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 JANUARY 2025

Astana, 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 January, positive air temperature anomalies were observed throughout the territory of Kazakhstan (Fig. 1). The average monthly air temperature anomaly was +4.42 ºC. In all regions of the country, except for some small centers in the south and in mountainous areas in the southeast, the air temperature anomaly exceeded 3.0 ºC and entered the gradation of «extremely warm» (41 % of meteorological stations recorded 95% extremes) (Fig. 2). The most significant positive anomaly (+7.6 ºC) was recorded at the Ust Kamenogorsk meteorological station in East Kazakhstan region. The highest temperature (+2.7 ºC) was recorded at the Aktau meteorological station in Mangistau.

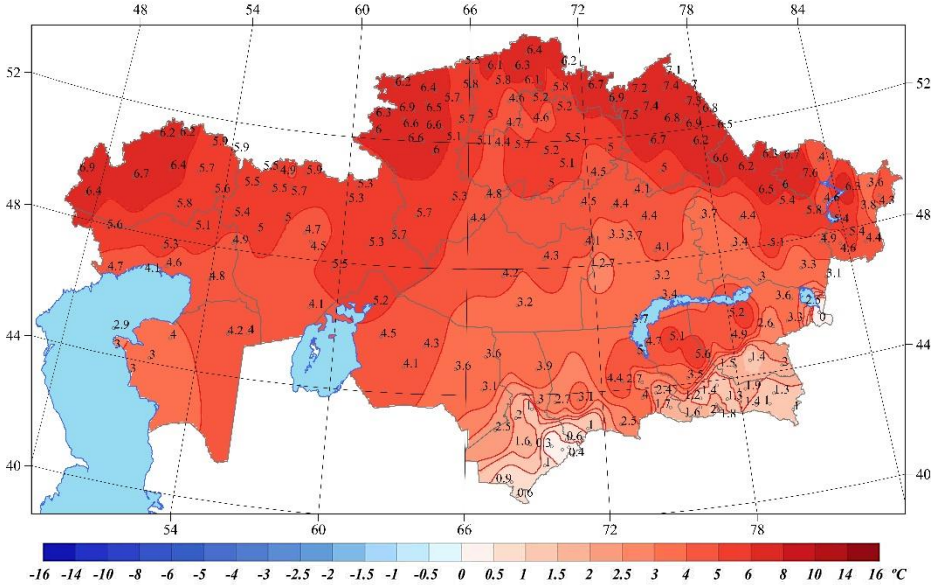

Figure 1 – Spatial distribution of anomalies of mean monthly air temperature (°C) in January 2025, calculated relative to the norms for the period 1991-2020

Air temperatures near normal were observed in some areas of the southern part of Turkestan, Zhambyl and Almaty regions, as well as in the east of Zhetysu region (Fig. 2).

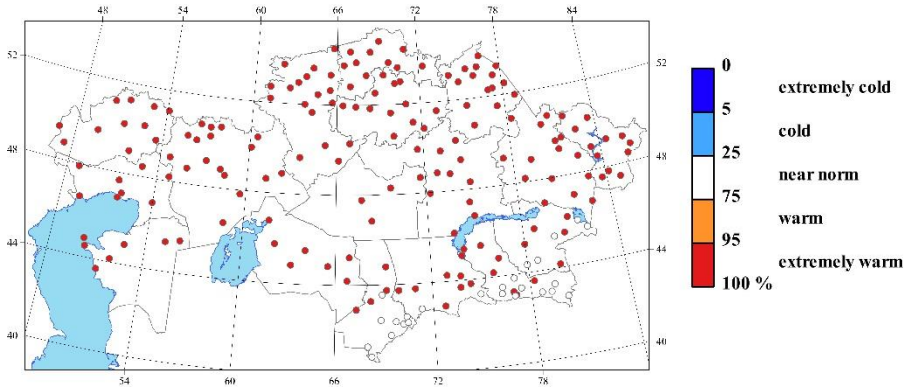

Figure 2 – Spatial distribution of probabilities of non-exceedance of air temperature in January 2025 calculated from data of the period 1941-2025

MONTHLY PRECIPITATION

In January, the amount of precipitation on the territory of the country was unevenly distributed (Fig. 3). The prevalence of precipitation deficits (less than 80 % of the norm) was observed in the western regions, in most of Turkestan and Zhambyl regions, as well as in some areas of Kostanay, North Kazakhstan, Karaganda, East Kazakhstan, Kyzylorda regions and Zhetysu region. According to data from meteorological stations located in West Kazakhstan (MS Urda, MS Uralsk) and Zhambyl (MS Tolebi) regions, 5 % extremes were recorded and included in the gradation «extremely dry» (Fig. 4).

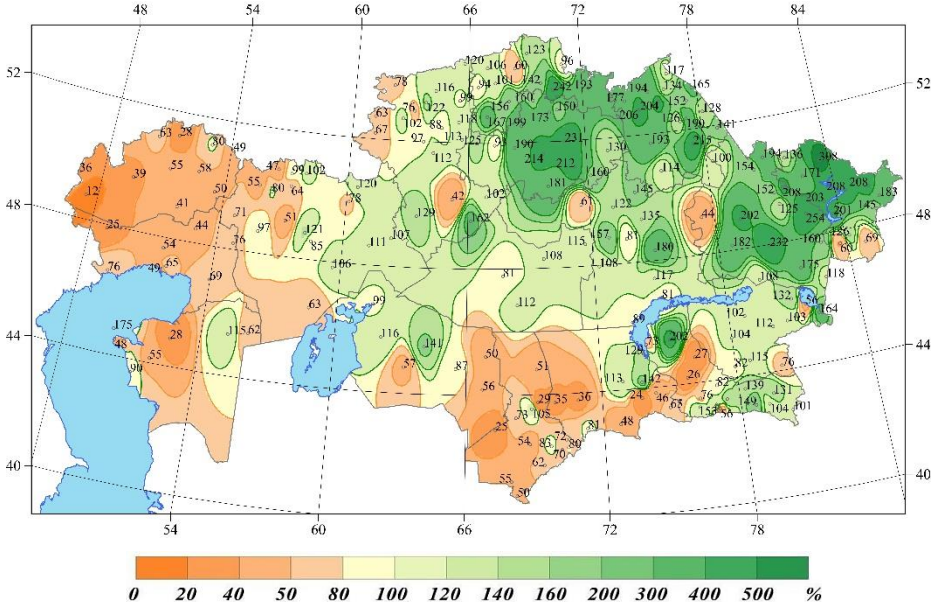

Figure 3 – Spatial distribution of precipitation in January 2025 (in % of the norm calculated relative to the base period 1991-2020)

Excess precipitation (more than 120 % of the norm) was observed in most of the northern, central and eastern regions of the country, in mountainous areas in the southeast, as well as in the southern part of Kostanay region, in some areas of southern Pribalkhash and Zhetysu region. The most significant amount of precipitation fell at the meteorological station Urzhar in Abay region – 81 mm, which is 174.6 % of the norm. At two meteorological stations in North Kazakhstan and Pavlodar regions records of monthly precipitation totals were updated (Tab.1). According to data from 7 meteorological stations located in the northern, north-eastern and eastern regions of the country it was «extremely wet» (5 % extremes were recorded) (Fig. 4).

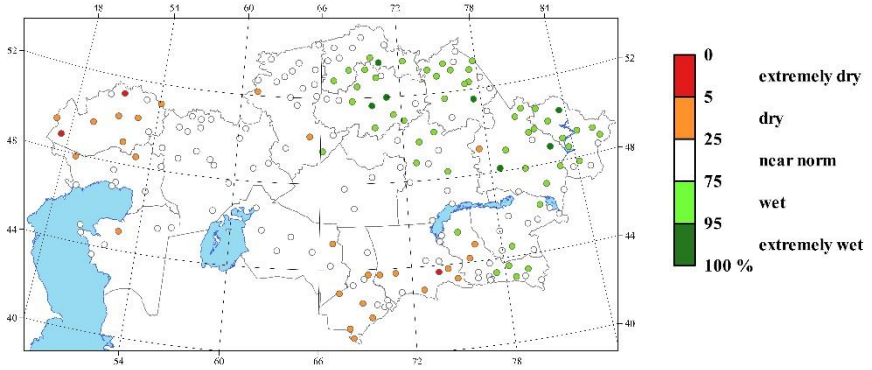

Figure 4 – Spatial distribution of probability of non-exceedance of precipitation in January 2025. Probabilities are calculated from data of the period 1941-2025

Table 1. Maximum monthly precipitation records for January 2025

№	Meteorological station	Region	New record of monthly total precipitation, mm	Previous record of monthly total precipitation, mm
1	Koktobe	Pavlodar	32,9	27,3 (1991)
2	Chkalovo	North-Kazakhstan region	32,5	31,9 (1997)