FECT
Foundation for Environment, Climate and Technology

Week of 20 -27 November 2020

CLIMATE MONITORING AND PREDICTION FOR SRI LANKA

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HIGHLIGHTS

Rainfall Prediction

- Between 18th-24th Nov: high rainfall over the Eastern Province the drop in rainfall over the rest of the country.

Monitored Rainfalls

- Between 11th - 17th Nov: up to 200 mm in Puttalam and Kurunegala districts on 15th Nov.

Monitored Wind

- From 10th - 16th Nov:up to 8 km/h Easterly winds were experienced by the entire island.
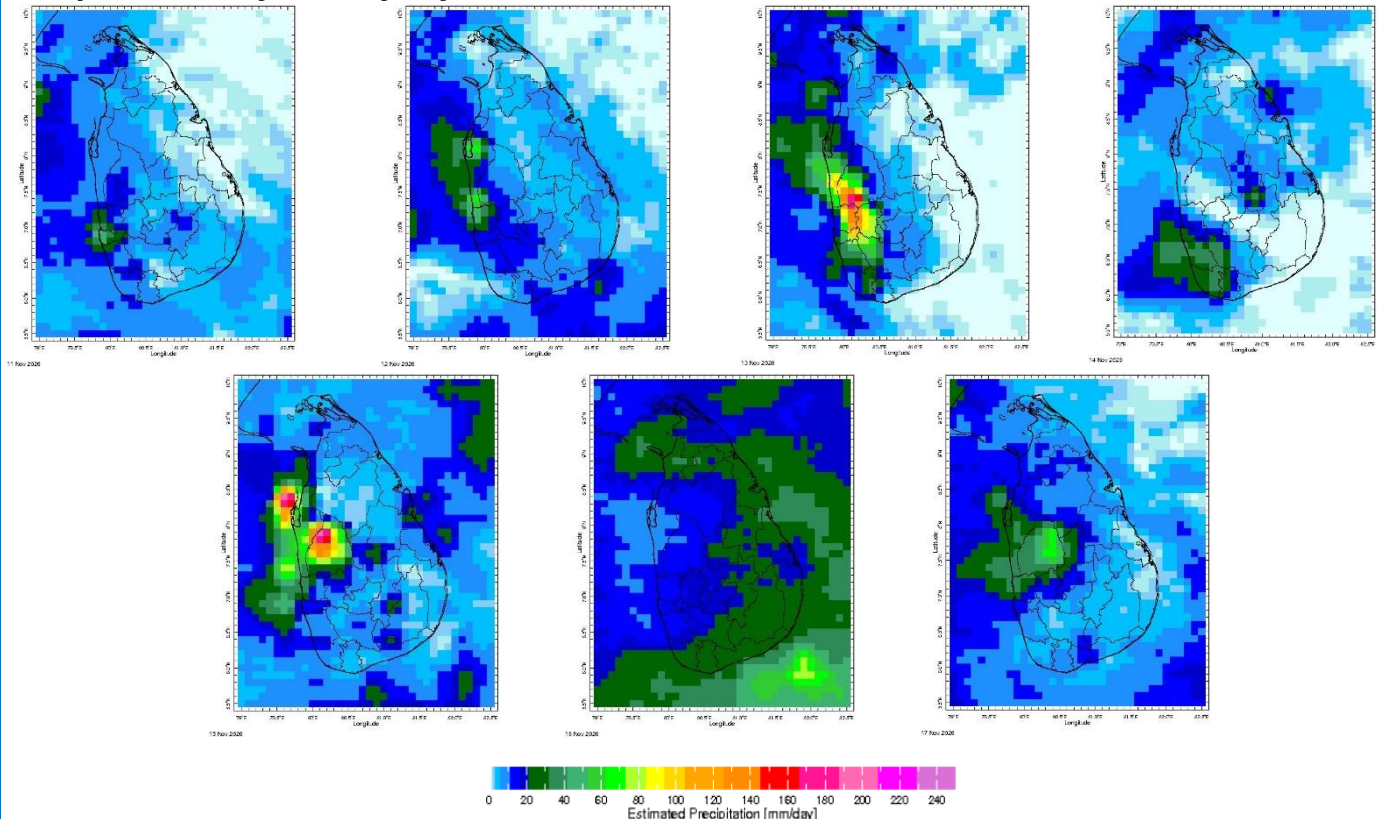
Monitored Sea Surface

- 0.5ºC above average sea surface temperature was observed in the seas around Sri Lanka.

Monitoring

Rainfall

Daily Estimates for Rainfall from 11th– 17th November

Estimated Precipitation [mm/day]
0   20   40   60   80   100   120   140   160   180   200   220   240

Total Rainfall for the Past Week

The RFE 2.0 tool shows total up to 200 – 300 mm in Gampaha, Kegalle, Kurunegala and Puttalam districts; up to 150 – 200 mm in Kalutara, Colombo and Ratnapura districts; up to 100 – 150 mm up to in Galle, Matara, Nuwara Eliya, Kandy, Matale and Anuradhapura districts; up to 75 – 100 mm in Polonnaruwa, Batticaloa, Moneragala and Mannar districts; up to 50 -75 mm in Hambantota, Badulla, Amapara, Trincomalee, Vavuniya, Mullaitivu, Kilinochchi and Jaffna districts.

Above rainfall average up to 200 – 300 mm in Kurunegala, Puttalam and Gampaha districts; up to 100 – 200 mm in Colombo, Kalutara, Kegalle and Ratnapura districts; up to 50 – 100 mm in Galle, Kandy, Matale, Nuwara Eliya, Anuradhapura and Mannar districts; up to 25 – 50 mm in Matara, Polonnaruwa and Vavuniya districts; up to 10 – 25 mm in Hambantota, Moneragala, Badulla, Batticaloa, Trincomalee, Mullaitivu and Kilinochchi districts; Below rainfall average up to 25 – 50 mm in Ampara, district.

Monthly Monitoring

During October – Above average rainfall conditions up to 4 mm in Vavuniya, Anuradhapura, Badulla, Ampara and Moneragala districts; up to 2 mm in Mannar, Batticaloa, Ratnapura and Hambantota districts; Below average rainfall up to 8 mm in Galle, Kalutara and Colombo district; up to 6 mm in Matara, Gampaha, Kegalle, Nuwara Eliya, Kandy, Kurunegala, Puttalam, Jaffna districts; up to 4 mm in Kilinochchi, Mullaitivu, Polonnaruwa, Matale and Trincomalee districts.

Ocean State *(Text Courtesy IRI)*

Pacific sea state: November 11, 2020

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

Indian Ocean State

0.5 ^{0}C above average sea surface temperature was observed in the seas around Sri Lanka.

Predictions

Rainfall

14-day prediction: NOAA NCEP models

From 18th – 24th November: Total rainfall up to 115 mm in East of the island; up to 105 mm rainfall in Northeast of the island; up to 85 mm rainfall in North, Central and Southeast of the island: up to 75 mm in Southwest of the island; 65 mm in Northwest and Southwest of the island and 55 mm in west of the island.

From 25th November – 1st December: Total rainfall up to 115 mm in Northeast of the island; up to 105 mm rainfall in East and North of the island; up to 85 mm in Northwest, Central and West of the island; up to 55 mm in South, Southwest and Southeast of the island.

NOAA Model Forecast:

From 24th – 29th September: Total rainfall up to 75 mm in Badulla district; up to 50 mm in Ampara, Moneragala, Ratnapura, Nuwara Eliya, Kandy, Matale, Polonnaruwa, Anuradhapura, Batticaloa, Trincomalee, Vavuniya, Mullaitivu, Kilinochchi and Jaffna districts; and up to 25 mm in Mannar, Puttalam, Kurunegala, Kegalle, Gampaha, Colombo, Kalutara, Galle, Matara and Hambantota districts.

MJO based OLR predictions

For the next 15 days:

MJO shall severely enhance the rainfall during 17th – 26th Nov and slightly enhance during 27th Nov - 1st Dec over Sri Lanka.

Interpretation

Monitoring

Rainfall: During the last two weeks, here has been high rainfall over the Puttalam, Kurunegala, Kegalle and Gampaha districts. North Western Province with significant rainfall over the Southern and Western Provinces. November is a month which typically has the highest rainfall in Sri Lanka. Rainfall deficiency in October is ompensated on the western coast during the last fortnight.
Wind: As is typical for mid-to late November the wind direction has reversed from the previous South-West to coming from North and East. The North-Easterlies became stronger. There is a cyclonic pattern in the Indian Ocean that is influencing the North-Easterly coast of Sri Lanka.
Temperatures: are cooling from the highs in the previous month as is seasonable – still the temperature anomalies are above normal for the Southern half the last – driven by the warm SST's.

Predictions

Cyclonic Circulation: Cyclonic circulation has emerged in the Bay of Bengal and it is predicted to intensify and track several hundred to the North-East of Sri Lanka on the 25th of November. This storm prediction remains watching carefully in case the tracks veers towards Sri Lanka and for its remoted impacts.
Rainfall: During the next two weeks, heavy rainfall predicted on the Western coast in Sri Lanka.
Temperatures: During 20th – 26th, the temperature remains high especially the Eastern and Northern coast.
Teleconnections: MJO - is in phases that more intensively enhances rainfall from 17th-26th Nov.
La Nina-has set in as assessed by IRI on October 20. The SST in the Indian Ocean is reacting slowly and is still warmer by 0.5 degree than is seasonable. Usually with La Nina, the rainfall from October to December is suppressed but this is not getting picked up in enough models because the rest of the SST is not typical for the La Nina.

# Weekly Climate Bulletin for Sri Lanka

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MONITORING

Daily Rainfall Monitoring

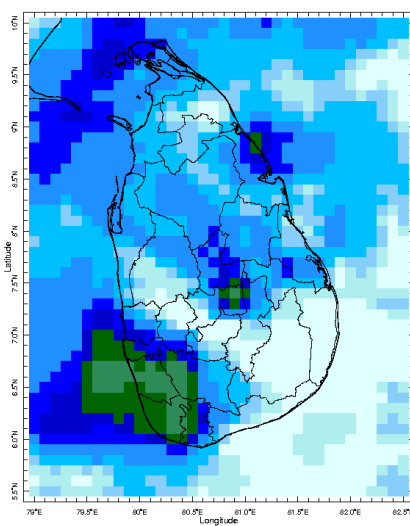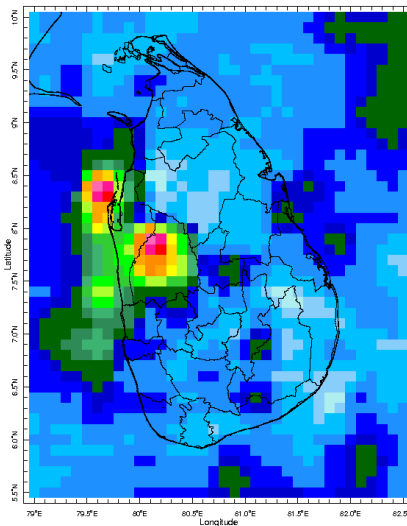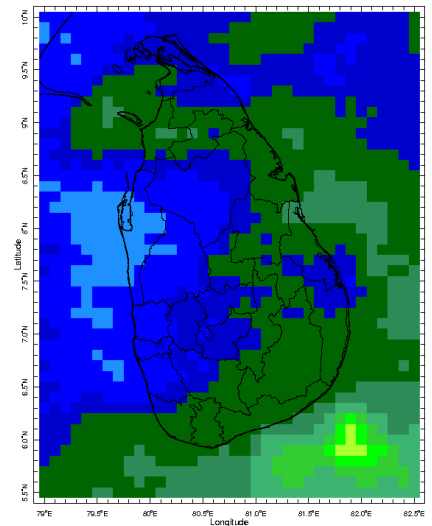**The following figures show the satellite observed rainfall in the last 7 days in Sri Lanka.**
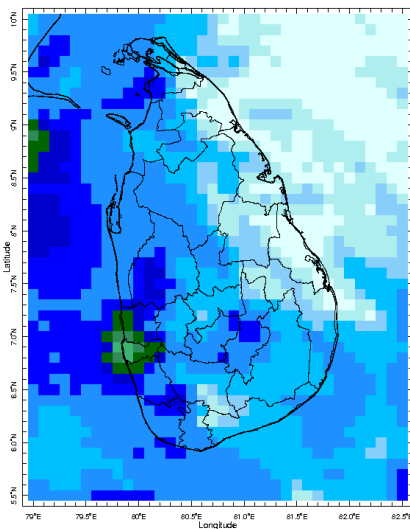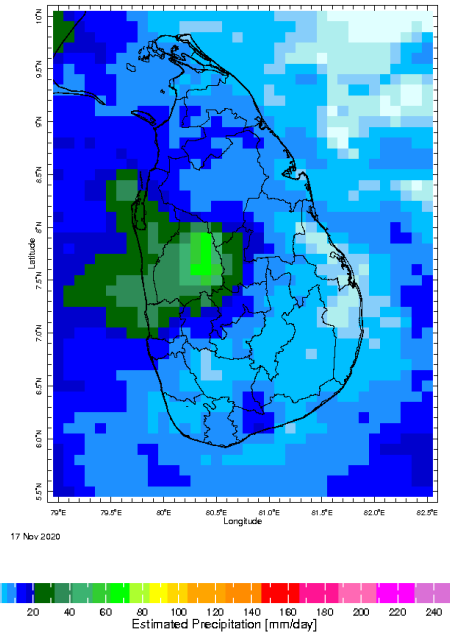

11 Nov 2020
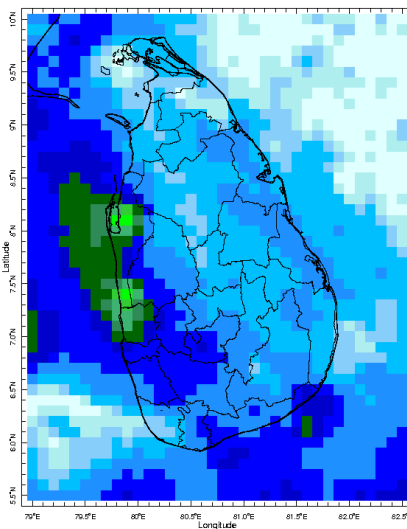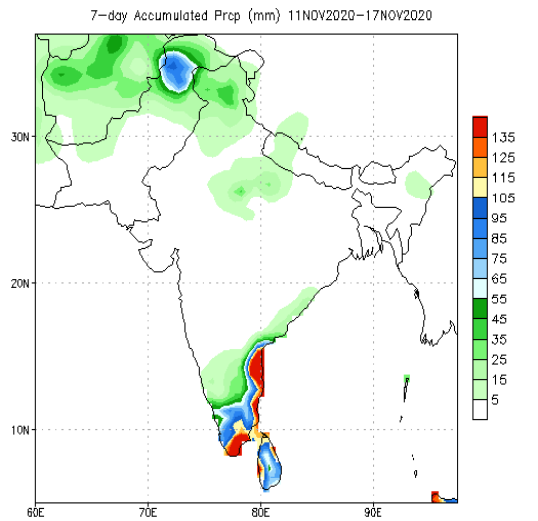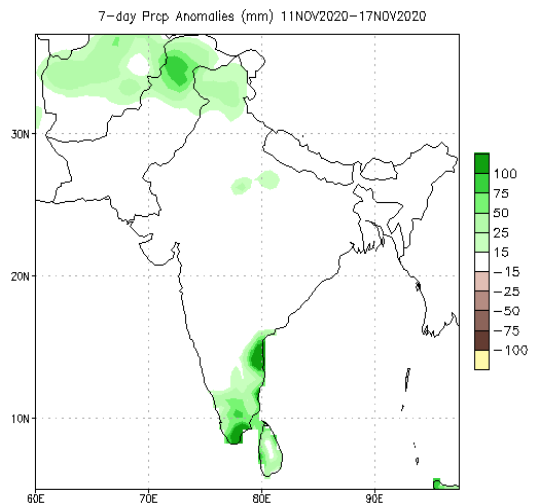
12 Nov 2020
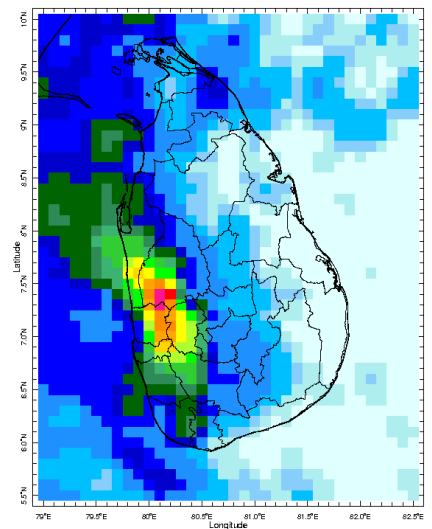
13 Nov 2020

14 Nov 2020

15 Nov 2020

16 Nov 2020

17 Nov 2020

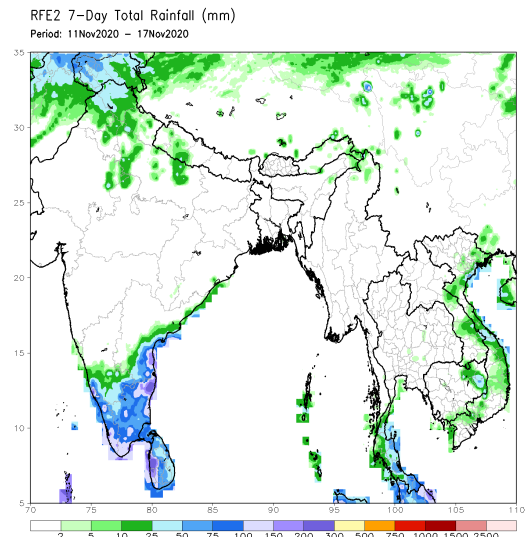Estimated Precipitation [mm/day]

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.

7-day Accumulated Prcp (mm) 11NOV2020-17NOV2020

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

RFE2 7-Day Total Rainfall (mm)
Period: 11Nov2020 − 17Nov2020

7-day Prcp Anomalies (mm) 11NOV2020-17NOV2020

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

RFE2 7-Day Total Rainfall Anomaly (mm)
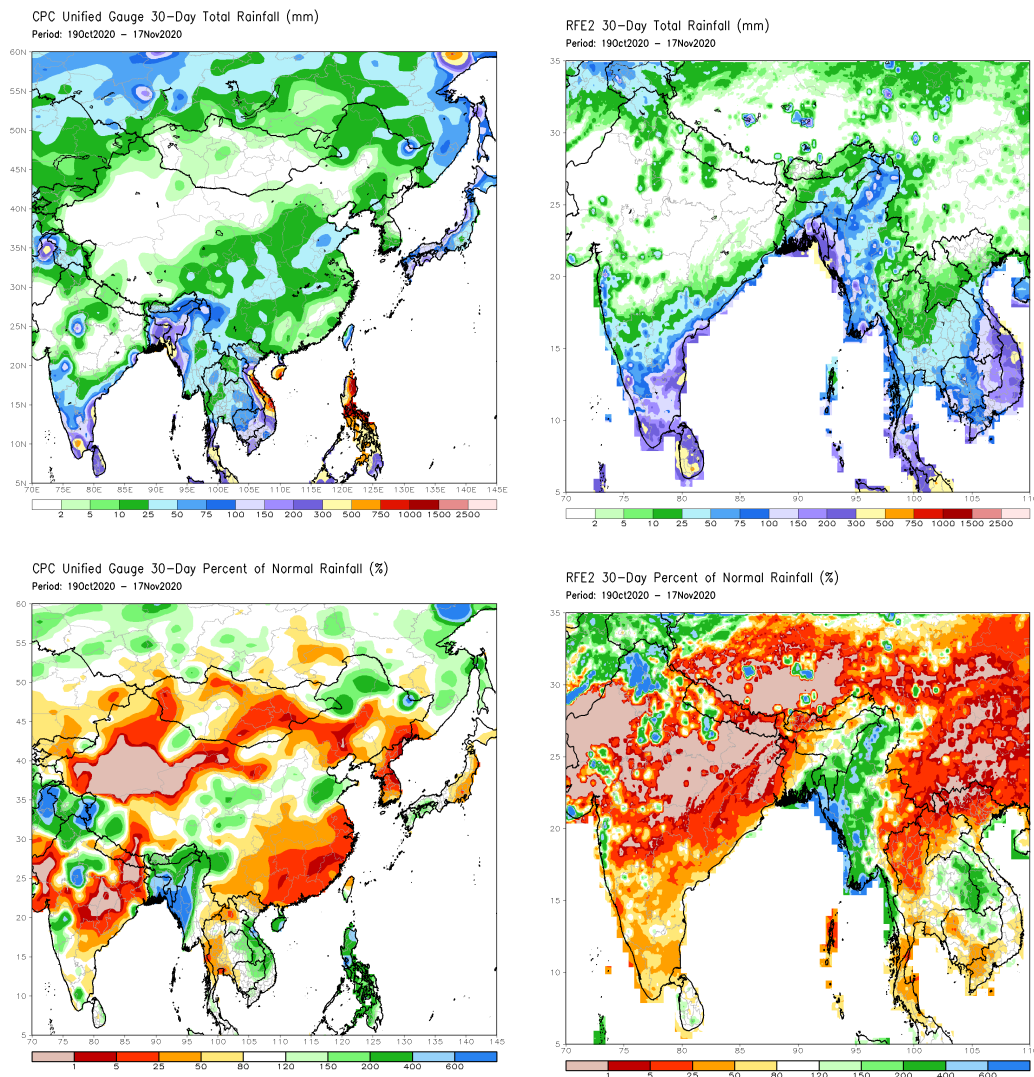Period: 11Nov2020 − 17Nov2020
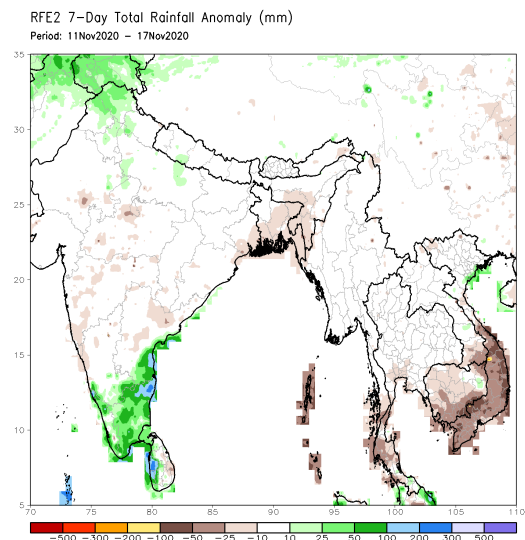
Monthly Rainfall Monitoring

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

Oct 2020

Estimated Precipitation [mm/day]

Monthly Average

Oct 2020

Estimated Precipitation [mm/day]

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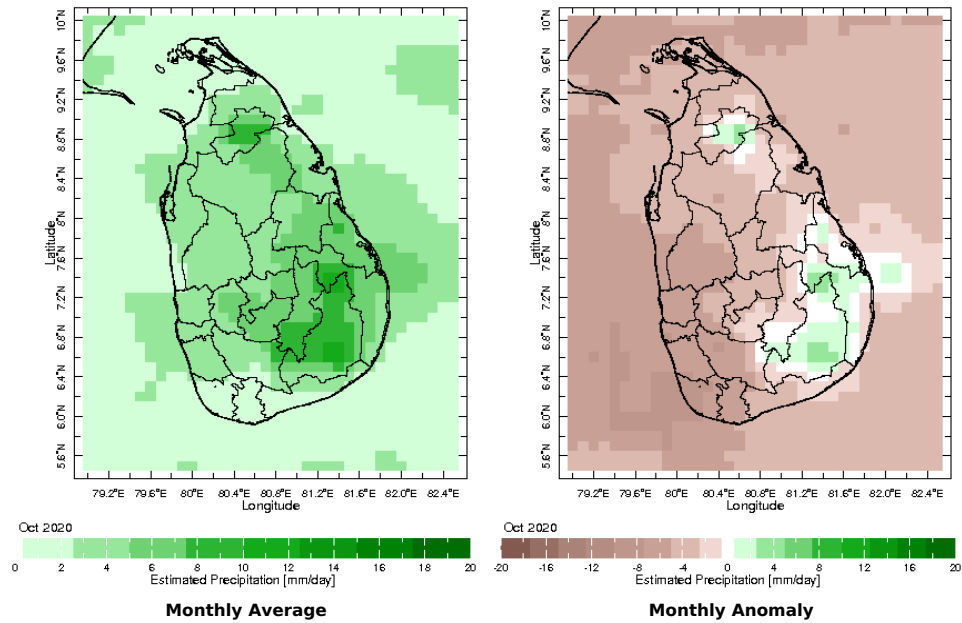
The figure in the top-left shows the total rainfall in the past 30 days from CPC Unified Precipitation Analysis while the figure in the top-right shows the total rainfall for the same period from RFE 2.0 Satellite Rainfall Estimates. The bottom two figures show the percentage of rainfall received in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


CPC Unified Gauge 30-Day Total Rainfall (mm)
Period: 19Oct2020 – 17Nov2020

RFE2 30-Day Total Rainfall (mm)
Period: 19Oct2020 – 17Nov2020

CPC Unified Gauge 30-Day Percent of Normal Rainfall (%)
Period: 19Oct2020 – 17Nov2020

RFE2 30-Day Percent of Normal Rainfall (%)
Period: 19Oct2020 – 17Nov2020

The following figure shows the observed accumulated rainfall (top) and daily observed rainfall (bottom) in Sri Lanka in the last 30 days.
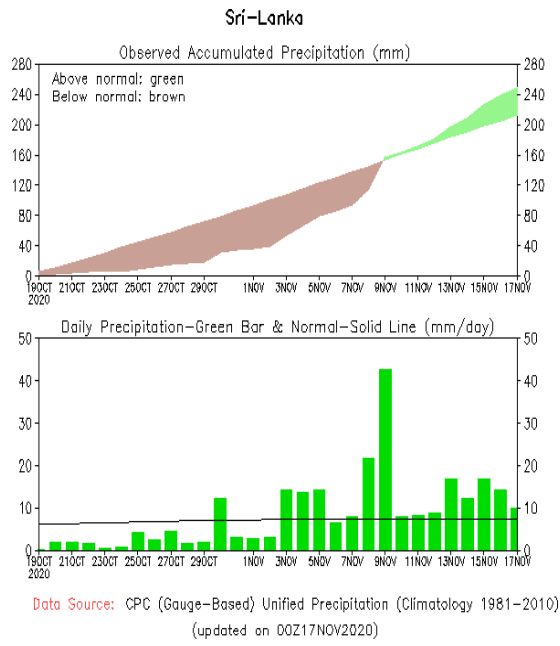
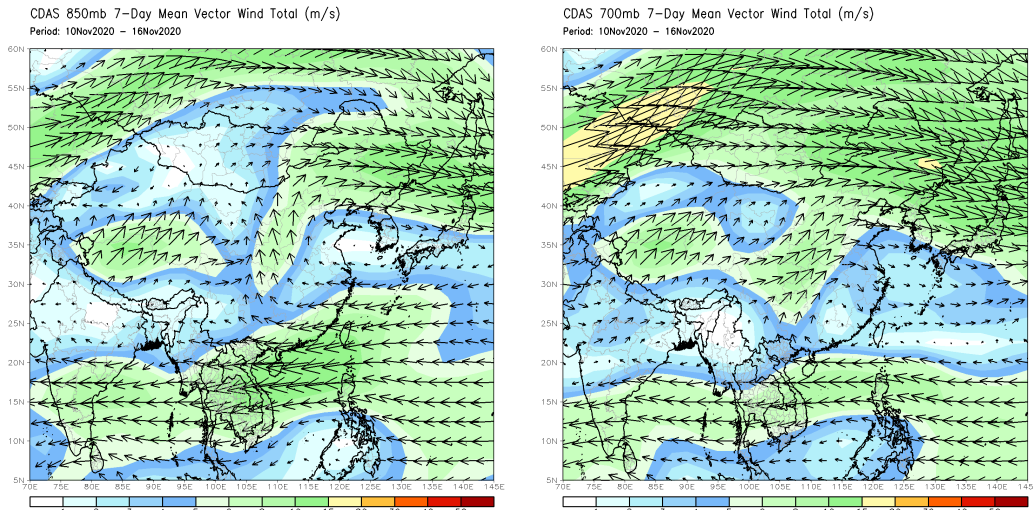## Dekadal (10 Day) Satellite Derived Rainfall Estimates
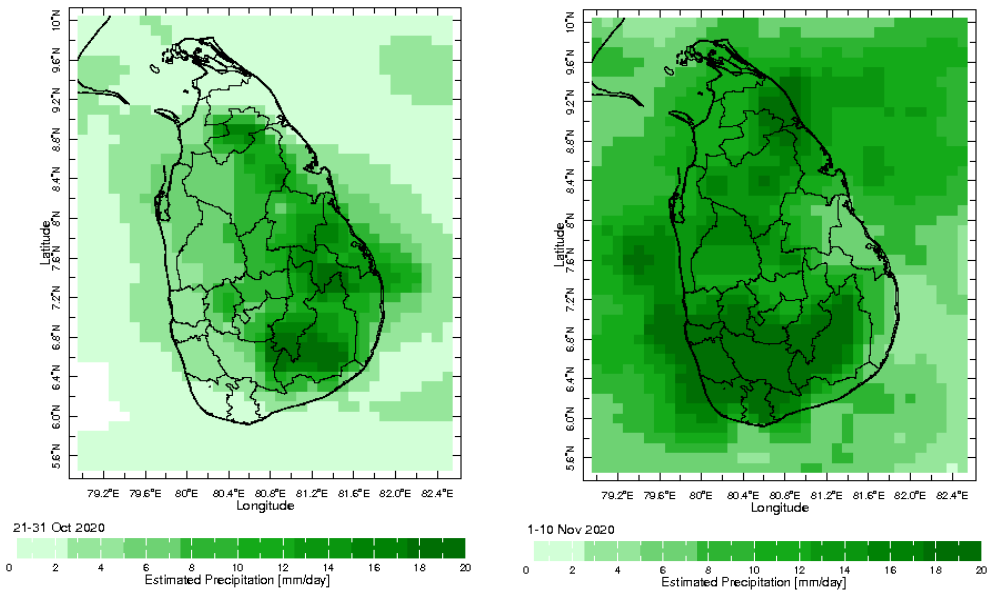

Weekly Temperature Monitoring
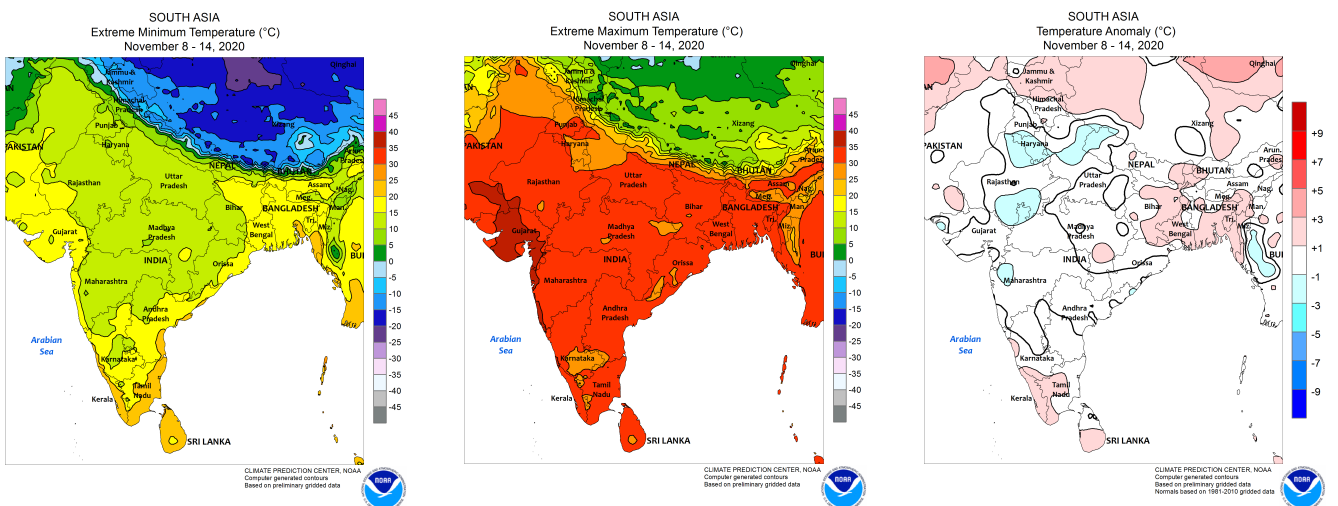
Weekly Wind Monitoring

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.

CDAS 850mb 7-Day Mean Vector Wind Total (m/s)
Period: 10Nov2020 - 16Nov2020

CDAS 700mb 7-Day Mean Vector Wind Total (m/s)
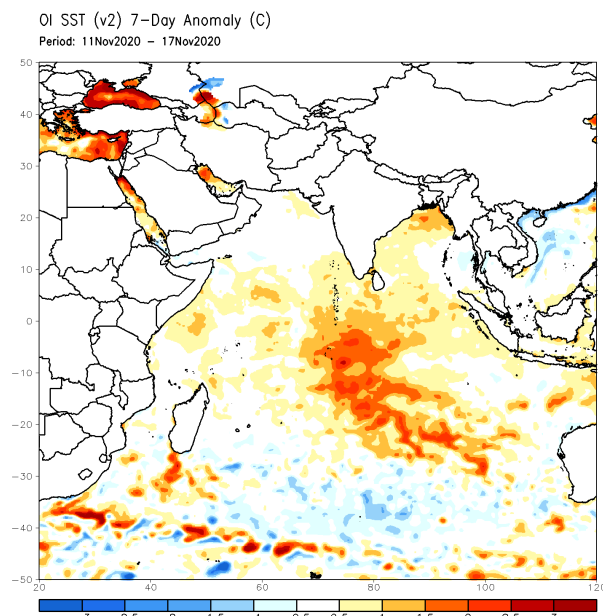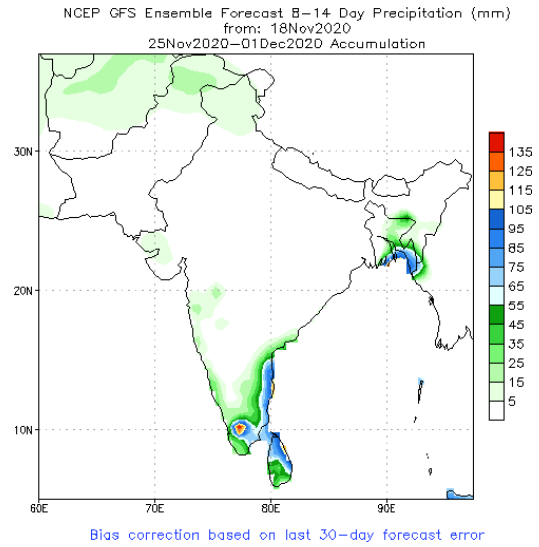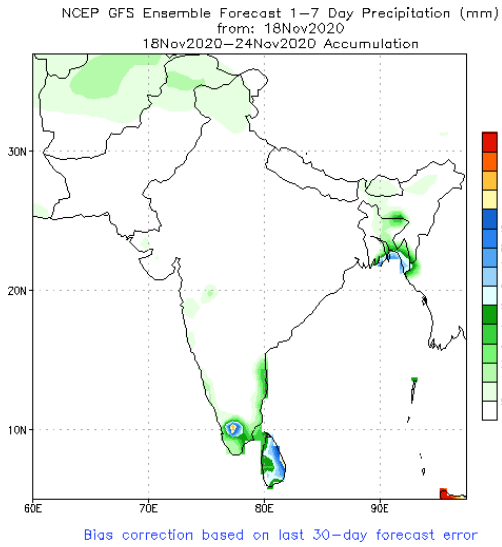Period: 10Nov2020 - 16Nov2020

Weekly Average SST Anomalies

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

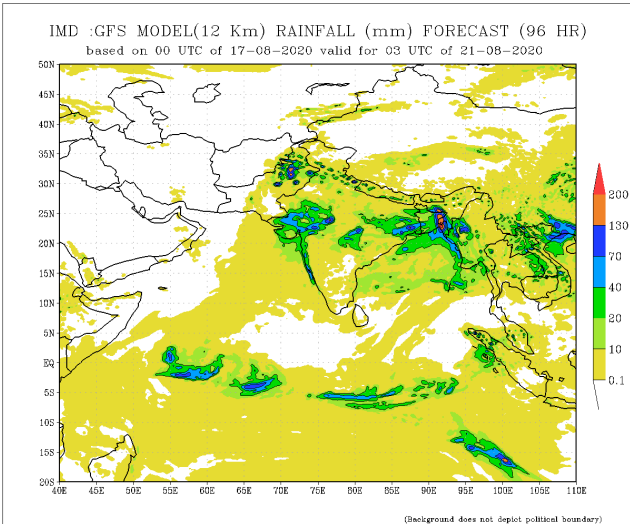11 Nov 2020

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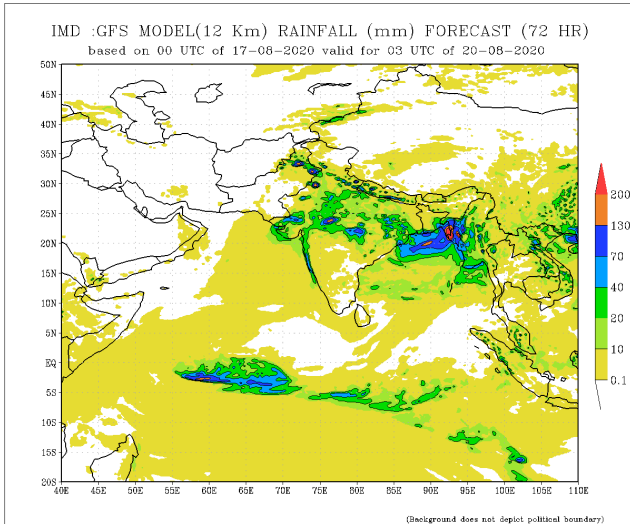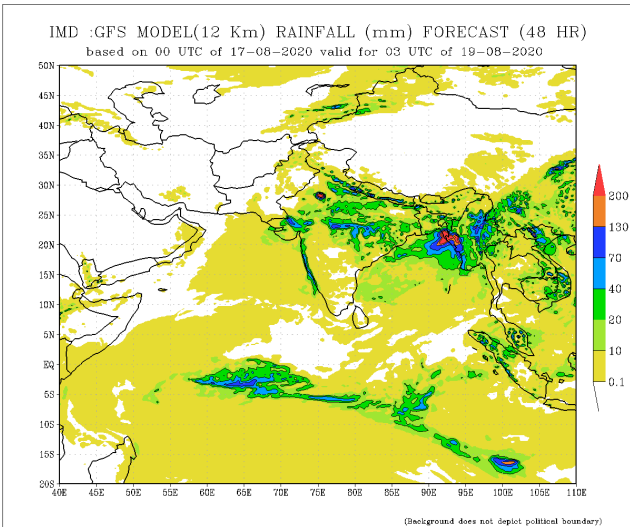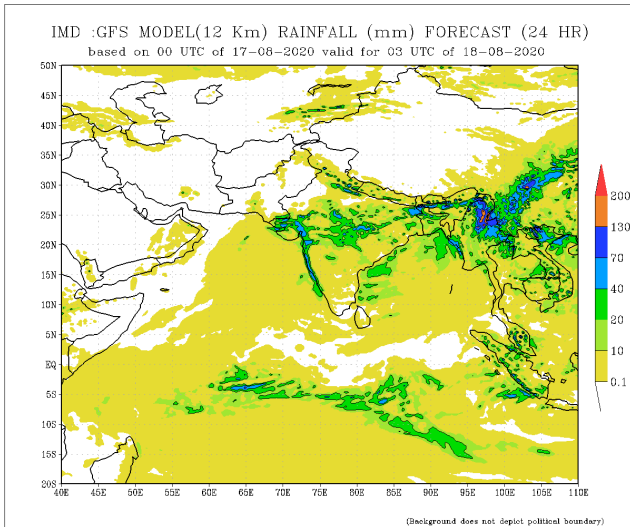
WORLDBATH topography
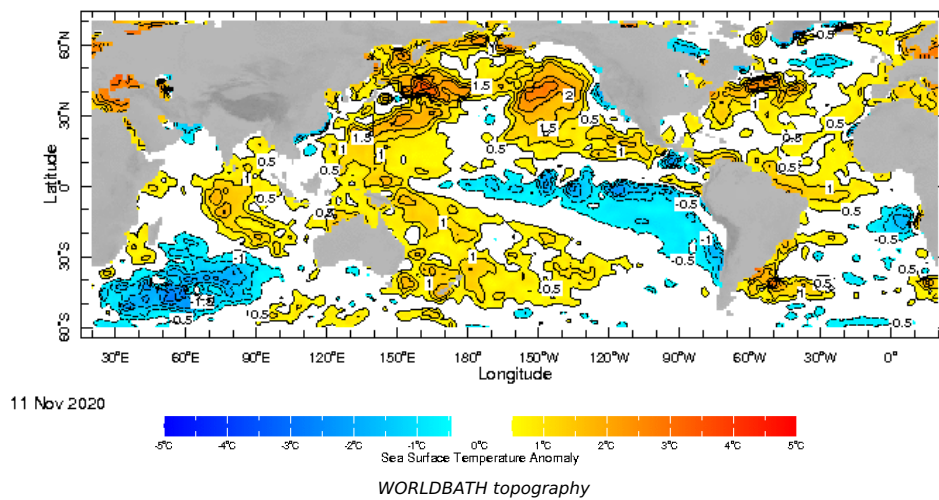
Optimum Interpolated Sea Surface Temperature Anomaly in the Indian Ocean from NOAA CPC
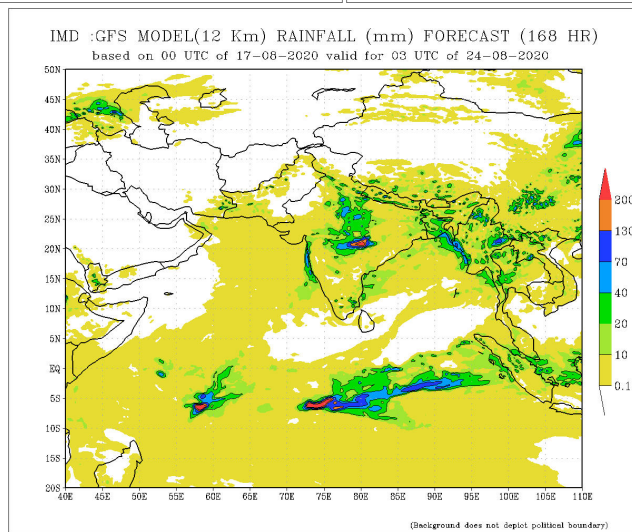

OI SST (v2) 7-Day Anomaly (C)
Period: 11Nov2020 - 17Nov2020

NCEP GFS 1- 14 Day prediction

NCEP GFS Ensemble Forecast 1-7 Day Precipitation (mm)
from: 18Nov2020
18Nov2020-24Nov2020 Accumulation

Bias correction based on last 30-day forecast error

NCEP GFS Ensemble Forecast 8-14 Day Precipitation (mm)
from: 18Nov2020
25Nov2020-01Dec2020 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 17-08-2020 valid for 03 UTC of 18-08-2020

(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) RAINFALL (mm) FORECAST (48 HR)
based on 00 UTC of 17-08-2020 valid for 03 UTC of 19-08-2020

(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) RAINFALL (mm) FORECAST (72 HR)
based on 00 UTC of 17-08-2020 valid for 03 UTC of 20-08-2020

(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) RAINFALL (mm) FORECAST (96 HR)
based on 00 UTC of 17-08-2020 valid for 03 UTC of 21-08-2020

(Background does not depict political boundary)

IMD :GFS MODEL(12 Km) RAINFALL (mm) FORECAST (120 HR)
based on 00 UTC of 17-08-2020 valid for 03 UTC of 22-08-2020

IMD :GFS MODEL(12 Km) RAINFALL (mm) FORECAST (144 HR)
based on 00 UTC of 17-08-2020 valid for 03 UTC of 23-08-2020

IMD :GFS MODEL(12 Km) RAINFALL (mm) FORECAST (168 HR)
based on 00 UTC of 17-08-2020 valid for 03 UTC of 24-08-2020

Weekly Rainfall Forecast from IRI

Total rainfall forecast from the IRI for next six days is provided in figures below. The figure to the left shows the expectancy of heavy rainfall events during these six days while the figure to the right is the prediction of total rainfall amount during this period.

Forecast for 24-29 Sep 2020 Issued 0000 24 Sep 2020

Forecast for 24-29 Sep 2020 Issued 0000 24 Sep 2020

Heavy Rainfall   Very Heavy Rainfall   Extremely Heavy Rainfall

Extreme Rainfall Forecast

Six-Day Total Precipitation Forecast [mm]

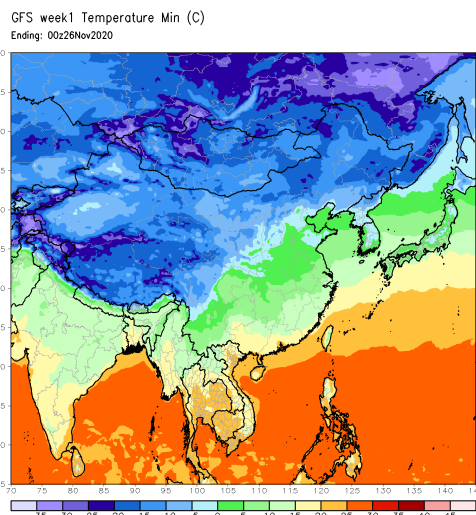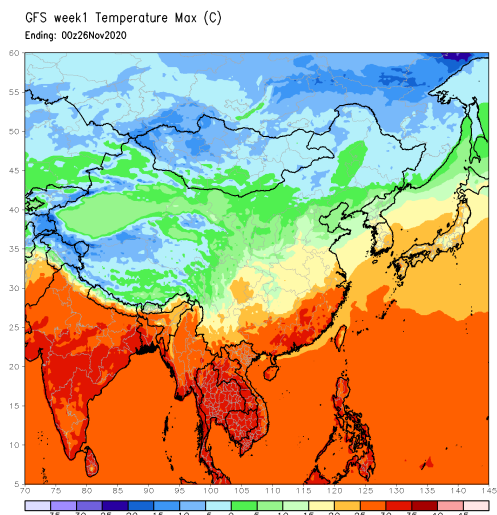**Total Six Day Precipitation Forecast**
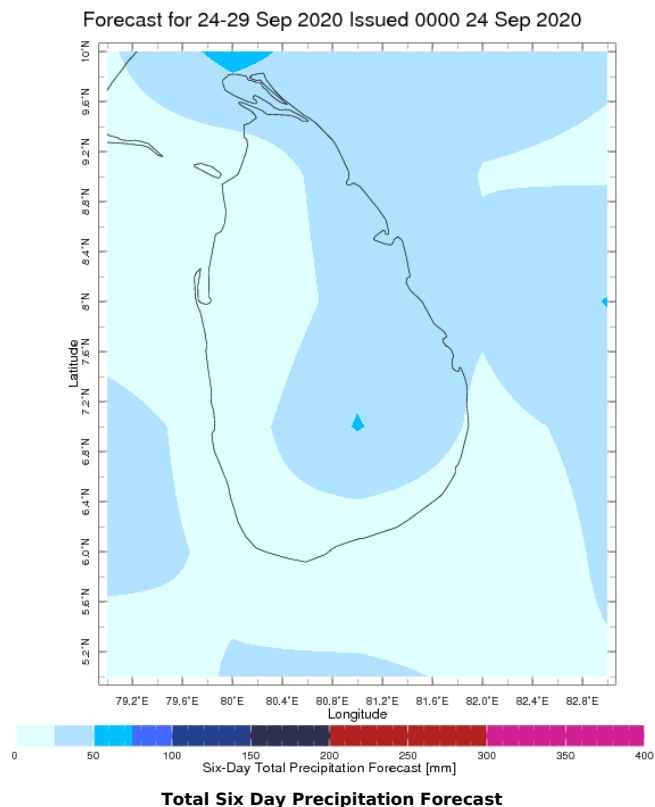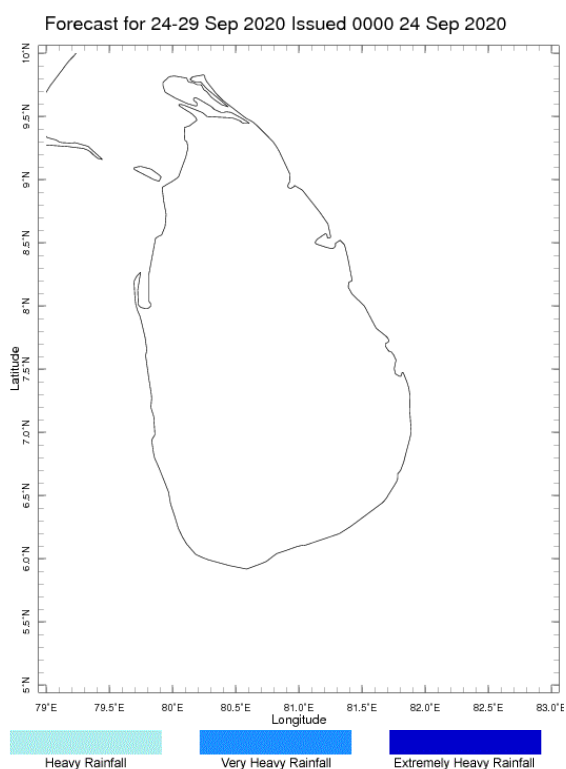
Madden Julian Oscillation (MJO) related Outgoing Longwave Radiation (OLR) Forecast

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.
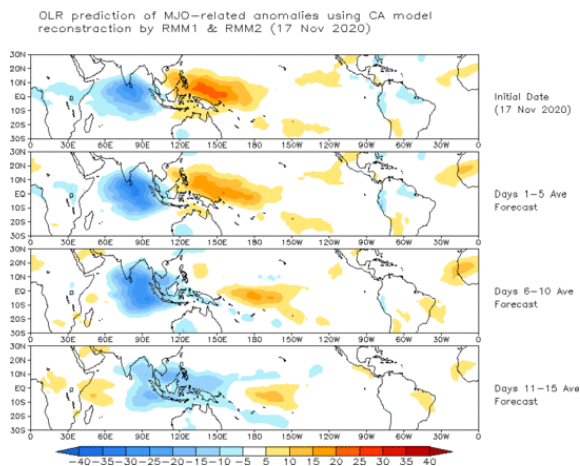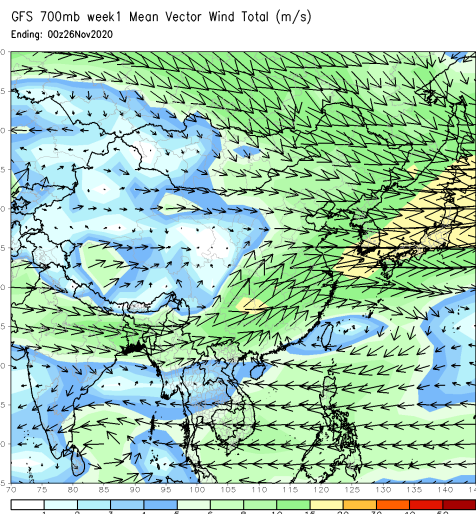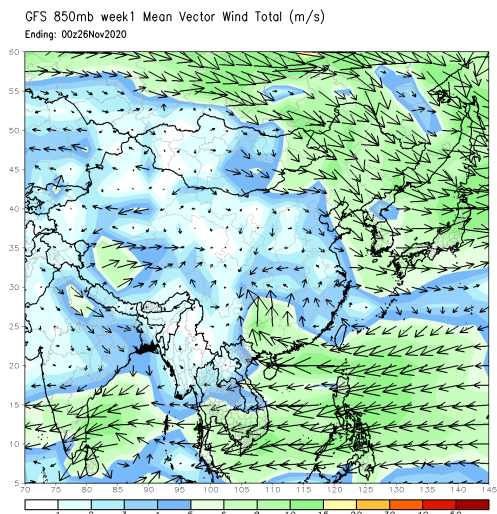

Weekly Temperature Forecast

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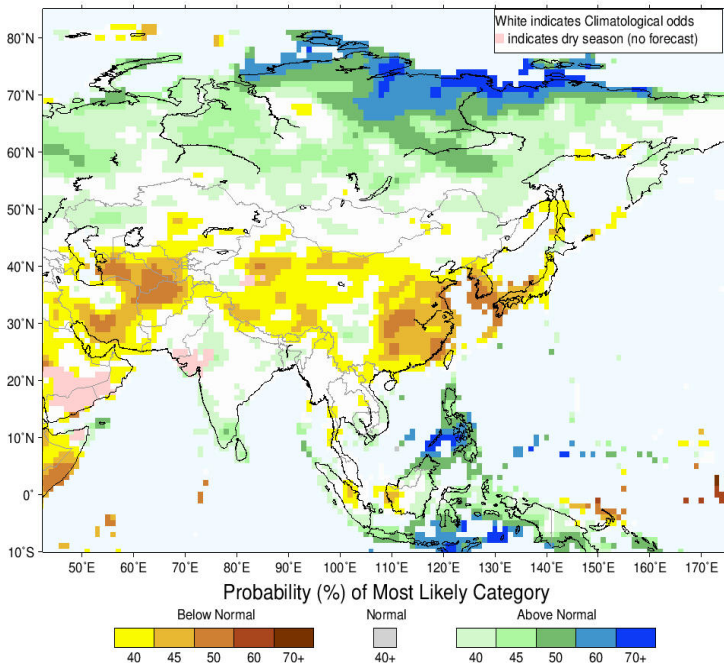

Weekly Wind Forecast

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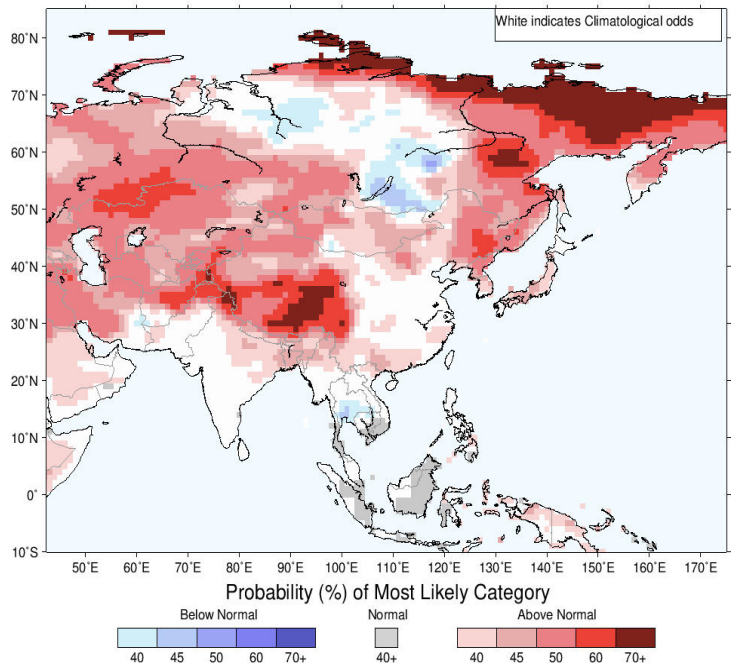
Seasonal Rainfall and Temperature Forecast

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%).

IRI Multi–Model Probability Forecast for Precipitation for November–December–January 2021, Issued October 2020

White indicates Climatological odds
indicates dry season (no forecast)

Probability (%) of Most Likely Category

Below Normal 40 45 50 60 70+ Normal 40+ Above Normal 40 45 50 60 70+

Precipitation Forecast

IRI Multi–Model Probability Forecast for Temperature for October–November–December 2020, Issued September 2020

White indicates Climatological odds

Probability (%) of Most Likely Category

Below Normal 40 45 50 60 70+ Normal 40+ Above Normal 40 45 50 60 70+

Temperature Forecast