



IRSTI 31.01  
Scientific article

<https://doi.org/10.32523/2616-6771-2024-147-2-81-91>

## Physical geographical basis for the formation of the names of mountain glaciers in Uzbekistan and the problem of transcription of glacionyms (using the example of glacionyms of the Piskom basin)

M.M. Avezov\*<sup>1</sup> 

<sup>1</sup>National University of Uzbekistan named after Mirzo Ulugbek, Tashkent, Uzbekistan

(E-mail: [m.avezov@nuu.uz](mailto:m.avezov@nuu.uz))

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**Abstract.** This article focuses on the subject of mountain glaciers in Uzbekistan, including their geographical position, the origin of glacionyms (geographical names of glaciers), their interpretations, and their interrelation with physiographic factors and natural conditions. The analysis is based on the Piskom basin and adjacent areas. In the toponymy of the Piskom basin, physical geographical terms such as “tor”, “say (suv, bulak)”, “ashuv”, “tash”, “bel” and their areas have been determined, and the share of these terms in the formation of toponyms has been determined. Based on the fact that more than 65% of the toponyms of the basin were formed at the expense of the above physical geographical terms, the physical geographical basis of the toponymy of the area has been scientifically proven. Various sources have provided suggestions and recommendations on the writing of Piskom basin glacionyms and their correct use in practice.

**Key words:** geographical names (toponyms), glacionyms, phytoglacionyms, zooglacionyms, geographical atlases, cartographic sources, transcription.

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## Introduction

Mountain glaciers are important in providing drinking water to mankind. Global climate change is causing a rapid reduction in the area of mountain glaciers on the Earth's surface. This situation leads to a sharp decrease in the area of glaciers, especially in the arid climate regions of Central Asia, including Uzbekistan. At the same time, the number of small glaciers is increasing due to the fact that several large glaciers in the mountains of our planet are breaking up into smaller parts as their area decreases. All these processes are being studied in depth by our glaciologists. However, it can be seen that the scientific sources they rely on are mostly written in Russian, where a number of glacier names have been changed to varying degrees, sometimes written in a very wrong context. This causes a number of inconveniences for researchers when working with existing scientific and cartographic sources.

The purpose of this scientific article is to determine the features of the formation of the names of mountain glaciers on the example of glacionyms of the Piskom river basin, to interpret some glacionyms from a scientific point of view, and to make suggestions on their correct writing in cartographic sources. To achieve this goal, the following tasks have been set:

1) to determine the geographical location of the mountain glaciers of the Piskom basin and the physical geographical basis of their naming;

2) to interpret glacionyms from a scientific point of view and to develop recommendations on the correct spelling of glacier names in various cartographic sources in Uzbek.

## Methods and materials

According to data, the number of mountain glaciers in Uzbekistan is 353, and their total area is 200.1 sq. km [7; p. 34]. Most of them are located in the Western Tien Shan, Hisar and adjacent ranges and are unevenly distributed.

In the Piskom river basin, the area is 102.52 square meters. The existence of 262 large and small glaciers with km was recorded (Table 1) [9].

**Table 1. Information on the area and number of glaciers in the Piskom river basin**

Small river basins	The number of glaciers	Total area of glaciers, sq. km
Moshtasgansay	1	0.06
Ispaysay	10	0.77
Kaphtarkumushsay	3	0.38
Kogarikapchigaisay	1	0.10
Bodakhsay	2	0.22
Ikhnachsay	3	0.37
The headwaters of the Piskom River	4	0.54
Chorolma	4	0.57
Beshtor	15	3.58

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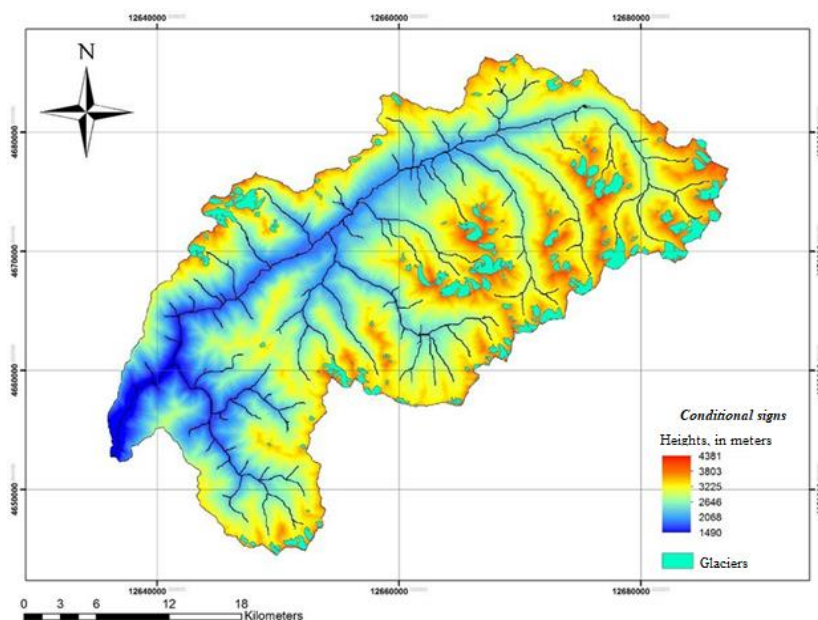
Kuksuv	25	6.27
Barkiraksay	9	5.18
The beginning (left) part of the Aygaing river	3	1.83
Akkopchigaysay	19	7.25
Tastorsay	9	4.05
Shavursay	28	18.99
Tekisashuv	2	0.74
Karakush	2	0.27
Saribashsay	1	0.32
The beginning (right) part of the Aygaing River	3	0.45
Atmitash	3	0.21
Ayutor of the Aygaing	7	2.86
Tekeshsay	6	2.62
Torakain	4	1.54
Atyaylau	3	0.25
Kukargentau	7	3.07
Kukbulak	2	0.27
Akbulakulken	2	2.10
Karabulak	2	0.99
Chotan	15	10.87
Ashutar	7	2.75
Kurumtar	10	2.16
Ayutor of the Maydantal	12	10.53
Maydantal	1	0.19
Tuprakbel	6	1.45
Kukhnazarsay	7	1.88
Karabaur	1	0.10
Anaulgensay	14	4.91
Karakizsay	9	1.83
Total by basin	262	102.52

The table was compiled by the authors based on the data of A.S.Shetinnokov and L.D.Podkopaeva (1968).

### **The discussion of the results**

The glacionyms of the Piskom river basin contain a large proportion of phytoglacionyms and zooglacionyms. The terminological structure of basin glacionyms is also unique. Toponyms of

the Piskom basin, including glacionyms, often contain physical geographical terms such as “*tash*”, “*tor*”, “*bel*”, “*oshuv*”, “*say (suv, bulak)*” (Fig. 2). This is directly related to the natural conditions of the area, mainly the relief structure and hydrographic features.



**Figure 1. Map of the geographical location of mountain glaciers in the upper part of the Piskom basin**

The term “*tor*” that formed basin glacionyms is specific for this region - the Piskom basin, and it almost does not participate in the formation of toponyms in other regions of Uzbekistan. The word *Tor* means the narrowest part of a mountain valley. In the Kazakh and Kyrgyz languages, the word “*tor*” means mountain pasture. In the old Turkish language, the word “*tor (ter)*” means “*special passage*”, “*opposite passage*” (in the sense of a two-way road – M.A.).

In the Kazakh language, the term “*ter*” means “*the highest part of the mountain valley*”. Usually, beyond the so-called narrow part of the mountain, the pass begins [1]. In Kyrgyz language, “*tor*” means “*special place, high mountain pasture*”.

In terms of geographical content, the word “*tor*” has several other meanings besides the above: a concave relief form formed by glaciers in the mountains – glacial cirque, kar, mountain gorge (*tangi*), a convenient place for a pass, a passage to the other side of the mountain, etc.

So, *Ayutor*, *Beshtor*, *Jamaltor* (probably *Yomontor* – M.A.), *Chakirtor*, *Tuyuktor*, *Kyziltor*, *Karaboshtor*, *Kuyumtor*, *Ashutor* (probably *Oshuvtor* – M.A.), *Kukargantor* located along the watershed of the basin dozens of glaciers and several other geographical features are not named so for nothing. Such toponyms indicate the natural conditions of the region, especially the geological-geomorphological structure. At the same time, geographical names with a “*tor*” component form a separate area in this basin and become “*endemic*” for the toponymy of the basin.

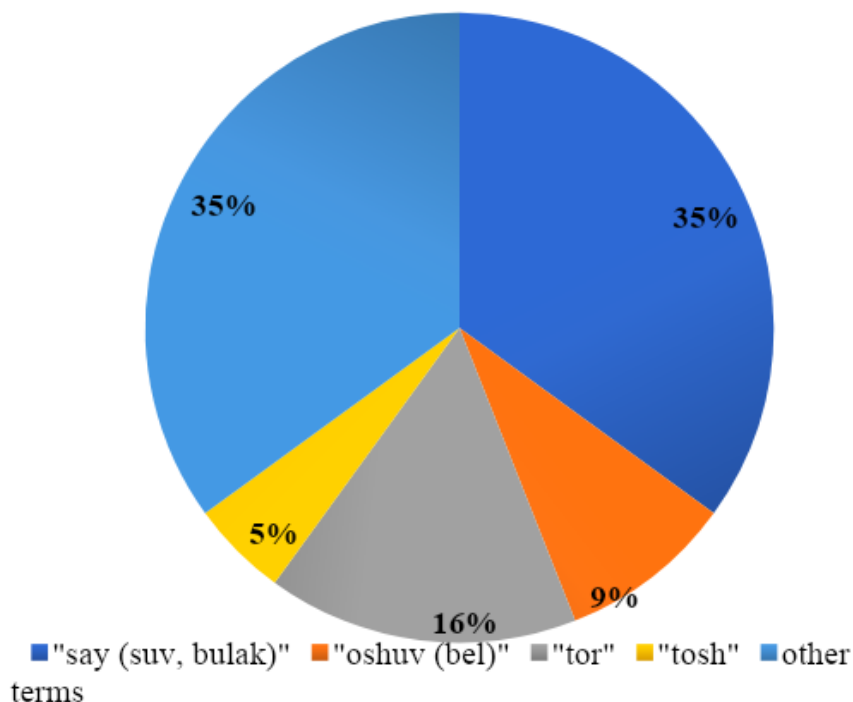


Figure 2. The share of physical geographical terms in the names that formed glacionyms of the Piskom river basin, in %

Among the glacionyms of the Piskom basin, the names formed on the basis of the topoterms "*bel*" and "*oshuv (overhead)*" are often found. In "Boburnoma" there is information that the terms "*dovan*", "*kotal*", "*dobon*" and "*band*" synonymous with these terms are used [3; p. 22]. The main reason for this is the geomorphological structure of the area. It is known that glaciers can be formed due to the accumulation of snow cover in the low, smooth terrains that can be crossed at the junction of two mountain ranges. Conditions for the formation of glaciers can be created especially in peaks with a high absolute height. Since most of the mountains surrounding the Piskom river valley are higher than 3000-3500 meters, it is natural that the terms "*bel*" and "*oshuv*" were involved in the naming of glaciers formed in such peaks.

The geomorphological structure is complex, the lithological composition of the rocks is strong and diverse, there are favorable natural conditions for precipitation and flow formation in areas with a large difference in elevation and slope of the earth's surface, as well as on the slopes facing moist air masses. This serves for the formation of permanent and temporary running water. For this reason, the density of the hydrographic network is much greater in mountainous areas than in plains.

The Piskom basin is also rich in streams and rivers, in accordance with its name (here: *Piskom in Persian-Tajik (bist+kom) – "twenty waters" – "streams are many places" – M.A.*). Most of the streams that supply them with water are fed by mountain glaciers. That is, most streams and rivers in the basin are rivers that are saturated with ice-snow waters according to the type of saturation. Therefore, in the names of the glaciers that supply water to these streams and rivers,

folk terms related to hydrology such as “say”, “suv”, “bulak” (most of them are secondary names, originally they were the names of streams and brooks originating from these glaciers, later they were transferred to the name of glaciers – M.A.) attended [4].

The term “**say**” is used in the form of “chay (choi, choy)” in Turkey and Azerbaijan. In Western Turkmenistan, this term is used in the form of “soy” and means “dry stream”, “flat ravine”, “hollow”, “small river”. Regarding the meaning of this term, the opinions of S.Karaev and M.Mirakmalov complement each other. According to them, the term “sai” means “small river”, “flowing water”, “waterway”, “valley”, “lowland with flowing water” and forms place names in several regions of our country [2; pp. 52-53, 3; p. 169, 8; p. 93].

According to S.Karaev, in some regions of Uzbekistan, a channel opened using old channels is also called a stream. The famous toponymist and terminologist E.Murzaev says that “soy (say, sayr, chay)” is a Turkish word that means “mountain stream (small mountain river)”, “valley” [5; p. 195]. According to the information of the famous toponymist, 406 place names made using stream toponym are stored in the toponyms card of the Tomsk Pedagogical Institute. T.Nafasov, a mature specialist in the toponymy of the Kashkadarya region, defines the word (term) “say” as follows: “say is a lake surrounded by ridges on both sides and a valley in the middle. A stream is a small flowing water in which rainwater flows in the spring and dries up in the summer” [6]. The term “suv” is also commonly used synonymously with “say”, that is, in the sense of “flow of water”.

In geographic literature and cartographic sources, confusions and incorrect translations often occur when writing different toponyms. In general, a number of works have been carried out regarding the writing, transcription and transliteration of toponyms located in the regions bordering Uzbekistan in Uzbek. Nevertheless, incorrect use (writing and pronunciation) of place names, especially glazionyms, is still found in various geographical and non-geographical literature, maps and atlases, dissertations and other sources.

For example, in some Uzbek-language sources, the name of Ikhnoch lake (stream and glacier) is often mistakenly used in forms such as Ikhnoch, Titov glacier as Titova, and Barkirak glacier and stream as Barkrak. In order to avoid such confusions and to fix glazionyms in Uzbek sources in a form that is compatible with language rules and easy to pronounce, we have combined our thoughts on the etymology of the name of the Piskom basin glazionyms in the Uzbek alphabet based on the Latin script and the etymology of the place name. It is presented in Table 2 below.

**Table 2. Information about the names of some glaciers in the mountains located in the Piskom basin and adjacent areas and their meaning**

№	Glasionim's writing on the studied topomap	Small river basin	The writing of Glasionim in Uzbek language (Latin script)	The meaning of the toponym
1	Маштасгон	Piskom	Moshtasgon	<i>An area with many small boulders</i>
2	Испасай	Piskom	Ispaysoy	<i>The etymology is unknown, an obscure name</i>
3	Каптаркумыш	Piskom	Kaptarkumush	<i>A place where there are many silver doves</i>

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4	Когарыкапчигасай	Piskom	Kogariqopchig'aysoy	<i>A stream flowing through a long, narrow and steep gorge</i>
5	Бодаксай	Piskom	Bodaksoy	<i>Botoq is a stream flowing from a depression at the foot of a mountain</i>
6	Ихначсай	Piskom	Ixnachsoy	<i>A stream flowing from an area where the ixnach plant grows abundantly</i>
7	Чаралма	Chorolma	Chorolma	<i>An area with four sides of apple trees</i>
8	Бештор	Aygaing	Beshtor	<i>The place where there are five passes</i>
9	Джамалтор	Aygaing	Jamaltor	<i>The junction of the passes</i>
10	Туюктор	Aygaing	Tuyuqtor	<i>A pass located in a closed area with no exit</i>
11	Чакыртор	Aygaing	Chaqirtor	<i>A pass with a lot of jagged rocks</i>
12	Джаяктор	Aygaing	Jo'yaktor	<i>A narrow pass</i>
13	Чукуртор	Aygaing	Chuqurtor	<i>A pass located in a steeply low area from the surroundings</i>
14	Кызылтор	Aygaing	Qiziltor	<i>Pass where red (magmatic) rocks are scattered</i>
15	Терметаш	Aygaing	Termetash	<i>Terme (terme) – avalanche / sorted rock / separate mountain peak</i>
16	Караканыш	Aygaing	Qoraqanish	<i>Khan's wife, princess</i>
17	Тундуксай	Aygaing	Tunduksoy	<i>A stream flowing from the northern slope of the mountain</i>
18	Исеноман	Aygaing	Esonomon	<i>A sputtering, dangerous waterway</i>
19	Аксаксой	Aygaing	Oqsoqsoy	<i>Flowing water that often turns and changes its direction</i>
20	Карабастор	Aygaing	Qoraboshtor	<i>A pass with exposed rocks (or a pass with a lot of vegetation of the same name)</i>
21	Баркрак	Aygaing	Barqiroq	<i>A noisy creek</i>
22	Тюякарын	Aygaing	Tuyaqorin	<i>A height similar to a camel's belly, uneven terrain</i>
23	Аккапчигай	Aygaing	Oqqopchig'ay	<i>A narrow gorge where the snow does not melt in the upper part</i>
24	Тастарсай	Aygaing	Tastorsoy	<i>A stream starting from a rocky pass</i>

25	Текетур	Aygaing	Teketur	<i>Pass near the peak (tege – mountain peak, tor – pass)</i>
26	Титова	Aygaing	Titov	<i>Related to the name of the cosmonaut German Titov</i>
27	Гагарина	Aygaing	Gagarin	<i>Cosmonaut Yuri Gagarin is associated with the name</i>
28	Пахтакор	Aygaing	Paxtakor	<i>Related to the cotton plant and its picking</i>
29	Токмасалды	Aygaing	To'qmasoldi	<i>The etymology is unknown, an obscure name</i>
30	Имени Географака САГУ	Aygaing	O'zMU geografiya fakulteti nomidagi	<i>It is related to the name of the first geography faculty established in Uzbekistan</i>
31	Калесника	Aygaing	Kalesnik	<i>It is associated with the name of the famous geographer, limnologist, academician S.V.Kolesnik</i>
32	Козий	Aygaing	Koziy	<i>Related to the name of a person (anthroponym)</i>
33	Тюзашу	Aygaing	Tekisoshuv	<i>A slightly inclined and straight pass</i>
34	Карагуш	Aygaing	Qoraqush	<i>Associated with the name of the bird / rocky land where no plants grow</i>
35	Сарыбаш	Aygaing	Saribosh	<i>A place without vegetation at high altitude</i>
36	Атмыташ	Aygaing	Atmitosh	<i>there are many places with jagged stones</i>
37	Аютор	Aygaing	Ayutor	<i>A pass where there are many bears</i>
38	Текешсай	Aygaing	Tekeshsoy	<i>A stream flowing from the area where the tekesh/tyanish plant (deer grass) grows</i>
39	Турагаин	Aygaing	To'raqayin (Turoqqayin)	<i>Big Birch (area where birch grows a lot)</i>
40	Атжайлау	Maydantal	Otyaylov	<i>A lawn where horses graze</i>
41	Когургентор	Maydantal	Ko'kargantor	<i>A green, grassy pass</i>
42	Кокбулак	Maydantal	Ko'kbuloq	<i>A spring in a place where green plants grow a lot (a spring with clear water)</i>
43	Акбулакулькен	Maydantal	Oqbuloqulkan	<i>A large spring fed by snow</i>
44	Карабулак	Maydantal	Qorabuloq	<i>A spring that feeds from the ground water</i>



45	Чотан	Maydantal	Chotan	<i>The etymology is unknown, an obscure name</i>
46	Торашу	Maydantal	To'roshuv	<i>The place where the passes cross</i>
47	Корумтор	Maydantal	Qurumtor	<i>Pass consisting of a pile of stones</i>
48	Ашутор	Maydantal	Oshuvtor	<i>A pass, a place to go over a mountain</i>
49	Койназар	Maydantal	Ko'ynazar	<i>A very narrow and deep gorge</i>
50	Карабау	Maydantal	Qorabaur	<i>The etymology is unknown, an obscure name</i>
51	Анаульген	Maydantal	Anaulkan	<i>Big creek, main stream</i>
52	Каракыз	Maydantal	Qoraqiz	<i>A stream flowing through a narrow gorge</i>

The table was compiled by the author, and the names in the 1st column of the table are given in Russian, as the topographic map on which glacionyms were studied is in Russian.

It should be emphasized that it is difficult to give a definite opinion about the etymology of toponyms, and we are far from it. Usually, etymologically based variants are provided by experts, and some of these variants are widely used by "consumers". In the course of research, it was not possible to determine the etymology of several glacier names, and it can be seen from this that this issue requires separate monographic studies, toponymic research and expeditions.

We think that our small work on the correct spelling and pronunciation of glacionyms in Uzbek can be useful for experts directly dealing with glaciers, as well as for other fields, including mass and print media workers, pedagogues.

## **Conclusions**

Piskom river basin is distinguished by the nature and uniqueness of toponyms. This can also be seen in the case of glacionyms in the Piskom Basin and adjacent areas. Geographical place names formed on the basis of a narrow toponym in basin toponymy form an area, and this situation is characteristic only for this area – "endemic". In the formation of toponyms of the basin, this term takes part mainly in the meaning of a pass or a pass, and in some cases in the meaning of the highest part of the mountain. The toponymy of the Piskom Basin is complex, with terms related to the Uzbek, Kyrgyz, Kazakh, and Tajik languages and their various dialects being widely used. Therefore, it is necessary to study the toponymy of this area in a separate monographic way and to create an explanatory dictionary of toponyms of the area, to achieve the correct spelling of basin toponyms, including glaciation names, in cartographic and other geographical sources in Uzbek, and to consolidate and standardize them by entering them into the state register.

**There is no conflict of interest. There is no source of funding.**

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**М.М. Эвезов**

*Мирзо Ғлықбек атындағы Өзбекстан Ұлттық университеті, Ташкент, Өзбекстан*

### **Өзбекстандағы тау мұздықтары атауларының қалыптасуының табиғи географиялық негіздері және гляционимдер транскрипциясы мәселелері (Пскем алабының гляционимдери мысалы)**

**Аңдатпа.** Мақалада Өзбекстанның таулы мұздықтары, олардың географиялық орны, мұздық атауларының шығу тегі – гляционимдер, олардың түсіндірмесі, сондай-ақ Пскем алабының және оған іргелес жатқан аумақтар мысалында олардың табиғи географиялық факторлармен және табиғи жағдайлармен байланысы туралы сұрақтар қарастырылды. Алаб топонимдерінің жасалуындағы «тар», «сай», «ошув», «тош», «бел» табиғи географиялық терминдерінің үлесі анықталып, таралу ареалдары айқындалды. Өзен алабы топонимдерінің 65%-дан астамы жоғарыда келтірілген табиғи географиялық терминдер арқылы жасалған, осының негізінде

бұл алап топонимдерінің табиғи географиялық негіздері ғылыми түрде дәлелденген. Пскем алабындағы мұздық атауларының дұрыс жазылуы және практикада қолданылуы бойынша ұсыныстар берілген.

**Түйін сөздер:** географиялық жер-су атаулары (топонимдер), топонимдерның түрлері, гляционимдер, фитогляционимдер, зоогляционимдер, географиялық атластар, картографиялық дереккөздер, транскрипция.

**М.М. Аvezов**

*Национальный университет Узбекистана имени Мирзо Улугбека, Ташкент, Узбекистан*

### **Физико-географические основы формирования названий горных ледников Узбекистана и проблемы транскрипции гляционимов (на примере гляционимов бассейна Пскем)**

**Аннотация.** В данной статье рассматриваются вопросы о горных ледниках Узбекистана, их географическое положение, о происхождении гляционимов – географических названиях ледников, их толкований, а также их взаимосвязь с физико-географическим факторами и природными условиями на примере Пскемского бассейна и прилегающих территорий. Определена доля физико-географических терминов «тор», «сай», «ошув», «тош», «бел» в формировании топонимов региона, а также определены ареалы их распространения. Более 65% топонимов бассейна образованы при помощи вышеперечисленных физико-географических терминов, на основе этого научно доказаны физико-географические основы топонимов данного бассейна. Даны предложения и рекомендации по правильному написанию и их использованию на практике гляционимов бассейна Пскем.

**Ключевые слова:** географическое название (топонимы), типы топонимов, гляционимы, фитогляционимы, зоогляционимы, географические атласы, картографические источники, транскрипция.

#### **Information about the author:**

**Avezov M.M.** – Doctor of Philosophy (PhD) in Geographical Sciences, Associate Professor of the Department of Physical Geography, Faculty of Geography and Geoinformation Systems of the National University of Uzbekistan named after Mirzo Ulugbek, University st., 4, 100174, Tashkent, Uzbekistan.

**Әvezов М.М.** – география ғылымдарының философия докторы (PhD), Мирзо Улугбек атындағы Өзбекстан Ұлттық университетінің география және геоақпараттық жүйелер факультеті табиғи география кафедрасының доценті, Университетская көш., 4, 100174, Ташкент, Өзбекстан.



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