

## DISTRIBUTION OF ATMOSPHERIC PRECIPITATION IN THE MIDDLE PART OF THE ZERAVSHAN RIVER BASIN

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**Abstract.** The article is devoted to the study of peculiarities of atmospheric precipitation distribution in the middle part of the Zeravshan river basin. For this purpose the reference meteorological observation points located on the territory of the studied basin are selected. A hyetographic curve characterising changes in the amount of precipitation with the altitude of the terrain is constructed.

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**Key words:** river, Zeravshan river basin, meteorological observation points, precipitation, hyetographic curve.

### Introduction

When discussing priorities for improving the activities of the hydrometeorological service in the country, President of the Republic of Uzbekistan Shavkat Mirziyoyev at a meeting on 3 November 2020 noted that the hydrometeorological service is an important aspect in the activities of agriculture, energy, transport, ecology and a number of other departments of the country. Indeed, water resources of Uzbekistan's rivers are formed mainly in mountainous areas. The main source of their supply is atmospheric precipitation, which is registered at meteorological observation points. The Zeravshan River is one of such water bodies. Today its water resources, along with the neighbouring Republic of Tajikistan, are widely used in Samarkand, Navoi, Kashkadarya, Jizzak oblasts and partially in Bukhara oblast of our republic. All of them have special socio-economic potential. [3; 6-c.].

All economic sectors that use and consume water in the above-mentioned provinces of the republic need accurate data on the Zeravshan River water discharge. This need is growing from year to year [3; 6-c.]. The accuracy of this hydrological information is closely related to the activities of hydrometeorological stations and posts that conduct observations in the study basin.

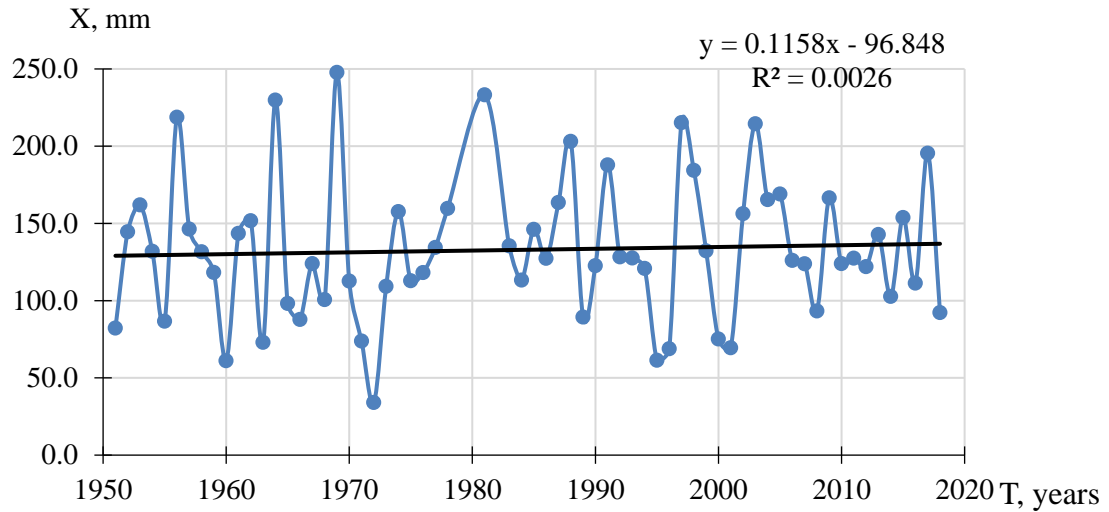
The issue of meteorological study of the Zeravshan River basin is the subject of works by M.I. Getker, B.K.

Tsarev, L.M. Karandaeva, F.H. Hikmatov and others. However, to date, there are no special studies to assess the distribution of precipitation in the Zeravshan river basin.

**The purpose of this work** is study the peculiarities of atmospheric precipitation distribution in the middle part of the Zeravshan river basin.

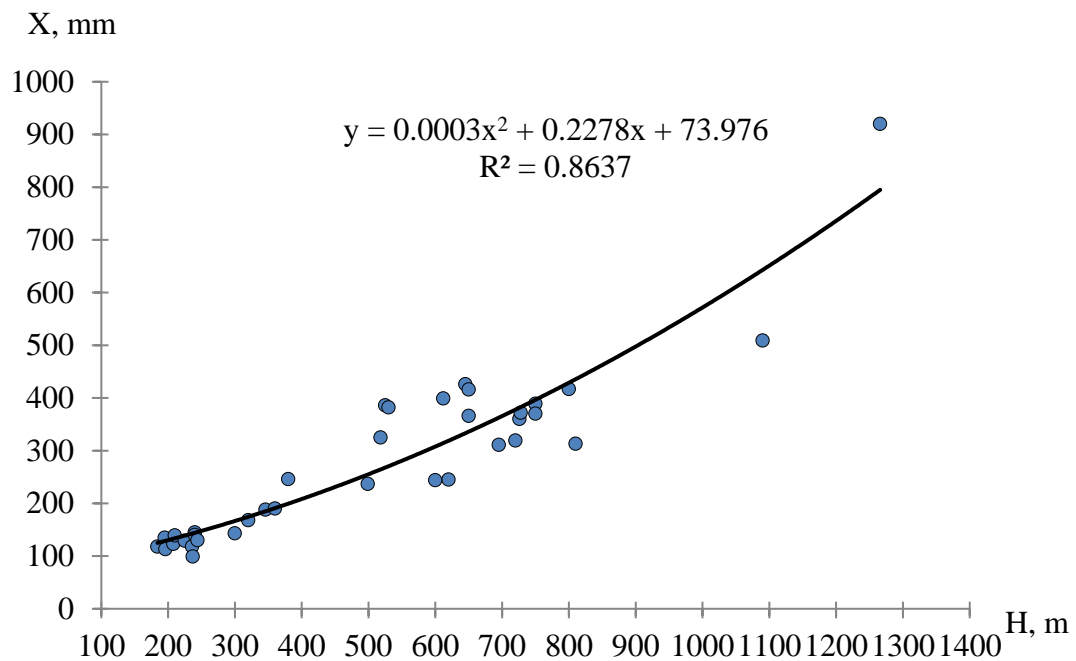
As it is known, water resources of any region are determined by the amount of precipitation falling on this territory. In this connection, in this work, the main attention is paid to the issues of determining the average long-term values of precipitation falling on the slopes of mountain ranges, framing from the south and north of the middle part of the basin of the Zeravshan River.

**Main results and their discussion.** The materials of observations of atmospheric precipitation recorded at meteorological stations located on the territory of the studied basin were analysed. The results of analyses of multi-year fluctuations of atmospheric precipitation showed that in the calculation period adopted by us their annual values remained almost unchanged. Such stability of annual precipitation values is most pronounced at meteorological stations Dzhangeldy, Bukhara, Samarkand, Navoi and others. However, it should be noted that at Ayakagytna meteorological station some increase in annual precipitation is observed (Fig.1).



**Fig. 1. Variations of annual precipitation values at the Ayakagytna MS**

Identification of peculiarities of variation with altitude of atmospheric precipitation falling on mountain slopes of Uzbekistan is of great scientific and practical importance in assessing their local water resources. Usually, when studying the regularities of change of atmospheric precipitation with altitude, the hyetographic curve is applied. When constructing the hyetograph curve, we used data from meteorological stations and posts located in the middle part of the Zeravshan River basin (Fig.2).



**Fig. 2. Changes in precipitation on the territory of the middle part of the Zeravshan river basin middle part of the Zeravshan river basin**

Hyetographic curves, i.e. dependences of annual precipitation values on the height of meteorological stations, allowed to calculate their zonal quantitative values. On the basis of these data, in order to approve the obtained results, a map of distribution of annual precipitation values by altitude zones of the Kuldjuktai ridge was constructed. This ridge is located in the middle part of the studied basin (Fig.3).

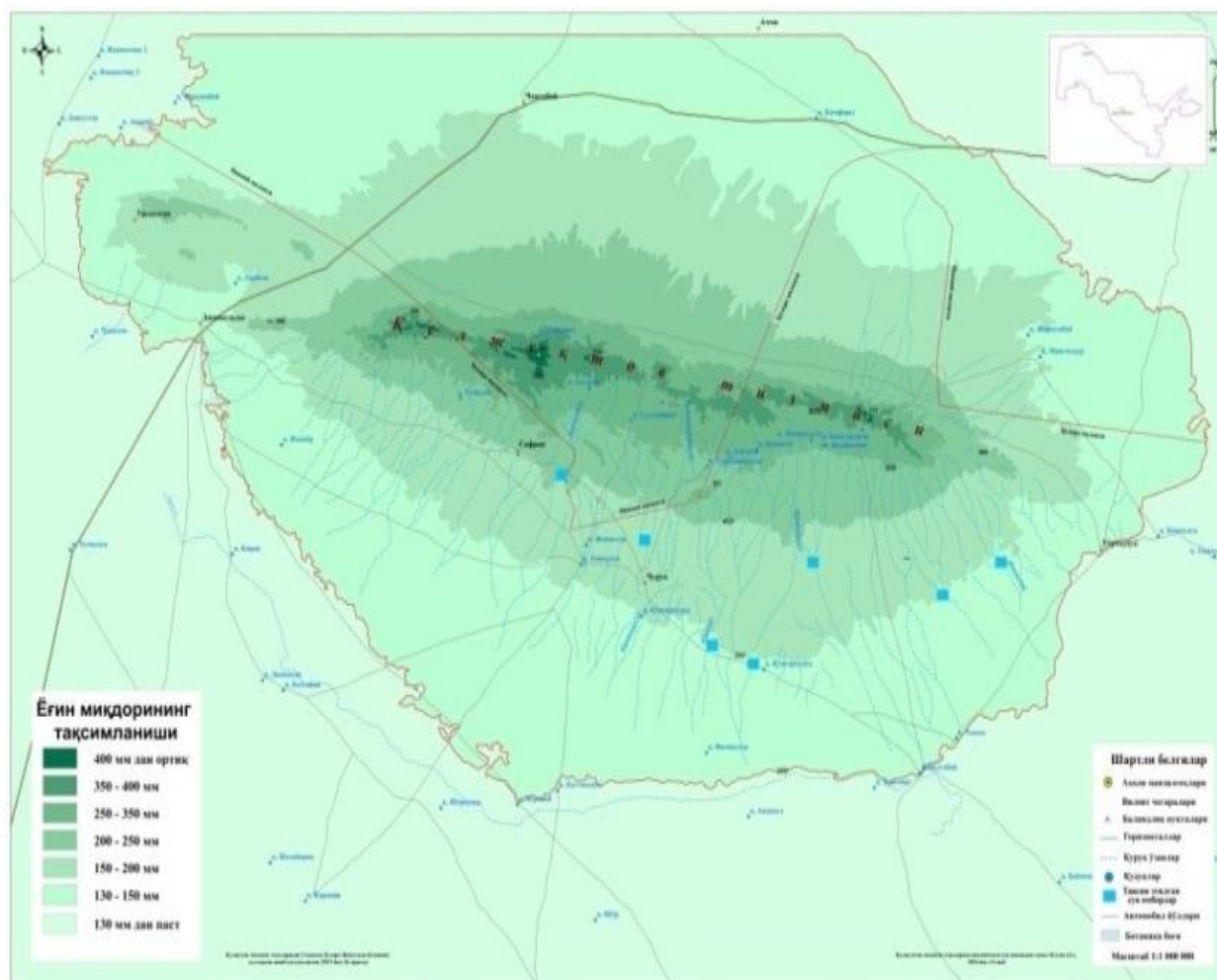


Fig.3. Distribution of annual precipitation totals by altitude zones on the slopes of the Kuldzhuktau ridge

As can be seen on the map (Fig.3), on the southern slopes of the Kuldjuktai ridge, at an altitude of 200 m, 120 mm of precipitation falls annually on average. At slope altitudes of 500 m the amount of precipitation increases 2.3 times and amounts to 250 mm. It is revealed that at the highest marks of the slope, i.e. within the altitudes of 750-780 m, the amount of annual precipitation amounts to 400 mm.

**In conclusion**, it should be noted that the methodology of quantitative assessment of precipitation change with altitude in the middle part of the Zeravshan river basin has been developed and tested. The results of the work have been tested on the example of the Kulzhutau

ridge. The map provides an opportunity to assess local water resources of the Kulzhutau Ridge.

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