

Brief information about the project

Name of the project	AP27511595 «Development of a regional geoinformation system for monitoring and assessment of breakthrough hazard of glacial-moraine lakes in the eastern part of Ile Alatau»
Relevance	The Ile Alatau glacial-moraine complex is located in a very dynamic zone; physical and chemical processes are actively taking place here, the consequence of which is the formation of morphological reservoirs, which are filled with water as a result of intensification of glacial runoff and melt water. Consequently, assessment of the outburst hazard of glacial-moraine lakes resulting from their development and overflow, as well as inventory of glacial-moraine lakes on the basis of ground, aerial, reconnaissance surveys, including space images using the latest computer technologies is an urgent task. For such purposes various geoinformation database systems are used in the world. GIS applications provide detailed analyses of all social, economic and topographical features of the area that influence the occurrence and impact of mudflow hazard.
Purpose	For such purposes various geoinformation database systems are used in the world. GIS applications provide detailed analyses of all social, economic and topographical features of the area that influence the occurrence and impact of mudflow hazard
Objectives	1. Collection of archival, departmental, stock and monitoring data on glacial-moraine lakes in the eastern part of Ile Alatau 2. Systematisation and analysis of space images and aerial photographs from UAVs to assess the current state of glacial-moraine lakes in the eastern part of Ile Alatau 3. UAV launch and high resolution overlapping imagery to enable the creation of 3D models of vulnerable mudflow hazard areas in the eastern part of Ile Alatau 4. Determination of morphometric characteristics of moraine lakes in the eastern part of Ile Alatau on the basis of remote sensing data and UAV data. 5. Analysis of changes in meteorological, glaciological and geomorphological factors influencing the state of glacial-moraine lakes and their dynamics. 6. Determination of criteria of breakthrough hazard of glacial-moraine lakes on the basis of identification of debris-forming conditions using GIS-technologies and remote sensing data and UAVs. 7. Modelling of glacial-moraine lake outburst in the eastern part of Ile Alatau 8. Creation of interactive maps (inventory, assessment and forecast-recommendation type) of glacial-moraine lakes in the eastern part of Ile Alatau. 9. Creation of regional geoinformation system for monitoring and assessment of breakthrough hazard of glacial-moraine lakes in the eastern part of Ile Alatau.
Expected and achieved results	1. Creation of a scientific and methodological database containing archival, departmental, stock and monitoring data on glacial-moraine lakes to assess their outburst hazard. 2. Spatial analysis of the glacial-moraine complex of the eastern part of Ile Alatau, including quantitative and qualitative characteristics.

	3. Detailed processing of UAV data to obtain accurate information on the characteristics of glacial-moraine lakes. 4. Classification of glacial-moraine lakes based on the processing and analysis of morphometric data. 5. Calculated and processed data of meteorological, glaciological and geomorphological characteristics for assessing the outburst hazard of glacial-moraine lakes and determining their criteria. 6. Methodology for determining the criteria for assessing the hazards of glacial-moraine lakes in the eastern part of Ile Alatau 7. Development of large-scale maps of outburst-hazardous areas based on remote sensing data and UAVs of the glacial-moraine complex. 8. Development of interactive maps (inventory, assessment and forecast-recommendation type) of glacial-moraine lakes of Ile Alatau based on the integrated use of GIS technologies, remote sensing data and UAVs. 9. Development of a regional geographic information system for monitoring and assessing the risk of outbursts of glacial-moraine lakes in the eastern part of Ile Alatau Depending on the requirements of the tender documentation, the forms of implementation of the project result may be: 9.1 publication of articles in foreign peer-reviewed scientific journals (presumed publications for publication of the project results, citation index of the publication, with a link to information about the publication in the relevant scientometric database). Requirements for the number of articles based on the research results are established in the tender documentation. Each article must contain information about the identification registration number and the name of the project within which it was financed, indicating grant funding as a source. Publication of at least 2 (two) articles and/or reviews in peer-reviewed scientific journals in the scientific area of the project, indexed in the Science Citation Index Expanded and included in the 1st (first), 2nd (second) and/or 3rd (third) quartile by impact factor in the Web of Science database and/or having a CiteScore percentile in the Scopus database of at least 50 (fifty);
Research team members with their identifiers (Scopus Author ID, Researcher ID, ORCID, if available) and links to relevant profiles	1. Abdullayeva Assel – Project Manager, PhD, Senior Lecturer. H-index – 2; Web of Science ResearcherID: ITE-4797-2023; Scopus Author ID: 58001704200; ORCID ID: 0000-0001-8947-4920. 2. Ospanova Marzhan – PhD, Senior Lecturer. H-index – 1; Scopus Author ID: 57223190936; ORCID ID: 0000-0002-6812-4507. 3. Zhanabayeva Zhanara – PhD doctoral student, Master of Natural Sciences, Senior Lecturer. H-index– 2; Web of Science ResearcherID: ABE-5670-2021; Scopus Author ID: 57191187902; ORCID ID: 0000-0002-4226-1941. 4. Raimbekova Zhanar – Master of Natural Sciences – PhD doctoral student, Senior Lecturer. H-index– 3; Web of Science ResearcherID: AAY-8667-2021; Scopus Author ID: 57219196407; ORCID ID: 0000-0003-4377-0948. 5. Taukebaev Omirzhan – Master of Natural Sciences – PhD doctoral student, Senior Lecturer. H-index– 3; Web of Science ResearcherID: HLG-0490-2023; Scopus Author ID: 58055198400; ORCID ID: 0000-0002-0275-2463. 6. Zulpykharov Kanat – Master of Science – PhD doctoral student, Senior Lecturer. H-index – 3; Web of Science ResearcherID: AAA-

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List of publications with links to them	-
Patents	-