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NATIONAL CENTRE FOR HYDROLOGY AND METEOROLOGY  
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4 October, 2024

## Extended Range Prediction for Bhutan

### Background

Extended Range Prediction (ERP) for Bhutan is prepared with the support from the Indian Meteorological Department (IMD), Government of India. The model used for the system is CFSv2 coupled model (Atmospheric and Ocean model) which runs once every week (Wednesday), with the 16 Ensemble Members at the horizontal resolution of around 25 km, and the products are made available the next day (Thursday). Therefore, the ERP products for Bhutan will be generated every Friday. ERP for Bhutan is carried out for two climate variables, rainfall and temperature.

Generally, the forecast output is produced on a weekly basis for a period of a month for both the variables. The current products available from NCHM are on pilot basis which needs further studies and validation with the ground observations until the product is fully operationalized.



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## Observed weather over last week

Most of the stations across the country showed a constant maximum and minimum temperature throughout the week. Rain was observed over the country. The table below displays observed real time rain and temperature data from regional meteorological stations over the last week.

| Station  | Parameter | 27 Sept | 28 Sept | 29 Sept | 30 Sept | 01 Oct | 02 Oct | 03 Oct |
|----------|-----------|---------|---------|---------|---------|--------|--------|--------|
| Babesa   | Tmax (°C) | 16      | 14.5    | 23.5    | 25.5    | 25     | 26     | 24.5   |
|          | Tmin (°C) | 13.5    | 11      | 12      | 13      | 13.5   | 16     | 12.5   |
|          | Rain (mm) | 50.6    | 12.4    | 0       | 0       | 0.6    | 2      | 6.8    |
| Dagana   | Tmax (°C) | 20      | 19.5    | 25      | 25.5    | 26.5   | 23.5   | 22     |
|          | Tmin (°C) | 17      | 16      | 16      | 17.5    | 18     | 20     | 19     |
|          | Rain (mm) | 56.6    | 11.2    | 0       | 0       | 8.4    | 40     | 30     |
| Chamkhar | Tmax (°C) | 18      | 19      | 23.5    | 25      | 23.5   | 24.5   | 20.5   |
|          | Tmin (°C) | 14      | 13.5    | 14      | 14.5    | 16.5   | 15     | 15     |
|          | Rain (mm) | 5       | 7.8     | 0       | 0       | 11.7   | 3.7    | 13.5   |
| Deothang | Tmax (°C) | 25      | 24      | 24      | 24      | 26     | 25     | 26     |
|          | Tmin (°C) | 19.5    | 20      | 21.5    | 22.5    | 23     | 22     | 22     |
|          | Rain (mm) | 30      | 12      | 16.5    | 0       | 15     | 0      | 36     |
| Gasa     | Tmax (°C) | 15      | 18      | 22.5    | 24      | 24     | 0      | 22.5   |
|          | Tmin (°C) | 10.5    | 18      | 22.5    | 24      | 24     | 22     | 12     |
|          | Rain (mm) | 11.6    | 0       | 0       | 0       | 25.2   | 6.2    | 22.8   |



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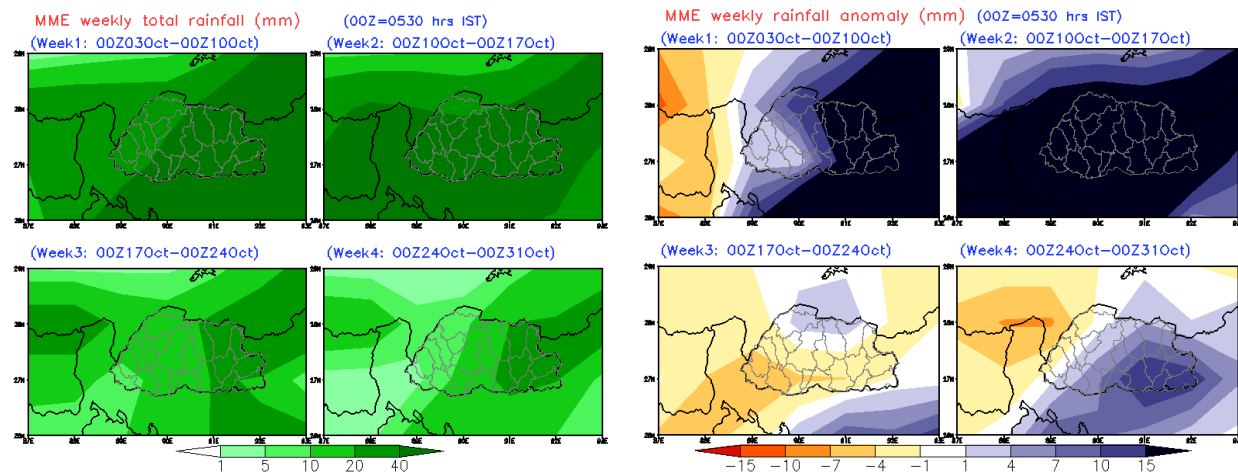
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## Weekly forecast for Bhutan

### 1. Rainfall Prediction



#### Week 1 ( 03 October - 10 October) and Week 2 ( 11 October - 17 October)

Above normal rainfall is expected throughout the region

#### Week 3 ( 17 October - 24 October)

Below normal rainfall is expected throughout the region

#### Week 4 ( 24 October - 31 October)

Above normal rainfall is expected throughout the region



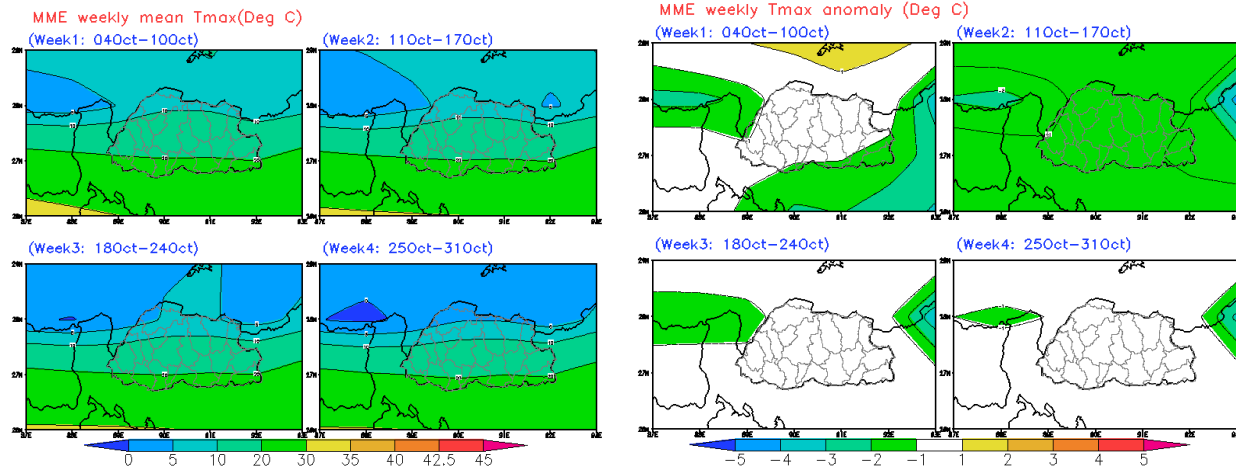
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## 2. Maximum Temperature Prediction



### Week 1 (04 October - 10 October)

Normal maximum temperature is expected throughout the region

### Week 2 (11 October - 17 October)

Below normal maximum temperature is expected throughout the region

### Week 3 (18 October - 24 October) and Week 4 (25 October - 31 October)

Normal maximum temperature is expected throughout the region



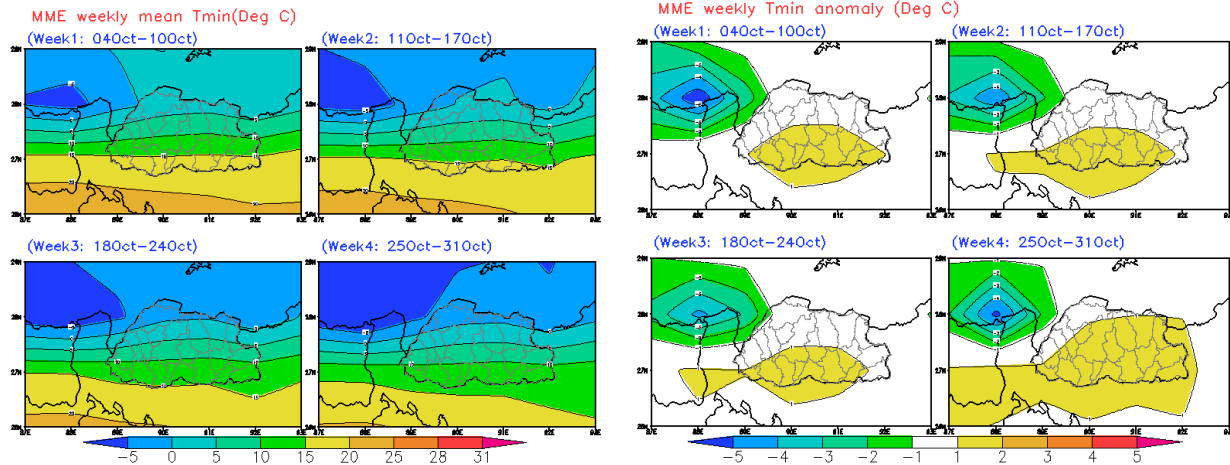
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### 3. Minimum Temperature Prediction



**Week 1 (04 October - 10 October) , Week 2 (11 October - 17 October) and Week 3 (18 October - 24 October)**

Above normal minimum temperature is expected in the south and normal minimum temperature throughout the region

**Week 4 (25 October - 31 October)**

Above normal minimum temperature is expected throughout the region.



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## Summary

- The rainfall is likely to be above normal for the first two weeks and then be below normal for the third week and then above normal for the last week.
- The maximum temperature is likely to be below normal on the second week and normal on the rest of the month.
- The minimum temperature is likely to be normal except for the south in the first three week and then above normal in the last week.

## Classification of rainfall for 24 Hours

|                          |                             |
|--------------------------|-----------------------------|
| No rainfall              | 0.0 mm                      |
| Very light rainfall      | 0.1 to 0.9 mm               |
| Light rainfall           | 1.0 to 10.0 mm              |
| Moderate rainfall        | 11.0 to 30.0 mm             |
| Heavy rainfall           | 31.0 to 70.0 mm             |
| Very heavy rainfall      | 71.0 to 150.0 mm            |
| Extremely heavy rainfall | Equal or more than 151.0 mm |