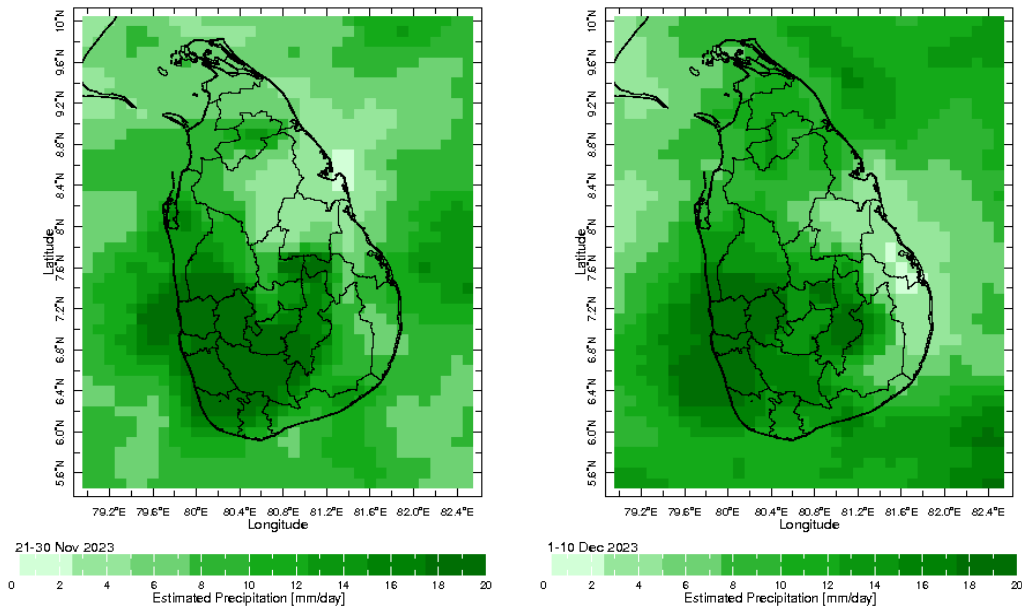
The figure in the top-left shows the total rainfall in the past 30 days from CPC Unified Precipitation Analysis while the figure in the top-right shows the total rainfall for the same period from RFE 2.0 Satellite Rainfall Estimates. The bottom two figures show the percentage of rainfall received in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



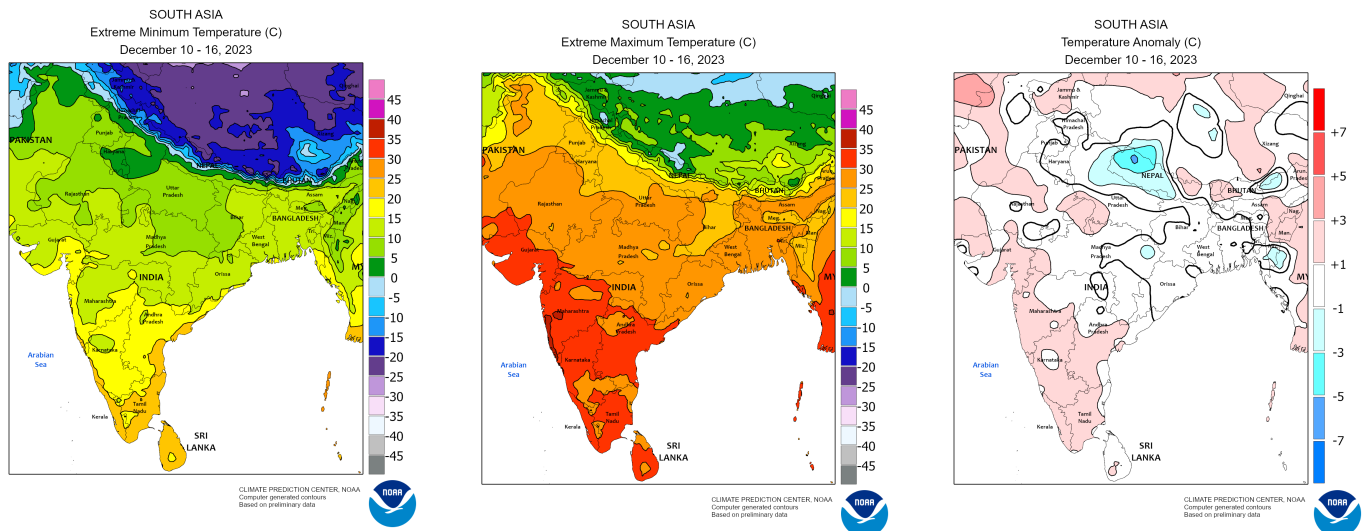
The following figure shows the observed accumulated rainfall (top) and daily observed rainfall (bottom) in Sri Lanka in the last 30 days.



Dekadal (10 Day) Satellite Derived Rainfall Estimates

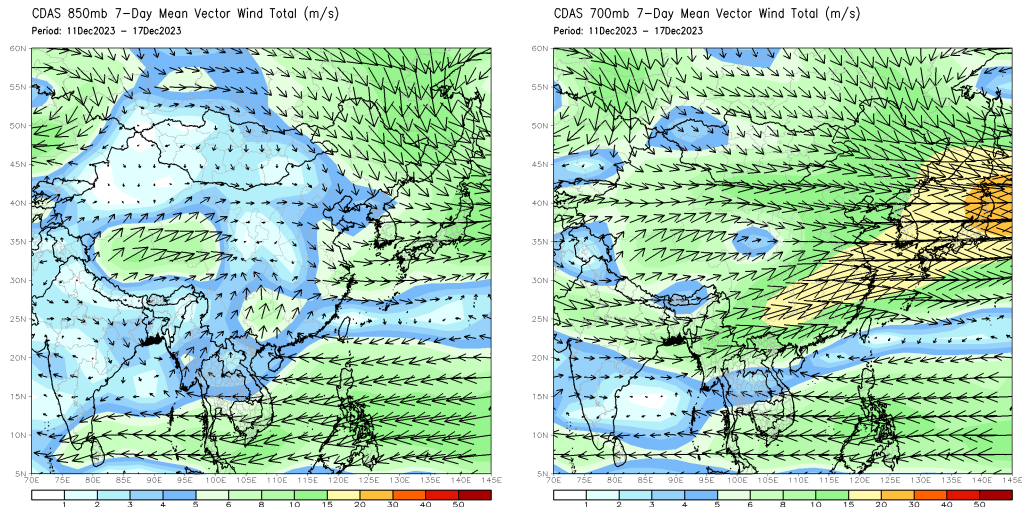


Weekly Temperature Monitoring



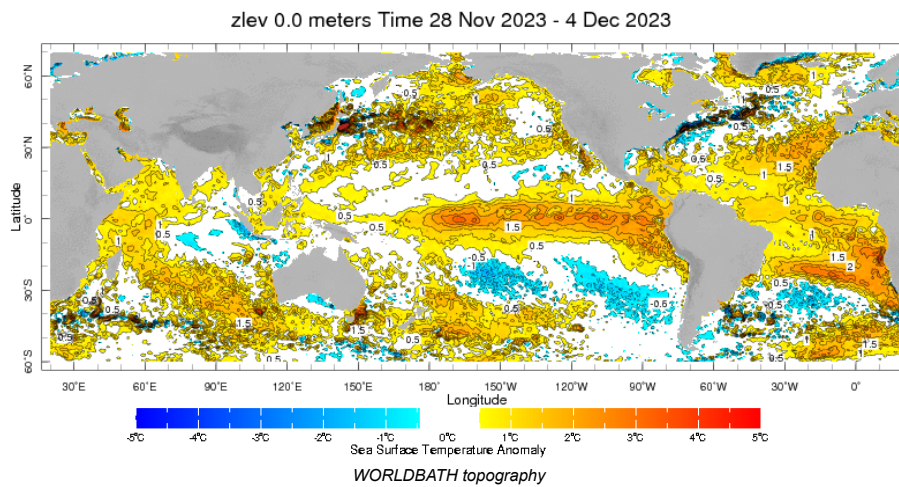
Weekly Wind Monitoring

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.

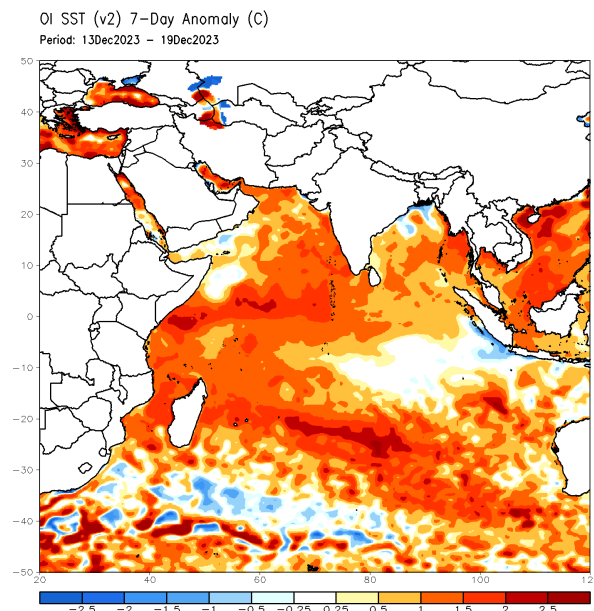


Weekly Average SST Anomalies

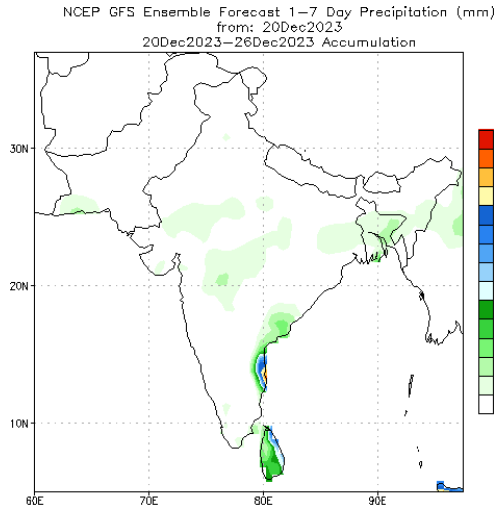
Weekly average Sea Surface Temperature (SST) anomaly in the world from NOAA NCEP



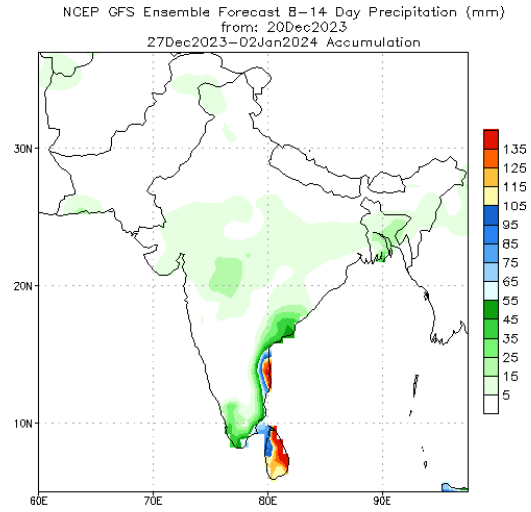
Optimum Interpolated Sea Surface Temperature Anomaly in the Indian Ocean from NOAA CPC



NCEP GFS 1- 14 Day prediction

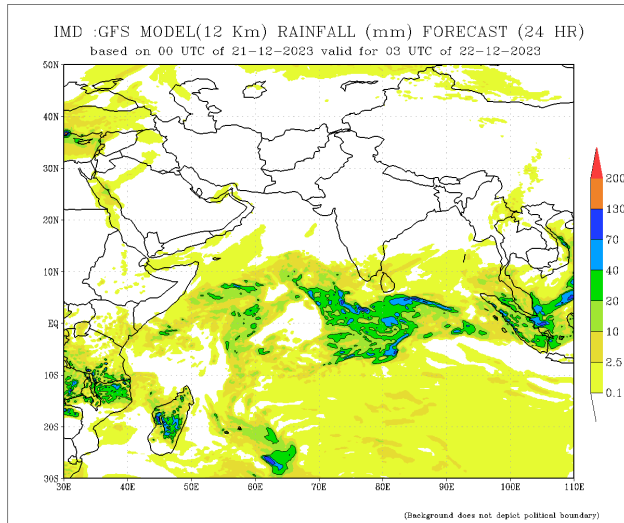


Bias correction based on last 30-day forecast error

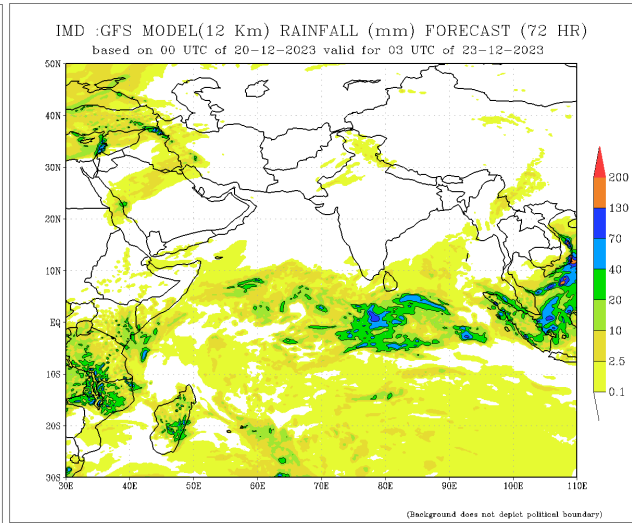


Bias correction based on last 30-day forecast error

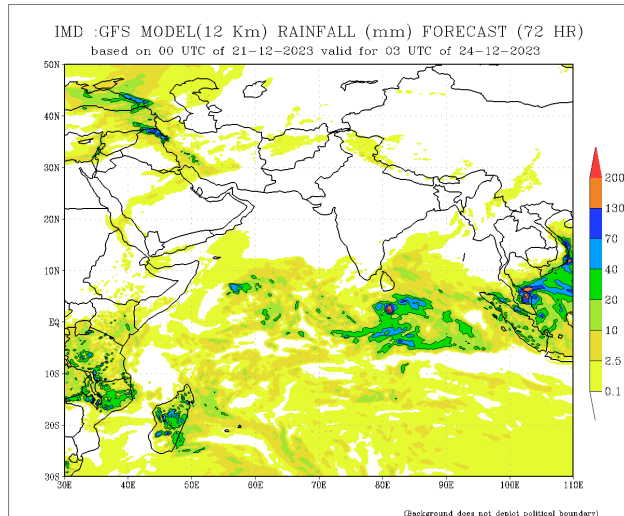
IMD GFS (T574) Model Rainfall Forecast from RMSC New Delhi, India



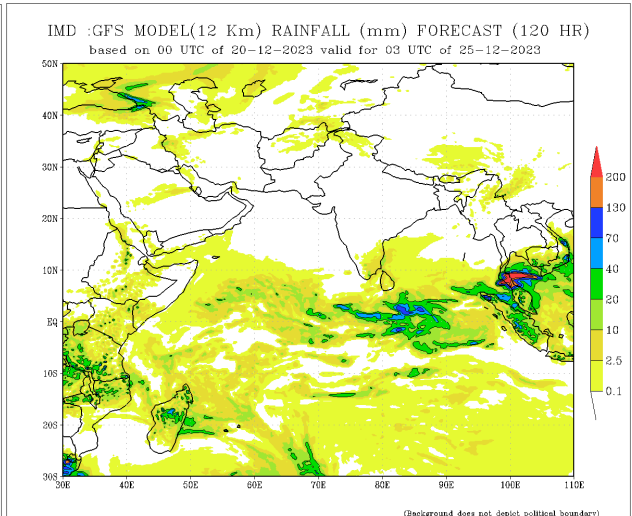
(Background does not depict political boundary)



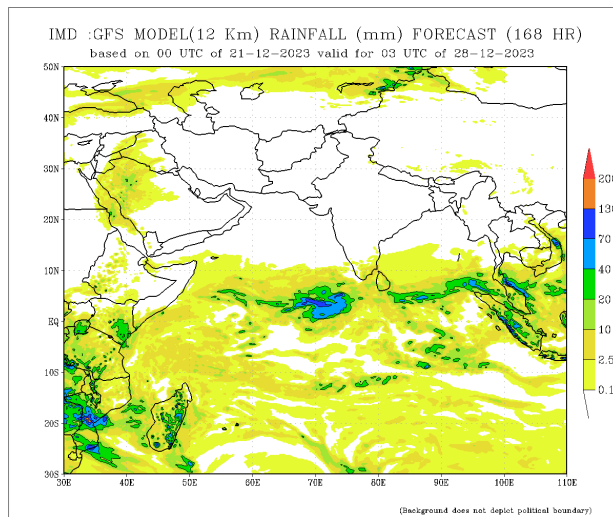
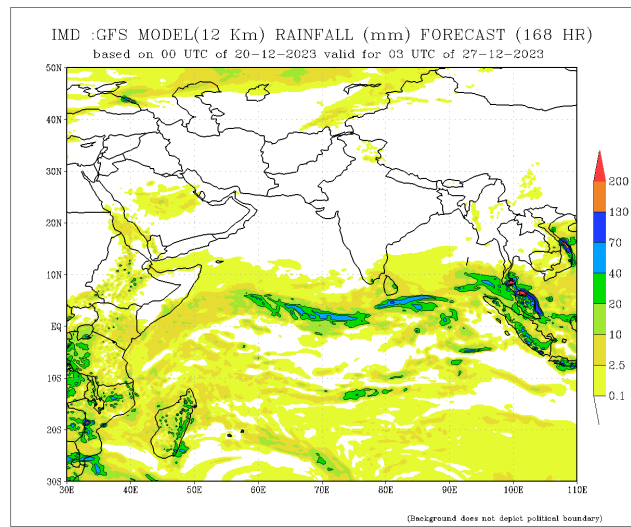
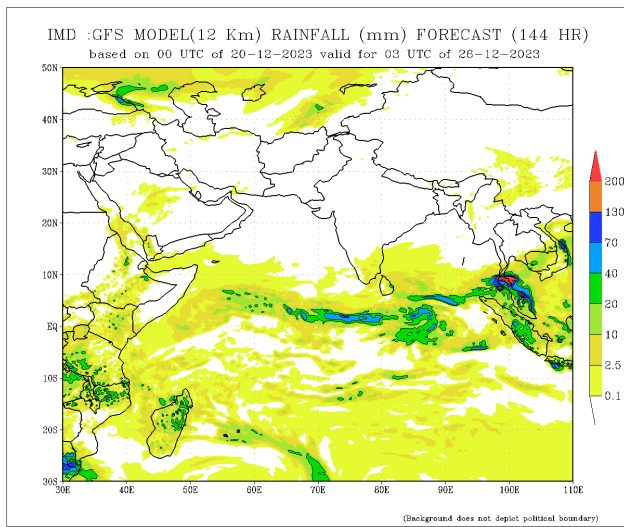
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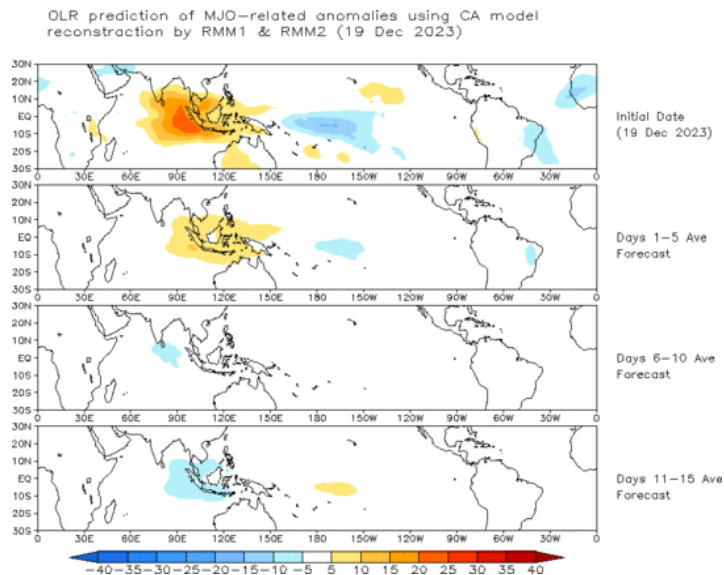


(Background does not depict political boundary)



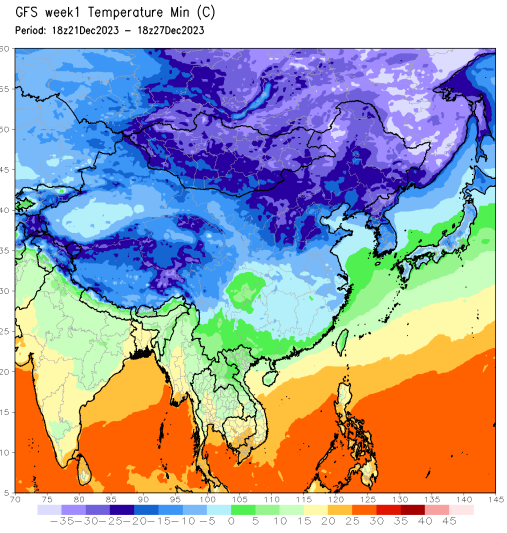
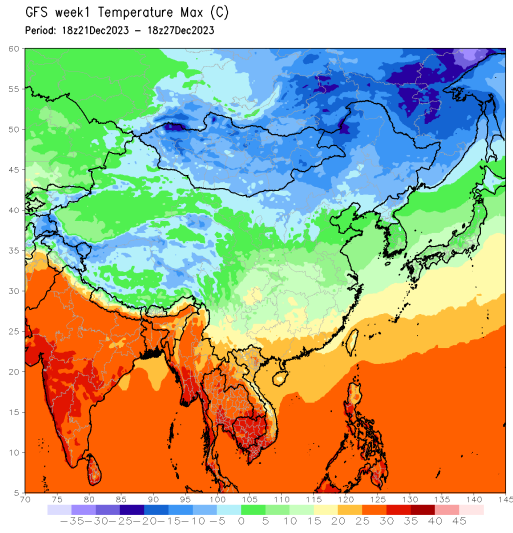
Madden Julian Oscillation (MJO) related Outgoing Longwave Radiation (OLR) Forecast

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.



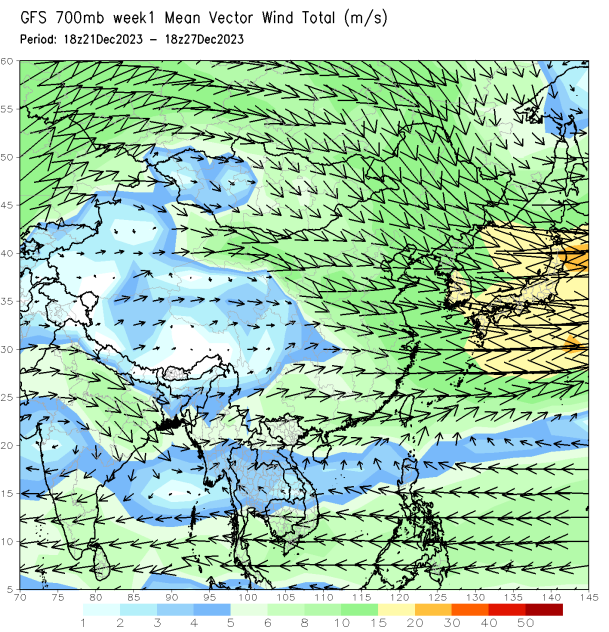
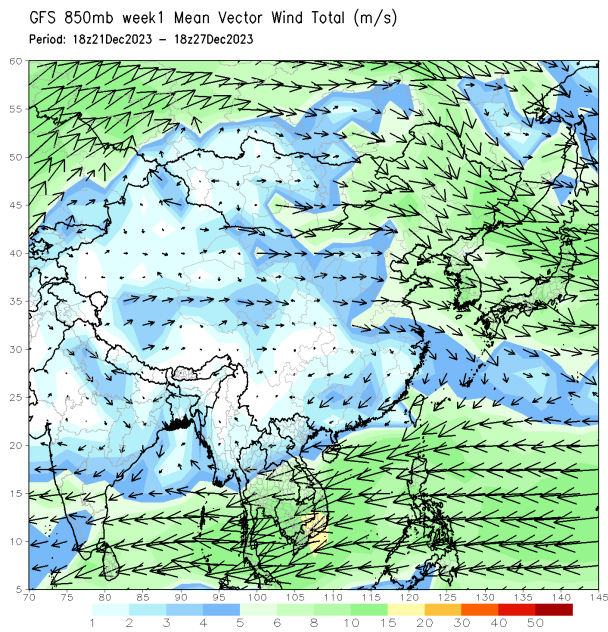
Weekly Temperature Forecast

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



Weekly Wind Forecast

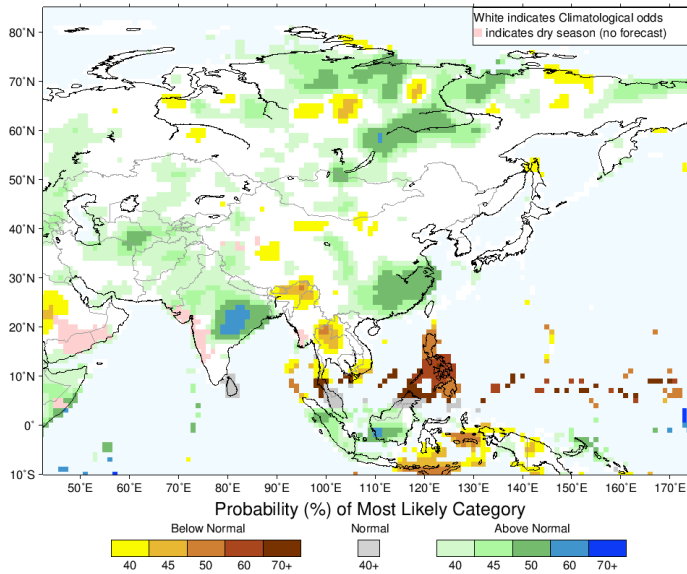
Weekly mean vector wind total prediction from the GFS model at 850 mb (left) and 700 mb (right) levels. (from NOAA CPC)



Seasonal Rainfall and Temperature Forecast

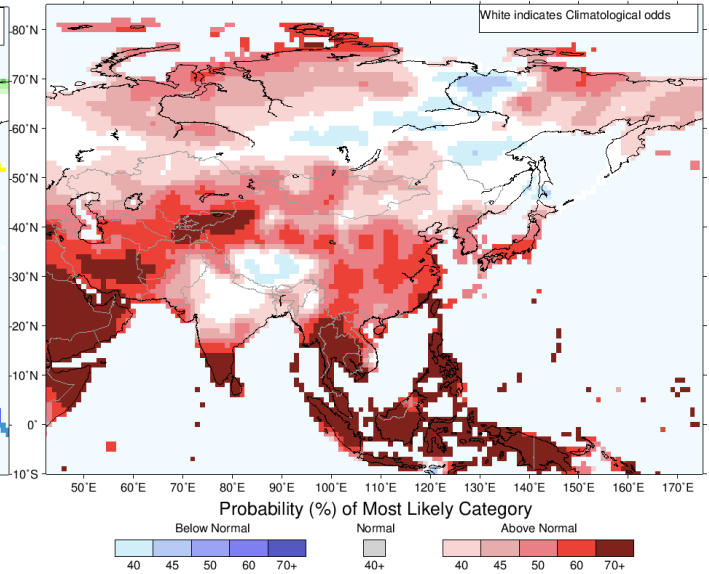
Following is the latest seasonal precipitation and temperature prediction for the next 3 months by the IRI. The color shading indicates the probability of the most dominant tercile – that is, the tercile having the highest forecast probability. The color bar alongside the map defines these dominant tercile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



Precipitation Forecast

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



Temperature Forecast

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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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