

## FACILITIES AND LOGISTICS

Thirteen main stations and 17 lesser camps and research facilities are located on the icefield and its peripheral areas. Permanent aluminum-sheathed and well insulated buildings exist at field sites. Wooden shelters and tents are used at trail camps. A 3000-volume library containing pertinent research materials, maps, aerial photos and other basic references is maintained at the five main icefield stations, as well as in the environmental sciences research library at the Atlin base station. A wide range of field and laboratory equipment for geophysical, glaciological, surveying, photogrammetric, botanical, meteorological and geological work is available for teaching and research.

Communication between camps and with the Juneau and Atlin bases is handled by radio. Helicopters, charter aircraft, and ski-planes are used for transportation, with ground transport carried out via foot travel, oversnow vehicles, dog team and skis.

Permanent installations are provided by the Foundation for Glacier and Environmental Research, c/o The Pacific Science Center, Seattle, Washington.

## ELIGIBILITY

Graduate and undergraduate participants must be enrolled in, or officially admitted for, work as candidates for a degree at their respective institutions. A high academic record or potential is expected. Considerable weight is placed on personal character, demonstrated interest and professional motivation. Several post-doctoral or senior scientist participantships are available to qualified older scientists.

In the operation of this program and in selecting individuals for participation in and for administration of the program, the University of Idaho and the Foundation for Glacier and Environmental Research will not discriminate against any person on the ground of race, creed, color, sex, or national origin.



Oversnow vehicles on Hades Highway Névé



Dog team on the Taku Névé

## APPLICATION

Application can be made as late as June 15th but earlier inquiry is urged. Applications should include information on experience and adaptability to rugged field conditions; transcripts; evidence of school or university status; and letters of recommendation from a supervisory head and two other individuals regarding scholarship and character.

Make application to:

Dr. Maynard M. Miller, Dean

College of Mines & Earth Resources

University of Idaho, Moscow, Idaho 83843

or to the

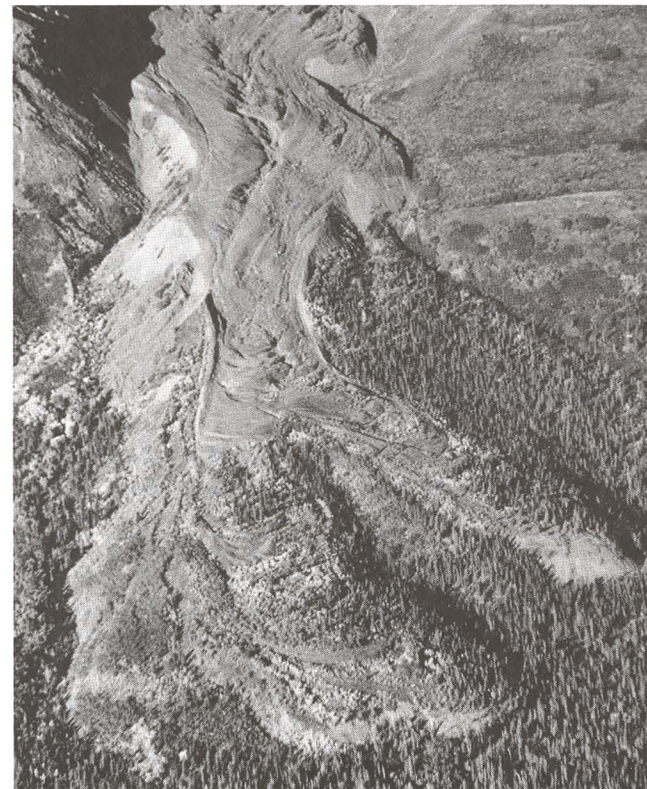
Foundation for Glacier and Environmental Research

Pacific Science Center 200-2nd Ave. North

Seattle, Washington 98109

Field Addresses: P.O. Box 775, Juneau, Alaska 99801

P.O. Box 99, Atlin, B.C., Canada



Rock glacier in the Alaska-B.C.-Yukon border region

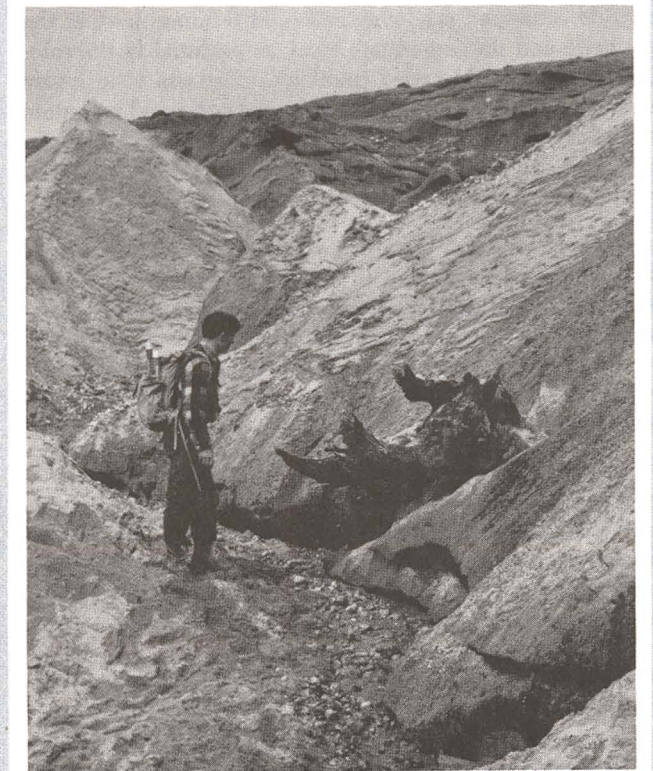
## STAFF AND RESOURCE SCIENTISTS

- DR. MAYNARD M. MILLER, Dean, College of Mines and Earth Resources and Professor, Geology Dept.; Director, Glaciological and Arctic Sciences Institute, University of Idaho (applied geomorphology, glaciology, Quaternary stratigraphy, mining geology)
- DR. EDWARD G. ANDERSON, Surveying Engineering Dept., University of New Brunswick, Fredericton, N.B., Canada (surveying, geodesy)
- DR. JAMES H. ANDERSON, Institute of Arctic Biology, University of Alaska, Fairbanks, AK (geobotany, palynology, dendro-glaciology)
- ROBERT A. ASHER, Foundation for Glacier and Environmental Research, Pacific Science Center, Seattle, WA (glaciology, data processing)
- DR. P. JAY FLEISHER, Earth Science Dept., State University College, Oneonta, N.Y. (glacial and periglacial processes, photo geology)
- DR. DAVID LIETZKE, Agronomy Dept., Virginia Polytechnic Institute (pedology, arctic soils and soil research)
- DR. BRUCE MOLNIA, Pacific-Arctic Branch of Marine Geology, U.S. Geological Survey, Menlo Park, CA (Alaskan marine-coastal geology)
- DR. ALFRED C. PINCHAK, Dept. of Fluid Mechanics, Case Western Reserve University, Cleveland, OH (continuum mechanics, hydrological research, surveying, analytical methods)
- BARRY W. PRATHER, Foundation for Glacier and Environmental Research, Pacific Science Center, Seattle, WA (glacier geophysics)
- DR. CHARLES L. ROSENFELD, Geography Dept., Oregon State University (remote sensing, arctic-alpine terrain analysis)
- LEON J. SCHEON, Glaciological and Arctic Sciences Institute, University of Idaho (Deputy Leader; geophysics and frozen ground phenomena)
- DR. HEINZ SLUPETZKY, Geographical Institute, University of Salzburg, Austria, and Geography and Geology Depts., University of Idaho (summer) (glaciology, mass balance research, alpine meteorology)
- DR. DOUGLAS N. SWANSTON, U.S. Forest Service, Forestry Sciences Lab, Juneau, AK (mass wastage, landslide mechanics)
- DR. ANN M. TALLMAN, Atomics International Division, Rockwell Hanford Operations, Richland, WA (Deputy Leader; Pleistocene stratigraphy, applications geology)
- DR. AYLMEER H. THOMPSON, Meteorology Dept., Texas A and M University (arctic climatology, synoptic meteorology, mountain wind research)
- DR. COLIN E. THORN, Dept. of Geography, University of Maryland, College Park, MD (arctic-alpine geomorphology, periglacial nivation processes)
- DR. GEORGE A. WILLIAMS, Head, Geology Dept., University of Idaho (economic geology, volcanics, mineral exploration)
- DR. CHARLES WILSON, Geophysical Institute, University of Alaska, College, AK (atmospheric geophysics, Antarctic research)
- WILLA W. HILTNER, Foundation for Glacier and Environmental Research, Pacific Science Center, Seattle, WA (logistics, survival instruction)
- JOAN W. MILLER, Foundation for Glacier and Environmental Research, Pacific Science Center, Seattle, WA (Program Manager, communications and logistics; administrative, personnel and fiscal affairs)
- Medical, Safety and Terrain and Survival Instruction:* W. M. Smith, M.D., and T. R. Haley, M.D., Found. for Glacier and Environmental Research (coordinators); O. Trott, M.D., M. Wheeler, M.D., J. Rude, M.D., B. Prather, W. Davidson, L. D. Miller, D. Thomas.
- Administration, Liaison and Logistics Staff:* J. W. Miller, W. Hiltner, K. Schoen, M. Parke, J. Florence, K. Loken, J. Wilson, D. Williams.
- Camp and Field Operations:* R. Asher, P. Egan, J. Guigné, D. Hardy, L. Gustafson, G. Linder, R. M. Miller, J. Price, W. Campbell, G. Thoma, J. Thoma, L. Thoma, F. Wallis, K. Hansen, J. Lynch, W. Buchanan.
- Other Lecturers, Scientific Advisors and Research Affiliates:* Dr. Talbert Abrams, Abrams, Aerial Survey Corp., Lansing, MI (aerial surveys); M. Alford, Inland Waters Branch, Whitehorse, Y.T. (hydrometrics); Dr. Robert F. Black, Geology Dept., Univ. of Connecticut (periglacial geology, permafrost research); Dr. D. Brew, Dr. A. Ford, V. Berwick, U.S. Geol. Survey, Alaska Branch and Juneau Office (regional geology, hydrology); Dr. J. H. Helle, Nat. Marine Fisheries Service, Auke Bay, AK (environmental science); Dr. V. Jones, Found. for Glacier and Envir. Research (glacio-climatology); A. Clough, J. Guigné, G. Linder, B. Prather, C. Natenstadt, L. Schoen, graduate students, Geology Dept., Univ. of Idaho (glaciology, geology); Dr. H. Curl, Envir. Research Lab, NOAA; Dr. J. Monger, Geol. Survey of Canada, Vancouver (B.C.-Yukon geology); Dr. D. Craig, Resident Geologist, Canadian Dept. of Indian Affairs, Whitehorse, Y.T. (cordilleran geology); J. Harvey, Atlin, B.C. (placer mining); J. Wallis, Atlin, B.C. (mining engineering, mineral exploration); Dr. A. Chrzanowski, Surveying Engineering Dept., Univ. of New Brunswick, Fredericton, N.B. (surveying); Dr. Kevin Hall, Inst. for Envir. Sci., U. of Orange Free State, So. Africa (sedimentation, Antarctic geology); Dr. D. Burrows, Found. for Glacier and Env. Res., Seattle, WA (meteorology; icing research); Dr. Gary Cloud, Dept. of Mechanical Engineering, Michigan State Univ., E. Lansing, MI (continuum mechanics); Dr. Robert L. Nichols, Dept. of Geology (emeritus), Tufts Univ., Medford, MA (geomorphology, polar research); Dr. A. C. Finchak, Case Western Reserve Univ. (fluid mechanics); Dr. H. Posamentier, Rider College, N.J. (dendro-glaciology); James S. Lynch, Dept. of Meteorology, Texas A & M Univ. (glacio-meteorology); Dr. Tom L. Pittman, U.S. Bureau of Mines, Juneau, AK (mineral resources); Dr. R. Blum, Mining and Metallurgy Dept., University of Idaho (geophysics); Dr. J. P. Welsh, Chief, Polar Oceanography Branch, NORDA, U.S. Navy (polar ice research).

# ARCTIC AND MOUNTAIN SCIENCES

20th Summer Institute of Glaciological and Arctic Sciences  
JULY 1 — AUGUST 18, 1979  
JUNEAU ICEFIELD, ALASKA  
and the Atlin Lake region  
B.C., Yukon, Canada

Supported by the National Science Foundation, University of Idaho, Foundation for Glacier and Environmental Research and the Juneau Icefield Research Program.



Alaska yellow cedar trunk embedded in sole of Taku Glacier. C<sup>14</sup> age, 850 A.D. (F.G.E.R. photo)



Englacial structures in the Gilkey Trench near Camp 19

## DATE

The Institute will be held from July 1 to August 18, 1979. For qualified students interested in participation in the long-term Juneau Icefield Research Program and allied regional research projects, or for those who desire field work on thesis problems, a period of additional field work may be arranged.

## THE PROGRAM

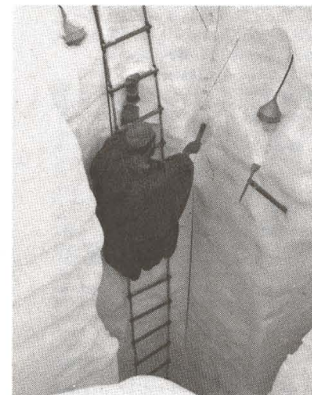
*"Nature without learning is a blind thing—and learning without Nature is an imperfect thing."*

—Plutarch.

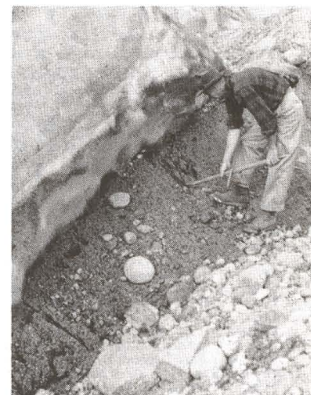
Emphasis is placed on expeditionary experience and research participation in various scientific projects developed for student involvement in the field. Field courses are offered in glaciology, geomorphology and selected environmental sciences. These are directed by Dr. M. M. Miller with visiting scientists assisting in these offerings and available for consultation. Academic Credit is arranged through the Geology and Geography Departments of the University of Idaho.

Special topic seminars covered are: Arctic Environmental Sciences; Terrestrial and Glacial Photogrammetry; Glacier Surveys and Mapping; Glacio-ecology; Lichenometry; Periglacial Geomorphology and Pleistocene Stratigraphy; Continuum Mechanics; Glacio-meteorology; Glacio-hydrology; Exploration Geophysics and Mineral Resources Prospecting; and Arctic Basin Research.

All offerings are designed to take full advantage of a classical glacial, periglacial and mountain and arctic environment in terms of field and "laboratory" instruction.



Density and melt-water measurements, Upper Taku Glacier



Debris-entrained thrust surface, Mendenhall Glacier

Lectures, field studies and problem sessions are held on adjunct topics. All offerings are given concurrently during a concentrated four-week session on the Juneau Icefield, emphasizing Neoglacial conditions. Each participant is exposed to all offerings. An initial week is devoted to indoctrination in field methods, and safety and survival techniques. Two to three weeks may be used for work on a specific field problem, dependent on the participant's aim, interest and abilities. The last two weeks generally are concentrated in the Atlin area where the deglaciated terrain provides opportunity for study of Cordilleran Wisconsinan chronology and Holocene periglacial environments. For those wishing to ally the instructional program with a specific thesis project, or equivalent research, including post-doctoral research, field problems may be developed.

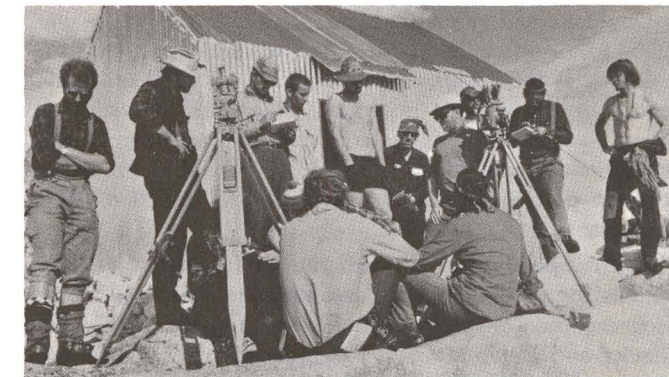
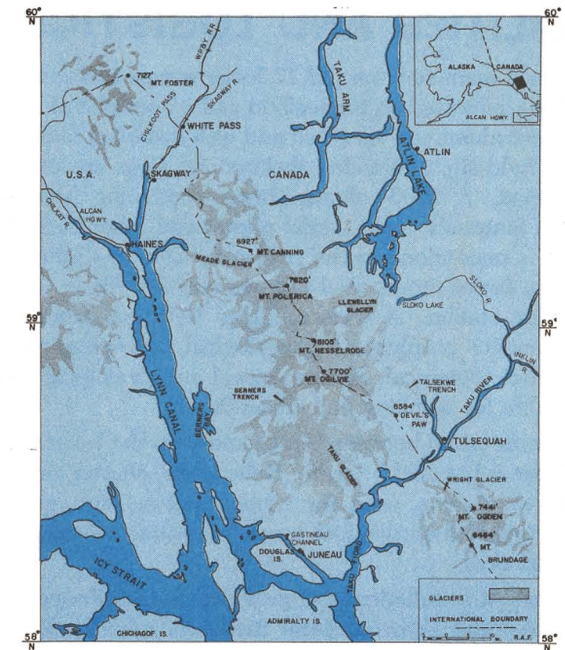
## PARTICIPANTSHIPS AND AWARDS

A limited number of field participantships are available at the undergraduate, graduate and post-doctoral or senior scientist level. These include undergraduate research participation awards and graduate level awards supported by the Foundation for Glacier and Environmental Research (FGER). Several JIRP research assistantships in connection with ongoing programs are offered to outstanding previous participants or others having equivalent experience. A few field training awards are also available to high-ability high school juniors and seniors with environmental and earth science interests.

Places for additional participants in each category are available at the field fee of \$1260 per student for the full session. Participants cover their own travel expenses between their home and Juneau, Alaska, and from Atlin, B.C., back home.

## LOCATION

The main glacier area lies on or near the Juneau Icefield in the Alaska-Canada Coast Range between Juneau, Alaska and Atlin, B.C. In past seasons field trips have been conducted to observe phenomena in the deglaciated coastal environs, such as Glacier Bay, the Chilkat region, the forested fiords of Lynn Canal and in the Dezadeash Lake and Atlin Lake areas on the continental side of the Boundary Range. Special emphasis this year will be given to the Atlin District, lying adjacent to the icefield on the north. Here a remarkable array of Wisconsinan deglaciation features and periglacial phenomena are observed. A permanent headquarters station is maintained at Atlin, B.C., from which field trips are also made to the Yukon Territory.



Surveying instruction at a field camp



Alaska Air National Guard ski-plane at Camp 10

## PURPOSE

The Juneau Icefield Research Program (JIRP) was organized in 1946 to pursue detailed long-term research on interrelationships of the many disciplines necessary to understand the total environment of arctic and mountain regions. As an extension of this program, the Summer Institute of Glaciological and Arctic Sciences was organized in 1959 to provide combined academic and field training, both at the graduate and undergraduate level, so essential to the solution of these multi-varied problems. The aim is to insure a total systems competence in potential polar and mountain scientists and to provide practical training with broad significance for geologists, hydrologists, geophysicists, atmospheric scientists and ecologists with field interests.

Students not only have the opportunity to observe and study subaerial processes in a dynamic region of existing glaciers, and rugged mountain terrain, but also to gain appreciation of the inter-science investigational approach in field studies which are applicable not only to pristine wilderness regions but to scientific environmental problems in rural and urban areas.

As part of their training, participants attend lectures at pertinent field sites, participate in demonstrations with instruments and materials in the field, and take and record a variety of different scientific measurements under supervision as part of a long-range research program of related investigations from high-elevation and continental periglacial areas to low-level temperate and maritime regions. Through this approach, students gain a realistic understanding of glacio-climatological, glacio-geological and glacio-ecological relationships in natural systems. In addition to selected academic offerings, the Institute gives practical field work and extensive experience in a variety of personally challenging projects.