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NATIONAL CENTRE FOR HYDROLOGY AND METEOROLOGY
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17 June 2022

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 during the last week. Moderate to very heavy rain was observed over the parts of the southern region and light to moderate rain was observed over the remaining region. The table below shows the observed rain and temperature data from the regional meteorological stations during last week.

Station	Parameter	09 June	10 June	11 June	12 June	13 June	14 June	15 June
Babesa	Tmax (°C)	21.0	20.0	23.5	24.0	26.0	21.0	19.0
	Tmin (°C)	15.0	13.5	14.5	15.0	14.5	15.0	14.0
	Rain (mm)	6.2	0.2	0.4	0.0	0.0	4.9	3.4
Dagana	Tmax (°C)	23.0	23.0	20.5	23.5	26.0	22.0	20.0
	Tmin (°C)	19.0	18.5	18.0	18.5	19.0	19.0	18.5
	Rain (mm)	3.8	1.6	13.8	0.2	3.6	26.4	25.4
Chamkhar	Tmax (°C)	22.5	21.0	21.0	21.0	20.5	20.0	18.0
	Tmin (°C)	13.0	13.5	14.5	13.5	14.0	15.0	15.0
	Rain (mm)	1.0	3.7	2.1	0.9	1.5	2.3	16.0
Deothang	Tmax (°C)	25.0	23.0	22.0	23.0	22.5	22.0	22.0
	Tmin (°C)	20.5	21.0	23.0	18.0	19.0	18.0	17.5
	Rain (mm)	6.8	60.8	193.6	8.4	57.4	179.6	196.6
Gasa	Tmax (°C)	14.0	16.0	17.5	16.0	17.5	17.0	16.0
	Tmin (°C)	11.0	10.0	11.5	10.5	11.0	12.0	11.0
	Rain (mm)	7.6	6.0	1.4	5.8	0.0	13.2	13.0



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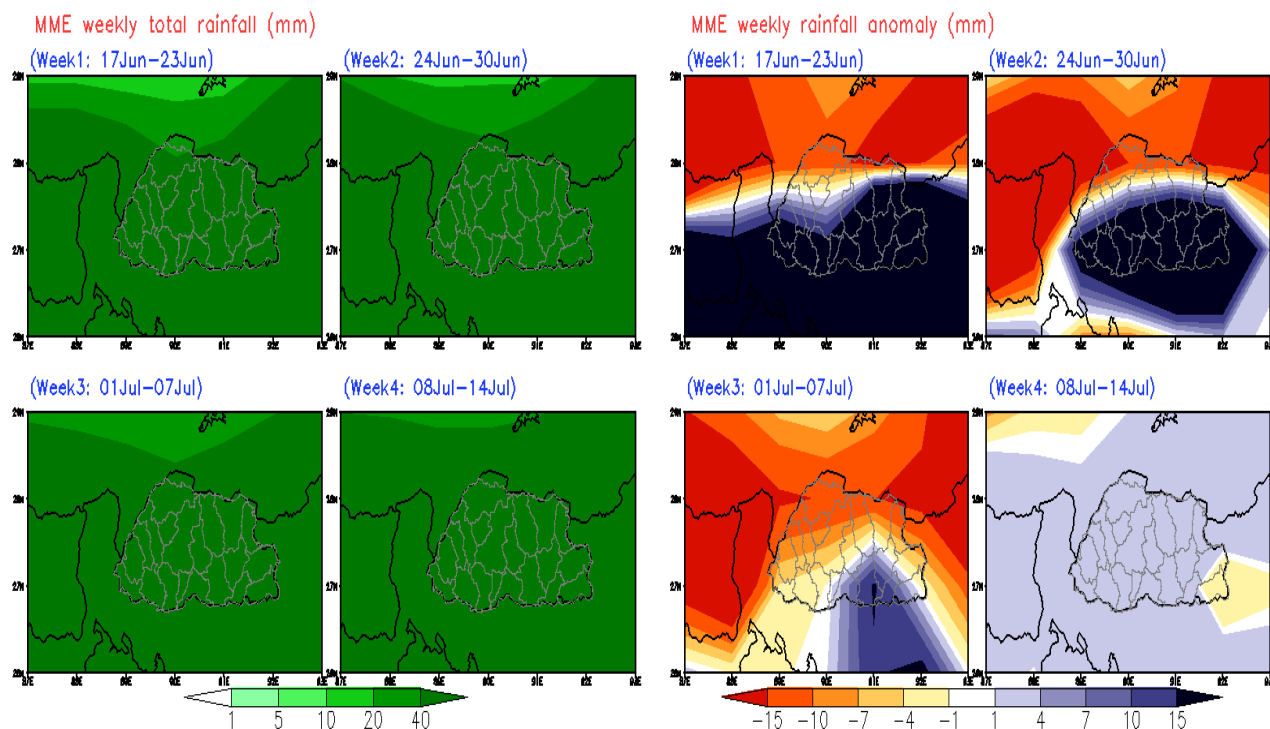
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Weekly forecast for Bhutan

1. Rainfall Prediction



Week 1 (17 June - 23 June) and Week 2 (24 June - 30 June)

Below normal rainfall is expected across the northern region while the remaining region can observe above normal rainfall.

Week 3 (01 July - 07 July)

The isolated parts of the southeast region can expect above normal rainfall and below normal rainfall is expected throughout the remaining region.

Week 4 (08 July - 14 July)

Above normal rainfall is expected throughout the region.



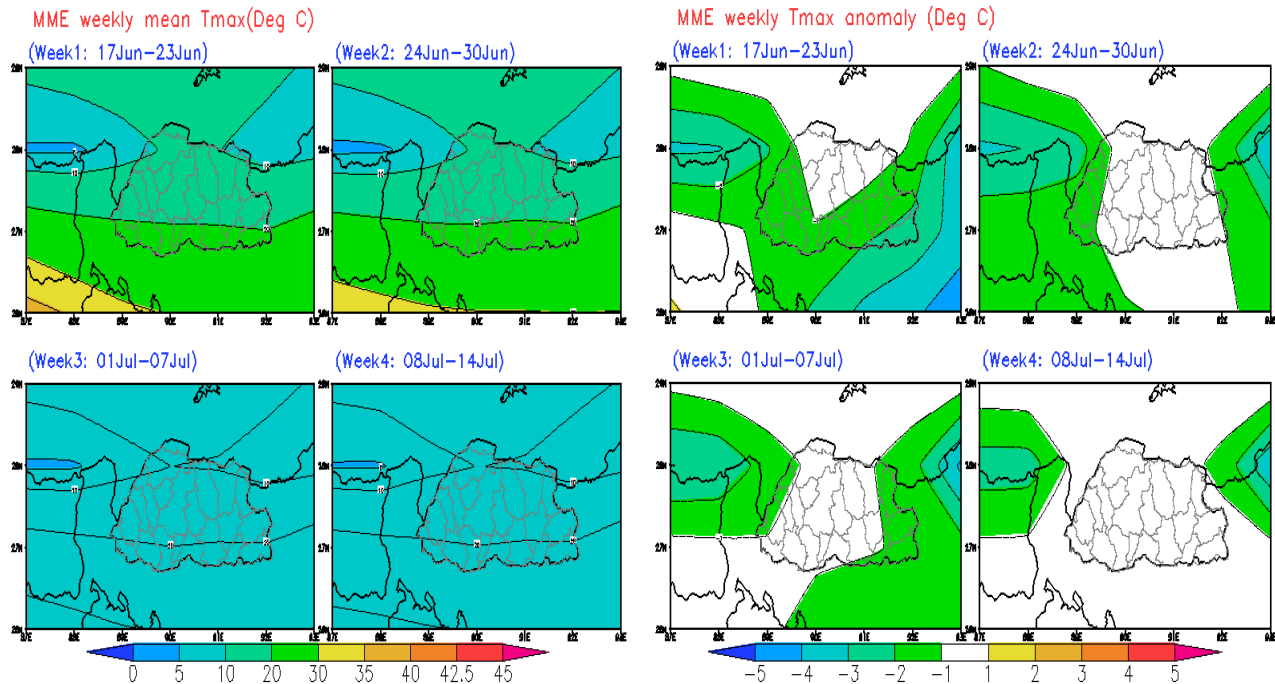
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2. Maximum Temperature Prediction



Week 1 (17 June - 23 June)

Below normal maximum temperature is expected across the western, southern and parts of the eastern region and the remaining region can expect normal maximum temperature.

Week 2 (24 June - 30 June)

Below normal maximum temperature is expected across the western region and the rest of the region can observe normal maximum temperature.

Week 3 (01 July - 07 July)

The eastern region can expect below normal maximum temperature and the rest of the region can observe normal maximum temperature.

Week 4 (08 July - 14 July)

Normal maximum temperature is expected across the country.



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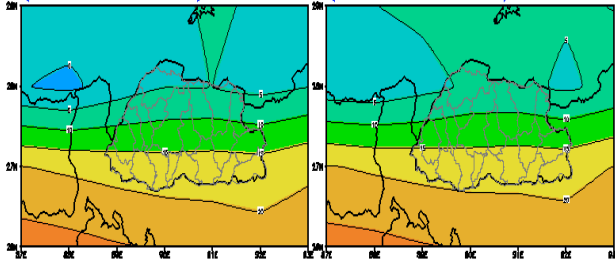


3. Minimum Temperature Prediction

MME weekly mean Tmin(Deg C)

(Week1: 17Jun-23Jun)

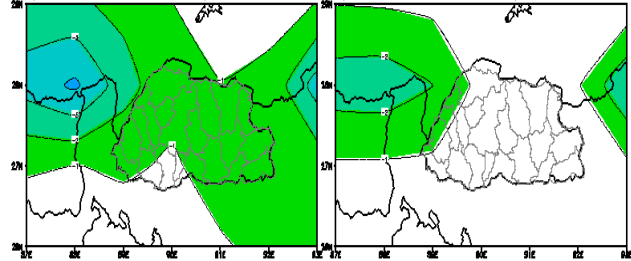
(Week2: 24Jun-30Jun)



MME weekly Tmin anomaly (Deg C)

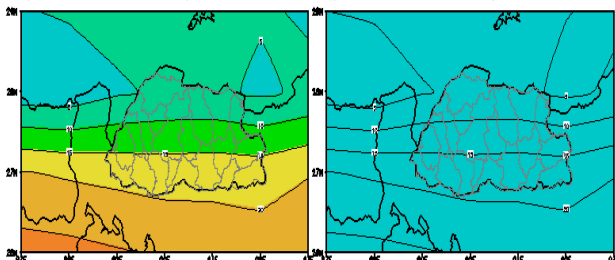
(Week1: 17Jun-23Jun)

(Week2: 24Jun-30Jun)



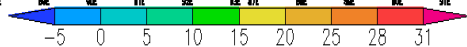
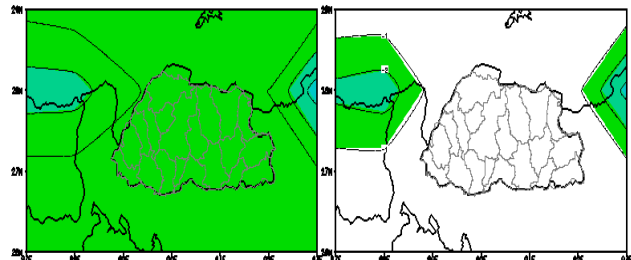
(Week3: 01Jul-07Jul)

(Week4: 08Jul-14Jul)



(Week3: 01Jul-07Jul)

(Week4: 08Jul-14Jul)



Week 1 (17 June - 23 June)

Below normal minimum temperature is expected across the country.

Week 2 (24 June - 30 June)

Normal minimum temperature is expected across the country.

Week 3 (01 July - 07 July)

Below normal minimum temperature is expected across the country.

Week 4 (08 July - 14 July)

Normal minimum temperature is expected across the country.

Summary

- The rainfall is likely to be below normal for week 3 and above normal for the rest of the weeks.
- The maximum temperature is likely to be below normal for week 1 and normal for all the remaining weeks.
- The minimum temperature is likely to be below normal for week 1, 3 and normal for week 2, 4.



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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