

## Experimental Climate Monitoring and Prediction

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

19 December 2013

### FECT BLOG

Past reports available at  
<http://fectsl.blogspot.com/> and

<http://fectsl.wordpress.com/>

### FECT WEBSITES

<http://www.climate.lk> and  
<http://www.tropicalclimate.org/>

## November 21, 2013

### PACIFIC SEAS STATE

During October through mid-November the observed ENSO conditions remained neutral. Most of the ENSO prediction models indicate a continuation of neutral ENSO into the first quarter of 2014.

During northern spring and summer a warming tendency is seen in both dynamical and statistical models.

(Text Courtesy IRI)

### INDIAN OCEAN STATE

Southern sea of Sri Lanka showed +1<sup>0</sup>C anomaly and rest of the seas around Sri Lanka showed neutral seas surface temperature during 8<sup>th</sup>-14<sup>th</sup> December 2013.

### MJO STATE

MJO is entering phase 4 and is likely to enter phase 5 during next week.

### Highlights

#### Monitoring and Predictions:

Rainfall shall increase gradually after 21<sup>st</sup> of December 2013. However, Eastern and Central provinces are likely to experience significant heaviest rainfall during coming week 17<sup>th</sup>-23<sup>rd</sup> December 2013. For coming two days (18<sup>th</sup> & 19<sup>th</sup> December), Eastern and Central provinces are likely to observe heavy rainfall and dry conditions prevail towards North and Northwestern parts of the country.

### Summary

#### Monitoring

**Weekly Monitoring:** During 9<sup>th</sup> -14<sup>st</sup> December 2013, rainfall ranged 5-30 mm/day. Maximum rainfall observed on 14<sup>th</sup> December for Central province. Rest of the days received lower amount of rainfall compared to the end of the week.

**Monthly Monitoring:** Kurunegala district received highest average rainfall during the month of November 2013.

#### Predictions

**7-day prediction:** During 17<sup>th</sup>-23<sup>rd</sup> December 2013, entire Sri Lanka received rainfall above 85 mm. Rainfall is likely to decrease towards Northern region and Eastern provinces shall experience more than 135 mm of rainfall.

**IMD WRF & NOAA CFS model forecast:** For 16<sup>th</sup> of December, IMD WRF model predicts less than 2.5 mm of rainfall for Southern, Eastern and Uva provinces and rest of the regions shall experience a dry period. For 19<sup>th</sup> of December, IMD WRF model predicts the same rainfall pattern over the country. NOAA model predicts the heaviest rainfall (more than 135 mm/week) for the Hambantota and Galle districts and shall decrease towards northwest direction during 17<sup>th</sup>-23<sup>rd</sup> December 2013.

**30 Days Prediction: Overall-** Rainfall shall decrease gradually till 21<sup>st</sup> of December. **Western Slopes** – Rainfall shall decrease gradually during 17<sup>th</sup>-21<sup>st</sup> December and it shall increase gradually thereafter. **Western Coast** – western coasts shall receive same magnitude of the rainfall as western slopes. **Eastern Slopes**– Rainfall shall decrease gradually till 23<sup>rd</sup> of December and gradually increase thereafter. **Eastern Coast** – The rainfall is not predicted till 22<sup>nd</sup> December and rainfall shall increase gradually thereafter. **Northern region-** The rainfall is not predicted till 22<sup>nd</sup>. **Southern Region-** The rainfall decreases till 22<sup>nd</sup>.

**Seasonal Prediction:** As per IRI Multi Model Probability Forecast issued on November 2013; for December 2013 to February 2014, there is a 50-60% probability for temperature to be above normal in the country while the rainfall is to be climatological.

### Inside this Issue

#### 1. Monitoring

- Daily Satellite Derived Rain fall Estimates
- Monthly Rain fall Estimates
- Decadal (10 Day) Satellite Derived Rainfall Estimates
- Weekly Average SST Anomalies

#### 2. Predictions

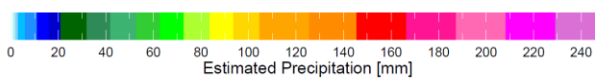
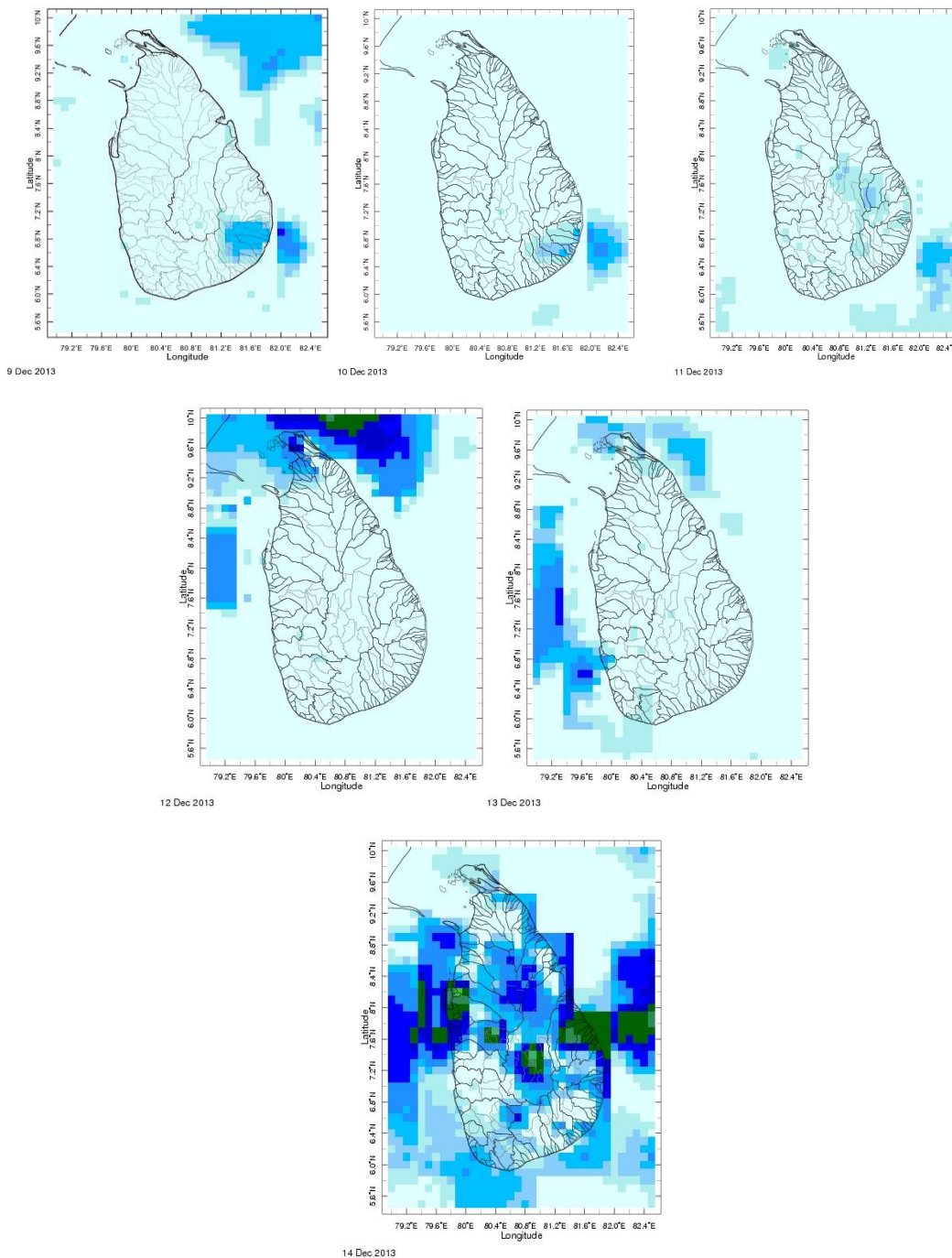
- NCEP GFS Ensemble 1-7 day predictions
- WRF model forecast Regional Meteorological Center, Chennai, Indian Meteorological Department)
- Weekly precipitation forecast (IRI)
- 1 month experimental predictions by Paul Roundy and L. Zubair
- Seasonal Predictions from IRI

<sup>1</sup> International Research Institute for Climate and Society, Earth Institute at Columbia University, New York.

<sup>2</sup> These interpretations of hydro-meteorological conditions for the Mahaweli basins are provided for the use of the WMS/MASL.

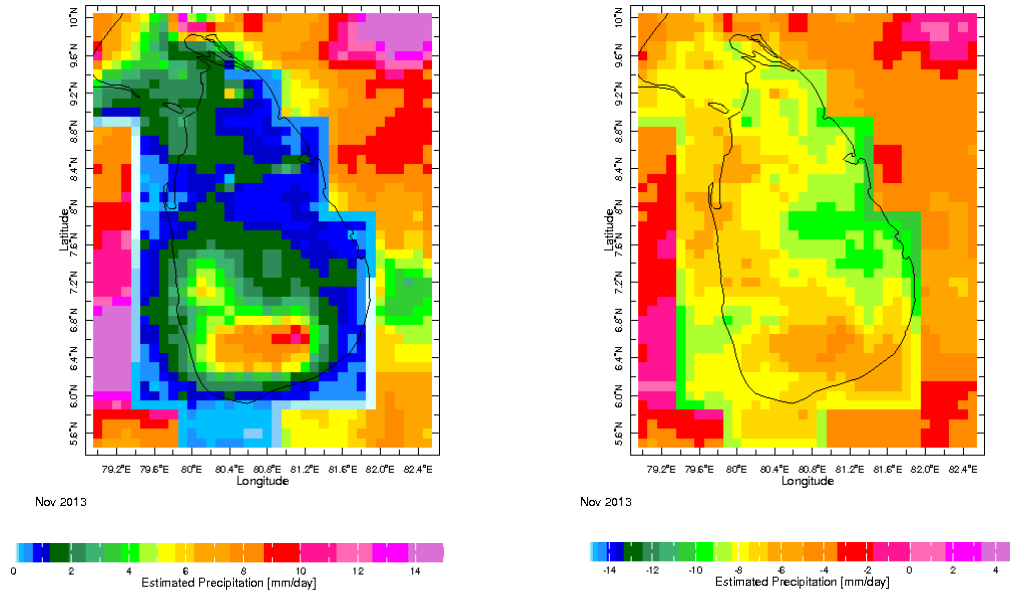
## 1. Monitoring

### a) Daily Satellite Derived Rainfall Estimate Maps: 9<sup>th</sup>-14<sup>th</sup> December 2013 (Left-Right, Top-Bottom)

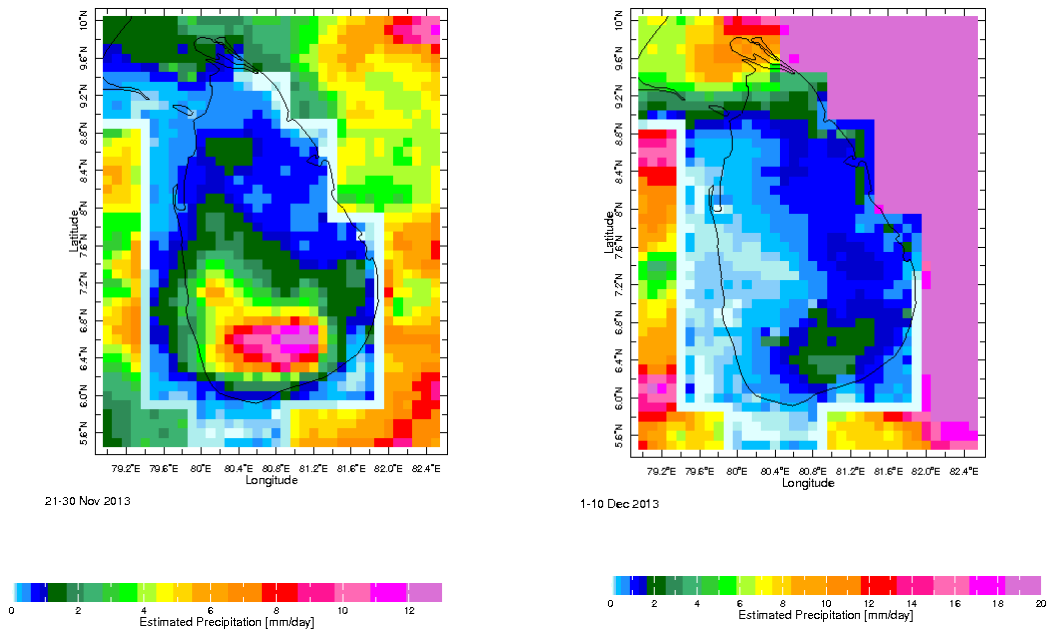


**Weekly Average SST Anomalies**

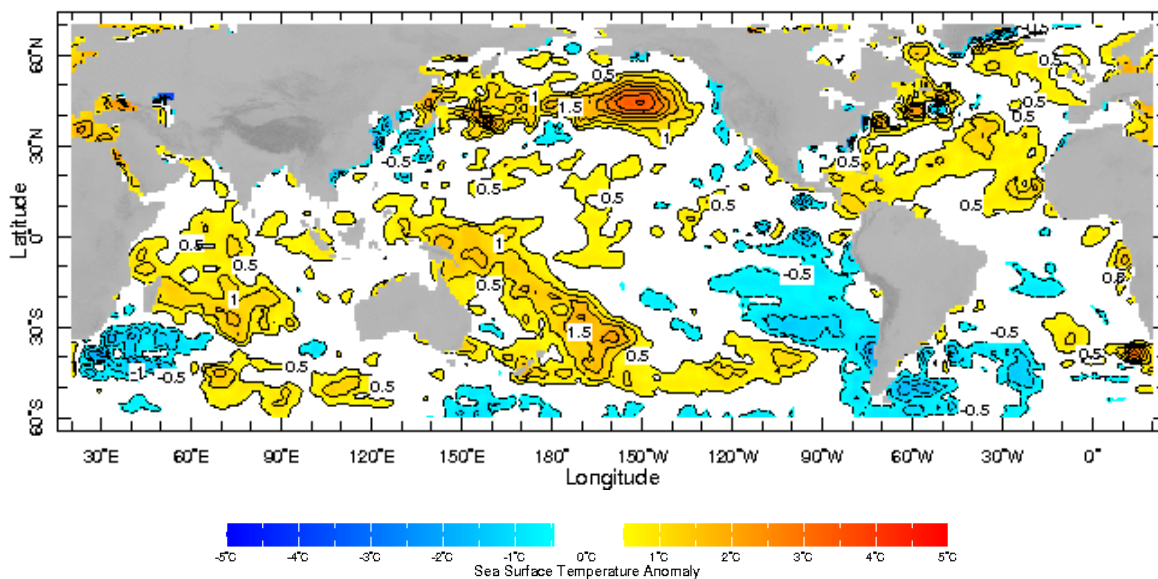
**b) Monthly Satellite Derived Rainfall Estimates for November 2013 (Total – Left and Anomaly - Right)**



**c) Dekadal (10 Day) Satellite Derived Rainfall Estimates (21-30 November & 01-10 December, 2013)**



**b) Weekly Average SST Anomalies**



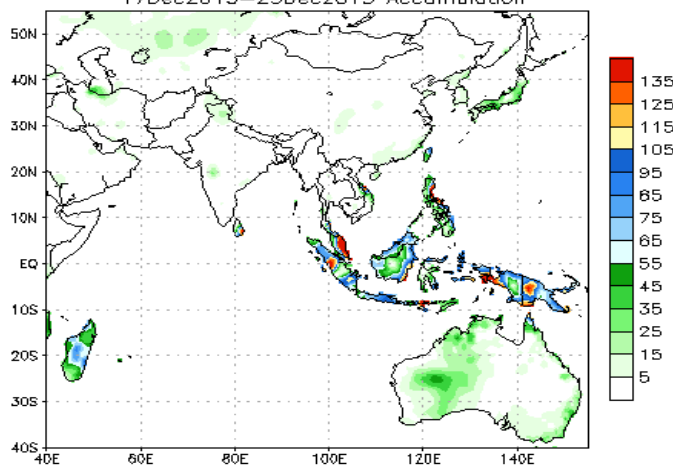
*Weekly Average SST Anomalies (°C) 8<sup>th</sup>-14<sup>th</sup> December, 2013*

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

**2. Predictions**

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

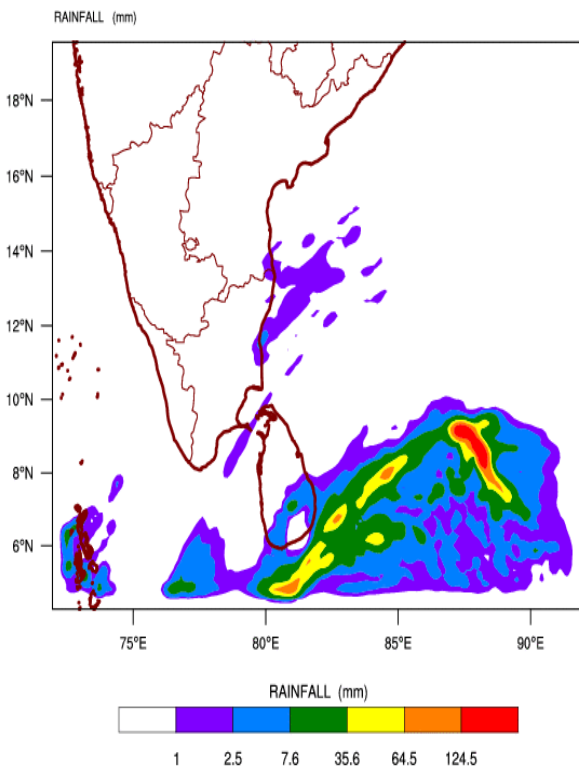
NCEP GFS Ensemble Forecast 1-7 Day Precipitation (mm)  
from: 17Dec2013  
17Dec2013-23Dec2013 Accumulation



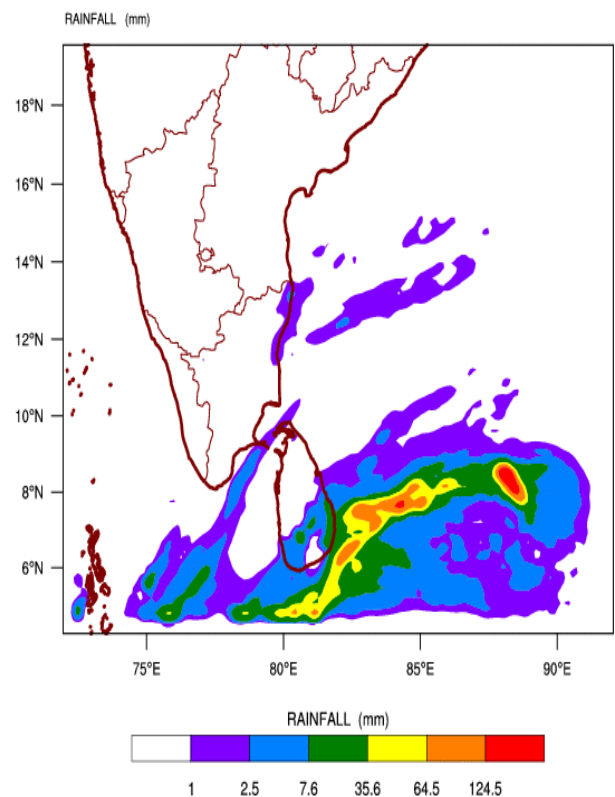
Bias correction based on last 30-day forecast error

**b) WRF model forecast Regional Meteorological Center, Chennai, Indian Meteorological Department**

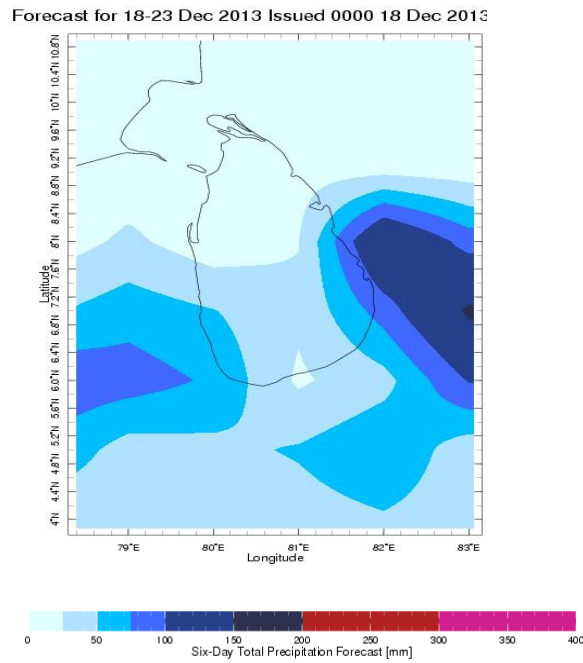
WRF MODEL FORECAST (48 HR.) RAINFALL(mm)  
based on 00 UTC of 16-12-2013 valid for 03 UTC of 18-12-2013



WRF MODEL FORECAST (72 HR.) RAINFALL(mm)  
based on 00 UTC of 16-12-2013 valid for 03 UTC of 19-12-2013



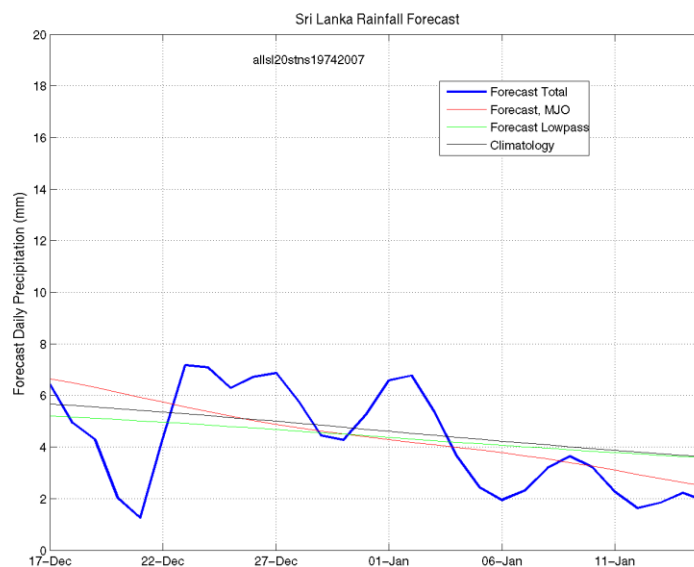
**b) Weekly Precipitation Forecast for 10<sup>th</sup>-16<sup>th</sup> December 2013 (Precipitation Forecast in Context Map Tool, IRI)**



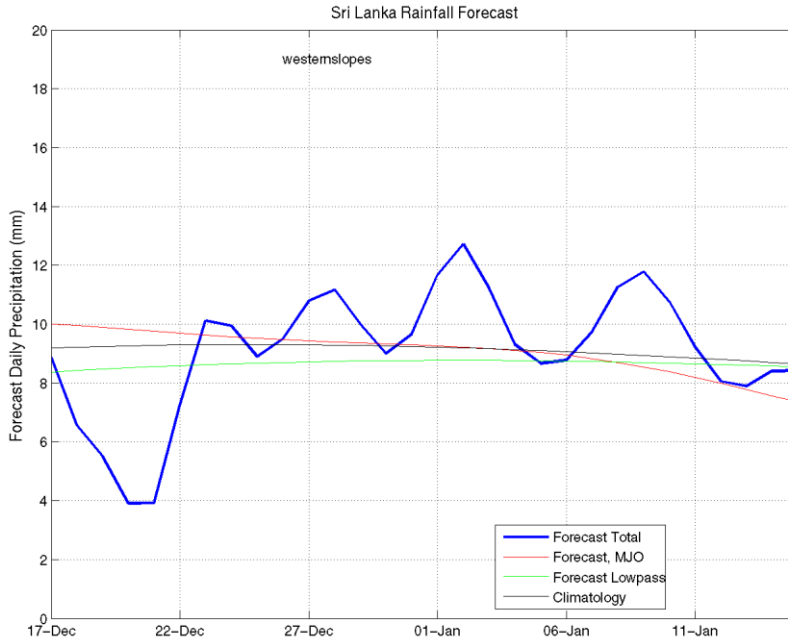
**d) 1 month experimental predictions by Paul Roundy and L. Zubair**

Predictions based on observed cloud cover and atmospheric waves. Issued 11<sup>th</sup> December, 2013

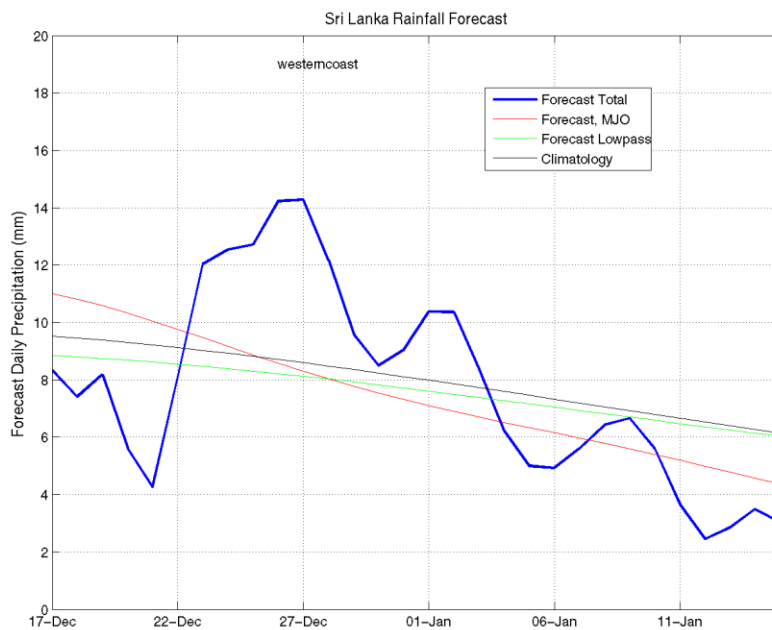
**All Sri Lanka (Rainfall Scale from 0-20mm/day)**



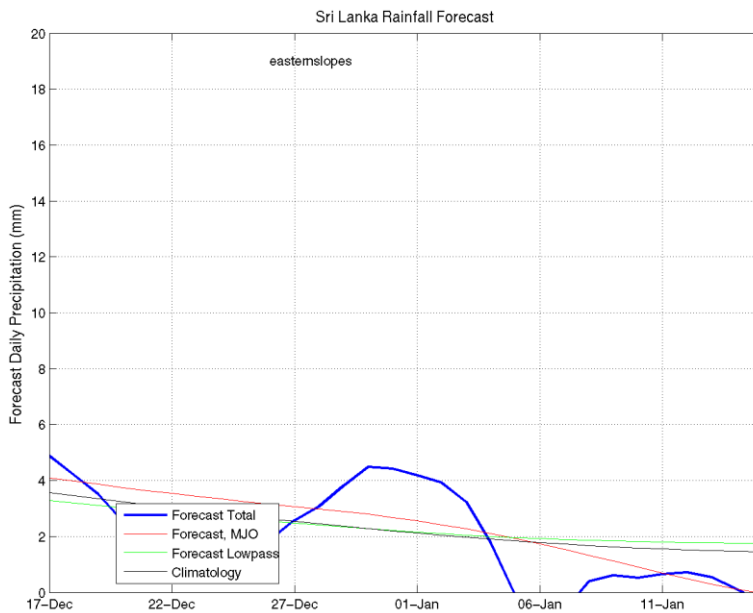
**Western Slopes (Rainfall Scale from 0-20 mm/day)**



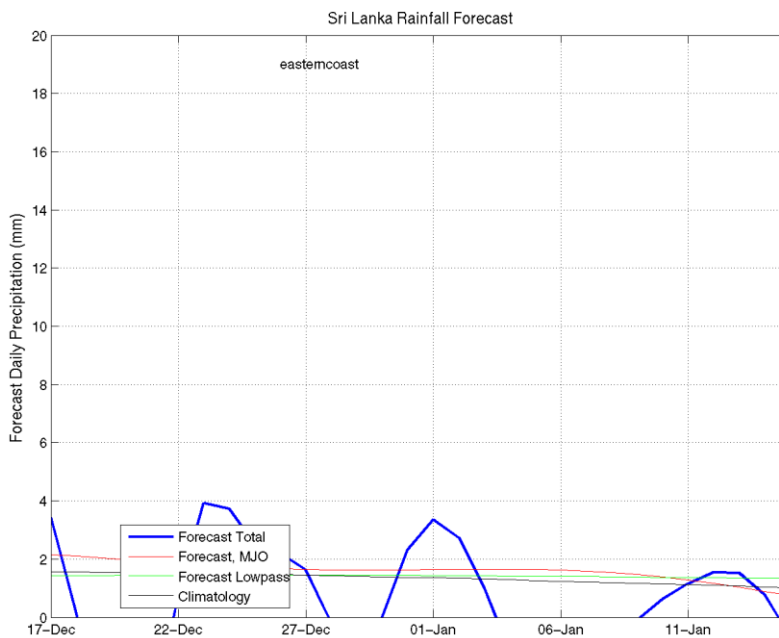
**Western Coast (Rainfall Scale from 0-20 mm/day)**



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

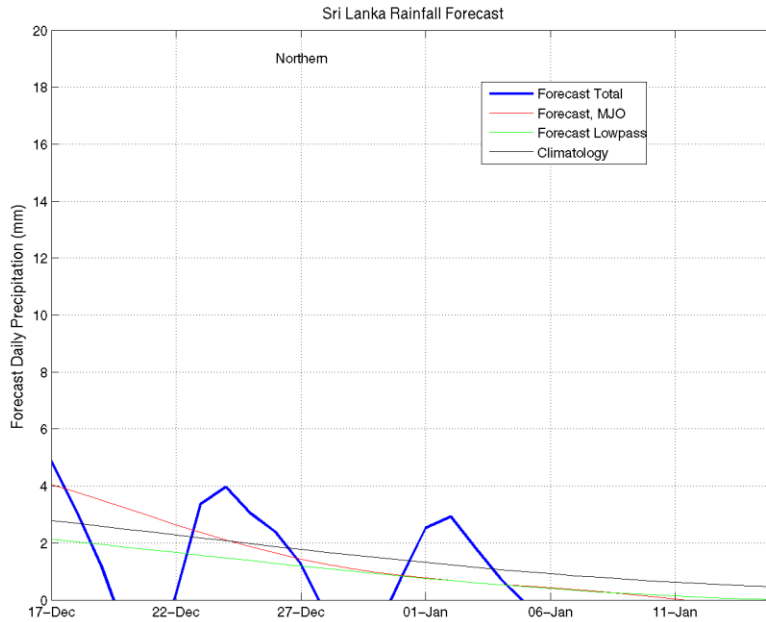


**Eastern Coast (Rainfall Scale- from 0-20 mm/day)**

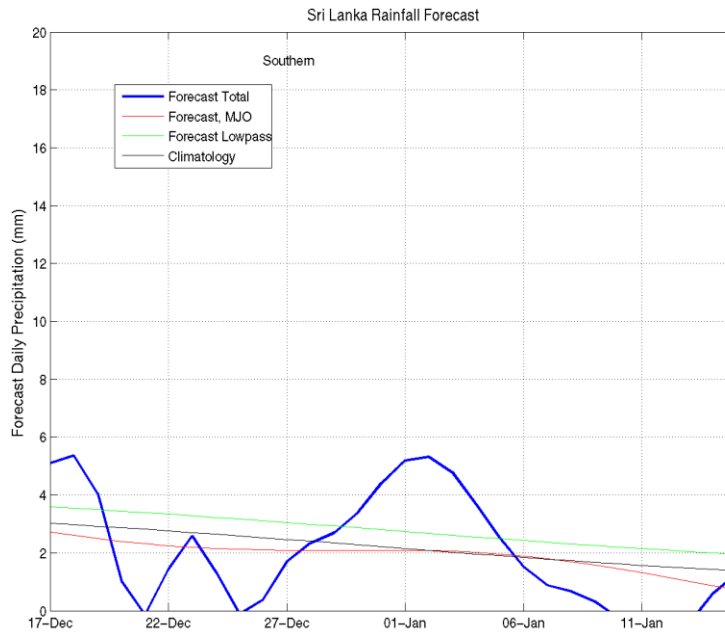




**Northern Region (Rainfall Scale- from 0-20 mm/day)**

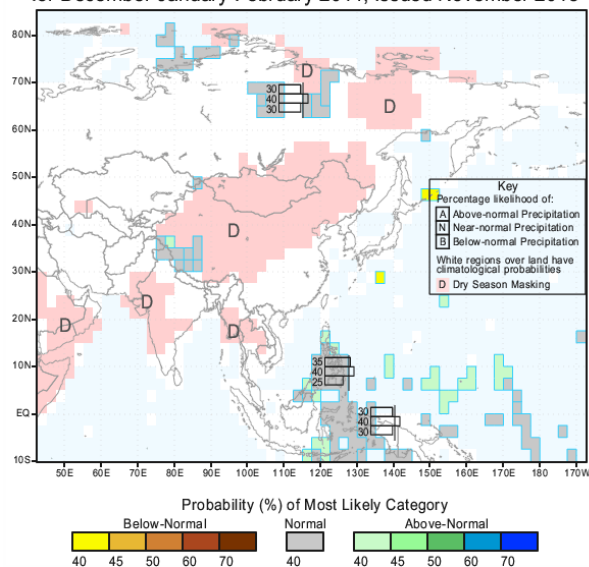


**Southern Region (Rainfall Scale- from 0-20 mm/day)**



*e) Seasonal Rainfall and Temperature Predictions from IRI*

IRI Multi-Model Probability Forecast for Precipitation  
for December-January-February 2014, Issued November 2013



IRI Multi-Model Probability Forecast for Temperature  
for December-January-February 2014, Issued November 2013

