

## VERIFICATION OF THE SEECOF -29 SUMMER 2023 CLIMATE OUTLOOK FOR REPUBLIC OF NORTH MACEDONIA COMPARED TO THE 1981-2010 BASE PERIOD

Hydrometeorological Service of Republic of North Macedonia prepares regular seasonal climate analysis, based on the products of SEECOF seasonal forecasts and the forecast products from the SEVCCC. The present analysis is for the summer season 2023 (June, July and August), and it is based on the averages of the climatological period 1981-2010.

### ➤ SUMMER 2023

The mean seasonal air temperature during summer 2023 ranged between 16.1°C in Lazaropole to 26.1°C in Gevgelija. Spatial distribution of the mean seasonal air temperature is shown on Figure 1. The mean air temperatures anomaly was from -0.3°C in Lazaropole to 0.8°C in Skopje.

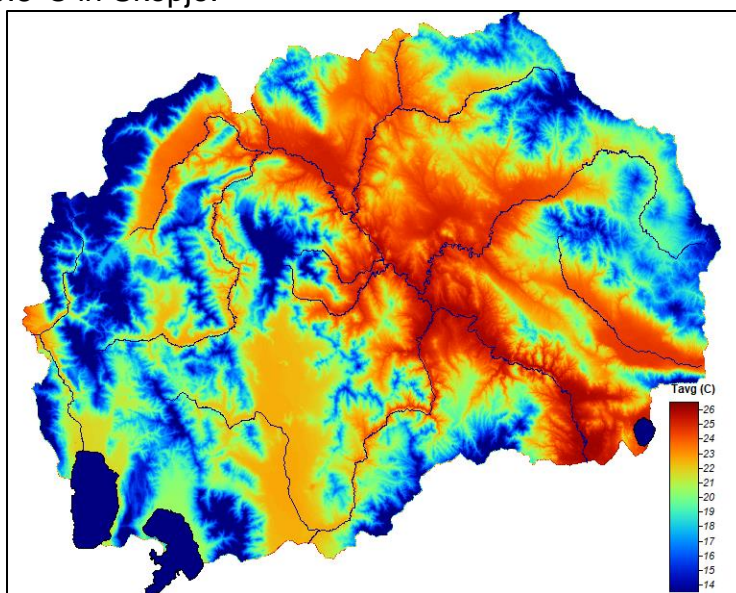


Figure 1: Spatial distribution of the mean seasonal air temperature (°C) during summer 2023

The mean maximum seasonal air temperature anomaly was above from 0.3°C in Prilep to 2.1°C in Mavrovo. The mean minimum seasonal air temperature anomaly was from 0.0°C in Lazaropole to 1.7°C in Mavrovo. The highest daily air temperature during summer 2023 was measured 42.1°C observed on 22<sup>nd</sup> of July in Demir Kapija. The lowest air temperature during summer 2021 was 4.2°C observed on 9<sup>th</sup> of August in Lazaropole.

According to percentile calculation method, the summer season 2023 was classified as normal to warm (Table1).

Rainfall totals were variable for this summer season. Spatial distribution of the precipitation sums is shown on Figure 2 and the anomaly compared to 1981-2010 base period on Figure 3.

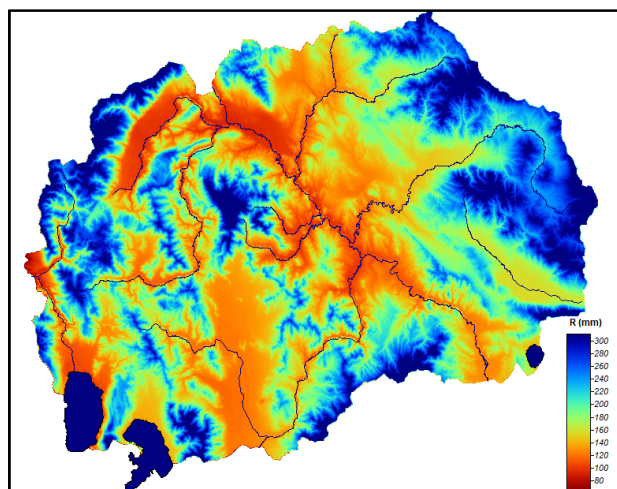


Figure 2: Spatial distribution of the precipitation sums (mm) for summer 2023

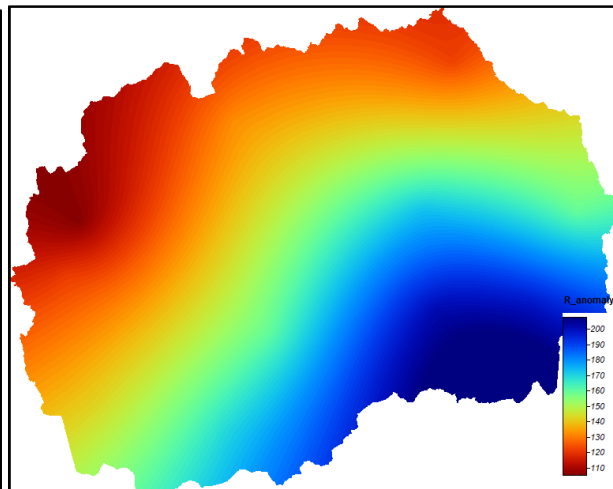


Figure 3: Spatial distribution of the precipitation sums anomaly (%) for summer 2023

The wettest day was 25<sup>th</sup> of June with 61.5mm measured in Berovo.

According to percentile calculation method, this summer precipitation regime was classified as normal to very wet (Table1).

Meteorological station	Temperature	Precipitation
Berovo	warm	very wet
Kriva Palanka	warm	wet
Stip	warm	normal
Strumica	warm	wet
Demir Kapija	warm	normal
Gevgelija	normal	normal
Skopje	warm	normal
Prilep	normal	very wet
Bitola	warm	normal
Ohrid	warm	wet
Lazaropole	normal	
Mavrovo	very warm	very wet

Table1: Air temperature and precipitation classification in Republic of North Macedonia for summer 2023 using percentile method compared to 1981-2010 base period

## Hydrometeorological Service of Republic of North Macedonia

Meteorology Department

Climatological analysis for summer 2023

The values of distribution of tercile for the air temperature and the precipitation sums are shown in table 2 and 3, respectively.

Air Temperature (°C)	summer	1981-2010	
	2023	33	67
Berovo	18.9	17.8	18.6
Kriva Palanka	20.3	19.3	20.0
Stip	24.6	23.0	24.0
Strumica	24.3	23.0	23.8
Demir Kapija	25.3	24.1	24.9
Gevgelija	26.1	25.0	26.0
Skopje	24.6	23.0	23.8
Prilep	22.1	21.3	22.1
Bitola	22.6	21.4	22.0
Ohrid	21.4	20.4	21.0
Lazaropole	16.1	15.7	16.2
Mavrovo	17.6	15.9	16.7

Table 2: Values of distribution of tercile for air temperature for period 1981-2010

Precipitation sums (mm)	summer	1981-2010	
	2023	33	67
Berovo	287.2	138.8	176.9
Kriva Palanka	254.0	132.4	207.3
Stip	82.5	87.6	131.9
Strumica	157.2	85.1	132.6
Demir Kapija	107.9	75.0	98.0
Gevgelija	65.0	61.9	136.0
Skopje	71.3	86.8	136.7
Prilep	234.0	75.3	135.8
Bitola	135.5	77.6	126.4
Ohrid	163.6	65.6	112.6
Lazaropole		118.5	190.4
Mavrovo	299.1	103.2	168.4

Table 3: Values of distribution of tercile for precipitation for period 1981-2010

The SEECOF-29 forecast product for the mean temperatures for summer season puts Republic of North Macedonia in a zone 1, which is likely to experience above average summer temperatures (20; 30; 50). Forecast for the precipitation for JJA 2023 categorized our country in zone 1 and no predictive signal (33; 34; 33).

A general judgment for the models evaluation for summer season is that the model was efficient concerning the temperature. Concerning the precipitation, evaluation of the model is difficult because of the variable precipitation regime. Nevertheless, the convective mountainous episodes were given as a warning.

Find also below a table presenting the general anomalies of SEECOF products and extreme events of the recorded summer weather.

Country	Seasonal temperature (JJA)		Seasonal precipitation (JJA)	
	Observed	SEEVCCC climate outlook for temperature	Observed	SEEVCCC climate outlook for precipitation
<b>REPUBLIC OF NORTH MACEDONIA</b>	Above average	Above average (20, 30, 50)	Normal to very wet on west mountainous part	No predictive signal (33, 34, 33)