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வளிமண்டலவியல் திணைக்களம்
DEPARTMENT OF METEOROLOGY
இலங்கை இலங்கை SRI LANKA

Consensus Seasonal Weather Outlook
July, August and September (JAS)
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

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And

Research Division

(a) Prevailing global climate conditions

ENSO-neutral conditions are continued during May and June, though sea surface temperatures (SSTs) were above average in the east-central Pacific Ocean (Figs. 1 and 2). Overall, the ocean and atmosphere system remains consistent with ENSO-neutral conditions.

Most of the models from the latest runs are favoring the continuation of ENSO-neutral. These predictions, combined with the near-average atmospheric conditions over the Pacific, have resulted in slightly more confidence for the persistence of ENSO-neutral (50 to ~55% chance) (Fig 3 (Upper)). However, chances for El Niño remain elevated (35-50%) relative to the long-term average into the fall. In summary, ENSO-neutral is favored (50 to ~55% chance) through the Northern Hemisphere fall 2017 (Climate Prediction Center, USA) (Fig 3 upper). Neutral IOD condition are expected to prevail during summer and fall 2017 (Fig 3 lower).

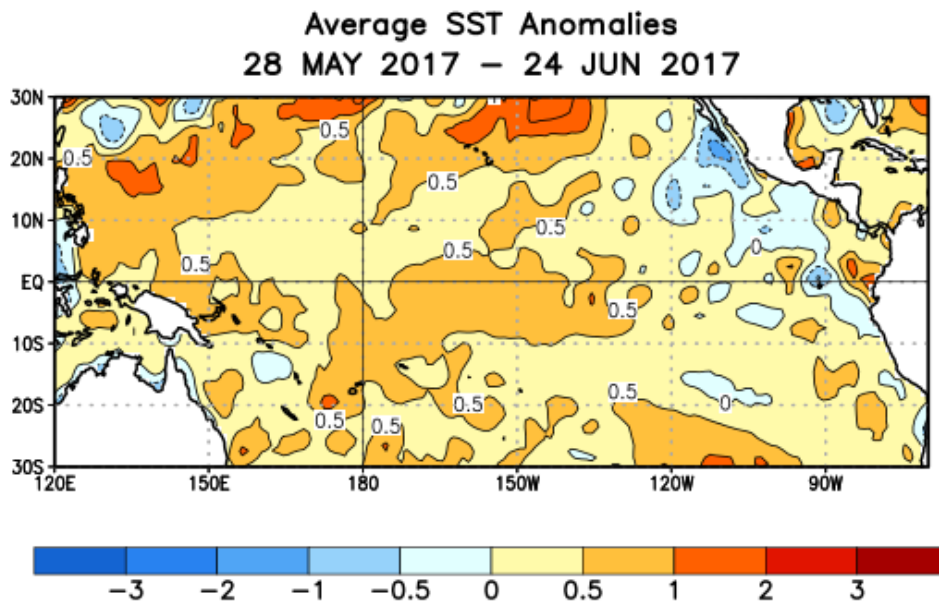


Fig 1: Observed Average sea surface temperature (SST) anomalies (°C)

Weekly SST Anomalies (DEG C)

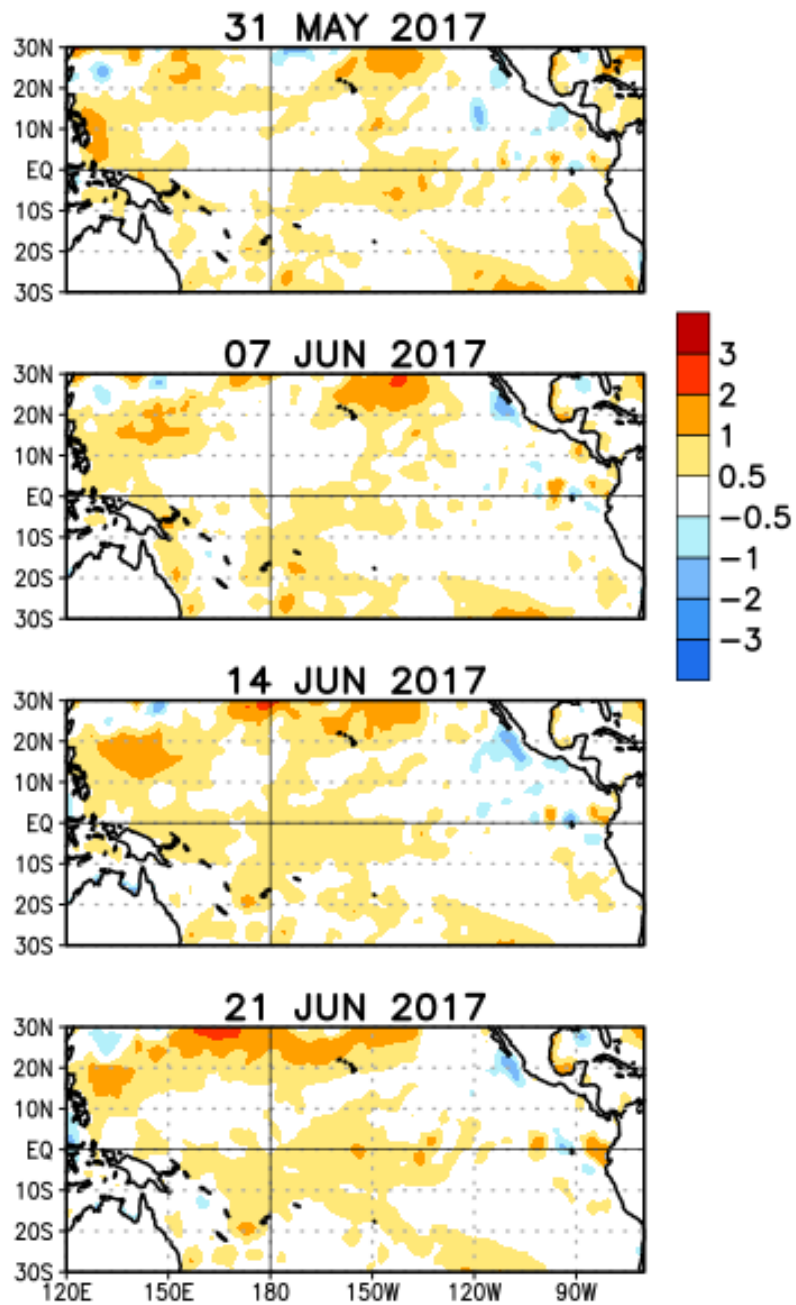


Fig 2 : Weekly Observed Average sea surface temperature (SST) anomalies (°C)

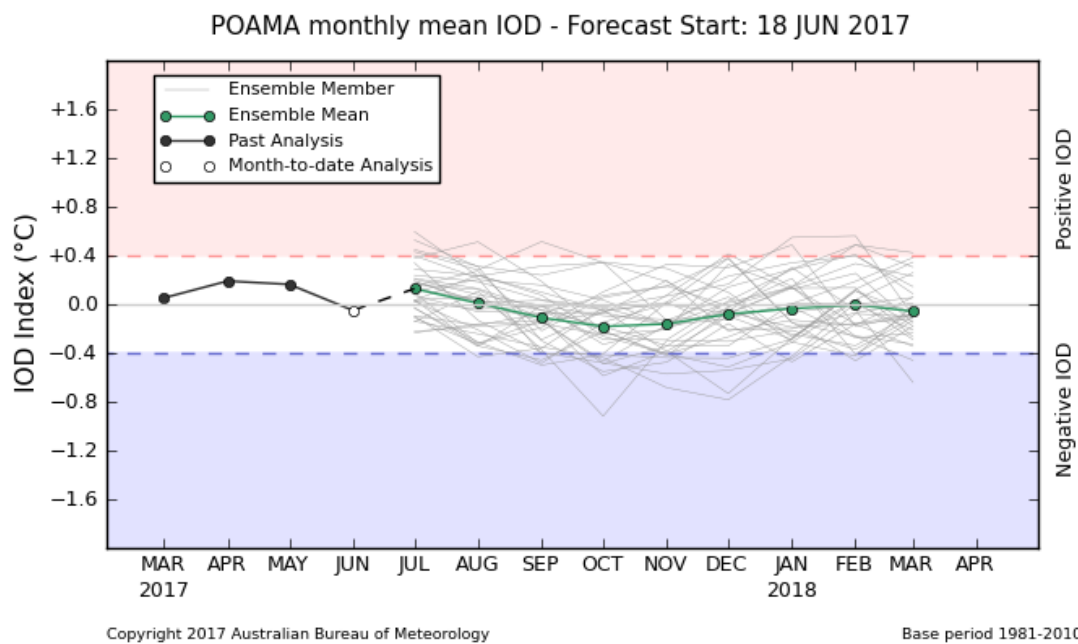
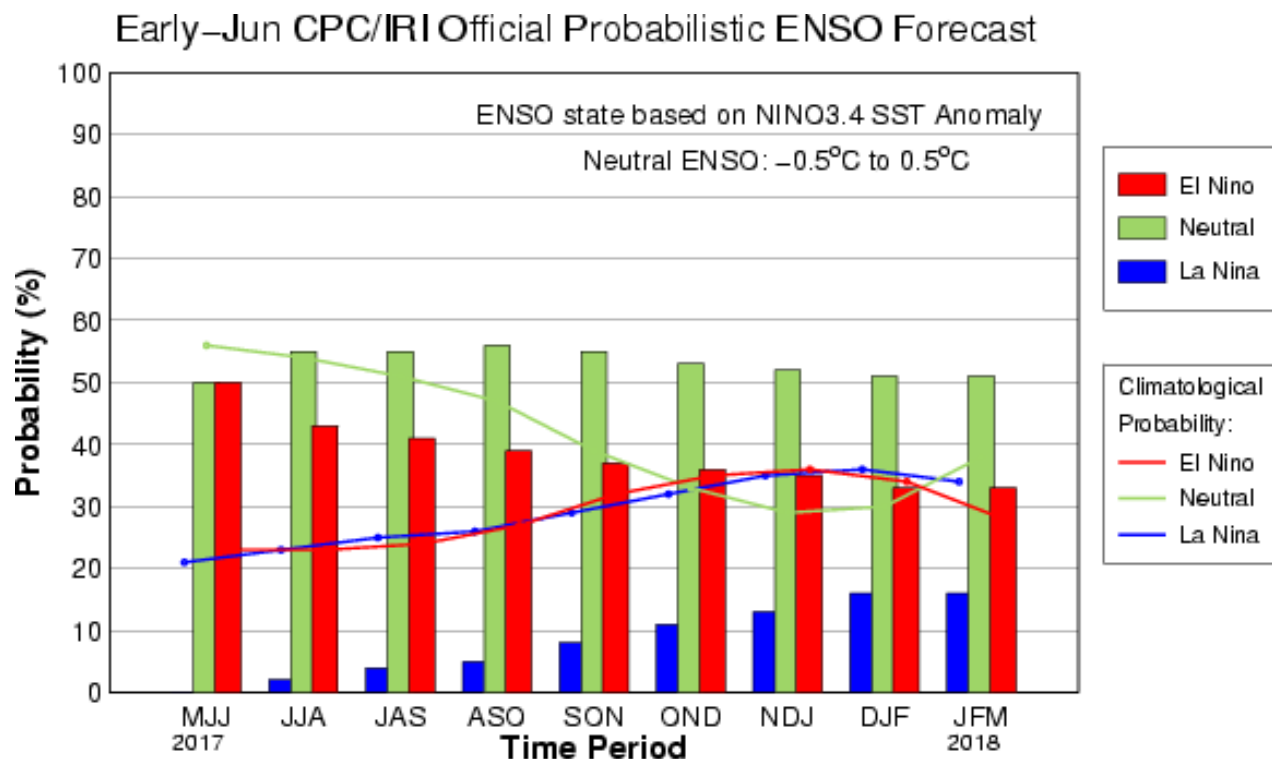


Fig 3: ENSO forecast from Climate Prediction Center (CPC)/ IRI Forecast (above) and IOD forecast from Australian Bureau of Meteorology (below).

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

(a.1) For JAS season

Figure 4 shows the probabilistic multi model ensemble forecast using dynamical models from 8 global producing centers (GPC) for JAS season. There is a higher chance of receiving slightly above normal rainfall for JAS season over Sri Lanka (Fig. 4). Out of 8 GPC individual forecasts 2 and 1 GPC forecasts give above and below normal rainfall for JAS season respectively (Fig 5). There is no signal for JAS season over Sri Lanka from 5 GPC forecast outputs.

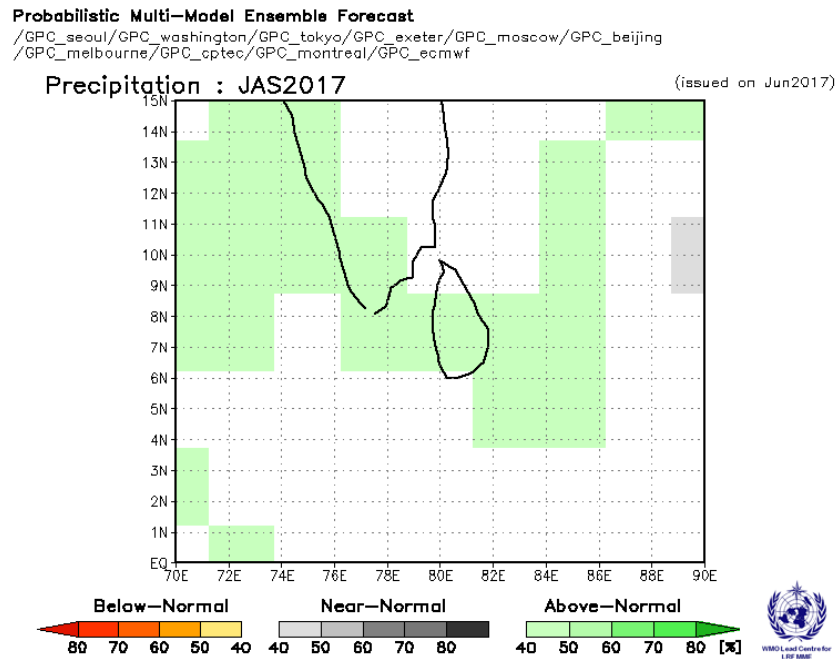


Fig 4 : Probabilistic multi model ensemble forecast for JAS using dynamical models from 8 WMO global producing centers (GPC).

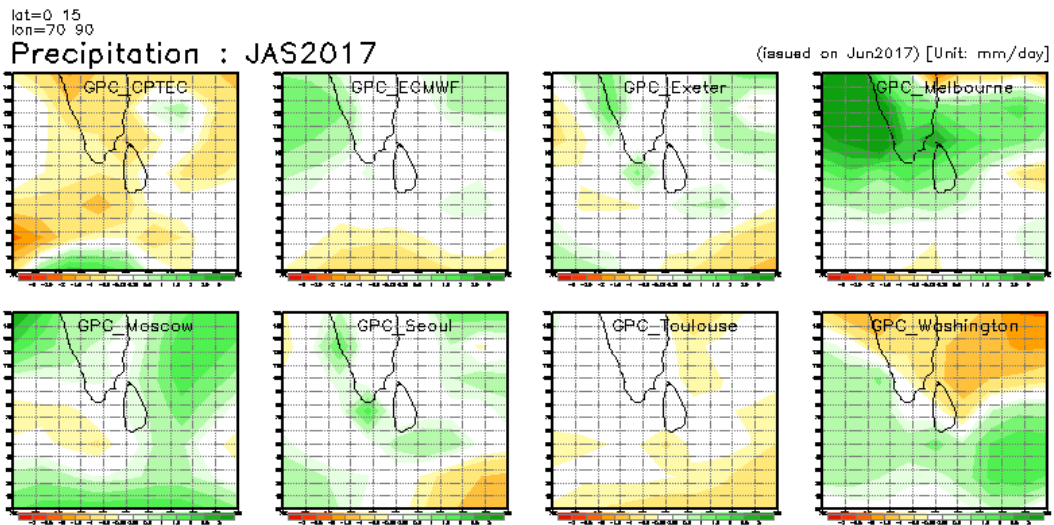


Fig 5 : Individual forecast for JAS season by dynamical models from 8 WMO GPC.

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

Figure 6 shows the probabilistic multi model ensemble forecast using dynamical models from 8 global producing centers (GPC) for, July, August, and September 2017. There is no signal for month of July, August and September 2017 for Sri Lanka (Fig 6). It indicates that there are equal chances of receiving below normal, near normal and above normal rainfall for July, August and September 2017.

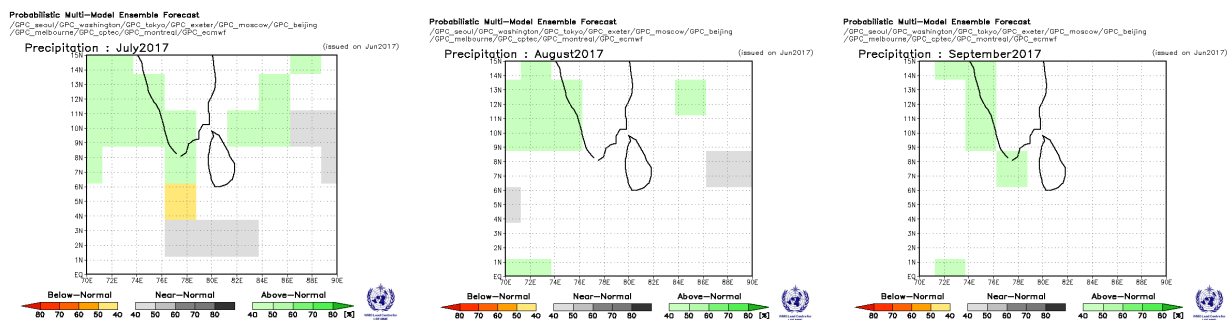


Fig 6: Probabilistic multi model ensemble forecast for July (left), August (middle) and September 2017 (right) using dynamical models from 10 WMO global producing centers (GPC).

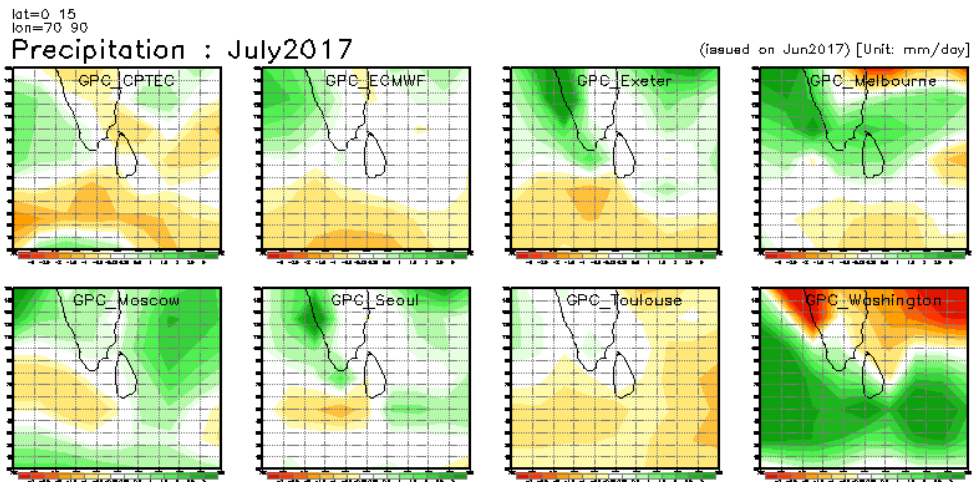


Fig 7 : Individual forecast for July by dynamical models from 8 WMO GPC.

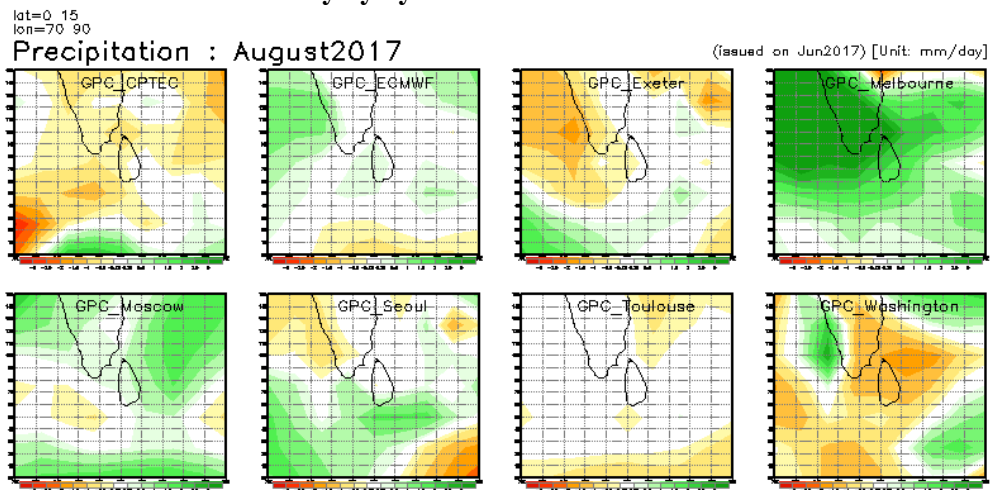


Fig 8 : Individual forecast for August 2017 by dynamical models from 8 WMO GPC.

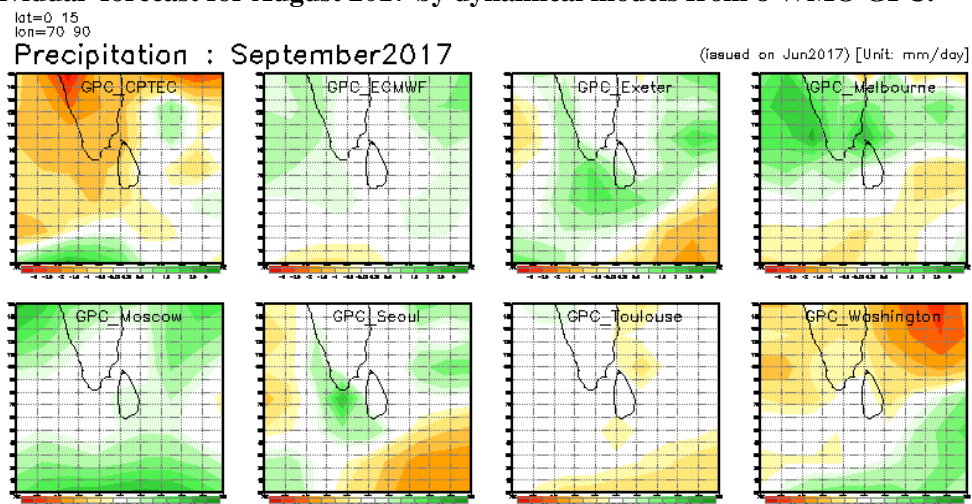


Fig 9 : Individual forecast for September 2017 by dynamical models from 8 WMO GPC.

Figures 7, 8 and 9 show the monthly forecast from individual global producing centers (GPC) centers for July, August and September 2017 respectively. Out of 8 GPC forecasts only one GCP forecast provides above normal rainfall for July (Fig 7). There is no signal for July over Sri Lanka from 7 GPS forecast outputs. Accordingly there is no signal for July 2017. As it indicates the equal chances of receiving below normal, near normal and above normal rainfall for July 2017, climatological probability can be expected.

Out of 8 GPC forecasts 2 GCP forecasts give above normal rainfall and only one GCP forecast provides below normal rainfall for August 2017 (Fig 8). There is no signal for August 2017 over Sri Lanka from 5 GPS forecast outputs. Accordingly there is no signal for August 2017. It indicates that there are equal chances of receiving below normal, near normal and above normal rainfall for August 2017. So climatological probability can be expected.

Out of 8 GPC forecasts only one GCP forecast gives below normal rainfall for September 2017 (Fig 9). There is no signal for September 2017 over Sri Lanka from 7 GPS forecast outputs. Accordingly there is no signal for September 2017. It indicates that there are equal chances of receiving below normal, near normal and above normal rainfall for September 2017. Climatological probability can be expected.

(c) Statistical downscaling of CFSv2 global forecast output

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

The probabilistic rainfall forecast for JAS 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. All the districts have more chance (higher probability) of receiving slightly below average rainfall during JAS season 2017.

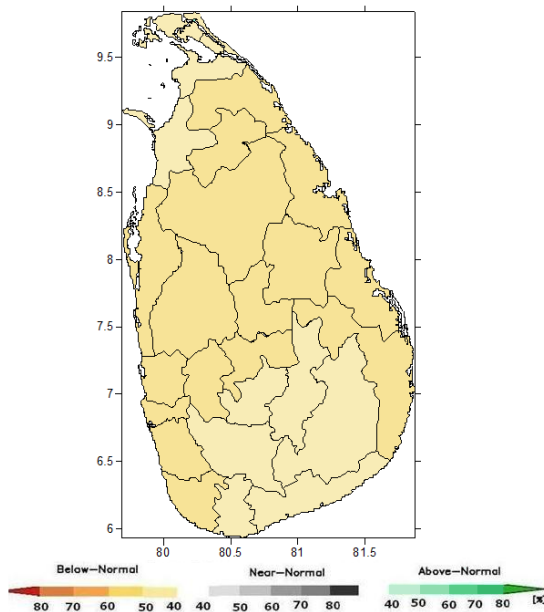


Fig 10. Probabilistic rainfall forecast for July-September 2017 using CPT

District	Average rainfall (mm) –JAS	Probability %		
		Below	Normal	Above
Colombo	632.2	60	20	20
Kalutara	898.8	60	20	20
Galle	821.7	60	20	20
Matara	621.9	50	25	25
Hambantota	167.3	45	25	30
Ampara	184.4	60	20	20
Batticaloa	202.2	60	20	20
Trincomalee	256.1	60	20	20
Mullaithivu	170.4	60	20	20
Jaffna	120.9	50	25	25
Killinochchi	108.5	50	25	25
Mannar	79.3	50	25	25
Puttalam	119.3	60	20	20
Gampaha	497.9	60	20	20
Kegalle	922.8	60	20	20
Ratnapura	681.9	50	25	25
Monaragala	184.9	50	25	25
Badulla	266.5	50	25	25
Pollonnaruwa	211.3	60	20	20
Vavuniya	196.8	60	20	20
Anuradapura	161.3	60	20	20
Kurunegala	242.7	60	20	20
Matale	213.9	60	20	20
Kandy	514.5	60	20	20
Nuwaraeliya	747.7	50	25	25

Table 1

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

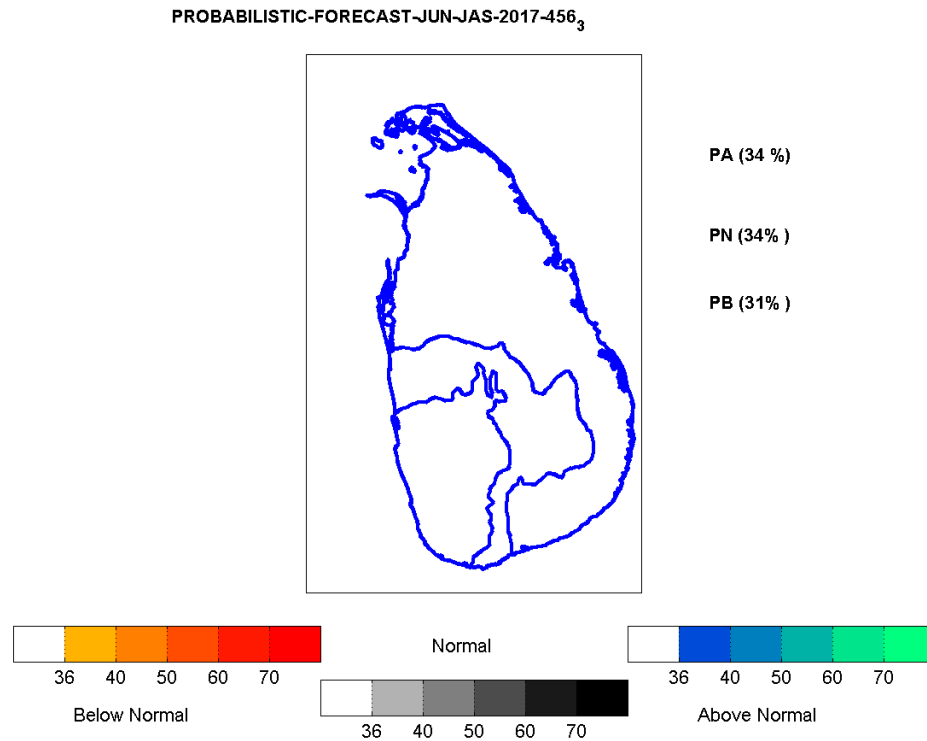


Fig 11. Probabilistic rainfall forecast for July-September 2017 using RIMES FOCUS System

The probabilistic rainfall forecast for JAS 2017 for Sri Lanka by downscaling for 3 climatic zones (Fig 11). There is no signal for JAS 2017 in all 3 climatic zones wet zone, dry zone and intermediate zone.

Summary

SUMMARY of MODEL FORECAST for JAS season for SRI LANKA					
Season	WMO LC MME	WMO GPC	RIMES FOCUS	CPT	Final
JAS season	AN	No Signal	No Signal	BN	N
July 2017	No Signal	No Signal	BN	BN	BN
August 2017	No Signal	No Signal			Climatological Probability
September 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 is are persisted in June and favored (50 to ~55% chance) to continue in JAS season 2017. Further neutral IOD condition are expected to prevail during JAS season 2017. Most of the global model forecasts provide no clear signal over Sri Lanka for JAS season.

Considering prevailing global climate conditions, statistical downscaling of model products and global model predations, near normal rainfall can be expected in most parts of the country except Southwest quarter for JAS season (Fig 12). There is no signal for Southwest quarter, indicating equal chances of receiving below normal, near normal and above normal rainfall during JAS season 2017.

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, low pressure systems and depressions etc. The seasonal predictability of the JAS season over Sri Lanka is also influenced by the Madden Julian Oscillation (MJO), which represent the major global scale intraseasonal variability pattern.

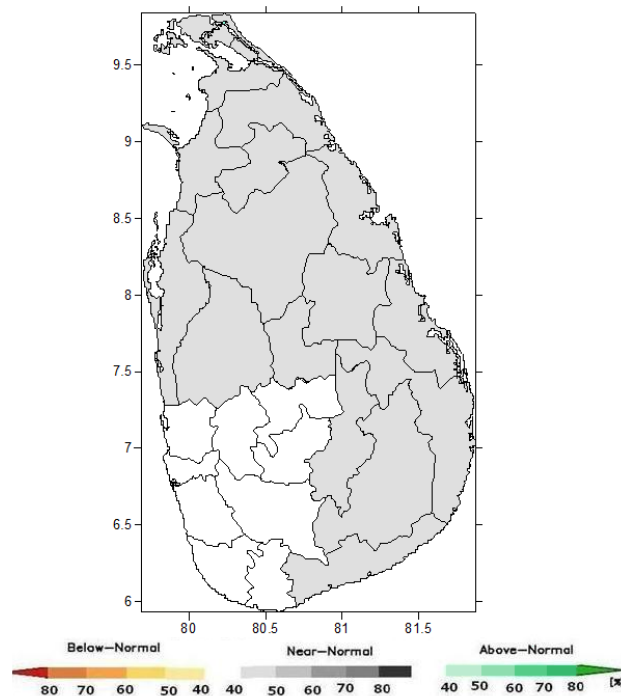


Fig 12. Consensus Probabilistic rainfall forecast for July-September 2017