

CLIMATOLOGICAL ANALYSIS

SEASON – WINTER 2023 /2024



BOSNIA AND HERZEGOVINA
FEDERATION OF BOSNIA AND HERZEGOVINA
FEDERAL HYDROMETEOROLOGICAL INSTITUTE

CLIMATOLOGICAL ANALYSIS SEASONE WINTER 2023.-2024.

Sarajevo, april 2024.

Mean air temperatures during the climatological winter 2023-2024 (1st December 2023. – 29th February 2024.) ranged between 4,3 °C in Livno and 11,1°C in Neum. On the mountain areas air temperatures were in the range of -3,3 °C on Bjelasnica to 2,7 °C on Ivan-sedlo. Temperature deviations from the normal values during the winter, which covers the period (1991.-2020.) were above normal. Deviation of the mean temperature than the average winter temperature ranged from 2,3 °C in Stolac to 5,0 °C in Gradacac. By percentage temperature values are classified into the category of very warm and extremely warm.

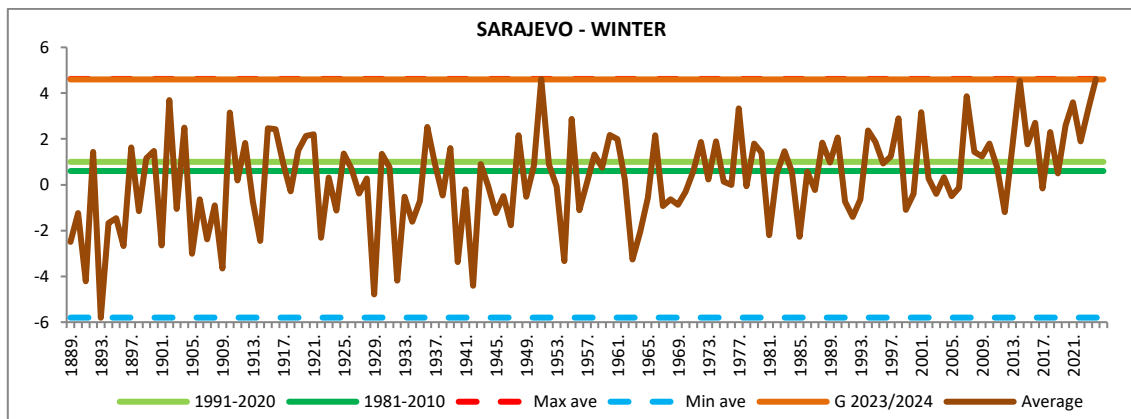
STATION	DEVIATION (°C)					PERCENTILES
	Alt	DECEMBER	JANUARY	FEBRUARY	WINTER	
Bihać	246	4,7	2,1	6,9	4,6	100
Bjelašnica	2067	2,3	0,9	4,5	2,6	100
Bugojno	562	4,2	1,7	5,7	3,9	96
Drvar	485	3,2	2,4	5,5	3,7	100
Gradačac	225	4,6	2,5	7,9	5,0	100
Ivan-sedlo	970	3,5	1,3	5,7	3,5	96
Livno	724	2,9	1,6	5,2	3,2	96
Mostar	99	2,5	1,8	4,3	2,9	100
Neum	9	2,5	1,5	3,7	2,6	96
Sarajevo	630	3,6	1,4	5,6	3,5	96
Sanski Most	154	3,2	1,8	6,2	3,7	100
Stolac	72	1,7	1,6	3,5	2,3	96
Tuzla	305	3,7	1,6	6,4	3,9	100
Zenica	345	2,7	1,4	5,6	3,2	96

Table 1 Deviation middle of winter air temperatures in relation to cli standard normal and the corresponding percentiles

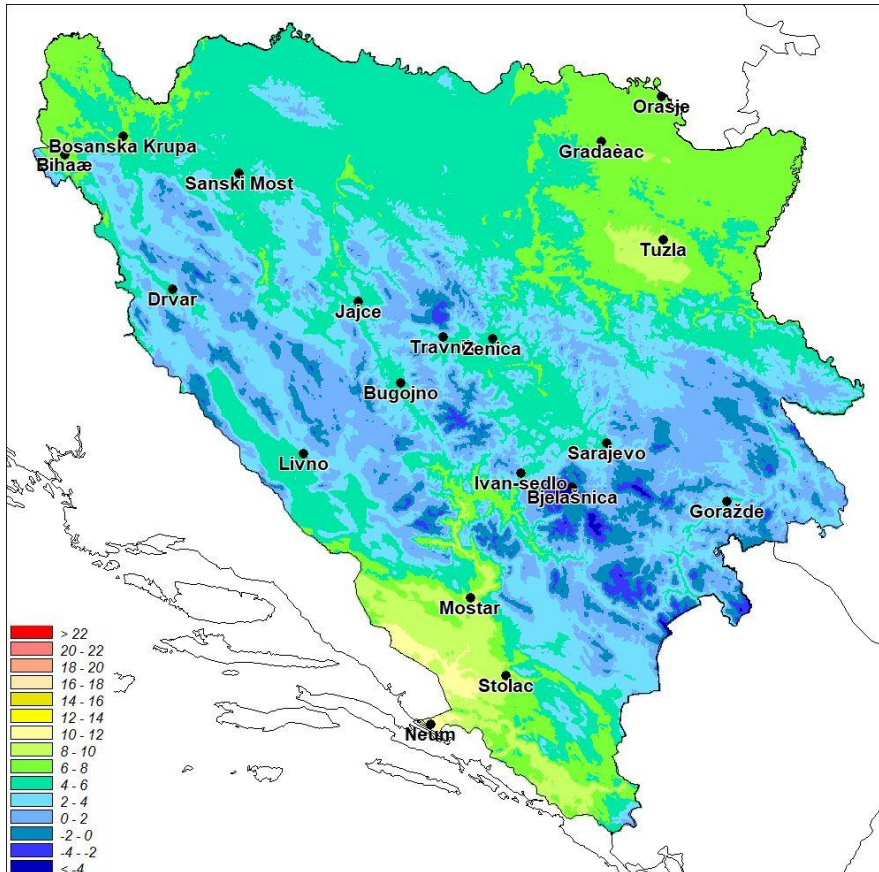
STATION	MOUNTH			STANICA	MOUNTH		
	December	January	February		December	January	February
Bihać	Red	Yellow	Red	Mostar	Red	Red	Red
Bjelašnica	Yellow	Green	Red	Neum	Red	Yellow	Red
Bugojno	Red	Yellow	Red	Sarajevo	Red	Green	Red
Drvar	Red	Yellow	Red	Sanski Most	Red	Yellow	Red
Gradačac	Red	Yellow	Red	Stolac	Yellow	Yellow	Red
Ivan-sedlo	Red	Green	Red	Tuzla	Red	Green	Red
Livno	Red	Green	Red	Zenica	Red	Yellow	Red



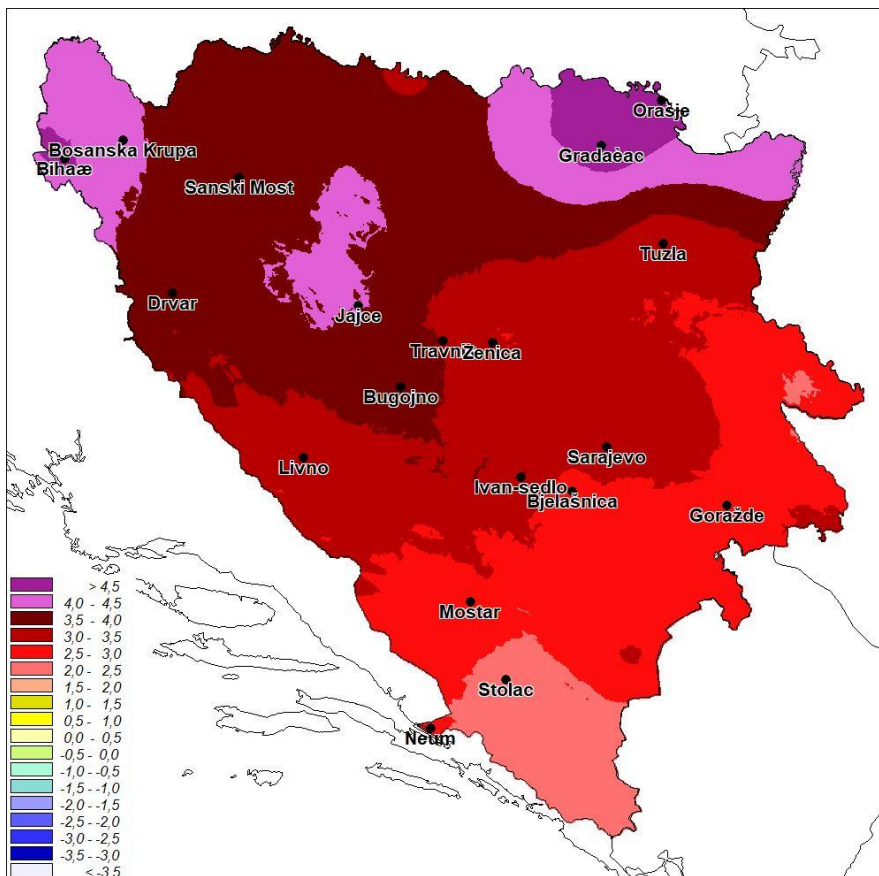
Table 2 Overview of marks mean temperature during the winter months by the method of percentiles



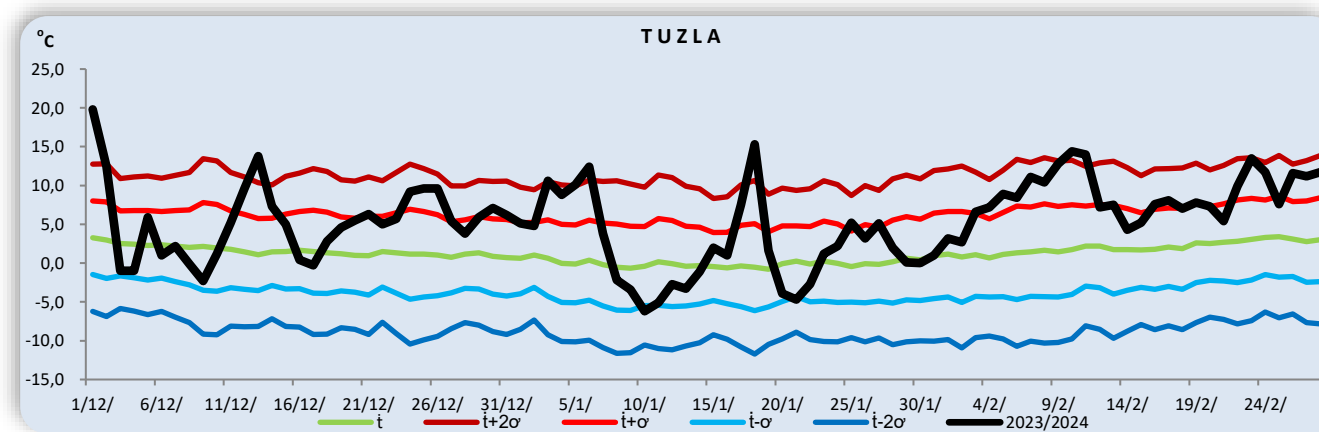
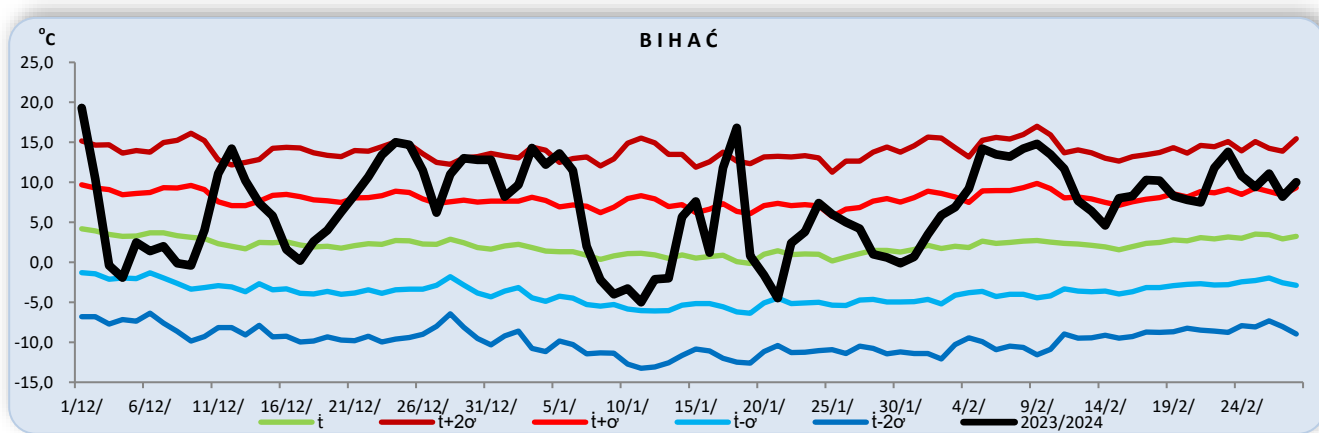
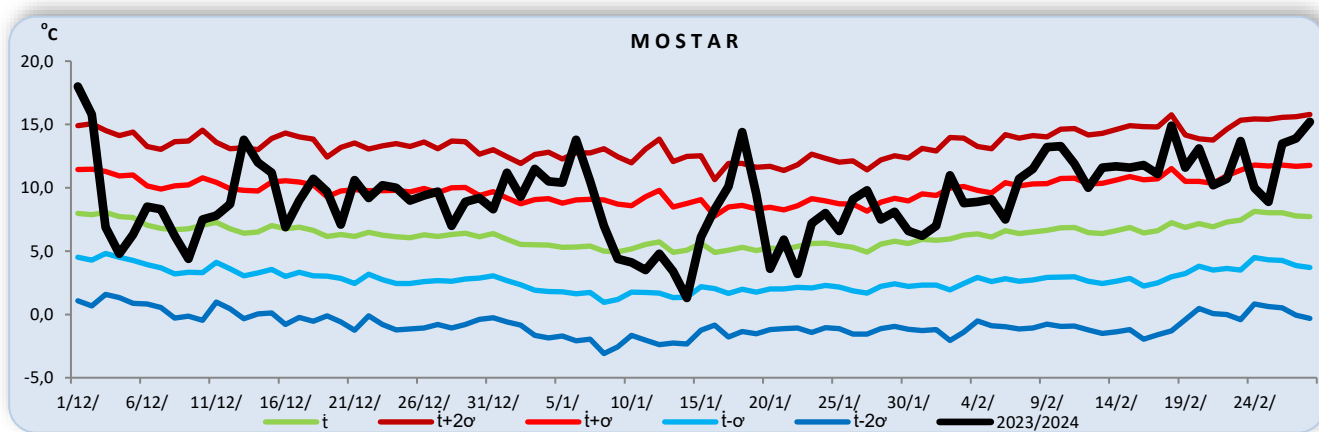
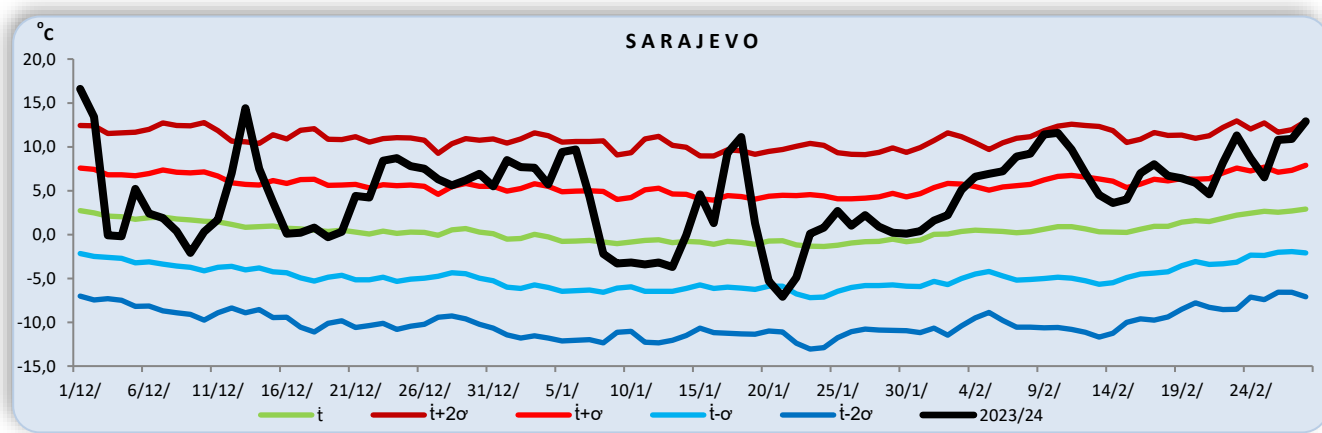
Graph 1 Winter temperature (°C) in Sarajevo



Map 1 Mean air temperature winter 2023.-2024. year (°C)



Map 2 Air temperature during winter 2023.-2024. using percentile method compared to the 1991-2020 base period



Graph 2-5 Mean daily air temperatures during winter 2023.-2024. year

Analysis of the monthly amount of precipitation expressed in % of average values shows that during the winter 2023 - 2024, deviations from normal precipitation amounts ranged from 53,1% in Tuzla to 110,8 % in Neum. By percentage amounts of precipitation are classified into categories of normal and wet.

The measured amounts of precipitation were in the range of 95,7 mm in Tuzla to 482,0 mm in Neum.

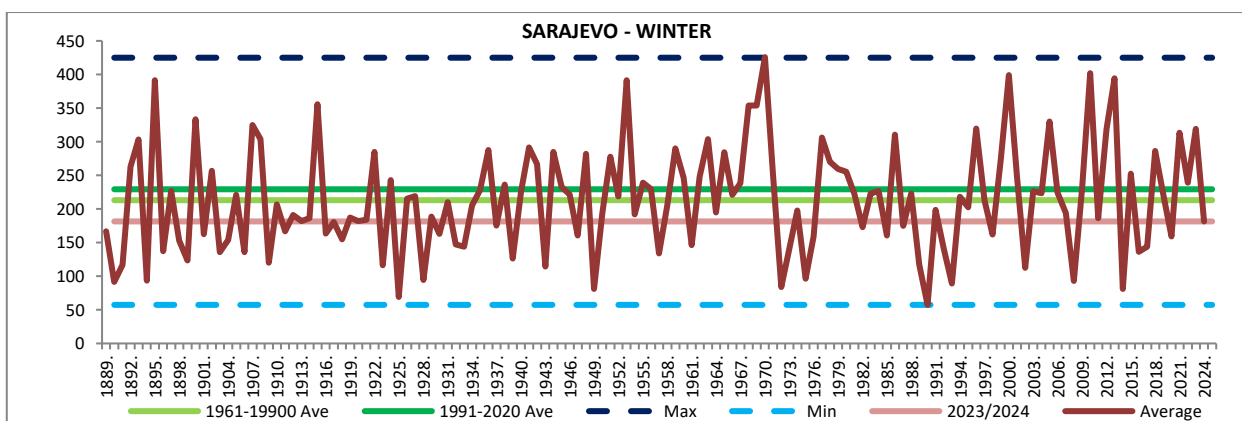
STATION	DEVIATION (%)					PERCENTILES
	Alt	DECEMBER	JANUARY	FEBRUARY	WINTER ¹	
Bihać	246	67,4	73,6	31,6	58,4	9
Bjelašnica	2067	74,0	133,4	93,3	98,2	54
Bugojno	562	69,7	92,1	77,0	78,6	32
Drvar	485	60,7	74,0	116,2	81,3	44
Gradacac	225	69,5	91,9	44,2	69,9	13
Ivan-sedlo	970	57,5	96,4	118,3	87,2	46
Livno	729	65,2	82,2	129,9	87,3	44
Mostar	99	34,3	44,6	133,2	65,2	21
Neum	9	54,0	69,1	90,8	110,8	66
Sarajevo	630	53,3	107,0	90,8	80,9	39
Sanski Most	154	80,8	74,9	15,4	59,0	5
Stolac	72	18,3	52,9	221,6	82,1	34
Tuzla	305	61,6	69,6	23,9	53,1	0
Zenica	345	61,8	66,7	49,4	59,5	9

Table 5 Deviation summer precipitation in relation to the climatological standard normal and the corresponding percentiles

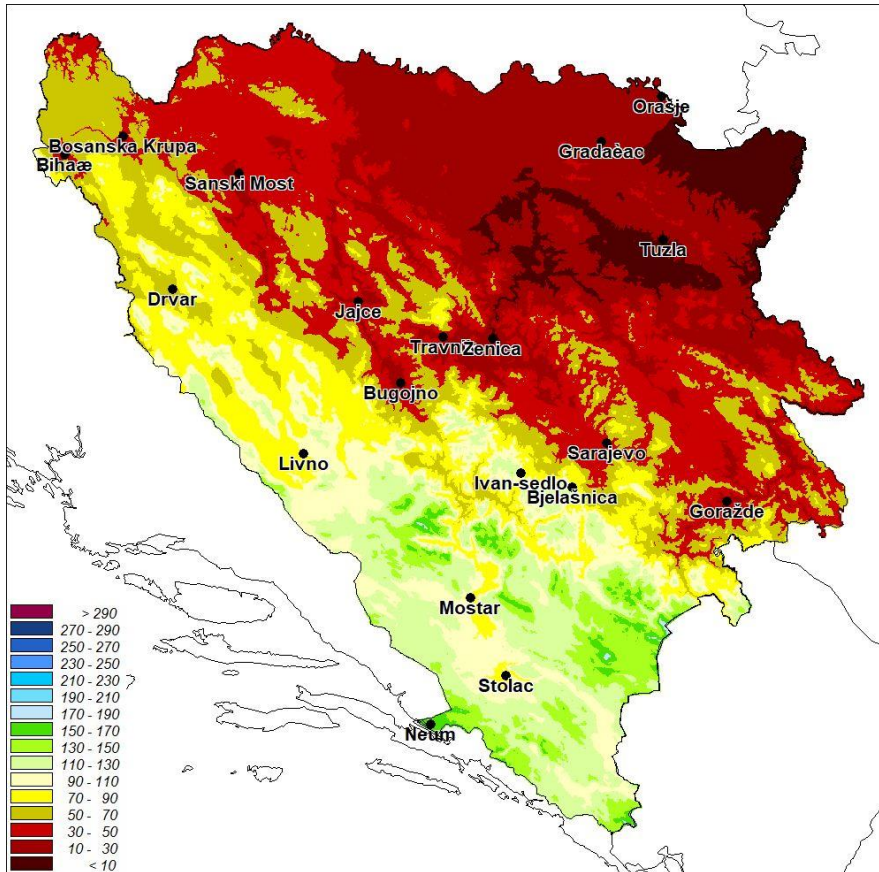
STATION	MOUNTH			STATION	MOUNTH		
	December	January	February		December	January	February
Bihać	Green	Green	Orange	Mostar	Green	Green	Green
Bjelašnica	Green	Light Blue	Green	Neum	Orange	Green	Dark Blue
Bugojno	Green	Green	Green	Sarajevo	Green	Green	Green
Drvar	Green	Green	Green	Sanski Most	Green	Green	Light Brown
Gradačac	Orange	Green	Orange	Stolac	Orange	Green	Green
Ivan-sedlo	Green	Green	Green	Tuzla	Green	Green	Dark Orange
Livno	Green	Green	Green	Zenica	Orange	Green	Green



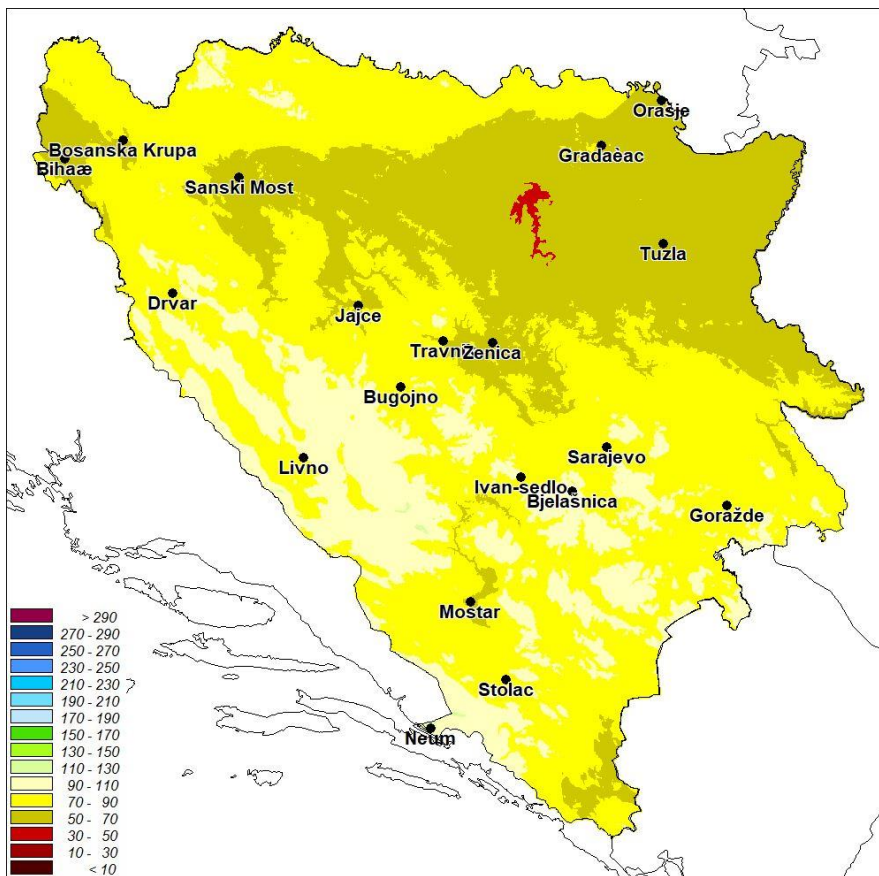
Table 6 Overview of marks on precipitation by month basis percentile



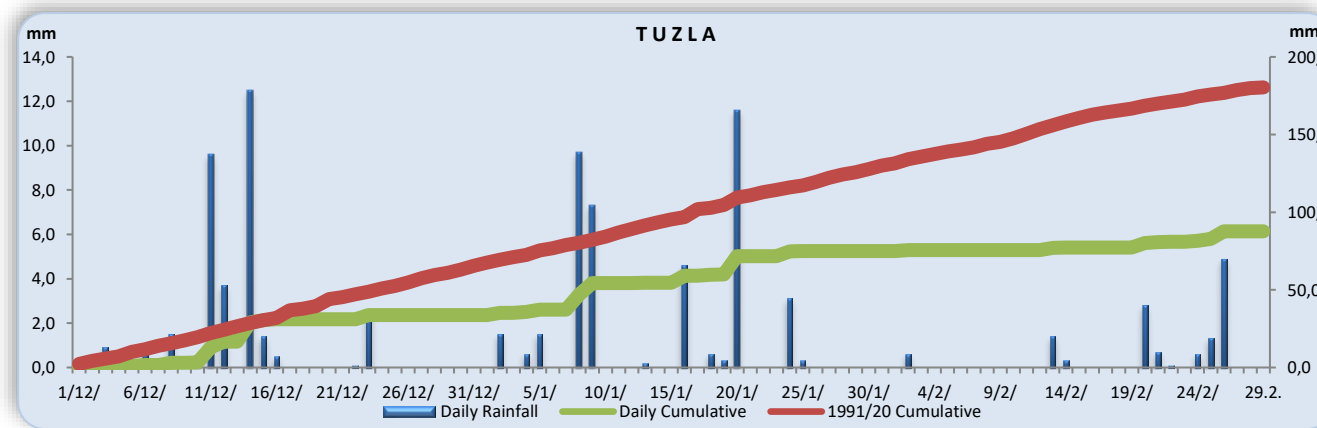
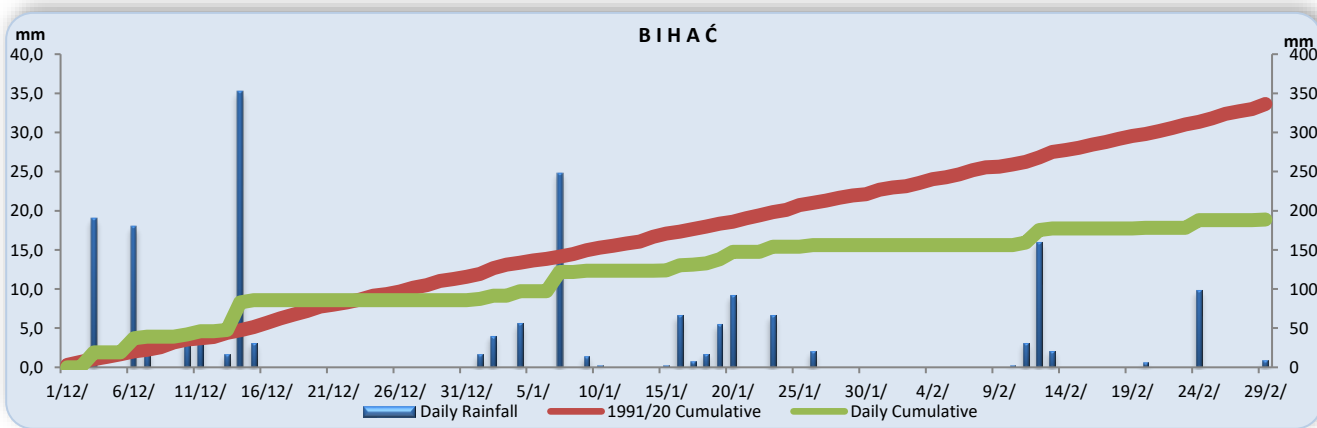
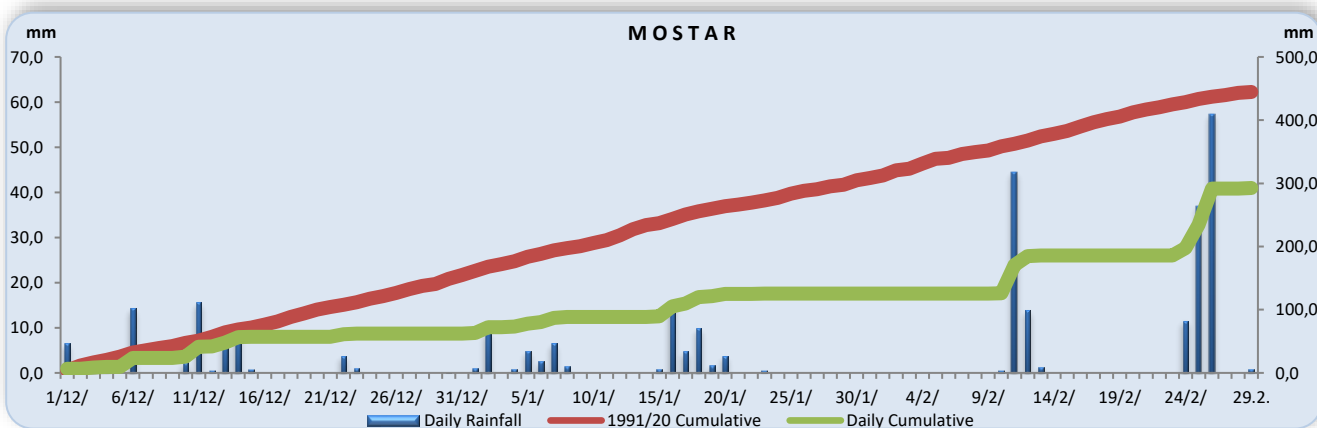
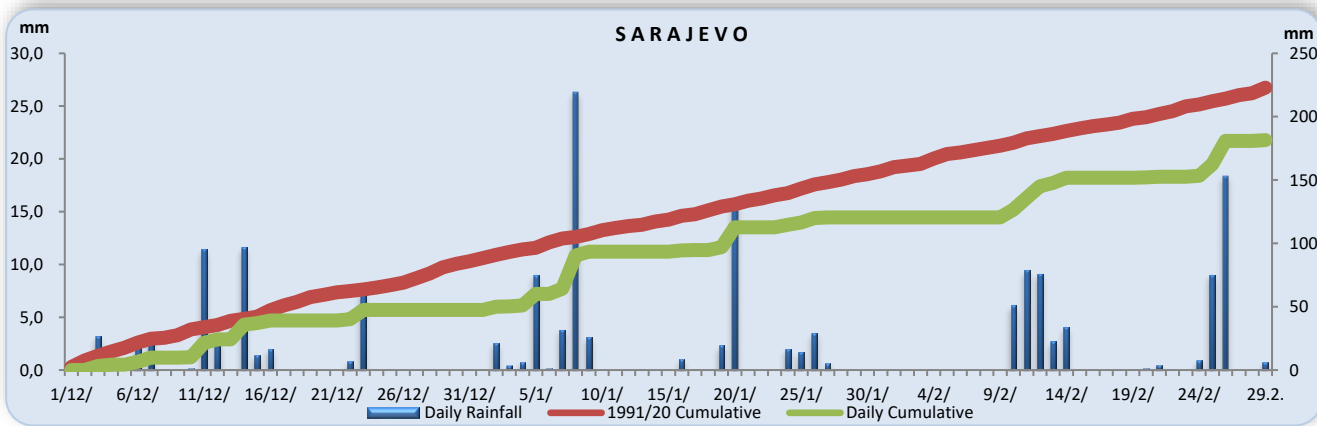
Graph 6 Winter precipitation (mm) in Sarajevo



Map 3 Amount precipitation – winter 2023.-2024. year (mm)



Map 4 Precipitation sums using percentile method during winter 2023.-2024. compared to the base period (1991 – 2020.)



Graph 5-8 daily and cumulative rainfall in the winter 2023. - 2024. year.

Season	22/23	Air Temperature (°C)				22/23	Precipitation sums (mm)			
Station	Rank*	33	50	66	Observed value	Rank**	33	50	66	Observed Value
Sarajevo	2	1,4	0,9	0,2	4,6	19	220	201	170	182
Mostar	1	6,8	6,2	5,8	9,4	25	565	386	333	293
Bihać	1	2,9	2,0	1,4	7,0	29	365	290	264	197
Tuzla	1	1,9	1,1	0,6	5,4	31	190	169	153	96
Zenica	2	1,6	0,8	0,6	4,7	29	181	158	145	106
Bugojno	2	0,8	0,3	-0,3	4,6	22	330	252	236	138
Gradačac	1	2,8	1,9	1,1	7,4	28	200	169	139	117
Livno	2	1,4	0,5	0,3	4,3	18	334	268	232	278
San Most	1	2,0	1,3	0,8	5,4	30	263	206	184	141
Bjelašnica	2	-5,3	-6,0	-6,5	-3,3	15	330	252	236	306

*Rank – 1981-2010. (period) – warmest season

**Rank – 1981-2010. (period) – highest seasonal precipitation

Country	Seasonal temperature DJF		Seasonal precipitation DJF		High Impact Events
	Observed	SEECOF - 30 climate outlook for temperature	Observed	SEECOF - 30 climate outlook for precipitation	
Bosnia and Herzegovina (FBiH)	Above normal in almost entire Bosnia and Herzegovina	Above normal (20, 30, 50) in entire Bosnia and Herzegovina	Below normal in almost entire Bosnia and Herzegovina;	Above normal (20,30,50)	-At meteorological stations Sarajevo, Bihać, Zenica and Mostar, the absolute temperature maximums for December were surpassed. -In February, snow cover was recorded only in mountainous areas. February 2024 was the warmest February since official measurements began at many stations. Climatological winter 2023/2024 is the warmest or second warmest winter since official measurements began.

¹ The actual amount of precipitation compared to the average sum

Photo: MS Bjelasnica – Zijad Omerovic

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