VERIFICATION OF THE SEECOF–24 WINTER 2020/2021 CLIMATE OUTLOOK AND SEASONAL BULLETIN FOR THE TERRITORY OF SERBIA

Belgrade, 12 April 2021

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Temperature

The SEECOF-24 outlook for the winter 2020/2021 in Serbia indicated warmer than normal temperature in Serbia with 50% probability relative to the 1981–2010 climatological base period (*Figure* A).

Climatological monitoring showed that the winter 2020/2021 was warm in entire Serbia, with above-normal temperature based on the tercile method (*Figure* B). The outlook for a warm winter was correct in entire Serbia.

OUTLOOK – WINTER **2020/2021**

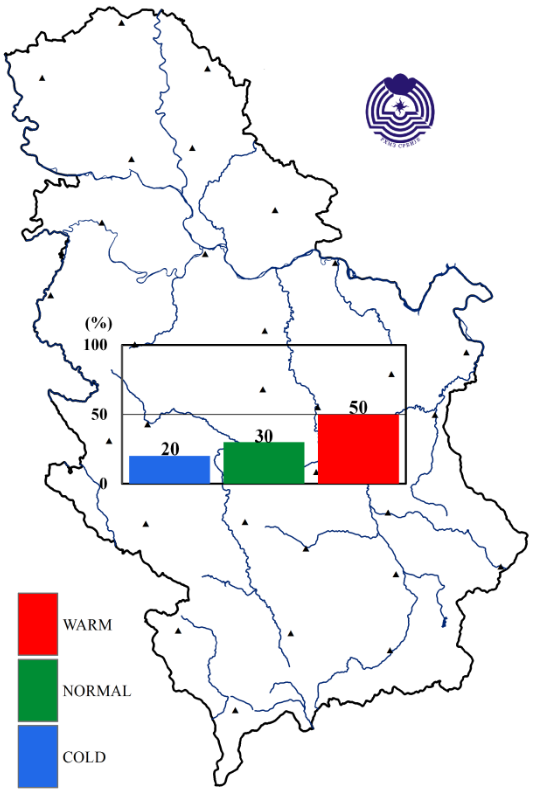

Figure A. SEECOF-24 - winter temperature outlook

MONITORING – WINTER **2020/2021**

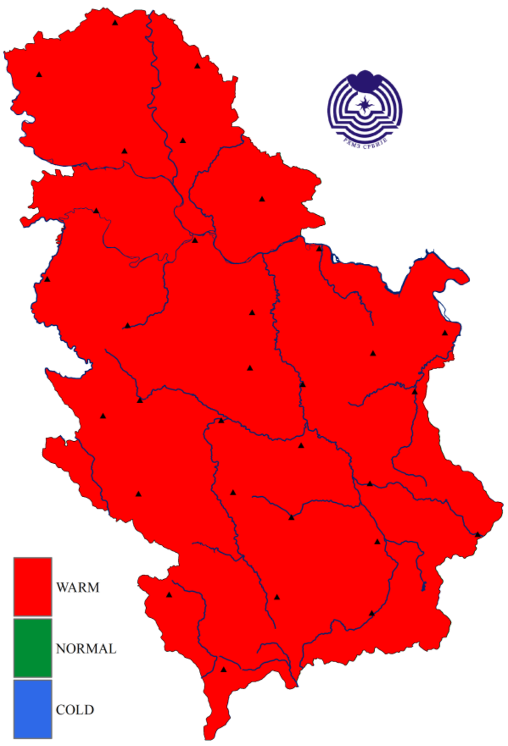

Figure B. Monitoring of the winter temperature using tercile method compared to the 1981-2010 base period

Precipitation

According to the SEECOF-24 outlook for the winter 2020/2021 approximately equal probabilities for below, near or above normal precipitation for Serbia were indicated, relative to the 1981–2010 climatological base period (*Figure* C), so climatology (average seasonal precipitation) was suggested.

Based on the climatological monitoring of precipitation, the winter of 2020/2021 was wet in most of Serbia. Average precipitation sums were in some parts of the western and central Serbia (*Figure* D). The outlook for a normal winter was not correct for most of Serbia.

OUTLOOK – WINTER **2020/2021**

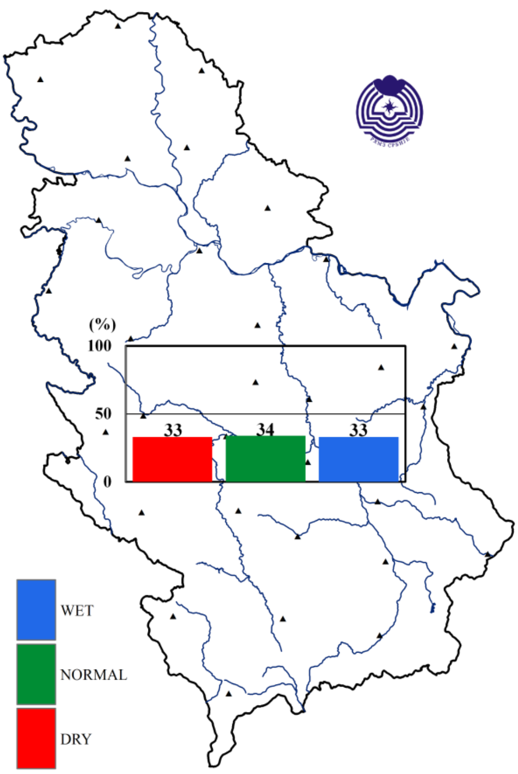

Figure C. SEECOF-24 - winter precipitation outlook

MONITORING – WINTER **2020/2021**

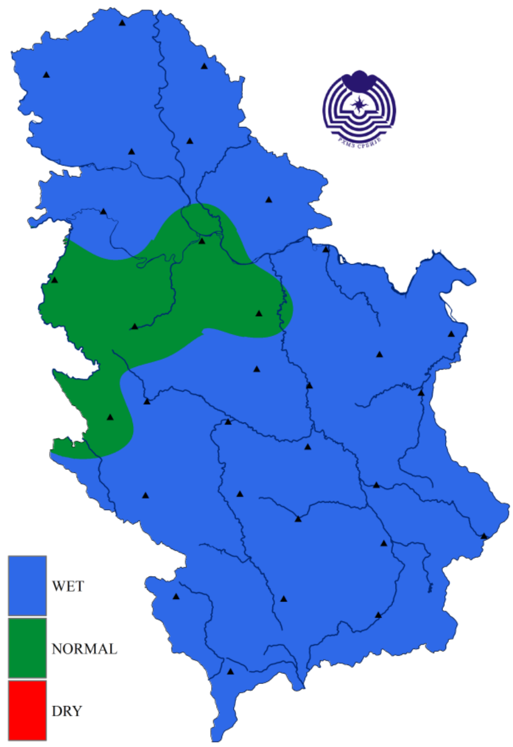

Figure D. Monitoring of the winter precipitation using tercile method compared to the 1981-2010 base period

Winter 2020/2021			Air Temperature (°C)			
Station	Rank*	Rank**	33	50	66	Observed value
Belgrade (1887-2021)	2	2	1.5	2.4	3.0	5.5
Palić (1945-2021)	4	3	-0.1	0.5	1.5	3.4
Sombor (1941-2021)	3	2	0.0	0.9	1.8	3.7
Novi Sad (1948-2021)	2	2	0.4	1.1	1.8	4.6
Zrenjanin (1943-2021)	2	2	0.3	1.0	1.8	4.2
Kikinda (1948-2021)	3	2	0.1	0.9	1.7	3.9
Banatski Karlovac (1985-2021)	2	2	0.7	1.4	2.0	4.2
Loznica (1952-2021)	2	2	0.7	1.8	2.5	5.1
Sremska Mitrovica (1925-2021)	3	2	0.4	0.9	1.6	4.1
Valjevo (1926-2021)	2	2	0.7	1.3	2.2	4.9
Kragujevac (1925-2021)	3	2	0.9	1.5	2.3	4.9
Smederevska Palanka (1939-2021)	4	3	0.7	1.5	2.1	4.4
Veliko Gradište (1926-2021)	3	2	0.4	1.0	1.6	3.7
Crni Vrh (1966-2021)	8	8	-3.6	-3.2	-2.1	-0.5
Negotin (1927-2021)	4	4	0.7	1.1	1.8	3.7
Zlatibor (1950-2021)	5	4	-2.2	-1.8	-0.8	1.3
Sjenica (1946-2021)	2	1	-3.4	-2.5	-2.0	0.4
Pozega (1952-2021)	3	2	-1.3	-0.7	0.3	2.3
Kraljevo (1926-2021)	2	2	0.5	1.1	2.1	4.5
Kopaonik (1949-2021)	7	6	-5.0	-4.6	-3.8	-2.5
Kursumlija (1952-2021)	2	2	0.3	1.0	1.5	3.9
Krusevac (1927-2021)	2	1	0.7	1.1	1.9	4.5

Cuprija (1948-2021)	3	2	0.4	1.2	1.7	4.2
Nis (1925-2021)	2	1	1.1	1.6	2.3	5.0
Leskovac (1948-2021)	2	1	0.3	0.9	1.7	4.4
Zajecar (1929-2021)	5	4	0.0	0.4	1.1	3.0
Dimitrovgrad (1945-2021)	2	1	-0.5	0.0	1.1	3.5
Vranje (1926-2021)	2	1	0.3	1.0	1.7	4.2

*Rank –period of stations work (warmest season)
**Rank – 1981-2021 period (warmest season)

Winter 2020/2021			**Precipitation sums (mm)**			
Station	Rank*	Rank**	33	50	66	Observed Value
Belgrade (1887-2021)	67	25	129.8	152.3	158.3	137.8
Palić (1936-2021)	25	14	90.1	104.4	121.5	131.8
Sombor (1931-2021)	23	9	104.2	114.8	123.0	147.8
Novi Sad (1945-2021)	28	13	109.9	119.1	133.5	141.5
Zrenjanin (1925-2021)	22	8	106.5	115.7	127.0	154.5
Kikinda (1925-2021)	23	7	98.0	105.5	121.2	142.8
Banatski Karlovac (1946-2021)	28	13	108.3	122.7	132.5	137.7
Loznica (1925-2021)	34	17	166.4	171.6	201.4	199.7
Sremska Mitrovica (1925-2021)	24	4	103.0	115.9	130.1	160.8
Valjevo (1926-2021)	43	21	149.5	157.6	173.3	158.6
Kragujevac (1925-2021)	25	12	113.0	120.0	134.0	158.9
Smederevska Palanka (1926-2021)	37	20	121.8	132.7	157.6	147.2
Veliko Gradište (1926-2021)	13	4	120.8	147.9	161.3	190.8

Crni Vrh (1966-2021)	5	5	127.6	143.8	170.7	214.0
Negotin (1941-2021)	12	9	105.9	137.3	186.9	244.2
Zlatibor (1950-2021)	19	15	204.3	225.1	237.8	236.6
Sjenica (1925-2021)	1	1	140.9	151.4	177.6	286.0
Pozega (1925-2021)	10	2	124.3	147.5	157.6	206.2
Kraljevo (1926-2021)	13	6	126.9	137.3	156.8	210.9
Kopaonik (1949-2021)	1	1	158.1	204.0	232.1	334.7
Kursumlija (1925-2021)	3	2	123.5	150.9	174.5	278.4
Krusevac (1925-2021)	10	8	115.1	133.2	155.6	198.0
Cuprija (1947-2021)	9	6	127.5	148.1	163.1	210.3
Nis (1925-2021)	1	1	117.7	137.1	150.6	268.1
Leskovac (1925-2021)	1	1	127.3	150.4	161.8	299.5
Zajecar (1925-2021)	8	5	103.7	136.3	146.6	224.8
Dimitrovgrad (1926-2021)	2	1	111.6	120.4	143.9	291.0
Vranje (1926-2021)	2	1	111.7	126.9	137.1	249.6

*Rank –period of stations work (highest seasonal precipitation)
**Rank – 1981-2021 period (highest seasonal precipitation)

Country	Seasonal temperature DJF		Seasonal precipitation DJF		High Impact Events
	Observed	SEECOF-24 climate outlook for temperature	Observed	SEECOF-24 climate outlook for precipitation	
Serbia (1)	Above normal in entire Serbia	**Above-normal** (20, 30, 50) in entire Serbia	Above normal in most of Serbia	**No predictive signal** (33, 34, 33) in entire Serbia	❖ ***3rd warmest winter for Serbia since 1951, and 2nd warmest for Belgrade since 1888*** ❖ ***2nd or 3rd warmest winter for most places since record-keeping began*** ❖ ***Record-breaking minimum number of frost days in Kikinda, Novi Sad, Valjevo, Kragujevac, Kraljevo, Kursumlija and Dimitrovgrad*** ❖ ***4th wettest winter for Serbia since 1951*** ❖ ***Record-breaking wet winter for Nis, Leskovac, Sjenica and Kopaonik,*** ***2nd wettest for Dimitrovgrad and Vranje, and 3rd wettest for Kursumlija since the record-keeping began*** ❖ ***Record-breaking number of winter days with daily precipitation sum of 20 mm and more for Nis, Leskovac and Dimitrovgrad***

Analysis of the 2020/2021 winter season for Serbia relative to the 1981-2010 base period

Warm and wet winter, with air temperature and precipitation sums extremely above the upper tercile boundary (*Figure 1*) based on the tercile distribution relative to the 1981-2010 base period.

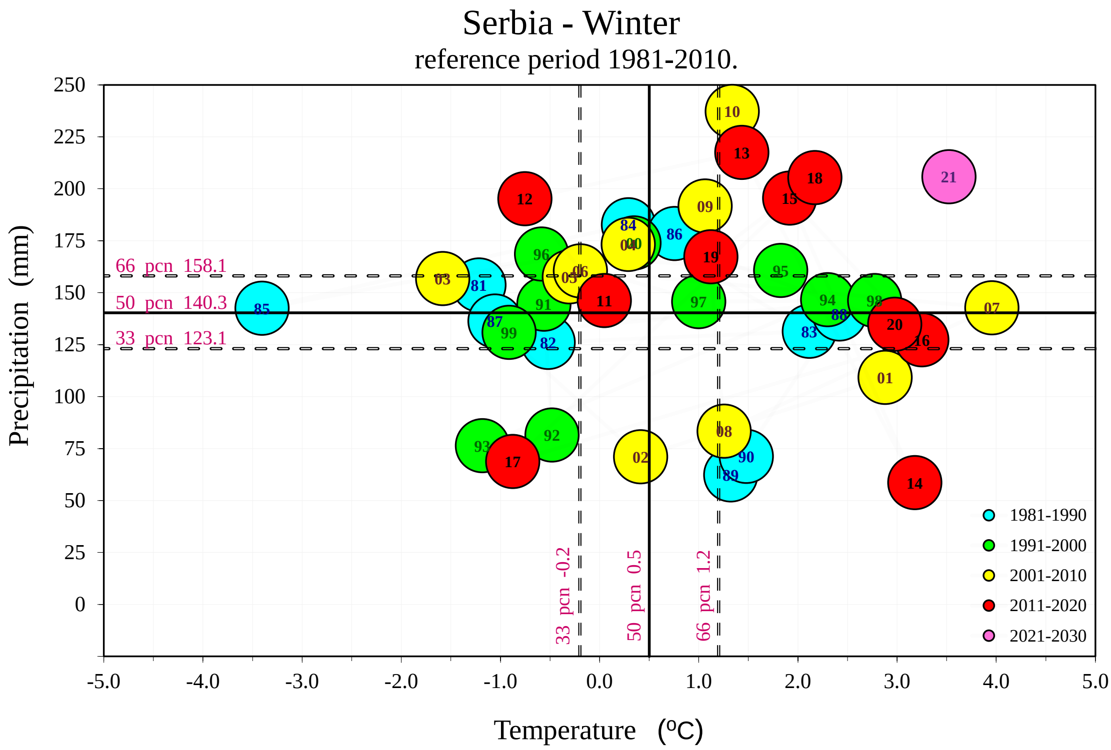

Figure 1. Assessment of precipitation sums and mean air temperature for winter in Serbia based on the accompanying terciles relative to 1981-2010 base period

Temperature

Winter 2020/2021 ranks as the 3rd **warmest for Serbia since 1951** and 2nd **warmest for Belgrade since 1888**. In Serbia observed winter mean air temperature was 3.5°C, which is 3.0°C above the average for the 1981-2010 period *(Figure 2).* In Belgrade, winter mean air temperature of 5.5°C (*Figure 3*) is 3.1°C above the average for the 1981-2010 period.

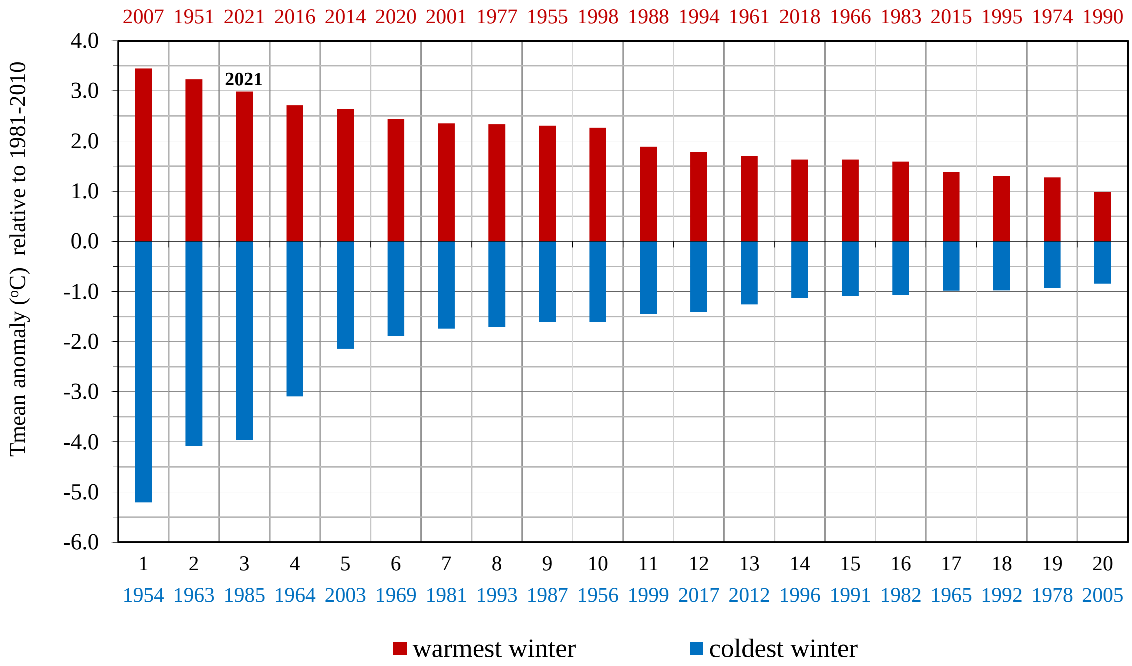

Figure 2. Rank of twenty warmest and coldest winter seasons in Serbia for the 1951-2021 period

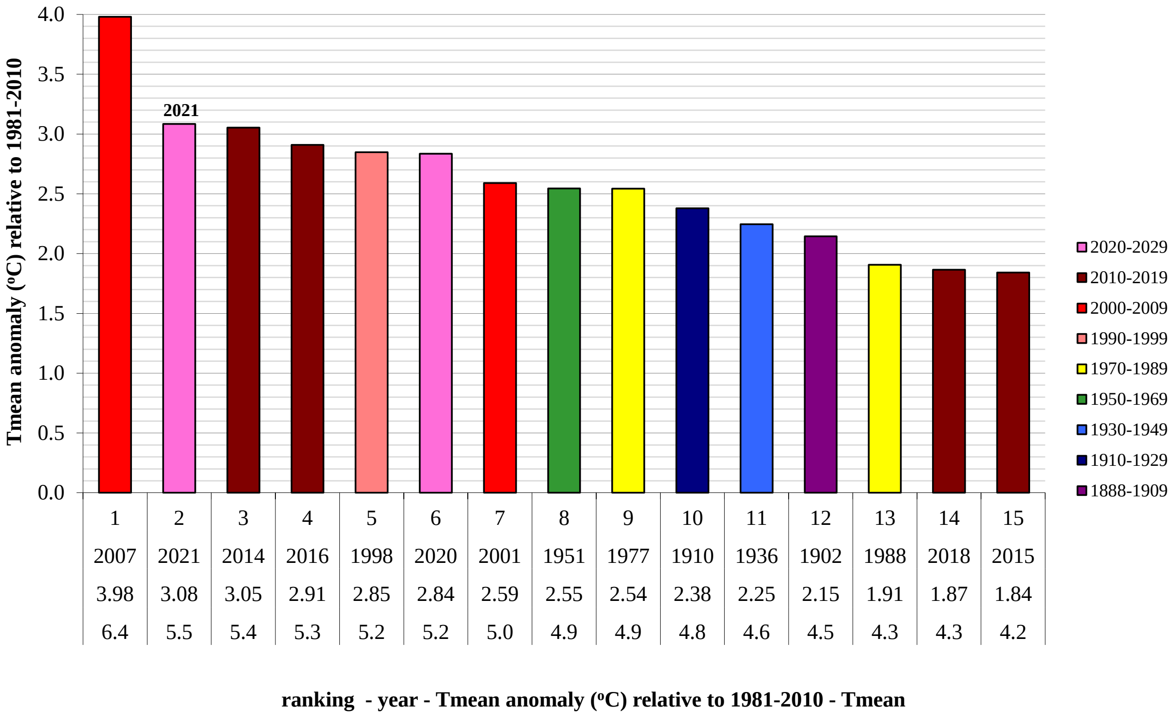

Figure 3. Rank of the warmest winters in Belgrade for the 1888-2021 period

Winter 2020/21 was second and third warmest for most places (*Table 1)* since the record keeping began.

Table 1. Mean seasonal air temperature during the warmest winter seasons

Station	**1.** (ºC) (year)	**2.** (ºC) (year)	**3.** (ºC) (year)
Belgrade	6.4 (2007)	**5.5 (2021)**	5.4 (2014)
Novi Sad	4.9 (2007)	**4.6 (2021)**	4.1 (1951)
Sombor	4.9 (2007)	3.8 (1951)	**3.7 (2021)**
Kikinda	4.5 (2007)	4.0 (1951)	**3.9 (2021)**
Zrenjanin	5.0 (2007)	**4.2 (2021)**	4.2 (1951)
B. Karlovac	4.6 (2007)	**4.2 (2021)**	4.1 (1998)
S. Mitrovica	4.6 (2007)	4.3 (1936)	**4.1 (2021)**
V. Gradište	4.2 (2007)	4.2 (1951)	**3.7 (2021)**
Valjevo	5.2 (2007)	4.9 (1951)	**4.7 (2021)**
Kragujevac	5.3 (2007)	5.2 (1951)	**4.9 (2021)**
Niš	5.4 (1951)	**5.0 (2021)**	4.8 (2007)
Loznica	5.8 (2007)	**5.1 (2021)**	5.0 (2016)
Sjenica	1.5 (1951)	**0.4 (2021)**	0.3 (2016)
Ćuprija	4.3 (2007)	4.3 (1951)	**4.2 (2021)**
Kruševac	4.9 (1951)	**4.5 (2021)**	4.4 (2007)
Požega	2.7 (2007)	2.3 (1977)	**2.3 (2021)**
Kraljevo	4.6 (2007)	**4.5 (2021)**	4.5 (1951)
Kuršumlija	3.9 (2007)	**3.9 (2021)**	3.8 (2016)
Leskovac	5.3 (1951)	**4.4 (2021)**	4.4 (1955)
Dimitrovgrad	4.0 (1951)	**3.5 (2021)**	3.1 (1955)
Vranje	4.7 (1951)	**4.2 (2021)**	4.0 (1955)

Mean air temperature in winter ranged from 2.3ºC in Pozega to 5.5ºC in Belgrade, and on the mountains from -2.5ºC at Kopaonik to 1.3ºC at Zlatibor (*Figure 4*).

In winter, departure of the mean air temperature from the normal[1], for the 1981-2010 base period, ranged from 2.4ºC in Zajecar to 3.4ºC in Novi Sad. Valjevo and Leskovac. and in the upland from 1.8ºC at Kopaonik to 3.2ºC in Sjenica (Figure *5*).

Based on the percentile method, mean winter air temperature was in the categories of extremely and very warm in entire Serbia apart from Crni Vrh where it was in the warm category (*Figure 6*).

Based on the tercile method, mean winter air temperature was in the warm category across the entire country (*Figure 7).*

[1] Term normal refers to climatological standard normal, that is, the average value of a particular climate event, calculated for the period from 1 January 1981 to 31 December 2010

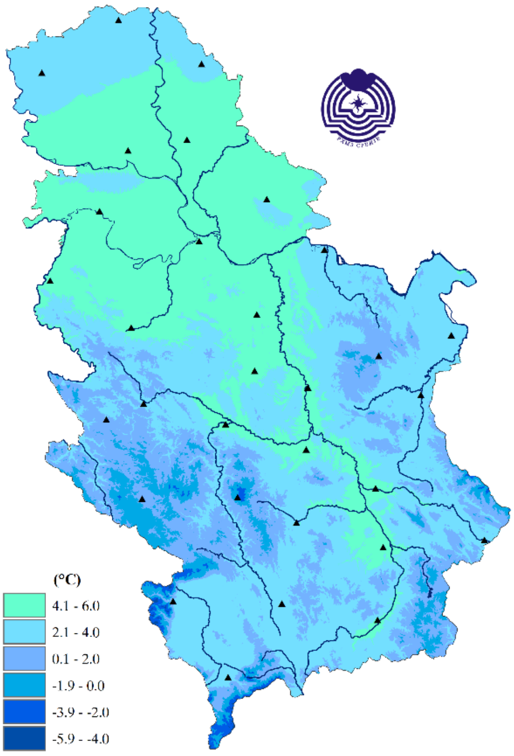

Figure 4 Spatial distribution of mean winter air temperature

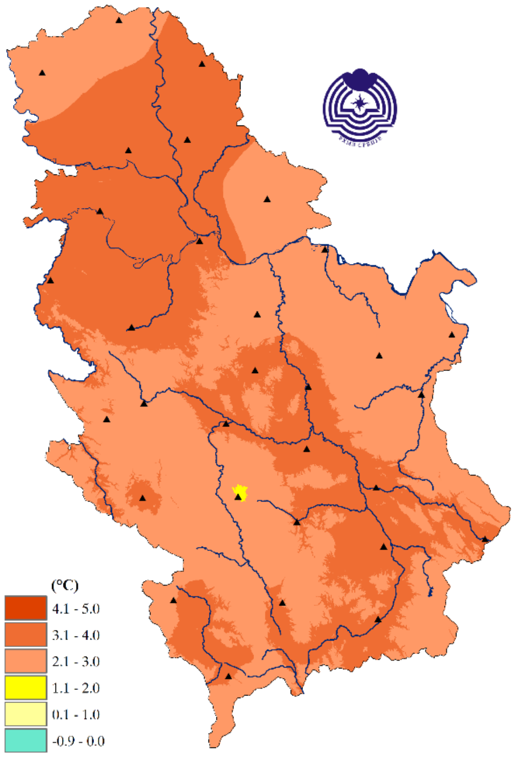

Figure 5. Spatial distribution of mean winter air temperature anomaly from the normal

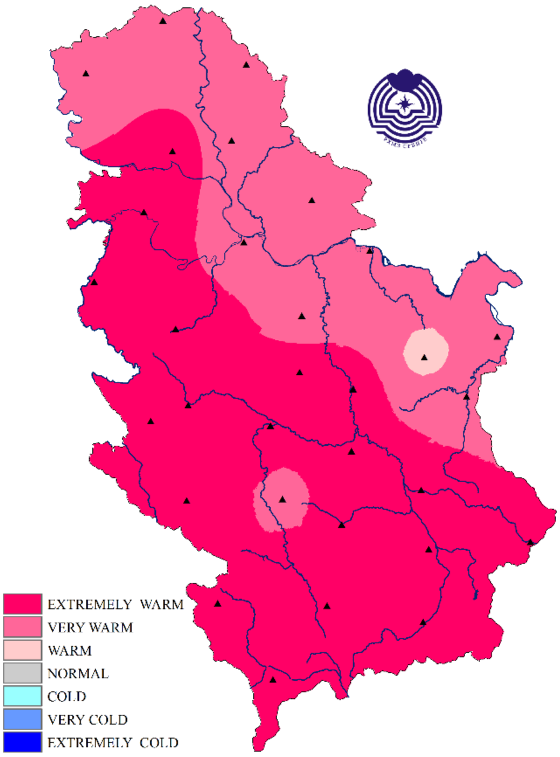

Figure 6. Spatial distribution of mean winter air temperature according to the percentile method

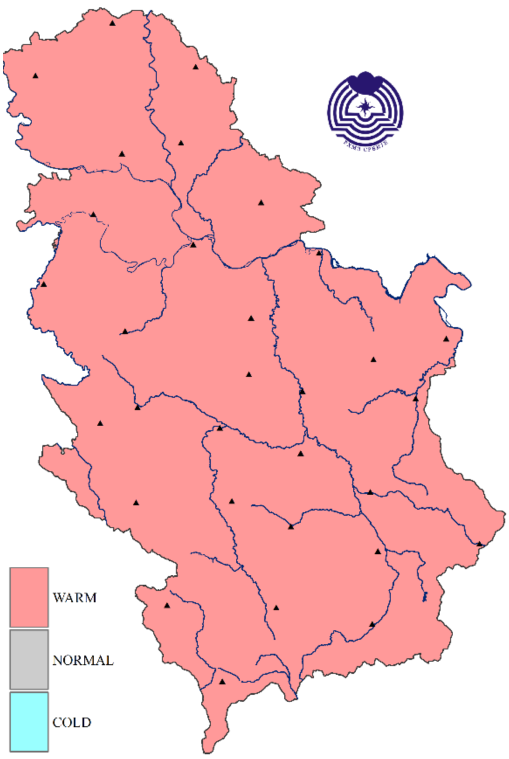

Figure 7. Spatial distribution of mean winter air temperature according to the tercile method

The highest winter air temperature of 22.6ºC was measured in Zajecar on February 23 and 26.

Number of ice days, with the maximum daily air temperature less than 0ºC, was 6 to 15 days below the average. Number of ice days ranged from 2 days in Negotin to 9 days in Dimitrovgrad and on the mountains, their number ranged from 17 days in Sjenica to 36 days at Kopaonik (*Figure 8*).

The lowest winter air temperature of -20.5ºC was measured in Sjenica on February 16.

Number of frost days, with the minimum daily air temperature below 0ºC, ranged from 23 days in Belgrade to 56 days in Pozega, and on the mountains from 51 days at Zlatibor to 82 days at Kopaonik. Number of frost days was 18 to 33 days below the winter average, and on the mountains from 4 to 22 days below the average (*Figure 9).* The minimum number of ice days was surpassed at seven main meteorological stations in Serbia: Kikinda, Novi Sad, Valjevo, Kragujevac, Kraljevo. Kursumlija and Dimitrovgrad.

Number of days with severe frost, with minimum daily air temperature below -10ºC, was up to six in the lowland and on the mountains, their number ranged from 9 days at Zlatibor and Crni Vrh to 18 days at Kopaonik, which is 2 to 15 days below the average.

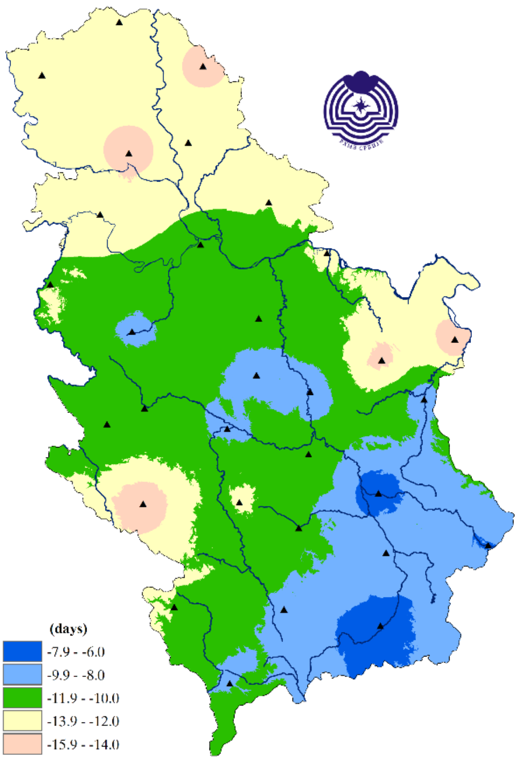

Figure 8. Deviation of the number of ice days from the normal

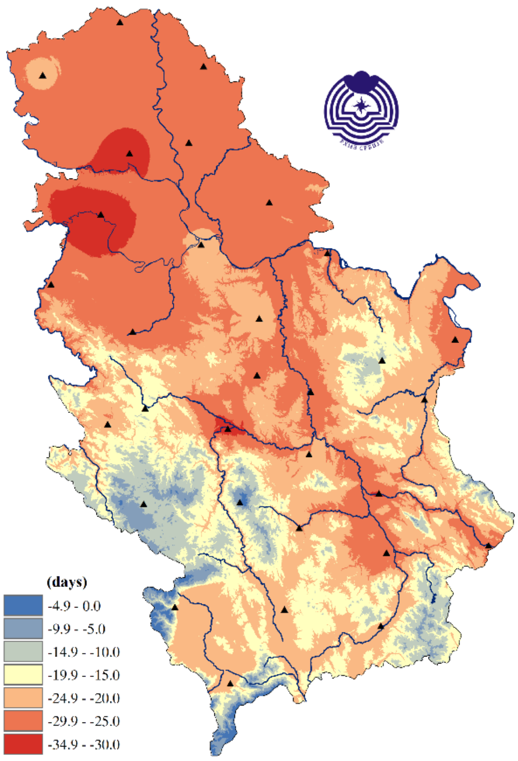

Figure 9. Deviation of the number of frost days from the normal

In Belgrade, warmer periods during which mean, maximum and minimum air temperature were above the multiannual average were recorded in the middle of the first and during third decade of December, in the first and last decade of January, and during most part of first, beginning of the second as well as most of third decade of February. Colder periods with the air temperature below the multiannual average were recorded at the beginning of December, at the end of second decade of January and middle of February (*Figure 10*).

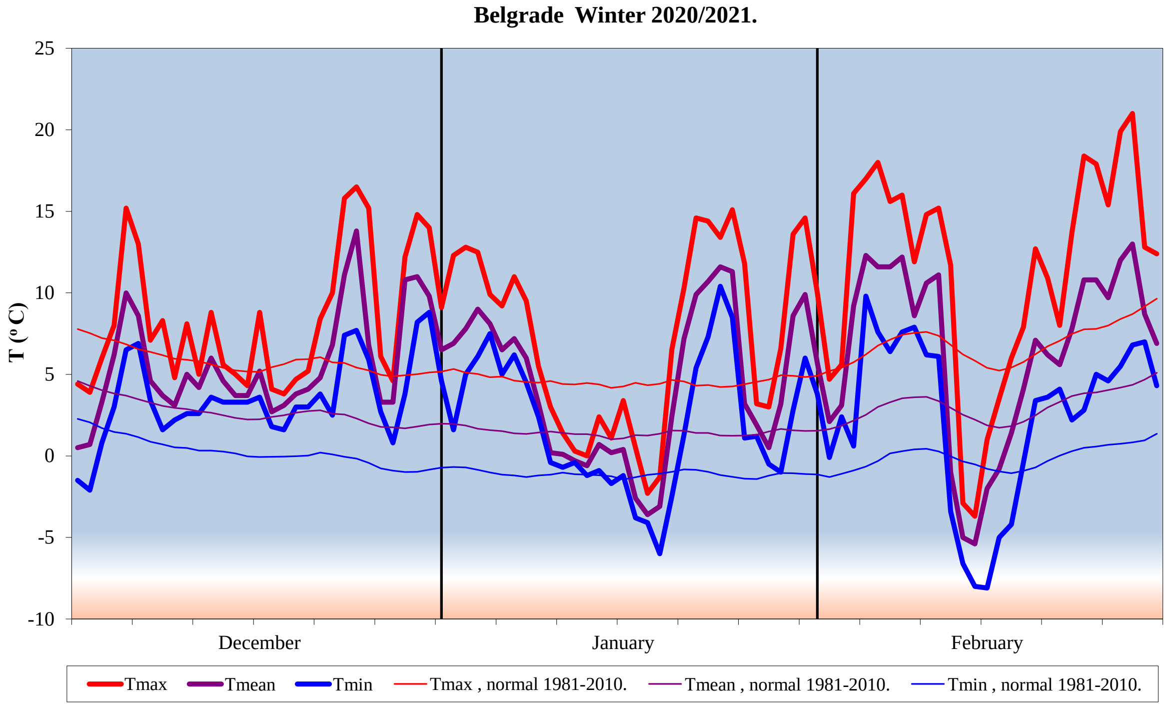

Figure 10. Three–month course of the mean, maximum and minimum daily air temperature in Belgrade

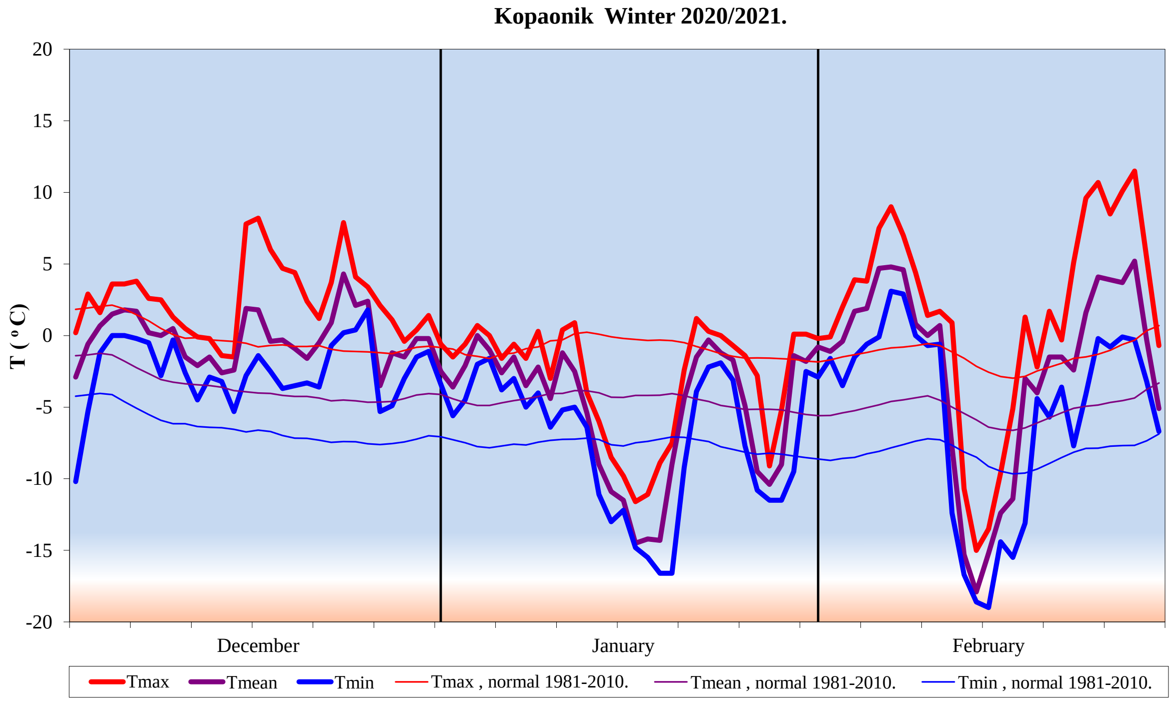

Figure 11. Three–month course of the mean, maximum and minimum daily air temperature at Kopaonik

Cold wave / heat wave

One cold wave[2] was registered during winter 2020/2021, lasting from 13 to 17 February in Vranje and Dimitrovgrad. Several heat waves[3] were observed during winter season. The first heat wave was recorded from 14 to 19 December at Kopaonik. The second was observed at 5 stations at the end of December and beginning of January, the third heat wave was registered from 20 to 24 January in Sombor and Novi Sad, the fourth was recorded at 10 station at the beginning of February and the fifth heat wave was observed at the end of February (*Chart 1*).

Chart 1.

HEAT WAVES / COLD WAVES IN SERBIA - WINTER 2020/2021

(reference period 1981-2010)

DECEMBER

station / day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
PALIĆ																															
SOMBOR																															
KIKINDA																															
ZRENJANIN																															
NOVI SAD																															
SR. MITROVICA																															
BEOGRAD																															
LOZNICA																															
VALJEVO																															
V. GRADISTE																												VW	VW	EW	EW
SM. PALANKA																															
KRAGUJEVAC																															
KRALJEVO																															
POZEGA																															
ZLATIBOR																															
CUPRIJA																															
KRUSEVAC																												VW	VW	EW	VW
NEGOTIN																															
ZAJECAR																															
CRNI VRH																															
KOPAONIK															VW	EW	VW	VW	VW												
SJENICA																															
NIS																															
VRANJE																												VW	EW	EW	VW
DIMITROVGRAD																															
LESKOVAC																												VW	VW	EW	VW
KURSUMLIJA																															
B. KARLOVAC																												VW	VW	VW	VW

JANUARY

station / day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
PALIĆ																															
SOMBOR																				VW	VW	VW	VW	VW							
KIKINDA																															
ZRENJANIN																															
NOVI SAD																				VW	EW	EW	VW	VW							
SR. MITROVICA																															
BEOGRAD																															
LOZNICA																															
VALJEVO																															
V. GRADISTE	VW	VW	VW	VW	VW	VW																									
SM. PALANKA																															
KRAGUJEVAC																															
KRALJEVO																															
POZEGA																															
ZLATIBOR																															
CUPRIJA																															
KRUSEVAC	VW	VW	EW																												
NEGOTIN																															
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CRNI VRH																															
KOPAONIK																															
SJENICA																															
NIS																															
VRANJE	VW	VW	VW	VW	VW	EW																									VW
DIMITROVGRAD																															
LESKOVAC	VW	VW	EW																												
KURSUMLIJA																															
B. KARLOVAC	VW	VW	VW																												

FEBRUARY

station / day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
PALIĆ																						VW	EW	EW	EW	EW		
SOMBOR																						VW	VW	VW	EW	EW		
KIKINDA																						VW	VW	VW	EW	EW		
ZRENJANIN																						VW	VW	VW	EW	EW		
NOVI SAD			EW	EW	EW	EW	VW																					
SR. MITROVICA																												
BEOGRAD																												
LOZNICA																												
VALJEVO			VW	VW	EW	VW	EW																					
V. GRADISTE																												
SM. PALANKA																												
KRAGUJEVAC																												
KRALJEVO																												
POZEGA			VW	EW	EW	VW	EW	VW	VW	EW																		
ZLATIBOR	VW	VW	EW	VW	EW	EW	EW															VW	EW	VW	VW	EW		
CUPRIJA																												
KRUSEVAC																												
NEGOTIN																												
ZAJECAR																												
CRNI VRH		VW	EW	VW	EW	EW	VW															EW	VW	VW	EW	EW		
KOPAONIK																						EW	EW	VW	EW	EW		
SJENICA		VW	EW	EW	EW	EW	EW	VW														EW	EW	VW	EW	EW	VW	
NIS																												
VRANJE	EW	EW	EW	EW	EW	EW	VW	VW	VW	VW			VC	VC	VC	EC	VC											
DIMITROVGRAD	EW	VW	EW	EW	EW	EW	VW	EW	VW	VW			VC	VC	EC	EC	VC					VW	VW	VW	VW	EW	VW	
LESKOVAC	EW	VW	EW	EW	EW	EW																						
KURSUMLIJA	VW	VW	EW	EW	EW	EW	EW	VW																				
B. KARLOVAC																												

EW	EXTREMELY WARM
VW	VERY WARM
VC	VERY COLD
EC	EXTREMELY COLD

[2] Coldwave, according to the percentile method, is a period during which minimum daily air temperature is in the very cold and extremely cold categories for 5 days or longer
[3] Heat wave, according to the percentile method, is a period during which maximum daily air temperature is in the very warm and extremely warm categories for 5 days or longer

Precipitation

Winter of 2020/21 ranks as the 4th wettest for Serbia (*Figure 12*) since 1951. **It was the wettest for Nis** (*Figure 13*), **Leskovac** (*Figure 14*), **Sjenica** *(Figure 15)* **and Kopaonik** *(Figure 16)*, **2nd wettest for Dimitrovgrad and Vranje**, and **3rd wettest for Kursumlija since the record keeping began.**

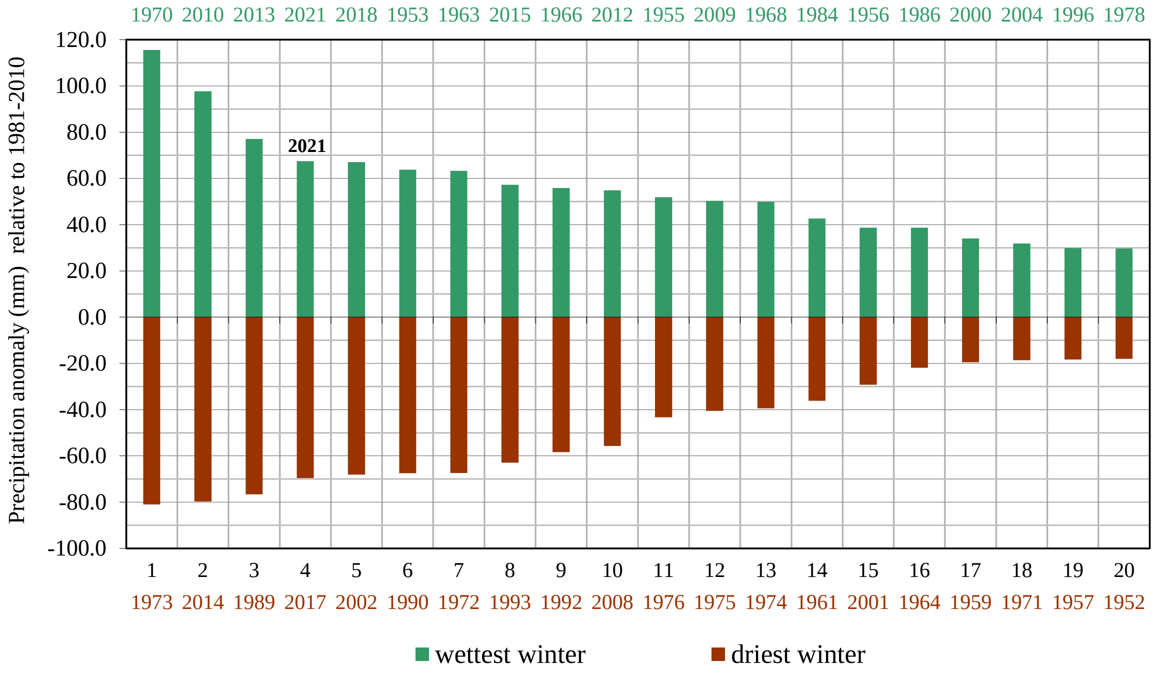

Figure 12. Rank of the wettest and driest winter seasons for Serbia for the 1951-2021 period

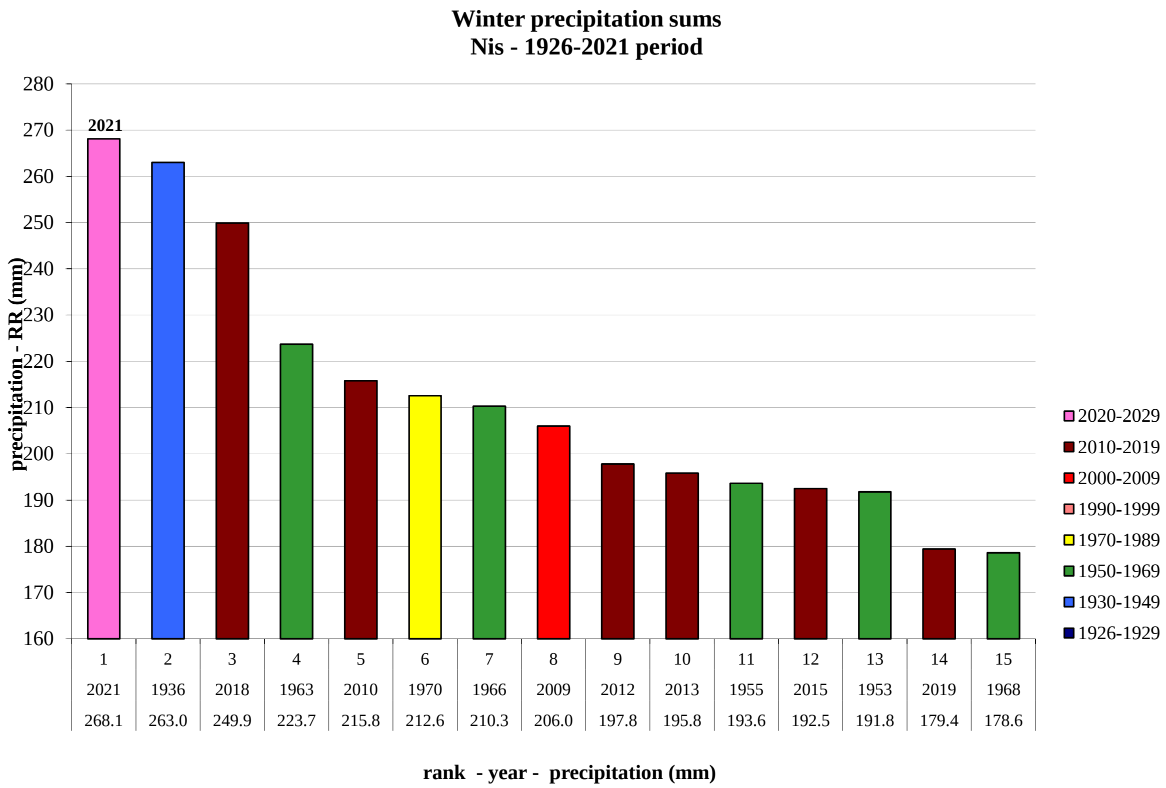

Figure 13. Rank of the wettest winters in Nis

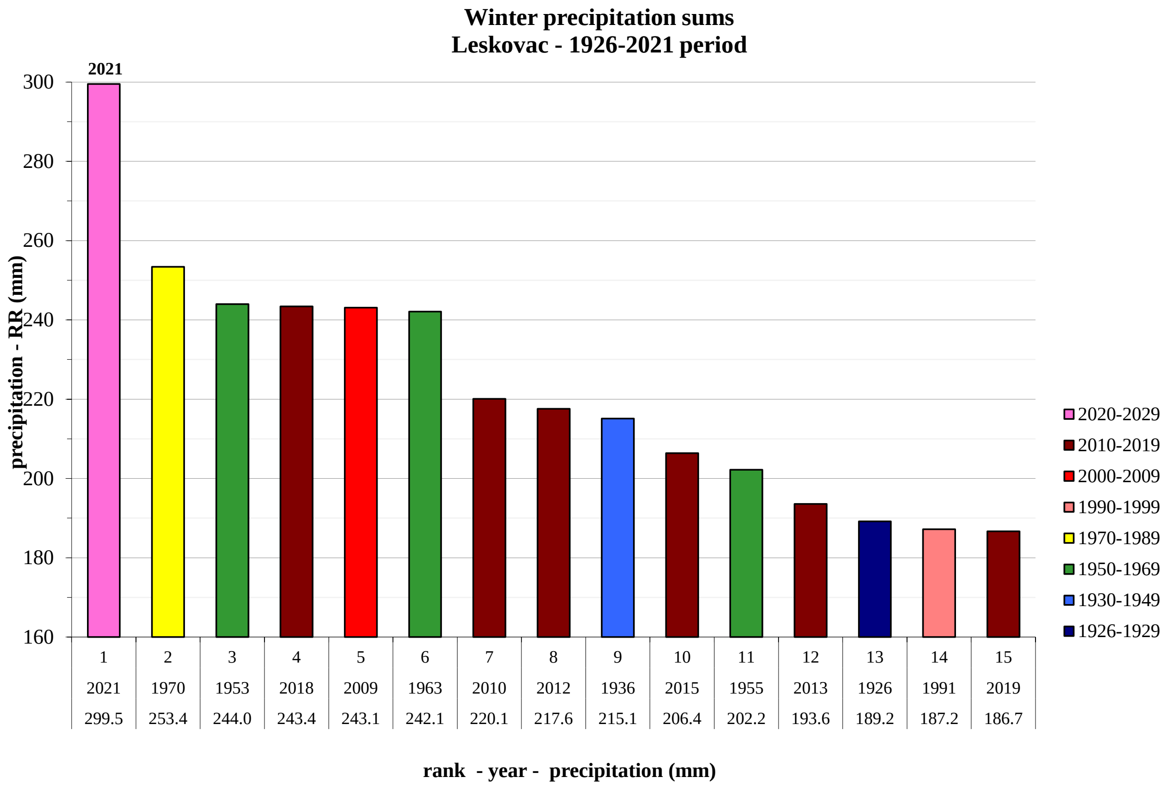

Figure 14. Rank of the wettest winters in Leskovac

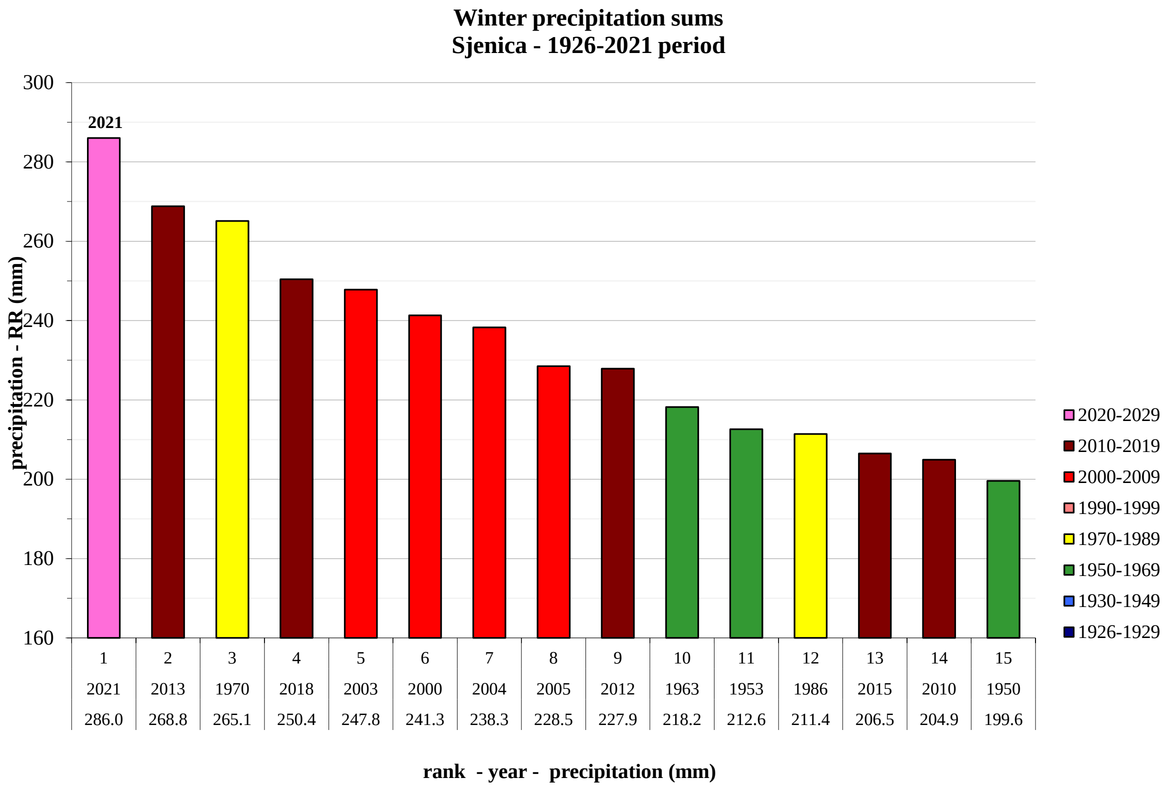

Figure 15. Rank of the wettest winters in Sjenica

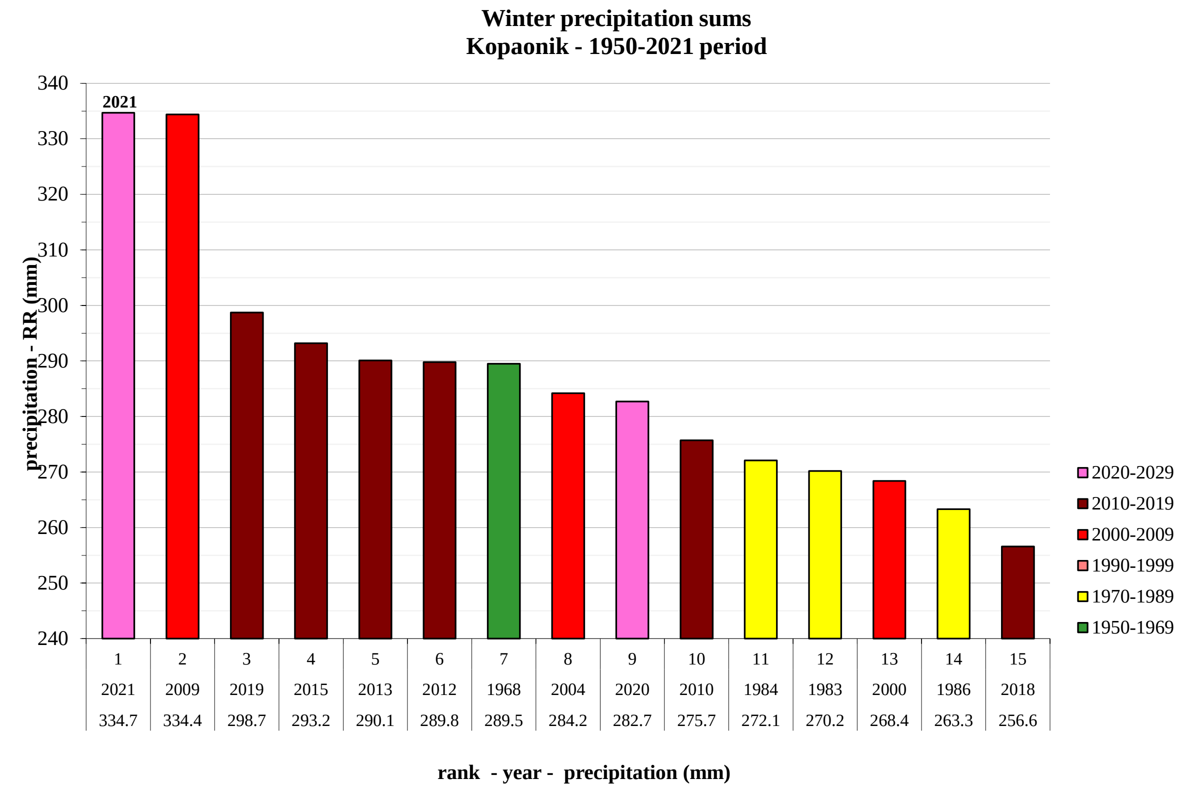

Figure 16. Rank of the wettest winters at Kopaonik

Figure 17 shows cumulative precipitation sums for Dimitrovgrad during winter per months relative to the average cumulative precipitation sums.

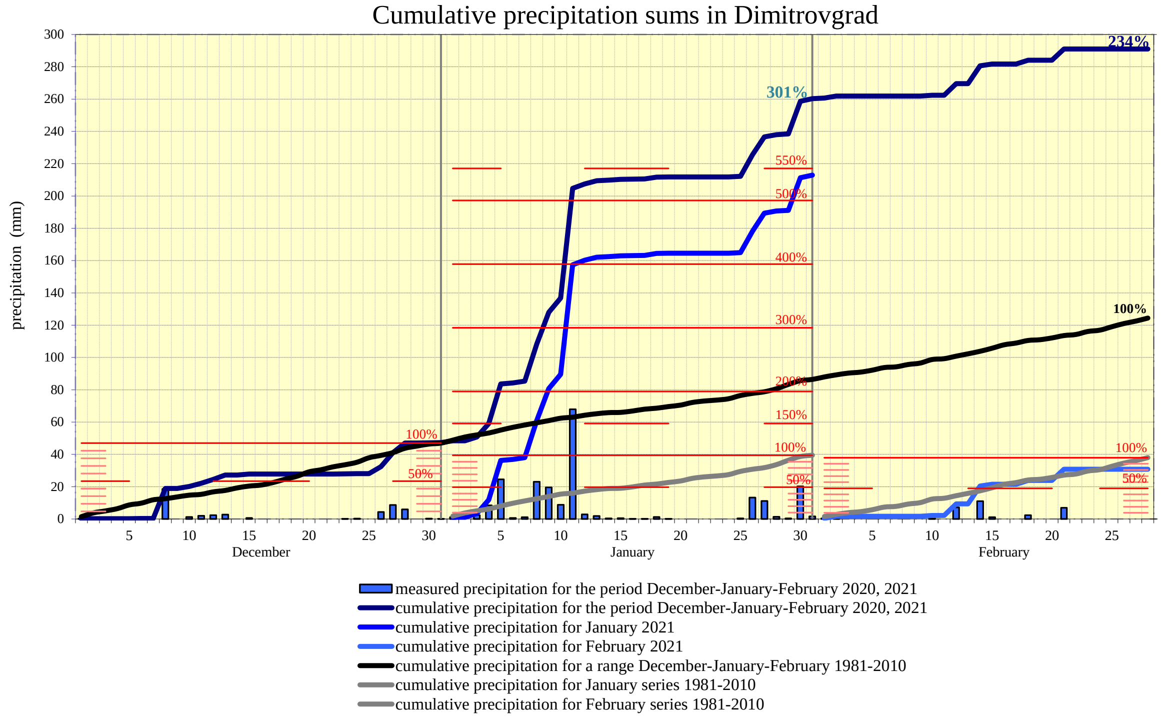

Figure 17. Cumulative precipitation sums for Dimitrovgrad

Winter precipitation totals were above the average in most of Serbia. Precipitation sums ranged from 131.8 mm on Palic to 334.7 mm at Kopaonik (*Figure 18*). Precipitation sums expressed in the percentages of normal (Figure 19) ranged from 95% in Belgrade to 234% in Dimitrovgrad (*Figure 17*) and on the mountains from 109% on Zlatibor to 187% in Sjenica.

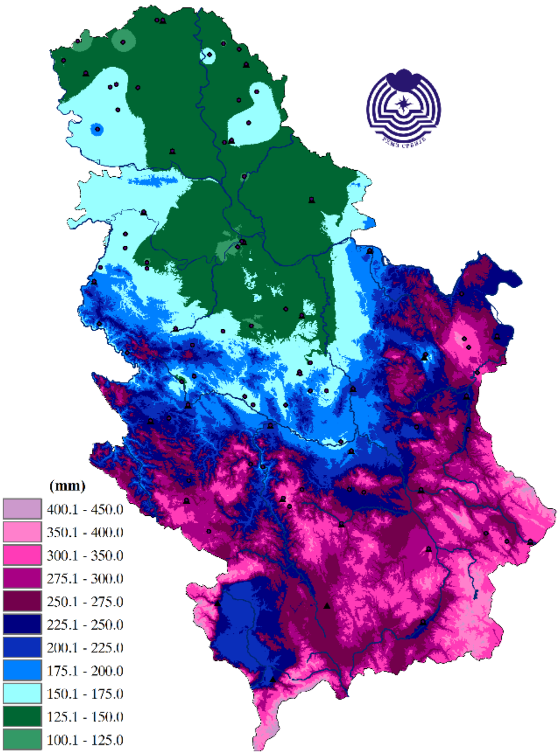

Figure 18. Spatial distribution of winter precipitation sums based on data from 28 major meteorological, 12 climatological and 45 rain gauge stations

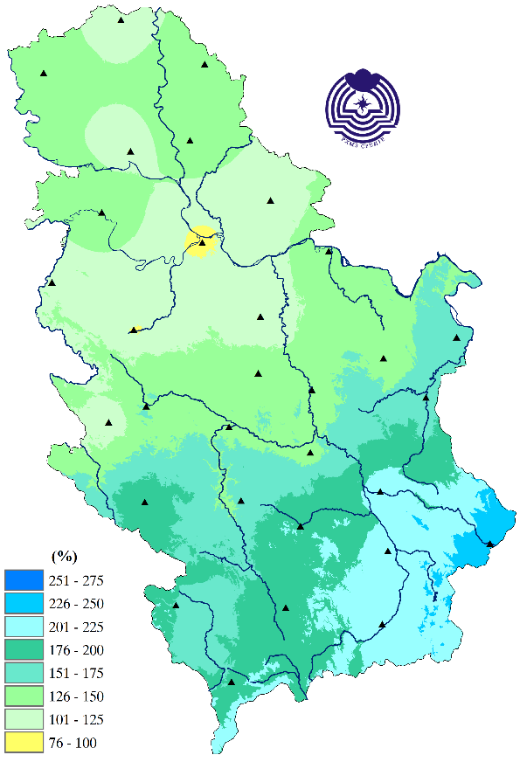

Figure 19. Spatial distribution of winter precipitation sums in percentage of normal

Based on the percentile method, winter precipitation sums were in the categories of extremely and very rainy in the south, as well as parts of western, central, northern and eastern Serbia, elsewhere they were in the categories of rainy and normal (*Figure 20*).

Precipitation sums based on the tercile method were in the rainy category in most of Serbia (*Figure 21*).

Number of days with precipitation of 0.1 mm that were recorded in the winter ranged from 33 days in Sombor, Valjevo and Zajecar to 54 on Crni Vrh. The observed number of days with precipitation in the northern, northeastern and southeastern parts of Serbia were above the average, up to 14 days above the average in Negotin, and below the average in western and central parts, up to 9 days below the average recorded in Valjevo (*Figure 22*). **Nis** and **Leskovac** observed 5 days with **precipitation of 20 mm and more** thereby setting the **new winter record** also set in **Dimitrovgrad** with 4 days.

Snow cover was recorded in entire Serbia, but the number of days with the snow cover was below the average across the entire country, from 6 days below the average at Kopaonik to 28 days below the average at Zlatibor (*Figure 23*). Number of days with snow cover in the lowland of Serbia ranged from 7 days in Kikinda and Palic to 25 days in Kursumlija. In the hilly-mountainous regions number of days with snow cover ranged from 45 days at Zlatibor to 80 days at Kopaonik. On January 30, Kopaonik observed the maximum snow depth of 120 cm.

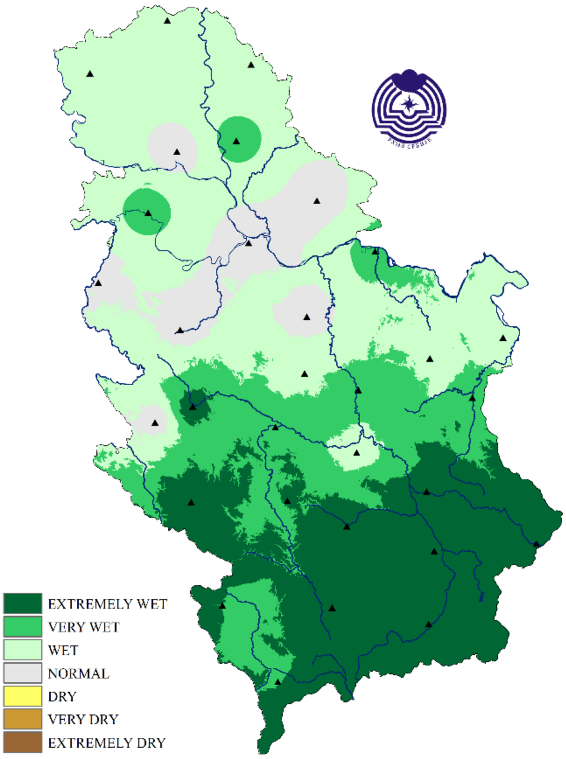

Figure 20. Winter precipitation sums according to the percentile method

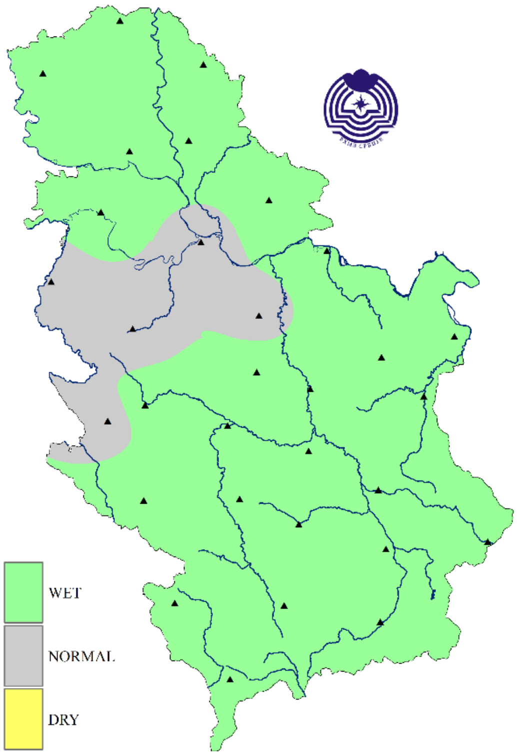

Figure 21. Winter precipitation sums according to the tercile method

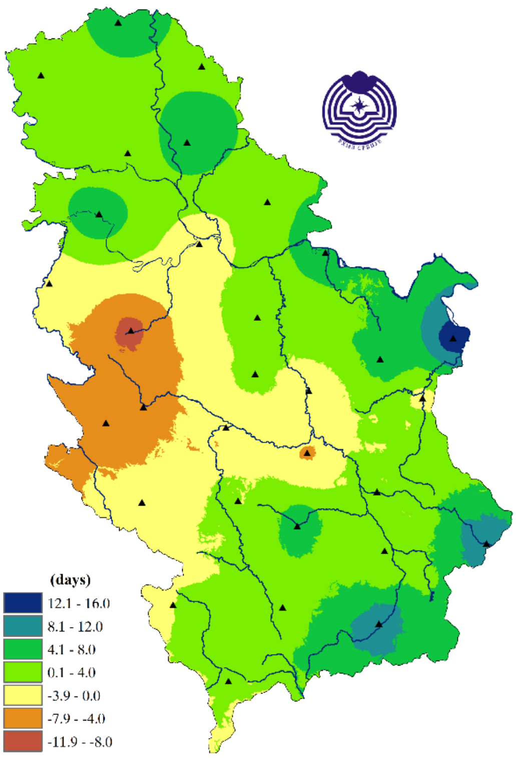

Figure 22. Deviation of number of days with precipitation of 0.1 mm and more from the normal

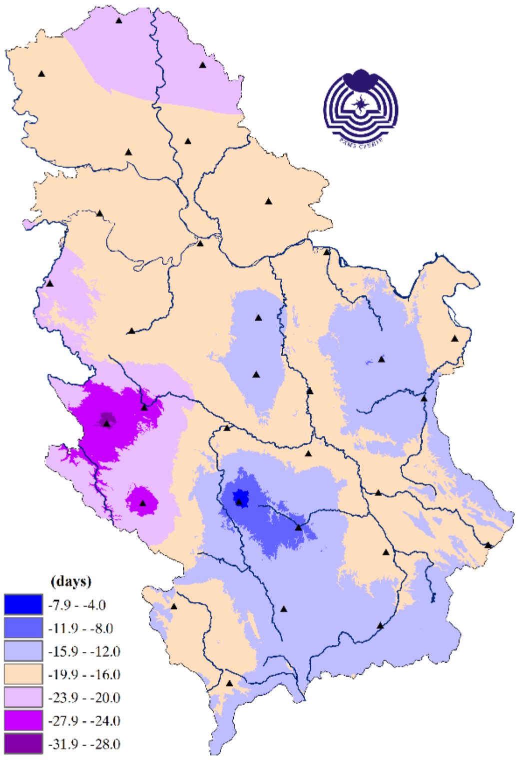

Figure 23. Deviation of number of days with snow cover from the normal

Cloud cover. bright and cloudy days

Mean winter cloud cover ranged from 6/10 in Sjenica to 8/10 in Zajecar, which is within the average in almost the entire Serbia, apart from Zajecar (*Figure 24*) and Negotin where above average cloud cover was recorded.

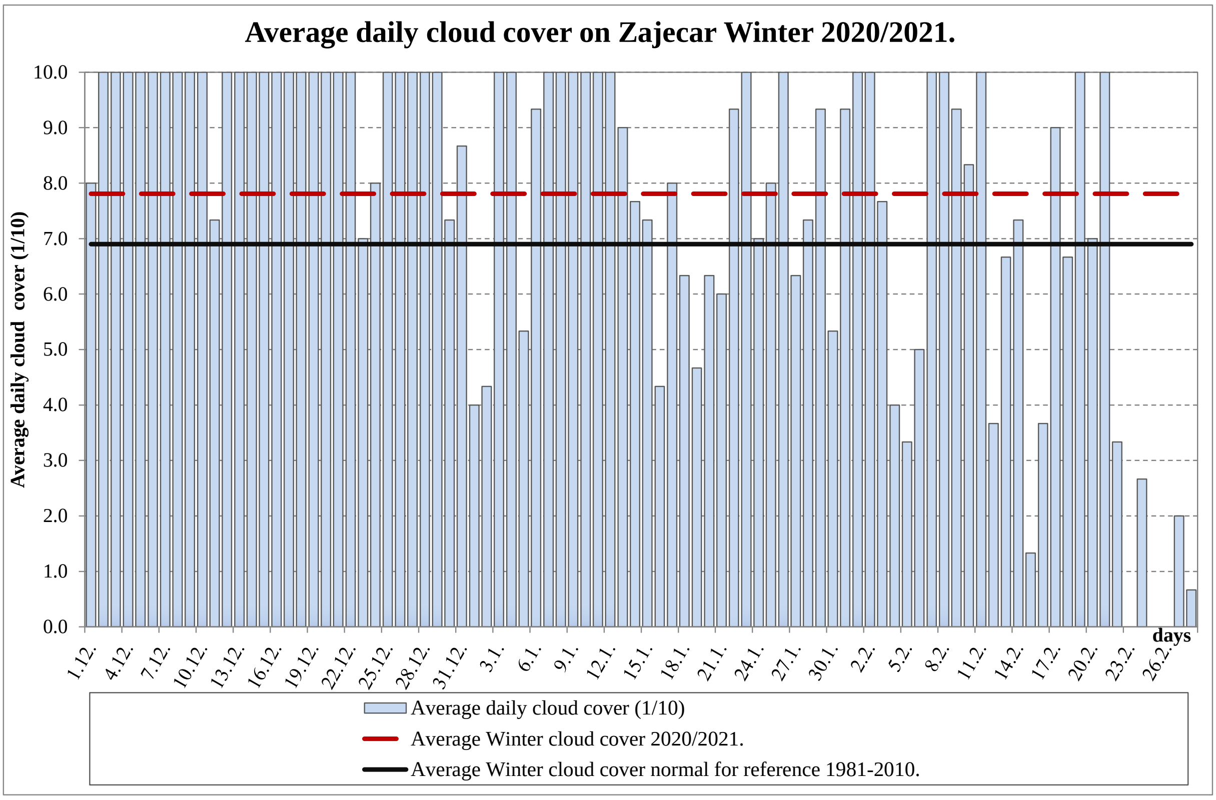

Figure 24. Average daily cloud cover in Zajecar

In winter, number of bright days[4] ranged from 5 days in Zajecar, which is 5 days below the average, up to 12 days in Sombor, Sjenica and Curpija, which is 2 days above the winter average. Number of cloudy days[5] ranged from 34 days in Veliko Gradiste and Belgrade to 55 days at Crni Vrh. Deviation of the number of cloudy days from the average was in a range from 9 days below the average in Veliko Gradiste to 12 days above the average in Negotin.

[4] Bright day is a day with average daily cloud cover of less than 2/10
[5] Cloudy day is a day with average daily cloud cover of more than 8/10

Sunshine duration (insolation)

Sunshine duration during winter ranged from 179.8 hours in Zajecar to 276.5 hours in Zrenjanin *(Figure 25*).

Relative to the normal for the 1981-2010 base period, winter insolation ranged from 82% in Zajecar and Crni Vrh to 149% in Krusevac (*Figure 26*).

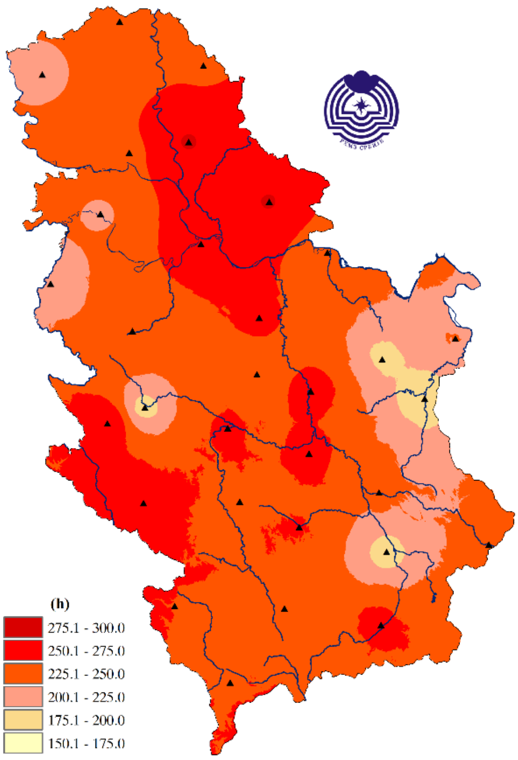

Figure 25. Insolation in hours

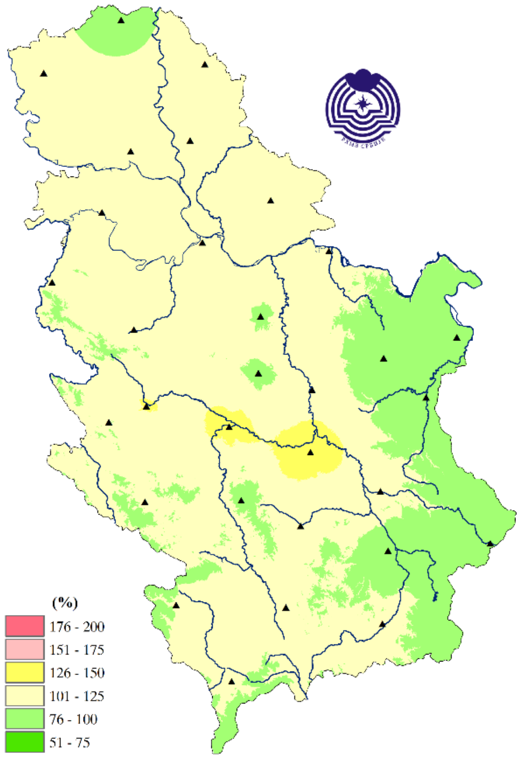

Figure 26. Insolation in percentage of normal

Analysis of the 2020/2021 winter season for Serbia relative to the 1961-1990 base period

Temperature

During winter, departure of the mean air temperature from the normal for the 1961–1990 base period ranged from 2.9ºC in Zajecar to 3.9ºC in Novi Sad and on the mountains from 2.3ºC at Kopaonik to 3.7ºC in Sjenica (*Figure 27*).

Based on the percentile method, mean air temperature was in the extremely warm category in entire Serbia (*Figure 28*).

Based on the tercile method, mean air temperature was above the average in entire Serbia.

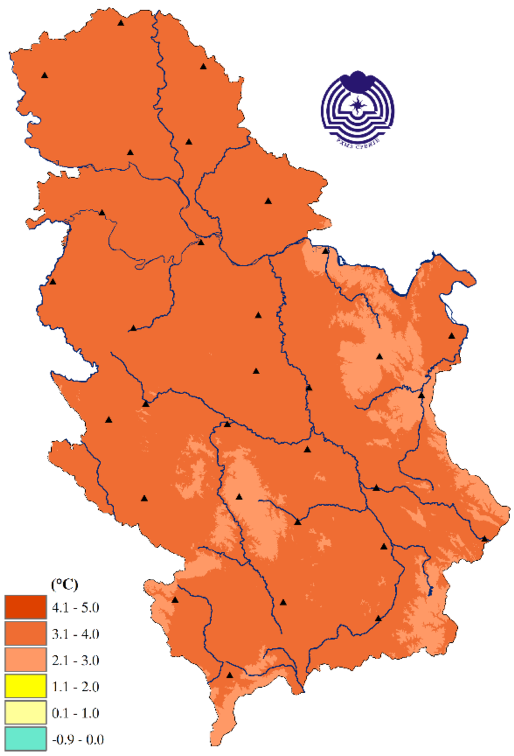

Figure 27. Spatial distribution of mean winter air temperature anomaly from the 1961-1990 normal

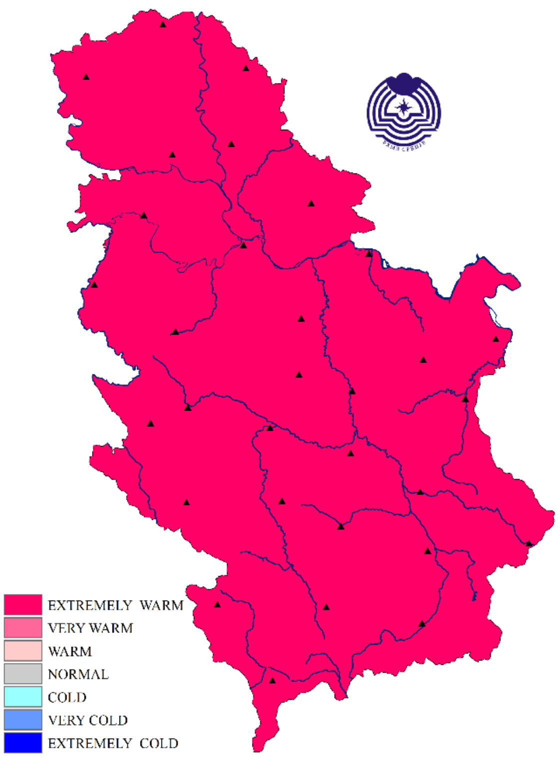

Figure 28. Spatial distribution of mean winter air temperature according to the percentile method

Precipitation

Winter precipitation sums in most of Serbia were above the average relative to the normal for the 1961-1990 base period. Precipitation sums expressed in the percentages of normal ranged from 91% in Belgrade to 225% in Leskovac and Dimitrovgrad (*Figure 29*).

Based on the percentile method, winter precipitation sums were in the categories of normal and rainy in the north and certain parts of central and western Serbia, whereas in the southwest, southeast and certain central parts they were in the categories of extremely and very rainy (*Figure 30*).

Precipitation sums based on the tercile method were in the rainy category in most of Serbia, and in normal category in Banatski Karlovac, Valjevo, Belgrade and Smederevska Palanka.

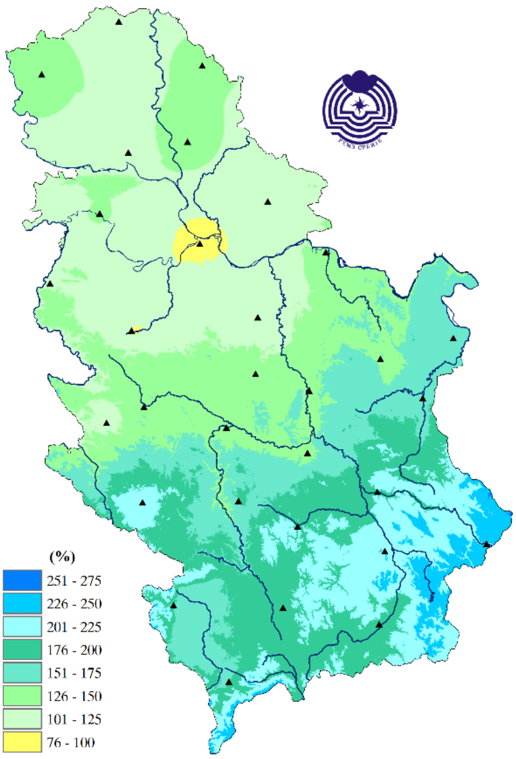

Figure 29. Spatial distribution of winter precipitation sums in percentage of the 1961-1990 normal

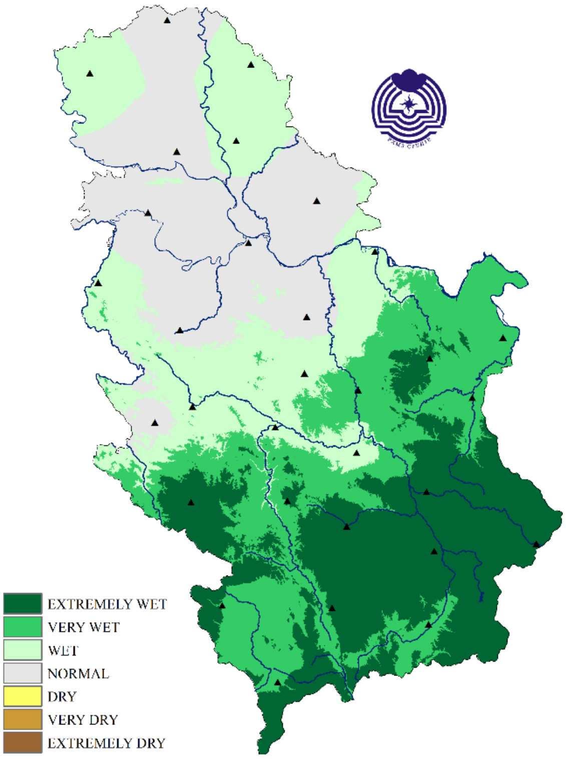

Figure 30. Winter precipitation sums according to the percentile method

Note: Climatological analysis of the meteorological elements based on the preliminary data obtained from the 28 main meteorological stations.