

Annex

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Assessment of the SEECOF-24 Climate Outlook for Slovenia for the winter season 2020/21

SEECOF-24 Climate Outlook for Slovenia for the winter season 2020/21

The consensus statement of SEECOF-24 climate outlook for the 2020/21 winter season emphasized the models showing the typical response to La Niña event over tropics and North America, but with less agreement over North Atlantic. Many models showed strong negative PNA and positive phase of NAO, EA and SCAN modes of variabilities. A higher probability of blocking events was expect over Europe with some differences among models in their location.

The consensus was that winter temperature would likely to be above normal in the whole SEECOF region, with probabilities decreasing from western toward eastern parts of the region. Winter temperature was likely to be above-normal in most of the SEECOF region (zone 1 and 2 in Figure 1), while it will be near- or above-normal in Israel and Lebanon, Jordan, Caucasian region, eastern parts of Turkey, as well as along the eastern and south-eastern coasts of the Black Sea (zone 3 in Figure 1). For western Slovenia the probabilities for below-, near- and above-normal temperature were estimated to be 10, 30 and 60 % and for eastern Slovenia the estimation was 20, 30 and 50 %.

For precipitation, winter totals were likely to be below-normal in the southern parts of the SEECOF region (in Greece, along the coasts of Ionian and Aegean Sea, Eastern Mediterranean with hinterland, Israel, Jordan and Lebanon, as well as in most of the Turkey, zone 1 in Figure 2). In rest of the SEECOF region (zone 2 in Figure 2) the uncertainty was high, hence with equal probabilities for below-, near- or above-average conditions of winter precipitations. For Slovenia that meant no clear signal for precipitation (33 % for each tercile category).

In addition, local factors (for example SST in the smaller basins of the region) might have shaped local variability at a regional level.

Figures 1 and 2 show the probabilistic consensus forecast for tercile categories of anomalies of seasonal temperature and precipitation, relative to the period 1981–2010.

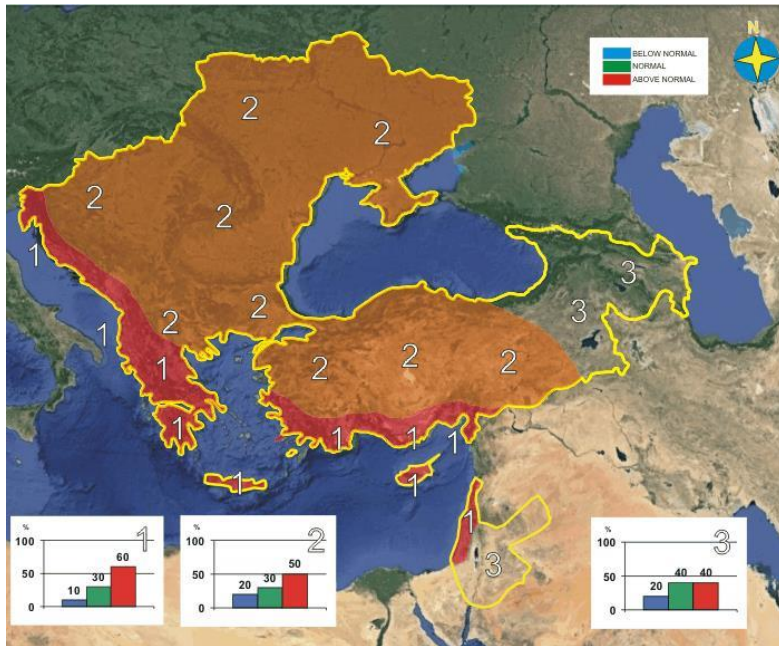


Figure 1. Graphical presentation of the winter 2020/21 temperature outlook

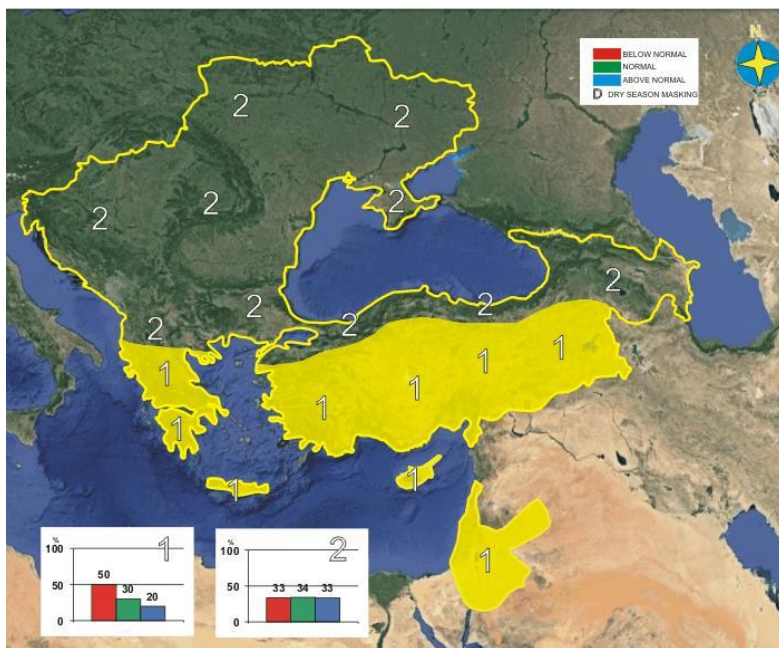


Figure 2. Graphical presentation of the winter 2020/21 precipitation outlook

Analysis of the winter season 2020/21

Average air temperature in Slovenia in winter 2020/21 was above the multi-annual average of the 30-year period 1981/82–2010/11 in whole country (Figure 3). Corresponding air temperature anomalies for winter 2020/21 (months December, January and February) were between 0.2 °C and 2.9 °C, average anomaly was 2.0 °C (surface weighted average value). Anomalies were largest in the south-eastern parts of the country (above 2.0 °C), with decreasing trend towards the Alps in the north-west of the country (below 1.0 °C).

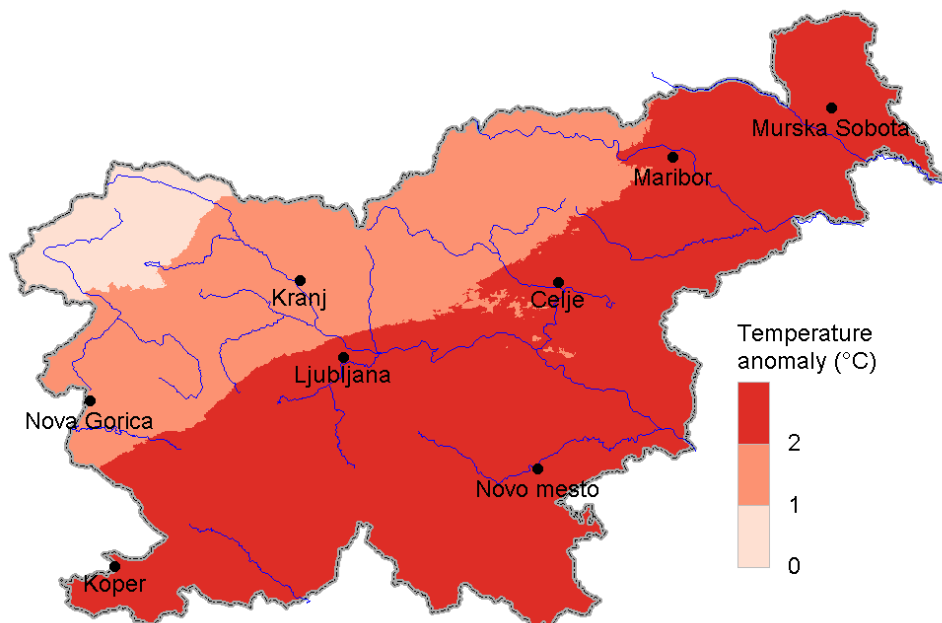


Figure 3. Mean air temperature anomaly in Slovenia in winter 2020/21, relative to the 1981/82–2010/11 average. Data are from 35 meteorological stations.

According to tercile ranks, thermal conditions in Slovenia in winter 2020/21 were above normal in whole country (Figure 4), except for the small part in the north-west (the Alps), where normal temperature conditions prevailed.

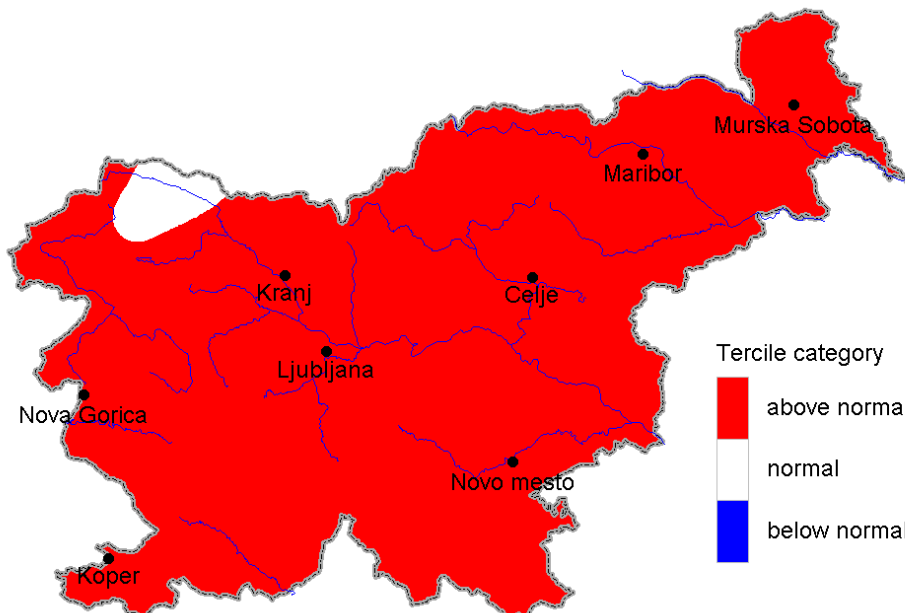


Figure 4. Mean air temperature tercile category of anomaly in Slovenia in winter 2020/21, relative to the period 1981/82–2010/11. Data are from 32 meteorological stations.

Precipitation index in Slovenia in winter 2020/21 was above average in whole country (Figure 5). It was the lowest in the south-eastern Slovenia (100 %–150 %), with increasing trend towards north-western Slovenia (over 250 % and up to 345 %). Precipitation index was

within the range from 104 % to 345 %, its average value was 159 % (surface weighted average value).

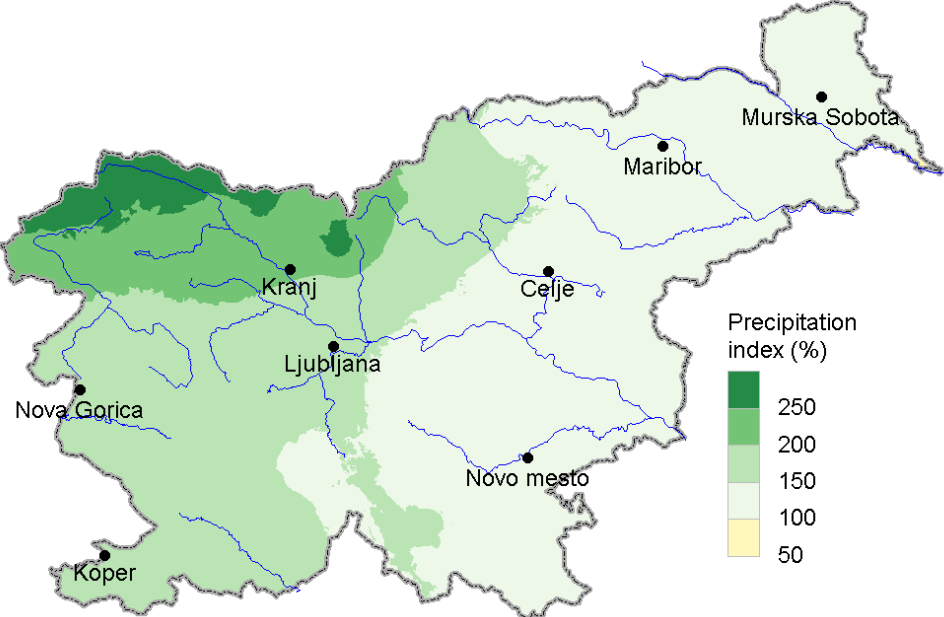


Figure 5. Precipitation index in Slovenia in winter 2020/21, relative to the 1981/82–2010/11 average. Data are from 154–158 meteorological stations.

According to this, the precipitation was within the third tercile (above-normal) in large part of the country (91 % of the meteorological stations), with values within second (normal) tercile in some eastern and north-eastern parts (9 % of the stations) (Figure 6).

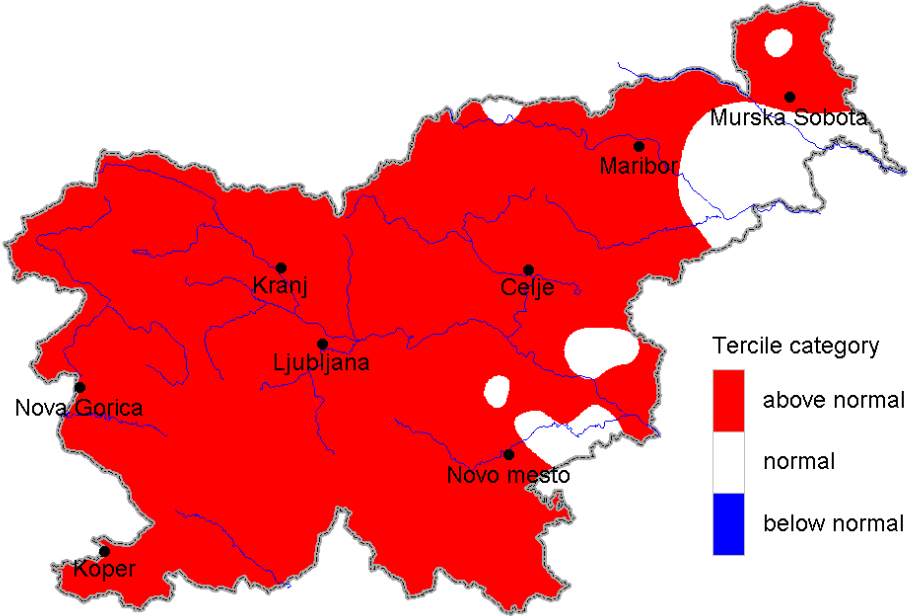


Figure 6. Precipitation tercile category of anomaly in Slovenia in winter 2020/21, relative to the period 1981/82–2010/11. Data are from 151 meteorological stations.

Since 2001 there have been 12 winters with positive temperature anomaly and 9 winters with negative anomaly, but negative anomalies have been smaller than positive (Figure 7). Winter 2020/21 is among the seven warmest since 1961 and the fourth consecutive winter with positive temperature anomaly since the winter 2017. It was also among the seven wettest since 1961. Winter precipitation has been very variable in last years, with approximately the same number of winters with positive and negative anomaly since year 2001 (Figure 8). There is also the impression that positive anomalies are larger than the negative ones.

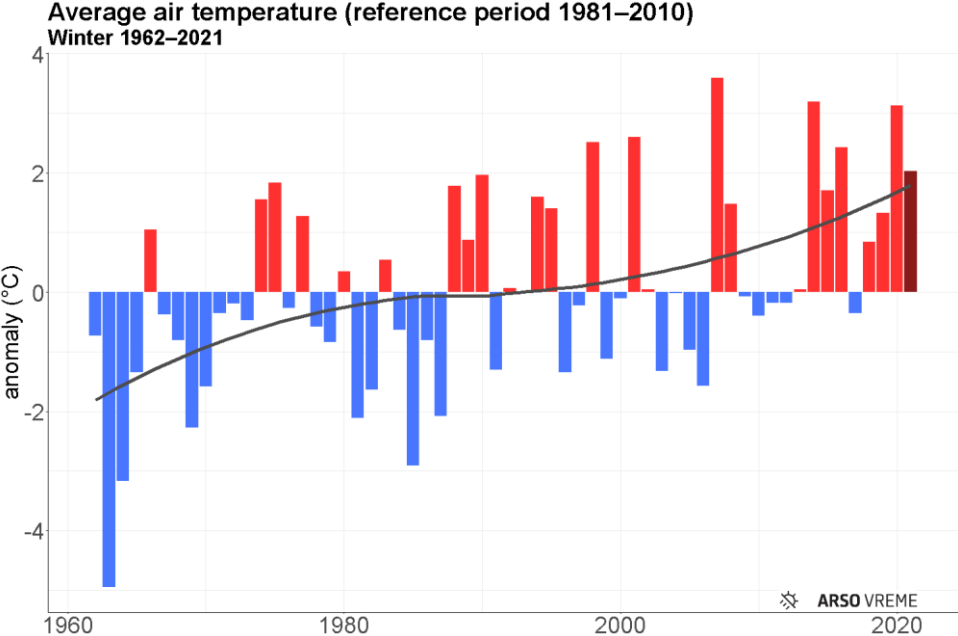


Figure 7. Winter mean air temperature anomaly in Slovenia in the period 1961/62–2020/21, relative to the 1981/82–2010/11 average

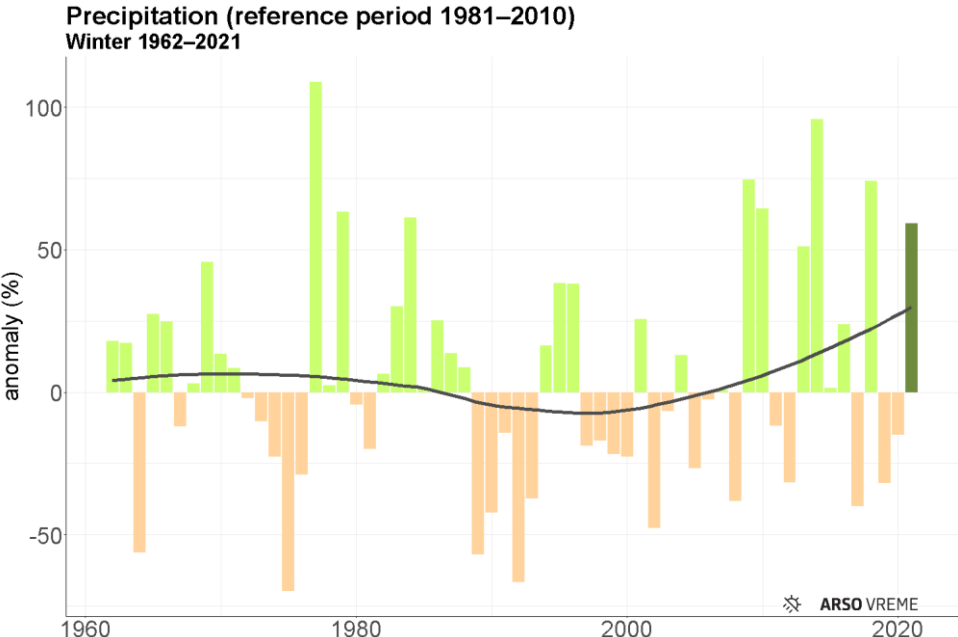


Figure 8. Winter precipitation anomaly in Slovenia in the period 1961/62–2020/21, relative to the 1981/82–2010/11 average

Average air temperature in *December 2020* was above the multi-annual average of the 30-year period 1981–2010 in whole Slovenia. Air temperature anomalies were between 0.6 °C and 2.9 °C (Figure 9), average anomaly was 1.8 °C (surface weighted average value). According to tercile ranks, thermal conditions in Slovenia were above-normal in whole Slovenia, except small parts in north west and east where normal temperature conditions prevailed.

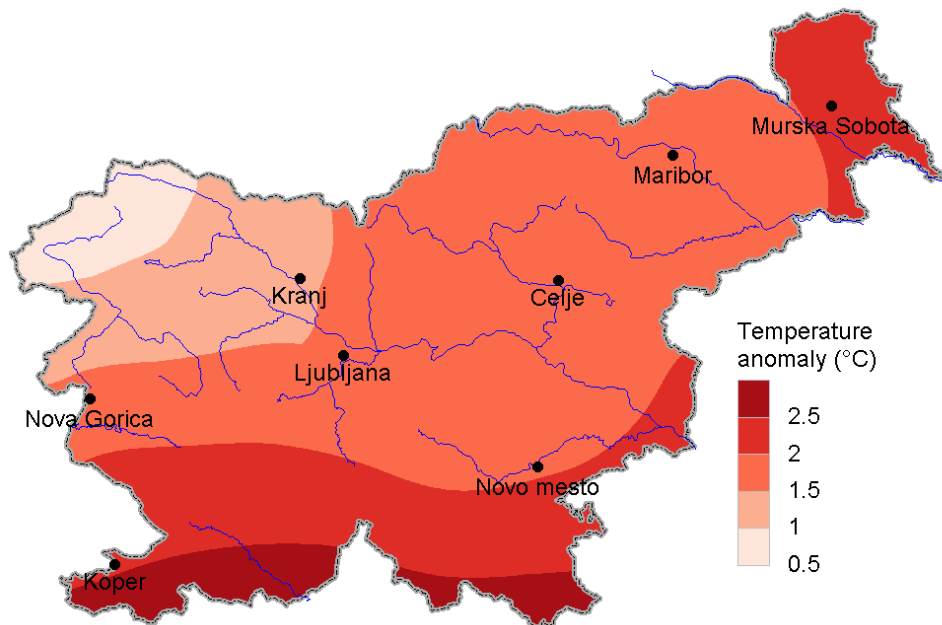


Figure 9. Mean air temperature anomaly in Slovenia in December 2020, relative to the 1981–2010 average. Data are from 35 meteorological stations.

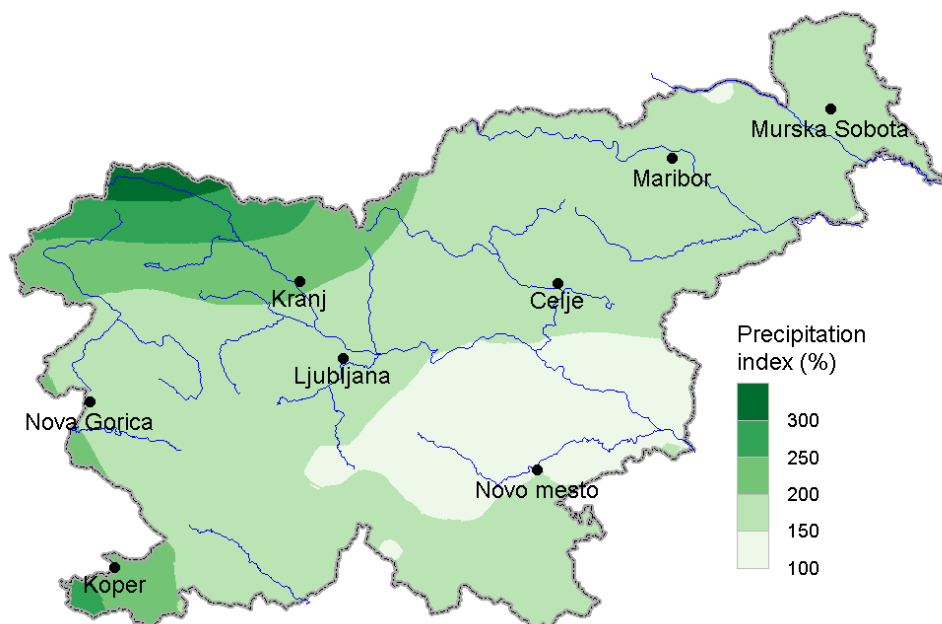


Figure 10. Precipitation index in Slovenia in December 2020, relative to the 1981–2010 average. Data are from 158 meteorological stations.

December 2020 was wet. Precipitation index was above average in whole country (Figure 10), its values were within the range from 112 % to 356 % and its average value was 175 % (surface

weighted average value). Precipitation index was within the third (above-normal) tercile in almost whole country, compared with the period 1981–2010, and within second (normal) tercile only in very small parts of east and south-east. December 2020 is among the five wettest since 1961.

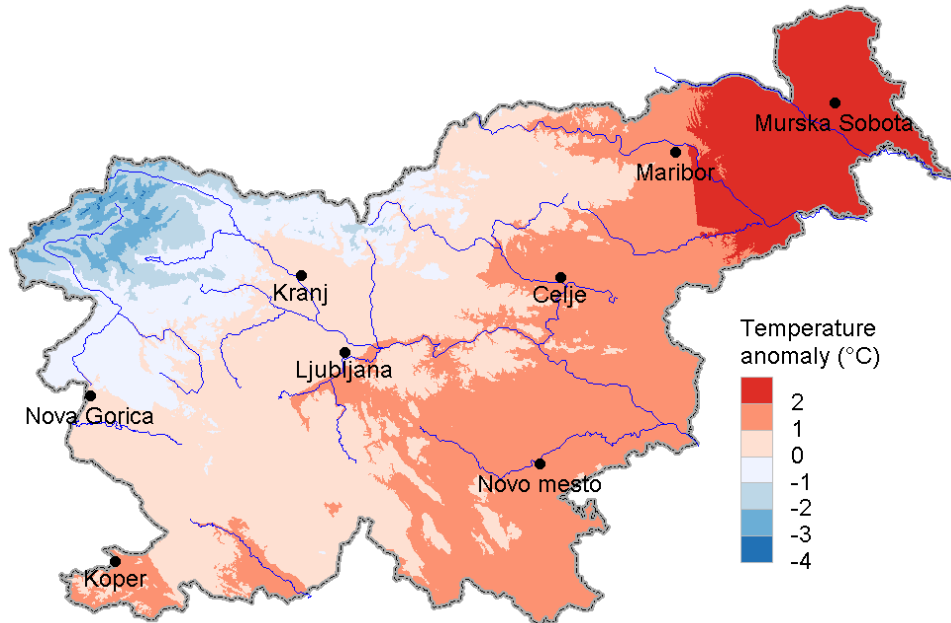


Figure 11. Mean air temperature anomaly in Slovenia in January 2021, relative to the 1981–2010 average. Data are from 35 meteorological stations.

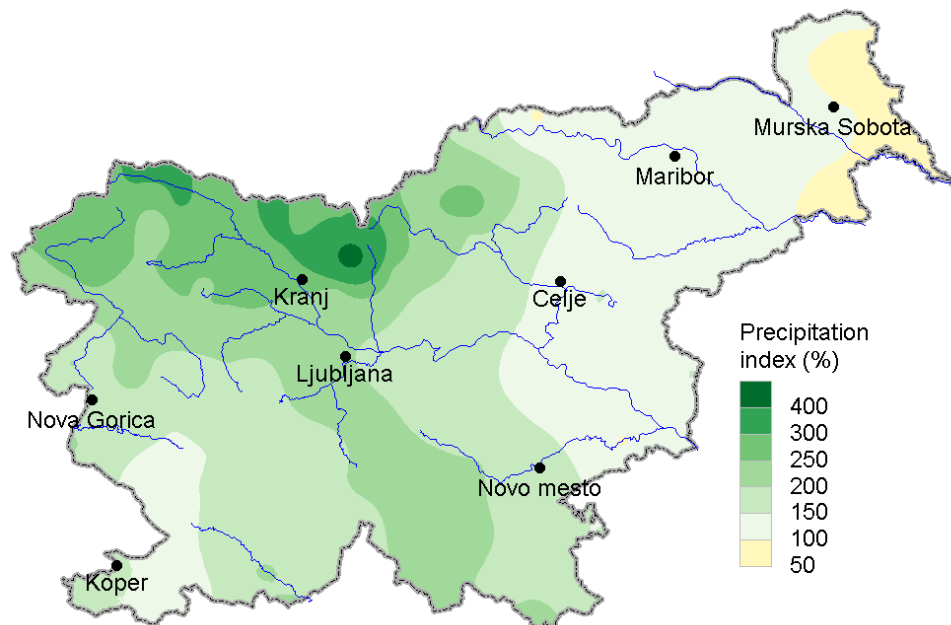


Figure 12. Precipitation index in Slovenia in January 2021, relative to the 1981–2010 average. Data are from 157 meteorological stations.

Average air temperature in *January 2021* was above the multi-annual average of the 30-year period 1981–2010 in two thirds of south-east Slovenia and below multi-annual average in north-west. Anomalies were between $-3.2\text{ }^{\circ}\text{C}$ and $3.0\text{ }^{\circ}\text{C}$, the lowest in the Alps (Figure 11), with

positive trend towards south and north-east. The average anomaly was 0.8 °C (surface weighted average value). According to tercile ranks, thermal conditions in Slovenia were above normal in central, south and east Slovenia, normal in north central Slovenia and below-normal in the north-west Slovenia.

January 2021 was also wet. Precipitation index was below 100 % only in small parts of north-east Slovenia and over 100 % everywhere else (Figure 12). The precipitation index was within the range from 76 % to 505 %, its average value was 180 % (surface weighted average value). The precipitation index was within the third (above-normal) tercile everywhere but in north-east Slovenia and small parts of east and south-west of the country where it was within normal tercile. January 2021 is among the 10 wettest since 1961.

February 2021 was very warm, among the seven warmest since 1961. Air temperature anomalies were between 1.5 °C and 4.8 °C (Figure 13), the average anomaly was 3.5 °C (surface weighted average value). It was especially warm in the south of the country. According to tercile ranks, thermal conditions in Slovenia were above-normal in whole country, except for very small area in north, where normal conditions prevailed.

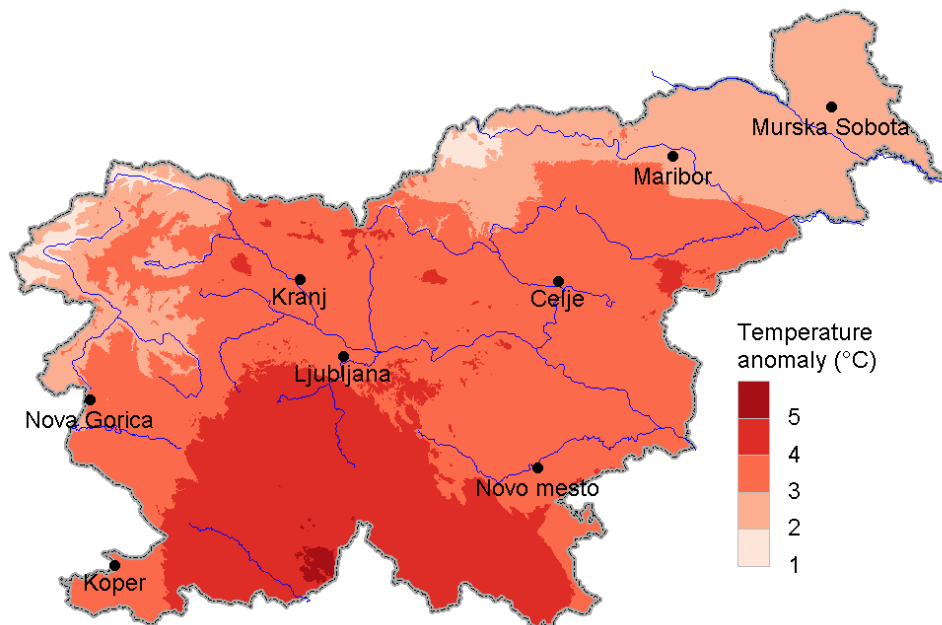


Figure 13. Mean air temperature anomaly in Slovenia in February 2021, relative to the 1981–2010 average. Data are from 35 meteorological stations.

February 2021 was wet in the west, normal in the central and dry in the east Slovenia (Figure 14). Precipitation index was within the range from 45 % to 278 %, its average value was 114 % (surface weighted average value). In the west and north-west Slovenia precipitation was within the third (above-average) tercile, in central, south-east and north-east within normal tercile and within the first (below-normal) tercile in parts of south-east Slovenia and in north-east near the border with Croatia.

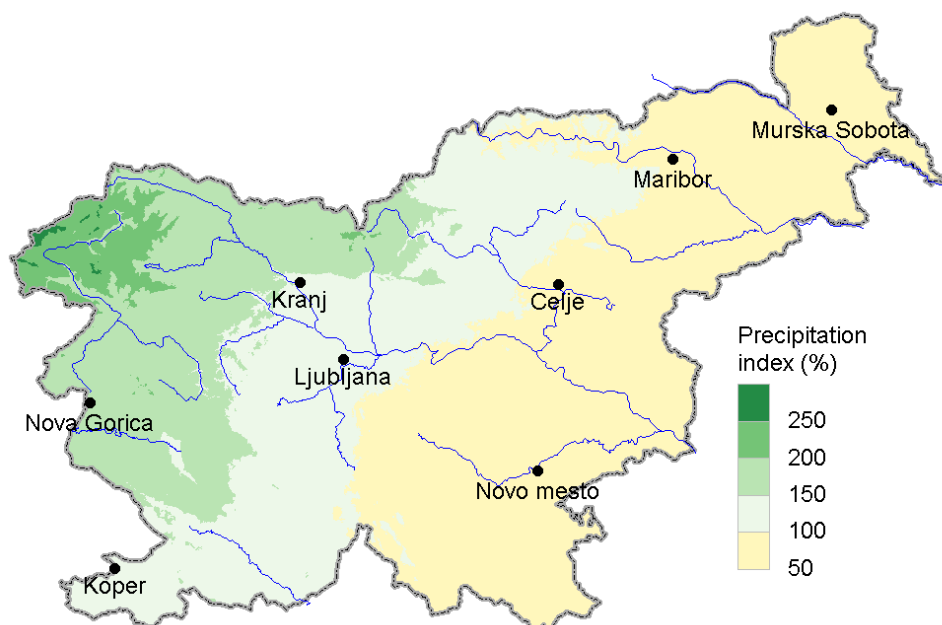


Figure 14. Precipitation index in Slovenia in February 2021, relative to the 1981–2010 average. Data are from 154 meteorological stations.

The summary for winter 2020/21 and monthly (December, January and February) temperature and precipitation conditions can be found in the Table 1.

Table 1. The summary for winter 2020/21 temperature and precipitation in Slovenia

SLOVENIA	Temperature anomaly, relative to the period 1981–2010	Average temperature anomaly	Precipitation index, relative to the period 1981–2010	Average precipitation index
December 2020	0.6 to 2.9 °C	1.8 °C	112 to 356 %	175 %
January 2021	–3.2 to 3.0 °C	0.8 °C	76 to 505 %	180 %
February 2021	1.5 to 4.8 °C	3.5 °C	45 to 278 %	114 %
Winter 2020/21	0.2 to 2.9 °C	2.0 °C	104 to 345 %	159 %

High Impact Events

Highlights for the winter 2020/21 in Slovenia:

- Temperature above average (among the seven warmest winters since 1961), very warm February (among the seven warmest since 1961);
- Precipitation above average (among the seven wettest winters since 1961), wet December (among five wettest since 1961) and January (among 10 wettest since 1961);
- Very warm period between 22 and 26 February with daily maximum temperature around 20 °C, which is very unusual and high value for February. On 24 and 26 February many record-breaking temperatures were measured and also the first above 25 °C in

February (Bilje near Nova Gorica and Dolenje near Ajdovščina, both in Vipava valley in south-west Slovenia, 25.1 °C on 24 February).

Verification of the SEECOF-24 Climate Outlook in Slovenia for winter season 2020/21

In the table 2 a verification summary of the SEECOF-24 climate outlook for the winter season 2020/21 (DJF) can be found. The climatological reference period is 1981–2010.

Table 2. SEECOF-24 climate outlook verification summary for Slovenia for winter 2020/21

Country	Seasonal temperature (DJF)		Seasonal precipitation (DJF)	
	Observed	SEECOF-24 climate outlook for temperature	Observed	SEECOF-24 climate outlook for precipitation
SLOVENIA	warmer than normal	warmer than normal	wetter than normal, except parts of east and north-east Slovenia where normal	no clear signal

Users' Perception of the SEECOF-24 Outlook

Meteorological Service at the Slovenian Environment Agency at this moment doesn't provide seasonal outlook for the country.