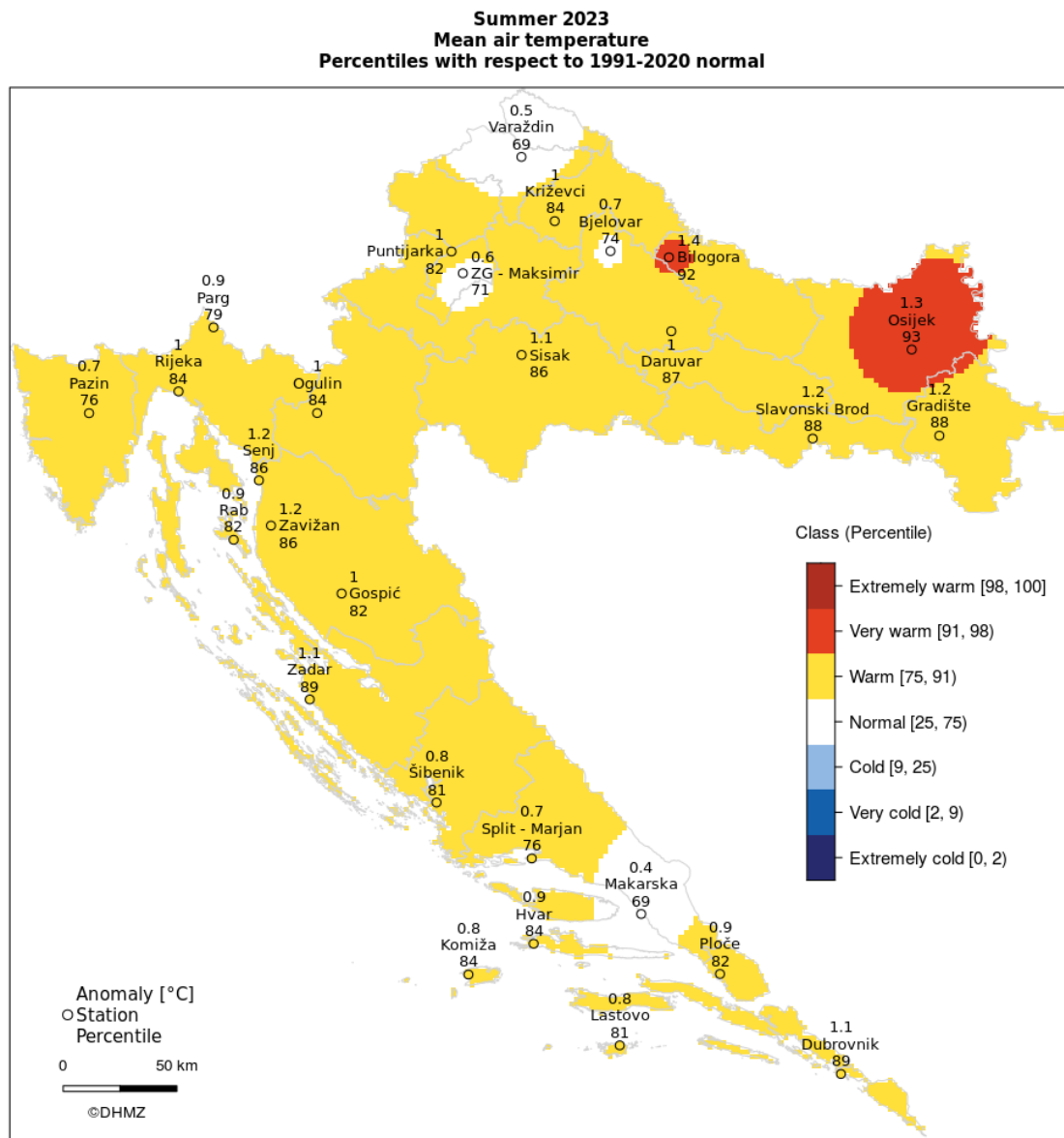


CLIMATE REPORT FOR CROATIA FOR SUMMER 2023

Air temperature anomalies for Croatia in summer 2023

Anomalies of the mean air temperature for summer 2023 with respect to the normal 1991 - 2020 are in the range from 0,4 °C (Makarska) to 1,4 °C (Bilogora). At all stations, the air temperature was higher than the multi-annual average.

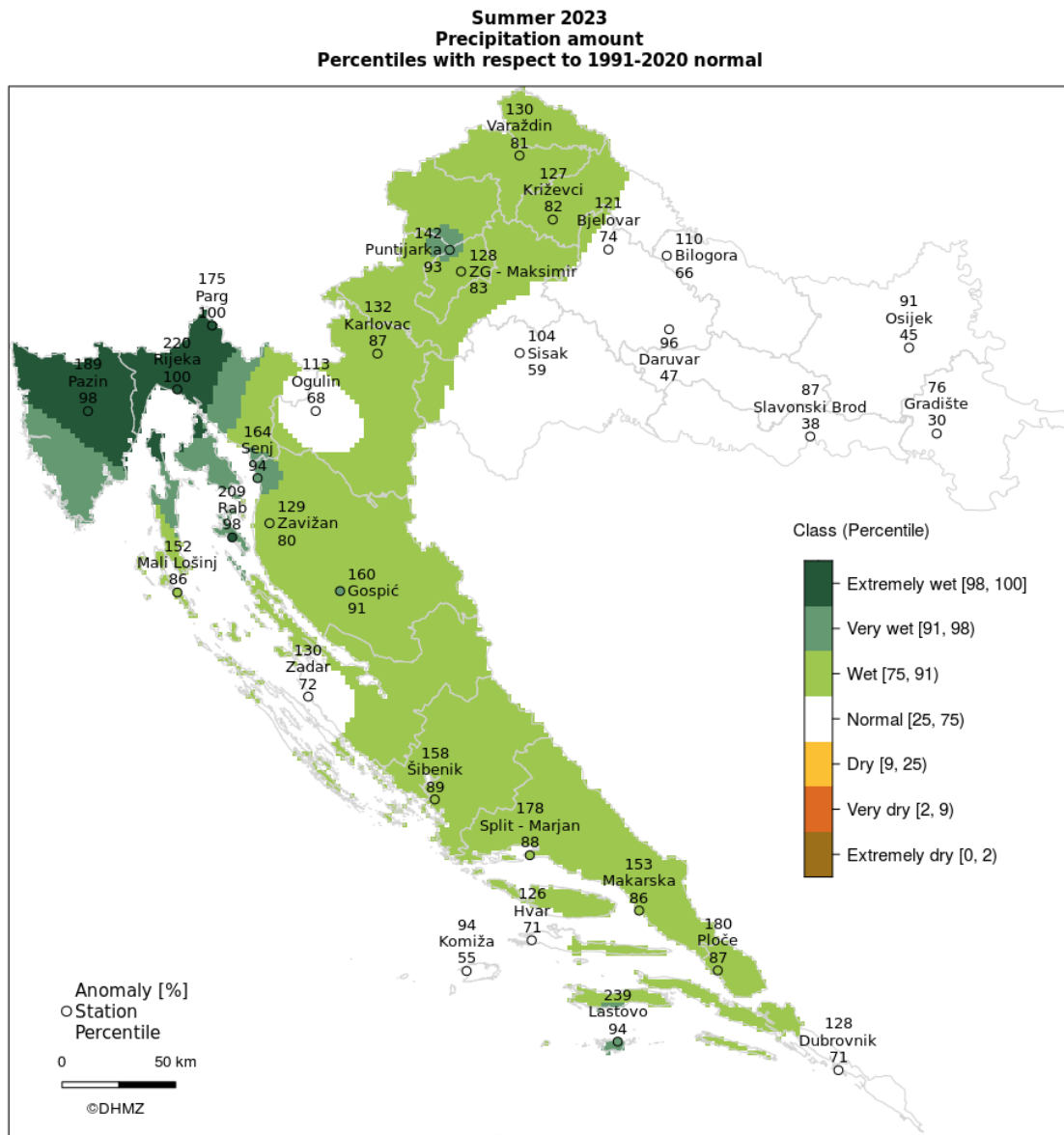
According to the percentile ranks and classification ratings, thermal conditions in Croatia for summer 2023 is described in the following categorie: **normal** (the north part of Croatia, surroundings of Zagreb, Bjelovar and Makarska), **warm** (most of Croatia) and **very warm** (wider area of town Osijek and surroundings of Bilogora).



Precipitation amounts for Croatia in summer 2023

The anomalies of the precipitation amount in summer 2023 compared to the normal 1991-2020 are in the range from 77 % of the multi-year average in Gradište (158,4 mm) to 239 % in Lastovo (167,5 mm). The analysis of anomalies in precipitation amounts, expressed as a percentage (%) of the multi-annual average (1991-2020), shows that precipitation amounts for summer 2023 were at most stations above multi-annual average.

Precipitation conditions are described in more detail in the following categories: **normal** (eastern Croatia and east part of central Croatia, wider area of the city of Ogulin and Zadar, island Vis, part of island Hvar, wider area of city of Dubrovnik), **wet** (part of central Croatia, most of mountainous Croatia, and most of the southern Croatia), **very wet** (part of mountain Medvednica, part of mountainous Croatia, part of Istra and Kvarner and island Lastovo) and **extremely wet** (wider area of city of Rijeka and surrounding of city of Rab on island Rab).



Air temperature anomalies for Croatia in June 2023

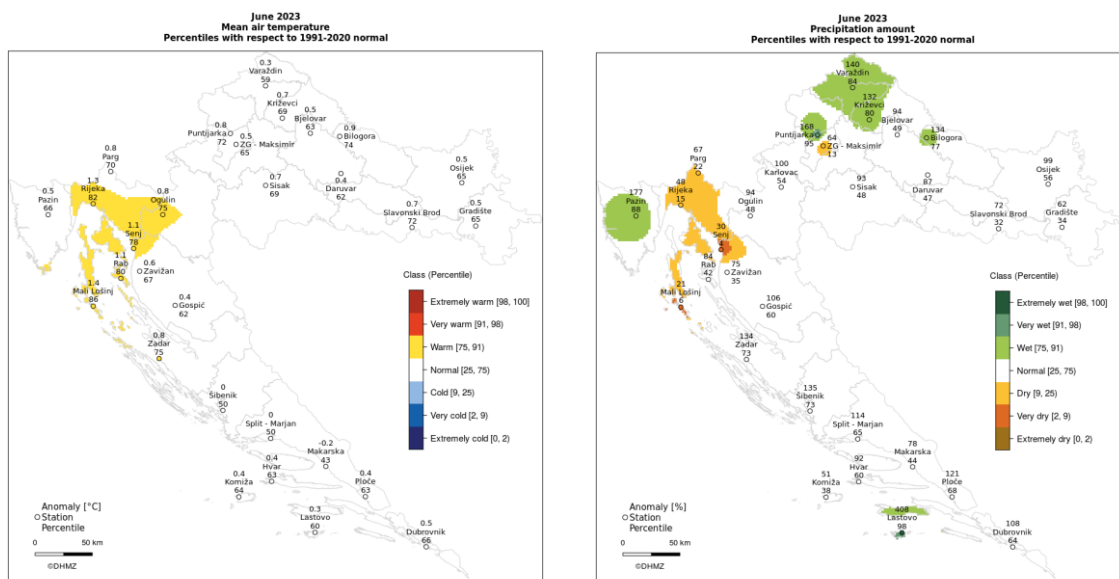
The anomalies of the mean air temperature in June 2023 with respect to the normal 1991 - 2020 were within the range from -0,2 °C (Makarska) to 1,4 °C (Mali Lošinj). At almost all stations air temperature was higher than the respective multi-annual average.

According to the percentile ranks and classification ratings, thermal conditions in Croatia for June 2023 are described in the following categories: **normal** (most part of Croatia) and **warm** (part of the north Adriatic - Kvarner).

Precipitation anomalies for Croatia in June 2023

Precipitation anomalies expressed as a percentage (%) of the multi-annual average (1991 – 2020) were in June 2023 within the range from 21 % in Mali Lošinj (with precipitation amount of 11,4 mm) to 408 % on island Lastovo (131,8 mm). Analysis of precipitation anomalies in June 2023, expressed as a percentage (%) of the multi-annual average shows that precipitation amounts at some stations were below average and at some above average.

Precipitation conditions in June 2023 are described in more detail in the following categories: **very dry** (town Senj and Mali Lošinj), **dry** (surroundings of city of Zagreb, Kvarner and hinterland of Kvarner – North Adriatic), **normal** (most of Croatia), **wet** (north part of Croatia, Istra and island Korčula) and **very wet** and **extremely wet** (island Lastovo).



Mean air temperature (left) and precipitation amount (right) - June 2023- percentiles with respect to 1991-2020 normal

Air temperature anomalies for Croatia in July 2023

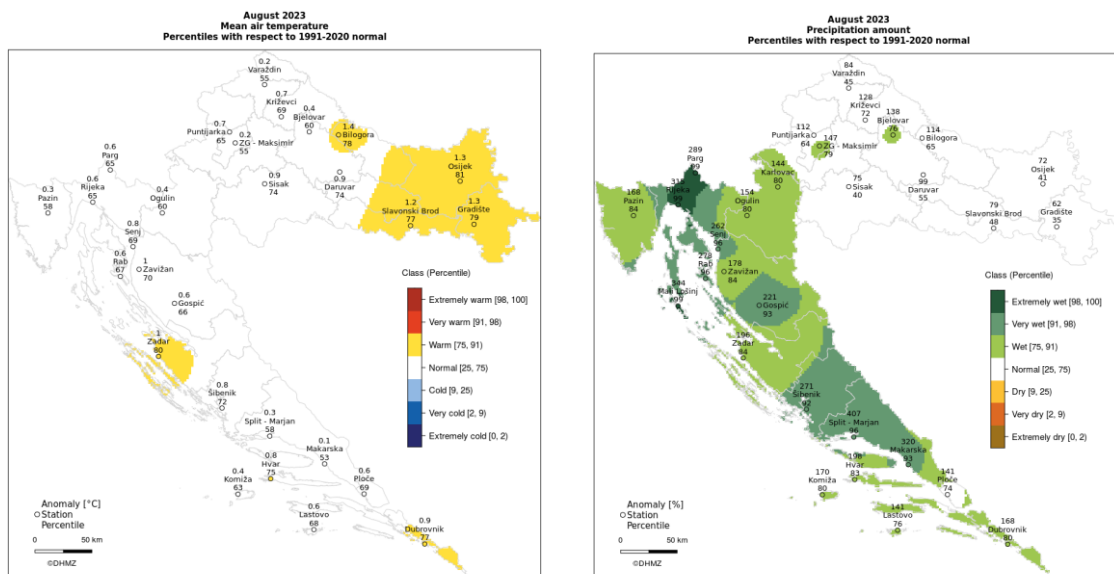
The anomalies of the mean air temperature in July 2023 with respect to the normal 1991 - 2020 were within the range from 1,0 °C (Varaždin) to 2,1 °C (Zavižan). At all stations air temperature were higher than the respective multi-annual average.

According to the percentile ranks and classification ratings, thermal conditions in Croatia for August 2023 are described in the following categories: **normal** (most part of Croatia except eastern part and some area at the Adriatic coast) and **warm** (eastern Croatia, wider area of Bilogora and city of Zadar, city of Hvar at island of Hvar, Dalmatia and wider area of city of Dubrovnik).

Precipitation anomalies for Croatia in August 2023

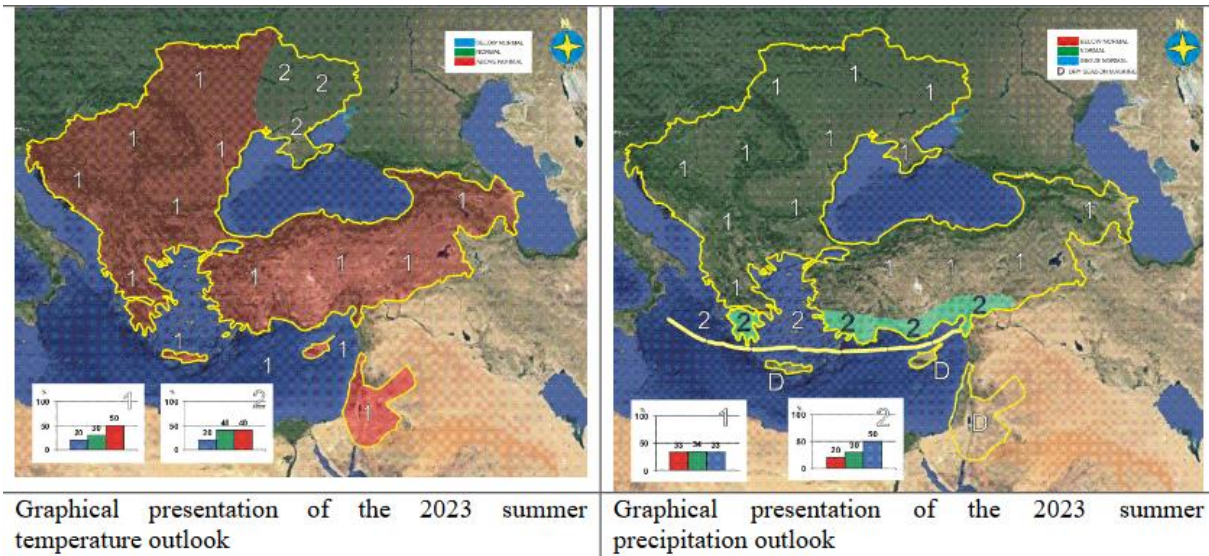
Precipitation anomalies expressed as a percentage (%) of the multi-annual average were in August 2023 within the range from 62 % in Gradište (with precipitation amount of 35,4 mm) to 407 % in Split-Marjan (128,9 mm). Analysis of precipitation anomalies in August 2023 expressed as a percentage (%) of the multi-annual average (1991-2020) shows that precipitation amounts were at most stations above the multi-annual average.

Precipitation conditions in August 2023 are described in more detail in the following categories: **normal** (eastern and most part of central Croatia), **wet** (wider area of city of Zagreb and Bjelovar, part of mountainous Croatia, Istra and parts of Dalmatia), **very wet** (part of mountainous Croatia, Kvarner, parts of north and central Dalmatia) and **extremely wet** (wider area of city of Rijeka with hinterland and Mali Lošinj).



Mean air temperature (left) and precipitation amount (right) - August 2023 – percentiles with respect to 1991-2020 normal

VERIFICATION OF SEECOF-29 CLIMATE OUTLOOK FOR THE 2023 SUMMER SEASON



Air temperature anomalies for Croatia in summer 2023

According to the SEECOF-29 climate outlook, for all Croatian territory, there were chance for above normal summer temperatures. Probability for exceeding the average summer season temperature was 50%. Probability of temperature being lower than normal was 20% and being normal was 30%.

The summer season in Croatia according to multi-annual average 1991-2020 concerning the temperature for the whole territory was above normal (from 0,4 °C to 1,4 °C).

We can conclude that the outlook for the summer 2023 according the temperature was very good.

Precipitation amounts for Croatia in summer 2023

According to the SEECOF-29 climate outlook, summer precipitation in whole Croatia had no privileged scenario, which means that climatology (middle tercile) had to be taken as the most likely scenario.

The actual precipitation amounts in the most of Croatia were mainly above the multi-annual average (1991-2020).

We can conclude that the outlook for the summer 2023 according the precipitation was correct in smaller part of Croatia.

Country	Seasonal temperature (JJA)		Seasonal precipitation (JJA)		High Impact Events
	Observed	SEECOF-29 climate outlook for temperature	Observed	SEECOF-29 climate outlook for precipitation	
Croatia	Above normal	Above normal (20,30,50)	Above normal (the largest part of the territory) Normal (the eastern part of Croatia)	No predictive signal (33,34,33)	<p>Summer 2023 was warm and very warm.</p> <p>In all three months heat waves were observed (one in June, July and August).</p> <p>In all three months convective related severe weather phenomena (thunderstorms, hail, heavy rains, flash floods, waterspouts) were observed mostly all over Croatia.</p> <p>In June, relatively often, severe thunderstorms accompanied with large amount of precipitation in short time, hail and flash floods hit mostly continental part of Croatia. Flood damage and crops damage due to hail were reported and traffic on many local road were interrupted.</p> <p>In July convective activity was very frequent all over Croatia. Urban floods as a result of large amounts of precipitation in a short time were common. Flood damage and crops and infrastructural damage were also frequent due to very large hail. Severe thunderstorms hit large part of continental Croatia on 19th July. In Zagreb, due to very strong wind (wind gusts up to 115 km/h) and heavy precipitation, unfortunately three people died.</p>

				<p>In August, a few convective episodes hit mostly north Adriatic and continental part of Croatia and on 28th August whole country. Flash floods caused damage on houses and roads.</p> <p>From 4 to 8th August, due to heavy precipitation in Slovenia and Austria, high water levels were observed in north part of Croatia and the Mura, Drava and Sava rivers flooded relatively large area of northern Croatia. The total estimated damage amounts to 2.180.000,00 euros.</p>
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