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# **Experimental Climate Monitoring and Prediction**

(Prepared for the Water Management Secretariat of the Mahaweli Authority)

by: Prabodha Agalawatte, Sewwandhi Chandrasekara, Sanjaya Ratnayake, Zeenas Yahiya,

Lareef Zubair and Michael Bell (FECT and IRI<sup>1</sup>)

# 30 November 2012

## **Monitoring and Predictions**

FECT BLOG

Past reports available at <a href="http://fectsl.blogspot.com/">http://fectsl.blogspot.com/</a>

# FECT WEBSITES

http://www.climate.lk

and <u>http://www.tropicalclimate.org/</u>

# **Pacific Seas State**

# 15 November 2012

Most of the ENSO prediction models predict a warmneutral ENSO condition for the coming few months, lasting into early 2013. During early November the observed SST conditions have been above average, but in the ENSOneutral range. The Central Pacific Ocean has a significant warm anomaly which shall have regional and global consequences. (IRI and FECT)

# Indian Ocean State

Very Warm SST persists in the Equatorial Indian Ocean close to Sri Lanka. The pattern is consistent with the El Nino SST pattern in the Pacific and with the positive Indian Ocean Dipole (IOD) Mode. Often the above two phenomenon go together (with a lag of a month) – now it appears that IOD+ phase is strong while El Nino is weakening. **Monitoring:** Heavy rains have persisted in Sri Lanka since the start of October – this as expected during a positive Indian Ocean Dipole mode phase (with warmer sea surfaces in the Arabian seas). **Prediction:** Rainfall shall be higher than normal for the rest of November. During December, since the IOD influence is minimal, the rainfall is likely to be near normal. Warmer than normal temperatures persist due to the warm Arabian sea surface anomalies.

# Summary<sup>2</sup>

**Highlights** 

# Monitoring

**Weekly Monitoring:** On the 21<sup>st</sup> of November, rainfall was observed in south western region in Sri Lanka. Then on the 22<sup>nd</sup> rainfall in this region increased upto 40 mm. Light rainfall was observed in Jaffna peninsula and north central regions while heavy rainfall was observed in western regions on the same day. On the 23<sup>rd</sup> and 24<sup>th</sup>, the entire country received rainfall with the exception of south eastern region. On the 25<sup>th</sup> heavy rainfall was observed throughout the country with upto 120 mm rainfall observed in Batticaloa and Moneragala regions. Heavy rainfall continued on the 26<sup>th</sup> of November with maximum rainfall observed in the northern Sri Lanka.

**Monthly Monitoring:** In October, a high positive rainfall anomaly was observed on the entire country. Surplus rainfall upto 150 mm was observed in all parts of the country with the exception of Uva region which received less rainfall than the rest of the country.

## Predictions

**7-day prediction:** During this week, an accumulated rainfall around 85 mm is predicted for south western regions and upto 55 mm for the rest of the country.

*IMD WRF Model Forecast & IRI forecast:* On the 30<sup>th</sup> of November Southern regions of Sri Lanka shall receive rainfall upto 35 mm while on the 1<sup>st</sup> of October rainfall (upto 7.5 mm) is only predicted in South Eastern regions of the country.

**1** Month Prediction: Overall- Rainfall shall increase until the 1<sup>st</sup> of December and then shall fluctuate with a decreasing trend afterwards. Western Slopes- Rainfall shall increase until 1<sup>st</sup> December and shall remain almost constant until 18<sup>th</sup> Dec. with minor fluctuations. Thereafter shall decrease until the 25<sup>th</sup>. Eastern slopes & Northern- Rainfall shall follow a similar pattern to the overall rainfall for the island.

**Seasonal Prediction:** As per IRI Multi Model Probability Forecast for December 2012 to February 2013, issued in November 2012, there is a 60%-70% probability for temperature to be above normal in the country while the rainfall is to be climatological.

## Inside this Issue

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- a. Daily Satellite Derived Rain fall Estimates
- b. Monthly Rain fall Estimates
- c. Decadal (10 Day) Satellite Derived Rainfall Estimates
- d. Weekly Average SST Anomalies

2. Predictions

- a. NCEP GFS Ensemble 1-7 day predictions
- b. IMD WRF model forecast
- c. Weekly precipitation forecast (IRI)
- d. 1 month experimental predictions by Paul Roundy and L. Zubair
- e. Seasonal Predictions from IRI

<sup>1</sup> International Research Institute for Climate and Society.

<sup>2</sup> These interpretations of hydro-meteorological conditions for the Mahaweli basins are provided for the use of the WMS/MASL. Official hydro-meteorological statements are provided by the Sri Lanka Department of Meteorology and Department of Irrigation. ECT Foundation for Environment Climate and Technology c/o, Maintenance Office, Mahaweli Authority, Digana Village, Rajawella, Sri Lanka.

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# 1. Monitoring

a) Daily Satellite Derived Rainfall Estimate Maps: 21<sup>st</sup> -26<sup>th</sup> November, 2012 (Left-Right, Top-Bottom)



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#### 2.0 N.9.0 **N.9** 9.2.N 0.2°N N-8.8 4"N 4.N Latitude 7.6"N 8"N Latitude 7.6'N 8'N 7.2'N 7.2°N 6.8°N 8.8°N 8.4°N 5.4°N N.0.9 6.0"N 6"N 5.6°N 80.4°E 80.8°E 81.2°E 81.6°E 82.0°E 82.4°E Longitude 80.4'E 80.8'E 81.2'E 81.6'E 82.0'E 82.4'E Longitude 79.2°E 79.6°E 80°E 79.2°E 79.6°E 80°E Oct 2012 Oct 2012 80 90 100 110 Estimated Precipitation [mm/month] -100 -50 0 50 100 Estimated Precipitation Anomaly, 2002-08 Base Period [mm/month]

# b) Monthly Satellite Derived Rainfall Estimates for October 2012 (Total – Left and Anomaly -Right)

# c) Dekadal (10 Day) Satellite Derived Rainfall Estimates (21-31 October & 1-10 November, 2012)



![](_page_3_Picture_0.jpeg)

d) Weekly Average SST Anomalies

![](_page_3_Figure_2.jpeg)

Weekly Average SST Anomalies (<sup>0</sup>C), 11<sup>th</sup>- 17<sup>th</sup> Nov, 2012

Data Source: NCEP Environmental monitoring center (Climatology 1971-2000)

![](_page_3_Figure_5.jpeg)

a) NCEP GFS Ensemble 1-7 day predictions, NOAA, Climate Prediction Centre, USA.

![](_page_3_Figure_7.jpeg)

Source - NOAA Climate Prediction Center

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b) WRF Model Forecast (Regional Meteorological Center, Chennai, Indian Meteorological Department) WRF MODEL FORECAST (48 HR.) RAINFALL(mm)\

![](_page_4_Figure_6.jpeg)

WRF MODEL FORECAST (72 HR.) RAINFALL(mm) based on 00 UTC of 28-11-2012 valid for 03 UTC of 01-12-2012

![](_page_4_Figure_8.jpeg)

![](_page_5_Figure_0.jpeg)

# c) Weekly Precipitation Forecast for 27<sup>th</sup> Nov- 2<sup>nd</sup> Dec 2012 (Precipitation Forecast in Context Map

![](_page_5_Figure_2.jpeg)

## d) 1 month experimental predictions by Paul Roundy and L. Zubair

Predictions based on observed cloud cover and atmospheric waves. Issued 29<sup>th</sup> November, 2012

## All Sri Lanka (Rainfall Scale from 0-20mm/day)

![](_page_5_Figure_6.jpeg)

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Western Slopes (Rainfall Scale from 0-20 mm/day)

![](_page_6_Figure_5.jpeg)

Eastern Slopes (Rainfall Scale- from 0-20 mm/day)

![](_page_6_Figure_7.jpeg)

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## Northern Region (Rainfall Scale- from 0-20 mm/day)

![](_page_7_Figure_5.jpeg)

# e) Seasonal Rainfall and Temperature Predictions from IRI

![](_page_7_Figure_7.jpeg)

![](_page_7_Figure_8.jpeg)

![](_page_8_Picture_0.jpeg)

## d) Seasonal Rainfall and Temperature Predictions from IRI Cntd...

![](_page_8_Figure_2.jpeg)

![](_page_8_Picture_3.jpeg)