Federation for Environment, Climate and Technology

c/o, Maintenance Office, Mahaweli Authority, Digana Village, Rajawella, Sri Lanka.
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Web Site http://www.climate.lk

Week of 1 Jan - 8 Jan 2021

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 Northern, North-central and Eastern provinces during 6th – 12th Jan.*

Monitored Rainfalls

- *Heavy rainfall was experienced in Eastern, & Western provinces. Up to 220 mm max rainfall in Matara in 28th Dec.*

Monitored Wind

- *From 22nd - 28th Dec: up to 8 km/h Northeasterly winds were experienced the East side of the island.*

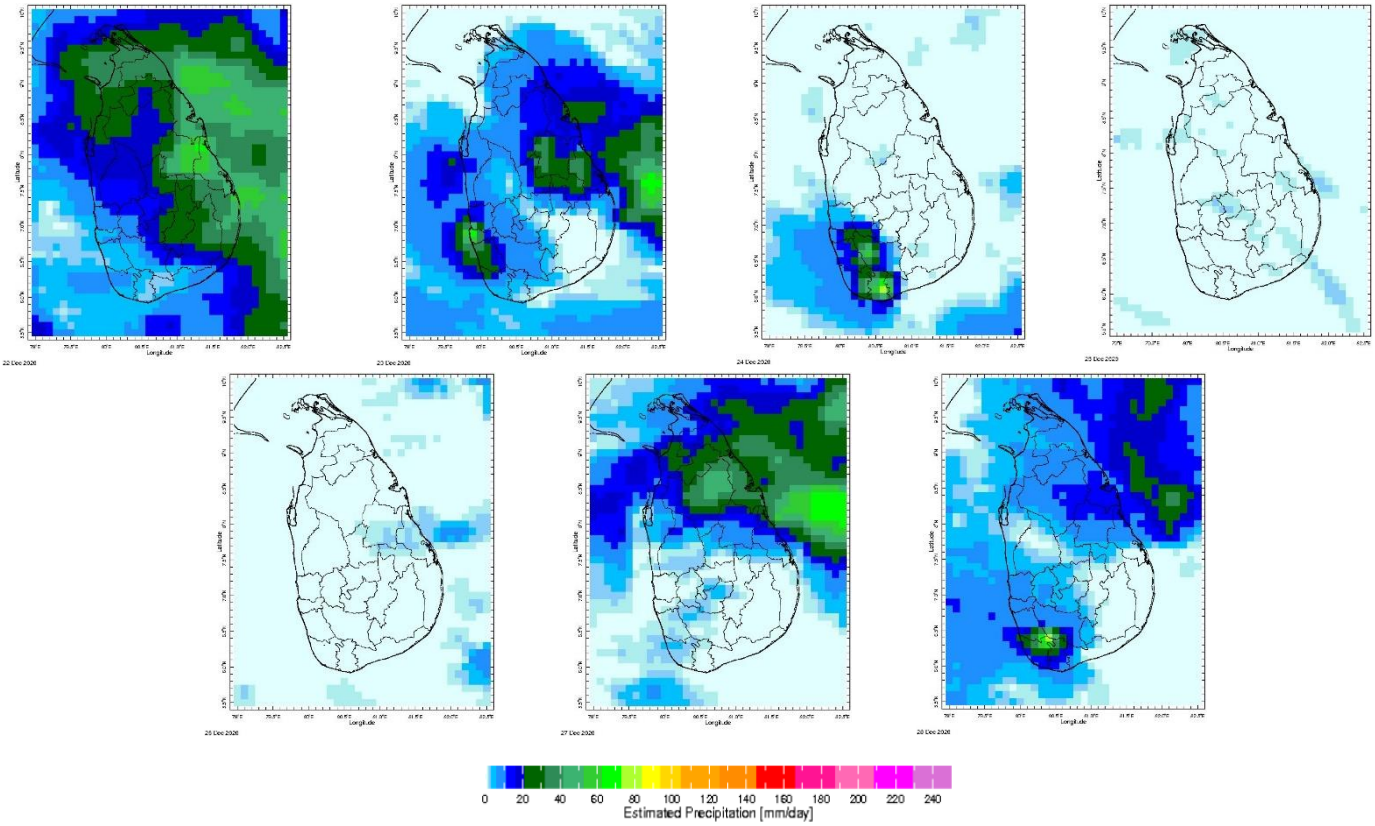
Monitored Sea Surface

- *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 22nd– 28th December



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Total Rainfall for the Past Week

The RFE 2.0 tool shows Cumulative rainfall by Districts:

Rainfall	Districts
150 – 200 mm	Colombo
100 – 150 mm	Gampaha, Kalutara, Galle, Ratnapura
70 – 100 mm	Matara, Hambantota
50 – 75 mm	Kegalle, Matale, Batticaloa, Polonnaruwa, Anuradhapura, Trincomalee, Mullaitivu, Vavuniya
25 – 50 mm	Nuwara Eliya, Kurunegala, Puttalam, Ampara, Mannar, Kilinochchi, Badulla
10 – 25 mm	Kandy, Jaffna, Moneragala

Weekly Rainfall Anomalies by Districts

Rainfall Excess

Rainfall	Districts
100 – 200 mm	Colombo
50 – 100 mm	Gampaha, Kalutara, Ratnapura, Galle, Matara, Hambantota
25 – 50 mm	Polonnaruwa, Anuradhapura, Trincomalee, Kegalle
10 – 25 mm	Nuwara Eliya, Matale, Kurunegala, Puttalam, Mullaitivu, Vavuniya, Mannar

Rainfall Deficit

Rainfall	Districts
25 – 50 mm	Ampara, Batticaloa, Moneragala, Badulla, Jaffna
10 – 25 mm	Kandy, Kilinochchi,

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

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Ocean State *(Text Courtesy IRI)*

Pacific sea state: December 23, 2020

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

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 to the East.

Predictions

Rainfall

14-day prediction: NOAA NCEP models

From 30th December – 5thJanuary:

Total rainfall by Provinces:

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

From 6th – 12th January:

Total rainfall by Provinces:

Rainfall	Provinces
140 mm	Northern, North-central, Eastern
115 mm	Central, Uva
105 mm	North-western
95 mm	Western, Sabaragamuwa
85 mm	Southern

MJO based OLR predictions

For the next 15 days:

MJO shall slightly enhance the rainfall during 29th Dec – 2nd Jan, have neutral influence during 3rd – 7th Jan and significantly suppress the rainfall during 8th – 12th Jan.

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Monitoring

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

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 week (January 6-12), extreme rainfall is predicted for the Northern, North-eastern & Eastern coastal regions. A drop in rainfall is predicted over the rest of the country. The amount of rainfall is extremely high and thus caution is warranted.

Temperatures: The temperature remains slightly above normal for December.

Teleconnections:

- MJO shall slightly enhance the rainfall during 29th Dec – 2nd Jan, neutral during 3rd – 7th Jan and significantly suppress the rainfall during 8th – 12th 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.

  Usually, with a La Nina, the rainfall from January to March is augmented and the model predictions are consistent. This is against a lower average rainfall from January to March 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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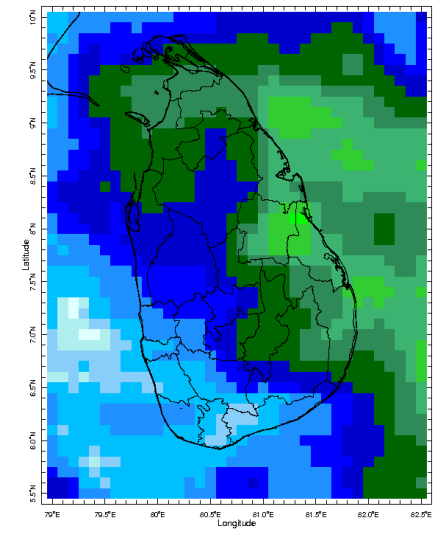
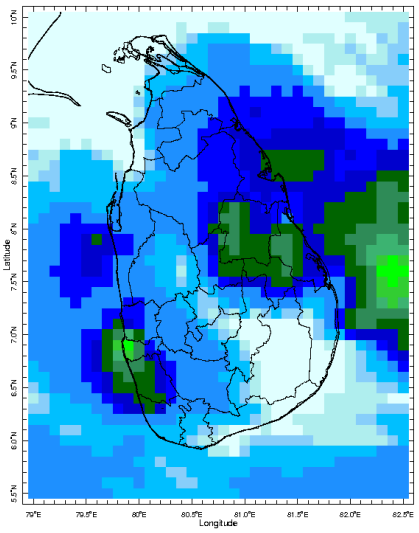
MONITORING

Daily Rainfall Monitoring

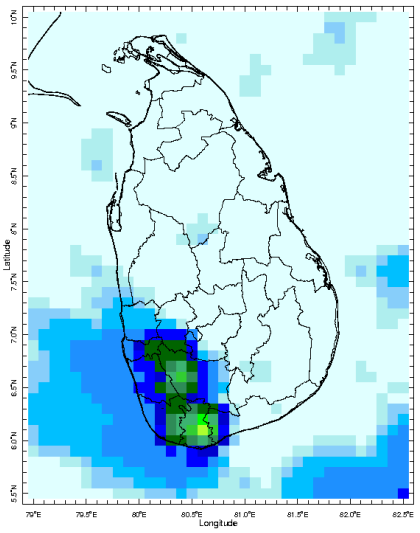
The following figures show the satellite observed rainfall in the last 7 days in Sri Lanka.



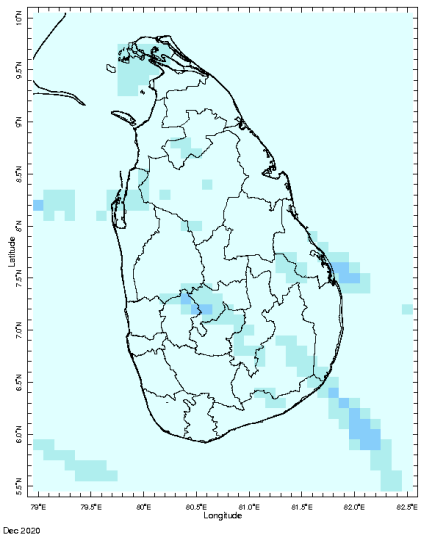
22 Dec 2020



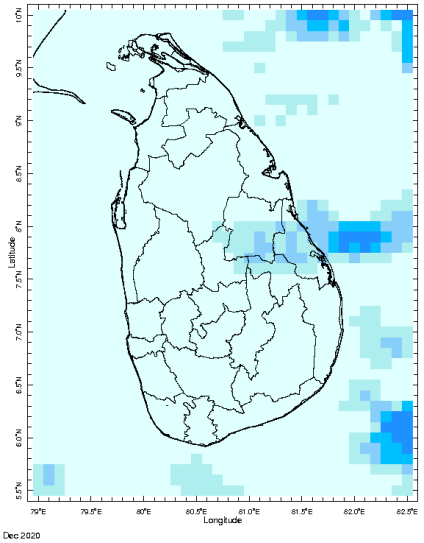
23 Dec 2020



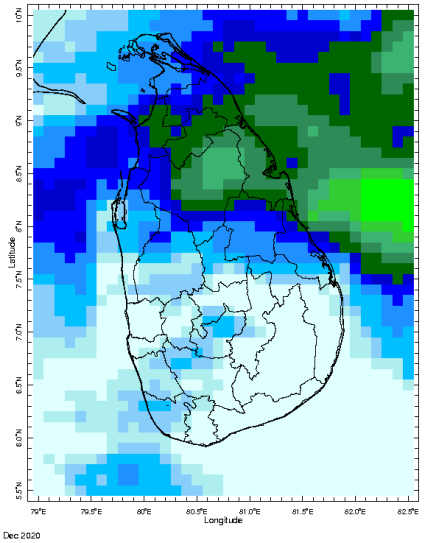
24 Dec 2020



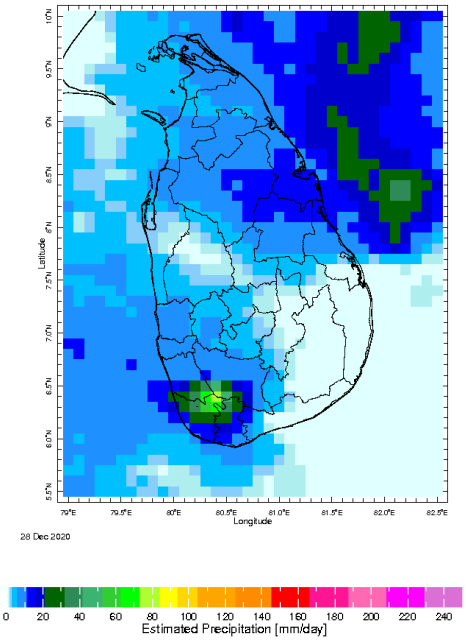
25 Dec 2020



26 Dec 2020

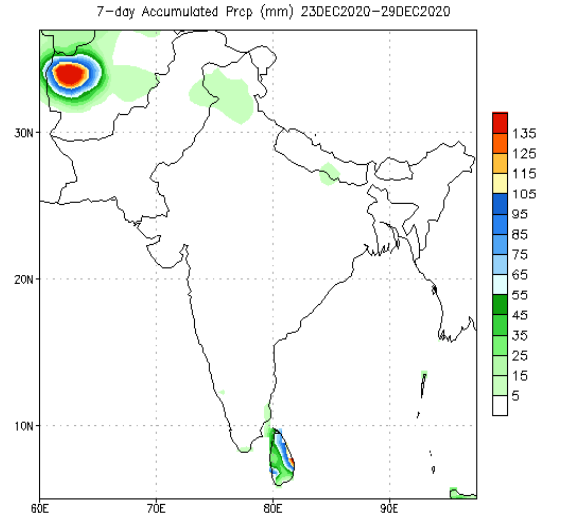


27 Dec 2020

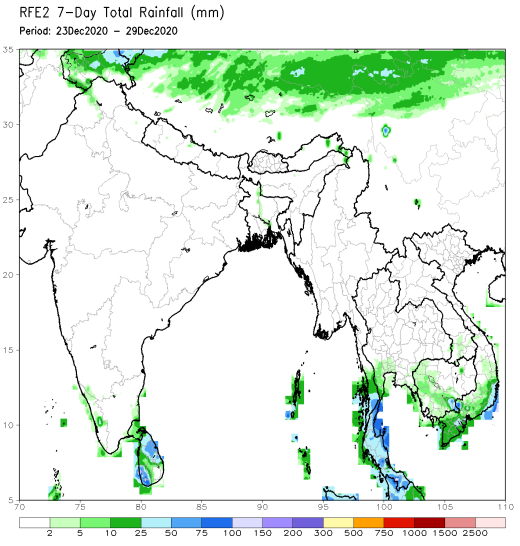


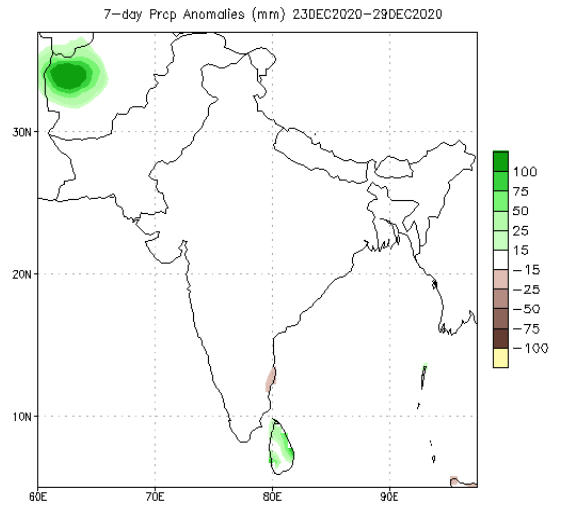
Weekly Rainfall Monitoring

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.

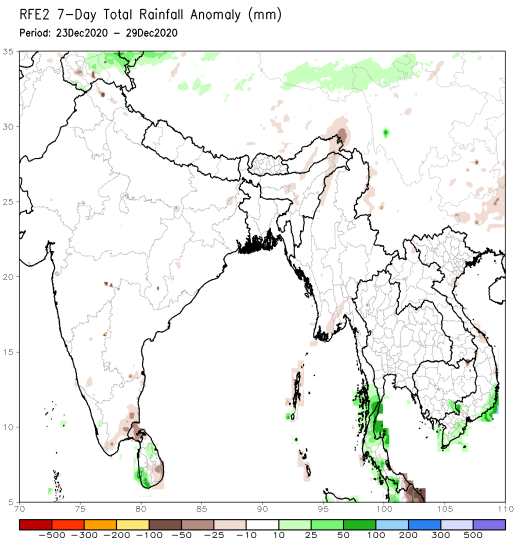


Data Source: CPC Unified (gauge-based & 0.5x0.5 deg resolution) Precipitation Analysis



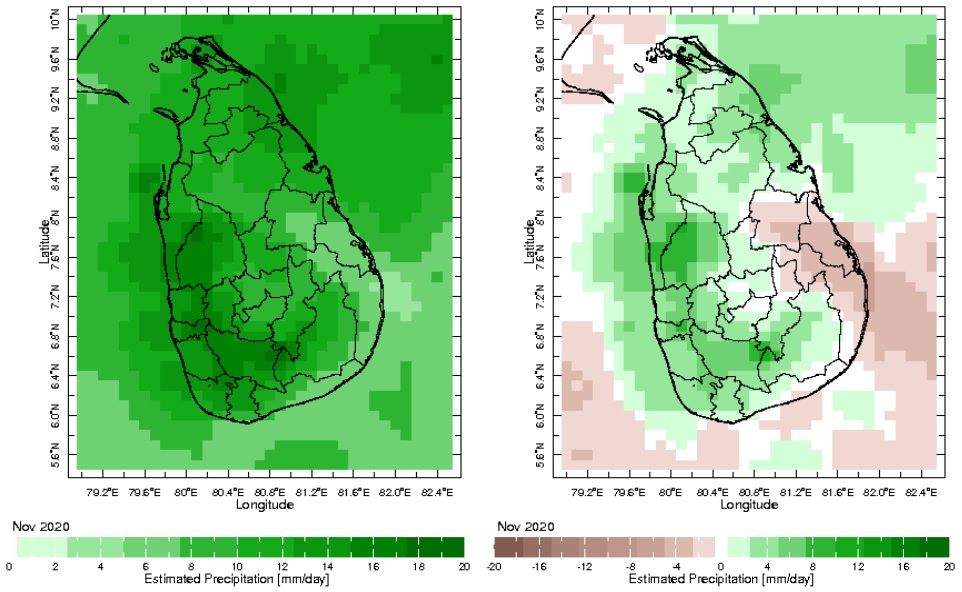


Data Source: CPC Unified (gauge-based & 0.5x0.5 deg resolution) Precipitation Analysis Climatology (1981-2010)



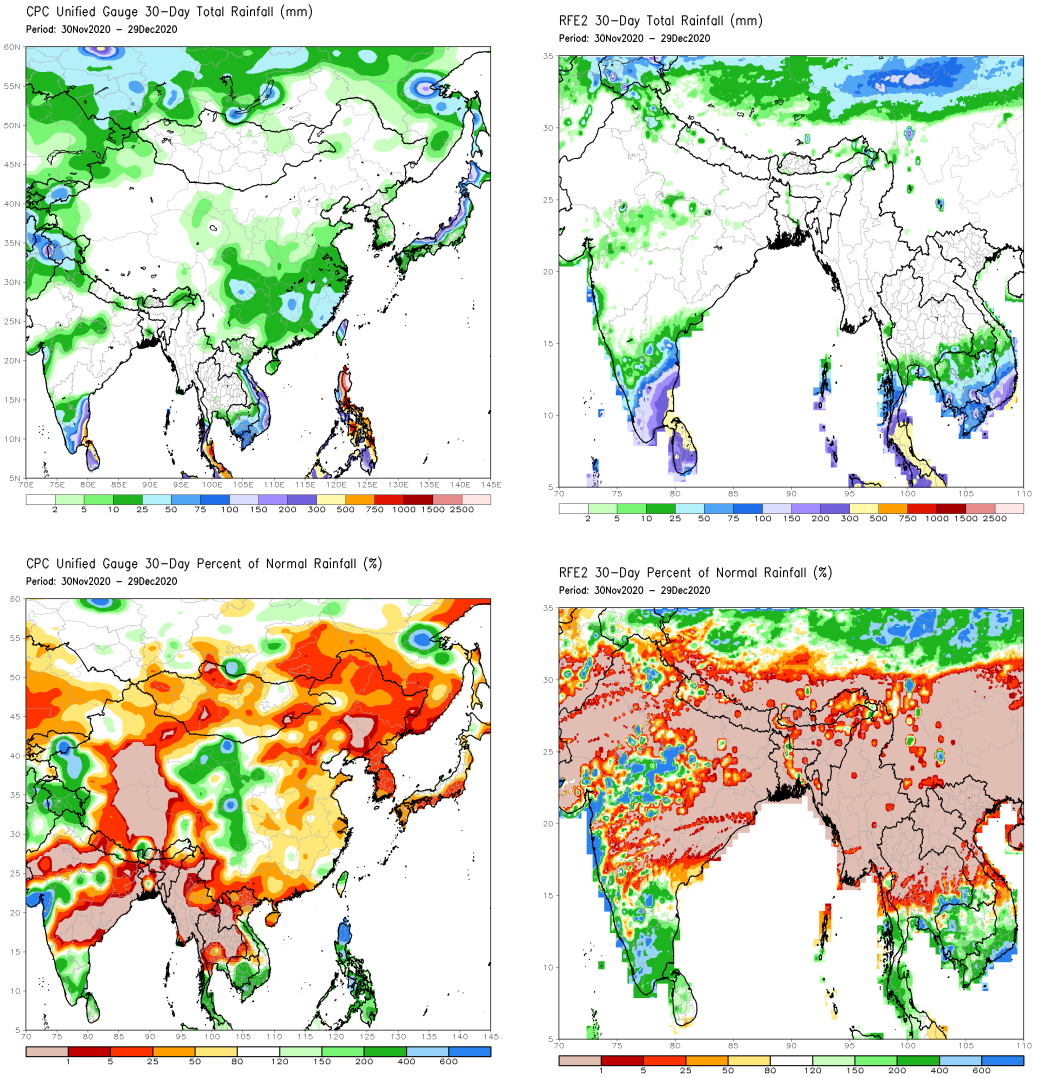
Monthly Rainfall Monitoring

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

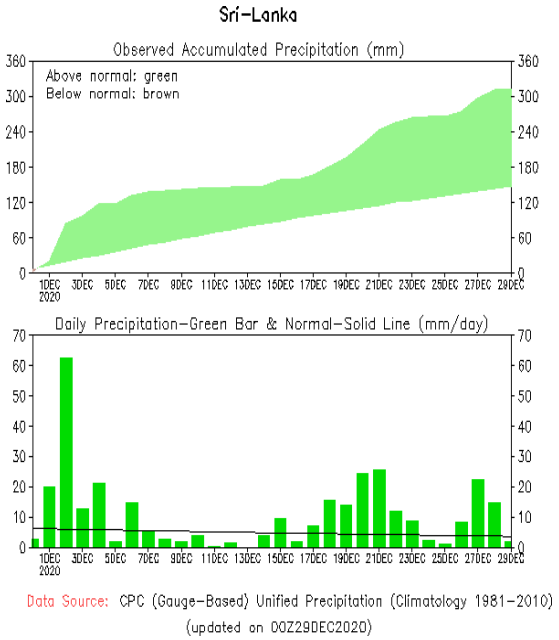


Monthly Average **Monthly Anomaly**

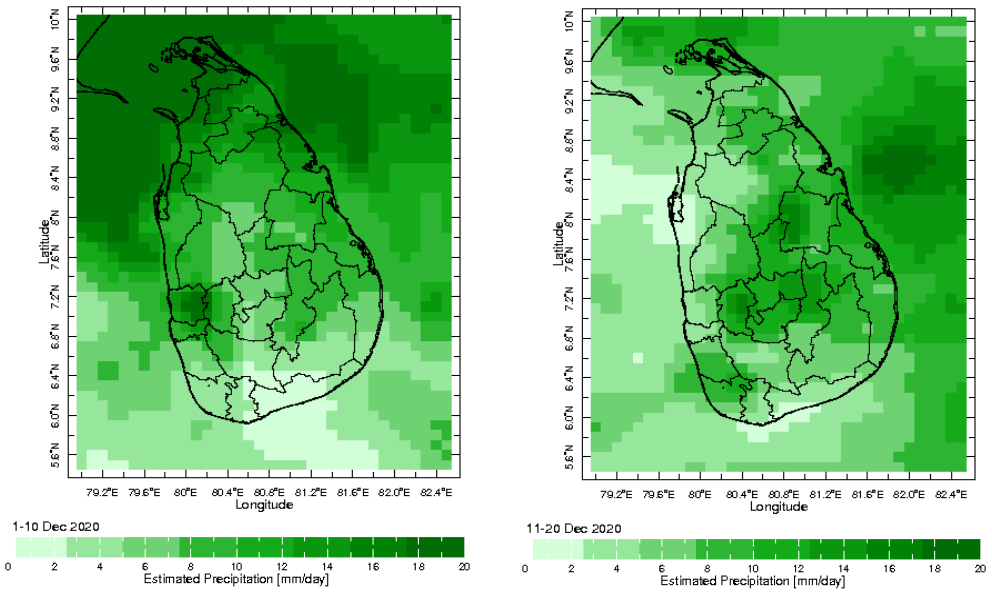
The figure in the top-left shows the total rainfall in the past 30 days from CPC Unified Precipitation Analysis while the figure in the top-right shows the total rainfall for the same period from RFE 2.0 Satellite Rainfall Estimates. The bottom two figures show the percentage of rainfall received in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



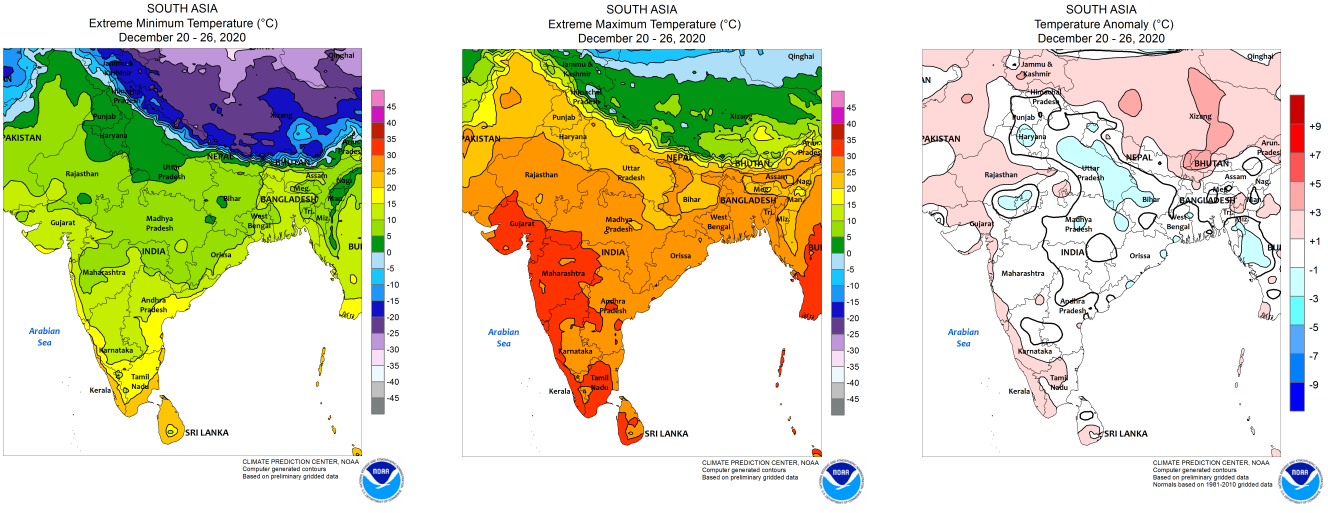
The following figure shows the observed accumulated rainfall (top) and daily observed rainfall (bottom) in Sri Lanka in the last 30 days.



Dekadal (10 Day) Satellite Derived Rainfall Estimates

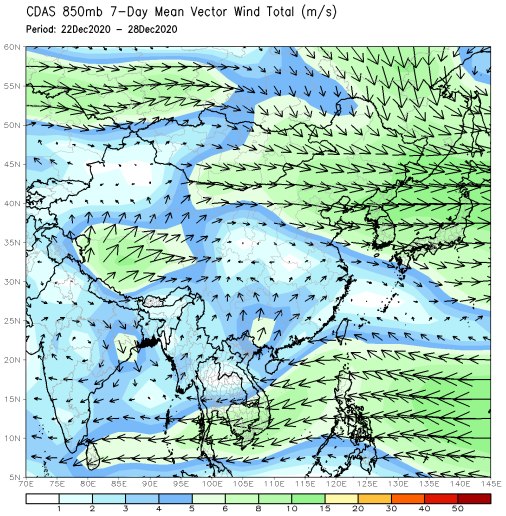


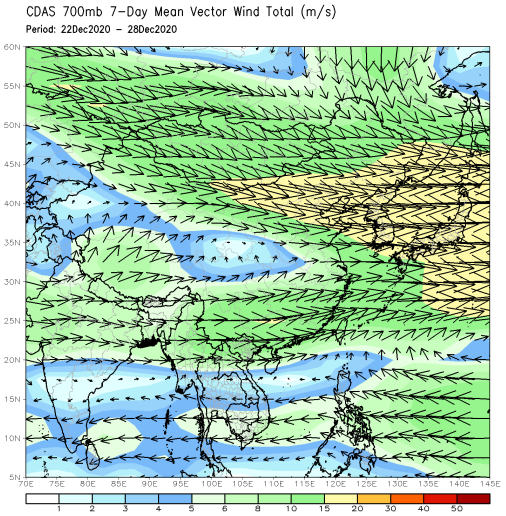
Weekly Temperature Monitoring



Weekly Wind Monitoring

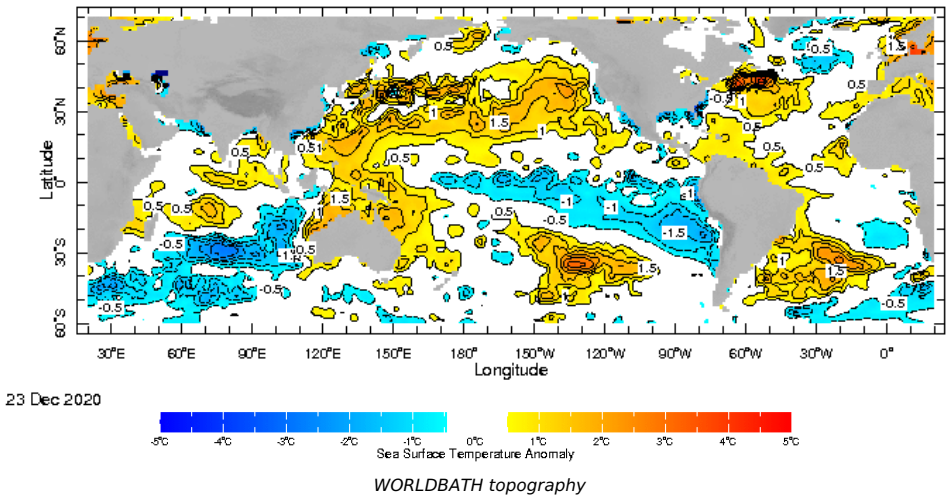
The following figures show the mean vector wind total of the past 7 days near Sri Lanka at two levels. The figure on the left shows 850 mb (~1500 m) level and the figure on the right shows 700 mb (~3000 m) level.



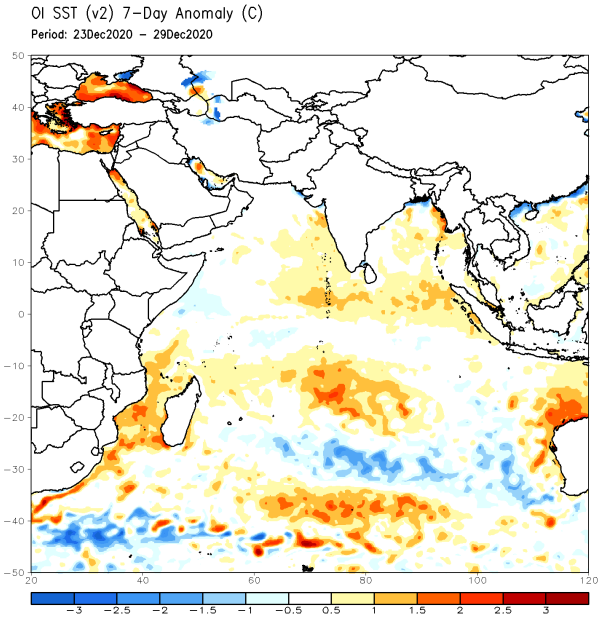


Weekly Average SST Anomalies

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

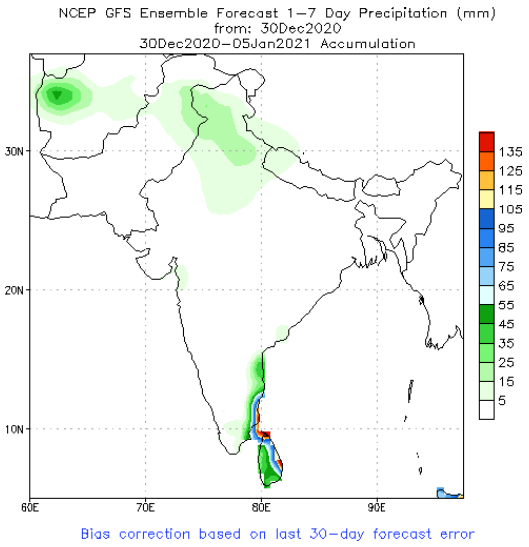


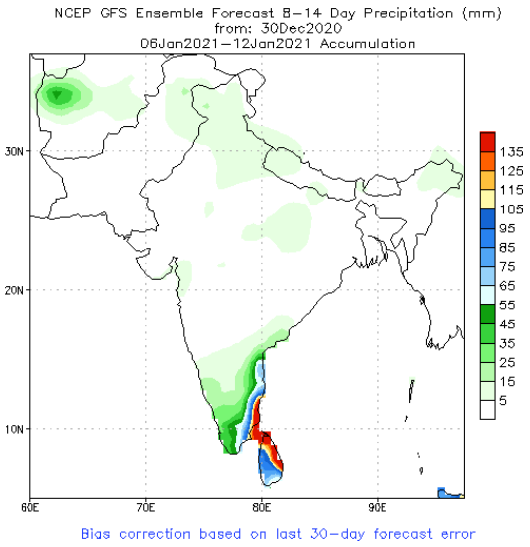
Optimum Interpolated Sea Surface Temperature Anomaly in the Indian Ocean from NOAA CPC



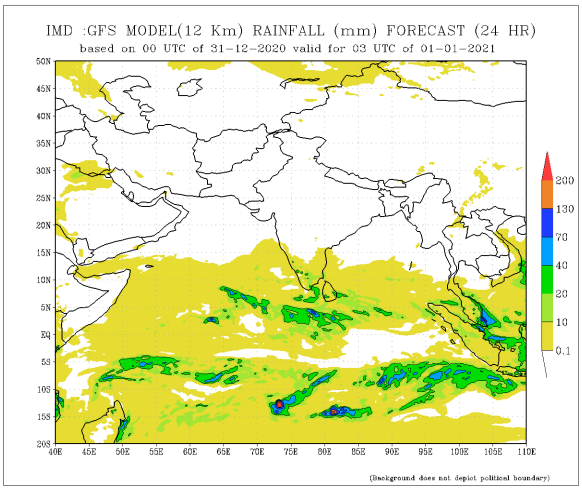
PREDICTIONS

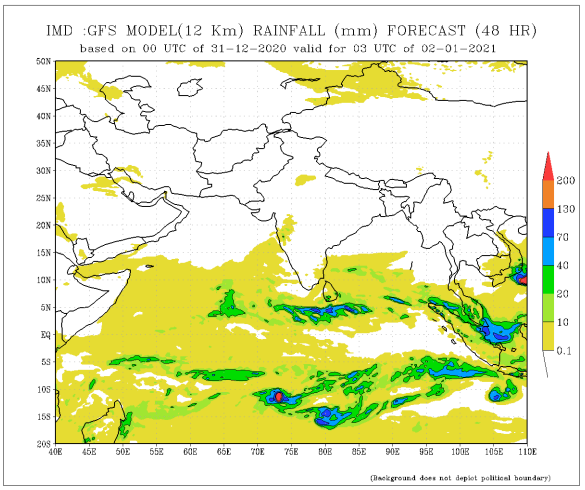
NCEP GFS 1- 14 Day prediction

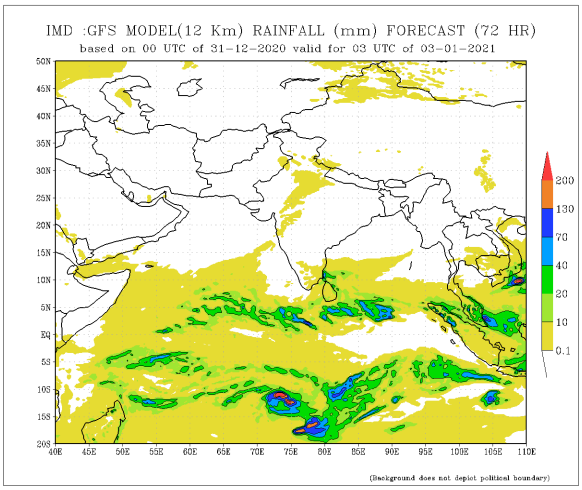


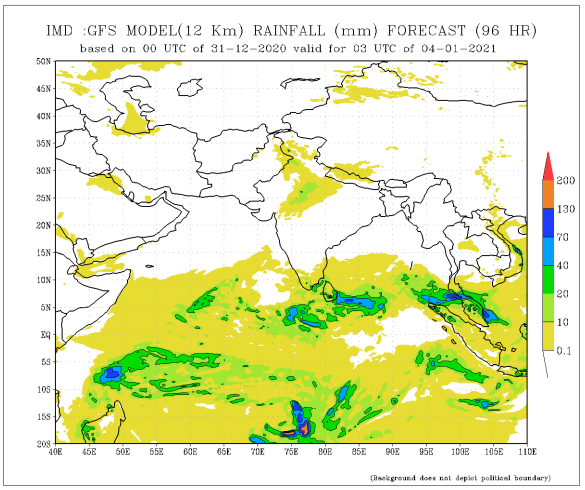


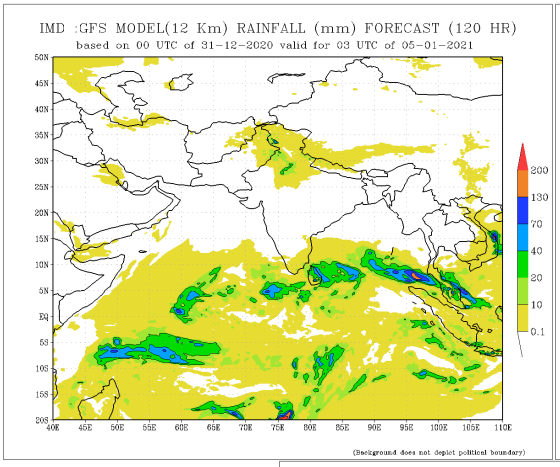
IMD GFS (T574) Model Rainfall Forecast from RMSC New Delhi, India

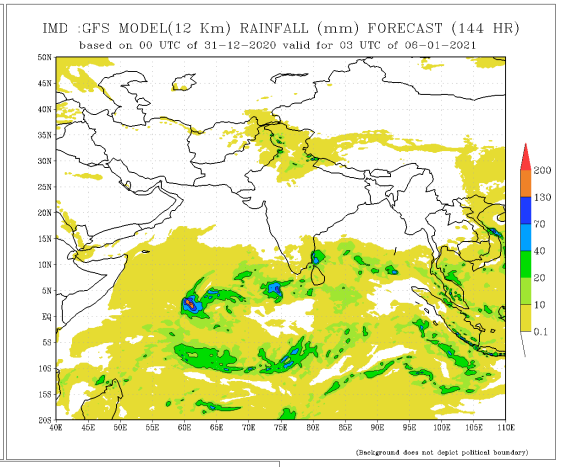


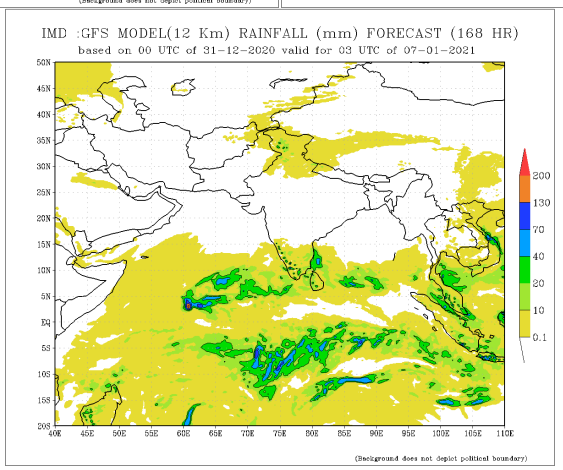






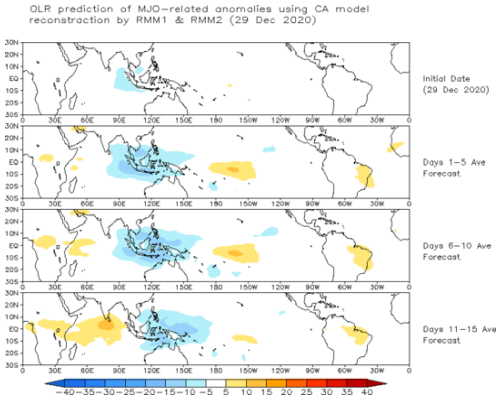






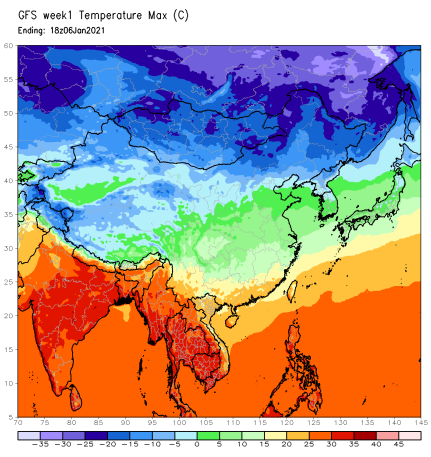
Madden Julian Oscillation (MJO) related Outgoing Longwave Radiation (OLR) Forecast

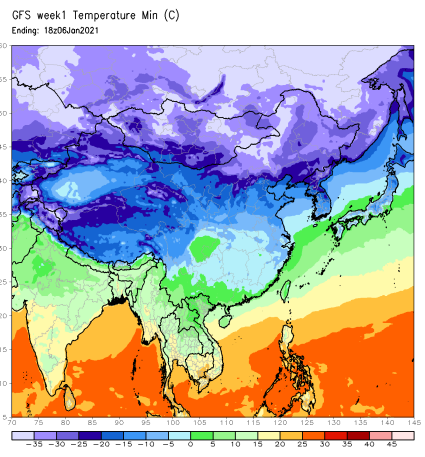
The Outgoing Longwave Radiation (OLR) is a proxy for rainfall. This can be used to identify convective rain clouds based on the MJO phase. Violet and Blue shading indicates enhanced tropical weather and Orange shading indicates suppressed conditions. The following figure shows the forecasts of MJO associated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



Weekly Temperature Forecast

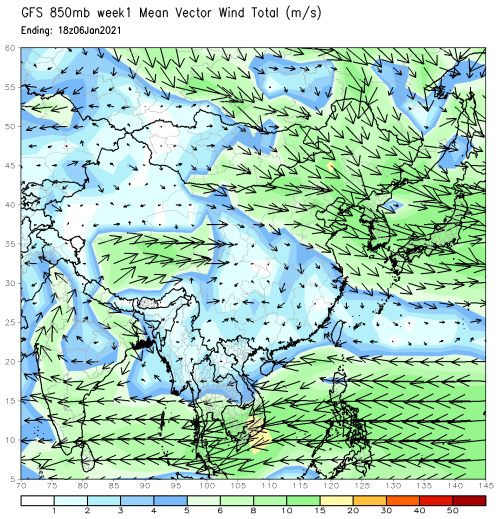
Weekly Minimum and Maximum Temperature prediction from the GFS model (from NOAA CPC)

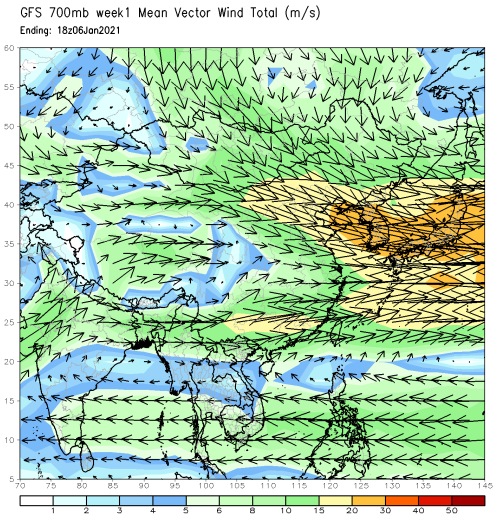




Weekly Wind Forecast

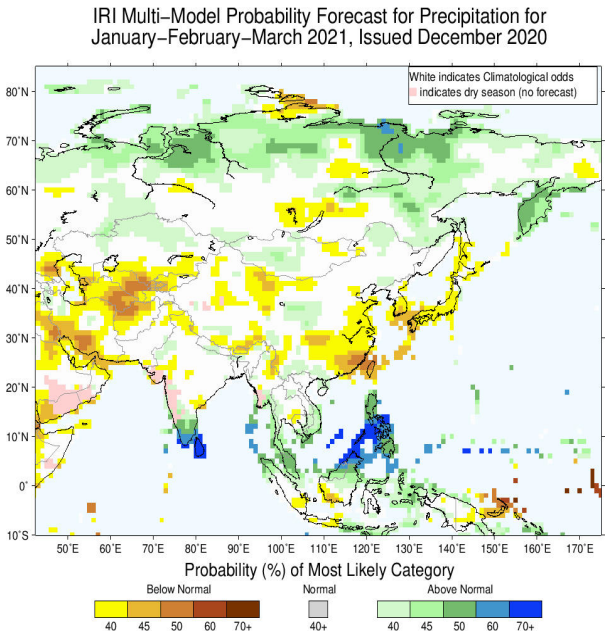
Weekly mean vector wind total prediction from the GFS model at 850 mb (left) and 700 mb (right) levels. (from NOAA CPC)

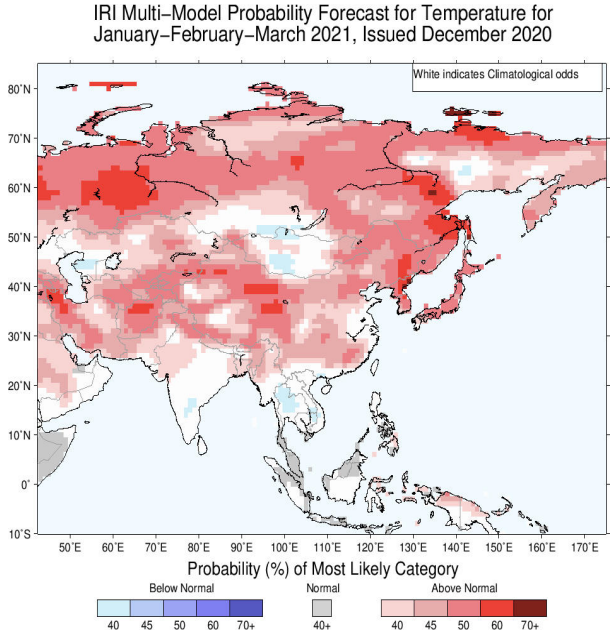




Seasonal Rainfall and Temperature Forecast

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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