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வளிமண்டலவியல் திணைக்களம்
DEPARTMENT OF METEOROLOGY
இலங்கை இலங்கை SRI LANKA

Consensus Seasonal Weather Outlook

February, March and April (FMA)

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

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And

Research Division

(a) Prevailing global climate conditions

La Niña continued during the past month, as indicated by the pattern of below-average sea surface temperatures (SSTs) across the central and eastern equatorial Pacific Ocean (Figs. 1 and 2). The atmospheric circulation over the tropical Pacific Ocean also reflected La Niña and the low-level trade winds were stronger than average over the western and central Pacific, with anomalous westerly winds at upper-levels. Overall, the ocean and atmosphere system reflects La Niña conditions (Climate Prediction Center, USA).

La Niña is predicted to persist through the FMA season by the majority of global models (Fig. 3 upper) and Neutral IOD condition is expected to prevail FMA season (Fig 3 lower).

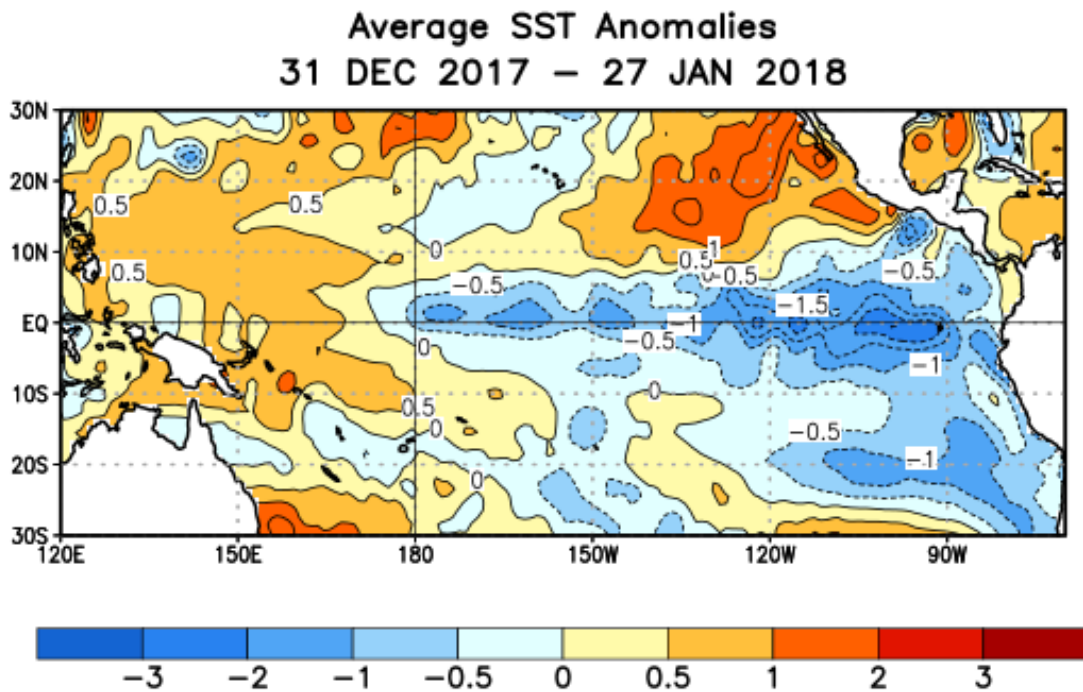


Fig 1: Observed Average sea surface temperature (SST) anomalies (°C)

Weekly SST Anomalies (DEG C)

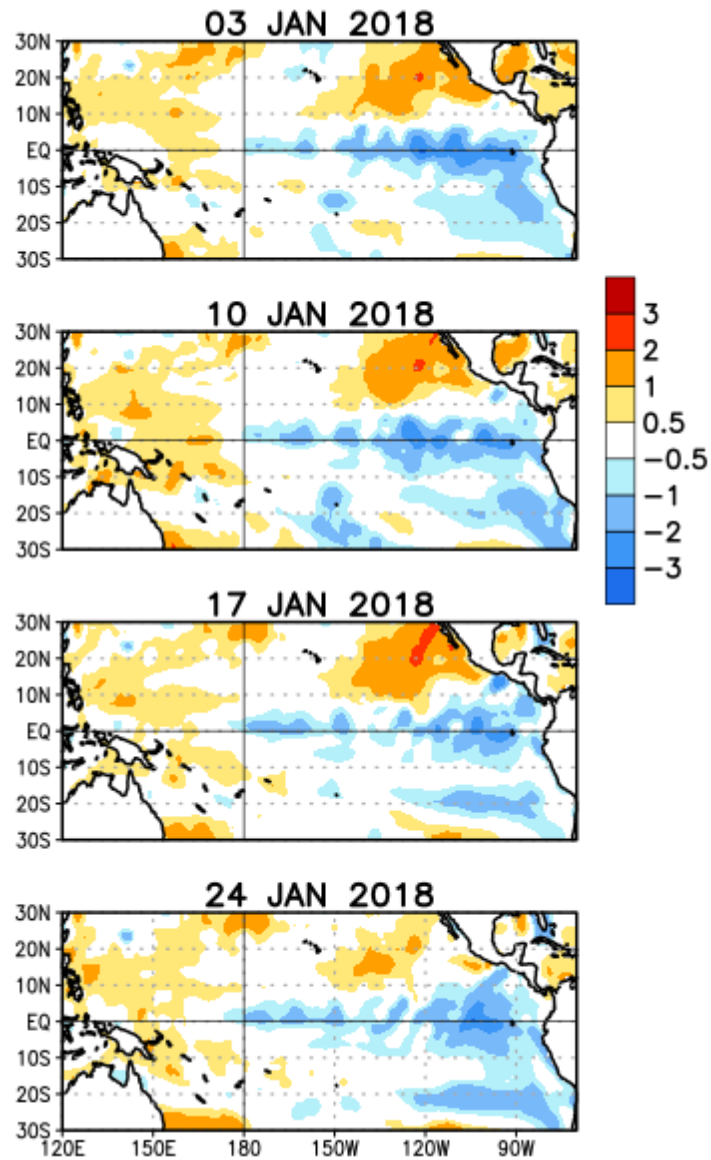
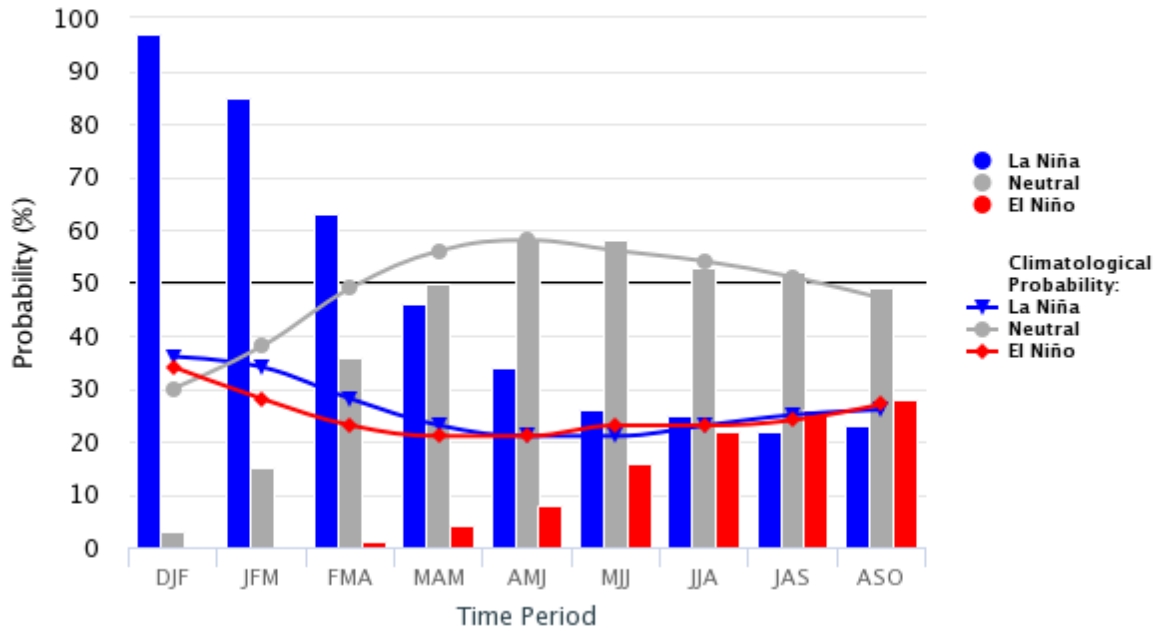


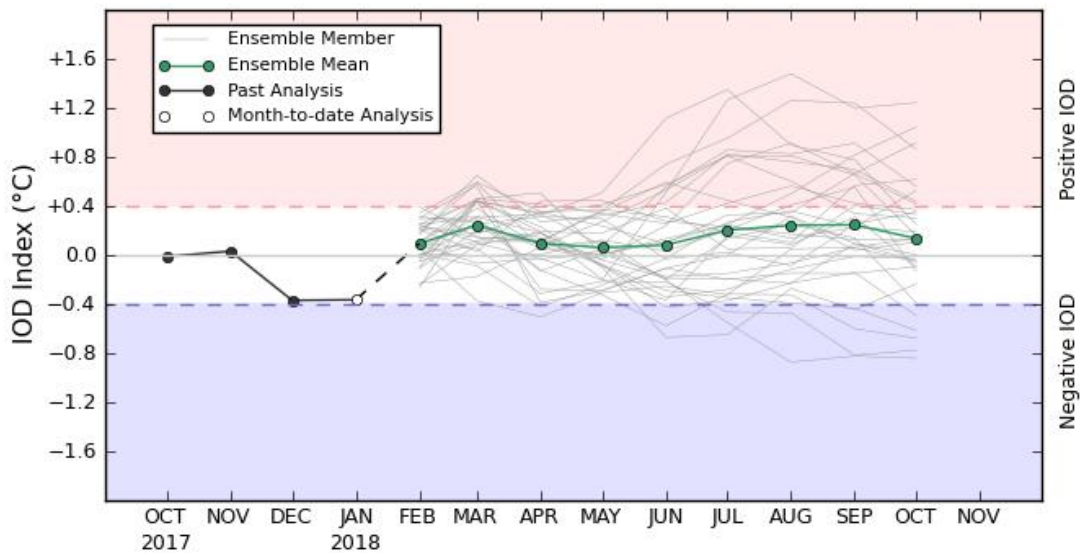
Fig 2: Weekly Observed Average sea surface temperature (SST) anomalies (°C)

Early-Jan CPC/IRI Official Probabilistic ENSO Forecasts

ENSO state based on NINO3.4 SST Anomaly
Neutral ENSO: -0.5 °C to 0.5 °C



POAMA monthly mean IOD - Forecast Start: 14 JAN 2018



Copyright 2018 Australian Bureau of Meteorology

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 FMA season

Figure 4 shows the probabilistic multi model ensemble forecast using dynamical models from 12 global producing centers (GPC) for FMA season. There is higher chance of receiving above normal rainfall for FMA season over Sri Lanka (Fig. 4). Out of 12 GPC individual forecasts 6 models provide above normal rainfall for FMA season (Fig 5). Only 1 GPC model is predicted below normal rainfall (Fig 5). There is no signal for FMA season over Sri Lanka from 5 GPC forecast outputs. Accordingly there is higher chance of receiving above normal rainfall for FMA season 2018.

Probabilistic Multi-Model Ensemble Forecast

/GPC_seoul/GPC_washington/GPC_tokyo/GPC_exeter/GPC_moscow/GPC_beijing
/GPC_melbourne/GPC_cptec/GPC_pretoria/GPC_montreal/GPC_ecmwf/GPC_offenbach

Precipitation : FMA2018

(issued on Jan2018)

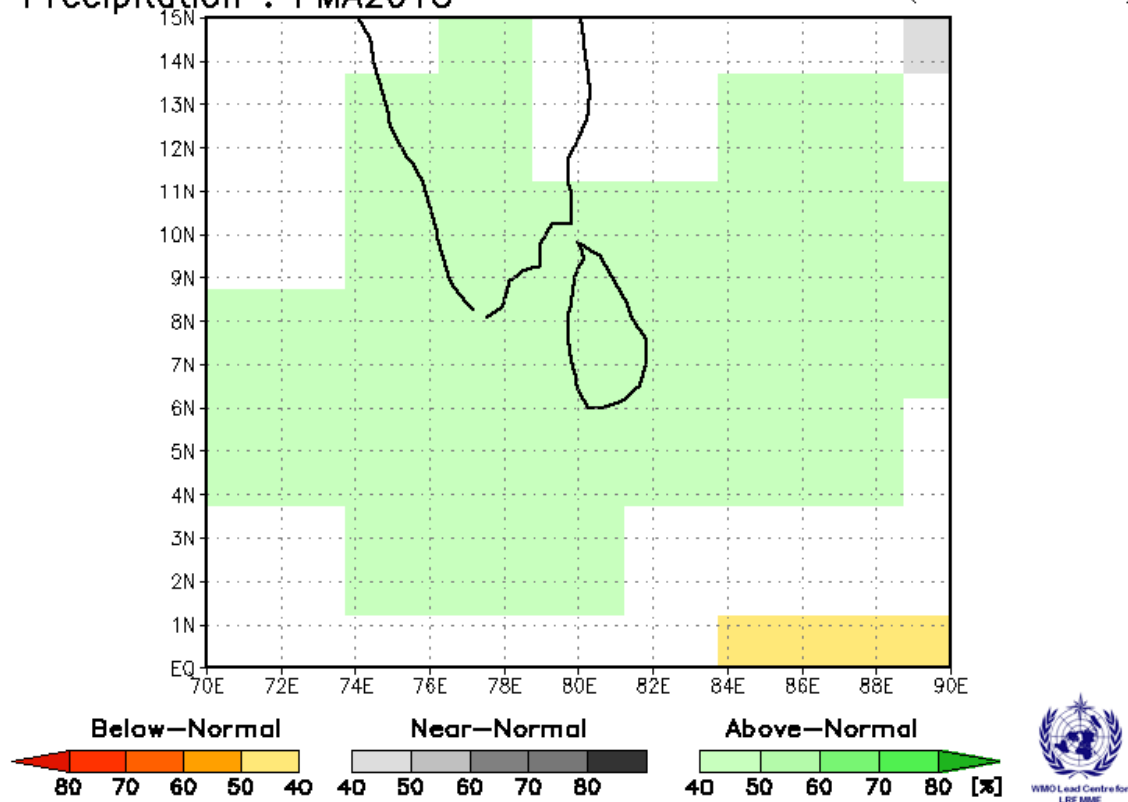


Fig 4: Probabilistic multi model ensemble forecast for FMA using dynamical models from 13 WMO global producing centers (GPC).

lat=0 15
lon=70 90

Precipitation : FMA2018

(issued on Jan2018) [Unit: mm/day]

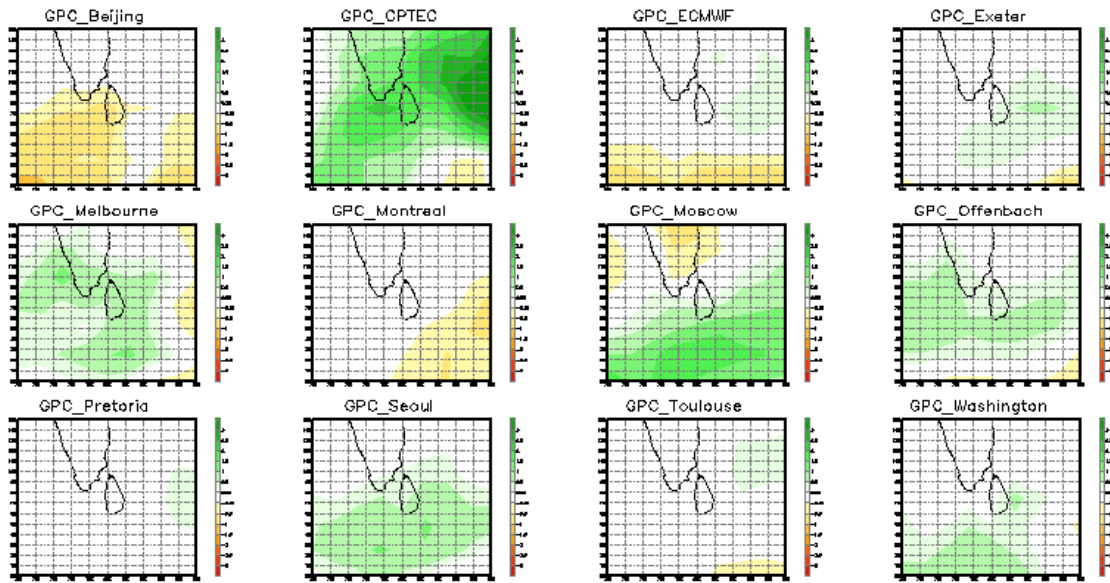


Fig 5: Individual forecast for FMA season by dynamical models from 13 WMO global producing centers (GPC).

(a.2) Forecast for February, March and April 2018

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

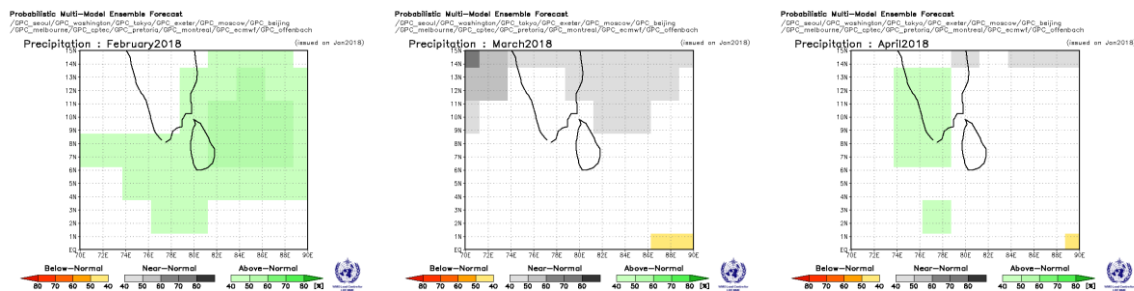


Fig 6: Probabilistic multi model ensemble forecast for February 2018 (left), March 2018 (middle) and April 2018 (right) using dynamical models from 12 WMO global producing centers (GPC).

lat=0 15
lon=70 90

Precipitation : February2018

(issued on Jan2018) [Unit: mm/day]

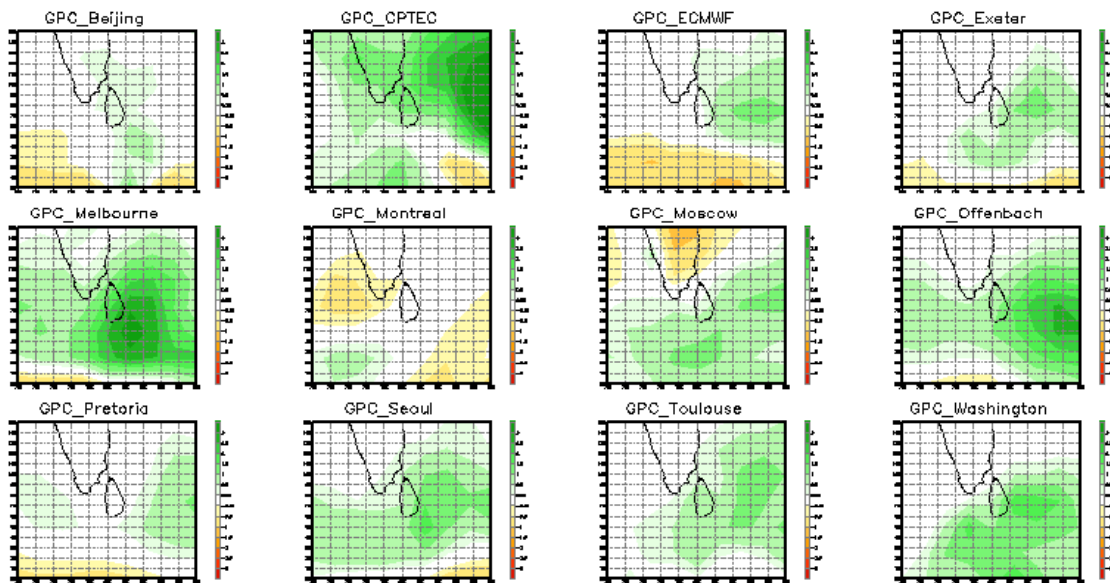


Fig 7: Individual forecast for February 2018 by dynamical models from 13 WMO global producing centers (GPC).

lat=0 15
lon=70 90

Precipitation : March2018

(issued on Jan2018) [Unit: mm/day]

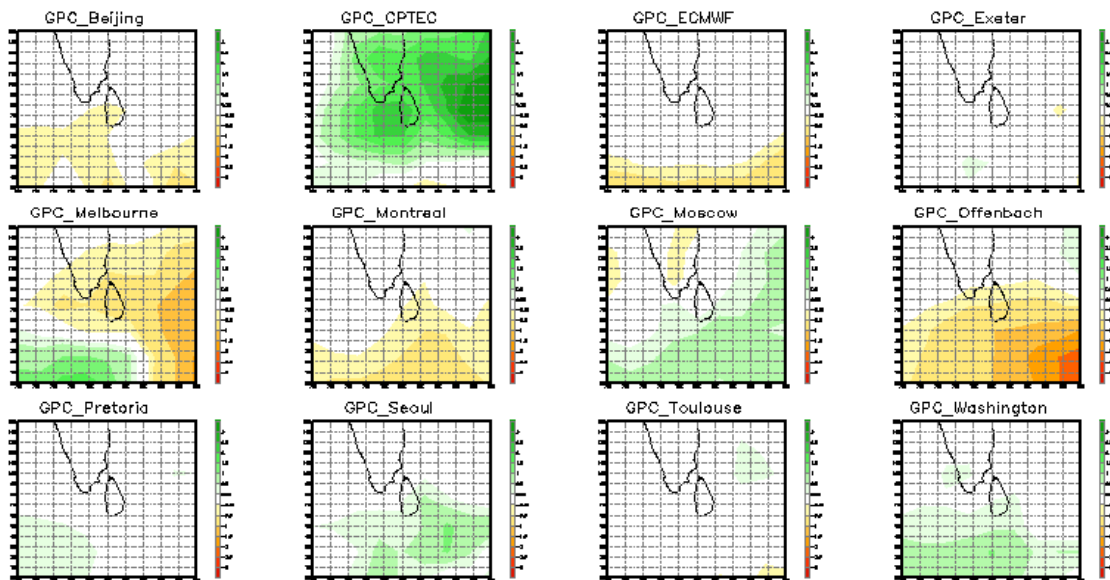


Fig 8: Individual forecast for March2018 by dynamical models from 13 WMO global producing centers (GPC).

lat=0 15
lon=70 90

Precipitation : April2018

(Issued on Jan2018) [Unit: mm/day]

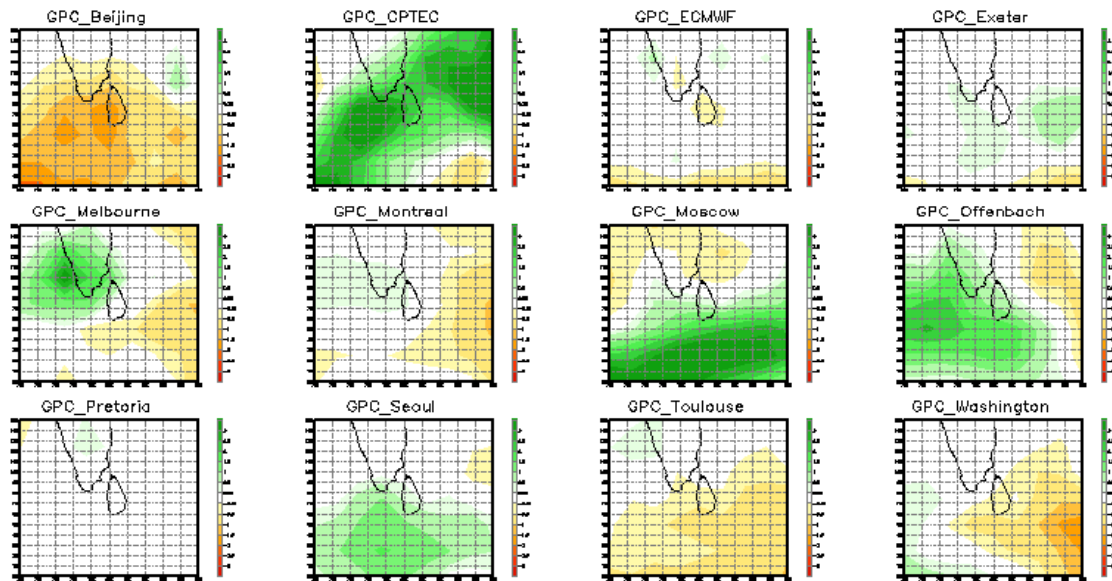


Fig 9: Individual forecast for April2018 by dynamical models from 13 WMO global producing centers (GPC).

Figures 7, 8 and 9 show the monthly forecast from individual global producing centers (GPC) centers for February 2017, March and April 2018 respectively.

Out of 12 GPC forecasts 8 GPC models provide above normal rainfall for February (Fig 7). There is no signal for February over Sri Lanka from 4 GPC forecast outputs (Fig 7). Accordingly there is a higher chance of receiving above normal rainfall for month of February 2018 for Sri Lanka.

Out of 12 GPC forecasts 2 GPC models provide above normal rainfall for March. 4 GPC models are predicted below normal rainfall for March (Fig 8). There is no signal for March over Sri Lanka from 6 GPC forecast outputs (Fig 8). Accordingly there is no signal for month of March. It indicates that there are equal chances of receiving below normal, near normal and above normal rainfall for March 2018.

Out of 12 GPC models, 4 GPC models predicted above normal and another 4 GPC models predicted below normal rainfall for April 2018 (Fig 9). There is no signal for April 2018 over Sri Lanka from 4 GPC forecast outputs. Accordingly there is no signal for April 2018. It indicates that there are equal chances of receiving below normal, near normal and above normal rainfall for April 2018.

(b) Statistical downscaling of CFSv2 global forecast output

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

The probabilistic rainfall forecast for FMA 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 table 1. Majority of districts have more chance (higher probability) of receiving about to slightly above average rainfall during FMA season 2018.

Table 1 : Probabilistic Forecast for FMA season2018 using CPT

District	Average rainfall (mm) –FMA	Probability %		
		Below	Normal	Above
Colombo	540.8	15	30	55
Kalutara	695.1	25	30	45
Galle	633.9	25	30	45
Matara	494.4	20	25	55
Hambantota	255.3	20	25	55
Ampara	330.5	20	25	55
Batticaloa	266.1	20	25	55
Trincomalee	199.2	20	25	55
Mullaithivu	178.9	20	25	55
Jaffna	93.1	20	30	50
Killinochchi	141.8	20	30	50
Mannar	195.3	20	30	50
Puttalam	264.2	20	30	50
Gampaha	474.4	20	30	50
Kegalle	647.2	20	30	50
Ratnapura	644.0	20	30	50
Monaragala	389.5	20	30	50
Badulla	509.8	20	30	50
Pollonnaruwa	300.5	20	30	50
Vavuniya	212.8	20	30	50
Anuradapura	244.9	20	30	50
Kurunegala	362.1	20	30	50
Matale	394.6	20	30	50
Kandy	448.9	20	30	50
Nuwaraeliya	475.7	20	30	50

Table 1

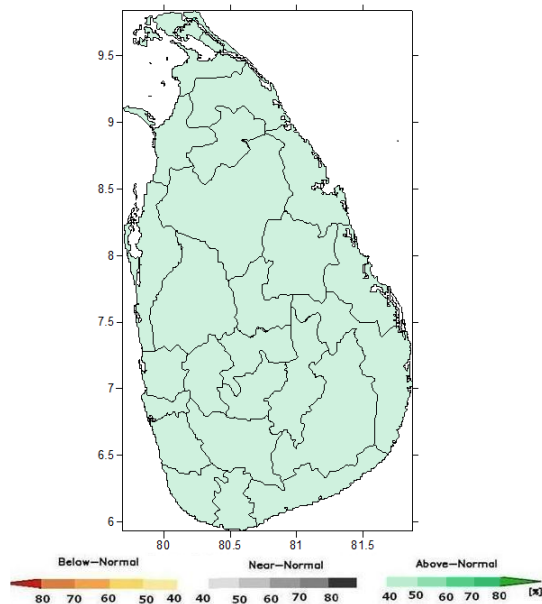


Fig 10. Probabilistic rainfall forecast for February-April 2018 using CPT

Summary : Consensus Seasonal Rainfall outlook for February, March, April (FMA) Season 2018

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

SUMMARY of MODEL FORECAST for FMA season for SRI LANKA				
Season	WMO LC MME	WMO GPC	CPT	Final
FMA season 2018	AN	AN	AN	AN
February 2018	AN	AN	AN	AN
March 2018	No signal	No signal		No signal ; Climatological Probability
April 2018	No signal	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

Moderate La Nina conditions and IOD-neutral conditions will prevail through FMA season 2018.

Most of the global model forecasts provide above normal rainfall for FMA season. WMO multi model ensemble prediction is favorable for above normal rainfall for FMA. Climate predictability tool provides higher chance of receiving above normal rainfall in majority of districts. La Niña is anticipated to affect precipitation in Sri Lanka during the upcoming months. La Niña is favored for above normal rainfall in month of February.

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

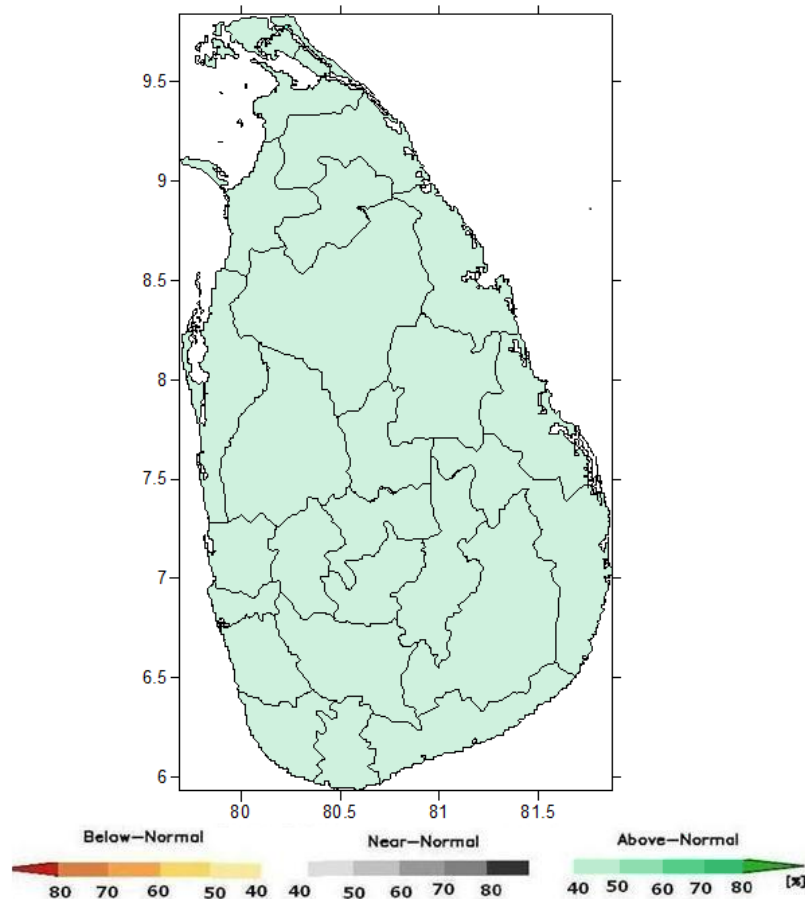


Fig 11. Consensus Probabilistic rainfall forecast for February–April 2018

Probabilistic Temperature Forecast for February –April (FMA) 2018

The probabilistic Temperature forecast for February, February and April season (FMA) 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 Mannar, Puttalam , Kurunegala, Anuradhapura, Vavunia, Gampaha, Colombo, Galle, Ratnapura, Kandy, Nuwara Eliya, and Badulla Districts (Fig 12) for the FMA season 2018.

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

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

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

District	Average Maximum Temperature (⁰ C) – (FMA)	Probability %		
		Below	Normal	Above
Anuradhapura	33.3	60	20	20
Badulla	28.5	50	25	25
Batticaloa	30.1	25	35	40
Colombo	31.6	60	20	20
Galle	30.4	50	25	25
Hambantota	30.8	30	40	30
Katugastota	30.8	60	20	20
Katunayake	32.5	60	20	20
Mannar	31.6	50	25	25
MahaIlluppallama	33.0	60	20	20
NuwaraEliya	22.1	60	20	20
Pottuvil	31.7	35	30	35
Puttalam	32.7	60	20	20
Ratnapura	33.8	60	20	20
Ratmalana	31.7	50	25	25
Trincomalee	30.9	40	30	30
Vavuniya	33.1	60	20	20
Kurunegala	33.7	60	20	20
Bandarawela	25.2	50	25	25

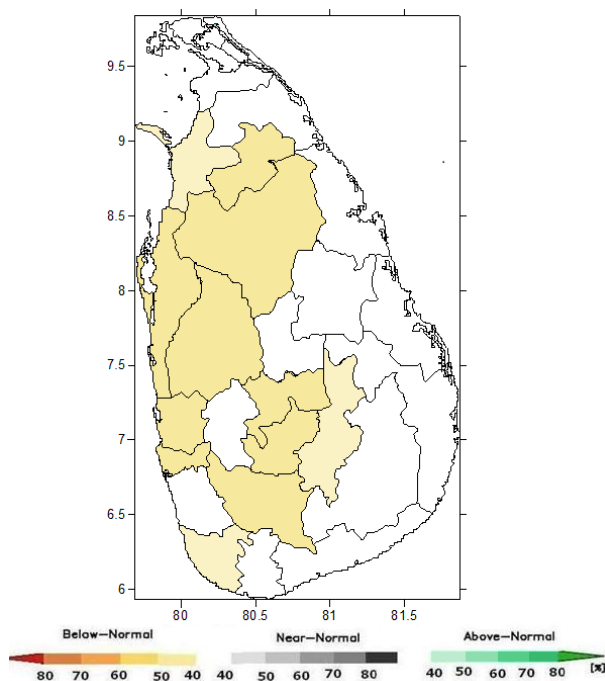


Fig 12: Probabilistic forecast for Maximum Temperatures for FMA season 2018

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

District	Average Minimum Temperature ($^{\circ}\text{C}$) – (FMA)	Probability %		
		Below	Normal	Above
Anuradhapura	22.8	40	30	30
Badulla	18.1	50	25	25
Batticaloa	24.3	20	20	60
Colombo	23.6	25	25	50
Galle	23.9	25	25	50
Hambantota	24.0	20	20	60
Katugastota	19.8	45	30	25
Katunayake	23.0	20	30	50
Mannar	24.6	40	30	30
MahaIlluppallama	22.1	50	25	25
NuwaraEliya	10.4	50	25	25
Pottuvil	23.4	35	25	40
Puttalam	23.0	60	20	20
Ratnapura	22.6	30	25	45
Ratmalana	23.2	20	20	60
Trincomalee	25.1	40	30	30
Vavuniya	21.9	60	20	20
Kurunegala	22.3	50	25	25
Bandarawela	14.7	50	25	25

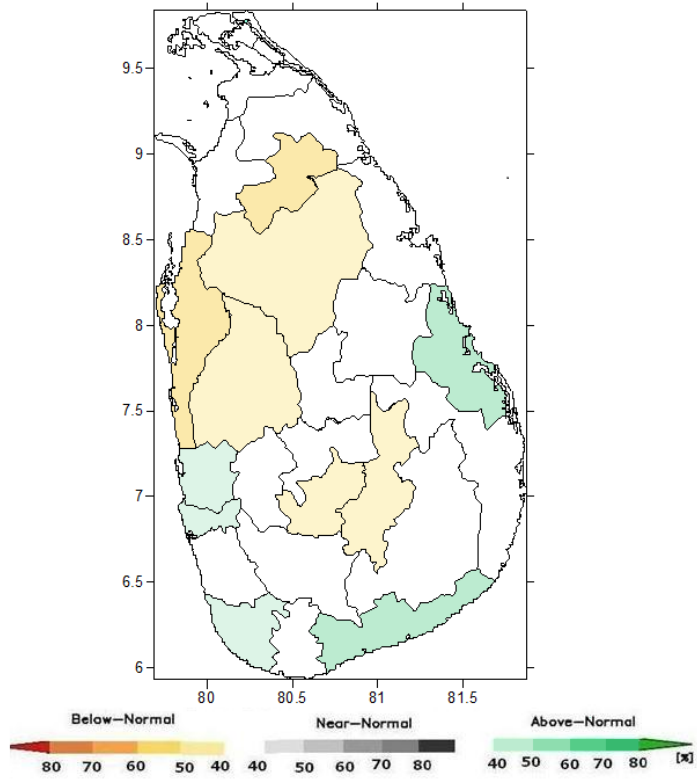


Fig 13: Probabilistic forecast for Minimum Temperatures for FMA season 2018