REPORT GD-4 PART 2

ISSN 0149-1776

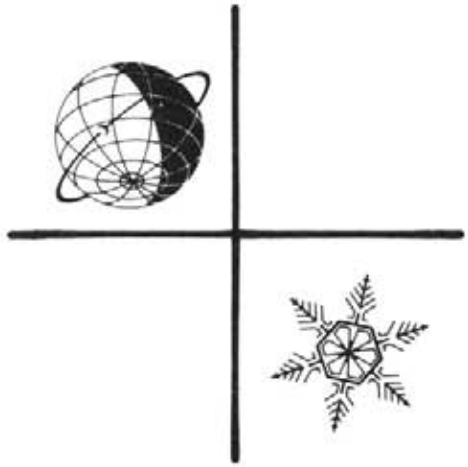
GLACIOLOGICAL DATA

this issue:

GLACIOLOGICAL FIELD STATIONS

PART 2

World Data Center A
for
Glaciology
Snow and Ice



FEBRUARY 1979

WORLD DATA CENTER A
National Academy of Sciences
2101 Constitution Avenue, N.W.
Washington, D.C., U.S.A., 20418

World Data Center A consists of the Coordination Office

and seven Subcenters:

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[Telephone: (202) 389-6478]

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World Data Center A: Glaciology
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Inst. of Arctic & Alpine Research
University of Colorado
Boulder, Colorado, U.S.A. 80309
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Meteorology (and Nuclear Radiation):

World Data Center A: Meteorology
National Climatic Center
Federal Building
Asheville, North Carolina, U.S.A. 28801
[Telephone: (704) 258-2850]

Oceanography:

World Data Center A: Oceanography
National Oceanic and Atmospheric
Administration
Washington, D.C., U.S.A. 20235
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Rockets and Satellites:

World Data Center A: Rockets and
Satellites
Goddard Space Flight Center
Code 601
Greenbelt, Maryland, U.S.A. 20771
[Telephone: (301) 982-6695]

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World Data Center A: Rotation
of the Earth
U.S. Naval Observatory
Washington, D.C., U.S.A. 20390
[Telephone: (202) 254-4023]

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World Data Center A
for Solar-Terrestrial Physics
Environmental Data and Information
Service, NOAA
Boulder, Colorado, U.S.A. 80303
[Telephone: (303) 499-1000, Ext. 6467]

Solid-Earth Geophysics (Seismology, Tsunamis, Gravimetry, Earth Tides, Recent Movements of the Earth's Crust, Magnetic Measurements, Paleomagnetism and Archeomagnetism, Volcanology, Geothermics):

World Data Center A
for Solid-Earth Geophysics
Environmental Data and Information
Service, NOAA
Boulder, Colorado, U.S.A. 80303
[Telephone: (303) 499-1000, Ext. 6521]

NOTES:

1. World Data Centers conduct international exchange of geophysical observations in accordance with the principles set forth by the International Council of Scientific Unions. WDC-A is established in the United States under the auspices of the National Academy of Sciences.
2. Communications regarding data interchange matters in general and World Data Center A as a whole should be addressed to: World Data Center A, Coordination Office (see address above).
3. Inquiries and communications concerning data in specific disciplines should be addressed to the appropriate subcenter listed above.

REPORT GD-4

GLACIOLOGICAL FIELD STATIONS

PART 2

Compiled by
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Institut de Geographie Alpine
Rue Maurice Gignoux
38031 Cedex, Grenoble
France

FEBRUARY 1979

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
Environmental Data and Information Service
Boulder, Colorado 80303 U.S.A.

FOREWORD

Information on data collection activities in glaciological science is a necessary complement to data sets themselves and to published results based on data interpretation. This issue marks a first effort by the Data Center to assemble such information for glaciological field stations. The questionnaire was developed by Professor Robert Vivian, Director of the Institut de Géographie Alpine, Université de Grenoble, during his stay as visiting scientist with the WDC in 1977, and he undertook subsequently to collate and summarize the results. While the lists are undoubtedly not exhaustive, we believe that they provide a useful interim guide to facilities and organizations involved in field research relating to glaciers and ice caps. At a later date it may be desirable to publish a supplement with additions and corrections.

It is currently planned that Glaciological Data number 5 will contain results of a WDC Workshop on Snow Cover and Sea Ice Mapping and Glaciological Data number 6, a survey of related map products. The planned issue on snow cover, including a bibliography, has been delayed due to staffing problems relating to computer data entry of bibliographic items. This issue is now scheduled to appear as number 7.

Roger G. Barry
Director
World Data Center A for Glaciology
(Snow and Ice)

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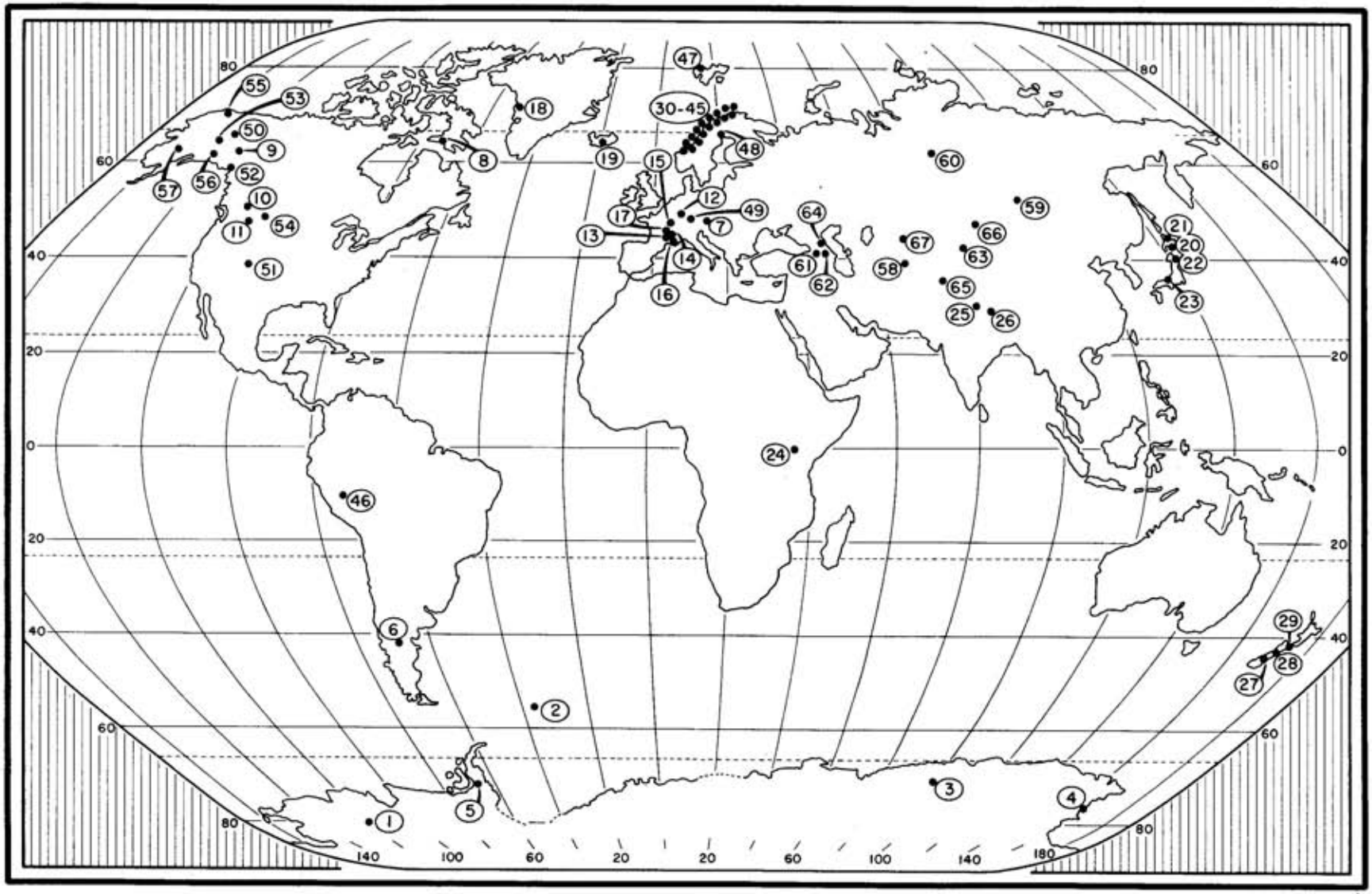
PART 1

PART 2

GLACIOLOGICAL FIELD STATIONS



KEY TO MAP

1. Antarctica - Byrd Station
2. Antarctica - Hodges Glacier Hut
3. Antarctica - Mawson, Casey Stations
4. Antarctica - Scott Base, Vanda Station
5. Antarctica - Spartan Glacier Station
6. Argentina - Mascardi-Tronador Station
7. Austria - Station Hintereis
8. Canada - Gee Lake Station
9. Canada - Icefield Ranges Research Project
10. Canada - Peyto Glacier Station
11. Canada - Wedgemount Lake
12. France - Argentière (Mt. Blanc)
13. France - Centre d'Etudes Nucleaires de Grenoble
14. France - Centre Technique du Génie Rural, des Eaux et des Forêts
15. France - Chalet Clos de l'Ours, Laboratoire de Cosmique, Observatoire Vallot, Cabane Tacul
16. France - Chambeyron, Fouillouse
17. France - Val Thorens-Chavière
18. Greenland - Scottish Universities Research Hut
19. Iceland - Satellite Monitoring of Changes of Glaciers of Iceland
20. Japan - Moshiri
21. Japan - Toikanbetsu
22. Japan - Tomakomai
23. Japan - Tsurugisawa-goya
24. Kenya - Alliance
25. Nepal - Hidden Valley
26. Nepal - Lhajung
27. New Zealand - Carrick
28. New Zealand - Dart Glacier Hut
29. New Zealand - Ivory Glacier Hut
30. Norway - Ålfoten
31. Norway - Blåisen
32. Norway - Cainhavarre
33. Norway - Engabreen

34. Norway - Erdalsbreen
35. Norway - Folgefonni
36. Norway - Gråsubreen
37. Norway - Hellstugubreen
38. Norway - Høgtuvbreen
39. Norway - Nigardsbreen
40. Norway - Okstindsjøen Station
41. Norway - Østre Memurūbre
42. Norway - Storsteinsfjell
43. Norway - Trollbergdalsbreen
44. Norway - Tūnsbergdalsbreen
45. Norway - Vesledalsbreen
46. Peru - Quelccaya
47. Spitsbergen - Forskningsstasjonen på Svalbard
48. Sweden - Tarfala Research Station
49. Switzerland - Eidgenössische Institut für Schnee- und Lawinenforschung
50. USA - Gulkana Glacier
51. USA - Institute of Arctic and Alpine Research
52. USA - Juneau Icefield Research Program (JIRP) Stations
53. USA - Mt. Wrangell
54. USA - Sperry Chalet Field Project
55. USA - University of Buffalo Brooks Range Camp
56. USA - Variegated Glacier
57. USA - Wolverine Glacier
58. USSR - Abramov Glacier
59. USSR - Aktru glaciers
60. USSR - Bol'shaya Khadata, Obruchev and IGAN Glaciers
61. USSR - Dzhankuat Glacier
62. USSR - Gergeti Glacier
63. USSR - Karabatkak Glacier
64. USSR - Marukh Glacier
65. USSR - Medvezhy Glacier
66. USSR - Shumsky Glacier
67. USSR - Zentralnyi Tuyuksu Glacier

NORWAY

Questionnaires are included for the following glaciers:

Blåisen	Storsteinsfjell	Høgtuvbreen
Trollbergdalsbreen	Engabreen	Cainhavarrebreen
Østre Memurubre	Hellstugubreen	Folgefonni
Ålfotbreen	Vesledalsbreen	Erdalsbreen
Tunsbergdalsbreen	Nigardsbreen	Gråsubreen

The upper six glaciers are situated in northern Norway; the rest, in southern Norway. Glacier maps, and in some cases a sketch map showing triangulation points, are available for all glaciers except Blåisen. It should be noted that Erdalsbreen is portrayed on the map named Vesledalsbreen/Erdalsbreen.

We have built small A-frame houses at all of these glaciers. These huts are in some cases given special names, and are mentioned on the questionnaires; however, the names are not officially approved. They are only nicknames given to the huts by the student assistants. It might be more correct to name the station after the glacier's name.

Many of the observation stations are no longer in use, but observation records from various places are, of course, kept for those years when the stations were manned - in most cases a 5-year period. The observation stations at Nigardsbreen (southern Norway) and Engabreen (northern Norway) are still in operation, and mass balance investigations are continuously made at Ålfotbreen, Folgefonni, Hellstugubreen, and Gråsubreen. The latter glaciers are situated in southern Norway.

In addition to these stations, I should mention that Olav Liestøl, working with Norsk Polarinstitutt, has a research station at Storbreen.

Gunnar Østrem

NORWAY

ÅLFOTEN

A. GEOGRAPHICAL LOCATION.

1) Country Norway
2) Name of station Ålfoten
3) Locality Nordfjord
4) Latitude: 61° 45' Longitude: 5° 40' Elevation(m) 905
5) Mountain range Ålfoten
6) Drainage basin Åskåra
7) Name of director G. Østrem
8) Name of parent organization Glaciological Section

Address NVE
Box 5091
Mj. Oslo 3 Norway
Telephone number 02 469800

9) Date of establishment of the station 1963
10) Distance from the end of the road (in kilometers or hours of walking)
4 hours
Other means of access: planes, float planes, helicopter, boat, etc.

Boarding point

11) Distance between the station and the glaciers studied
100 m

Map: Alfotbreen (Nordfjord, Norway), 1:10,000, Norges Vassdrags- og Elektrisitetsvesen Hydrologisk Avd., Norway, 1969.

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 1
a) Total floor space 12 m^2
b) Details: e.g. Laboratories
Dormitories
Number of beds 2
Kitchens, dining rooms
Workshops

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology 1
   b) Snow studies 1
   c) Hydrology 2
   d) Climatology 3
   e) Geophysics
   f) Geomorphology
   g) Botany, biology
   h) Quaternary history

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record 1963
2) Yearly utilization period 4 months
3) Type of utilization (teaching, research, level of students involved) measurements
4) Number of researchers: Summer 0 Winter 0
5) Number of technicians: Summer 0 Winter 0
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s) Ålfotbreen/362-4
   b) Fluctuations (terminal position, surface, mass balance) 0
   c) Dynamics, movement P
   d) Studies of surface
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing
2) Snow study:
   a) Snow cover 0
   b) Avalanches
3) Hydrology:
   a) Discharges 0
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology

4) Climatology:
   a) Proximity to glacier
   b) Parameters temperature, precipitation, humidity, wind, radiation
5) Geophysics:
   a) Radio-echo sounding method
   b) Magnetic surveys; electromagnetism
6) Earth science (including area surrounding station)
   a) Geology
   b) Tectonics
   c) Glacial geomorphology
7) Botany - biology (including area surrounding station)
   a) Pollen analysis
   b) Micro bacterial fauna
   c) Flora
   d) Fossil woods (C^{14} dating)
   e) Timberline
   f) Lichenometry
8) Quaternary history:

E. DATA AVAILABILITY.

1) Tabulations
   Published reports annual reports from NVE
   Unpublished reports
2) Data files (tape, cards, satellite transmissions)
3) Address from which data are available
   Hydrological Division, NVE
   Box 5091, Mj. Oslo 3 Norway
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST). Glasiologiske undersøkelser i Norge (annual reports)

G. OTHER COMMENTS.

NORWAY

BLÅISEN

A. GEOGRAPHICAL LOCATION.

1) Country Norway
2) Name of station Blåisen
3) Locality Northern Norway
4) Latitude: 68° 21' N Longitude: 17° 52' E Elevation(m) 850
5) Mountain range Skjomen
6) Drainage basin Sildvikelv
7) Name of director G. Østrem
8) Name of parent organization Glaciological Section

Address NVE
Box 5091
Mj. Oslo 3, Norway
Telephone number 02 469800

9) Date of establishment of the station 1963
10) Distance from the end of the road (in kilometers or hours of walking)
5 hours
Other means of access: planes, float planes, helicopter, boat, etc.
Boarding point
11) Distance between the station and the glaciers studied 300 m

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 1
a) Total floor space 12 m^2
b) Details: e.g. Laboratories
Dormitories
Number of beds 2
Kitchens, dining rooms
Workshops

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology 1
   b) Snow studies 1
   c) Hydrology
   d) Climatology
   e) Geophysics
   f) Geomorphology
   g) Botany, biology
   h) Quaternary history

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record 1963-68
2) Yearly utilization period 6-9days
3) Type of utilization (teaching, research, level of students involved) measurements
4) Number of researchers: Summer 0 Winter 0
5) Number of technicians: Summer 0 Winter 0
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s) Blåisen/742-11
   b) Fluctuations (terminal position, surface, mass balance) P
   c) Dynamics, movement
   d) Studies of surface
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing
2) Snow study:
   a) Snow cover P
   b) Avalanches
3) Hydrology:
   a) Discharges
   b) Ice cover percentege
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology

4) Climatology:
   a) Proximity to glacier
   b) Parameters
5) Geophysics:
   a) Radio-echo sounding method
   b) Magnetic surveys; electromagnetism
6) Earth science (including area surrounding station)
   a) Geology
   b) Tectonics
   c) Glacial geomorphology
7) Botany - biology (including area surrounding station)
   a) Pollen analysis
   b) Micro bacterial fauna
   c) Flora
   d) Fossil woods (C^{14} dating)
   e) Timberline
   f) Lichenometry
8) Quaternary history:

E. DATA AVAILABILITY.

1) Tabulations
   Published reports annual reports from NVE
   Unpublished reports
2) Data files (tape, cards, satellite transmissions)
3) Address from which data are available
   Hydrological Division, NVE
   Box 5091, Mj. Oslo 3, Norway
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST). Glasiologiske undersøkelser i Norge (annual reports)

G. OTHER COMMENTS.

NORWAY

CAINHAVARRE

A. GEOGRAPHICAL LOCATION.

1) Country Norway
2) Name of station Cainhavarre
3) Locality Northern Norway
4) Latitude: 68° 06' Longitude: 18° 01' Elevation(m) 980
5) Mountain range Skjomen
6) Drainage basin Elvegårdselv
7) Name of director G. Østrem
8) Name of parent organization Glaciological Section

Address NVE
Box 5091
Mj. Oslo 3, Norway
Telephone number 02 469800

9) Date of establishment of the station 1964
10) Distance from the end of the road (in kilometers or hours of walking)
3 hours
Other means of access: planes, float planes, helicopter, boat, etc.
Boarding point
11) Distance between the station and the glaciers studied 1200 m

Map: Cainhavarre-breen, 1:10,000, Norges Vassdrags- og Elektrisitetsvesen Hydrologisk, Avd., Norway, 1967.

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 1
a) Total floor space 12 m^2
b) Details: e.g. Laboratories
Dormitories
Number of beds 2
Kitchens, dining rooms
Workshops

Cold rooms_____
Generator source_____

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology 1
   b) Snow studies 1
   c) Hydrology
   d) Climatology
   e) Geophysics
   f) Geomorphology
   g) Botany, biology
   h) Quaternary history

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record 1964-68
2) Yearly utilization period 1 week
3) Type of utilization (teaching, research, level of students involved) measurements
4) Number of researchers: Summer 0 Winter 0
5) Number of technicians: Summer 0 Winter 0
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s) Cainhavarre / 738-34
   b) Fluctuations (terminal position, surface, mass balance) P
   c) Dynamics, movement
   d) Studies of surface
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing
2) Snow study:
   a) Snow cover P
   b) Avalanches
3) Hydrology:
   a) Discharges
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology

4) Climatology:
   a) Proximity to glacier
   b) Parameters
5) Geophysics:
   a) Radio-echo sounding method
   b) Magnetic surveys; electromagnetism
6) Earth science (including area surrounding station)
   a) Geology
   b) Tectonics
   c) Glacial geomorphology
7) Botany - biology (including area surrounding station)
   a) Pollen analysis
   b) Micro bacterial fauna
   c) Flora
   d) Fossil woods (C^{14} dating)
   e) Timberline
   f) Lichenometry
8) Quaternary history:

E. DATA AVAILABILITY.

1) Tabulations
   Published reports annual reports from NVE
   Unpublished reports
2) Data files (tape, cards, satellite transmissions)
3) Address from which data are available
   Hydrological Division, NVE
   Box 5091, Mj. Oslo 3, Norway
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST). Glasiologiske undersøkelser i Norge (annual reports)

G. OTHER COMMENTS.

NORWAY

ENGABREEN

A. GEOGRAPHICAL LOCATION.

1) Country Norway
2) Name of station Tåkeheim - (Engabreen)
3) Locality Northern Norway
4) Latitude: 66° 40' N Longitude: 13° 51' E Elevation(m) 619
5) Mountain range Svartisen
6) Drainage basin Holandsfjord
7) Name of director G. Østrem
8) Name of parent organization Glaciological Section

Address NVE
Box 5091
Mj. Oslo 3, Norway
Telephone number 02 469800

9) Date of establishment of the station 1969
10) Distance from the end of the road (in kilometers or hours of walking)
3 hours
Other means of access: planes, float planes, helicopter, boat, etc.

Boarding point

11) Distance between the station and the glaciers studied 60 m

Map: Engabreen (Svartisen, Norway), 1:20,000, Norges Vassdrags- of Elektrisitetsvesen, Hydrologisk Avd., Norway, 1970.

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 2
a) Total floor space 27 m^2
b) Details: e.g. Laboratories
Dormitories
Number of beds 3
Kitchens, dining rooms
Workshops

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology 1
   b) Snow studies 1
   c) Hydrology 2
   d) Climatology 3
   e) Geophysics
   f) Geomorphology
   g) Botany, biology
   h) Quaternary history

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record 1969-
2) Yearly utilization period 2 1/2 months
3) Type of utilization (teaching, research, level of students involved) measurements
4) Number of researchers: Summer 0 Winter 0
5) Number of technicians: Summer 2 Winter 0
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s) Lillebreen/670-10, Engabreen/670-11
   b) Fluctuations (terminal position, surface, mass balance) 0
   c) Dynamics, movement 0
   d) Studies of surface
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing
2) Snow study:
   a) Snow cover 0
   b) Avalanches
3) Hydrology:
   a) Discharges 0
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology 0
   f) Sediment transport 0

4) Climatology:
   a) Proximity to glacier
   b) Parameters precipitation, temperature, wind, humidity, cloudiness
5) Geophysics:
   a) Radio-echo sounding method
   b) Magnetic surveys; electromagnetism
6) Earth science (including area surrounding station)
   a) Geology
   b) Tectonics
   c) Glacial geomorphology
7) Botany - biology (including area surrounding station)
   a) Pollen analysis
   b) Micro bacterial fauna
   c) Flora
   d) Fossil woods (C^{14} dating)
   e) Timberline
   f) Lichenometry
8) Quaternary history:

E. DATA AVAILABILITY.

1) Tabulations
   Published reports Annual reports from NVE
   Unpublished reports
2) Data files (tape, cards, satellite transmissions)
3) Address from which data are available
   Hydrological Division, NVE
   Box 5091, Mj. Oslo 3 Norway
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST). Glasiologiske undersøkelser i Norge; Materialtransportundersøkelser i norske breewer (annual reports)

G. OTHER COMMENTS.

NORWAY

ERDALSBREEN

A. GEOGRAPHICAL LOCATION.

1) Country Norway
2) Name of station Erdalsbreen
3) Locality Western Norway
4) Latitude: 61° 49' N Longitude: 7° 16' E Elevation(m) 900
5) Mountain range Fostedalsbreen Icecap
6) Drainage basin Stryn
7) Name of director G. Østrem
8) Name of parent organization Glaciological Section

Address NVE
Box 5091
Mj. Oslo 3, Norway
Telephone number 02.469800

9) Date of establishment of the station 1967
10) Distance from the end of the road (in kilometers or hours of walking)
2 1/2-3 hours
Other means of access: planes, float planes, helicopter, boat, etc.

Boarding point

11) Distance between the station and the glaciers studied 150 m

Map: Erdalsbreen- Vesledalsbreen (Part of Jostedalsbreen, Norway), 1:20,000, Norges Vassdrags- og Elektrisitetsvesen, Hydrologisk Avd., Norway, 1967.

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 1
a) Total floor space 12 m^2
b) Details: e.g. Laboratories
Dormitories
Number of beds 2
Kitchens, dining rooms
Workshops

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology 3
   b) Snow studies
   c) Hydrology 1
   d) Climatology 2
   e) Geophysics
   f) Geomorphology
   g) Botany, biology
   h) Quaternary history

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record 1967-73
2) Yearly utilization period 12-15 weeks
3) Type of utilization (teaching, research, level of students involved) measurements
4) Number of researchers: Summer 0 Winter 0
5) Number of technicians: Summer 1 Winter 0
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s) Erdalsbreen / 373-34
   b) Fluctuations (terminal position, surface, mass balance)
   c) Dynamics, movement P
   d) Studies of surface
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing
2) Snow study:
   a) Snow cover
   b) Avalanches
3) Hydrology:
   a) Discharges P
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology
   f) Sediment transport P

4) Climatology:
   a) Proximity to glacier
   b) Parameters temperature, cloudiness, precipitation, wind
5) Geophysics:
   a) Radio-echo sounding method
   b) Magnetic surveys; electromagnetism
6) Earth science (including area surrounding station)
   a) Geology
   b) Tectonics
   c) Glacial geomorphology
7) Botany - biology (including area surrounding station)
   a) Pollen analysis
   b) Micro bacterial fauna
   c) Flora
   d) Fossil woods (C^{14} dating)
   e) Timberline
   f) Lichenometry
8) Quaternary history:

E. DATA AVAILABILITY.

1) Tabulations
   Published reports annual reports from NVE
   Unpublished reports
2) Data files (tape, cards, satellite transmissions)
3) Address from which data are available
   Hydrological Division, NVE
   Box 5091, Mj. Oslo 3, Norway
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST).

Glasiologiske undersøkelser i Norge ;
Materialtransportundersøkelser i norske breewer
(annual reports)

G. OTHER COMMENTS.

NORWAY

FOLGEFONNI

A. GEOGRAPHICAL LOCATION.

1) Country Norway
2) Name of station Holmaskjeri (Folgefonni)
3) Locality Hardauger
4) Latitude: 60° 06' N Longitude: 6° 24' E Elevation(m)
5) Mountain range Folgefonni
6) Drainage basin Øverhus
7) Name of director G. Østrem
8) Name of parent organization Glaciological Section

Address NVE
Box 5091
Mj. Oslo 3 Norway
Telephone number 02 469800

9) Date of establishment of the station 1963
10) Distance from the end of the road (in kilometers or hours of walking)
2 1/2 hours
Other means of access: planes, float planes, helicopter, boat, etc.

Boarding point

11) Distance between the station and the glaciers studied 50 m

Map: Part of Folgefonni, 1:10,000, Norges Vassdrags- og Elektrisitetsvesen, 1964.

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 2
a) Total floor space 21 m^2
b) Details: e.g. Laboratories
Dormitories
Number of beds 2
Kitchens, dining rooms
Workshops

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology 1
   b) Snow studies
   c) Hydrology
   d) Climatology 2
   e) Geophysics
   f) Geomorphology
   g) Botany, biology
   h) Quaternary history

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record 1963-
2) Yearly utilization period 2 1/2 months
3) Type of utilization (teaching, research, level of students involved) measurements
4) Number of researchers: Summer 0 Winter 0
5) Number of technicians: Summer 2 Winter 0
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s) Bondhusbreen /204-8, Gråbreen /205-1 and Blåbreen /210-26
   b) Fluctuations (terminal position, surface, mass balance) P
   c) Dynamics, movement P
   d) Studies of surface
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing
2) Snow study:
   a) Snow cover P
   b) Avalanches
3) Hydrology:
   a) Discharges
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology
   f) Sediment transport P

4) Climatology:
   a) Proximity to glacier
   b) Parameters temperature, humidity, precipitation, wind, cloudiness
5) Geophysics:
   a) Radio-echo sounding method
   b) Magnetic surveys; electromagnetism
6) Earth science (including area surrounding station)
   a) Geology
   b) Tectonics
   c) Glacial geomorphology
7) Botany - biology (including area surrounding station)
   a) Pollen analysis
   b) Micro bacterial fauna
   c) Flora
   d) Fossil woods (C^{14} dating)
   e) Timberline
   f) Lichenometry
8) Quaternary history:

E. DATA AVAILABILITY.

1) Tabulations
   Published reports annual reports from NVE
   Unpublished reports
2) Data files (tape, cards, satellite transmissions)
3) Address from which data are available
   Hydrological Division, NVE
   Box 5091 Mj. Oslo 3, Norway
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST). Glasiologiske undersøkelser i Norge (annual reports)

G. OTHER COMMENTS.

NORWAY

GRÅSUBREEN

A. GEOGRAPHICAL LOCATION.

1) Country Norway
2) Name of station Gråsubreen
3) Locality South Norway
4) Latitude: 61° 40' N Longitude: 8° 36' E Elevation(m) 2100
5) Mountain range Fotunheimen
6) Drainage basin Sjoa
7) Name of director G. Østrem
8) Name of parent organization Glaciological Section

Address NVE
Box 5091, Mj. Oslo 3, Norway

Telephone number 02 469800

9) Date of establishment of the station 1961
10) Distance from the end of the road (in kilometers or hours of walking)
2 hours
Other means of access: planes, float planes, helicopter, boat, etc.

Boarding point

11) Distance between the station and the glaciers studied
200 m

Map: Gråsubreen, Jotunheimen, Norway, 1:10,000, Norges Vassdrags- og Elektrisitetsvesen, Hydrologisk Avd., Norway, 1968.

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 1
a) Total floor space 12 m^2
b) Details: e.g. Laboratories
Dormitories
Number of beds 2
Kitchens, dining rooms
Workshops

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology 1
   b) Snow studies 1
   c) Hydrology
   d) Climatology
   e) Geophysics
   f) Geomorphology
   g) Botany, biology
   h) Quaternary history

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record 1961 -
2) Yearly utilization period 5-8 days
3) Type of utilization (teaching, research, level of students involved) measurements
4) Number of researchers: Summer 0 Winter 0
5) Number of technicians: Summer 0 Winter 0
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s) Gråsubreen/Sjoa 5/ 47
   b) Fluctuations (terminal position, surface, mass balance) 0
   c) Dynamics, movement P
   d) Studies of surface
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing
2) Snow study:
   a) Snow cover 0
   b) Avalanches
3) Hydrology:
   a) Discharges
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology

4) Climatology:
   a) Proximity to glacier
   b) Parameters
5) Geophysics:
   a) Radio-echo sounding method P
   b) Magnetic surveys; electromagnetism
6) Earth science (including area surrounding station)
   a) Geology
   b) Tectonics
   c) Glacial geomorphology
7) Botany - biology (including area surrounding station)
   a) Pollen analysis
   b) Micro bacterial fauna
   c) Flora
   d) Fossil woods (C^{14} dating)
   e) Timberline
   f) Lichenometry
8) Quaternary history:

E. DATA AVAILABILITY.

1) Tabulations
   Published reports Annual reports from NVE
   Unpublished reports
2) Data files (tape, cards, satellite transmissions)
3) Address from which data are available
   Hydrological Division, NVE
   Box 5091, Mj. Oslo 3, Norway
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST). Glasiolgiske undersøkelser i Norge (annual reports)

G. OTHER COMMENTS.

NORWAY

HELLSTUGUBREEN

A. GEOGRAPHICAL LOCATION.

1) Country Norway
2) Name of station Tordenfjell (Hellstugubreen)
3) Locality South Norway
4) Latitude: 61° 34' N Longitude: 8° 27' E Elevation(m) 2085
5) Mountain range Fotunheimen
6) Drainage basin Bøvra and Sjoa
7) Name of director G. Østrem
8) Name of parent organization Glaciological section

Address NVE
Box 5091
Mj. Oslo 3, Norway
Telephone number 02 469800

9) Date of establishment of the station 1961
10) Distance from the end of the road (in kilometers or hours of walking)
2 1/2 hours
Other means of access: planes, float planes, helicopter, boat, etc.

Boarding point

11) Distance between the station and the glaciers studied
10 m

Map: Hellstugubreen, Jotunheimen, 1:10,000, Norway.

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 1
a) Total floor space 9 m^2
b) Details: e.g. Laboratories
Dormitories
Number of beds 2
Kitchens, dining rooms
Workshops

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology 1
   b) Snow studies 1
   c) Hydrology
   d) Climatology
   e) Geophysics
   f) Geomorphology
   g) Botany, biology
   h) Quaternary history

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record 1961
2) Yearly utilization period 5-8 days
3) Type of utilization (teaching, research, level of students involved) measurements
4) Number of researchers: Summer 0 Winter 0
5) Number of technicians: Summer 0 Winter 0
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s) Hellstugubreen/Bøvra 5-14 W. Memurūbre/Sjoa 5-31
   b) Fluctuations (terminal position, surface, mass balance) 0
   c) Dynamics, movement P
   d) Studies of surface
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing
2) Snow study:
   a) Snow cover 0
   b) Avalanches
3) Hydrology:
   a) Discharges
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology

4) Climatology:
   a) Proximity to glacier
   b) Parameters
5) Geophysics:
   a) Radio-echo sounding method
   b) Magnetic surveys; electromagnetism
6) Earth science (including area surrounding station)
   a) Geology
   b) Tectonics
   c) Glacial geomorphology
7) Botany - biology (including area surrounding station)
   a) Pollen analysis
   b) Micro bacterial fauna
   c) Flora
   d) Fossil woods (C^{14} dating)
   e) Timberline
   f) Lichenometry
8) Quaternary history:

E. DATA AVAILABILITY.

1) Tabulations
   Published reports Annual reports from NVE
   Unpublished reports
2) Data files (tape, cards, satellite transmissions)
3) Address from which data are available
   Hydrological Division, NVE
   Box 5091, Mj. Oslo 3, Norway
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST). Glasiologiske undersøkelser i Norge (annual reports)

G. OTHER COMMENTS.

NORWAY

HØGTUVBREEN

A. GEOGRAPHICAL LOCATION.

1) Country Norway
2) Name of station Tuvstuggū (Høgtuvbreen)
3) Locality Northern Norway
4) Latitude: _____ Longitude: _____ Elevation(m) _____
5) Mountain range Høgtuva
6) Drainage basin Rana
7) Name of director G. Østrem
8) Name of parent organization Glaciological Section

Address NVE
Box 5091
Mj. Oslo 3, Norway
Telephone number 02 469800

9) Date of establishment of the station 1971
10) Distance from the end of the road (in kilometers or hours of walking)
4 hours
Other means of access: planes, float planes, helicopter, boat, etc. _____
Boarding point _____
11) Distance between the station and the glaciers studied 150 m

Map: Part of Høgtuvbreen, Northern Norway, 1:10,000, Norges Vassdrags- og Elektrisitetsvesen, Hydrologisk Avd., Norway, 1973.

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 1
a) Total floor space 15 m^2
b) Details: e.g. Laboratories _____
Dormitories _____
Number of beds 2
Kitchens, dining rooms _____
Workshops _____

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology 1
   b) Snow studies 1
   c) Hydrology 2
   d) Climatology 3
   e) Geophysics
   f) Geomorphology
   g) Botany, biology
   h) Quaternary history

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record 1971-77
2) Yearly utilization period 2 1/2 months
3) Type of utilization (teaching, research, level of students involved) measurements
4) Number of researchers: Summer 0 Winter 0
5) Number of technicians: Summer 2 Winter 0
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s) Høgtuvbreen / 655-7
   b) Fluctuations (terminal position, surface, mass balance) P
   c) Dynamics, movement P
   d) Studies of surface
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing
2) Snow study:
   a) Snow cover P
   b) Avalanches
3) Hydrology:
   a) Discharges P
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology
   f) Sediment transport P

4) Climatology:
   a) Proximity to glacier
   b) Parameters temperature, precipitation, humidity, wind, cloudiness
5) Geophysics:
   a) Radio-echo sounding method
   b) Magnetic surveys; electromagnetism
6) Earth science (including area surrounding station)
   a) Geology
   b) Tectonics
   c) Glacial geomorphology
7) Botany - biology (including area surrounding station)
   a) Pollen analysis
   b) Micro bacterial fauna
   c) Flora
   d) Fossil woods (C^{14} dating)
   e) Timberline
   f) Lichenometry
8) Quaternary history:

E. DATA AVAILABILITY.

1) Tabulations
   Published reports Annual reports from NVE
   Unpublished reports
2) Data files (tape, cards, satellite transmissions)
3) Address from which data are available
   Hydrological Division, NVE
   Box 5091, Mj. Oslo 3, Norway
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST). Glasiologiske undersøkelser i Norge; Materialtransportundersøkelser i norski breewer (annual reports)

G. OTHER COMMENTS.

NORWAY

NIGARDSBREEN

A. GEOGRAPHICAL LOCATION.

1) Country Norway
2) Name of station Steinmannen (Nigardsbreen)
3) Locality Western Norway
4) Latitude: 61° 36' N Longitude: 7° 03' E Elevation(m) 1633
5) Mountain range Fostedalsbreen Icecap
6) Drainage basin Fostedalen
7) Name of director G. Østrem
8) Name of parent organization Glaciological Section

Address NVE
Box 5091
Mj. Oslo 3, Norway
Telephone number 02-469800

9) Date of establishment of the station 1962
10) Distance from the end of the road (in kilometers or hours of walking)
4 hours
Other means of access: planes, float planes, helicopter, boat, etc.

Boarding point

11) Distance between the station and the glaciers studied 100 m

Map: Nigardsbreen, part of Jostedalsbreen, Southern Norway, 1:20,000, Norges Vassdrags- og Elektrisitetsvesen Hydrologisk Avd., Norway, 1975.

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 2
a) Total floor space 20 m^2
b) Details: e.g. Laboratories
Dormitories
Number of beds
Kitchens, dining rooms 2
Workshops

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology 1
   b) Snow studies 1
   c) Hydrology 2
   d) Climatology 3
   e) Geophysics
   f) Geomorphology
   g) Botany, biology
   h) Quaternary history

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record 1962-
2) Yearly utilization period ca 3 months
3) Type of utilization (teaching, research, level of students involved) research
4) Number of researchers: Summer 0 Winter 0
5) Number of technicians: Summer 2 Winter 0
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s) Nigardsbreen / 310-14
   b) Fluctuations (terminal position, surface, mass balance) 0
   c) Dynamics, movement 0
   d) Studies of surface
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing 0
2) Snow study:
   a) Snow cover 0
   b) Avalanches
3) Hydrology:
   a) Discharges 0
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology 0
   f) Sediment transport 0

4) Climatology:
   a) Proximity to glacier
   b) Parameters precipitation, wind, temperature, humidity, cloudiness, radiation
5) Geophysics:
   a) Radio-echo sounding method
   b) Magnetic surveys; electromagnetism
6) Earth science (including area surrounding station)
   a) Geology
   b) Tectonics
   c) Glacial geomorphology
7) Botany - biology (including area surrounding station)
   a) Pollen analysis
   b) Micro bacterial fauna
   c) Flora
   d) Fossil woods (C^{14} dating)
   e) Timberline
   f) Lichenometry
8) Quaternary history:

E. DATA AVAILABILITY.

1) Tabulations
   Published reports Annual reports from NVE
   Unpublished reports
2) Data files (tape, cards, satellite transmissions)
3) Address from which data are available
   Hydrological Division, NVE
   Box 5091 Mj. Oslo 3
   Norway
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST). Glasiologiske undersøkelser i Norge ; Materialtransportundersøkelser i Norske breewer (annual reports)

G. OTHER COMMENTS.

NORWAY

OKSTINDSJØEN STATION

A. GEOGRAPHICAL LOCATION.

1) Country Norway
2) Name of station Okstindsjøen Field Station
3) Locality Okstindan, Rana, Nordland
4) Latitude: 62° 02' N Longitude: 14° 25' E Elevation(m) 760
5) Mountain range Okstindan
6) Drainage basin Bjerka Elva
7) Name of director Peter Worsley
8) Name of parent organization University of Reading
Okstindan Research Project
Address Department of Geography
The University, Reading RG6 2AB
England
Telephone number 0734-85123
9) Date of establishment of the station 1969
10) Distance from the end of the road (in kilometers or hours of walking)
2 hours
Other means of access: planes, float planes, helicopter, boat, etc.
Helicopter (Umbukta) Float plane (Grasvatn 30 min.)
Boarding point
11) Distance between the station and the glaciers studied
2 km (nearest glacier)

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 1
a) Total floor space 51 m^2
b) Details: e.g. Laboratories
Dormitories 2
Number of beds 8
Kitchens, dining rooms 1
Workshops 1

Cold rooms
Generator source Petrol

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology 4
   b) Snow studies 6
   c) Hydrology 5
   d) Climatology 3
   e) Geophysics 7
   f) Geomorphology 1
   g) Botany, biology 8
   h) Quaternary history 1

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record 1968 to date
2) Yearly utilization period June to September
3) Type of utilization (teaching, research, level of students involved)
   Research 75% teaching 25%
   Graduates & Undergraduates
4) Number of researchers: Summer 6(average) Winter
5) Number of technicians: Summer Winter
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects Department of Geology, Cardiff
   Department of Geography, Durham

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s) Charles Rabots Bre (Røssåga 20) and others
   b) Fluctuations (terminal position, surface, mass balance) O 1968 -
   c) Dynamics, movement P 1971-4 Hambrey
   d) Studies of surface P 1971-4 Hambrey
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type) O Natural caves
   g) Ice Chemistry and physics P-O~~16~~:O~~18~~ Hambrey
   h) Remote sensing
2) Snow study:
   a) Snow cover
   b) Avalanches
3) Hydrology:
   a) Discharges P Cheetham 1974-6
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology O

4) Climatology:
   a) Proximity to glacier
   b) Parameters 0 Radiation balance/energy balance; standard climatological data.
5) Geophysics:
   a) Radio-echo sounding method
   b) Magnetic surveys; electromagnetism
6) Earth science (including area surrounding station)
   a) Geology 0
   b) Tectonics
   c) Glacial geomorphology 0 End moraine genesis:till deposition
7) Botany - biology (including area surrounding station)
   a) Pollen analysis 0
   b) Micro bacterial fauna
   c) Flora 0
   d) Fossil woods (C^{14} dating) 0
   e) Timberline 0
   f) Lichenometry 0 Griffey: Bertie
8) Quaternary history:
   Neoglacial geology, late-glacial deglaciation, land/sea level changes, periglacial processes, soil development, cirque history

E. DATA AVAILABILITY.

1) Tabulations
   Published reports x
   Unpublished reports x
2) Data files (tape, cards, satellite transmissions)
3) Address from which data are available Okstindan Research Project
   Dept. of Geography, University of Reading
   Reading RG6 2AB, England
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST). x

G. OTHER COMMENTS.

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Worsley, P.; Alexander, M.J. (1976) Glacier variations and environmental implications - Neoglacial data from the outermost moraine ridges at Engabreen, north Norway. Geografiska Annaler, v.58A, pp. 55-69.

Staff with long-term interest or commitment (as at January 1978)

University of Reading (Department of Geography)

Peter Worsley, Ph.D. F.G.S.	Quaternary geology, geomorphology
Ian M. Fenwick, M.Sc.	Pedology
Russell D. Thompson, Ph.D.	Climatology
Robert B. Parry, B.A.	Geomorphology

University of Durham (Department of Geography)

Michael J. Alexander, M.Sc.	Pedology

University of Cardiff (Department of Geology)

Charles Harris, Ph.D.	Pedology, periglacial processes

NORWAY
ØSTRE MEMURŪBRE

A. GEOGRAPHICAL LOCATION.

1) Country Norway
2) Name of station Ravnarheim (Østre Memurūbre)
3) Locality South Norway
4) Latitude: 61° 33' N Longitude: 8° 31' E Elevation(m) 1870
5) Mountain range Fotunheimen
6) Drainage basin Sjoa
7) Name of director G. Østrem
8) Name of parent organization Glaciological Section

Address NVE
Box 5091
Mj. Oslo 3, Norway

Telephone number 02 469800

9) Date of establishment of the station 1967
10) Distance from the end of the road (in kilometers or hours of walking)
4 hours

Other means of access: planes, float planes, helicopter, boat, etc.

Boarding point

11) Distance between the station and the glaciers studied 100 m

Map: Austre Memurūbre, Jotunheimen, Norway, 1:10,000, Norges Vassdrags- og Elektrisitetsvesen, Hydrologisk Avd., Norway, 1968.

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 1
a) Total floor space 15 m^2
b) Details: e.g. Laboratories
Dormitories
Number of beds 2
Kitchens, dining rooms
Workshops

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology 1
   b) Snow studies 1
   c) Hydrology 2
   d) Climatology 3
   e) Geophysics
   f) Geomorphology
   g) Botany, biology
   h) Quaternary history

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record 1967-72
2) Yearly utilization period 3 months
3) Type of utilization (teaching, research, level of students involved) measurements
4) Number of researchers: Summer 0 Winter 0
5) Number of technicians: Summer 2 Winter 0
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s) Østre Memurūbre / Sioa 5-33
   b) Fluctuations (terminal position, surface, mass balance) P
   c) Dynamics, movement P
   d) Studies of surface
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing
2) Snow study:
   a) Snow cover P
   b) Avalanches
3) Hydrology:
   a) Discharges P
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology
   f) Sediment transport P

4) Climatology:
   a) Proximity to glacier
   b) Parameters temperature, precipitation, humidity, wind, cloudiness, radiation
5) Geophysics:
   a) Radio-echo sounding method
   b) Magnetic surveys; electromagnetism
6) Earth science (including area surrounding station)
   a) Geology
   b) Tectonics
   c) Glacial geomorphology
7) Botany - biology (including area surrounding station)
   a) Pollen analysis
   b) Micro bacterial fauna
   c) Flora
   d) Fossil woods (C^{14} dating)
   e) Timberline
   f) Lichenometry
8) Quaternary history:

E. DATA AVAILABILITY.

1) Tabulations
   Published reports Annual reports from NVE
   Unpublished reports
2) Data files (tape, cards, satellite transmissions)
3) Address from which data are available
   Hydrological Division, NVE
   Box 5091, Mj. Oslo 3, Norway
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST). Glasiologiske undersøkelser i Norge;
Materialtransportundersøkelser i norske breewer
(annual reports)

G. OTHER COMMENTS.

NORWAY

STORSTEINSFJELL

A. GEOGRAPHICAL LOCATION.

1) Country Norway
2) Name of station Storsteinsfjell
3) Locality Northern Norway
4) Latitude: 68° 13' N Longitude: 17° 55' E Elevation(m) 975
5) Mountain range Storsteinsfjell
6) Drainage basin Elvegårdselv
7) Name of director G. Østrem
8) Name of parent organization Glaciological Section

Address NVE
Box 5091
Mj. Oslo 3, Norway
Telephone number 02 469800

9) Date of establishment of the station 1963
10) Distance from the end of the road (in kilometers or hours of walking)
1 1/2 hours

Other means of access: planes, float planes, helicopter, boat, etc.

Boarding point

11) Distance between the station and the glaciers studied 400 m

Map: Storsteinsfjellbreen, 1:10,000, Norges Vassdrags- og Elektrisitetsvesen, Norway, 1964.

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 3
a) Total floor space ca 30 m^2
b) Details: e.g. Laboratories
Dormitories
Number of beds 4
Kitchens, dining rooms
Workshops

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology 1
   b) Snow studies 1
   c) Hydrology 2
   d) Climatology 3
   e) Geophysics
   f) Geomorphology
   g) Botany, biology
   h) Quaternary history

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record 1963-68
2) Yearly utilization period 2 1/2 months
3) Type of utilization (teaching, research, level of students involved) measurements
4) Number of researchers: Summer 0 Winter 0
5) Number of technicians: Summer 2 Winter 0
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s) Storsteinsfjellbreen/738-11
   b) Fluctuations (terminal position, surface, mass balance) P
   c) Dynamics, movement, P
   d) Studies of surface
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing
2) Snow study:
   a) Snow cover P
   b) Avalanches
3) Hydrology:
   a) Discharges P
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology
   f) Sediment transport P

4) Climatology:
   a) Proximity to glacier
   b) Parameters temperature, cloudiness, wind, precipitation
5) Geophysics:
   a) Radio-echo sounding method
   b) Magnetic surveys; electromagnetism
6) Earth science (including area surrounding station)
   a) Geology
   b) Tectonics
   c) Glacial geomorphology
7) Botany - biology (including area surrounding station)
   a) Pollen analysis
   b) Micro bacterial fauna
   c) Flora
   d) Fossil woods (C^{14} dating)
   e) Timberline
   f) Lichenometry
8) Quaternary history:

E. DATA AVAILABILITY.

1) Tabulations
   Published reports Annual reports from NVE
   Unpublished reports
2) Data files (tape, cards, satellite transmissions)
3) Address from which data are available
   Hydrological Division, NVE
   Box 5091, Mj. Oslo 3, Norway
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST). Glasiologiske undersøkelser i Norge (annual reports)

G. OTHER COMMENTS.

NORWAY

TROLLBERGDALSBREEN

A. GEOGRAPHICAL LOCATION.

1) Country Norway
2) Name of station Versailles (Trollbergdalsbreen)
3) Locality Northern Norway
4) Latitude: 66° 43' N Longitude: 14° 27' E Elevation(m) 950
5) Mountain range Beiarn
6) Drainage basin Beiarelv
7) Name of director G. Østrem
8) Name of parent organization Glaciological Section

Address NVE
Box 5091
Mj. Oslo 3, Norway
Telephone number 02 469800

9) Date of establishment of the station 1969
10) Distance from the end of the road (in kilometers or hours of walking)
3 hours
Other means of access: planes, float planes, helicopter, boat, etc.

Boarding point

11) Distance between the station and the glaciers studied 200 m

Map: Trollbergdalsbreen, Beiarn, Norway.

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 1
a) Total floor space 15 m^2
b) Details: e.g. Laboratories
Dormitories
Number of beds 2
Kitchens, dining rooms
Workshops

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology 1
   b) Snow studies 1
   c) Hydrology 2
   d) Climatology 3
   e) Geophysics
   f) Geomorphology
   g) Botany, biology
   h) Quaternary history

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record 1969-75
2) Yearly utilization period 2 1/2 months
3) Type of utilization (teaching, research, level of students involved) measurements
4) Number of researchers: Summer 0 Winter 0
5) Number of technicians: Summer 2 Winter 0
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s) Trollbergdalsbreen/685-7
   b) Fluctuations (terminal position, surface, mass balance) P
   c) Dynamics, movement P
   d) Studies of surface
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing
2) Snow study:
   a) Snow cover P
   b) Avalanches
3) Hydrology:
   a) Discharges P
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology
   f) Sediment transport P 150

4) Climatology:
   a) Proximity to glacier
   b) Parameters Temperature, humidity, precipitation, wind, cloudiness
5) Geophysics:
   a) Radio-echo sounding method
   b) Magnetic surveys; electromagnetism
6) Earth science (including area surrounding station)
   a) Geology p
   b) Tectonics
   c) Glacial geomorphology
7) Botany - biology (including area surrounding station)
   a) Pollen analysis
   b) Micro bacterial fauna
   c) Flora
   d) Fossil woods (C^{14} dating)
   e) Timberline
   f) Lichenometry
8) Quaternary history:

E. DATA AVAILABILITY.

1) Tabulations
   Published reports Annual reports from NVE
   Unpublished reports
2) Data files (tape, cards, satellite transmissions)
3) Address from which data are available
   Hydrological Division, NVE
   Box 5091, Mj. Oslo 3, Norway
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST). Glasiologiske undersøkelser i Norge;
Materialtransportundersøkelser i norske breewer
(annual reports)

G. OTHER COMMENTS.

NORWAY

TŪNSBERGDALSBREEN

A. GEOGRAPHICAL LOCATION.

1) Country Norway
2) Name of station Tunsbū (Tūnsbergdalsbreen)
3) Locality Western Norway
4) Latitude: 61° 43' N Longitude: 7° 08' E Elevation(m) 1350
5) Mountain range Fostedalsbreen Icecap
6) Drainage basin Fostedalen
7) Name of director G. Østrem
8) Name of parent organization Glaciological Section

Address NVE
Box 5091 Mj. Oslo 3, Norway

Telephone number 02 469800

9) Date of establishment of the station 1966
10) Distance from the end of the road (in kilometers or hours of walking)
3 hours

Other means of access: planes, float planes, helicopter, boat, etc.

Boarding point

11) Distance between the station and the glaciers studied
1000 m

Map: Tunsbergdalsbreen, 1:20,000, Norges Vassdrags- og Elektrisitetsvesen, Norway, 1966.

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 1 2
a) Total floor space 9 m^2
b) Details: e.g. Laboratories
Dormitories
Number of beds 2
Kitchens, dining rooms
Workshops

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology 1
   b) Snow studies
   c) Hydrology 2
   d) Climatology 3
   e) Geophysics
   f) Geomorphology
   g) Botany, biology
   h) Quaternary history

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record 1967-72
2) Yearly utilization period 2 1/2 m
3) Type of utilization (teaching, research, level of students involved) measurements
4) Number of researchers: Summer 0 Winter 0
5) Number of technicians: Summer 2 Winter 0
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s) Vesledalsbreen /373-33
   b) Fluctuations (terminal position, surface, mass balance) P
   c) Dynamics, movement P
   d) Studies of surface
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing
2) Snow study:
   a) Snow cover P
   b) Avalanches
3) Hydrology:
   a) Discharges P
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology P
   f) Sediment transport P

4) Climatology:
   a) Proximity to glacier
   b) Parameters temperature, humidity, wind, cloudiness, precipitation
5) Geophysics:
   a) Radio-echo sounding method
   b) Magnetic surveys; electromagnetism
6) Earth science (including area surrounding station)
   a) Geology
   b) Tectonics
   c) Glacial geomorphology
7) Botany - biology (including area surrounding station)
   a) Pollen analysis
   b) Micro bacterial fauna
   c) Flora
   d) Fossil woods (C^{14} dating)
   e) Timberline
   f) Lichenometry
8) Quaternary history:

E. DATA AVAILABILITY.

1) Tabulations
   Published reports annual reports from NVE
   Unpublished reports
2) Data files (tape, cards, satellite transmissions)
3) Address from which data are available
   Hydrological Division, NVE
   Box 5091, Mj. Oslo 3, Norway
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST). Glasiologiske undersøkelser i Norge;
Materialtransportundersøkelser i norske breewer
(annual reports)

G. OTHER COMMENTS.

NORWAY

VESLEDALSBREEN

A. GEOGRAPHICAL LOCATION.

1) Country Norway
2) Name of station Optimus (Vesledalsbreen)
3) Locality Western Norway
4) Latitude: 61° 51' N Longitude: 7° 16' E Elevation(m) 1573 m
5) Mountain range Fostedalsbreen icecap
6) Drainage basin Stryn
7) Name of director G. Østrem
8) Name of parent organization Glaciological Section

Address NVE
Box 5091
Mj. Oslo 3, Norway

Telephone number 02 469800

9) Date of establishment of the station 1967
10) Distance from the end of the road (in kilometers or hours of walking)
4 hours

Other means of access: planes, float planes, helicopter, boat, etc.

Boarding point

11) Distance between the station and the glaciers studied 50 m

Map: Erdalsbreen- Vesledalsbreen (Part of Jostedalsbreen, Norway), 1:20,000, Norges Vassdrags- og Elektrisitetsvesen, Hydrologisk Avd., Norway, 1967.

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 2
a) Total floor space 24 m^2
b) Details: e.g. Laboratories
Dormitories
Number of beds 2
Kitchens, dining rooms
Workshops

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology 1
   b) Snow studies
   c) Hydrology 2
   d) Climatology
   e) Geophysics
   f) Geomorphology
   g) Botany, biology
   h) Quaternary history

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record 1966-72
2) Yearly utilization period 1-2 weeks
3) Type of utilization (teaching, research, level of students involved) measurements
4) Number of researchers: Summer 0 Winter 0
5) Number of technicians: Summer 0 Winter 0
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s) Tunsbergdalsbreen /310-7
   b) Fluctuations (terminal position, surface, mass balance) P
   c) Dynamics, movement
   d) Studies of surface
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing P
2) Snow study:
   a) Snow cover P
   b) Avalanches
3) Hydrology:
   a) Discharges
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology

4) Climatology:
   a) Proximity to glacier
   b) Parameters
5) Geophysics:
   a) Radio-echo sounding method
   b) Magnetic surveys; electromagnetism
6) Earth science (including area surrounding station)
   a) Geology
   b) Tectonics
   c) Glacial geomorphology
7) Botany - biology (including area surrounding station)
   a) Pollen analysis
   b) Micro bacterial fauna
   c) Flora
   d) Fossil woods (C^{14} dating)
   e) Timberline
   f) Lichenometry
8) Quaternary history:

E. DATA AVAILABILITY.

1) Tabulations
   Published reports Annual reports from NVE
   Unpublished reports
2) Data files (tape, cards, satellite transmissions)
3) Address from which data are available
   Hydrological Division, NVE
   Box 5091, Mj. Oslo 3, Norway
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST). Glasiologiske undersøkelser i Norge (annual reports)

G. OTHER COMMENTS.

PERU
QUELCCAYA

A. GEOGRAPHICAL LOCATION.

1) Country Peru
2) Name of station Quelccaya
3) Locality Andes Mt., South Central Peru
4) Latitude: 14°S Longitude: 70° 50' W Elevation(m) 5645m
5) Mountain range Andes
6) Drainage basin Amazon
7) Name of director Dr. Lonnie C. Thompson
8) Name of parent organization National Science Foundation

Address 1800 G. Street
Washington, DC USA

Telephone number

9) Date of establishment of the station 1974
10) Distance from the end of the road (in kilometers or hours of walking)
100 km 3 days
Other means of access: planes, float planes, helicopter, boat, etc.
horse
Boarding point

11) Distance between the station and the glaciers studied
.5km

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings None (this is a seasonal station)
a) Total floor space
b) Details: e.g. Laboratories
Dormitories
Number of beds
Kitchens, dining rooms
Workshops

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology 3
   b) Snow studies 2
   c) Hydrology 5
   d) Climatology 1
   e) Geophysics 6
   f) Geomorphology
   g) Botany, biology
   h) Quaternary history 4

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record 1974 - present
2) Yearly utilization period June - August
3) Type of utilization (teaching, research, level of students involved) Research
4) Number of researchers: Summer 6 Winter
5) Number of technicians: Summer 2 Winter
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s) Quelccaya Ice Cap
   b) Fluctuations (terminal position, surface, mass balance) 0
   c) Dynamics, movement 0
   d) Studies of surface 0
   e) Studies of deep ice (coring) planned
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics 0
   h) Remote sensing
2) Snow study:
   a) Snow cover 0
   b) Avalanches
3) Hydrology:
   a) Discharges 0
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology

4) Climatology:
   a) Proximity to glacier 0 km
   b) Parameters long term automatic weather stations
5) Geophysics:
   a) Radio-echo sounding method
   b) Magnetic surveys; electromagnetism planned
6) Earth science (including area surrounding station)
   a) Geology
   b) Tectonics
   c) Glacial geomorphology 0
7) Botany - biology (including area surrounding station)
   a) Pollen analysis planned
   b) Micro bacterial fauna
   c) Flora
   d) Fossil woods (C^{14} dating) peat
   e) Timberline
   f) Lichenometry
8) Quaternary history:
   On going-establishing ice cap fluctuations from C^{14} dating of moraines.

E. DATA AVAILABILITY.

1) Tabulations
   Published reports 4
   Unpublished reports 3
2) Data files (tape, cards, satellite transmissions)
3) Address from which data are available
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST).

G. OTHER COMMENTS.

References

Mercer, J.H. (1977) Radiocarbon dating of the last glaciation in Peru. Geology, v.5, pp. 600-604.

Thompson, L.G.; Dansgaard, W. (1975) Oxygen isotope and microparticle investigation of snow samples from Quelccaya Ice Cap, Peru. Antarctic Journal of the United States, v. 10(1), pp. 24-26.

Thompson, L.G.; Mercer, J.H.; Marangunic, C.; Ricker, J. (1975) Peru's Quelccaya Ice Cap: Glaciological and glacial geological studies, 1974. Antarctic Journal of the United States, v. 10(1), pp.19-24.

Thompson, L.G. (In press) Glaciology of the Peruvian Quelccaya Ice Cap.

SPITSBERGEN
FORSKNINGSSTASJONEN PÅ SVALBARD

A. GEOGRAPHICAL LOCATION.

1) Country Norway, Svalbard (Spitsbergen)
2) Name of station Forskningsstasjonen på Svalbard
3) Locality Spitsbergen
4) Latitude: 78° 50' Longitude: 11° 30' Elevation(m) 10
5) Mountain range ?
6) Drainage basin ?
7) Name of director ?
8) Name of parent organization Norsk Polarinstitutt

Address Norsk Polarinstitutt, Rolfstang veien 12, 1330 Oslo Lufthavn
Norway

Telephone number 02.123650

9) Date of establishment of the station 1966
10) Distance from the end of the road (in kilometers or hours of walking)
?

Other means of access: planes, float planes, helicopter, boat, etc.
Plane, helicopter, boat
Boarding point Ny Ålesund

11) Distance between the station and the glaciers studied 3 km to Bröggerbreen, 4 km to Lovénbreen glacier

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 5
a) Total floor space ca 400 m^2
b) Details: e.g. Laboratories (2 biology)
Dormitories 20 rooms
Number of beds ca 40
Kitchens, dining rooms 1 each
Workshops 1

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology mass balance
   b) Snow studies
   c) Hydrology discharge, sediment load
   d) Climatology meteorological station
   e) Geophysics seismology, Ionosphere physics
   f) Geomorphology
   g) Botany, biology M.A.B.
   h) Quaternary history

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record from 1966
2) Yearly utilization period 5 months
3) Type of utilization (teaching, research, level of students involved) research
4) Number of researchers: Summer 2 Winter 1
5) Number of technicians: Summer (5) Winter (5)
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects M.A.B., seismology, Ionosphere physics

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s) ?
   b) Fluctuations (terminal position, surface, mass balance) 0 mass balance
   c) Dynamics, movement 0 movement
   d) Studies of surface
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics 0 chemistry of melt water
   h) Remote sensing
2) Snow study:
   a) Snow cover
   b) Avalanches
3) Hydrology:
   a) Discharges Discharge and sediment load
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature 0
   e) Lacustrine hydrology

4) Climatology:
   a) Proximity to glacier
   b) Parameters radiation, wind, temperature, moisture
5) Geophysics:
   a) Radio-echo sounding method P
   b) Magnetic surveys; electromagnetism
6) Earth science (including area surrounding station)
   a) Geology
   b) Tectonics
   c) Glacial geomorphology
7) Botany - biology (including area surrounding station)
   a) Pollen analysis
   b) Micro bacterial fauna
   c) Flora
   d) Fossil woods (C^{14} dating)
   e) Timberline
   f) Lichenometry
8) Quaternary history:

E. DATA AVAILABILITY.

1) Tabulations
   Published reports Norsk Polarinstitutt Årbok
   Unpublished reports
2) Data files (tape, cards, satellite transmissions)
   tape
3) Address from which data are available
   Norsk Polarinstitutt
   Rolfstans veien 12, 1330 Oslo Lufthavn
   Norway
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST). Norsk Polarinstitutt Årbok

G. OTHER COMMENTS.

SWEDEN
TARFALA RESEARCH STATION

A. GEOGRAPHICAL LOCATION.

1) Country Sweden
2) Name of station Tarfala
3) Locality Kebnekaise Mountains west of Kiruna, Swedish Lapland
4) Latitude: 67° 55' N Longitude: 18° 40E Elevation(m) 1130
5) Mountain range Kebnekaise
6) Drainage basin Tarfalajåkka, tributary to Kalix älv
7) Name of director Valter Schytt
8) Name of parent organization Department of Physical Geography
University of Stockholm

Address Box 6801
S-11386, Stockholm

Field station: Tarfala Research Station
c/o Kebnekaise
S-98100 Kiruna, Sweden

Telephone number 08-340860 0980-16165

9) Date of establishment of the station 1948 (work since 1945)
10) Distance from the end of the road (in kilometers or hours of walking)
30 km 6-7 hours
Other means of access: planes, float planes, helicopter, boat, etc.
Float plane (only in August), ski plane (Febr.-May), helicopter (all year)
Boarding point
Kiruna (sometimes Nikkaluokta)
11) Distance between the station and the glaciers studied
0.5 km

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings a total of 12
a) Total floor space 500 m^2
b) Details: e.g. Laboratories 41 m^2 in two houses
Dormitories in 6 houses
Number of beds 41 + a few extra
Kitchens, dining rooms 1 mess hut with good facilities
Workshops, snow scooter garage, sauna, laundry

Cold rooms no
Generator source 220 V AC (power from outside)

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology 1
   b) Snow studies 4
   c) Hydrology 3
   d) Climatology 5
   e) Geophysics
   f) Geomorphology 2
   g) Botany, biology
   h) Quaternary history

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record meteorological records all year by recorders
2) Yearly utilization period one month in March-April: 15 May - end September
3) Type of utilization (teaching, research, level of students involved) courses for graduate and undergraduate students in summer, research all year
4) Number of researchers: Summer 2-8 Winter 2-3
5) Number of technicians: Summer 5-8 Winter 2-3
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects Dept. of Meteorology, University of Uppsala
   Dept. of Hydrology, University of Uppsala

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s) Storglaciären
      Isfallsglaciären
   b) Fluctuations (terminal position, surface, mass balance)
      O since 1945/46
   c) Dynamics, movement several years
   d) Studies of surface O
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing
2) Snow study:
   a) Snow cover O since 1946
   b) Avalanches
3) Hydrology:
   a) Discharges O since 1959
   b) Ice cover percentage
   c) Sub glacial hydrology several studies
   d) Ice surface feature some
   e) Lacustrine hydrology some

4) Climatology:
   a) Proximity to glacier 0.5 km - Base station. On glacier - temporarity
   b) Parameters wind, temperature (air, ground, river), radiation
5) Geophysics:
   a) Radio-echo sounding method
   b) Magnetic surveys; electromagnetism
6) Earth science (including area surrounding station)
   a) Geology
   b) Tectonics
   c) Glacial geomorphology 0
7) Botany - biology (including area surrounding station)
   a) Pollen analysis
   b) Micro bacterial fauna
   c) Flora
   d) Fossil woods (C^{14} dating)
   e) Timberline
   f) Lichenometry 0
8) Quaternary history:
   Several studies

E. DATA AVAILABILITY.

1) Tabulations
   Published reports Geogr. Annaler, ICE, Hydrological Data-Norden
   Unpublished reports
2) Data files (tape, cards, satellite transmissions)
   Meteorolog. data, accumulation data and hydrological data on card and/or tape
3) Address from which data are available Stockholm office.
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST).

G. OTHER COMMENTS.

References

Ahlman, Hans W:son (1951) Scientific investigations in the Kebnekajse Massif, Swedish Lappland. I. General outline of the investigations in 1946-51. Geografiska Annaler, v.33(1-2), pp. 90-94.

Cêwe, Tord; Norrbin, Johan (1965) Tarfalajåkka; Ladtjojåkka och Ladtjojaure: Vattenföring, slamtransport och sedimentation. (Tarfalajåkka, Ladtjojåkka and Ladtjojaure: Water movement, sediment transport and deposition.) Ymer, no. 1-2, pp. 85-111.

Danfors, Erik; Fleetwood, Åke; Schytt, Valter (1962) Application of the neutron scattering method for measuring snow density. Geografiska Annaler, v.44(3-4), pp. 409-411.

Ekman, Stig Rune (1961) Thermal drilling in Isfallsglaciären, Kebnekajse. Geografiska Annaler, v.43(3-4), pp. 422-423.

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Hydrological Data - Norden, Tarfala research basin, Sweden. Data volume 1965-1972, 1976.

Johansson, Harald F. (1951) Scientific investigations in the Kebnekajse Massif, Swedish Lappland. II. The petrology and tectonics of the Kebnekajse region and their morphological importance. Geografiska Annaler, v.33(1-2), pp. 95-120.

Karlén, Wibjörn (1973) Holocene glacier and climatic variations, Kebnekajse Mountains, Swedish Lappland. Geografiska Annaler, v.55A(1), pp. 29-63.

Nilsson, Jörgen; Sundblad, Björn (1975) The internal drainage of Storglaciären and Isfallsglaciären described by an autoregressive model. Geografiska Annaler, v.57A (1-2), pp. 73-98.

Schytt, Valter (1949) Glaciologiska arbeten i Kebnekajse. (Glaciological work in Kebnekajse.) Ymer, no. 1, pp. 18-42.

Schytt, Valter (1949) Re-freezing of the melt-water on the surface of glacier ice. Geografiska Annaler, v.31(1-4), pp. 222-227.

Schytt, Valter (1959) The glaciers of the Kebnekajse-Massif. Geografiska Annaler, v.41(4), pp. 213-227.

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Schytt, Valter (1962) Mass balance studies in Kebnekajse. Journal of Glaciology, v.4(33), pp. 281-286.

Schytt, Valter (1962) Mass balance studies on Storglaciären during 1962. Geografiska Annaler, v.44(3-4), pp. 407-409.

Schytt, Valter (1962) A tunnel along the bottom of Isfallsglaciären. Geografiska Annaler, v.44(3-4), pp. 411-412.

Schytt, Valter (1962) A tunnel project in Kebnekajse, Swedish Lapland. Ice, no. 10, pp. 4-5.

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Schytt, Valter (1973) Snow densities on Storglaciären in spring and summer. Geografiska Annaler, v.54A(3-4), pp. 155-158.

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Woxnerud, Eric (1951) Scientific investigations in the Kebnekajse Massif, Swedish Lappland. III. Kartografiska arbeten i Kebnekajse. (Cartographic work in Kebnekajse.) IV. Det lokala triangelnätets i Kebnekajse anslutning till riksnätet. Syd- och nordtopparnas höjd över havet. (Altitude above sea level of the southern and northern mountain peaks.) Geografiska Annaler, v. 33(3-4), pp. 121-143.

SWITZERLAND
EIDGENÖSSISCHE INSTITUT FÜR SCHNEE-UND LAWINENFORSCHUNG

A. GEOGRAPHICAL LOCATION.

1) Country Switzerland
2) Name of station Eidgenössische Institut für Schnee- und Lawinenforschung
3) Locality Weissfluhjoch
4) Latitude: N 46° 50' Longitude: E 9° 48' Elevation(m) 2667
5) Mountain range Swiss Alps (Nordbünden)
6) Drainage basin Rhein
7) Name of director Prof. M. de Quervain
8) Name of parent organization Oberforstinspektorat, Bern
Eidg. Institut für Schnee-und Lawinenforschung
Address 7260 Weissfluhjoch-Davos

Telephone number 083 532 64
9) Date of establishment of the station 1942
10) Distance from the end of the road (in kilometers or hours of walking)
3 hours
Other means of access: planes, float planes, helicopter, boat, etc.
helicopter and cablecar
Boarding point
Davos
11) Distance between the station and the glaciers studied 20 km

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 1
a) Total floor space ca 700 m^2
b) Details: e.g. Laboratories 5 (cold rooms included)
Dormitories
Number of beds none
Kitchens, dining rooms 1
Workshops 2

Cold rooms 4
Generator source AC

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology 4
   b) Snow studies 1 & avalanches
   c) Hydrology 3
   d) Climatology 2
   e) Geophysics
   f) Geomorphology
   g) Botany, biology
   h) Quaternary history

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record 1936/37--1976/77
2) Yearly utilization period full year
3) Type of utilization (teaching, research, level of students involved)
   snow and avalanche research , consulting work, teaching at ETH in Zurich
4) Number of researchers: Summer 12 Winter 12
5) Number of technicians: Summer 8 Winter 8
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects University of Berne

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s) 1
   b) Fluctuations (terminal position, surface, mass balance) O, winter & yearly balance ; cooperation with Swiss Glacier Commission
   c) Dynamics, movement
   d) Studies of surface
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing snow cover by aeroplane photography
2) Snow study:
   a) Snow cover O 1936/37-1976/77 formation, properties, distribution, melt,runoff
   b) Avalanches O 1952/53-1976/77 formation, dynamics, effects, protection, forestry aspects
3) Hydrology:
   a) Discharges O snow hydrology, O^{16}/O^{18},T,D-studies of discharge water
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology

4) Climatology:
   a) Proximity to glacier 20 km
   b) Parameters air temp., precipitation, wind, radiation, clouds, humidity, pressure
5) Geophysics:
   a) Radio-echo sounding method
   b) Magnetic surveys; electromagnetism
6) Earth science (including area surrounding station)
   a) Geology
   b) Tectonics
   c) Glacial geomorphology
7) Botany - biology (including area surrounding station)
   a) Pollen analysis
   b) Micro bacterial fauna
   c) Flora reforestation projects
   d) Fossil woods (C^{14} dating)
   e) Timberline
   f) Lichenometry
8) Quaternary history:

E. DATA AVAILABILITY.

1) Tabulations yes
   Published reports annual report: "Schnee und Lawinen in den Schweizer Alpen"
   Unpublished reports internal reports

2) Data files (tape, cards, satellite transmissions)
   tables in the yearly reports ; meteorological data stored on cards at the Federal Institute of Meteorology, Zurich

3) Address from which data are available Eidg. Institut für Schnee-und Lawinforschung, 7260 Weissfluhjoch, Davos, Switzerland

4) Other information Our Institute is not a glaciological field station in a strict sense but our climatological measurements may also be used for glaciological research.

F. MAIN PUBLICATIONS (ATTACH LIST). The main publication list has been sent to the center in Boulder a few days ago!

G. OTHER COMMENTS.
This is the form for the whole Institute, answered in respect to "Glaciological projects".
Section I Weather, snow cover, avalanches
P.M.B. Föhn, Section Head

References

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in der Gand, H. (1968) Aufforstungsversuche an einem Gleitschneehang. Ergebnisse der Winteruntersuchungen 1955/56 bis 1961/62. (Attempts to reforest a slope where the problem of snow glide exists: Results from research during the winters 1955 through 1961-62.

Good, W. (1971) Optimaler Einsatz der Mittel zur Ortung Lawinenverschütteter. (Optimal techniques available for locating avalanche victims.)

International Commission on Snow and Ice (1973) Avalanche classification. (Expanded German version also available.) 23 pp.

Jaccard, C. (1966) Neue Fortschritte in der Lawinenforschung. (New developments in avalanche research.) 5 pp.

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Jaccard, C. (1966) A possible method for the numerical forecast of avalanche occurrence. 5 pp.

Jaccard, C., et al. (1966) Bericht über eine Prüfung von Verfahren zum Auffinden Lawinenverschütteten. (Report on a test for finding avalanche victims.) 26 pp.

Jaccard, C. (1966) Die Prüfung der Geräte zum Auffinden von Lawinenverschütteten. (A test of equipment for finding avalanche victims.) 3 pp.

Quervain, M. de (1966) Lawinenprobleme in Praxis und Forschung. (Avalanche problems in practice and research.) 6 pp. (French, Italian and English summaries.)

Quervain, M. de (1966) Betr. Lawinenunfall Nr. 12. (Avalanche accident no. 12.) Winterbericht, no. 30, 1965/66. 1 p.

Quervain, M. de (1968) Die Rolle des Waldes beim Lawinenschutz. (The role of forests in avalanche protection.) 7 pp.

Quervain, M. de (1972) Lawinenbildung. (Avalanche formation.) 18 pp.

Quervain, M. de (1973) Eine internationale Lawinenklassifikation. (An international avalanche classification system.) 18 pp. (Also available in English.)

Quervain, M. de (1973) Die Berücksichtigung der Lawinenhäufigkeit in der Lawinengefahrenkarte. (Avalanche frequency on an avalanche danger map.) 6 pp.

Roch, A. (1966) Le Symposium international sur les aspects scientifiques des avalanches de neige et de glace, Davos, 5-10 April 1965. (International symposium on the scientific aspects of snow and ice avalanches, Davos, 5-10 April 1965.) 5 pp.

Roch, A., et al. (1966) How to estimate avalanche danger. 8 pp.

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Salm, B. (1968) Lauernde Gefahr Lawine. (Impending avalanche danger.) (Newspaper article.)

Salm, B. (1971) Avalanche danger and avalanche forecast in Switzerland. 6 pp. (In Japanese, translated by von N. Maeno.)

Schild, M. (1966) Moyens et methodes disponibles en Suisse pour le declenchement artificiel d'avalanches. (Means and methods available in Switzerland for artificial avalanche release.)

Schild, M. (1966) Die Verwendungsmöglichkeiten von Sprengstoffen bei Schnee- und Lawinenproblemen. (Possibility of utilizing explosives for snow and avalanche problems.) 10 pp. (Summaries in French, Italian and English.)

Schild, M. (1968) Bericht über das Lawinenrettungswesen, 1967/68. (Report on the avalanche rescue service, 1967/68.) 3 pp.

Schild, M. (1972) Lawinen. (Dokumentation für Lehrer, Skilagerleiter und Tourenleiter.) (Avalanches. (Documentation for teachers, ski instructors and tour leaders.)) 132 pp.

Zingg, Th. (1967) Die Niederschlags- und Lawinenverhältnisse im Frühwinter in den oberen Vispertälern. (Precipitation and avalanches in early winter in the upper Visper Valleys.) 5 pp.

For complete citations, please contact the Eidgenössische Institut für Schnee- und Lawinenforschung, Davos.

USA
GULKANA GLACIER

A. GEOGRAPHICAL LOCATION.

1) Country USA
2) Name of station Gulkana Glacier
3) Locality Alaska Range, Alaska
4) Latitude: 63° 15' N Longitude: 145° 28' W Elevation(m) 1800m
5) Mountain range Alaska Range
6) Drainage basin Delta River
7) Name of director L.R. Mayo
8) Name of parent organization U.S. Geological Survey
Water Resources Division
Address Box 11
101 12th Ave.
Fairbanks, Alaska 99701
Telephone number 452-1951 Ext 214
9) Date of establishment of the station 1967
10) Distance from the end of the road (in kilometers or hours of walking)
8 km
Other means of access: planes, float planes, helicopter, boat, etc.
plane and helicopter
Boarding point Fairbanks
11) Distance between the station and the glaciers studied 0.2 km

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 1 - A frame
a) Total floor space 11 m^2
b) Details: e.g. Laboratories
Dormitories
Number of beds 2
Kitchens, dining rooms
Workshops

all combined into single bldg.

All combined into single building.

Cold rooms none
Generator source wind powered

2) Major research activities of the station (please check and **rank in order of** importance)
a) Glaciology 1
b) Snow studies 4
c) Hydrology 2
d) Climatology 3
e) Geophysics
f) Geomorphology 5
g) Botany, biology
h) Quaternary history 6

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record continuously recorded air temp. and precipitation
2) Yearly utilization period 4 visits per year
3) Type of utilization (teaching, research, level of students involved) research monitoring

4) Number of researchers: Summer 2 Winter 2
5) Number of technicians: Summer 0 Winter 0
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

6) L.R. Mayo, Glaciologist; D.C. Trabant, Glaciologist

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
a) Name/UNESCO inventory number of glacier(s)
b) Fluctuations (terminal position, surface, mass balance) 0 1967-
c) Dynamics, movement 0 1974-
d) Studies of surface
e) Studies of deep ice (coring)
f) Subglacial studies (access type)
g) Ice Chemistry and physics
h) Remote sensing 0 aerial photography 1967-

2) Snow study:
a) Snow cover 0 depth, density 1967-
b) Avalanches
3) Hydrology:
a) Discharges 0 1967-
b) Ice cover percentage P 1967
c) Sub glacial hydrology
d) Ice surface feature
e) Lacustrine hydrology

4) Climatology:
   a) Proximity to glacier 1480 m altitude very close
   b) Parameters air temperature, precipitation
5) Geophysics:
   a) Radio-echo sounding method upcoming
   b) Magnetic surveys; electromagnetism
6) Earth science (including area surrounding station)
   a) Geology
   b) Tectonics
   c) Glacial geomorphology
7) Botany - biology (including area surrounding station)
   a) Pollen analysis
   b) Micro bacterial fauna
   c) Flora
   d) Fossil woods (C^{14} dating)
   e) Timberline
   f) Lichenometry
8) Quaternary history:

E. DATA AVAILABILITY.

1) Tabulations From USGS-WRD, Fairbanks (address above)
   Published reports USGS - Profession Papers 715 A,B------
   Unpublished reports
2) Data files (tape, cards, satellite transmissions)
3) Address from which data are available
   same as parent organization
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST).

G. OTHER COMMENTS.

We have just begun a mass balance-dynamics program on Columbia Glacier in Prince William Sound, Alaska. You will probably receive this report from our Tacoma, WA office.

USA

INSTITUTE OF ARCTIC AND ALPINE RESEARCH

A. GEOGRAPHICAL LOCATION.

1) Country U.S.A.
2) Name of station INSTAAR Mountain Research Station
3) Locality Colorado
4) Latitude: 40° 02' 13S Longitude: 105° 32' 39S Elevation(m) 2,925 m
5) Mountain range Front Range
6) Drainage basin North Boulder Creek
7) Name of director Dr. Misha Plam
8) Name of parent organization Institute of Arctic and Alpine Research, University of Colorado
Address Mountain Research Station, Nederland, Colorado 80466, U.S.A.

Telephone number (303) 492-8841
9) Date of establishment of the station 1953
10) Distance from the end of the road (in kilometers or hours of walking) dirt road from highway to the station - 3 km long
Other means of access: planes, float planes, helicopter, boat, etc.

Boarding point

11) Distance between the station and the glaciers studied 9 km

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 41
a) Total floor space
b) Details: e.g. Laboratories alpine lab - 502 m^2
Dormitories 29 two-person summer cabins, 7 winterized family cabins
Number of beds
Kitchens, dining rooms 1
Workshops 1

Cold rooms -
Generator source power line

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology 5
   b) Snow studies 6
   c) Hydrology 7
   d) Climatology 1
   e) Geophysics 8
   f) Geomorphology 2
   g) Botany, biology 3
   h) Quaternary history 4

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record 25 years
2) Yearly utilization period year round
3) Type of utilization (teaching, research, level of students involved) research and teaching (undergraduate and graduate)
4) Number of researchers: Summer 6 + 8 graduates Winter 3 + 5 graduates
5) Number of technicians: Summer 2 Winter 2
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s) Arapahoe, Arikaree, Isabelle
   b) Fluctuations (terminal position, surface, mass balance) 0
   c) Dynamics, movement
   d) Studies of surface 0
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing P
2) Snow study:
   a) Snow cover 0
   b) Avalanches 0
3) Hydrology:
   a) Discharges P
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology

4) Climatology:
   a) Proximity to glacier
   b) Parameters temp., PPT, humidity, solar, wind
5) Geophysics:
   a) Radio-echo sounding method
   b) Magnetic surveys; electromagnetism
6) Earth science (including area surrounding station)
   a) Geology
   b) Tectonics
   c) Glacial geomorphology 0
7) Botany - biology (including area surrounding station)
   a) Pollen analysis
   b) Micro bacterial fauna
   c) Flora 0
   d) Fossil woods (C^{14} dating)
   e) Timberline 0
   f) Lichenometry
8) Quaternary history:
   0

E. DATA AVAILABILITY.

1) Tabulations
   Published reports Yes
   Unpublished reports Yes
2) Data files (tape, cards, satellite transmissions)
   climate data on cards
3) Address from which data are available Institute of Arctic and Alpine Research, Mountain Research Station, Nederland, Co. 80466, U.S.A.
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST).

G. OTHER COMMENTS.
   Summer courses - Mountain Geomorphology
   Mountain Climatology
   Mountain Ecology

References

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USA

JUNEAU ICEFIELD RESEARCH PROGRAM (JIRP) STATIONS

A. GEOGRAPHICAL LOCATION.

1) Country USA (and Canada)
2) Name of station Juneau Icefield Research Program (JIRP) stations--12 total
3) Locality Juneau Icefield, Alaska-B.C.
4) Latitude: _____ Longitude: _____ Elevation(m) _____
5) Mountain range Northern Boundary Range, on Alaska-B.C.-Yukon border
6) Drainage basin Headwaters Taku and Skagway Rivers and the Yukon River
7) Name of director Dr. Maynard M. Miller
8) Name of parent organization Foundation for Glacier and Environmental Research

field addresses:
Address Pacific Science Center, 200-2nd Ave. No., Seattle, Wa. 98109
and P.O. Box 775, Juneau, Alaska, 99801 — Also c/o Glaciological Inst.
and P.O. Box 99, Atlin, B.C., Canada VOW 1AO — Univ. of Idaho, Moscow
Telephone number 206-523-3909 (Seattle) — Idaho, 83893 (208-885-6195)

9) Date of establishment of the station 1949 (1st) to 1974 (most recent)
10) Distance from the end of the road (in kilometers or hours of walking)
nearest 8 km; farthest 150 km from Juneau, Alaska
Other means of access: planes, float planes, helicopter, boat, etc.
ski-plane or helicopter
Boarding point Juneau, Alaska

11) Distance between the station and the glaciers studied 5 to 100 meters in most cases

Map: Study Area of the Icefield Ranges Research Project, 1:500,000, American Geographical Society, 1969.

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 41 in 12 different research stations; max. at any one station=1
a) Total floor space 1500 square meters
b) Details: e.g. Laboratories 5
Dormitories 15
Number of beds 3 to 40 per camp
Kitchens, dining rooms 12
Workshops - generator buildings - 6

Cold rooms none

Generator source field generator units, 3-5 kw and smaller in lesser stations.

2) Major research activities of the station (please check and rank in order of importance)

a) Glaciology 1
b) Snow studies 2
c) Hydrology 4
d) Climatology 3
e) Geophysics 5
f) Geomorphology 6
g) Botany, biology 8
h) Quaternary history 7
i) Geology 9

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record Every year consecutively since 1946
2) Yearly utilization period all summer; some winter and spring occupancy
3) Type of utilization (teaching, research, level of students involved) Teaching, field research--graduate students, some undergraduates, also each summer 10 high-ability highschool students (NSF support) and some post-doctorals
4) Number of researchers: Summer 10 to 20 Winter 5 to 10
5) Number of technicians: Summer 5 Winter 2
6) List of station personnel (and speciality). ATTACH LIST. See attached brochures &
7) Other laboratories working temporarily at the station on joint/separate reports. projects US Geological Survey; NASA; US Forest Service; National Weather Service; Glaciological and Arctic Sciences Institute; University of Idaho; Michigan State University; National Geographic Society; Geophysical Inst. of University of Alaska; Univ. of B.C.; Univ. of New Brunswick; Queens University, etc.

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.

Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.) (Period covers all summers consecutively since 1946 - esp. in glaciology, meteorology, geophysics, geobiology, geology, geomorphology)

1) Glaciological research:

a) Name/UNESCO inventory number of glacier(s) 36 main glaciers (O & P), on about 1/3 of these annual data since 1946.

O&P b) Fluctuations (terminal position, surface, mass balance) termini; and total glacier systems including surface and mass balance

O&P c) Dynamics, movement continuum mechanics, transverse, and vertical velocity pro-

O&P d) Studies of surface test pits, crevasse stratigraphy, firn files, basal slip, etc

O&P e) Studies of deep ice (coring) mechanical & thermal drilling, physical character-

O f) Subglacial studies (access type) glacier cave mapping, struc.,etc. istics &

P g) Ice Chemistry and physics salinity studies; particulate analysis thermal

O&P h) Remote sensing Landsat IR analyses re nèvé-lines & hydrological changes, regimes. thermal scanner research, etc.

2) Snow study:

O&P a) Snow cover snow metamorphism; albedo; suncup evolution, ablation, etc.

O&P b) Avalanches ice-fall research using geophones & hydrophone records; micro-seisms

3) Hydrology: glacial stream hydrometrics

O&P a) Discharges liquid balance studies; jokulhlaup phenomena; crevasse water tables,

O&P b) Ice cover percentage nèvé-line records--annual

c) Sub glacial hydrology crevasse & glacier core reservoirs for liquid water, run-

O&P d) Ice surface feature suncup evolution; sastrugi studies (water), off stage

O&P e) Lacustrine hydrology piston corer samples; sediment crevasse patterns, record. analysis, stage recorder data/level changes, etc. etc.

4) Climatology:

a) Proximity to glacier 5 to 100 meters

O&P b) Parameters Katabatic flow; surface shear; eddy convection; micro-met;

5) Geophysics: regional synoptic weather data; solar radiation, duration of sun-

P a) Radio-echo sounding method planned - have used micro-wave shine, etc.

O b) Magnetic surveys; electromagnetism magnetics re subglacial ore bodies, etc.; also extensive seismic & gravity surveys re glacier depths as well as much bore-hole thermal sensing using glacier thermisters.

6) Earth science (including area surrounding station)

O&P a) Geology bedrock geology mapping; structural study (joints); differential

P b) Tectonics micro-seism research to differentiate glacier "noise" weathering.

O&P c) Glacial geomorphology weathering phenomena; moraines; periglacial features, etc.

7) Botany - biology (including area surrounding station)

O&P a) Pollen analysis glacial bogs on Alaskan coast & inland in B.C. & Yukon

P b) Micro bacterial fauna mold-spore research

O&P c) Flora taxonomic assessments & regional botany surveys

O&P d) Fossil woods (C^{14} dating) many sites in peripheral sectors & in soils of high

O&P e) Timberline dendro-chronology & dendro-glaciology nunataks on icefield.

O&P f) Lichenometry extensive in deglaciated sectors

8) Quaternary history:

O&P Detailed studies of this both on Alaskan coastal side of icefield and in B.C. & Yukon interior flanks. Also in adjoining Atlin & Raish lakes areas to north (see map).

E. DATA AVAILABILITY. Full record of all glaciological, survey data, photo station, air photos & weather data from all station, plus comparison of annual firn stratigraphy, etc.

1) Tabulations

Published reports annual reports of JIRP & some monographs & professional

Unpublished reports many in process journal papers

2) Data files (tape, cards, satellite transmissions) glaciology card data; some tape info on avalanche records; satellite imagery file; complete files of annual meteorological data from each field station, especially summer record. Complete annual theadolite surveys of glacier flow, etc.

3) Address from which data are available c/o Glaciological & Arctic Sciences Inst. University of Idaho, Moscow, Idaho, 83843; and published reports for Office of Naval Research, Army Research Office, National Geographic Society Research Series, theses, Dept. of Commerce, Dept. of Interior, etc.

4) Other information Extensive field research libraries at these stations, especially camps 10, 17, 18, 8, & 26 (totalling over 3500 volumes, plus extensive reprint collection, maps, etc.)

F. MAIN PUBLICATIONS (ATTACH LIST). See attached - in study 38 M-S & PhD theses developed out of this program

G. OTHER COMMENTS. Program has continued annually without interruption each year since 1946. 12 station network (S/20 note (sunilar ferm) on adjunct stations (29 & 30) in Atlin Lake region north of the Juneau Icefield in the B.C.-Yukon area; also maps--attached with station locations.

Between 80 & 120 students, staff, research associates, etc. use these stations each summer. The field season normally extends from early June to late Sept., with the Glaciological Inst. field courses (Univ. of Idaho) conducted during July & August. Students & staff representing some two dozen Universities are annually involved.

USA

MT. WRANGELL

A. GEOGRAPHICAL LOCATION.

1) Country USA
2) Name of station Mt. Wrangell
3) Locality Summit of Mt. Wrangell, Alaska
4) Latitude: 62° N Longitude: 144° W Elevation(m) 4000
5) Mountain range Wrangell Mountains
6) Drainage basin Copper River
7) Name of director
8) Name of parent organization Geophysical Institute, University of Alaska

Address Carl S. Benson
Geophysical Institute
University of Alaska
Telephone number Fairbanks, Alaska 99701

9) Date of establishment of the station 1953 and again in 1961
10) Distance from the end of the road (in kilometers or hours of walking)
no roads in area
Other means of access: planes, float planes, helicopter, boat, etc.
air craft-on skis or helicopter (high altitude models only)
Boarding point Gulkana Air strip-near Glennallen or Copper Center; Alaska

11) Distance between the station and the glaciers studied
0 km-station is on an exposed ridge of crater surrounded by ice cap

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 2 in poor condition-the station building was designed to
a) Total floor space be heated by volcano heat. Increased heat
b) Details: e.g. Laboratories 1 flow and sulfur fumes have made the building
Dormitories uninhabitable. Possible rebuilding is
Number of beds being considered.
Kitchens, dining rooms
Workshops

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology X
   b) Snow studies X
   c) Hydrology
   d) Climatology
   e) Geophysics
   f) Geomorphology
   g) Botany, biology
   h) Quaternary history

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record 1953 & 1954, 1961-67, 1965,66, 1972 to present
2) Yearly utilization period mainly summer
3) Type of utilization (teaching, research, level of students involved)
   Research - PhD and MS students
4) Number of researchers: Summer (see below) Winter
5) Number of technicians: Summer Winter
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

4) No permanent staff at summit

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s)
   b) Fluctuations (terminal position, surface, mass balance) 0
   c) Dynamics, movement 0
   d) Studies of surface 0
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics 0 chemistry of volcanic and glacier water
   h) Remote sensing 0 aerial photogrammetry and ERTS imagery
2) Snow study:
   a) Snow cover 0
   b) Avalanches
3) Hydrology:
   a) Discharges
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology

4) Climatology:
   a) Proximity to glacier
   b) Parameters
5) Geophysics:
   a) Radio-echo sounding method during 1976 and 1975
   b) Magnetic surveys; electromagnetism
6) Earth science (including area surrounding station)
   a) Geology Recon: Geology + petrology of glacier-volcano interactions
   b) Tectonics
   c) Glacial geomorphology
7) Botany - biology (including area surrounding station)
   a) Pollen analysis
   b) Micro bacterial fauna
   c) Flora
   d) Fossil woods (C^{14} dating)
   e) Timberline
   f) Lichenometry
8) Quaternary history:

E. DATA AVAILABILITY.

1) Tabulations
   Published reports
   Unpublished reports
2) Data files (tape, cards, satellite transmissions)
3) Address from which data are available
   Carl S. Benson
   Geophysical Institute
   University of Alaska , Fairbanks, Alaska 99701
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST).

G. OTHER COMMENTS.

References

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*Bingham, D.K. (1967) Ice motion and heat flow studies on Mt. Wrangell, Alaska. M.S. thesis, University of Alaska.

*Most useful

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*Bingham, D.K.; Benson, C.S. (1968) Ash temperature variations on Mt. Wrangell, Alaska. New Zealand Journal of Geology and Geophysics, v.11, pp. 781-786.

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*Wharton, G.B. (1966) Snow stratigraphy studies in the caldera at the summit of Mt. Wrangell, Alaska. M.S. thesis, University of Alaska.

*Most useful

USA

SPERRY CHALET FIELD PROJECT

A. GEOGRAPHICAL LOCATION.

1) Country U S A
2) Name of station Sperry Chalet Field Project
3) Locality Glacier National Park, Montana, USA
4) Latitude: 48°37 Longitude: 113°52' Elevation(m) 2469
5) Mountain range Rocky Mountains - main divide
6) Drainage basin Flathead River/ Columbia River
7) Name of director Robert R. Curry
8) Name of parent organization University of Montana, Department of Geology

Address Missoula, Montana 59812 USA

Telephone number 406 243-2341

9) Date of establishment of the station 1973
10) Distance from the end of the road (in kilometers or hours of walking)
6 hours walking

Other means of access: planes, float planes, helicopter, boat, etc. none

Boarding point -

11) Distance between the station and the glaciers studied 0-3km

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 2 (1 operated by the National Park Service; one
a) Total floor space by a contractor) ??
b) Details: e.g. Laboratories no laboratory space
Dormitories at Sperry Chalet
Number of beds 10-20
Kitchens, dining rooms 1 each at Sperry Chalet
Workshops yes

Cold rooms no
Generator source no

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology 1
   b) Snow studies 2
   c) Hydrology 3
   d) Climatology 3
   e) Geophysics 4
   f) Geomorphology 5
   g) Botany, biology
   h) Quaternary history

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record Mass Balance started in 1935
2) Yearly utilization period year-around (Sperry Chalet only open July & August)
3) Type of utilization (teaching, research, level of students involved)
   Graduate and undergraduate teaching and faculty research
4) Number of researchers: Summer 2 Winter 2
5) Number of technicians: Summer 1 Winter 1
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects. Geological Survey maintains primary responsibility for mass balance studies.
   National Park Service coordinates researchers

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s)
   b) Fluctuations (terminal position, surface, mass balance)
      1935 to present + historical photographs
   c) Dynamics, movement 1973 ff
   d) Studies of surface 1973 ff
   e) Studies of deep ice (coring) 1975ff
   f) Subglacial studies (access type) proposed by Stanford University
   g) Ice Chemistry and physics 1973 ff
   h) Remote sensing 1972 ff
2) Snow study:
   a) Snow cover (and chemistry) 1973 ff
   b) Avalanches
3) Hydrology:
   a) Discharges 1972 ff
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology

4) Climatology:
   a) Proximity to glacier
   b) Parameters 1973 ff
5) Geophysics:
   a) Radio-echo sounding method
   b) Magnetic surveys; electromagnetism
   ~~c) Seismic profiling 1975ff~~
6) Earth science (including area surrounding station)
   a) Geology 1970 ff
   b) Tectonics
   c) Glacial geomorphology 1973 ff
7) Botany - biology (including area surrounding station)
   a) Pollen analysis
   b) Micro bacterial fauna
   c) Flora
   d) Fossil woods (C^{14} dating)
   e) Timberline
   f) Lichenometry
8) Quaternary history:

E. DATA AVAILABILITY.

1) Tabulations through U.S. Geological Survey, Water Resources Division, Helena
   Published reports glacier maps through USGS
   Unpublished reports Through Dept. of Geology, University of Montana and through National Park Service, Office of the Naturalist, Glacier National Park.
2) Data files (tape, cards, satellite transmissions)
3) Address from which data are available as above
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST).

G. OTHER COMMENTS.
This is not a single-use glaciologic research station since it lies within a national park. Rather, a field station facility, operated for tourists and National Park maintenance it is used cooperatively by federal and university research scientists.

References

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Dyson, J.L. (1966) Glacier and glaciation in Glacier National Park, Glacier National History Association, Inc., Glacier National Park.

U.S. Geological Survey (Various dates) Reports on glaciers in Glacier National Park; Helena Office, U.S. Geological Survey.

Principal Personnel

Robert R. Curry - Professor of Geology, University of Montana, Missoula, Mt. 59812

Charles Dalby - Graduate student, U.S. Forest Service, Kootenai National Forest, Libby, Montana

Tom Gignoux - Graduate student, Department of Geology, University of Montana

Gail McMurtrey - U.S. Geological Survey, Federal Building, Helena, Mt. 59601

USA

UNIVERSITY OF BUFFALO BROOKS RANGE CAMP

A. GEOGRAPHICAL LOCATION.

1) Country USA
2) Name of station University of Buffalo Brooks Range Camp
3) Locality Brooks Range, Alaska - Trans Alaska Pipeline Road at Continental Divide
4) Latitude: 68 06' N Longitude: 149 27'W Elevation(m) 1440
5) Mountain range Brooks Range,
6) Drainage basin Atigun River
7) Name of director Parker E. Calkin
8) Name of parent organization Dept. of Geological Sciences, State University of New York at Buffalo
Address 4240 Ridge Lea Rd.
Buffalo, N.Y. 14226

Telephone number (716) 831-1852
9) Date of establishment of the station 21 June 1977
10) Distance from the end of the road (in kilometers or hours of walking)
On TransAlaska Pipeline Road
Other means of access: planes, float planes, helicopter, boat, etc.
Access by car or plane via air strip at Gailbraith Lake or Chandalar Camps
Boarding point
11) Distance between the station and the glaciers studied 2 to 17 km

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings Trailer at present (simply eating and sleeping space)
a) Total floor space 5m²
b) Details: e.g. Laboratories
Dormitories
Number of beds
Kitchens, dining rooms
Workshops

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology 3
   b) Snow studies
   c) Hydrology 2
   d) Climatology 5
   e) Geophysics
   f) Geomorphology 4
   g) Botany, biology
   h) Quaternary history 1

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record Start June, 1977 -
2) Yearly utilization period Plan May through Aug.
3) Type of utilization (teaching, research, level of students involved)
   Research
4) Number of researchers: Summer 4 Winter
5) Number of technicians: Summer Winter
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s) not available, tentative names on enclosed map: Grizzly, Marmot, Buffalo, and Snow Bunting Glaciers.
   b) Fluctuations (terminal position, surface, mass balance) O -Stakes placed over surfaces of 4 cirque glaciers to help measure balance.
   c) Dynamics, movement
   d) Studies of surface O - Related to moraine formation.
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing
2) Snow study:
   a) Snow cover O - Studied with ablation stakes and pits on 4 glaciers
   b) Avalanches
3) Hydrology:
   a) Discharges O- Will be measured starting May 1978
   b) Ice cover percentage O
   c) Sub glacial hydrology
   d) Ice surface feature O
   e) Lacustrine hydrology

4) Climatology:
   a) Proximity to glacier
   b) Parameters
5) Geophysics:
   a) Radio-echo sounding method
   b) Magnetic surveys; electromagnetism
6) Earth science (including area surrounding station)
   a) Geology
   b) Tectonics
   c) Glacial geomorphology O - Atigun River Basin north to Gailbraith Lake
7) Botany - biology (including area surrounding station)
   a) Pollen analysis
   b) Micro bacterial fauna
   c) Flora
   d) Fossil woods (C^{14} dating)
   e) Timberline
   f) Lichenometry O - On Neoglacial moraines and late Wisconsin deposits
8) Quaternary history:

We are attempting to work out the Quaternary history of the Atigun River Basin north to Gailbraith Lake with particular emphasis on Neoglacial history of glacier fluctuations and slope movement.

E. DATA AVAILABILITY.

1) Tabulations Discharge measurements of headwaters of Atigun and North Fork
   Published reports Chandalar rivers for summer (July, 1977)
   Unpublished reports
2) Data files (tape, cards, satellite transmissions)
3) Address from which data are available P. Calkin, Dept. of Geological Sciences, SUNY, 4240 Ridge Lea Rd., Buffalo, 14226 or Dr. Larry Onesti, Dept. of Geography, Indiana University, Bloomington, Indiana
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST).

G. OTHER COMMENTS.

USA
VARIEGATED GLACIER

A. GEOGRAPHICAL LOCATION.

1) Country USA
2) Name of station Variegated Glacier
3) Locality
4) Latitude: 60° N Longitude: Elevation(m) 1200
5) Mountain range St. Elias
6) Drainage basin
7) Name of director Barclay Kamb--Hermann Engelhardt
8) Name of parent organization California Institute of Technology
Pasadena, CA 91125
Address
Telephone number 213-795-6841
9) Date of establishment of the station June 1978
10) Distance from the end of the road (in kilometers or hours of walking)
Other means of access: planes, float planes, helicopter, boat, etc.
boat and helicopter
Boarding point Yakutat
11) Distance between the station and the glaciers studied
5 km

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings
a) Total floor space
b) Details: e.g. Laboratories
Dormitories
Number of beds
Kitchens, dining rooms
Workshops

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology borehole photography
   b) Snow studies
   c) Hydrology
   d) Climatology
   e) Geophysics
   f) Geomorphology
   g) Botany, biology
   h) Quaternary history

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record 1978
2) Yearly utilization period June - August
3) Type of utilization (teaching, research, level of students involved)
   research
4) Number of researchers: Summer 4 Winter
5) Number of technicians: Summer 1 Winter
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s)
   b) Fluctuations (terminal position, surface, mass balance) sliding
   c) Dynamics, movement inclinometry
   d) Studies of surface surveying
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type) borehole photography
   g) Ice Chemistry and physics ice-bedrock interface
   h) Remote sensing
2) Snow study:
   a) Snow cover
   b) Avalanches
3) Hydrology:
   a) Discharges
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology

4) Climatology:
   a) Proximity to glacier
   b) Parameters
5) Geophysics:
   a) Radio-echo sounding method
   b) Magnetic surveys; electromagnetism
6) Earth science (including area surrounding station)
   a) Geology
   b) Tectonics
   c) Glacial geomorphology
7) Botany - biology (including area surrounding station)
   a) Pollen analysis
   b) Micro bacterial fauna
   c) Flora
   d) Fossil woods (C^{14} dating)
   e) Timberline
   f) Lichenometry
8) Quaternary history:

E. DATA AVAILABILITY.

1) Tabulations
   Published reports
   Unpublished reports basal sliding and conditions at the glacier bed as revealed by borehole photography
2) Data files (tape, cards, satellite transmissions)
3) Address from which data are available
   Journal of Glaciology---to be published
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST).

G. OTHER COMMENTS.

USA

WOLVERINE GLACIER

A. GEOGRAPHICAL LOCATION.

1) Country USA
2) Name of station Wolverine Glacier
3) Locality Kenai Peninsula, Alaska
4) Latitude: 60° 24' N Longitude: 148° 54' W Elevation(m) 900
5) Mountain range Kenai Mtns
6) Drainage basin Nellie Juan
7) Name of director L.R. Mayo
8) Name of parent organization U.S. Geological Survey
Water Resources Division
Address Box 11
101 12th Ave.
Fairbanks, Alaska 99701
Telephone number 452-1951 Ext. 214
9) Date of establishment of the station 1967
10) Distance from the end of the road (in kilometers or hours of walking)
27 km from road
Other means of access: planes, float planes, helicopter, boat, etc.
planes, float planes, helicopter--4.5 km from lake for float plane
Boarding point for air transportation, Lawing Air strip
11) Distance between the station and the glaciers studied immediately adjacent to Wolverine Glacier. Snow Glacier is 5 km from station

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 1 A-frame
a) Total floor space 11 m^2
b) Details: e.g. Laboratories } all combined into the
Dormitories } single building
Number of beds 2
Kitchens, dining rooms
Workshops

Cold rooms none

Generator source wind powered

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology 1
   b) Snow studies 4
   c) Hydrology 2
   d) Climatology 3
   e) Geophysics
   f) Geomorphology 5
   g) Botany, biology
   h) Quaternary history 6

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record Continuously recorded air temperature and precipitation
2) Yearly utilization period 4 visits per year
3) Type of utilization (teaching, research, level of students involved) research monitoring
4) Number of researchers: Summer 2 Winter 2
5) Number of technicians: Summer 0 Winter 0
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

6) L.R. Mayo, Glaciologist; D.C. Trabant, Glaciologist

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s)
   b) Fluctuations (terminal position, surface, mass balance) 0 1967-
   c) Dynamics, movement 0 1974-
   d) Studies of surface
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing 0-Aerial photography 1967-
2) Snow study:
   a) Snow cover 0 depth, density 1967-
   b) Avalanches
3) Hydrology:
   a) Discharges 0 1967-
   b) Ice cover percentage P 1967
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology

4) Climatology:
   a) Proximity to glacier 1000 m altitude very close
   b) Parameters air temperature and precipitation
5) Geophysics:
   a) Radio-echo sounding method upcoming
   b) Magnetic surveys; electromagnetism
6) Earth science (including area surrounding station)
   a) Geology
   b) Tectonics
   c) Glacial geomorphology
7) Botany - biology (including area surrounding station)
   a) Pollen analysis
   b) Micro bacterial fauna
   c) Flora
   d) Fossil woods (C^{14} dating)
   e) Timberline
   f) Lichenometry
8) Quaternary history:

E. DATA AVAILABILITY.

1) Tabulations from USGS-WRD, Fairbanks (address above)
   Published reports USGS - Profession Papers 715 A, B------
   Unpublished reports
2) Data files (tape, cards, satellite transmissions)
3) Address from which data are available
   Same as parent organization
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST).

G. OTHER COMMENTS.
We also have snow balance and ice dynamics data on Black Rapids Glacier, Alaska Range, Alaska since 1973 in ongoing program. Black Rapids is a close neighbor of Gulkana Glacier but has no permanent station established.

USSR

ABRAMOV GLACIER

A. GEOGRAPHICAL LOCATION.

1) Country USSR
2) Name of station Abramov Glacier
3) Locality Kirgiz SSR
4) Latitude: 39°35' N Longitude: 71°35' E Elevation(m) 3850 m
5) Mountain range Alai Range (southern slope)
6) Drainage basin Koksu River - Kysylsu River - Vachsh - Amudaria - Aral Sea
7) Name of director Dr. V.F. Suslov
8) Name of parent organization Tashkent Hydrometeorological Institute (SARNIGMI)

Address Observatorskaya St., 72
Tashkent, 700000, USSR

Telephone number

9) Date of establishment of the station 1967
10) Distance from the end of the road (in kilometers or hours of walking)
about 60 km from autoroad by horse road

Other means of access: planes, float planes, helicopter, boat, etc.
there is a place for helicopter landing

Boarding point

11) Distance between the station and the glaciers studied 1-5 km by foot and by tractor

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings Some buildings, function - year around
a) Total floor space
b) Details: e.g. Laboratories
Dormitories
Number of beds
Kitchens, dining rooms
Workshops

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology x
   b) Snow studies x
   c) Hydrology x
   d) Climatology x
   e) Geophysics x
   f) Geomorphology x
   g) Botany, biology x
   h) Quaternary history x

Additional information can be obtained from principal investigator or from Prof. V.M. Kotlyakov.

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record
2) Yearly utilization period
3) Type of utilization (teaching, research, level of students involved)
4) Number of researchers: Summer Winter
5) Number of technicians: Summer Winter
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s)
   b) Fluctuations (terminal position, surface, mass balance)
   c) Dynamics, movement
   d) Studies of surface
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing
2) Snow study:
   a) Snow cover
   b) Avalanches
3) Hydrology:
   a) Discharges
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology

USSR

AKTRU GLACIERS

A. GEOGRAPHICAL LOCATION.

1) Country USSR
2) Name of station Aktru glaciers
3) Locality Altaiskiy Kray
4) Latitude: 50°05' N Longitude: 87°45' E Elevation(m) 2150 m
5) Mountain range Severo-Chuiskiy Range(Altai), northern slope
6) Drainage basin Aktru River - Chuya - Katun' - Ob'
7) Name of director Before 1977 Prof. M.V. Tronov, now Dr. V.S. Revyakin
8) Name of parent organization Tomsk University, Glacioclimatological Laboratory

Address Lenina Av., 36
Tomsk, 634010, USSR

Telephone number

9) Date of establishment of the station 1957
10) Distance from the end of the road (in kilometers or hours of walking)
In summer autoroad reaches the station

Other means of access: planes, float planes, helicopter, boat, etc.

Boarding point

11) Distance between the station and the glaciers studied 2-5 km by foot

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 2
a) Total floor space
b) Details: e.g. Laboratories
Dormitories
Number of beds
Kitchens, dining rooms
Workshops

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology x
   b) Snow studies x
   c) Hydrology x
   d) Climatology x
   e) Geophysics x
   f) Geomorphology x
   g) Botany, biology x
   h) Quaternary history x

Additional information can be obtained from principal investigator or from Prof. V.M. Kotlyakov.

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record
2) Yearly utilization period
3) Type of utilization (teaching, research, level of students involved)
4) Number of researchers: Summer Winter
5) Number of technicians: Summer Winter
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s)
   b) Fluctuations (terminal position, surface, mass balance)
   c) Dynamics, movement
   d) Studies of surface
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing
2) Snow study:
   a) Snow cover
   b) Avalanches
3) Hydrology:
   a) Discharges
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology

USSR

BOL'SHAYA KHADATA, OBRUCHEV AND IGAN GLACIERS

A. GEOGRAPHICAL LOCATION.

1) Country USSR
2) Name of station Bol'shaya Khadata, Obruchev and IGAN glaciers
3) Locality Tyumenskaya Oblact'
4) Latitude: 67°35' N Longitude: 66°05' E Elevation(m) 230 m
5) Mountain range Polar Urals (eastern slope)
6) Drainage basin Bol.Khadata River - Ob' River
7) Name of director Dr. V.G. Khodakov
8) Name of parent organization Institute of Geography, Academy of Sciences of the USSR
   Address Staromonetny St., 29
   Moscow, 109017, USSR
   Telephone number
9) Date of establishment of the station 1957
10) Distance from the end of the road (in kilometers or hours of walking)
    110 km from the rail road. The station can be reached by cross-country road
    Other means of access: planes, float planes, helicopter, boat, etc.
    The station can be reached by helicopter
    Boarding point
11) Distance between the station and the glaciers studied 6-8 km by boat and by foot

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings Many buildings ("village")
   a) Total floor space
   b) Details: e.g. Laboratories
      Dormitories
      Number of beds
      Kitchens, dining rooms
      Workshops

Cold rooms_____
Generator source_____

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology x
   b) Snow studies x
   c) Hydrology x
   d) Climatology x
   e) Geophysics x
   f) Geomorphology x
   g) Botany, biology x
   h) Quaternary history x

Additional information can be obtained from principal investigator or from Prof. V.M. Kotlyakov.

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record_____
2) Yearly utilization period_____
3) Type of utilization (teaching, research, level of students involved)_____
4) Number of researchers: Summer_____Winter_____
5) Number of technicians: Summer_____Winter_____
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects_____

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s)_____
   b) Fluctuations (terminal position, surface, mass balance)_____
   c) Dynamics, movement_____
   d) Studies of surface_____
   e) Studies of deep ice (coring)_____
   f) Subglacial studies (access type)_____
   g) Ice Chemistry and physics_____
   h) Remote sensing_____
2) Snow study:
   a) Snow cover_____
   b) Avalanches_____
3) Hydrology:
   a) Discharges_____
   b) Ice cover percentage_____
   c) Sub glacial hydrology_____
   d) Ice surface feature_____
   e) Lacustrine hydrology_____

USSR

DZHANKUAT GLACIER

A. GEOGRAPHICAL LOCATION.

1) Country USSR
2) Name of station Dzhankuat Glacier
3) Locality Central Caucasus
4) Latitude: 43° N Longitude: 43° E Elevation(m) 2700-4000
5) Mountain range the Caucasus
6) Drainage basin Terek river (Caspian Sea)
7) Name of director Prof. Genady Goluber (scientific leader)
8) Name of parent organization Faculty of Geography
Moscow State University
Address Faculty of Geography, Moscow State University
Moscow 117234 USSR

Telephone number
9) Date of establishment of the station 1965
10) Distance from the end of the road (in kilometers or hours of walking)
4 km, 1 1/2 hours walking
Other means of access: planes, float planes, helicopter, boat, etc.
helicopter
Boarding point 15 km from the station, the main road

11) Distance between the station and the glaciers studied
0.5 km from the tongue

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 2 huts (and tents)
a) Total floor space
b) Details: e.g. Laboratories
Dormitories
Number of beds
Kitchens, dining rooms
Workshops

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology 1
   b) Snow studies 2 (as related to glacial and hydrological studies)
   c) Hydrology 1
   d) Climatology 3
   e) Geophysics 4
   f) Geomorphology 7
   g) Botany, biology 6
   h) Quaternary history 5

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record Constant mass and water balance measurements from 1968 on
2) Yearly utilization period May-September
3) Type of utilization (teaching, research, level of students involved)
   Research; 3-8 students participate every year
4) Number of researchers: Summer 3-7 Winter 2-4 (office work)
5) Number of technicians: Summer 2-5 Winter 1-3 (--n--)
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects various departments of Moscow University

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s) Dzhankuat Glacier
   b) Fluctuations (terminal position, surface, mass balance) O, from 1968
   c) Dynamics, movement P
   d) Studies of surface O, Stereophotogrammetric survey from 1968.
   e) Studies of deep ice (coring) O, thermoelectrodrilling from 1970
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics O, from 1976
   h) Remote sensing
2) Snow study:
   a) Snow cover O, snow surveys and other studies for mass balance, 1968-present time.
   b) Avalanches
3) Hydrology:
   a) Discharges O, 1965, 1968-present time
   b) Ice cover percentage O, from 1968
   c) Sub glacial hydrology O, from 1969
   d) Ice surface feature O, from 1968
   e) Lacustrine hydrology

4) Climatology: 0, 0.5 km from the glacier, from 1968
   a) Proximity to glacier 0, on the glacier tongue
   b) Parameters precipitation, temperature, sunshine, humidity, wind, energy balance (P)
5) Geophysics:
   a) Radio-echo sounding method 0, from 1968
   b) Magnetic surveys; electromagnetism electromagnetic surveys of the moraines, 1970-71, (P)
6) Earth science (including area surrounding station)
   a) Geology
   b) Tectonics
   c) Glacial geomorphology P
7) Botany - biology (including area surrounding station)
   a) Pollen analysis P
   b) Micro bacterial fauna P
   c) Flora
   d) Fossil woods (C^{14} dating)
   e) Timberline
   f) Lichenometry P, 1968-1974
8) Quaternary history:
   P, 1968-1974, Glacier fluctuation during the Little Ice Age

E. DATA AVAILABILITY

1) Tabulations
   Published reports
   Unpublished reports
2) Data files (tape, cards, satellite transmissions)
   Data are being prepared for further partial publication in the "Fluctuations of Glaciers"
3) Address from which data are available
4) Other information

F. MAIN PUBLICATIONS (ATTACH LIST).

G. OTHER COMMENTS.

References

There are about 40 publications in Russian on Dzhjanknat Glacier Basin. Many of them have been published in Materialy Glaciologicheskih Issledovanii. Chronika, Obsuzjdenia, volumes 17-23, Moscow, 1970-1977.

Many of the results of the investigations have been discussed by G. Golubev in a book, Gidrologia Lednikov (Hydrology of Glaciers), Leningrad, 1976. Another book prepared by a group of authors under the leadership of G. Golubev presented the results of studies on the International Hydrological Decade Programme, and is being published by Gidrometeoizdat. It is expected to appear in 1978.

USSR

GERGETI GLACIER

A. GEOGRAPHICAL LOCATION.

1) Country USSR
2) Name of station Gergeti Glacier
3) Locality Georgian SSR
4) Latitude: 42°40' N Longitude: 44°35' E Elevation(m) 3650 m
5) Mountain range Kazbek Massiv, Main Caucasian Range
6) Drainage basin Chkheri River - Terek River - Caspian Sea
7) Name of director Dr. V.S. Tsomaya
8) Name of parent organization Caucasian Hydrometeorological Institute

Address Plekhanov Av., 150
Tbilisi, 380012, USSR

Telephone number

9) Date of establishment of the station 1961
10) Distance from the end of the road (in kilometers or hours of walking)
10 km by horse road from Military Georgian Road

Other means of access: planes, float planes, helicopter, boat, etc.

Boarding point

11) Distance between the station and the glaciers studied 0.5-1 km by foot

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 1
a) Total floor space
b) Details: e.g. Laboratories
Dormitories
Number of beds
Kitchens, dining rooms
Workshops

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology x
   b) Snow studies x
   c) Hydrology x
   d) Climatology x
   e) Geophysics
   f) Geomorphology x
   g) Botany, biology
   h) Quaternary history

Additional information can be obtained from principal investigator or from Prof. V.M. Kotlyakov.

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record
2) Yearly utilization period
3) Type of utilization (teaching, research, level of students involved)
4) Number of researchers: Summer Winter
5) Number of technicians: Summer Winter
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s)
   b) Fluctuations (terminal position, surface, mass balance)
   c) Dynamics, movement
   d) Studies of surface
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing
2) Snow study:
   a) Snow cover
   b) Avalanches
3) Hydrology:
   a) Discharges
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology

USSR

KARABATKAK GLACIER

A. GEOGRAPHICAL LOCATION.

1) Country USSR
2) Name of station Karabatkak Glacier
3) Locality Kirgiz SSR
4) Latitude: 42°05' N Longitude: 78°25' E Elevation(m) 2560 m
5) Mountain range Terskey Alatau (northern slope)
6) Drainage basin Chon-Kysylsu River - Issyk-Kul' Lake
7) Name of director Dr. R.D. Zabirov
8) Name of parent organization Tien-Shan highmountain Station of the Academy of Sciences of the Kirgiz SSR
Address Pionerskaya St., 19
Pokrovka, Kirgiz SSR
722400, USSR
Telephone number
9) Date of establishment of the station 1947
10) Distance from the end of the road (in kilometers or hours of walking)
Horse road reaches the station
Other means of access: planes, float planes, helicopter, boat, etc.
Boarding point
11) Distance between the station and the glaciers studied 8-10 km by horse

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 2
a) Total floor space
b) Details: e.g. Laboratories
Dormitories
Number of beds
Kitchens, dining rooms
Workshops

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology x
   b) Snow studies x
   c) Hydrology x
   d) Climatology x
   e) Geophysics x
   f) Geomorphology x
   g) Botany, biology x
   h) Quaternary history x

Additional information can be obtained from principal investigator or from Prof. V.M. Kotlyakov.

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record
2) Yearly utilization period
3) Type of utilization (teaching, research, level of students involved)
4) Number of researchers: Summer Winter
5) Number of technicians: Summer Winter
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "0" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s)
   b) Fluctuations (terminal position, surface, mass balance)
   c) Dynamics, movement
   d) Studies of surface
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing
2) Snow study:
   a) Snow cover
   b) Avalanches
3) Hydrology:
   a) Discharges
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology

USSR

MARUKH GLACIER

A. GEOGRAPHICAL LOCATION.

1) Country USSR
2) Name of station Marukh Glacier
3) Locality Krasnodarskiy Kray
4) Latitude: 43°20' N Longitude: 41°25' E Elevation(m) 2900 m
5) Mountain range West Caucasus, Main Caucasian Range (northern slope)
6) Drainage basin Marukha River - Mal.Zelenchuk River - Kuban' River
7) Name of director Dr. A.N. Krenke
8) Name of parent organization Institute of Geography of the Academy of Sciences of the USSR
Address Staromonetny St., 29
Moscow, 109017, USSR
Telephone number
9) Date of establishment of the station 1967
10) Distance from the end of the road (in kilometers or hours of walking)
14 km by horse road from autoroad
Other means of access: planes, float planes, helicopter, boat, etc.
there is a place for helicopter landing
Boarding point
11) Distance between the station and the glaciers studied 0.5-1 km by foot

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings Summer huts
a) Total floor space
b) Details: e.g. Laboratories
Dormitories
Number of beds
Kitchens, dining rooms
Workshops

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology x
   b) Snow studies x
   c) Hydrology x
   d) Climatology x
   e) Geophysics x
   f) Geomorphology x
   g) Botany, biology x
   h) Quaternary history x

Additional information can be obtained from principal investigator or from Prof. V.M. Kotlyakov.

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record
2) Yearly utilization period
3) Type of utilization (teaching, research, level of students involved)
4) Number of researchers: Summer Winter
5) Number of technicians: Summer Winter
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s)
   b) Fluctuations (terminal position, surface, mass balance)
   c) Dynamics, movement
   d) Studies of surface
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing
2) Snow study:
   a) Snow cover
   b) Avalanches
3) Hydrology:
   a) Discharges
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology

USSR

MEDVEZHY GLACIER

A. GEOGRAPHICAL LOCATION.

1) Country USSR
2) Name of station Medvezhy Glacier
3) Locality Tadzhik SSR
4) Latitude: 38°40' N Longitude: 72°05' E Elevation(m) 2900 m
5) Mountain range Akademii Nauk Range, Central Pamirs
6) Drainage basin Vanch River - Pyandzh River - Amudaria River - Aral Sea
7) Name of director Before 1975 Dr. L.D. Dolgushin, now Dr. D.G. Tcvetkov
8) Name of parent organization Institute of Geography, Academy of Sciences of the USSR

Address Staromonetny St., 29
Moscow, 109017, USSR

Telephone number

9) Date of establishment of the station 1963
10) Distance from the end of the road (in kilometers or hours of walking)
Autoroad reaches glacier

Other means of access: planes, float planes, helicopter, boat, etc.

Boarding point

11) Distance between the station and the glaciers studied 2-10 km by foot

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings Summer huts
a) Total floor space
b) Details: e.g. Laboratories
Dormitories
Number of beds
Kitchens, dining rooms
Workshops

Cold rooms
Generator source

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology x
   b) Snow studies
   c) Hydrology x
   d) Climatology x
   e) Geophysics x
   f) Geomorphology x
   g) Botany, biology
   h) Quaternary history x

Additional information can be obtained from principal investigator or from Prof. V.M. Kotlyakov.

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record
2) Yearly utilization period
3) Type of utilization (teaching, research, level of students involved)
4) Number of researchers: Summer Winter
5) Number of technicians: Summer Winter
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s)
   b) Fluctuations (terminal position, surface, mass balance)
   c) Dynamics, movement
   d) Studies of surface
   e) Studies of deep ice (coring)
   f) Subglacial studies (access type)
   g) Ice Chemistry and physics
   h) Remote sensing
2) Snow study:
   a) Snow cover
   b) Avalanches
3) Hydrology:
   a) Discharges
   b) Ice cover percentage
   c) Sub glacial hydrology
   d) Ice surface feature
   e) Lacustrine hydrology

USSR

SHUMSKY GLACIER

A. GEOGRAPHICAL LOCATION.

1) Country USSR
2) Name of station Shumsky Glacier
3) Locality Kazakh SSR
4) Latitude: 45°10' N Longitude: 80°45' E Elevation(m) about 3000 m
5) Mountain range Dzhungarskiy Alatau (northern slope)
6) Drainage basin Lepsa River - Balkhash Lake
7) Name of director Dr. P.A. Cherkasov
8) Name of parent organization Section of Geography, Academy of Sciences of the Kazakh SSR
   Address Kalinina St., 69A
   Alma-Ata, 480100, USSR

   Telephone number
9) Date of establishment of the station 1957, but not every year
10) Distance from the end of the road (in kilometers or hours of walking)

    Other means of access: planes, float planes, helicopter, boat, etc.

    Boarding point

11) Distance between the station and the glaciers studied

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings Summer hut
   a) Total floor space
   b) Details: e.g. Laboratories
      Dormitories
      Number of beds
      Kitchens, dining rooms
      Workshops

Cold rooms_____
Generator source_____

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology x
   b) Snow studies
   c) Hydrology x
   d) Climatology x
   e) Geophysics
   f) Geomorphology x
   g) Botany, biology
   h) Quaternary history x

Additional information can be obtained from principal investigator or from Prof. V.M. Kotlyakov.

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record_____
2) Yearly utilization period_____
3) Type of utilization (teaching, research, level of students involved)_____
4) Number of researchers: Summer_____ Winter_____
5) Number of technicians: Summer_____ Winter_____
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects_____

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "0" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s)_____
   b) Fluctuations (terminal position, surface, mass balance)_____
   c) Dynamics, movement_____
   d) Studies of surface_____
   e) Studies of deep ice (coring)_____
   f) Subglacial studies (access type)_____
   g) Ice Chemistry and physics_____
   h) Remote sensing_____
2) Snow study:
   a) Snow cover_____
   b) Avalanches_____
3) Hydrology:
   a) Discharges_____
   b) Ice cover percentage_____
   c) Sub glacial hydrology_____
   d) Ice surface feature_____
   e) Lacustrine hydrology_____

USSR

ZENTRALNYI TUYUKSU GLACIER

A. GEOGRAPHICAL LOCATION.

1) Country USSR
2) Name of station Zentralnyi Tuyuksu Glacier
3) Locality Kazakh SSR
4) Latitude: 43°05' N Longitude: 77°10' E Elevation(m) 3420 m a.s.l.
5) Mountain range Zailiyskiy Alatau (northern slope)
6) Drainage basin Malaya Almatinka River - Ili River - Balkhash Lake
7) Name of director Dr. K.G. Makarevich
8) Name of parent organization Section of Geography, Academy of Sciences of the Kazakh SSR
Address Kalinina St., 69A
Alma-Ata, 480100, USSR
Telephone number
9) Date of establishment of the station 1957; irregular studies earlier
10) Distance from the end of the road (in kilometers or hours of walking)
Autoroad in summer time reaches the station; 30 km from Alma-Ata
Other means of access: planes, float planes, helicopter, boat, etc.
Boarding point
11) Distance between the station and the glaciers studied 1-3 km by foot

B. DESCRIPTION OF THE STATION (INCLUDE A MAP IF AVAILABLE).

1) Number of buildings 1
a) Total floor space
b) Details: e.g. Laboratories
Dormitories
Number of beds
Kitchens, dining rooms
Workshops

Cold rooms_____
Generator source_____

2) Major research activities of the station (please check and rank in order of importance)
   a) Glaciology x
   b) Snow studies x
   c) Hydrology x
   d) Climatology x
   e) Geophysics x
   f) Geomorphology x
   g) Botany, biology x
   h) Quaternary history x

Additional information can be obtained from principal investigator or from Prof. V.M. Kotlyakov.

C. CALENDAR TIMING OF ACTIVITIES OF THE STATION.

1) Period of record_____
2) Yearly utilization period_____
3) Type of utilization (teaching, research, level of students involved)_____
4) Number of researchers: Summer_____Winter_____
5) Number of technicians: Summer_____Winter_____
6) List of station personnel (and speciality). ATTACH LIST.
7) Other laboratories working temporarily at the station on joint/separate projects_____

D. MAIN TYPES OF RESEARCH AND DATA COLLECTED.
Put "O" for ongoing research, "P" for previous studies. Indicate period of records. (Add appropriate details.)

1) Glaciological research:
   a) Name/UNESCO inventory number of glacier(s)_____
   b) Fluctuations (terminal position, surface, mass balance)_____
   c) Dynamics, movement_____
   d) Studies of surface_____
   e) Studies of deep ice (coring)_____
   f) Subglacial studies (access type)_____
   g) Ice Chemistry and physics_____
   h) Remote sensing_____
2) Snow study:
   a) Snow cover_____
   b) Avalanches_____
3) Hydrology:
   a) Discharges_____
   b) Ice cover percentage_____
   c) Sub glacial hydrology_____
   d) Ice surface feature_____
   e) Lacustrine hydrology_____

ERRATA

Glaciological Data, no. 3, December 1978

pp. 54, line 21, "Applied studies of snow" should read "Applied studies of snow and ice".

pp. 57, References should read "Kotlyakov, V.M., editor (1977)...

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