

Annex

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Assessment of the SEECOF-22 Climate Outlook for Slovenia for the winter season 2019/20

SEECOF-22 Climate Outlook for Slovenia for the winter season 2019/20

The consensus statement of SEECOF-22 climate outlook for the 2019/20 winter season emphasized the neutral ENSO conditions observed by sea surface temperatures and forecast for the three winter months by models showing high agreement for oceanic evolution. The Indian Ocean Dipole (IOD) was main driver showing a clear signal with strong positive phase (warm anomalies over western tropical Indian Ocean and cold anomalies over the East), influencing the atmospheric circulation. As a continuation of previous forecasts, models showed good agreement on favour of positive phases of East Atlantic (EA) and North Atlantic Oscillation NAO (which are two main modes of variability over the Atlantic), possibly linked with the strong IOD positive signal.

The consensus was that above normal winter temperature was likely in the whole SEECOF region. Probabilities for the above-normal conditions were higher in the Pannonian Plain, Carpathian region, Western and Central Balkans, Greece, along the coasts of Adriatic and Ionian Sea, as well as Eastern Mediterranean (zone 1 in Figure 1). For Slovenia the probabilities for below-, near- and above-normal temperature were estimated to be 10, 30 and 60 %.

In most of the SEECOF region (zone 1 in Figure 2) the uncertainty for precipitation was high, i.e. probabilities for below-, near- or above-average conditions were approximately equal. Winter precipitation totals were likely to be below-normal in the eastern Balkan Peninsula and southern Ukraine (zone 2 in Figure 2). Near-normal to above-average seasonal precipitation sums were expected in the South Caucasus region and north-eastern Turkey (zone 3 in Figure 2). For Slovenia that meant no clear signal for precipitation.

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.

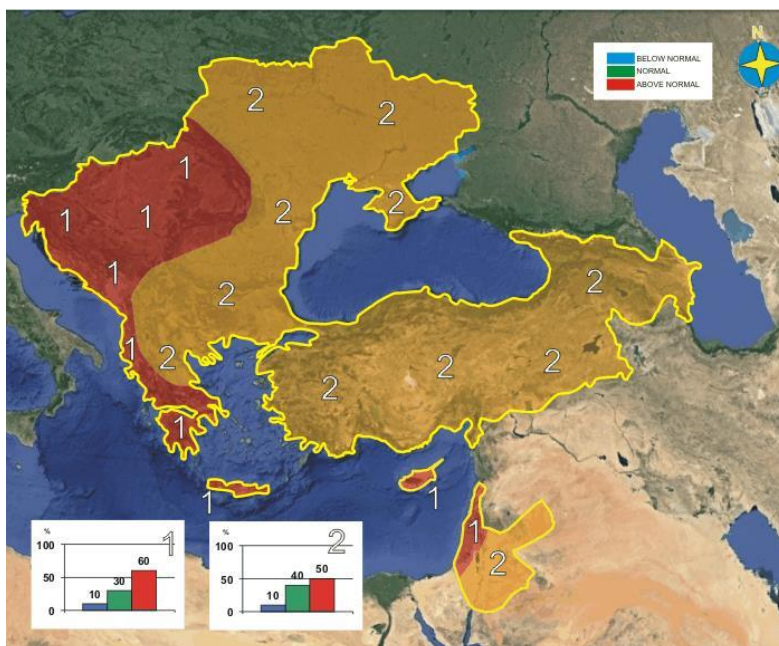


Figure 1. Graphical presentation of the winter 2019/20 temperature outlook

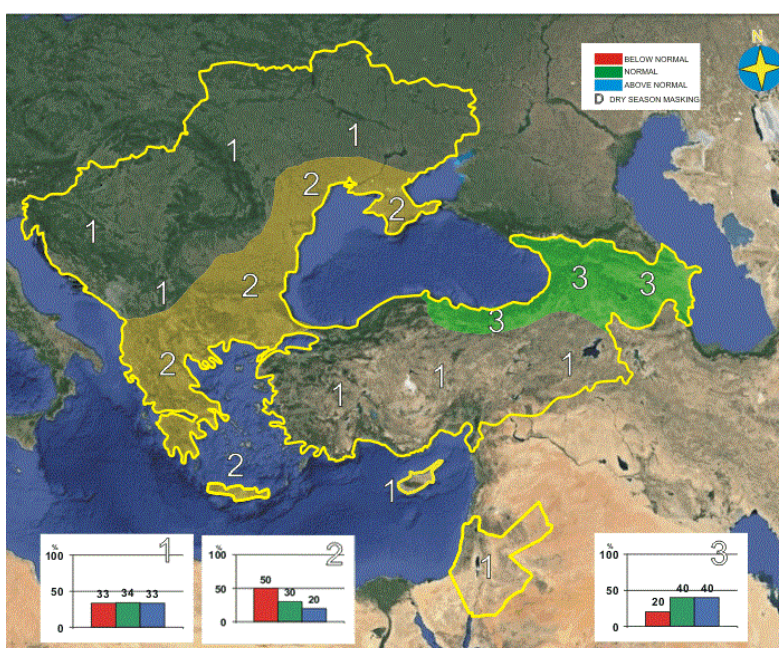


Figure 2. Graphical presentation of the winter 2019/20 precipitation outlook

Analysis of the winter season 2019/20

Average air temperature in Slovenia in winter 2019/20 was above the multi-annual average of the 30-year period 1981–2010 in the whole country (Figure 3). Corresponding air temperature anomalies for winter 2019/20 (months December, January and February) were between 1.7 °C and 3.8 °C, average anomaly was 3.1 °C (surface weighted average value). Anomalies were largest in south-eastern parts of the country (above 3.5 °C) and smallest in the Alpine valleys in the north-west of the country (below 2.0 °C).

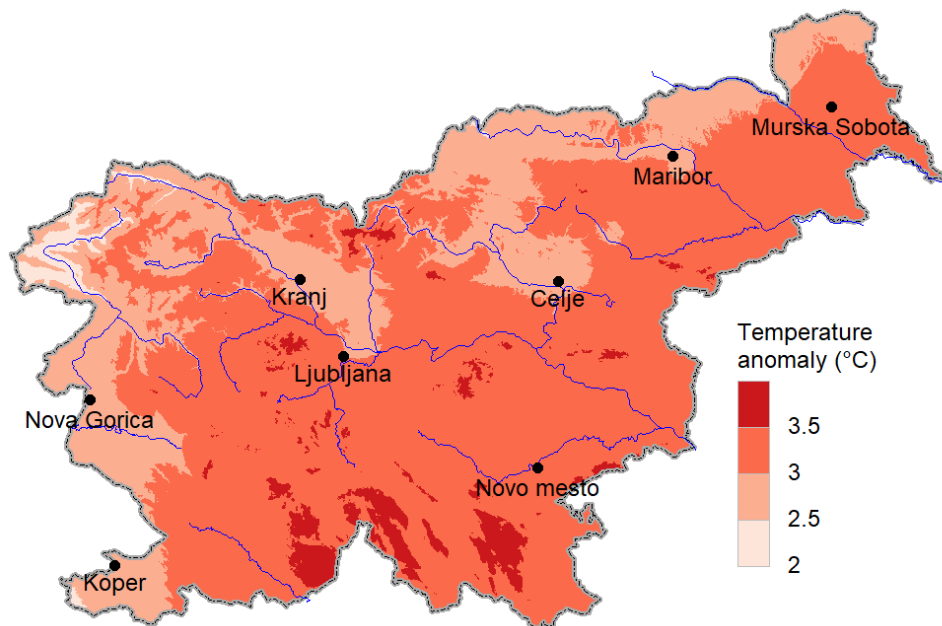


Figure 3. Mean air temperature anomaly in Slovenia in winter 2019/20, relative to the 1981–2010 average. Data are from 33–34 meteorological stations.

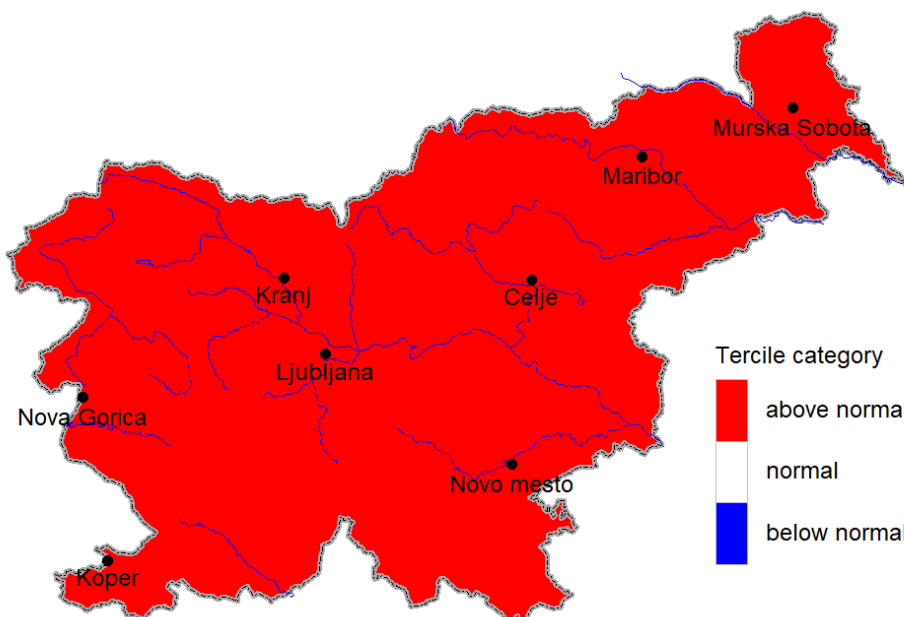


Figure 4. Mean air temperature tercile category of anomaly in Slovenia in winter 2019/20, relative to the period 1981–2010. Data are from 28 meteorological stations.

According to tercile ranks, thermal conditions in Slovenia in winter 2019/20 were above normal in the whole country (Figure 4).

Precipitation index in Slovenia in winter 2019/20 was below average in whole country except in north-west and north-east (Figure 5). The precipitation index in southeast Slovenia was below 80 %. Precipitation index was within the range from 64 % to 125 %, average precipitation index was 85 % (surface weighted average value).

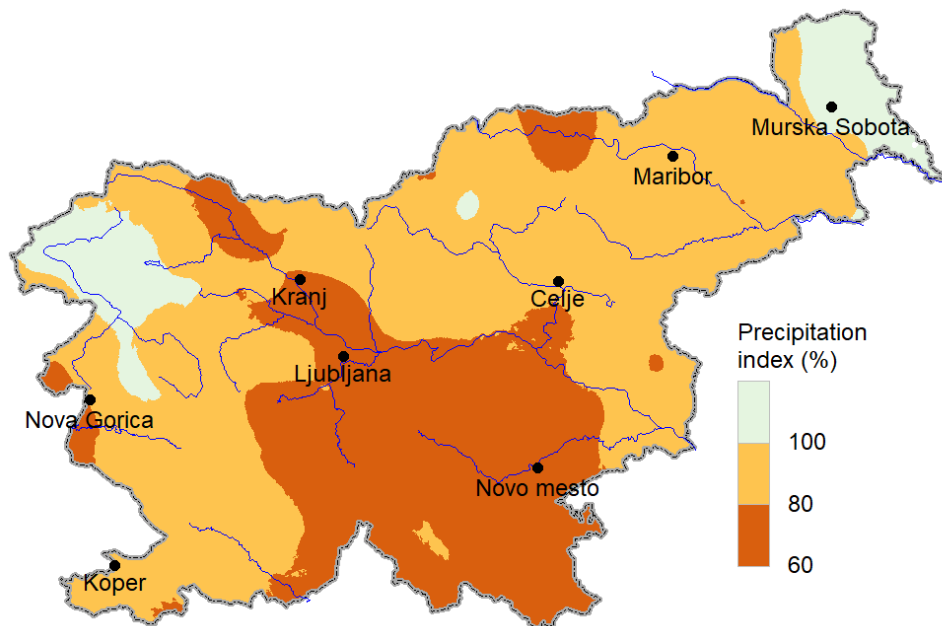


Figure 5. Precipitation index in Slovenia in winter 2019/20, relative to the 1981–2010 average. Data are from 151–159 meteorological stations.

According to this, the precipitation was within the third tercile (above-normal) only in small parts of north Slovenia (2 out of the 149 stations), on 42 % of weather station, mostly in the south-east, was precipitation in the first (below-normal) tercile and on 56 % of weather stations, mostly in west, north and north-east Slovenia, within second (normal) tercile (Figure 6).

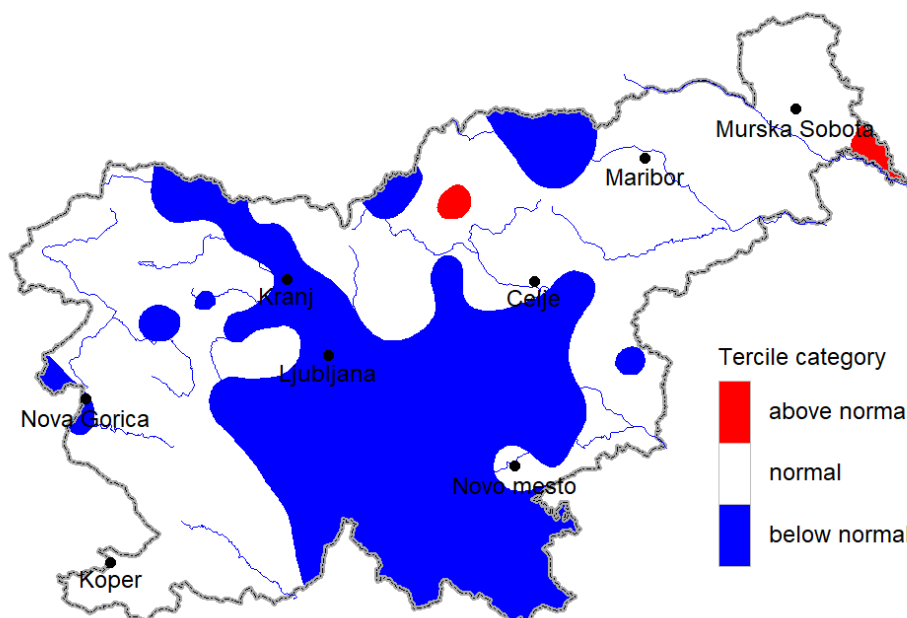


Figure 6. Precipitation tercile category of anomaly in Slovenia in winter 2019/20, relative to the period 1981–2010. Data are from 149 meteorological stations.

Since 2001 there have been 11 winters with positive temperature anomaly and 9 winters with negative anomaly, but negative anomalies have been smaller than positive (Figure 7). Winter

2019/20 is among the three warmest since 1961. Winter precipitation has been very variable in last years, but winters with above average precipitation prevailed (Figure 8).

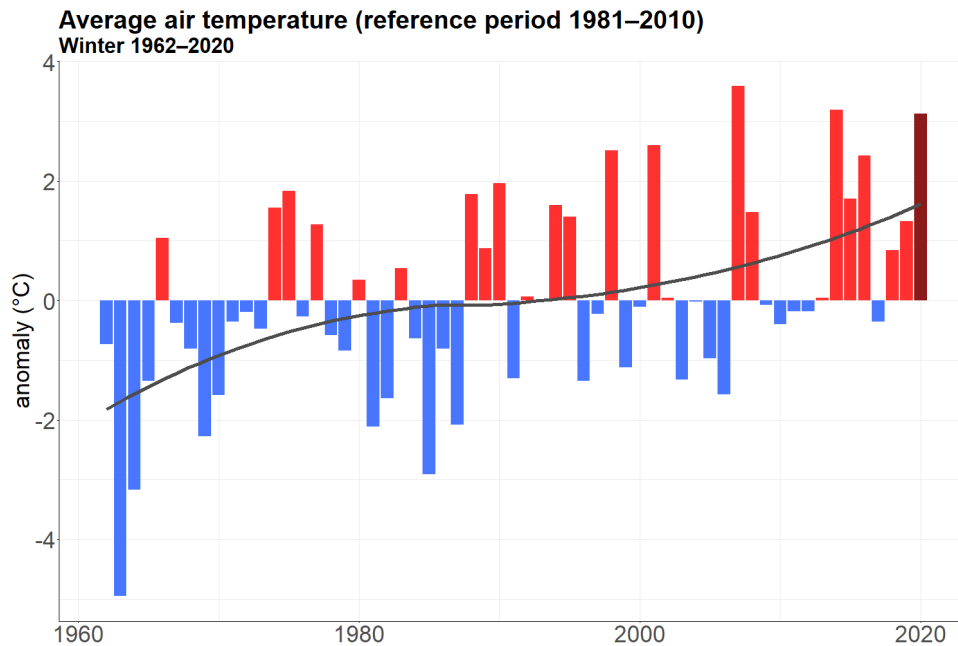


Figure 7. Winter mean air temperature anomaly in Slovenia in the period 1961/62–2019/20, relative to the 1981–2010 average

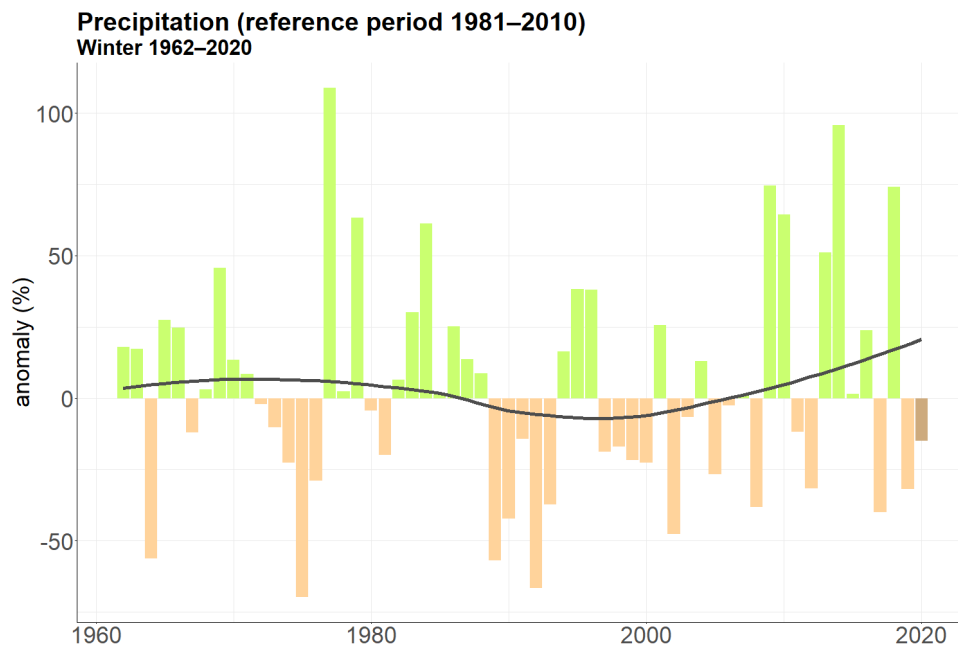


Figure 8. Winter precipitation anomaly in Slovenia in the period 1961/62–2019/20, relative to the 1981–2010 average

Average air temperature in *December 2019* was above the multi-annual average of the 30-year period 1981–2010 in whole Slovenia. Air temperature anomalies were between 1.5 °C and 3.4 °C (Figure 9), average anomaly was 2.7 °C (surface weighted average value). According to tercile ranks, thermal conditions in Slovenia were above-normal in whole Slovenia.

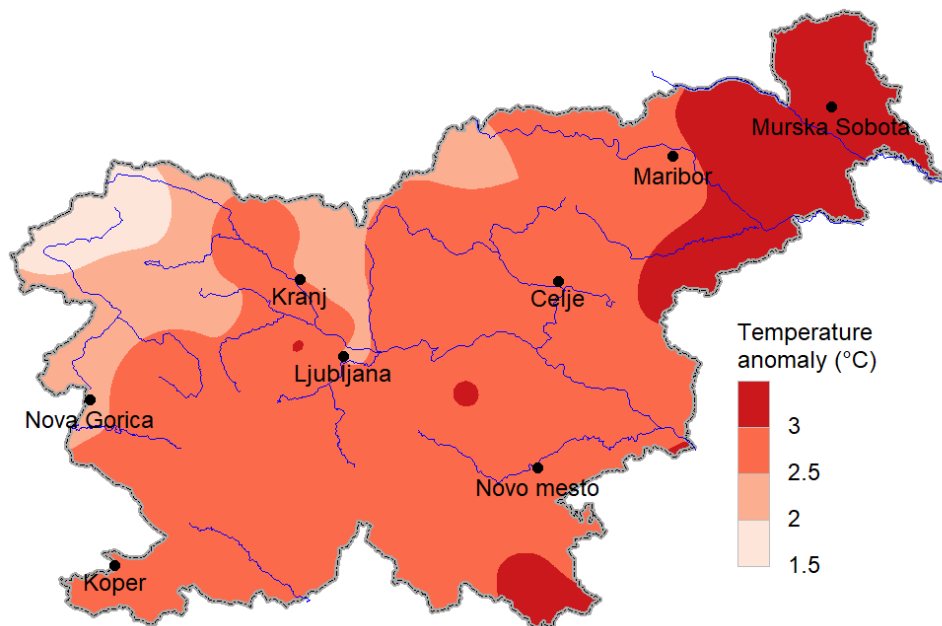


Figure 9. Mean air temperature anomaly in Slovenia in December 2019, relative to the 1981–2010 average. Data are from 34 meteorological stations.

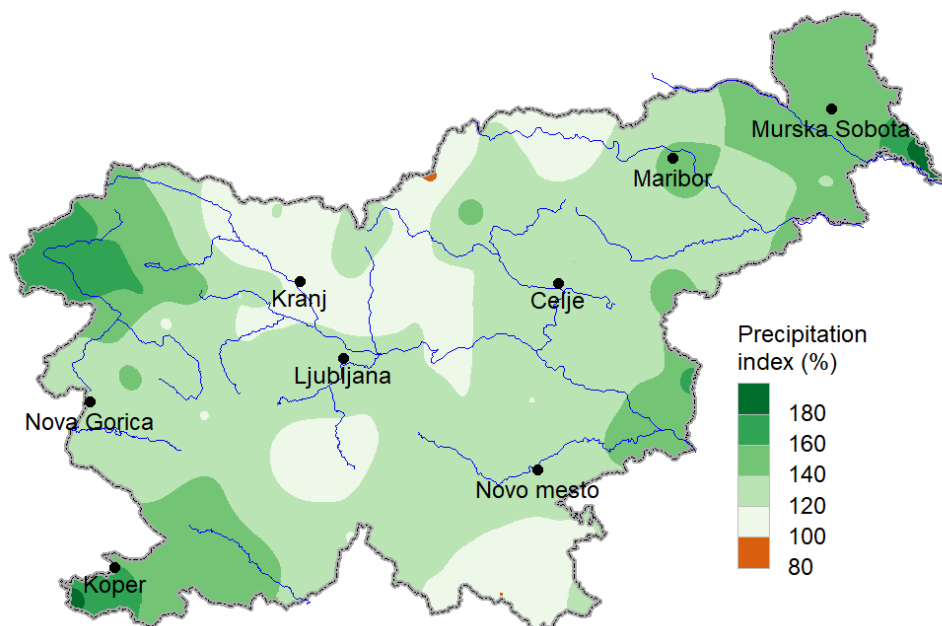


Figure 10. Precipitation index in Slovenia in December 2019, relative to the 1981–2010 average. Data are from 159 meteorological stations.

December 2019 was wet. Precipitation index was above average in whole country (Figure 10), except in parts of north, central and south-east Slovenia. Precipitation index was within the range from 88 % to 200 %, its average value was 132 % (surface weighted average value). Precipitation index was within the second (normal) tercile in central, parts of north-east and south-east Slovenia, compared with the period 1981–2010, and within third (above-normal) tercile elsewhere.

Average air temperature in *January 2020* was above the multi-annual average of the 30-year period 1981–2010 in whole Slovenia. Anomalies were between 0.7 °C and 4.0 °C, the highest in the Alps (Figure 11), their average value was 2.1 °C (surface weighted average value). According to tercile ranks, thermal conditions in Slovenia were above normal in whole country.

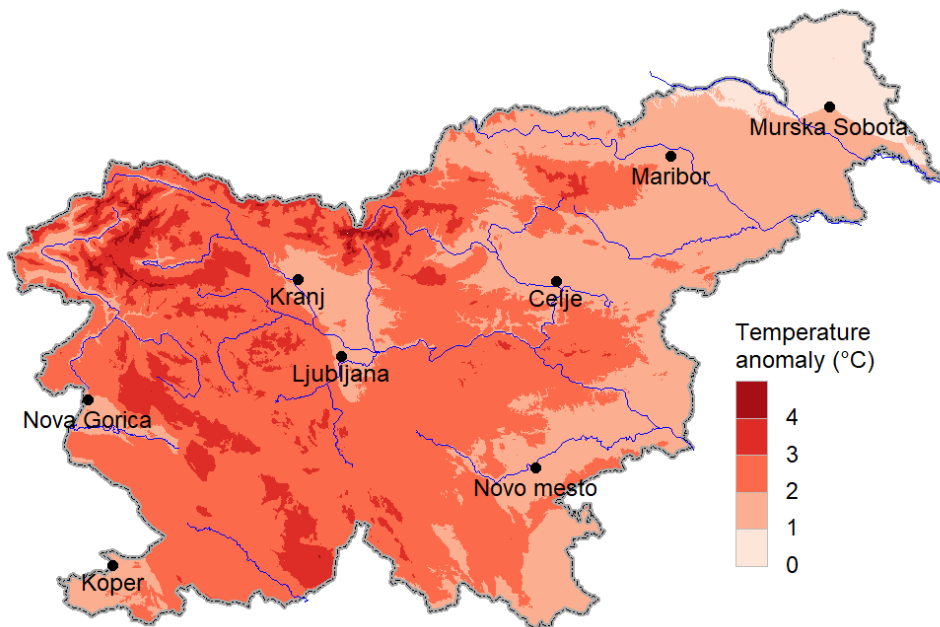


Figure 11. Mean air temperature anomaly in Slovenia in January 2020, relative to the 1981–2010 average. Data are from 34 meteorological stations.

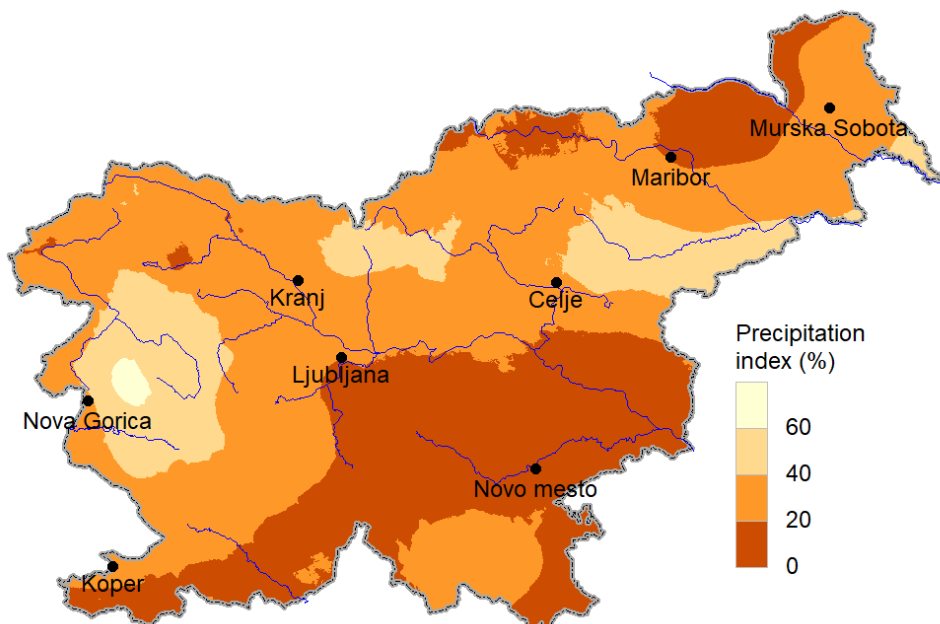


Figure 12. Precipitation index in Slovenia in January 2020, relative to the 1981–2010 average. Data are from 158 meteorological stations.

January 2020 was very dry. Precipitation index was below 60 % almost everywhere. It was especially low in south and north-east Slovenia where not even 20 % of normal precipitation

fell (Figure 12). The precipitation index was within the range from 4 % to 76 %, its average value was 27 % (surface weighted average value). The precipitation index was within the first (below-normal) tercile everywhere but on two stations. January 2020 is among the eight driest since 1961.

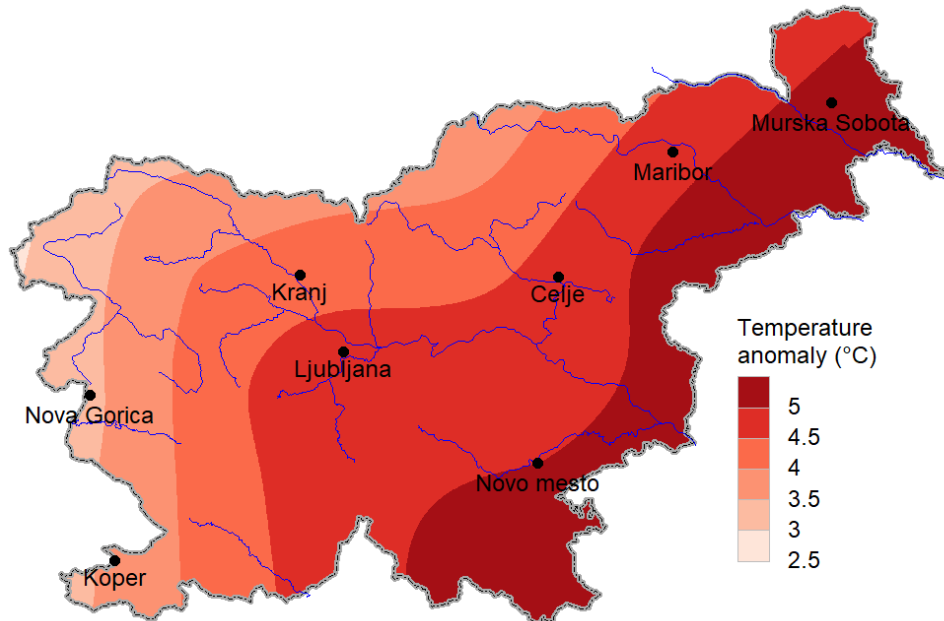


Figure 13. Mean air temperature anomaly in Slovenia in February 2020, relative to the 1981–2010 average. Data are from 33 meteorological stations.

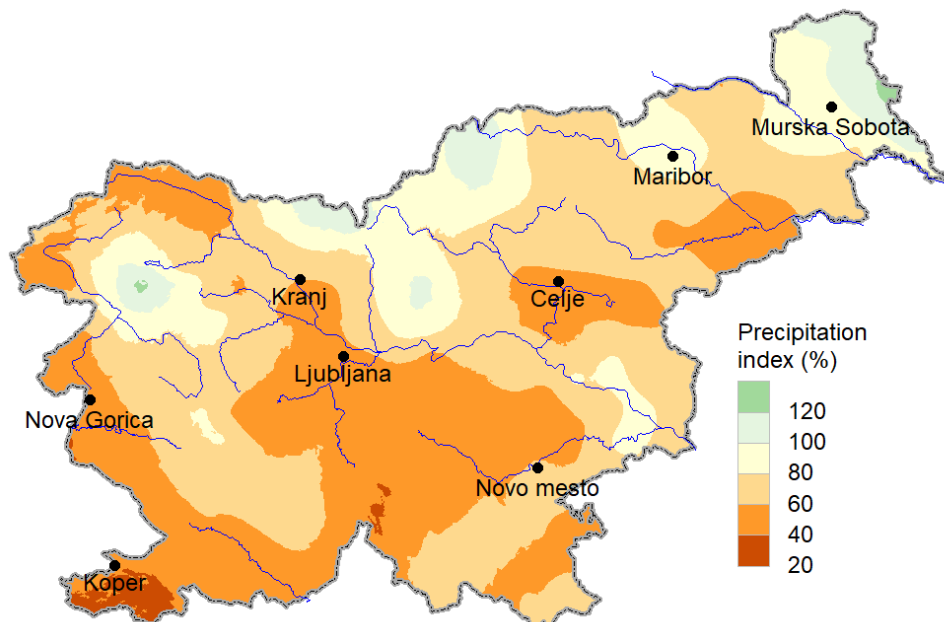


Figure 14. Precipitation index in Slovenia in February 2020, relative to the 1981–2010 average. Data are from 151 meteorological stations.

February 2020 was very warm, the second warmest since 1961. Air temperature anomalies were between 2.9 °C and 5.7 °C (Figure 13), the average anomaly was 4.5 °C (surface

weighted average value). According to tercile ranks, thermal conditions in Slovenia were above-normal in whole country.

Precipitation index in *February 2020* was below average almost everywhere but in the Alps and some parts of north and northeast Slovenia (Figure 14). Precipitation index was within the range from 31 % to 135 %, its average value was 68 % (surface weighted average value). In the south-west and south-east precipitation was within the first (below-average) tercile and within the second (normal) tercile elsewhere.

The summary for winter 2019/20 and monthly (December, January and February) temperature and precipitation conditions can be found in the Table 1.

Table 1. The summary for winter 2019/20 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 2019	1.5 to 3.4 °C	2.7 °C	88 to 200 %	132 %
January 2020	0.7 to 4.0 °C	2.1 °C	4 to 76 %	27 %
February 2020	2.9 to 5.7 °C	4.5 °C	31 to 135 %	68 %
Winter 2019/20	1.7 to 3.8 °C	3.1 °C	64 to 125 %	85 %

High Impact Events

Highlights for the winter 2019/20 in Slovenia:

- Temperature above average (among the three warmest since 1961),
- Precipitation below average, wet December and dry January and February,
- Very warm February (second warmest since 1961),
- Very dry January (among the eight driest since 1961).

Verification of the SEECOF-22 Climate Outlook in Slovenia for winter season 2019/20

In the table 2 a verification summary of the SEECOF-22 climate outlook for the winter season 2019/20 (DJF) can be found. The climatological reference period is 1981–2010.

Table 2. SEECOF-22 climate outlook verification summary for Slovenia for winter 2019/20

Country	Seasonal temperature (DJF)		Seasonal precipitation (DJF)	
	Observed	SEECOF-22 climate outlook for temperature	Observed	SEECOF-22 climate outlook for precipitation
SLOVENIA	warmer than normal	warmer than normal	drier than normal mostly in south-east, normal mostly in west, north and north-east	no clear signal

Users' Perception of the SEECOF-22 Outlook

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