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NATIONAL CENTRE FOR HYDROLOGY AND METEOROLOGY
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11 August, 2023

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 an increase in maximum and minimum temperature in the middle of the week. Very light to light rain was observed over the isolated parts of the country for the last week. The table below displays observed real time rain and temperature data from regional meteorological stations over the last week.

Station	Parameter	04 Aug	05 Aug	06 Aug	07 Aug	08 Aug	09 Aug	10 Aug
Babesa	Tmax (°C)	26.8	25.0	26.0	27.0	26.6	25.0	25.6
	Tmin (°C)	15.0	15.5	15.0	15.0	14.8	15.2	15.5
	Rain (mm)	0	1	0	4.6	2.3	2.8	3.8
Dagana	Tmax (°C)	23.0	23.0	26.0	26.5	22.5	24.0	27.5
	Tmin (°C)	20.0	20.0	19.0	20.0	20.0	19.0	19.0
	Rain (mm)	4.6	0.2	0.0	3.8	29.0	0.0	14.4
Chamkhar	Tmax (°C)	19.0	20.5	22.5	23.0	22.0	22.5	23.0
	Tmin (°C)	15.0	15.5	15.0	16.0	15.0	15.5	16.0
	Rain (mm)	1.3	0.3	3.2	0.3	4.1	1.5	4.0
Deothang	Tmax (°C)	32.0	32.0	32.0	20.0	20.0	32.0	32.0
	Tmin (°C)	22.0	22.0	23.0	22.0	22.0	22.0	23.0
	Rain (mm)	25.0	10.0	25.0	5.0	27.0	0.5	20.5
Gasa	Tmax (°C)	19.0	15.5	22.0	21.5	21.5	22.5	22.0
	Tmin (°C)	14.0	12.5	11.5	13.5	11.5	12.5	12.5
	Rain (mm)	9.4	10.5	7.2	14.2	13.8	12.2	36.8



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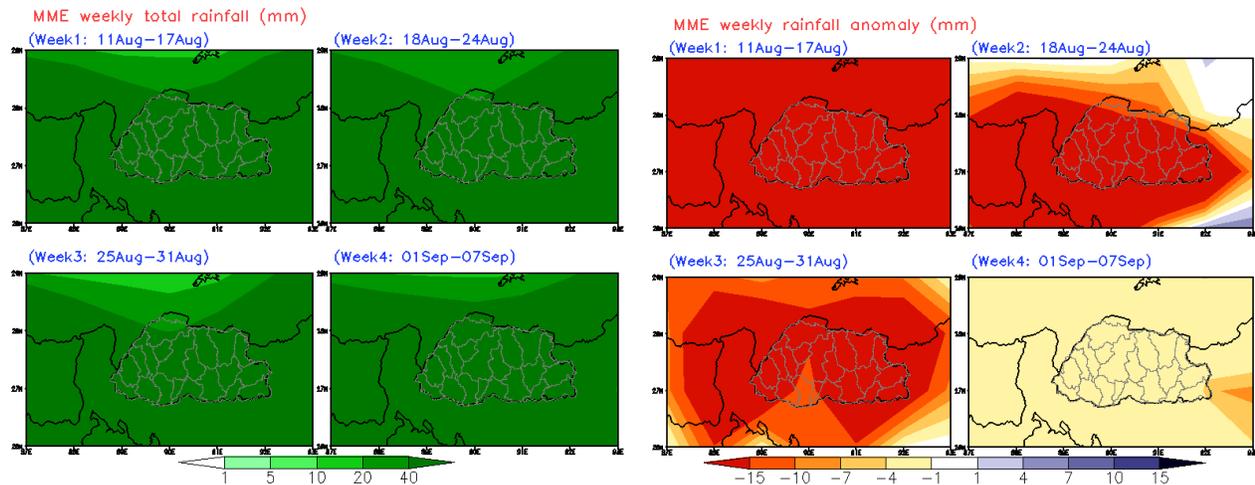
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Weekly forecast for Bhutan

1. Rainfall Prediction



Week 1 (11 August - 17 August)

Below normal rainfall is expected throughout the region.

Week 2 (18 August - 24 August)

Below normal rainfall is expected throughout the region.

Week 3 (25 August - 31 August)

Below normal rainfall is expected throughout the region.

Week 4 (1 September - 7 September)

Normal rainfall is expected throughout the region.



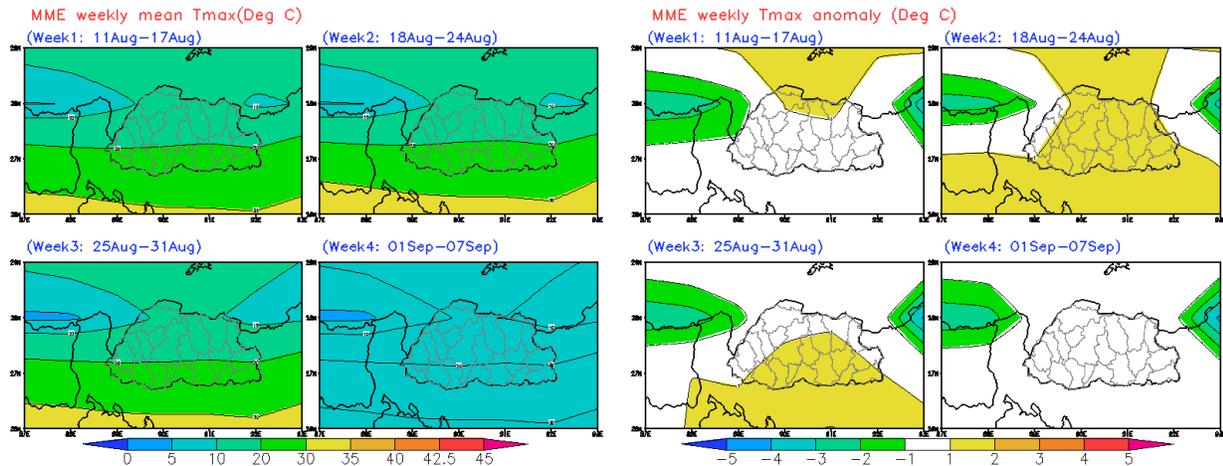
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2. Maximum Temperature Prediction



Week 1 (11 August - 17 August)

Isolated parts of the northern region can expect above normal maximum temperature while normal maximum temperature is expected across the remaining region.

Week 2 (18 August - 24 August)

Above normal maximum temperature is expected across the region except in the western region.

Week 3 (25 August - 31 August)

South central parts of the region can expect above normal maximum temperature while normal maximum temperature is expected throughout the region.

Week 4 (1 September - 7 September)

Normal maximum temperature is expected throughout the region.



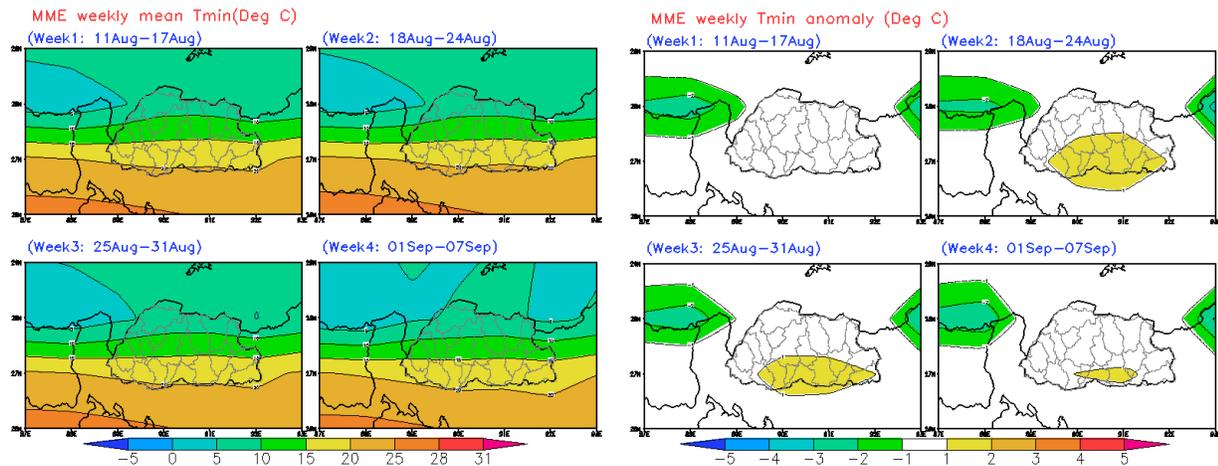
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3. Minimum Temperature Prediction



Week 1 (11 August - 17 August)

Normal minimum temperature is expected throughout the region.

Week 2 (18 August - 24 August), Week 3 (25 August - 31 August) and Week 4 (1 September - 7 September)

The southern region can expect above normal minimum temperature and the rest of the region can observe normal minimum temperature.



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Summary

- The rainfall is likely to be above normal for the first three weeks and normal for the last weeks.
- The maximum temperature is likely to be above normal for the first three weeks at isolated places and below normal for the last week.
- The minimum temperature is likely to be normal for all four weeks, except southern parts can expect above normal minimum temperature for the last three weeks.

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