Federation for Environment, Climate and Technology

c/o, Maintenance Office, Mahaweli Authority, Digana Village, Rajawella, Sri Lanka.
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Week of 29 Jan - 5 Feb 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

- *Heavy rainfall of 135 mm expected in Batticaloa district during 27th Jan - 3rd Feb. The drop in rainfall over the rest of the country.*

Monitored Rainfalls

- *Heavy rainfall was experienced in Western & Southern provinces during 21th- 27th.Up to 91 mm Highest rainfall in Kalutara on 21st Jan.*

Monitored Wind

- *From 20th - 26th Jan: up to 6 km/h Easterly to Northeasterly winds were experienced by the entire island.*

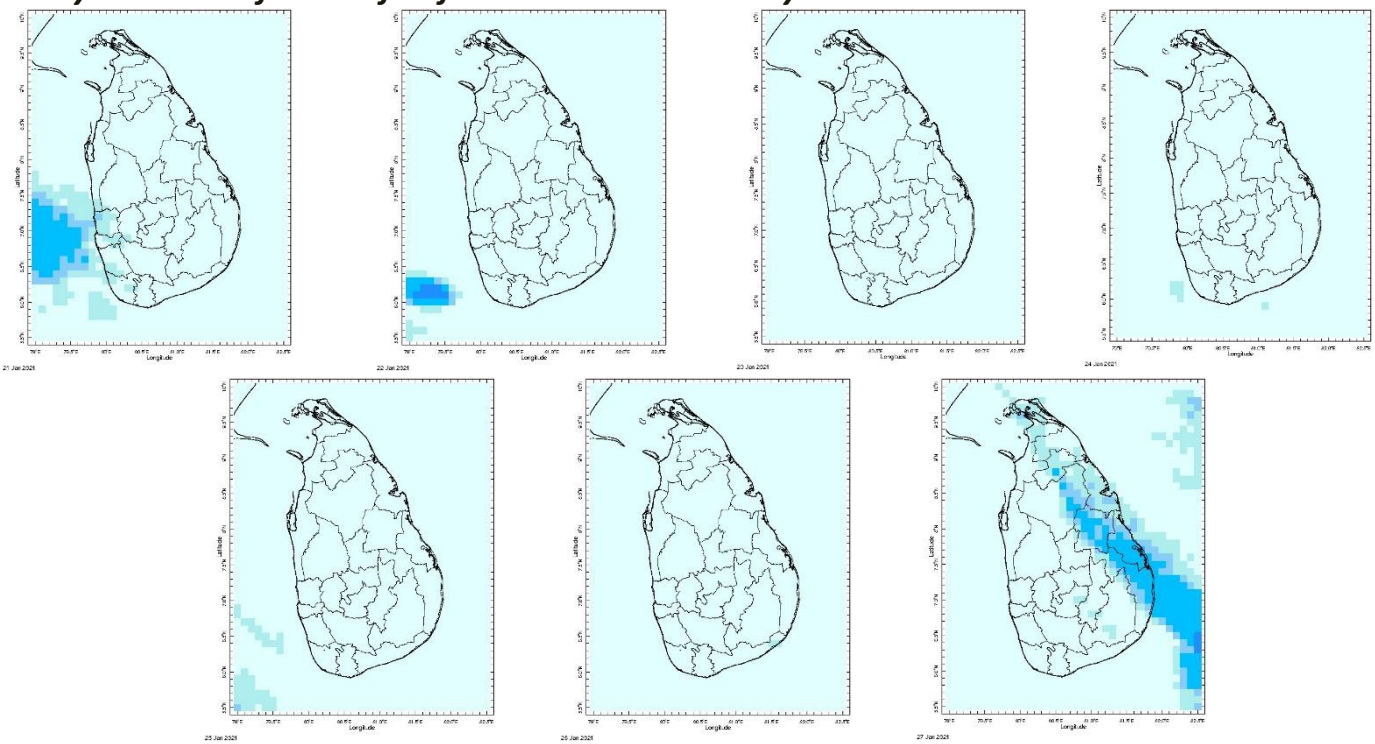
Monitored Sea Surface

- *Sea surface temperature was observed near-neutral all along around Sri Lanka.*

Monitoring

Rainfall

Daily Estimates for Rainfall from 21st – 27th January



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Total Rainfall for the Past Week

The RFE 2.0 tool shows 7-day total Cumulative rainfall by Districts:

Rainfall	Districts
5 – 10 mm	Batticaloa
2 – 5 mm	Ampara, Polonnaruwa, Anuradhapura

Weekly Rainfall Anomalies by Districts:

Rainfall Deficit

Rainfall	Districts
10 – 25 mm	Galle, Matara, Ratnapura, Kalutara, Colombo, Kegalle, Nuwara Eliya, Kandy, Anuradhapura, Polonnaruwa, Trincomalee, Mannar, Vavuniya, Jaffna

Monthly Monitoring

During late December and early January, Dekadal Rainfall (mm/day) by Districts:

1st – 10th January:

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

11th – 20th January:

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

Ocean State *(Text Courtesy IRI)*

Pacific sea state: January 20, 2021

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

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Indian Ocean State

Sea surface temperature was observed near-neutral all along around Sri Lanka.

Predictions

Rainfall

14-day prediction: NOAA NCEP models

From 28th January – 3rd February:

Total rainfall by Provinces:

Rainfall	Provinces
135 mm	Eastern
75 mm	Northern
65 mm	North-central
45 mm	Uva, Central, Western, Southern
35 mm	North-western, Sabaragamuwa

From 4th – 10th February:

Total rainfall by Provinces:

Rainfall	Provinces
125 mm	Eastern
65 mm	Northern
55 mm	North-central, Uva
45 mm	Central, Southern, Western, Sabaragamuwa
25 mm	North-western

MJO based OLR predictions

For the next 15 days:

MJO shall significantly suppress the rainfall during 27th Jan– 10th Feb.

Interpretation

Monitoring

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

Wind: As is typical for January the Northeasterly winds prevailed in the sea area and around the island.

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

Predictions

Rainfall: During the next week (28th Jan – 3rd Feb), heavy rainfall is predicted for the Eastern coastal region and significant rainfall of 95 mm in Mullaitivu, Trincomalee and Jaffna districts. A drop in rainfall is predicted over the rest of the country.

Temperatures: The temperature remains slightly above normal for January. During 18th Jan–4th Feb, the temperature remains high especially the Western and Southern coast.

Teleconnections:

- MJO shall significantly suppress the rainfall during 27th Jan– 10th Feb.
- La Nina - The SST forecast is for La Nina conditions to continue through April weakening through June. So, the La Niña is expected to be moderate to strong in coming seasons.

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Weekly Climate Bulletin for Sri Lanka

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   e. Weekly Wind Forecast
   f. Seasonal Predictions from IRI

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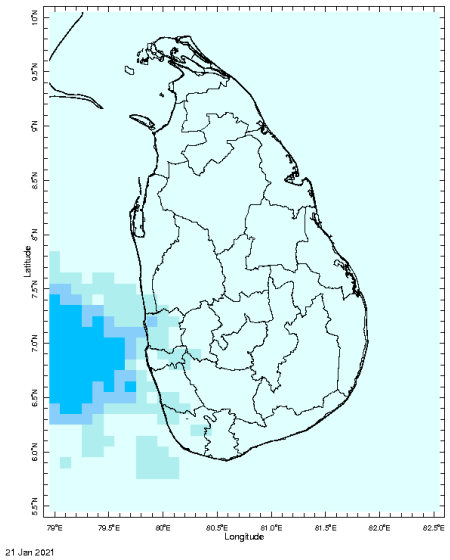
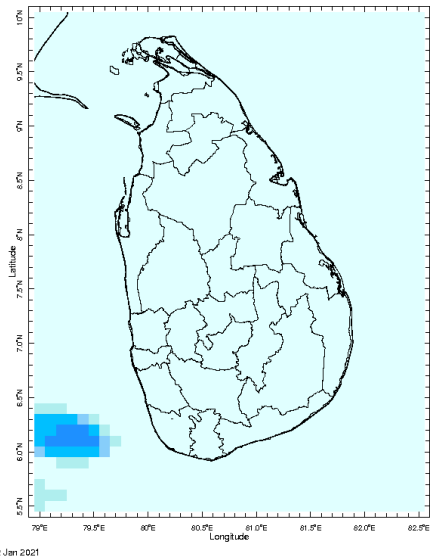
MONITORING

Daily Rainfall Monitoring

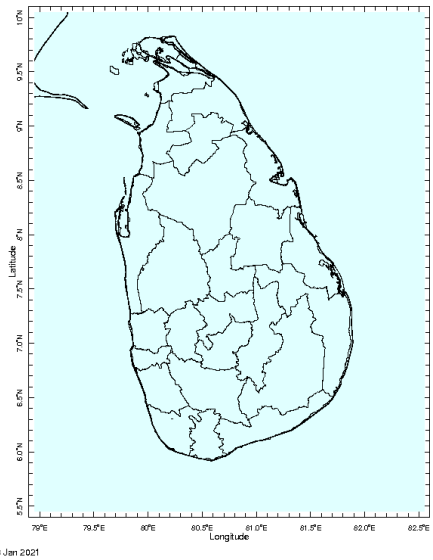
The following figures show the satellite observed rainfall in the last 7 days in Sri Lanka.



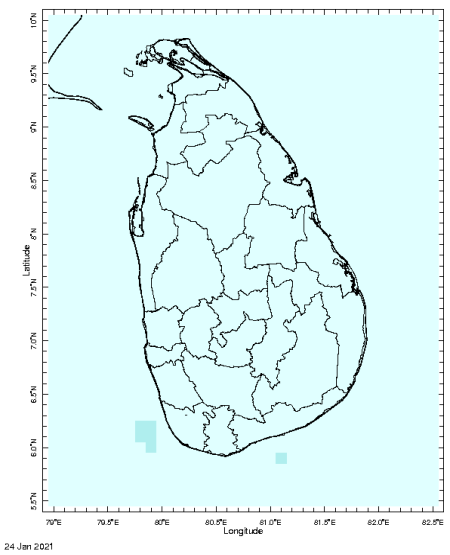
21 Jan 2021



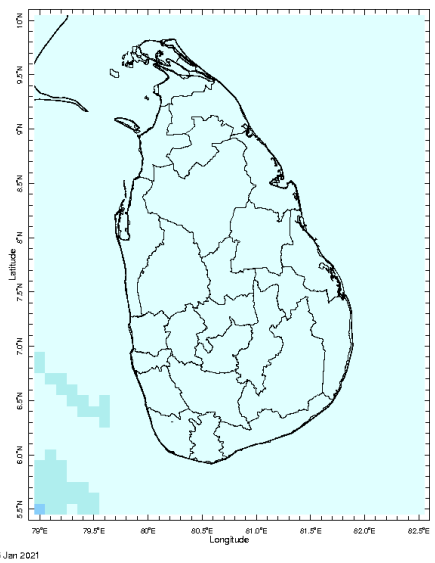
22 Jan 2021



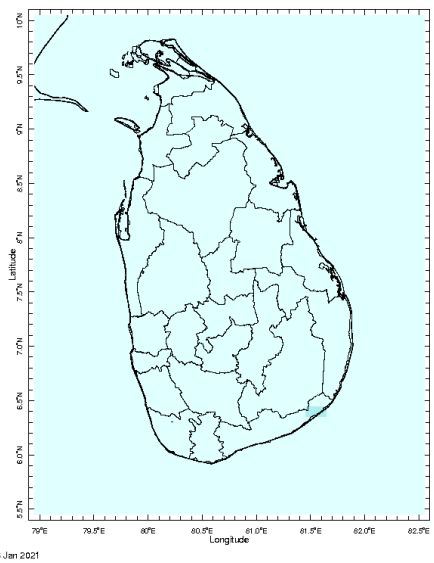
23 Jan 2021



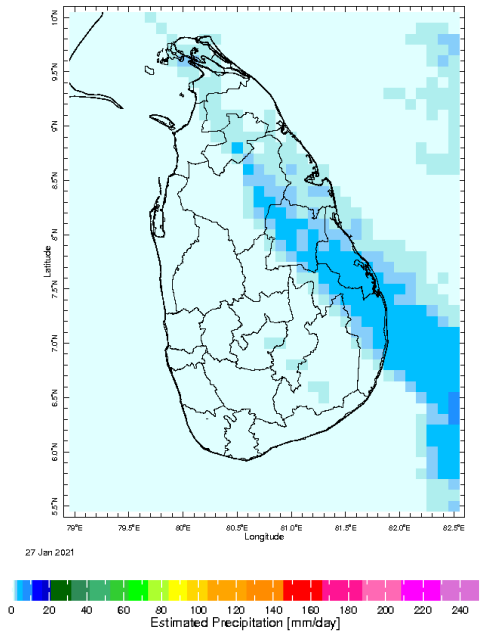
24 Jan 2021



25 Jan 2021

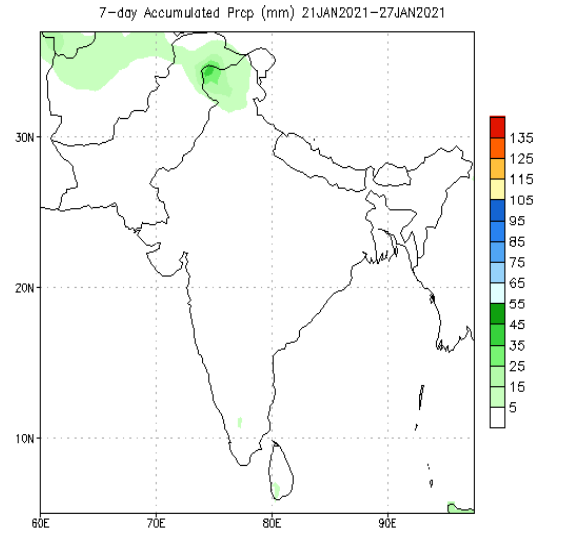


26 Jan 2021

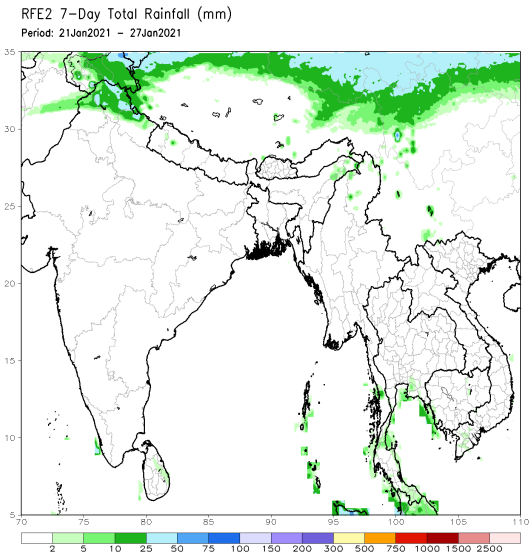


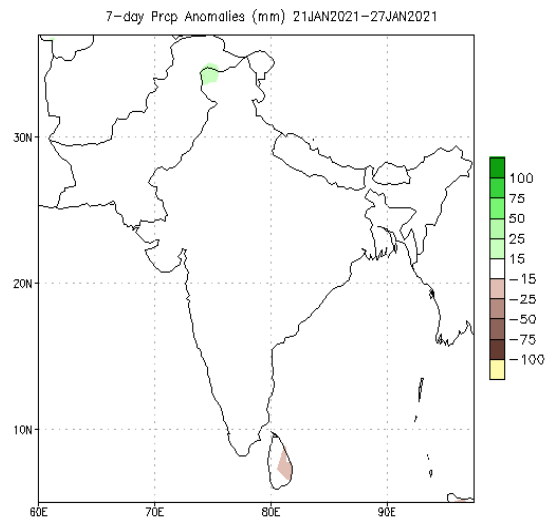
Weekly Rainfall Monitoring

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.

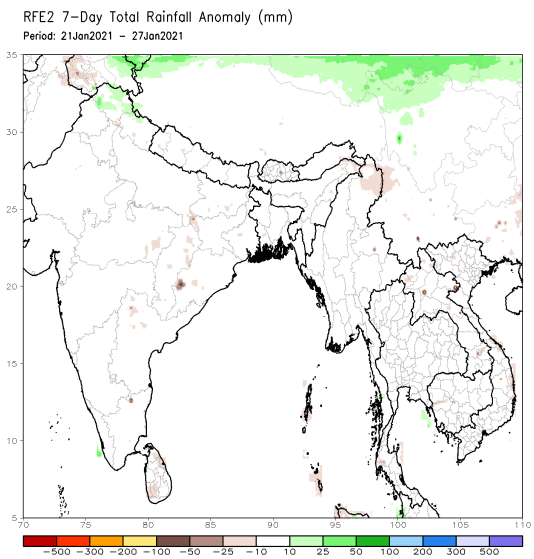


Data Source: CPC Unified (gauge-based & 0.5x0.5 deg resolution) Precipitation Analysis



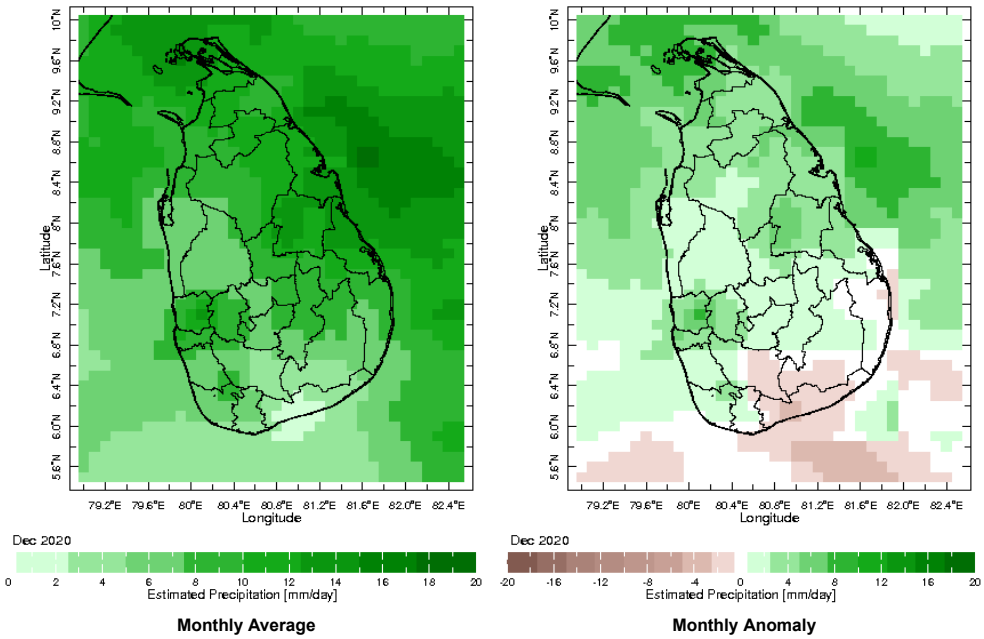


Data Source: CPC Unified (gauge-based & 0.5x0.5 deg resolution) Precipitation Analysis Climatology (1981-2010)

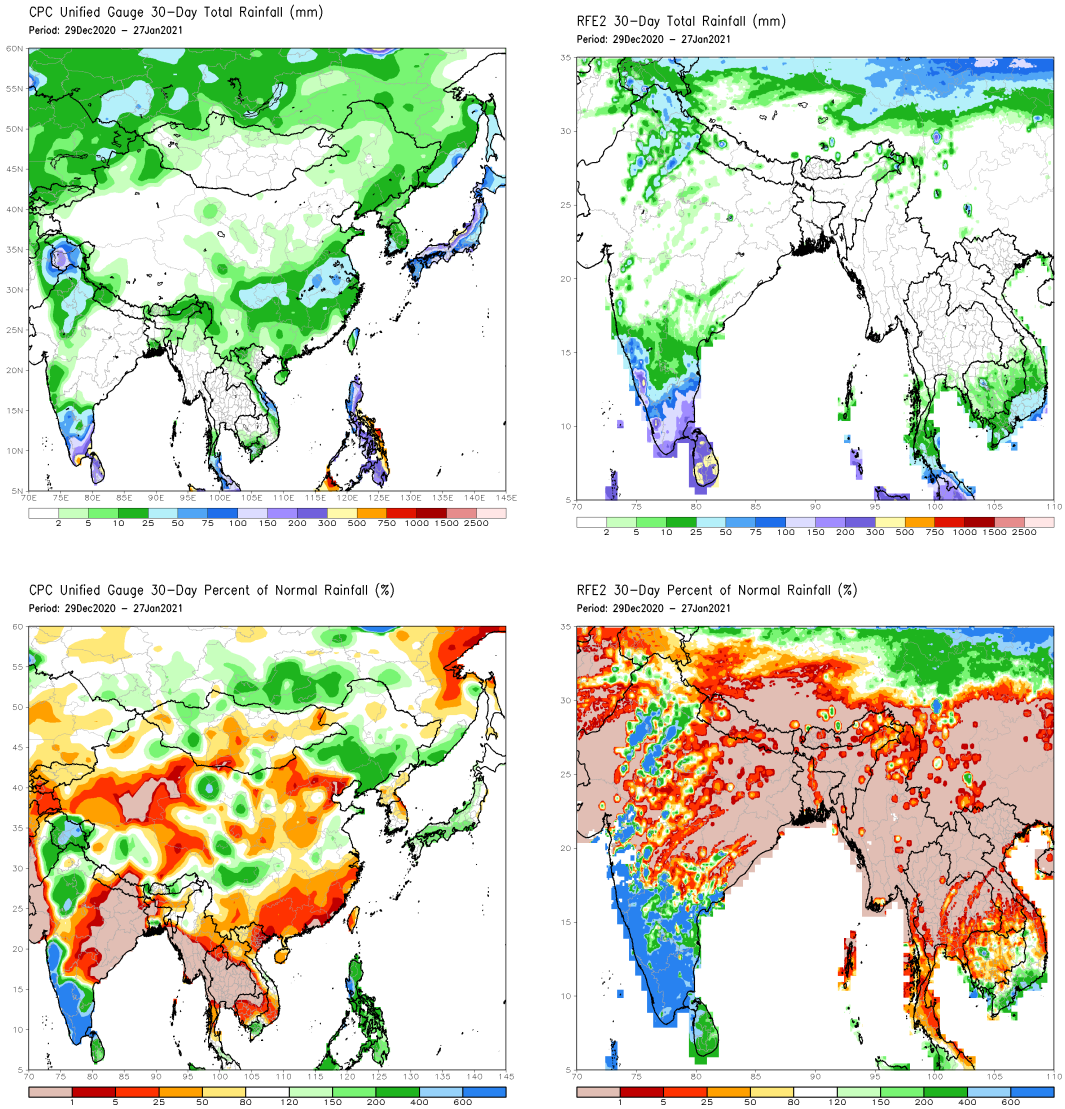


Monthly Rainfall Monitoring

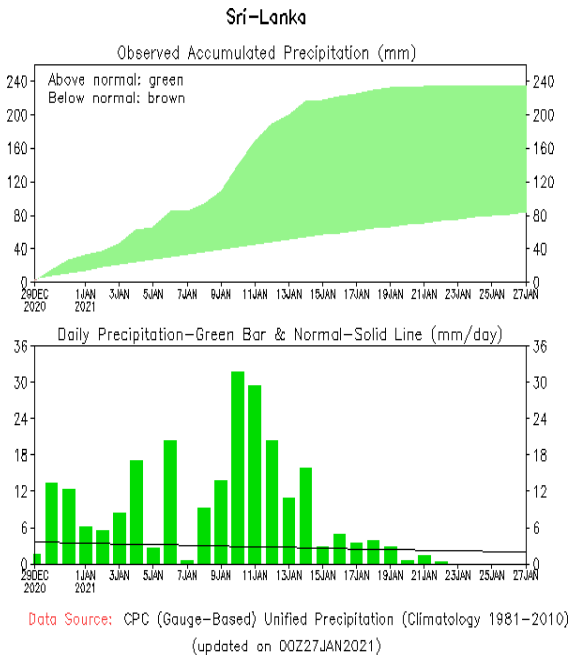
The figure in the left shows the average observed rainfall in the previous month. The rainfall anomaly in the previous month is shown in the figure to the right. The brown color in the anomaly figure shows places which received less rainfall than the historical average while the green color shows places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



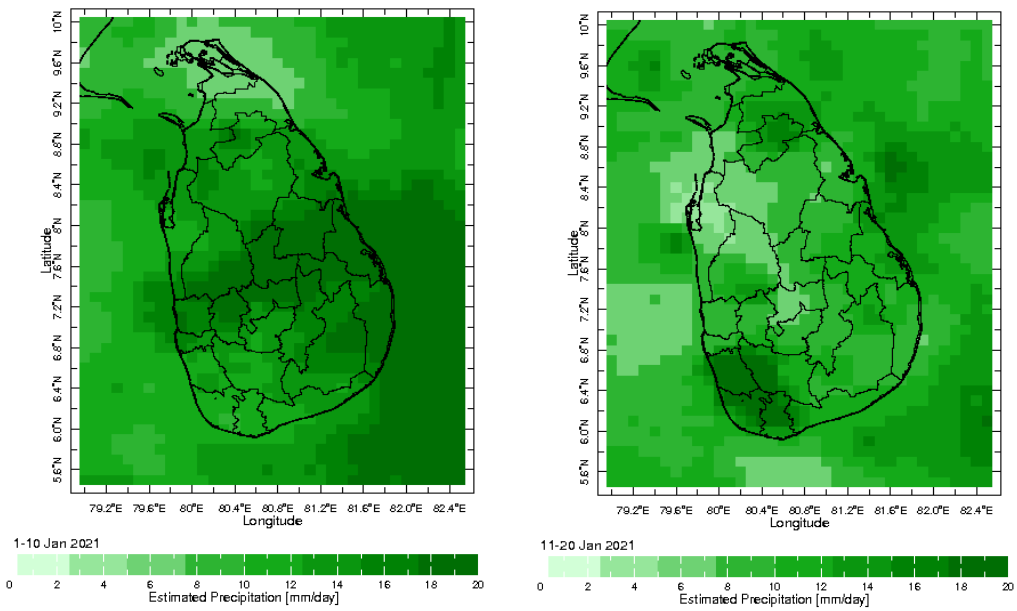
The figure in the top-left shows the total rainfall in the past 30 days from CPC Unified Precipitation Analysis while the figure in the top-right shows the total rainfall for the same period from RFE 2.0 Satellite Rainfall Estimates. The bottom two figures show the percentage of rainfall received in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



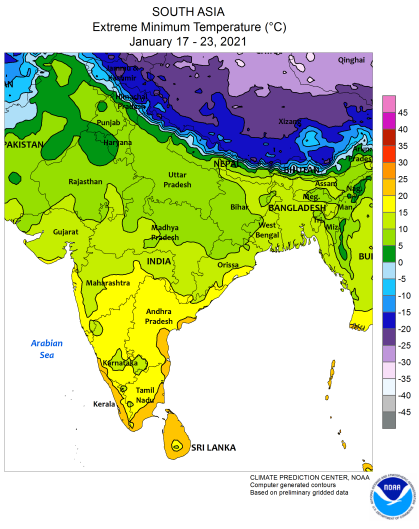
The following figure shows the observed accumulated rainfall (top) and daily observed rainfall (bottom) in Sri Lanka in the last 30 days.

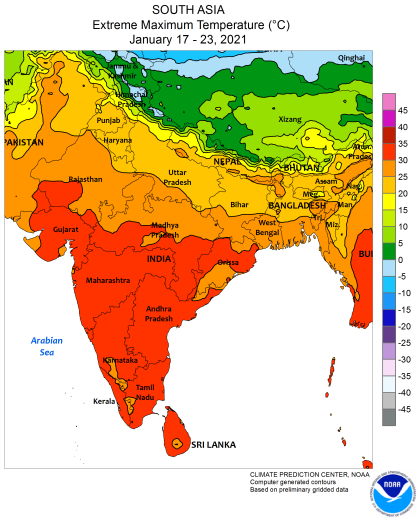


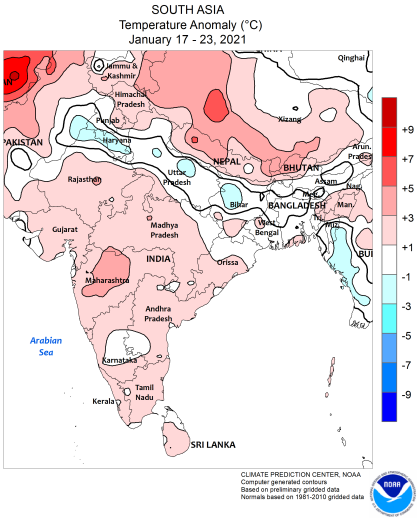
Dekadal (10 Day) Satellite Derived Rainfall Estimates



Weekly Temperature Monitoring

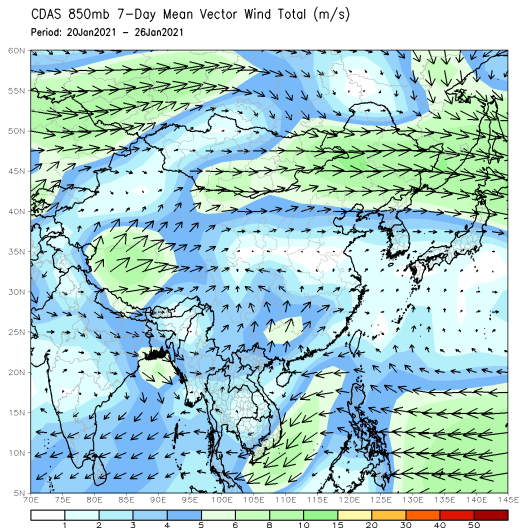


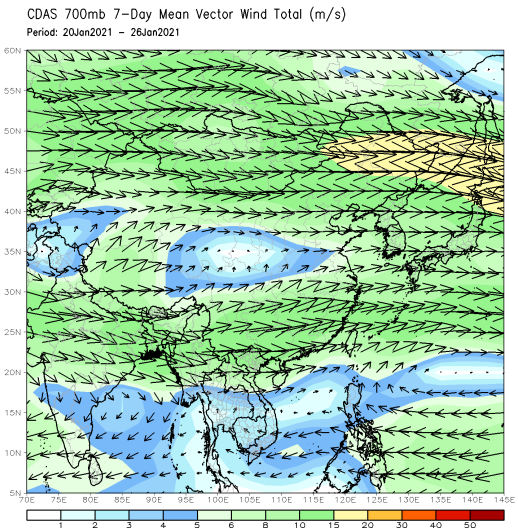




Weekly Wind Monitoring

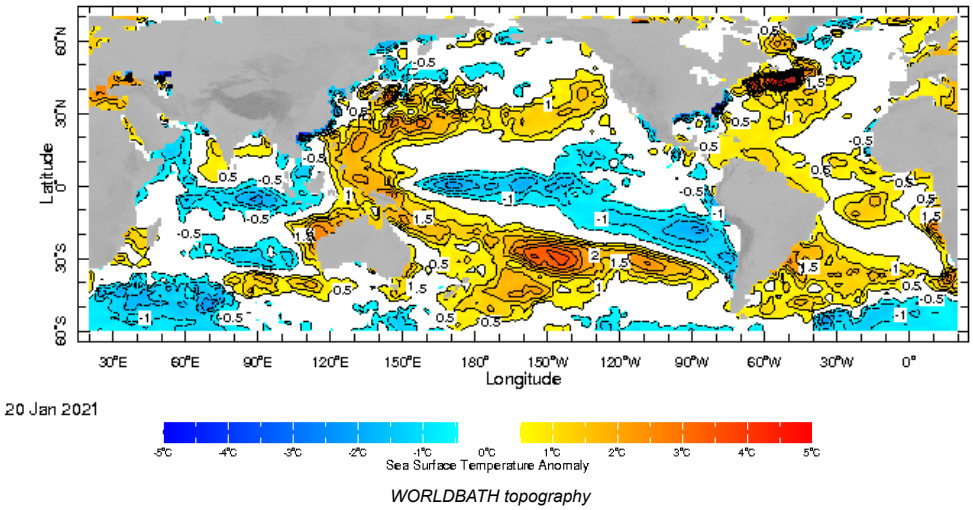
The following figures show the mean vector wind total of the past 7 days near Sri Lanka at two levels. The figure on the left shows 850 mb (~1500 m) level and the figure on the right shows 700 mb (~3000 m) level.



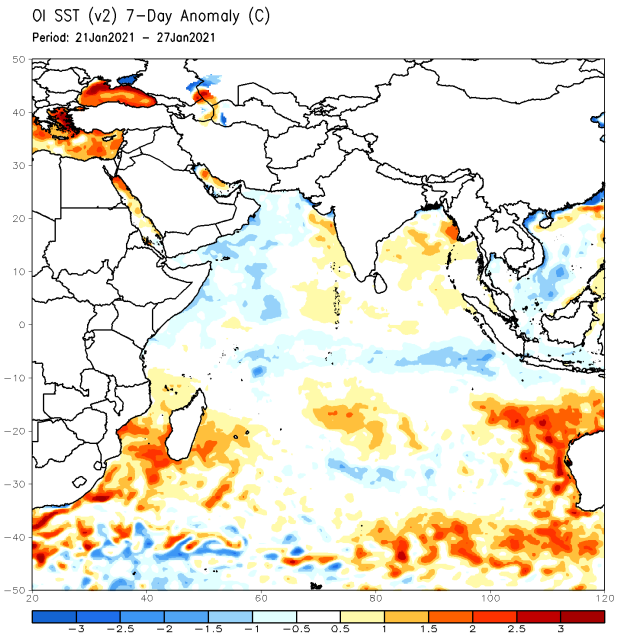


Weekly Average SST Anomalies

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

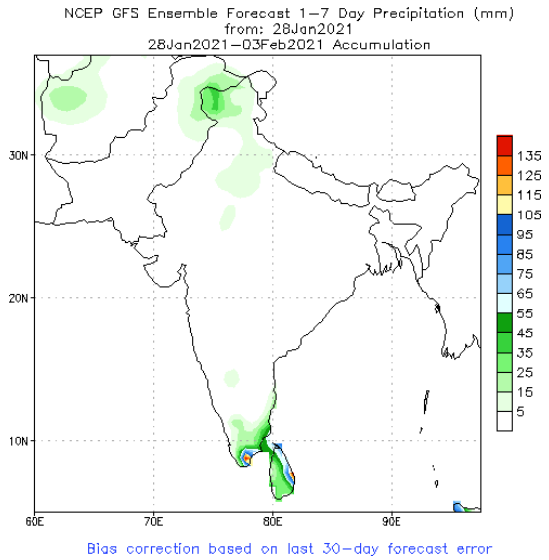


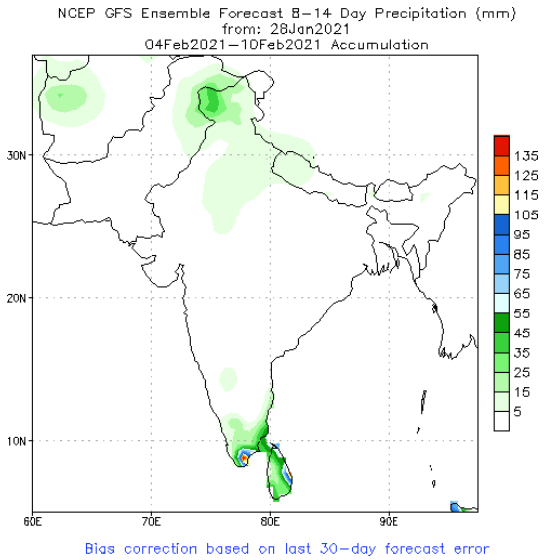
Optimum Interpolated Sea Surface Temperature Anomaly in the Indian Ocean from NOAA CPC



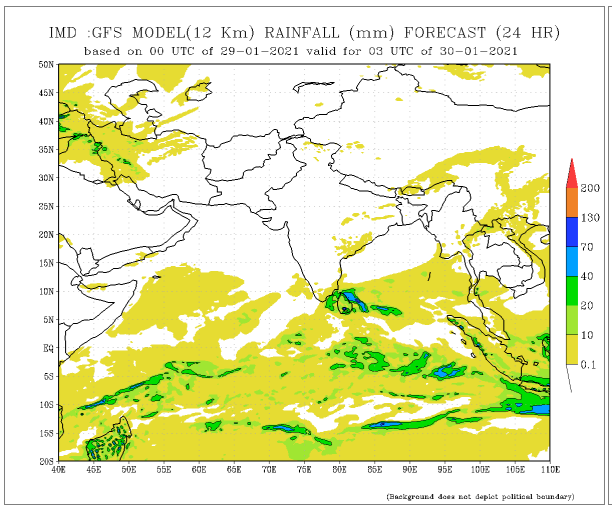
PREDICTIONS

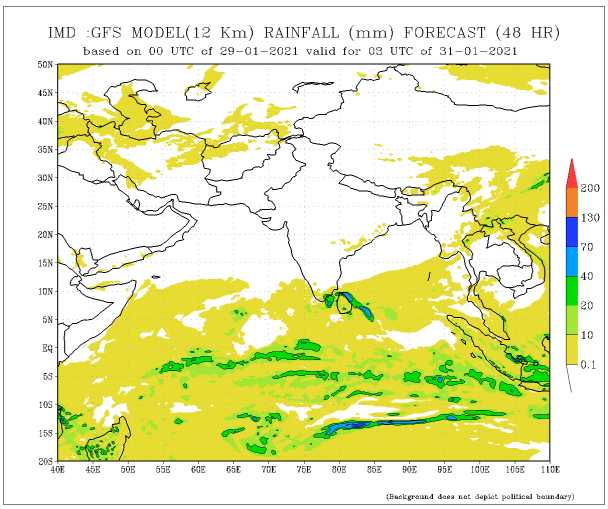
NCEP GFS 1- 14 Day prediction

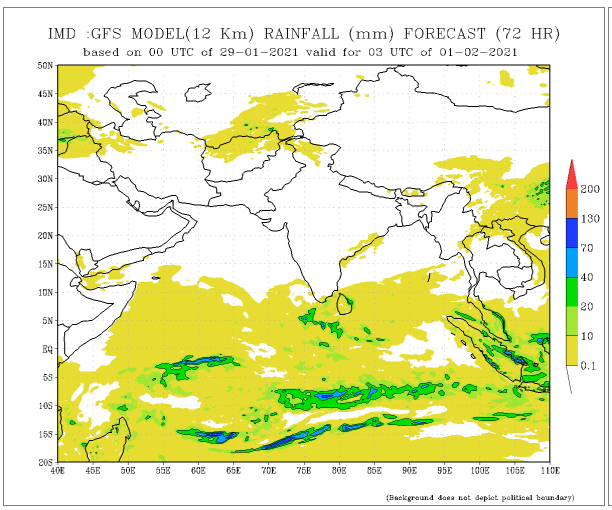


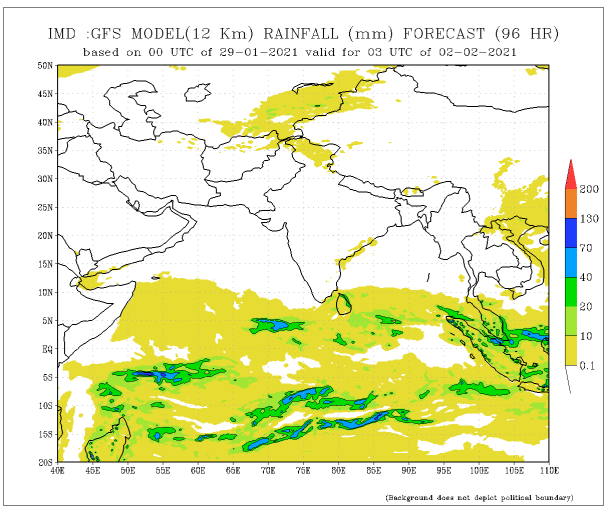


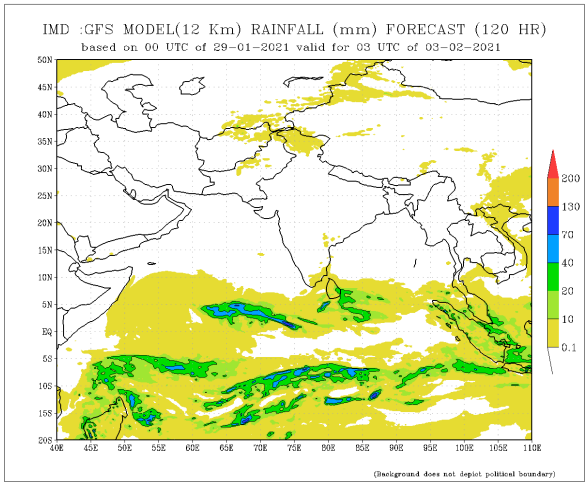
IMD GFS (T574) Model Rainfall Forecast from RMSC New Delhi, India

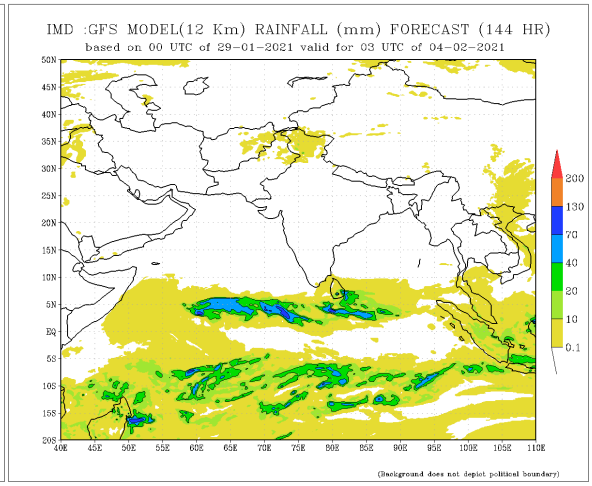


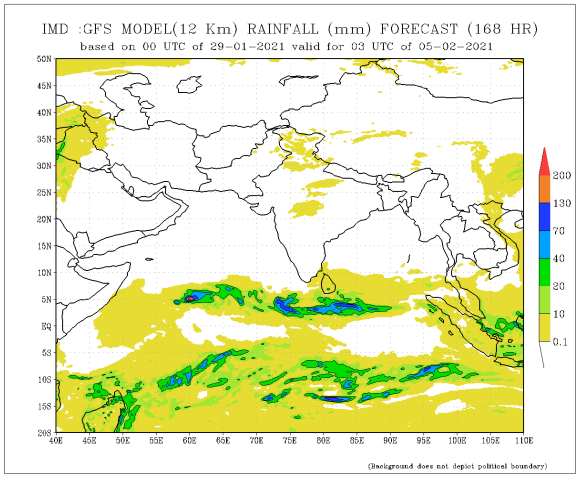






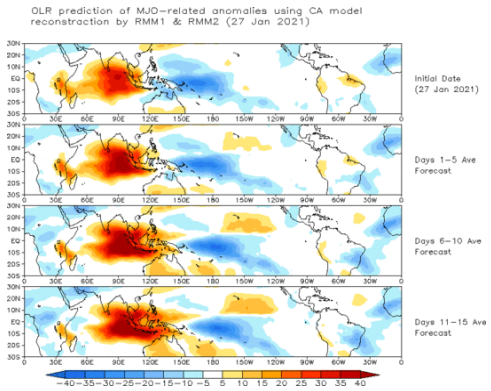






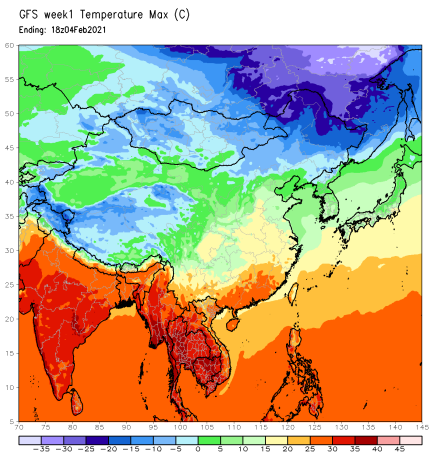
Madden Julian Oscillation (MJO) related Outgoing Longwave Radiation (OLR) Forecast

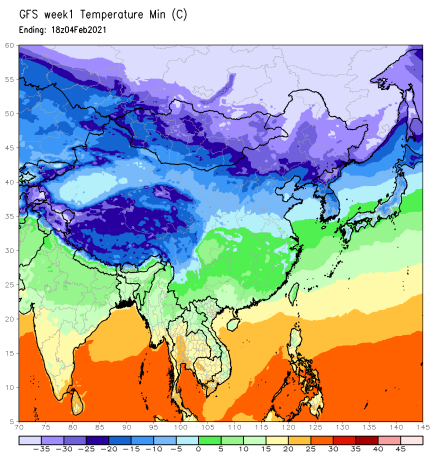
The Outgoing Longwave Radiation (OLR) is a proxy for rainfall. This can be used to identify convective rain clouds based on the MJO phase. Violet and Blue shading indicates enhanced tropical weather and Orange shading indicates suppressed conditions. The following figure shows the forecasts of MJO associated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



Weekly Temperature Forecast

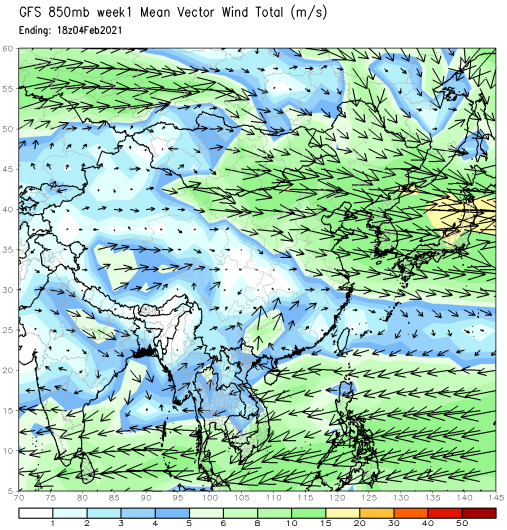
Weekly Minimum and Maximum Temperature prediction from the GFS model (from NOAA CPC)

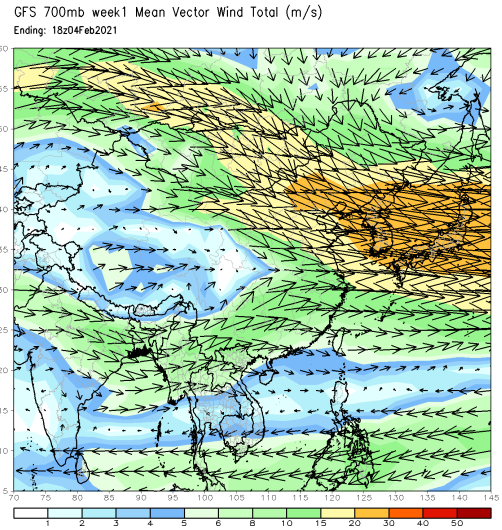




Weekly Wind Forecast

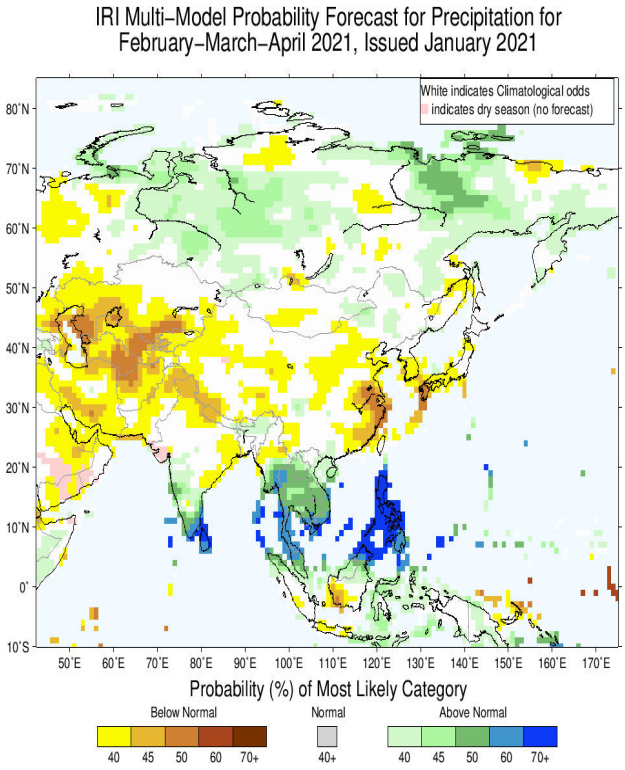
Weekly mean vector wind total prediction from the GFS model at 850 mb (left) and 700 mb (right) levels. (from NOAA CPC)



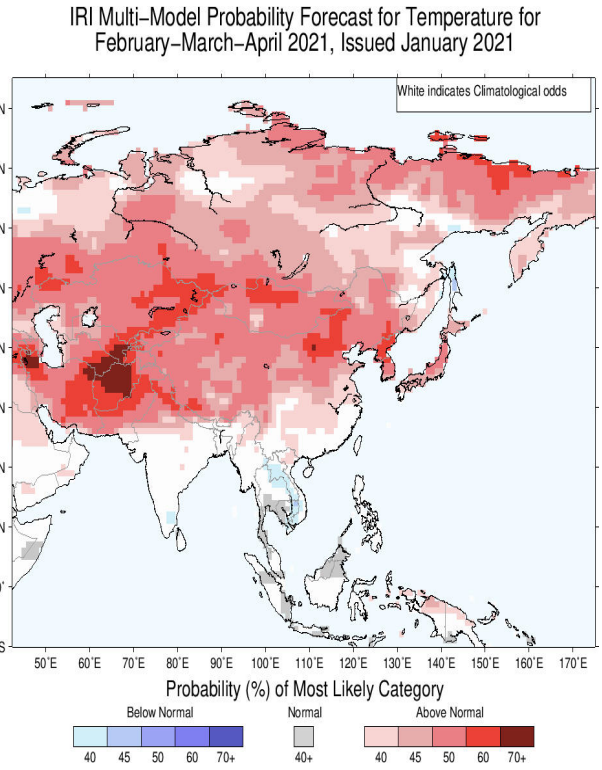


Seasonal Rainfall and Temperature Forecast

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%).



Precipitation Forecast



Temperature Forecast

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