

**PRESS RELEASE**  
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भारत सरकार  
**Government of India**  
पृथ्वीविज्ञानमंत्रालय (एम. ओ. ई. एस.)  
**Ministry of Earth Sciences (MoES)**  
भारत मौसम विज्ञानविभाग  
**INDIA METEOROLOGICAL DEPARTMENT**

**Seasonal Outlook for the Temperatures during  
March to May, 2019**

**Highlights**

- The March to May, 2019 season averaged temperatures are likely to be normal over most of the subdivisions except a few subdivisions of Northwest India, Northeast India and southern part of west coast where above normal temperatures are most likely.
- The season averaged maximum temperatures in Himachal Pradesh, West Rajasthan, Konkan, Goa, Coastal Karnataka, Kerala and Arunachal Pradesh are likely to be warmer than normal by 0.5°C to 1°C.
- Normal to slightly above normal heat wave conditions are likely in the core heat wave zone during the season.

**1. Background**

Since 2016, India Meteorological Department (IMD), Ministry of Earth Sciences (MoES) has been issuing seasonal forecast outlooks for subdivision scale temperatures over the country for both hot and cold weather seasons based on predictions from the Monsoon Mission Coupled Forecasting System (MMCFS) Model developed under MoES's monsoon mission project. IMD has now prepared Seasonal Outlook for the subdivision averaged temperatures during the hot weather season of March to May, 2019 season and the same is presented here.

The MMCFS has a spatial resolution of about 38 km and improved modules of model physics. The model climatology was prepared based on retrospective forecasts for 27 years (1982-2008). The seasonal temperature forecast outlook for the March to May, 2019 presented here is prepared using MMCFS simulations based on the initial conditions of February, 2019. The forecast was prepared using 33 ensemble member forecasts. The model hindcasts and forecasts were bias corrected using the probability distribution function (pdf) method. The model shows moderate skill over many subdivisions over northwest and central India during the period 1982-2008.

## 2. Forecast for the March, April and May (MAM) Season, 2019

Fig.1, Fig.2 & Fig.3 show the forecast for the subdivision averaged maximum, minimum and mean temperature anomalies (departures from the long term normal) respectively over India for March to May season, 2019. The MAM season averaged temperature forecast indicates near normal maximum, minimum and mean temperatures over most of the subdivisions except a few subdivisions of Northwest India, Northeast India and southern part of west coast.

The season averaged maximum temperatures (**Fig.1**) are likely to be warmer than normal by  $>1^{\circ}\text{C}$  over Uttarakhand. It is likely to be warmer than normal by  $0.5^{\circ}\text{C}$  to  $1^{\circ}\text{C}$  over Himachal Pradesh, West Rajasthan, Konkan and Goa, Coastal Karnataka, Kerala, and Arunachal Pradesh. Rest of the country is likely to experience near normal maximum temperatures (departure from long term normal: between  $-0.5^{\circ}\text{C}$  and  $0.5^{\circ}\text{C}$ ).

The season averaged minimum temperatures (**Fig.2**) are likely to be warmer than normal by  $0.5^{\circ}\text{C}$  to  $1^{\circ}\text{C}$  over Uttarakhand, Himachal Pradesh, West Rajasthan, Saurashtra, Coastal Karnataka, Kerala, Tamil Nadu, Coastal Andhra Pradesh and Arunachal Pradesh. Rest of the country is likely to experience near normal minimum temperatures (departure from long term normal: between  $-0.5^{\circ}\text{C}$  and  $0.5^{\circ}\text{C}$ ).

The season averaged mean temperatures (**Fig.3**) are likely to be warmer than normal by  $0.5^{\circ}\text{C}$  to  $1^{\circ}\text{C}$  over Uttarakhand, Himachal Pradesh, West Rajasthan, Coastal Karnataka, Kerala and Arunachal Pradesh. Rest of the country is likely to experience near normal mean temperatures (departure from long term normal: between  $-0.5^{\circ}\text{C}$  and  $0.5^{\circ}\text{C}$ ).

There is about 37% probability of maximum temperatures in the core HW zone during March to May 2019 to be above normal. (**Fig.4**). Core heat wave zone covers states of Punjab, Himachal Pradesh, Uttarakhand, Delhi, Haryana, Rajasthan, Uttar Pradesh, Gujarat, Madhya Pradesh, Chhattisgarh, Bihar, Jharkhand, West Bengal, Odisha and Telangana and meteorological subdivisions of Marathwada, Vidharbha, Madhya Maharashtra and coastal Andhra Pradesh. This in turn suggests that normal to slightly above normal heat wave conditions are likely in the core heat wave zone during the season.

## 3. ENSO conditions in the Pacific Ocean

Currently, near borderline El Niño conditions are prevailing over equatorial Pacific Ocean. The latest MMCFS & global forecasts collectively indicate that near borderline El Niño conditions are likely to persist during the MAM season and weaken thereafter.

## 4. Extended Range Forecast Services

IMD also provides extended range forecasts (7 –day averaged forecasts for the next four weeks) of maximum and minimum temperatures over the country updated every week. This is based on the Multi-model ensemble dynamical Extended Range Forecasting System currently operational at IMD, New Delhi. The forecasts are available through IMD, Delhi website ([www.imd.gov.in](http://www.imd.gov.in)).

Temperature Forecast for March to May, 2019 based on initial condition of February, 2019.

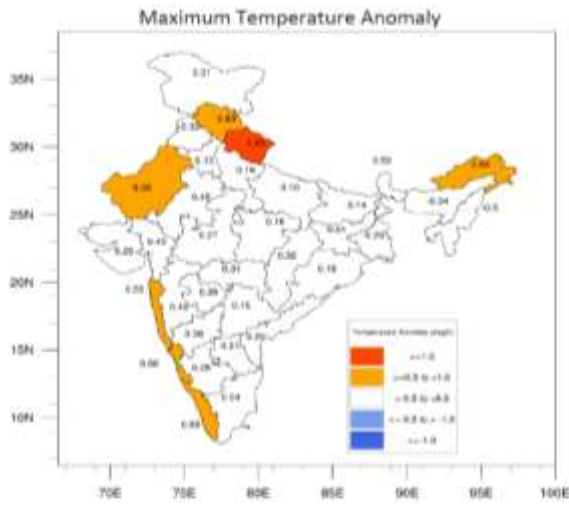


Fig.1.Subdivision averaged Maximum Temperature Anomaly forecast for March to May 2019.

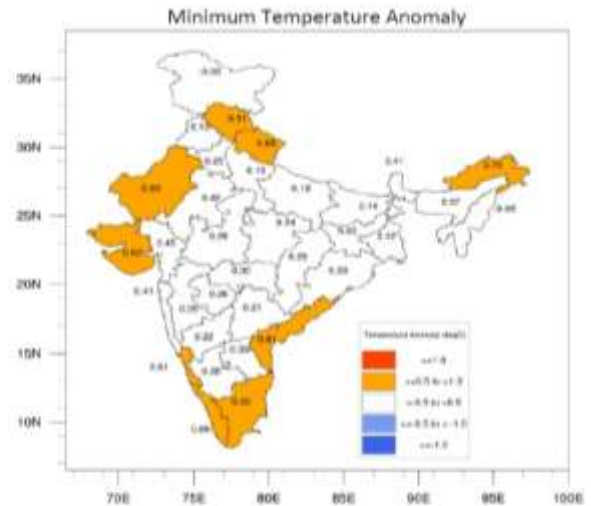


Fig.2. Subdivision averaged Minimum Temperature Anomaly forecast for March to May 2019.

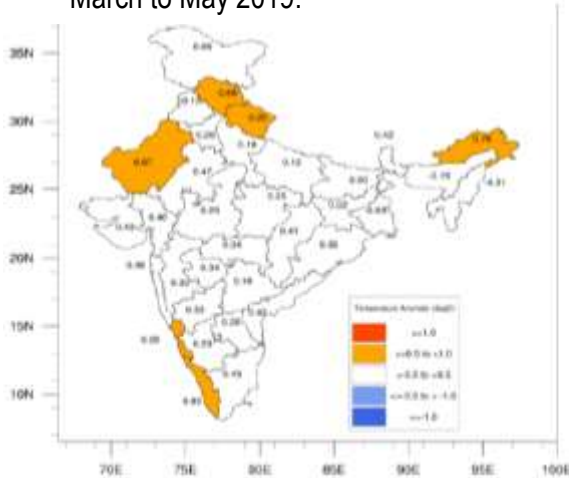


Fig.3.Subdivision averaged Mean Temperature Anomaly forecast for March to May 2019.

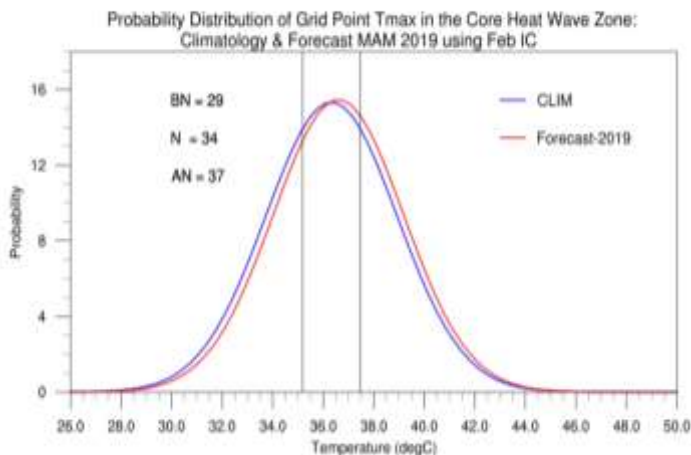


Fig.4. Climatological probability distribution of grid point maximum temperatures (Tmax) during March to May 2019 over Core Heat Wave Zone along with forecast probability distribution of the same for March to May 2019.