



Ministry of ecology and natural  
resources of The Republic Of  
Kazakhstan Republican State  
Enterprise «Kazhydromet»

**MONTHLY BULLETIN**  
**ANOMALIES OF MEAN MONTHLY AIR**  
**TEMPERATURE AND MONTHLY PRECIPITATION**  
**ON THE TERRITORY OF KAZAKHSTAN**  
**IN AUGUST 2024**

**INTRODUCTION**

The study of regional climate and continuous monitoring of its change is one of the priority tasks of the national hydrometeorological service of Kazakhstan RSE «Kazhydromet».

For the preparation of the bulletin used observation data on the network of meteorological monitoring RSE «Kazhydromet»: series of average monthly air temperatures and monthly precipitation totals in the period since 1941.

Anomalies of mean monthly surface air temperatures and monthly precipitation totals are determined relative to the norms - mean multiyear values calculated for the period 1991-2020, recommended by the World Meteorological Organization as a baseline for monitoring the degree of anomaly of the current climate. Air temperature anomalies are calculated as deviations of the observed value from the norm. Precipitation anomalies are presented in percent of the norm, that is as a percentage ratio of the amount of precipitation to the corresponding value of the norm.

To characterize climatic extremes, maps are given, where for each station the range of empirical probability of non-exceedance of the current value in the time series of the variable under consideration for the period from 1941 to the current year is given (empirical probability of non-exceedance is the fraction of time series values less than or equal to the current value). If the probability of non-exceedance of the current value of the variable falls into the extreme ranges (0-5 % or 95-100 %), it means that this value occurred in no more than 5 % of cases in the period from 1941. If we look at the amount of precipitation, the former indicates extremely low precipitation, the latter extremely high precipitation.

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## ANOMALIES OF MEAN MONTHLY AIR TEMPERATURE

In August, positive air temperature anomalies were observed across most of the eastern, southern, and southwestern regions of the country (Fig. 1). Temperatures exceeding the norm by more than 2 °C were recorded in the eastern and southeastern regions. The most significant positive anomaly (2.9 °C) was observed in the East Kazakhstan region at the Ust-Kamenogorsk MS. Most values with positive anomalies fell into «extremely warm» gradation with a non-exceedance probability of 95-100 % (Fig. 2). At 21 MS located in the Almaty and East Kazakhstan regions, as well as the Abai and Jetisu regions, records for maximum monthly air temperatures were updated (Table 1).

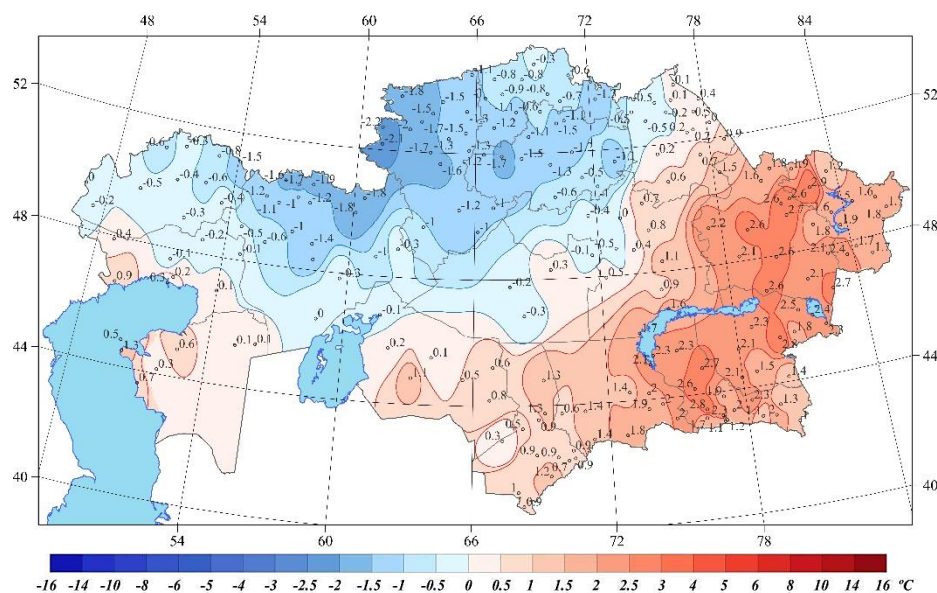


Figure 1 – Spatial distribution of anomalies of mean monthly air temperature (°C) in August 2024, calculated relative to the norms for the period 1991-2020

Air temperatures close to the norm were observed in most of the Mangystau, Kyzylorda, and some areas of the Pavlodar, Karaganda, and Turkestan regions. Negative anomalies were observed in the northern and

northwestern parts of the country. At 8 MS located in these areas, temperatures fell into «extremely cold» gradation with a non-exceedance probability of 5-25 % (Fig. 2). The most significant negative anomaly (-2.2 °C) was observed at the Arshalinsky MS in the Kostanay region.

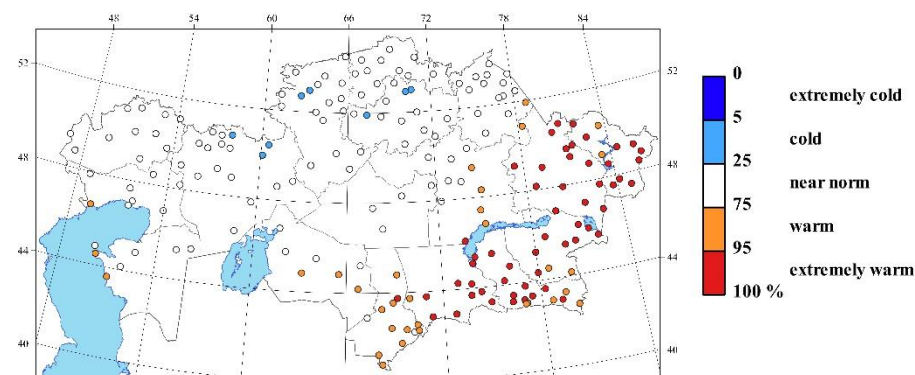


Figure 2 – Spatial distribution of probabilities of non-exceedance of air temperature in August 2024 calculated from data of the period 1941-2024

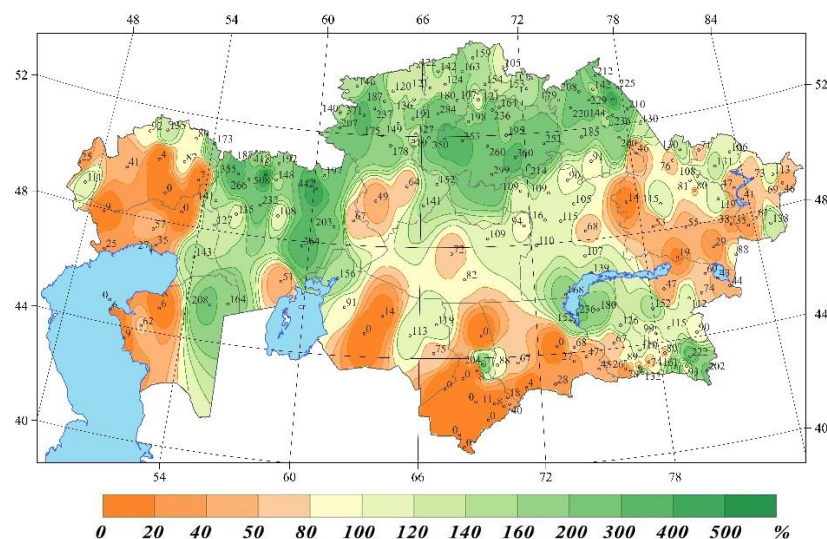
Table 1. Record values of the average monthly air temperature in August 2024

№	Meteorological station	Region	New maximum air temperature, °C	The previous record of the average monthly air temperature, °C
1	Bakty	Abai	24.4	23.4 (1945 y.)
2	Karauyl	Abai	21.7	21.6 (2002 y.)
3	Urzhar	Abai	23.1	23.0 (1984 y.)
4	Aydarly	Almaty	27.1	26.4 (2002 y.)
5	Aksengir	Almaty	25.4	24.8 (2019 y.)
6	Almaty AS	Almaty	25.6	25.2 (2008 y.)
7	Aul 4	Almaty	25.6	25.4 (1998 y.)
8	Bakanas	Almaty	26.6	25.8 (1998 y.)
9	Esik	Almaty	24.1	23.7 (1987 y.)
10	Shelek	Almaty	26.3	25.6 (1984 y.)
11	Uzynagash	Almaty	23.5	23.3 (1983 y.)

<b>№</b>	<b>Meteorological station</b>	<b>Region</b>	<b>New maximum air temperature, °C</b>	<b>The previous record of the average monthly air temperature, °C</b>
12	Aktogai	East Kazakhstan	25.5	25.3 (1998 y.)
13	Ust-Kamenogorsk	East Kazakhstan	21.4	21.3 (1998 y.)
14	Tole bi	Zhambylskaya	25.8	25.6 (1999 y.)
15	Alakol	Jetisu	25.8	25.5 (1998 y.)
16	Matai	Jetisu	26.1	25.9 (1998 y.)
17	Sarkand	Jetisu	24.2	23.6 (1998 y.)
18	Saryozek	Jetisu	23.3	22.9 (2002 y.)
19	Usharal	Jetisu	25.2	24.9 (1998 y.)
20	Ushtobe	Jetisu	24.5	24.3 (1998 y.)
21	Zhalanashkol	Jetisu	26.8	26.5 (2019 y.)

## MONTHLY PRECIPITATION

The distribution of precipitation was uneven across the country. A predominance of precipitation deficits (less than 80% of the norm) was observed in most of the western, eastern, southern, and some central regions of the country, as well as in the southern parts of the Kostanay and Aktobe regions (Fig. 3). According to data from 13 MS located in the Turkestan, West Kazakhstan, Atyrau, Mangystau, East Kazakhstan, Kyzylorda, and Zhambyl regions, conditions were «extremely dry» (5 % extremes were recorded). At 12 MS in the West Kazakhstan (Taipak MS), Atyrau (Karabau MS), Kyzylorda (Karak MS), Mangystau (Kulaly Island MS), Zhambyl (Moyynkum MS), and Turkestan (Arys, Kazygurt, Tasty, Turkestan, Shardara, Kyzylkum, Zhetysai meteorostations) regions, no precipitation was recorded throughout the month (Fig. 4).



Precipitation of Figure 3 – Spatial distribution of precipitation in August 2024 (in % of the norm calculated relative to the base period 1991-2020)

Precipitation exceeding 120 % of the norm was observed in the northern,

western, eastern, and southeastern parts of the country, as well as in the eastern part of the Mangystau region and northern Pribalkashye. The highest amount of precipitation was recorded at the Uspenka MS in the Pavlodar region, with 139 mm, which is 430.3 % of the norm. Monthly precipitation records were updated at 5 MS in the Aktobe, Akmola, and Pavlodar regions (Table 2). According to data from 13 MS located in the northwestern, northern, and northeastern areas of the country, conditions were «extremely wet» (5 % extremes were recorded) (Fig. 4).

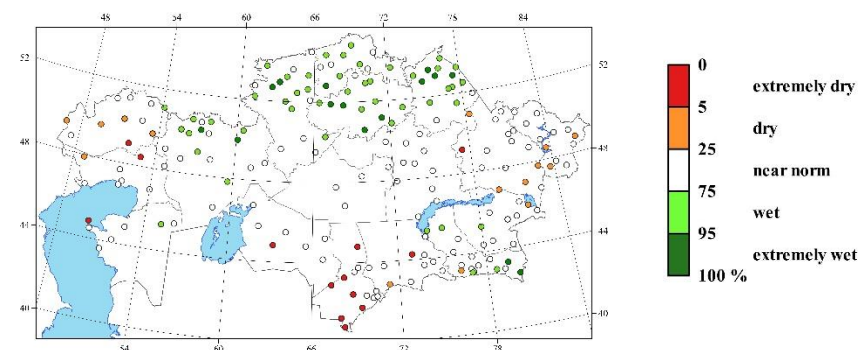


Figure 4 – Spatial distribution of probability of non-exceedance of precipitation in August 2024. Probabilities are calculated from data of the period 1941-2024

Table 1. Maximum monthly precipitation records for August 2024

№	Meteorological station	Region	New record of monthly total precipitation, mm	Previous record of monthly total precipitation, mm
1	Uspenka	Pavlodar	139	103,1 (2021 y.)
2	Atbasar	Akmola	104,8	92,0 (2001 y.)
3	Aktobe	Aktobe	103,7	74,9 (1964 y.)
4	Zhaksy	Akmola	99,8	83,6 (2001 y.)
5	Karabutak	Aktobe	88,3	68,6 (1982 y.)