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வளிமண்டலவியல் திணைக்களம்
DEPARTMENT OF METEOROLOGY
இலங்கை இலங்கை SRI LANKA

Consensus Seasonal Weather Outlook
August, September and October (ASO)
Seasonal Rainfall for Sri Lanka

This forecast was prepared using

- The prevailing global climate conditions.
- Forecasts from different climate models from around the world.
 - Statistical downscaling of GCM output using CPT

Issued by Centre for Climate Change Studies (CCCS)

And

Research Division

(a) Prevailing global climate conditions

During July, ENSO-neutral continued, although equatorial sea surface temperatures (SSTs) remained above average in the central and east-central Pacific Ocean (Figs. 1 and 2). In the atmosphere, tropical convection was suppressed over the west-central tropical Pacific and enhanced over the Maritime Continent. The lower-level and upper-level winds were near average over most of the tropical Pacific. Overall, the ocean and atmosphere system remains consistent with ENSO-neutral.

Majority of the models favor ENSO-neutral through the remainder of 2017 (Fig 3 upper). These predictions, along with the near-average atmospheric conditions over the Pacific, lead forecasters to favor ENSO-neutral into the winter (~50 to 55% chance). In summary, ENSO-neutral is favored (~50 to 55% chance) into the Northern Hemisphere fall and winter 2017-18 (Climate Prediction Center, USA). Neutral IOD condition is expected to prevail Fall and winter 2017-18 (Fig 3 lower).

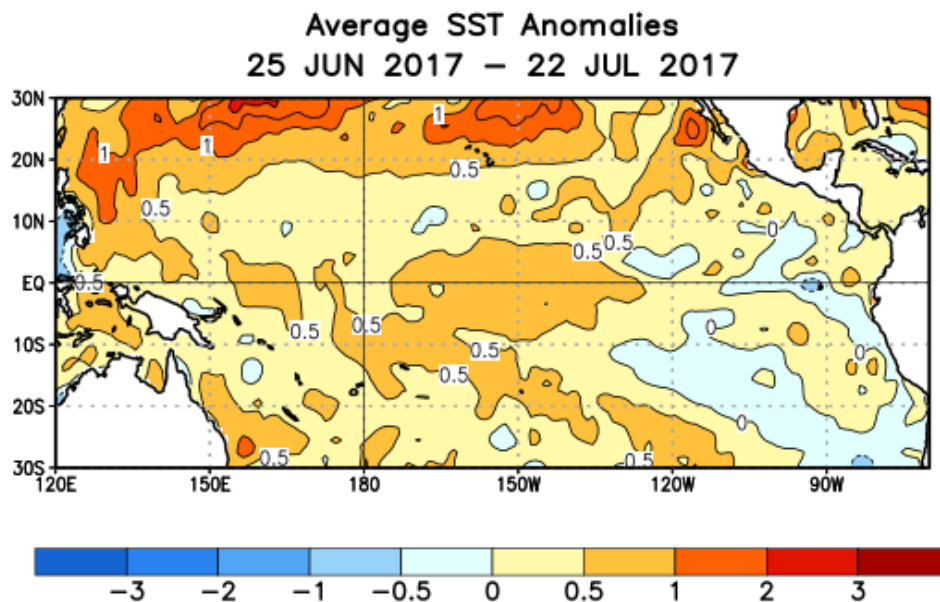


Fig 1: Observed Average sea surface temperature (SST) anomalies (°C)

Weekly SST Anomalies (DEG C)

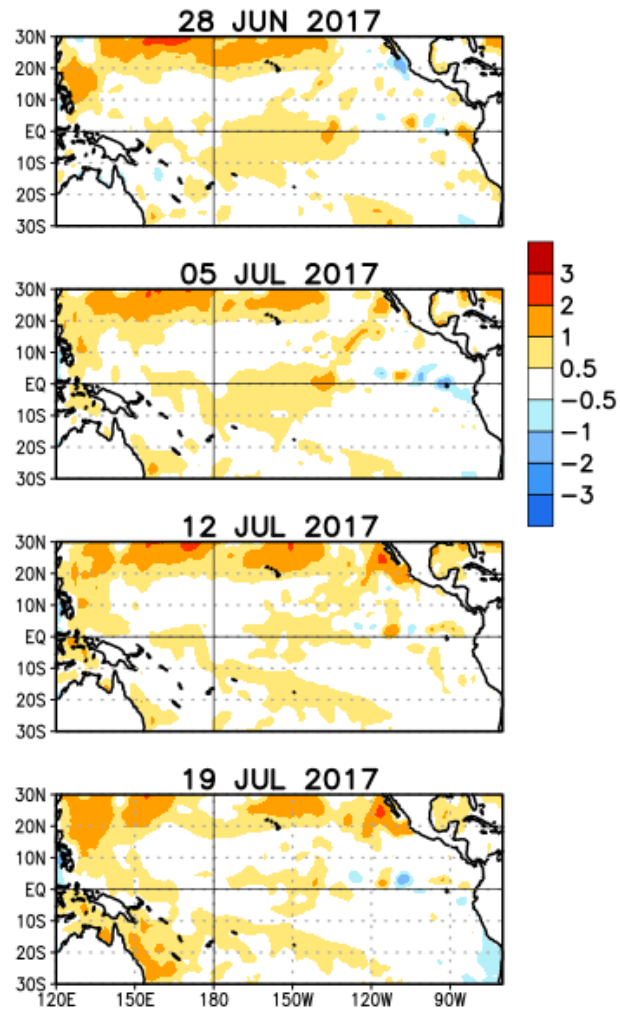
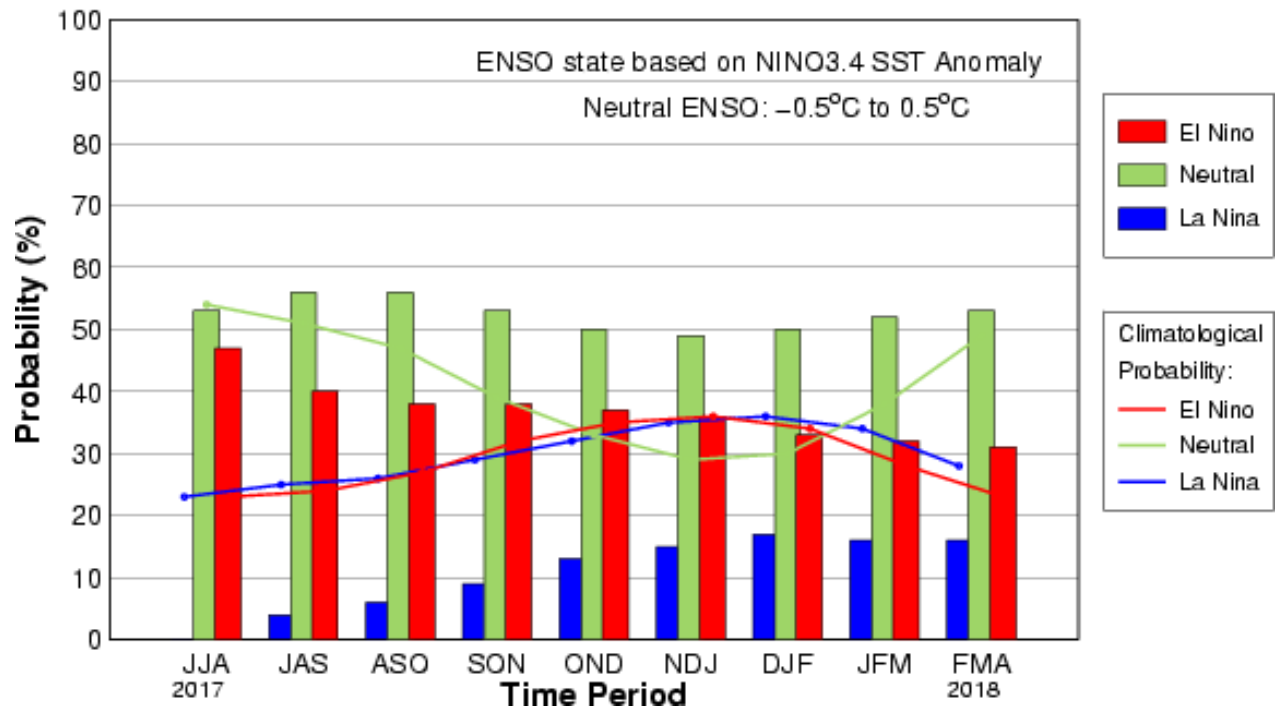
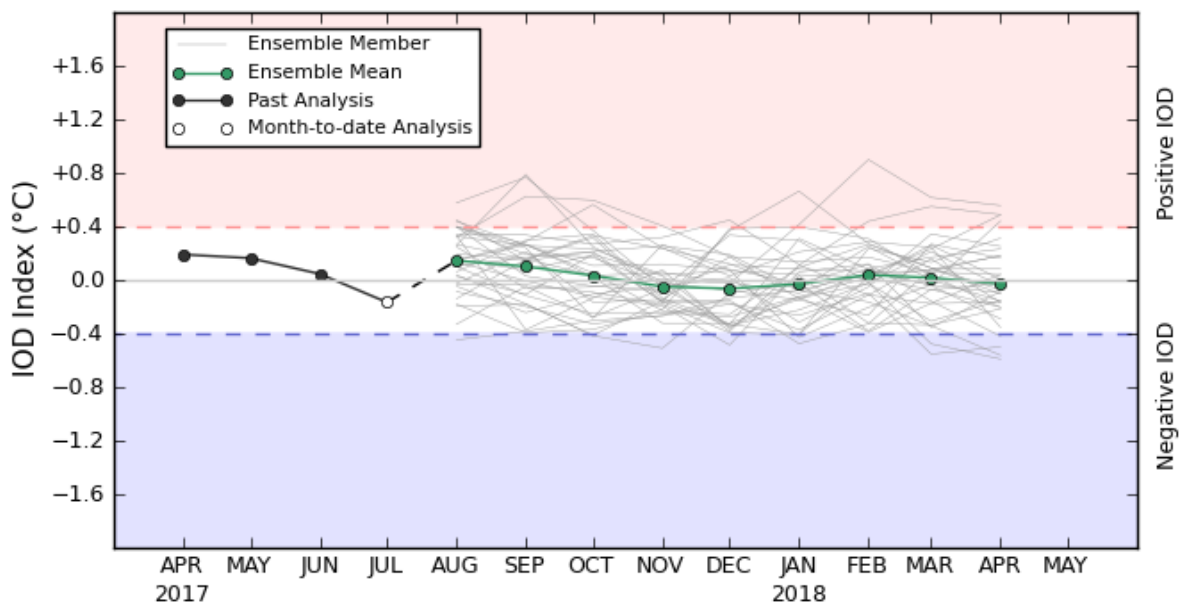


Fig 2 : Weekly Observed Average sea surface temperature (SST) anomalies (°C)

Early-Jul CPC/IRI Official Probabilistic ENSO Forecast



POAMA monthly mean IOD - Forecast Start: 16 JUL 2017



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Base period 1981-2010

Fig 3: ENSO forecast from Climate Prediction Center (CPC)/ IRI Forecast (above) and IOD forecast from Australian Bureau of Meteorology (below).

(a.) Forecasts from different climate models from around the world.

(a.1) For ASO season

Figure 4 shows the probabilistic multi model ensemble forecast using dynamical models from 12 global producing centers (GPC) for ASO season. There is higher chance of receiving above normal rainfall for ASO season over Sri Lanka (Fig. 4). Out of 12 GPC individual forecasts 5 and 2 GPC forecasts give above and below normal rainfall for ASO season respectively (Fig 5). There is no signal for ASO season over Sri Lanka from 5 GPC forecast outputs. Accordingly there is a higher chance of receiving above normal rainfall for ASO season 2017.

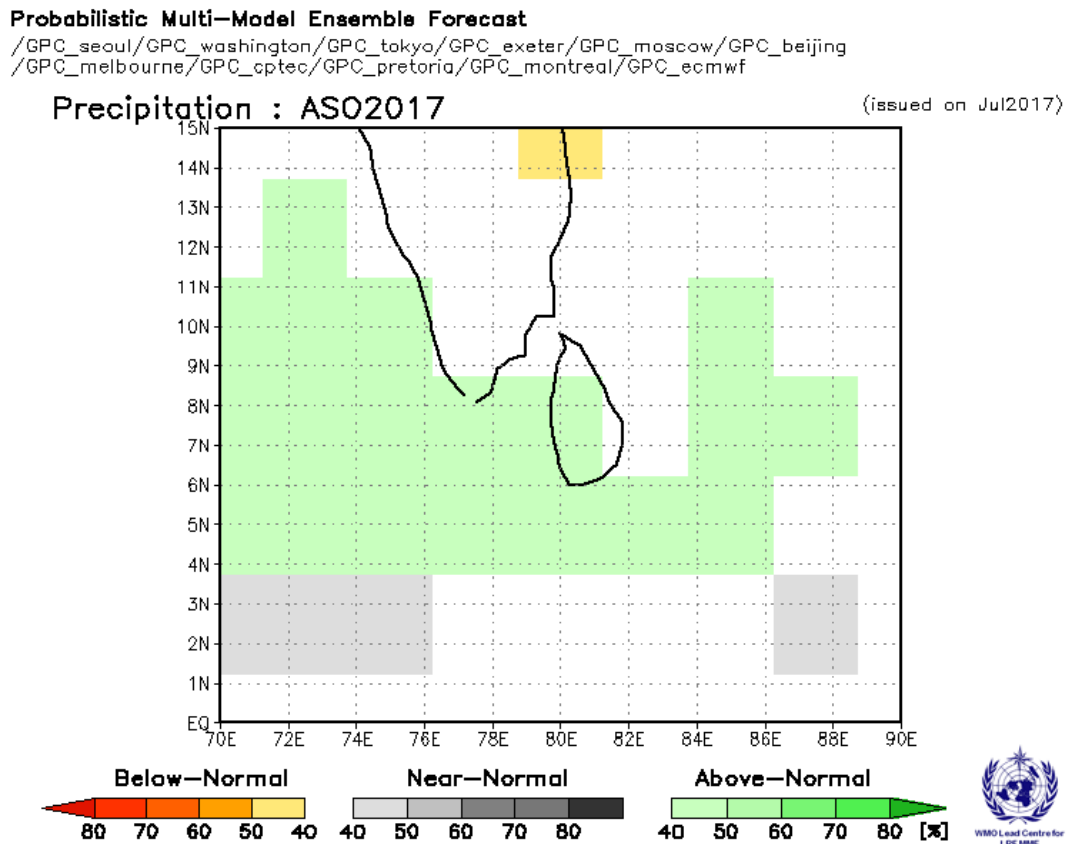


Fig 4 : Probabilistic multi model ensemble forecast for ASO using dynamical models from 11 WMO global producing centers (GPC).

lat=0 15
lon=70 90

Precipitation : ASO2017

(issued on Jul2017) [Unit: mm/day]

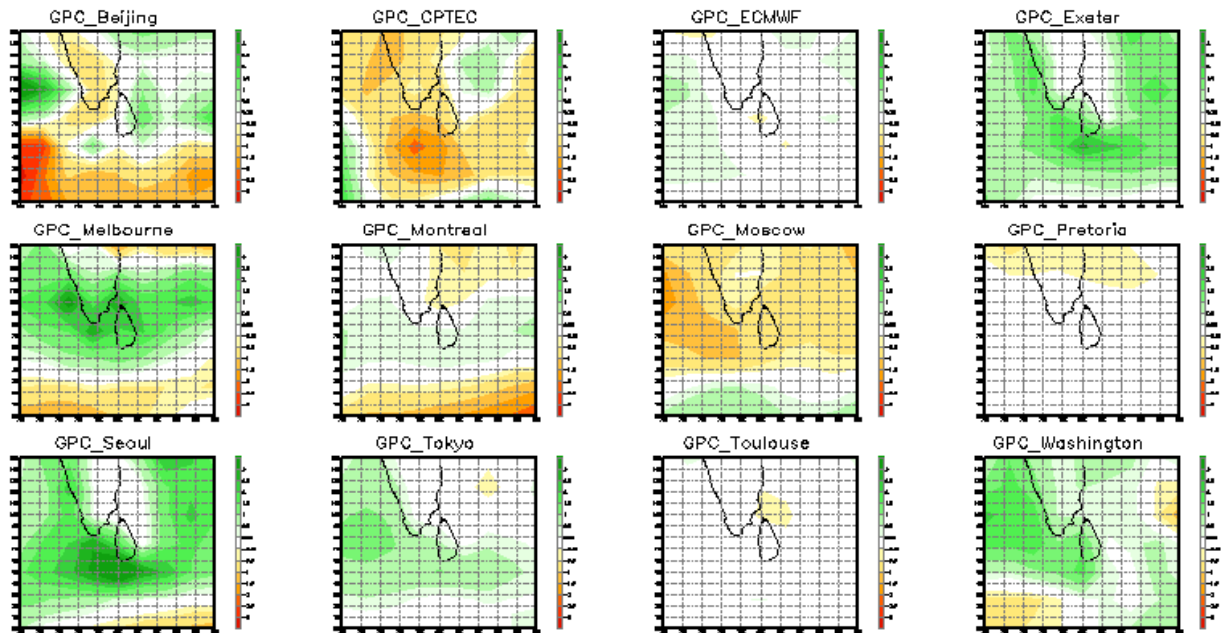


Fig 5 : Individual forecast for ASO season by dynamical models from 8 WMO global producing centers (GPC).

(a.2) Forecast for August, September and October 2017

Figure 6 shows the probabilistic multi model ensemble forecast using dynamical models from 12 global producing centers (GPC) for, August, September and October 2017. There is no signal for month of August, September and October 2017 for Sri Lanka (Fig 6). It indicates that there are equal chances of receiving below normal, near normal and above normal rainfall for August, September and October 2017.

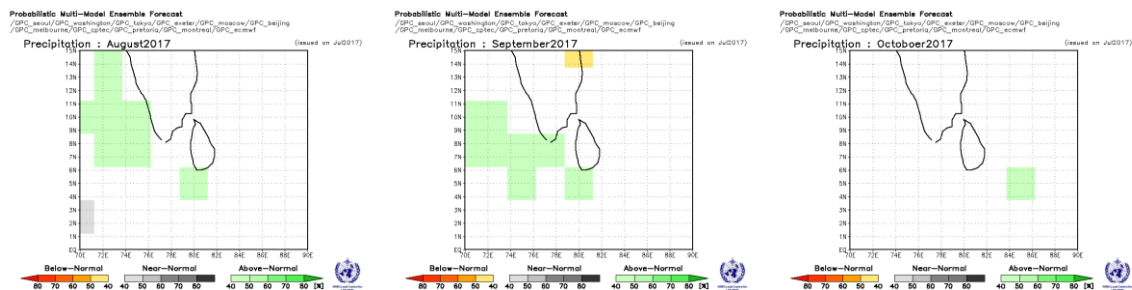


Fig 6: Probabilistic multi model ensemble forecast for August (left), September (middle) and October 2017 (right) using dynamical models from 10 WMO global producing centers (GPC).

lat=0 15
lon=70 90

Precipitation : August2017

(issued on Jul2017) [Unit: mm/day]

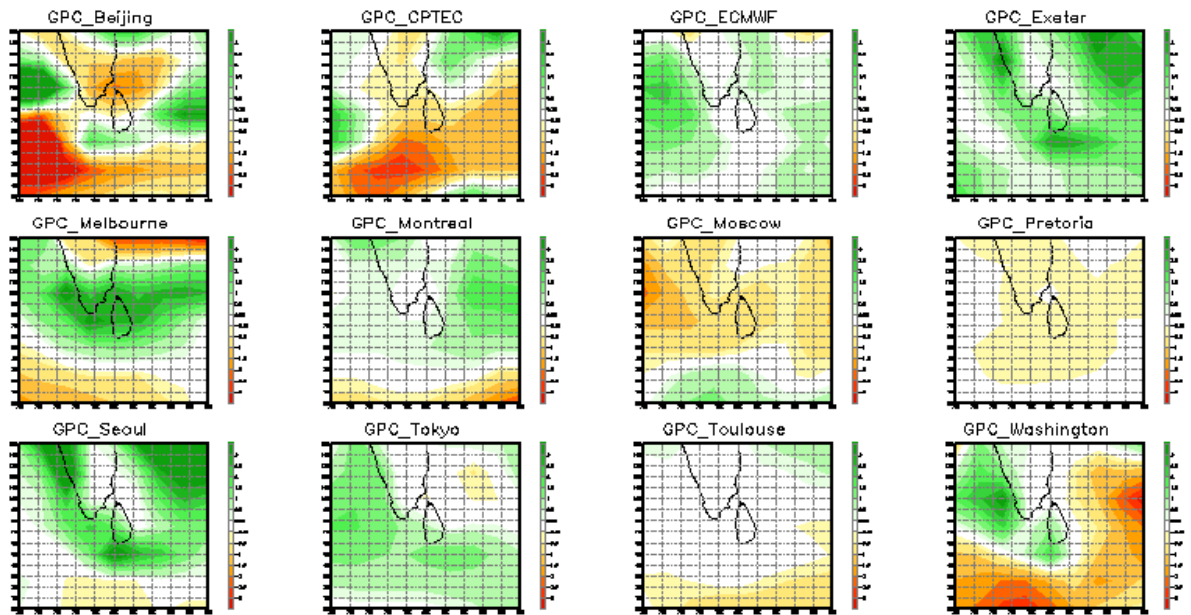


Fig 7 : Individual forecast for August 2017 by dynamical models from 8 WMO global producing centers (GPC).

lat=0 15
lon=70 90

Precipitation : September2017

(issued on Jul2017) [Unit: mm/day]

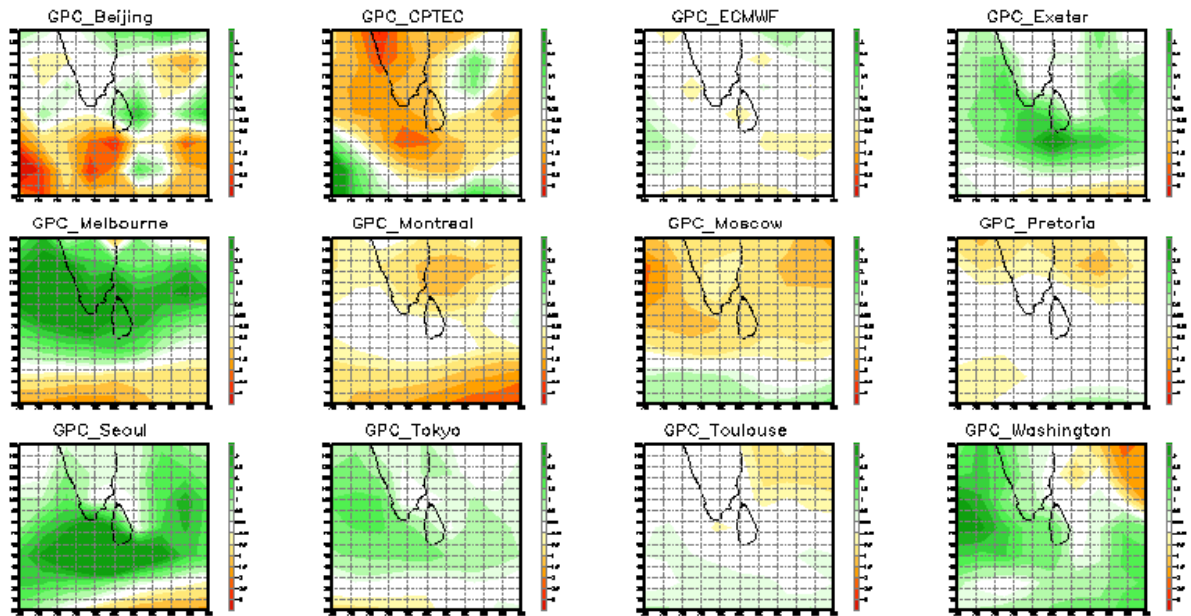


Fig 8 : Individual forecast for September 2017 by dynamical models from 8 WMO global producing centers (GPC).

lat=0 15
lon=70 90

Precipitation : October2017

(issued on Jul2017) [Unit: mm/day]

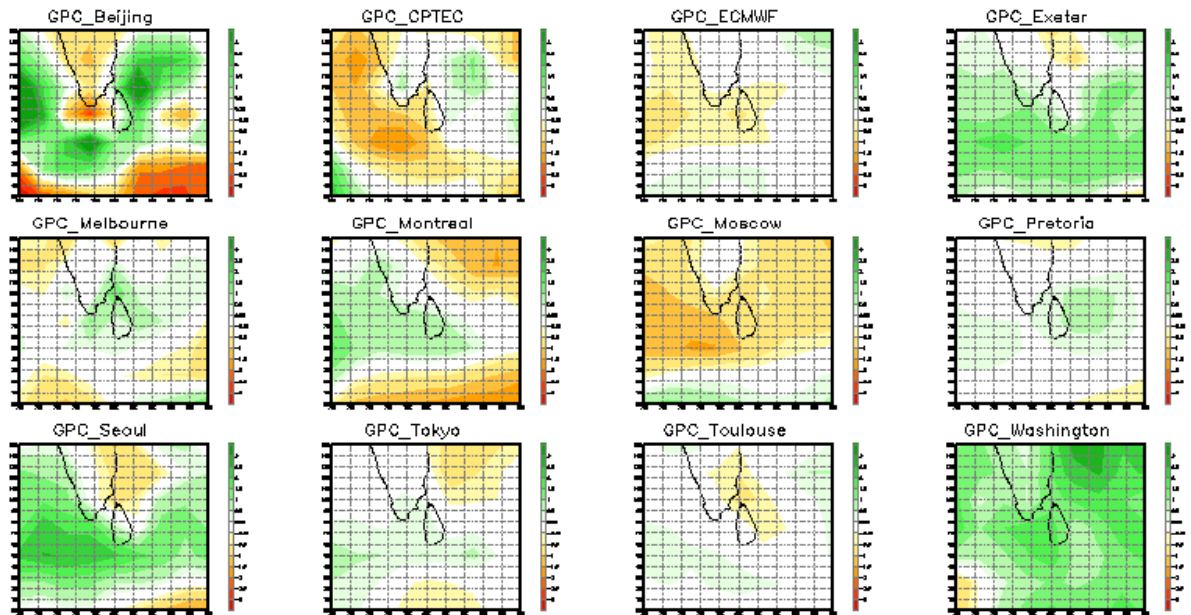


Fig 9 : Individual forecast for October 2017 by dynamical models from 8 WMO global producing centers (GPC).

Figures 7, 8 and 9 show the monthly forecast from individual global producing centers (GPC) centers for August, September and October 2017 respectively.

Out of 12 GPC forecasts 3 GPC forecasts provide below and 3 GPC forecasts provide above normal rainfall for August (Fig 7). There is no signal for August over Sri Lanka from 6 GPC forecast outputs. Accordingly there is no signal for August 2017.

Out of 12 GPC forecasts 2 GPC forecasts give below normal rainfall for September 2017 (Fig 8). Out of 12 GPC forecasts 4 GPC forecasts provide above normal rainfall, for September 2017. There is no signal for September 2017 over Sri Lanka from 6 GPC forecast outputs. Accordingly there is no signal for September 2017.

Out of 12 GPC forecasts 3 GPC forecasts give below normal and 3 GPC forecasts give above normal rainfall for October 2017 (Fig 9). There is no signal for October 2017 over Sri Lanka from 6 GPC forecast outputs. Accordingly there is no signal for October 2017.

(c) Statistical downscaling of CFSv2 global forecast output

(c.1) Probabilistic Forecast for ASO season 2017 using Climate Predictability tool (CPT)

The probabilistic rainfall forecast for ASO 2017 for Sri Lanka by downscaling CFSv2 SST using CPT is given below.

The district wise average rainfall is given in the column 2 of the table 1. Chance (probability) of receiving below/about/above average is given in the columns 3, 4, and 5 respectively in the table 1. Majority of districts have more chance (higher probability) of receiving slightly below average rainfall during ASO season 2017 except Northwestern parts and Southeastern parts.

| District | Average rainfall (mm) –ASO | Probability % | | |
|--------------|----------------------------|---------------|--------|-------|
| | | Below | Normal | Above |
| Colombo | 844.0 | 60 | 20 | 20 |
| Kalutara | 1099.6 | 60 | 20 | 20 |
| Galle | 1001.3 | 60 | 20 | 20 |
| Matara | 778.5 | 50 | 25 | 25 |
| Hambantota | 295.9 | 25 | 25 | 50 |
| Ampara | 306.8 | 30 | 30 | 40 |
| Batticaloa | 329.3 | 40 | 30 | 30 |
| Trincomalee | 398.7 | 60 | 20 | 20 |
| Mullaithivu | 332.2 | 50 | 25 | 25 |
| Jaffna | 323.7 | 35 | 20 | 45 |
| Killinochchi | 297.7 | 35 | 20 | 45 |
| Mannar | 250.7 | 45 | 25 | 30 |
| Puttalam | 321.8 | 50 | 25 | 25 |
| Gampaha | 723.9 | 60 | 20 | 20 |
| Kegalle | 1084.4 | 60 | 20 | 20 |
| Ratnapura | 852.0 | 60 | 20 | 20 |
| Monaragala | 371.0 | 35 | 25 | 45 |
| Badulla | 465.4 | 30 | 25 | 45 |
| Pollonnaruwa | 372.0 | 50 | 25 | 25 |
| Vavuniya | 382.3 | 50 | 25 | 25 |
| Anuradapura | 349.6 | 50 | 25 | 25 |
| Kurunegala | 463.3 | 60 | 20 | 20 |
| Matale | 413.9 | 45 | 25 | 30 |
| Kandy | 653.2 | 50 | 25 | 25 |
| Nuwaraeliya | 800.9 | 50 | 25 | 25 |

Table 1

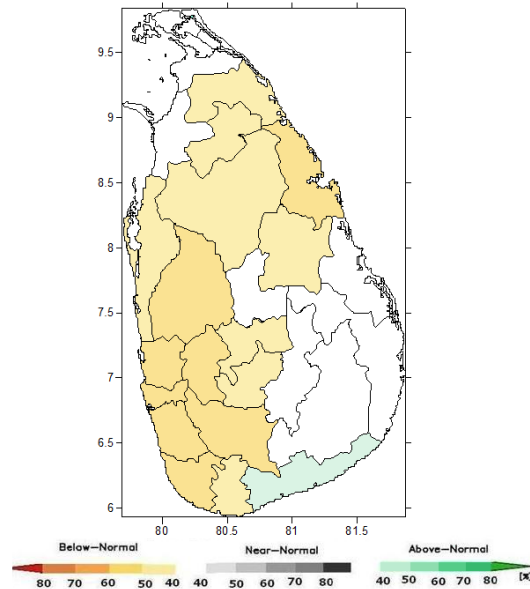


Fig 10. Probabilistic rainfall forecast for August-October 2017 using CPT

(d) (c.2) (c.1) **Probabilistic Forecast for ASO season 2017 using RIMES FOCUS System**

PROBABILISTIC-FORECAST-JUL-ASO-2017-3567₃

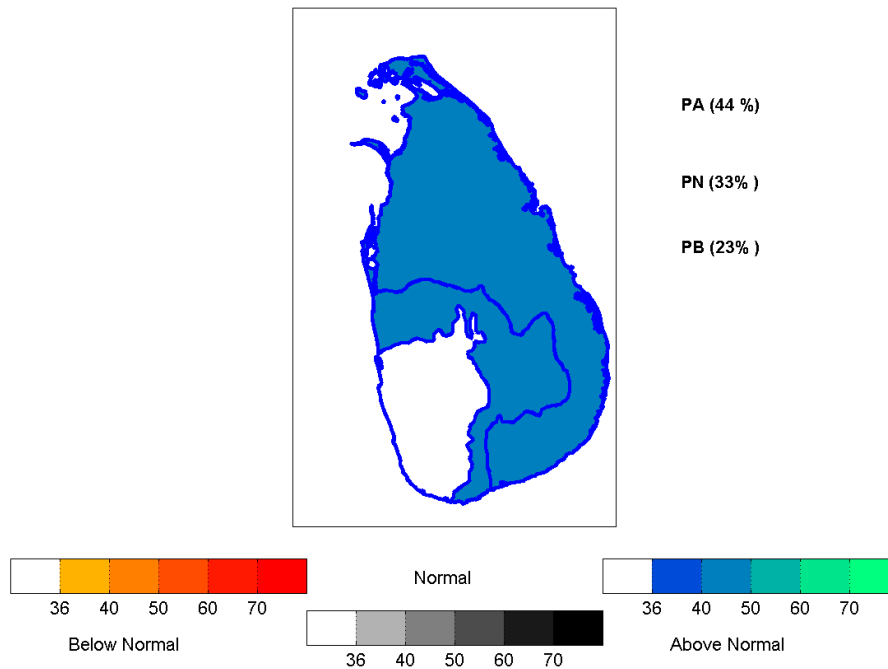


Fig 11. Probabilistic rainfall forecast for August-October 2017 using RIMES FOCUS System

The probabilistic rainfall forecast for ASO 2017 for Sri Lanka by downscaling for 3 climatic zones (Fig 11) indicates higher chances of receiving above normal rainfall for the Dry zone, and Intermediate zone. There is no signal in the Wet zone.

Summary

| SUMMARY of MODEL FORECAST for ASO season for SRI LANKA | | | | | |
|--|------------|-----------|---|---|---|
| Season | WMO LC MME | WMO GPC | RIMES FOCUS | CPT | Final |
| ASO season | AN | AN | AN in Dry and Intermediate zones | BN except Southeastern and Northwestern parts | No signal in Southwest Quarter, Near Normal elsewhere |
| August 2017 | No Signal | AN | BN in wet and Intermediate zones AN in Dry zone | BN in Colombo, Kalutara, Galle, Gampaha, Kegalle, Matale, Kandy, Nuwaraeliya, and Trincomalee districts and No signal elsewhere | BN in Colombo, Kalutara, Galle, Gampaha, Kegalle, Matale, Kandy, Nuwaraeliya, and Trincomalee districts and No signal elsewhere |
| September 2017 | No Signal | No Signal | | | Climatological Probability |
| October 2017 | No signal | No signal | | | Climatological Probability |

BN: Below Normal **N:** Normal **AN:** Above Normal **CP:** Climatological Probability

Table 2 : Summary of Model forecasts for Sri Lanka

ENSO-neutral IOD-neutral conditions persisted and will be continued through the remainder of 2017.

Most of the global model forecasts provide no clear signal over Sri Lanka for ASO season. WMO multi model ensemble prediction is favorable for above normal rainfall for ASO. Climate predictability tool provides higher chance of receiving below normal rainfall in majority of districts. RIMES FOCUS System indicates higher chances of receiving above normal rainfall for the Dry zone, and intermediate zone.

Considering the prevailing global climate conditions, forecasts from different global climate models and statistical downscaling of GCM output using CPT, near normal rainfall can be expected for most parts of the island except Southwest quarter in ASO season 2017. Climatological probability can be expected in Southwest quarter for ASO season (Fig 12).

However, the predictability is also limited to some extent due to the strong day to day atmospheric variability caused by the passage of the synoptic scale systems such as lows, and depressions etc. The seasonal predictability of the ASO season over Sri Lanka is also influenced by the Madden Julian Oscillation (MJO), which represents the major global scale of intraseasonal variability pattern.

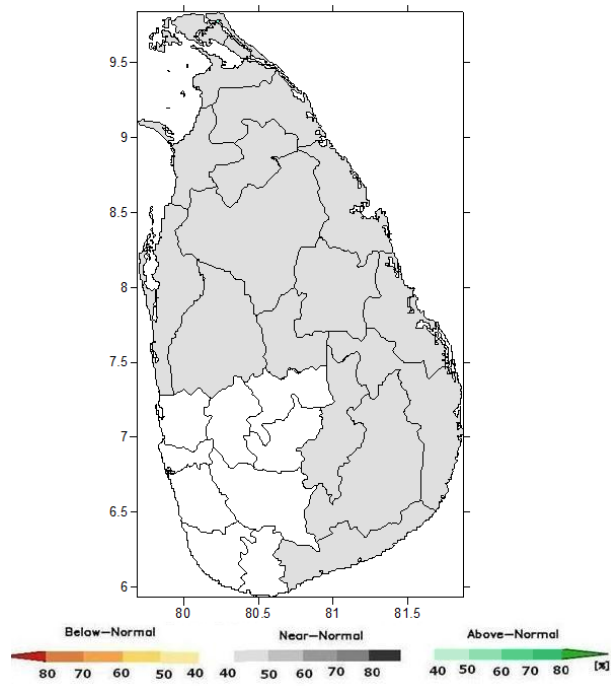


Fig 12.Consensus Probabilistic rainfall forecast for August-October 2017