



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 MARCH 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.

Responsible for the release:

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ANOMALIES OF MEAN MONTHLY AIR TEMPERATURE

In March, positive air temperature anomalies were observed in most of the territory of Kazakhstan (Fig. 1). The greatest positive anomalies were recorded in the West Kazakhstan region at MS Chapaevo (5.6 °C) and in the Aktobe region at MS Karabutak (5.5 °C). Nine weather stations in the northwestern part of the country (West Kazakhstan, Atyrau, Kostanay and North Kazakhstan regions) fell into an extremely warm gradation with a probability of not exceeding 95–100% (Fig. 2). In the eastern and southeastern parts of the country, anomalies were about normal. Negative anomalies (-0.1 °C) were observed in the Abai region (MC Ayagoz) and in the Zhetysu region (MS Kogaly), becoming the most significant negative anomalies in the country.

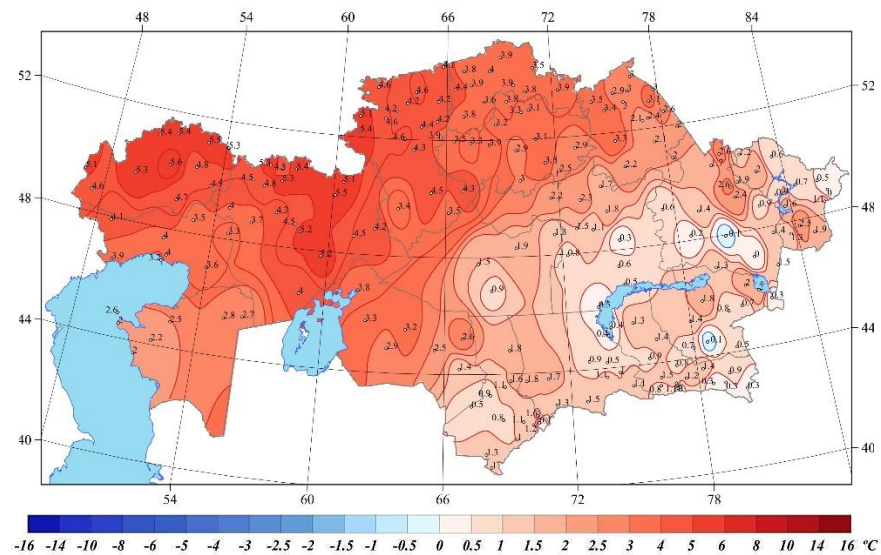


Figure 1 – Spatial distribution of anomalies of mean monthly air temperature (°C) in March 2025, calculated relative to the norms for the period 1991-2020

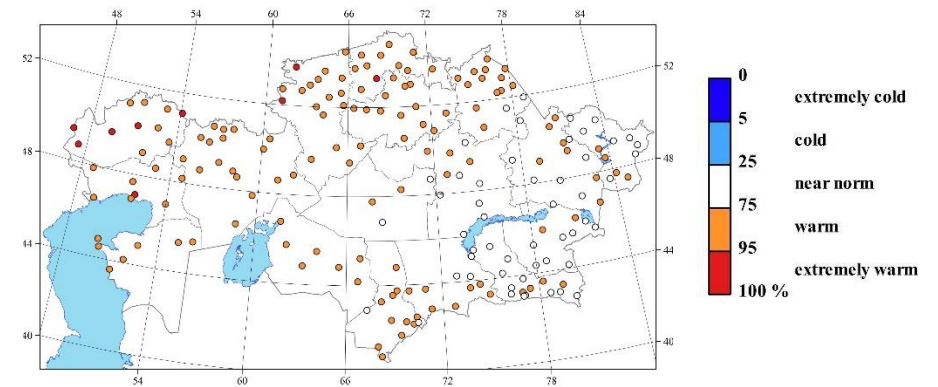


Figure 2 – Spatial distribution of probabilities of non-exceedance of air temperature in March 2025 calculated from data of the period 1941-2025

MONTHLY PRECIPITATION

In March, precipitation in the country was unevenly distributed (Fig. 3). The predominance of precipitation deficit (less than 80% of the norm) was observed in the central western and southern parts of the country. According to the 5 MS data located in the eastern and southern regions, 5% extremes corresponding to the "extremely dry" gradation were recorded (Fig. 4). The minimum amount of precipitation was recorded on the Kainar MS in the Abai region (0.9 mm). In the western, northern and southeastern regions, precipitation corresponded to 120% or more of the norm. According to the meteorological stations of Mangystau, Turkistan, Zhambyl, Almaty, East Kazakhstan regions and the regions of Abai and Zhetysu, precipitation exceeded 200% of normal. 95% extremes corresponding to the "extremely humid" gradation were recorded for 5 MS located in the eastern and southern regions. The largest amount of precipitation fell at the Ford-Shevchenko weather station in the Mangystau region – 44.7 mm, which was 399.1% of the norm.

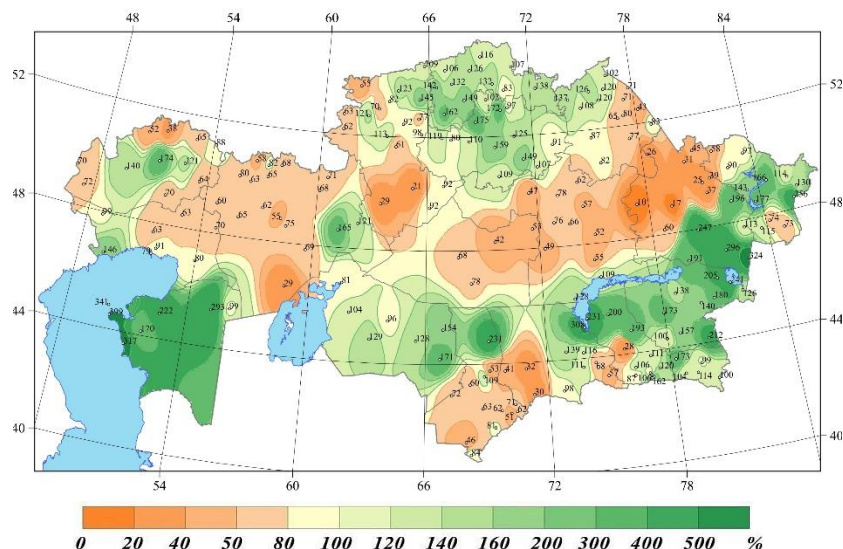


Figure 3 – Spatial distribution of precipitation in March 2025 (in % of the norm calculated relative to the base period 1991-2020)

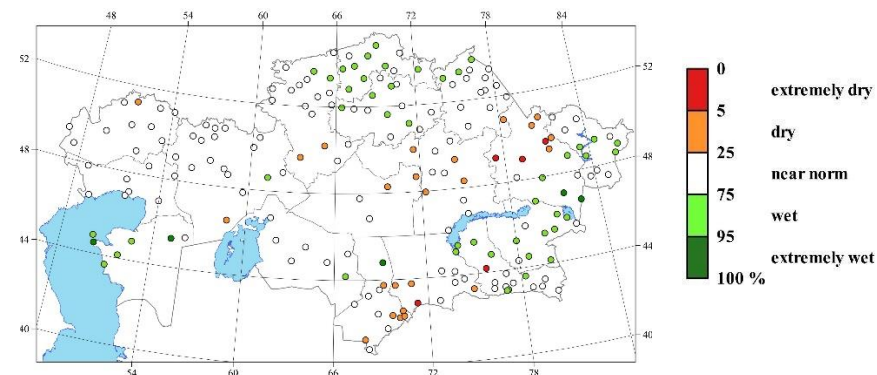


Figure 4 – Spatial distribution of probability of non-exceedance of precipitation in March 2025. Probabilities are calculated from data of the period 1941-2025