Systems of glaciological studies in the Arctic

Institute of Geography, Russian Academy of Sciences

Cryosphere poligon in Barentsburg area

Goal of studies

- To estimate the temporal and spatial changes in environment:

- Snow cover
- Permafrost
- Glaciers

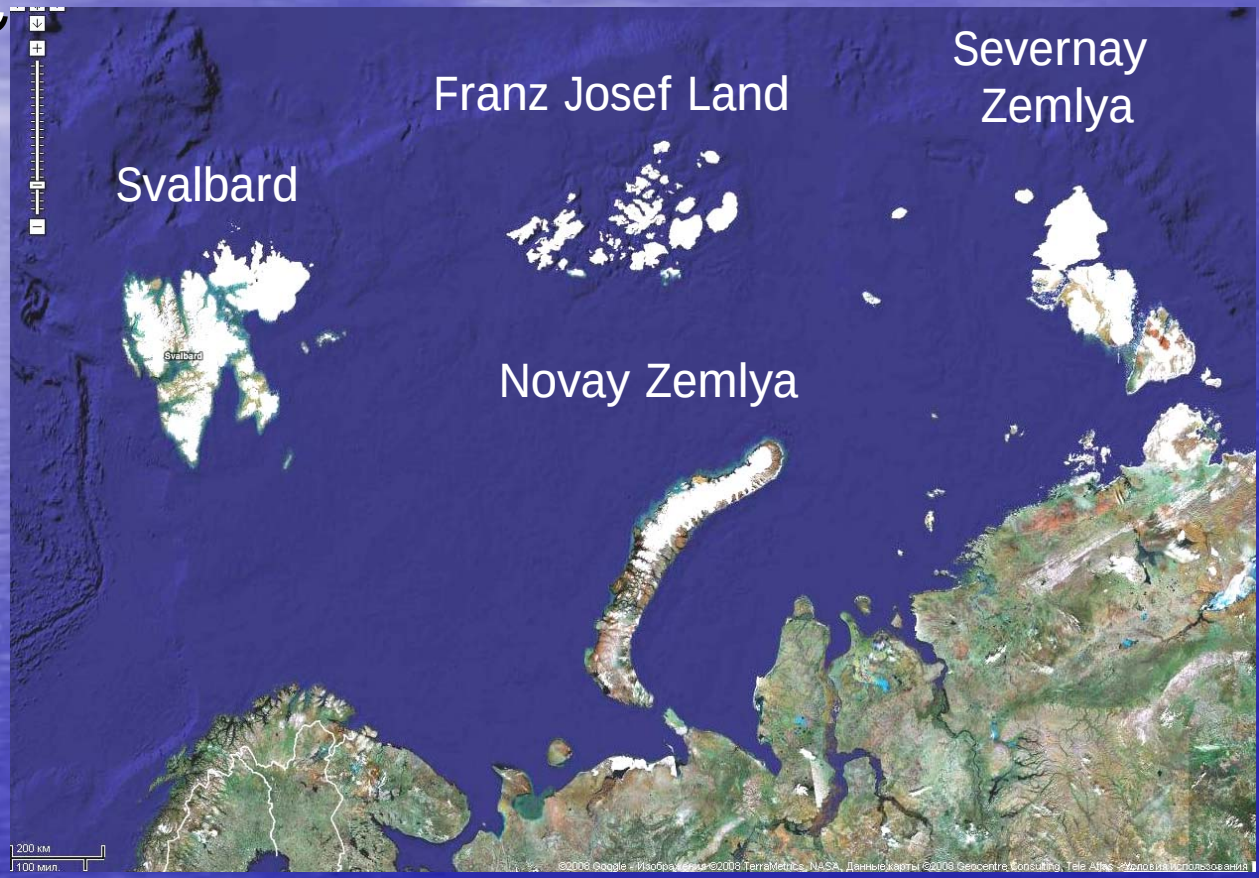
Goals of glaciological studies

- - To estimate the response of glacier regime and dynamics on climate changes
- - To estimate the iceberg run-off from outlet glaciers and ice caps to the Arctic seas
- - To estimate the response of permafrost on climate changes

Methods of studies

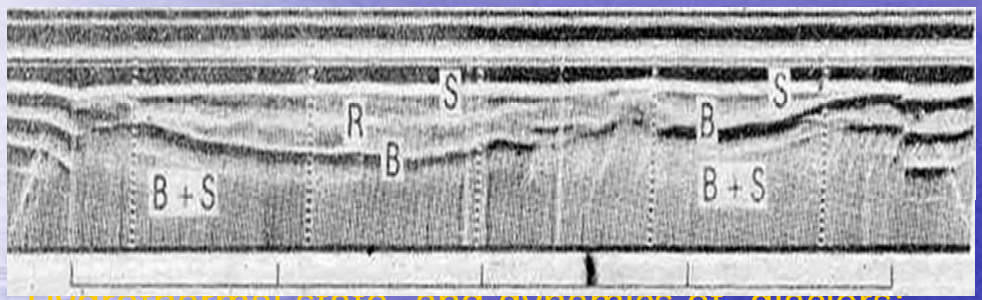
- Ground-based radio-echo sounding
- Radiophysical measurements
- Shallow and deep drilling
- Ice temperature measurements
- Mass balance measurements
- DGPS and GPS measurements
- Analysis of satellite images and data

Regions of glaciological studies in the Arctic

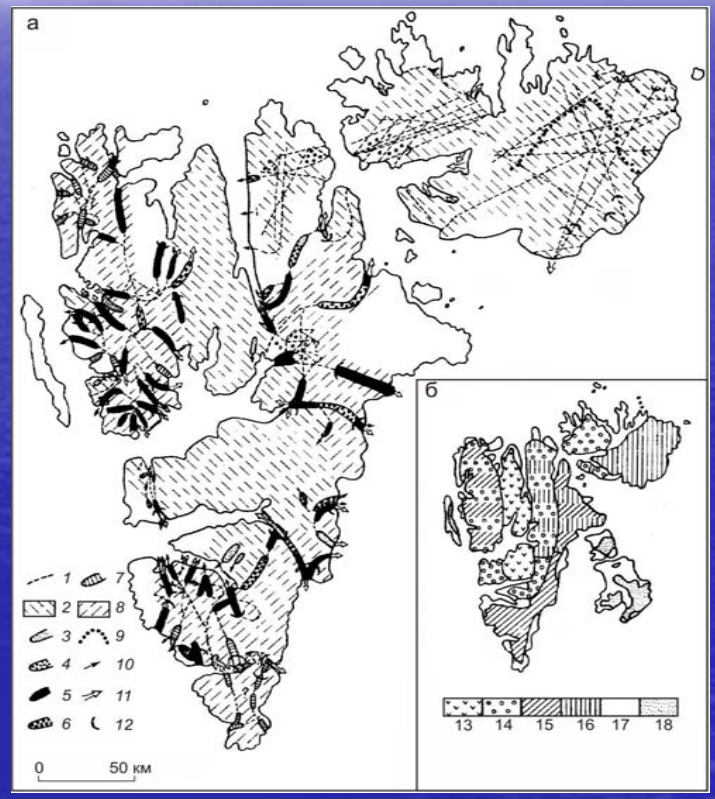


Airborne radio-echo sounding on Svalbard

RES record with IRH:Fridtjovbreen



RES Flights in 1974-1984



Hydrothermal state and dynamics of glaciers:

-Cold glaciers

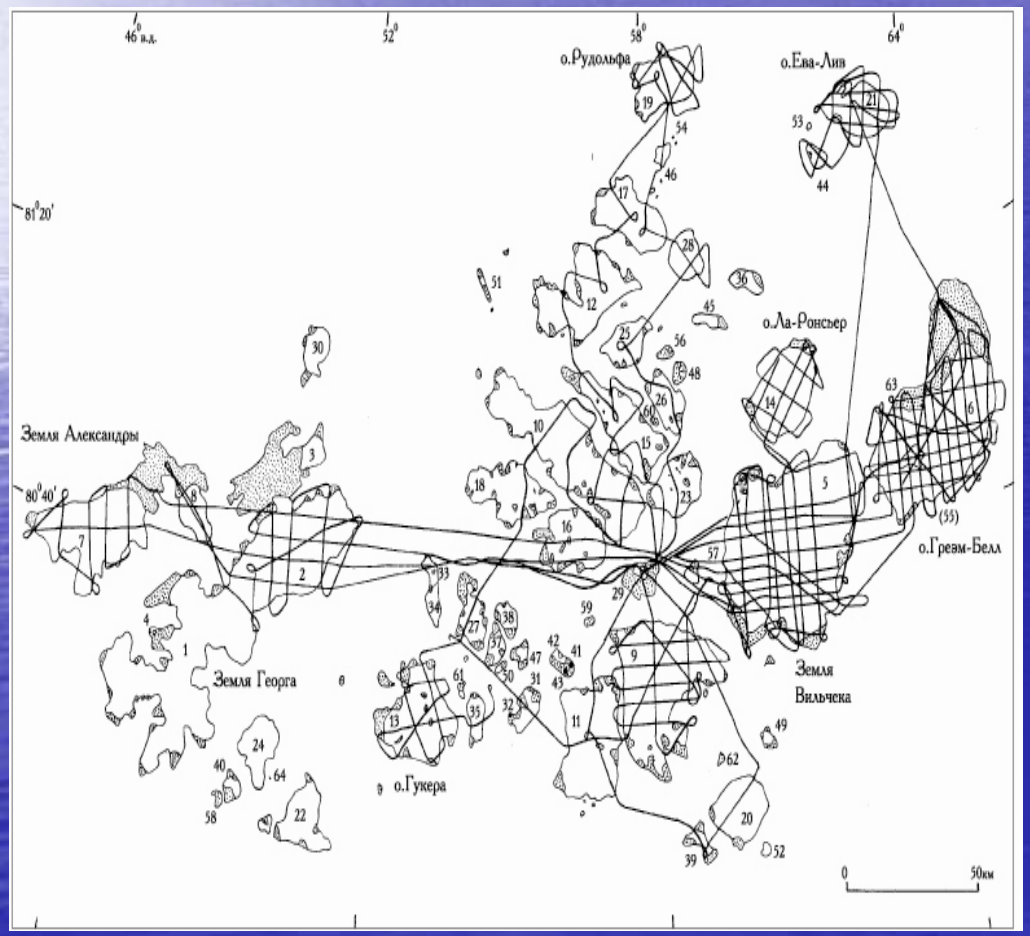
-Polythermal glaciers

-Surge-type glaciers

-Glaciers with icings and winter englacial runoff

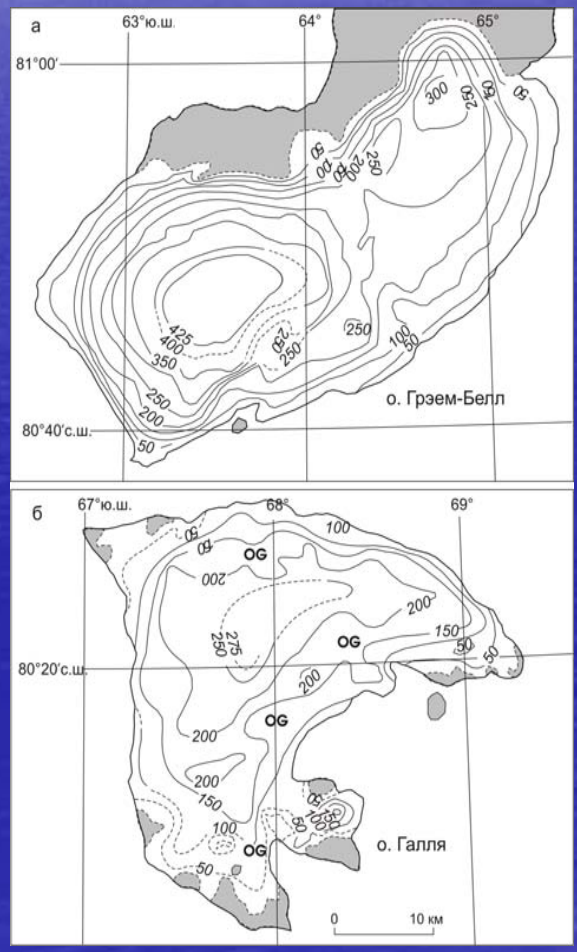
Airborne radio-echo sounding on Franz Josef Land

RES Flight in 1994



Ice thickness maps:

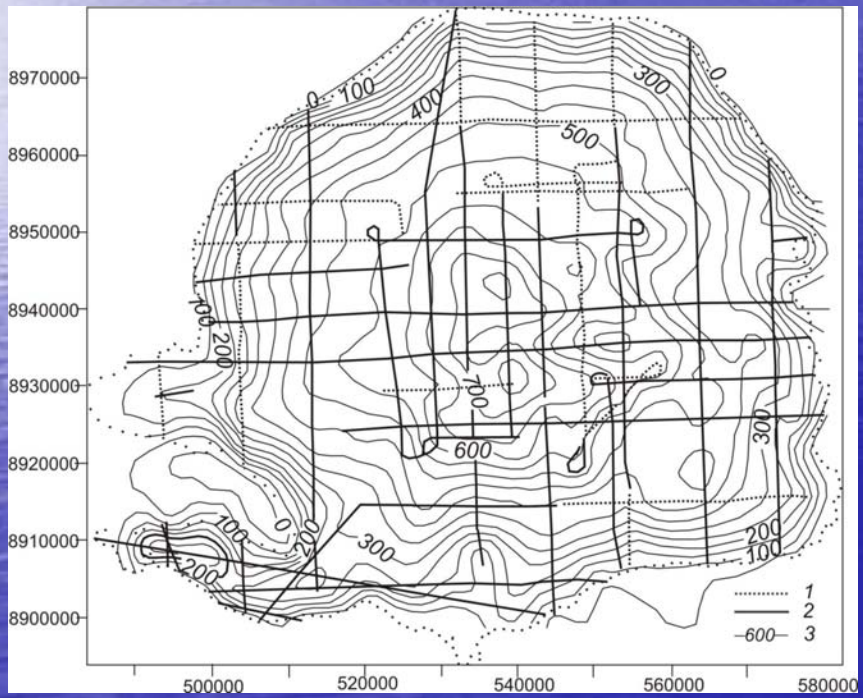
Graham Bell Island



Airborne radio-echo sounding on Severnaya Zemlya

Academy of Sciences:

ice thickness

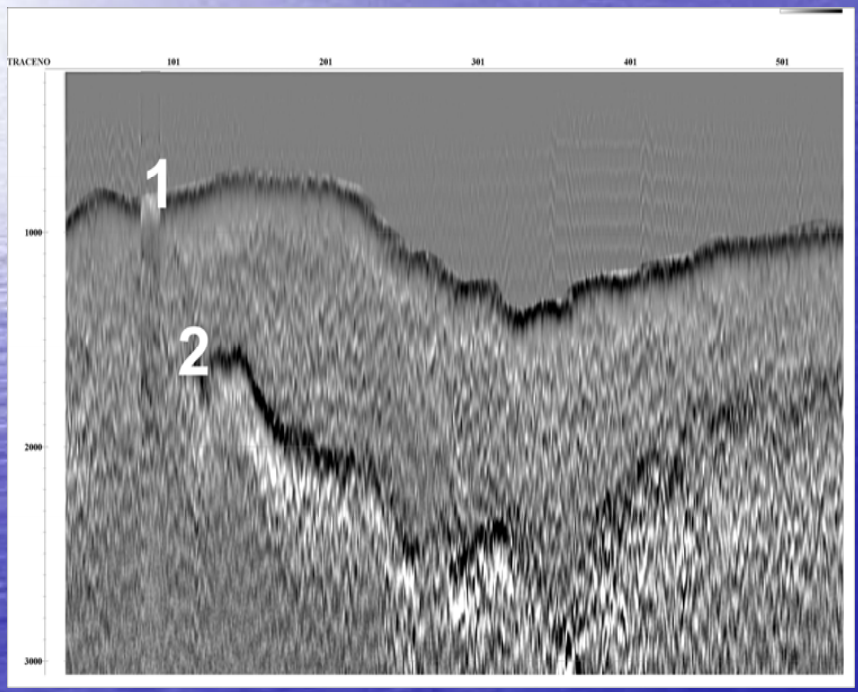


RES flights in 1997

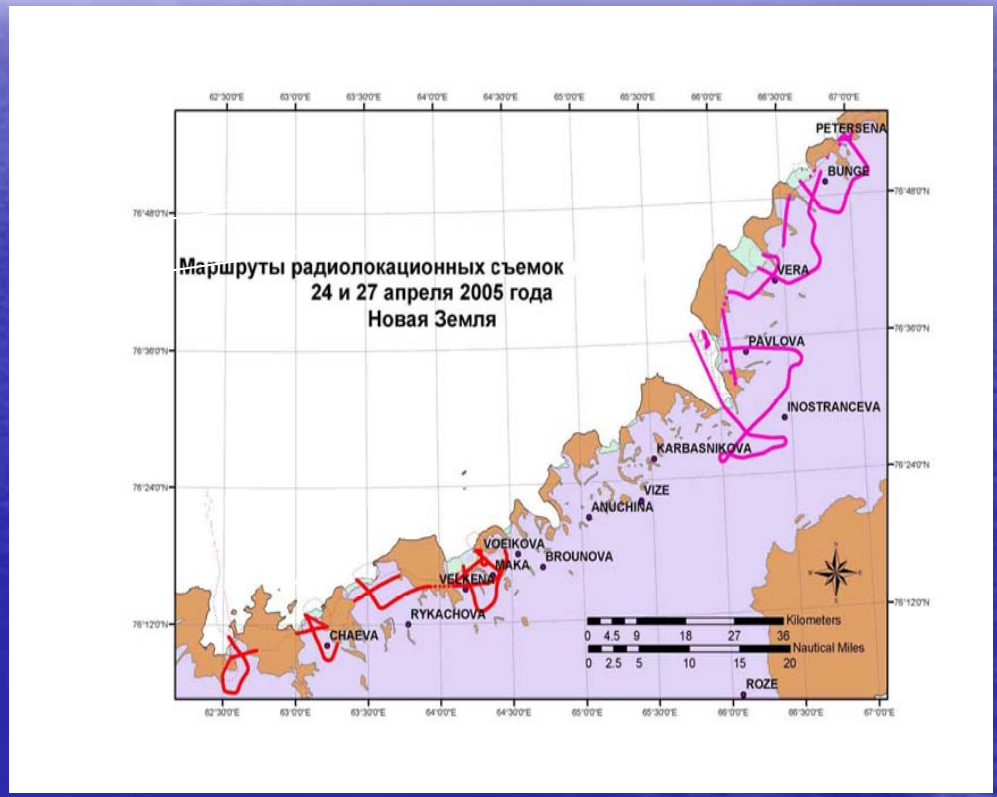
Airborne radio-echo sounding on Novaya Zemlya

RES record: 1- surface

2-bedrock



RES flights in 2005



Radar equipment

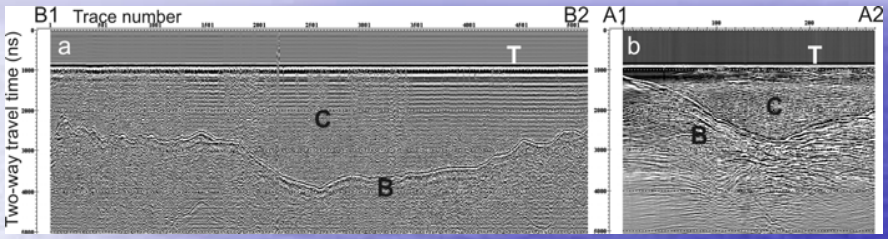
RLS-620

DRS

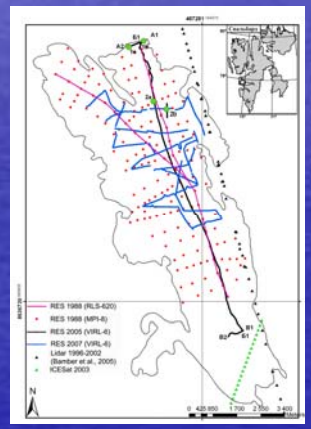
VIRL-6

Some results from Svalbard glaciers: Fridtjovbreen

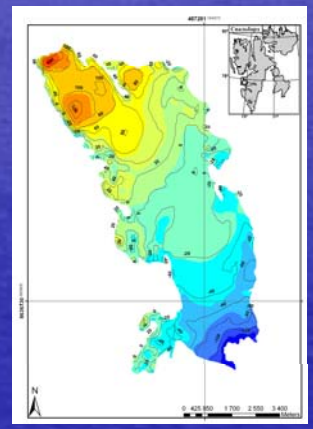
Radar records



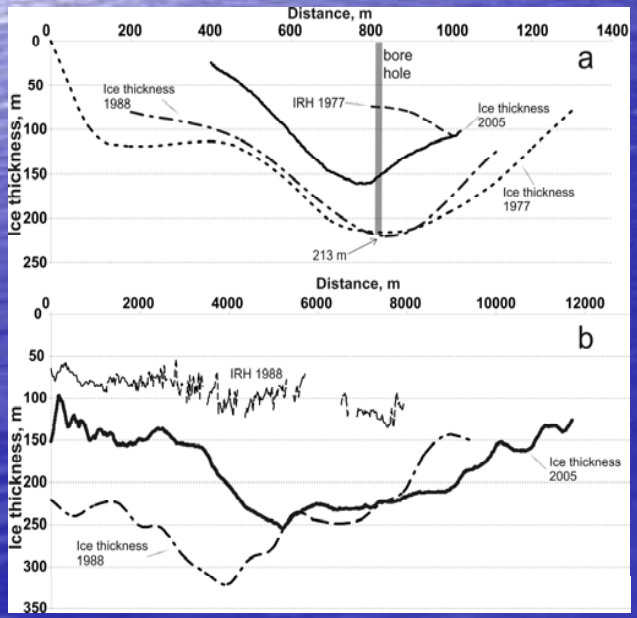
RES studies



Ice thickness changes, 1988-2007

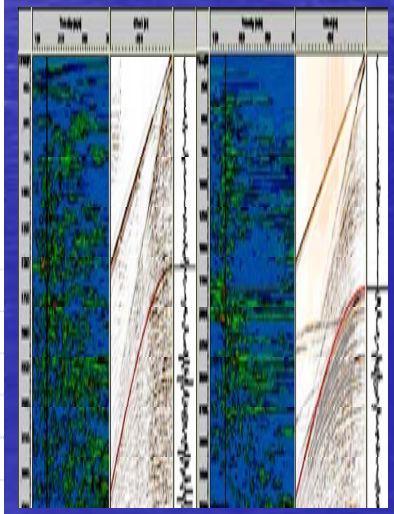


Changes in ice thickness and internal structure, 1977-2005

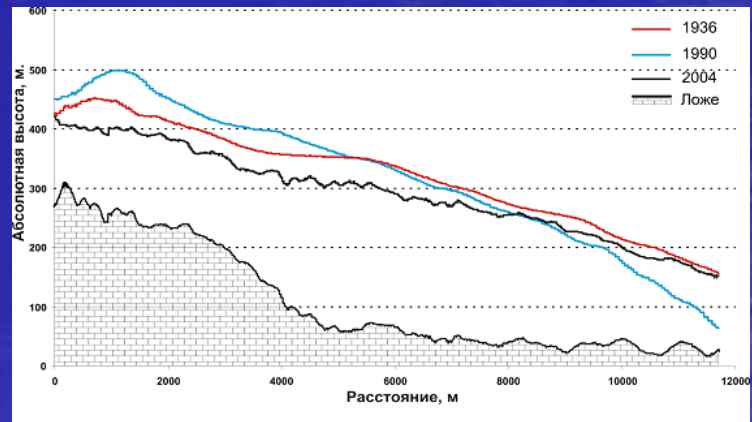


CMP measurements:

Radio wave velocity



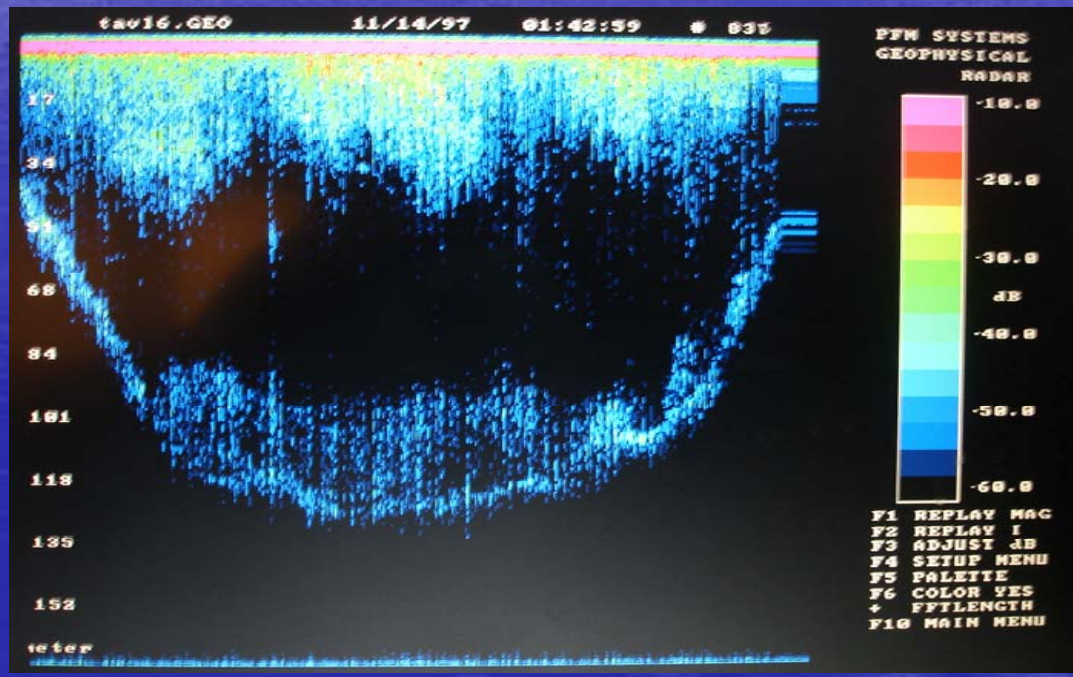
Glacier surface elevation changes, 1990-2004



Some results from Svalbard glaciers:Tavlebreen

RES profiles, 2006

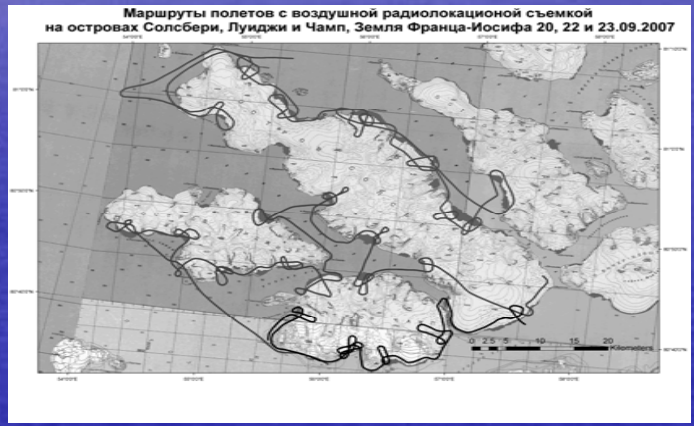
RES record: cold and temperate ice, 2006



Ice calving from outlet glaciers and ice caps to Arctic seas

Airnborne RES from vessel “Michael Somov”

RES flights on Franz Josef Land, 2007



Potential iceberg calving