



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 2025

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, positive air temperature anomalies were observed throughout Kazakhstan (Fig. 1). The average monthly air temperature anomaly was +3.89 °C. Anomalies above 5.0 °C prevailed in the north-west of the country. The most significant positive anomaly (+5.9 °C) was noted at the Karamendy meteorological station in Kostanay region. According to 148 meteorological stations located almost throughout the country (except the western part and the extreme part of the mountainous and foothill areas of the east and southeast), it was "extremely warm" - the air temperature values entered the "extremely warm" gradation with a probability of not exceeding 95-100% (Fig. 2). At 13 meteorological stations, most of these, record maximum values of the average monthly air temperature have been set in the northern and eastern parts of the country, as well as in the south of the Balkhash region and the south of the republic (Table 1). Previous highs were observed in April 2012, 2020, and 2022.

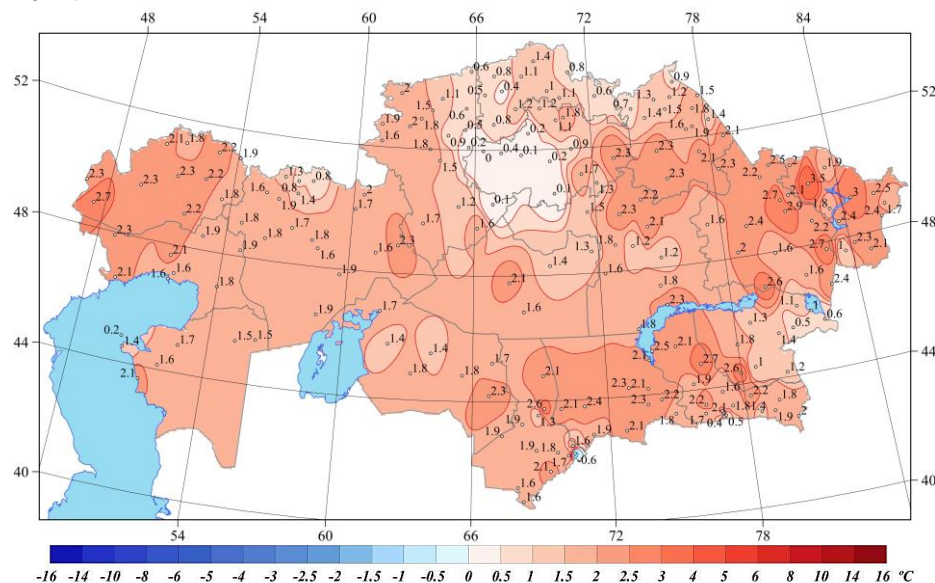


Figure 1 - Spatial distribution of anomalies of mean monthly air temperature (°C) in April 2025, calculated relative to the norms for the period 1991-2020

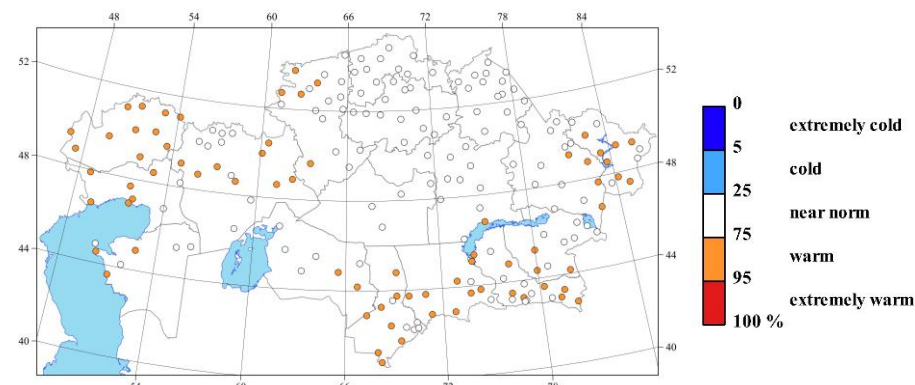


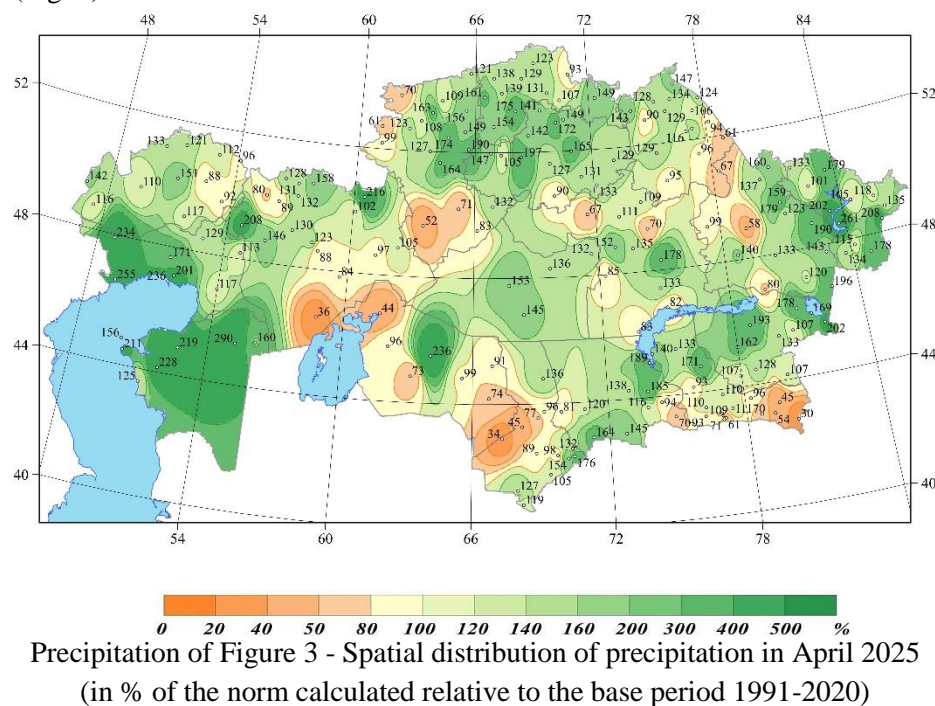
Figure 2 - Spatial distribution of probabilities of non-exceedance of air temperature in April 2025 calculated from data of the period 1941-2025

Table 1. Record values of the average monthly air temperature in April 2025

№	Meteorological station	Region	New maximum air temperature, °C	The previous record of the average monthly air temperature, °C
1	Yesil	Akmola	11,5	11,4 (2012 y.)
2	Kokshetau	Akmola	10,3	9,6 (2012 y.)
3	Kishkenekol	North Kazakhstan	9,9	9,6 (2012 y.)
4	Ruzaevka	North Kazakhstan	10,4	10,3 (2012 y.)
5	Aktogay	Karaganda	9,3	9,1 (2020 y.)
6	Saryshagan	Karaganda	13,1	12,7 (2020 y.)
7	Zhelezodorozhnyy	Kostanay	11,0	10,6 (2012 y.)
8	Karaul	Abay	11,0	10,9 (2020 y.)
9	Kuigan	Almaty	14,6	14,4 (2022 y.)
10	Aul № 4	Алматинская	15,5	15,4 (2022 y.)
11	Ust-Kamenogorsk	East Kazakhstan	11,5	11,4 (2020 y.)
12	Shuyldak	Turkestan	9,7	9,0 (2012 y.)
13	Chiganak	Zhambyl	15,1	14,9 (2022 y.)

MONTHLY PRECIPITATION

In April, precipitation in the country was unevenly distributed (Fig. 3). Precipitation deficit of less than 80%, in some places even less than 10-20 % of the norm was observed in the southern areas, in most of the western, eastern and southeastern areas, as well as in some areas of central and northern Kazakhstan. At several meteorological stations in the Kyzylorda, Turkestan, and Zhambyl regions, values with a probability of non-excess in the range of 0-5 % were recorded, which corresponds to the gradation "extremely dry" (Fig. 4).



More than 120% of the precipitation is observed in the northeastern regions and in most of the Aktobe region, as well as in some areas of the eastern, southeastern, and extreme regions of the northwest and west. Values exceeding the norm by two times were observed in Aktobe, Atyrau, Kostanay, Akmola, Pavlodar regions, and in the Abai region. At several meteorological stations in these regions, 5% extremes of the probability of non-exceedance were observed, which makes it possible to classify the conditions as "extremely wet" (Fig. 4). The most significant amount of precipitation fell at the Ulken Almaty Lake meteorological stations – 105.9 mm, which was 101 % of the norm.

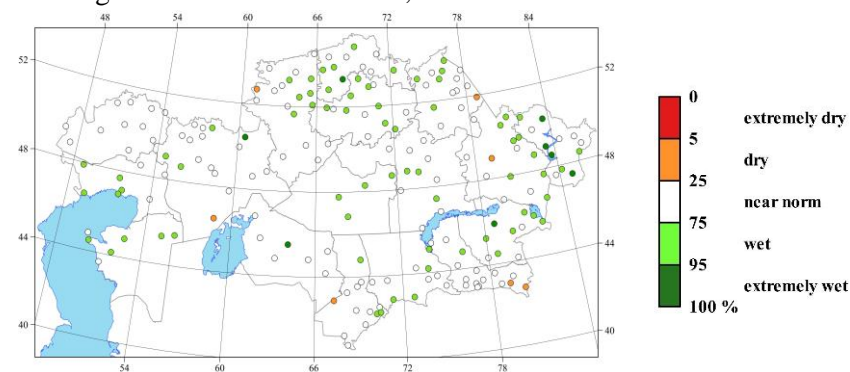


Figure 4 - Spatial distribution of probability of non-exceedance of precipitation in April 2025. Probabilities are calculated from data of the period 1941-2025