

NATIONAL ACADEMY OF SCIENCES OF TAJIKISTAN

STATE SCIENTIFIC INSTITUTION "GLACIER RESEARCH CENTER OF
THE NATIONAL ACADEMY OF SCIENCES OF TAJIKISTAN"

«APPROVED»

Director of the State scientific
institution "Glacier research center of
the National Academy of Sciences of
Tajikistan"

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«AGREED»

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----- 2023

SCIENTIFIC PROGRAM

**PARTICIPATION OF THE STATE SCIENTIFIC INSTITUTION
"GLACIER RESEARCH CENTER OF THE NATIONAL ACADEMY OF
SCIENCES OF TAJIKISTAN" IN PREPARATION AND
IMPLEMENTATION OF THE INTERNATIONAL YEAR OF GLACIER
PRESERVATION (2023-2025) JOINTLY WITH PARTNERS**

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PARTICIPATION OF THE STATE SCIENTIFIC INSTITUTION "GLACIER RESEARCH CENTER OF THE NATIONAL ACADEMY OF SCIENCES OF TAJIKISTAN" IN PREPARATION AND IMPLEMENTATION OF THE INTERNATIONAL YEAR OF GLACIER PRESERVATION (2023-2025) JOINTLY WITH PARTNERS

Approved by decision of the
Scientific Council
State Scientific Institution "Glacier
Research Center of the NAST".
protocol of 2023 № ...

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Introduction

Tajikistan has the highest percentage of mountainous areas in the region, occupying 93% of the country. More than half of Tajikistan's mountains are at elevations of 3,000 meters or higher. Data from 1940 to 2020 show that temperatures in most areas of the country, including low-altitude (up to 1,000 meters above sea level), mountainous (1,000-2,500 meters above sea level) and high-altitude (above 2,500 meters above sea level) have increased, but the extent of warming varies depending on geographic location and climatic factors.

For each decade of the period 1940-2020 there was an increase in temperature by 0.1-0.2°C. The number of days with a temperature of 40 °C or higher is increasing. Mountain areas experienced a temperature increase of 0.3-0.5°C. Fall temperatures in all mountain areas were 0.6-1.1 °C above average.

Decreasing glacier mass is one of the most obvious indicators of atmospheric warming in the world. Monitoring of these changes is one of the main goals of the international strategy developed by the Global Climate Observing System. Long-term measurements of glacier mass balance are the basis for calibrating and validating models that simulate future ice sheet runoff.

This is very important not only for Central Asia, which is one of the most arid continental regions of the northern hemisphere, but for the entire globe.

In a densely populated part of this region, water shortages due to shrinking glaciations potentially lead to pronounced political instability, sudden environmental changes, and threats to food security.

The future water resources of the high altitude and polar regions are highly dependent on the state of the cryosphere, especially the amount of snow, glaciers and the state of permafrost. These components of the cryosphere contain enormous quantities of freshwater, and as the climate continues to warm, in the future, they will play an important role in ensuring water availability in these regions.

Fluctuations in mountain and polar glaciers have been tracked in various parts of the world for more than a century, and changes in glacier conditions are considered reliable indicators of global atmospheric warming trends. Mountain glaciers and polar ice caps are important for early detection strategies in global climate observations. Consequently, in the Global Climate Observing System, glaciers are critical climate variables.

In the next decade, the Arctic may completely lose sea ice in the summer periods. This forecast made the British edition of *The Guardian*, referring to the

report on the state of the cryosphere, which scientists made public before the 27th Conference of the Parties to the UN Framework Convention on Climate Change. "There's nothing we can do about it now. We've just made a mess of it and let the system get too hot already," admitted Julie Brigham-Gretta - University of Massachusetts Institute of Technology staff member and co-author of the study.

In May 2021, American scientists raised concerns that melting glaciers in the Antarctic could threaten the existence of coastal cities such as New York and Shanghai. As temperatures rise on the planet, Arctic sea ice begins to melt. There is so much ice in the Antarctic that global warming could cause a 60 m rise in sea level.

The Republic of Tajikistan, under the leadership of the Founder of Peace and National Unity - Leader of the Nation, President of the Republic of Tajikistan, Honorable Emomali Rahmon, has taken a key role in the world policy of protecting glaciers and water resources.

Recent history shows that Tajikistan, among other members of the international community at the global level, actually remains one of the initiators of active actions on the rational use and effective cooperative management of water resources.

The Republic of Tajikistan is the main promoter of the five global water initiatives:

1. Proclaiming of 2003 as International Year of Freshwater by the Resolution of the 55th session of the UN General Assembly of December 20, 2000, 55/196;
2. Proclaiming of 2005-2015 as International Decade for Action "Water for Life" by the Resolution of the 58th session of the UN General Assembly of December 23, 2003, 58/217;
3. Proclaiming of 2013 as International Year of Water Cooperation by the Resolution of the 65th session of the UN General Assembly of December 20, 2010, 65/154;
4. Proclaiming of 2018-2028 as International Year of Water Cooperation by the Resolution of the 65th session of the UN General Assembly of December 20, 2010, 65/154;
5. Resolution of the 77th Session of the United Nations General Assembly of 14 December 2022 on:
 - declaring 2025 the International Year of Glaciers Preservation;
 - declaring March 21 the International Day of Glaciers Preservation;

- establishing an international trust fund under the United Nations to help preserve glaciers;
- holding an International Conference on Glacier Protection in Dushanbe in 2025.

The scientific program was developed on the basis of the Action Plan for the participation of the State Scientific Institution (SSI) "Glacier Research Center of the National Academy of Sciences of Tajikistan" in the preparation and conduction of the International Year of Glacier Preservation (2023-2025).

The program defines the national needs and priority research aimed at obtaining new knowledge on natural processes in glacial zones for comprehensive assessments and forecasts of the state of the natural environment in the highlands of Tajikistan in a changing climate conditions. The program also takes into account new areas of research to ensure the effective solution of systemic problems in the field of sustainable development of the cryosphere zone in the territory of the Republic of Tajikistan, the effective use of natural resource potential, solving environmental problems and preservation of the natural environment of high mountain regions in the preparation and implementation of the IYGP.

The Program is based on the activities mentioned and announced in:

1. Action Plan for the participation of the State Scientific Institution "Glacier Research Center of the National Academy of Sciences of Tajikistan" in the preparation and holding of the High Level International Conference on Glacier Preservation in 2025.
2. Action Plan for the participation of the State Scientific Institution (SSI) "Glacier Research Center of the National Academy of Sciences of Tajikistan" in the preparation and implementation of the International Year of Glacier Preservation (2023-2025).
3. UN General Assembly Resolutions, GA/77/443 of December 14, 2022.
4. Protocol of the Meeting of the Government of the Republic of Tajikistan of December 29, 2022, No. 12 (p 16).

Summary of Scientific Proposals for IYGP 2025

Cryospheric research is represented by projects to study the causes and consequences of accumulation and melting of snow and glacier cover in mountain regions and polar areas during the IYGP against the background of its long-term

variability and to study small and large mountain glaciers as indicators of climate change.

Ecosystem studies of mountain and polar regions include the study of the state of biological complexes of high mountain regions under current conditions of global warming.

As part of climate projects, comprehensive studies of mountain areas include studies of natural complexes, socio-economic conditions and public health.

Climatic research is represented by a project to study the climate variability of mountain and polar regions, glaciological studies of glaciers.

Much attention will be paid to studies of the cryosphere of mountain areas, which are based on the study of the state of glaciers and the flow of mountain rivers.

Scientific and thematic areas of IYGP-2025:

1. Methods of glacier protection (chemical, technical and biological) and their practical application.
2. Cryosphere, glaciations and glaciers.
3. The mass balance of glaciers.
4. Mode and fluctuations of glaciers.
5. Application of remote sensing data and GIS-technology in the study of glaciers.
6. Space and aerial studies and monitoring of glaciers, snow cover.
7. Glacial lakes and breakthrough glacial lakes.
8. Meltwater runoff.
9. Hydrochemical and isotopic study of glaciers and snow cover.
10. Underground glaciers and permafrost.
11. Paleoglaciology and paleoclimatology.
12. Innovative methods for research on glaciers and snow cover.
13. Modeling in glaciology (snow cover and melt flow).
14. The climate system and climate change.

15. Development of the network of systematic observation of glaciers, snow cover and hydrometeorology at an altitude of 3500 to 5000 meters.
16. Hydrology and glacial hydrology.
17. Snow cover.
18. Snow avalanches and glacial mudflows.
19. Glaciation and glaciers in the Arctic.
20. Glaciation and glaciers in the Antarctic.
21. Dynamics of change in glaciation and glaciers in the Arctic and Antarctica.
22. Sea, lake, and river ice.
23. Rational use and management of snow and ice resources.
24. Snow and ice conditions of economic activity.
25. Natural disasters and hydrometeorological phenomena associated with glaciers, snow cover and glacial mudflows and methods to reduce damage from their consequences.
26. Socio-economic and economic aspects of climate change and hydrometeorological impacts associated with intensive glacier melting and glacial lake outburst floods.
27. Medical and social, sanitary and health conditions of people living in subpolar and high mountain areas under intensive glacier melting conditions.
28. Educational and scientific capacity building in the field of glacier research and preservation, and dissemination of knowledge to the general public.

1. Brief rationale and significance of the work

The natural environment is crucial for safe and efficient operations in the mountain and polar regions of the Earth. The presence of low temperatures, glaciation development, permafrost, and vulnerable terrestrial ecosystems are factors that have a significant impact on the social and economic complex, energy, transportation, and the way of life of the indigenous population.

Changes in the natural environment in mountain and polar areas under certain scenarios can threaten the current situation associated with the degradation of

glaciers and the emergence of breakthrough mountain lakes, which bring significant socio-economic damage to the economy.

The possibility of melting glaciers, expansion of the "ozone depletion", increased solar activity and a number of other natural features determine a wide range of research in mountain and polar areas. Therefore, it is quite natural that there is interest in the regional state of the natural environment not only on the part of scientists, but also economists and even politicians of all countries of the world.

Sustained unidirectional changes in the natural and climatic conditions of high altitude areas can have a significant impact on the environment and socio-economic activities, so the problem of climate change is extremely important for all mankind.

An important area of activity in high mountains and polar regions is the forecasting of atmospheric and lake processes as well as glaciation processes.

Consequently, the implementation of the International Year of Glacier Protection (2023-2025), will play a major role in the development of a system of glaciological and hydrometeorological research at the global level. The basis of the system of such research is the observation network, including stationary and automatic hydrometeorological stations, and observation facilities from space. To improve forecasting and studying the current state of the cryosphere and glaciation, in general, it is necessary to develop and modernize the observation network of mountain and polar countries, creating new methods of forecasting, as well as studying key glaciological and hydrometeorological processes.

In 2025, the State Scientific Institution (SSI) "Glacier Research Center of the National Academy of Sciences of Tajikistan" will be 8 years of establishment. Its main objective is to organize large-scale comprehensive research on glaciers of the Republic of Tajikistan. For this purpose, new approaches and methods will be used to address important challenges facing the national and world science and practice in the field of development and study of the current state of glaciation in the highlands of Tajikistan.

2. Goals and Objectives of the International Year of Glacier Preservation (2023-2025)

The main goal of the IYGP (2023-2025) is to study and investigate the current state and future changes in climate and the natural environment, as well as to assess the consequences of these changes for the socio-economic complex of high mountain and polar regions.

In order to achieve these goals, it is advisable to solve the following main tasks:

- determination of the current state and assessment of future changes in glaciation and its manifestations in natural complexes of high-altitude and polar regions;

- development of technologies for monitoring and forecasting atmospheric, ionospheric and cryospheric processes;

- determination of anthropogenic and natural changes in the state of the environment and their impact on the ecosystems of mountain and polar regions;

- development of recommendations for preserving glaciers under climate change and environmental conditions.

The practical basis for solving the problems of MGZL 2023-2025 is coordinated observations in the cryosphere using existing monitoring systems and special field observations, using modern GIS technologies and remote sensing tools.

For the mountain and polar regions, the priority practical activities for achieving the 2023-2025 IYGP goals are:

- modernization and development of the system to study glaciological, hydrometeorological, geological and geophysical conditions of glaciers using space, specialized automated technical means, and the existing system of ground-based observations in the highlands and polar regions of the Earth;

- development and improvement of the system of climatic monitoring and monitoring of the state of modern glaciations in the main river basins of mountain and polar regions;

- conduction of comprehensive expeditions on glaciers and improvement of international expeditions with participation of Tajik experts.

The scientific basis for the participation of the State Scientific Institution "Glacier Research Center of the National Academy of Sciences of Tajikistan" (GRC NAST) in IYGP 2023-2025 is the national target programs, under which studies of the glaciation zone of Tajikistan are carried out.

During the IYGP period 2023-2025 it is expected to:

- obtaining assessments of the status of large-scale processes affecting glaciation in Tajikistan and global climate, using the work of high-altitude stations, field expeditions, satellite systems, etc;

- expanding of the program of seasonal meteorological, glaciological and hydrological studies at high-mountain stations and seasonal field bases of GRC NAST;

- study of meso- and small-scale high-altitude processes affected by climate change and involved in the formation of feedbacks in the mountain part of the climate system (albedo, atmospheric inversions, glacier fluctuations, etc.);

- performing a set of geophysical observations of glaciation degradation processes affecting climate and the environment, including observations of short-term variations and long-term trends of solar activity on geophysical and atmospheric processes in mountain areas, as well as monitoring electromagnetic pollution of ionosphere and assessment of its consequences;

- assessment of the current state of terrestrial mountain components of the cryosphere (glaciers and permafrost) and promoting the expansion of these studies, in particular to collect paleoclimatic information and forecast evolution under various climate change scenarios;

- assessment of mountain ecosystems under conditions of climate change and anthropogenic impacts and development of recommendations for conservation activities;

- improvement and development of existing monitoring systems and technologies for forecasting and modeling processes in the ionosphere and cryosphere;

- promotion of implementation of major international projects and programs on climate and environment research in Central Asian mountain regions, conducted by international organizations, in which Tajikistan participates and, in particular, by GRC NAST;

- development of recommendations for further socio-economic development of mountain regions of Tajikistan;

- deployment of the observation system in mountain regions.

Over the past 5 years, the observational system of climate monitoring of the GRC NAST has obtained a sufficient amount of information based on the work of high-altitude stations established in the vicinity of the studied glaciers.

For Tajikistan, the priority practical tasks for achieving the 2023-2025 IYGP goals are:

- development of a network of glaciological and hydrometeorological high altitude stations at 3500-5000 m above sea level and establishing a study of glacier mass balance;
- conducting complex high-altitude expeditions with participation of national, regional and international partners;
- carrying out drilling operations on the Fedchenko Glacier to obtain a core, as well as chemical, isotopic and radioisotopic studies to determine the age of the glacier (jointly with development partners).

The following activities are planned for the IYGP period 2023-2025:

- improvement and widening of methods of research on glaciers and snow cover;
- assessment of the state and forecast of scientific and technical development in order to attract public resources for scientific research in the study and monitoring of glaciers under conditions of climate change of fundamental importance;
- resumption of permanent stationary observations at the Gorbunov meteorological station, installed on the largest in Central Asia Fedchenko glacier;
- development of GIS technologies, RS and creation of conditions for access to high resolution satellite imagery;
- publication in 2023 of a consolidated volume, and by 2025, all volumes of the catalog of glaciers of Tajikistan, which, in general, represent the current state of glaciers in the process of climate change;
- equipping and providing the Laboratory of isotope studies of glaciers and snow cover of GRC NAST with the necessary facilities and conducting isotope studies on an ongoing basis;
- ensuring a sufficient number of helicopter flight hours (at least 20-30 hours of flight per year) for monitoring, aerial photographing and mapping work on glaciers, as well as safe delivery of staff to difficult to access locations on glaciers at the expense of the budget and funds from international organizations and foundations;
- formation of state information resources in the field of research and monitoring of glaciers, regularly issue a newsletter on the progress of IYGP 2023 – 2025;

- creation and maintenance of a unified information database, development and updating of glacier passports, as well as preparation of a collection of scientific publications on glaciers and water resources of Tajikistan.

3. Main goals, tasks and directions of the Program

3.1 Main goals and tasks of the Program

The purpose of the Program is to concentrate and coordinate scientific and technical activities of high altitude and polar regions, including the Republic of Tajikistan, in the framework of the activities of IYGP 2023 - 2025.

The main scientific tasks of the Program define national needs and priority research aimed at obtaining new knowledge about natural processes and the environment in polar and high-mountain inaccessible regions, and the important role they play in global changes in the natural environment. In addition, there is a need for further research to effectively address systemic problems in the sustainable development of the environment of polar and high altitude regions and the vulnerability of ecosystems as part of the preparation and conduct of IYGP 2023-2025.

The main practical tasks of the program for Tajikistan include:

- development of an observation system in mountain and high mountain areas (3500-5000 m a.s.l.);
- expansion of methods of research of glaciers and snow cover;
- conducting permanent stationary observations of the largest glacier in Central Asia - Fedchenko - at the meteorological station named after Gorbunov;
- development of GIS technologies, RS and creation of conditions for access to high resolution satellite images.

3.2 Main directions of the Program

For convenience, all scientific topics are summarized in the following thematic directions

Section 1. Cryosphere and glaciology

Section 1.1. Permafrost

Section 1.2. Glaciology

Section 1.2. Hydrometeorology .

Section 2.1. Meteorology

Section 2.1. Hydrology

[Section 2.3. Aerology](#)

Direction 3. Natural disasters

Section 3.1. Avalanches and mudflows,

Section 3.2. Glacial lake outburst floods.

Direction 4: Isotope and hydrochemical studies

Direction 5. Scientific expeditionary activities

Direction 6. GIS-technology, Remote sensing data, drones

Direction 7. Modelling and forecasting

Direction 8. Medical-Social and Sanitary Status

Direction 9. Educational and Scientific Capacity Building

Direction 10. Development of measures for the protection of glaciers

Direction 11. Others (may be added as appropriate)

THE MAIN GOALS OF DIRECTIONS

Direction 1. Cryosphere and glaciology

Section 1.1. Permafrost

1.1.1 Studies of permafrost in the high mountainous areas of the Eastern Pamirs and Kafirnigan River basin.

The main aim of this study is to determine the volume of ice and its reserves in the permafrost in the mentioned regions and river basins of Tajikistan by altitudinal zones.

Section 1.2. Glaciology.

1.2.1 Study of the current state of the Fedchenko glacier in the context of climate change

Unfortunately, after the 1990s systematic observations on this large glacier and on other glaciers were discontinued, and over the last 40-50 years the study of glaciers in this basin is fragmentary and does not reflect the real situation of glaciation on this glacier junction.

The aim of the study is to assess the current state of the Fedchenko Glacier based on remote sensing data and conduct a retrospective analysis of its basin glaciation under climate change, as well as to determine the prospects and the need for systematic research on this glacier. Jointly with partners in sustainable development, resume direct research on Fedchenko Glacier.

1.2.2 Assessment of degradation dynamics of glaciers in the river basin of Tajikistan

The aim of this work is to study the dynamics of glaciers of the Surkhob river tributaries.

1.2.3 Study of current status and assessment of degradation dynamics of glaciers in the river basin of Tajikistan

The aim of this work is to study dynamics of glaciers change in the river basin Panj.

1.2.4 Study of the current state of glaciation in the Gunt basin

The aim of this work is to analyze and assess the current state of glaciation in the Gunt River basin under conditions of climate change.

1.2.5 Input of Glaciers in the Zeravshan River Basin in the formation of water and energy resources of the territory

The main aim is to study the state and further evolution of glaciers in the Zeravshan river basin and determine their role in the formation of water and energy resources.

1.2.6 Study of the current state and assessment of degradation dynamics of glaciers in the Kafirnigan river basin

The aim of this work is to study the current state and dynamics of changes in the glaciers of the Kafirnigan river basin

1.2.7 Study of the state of glaciers in the Obi Hingob river basin

The main aim is to determine the condition of glaciers in the Hingob River basin and the degree of their degradation and instability under conditions of climate change.

1.2.8 Observation of changes in the dynamics of glaciers in the Iskandaryo River basin

Main aim - Analysis of changes in the state of tributary glaciers in the Iskandaryo river basin and assessment of the degradation degree of glaciers in this basin

1.2.9 Monitoring of glacier mass balance in major river basins of Tajikistan based on modeling

The main aim is to determine the rate of change of glacier mass balance based on remote sensing and expeditionary works in some regions of Tajikistan.

1.2.9 Monitoring of glacier mass balance in main river basins of Tajikistan based on modeling

Main aim - determination of rates of glacier mass balance changes based on remote sensing and expeditionary works in some regions of Tajikistan.

1.2.10. Development of a methodology for determining changes in the volume of glaciers in the main river basins of Tajikistan, through the use of GIS technology.

Main aim - determination of dynamics of ice volume changes on glaciers of main river basins of Tajikistan based on remote sensing.

Direction 2. Hydrometeorology.

2.1. Dynamics of hydrometeorological parameters and their correlation with the hydrological regime of major river basins in Tajikistan

The aim of this work is to objectively assess the dynamics of snow resources, analysis of precipitation and temperature regime

2.2. Hydrological regime and glaciation degradation of major rivers in Tajikistan under climate change conditions

The aim of this work is comparative analysis of hydrological regime of major rivers in Tajikistan under conditions of climate change and degradation of glaciers.

2.3. Forecast of the Vakhsh River flow using models and satellite data on snow cover

The main aim is to assess the water availability of the Vakhsh river using snowmelt runoff model (SRM), a detailed description of the map of the Vakhsh River watershed.

2.4. Restoration of aerological observations at Dushanbe and Khorog stations.

The aim of this work is to reconstruct aerological observations to obtain information on temperature, humidity, air pressure and wind direction and speed and to predict convective processes and jet currents in the upper troposphere.

Direction 3. Natural Disasters

3.1 Study and monitoring of pulsating glaciers in Tajikistan

The main aim is to assess the current state of pulsating glaciers and their monitoring based on GIS technology, remote sensing and scientific expeditionary work.

3.2 Main exogenous geological and glaciological processes under climate change conditions

The main aim is to study and monitor the main threatening exogenous geological and glaciological processes of the Republic of Tajikistan.

3.3 Study, monitoring and modeling of breakthrough glacial lakes

The main aim is to identify the condition of breakthrough glacial lakes, monitoring and development of measures to reduce damage

3.4. Study of connection of ordinary and glacial mudflows with changes in hydrometeorological parameters

The main aim - qualitative and quantitative study of relation of mudflows with changes in the main hydrometeorological parameters.

Direction 4. Isotope and hydrochemical research

4.1 Creation of a network for collection of precipitation, snow cover and melt water samples for isotopic and chemical analysis.

The main aim is for year-round regular monitoring of isotope content and chemical analysis from isotope network.

4.2 Study of isotope content in glaciers, snow cover and meltwater of main river basins of Tajikistan collected during expedition works.

Main aim - determination of isotope content in glaciers, snow cover and melted water

4.3 Study of tritium content in glaciers of main river basins of Tajikistan

Main aim - determination of tritium content to establish the age and dynamics of glaciers in the river basins of Tajikistan.

4.4. Conducting hydrochemical analyses of heavy metals and chemical elements in meltwater from glaciers and snowfields

Main aim - determination of the content of heavy metals and chemical elements, as well as the level of contamination in the objects under study.

Direction 5. Scientific expeditionary works

5.1. Organization and implementation of expeditionary works to study glaciers and snow cover in main river basins of Tajikistan:

5.1.1. Aerial and route monitoring of snow cover in river basins of Tajikistan

The main aim is to conduct aerial observations in the headwaters of the main rivers of Tajikistan jointly with partners to determine the height of snow cover and snow lines.

5.1.2. Study of glacier mass balance in the glaciological network of major river basins in Tajikistan

The main aim is to work with partners to develop a study of the mass balance of glaciers and provide this data to the World Glacier Monitoring Center.

5.1.3. Conducting expeditionary works to develop and expand the glaciological network from 3500 to 4900 m.

The main aim is to work with development partners to develop measures to expand the glaciological network, and to collect and analyze glaciological and hydrometeorological data every year to assess the dynamics of changes in the condition of glaciers and snow cover.

5.1.4. Monitoring of Medvezhy glacier on the basis of expedition and GIS-technology.

The main aim is to study the state of the Medvezhy Glacier and establish continuous monitoring and forecasting of the glacier dynamics.

5.1.5. Study and monitoring of the Baralmas glacier in the Surkhob river headwaters

The main aim is to study the condition of the Kyzylsu glacier, establish monitoring and modeling of the degree of glacial lake outburst flooding, monitoring and development of measures to reduce damage.

5.1.6. Study and monitoring of glaciers of Lake Karakul in the Eastern Pamirs

The main aim is to study the current state of glaciers in the basin of Lake Karakul and to monitor the hydrological and hydrochemical conditions of the lake.

5.1.7. Establishment of regular research work on the Fedchenko Glacier

Main aim - establishment of regular research works at Gorbunov station and carrying out scientific glaciological studies and core cutting for studying past climate, conducting isotope studies and determining the age of the glacier.

5.1.8. Study of glacier №383 in the basin of the Obikhingov River, the upper Nisai River

The main aim is to assess the condition and determine the mass balance of the glacier.

5.1.9. Study of the RGO glacier in the Vanj River basin

The main aim is to assess the condition of the glacier through the use of drones.

5.1.10. Ground and satellite monitoring of the Medvezhy Glacier in the Wange river basin.

The main aim is to study the state of the glacier, establishing continuous monitoring and predicting its possible pulsation.

5.1.11. Study of permafrost in the Eastern Pamirs and Kafirnigan River basin.

The main aim is to study permafrost in the Eastern Pamirs of the Kafirnigan river basin.

4. Program Management

Preparation of the State Scientific Institution "Glacier Research Center of the National Academy of Sciences of Tajikistan" for participation in the International Year of Glacier Preservation (2023-2025) is carried out as part of the activities of the Center for the organization of the IYGP (2023-2025). OC IYGP (2023-2025) consists of a secretariat and responsible representatives of the relevant departments of the NAST. There are two co-chairmen: the President of the National Academy of Sciences of Tajikistan and the Director of the State Scientific Institution "Glacier Research Center of the National Academy of Sciences of Tajikistan" at the head of the OC IYGP (2023-2025).

Current activities of the OC IYGP (2023-2025) are implemented through a secretariat organized at the State Scientific Institution "Glacier Research Center of the National Academy of Sciences of Tajikistan".

4.1. How to participate in this program?

It should be particularly noted that this program is open to all organizations regardless of their form of ownership in Tajikistan, as well as foreign scientific institutions, public organizations, temporary research teams and foundations. Priority will be given to all organizations that have contracts, agreements or memorandums of cooperation with our organization.

As the number of willing participants increases, if necessary, an "International Organizing Committee for the International Year of Glacier Preservation 2023-2025" may be organized. (OC IYGP 2023-2025).

All organizations to be included in this program will be assisted in organizing expeditionary work on the glaciers.

In order to enroll your organization in this program, all you need to do is fill out the Application Form and send it to us at abdkaumov@mail.ru or fill out in online form on our website <https://cryosphere.tj/>.

5. Assessment of the expected efficiency and socio-economic consequences of the Program implementation

The implementation of the IYGP measures (2023-2025) will allow:

- obtain comprehensive information on various components of the natural environment not only in the river basins of Tajikistan but also in the high-mountain and polar regions of the world;

- develop a system of providing information about the environment of glacial zones, including observation systems and forecasting issues;

- obtain reliable comprehensive assessments of current and future climate and environmental changes and develop recommendations for national and local authorities and organizations engaged in economic, environmental and other activities in high altitude and polar regions;

- the recommendations obtained may be necessary and useful for various national activities carried out in high mountain and polar regions;

- the results of the IYGP (2023-2025) will make a significant contribution to the main goal of studying and preserving the cryosphere - identifying past and current, as well as assessing future changes in the high and polar regions of the earth;

- the results of IYGP (2023-2025) will preserve the national heritage of world science - the results of various generations of researchers in the high and polar regions of the Earth for future use; will create a potential for the development of scientific research and information support activities in these areas;

- make a significant contribution to world science; provide an understanding of future climate change trends; and provide a basis for improved forecasting of glaciers, snow cover, and the natural environment in general.