Federation for Environment, Climate and Technology

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EXPERIMENTAL CLIMATE MONITORING AND PREDICTION

By: Piushani Ellegala, Ruchira Lokuhetti, Chayana Gunathilake, Lareef Zubair and Michael Bell[1] (FECT and IRI[1])

HIGHLIGHTS

Rainfall Forecast

- NOAA rainfall forecast predicts up to 75 mm in Galle; up to 50 mm in Western province, Jaffna, Kegalle, Matara, Ratnapura and Trincomalee districts.*during 29 June - 04 July.*

Monitored Rainfalls

- *Between 24 - 30 June: up to 90 mm of rainfall was recoreded in Anuradhapura, Vavuniya and Matale districts on 24th June.*

Monitored Wind

- *From 23 - 29 June: up to 15 km/h, northwessterly winds were experienced by the entire island.*

Monitored Sea Surface

- *1 ^{0}C above average sea surface temperature was observed in the seas around Sri Lanka.*

Monitoring

Rainfall

Weekly Monitoring

Date	Rainfall
24th June	Up to 90mm in Vavuniya, Anuradhapura and Matale districts; up to 80mm in Polonnaruwa and Kurunegala districts; up to 70mm in Kandy district; up to 60mm in Mannar, Ampara and Badulla districts; up to 50mm in Monaragala and Ratnapura districts; up to 40 mm in Puttalam and Trincomalee districts; up to 30mm in Mulativu, Kilinochchi, Hambantota, Nuwara Eliya and Batticaloa districts; up to 20mm in Kegalle, Gampaha, Colombo, Kalutara, Galle and Matara districts; and up to 10mm in Jaffna district.
25th June	Up to 80 mm in Anuradhapura, Trincomalee and Polonnaruwa districts; up to 70 mm in Hambantota district; up to 60 mm in Monaragala district; up to 50 mm in Vavuniya, Kandy, Nuwara Eliya, Badulla and Ampara districts; and up to 40 mm in Mannar, Kurunegala, Matale, Kegalle and Ratnapura districts; up to 30 mm in Mullaitivu, Puttalam, Gampaha, Kalutara, Colombo, Galle, Matara, Kilinochchi and Batticaloa districts; and up to 20 mm in Jaffna district.

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Date	Rainfall
26th June	Up to 15 mm in Galle district; up to 10 mm in Ampara district; up to 10 mm in Gampaha, Colombo, Kalutara, Matara, Ratnapura, Kegalle and Nuwara Eliya districts; and up to 5 mm in Puttalam, Kandy, Kurunegala and Matale districts.
27st June	Up to 5 mm in Ratnapura and Nuwara Eliya districts.
28nd June	Up to 2 mm in Mullaitivu district.
29rd June	Up to 50 mm in Vavuniya district; up to 40 mm in Anuradhapura district; up to 20 mm in Trincomalee, Mullaitivu, Kegalle, Nuwara Eliya and Badulla districts; up to 15 mm in Mannar, Colombo, Kalutara, Kandy and Monaragala districts; and up to 10 mm in Kilinochchi, Polonnaruwa, Matale, Kurunegala, Puttalam, Gampaha, Ampara, Galle, Matara, Hambantota, Kegalle and Nuwara Eliya districts.
30th June	Up to 15 mm in Galle, Matara and Hambantota districts; up to 10 mm in Kalutara,Ratnapura, Monaragala, Polonnaruwa, Trincomalee and Batticaloa districts; and up to 5 mm in Colombo, Ampara, Matale, Anuradhapura and Kilinochchi districts.

Total Rainfall for the Past Week

The RFE 2.0 tool shows total up to 75 – 100 mm in Anuradhapura, Vavuniya and Matale districts; up to 50 – 75 mm in Mannar, Polonnaruwa, Trincomalee, Kandy, Badulla, Nuwara Eliya, Batticaloa, Monaragala, Kurunegala, Kegalle and Hambantota districts; up to 25 – 50 mm in Mullaitivu, Gampaha, Colombo, Puttalam, Kalutara, Galle and Matara districts; and up to 10 – 25 mm in Kilinochchi, Gampaha, Ampara and Jaffna districts.

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

Monthly Monitoring

During June – Above average rainfall conditions up to 10 mm were experienced by Vavuniya and Anuradhapura districts; up to 6 mm in Mannar, Kurunegala, Matale, Polonnaruwa, Trincomalee, Ampara, Kegalle, Badulla, Monaragala, Hambantota, Batticaloa and Kandy districts; and up to 4 mm in Jaffna, Kilinochchi, Mullaitivu, Puttalam, Colombo, Gampaha, Kegalle, Nuwara Eliya and Ratnapura. Below average rainfall conditions down to 4 mm were experienced by Galle and Matara districts.

Ocean State *(Text Courtesy IRI)*

Pacific sea state: June 24, 2020

SSTs in the east-central and southeast Pacific decreased to near the La Niña threshold in late June, and the atmospheric variables were either ENSO-neutral or indicative of weak La Niña conditions. The average of the forecasts of many models just short of the borderline of weak La Niña SST conditions through fall, becoming slightly weaker beginning in early winter. The official CPC/IRI outlook is somewhat similar to these model forecasts, calling for a likely continuation of ENSO-neutral in summer, with approximately equal chances of ENSO-neutral or La Niña for fall and winter.

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Indian Ocean State

1 ^{0}C above average sea surface temperature was observed in the seas around Sri Lanka.

Predictions

Rainfall

14-day prediction: NOAA NCEP models

From 1st July – 7st July: Total rainfall up to 55 mm in Kalutara and Ratnapura districts; up to 45 mm in Colombo, Gampaha, Kegalle, Galle, Nuwara Eliya, Kandy and Badulla districts; up to 35 mm in Anuradhapura, Polonnaruwa, Puttalam, Matara, Kurunegala, Matale, Batticaloa, Ampara and Hambantota districts; and up to 25 mm in Anuradhapura, Vavuniya and Mullaitivu districts.

From 8nd July – 14th July: Total rainfall up to 35 mm in Colombo, Kegalle and Ratnapura districts; up to 25 mm in Gampaha, Puttalam, Matale, Kurunegala, Kandy, Nuwara Eliya, Badulla, Ampara and Polonnaruwa districts; and up to 15 mm in Anuradhapura, Monaragala, Batticaloa, Matara and Trincomalee districts.

NOAA Model Forecast:

From 29th June – 4th July: Total rainfall up to 75 mm in Galle district; up to 50 mm in Gampaha, Colombo, Kalutara, Kegalle, Ratnapura, Matara, Jaffna, Kilinochchi, Mullaitivu and Trincomalee districts.

MJO based OLR predictions

For the next 15 days:

Currently, MJO is in the neutral phase and shall enhance the rainfall in the next 15 days.

[1] International Research Institute for Climate and Society, Earth Institute at Columbia University, New York.
Official hydro-meteorological statements are provided by the Sri Lanka Department of Meteorology and Department of Irrigation.

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Weekly Hydro- Meteorological Report for Sri Lanka

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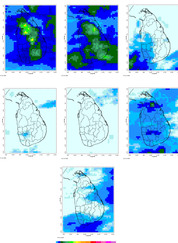
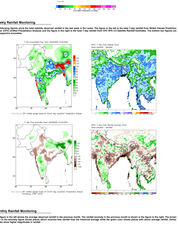
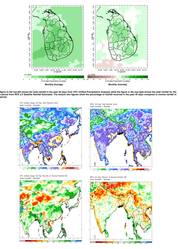
Daily Rainfall Monitoring

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

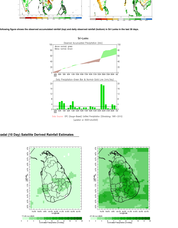






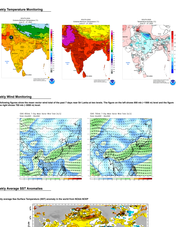
Weekly Rainfall Monitoring

The following figures show the weekly observed rainfall in the last week in the Lanka. The Rainfall in the WP is the total 3 day rainfall from Atlantic Climatic Prediction Center (ACPC) Climate Prediction Center (CPC) Rainfall Estimates and the Figure in the Right Hand Side is the Rainfall Anomaly Estimate. The Values are Figures in the Right Hand Side.

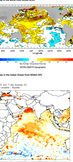


Monthly Rainfall Monitoring

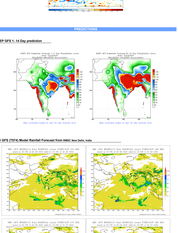
The Figure in the Left Hand Side shows the total rainfall in the last 30 days from NOAA Satellite Precipitation Analysis. The Figure in the Right Hand side the total rainfall for the last 30 days from Climate Prediction Center (CPC) Rainfall Estimates. The Figure in the Right Hand Side is the Rainfall Anomaly Estimate. The Values are Figures in the Right Hand Side.



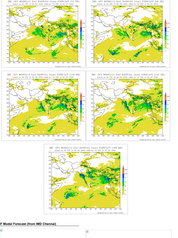
The following figure shows the observed accumulated rainfall (red) and daily observed rainfall (blue) in Sri Lanka in the last 30 days.



Detailed (10 Day) Satellite Derived Rainfall Estimates

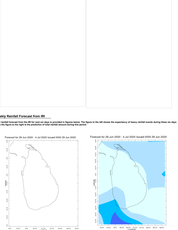


Weekly Temperature Monitoring



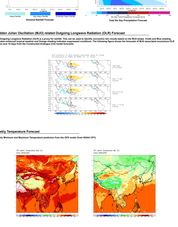
Weekly Wind Monitoring

The following figure shows the wind flow over the last week (red) and that of the past 7 days (blue) for Lanka and nearby. The figure on the left shows 850 mb (~ 1500 m) level and the figure on the right shows 200 mb (~ 12000 m) level.

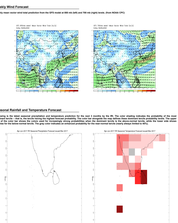


Weekly Average SST Anomalies

Weekly average Sea Surface Temperatures (SST) anomaly in the Indian Ocean region



Optimum Interpolated Sea Surface Temperatures Anomaly in the Indian Ocean from NOAA OPD



PREDICTIONS

NCEP GFS 1 - 14 Day prediction

IMD GFS (T574) Model Rainfall Forecast From IMAH, New Delhi, India

NRF Model Forecast (from IMD Channel)

Weekly Rainfall Forecast from IRI

Total rainfall Received from the IRI for week 1 to week 4 is provided in Figures below. The Figure to the left shows the expectancy of heavy rainfall events during these six days. The Figure to the right shows the total rainfall expected during these six days.

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

The Outgoing Longwave Radiation (OLR) is a proxy for rainfall. Thin red lines are ensemble members, the thick black line is the mean. Vertical red lines mark the beginning of each forecast month. The Madden Julian Oscillation (MJO) is a major source of intraseasonal variability in the tropical atmosphere-ocean system. The Outgoing Longwave Radiation (OLR) is a proxy for rainfall. The Hovmoller diagram shows the evolution of MJO intraseasonal anomalies in OLR for the last 30 days from the Indian Ocean and Western Pacific (OLR Index Indexed).

Weekly Temperature Forecast

Weekly Minimum and Maximum Temperature Forecast from the IRI models (from NOAA OPD)

Weekly Wind Forecast

Weekly mean zonal and meridional wind predictions from the GFS model at 850 mb (left) and 200 mb (right) levels. (from NOAA OPD)

Seasonal Rainfall and Temperature Forecast

Following are the three seasonal probabilistic long forecasts prepared by the Met Office, UK. The Left Hand Side Figure shows the probability of the most probable rainfall category (Below Normal, Normal or Above Normal) and the Right Hand Side Figure shows the probability of the most probable temperature category (Below Normal, Normal or Above Normal) for the three month period. The Left Hand Side Figure shows the probability of the most probable rainfall category and the Right Hand Side Figure shows the probability of the most probable temperature category.

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