



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 JULY 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.

Responsible for the release:

Y. Amanulla – Leading Researcher of DCR RC

A. Medetova – Leading Researcher of DCR RC

ANOMALIES OF MEAN MONTHLY AIR TEMPERATURE

In July, a negative air temperature anomaly prevailed in Kyzylorda and Ulytau regions, reaching a maximum of minus 1.4 °C in the central part of Aktobe region, as well as in the south-west of Kostanay and north Turkestan regions (Fig. 1). A positive anomaly covered the eastern half and western areas of the country. Foci of positive anomalies of more than 1.5 °C were observed in Abai, Atyrau, Pavlodar and East Kazakhstan regions. The probability of non-exceedance of the temperature in these regions was 75-95% (Fig. 2). The highest average monthly air temperature (+30.2 °C) in July was recorded at MS Shardara in Turkestan region.

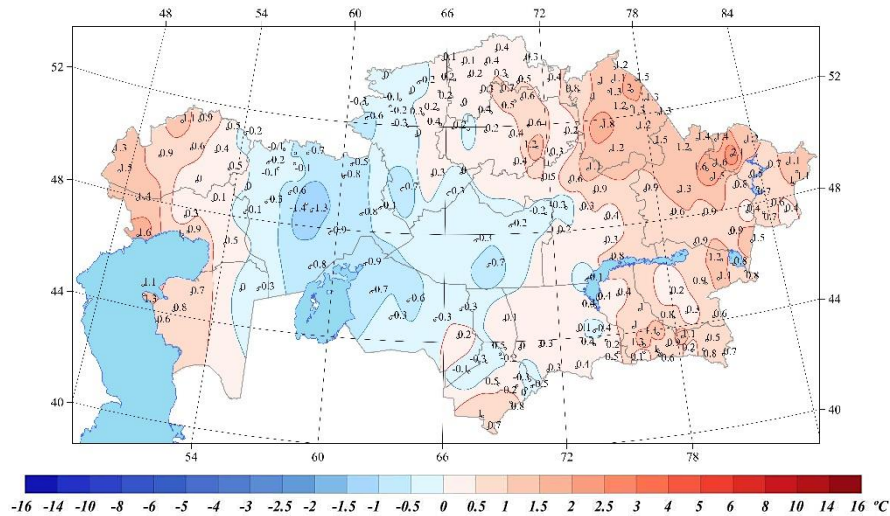


Figure 1 - Spatial distribution of anomalies of mean monthly air temperature (°C) in July 2024, calculated relative to the norms for the period 1991-2020

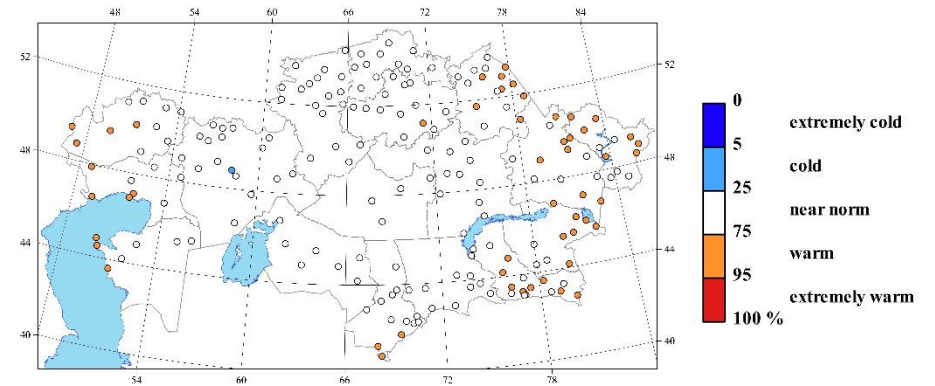
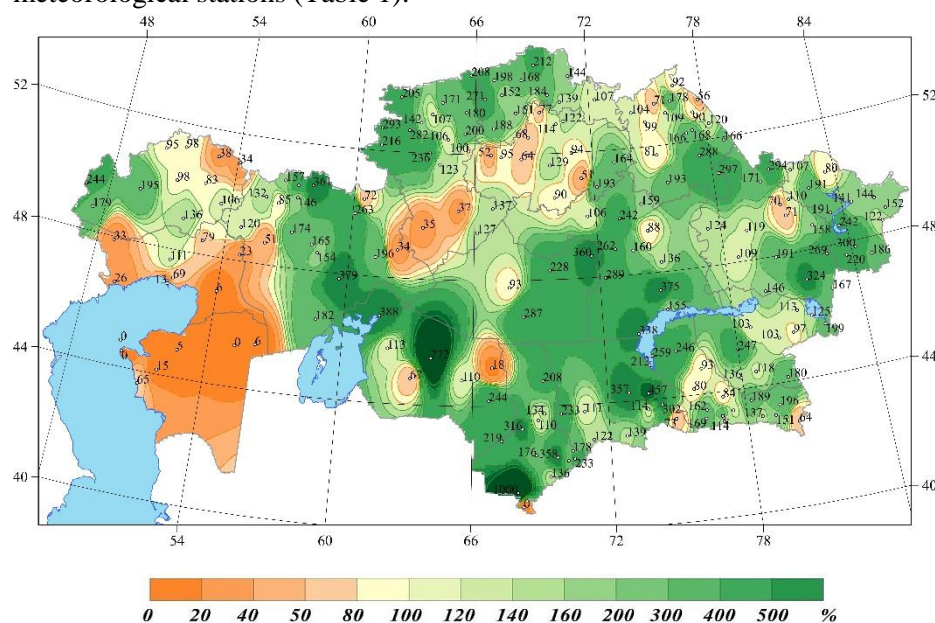


Figure 2 - Spatial distribution of probabilities of non-exceedance of air temperature in July 2024 calculated from data of the period 1941-2024

MONTHLY PRECIPITATION

In July, an excess of precipitation relative to the norm was observed in most of the territory of Kazakhstan (Fig. 3). In the northern, central, southern, and eastern areas, as well as in the Aktobe region and the west of the West Kazakhstan region, precipitation exceeded 165 % of the norm. In the Kyzylorda and Turkestan regions, foci were observed to significantly exceed their norm, where their number amounted to 772-1000 % of the norm. Precipitation values at 32 meteorological stations located in different parts of the country entered the "extremely dry" gradation with a 95-100 % probability of non-exceeding (Fig. 4). The most significant amount of precipitation fell on MS Dmitrievka in the East Kazakhstan region - 162.4 mm, which amounted to 294.2 % of the norm. New records of the maximum monthly precipitation were set at 7 meteorological stations (Table 1).



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

Precipitation deficit (less than 80 % of the norm) was observed in the Mangystau region, the southern part of the Atyrau region, the northeastern part of the East Kazakhstan region, as well as in places in the southeastern part of the country, in Abai, Kostanay, Akmola, Pavlodar and Kyzylorda regions. According to 4 meteorological stations, it was extremely dry (5 % extremes were noted). Precipitation was absent on MS Beineu, Fort Shevchenko, Kulaly Island (Mangystau region), and MS Zhetysai (Turkestan region) throughout the month (Fig. 4).

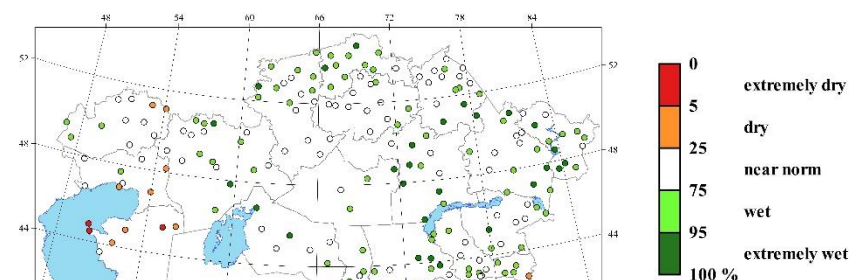


Figure 4 - Spatial distribution of probability of non-exceedance of precipitation in July 2024. Probabilities are calculated from data of the period 1941-2024

Table 1. Maximum monthly precipitation records for July 2024.

№	Meteorological station	Region	New record of monthly total precipitation, mm	Previous record of monthly total precipitation, mm
1	Dmitrievka	East Kazakhstan	162,4	134,3 (1993 y.)
2	Tugyl	East Kazakhstan	71,0	62,1 (1961 y.)
3	Bektauata	Karaganda	114,5	106,1 (2008 y.)
4	Saryshagan	Karaganda	45,9	42,0 (1967 y.)
5	Shalkar	Aktobe	56,9	52,8 (1960 y.)
6	Koktobe	Pavlodar	140,3	110,7 (2016 y.)
7	Khantau	Zhambyl	48,0	36,0 (2001 y.)