

Glaciological studies of the Institute of Geography, Russian Academy of Sciences (IGRAS) in the Arctic

Abstract of report on 7 July

1. Aims of the studies

- To estimate the response of glaciers and ice caps regime and dynamics on climate change in the Arctic;
- To estimate the iceberg run-off and ice calving from outlet glaciers and ice caps to Arctic seas

2. Field studies of IGRAS in the Arctic:

- Svalbard (since 1974 to 2007);
- Novaya Zemlya (2003).

3. Cooperative studies of IGRAS and other institutions

- Frantz Josef Land (1974, Scott Polar Research Institute, Great Britain);
- Severnaya Zemlya (1997, Scott Polar Research Institute, Great Britain);
- Frantz Josef Land (2005-2007, AARI, Russia);
- Novaya Zemlya (2005-2007, AARI, Russia);
- Svalbard (2003-2006, Institute of Geophysics, Polish Academy of Sciences; Silesian University, Poland; Polytechnical University of Madrid, Spain; University of Oslo, Norway; University of Ravaniemi, Finland).

4. Methods of studies

- Analysis of topographic maps;
- Analysis of satellite images and data (Landsat, SPOT, Icesat, INSARsat, ASTER);
- Airborne radio-echo sounding;
- Ground-based radio-echo sounding and GPS measurements;
- Ground based radiophysical measurements (radio wave velocity, amplitude of reflected signals);
- Mass balance measurements.

5. Studied parameters of glaciers and ice caps

- Ice margin position;
- Area;
- Length;
- Glacier surface elevation;
- Ice velocity;
- Ice thickness;
- Bedrock topography;
- Internal structure;
- Hydrothermal state and structure;
- Water content in temperate and polythermal glaciers;
- Accumulation rate;
- Ablation rate;

- *Spatial and temporal changes of these parameters;*

- Thickness of icebergs;

6. Regional studies (Analysis of topographic maps and satellite images, airborne radio-echo sounding):

- Svalbard;
- Frantz Josef Land;
- Severnaya Zemlya;
- Novaya Zemlya;

7. Detailed studies (ground-based radar and radiophysical measurements):

- Svalbard: Fridtjovbreen (1977-2007) (Fig. 6) *;
- Aldegondabreen (1999, 2007);
- Tavlebreen (2006, 2007) *
- Hansbreen (2003, 2004, 2006)*;

-Amundsenisen (1984, 2004, 2006)*.

* *Studies by IPY project GLACIODYN*

8. Planning studies of IGRAS

- Creation of cryosphere polygon in Barentsburg area to study the response of snow cover, permafrost and glaciers on climate changes;

-Permafrost;

-Glaciers:

-Fridtjovbreen;

-Austre Grønfjordbreen;

-Aldegondabreen;

-Tavlebreen.

Field studies on glaciers:

-mass balance;

-ice temperature;

-ice thickness;

-internal structure;

-hydrothermal state and structure;

- water content;

-geometry (area, length, glacier surface elevation).