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Republic of Serbia

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Department of National Center for Climate Change, Climate Model Development and Disaster Risk Assessment
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- ***The 5th wettest October for Serbia and averagely warm in most of the country***
- ***The wettest October for Krusevac, Leskovac, Dimitrovgrad, Kragujevac and Kopaonik***
- ***Absolute daily precipitation maximum was surpassed on October 3 in Krusevac, Kursumlija and Zajecar***
- ***Record-breaking snow cover at Kopaonik and Zlatibor***
- ***The earliest onset of snow cover was registered in Kursumlija, Dimitrovgrad, Vranje and Crni Vrh***
- ***Record early appearance of snow in Kursumlija, Dimitrovgrad and Vranje***

AIR TEMPERATURE

Mean monthly air temperature

Mean October air temperature ranged from 9.4 ºC in Pozega to 13.0 ºC in Belgrade, and on the mountains from 2.9 ºC at Kopaonik to 7.4 ºC at Zlatibor (*Figure 1*).

Departure of the mean monthly air temperature from the normal[1] for the 1991-2020 base period ranged from -2.4 ºC at Kopaonik to +0.1 ºC in Novi Sad (*Figure 2*).

Mean October air temperature, based on the percentile method[2], was in the normal category in most of the country, cold category in Veliko Gradiste, Sjenica, Pozega, Kraljevo, Nis, Leskovac, Zajecar, Dimitrovgrad and Zlatibor, and very cold in Vranje and Kopaonik (*Figure 3).*

[1] Term ***normal*** refers to ***climatological standard normal***, that is, the average value of a particular climate element, calculated for the period from January 1, 1991 to December 31, 2020

[2] **n**th percentile of a variable refers to the value of the observed variable below which there is n percent of data previously arranged in an ascending order

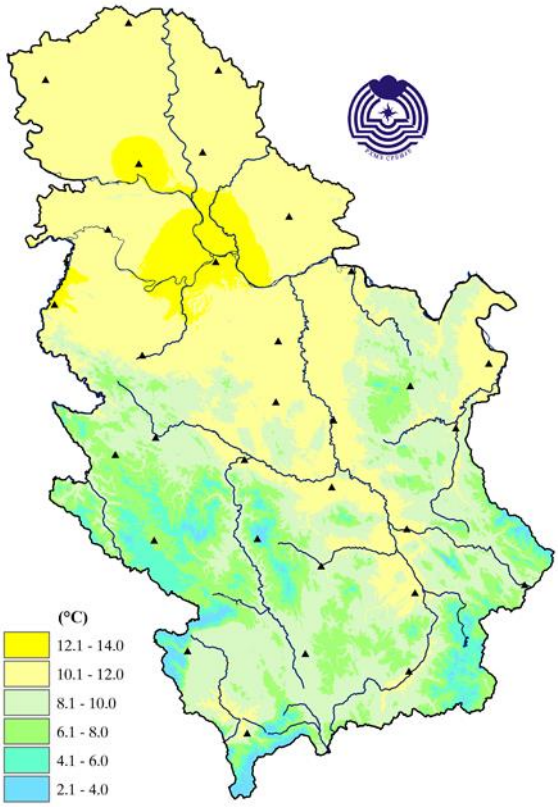


Figure 1. Spatial distribution of mean monthly air temperature (ºC)

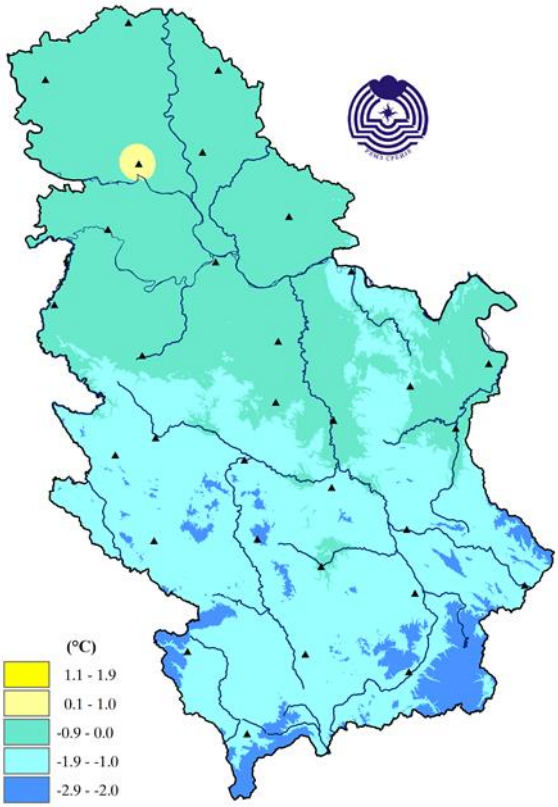


Figure 2. Spatial distribution of mean monthly air temperature anomaly (ºC)

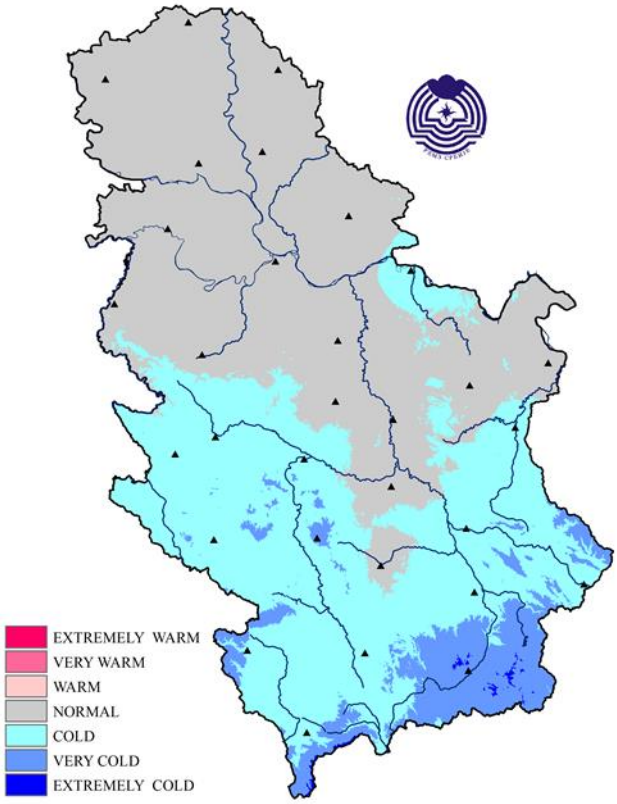


Figure 3. Spatial distribution of the mean monthly air temperature using percentile method

At Kopaonik October 2025 ranks as **the 7th coldest** in the period from 1949 to 2025 (Figure 4).

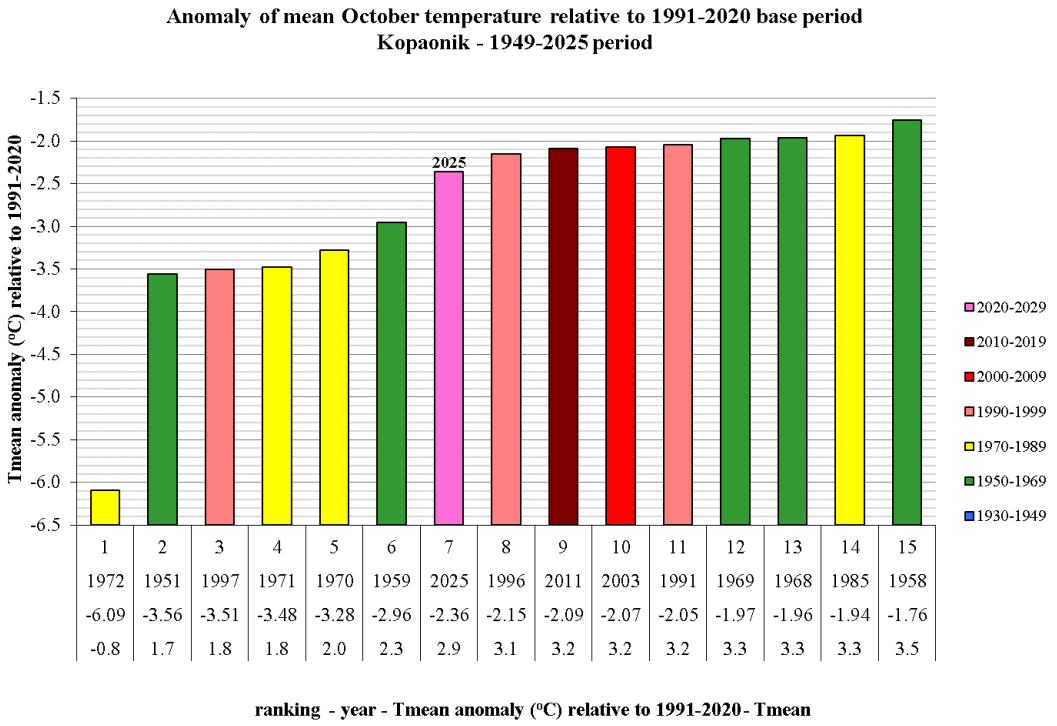


Figure 4. Rank of the coldest October on Kopaonik

Mean daily air temperature in Belgrade, based on the percentile method, was in the normal category most of October; at the beginning of the year, air temperature was in the categories spanning from cold to extremely cold; and beginning of the third decade as well as at the end of the month, it was in the categories of warm and very warm *(Figure 5).* Daily course of the mean daily air temperature and the accompanying percentiles for the stations Sombor, Novi Sad, Loznica, Negotin, Kragujevac, Zlatibor, Nis and Vranje are given in the Appendix.

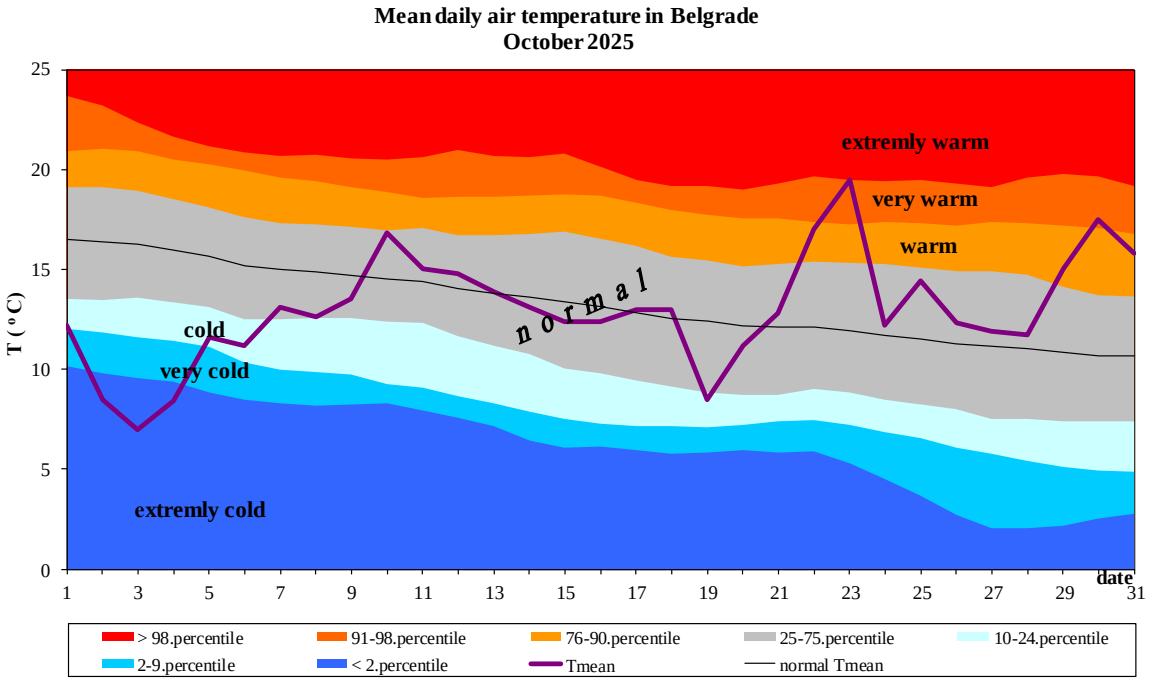


Figure 5. Daily course of the mean daily air temperature and accompanying percentiles for Belgrade

Maximum air temperature

Mean maximum air temperature in October ranged from 15.3 ºC in Vranje and Dimitrovgrad to 18.3 ºC in Sombor, whereas Belgrade observed 17.7 °C. On the mountains, mean maximum October air temperature ranged from 5.9 ºC at Kopaonik to 12.0 ºC in Sjenica.

Based on the percentile method, mean maximum air temperature was in following categories: normal category in most of Serbia, cold category in Kragujevac, Pozega, Kraljevo, Kursumlija, Krusevac and Crni Vrh, very cold category in Sjenica, Nis, Leskovac, Dimitrovgrad and Zlatibor, and extremely cold in Vranje and Kopaonik.

The highest maximum daily air temperature of 26.3 ºC was measured in Loznica on October 23. On the same day, Belgrade observed air temperature of 25.6 ºC.

Number of summer days[3] was the following: Valjevo – 2 days, Novi, Sad, Loznica, Sremska Mitrovica, Belgrade, Negotin, Krusevac and Zajecar – 1 day. In most of the country, number of summer days was up to 5 days below the average.

Kopaonik observed 2 ice days[4].

Heat wave[5] was observed in Novi Sad in the period from October 29 to November 2 and in Veliko Gradiste from October 30 to November 3.

Figure 6 shows daily course of the maximum daily air temperature and the accompanying percentiles for Belgrade in October 2025 and for the stations Sombor, Novi Sad, Loznica, Negotin, Kragujevac, Zlatibor, Nis and Vranje are given in the Appendix.

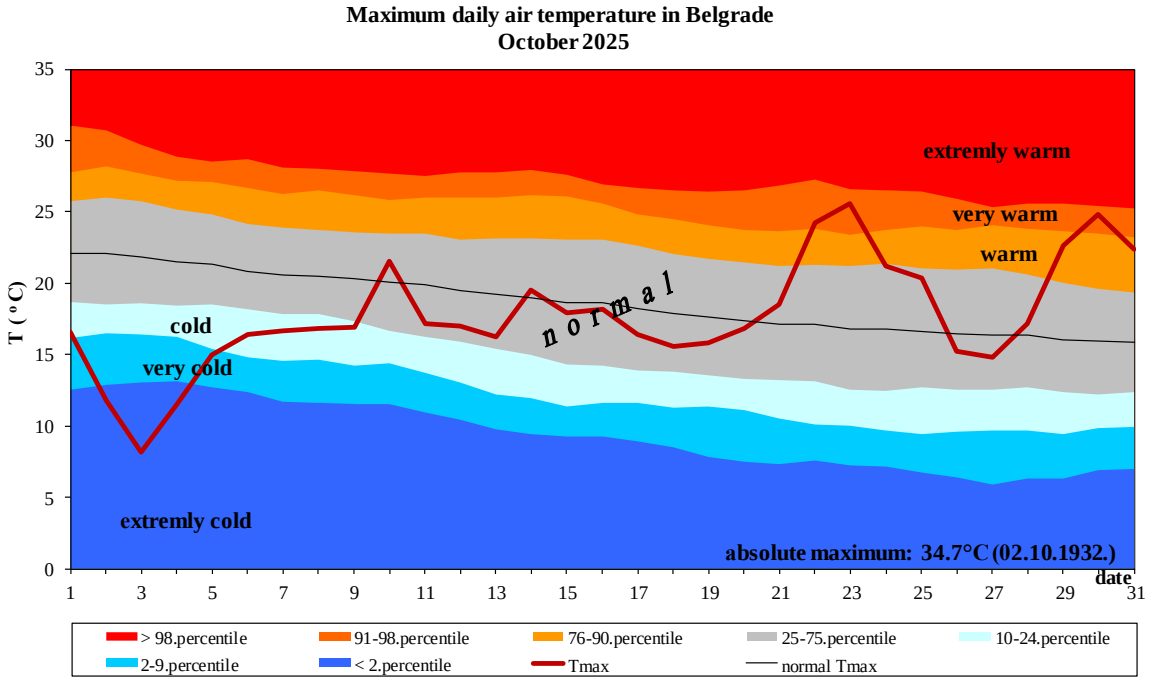


Figure 6. Daily course of the maximum daily air temperature and accompanying percentiles for Belgrade

[3] Summer day refers to a day with maximum daily air temperature 25 °C and above
[4] Ice day refers to a day with maximum daily air temperature lower than 0 °C
[5] Heat wave is, 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 consecutive days or longer

Minimum air temperature

Mean minimum air temperature in October ranged from 5.0 ºC in Zajecar to 9.5 ºC in Belgrade. On the mountains, mean minimum air temperature ranged from 0.4 ºC at Kopaonik to 4.5 ºC at Zlatibor.

Based on the percentile method, mean minimum monthly air temperature was in the following categories: normal in most of the country, cold category in Kikinda, Veliko Gradiste, Dimitrovgrad, Vranje, Palic, Crni Vrh and Kopaonik.

The lowest minimum daily air temperature of -4.7 ºC was measured on October 3 at Kopaonik. In the lowland, the lowest daily air temperature of -3.9 ºC was measured in Zajecar on October 20. On October 19, Belgrade observed the lowest October air temperature of 4.5 ºC.

Number of frost days[6] ranged from 1 to 2 days in most of the country apart from Novi Sad, Loznica, Valjevo, Belgrade and Nis, while Pozega observed 3. On the mountains, the highest number of frost days, total of 14 days, was recorded at Kopaonik, in Sjenica – 10, Crni vrh – 3 days. Zlatibor – 2 days. Number of frost days was up to 2 days below October average.

Cold wave[7] was recorded at Zlatibor from September 30 to October 3 and at Kopaonik from October 1 to 5.

Figure 7 shows assessment of the minimum and maximum air temperature in Serbia for October based on the tercile distribution relative to the 1991-2020 base period. It can be noted that the mean minimum air temperature was at the lower tercile threshold and mean maximum air temperature below lower tercile threshold.

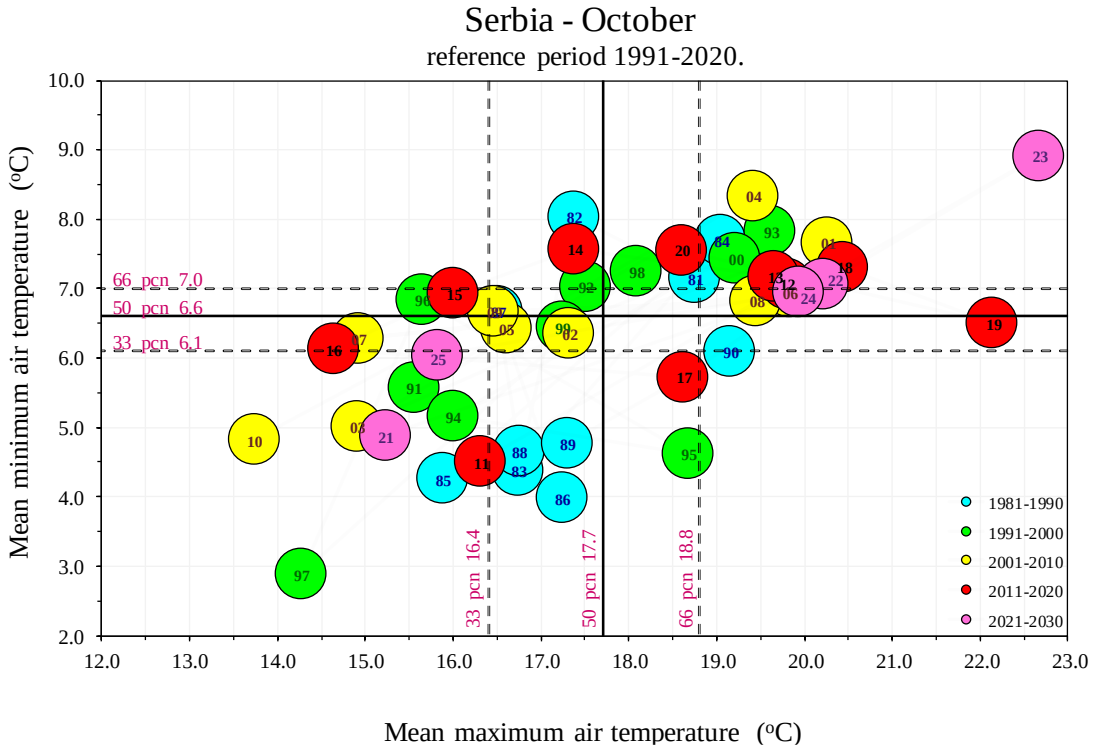


Figure 7. Assessment of minimum and maximum air temperature for Serbia with the accompanying terciles in relation to the 1991-2020 base period

[6] Frost day is defined as the day with minimum air temperature lower than 0 °C

[7] Cold wave is, 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 consecutive days or longer

Figure 8 shows daily course of the minimum daily air temperature and the accompanying percentiles for Belgrade in October 2025, and for the stations Sombor, Novi Sad, Loznica, Negotin, Kragujevac, Zlatibor, Nis and Vranje are given in the Appendix.

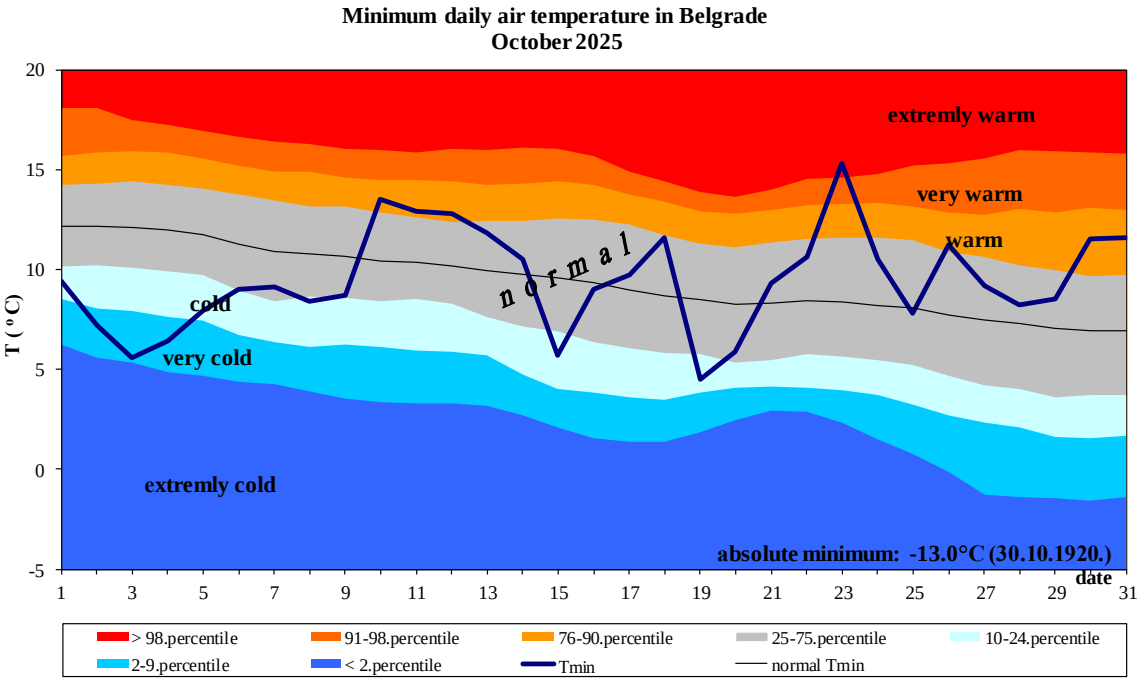


Figure 8. Daily course of the minimum daily air temperature and accompanying percentiles for Belgrade

PRECIPITATION

October 2025 ranks **as the 5th wettest for Serbia** since 1951 (*Figure 9).* Krusevac and Leskovac observed precipitations sums **three times higher** than the October average. **The wettest October** was in Krusevac, Leskovac, Dimitrovgrad and Kopaonik as well as in Kragujevac, and this October was among the 10 wettest since the record-keeping at 15 stations in Serbia began (*Table 1).*

In the appendix are graphs showing 15 wettest years since the record-keeping began for the stations: Krusevac, Leskovac, Dimitrovgrad, Kopaonik, Kragujevac, Kursumlija, Nis, Cuprija, Zlatibor, Vranje, Negotin, Zajecar and Smederevska Palanka.

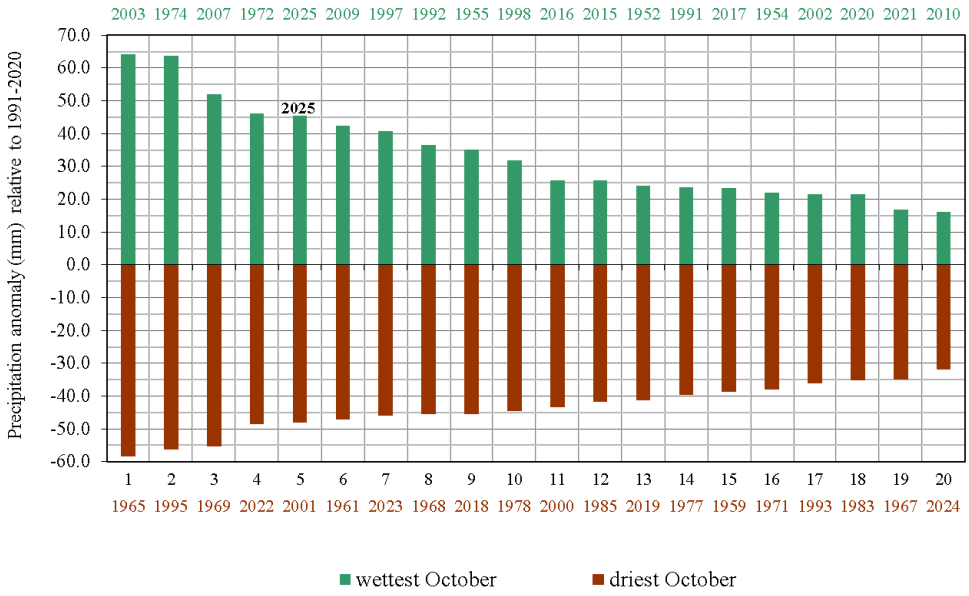


Figure 9. Rank of the wettest and driest October in Serbia for the period from 1951 to 2025

Table 1. Ranking of October 2025 in terms of precipitation, average, and percentage of the 1991-2020 normal

STATION	historical period	∑RR for October 2025 (mm)	normal for October 1991-2020	percentage (%) from normal	ranking for October 2025 (descending RR)
KRUSEVAC	1925-2024	179.7	55.4	324	1
LESKOVAC	1925-2024	183.2	60.7	302	1
DIMITROVGRAD	1926-2024	161.1	59.6	270	1
KOPAONIK	1949-2024	192.9	82.0	235	1
KRAGUJEVAC	1925-2024	127.4	54.2	235	1
KURSUMLIJA	1925-2024	167.2	57.1	293	2
NIS	1925-2024	131.9	55.8	236	2
CUPRIJA	1926-2024	111.3	57.4	194	3
ZLATIBOR	1950-2024	152.7	81.4	187	4
VRANJE	1926-2024	131.9	60.2	219	6
NEGOTIN	1941-2024	120.5	57.2	211	7
ZAJECAR	1925-2024	109.4	53.5	204	7
S.PALANKA	1926-2024	110.4	57.3	193	9
V.GRADISTE	1926-2024	103.5	54.3	191	10
KRALJEVO	1926-2024	109.7	62.9	174	10

October precipitation sums ranged from 27.7 mm in Kikinda to 192.9 mm at Kopaonik, while Belgrade recorded 88.0 mm (*Figure 10).*

Precipitation totals compared to the normal for the 1991-2020 base period ranged from 54% in Novi Sad to 324% in Krusevac (*Figure 11*). Based on the percentile method, precipitation sums were in the normal category in Vojvodina, Crni Vrh and Pozega, rainy category in Valjevo, Belgrade, Veliko Gradiste, Sjenica and Kraljevo, elsewhere, in the southern and parts of central Serbia, it was rainy and extremely rainy (*Figure 12).*

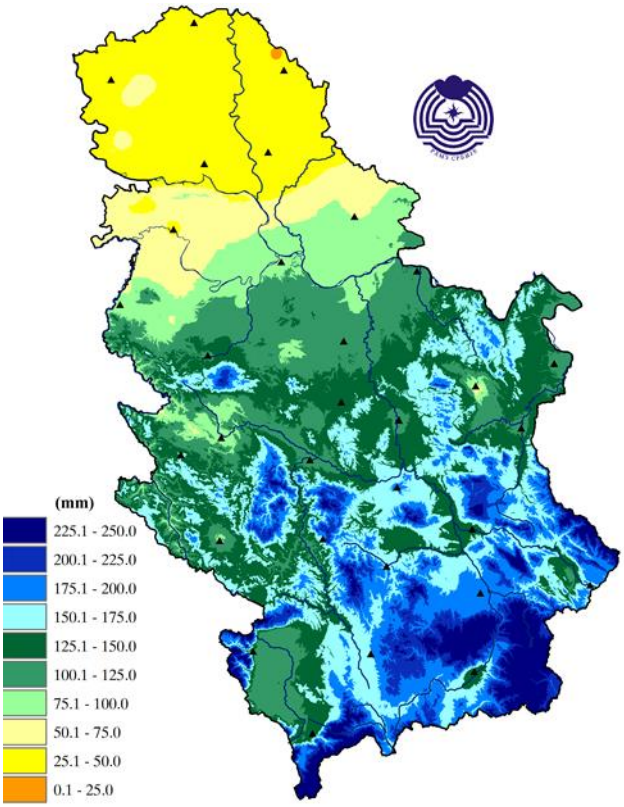


Figure 10. Spatial distribution of the monthly precipitation sums (mm) according to data from 28 major meteorological, 16 climatological and 79 rain gauge stations

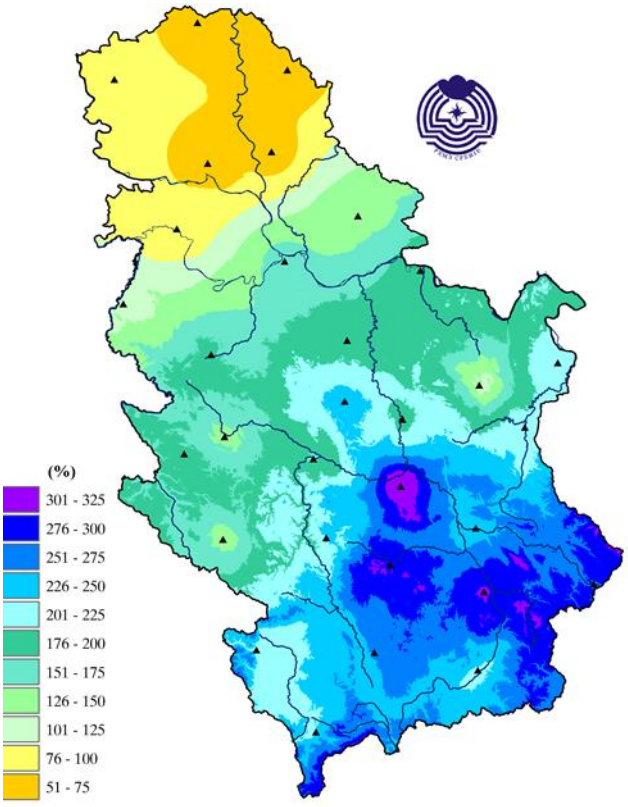


Figure 11. Spatial distribution of the monthly precipitation sums in the percentages of normal for the 1991–2020 base period

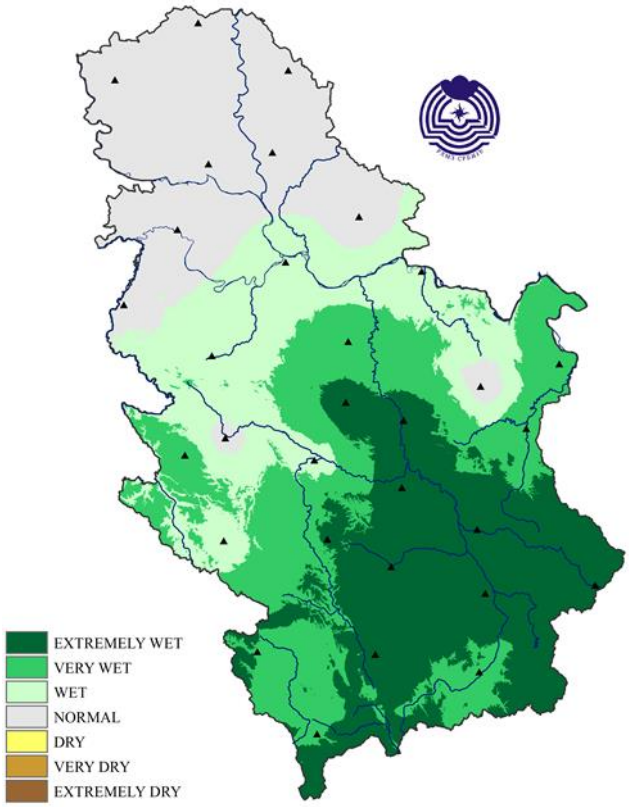


Figure 12. Monthly precipitation sums according to the percentile method

On October 3, at 3 main meteorological stations **the absolute daily precipitation maximum was surpassed** (*Table 2).* The highest daily precipitation sum of 68.6 mm was exceeded in Krusevac on October 3. The precipitations sums are as follows: Kursumlija – 56.6 mm, Zlatibor – 55.4 mm, Leskovac – 55.0 mm, Negotin – 54.2 mm. On October 27, Dimitrovgrad measured precipitation sum of 52.3 mm. On October 4, Belgrade recorded the highest sum of 30.0 mm of precipitation.

Table 2. Record-breaking daily precipitation sums for October

Station	2025		Previous record Aps RRmax	Date of previous record Aps RRmax
	RRmax October 2025	date RRmax		
KRUSEVAC	**68.6**	3	39.5	13. X 2009.
KURSUMLIJA	**56.6**	3	54.3	7. X 1979.
ZAJECAR	**47.9**	3	43.0	31. X 1936.

Number of days with precipitation in October ranged from 8 in Kikinda to 21 at Crni Vrh (*Figure 13).* The observed number of days with precipitation was up to 7 days above the October average (*Figure 14).*

One day with precipitation of 50 mm and higher was recorded in Negotin, Kursumlija, Krusevac, Leskovac, Dimitrovgrad and Zlatibor.

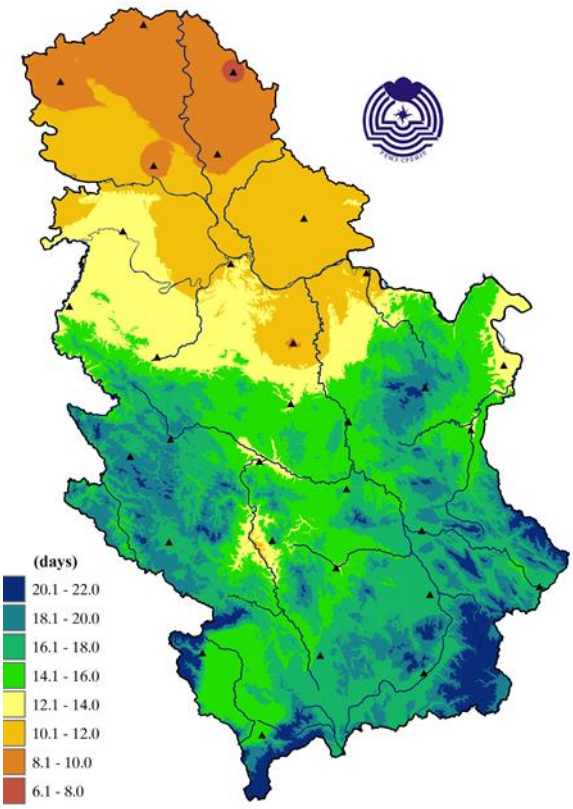


Figure 13. Spatial distribution of number of days with precipitation

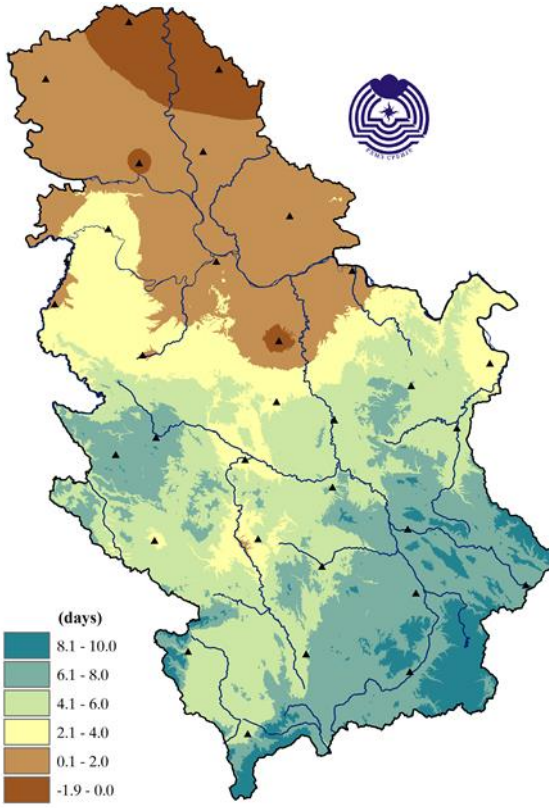


Figure 14. Spatial distribution of deviation of number of days with precipitation

Snow cover was recorded on the mountains from 3 to 5 October as well as in the western, southern and eastern Serbia. The highest snow depth was measured on October 4 (*Figure 15).* The highest snow depth of 59 cm was measured on October 4.

On October 4, notable snow cover amounts were registered at several stations: KS RC Kukavica (MMS Leskovac) 57 cm, PS Bjeluša (MMS Požega) 52 cm, Zlatiboru 35 cm, PS Reževiće (MMS Sjenica) 31 cm, KS Blaževo (MMS Kopaonik) - 30 cm on October 3.

On October 4, Kopaonik and Zlatibor recorded the highest October snow depth since the record-keeping at these stations began. Kopaonik - 59 cm, the previous October record was 44 cm set on October 23, 1958. Zlatibor recorded 35 cm thereby besting the previous October record of 29 cm set on October 10, 1954.

The earliest onset of the snow cover was registered in Kursumlija, Dimirovgrad, Vranje and Crni vrh thereby besting the previous record early appearance of snow which was recorded in Kursumlija, Dimitrovgrad and Vranje (*Table 3).*

Table 3. The earliest onset of snow cover

STATION	SNOW COVER 2025	ONSET OF FIRST SNOW	FIRST SNOW COVER
		earliest date	earliest date
KURSUMLIJA	**03.X.2025. (3cm)**	**16.10.2009/2011**	**28.X.2003 (1cm)**
DIMITROVGRAD	**03.X.2025. (1cm)**	**04.10.1972**	**16.X.2009 (3cm)**
VRANjE	**03.X.2025. (1cm)**	**05.10.1972**	**17.X.1970 (4cm)**
CRNI VRH	**02.X.2025. (8cm)**	**01.10.1987 (not exceeded)**	**07.X.1994 (10cm)**

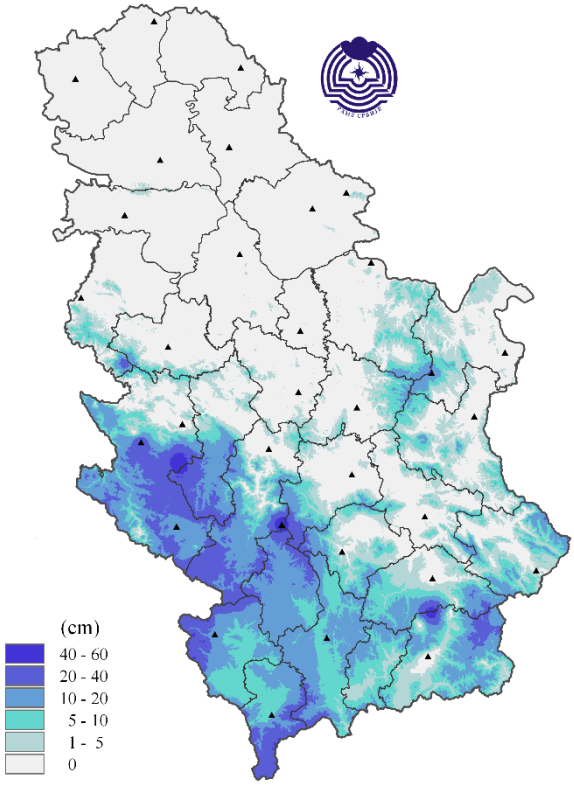


Figure 15. Snow cover height (cm) in Serbia at 8 a.m. on October 4, 2025

The highest number of days with snow cover was measured at Kopaonik, total of 13 days, ranging from 2 to 14 October, 4 days at Zlatibor, 3 days at Crni Vrh and Sjenica, and 1 day in Kursumlija, Dimitrovgrad and Vranje.

Figure 16 shows assessment of air temperature and precipitation sums for Serbia for October based on the tercile distribution relative to the 1991–2020 base period. It can be noted that October 2025 was characterized by air temperature below lower tercile threshold and precipitation sums above the upper tercile threshold.

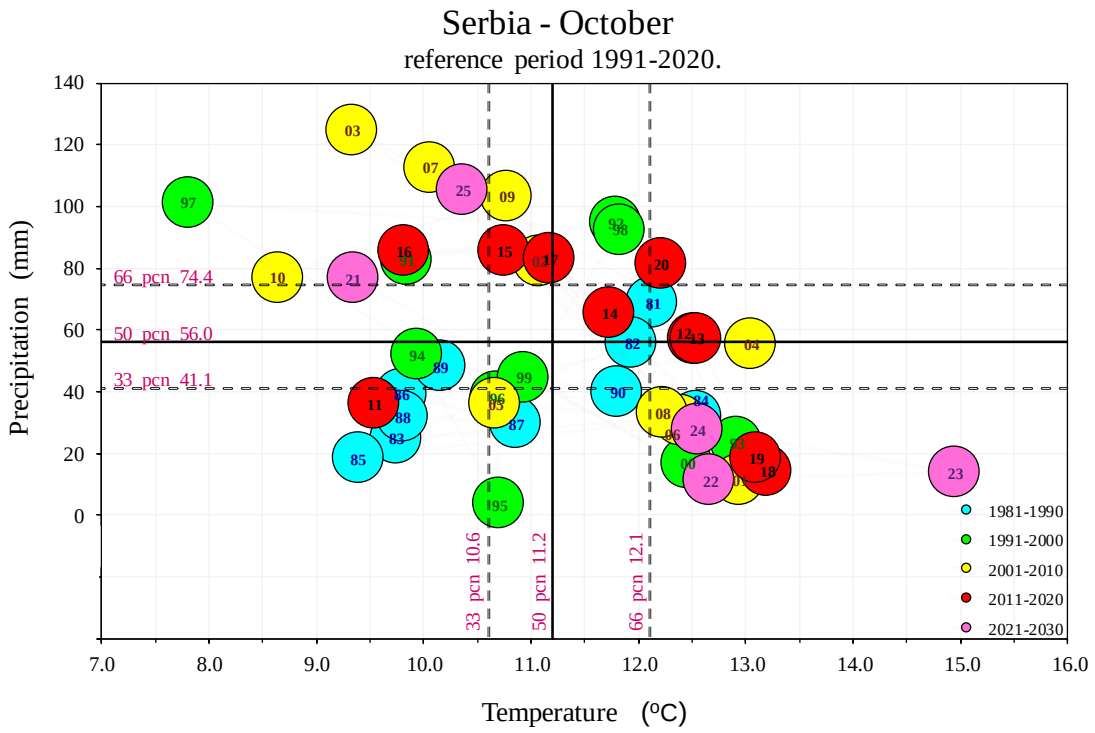


Figure 16. Assessment of air temperature and precipitation for Serbia with the accompanying terciles in relation to the 1991-2020 base period

Figure 17 show daily and cumulative precipitations sums with averaged normal 1991-2020 for October in Belgrade, and for the stations Sombor, Novi Sad, Loznica, Negotin, Kragujevac, Zlatibor, Nis and Vranje precipitation sums are given in Appendix.

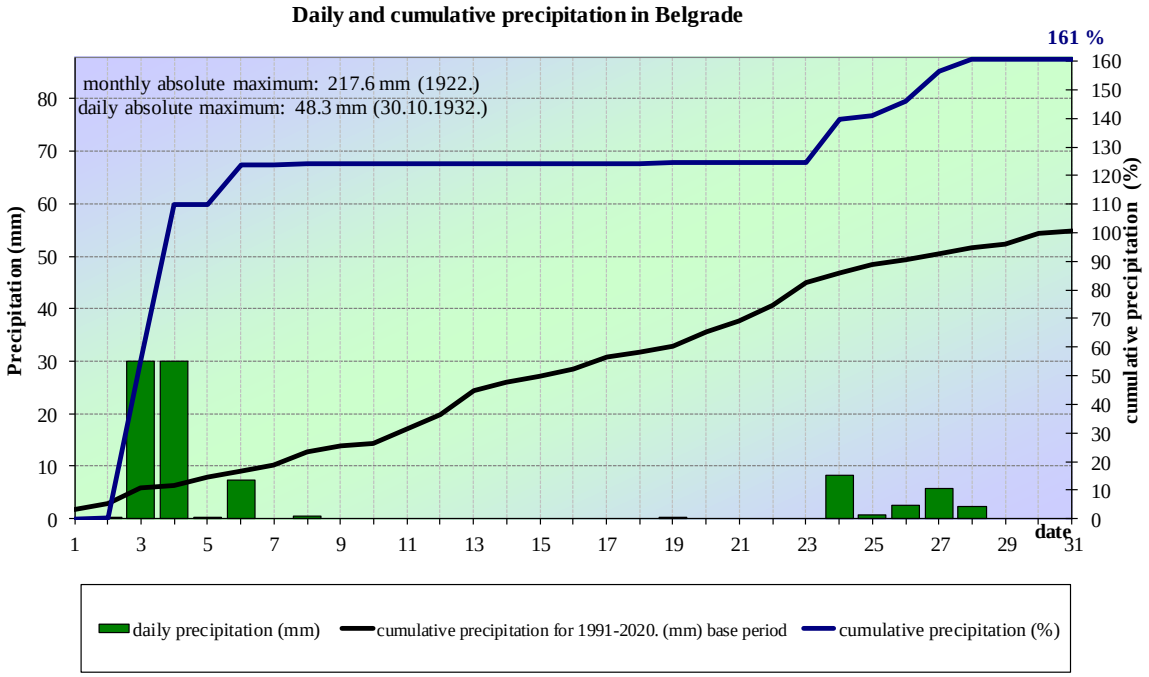


Figure 17. Daily and cumulative precipitation in Belgrade

CLOUD COVER, BRIGHT AND CLOUDY DAYS

Mean October cloud cover in Serbia was around or slightly above the average, ranging from 6/10 to 8/10. Figures 18, 19 and 20 show the average daily cloud cover for Belgrade, Kopaonik and Banatski Karlovac.

Bright days[8] were not recorded in Pozega whereas the highest number, total of 7, was recorded in Kragujevac and Kraljevo. Belgrade recorded 4 days. The observed number of bright days was up to 6 days below October average.

Number of cloudy days[9] ranged from 8 in Banatski Karlovac and Sremska Mitrovica to 19 at Kopaonik. Belgrade observed 11 cloudy days. Number of cloudy days was up to 8 days above the October average.

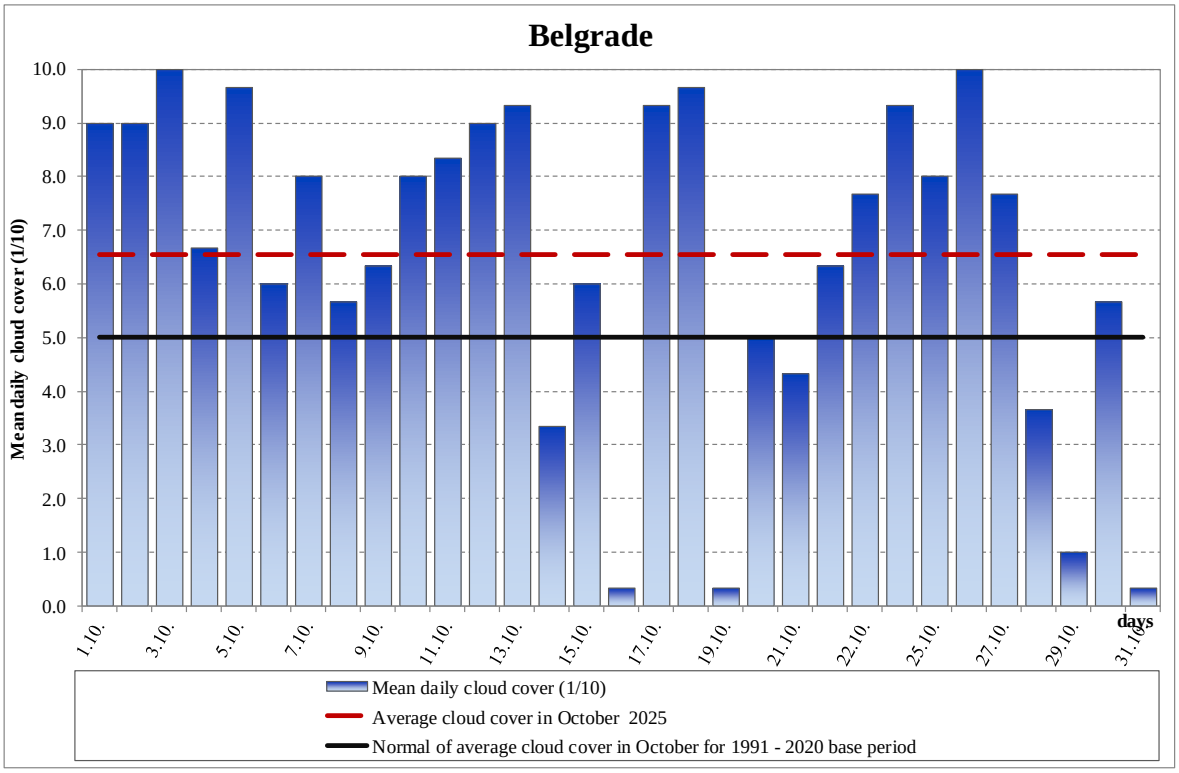


Figure 18. Mean daily cloud cover in Belgrade

[8] Bright day refers to a day with cloud cover less than 2/10
[9] Cloudy day refers to a day with cloud cover over 8/10

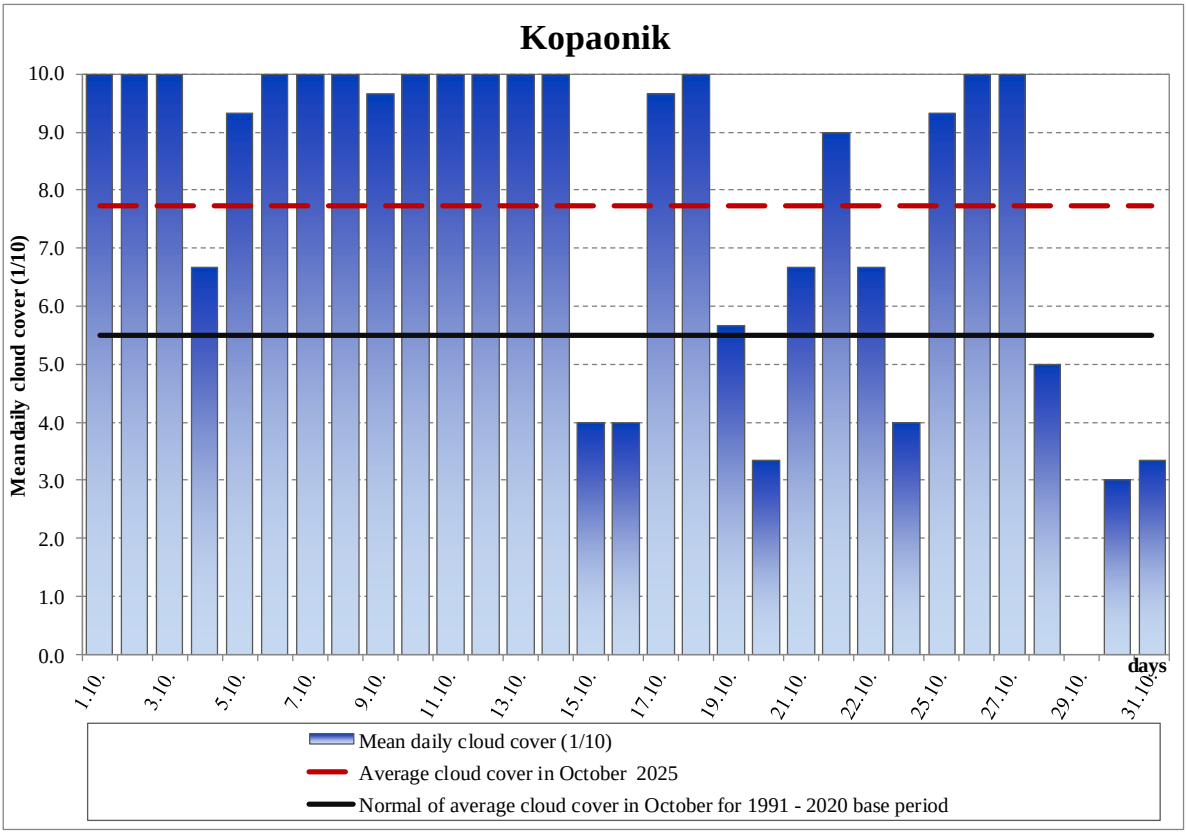


Figure 19. Mean daily cloud cover on Kopaonik

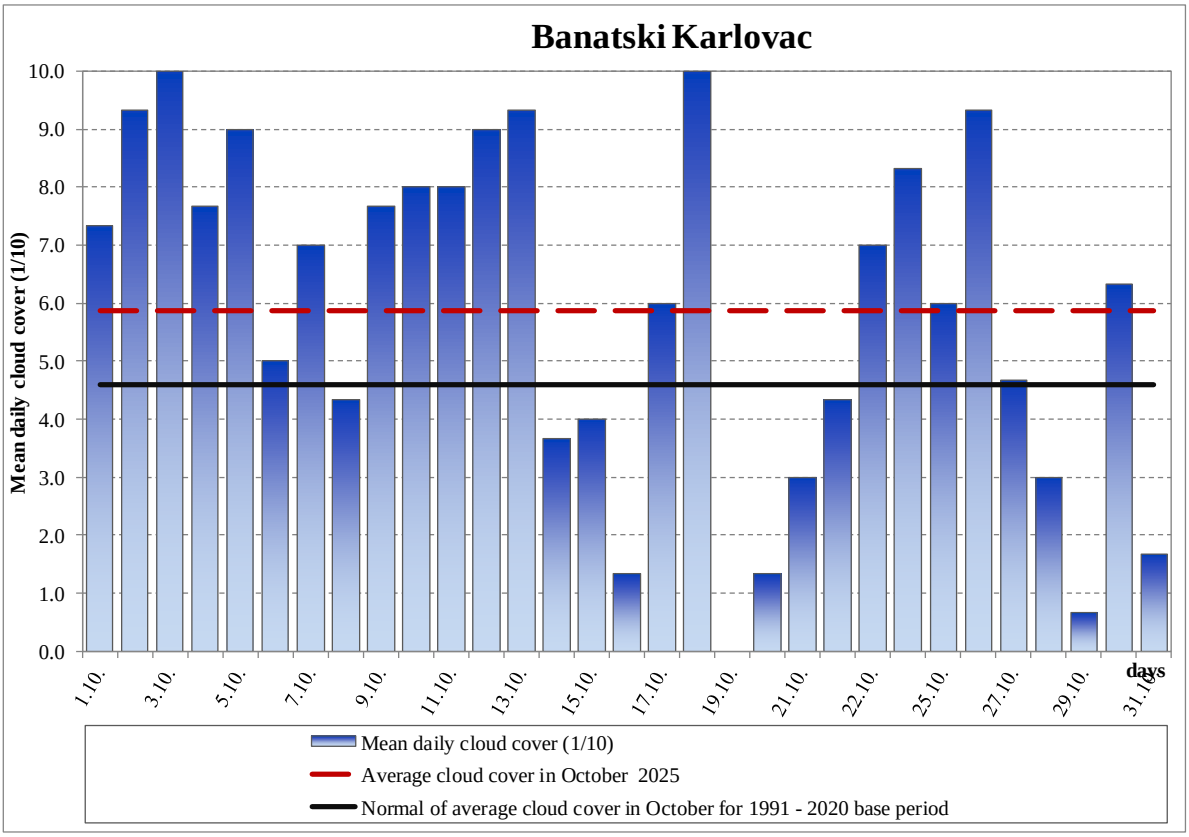


Figure 20. Mean daily cloud cover in Banatski Karlovac

SUNSHINE DURATION (INSOLATION)

Sunshine duration in October ranged from 75.4 hours in Leskovac to 172.0 hours in Kikinda (*Figure 21*).

In Nis and Kopaonik, **record low number of sunshine hours was recorded in October.** Nis recorded 88.8 hours thereby exceeding the previous October minimum of 90.0 hours set in October 2016. Kopaonik measured 88.5 hours besting the previous record of 98.0 hours from 2003.

October insolation ranged from 54% in Leskovac to 106% in Negotin compared to the normal for the 1991-2020 base period (*Figure 22).*

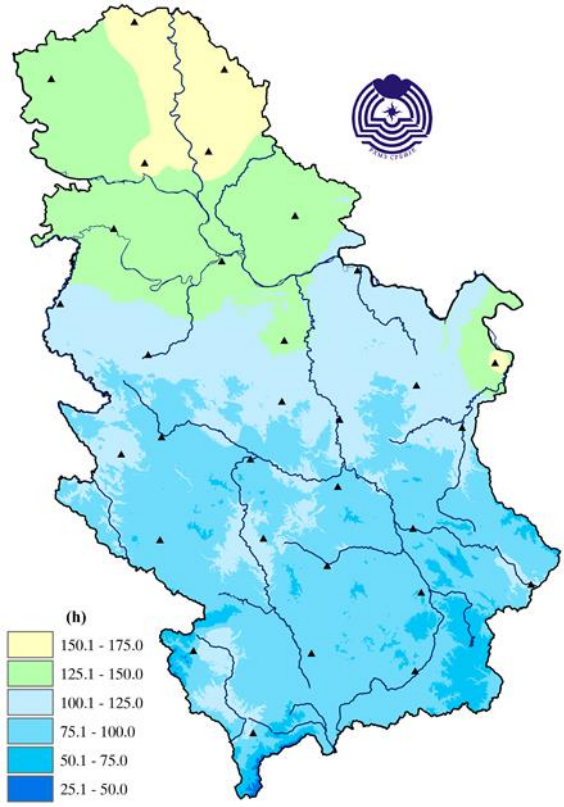


Figure 21. Insolation, expressed in hours

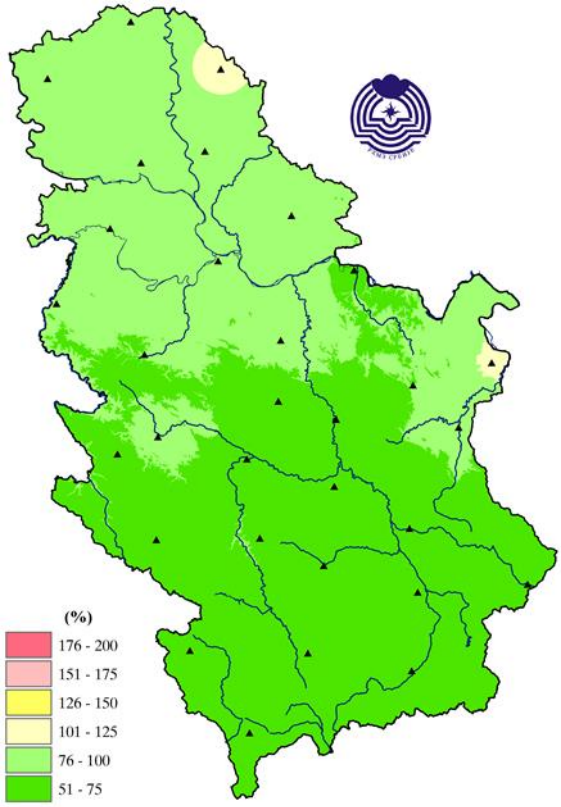


Figure 22. Insolation expressed in the percentages of normal

Note: Climate analysis of meteorological elements was done based on the preliminary data obtained from 28 main meteorological stations

OVERVIEW OF THE SYNOPTIC SITUATION*

Large wave disturbances and strong circulation systems with several weather extremes. At the beginning of the month, first a moist wave from the Mediterranean, followed by very cold air from the northeast and north; cold weather, wet snow, and a deep snow cover. Then, northwesterly circulation and cool conditions, in some places with rain. During the third decade, warm, very warm, and changeable weather at the beginning and end of the period, as part of a ridge emanating from the Mediterranean.

Period at the beginning of the month was marked by the influence of low-pressure system from the central Mediterranean and accompanying waves of moist air moving across the Adriatic and the southern Balkans, passing over our region toward the Black Sea and the Carpathians. Weather was cloudy with rain, locally heavy rain was recorded in the central, southern, and eastern areas. At the same time, there was an advection of cold air from the northeast associated with a surface anticyclone and a pocket of cold air in the upper-air low pressure circulation, which was retrograding from the east, moving across the Pannonian Plain and deepening toward the southern Adriatic. Consequently, this brought cooling and precipitation with pronounced wind shear in the mid-troposphere, with snow in some lower areas and especially in the mountainous regions in the south, with a significant snow cover for early October. In the middle of the decade, a new, less cold frontal wave arrived from the north and northwest, along with the influence of a pronounced low-pressure system which, while slowly filling, moved across our region toward the southeast and east, that is, toward the Aegean and Black Seas. There was occasional rain, and still some light snow on the higher mountains. From the end of the first decade, it became gradually warmer, changeable, and mostly without precipitation, except in some areas in the southeast.

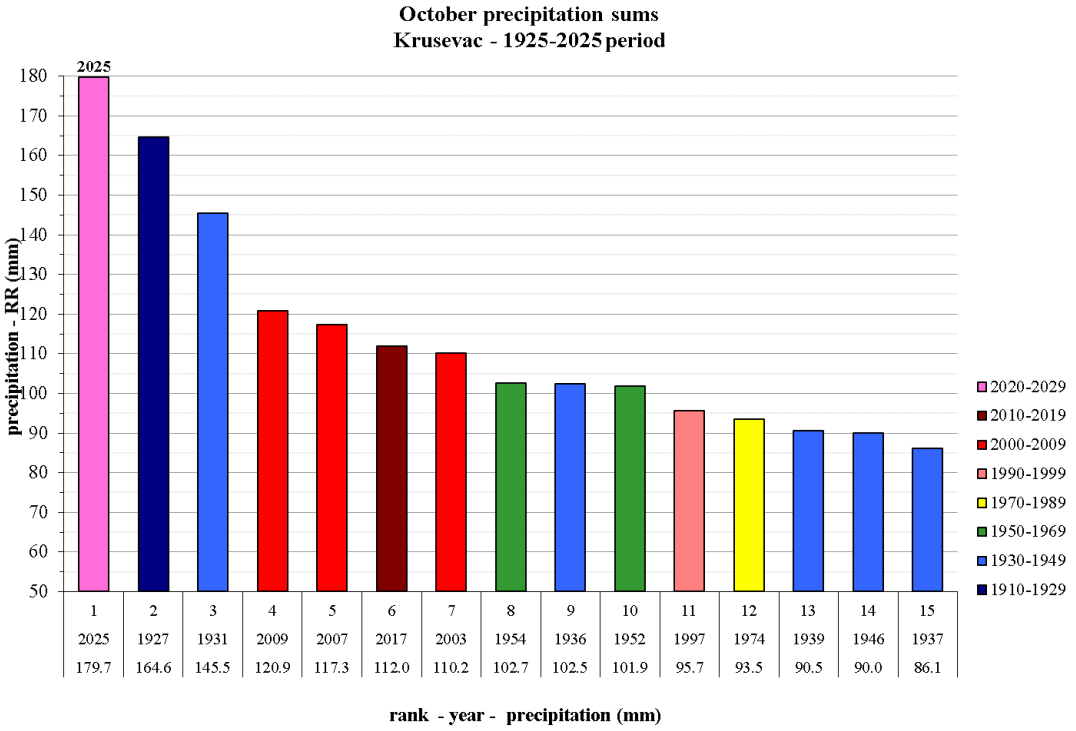
In a subsequent period, northwesterly upper-level circulation was established accompanied by rising surface pressure and a weakly pronounced anticyclone, which persisted until the middle of the month. During this period, mostly bright weather caused, in the early morning hours, occasional ground frost. Namely, a ridge, that is, an anticyclone dominated the north, northwest, and west of the continent. Then, the development of a low-pressure system in the north, in the Arctic region, and its movement southward led to the weakening of the aforementioned ridge in the west and over the Balkans, this brought a brief period of northerly, and then northwesterly circulation, accompanied by the passage of an upper-air trough axis. The weather was changeable and mostly dry, slightly warmer at the beginning of the decade and in some places, mainly in the south and east, with rain.

During the third decade, the development of a new low-pressure system in the northwest of the continent, over the northeastern Atlantic, the British Isles, and the North Sea and its expansion toward the eastern and central parts of Europe led to strong, predominantly zonal upper-air circulation and an advection of warmer air and occasional waves of moist air moved toward the Apennines, the Adriatic, and the Pannonian Plain, continuing toward the central Balkans and then further east, northeast, and southeast. Warm and very warm weather prevailed at the beginning of the third decade and again at the end of the month, under the influence of a ridge extending from the Mediterranean. The weather was changeable, at times with rain and local showers, more pronounced in the southern and southeastern parts of the country.

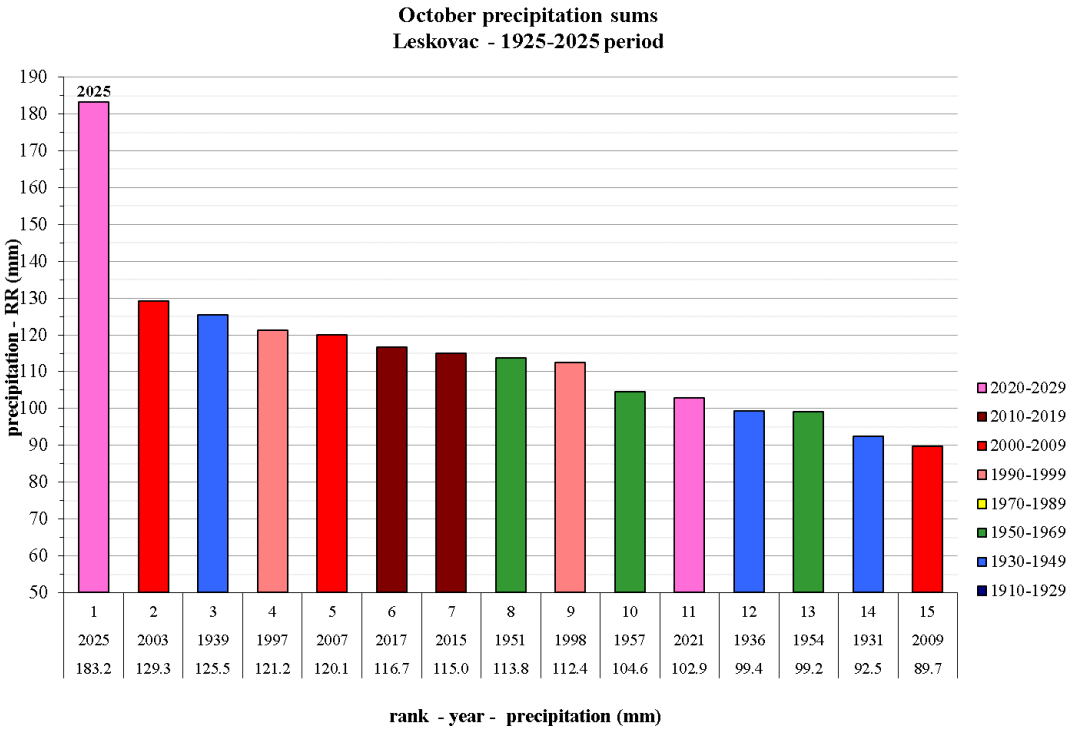
* National Center for Hydrometeorlogical Early Warning System

APPENDIX

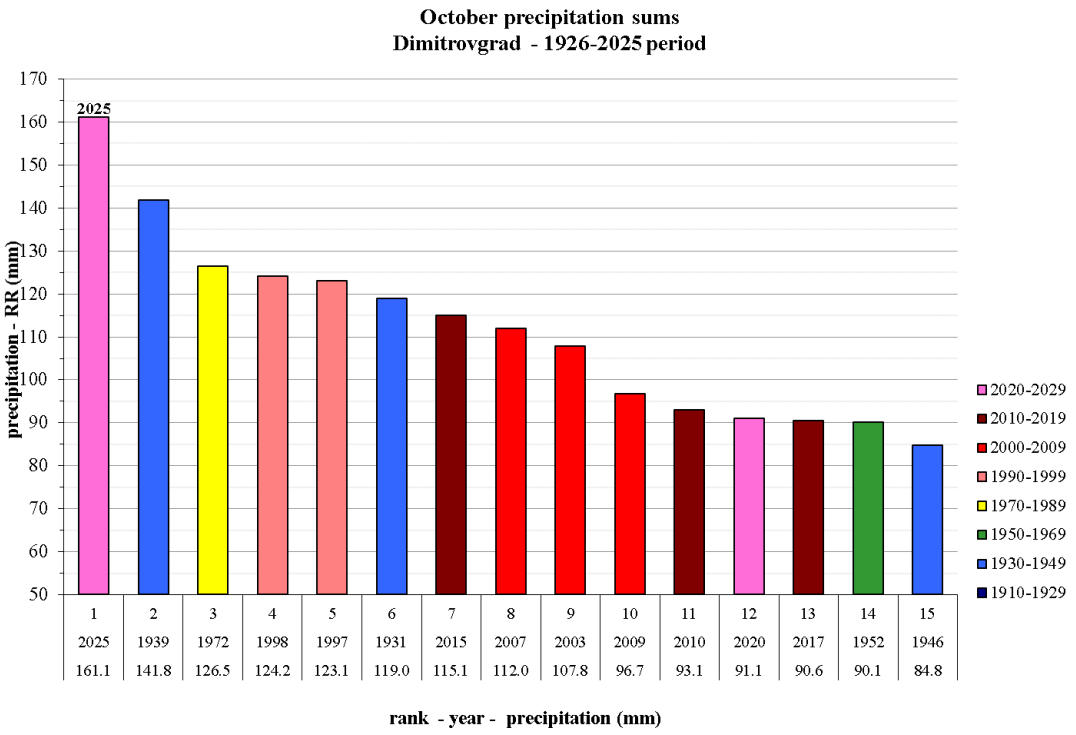
Ranks of the wettest October



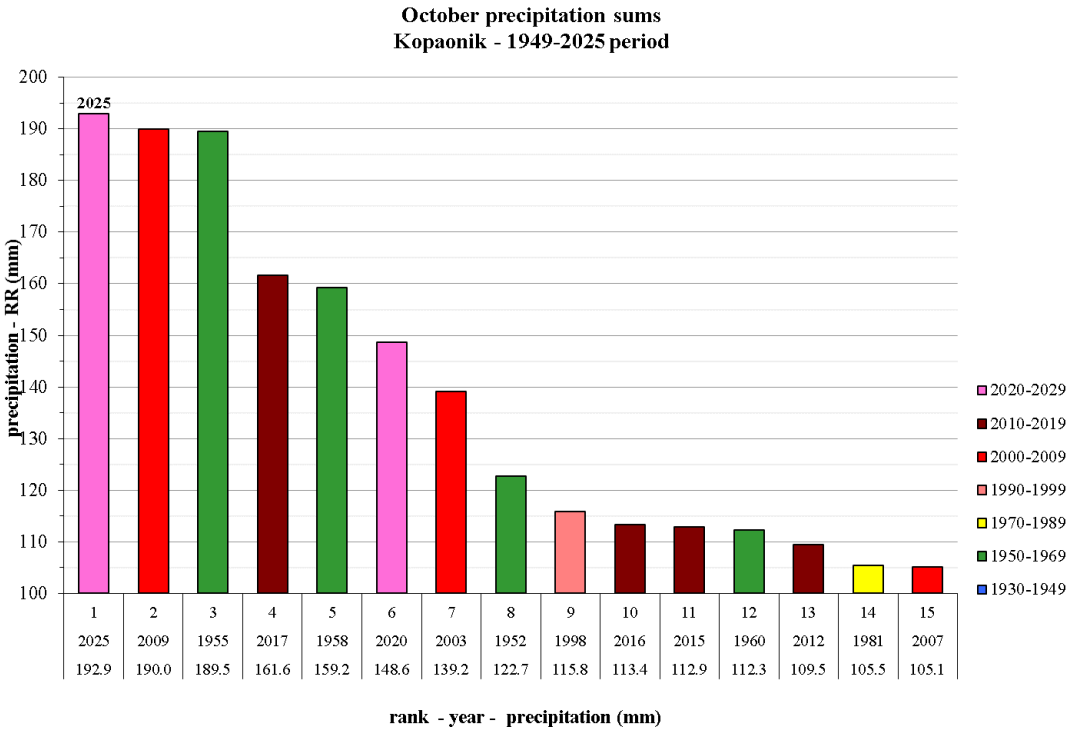
Appendix 1. Rank of the highest precipitation in Krusevac



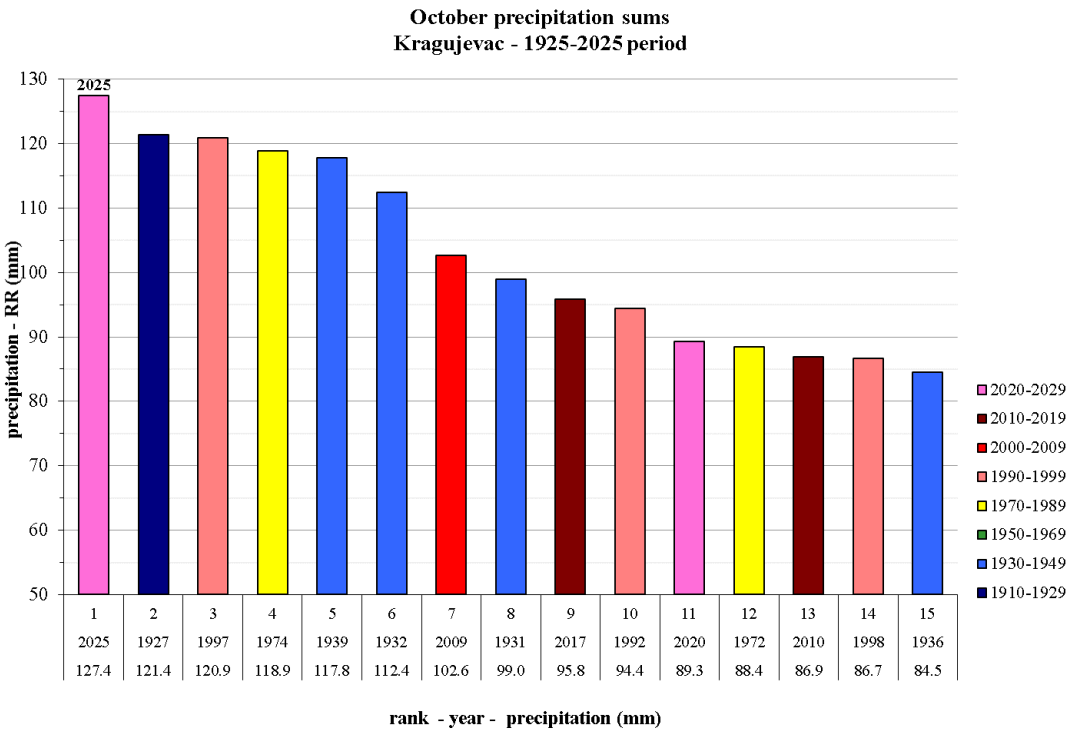
Appendix 2. Rank of the highest precipitation in Leskovac



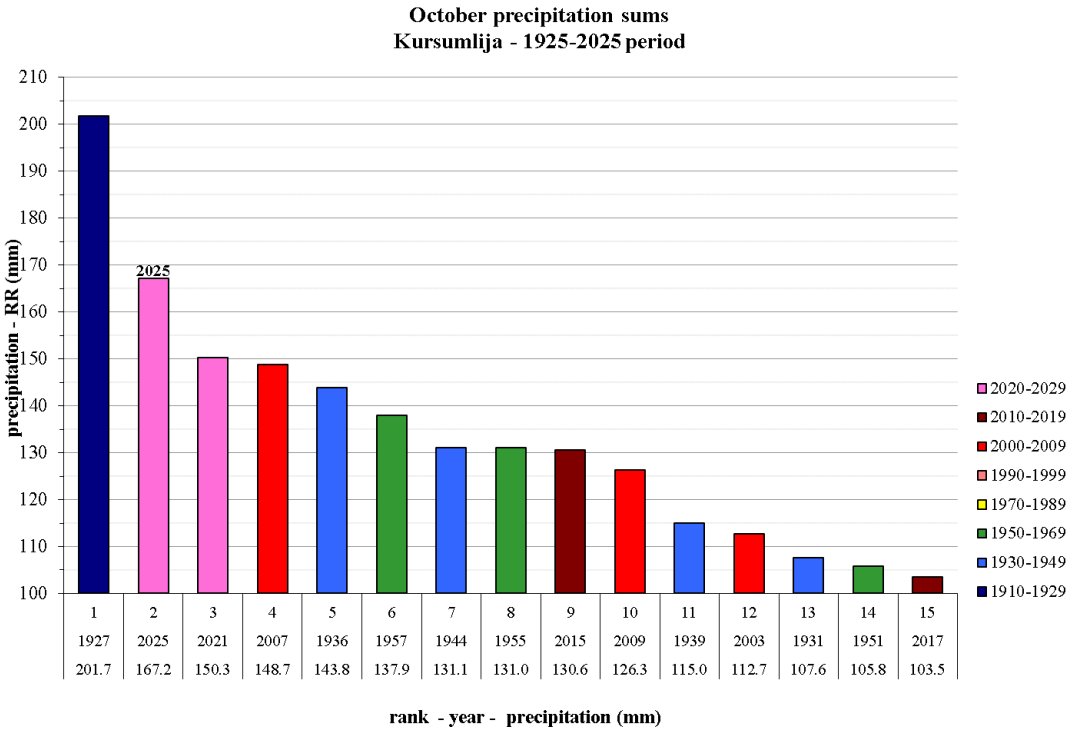
Appendix 3. Rank of the highest precipitation in Dimitrovgrad



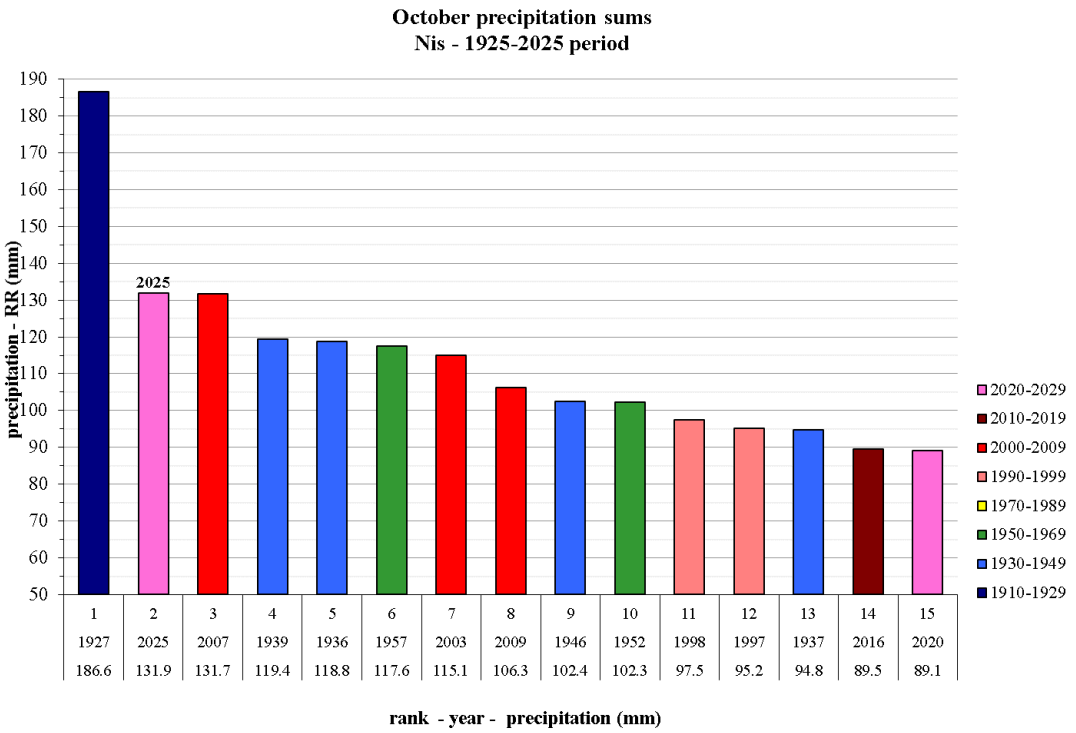
Appendix 4. Rank of the highest precipitation on Kopaonik



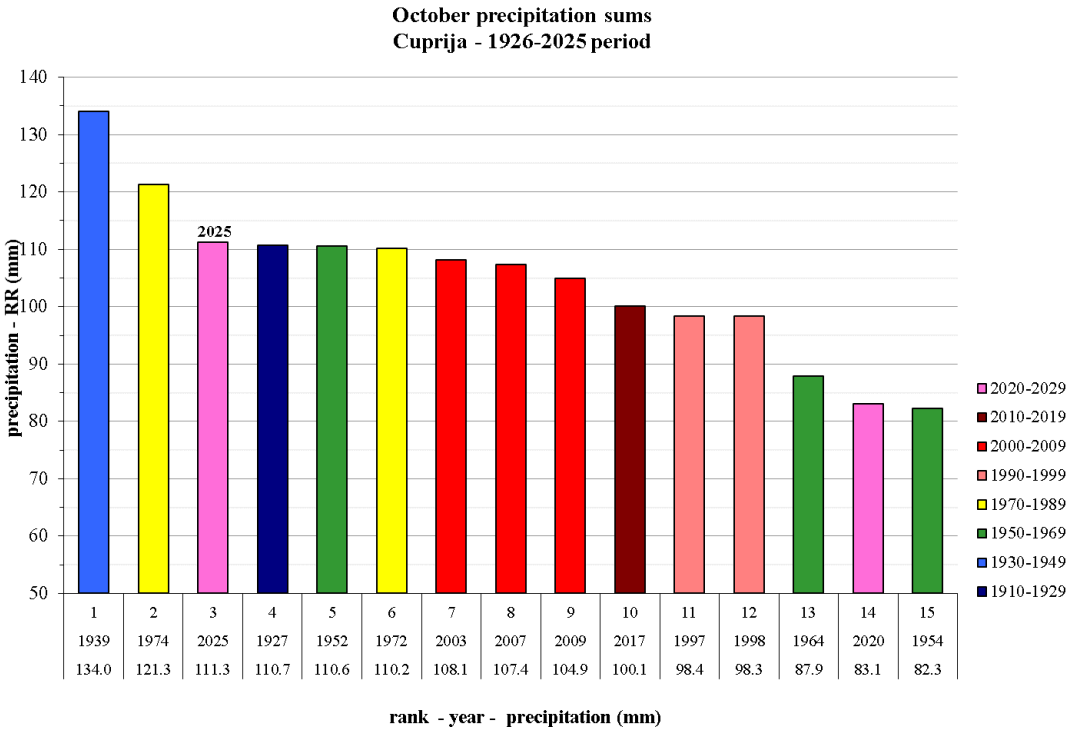
Appendix 5. Rank of the highest precipitation in Kragujevac



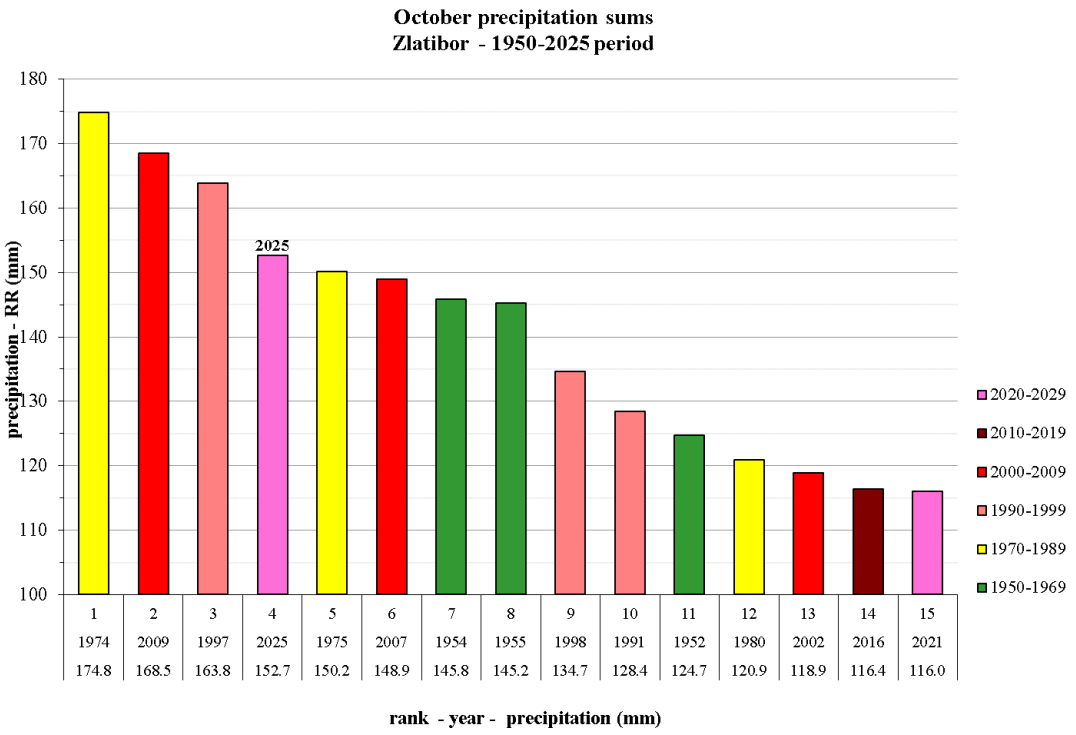
Appendix 6. Rank of the highest precipitation in Kursumlija



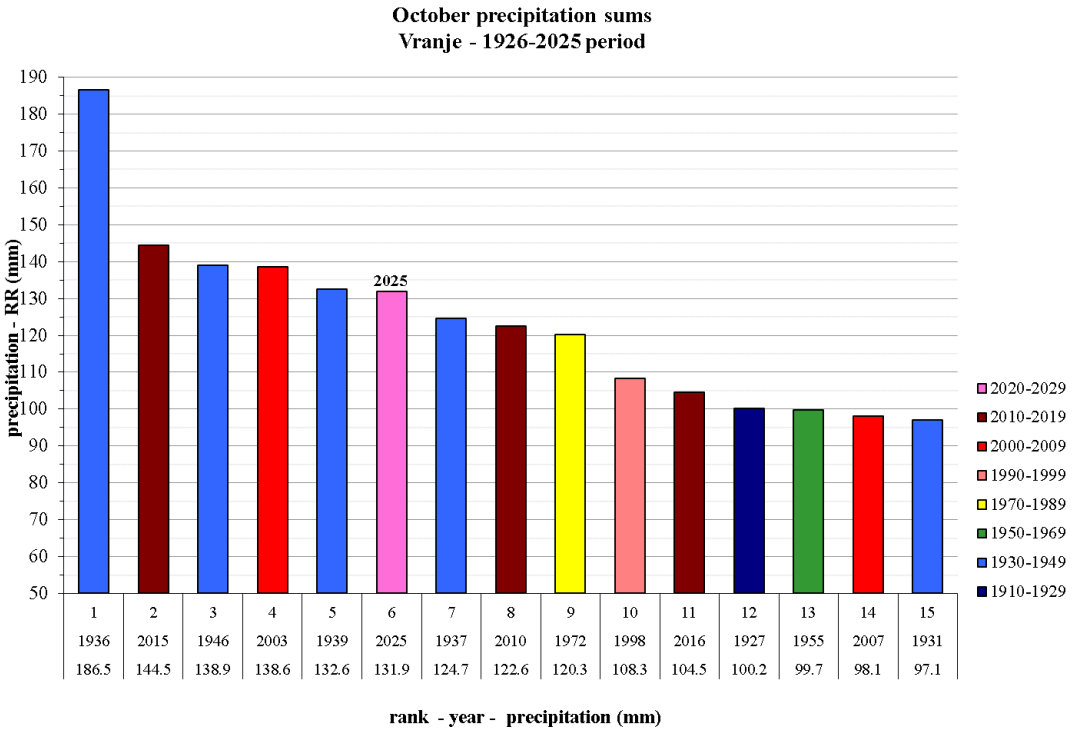
Appendix 7. Rank of the highest precipitation in Nis



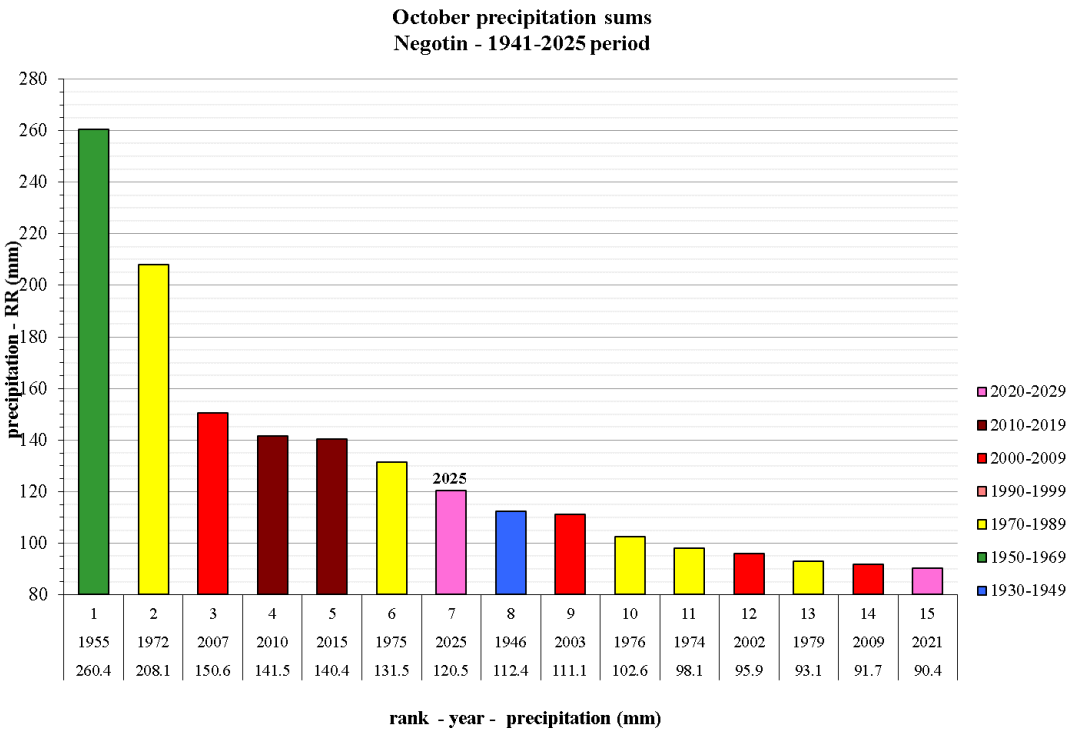
Appendix 8. Rank of the highest precipitation in Cuprija



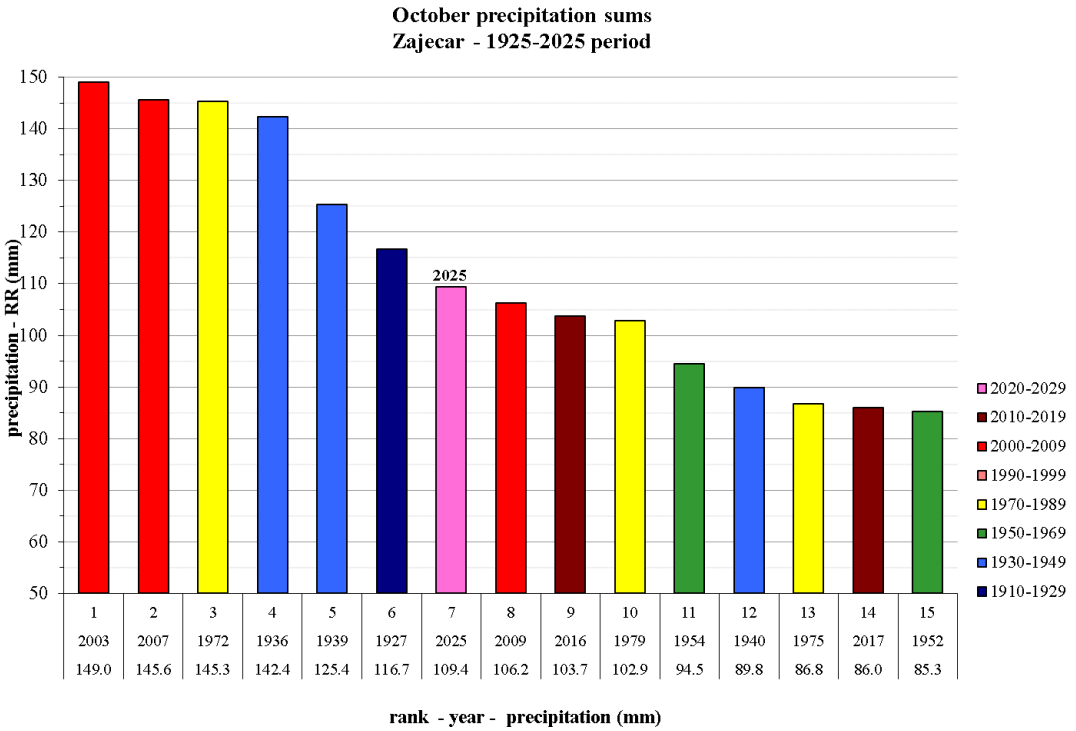
Appendix 9. Rank of the highest precipitation on Zlatibor



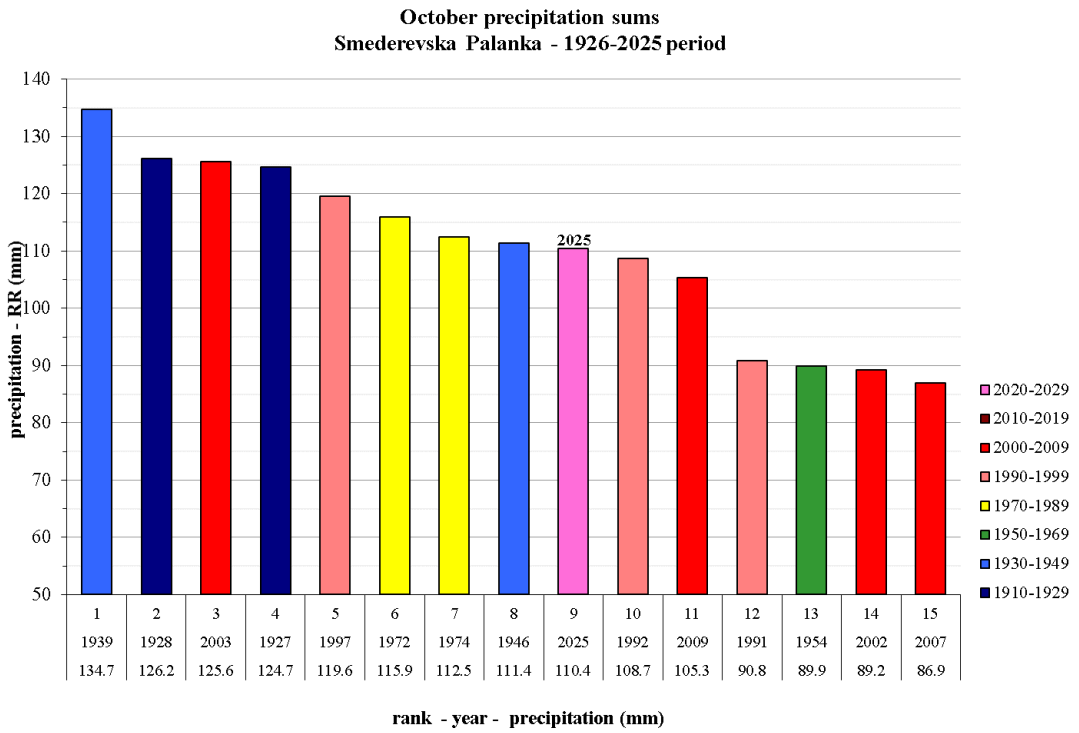
Appendix 10. Rank of the highest precipitation in Vranje



Appendix 11. Rank of the highest precipitation in Negotin

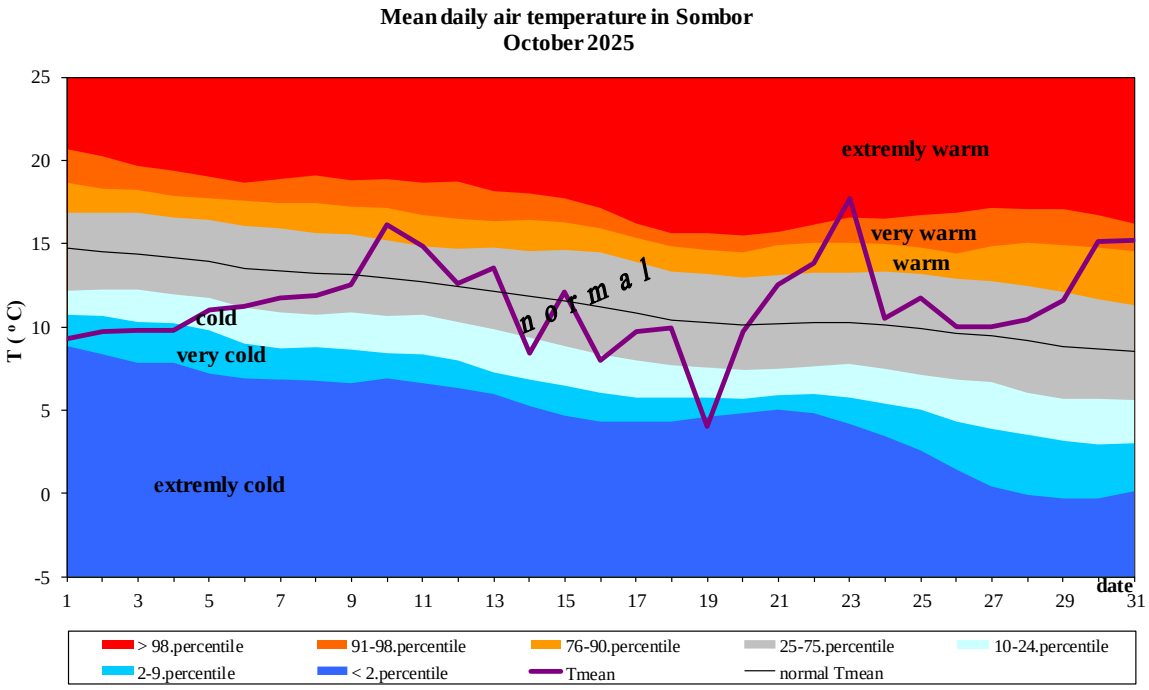


Appendix 12. Rank of the highest precipitation in Zajecar

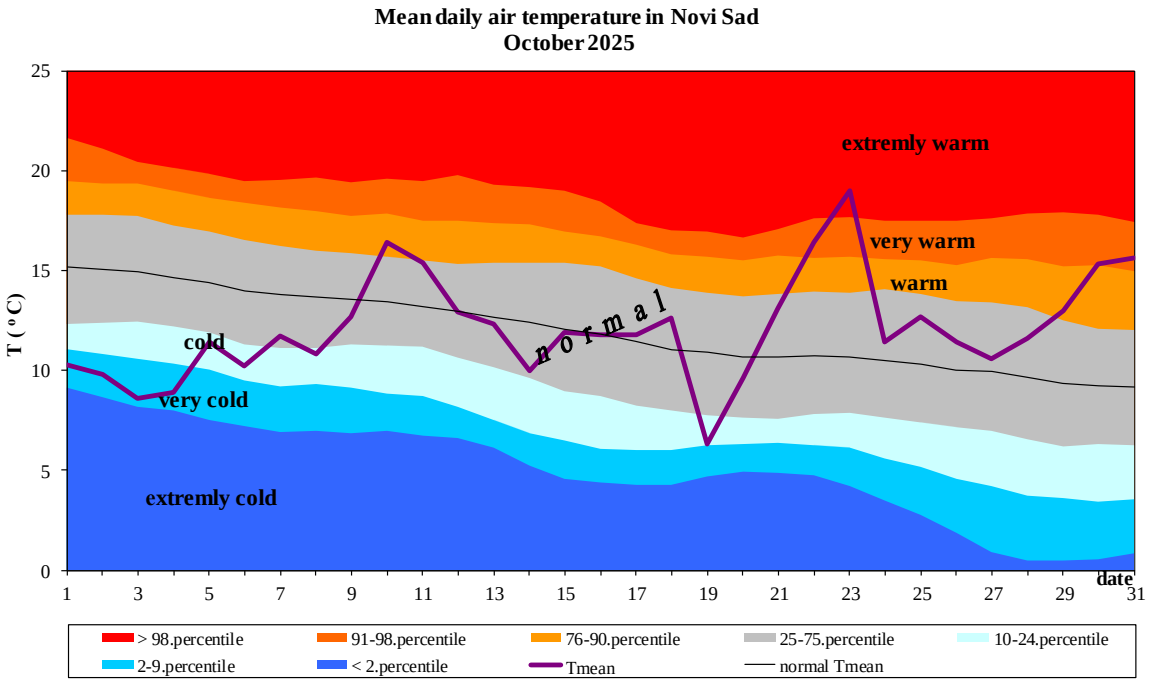


Appendix 13. Rank of the highest precipitation in Smederevska Palanka

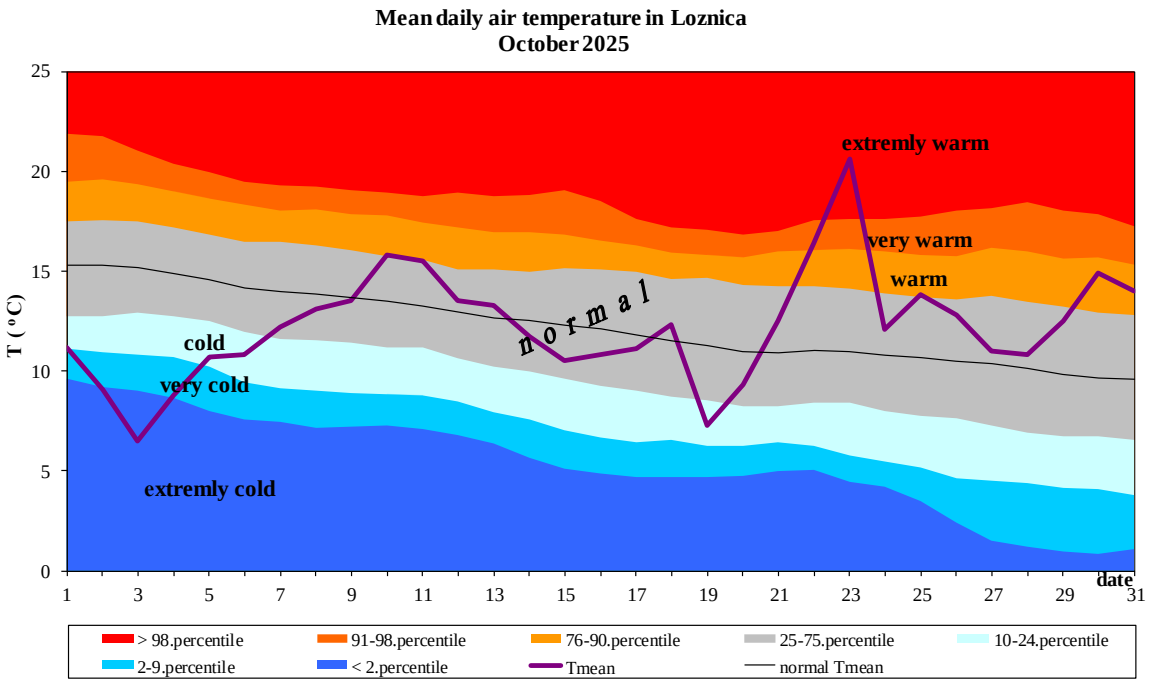
Mean air temperature



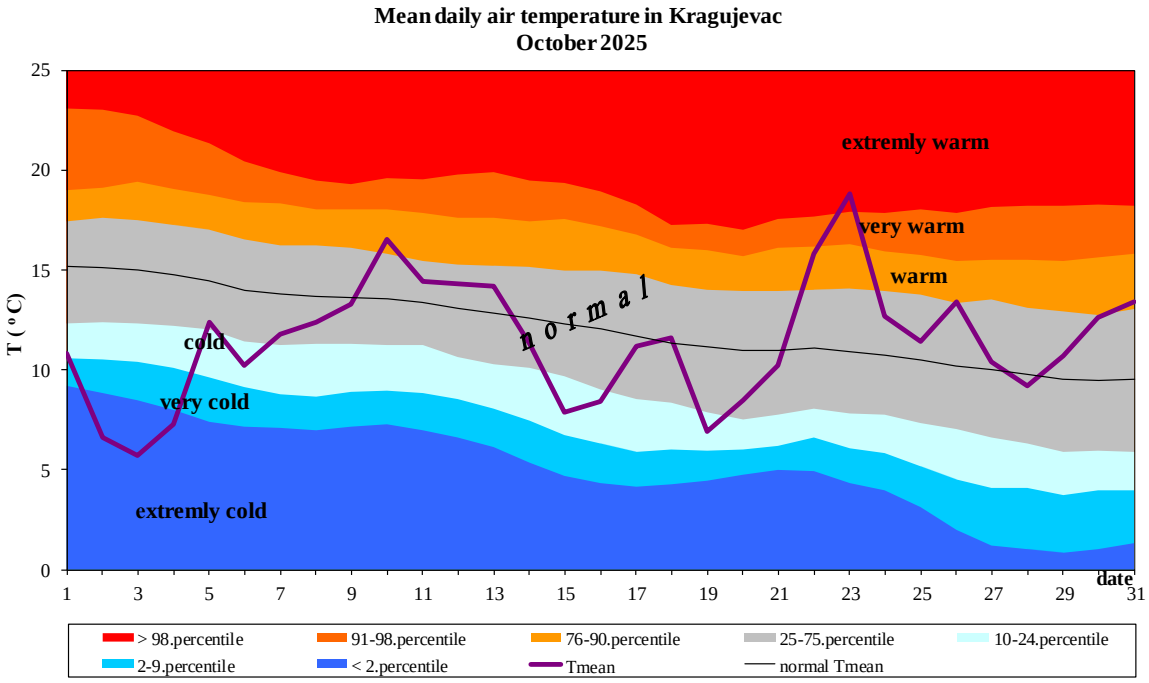
Appendix 14. Daily course of the mean daily air temperature and accompanying percentile for Sombor



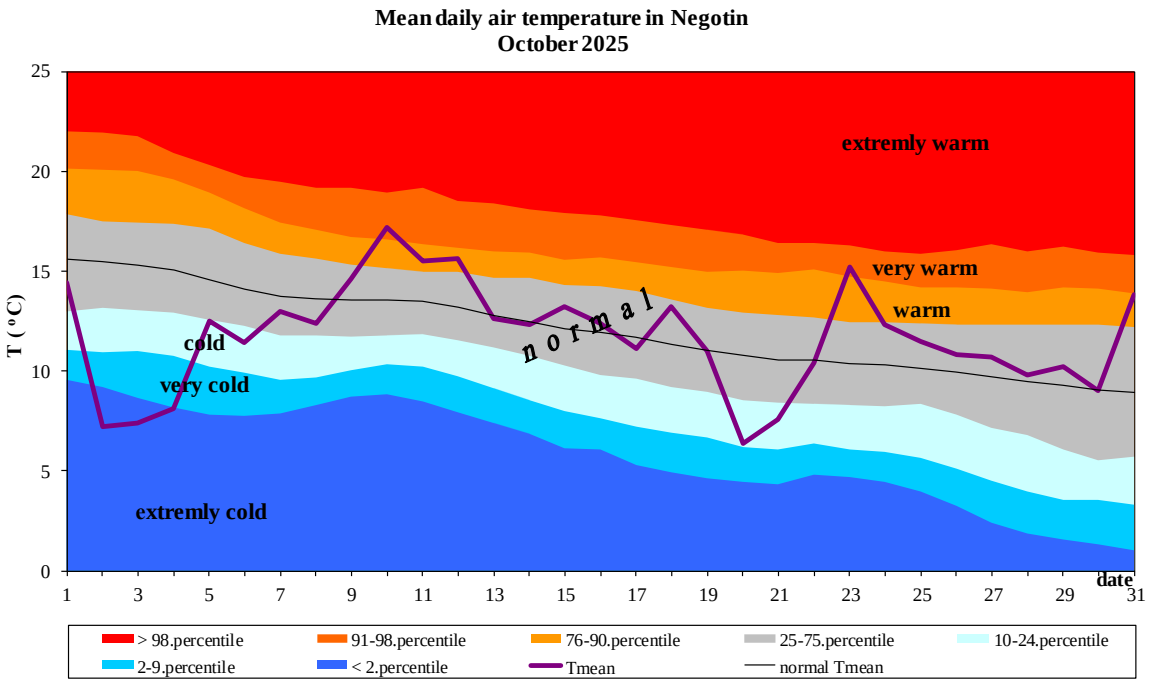
Appendix 15. Daily course of the mean daily air temperature and accompanying percentile for Novi Sad



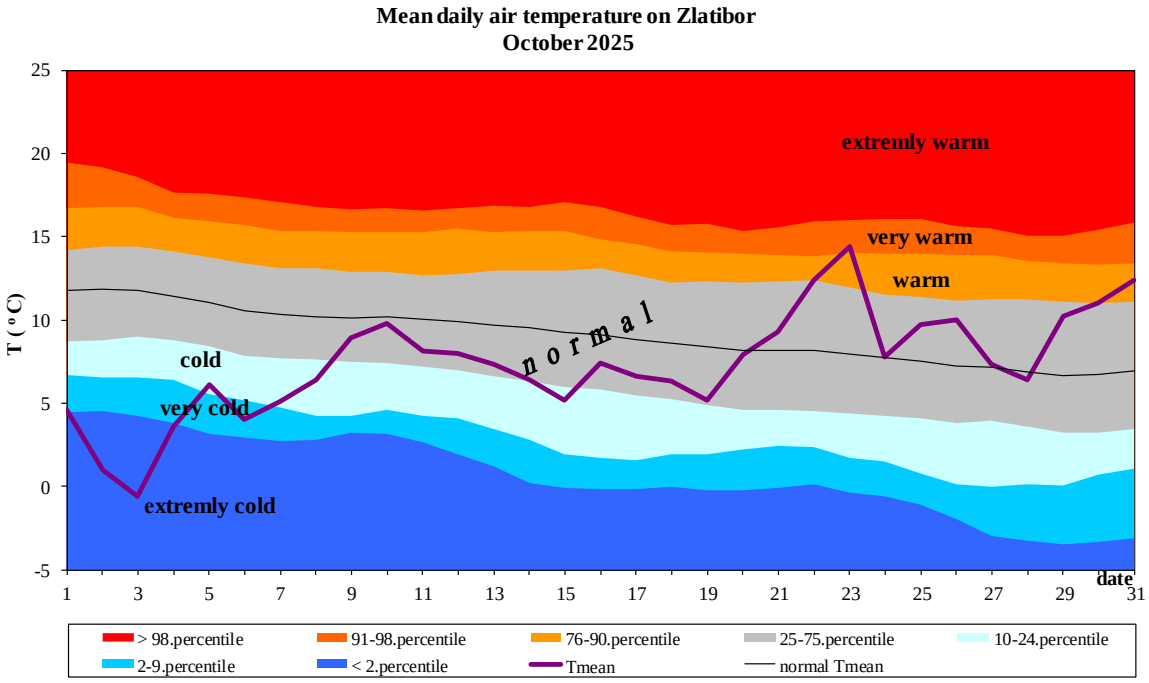
Appendix 16. Daily course of the mean daily air temperature and accompanying percentile for Loznica



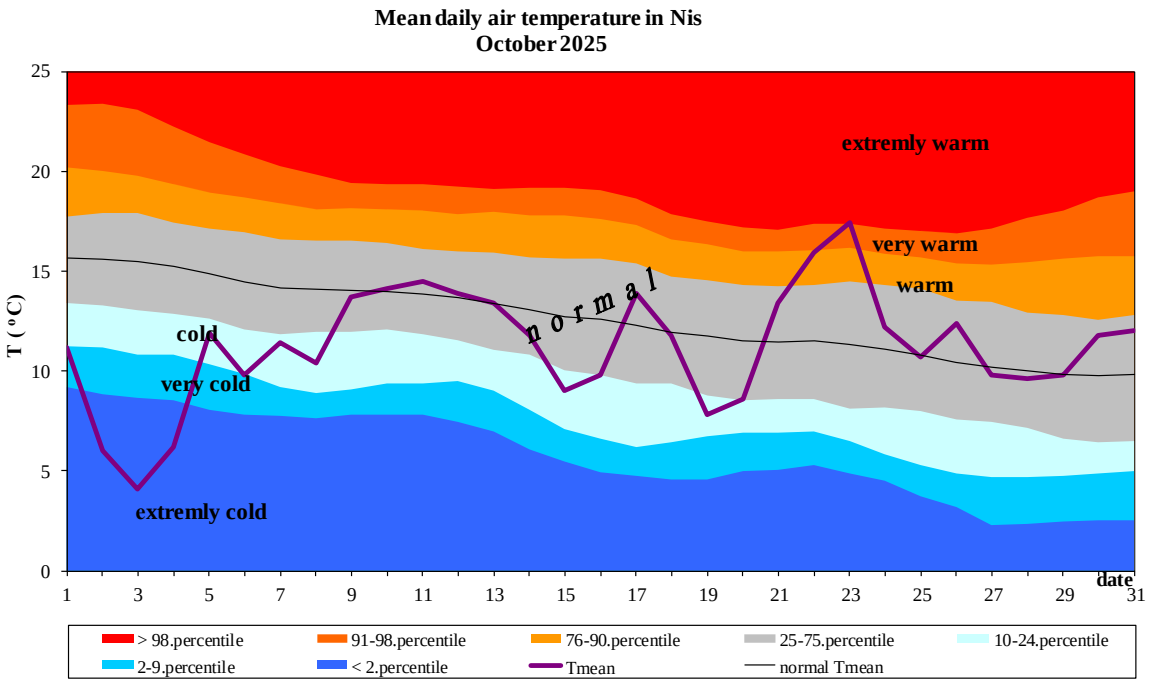
Appendix 17. Daily course of the mean daily air temperature and accompanying percentile for Kragujevac



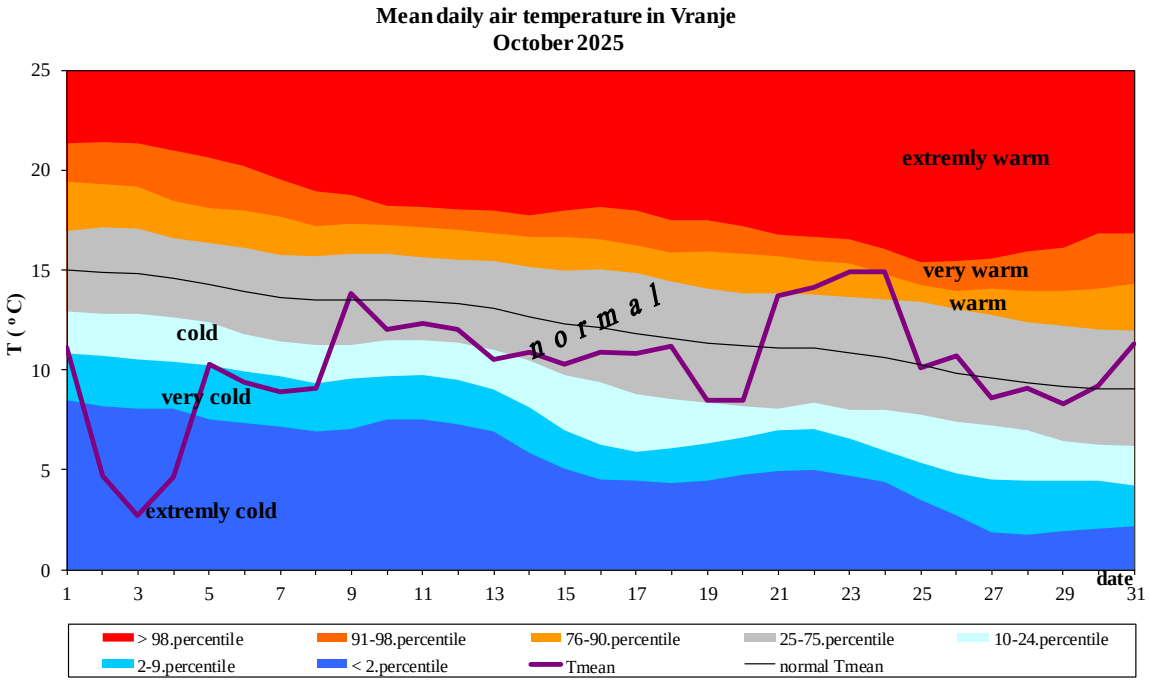
Appendix 18. Daily course of the mean daily air temperature and accompanying percentile for Negotin



Appendix 19. Daily course of the mean daily air temperature and accompanying percentile on Zlatiboru

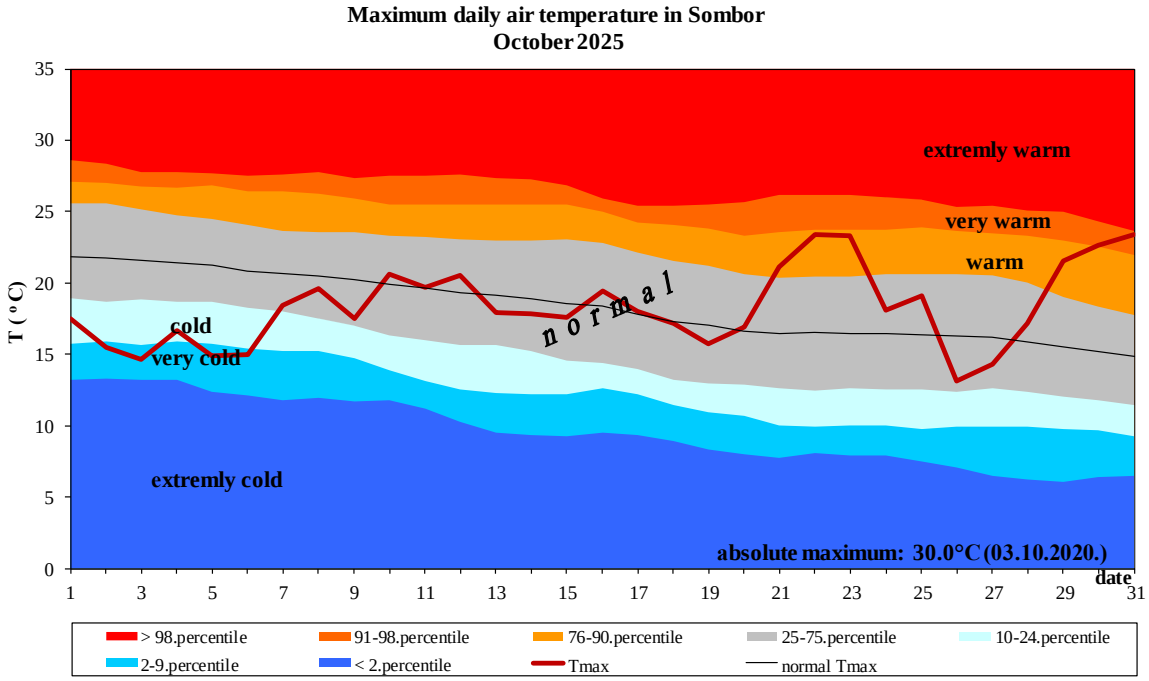


Appendix 20. Daily course of the mean daily air temperature and accompanying percentile for Nis

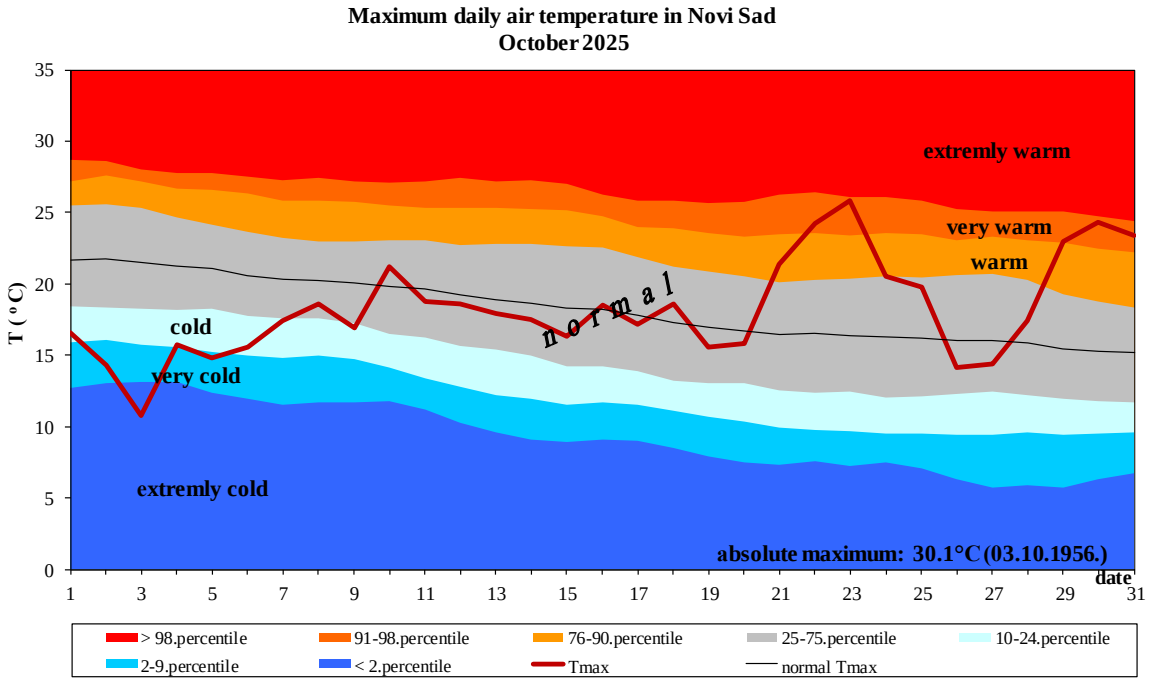


Appendix 21. Daily course of the mean daily air temperature and accompanying percentile for Vranje

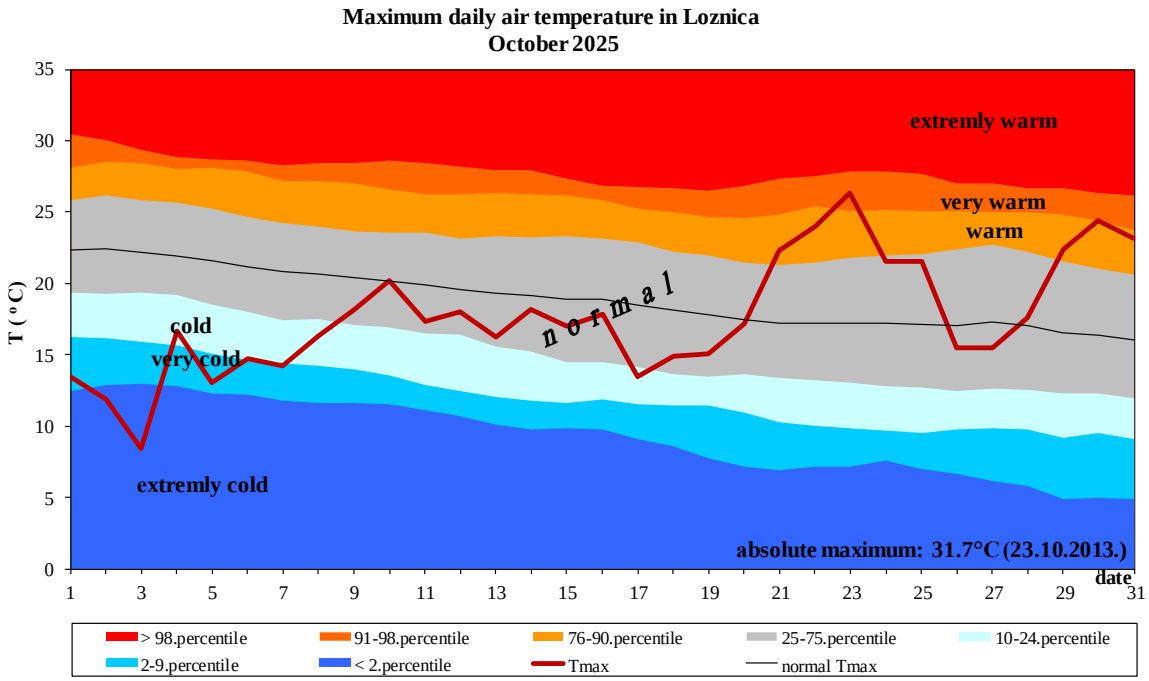
Maximum air temperature



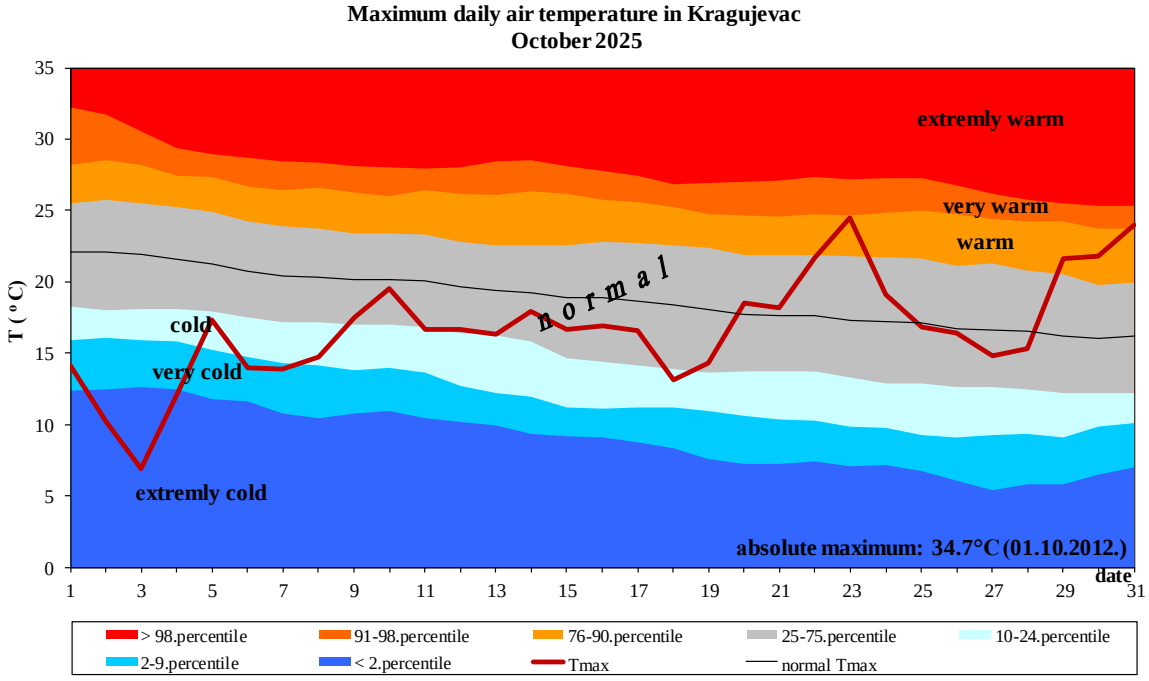
Appendix 22. Daily course of the maximum daily air temeperature and the accompanying percentile for Sombor



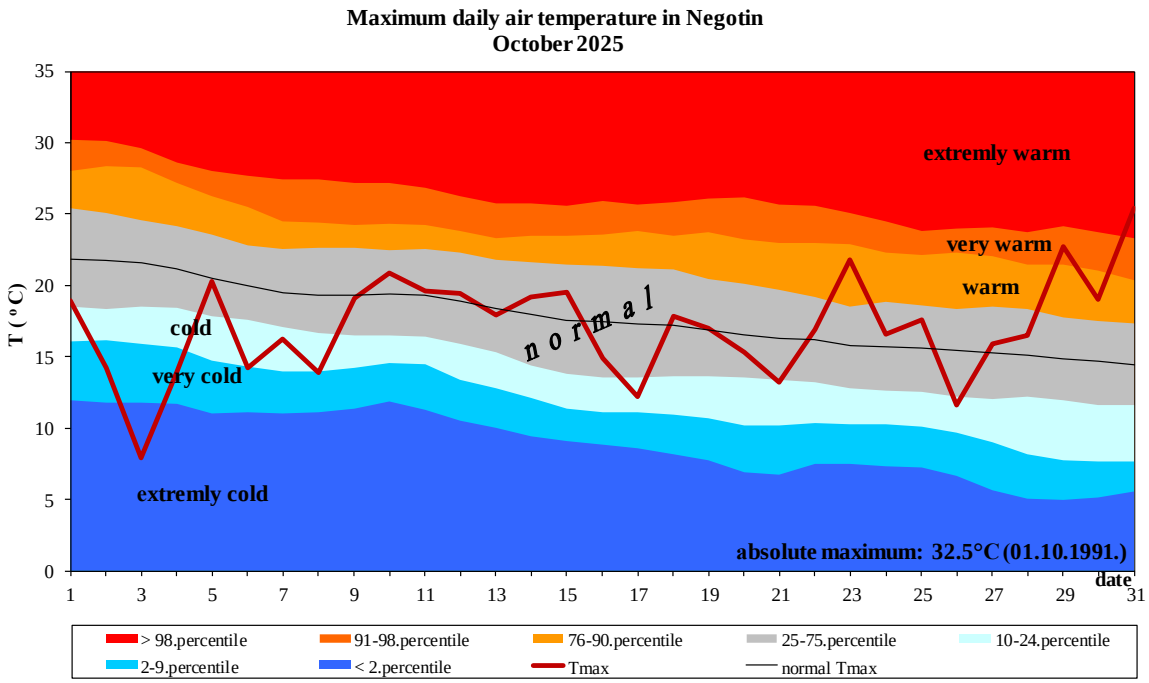
Appendix 23. Daily course of the maximum daily air temeperature and the accompanying percentile for Novi Sad



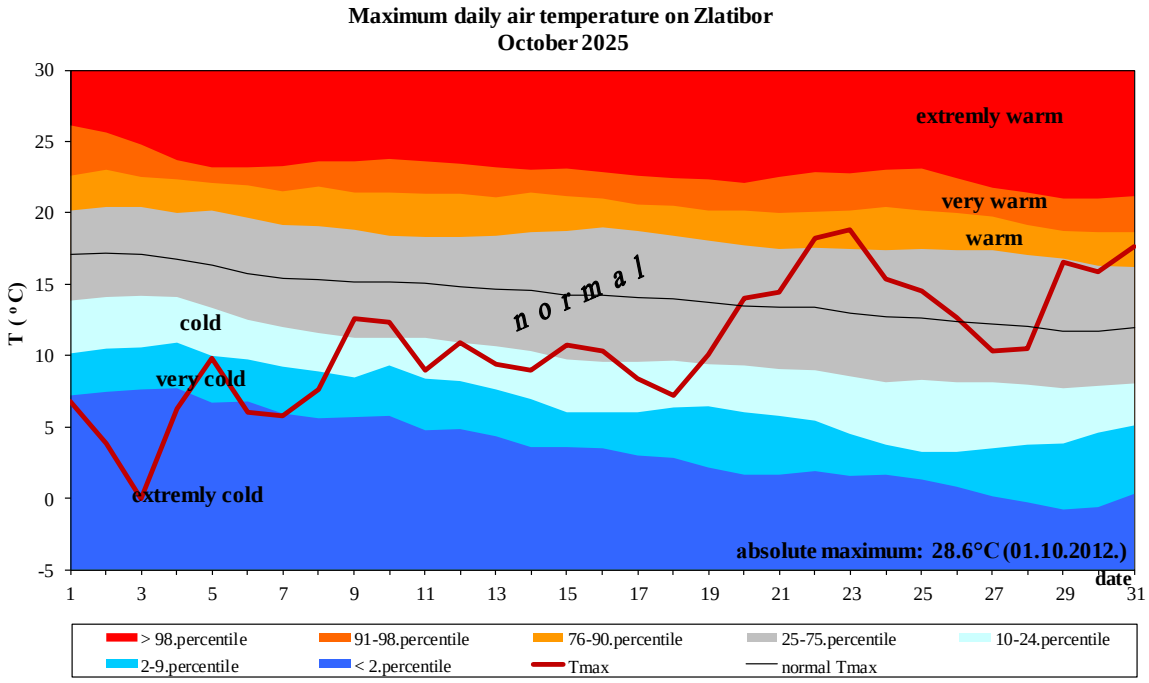
Appendix 24. Daily course of the maximum daily air temeperature and the accompanying percentile for Loznica



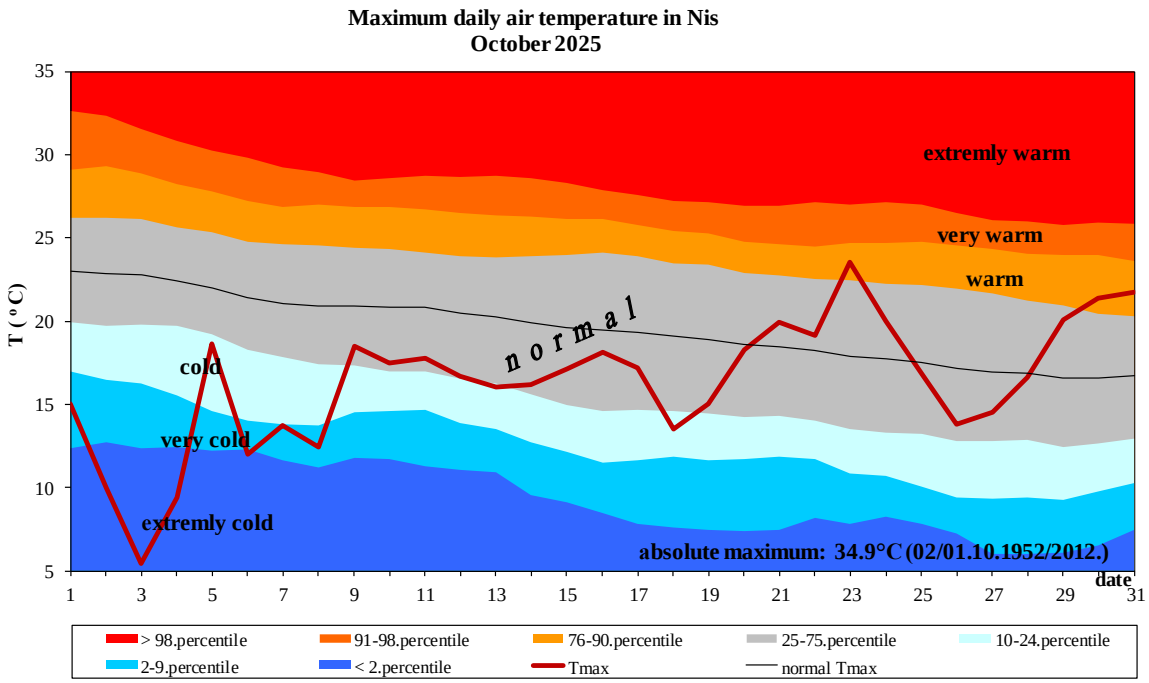
Appendix 25. Daily course of the maximum daily air temeperature and the accompanying percentile for Kragujevac



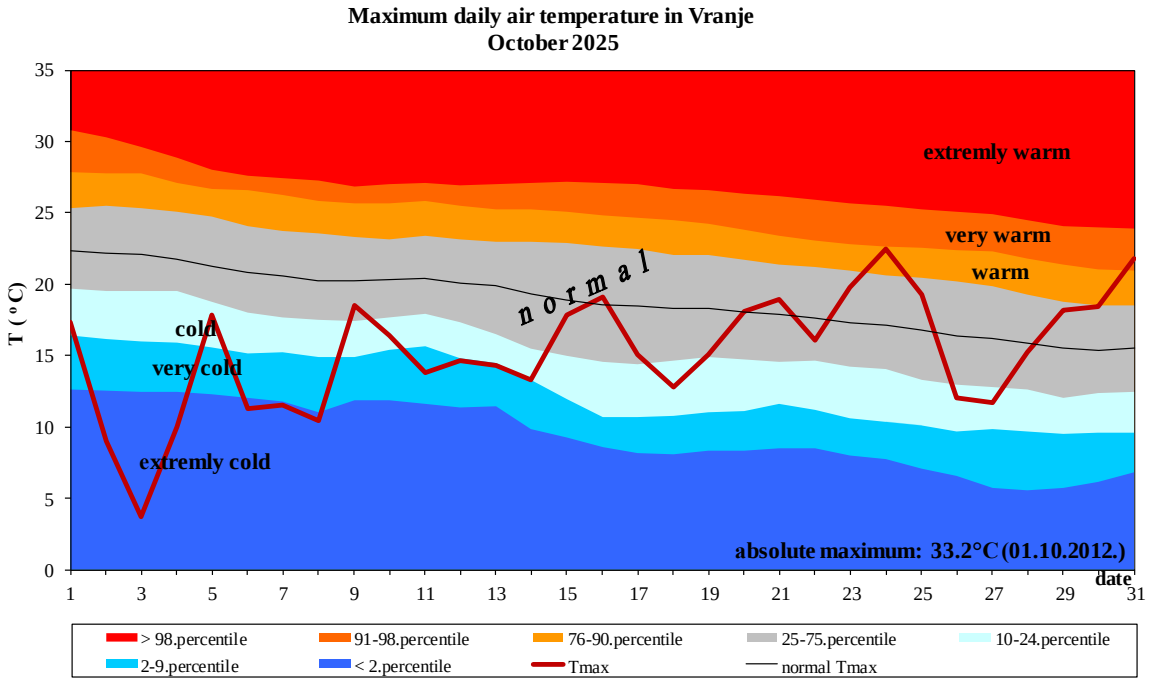
Appendix 26. Daily course of the maximum daily air temeperature and the accompanying percentile for Negotin



Appendix 27. Daily course of the maximum daily air temeperature and the accompanying percentile on Zlatibor

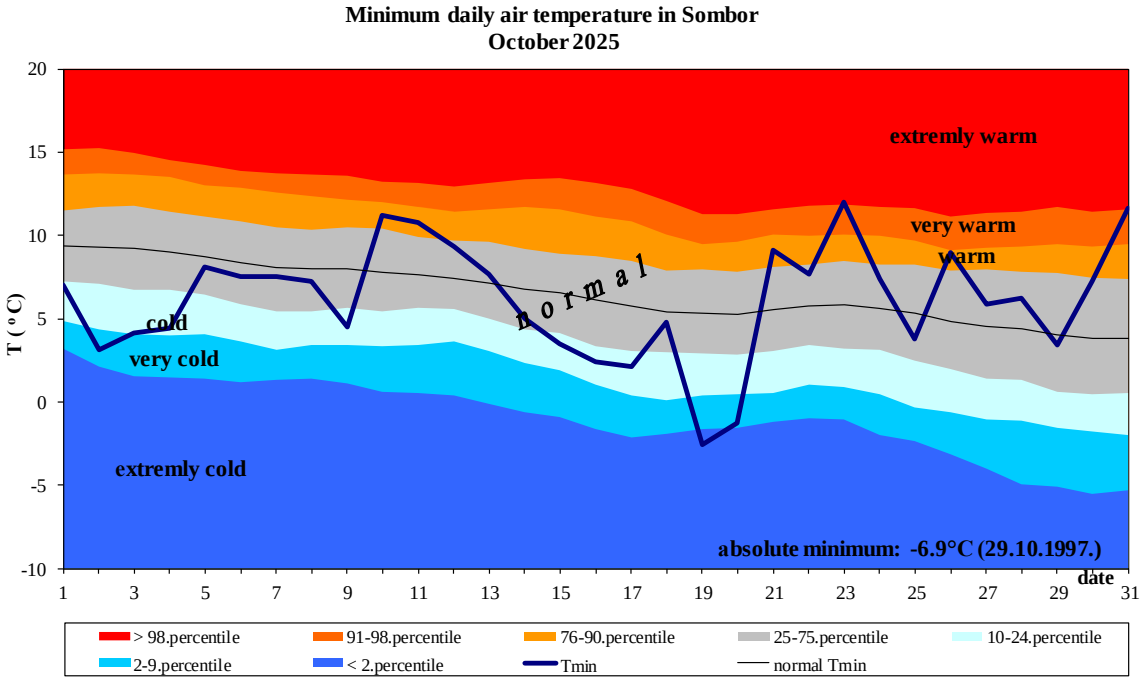


Appendix 28. Daily course of the maximum daily air temeperature and the accompanying percentile for Nis

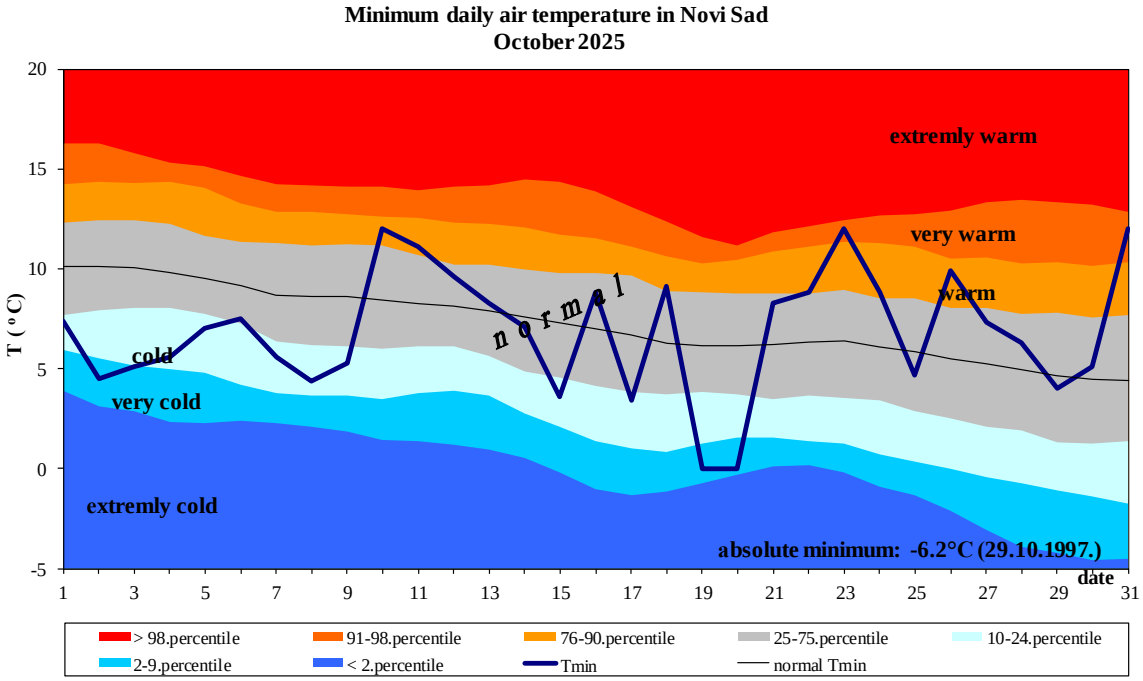


Appendix 29. Daily course of the maximum daily air temeperature and the accompanying percentile for Vranje

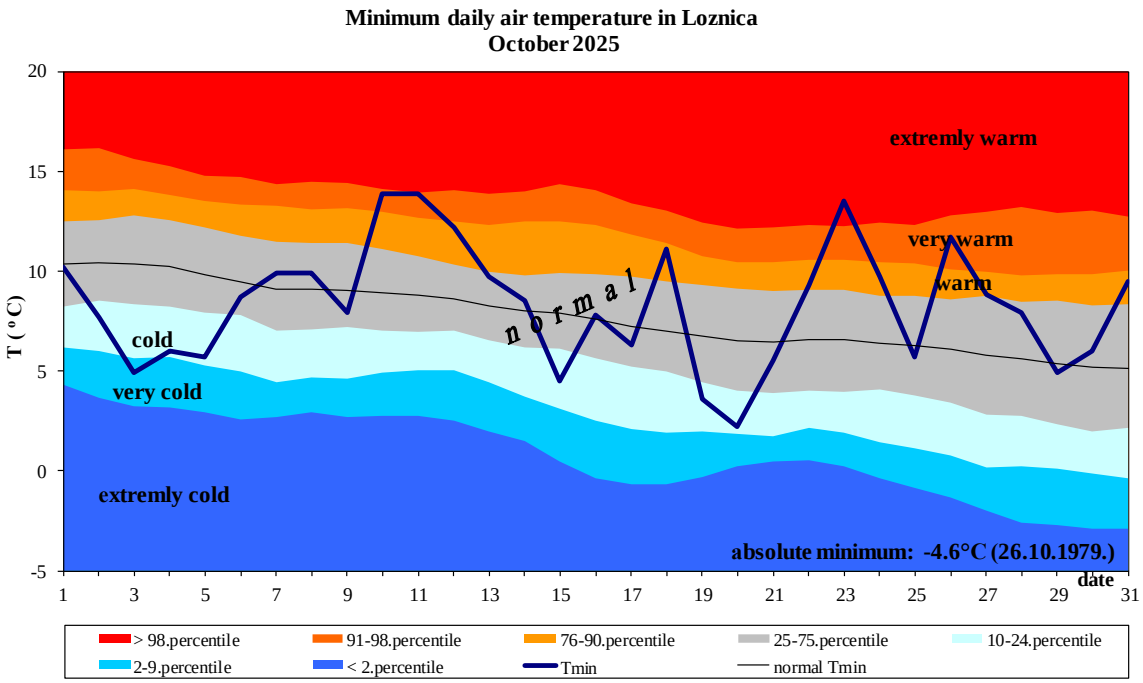
Minimum air temperature



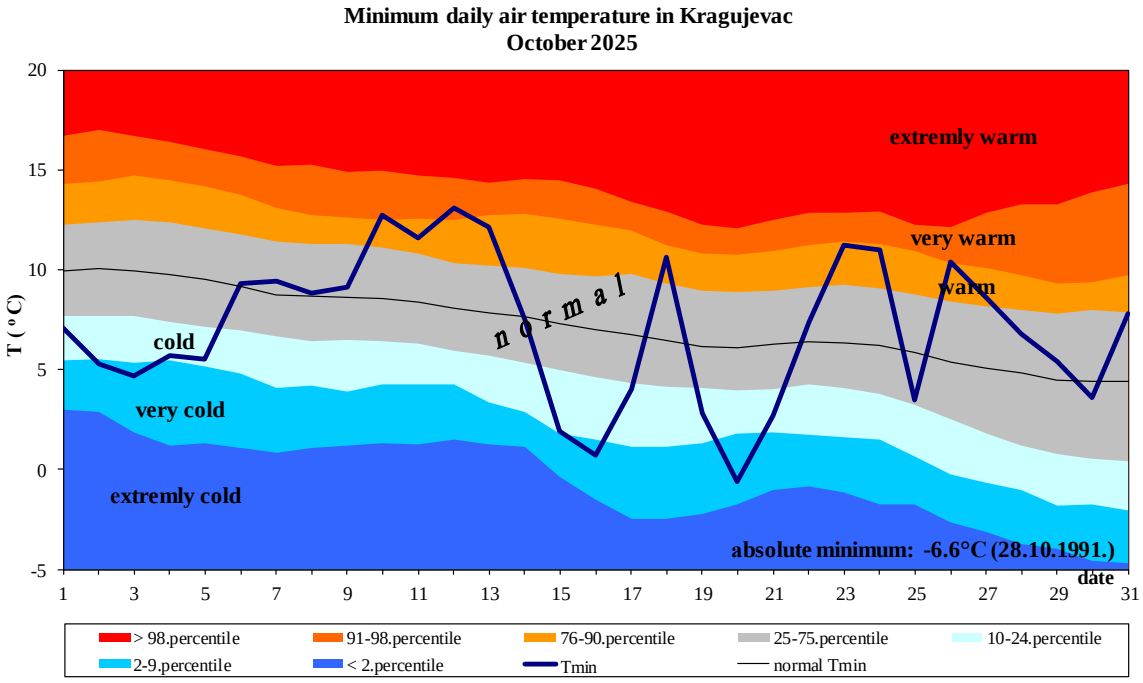
Appendix 30. Daily course of the minimum daily air temperature and the accompanying percentile for Sombor



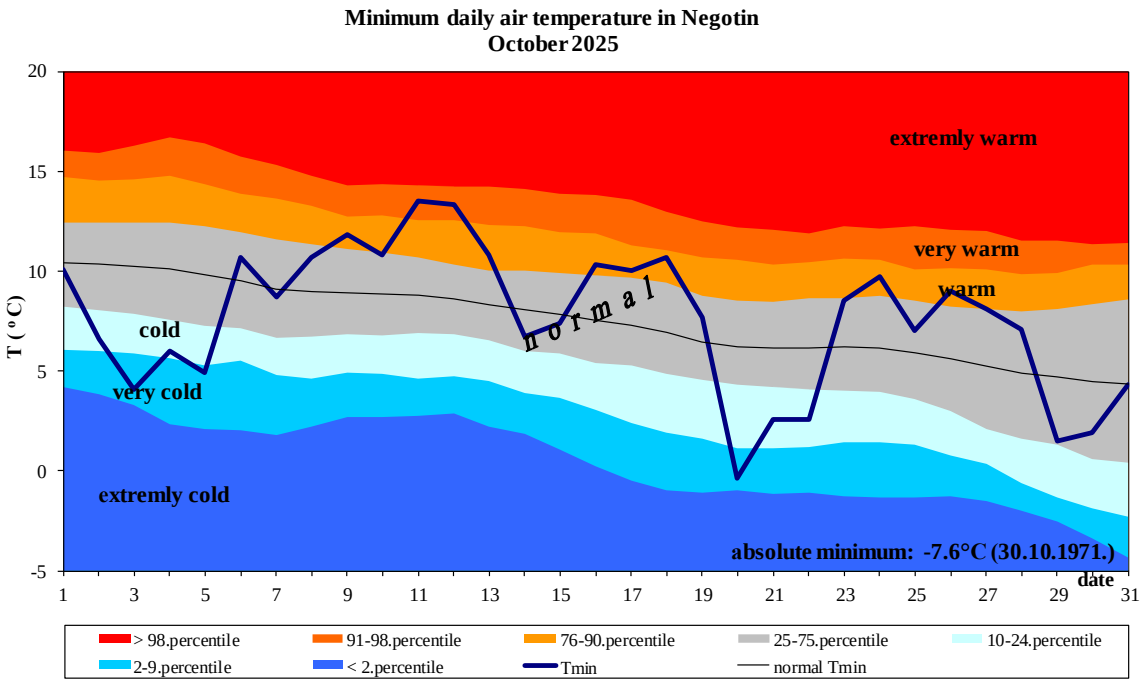
Appendix 31. Daily course of the minimum daily air temperature and the accompanying percentile for Novi Sad



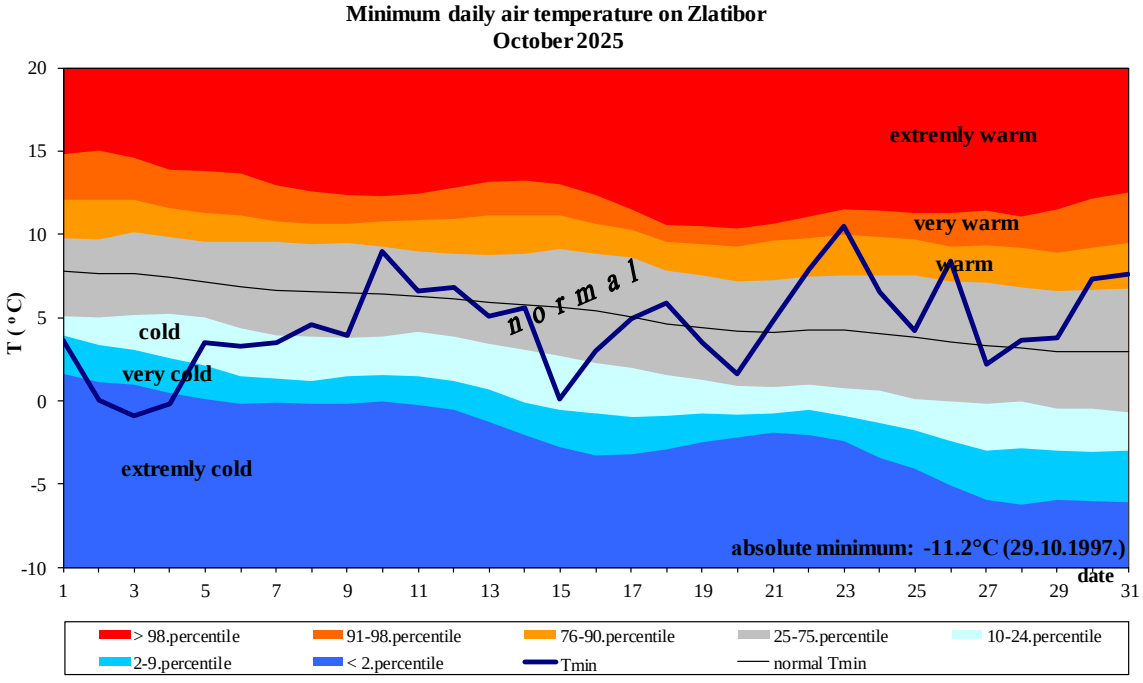
Appendix 32. Daily course of the minimum daily air temperature and the accompanying percentile for Loznica



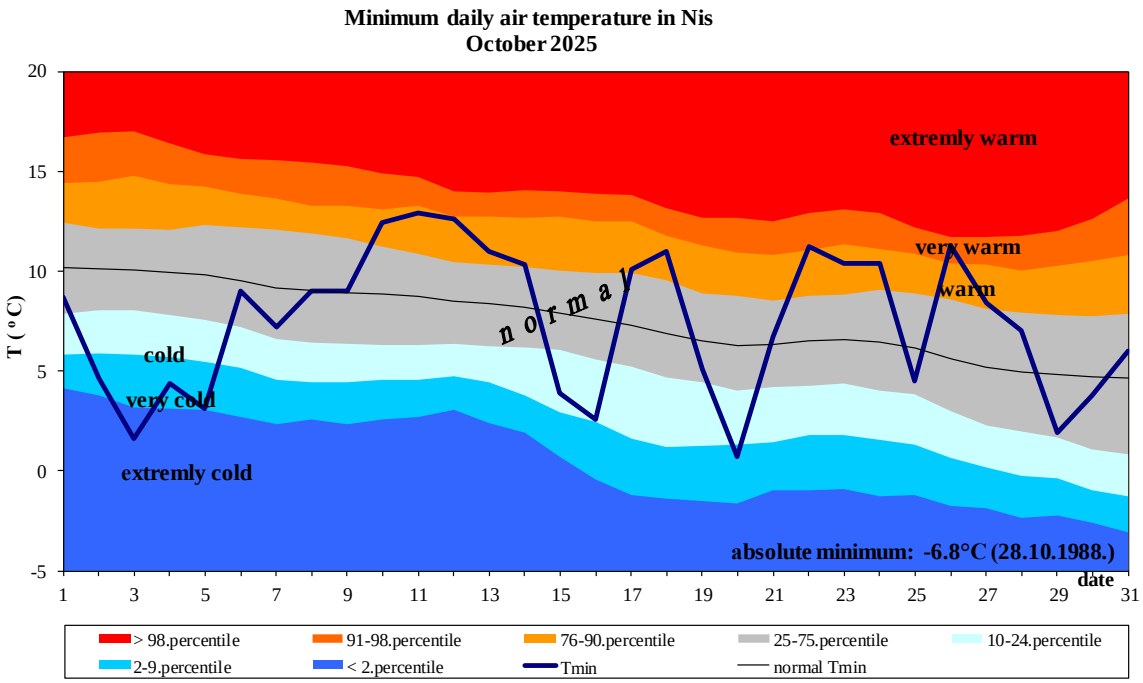
Appendix 33. Daily course of the minimum daily air temperature and the accompanying percentile for Kragujevac



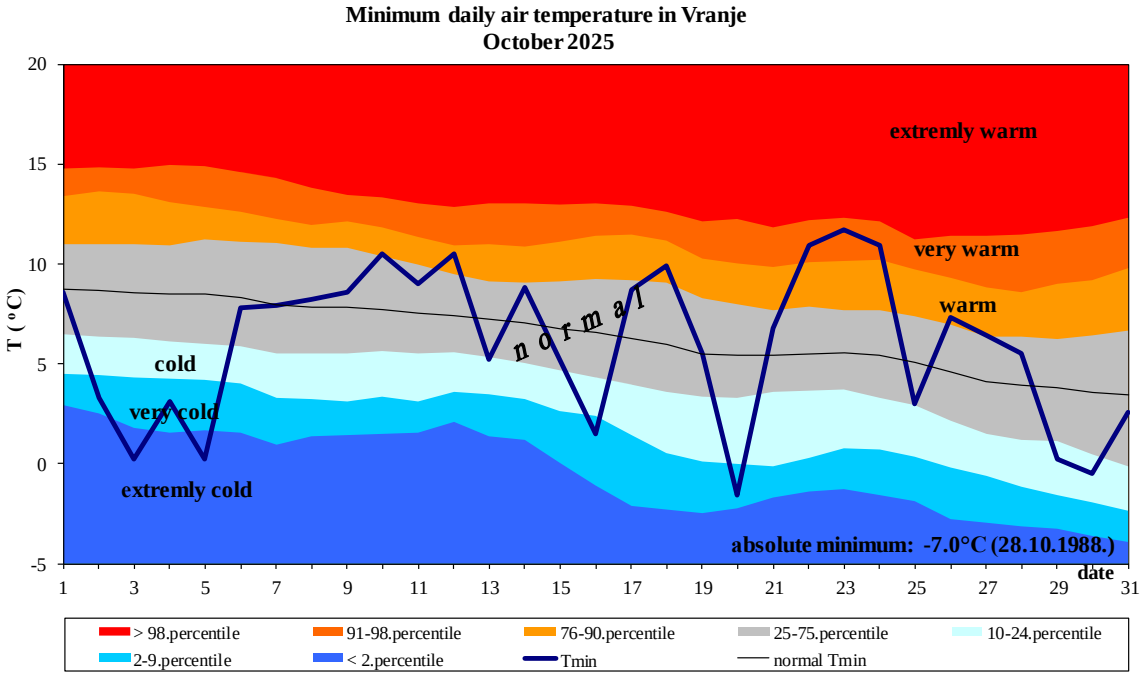
Appendix 34. Daily course of the minimum daily air temperature and the accompanying percentile for Negotin



Appendix 35. Daily course of the minimum daily air temperature and the accompanying percentile on Zlatibor

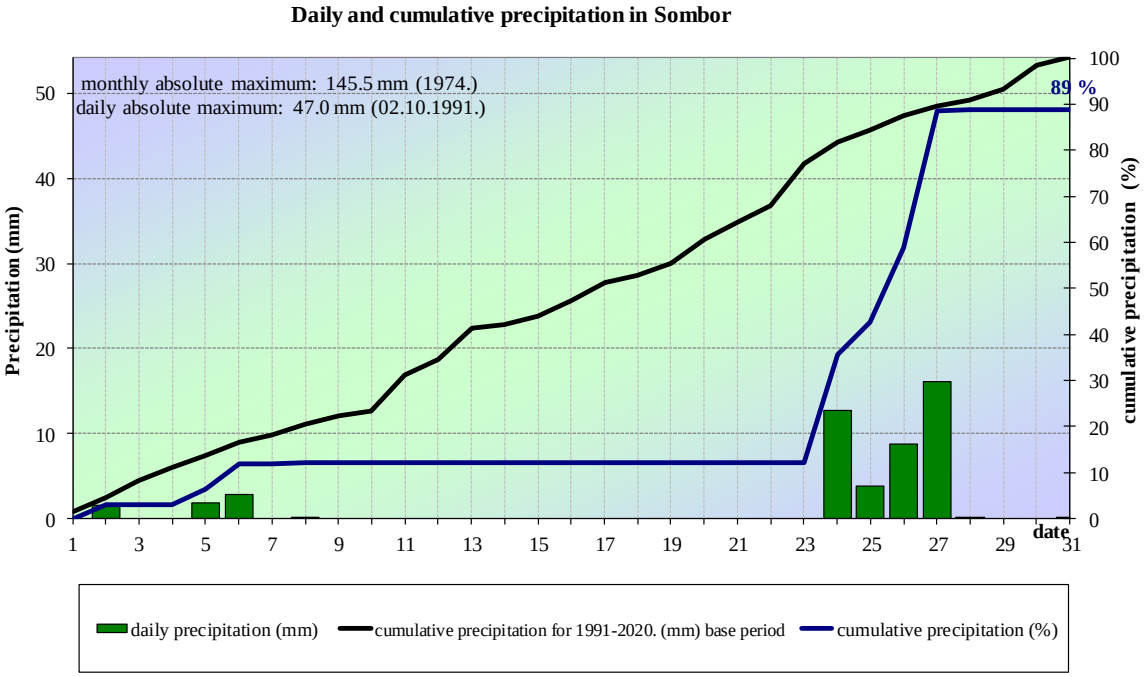


Appendix 36. Daily course of the minimum daily air temperature and the accompanying percentile for Nis

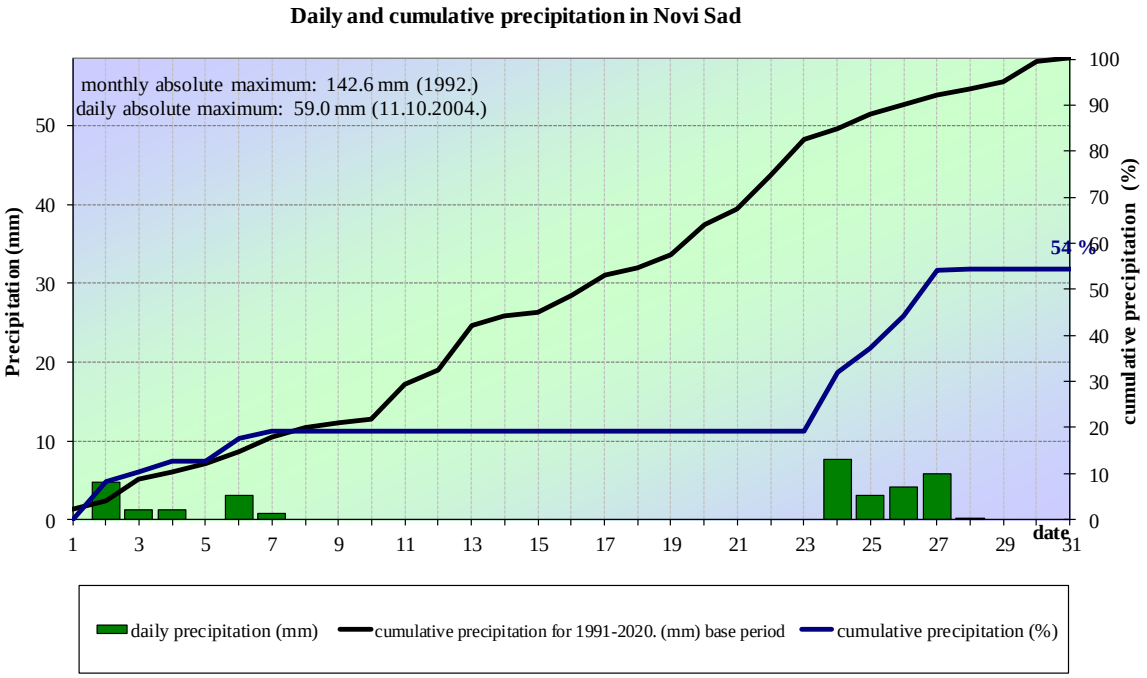


Appendix 37. Daily course of the minimum daily air temperature and the accompanying percentile for Vranje

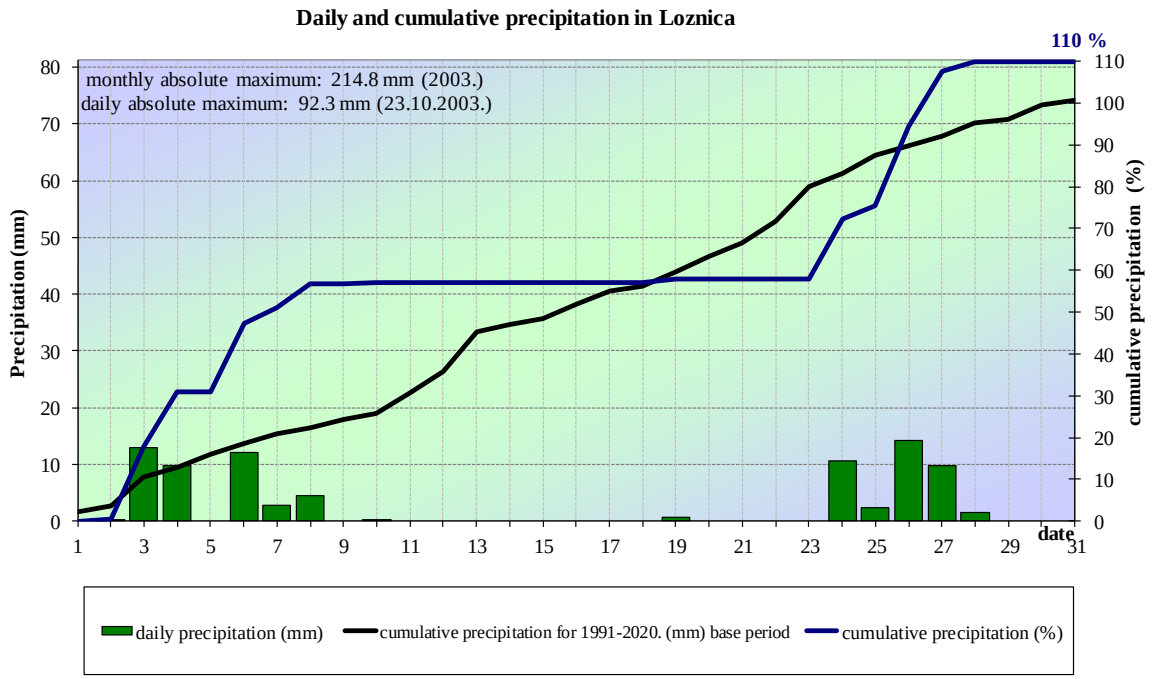
Precipitation



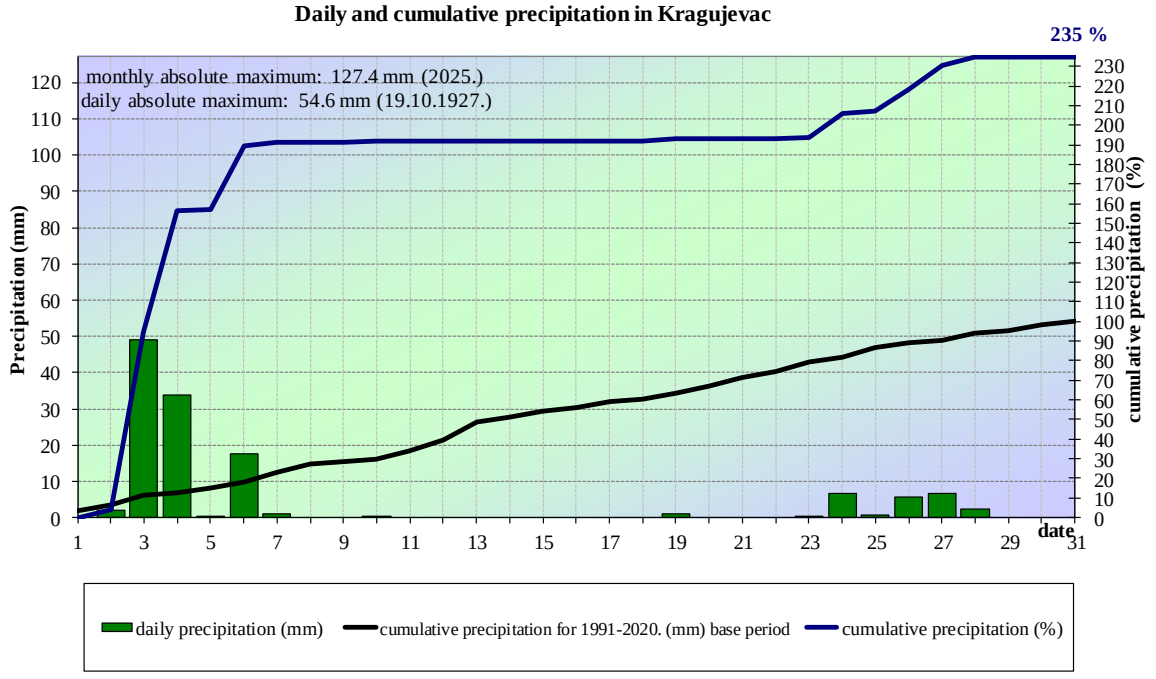
Appendix 38. Daily and cumulative precipitation sums for Sombor



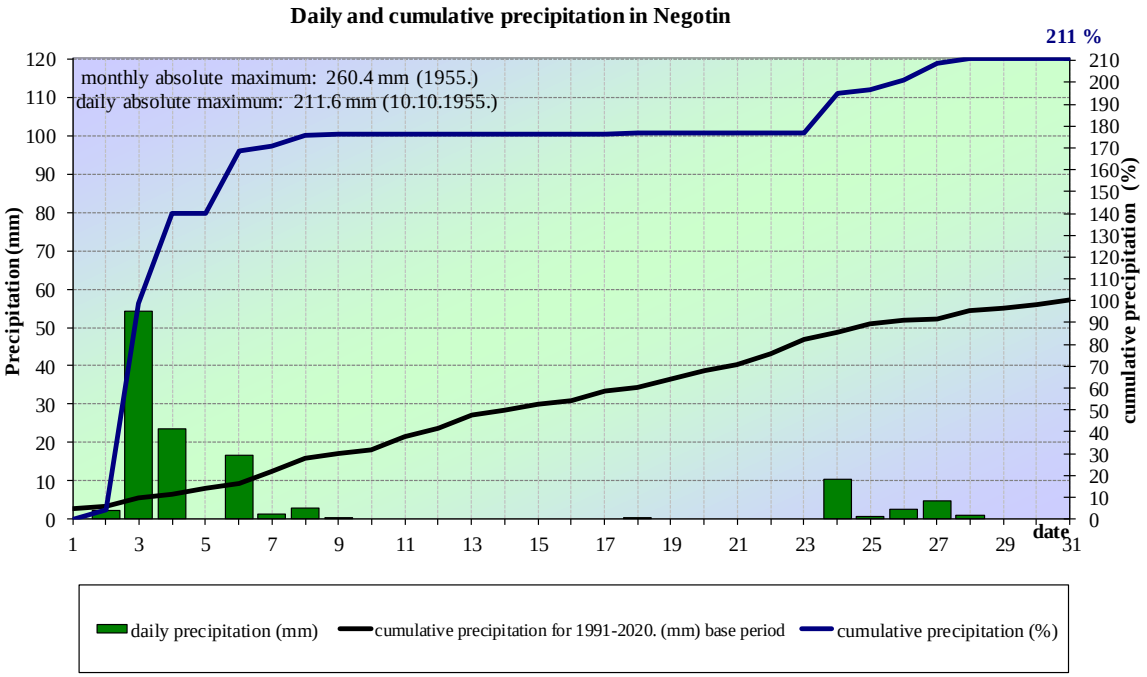
Appendix 39. Daily and cumulative precipitation sums for Novi Sad



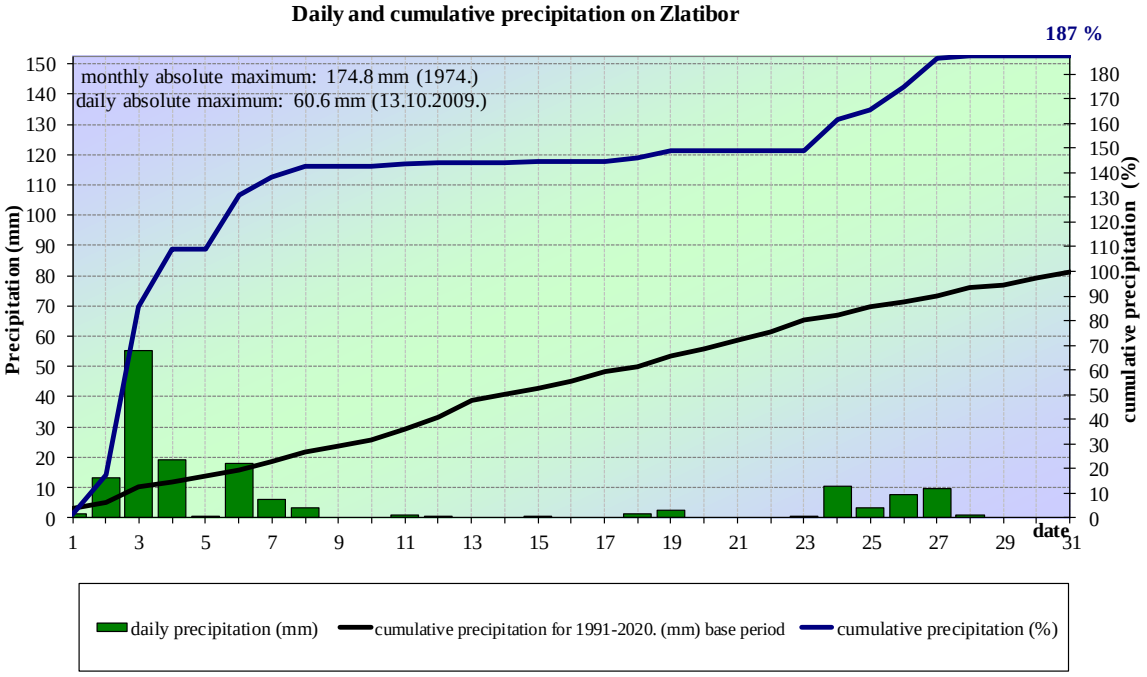
Appendix 40. Daily and cumulative precipitation sums for Loznica



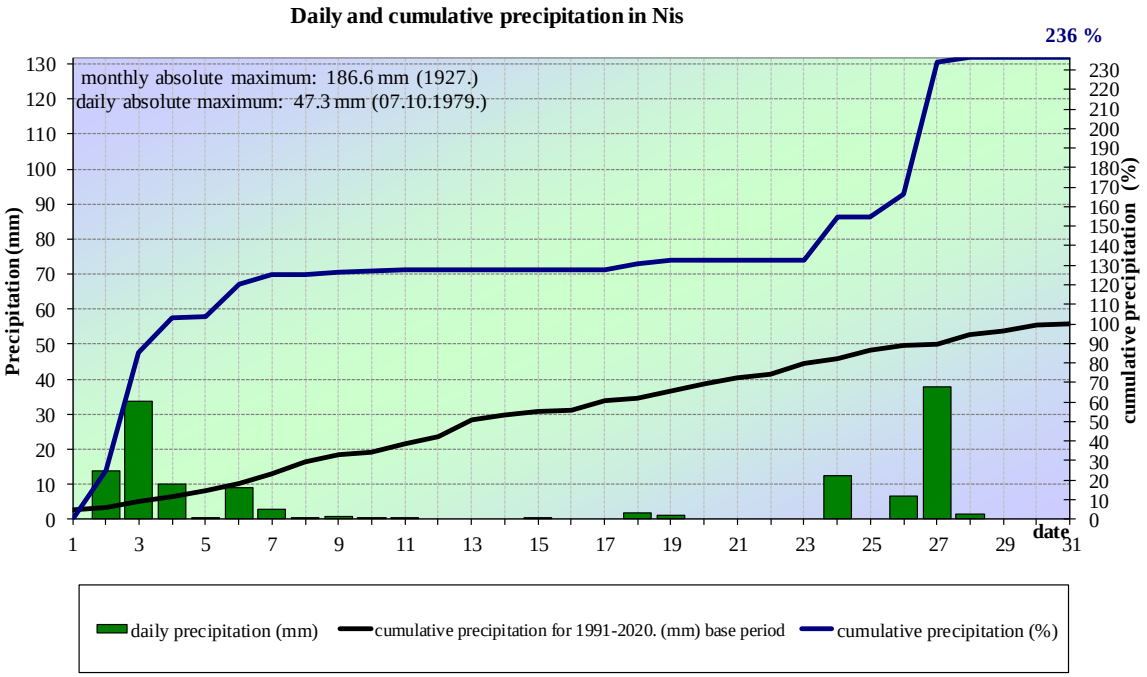
Appendix 41. Daily and cumulative precipitation sums for Kragujevac



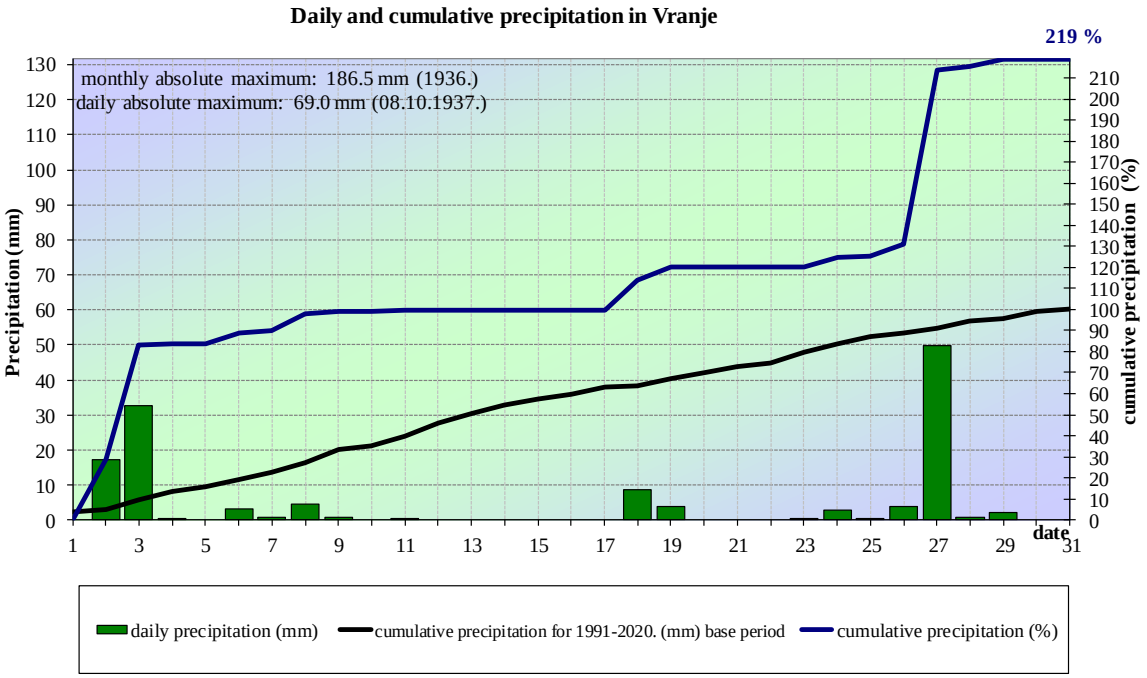
Appendix 42. Daily and cumulative precipitation sums for Negotin



Appendix 43. Daily and cumulative precipitation sums on Zlatibor



Appendix 44. Daily and cumulative precipitation sums for Nis



Appendix 45. Daily and cumulative precipitation sums for Vranje