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வளிமண்டலவியல் திணைக்களம்
DEPARTMENT OF METEOROLOGY
ශ්‍රී ලංකාව இலங்கை SRI LANKA

Consensus Seasonal Weather Outlook

April, May and June(AMJ)

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) Prevailingglobal climate conditions

During March 2018, La Niña weakened, but was still reflected by below-average sea surface temperatures (SSTs) in the east-central equatorial Pacific Ocean (Fig. 1). The latest weekly index values were -0.8C and -0.6C in the Niño-3.4 and Niño-3 regions, respectively, and were near zero in the surrounding Niño.4 and Niño1+2 regions (Fig. 2). The atmospheric anomalies typical of La Niña weakened considerably across the tropical Pacific.

Most models predict La Niña will decay and return to ENSO-neutral during the Northern Hemisphere spring 2018 (Fig. 3). The forecast consensus similarly favors a transition during the spring, with a continuation of ENSO-neutral conditions through the summer. In summary, a transition from La Niña to ENSO-neutral is most likely (~55% chance) during the March-May season, with neutral conditions likely to continue into the second half of the year (Climate Prediction Center, USA). Most of the models predicted Neutral IOD condition in April and May and Negative IOD condition in June (Fig 3 lower).

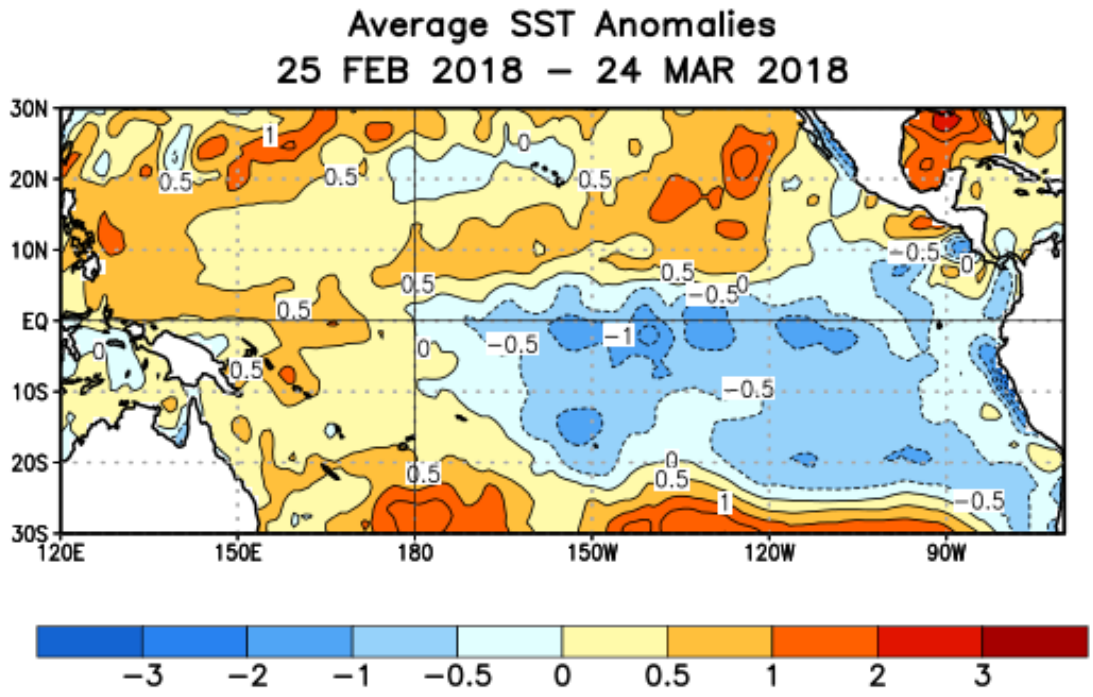


Fig 1:ObservedAveragesea surface temperature (SST) anomalies (°C)

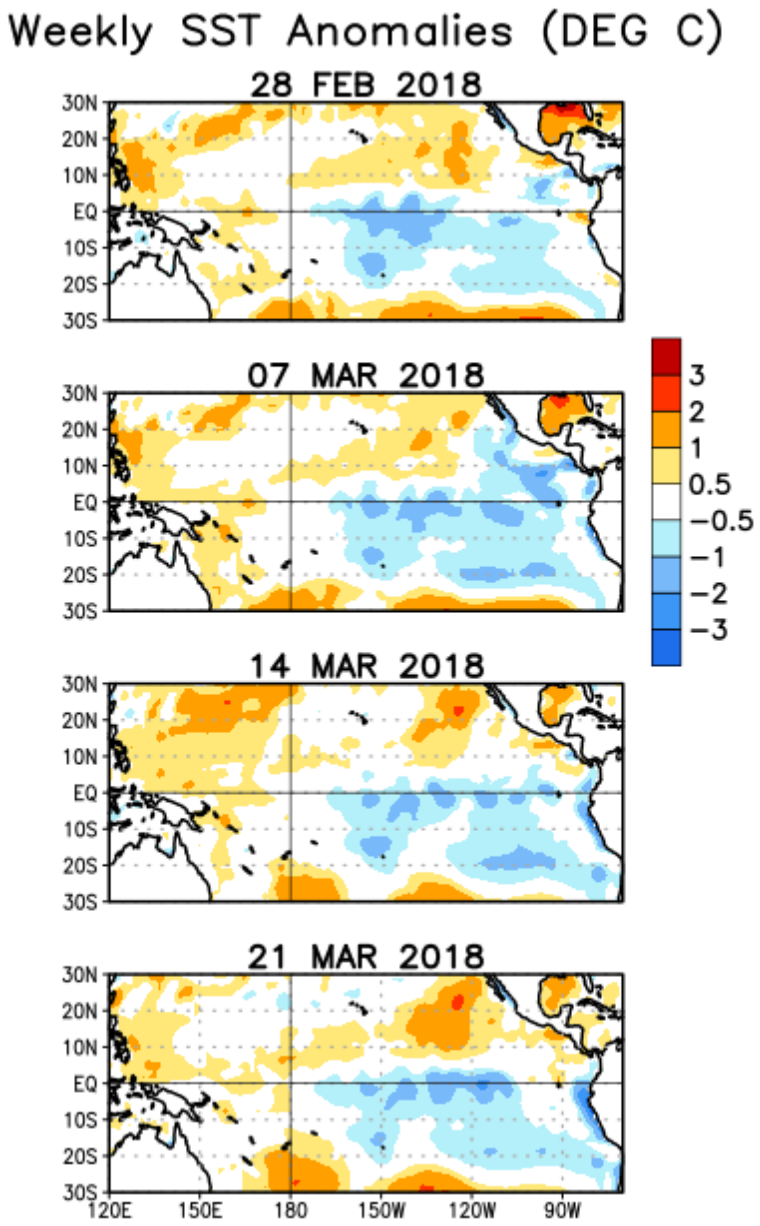
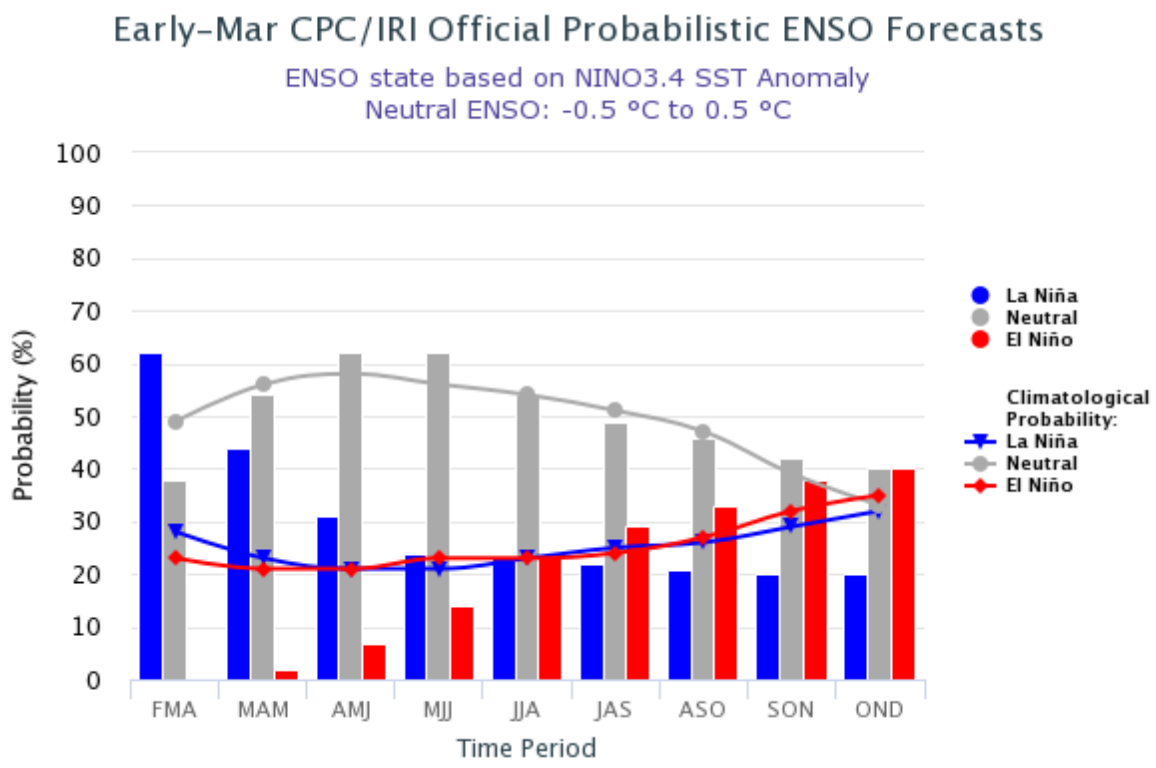


Fig 2:WeeklyObservedAveragesea surface temperature (SST) anomalies (°C)



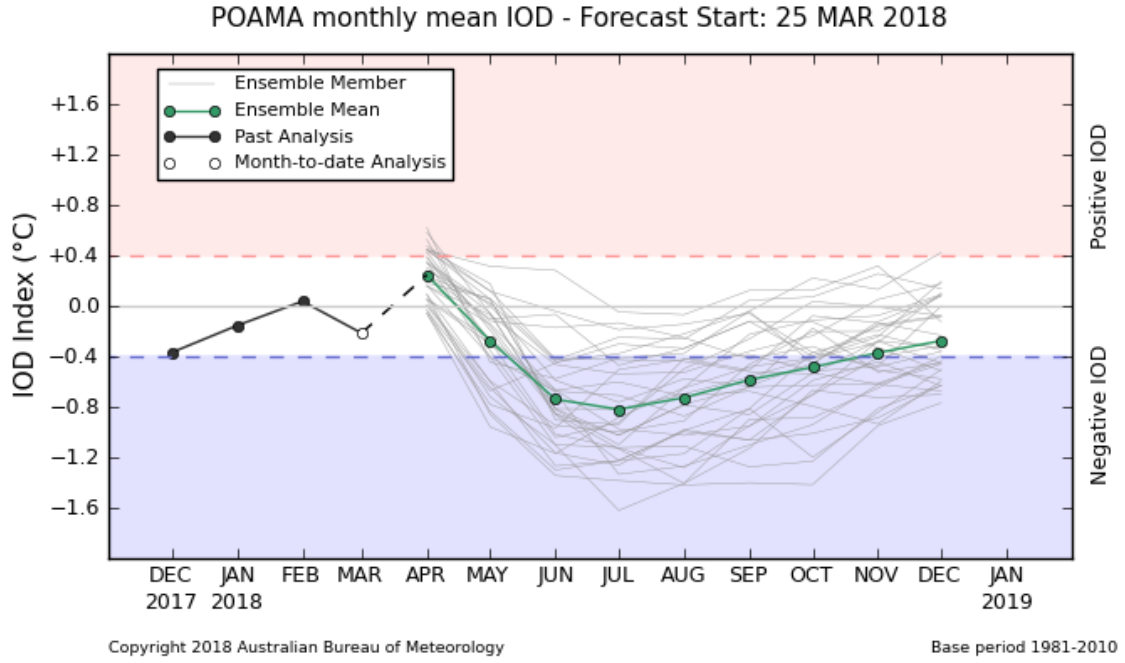


Fig 3: ENSO forecast from Climate Prediction Center (CPC)/ IRI Forecast(above) andIOD forecast from Australian Bureau of Meteorology (below).

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

(a.1) For AMJ season

Figure 4 shows the probabilistic multi model ensemble forecast using dynamical models from 12 global producing centers (GPC) for AMJ season. There is no signal for AMJ season over Sri Lanka(Fig.4).Out of 11 GPC individual forecasts 4 modelspredictedabovenormal rainfall for AMJ season(Fig 5). Only 2 GPC models predicted below normal rainfall (Fig 5). There is no signal for AMJ season over Sri Lanka from 5 GPC forecast outputs. Accordingly There is no signal for AMJ season over Sri Lanka.It indicates that there are equal chances of receiving below normal, near normal and above normal rainfall for April 2018.

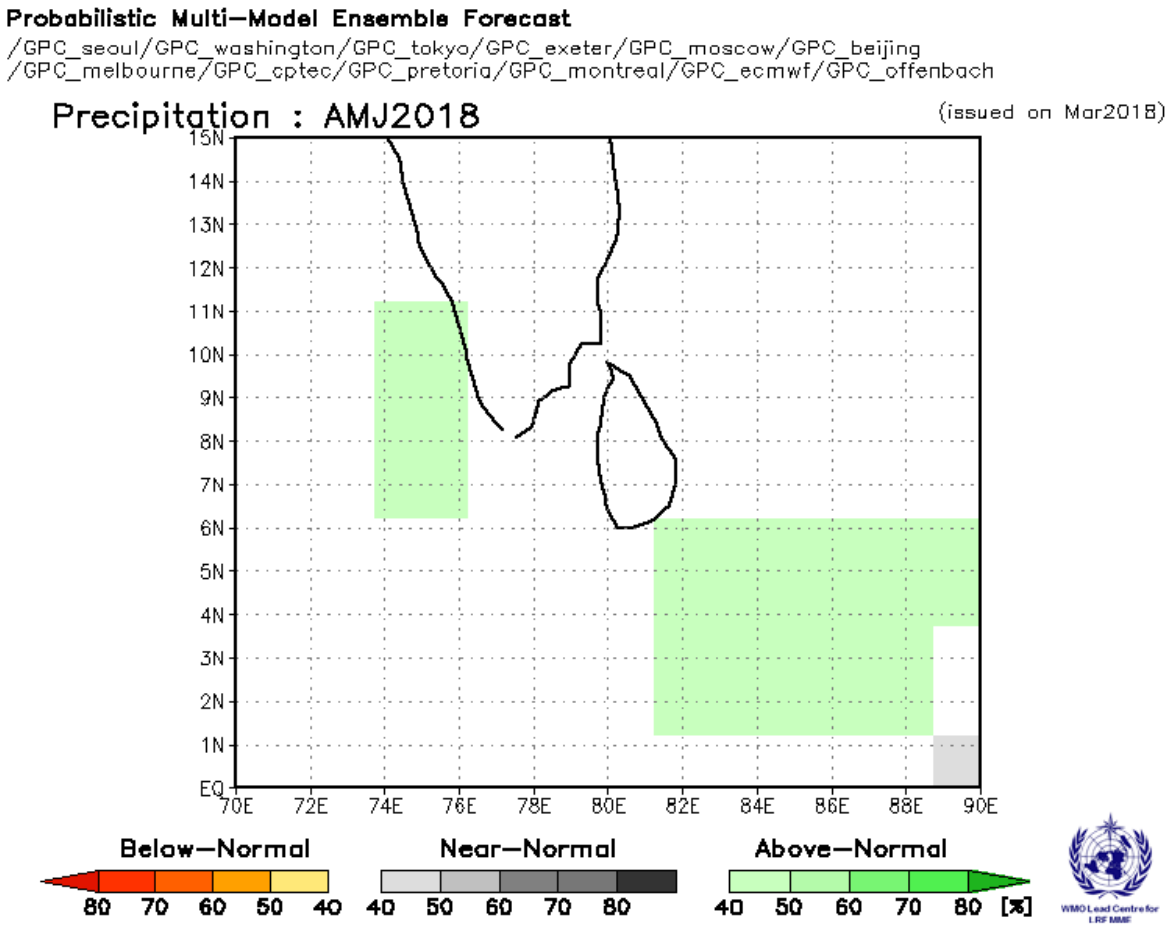


Fig 4: Probabilistic multi model ensemble forecast for AMJ using dynamical models from 12 WMO global producing centers (GPC).

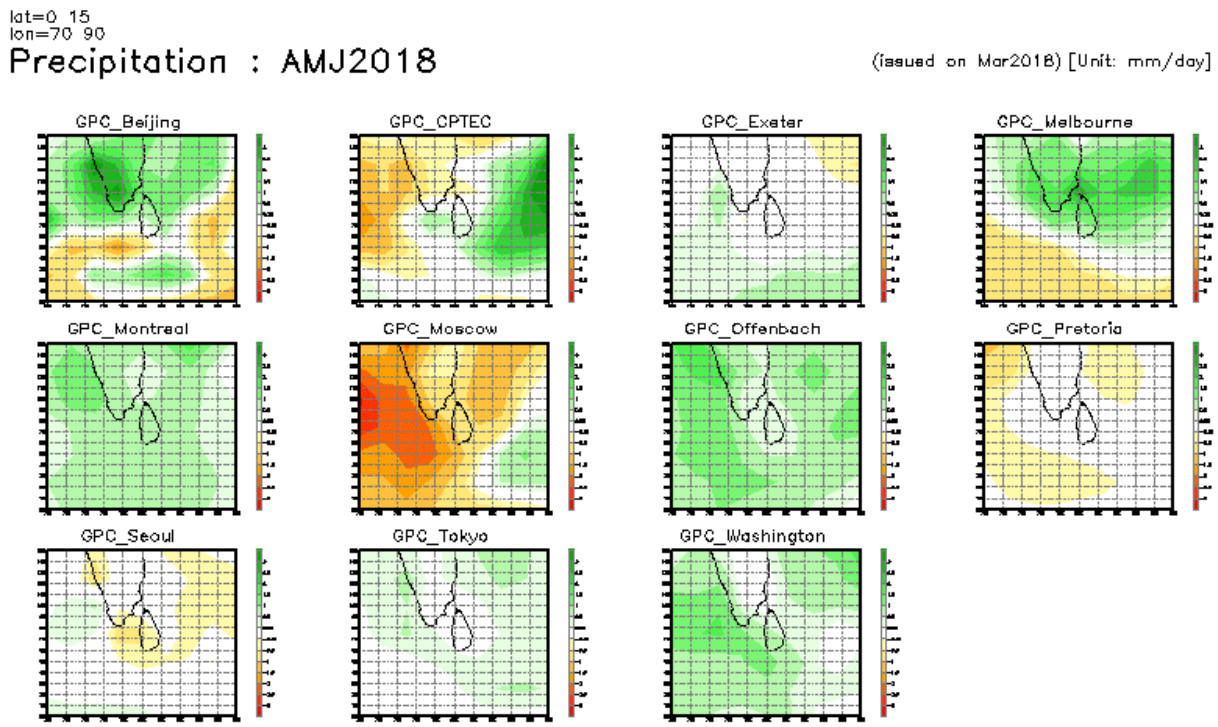


Fig 5: Individual forecast for AMJ season by dynamical models from 11 WMO global producing centers (GPC).

(a.2) Forecast for April, May and June2018

Figure 6 shows the probabilistic multi model ensemble forecast using dynamical models from 12 global producing centers (GPC) for, April,Mayand June2018. There is no signal for month of April, May and June 2018 (Fig 6). It indicates that there are equal chances of receiving below normal, near normal and above normal rainfall for April, May and June2018. (Fig 6).

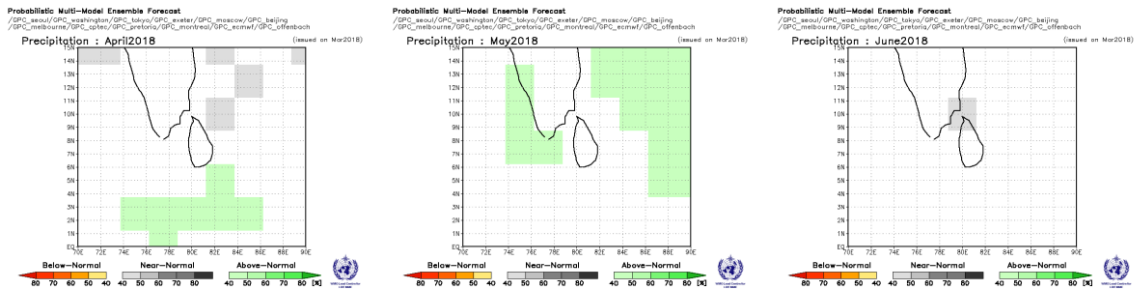


Fig 6:Probabilistic multi model ensemble forecast for April 2018 (left), May 2018 (middle) and June2018 (right) using dynamical models from 12 WMO global producing centers (GPC).

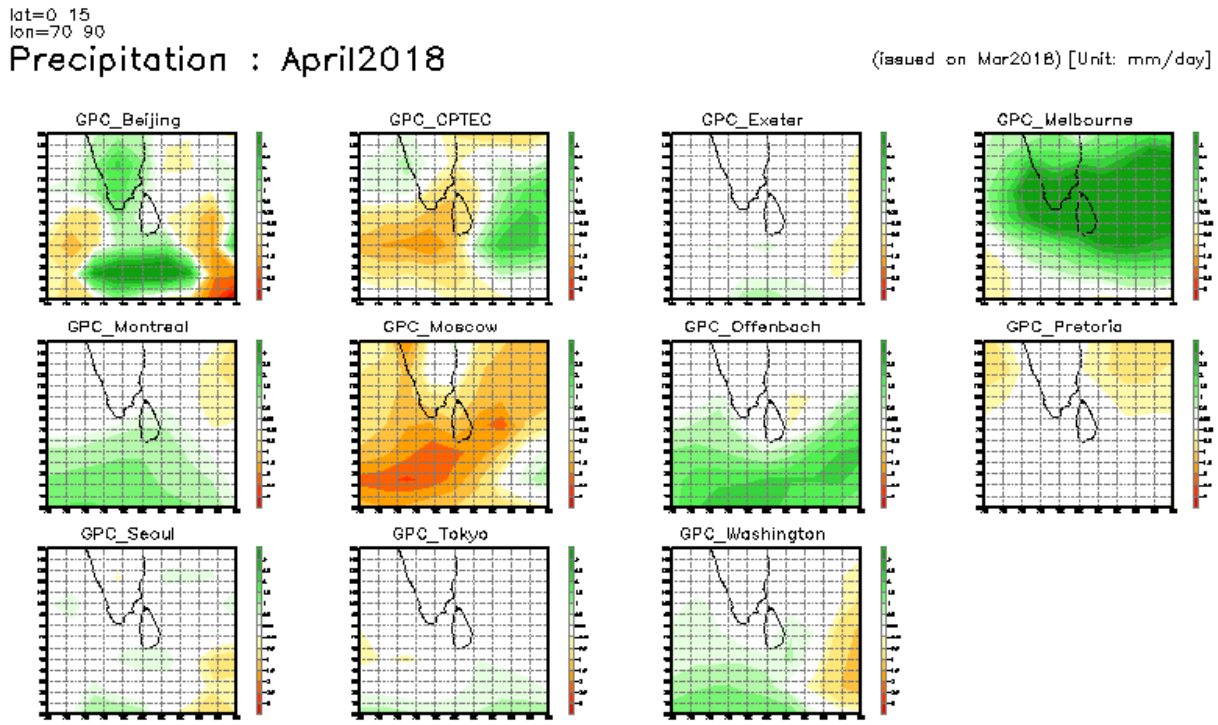


Fig 7: Individual forecast for April 2018 by dynamical models from 11 WMO global producing centers (GPC).

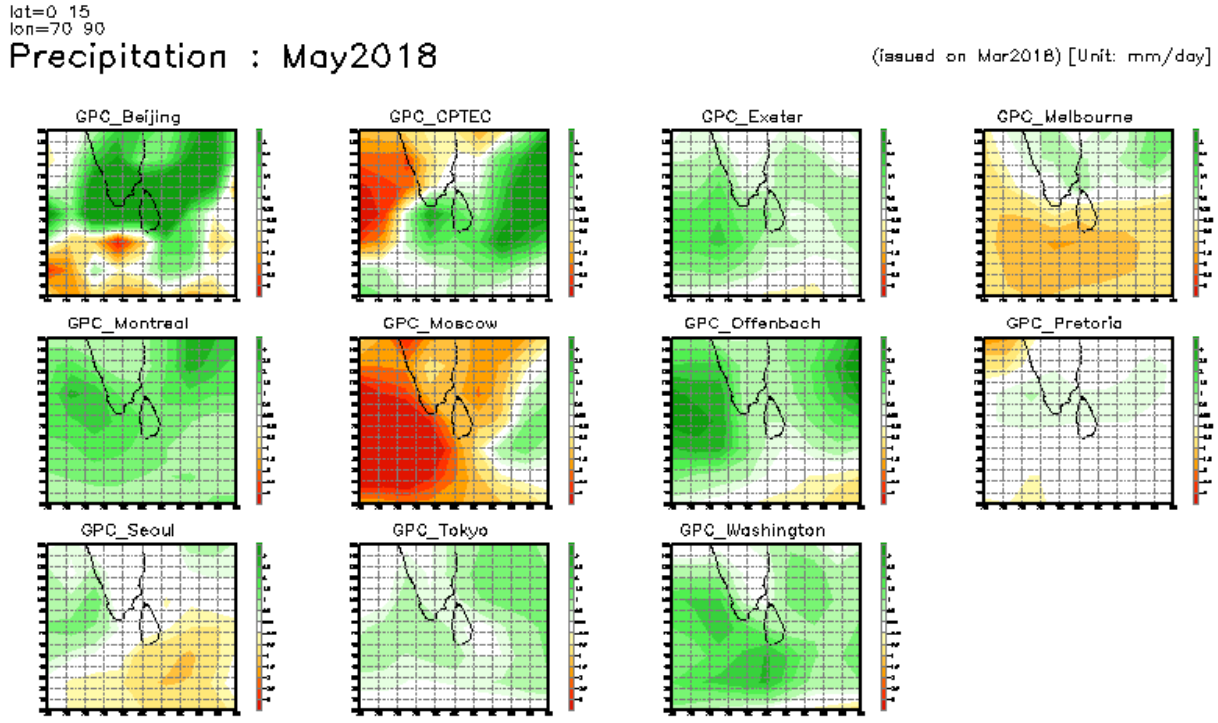


Fig 8: Individual forecast for May2018 by dynamical models from 11 WMO global producing centers (GPC).

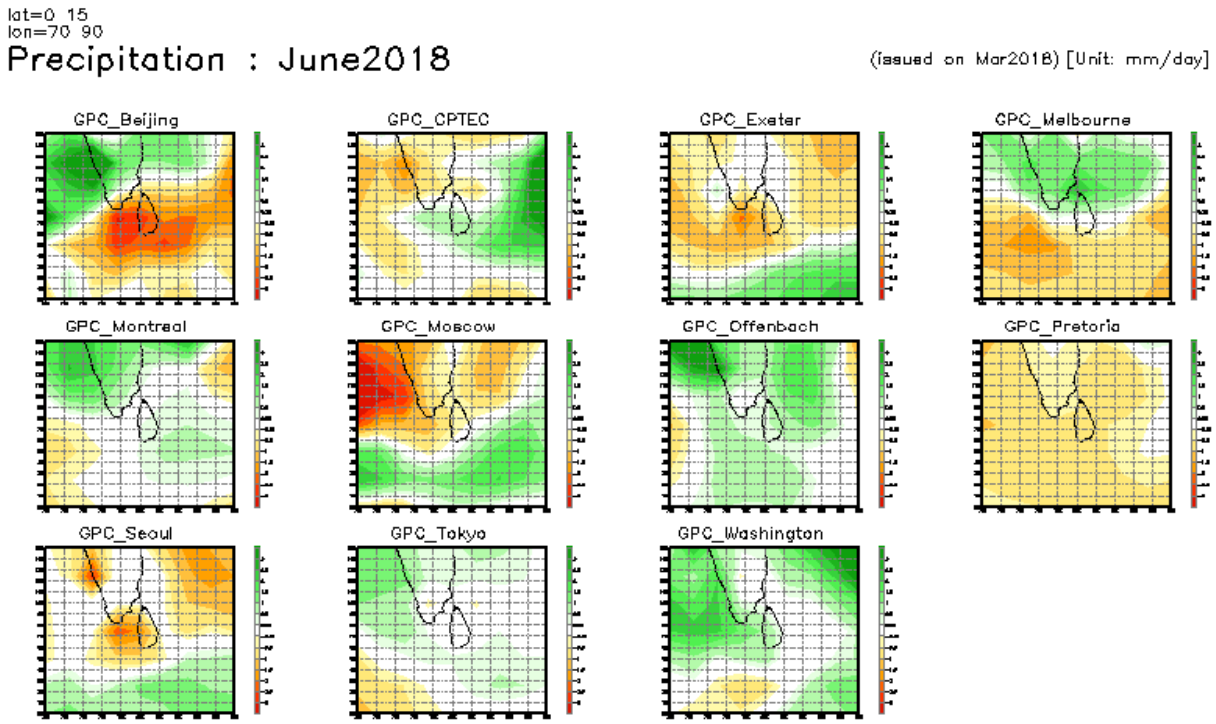


Fig 9: Individual forecast for June2018 by dynamical models from 11 WMO globalproducing centers (GPC).

Figures 7, 8 and 9 show the monthly forecast from individual global producing centers (GPC) centers for April 2017, MayandJune2018 respectively.

Out of 11 GPC forecasts 2GPCmodels predictedabove normal rainfall for April(Fig 7). Another 2GPCmodels predicted below normal rainfall for April(Fig 7). There is no signal for April over Sri Lanka from 7 GPC forecast outputs(Fig 7). Accordingly there is no signal for month of April. It indicates that there are equal chances of receiving below normal, near normal and above normal rainfall for April2018.

Out of 11 GPC forecasts 6 GPC models provide above normal rainfall for May. 2 GPC modelsare predicted below normal rainfall for May (Fig 8). There is no signal for May over Sri Lanka from 3 GPC forecast outputs(Fig 8).Accordingly there is a higher chance of receiving above normal rainfall for month of May2018 for Sri Lanka.

Out of 11 GPC models,2GPCmodels predictedabovenormal and 5 GPC models predicted below normal rainfall forJune2018 (Fig 9).There is no signal for June2018 over Sri Lanka from 4 GPC forecast outputs. Accordingly there is a higher chance of receiving below normal rainfall for month of June2018.

Statistical downscaling of CFSv2 global forecast output

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

The probabilistic rainfall forecast for AMJ 2018for 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 located along the western coastal belt including Kurunegala and Kegalle districts have more chance (higher probability) of receiving slightly below average rainfall during AMJ season 2018. HambantotaMonaragala and BadullaDistricts have more chance (higher probability) of receiving slightly above average rainfall during AMJ season 2018.

Table 1 :**Probabilistic Forecast for AMJ season2018 using CPT**

District	**Average rainfall (mm) –AMJ**		**Probability %**	
		Below	Normal	Above
Colombo	942.5	60	20	20
Kalutara	1233.9	60	20	20
Galle	1019.5	60	20	20
Matara	763.9	40	30	30
Hambantota	245.9	20	30	50
Ampara	167.8	35	30	35
Batticaloa	144.0	30	30	40
Trincomalee	144.8	30	30	40
Mullaithivu	150.7	30	30	40
Jaffna	98.5	40	30	30
Killinochchi	121.8	40	30	30
Mannar	166.2	40	30	30
Puttalam	314.1	50	30	20
Gampaha	804.8	50	30	20
Kegalle	1142.6	50	30	20
Ratnapura	939.2	40	30	30
Monaragala	281.8	20	30	50
Badulla	360.7	20	30	50
Pollonnaruwa	197.8	35	30	35
Vavuniya	187.9	30	35	35
Anuradapura	213.8	35	30	35
Kurunegala	434.2	50	30	20
Matale	314.0	35	30	35
Kandy	561.1	35	30	35
Nuwaraeliya	776.2	30	35	35

Table 1

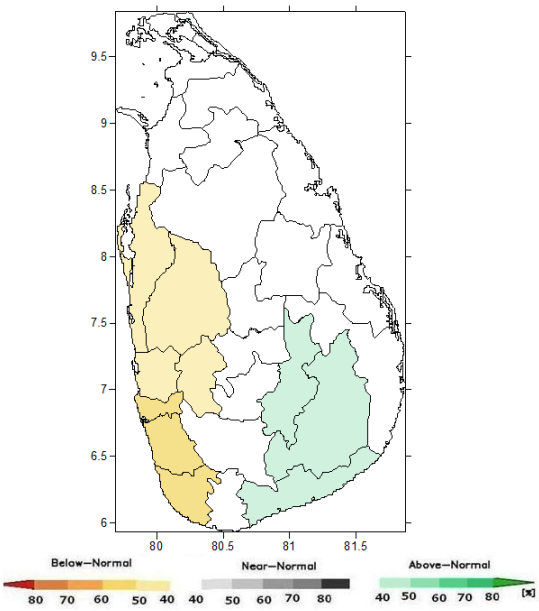


Fig 10. Probabilistic rainfall forecast for April-June2018 using CPT

Summary :Consensus Seasonal Rainfall outlook for April, May, June (AMJ) Season 2018

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

SUMMARY of MODEL FORECASTforAMJseason for SRI LANKA				
Season	WMO LC MME	WMO GPC	CPT	Final
AMJ season 2018	No signal	No signal	BN districts located along the western coastal belt AN in Hambantota, Monaragala and Badulla	Near Normal
April2018	No signal	No signal	AN	NN
May2018	No signal	AN		AN
June2018	No signal	BN		BN

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

Table 2: Summary of Model forecasts for Sri Lanka

A transition from La Niña to ENSO-neutral is most likely (~55% chance) during the AMJ season, with neutral conditions likely to continue into the second half of the year (Climate Prediction Center, USA). Most of the models predicted Neutral IOD condition in April and May and Negative IOD condition in June .

There is no signal from most of the global model for AMJseason as well as fromWMO multi model ensemble prediction. Climate predictability tool provides no signal in majority of districts.

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 in AMJ season 2018(Fig 11) with near normal rainfall in April, slightly above normal rainfall in May and slightly below normal rainfall in June.

However, the predictability is also limited to some extent due to the strong day to dayatmosphericvariability caused by the passage of the synoptic scale systems such as lows, anddepressions etc. The seasonal predictability of the AMJ season over SriLanka is also influenced by theMadden Julian Oscillation (MJO), which represents the majorglobal scale of intra-seasonal variability pattern.

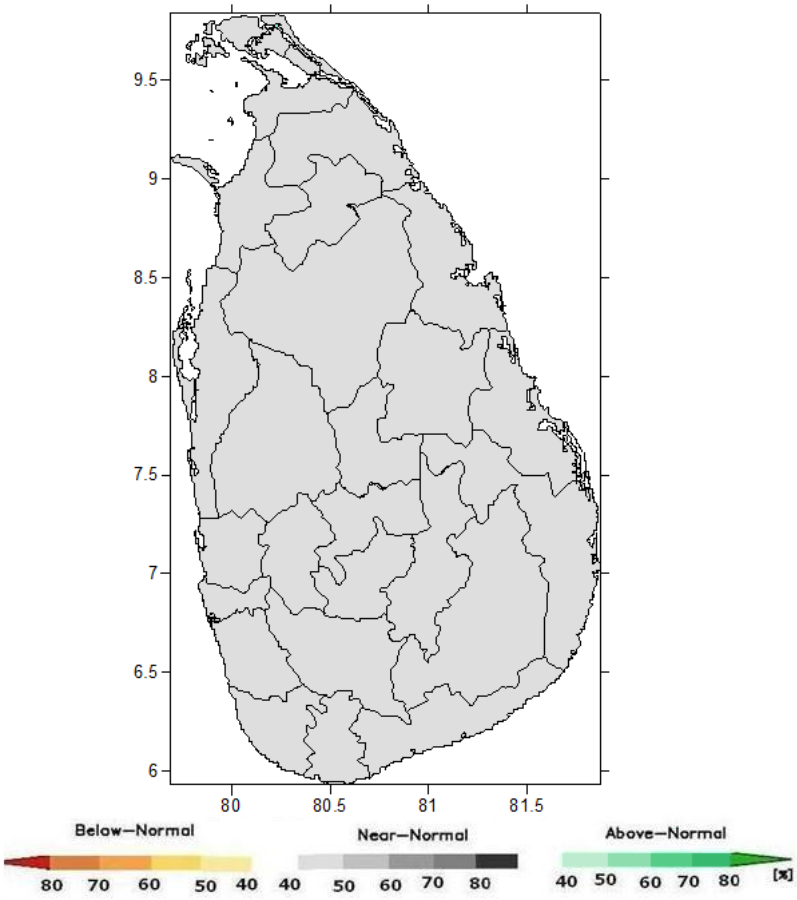


Fig 11.Consensus Probabilistic rainfall forecast for April–June2018

Probabilistic Temperature Forecast forApril –June (AMJ) 2018

The probabilistic Temperature forecast for April, April and June season (AMJ) 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 above average Maximum Temperatures in Anuradhapura ,kandy, Mannar, NuwaraEliya, puttallam,Trincomalee Vavunia and Bandarawela Districts and slightly below average Maximum Temperatures in Badulla, Batticaloa, Galle, Hambantota, Rathnapura and Kurunegala Districs(Fig 12) for the AMJ season 2018.

There is a higher chance of receiving slightly below average Minimum Temperatures in Anuradhapura, Badulla, Batticaloa, Galle, Colombo, Hambantota, Katugastota, Nuwara Eliya, Potttuvil, Rathnapura, Trincomalee, Vavunia, kurunegala and Bandarawela districts and slightly above average Minimum Temperatures in Mannar, Puttalam districts (Fig 13) for the AMJ season 2018.

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

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

District	**Average Maximum Temperature (^{0}C) – (AMJ)**		**Probability %**	
		Below	Normal	Above
Anuradhapura	33.3	30	20	50
Badulla	28.5	50	20	30
Batticaloa	30.1	55	20	25
Colombo	31.6	50	20	30
Galle	30.4	55	20	25
Hambantota	30.8	55	20	25
Katugastota	30.8	30	20	50
Katunayake	32.5	25	20	55
Mannar	31.6	30	20	50
MahaIlluppallama	33.0	25	20	55
NuwaraEliya	22.1	25	20	55
Pottuvil	31.7	30	20	50
Puttalam	32.7	30	20	50
Ratnapura	33.8	30	20	50
Ratmalana	31.7	50	20	30
Trincomalee	30.9	30	20	50
Vavuniya	33.1	30	20	50
Kurunegala	33.7	60	20	20
Bandarawela	25.2	25	20	55

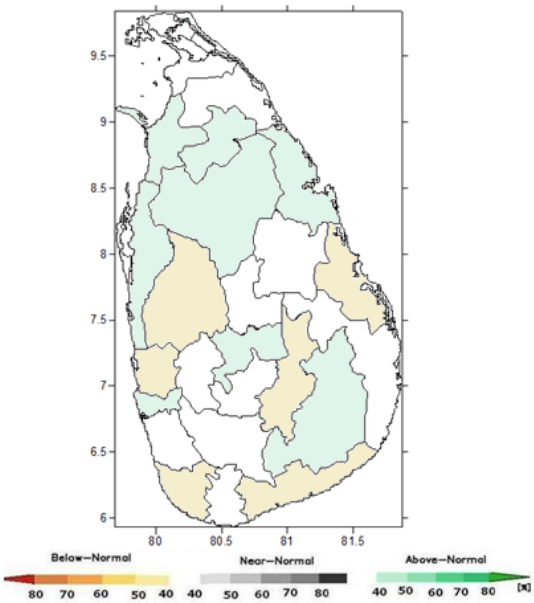


Fig 12:Probabilistic forecast for Maximum Temperatures for AMJ season 2018

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

District	Average Minimum Temperature (^{0}C) – (AMJ)		Probability %	
		Below	Normal	Above
Anuradhapura	22.8	45	20	35
Badulla	18.1	60	20	20
Batticaloa	24.3	50	20	30
Colombo	23.6	45	20	35
Galle	23.9	45	20	35
Hambantota	24.0	55	20	25
Katugastota	19.8	45	20	25
Katunayake	23.0	25	20	45
Mannar	24.6	35	20	45
MahaIlluppallama	22.1	35	20	45
NuwaraEliya	10.4	45	20	35
Pottuvil	23.4	55	20	25
Puttalam	23.0	35	20	45
Ratnapura	22.6	60	20	20
Ratmalana	23.2	25	20	55
Trincomalee	25.1	60	20	20
Vavuniya	21.9	60	20	20
Kurunegala	22.3	45	20	35
Bandarawela	14.7	45	20	35

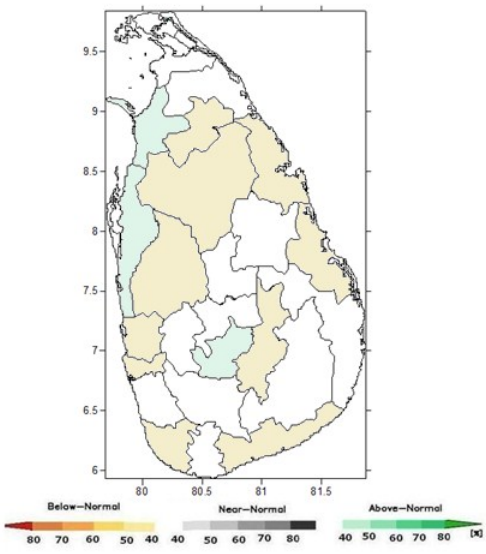


Fig 13:Probabilistic forecast for Minimum Temperatures for AMJ season 2018