කාලගුණ විද්‍යා දෙපාර්තමේන්තුව
வளிமண்டலவியல் திணைக்களம்
DEPARTMENT OF METEOROLOGY
ශ්‍රී ලංකාව இலங்கை SRI LANKA

Consensus Seasonal Weather Outlook

June, July and August (JJA)

Seasonal Rainfall and Temperature 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 May 2018, the tropical Pacific returned to ENSO-neutral, as indicated by mostly near-to-below average sea surface temperatures (SSTs) along the equator (Fig. 1). The latest weekly Niño indices were near zero in all regions, except for Niño-1+2, which remained slightly negative (Fig. 2). Atmospheric indictors related to La Niña also continued to fade. Low-level winds were near average over most of the tropical Pacific Ocean, and upper-level winds were anomalous westerly over the eastern Pacific. Overall, the ocean and atmosphere system reflected a return to ENSO-neutral.

The majority of models in the IRI/CPC plume predict ENSO-neutral to continue at least through the Northern Hemisphere summer 2018 (Fig. 3 upper). ENSO-neutral and IOD-neutral (Fig. 3 lower) is favored through June to August 2018 (Climate Prediction Center, NOAA, USA)

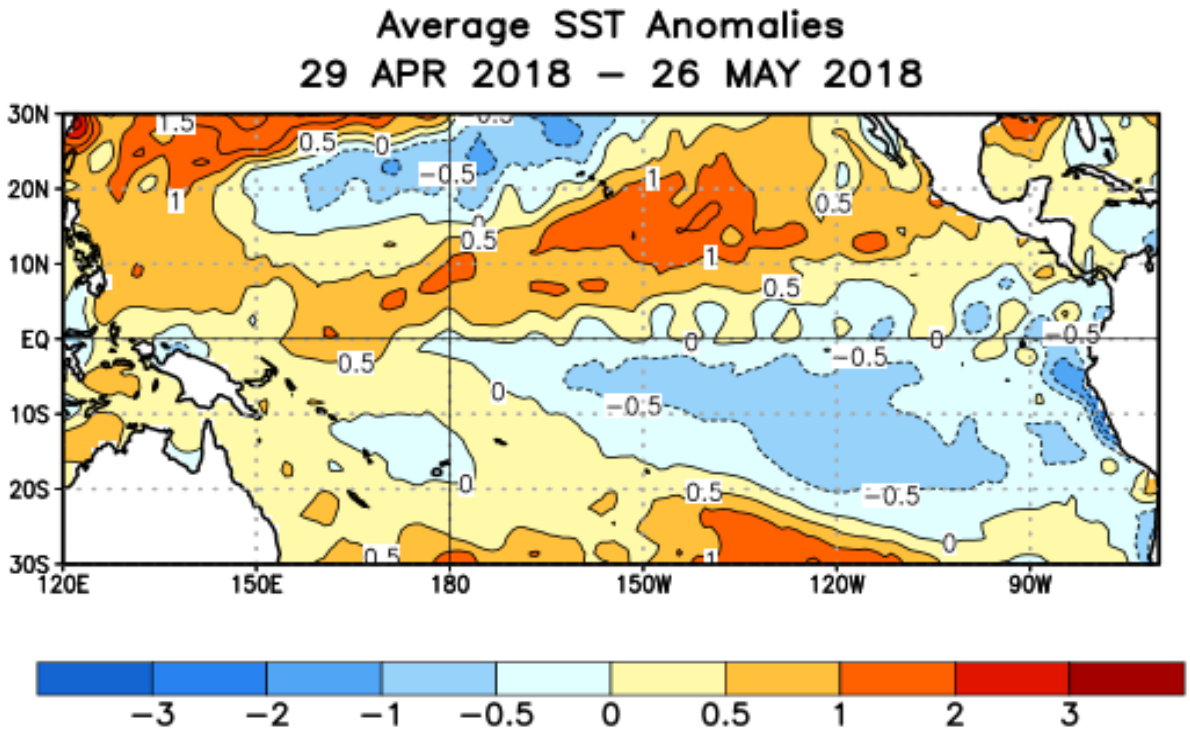


Fig 1:Observed Average sea surface temperature (SST) anomalies (°C)

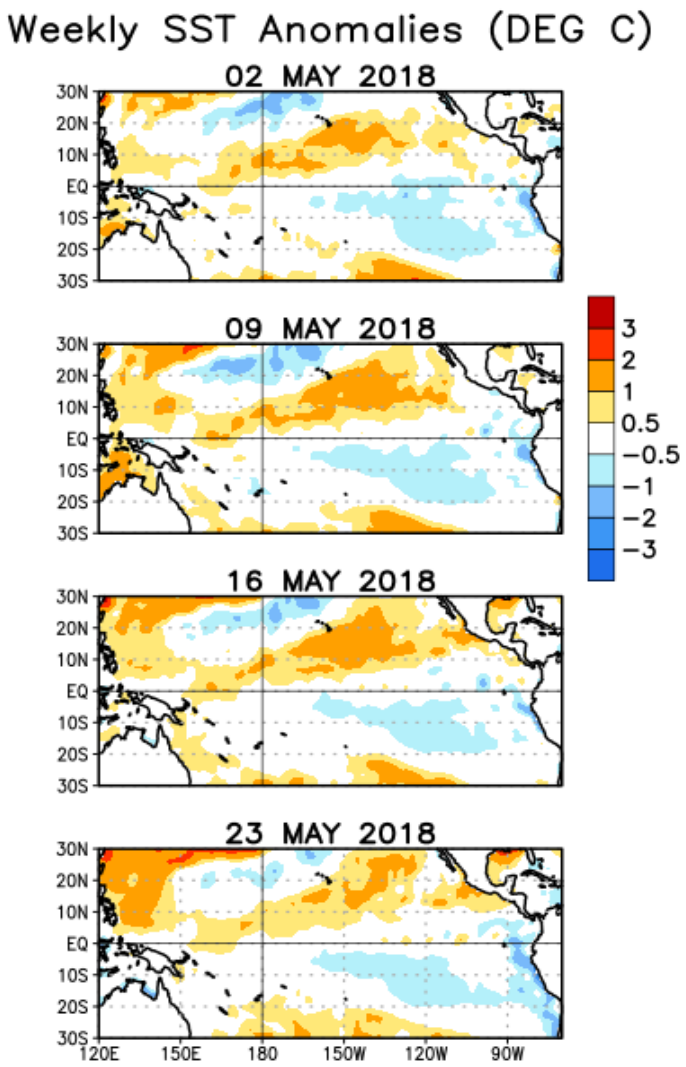
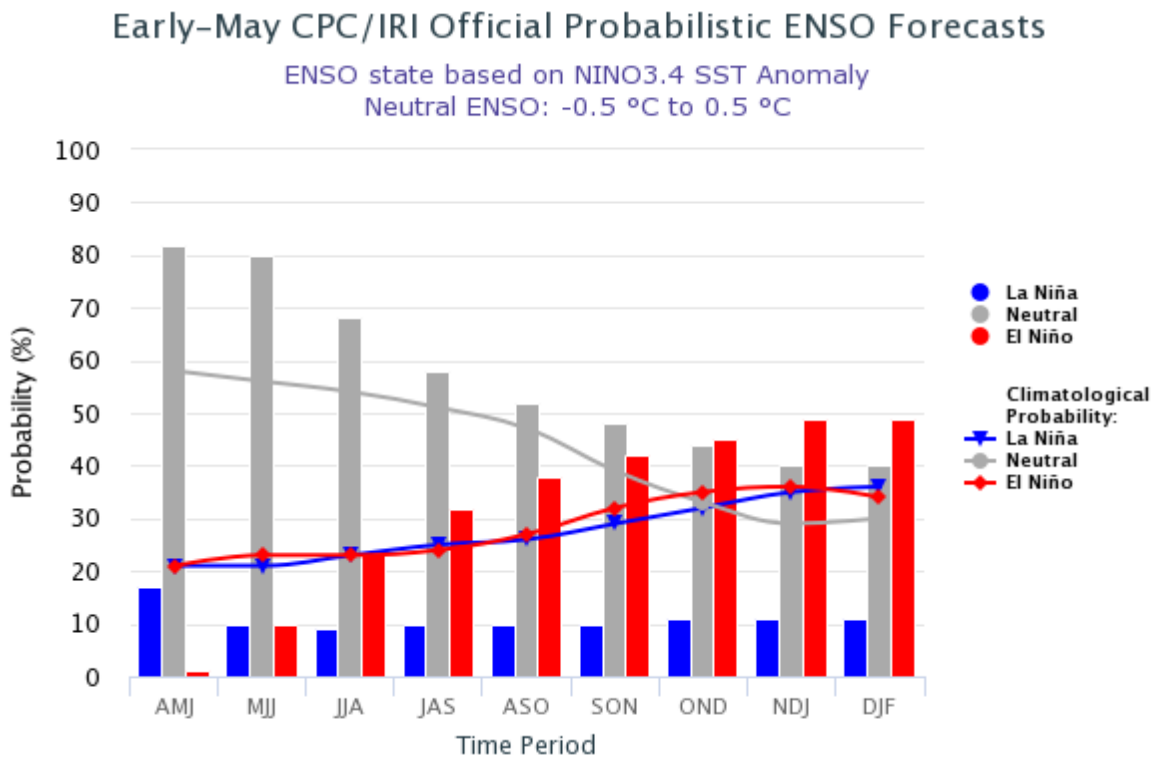


Fig 2:Weekly Observed Average sea surface temperature (SST) anomalies (°C)



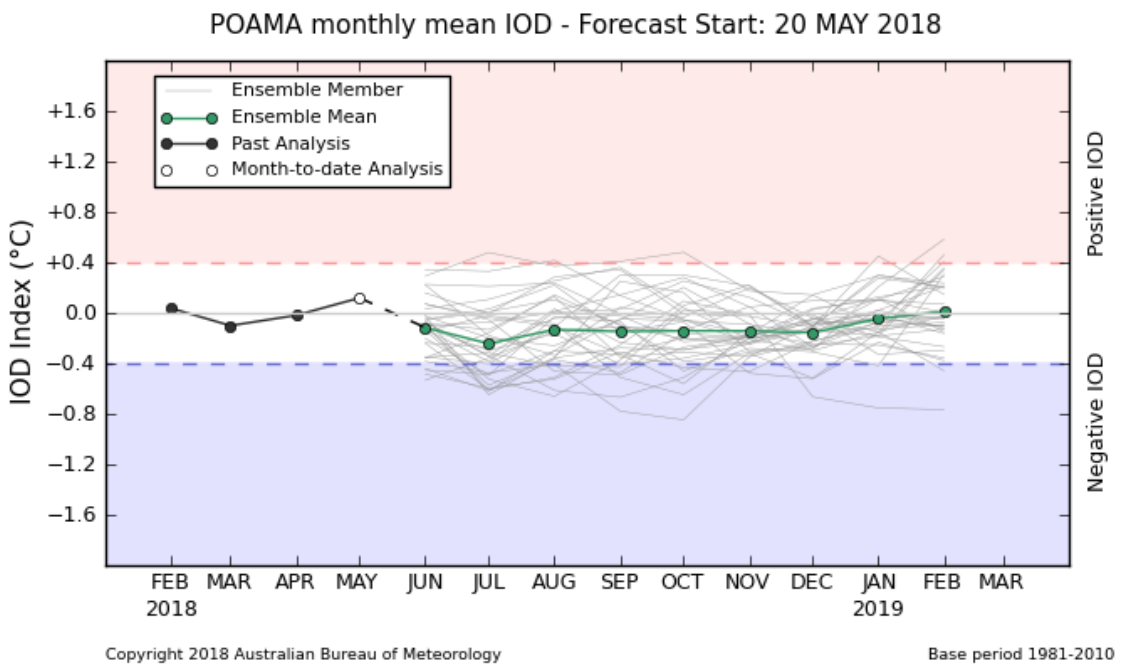


Fig 3: ENSO forecast from Climate Prediction Center (CPC)/ IRI Forecast(above) and IOD forecast from Australian Bureau of Meteorology (below).

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

(a.1) For JJA season

Figure 4 shows the probabilistic multi model ensemble forecast using dynamical models from 12 global producing centers (GPC) for JJA season. There is higher chance of receiving above normal rainfall in Northern and eastern parts during JJA season. There is no signal for remaining parts of Sri Lanka (Fig.4) indicating equal chances of receiving below normal, near normal and above normal rainfall for those parts during JJA season.

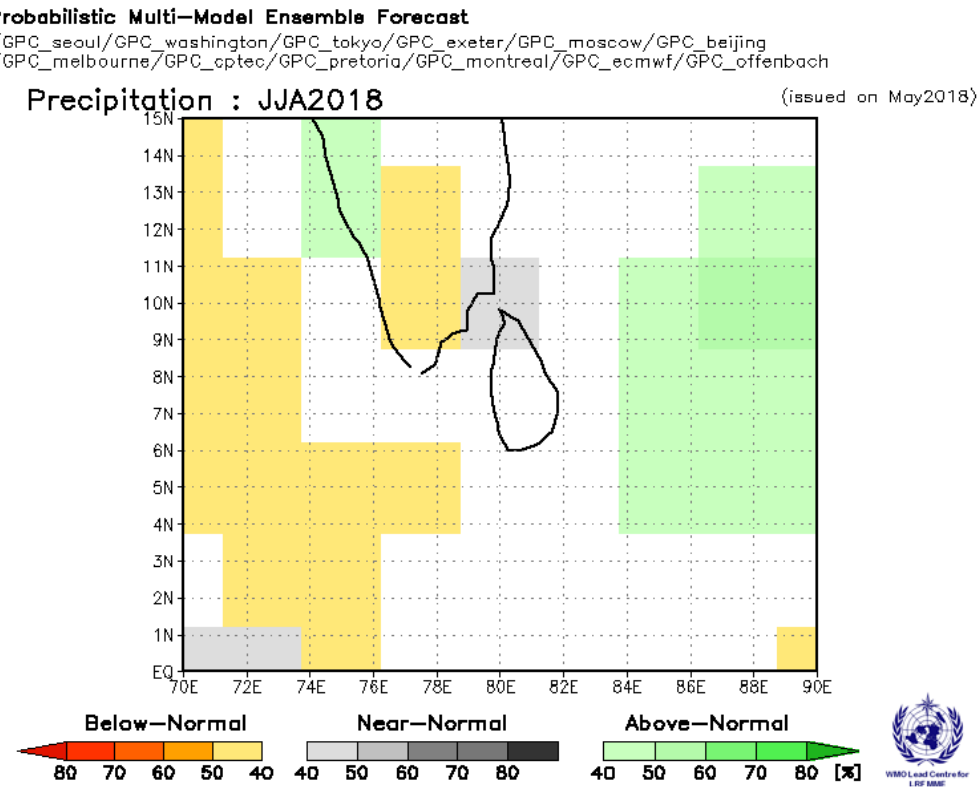


Fig 4: Probabilistic multi model ensemble forecast for JJA using dynamical models from 12 WMO global producing centers (GPC).

Out of 13 GPC individual forecasts 4 models provide below normal rainfall during JJA season (Fig 5). Only one GPC model is predicted above normal rainfall (Fig 5). There is no signal for JJA season over Sri Lanka from 8 GPC forecast outputs. Accordingly there is no signal for JJA 2018. It indicates that there are equal chances of receiving below normal, near normal and above normal rainfall for JJA 2018.

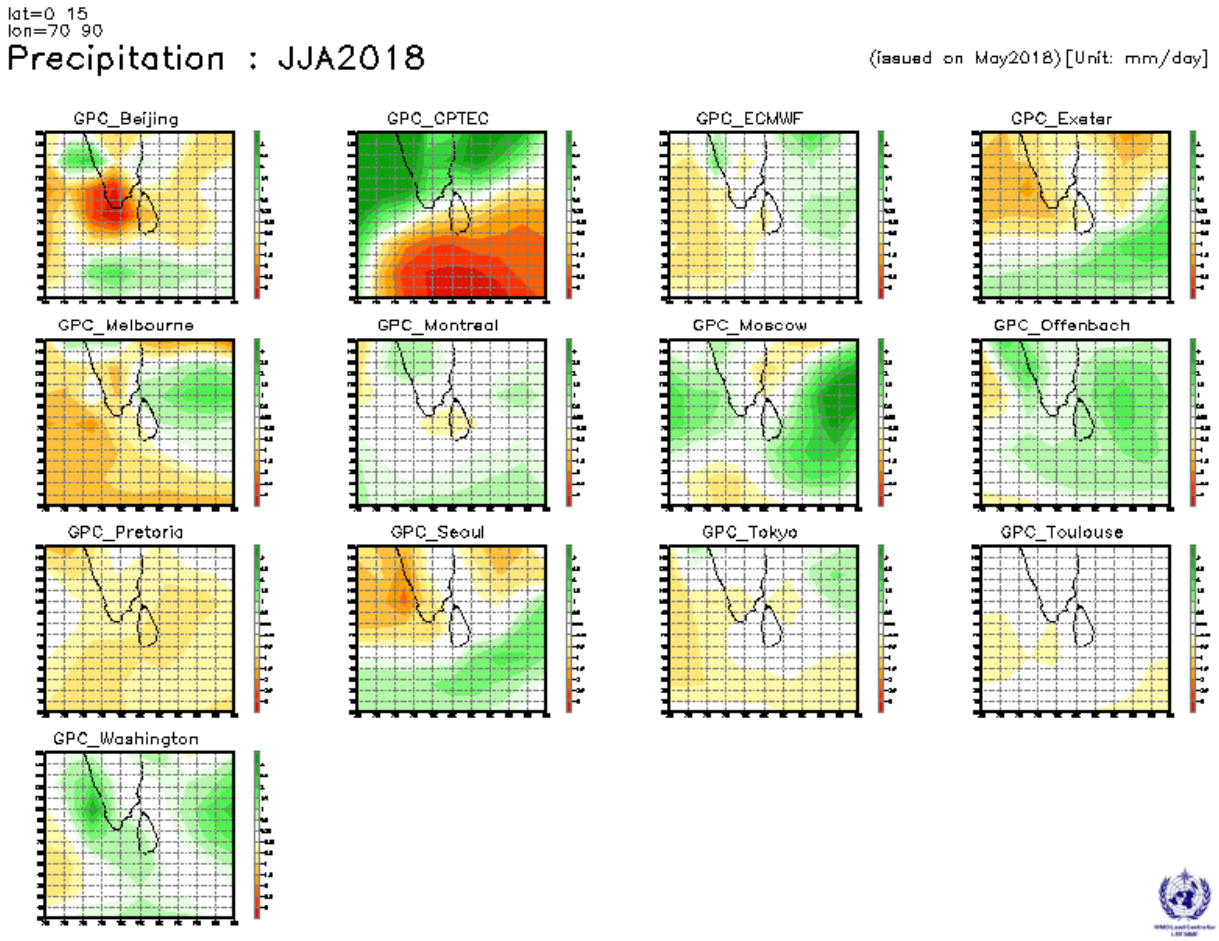


Fig 5: Individual forecast for JJA season by dynamical models from 13 WMO global producing centers (GPC).

(a.2) Forecast for June, July and August 2018

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

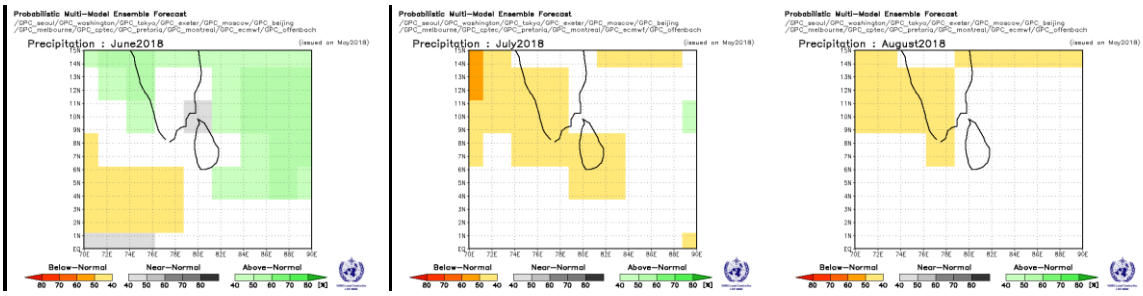


Fig 6: Probabilistic multi model ensemble forecast for June 2018 (left), July 2018 (middle) and August2018 (right) using dynamical models from 12 WMO global producing centers (GPC).

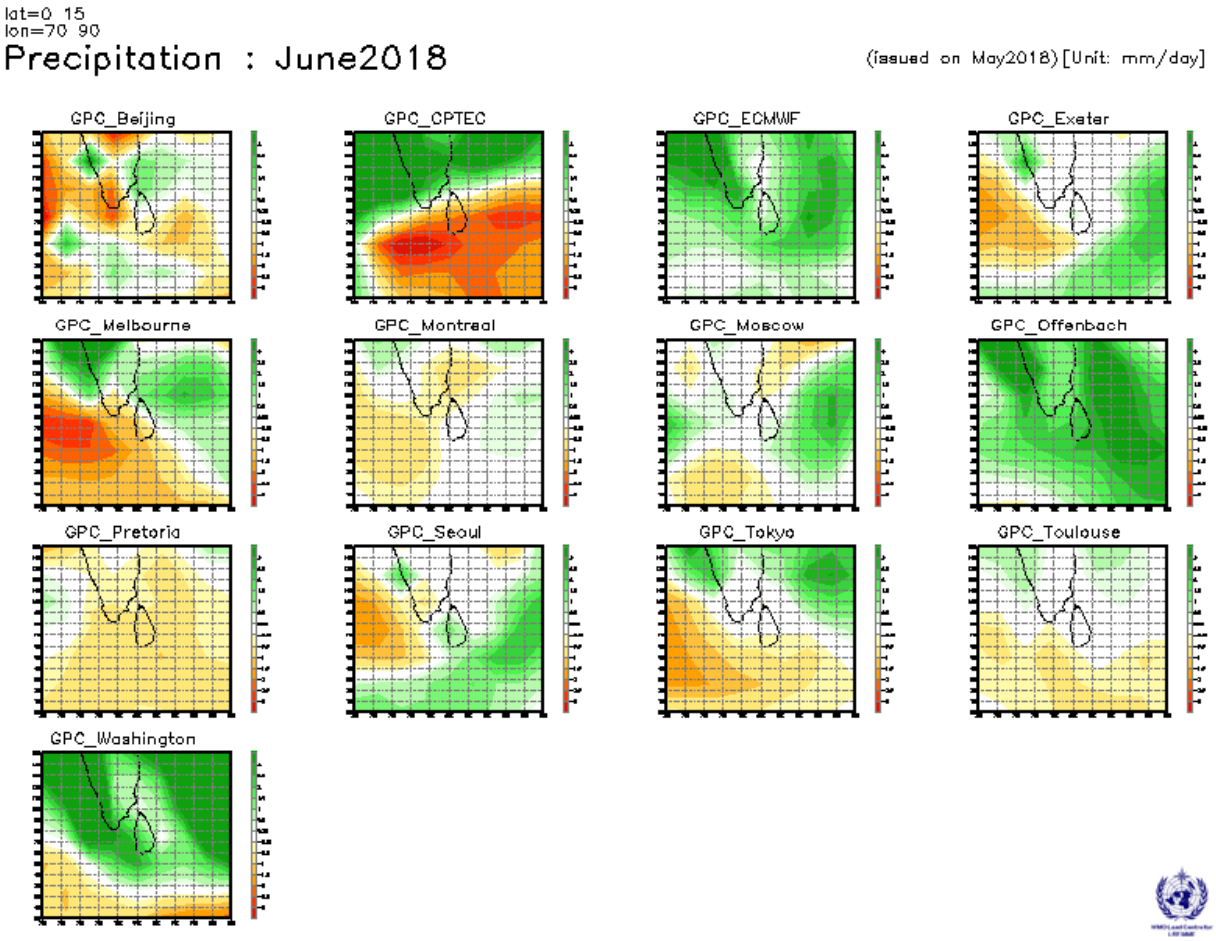


Fig 7: Individual forecast for June 2018 by dynamical models from 13 WMO global producing centers (GPC).

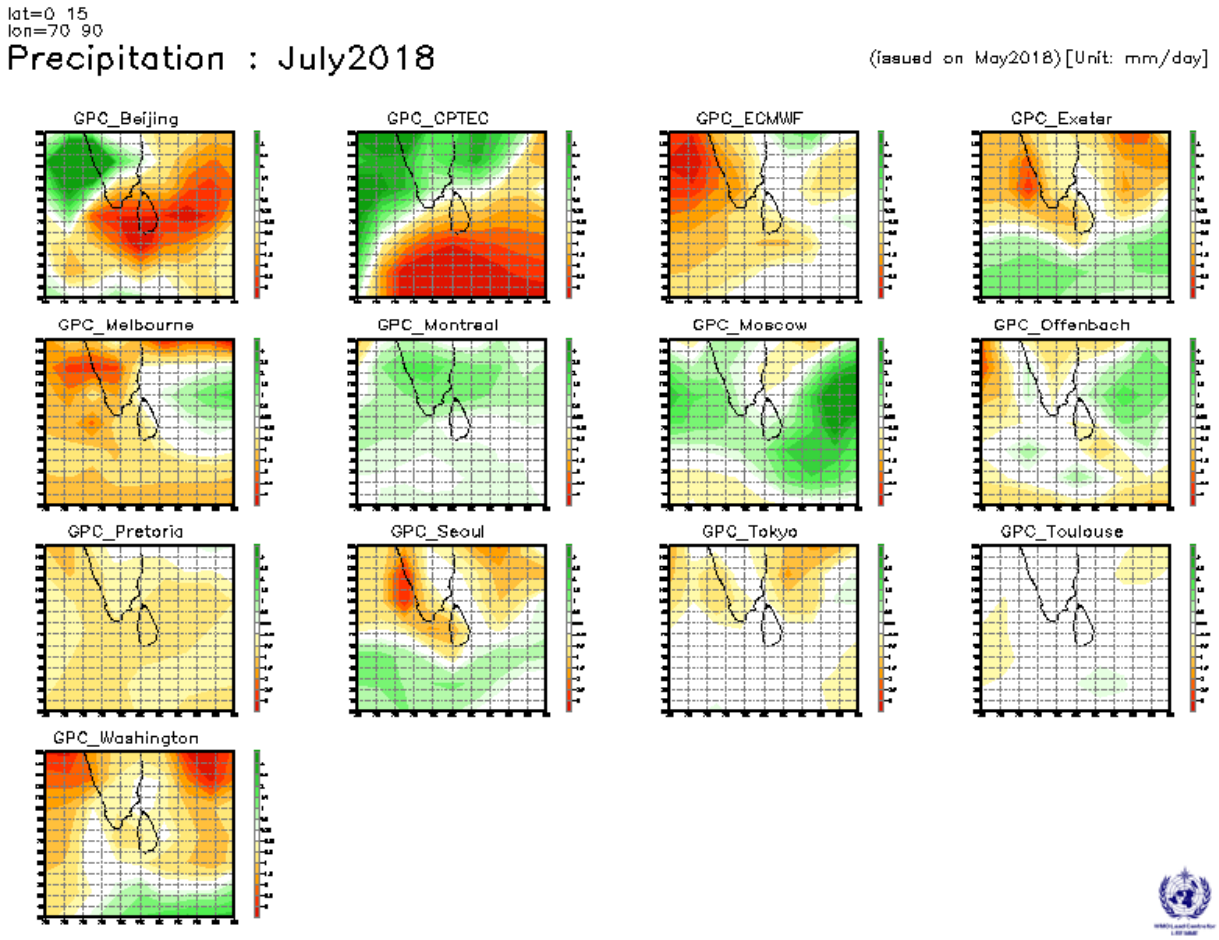


Fig 8: Individual forecast for July 2018 by dynamical models from 13 WMO global producing centers (GPC).

Figures 7, 8 and 9 show the monthly forecast from individual global producing centers (GPC) centers for June, July and August 2018 respectively.

Out of 13 GPC forecasts 3 GPC models predicted above normal rainfall and another 2 GPC models predicted below normal rainfall for June (Fig 7). There is no signal for June over Sri Lanka from 8 GPC forecast outputs (Fig 7). Accordingly there is no signal for June 2018. It indicates that there are equal chances of receiving below normal, near normal and above normal rainfall for the month of June 2018 for Sri Lanka.

Out of 13 GPC forecasts 8 GPC models are predicted below normal rainfall (Fig 8). There is no signal for July over Sri Lanka from 7 GPC forecast outputs (Fig 8). Accordingly there is higher chance of receiving below normal rainfall for July 2018.

Out of 13 GPC forecasts 2 models are predicted below normal rainfall and only one model is

predicted above normal rainfall for August 2018 (Fig 9).There is no signal for August 2018 over Sri Lanka from 10 GPC forecast outputs. Accordingly there is no signal for month of July 2018. It indicates that there are equal chances of receiving below normal, near normal and above normal rainfall for August 2018.

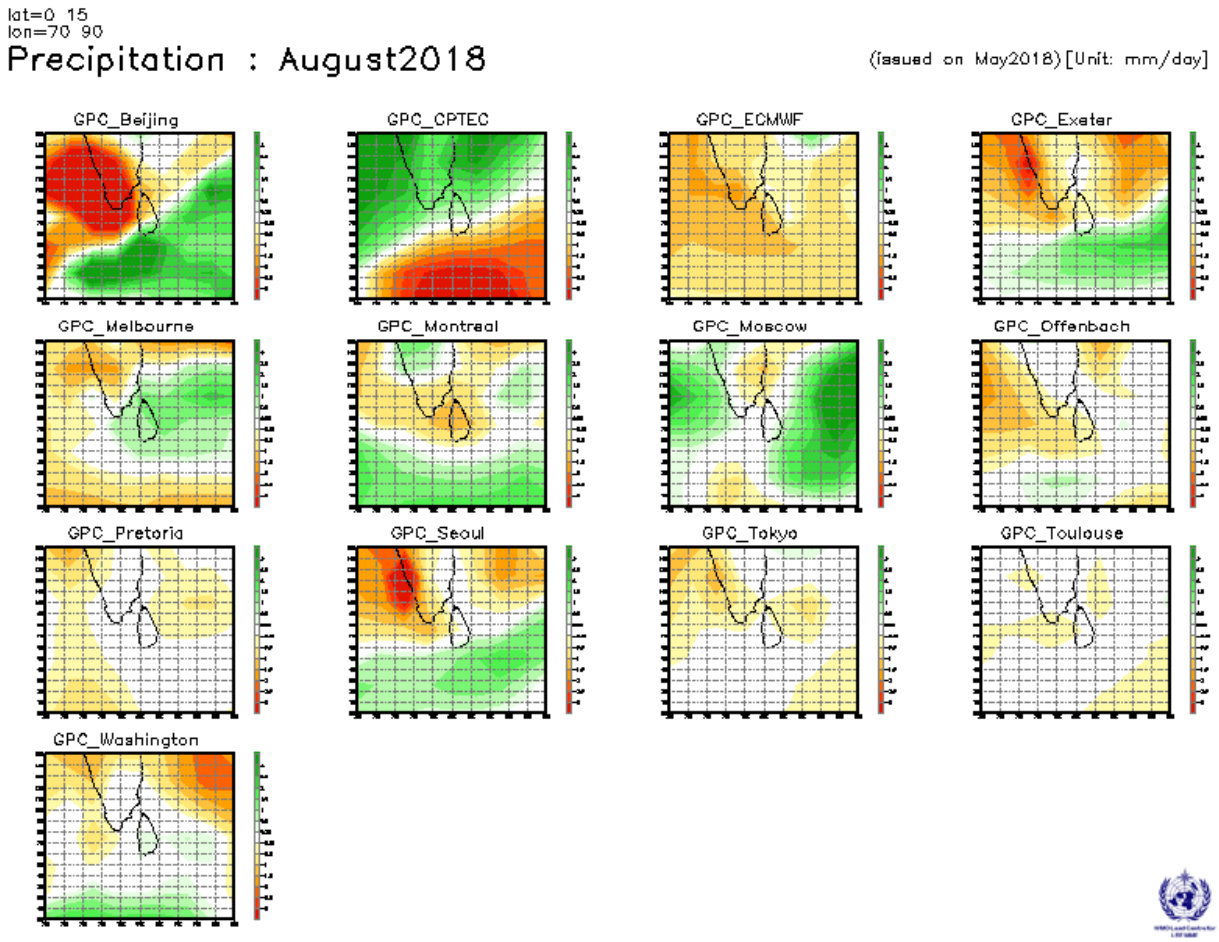


Fig 9: Individual forecast for August 2018 by dynamical models from 13 WMO global producing centers (GPC).

Statistical downscaling of CFSv2 global forecast output

(b.1) Probabilistic Forecast for JJA season2018 using Climate Predictability tool (CPT)

The probabilistic rainfall forecast for JJA 2018 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 table1. There is no signal for all districts. It indicates that there are equal chances of receiving below normal, near normal and above normal rainfall for all districts for JJA season2018.

Table 1 :Probabilistic Rainfall Forecast for JJA season2018 using CPT

District	**Average rainfall (mm) –JJA**		**Probability %**	
		Below	Normal	Above
Colombo	590.1	35	35	30
Kalutara	861.5	35	30	35
Galle	771.0	35	35	30
Matara	604.3	35	35	30
Hambantota	146.9	30	35	35
Ampara	131.5	35	30	35
Batticaloa	141.2	35	30	35
Trincomalee	168.8	35	35	30
Mullaithivu	99.5	35	35	30
Jaffna	71.6	35	30	35
Killinochchi	57.1	35	30	35
Mannar	40.3	35	30	35
Puttalam	98.4	35	35	30
Gampaha	478.5	35	35	30
Kegalle	934.8	35	30	35
Ratnapura	675.1	35	30	35
Monaragala	125.9	30	35	35
Badulla	183.7	30	35	35
Pollonnaruwa	128.9	30	35	35
Vavuniya	109.8	30	35	35
Anuradapura	89.7	30	35	35
Kurunegala	212.4	35	35	30
Matale	163.5	30	35	35
Kandy	497.6	35	35	30
Nuwaraeliya	767.1	35	35	30

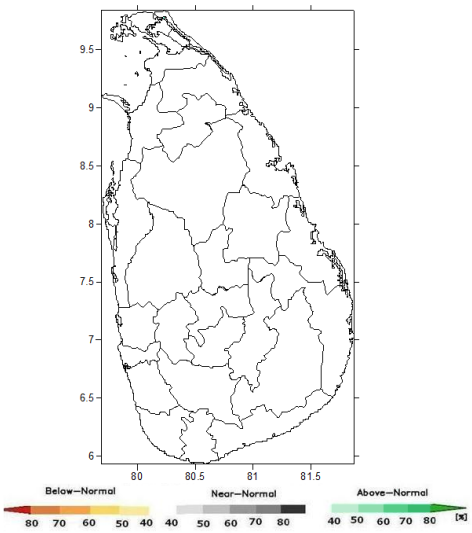


Fig 10. Probabilistic rainfall forecast for June-August 2018 using CPT

Summary : Consensus Seasonal Rainfall outlook for June, July, August (JJA) Season 2018

Table 2: SUMMARY of MODEL FORECAST for JJA season for SRI LANKA

SUMMARY of MODEL FORECAST for JJA season for SRI LANKA				
Season	WMO LC MME	WMO GPC	CPT	Final
JJA season 2018	N Northern and No signal elsewhere	No signal	No signal	No signal
June2018	N Northern and No signal elsewhere	No signal	BN Eastern Coast NN central parts No signal elsewhere	BN Eastern Coast NN central parts No signal elsewhere
July2018	BN	BN		BN
August2018	No signal	No signal		No signal

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

Summary of Model Forecasts for Sri Lanka

ENSO-neutral and IOD-neutral conditions are favored through June to August 2018. According model predictions there is no signal for JJA season. WMO multi model ensemble prediction indicated that there is no signal for most of the districts except for districts located in Northern parts where near normal rainfall is likely during JJA season. Climate predictability tool provides no signal for JJA season.

Considering the prevailing global climate conditions, forecasts from different global climate models and statistical downscaling of GCM output using CPT, climatological probability can be expected during JJA season 2018.

Probabilistic Temperature Forecast for June –August (JJA) 2018

The probabilistic Temperature forecast for June, July and August season (JJA) 2018 for Sri Lanka as given below.

The district wise average Maximum Temperature and Minimum Temperatures are given in the column 2 of the table 3 and 4 respectively. Chance (probability) of receiving below/about/above average is given in the columns 3, 4, and 5 respectively in the table 3 and table 4 respectively.

There is a higher chance of receiving slightly below average Maximum Temperatures in Anuradhapura, Kurunegala, Puttalam, Gampaha, Colombo, Galle, Ratnapura, Hambantota, Trincomalee, Batticoloa, Kandy and Badulla Districts and slightly above average Maximum Temperatures in Mannar, Vavunia, Nuwara Eliya and Ampara Districts (Fig 12) for JJA season 2018.

There is a higher chance of receiving slightly below average Minimum Temperatures in Anuradhapura, Kurunegala, Puttalam, Kandy, Nuwara Eliya, Badulla, Batticaloa, Ampara, Gampaha, Colombo, Galle and Hambantota districts and slightly above average Minimum Temperatures in Mannar, Vavunia, Trincomalee and Rathnapura districts (Fig 13) for JJA season 2018.

The probabilistic forecast for Maximum Temperature and Minimum Temperatures for JJA season 2018 for Sri Lanka is given below.

Table 3: probabilistic forecast for Maximum Temperature for JJA season 2018

District	**Average Maximum Temperature (^{0}C) – (JJA)**		**Probability %**	
		Below	Normal	Above
Anuradhapura	33.0	45	20	35
Badulla	30.6	55	20	25
Batticaloa	33.5	55	20	25
Colombo	30.1	50	20	30
Galle	28.7	50	20	30
Hambantota	30.3	55	20	25
Katugastota	28.0	50	20	30
Katunayake	30.5	45	20	35
Mannar	30.8	30	20	50
MahaIlluppallama	32.8	45	20	35
NuwaraEliya	18.7	35	20	45
Pottuvil	31.4	30	20	50
Puttalam	31.5	45	20	35
Ratnapura	30.8	50	20	30
Ratmalana	30.3	50	20	30
Trincomalee	34.5	55	20	25
Vavuniya	33.9	30	20	50
Kurunegala	30.9	45	20	35
Bandarawela	25.8	45	20	35

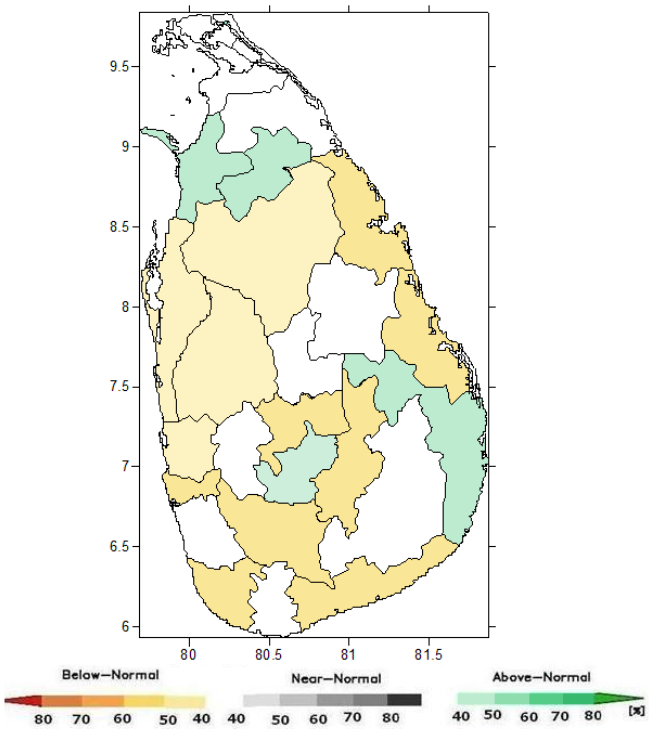


Fig 12: Probabilistic forecast for Maximum Temperatures for JJA season 2018

Table 4: Probabilistic forecast for Minimum Temperatures for JJA season 2018

District	**Average Minimum Temperature (^{0}C) – (JJA)**		**Probability %**	
		Below	Normal	Above
Anuradhapura	24.6	50	20	30
Badulla	18.6	45	20	35
Batticaloa	25.3	45	20	35
Colombo	25.3	55	20	25
Galle	24.9	50	20	30
Hambantota	24.8	50	20	30
Katugastota	21.1	50	20	30
Katunayake	24.9	55	20	25
Mannar	26.7	35	20	45
MahaIlluppallama	24.4	45	20	35
NuwaraEliya	12.9	55	20	25
Pottuvil	23.0	45	20	35
Puttalam	25.8	55	20	25
Ratnapura	23.5	30	20	50
Ratmalana	25.0	55	20	25
Trincomalee	25.9	35	20	45
Vavuniya	24.4	35	20	45
Kurunegala	23.8	55	20	25
Bandarawela	16.7	45	20	35

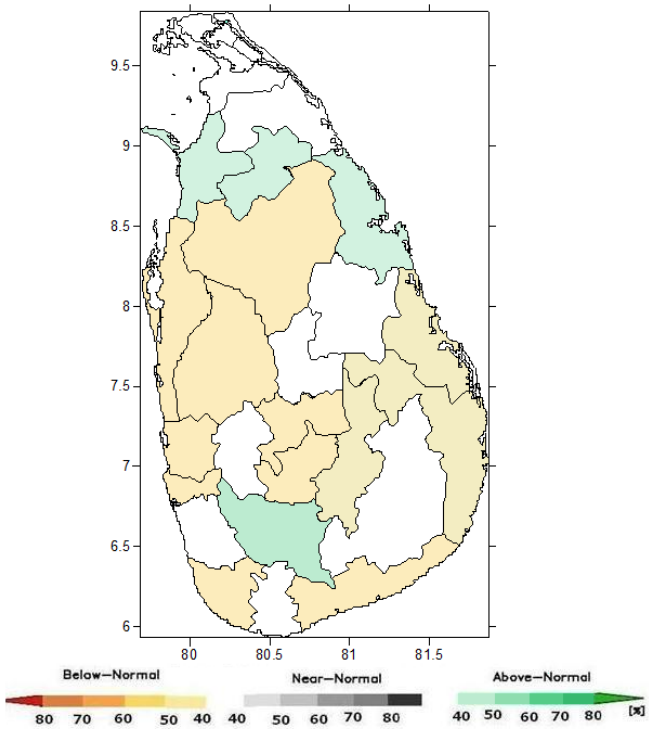


Fig 13:Probabilistic forecast for Minimum Temperatures for JJA season 2018