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வளிமண்டலவியல் திணைக்களம்
DEPARTMENT OF METEOROLOGY
ශ්‍රී ලංකාව இலங்கை SRI LANKA

Consensus Seasonal Weather Outlook
November, December and January (NDJ)
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

From late September to late October, ENSO-neutral conditions were reflected in near-to-below average sea surface temperatures (SSTs) across most of the central and eastern Pacific Ocean (Figs. 1 and 2).

For the upcoming NDJ season 2017-18, a weak La Niña is favored in the dynamical model averages of the IRI/CPC plume (Fig 3 upper). These forecasts are supported by the ongoing easterly wind anomalies across portions of the Pacific Ocean and the reservoir of below-average subsurface temperatures. In summary, borderline La Niña conditions are favored (~55-65%) during 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).

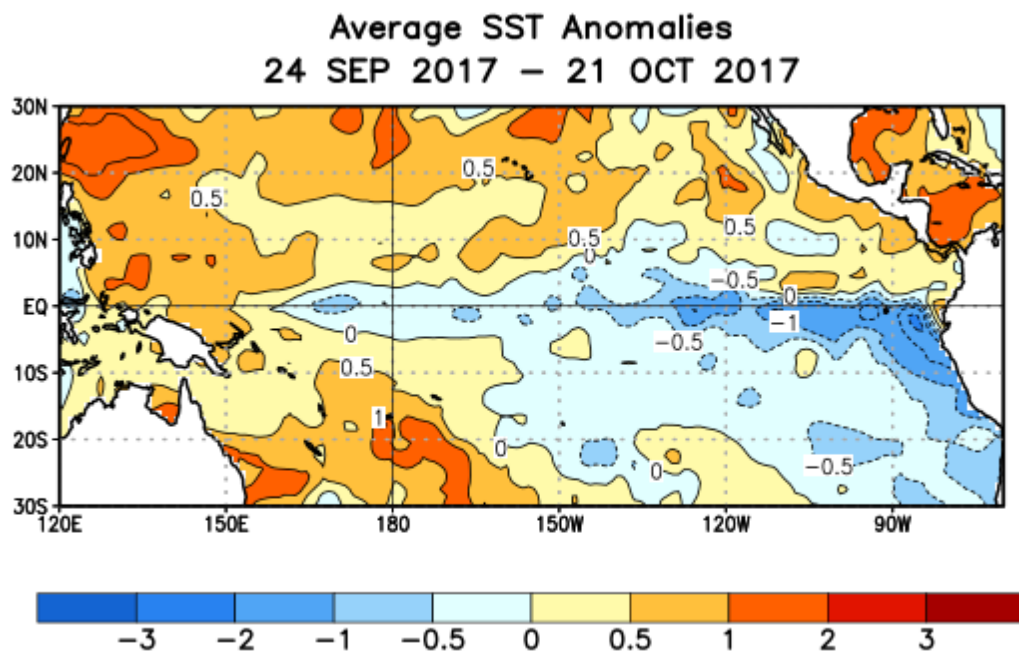


Fig 1: Observed Average sea surface temperature (SST) anomalies (°C)

Weekly SST Anomalies (DEG C)

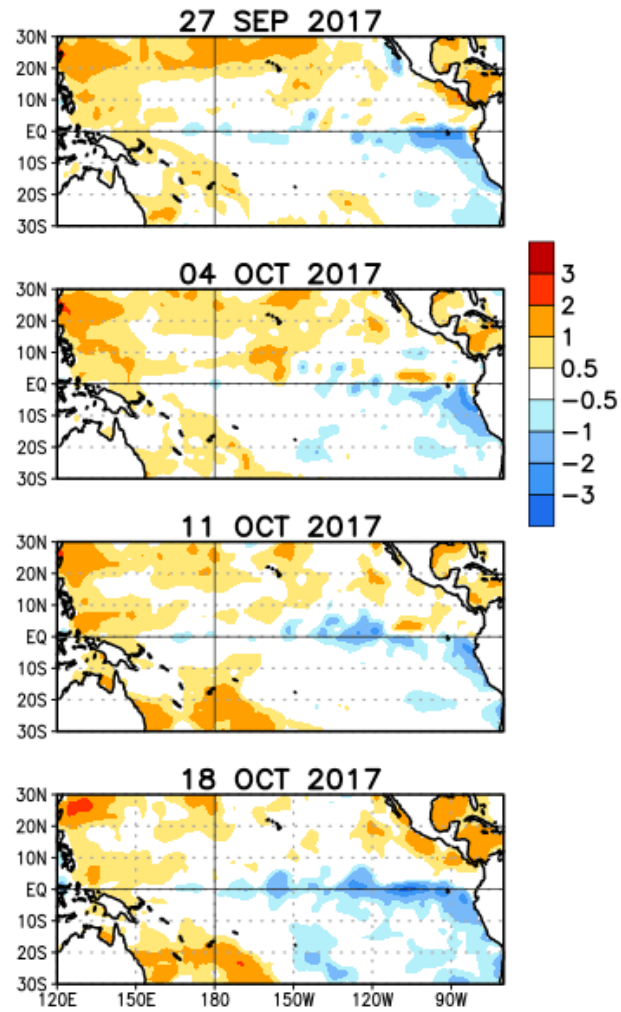


Fig 2 :Weekly Observed Average sea surface temperature (SST) anomalies (°C)

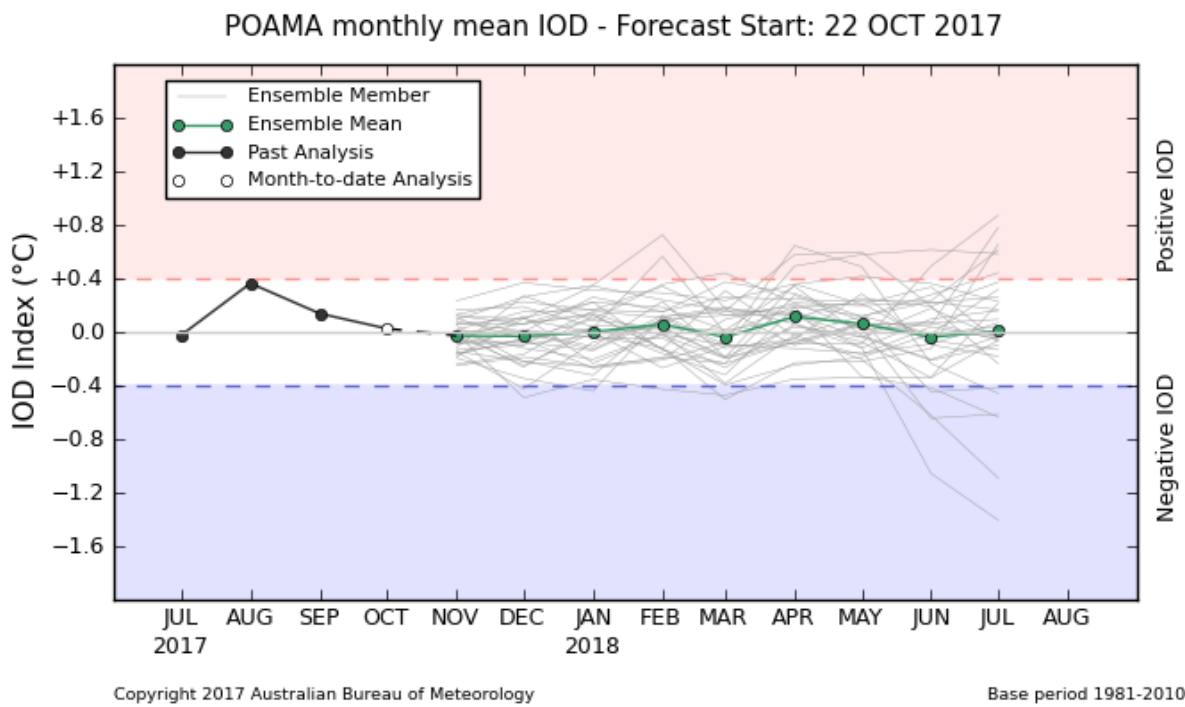
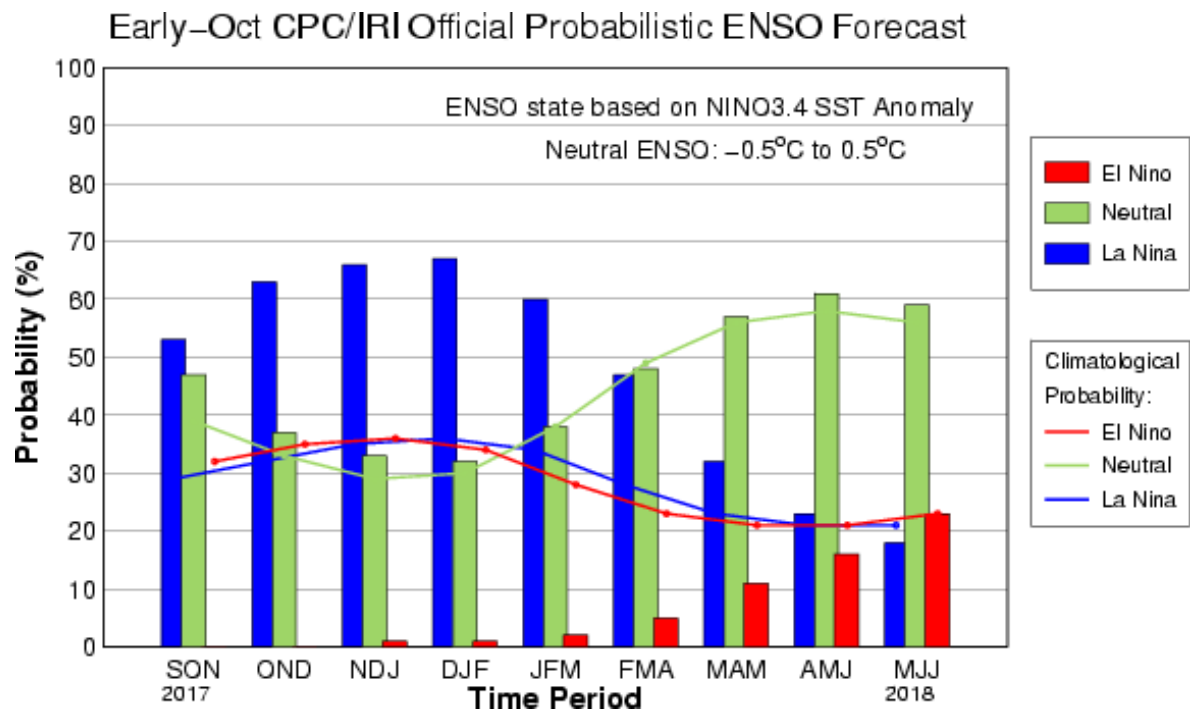


Fig 3: ENSO forecast from Climate Prediction Center (CPC)/ IRI Forecast (above) and IOD forecast from Australian Bureau of Meteorology (below).

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

(a.1) For NDJ season

Figure 4 shows the probabilistic multi model ensemble forecast using dynamical models from 13 global producing centers (GPC) for NDJ season. There is higher chance of receiving below normal rainfall for NDJ season over Sri Lanka (Fig. 4). Out of 13 GPC individual forecasts 7 forecasts give below normal rainfall for NDJ season (Fig 5). Only one GPC provide above normal forecast. There is no signal for NDJ season over Sri Lanka from 5 GPC forecast outputs. Accordingly there is a higher chance of receiving below normal rainfall for NDJ season 2017.

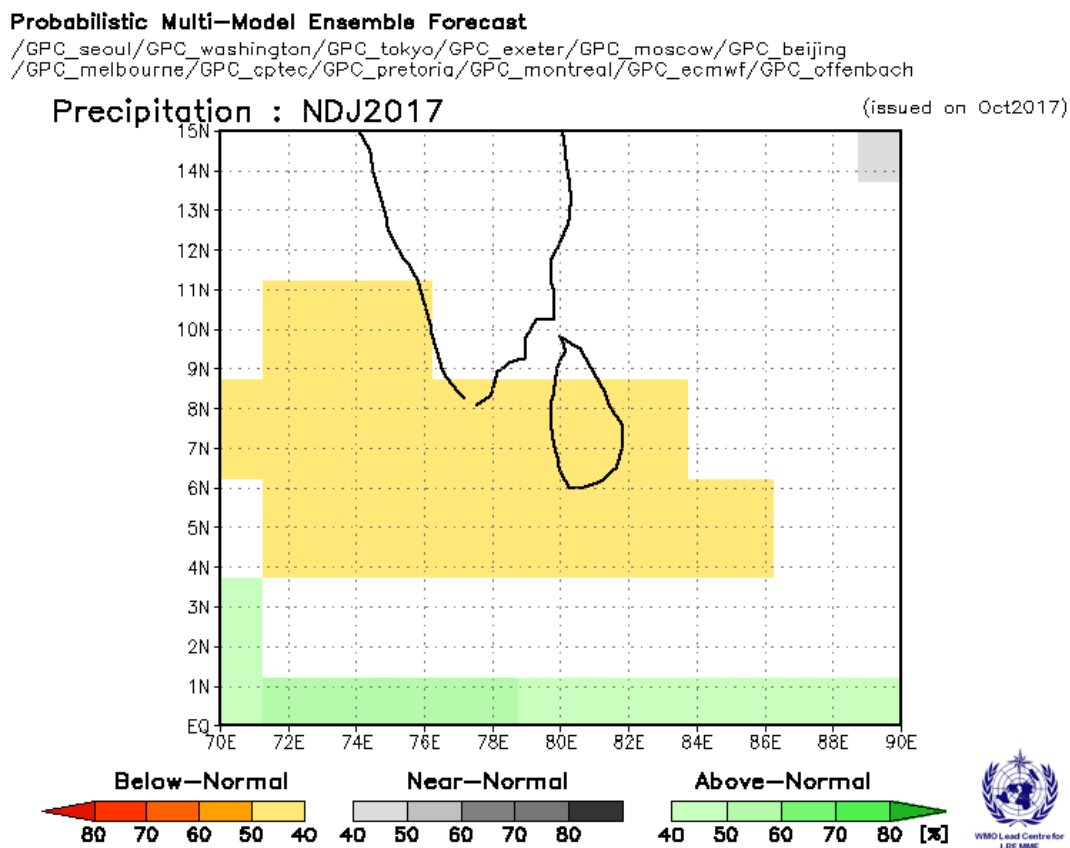


Fig 4 : Probabilistic multi model ensemble forecast for NDJ using dynamical models from 12 WMO global producing centers (GPC).

lat=0 15
lon=70 90

Precipitation : NDJ2017

(issued on Oct2017) [Unit: mm/day]

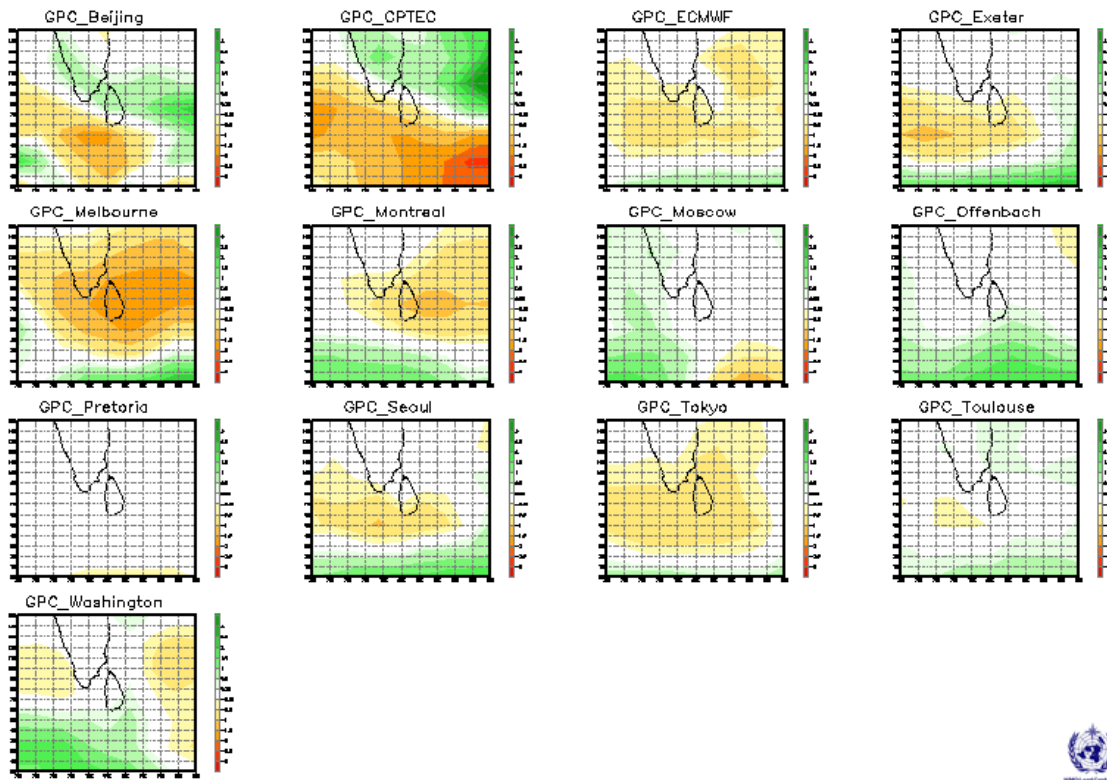


Fig 5 : Individual forecast for NDJ season by dynamical models from 13 WMO global producing centers (GPC).

(a.2) Forecast for November, December and January 2017

Figure 6 shows the probabilistic multi model ensemble forecast using dynamical models from 12 global producing centers (GPC) for, November 2017, December 2017 and January 2018. There is a higher chance of receiving below normal rainfall for month of November 2017. There is no signal for December 2017 and January 2018 for Sri Lanka (Fig 6). It indicates that there are equal chances of receiving below normal, near normal and above normal rainfall for December 2017 and January 2018.

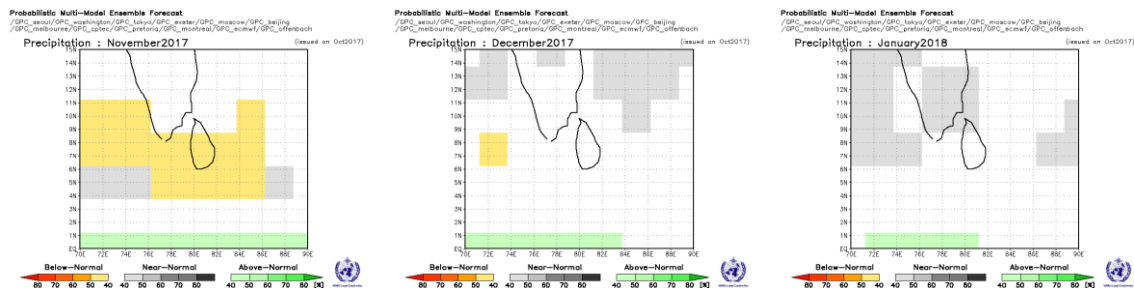


Fig 6: Probabilistic multi model ensemble forecast for November (left), December (middle) and January2017 (right) using dynamical models from 12 WMO global producing centers (GPC).

lat=0 15
lon=70 90

Precipitation : November2017

(issued on Oct2017) [Unit: mm/day]

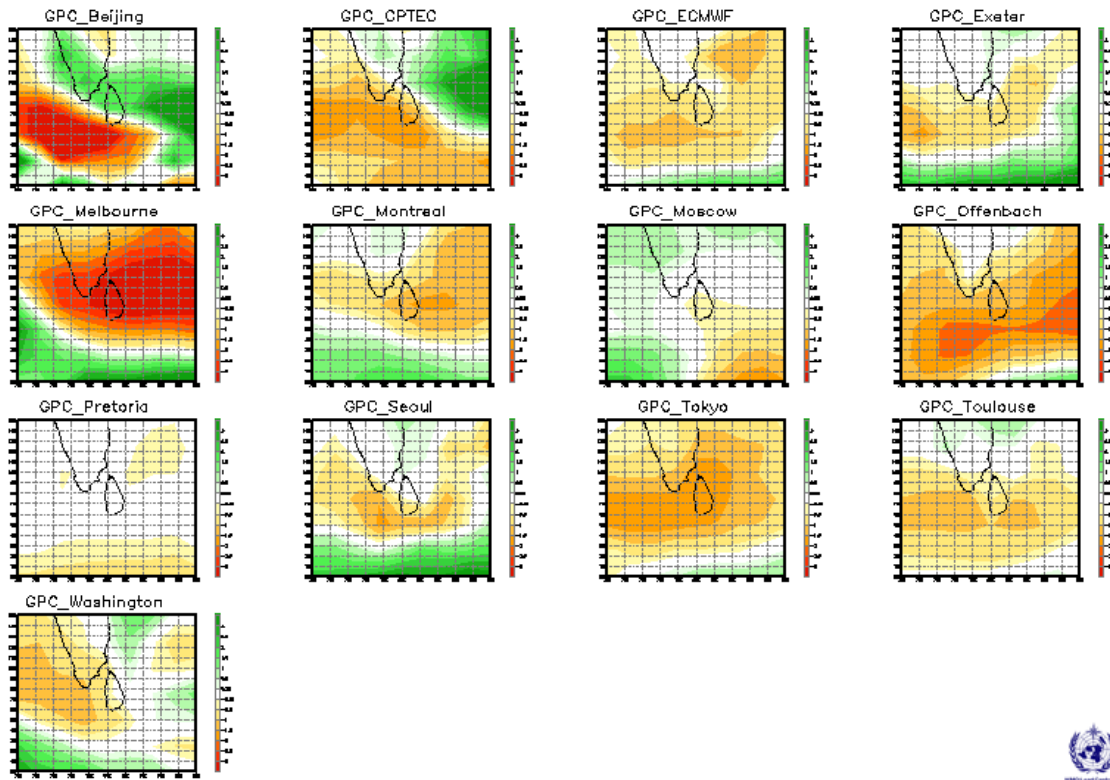


Fig 7 : Individual forecast for November 2017 by dynamical models from 13 WMO global producing centers (GPC).

lat=0 15
lon=70 90

Precipitation : December 2017

(issued on Oct2017) [Unit: mm/day]

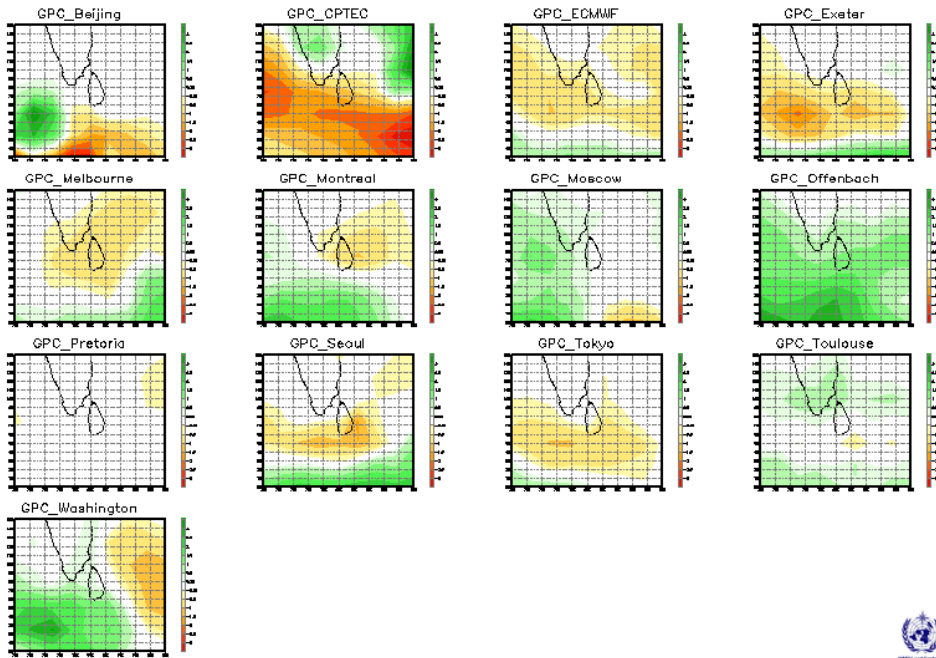


Fig 8 : Individual forecast for December 2017 by dynamical models from 13 WMO global producing centers (GPC).

lat=0 15
lon=70 90

Precipitation : January 2018

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

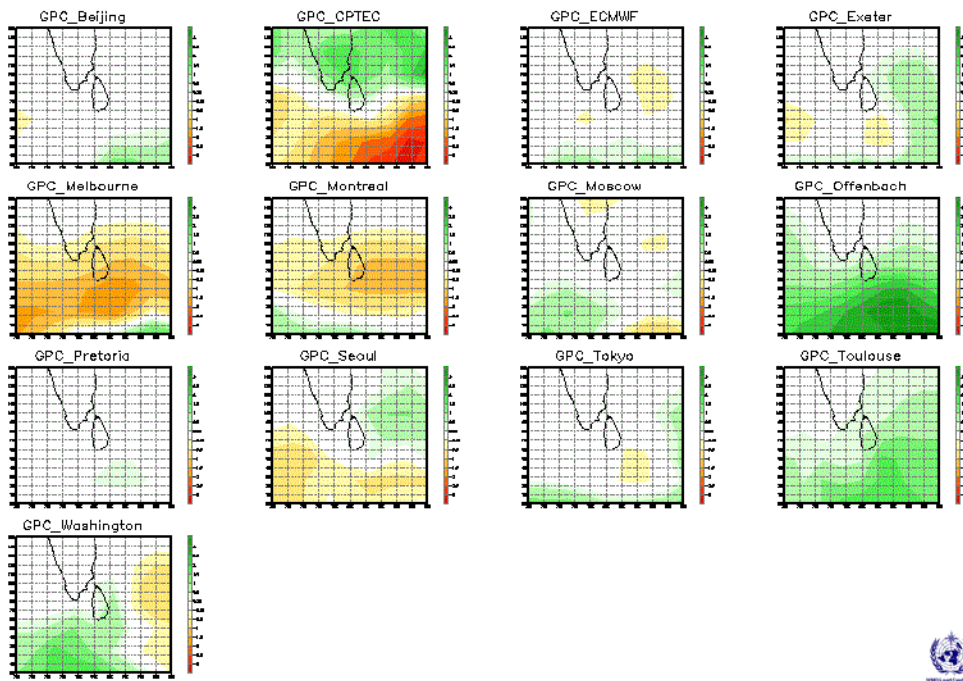


Fig 9 : Individual forecast for January 2017 by dynamical models from 13 WMO global producing centers (GPC).

Figures 7, 8 and 9 show the monthly forecast from individual global producing centers (GPC) centers for November, December and January 2017 respectively.

Out of 13 GPC forecasts 9 GPC forecasts provide below normal rainfall for November (Fig 7). Only GPC model forecasts above normal rainfall for November (Fig 7). There is no signal for November over Sri Lanka from 2 GPC forecast outputs. Accordingly there is a higher chance of receiving below normal rainfall for month of November 2017.

Out of 13 GPC forecasts 5 GPC models give below normal rainfall for December 2017 (Fig 8). Out of 13 GPC models only one model forecasts above normal rainfall for December 2017. There is no signal for December 2017 over Sri Lanka from 7 GPC forecast outputs. Accordingly there is no signal for December 2017.

Out of 13 GPC forecasts 2 GPC forecasts give below normal and 2 GPC forecasts give above normal rainfall for January 2018 (Fig 9). There is no signal for January 2017 over Sri Lanka from 7 GPC forecast outputs. Accordingly there is no signal for January 2018.

(c) Statistical downscaling of CFSv2 global forecast output

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

The probabilistic rainfall forecast for NDJ 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 above average rainfall during NDJ season 2017/2018.

District	Average rainfall (mm) –NDJ	Probability %		
		Below	Normal	Above
Colombo	609.8	25	30	45
Kalutara	783.8	25	30	45
Galle	745.5	25	30	45
Matara	697.7	25	30	45
Hambantota	452.6	25	30	45
Ampara	832.5	25	30	45
Batticaloa	885.5	25	30	45
Trincomalee	766.1	25	30	45
Mullaithivu	680.6	30	30	40
Jaffna	652.9	30	30	40
Killinochchi	680.3	30	30	40
Mannar	503.1	30	30	40
Puttalam	406.3	25	30	45
Gampaha	507.9	25	30	45
Kegalle	660.0	25	30	45
Ratnapura	718.7	25	30	45
Monaragala	672.8	25	30	45
Badulla	915.8	25	30	45
Pollonnaruwa	826.5	25	30	45
Vavuniya	603.1	25	30	45
Anuradapura	557.8	25	30	45
Kurunegala	483.8	25	30	45
Matale	868.7	25	30	45
Kandy	811.1	25	30	45
Nuwaraeliya	694.3	25	30	45

Table 1

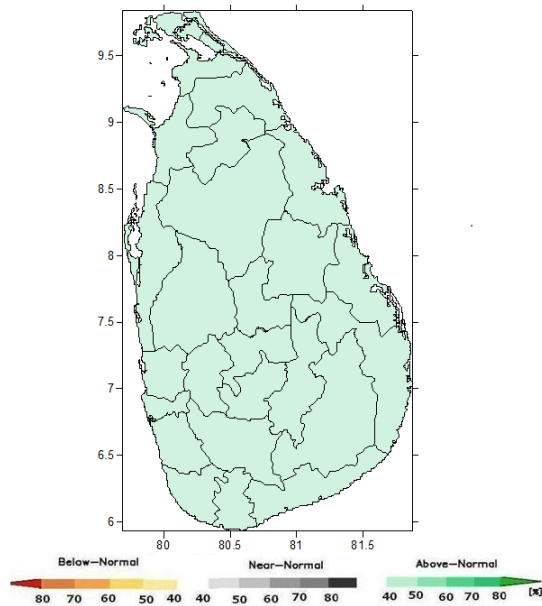


Fig 10. Probabilistic rainfall forecast for November-January 2017/2018 using CPT

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

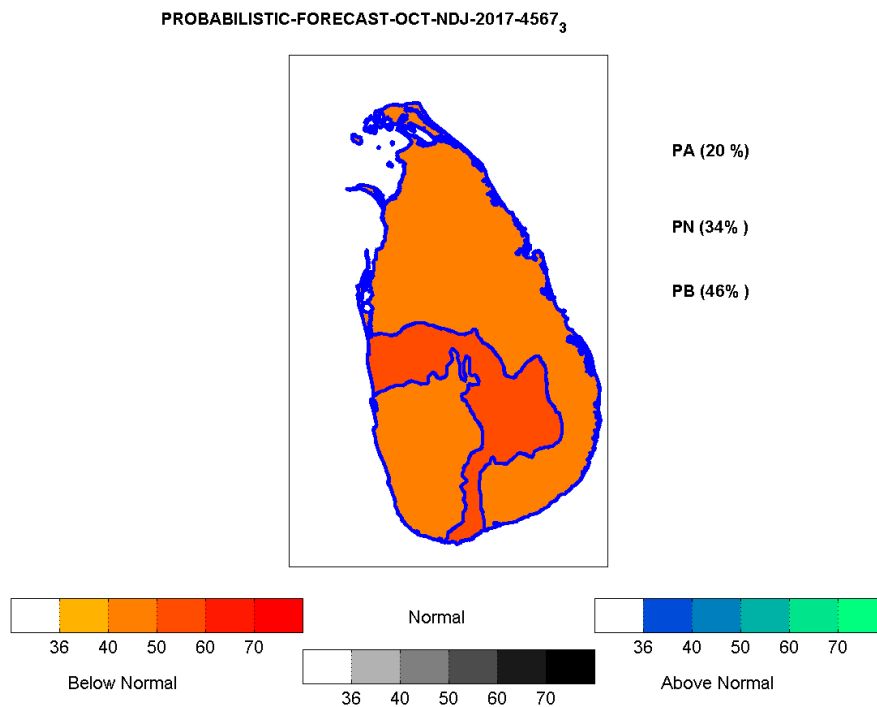


Fig 11. Probabilistic rainfall forecast for November-January 2017/2018 using RIMES FOCUS System

The probabilistic rainfall forecast for NDJ 2017 for Sri Lanka by downscaling for 3 climatic zones (Fig 11) indicates higher chances of receiving below normal rainfall for the Dry zone, Wet zone and Intermediate zone.

Summary

SUMMARY of MODEL FORECAST for ASO season for SRI LANKA					
Season	WMO LC MME	WMO GPC	RIMES FOCUS	CPT	Final
NDJ season	BN	BN	BN	AN	BN
November 2017	BN	BN	AN in Dry zone. BN Intermediate zones and No Signal in wet zone	No signal	BN
December 2017	No Signal	No Signal			Climatological Probability
January 2018	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

Borderline La Nina conditions and IOD-neutral conditions persisted and will be continued through the remainder of 2017 and early 2018.

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

Considering the prevailing global climate conditions, forecasts from different global climate models and statistical downscaling of GCM output using CPT, slightly below normal rainfall can be expected for most parts of the island for NDJ season 2017/2018 (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 NDJ season over Sri Lanka is also influenced by the Madden Julian Oscillation (MJO), which represents the major global scale of intra-seasonal variability pattern.

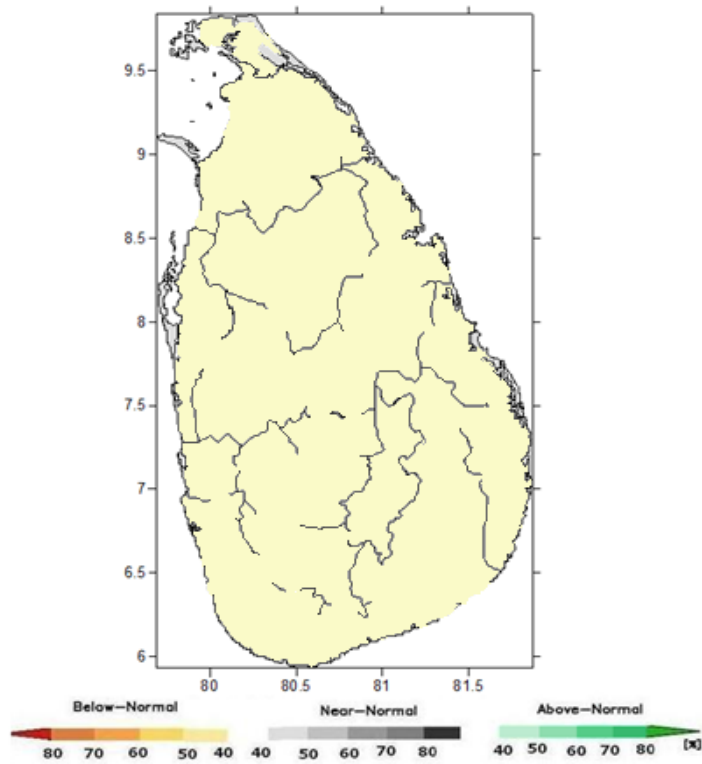


Fig 12.Consensus Probabilistic rainfall forecast for November-January 2017/2018