

Annex

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Assessment of the SEECOF-18 Climate Outlook for Slovenia for winter season 2017/18

SEECOF-18 Climate Outlook for Slovenia for the winter season 2017/18

The consensus statement of SEECOF-18 for 2017/18 winter season emphasized the presence of weak La Niña conditions in the tropical Pacific which would according to the latest model-derived predictions of ENSO indicate weak La Niña conditions as the most likely scenario for the winter 2017/18. The weak La Niña condition favours a negative phase of the Pacific North America pattern (PNA), which in turn could increase the probability for the development of positive phases of North Atlantic Oscillation (NAO) and possibly of Eastern Atlantic patterns (EA).

The consensus for thermal conditions was that above normal thermal anomalies would likely dominate the whole SEECOF region in winter 2017/18. Chances for warmer than normal conditions would be over Balkan Peninsula, Eastern Mediterranean coast and hinterland regions (zone 2, Figure 1). For Slovenia the probabilistic forecast for the tercile categories of anomalies for mean temperature, relative to the period 1981–2010, was 20 % for below-, 30 % for near- and 50 % for above-average conditions.

Precipitation uncertainties are generally larger than for temperature. The main feature of the consensus for precipitation was a north-south gradient favouring wetter than normal conditions over northernmost part of SEECOF region (zone 1, Figure 2). The drier than normal conditions would probably prevail on Southernmost of the Balkan Peninsula, along the coasts of the Eastern Mediterranean, Ionian, as well as the coasts of central and Southern Adriatic Sea (zone 3, Figure 2). In the rest part of the SEECOF domain there was no clear signal for precipitation (zone 2, Figure 2). For Slovenia that means that higher than normal precipitation conditions in northern and north-western parts of the country were most probable (30 % for below, 30 % for near- and 40 % for above-average conditions). For the rest of the country there was no clear signal for precipitation. Probabilities for below-, near- and above-average conditions were approximately equal.

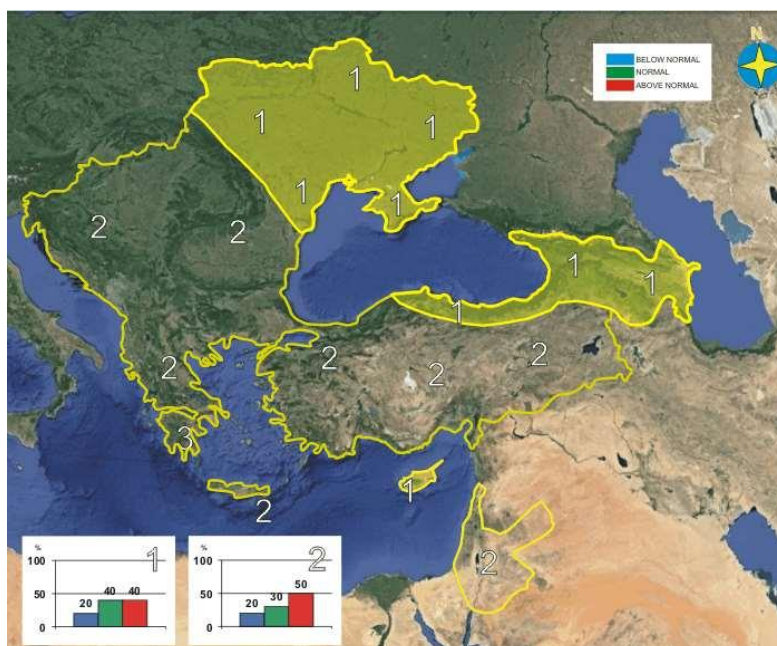


Figure 1. Graphical presentation of the winter 2017/18 temperature outlook

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.

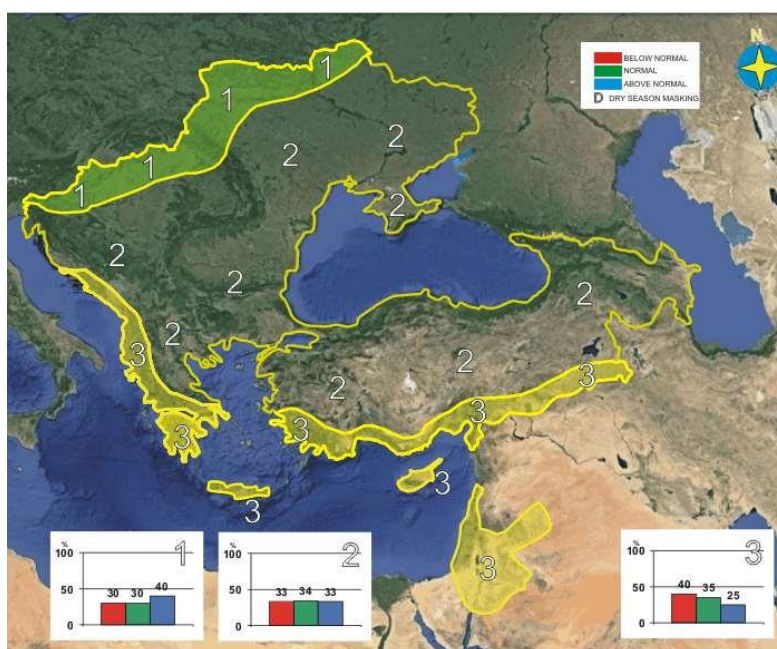


Figure 2. Graphical presentation of the winter 2017/18 precipitation outlook

Analysis of the winter season 2017/18

Average air temperature in Slovenia in winter 2017/18 was above the multi-annual average of the 30-year period 1981–2010 for the whole country, except for higher areas in western and north-western parts (Figure 3). Corresponding air temperature anomalies for winter 2017/18 (months December, January and February) were between -1.2°C to 1.9°C , average anomaly

was 0.8 °C (surface weighted average value). Anomalies were largest in the eastern and north-eastern parts of the country (above 1.0 °C) and the smallest in the north-western heights of the country (between −2 °C and 0 °C).

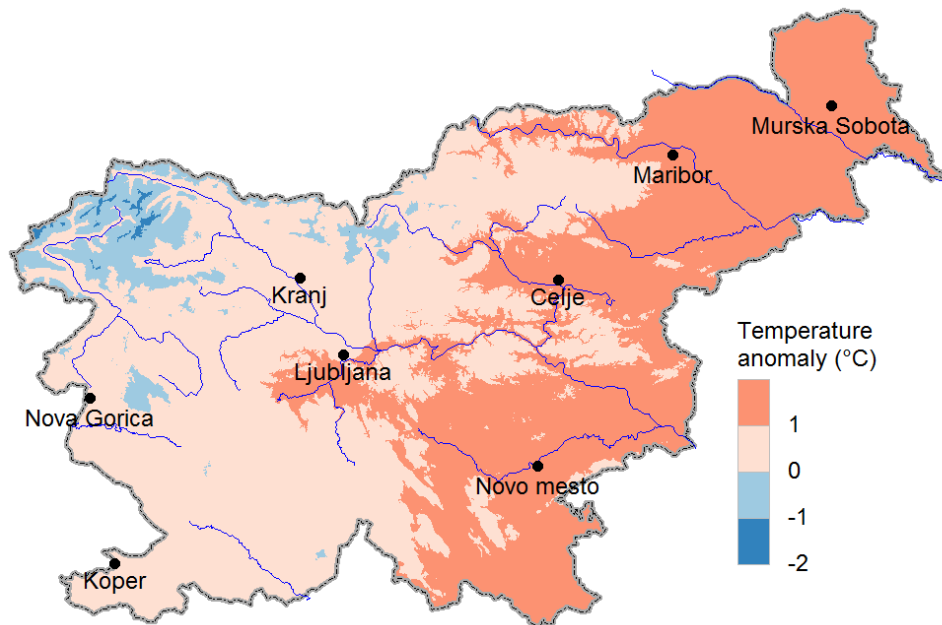


Figure 3. Mean air temperature anomaly in Slovenia in winter 2017/18, relative to the 1981–2010 average. Data are from 30–31 meteorological stations.

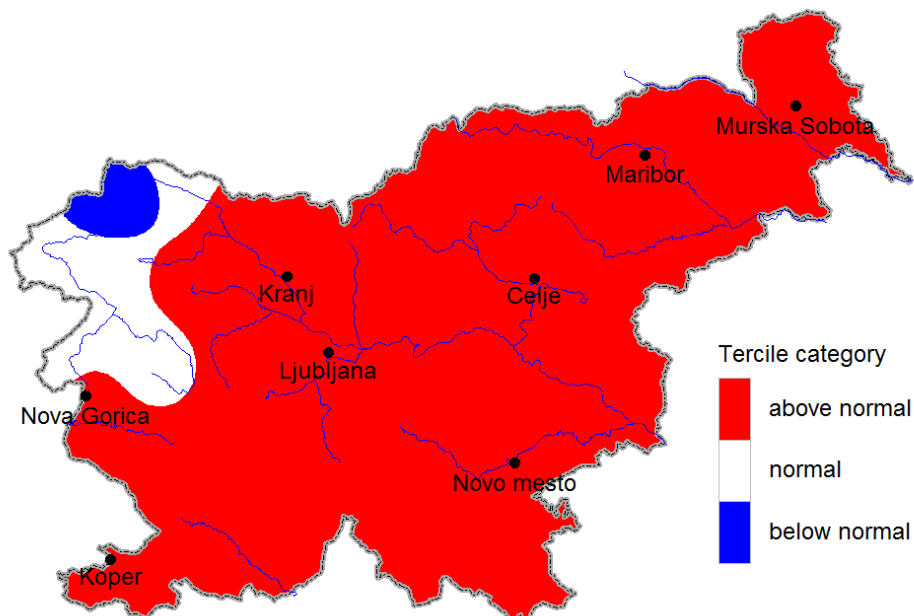


Figure 4. Mean air temperature tercile category of anomaly in Slovenia in winter 2017/18, relative to the period 1981–2010. Data are from 26 meteorological stations.

According to tercile ranks, thermal conditions in Slovenia in winter 2017/18 were above normal, relative to the period 1981–2010, in the whole country, except for the north-western part, where conditions were normal or below normal, especially in heights (Figure 4).

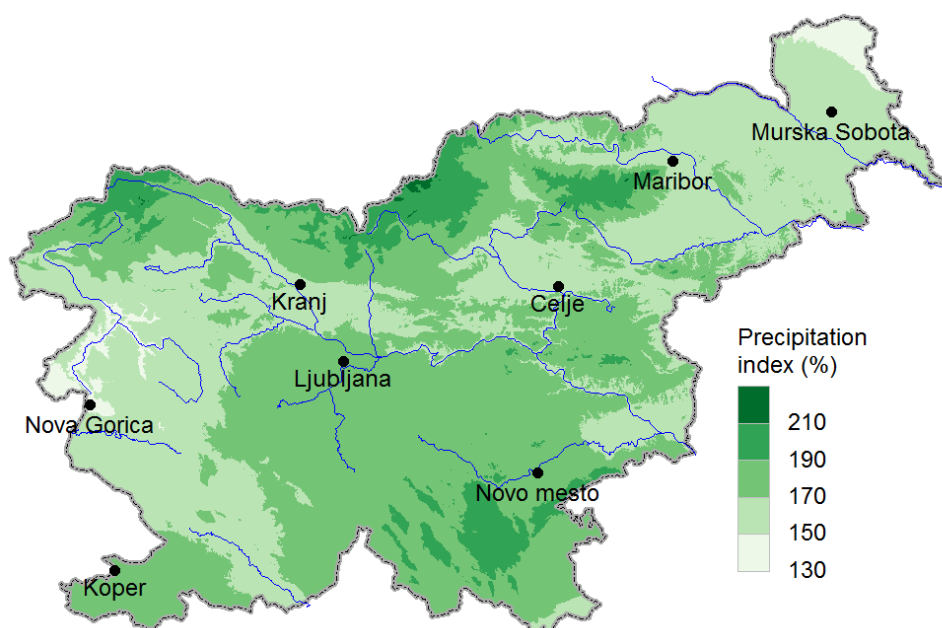


Figure 5. Precipitation index in Slovenia in winter 2017/18, relative to the 1981–2010 average. Data are from 160–168 meteorological stations.

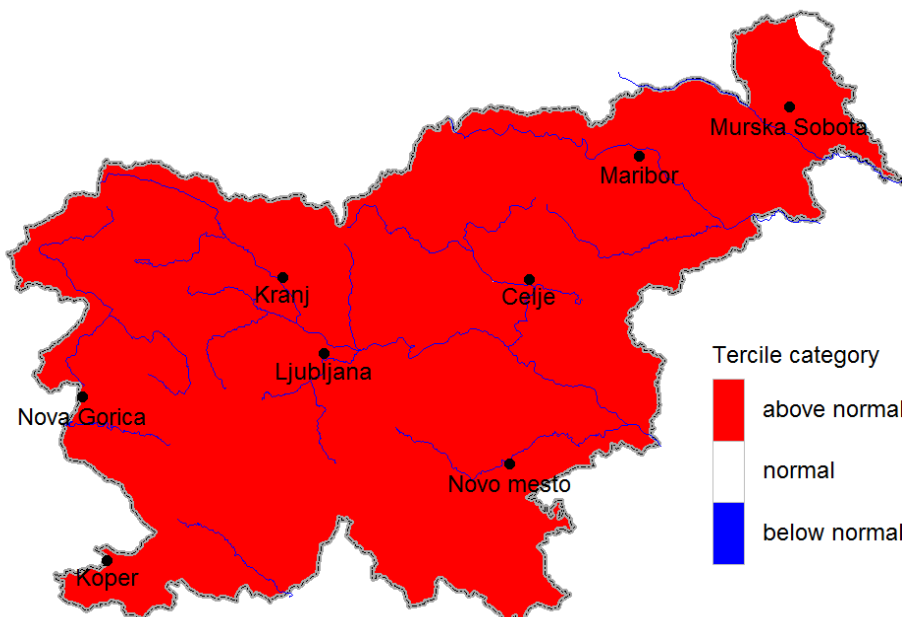


Figure 6. Precipitation tercile category of anomaly in Slovenia in winter 2017/18, relative to the period 1981–2010. Data are from 159 meteorological stations.

Precipitation index in Slovenia in winter 2017/18, relative to the period 1981–2010, was above average (Figure 5). The precipitation index in central, north and littoral parts of Slovenia was above 170 %, but it reached the lowest values (130–150 % or even lower) in the

utmost north-east and some parts of the west. Precipitation index was within the range from 117 % to 265 %, average precipitation index was 173 % (surface weighted average value).

Precipitation was within the third (above-normal) tercile in whole country, compared with 1981–2010 period (99 % of the stations), only on one weather station was precipitation in the second (normal) tercile (Figure 6).

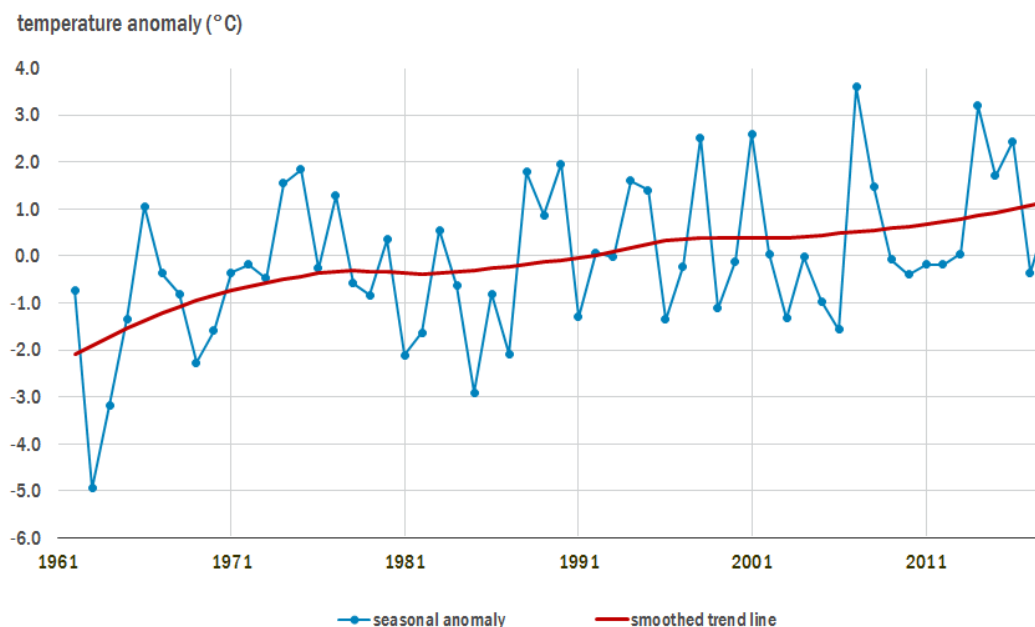


Figure 7. Winter mean air temperature anomaly in Slovenia in the period 1961/62–2017/18, relative to the 1981–2010 average

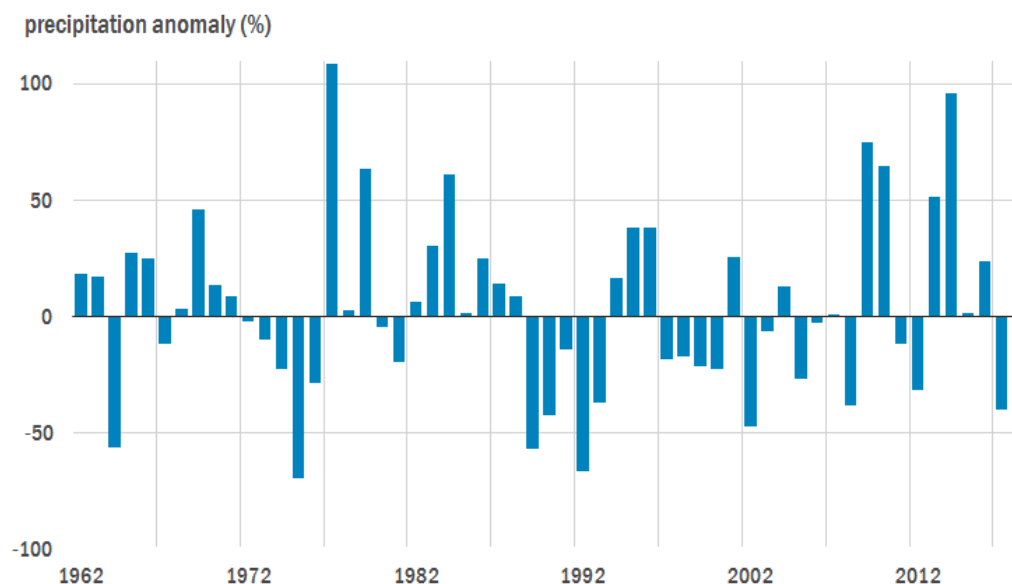


Figure 8. Winter precipitation index in Slovenia in in the period 1961/62–2017/18, relative to the 1981–2010 average

Temperature in Slovenia was near smoothed trend line for winter in the period 1961–2018 (Figure 7). It has been approximately the 17th warmest winter since 1961. Winter has been the fourth wettest since 1961 (Figure 8), second only to winters 1976/77, 2013/14 and 2008/9.

Average air temperature in *December 2017* was above the multi-annual average of the 30-year period 1981–2010 in whole Slovenia, except for the north-western part. Air temperature anomalies were between $-1.3\text{ }^{\circ}\text{C}$ to $2.6\text{ }^{\circ}\text{C}$ (Figure 9), average anomaly was $0.9\text{ }^{\circ}\text{C}$ (surface weighted average value). According to tercile ranks, thermal conditions in Slovenia were above-normal, relative to the period 1981–2010, in central, eastern and north-eastern parts of the country and normal elsewhere, except for heights of the north-west.

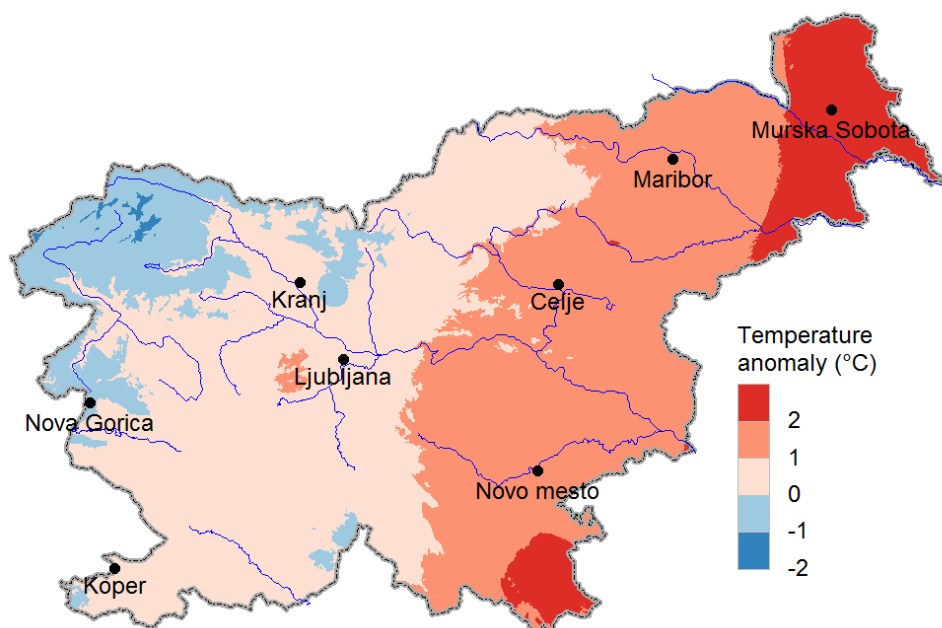


Figure 9. Mean air temperature anomaly in Slovenia in December 2017, relative to the 1981–2010 average. Data are from 31 meteorological stations.

Precipitation index in *December 2017*, relative to the period 1981–2010, was above average in whole country (Figure 10). Precipitation index was within the range from 91 % to 285 %, its average value was 177 % (surface weighted average value).

January 2018 was unusually warm. Average air temperature was up to $5\text{ }^{\circ}\text{C}$ above the multi-annual average of the 30-year period 1981–2010. Anomalies were between $1.7\text{ }^{\circ}\text{C}$ to $5.2\text{ }^{\circ}\text{C}$ (Figure 11), their average value was $4.1\text{ }^{\circ}\text{C}$ (surface weighted average value). According to tercile ranks, thermal conditions in Slovenia were above-normal, relative to the period 1981–2010, for the whole country.

Precipitation index in *January 2018* was above 100 %, relative to the period 1981–2010, in central, western and eastern part of the country, while it was below 100 % in the north-east, north and littoral parts (Figure 12). Precipitation index was within the range from 57 % to 190 %, its average value was 110 % (surface weighted average value). In the most of the country precipitation was within the second (normal) tercile, compared with the period 1981–2010 (73 % of the stations), in other parts precipitation was within above-normal tercile (24 % of the stations). Only two weather stations in the north-west reported precipitation within below-normal tercile.

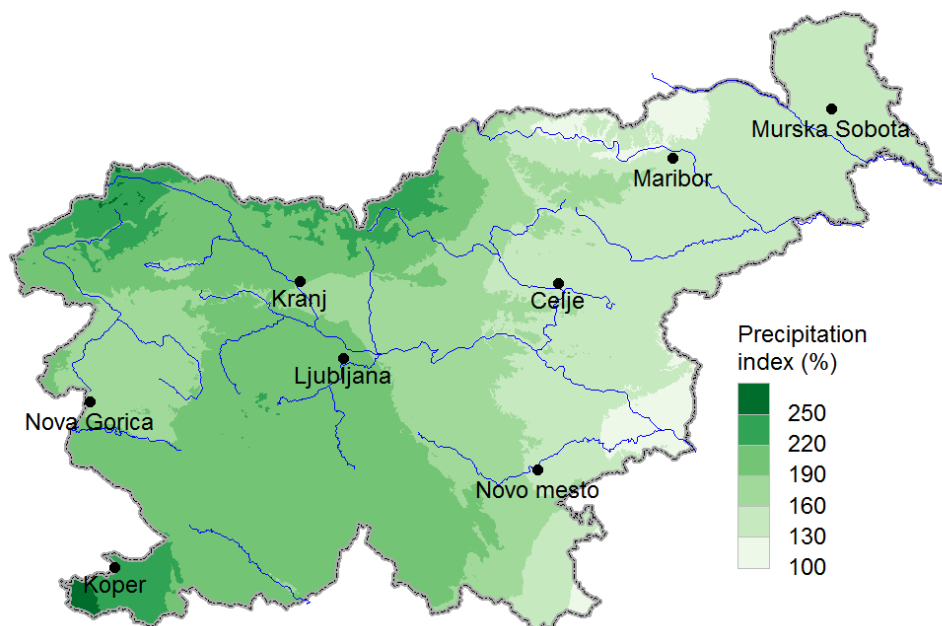


Figure 10. Precipitation index in Slovenia in December 2017, relative to the 1981–2010 average. Data are from 168 meteorological stations.

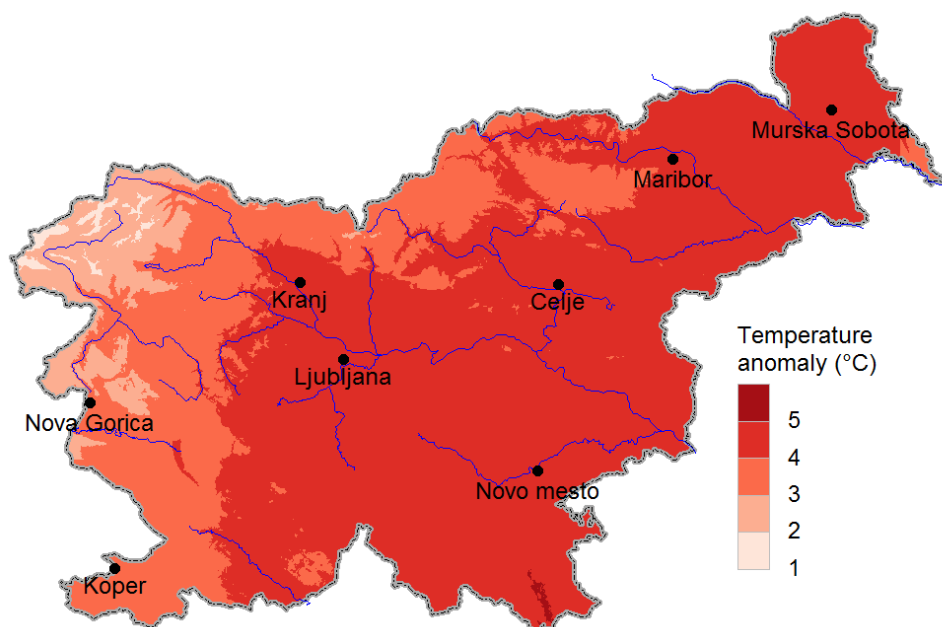


Figure 11. Mean air temperature anomaly in Slovenia in January 2018, relative to the 1981–2010 average. Data are from 31 meteorological stations.

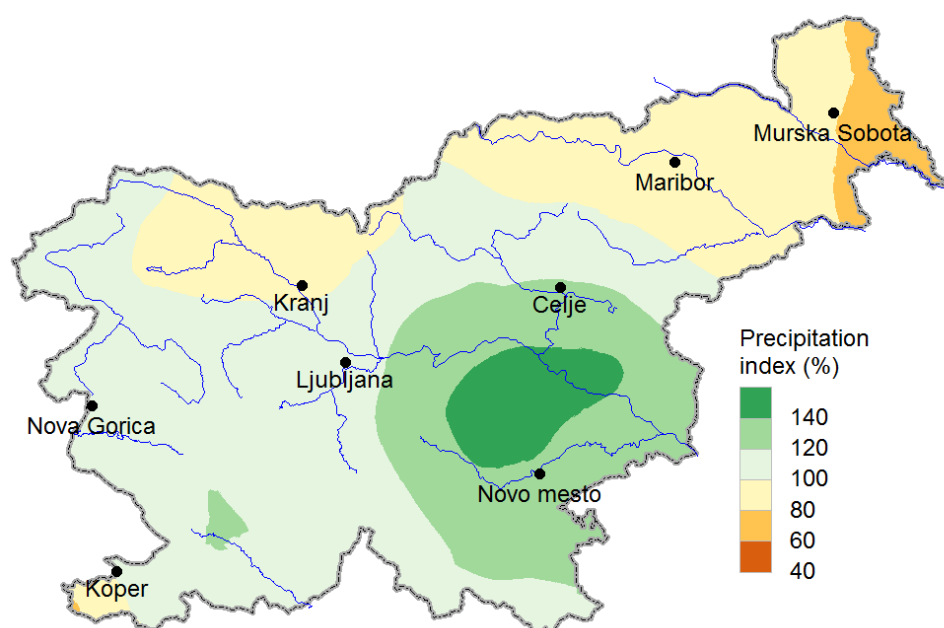


Figure 12. Precipitation index in Slovenia in January 2018, relative to the 1981–2010 average. Data are from 163 meteorological stations.

February 2018 was, quite opposite to January, unusually cold, mostly due to distinctive cold wave in the last decade. Average daily temperatures dropped even 10 °C and more below 1981–2010 average in the last four days. Air temperature anomalies were between -4.1 °C to -0.9 °C (Figure 13), the average anomaly was -2.5 °C (surface weighted average value). According to tercile ranks, thermal conditions in Slovenia were below normal, relative to the period 1981–2010, for the whole country, except some parts in northern and littoral Slovenia, where condition were within normal tercile.

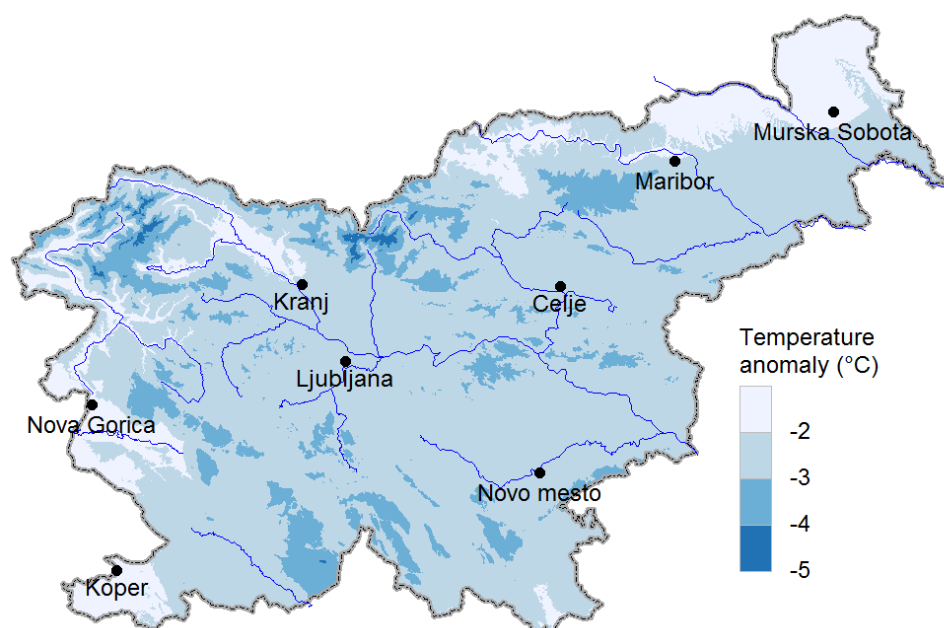


Figure 13. Mean air temperature anomaly in Slovenia in February 2018, relative to the 1981–2010 average. Data are from 30 meteorological stations.

Precipitation index in *February 2018*, relative to the period 1981–2010, was above average in the most of the country, except in some parts of western Slovenia (Figure 14). Precipitation index was within the range from 78 % to 421 %, its average value was 225 % (surface weighted average value). In the most parts of Slovenia precipitation was within the third (above average) tercile, compared with the period 1981–2010 (93 % of the stations), precipitation was within normal tercile in some western parts of the country.

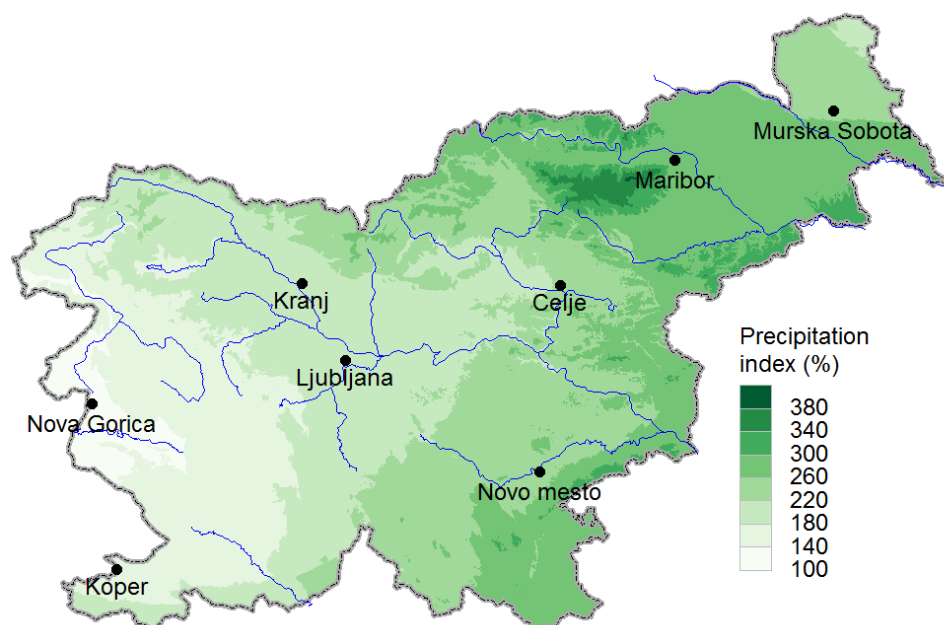


Figure 14. Precipitation index in Slovenia in February 2018, relative to the 1981–2010 average. Data are from 160 meteorological stations.

The summary for winter 2017/18 and monthly (December, January and February) temperature and precipitation conditions can be found in the Table 1.

Table 1. The summary for winter 2017/18 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 2017	–1.3 to 2.6 °C	0.9 °C	91 to 285 %	177 %
January 2018	1.7 to 5.2 °C	4.1 °C	57 to 190 %	110 %
February 2018	–4.1 to –0.9 °C	–2.5 °C	78 to 421 %	225 %
Winter 2017/18	–1.2 to 1.9 °C	0.8 °C	117 to 265 %	173 %

High Impact Events

Highlights for winter 2017/18 in Slovenia:

- Among the 20 warmest winters since 1961/62.

- Fourth wettest since 1961/62, second only to winters 1976/77, 2013/14 and 2008/09.
- December temperature above average, January very warm, third warmest since 1961, second only to January 2014 and 2007.
- February very cold, 11th coldest since 1961, due to distinctive cold wave in the last decade. Average daily temperature in the last three to four days of the month dropped 10 °C and more below 1981–2010 average in some areas.
- Very wet December and February. December 4th wettest since 1961, February 5th wettest since 1961.

Verification of the SEECOF-18 Climate Outlook in Slovenia for winter season 2017/18

In the table 2 a verification summary of the SEECOF-18 climate outlook for the winter season 2017/18 (DJF) can be found. The climatological reference period is 1981–2010.

Table 2. SEECOF-18 climate outlook verification summary for Slovenia for winter 2017/18

Country	Seasonal temperature (DJF)		Seasonal precipitation (DJF)	
	Observed	SEECOF-18 climate outlook for temperature	Observed	SEECOF-18 climate outlook for precipitation
SLOVENIA	warmer than normal in the most of the country normal to colder than normal in the north-west	warmer than normal	wetter than normal	wetter than normal in the north no clear signal in the south

Users' Perception of the SEECOF-18 Outlook

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