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 APRIL 2024

Astana, 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 April, a positive temperature anomaly was observed throughout the country (Fig. 1). In the western areas, the anomalies amounted to more than 5-6 °C. The highest temperature (18.3 °C) was recorded at Kyzan MS in the Mangystau region. According to 72 MS located in the western areas and the Kyzylorda region, in places in the Ulytau region, as well as in the Kostanay, Karaganda, and Turkestan regions, they entered the «extremely warm» gradation, with a probability of not exceeding 95-100 % (Fig. 2). A record maximum value of the average monthly air temperature was set for 8 MS in the western regions (Table 1). In most of the northern, central, and southern areas, the temperature exceeded the norm by more than 3-4 °C. In the eastern half of the country, the temperature exceeded the norm with the lowest values of anomalies – only 1-2 °C.

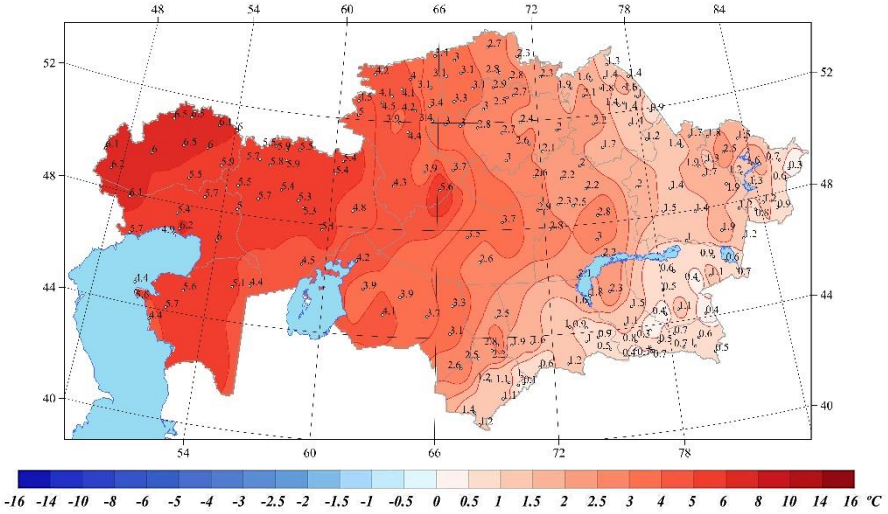

Figure 1 - Spatial distribution of anomalies of mean monthly air temperature (°C) in April 2024, calculated relative to the norms for the period 1991-2020

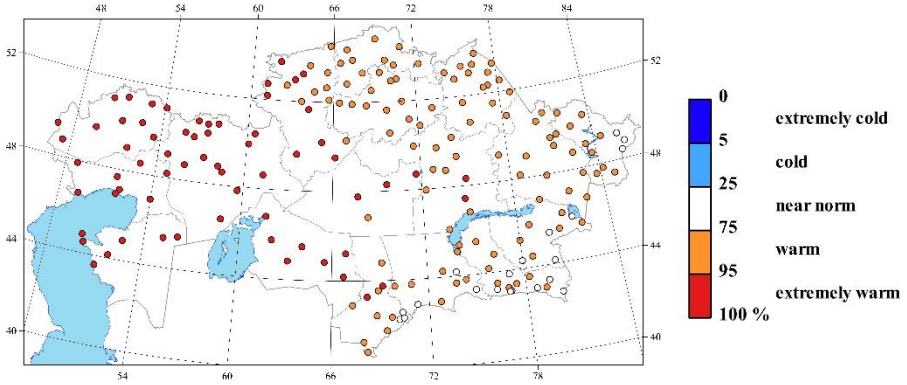

Figure 2 - Spatial distribution of probabilities of non-exceedance of air temperature in April 2024 calculated from data of the period 1941-2024

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

№	Meteorological station	Region	New maximum air temperature, °C	The previous record of the average monthly air temperature, °C
1	Ganyushkino	Atyrau	16.6	15.8 (2012 y.)
2	Ushtagan	Atyrau	17.1	16.9 (2012 y.)
3	Janybek	West Kazakhstan	15.7	15.4 (2012 y.)
4	Urda	West Kazakhstan	17.0	16.7 (2012 y.)
5	Kamenka	West Kazakhstan	13.9	13.5 (2012 y.)
6	Kulaly Island	Mangystau	15.6	14.6 (1975 y.)
7	Aktau	Mangystau	16.1	15.2 (1986 y.)
8	Fort-Shevchenko	Mangystau	17.0	16.0 (1975 y.)

MONTHLY PRECIPITATION

In April, a shortage of precipitation prevailed. Values of less than 80 % of the norm were observed in the western and central regions, as well as in places in the northern, southern and southeastern areas (Fig.3). Precipitation of less than 10 % of the norm was observed in the western, central, southern and southwestern areas and entered the 0-5 % gradation - extremely dry (Fig.4). Precipitation of more than 140 % of the norm was observed partially in West Kazakhstan, Aktobe, Kyzylorda, Kostanay, Akmola, Pavlodar, Zhambyl and East Kazakhstan regions. The most significant amount of precipitation fell on the Kamenskoe plateau MS in the Almaty region – 158.1 mm, which was 103 % of the norm.

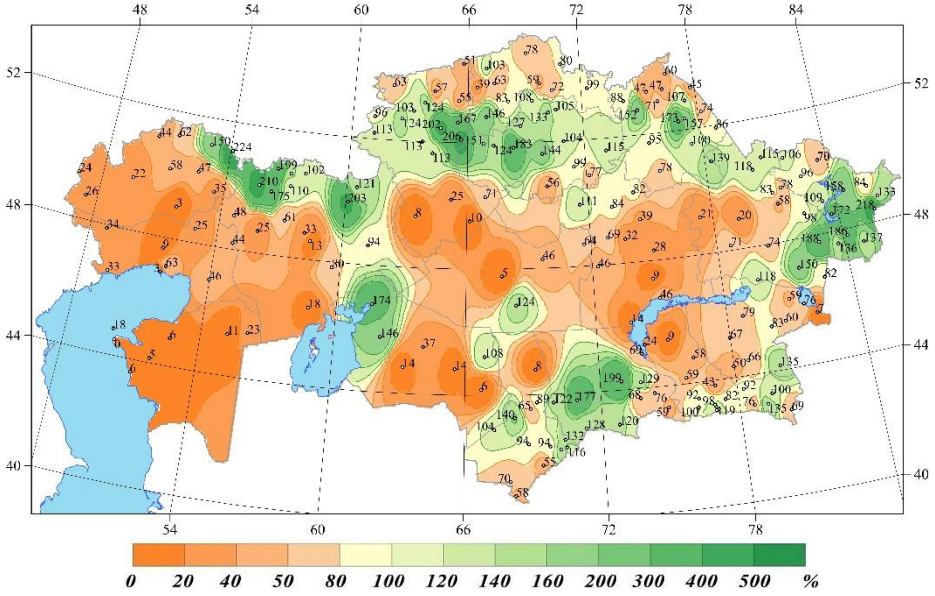

Figure 3 - Spatial distribution of precipitation in April 2024 (in % of the norm calculated relative to the base period 1991-2020)

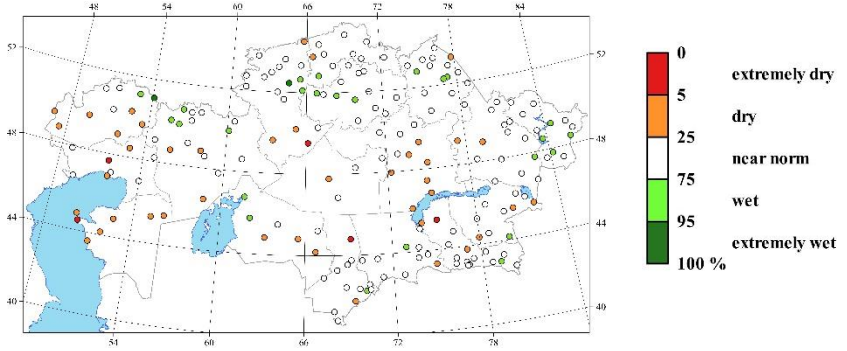

Figure 4 - Spatial distribution of probability of non-exceedance of precipitation in April 2024. Probabilities are calculated from data of the period 1941-2024