



Thirty-third Session of the SOUTH EAST EUROPEAN CLIMATE OUTLOOK FORUM

SEECOF-33 ONLINE MEETING

ANALYSIS AND VERIFICATION OF THE SEECOF-32 CLIMATE OUTLOOK FOR THE 2024/25 WINTER FOR SOUTH-EAST EUROPE

CLIMATE OUTLOOK FOR 2024/25 WINTER SEASON FOR THE SEE REGION

As stated in the SEECOF-32 Consensus Statement on the Seasonal Climate Outlook for the 2024/25 Winter Season over South-East Europe (SEE) document:

http://www.seevccc.rs/SEECOF/SEECOF-32/STEP-3/Consensus_Statement-SEECOF-32.pdf

Observed sea surface temperatures and forecast for the winter months indicated dominant La Niña conditions, a negative to positive Indian Ocean Dipole, and positive anomalies over the tropical and most of northern Atlantic Ocean, but with lower anomalies comparing to last winter. In the atmosphere, models showed different cyclonic anomalies over Europe, and anticyclonic anomalies over the Middle East. Diagnostics of upper levels indicated a positive NAO phase and a moderate positive EA pattern unlike last winter which had a strongly positive EA.

Analysis shows slightly La Niña conditions and negative to positive phase of Indian Ocean Dipole, as well as positive EA and slightly positive NAO phase. Anticyclonic anomalies over Europe were underestimated by the models.

Winter temperature was likely to be above-normal, with the probability increasing from the north (Zone 1 in Figure 1) towards the south of the region (Zone 2 in Figure 1). Southern and eastern Turkey, Cyprus and Middle East were likely to experience below-normal conditions in terms of winter precipitation sums (Zone 2 in Figure 2). However, in the most of the SEECOF region, there was an equal probability for winter precipitation (Zone 1 in Figure 2). It was noteworthy that certain parts of the country, particularly mountainous regions, could be observed near- or above-normal winter precipitation totals due to the episodes of enhanced convection accompanied by heavy precipitation.

It was noted that seasonal averages cannot provide details about short spells of weather during the season. It is possible that even in an average season spells of severe wintry weather (for example: winter storms, very cold episodes, very wet spells) could occur and lead to significant local socio-economic impacts.

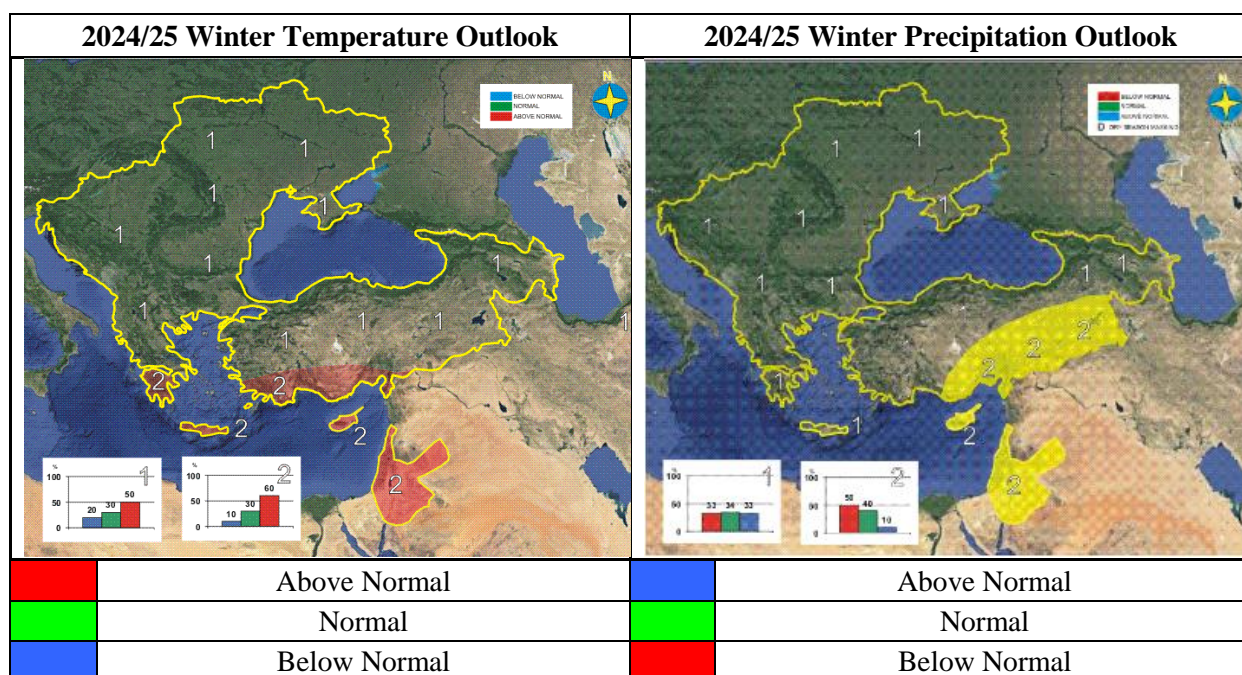


Figure 1. Graphical presentation of the Climate Outlook for the 2024/25 Winter Season for the SEE Region

ANALYSIS OF THE WINTER 2024/25 FOR THE SEE REGION

Analyses of the winter season temperature and precipitation anomalies are based on:

- Operational products of the RCC Node-CM (Regional Climate Centre on Climate Monitoring) provides maps for the World Meteorological Organization (WMO) Region VI (Europe and Middle East), http://rcccm.dwd.de/DWD-RCCCM/EN/products/europe/europe_node.html
- Climate monitoring products of the South East European Virtual Climate Change Center – SEEVCCC (Member of the WMO RA VI RCC Node-CM), http://www.seevccc.rs/imgsrc/clim_mon/202502/
- National climate monitoring reports of the following SEECOF-29 participating countries: Bulgaria, Croatia, Cyprus, Georgia, Republic of North Macedonia, Republic of Moldova, Serbia, Slovenia and Turkey are available on:

<http://www.seevccc.rs/SEECOF/SEECOF-33/STEP-1/>

Winter 2024/25 seasonal mean temperature was in a range from -10 °C in the mountainous areas of northeastern Turkey, to around 10 °C in Cyprus, Crete and Middle East. In most of the low-lying regions it was between 0 °C and 5 °C, except in Azerbaijan, eastern Turkey, most of Ukraine and some locations in Georgia where it was lower than 0 °C while in most of Greece, western Turkey and along Adriatic coast mean air temperature was up to 10 °C. In the Mediterranean Sea mean air temperature was in a range from 10 °C up to 20 °C (Figures 2 and 3, left panel). Most of the SEECOF region observed above-normal winter temperatures (Figures 4 and 5, left panel). Temperature anomalies reached up to +3 °C above normal, relative to the 1991-2020 base period, in most of Ukraine and northern part of Moldova. Below normal was only in northeastern Turkey with air temperature anomaly up to -2 °C.

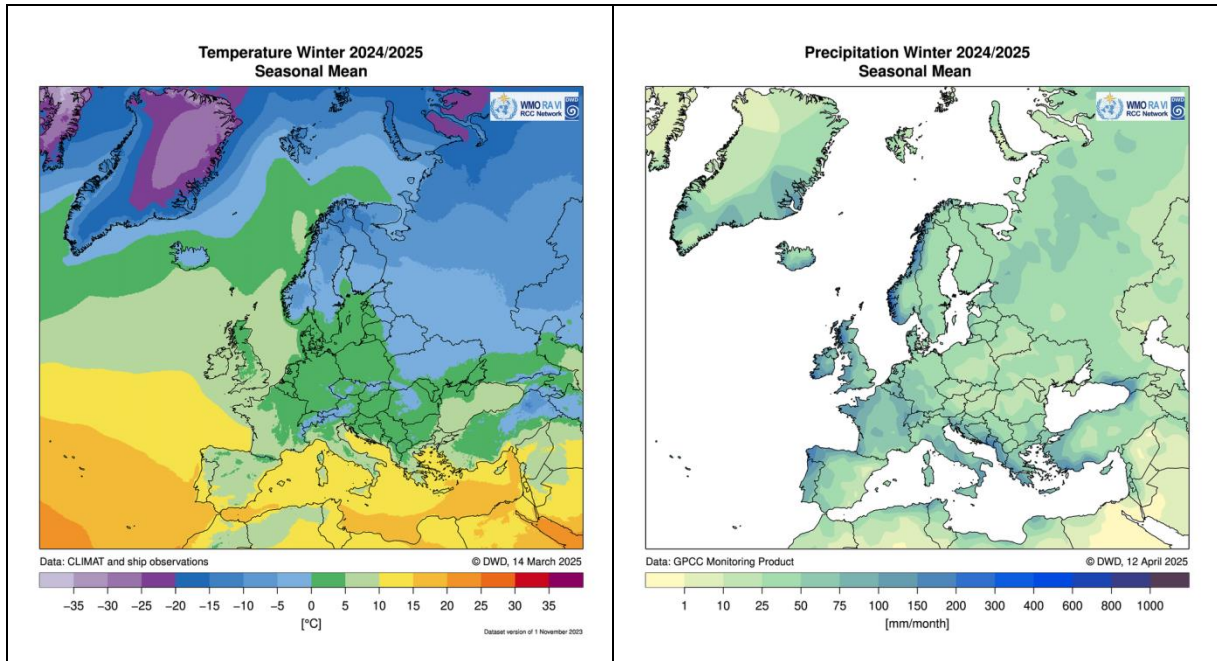


Figure 2. Winter season 2024/25, Europe – observed temperatures (left panel) and observed precipitation in mm per month (right panel). Source:

https://www.dwd.de/EN/ourservices/rcccm/int/rcccm_month_ttt.html?nn=796932 (left panel)

https://www.dwd.de/EN/ourservices/rcccm/int/rcccm_month_rrr.html?nn=796932 (right panel)

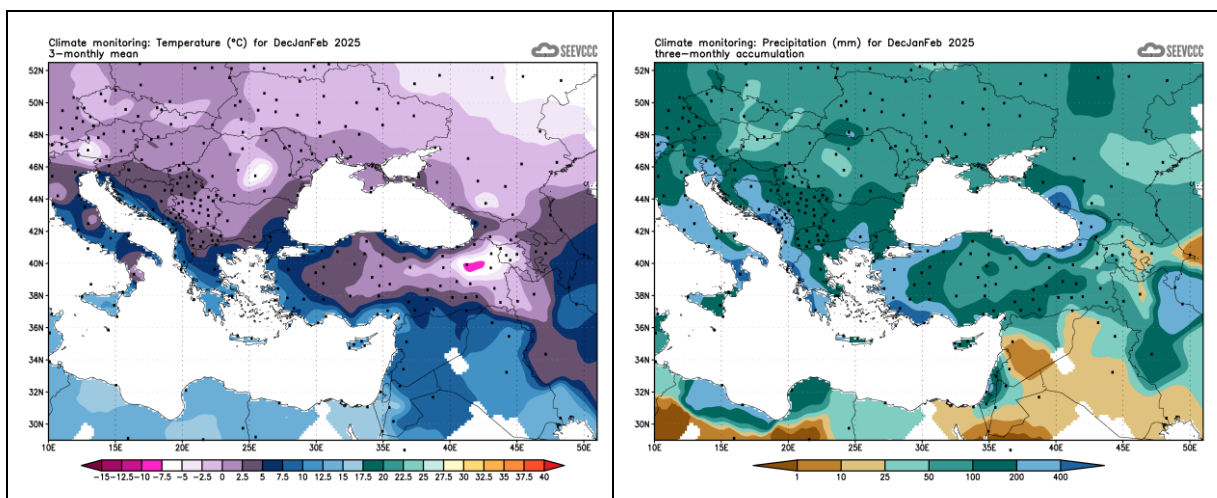


Figure 3. Winter season 2024/25, SEECOF region – observed temperature (left panel) and observed precipitation (right panel). Source:

http://www.seevccc.rs/imgsrc/clim_mon/202502/temp_av3m.gif (left panel)

http://www.seevccc.rs/imgsrc/clim_mon/202502/prec_tot3m.gif (right panel)

Seasonal precipitation totals (Figures 2 and 3, right panel) were between 200 mm and 400 mm in parts of the southwestern Balkans, western Georgia and western and part of northern Turkey, with more than 400 mm in southern part of Montenegro, along Ionian coast and in southwestern Turkey. In rest of the SEECOF region, precipitation totals were below 200 mm. It was drier than normal in almost the entire Turkey, Carpathian region, Middle East, most of Ukraine, Moldova, Cyprus, eastern and southeastern Serbia and central part of South Caucasus, with less than 80% of the long-term average (Figures 4 and 5, right panel).

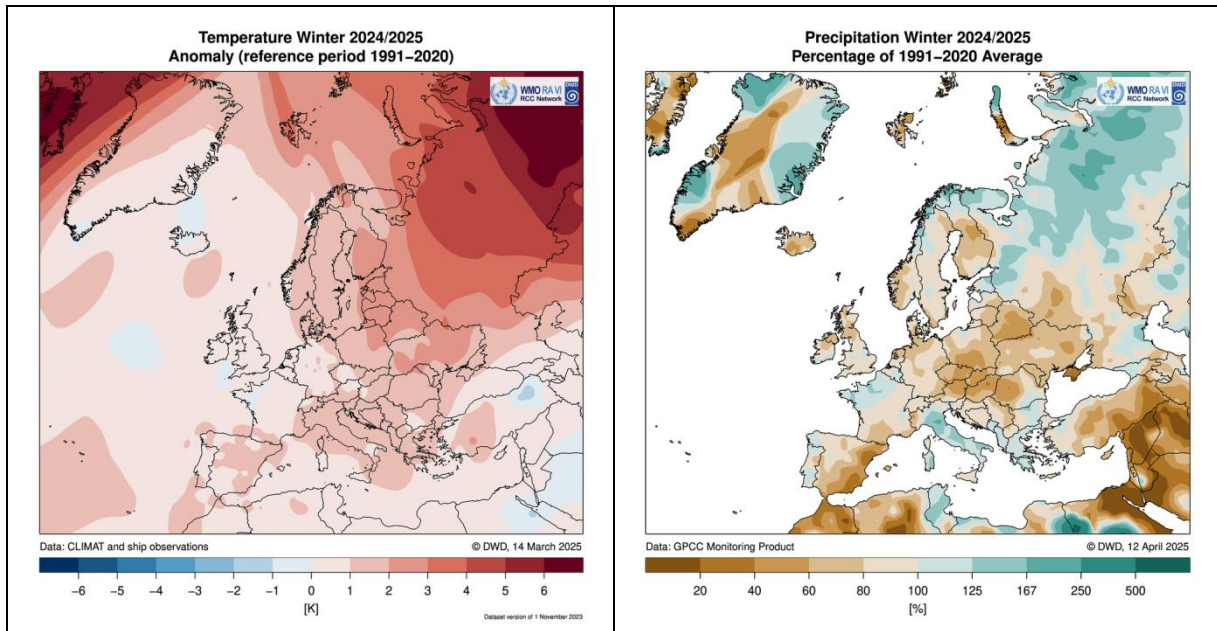


Figure 4. Winter season 2024/25, Europe – observed temperature anomalies (left panel) and observed precipitation anomalies in percent of 1981-2010 normal (right panel). Source: https://www.dwd.de/EN/ourservices/rcccm/int/rcccm_month_ttt.html?nn=796932 (left panel) https://www.dwd.de/EN/ourservices/rcccm/int/rcccm_month_rrr.html?nn=796932 (right panel)

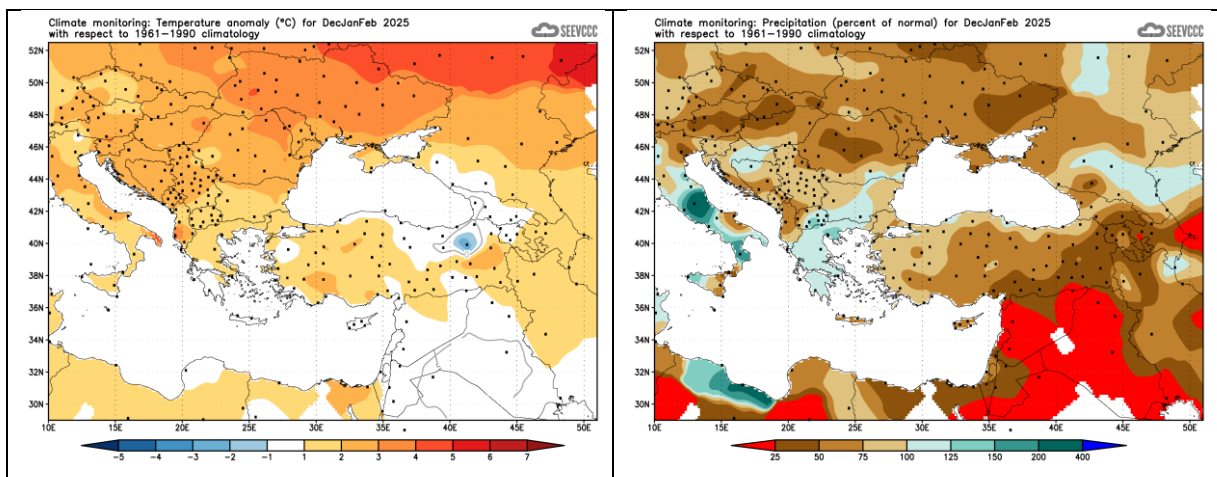


Figure 5. Winter season 2024/25, SEECOF region – observed temperature anomalies (left panel) and observed precipitation anomalies in percent of 1961-1990 normal (right panel). Source: http://www.seevccc.rs/imgsrc/clim_mon/202502/temp_an3m.gif (left panel) http://www.seevccc.rs/imgsrc/clim_mon/202502/prec_pn3m.gif (right panel)

VERIFICATION OF CLIMATE OUTLOOK FOR THE 2024/25 WINTER

Winter 2024/25 temperature was in the above normal category in most of the SEECOF region, except for eastern Turkey, while around normal was in Cyprus, Middle East, most of Turkey and southern Greece. Consequently, the outlook was correct for most of the SEECOF region.

SEECOF-32 Climate outlook for winter precipitation was correct for southern Turkey, Middle East and Cyprus, forecasting below-normal precipitation sums. On the other hand, the outlook did not anticipate below-normal winter precipitation totals in Carpathian Mountains, Moldova and Ukraine.

APPENDIX A: Analysis and verification of the SEECOF-32 climate outlook for the 2024/25 winter season:

Verification summary based on the national reports and contributions of the participants of Pre-COF of the SEECOF-33 meeting

Country	Seasonal temperature (DJF)		Seasonal precipitation (DJF)		High Impact Events
	Observed	SEECOF-32 climate outlook for temperature	Observed	SEECOF-32 climate outlook for precipitation	
Bulgaria ref. (1991-2020)	Above normal	Above normal	Near or Above normal	No signal	<ul style="list-style-type: none"> The winter of 2024-2025 is yet again warmer than average but it is the coldest from the last 6 winters. In term of precipitation it is with seasonal amounts near or above normal and it is wetter than the last 2 dry winters. December 2024 was the wettest since 2015. There was a significant precipitation event in the last week of the month when large amount of snow accumulated on the northern slopes of the mountains (Fig. 5b). In contrast the month of January was the driest since 2021 and February was to the dry side too. A cold spell occurred in late February with more than 5 (Fig. 5a) days with minimum temperatures below -10 °C but mostly in the east part of the country. In the middle of the month there were also icy days with negative maximum temperatures.
Croatia ref. (1991-2020)	Above normal (in whole Croatia)	Near or Above normal (20,30,50)	Normal (most of Croatia)	Normal (33,34,33)	<ul style="list-style-type: none"> Wind – a few episodes with gale and hurricane force gusts of bura wind (NE wind) was recorded along the Adriatic coast (December, January). Traffic between continental part and Adriatic coast were partly or completely interrupted. Maritime traffic was also partially interrupted and there were disruptions in air traffic. There were traffic problems due to fallen trees, but also with the electricity supply.

					<p>Precipitation and floods</p> <ul style="list-style-type: none"> • Episodes with heavy precipitation, thunderstorms, hail and flash floods were rather frequent, especially in Dalmatia. • During the winter there were several episodes with heavy snow (in December and January) that caused traffic problems on roads and railways. Wet snow caused problems in electricity supply.
<p>Cyprus ref. (1981-2010)</p>	<p>DEC Above normal</p> <p>JAN Well Above normal</p> <p>FEB Below normal</p>	<p>DEC Around normal</p> <p>JAN Above normal</p> <p>FEB Above normal</p>	<p>DEC Well Above normal</p> <p>JAN Well Below normal</p> <p>FEB Well Below normal</p>	<p>DEC Well Below normal</p> <p>JAN Below normal</p> <p>FEB Well Below normal</p>	<p>DEC: Extremes (deviating by 4°C or more from normal) were recorded in all of the selected meteorological stations. As an example, note the recorded maximum of Polis Chrysochous that was 23.9°C (with a normal of 18.0°C), Pafos that was 22.9°C (normal of 18.9°C), Prodromos 12.9°C (normal of 8.3°C) and Larnaca 22.6°C (normal of 18.6°C). Concerning the mean daily minimum temperatures note the recorded minimum of Paphos that was 17.3°C (with a normal of 10.0°C), Polis Chrysochous 13.9°C (normal of 9.3°C), Prodromos 7.0°C (normal of 2.6°C), Athalassa 11.7°C (normal of 7.0°C), Larnaca 14.4°C (normal of 9.2°C) and Achna Άχνα 13.0°C (normal of 8.3°C).</p> <p>From the distribution (provisional accumulated precipitation chart) of the accumulated precipitation of December is evident that the surface distribution was well above normal reaching 113.7mm or 121% of normal.</p> <p>During the periods 2-5, 7, 9-11, 16 and 20-31 of December local showers and isolated thunderstorms were recorded.</p> <p>For the 3-4, 21-24 and 30-31 of December, yellow EMMA warning was issued concerning thunderstorms and for the 25-</p>

					<p>26 yellow EMMA warning for showers.</p> <p>Based on the provisional data, hail was recorded on the 28th and the 30th of the month, while there was snow on the 25-26 and 30-31 of December.</p> <p>JAN: Extreme maximum temperatures with positive deviations of more than 4°C were recorded at all stations, such as at Prodromos station where the highest daily maximum temperature (13.4°C) was 7.1°C above normal. Also, the highest daily maximum temperature at Achna station (22.5°C) was 6.2°C above normal.</p> <p>Extreme minimum temperatures with positive deviations of more than 4°C were also observed. Examples include the station at Larnaca Airport, where the highest daily minimum temperature (12.6°C) was 5.1°C above normal, while at Achna station it was 5.2°C above the corresponding normal.</p> <p>From the initial data, as recorded by the Department of Meteorology, it appears that, for January, with regard to accumulated precipitation, the seasonal model did not behave well at all, since the rainfall amount was much less than the expected over the entire island.</p> <p>The average cumulative precipitation for the entire area of the island reached 12.8 millimeters or 15% of the normal for the month, ranking it as one of the driest Januarys since measurements have been made.</p> <p>During the periods 4-5, 10, 12, 16, 21-26 and 31 of January local showers and thunderstorms were reported.</p> <p>Also, for the 25th and the 26th of January, EMMA yellow level warnings for thunderstorms were issued.</p> <p>It is worth mentioning that based on the provisional data,</p>
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					<p>snowfall was reported on the 22nd and 23rd of January.</p> <p>FEB: Extremely low maximum temperatures were recorded at all stations, such as at Prodromos with a lowest daily maximum temperature of -3.4°C (with the normal being 6.7°C) and at Athalassa with a lowest daily maximum temperature of 7.5°C (with the normal being 16°C). Many extremely low minimum temperatures were also observed. Indicative are the minimum temperatures at Prodromos with a lowest daily minimum temperature of -9°C (with the normal being 0.5°C) and at Athalassa with a lowest daily minimum temperature of -3.7°C (with the normal being 5.3°C).</p> <p>Regarding the cumulative rain, it seems that February recorded a disappointing rainfall as it was only 49% of the month's normal. As can be seen from the distribution map of the provisional accumulated precipitation for February below, the average surface distribution reached only 33.8mm.</p> <p>During the periods 4-6, 9-13, 16-24, and 26-28 of February local showers and thunderstorms were recorded.</p> <p>Based on the provisional data, hail was recorded on the 12th and the 15th of the month, while snow was recorded during the periods 4-6, 9-12, 16-18, 21-23, 25- 26 and 28 of February.</p> <p>A yellow EMMA warning was issued for February 28th, regarding showers and thunderstorms, while an orange EMMA warning was issued for February 22nd, 23rd, and 24th, regarding extremely low temperatures. A yellow EMMA warning was also issued for February 24th and 25th, regarding extremely low temperatures.</p>
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Georgia ref. (1981-2010)	Above and Near normal	Above normal	Near and Above normal at western parts Below or Near normal at eastern part	No signal	<ul style="list-style-type: none"> • No high impact events
Republic of Moldova ref. (1991-2020)	Above normal	Above normal	Below normal	Below, near or above normal	<ul style="list-style-type: none"> • During the season there were fogs, ice and frost deposits, increased wind speeds up to 19 m/s, and icy roads
Serbia ref. (1991-2020)	Above normal	Above-normal (20, 30, 50)	Below normal in most of Serbia average precipitation sums in some parts of eastern, northwestern, southwestern and central Serbia	No predictive signal (33, 34, 33)	<ul style="list-style-type: none"> • In January at 10 stations absolute air maximum exceeded • 3 heat waves; the first was recorded in Negotin and Zajecar, the second in Kikinda, Belgrade and Nis, and the third in most of Serbia • 2 cold waves in Dimitrovgrad, and 1 in Zajecar • Number of days with snow cover significantly below the normal in the low-lying areas of Serbia
Slovenia ref. (1991-2020)	Warmer than normal	Warmer than normal	Normal almost everywhere Drier than normal in northeastern Slovenia	No signal	<ul style="list-style-type: none"> • No high impact events

Turkey ref. (1991-2020)	Near or Above normal except northeastern parts	Above normal	Below normal at most parts Above normal at Black Sea coastal	No clear signal for most parts and Below normal at southeastern parts	<ul style="list-style-type: none"> • During the winter season, Türkiye experienced 180 meteorological disasters. The most frequent types were snow, with 71 occurrences; storms, with 32; and heavy rain/floods, with 29. • January 2025 was the third hottest January on record with an anomaly of 2.6°C. • 2 stations reached new monthly maximum temperature record in in the 2024/25 winter season.
Republic of North Macedonia ref. (1991-2020)	Above normal	Above normal	Normal	No signal (33, 34, 33)	<ul style="list-style-type: none"> • Exceeded daily precipitation at 1 st December in Demir Kapija 119.6mm and Prilep 67.4mm