ACADEMIC CREDIT

Participants will be registered in the Michigan State University summer quarter. The basic credit requirement is six points, transferrable to other universities. Registration cost is paid by the Institute for NSF participants. Additional credits can be arranged.

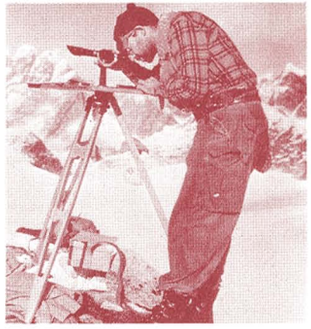
ELIGIBILITY

The NSF Awardees must be enrolled in or accepted for graduate work as candidates for a degree at their respective institutions. Indication of intent to go to graduate school is not sufficient. A generally high academic record is expected. Considerable weight is placed on personal character, demonstrated interest and professional motivation. Postdoctoral awards are also given each year for qualified senior scientists and several non-NSF participantships can also be made available to qualified high school earth science teachers. *In selecting individuals for project participation and administration, Michigan State University will not discriminate on grounds of race, creed, color, or national origin of any applicant or participant.*

APPLICATION

Application can be made as late as June 15th; however, earlier inquiry is urged. Letters of application should contain information on experience and adaptability to rugged field conditions; transcripts; evidence of graduate school status or acceptance; and letters of recommendation from a departmental or supervisory head, and two other individuals regarding scholarship and character. Half of the billets will be allocated by May 1st. All other participants will be notified before June 30th.

Make application to:
Director, Glaciological and Arctic Sciences Institute
Michigan State University, East Lansing, Michigan 48823
Field Addresses: P. O. Box 775, Juneau, Alaska 99801
P. O. Box 99, Atlin, B. C., Canada



(5) Debris-entrained thrust surface, Mendenhall Glacier; (6) Plane tabling on Twin Glacier nunatak.

STAFF

Dr. Maynard M. Miller, Director, Glaciological and Arctic Sciences Institute, Professor, Geology Dept., Michigan State University. (glaciology, geomorphology, photo-interpretation, research, expedition techniques)

Dr. Hugh Bennett, Geology Dept., Michigan State University. (glacier geophysics)

Dr. Roland E. Beschel, Biology Dept., Queen's University, Kingston, Ont., Canada. (Arctic botany, lichenometry)

Dr. Robert F. Black, Geology Dept., University of Wisconsin. (periglacial studies, permafrost, polar geology)

Dr. James E. Buch, Geology Dept., State University of New York, Cortland. (glaciology, mass balance research, glacier stratigraphy)

Dr. Gottfried Konecny, Head, Surveying Engineering Dept., University of New Brunswick, Canada. (terrestrial photogrammetry, glacier surveys)

Dr. Edward J. Krakwisky, Surveying Engineering Dept., University of New Brunswick, Canada. (field surveying, photogrammetry, geodesy)

Dr. Robert W. Little, Metallurgy, Mechanics & Materials Science Dept., Michigan State University. (glacier mechanics)

Dr. Robert L. Nichols, Head, Geology Dept., Tufts University. (Pleistocene geology, Antarctic geomorphology, photo interpretation)

Dr. Alfred Pinchak, Dept. of Fluid Mechanics, Case Western Reserve University. (fluid mechanics, glaciology research)

Dr. Douglas N. Swanston, Institute of Northern Forestry, U.S. Forest Service, Juneau, Alaska. (mass wastage, pedology)

Dr. Aylmer Thompson, Meteorology Dept., Texas A. & M. (mountain meteorology)

Medical Staff, Safety & Survival Instruction: T. R. Haley, M.D., Foundation for Glacier and Field Res. (medical coordinator), W. M. Smith, M.D., Lee S. Fent, M.D., Philip E. Fluvog, M.D.; Ome Daiber, Mt. Rescue Council, Seattle; T. Falley; D. Williams, Juneau, Alaska.

Camp and Field Operations: H. Bressler, C. Cox, R. Dilts, R. Files, I. Herrigstad, A. and N. Livingston, K. Loken, J. W. Miller, R. Miller, L. Schoen, V. Sundberg, M. Taylor.

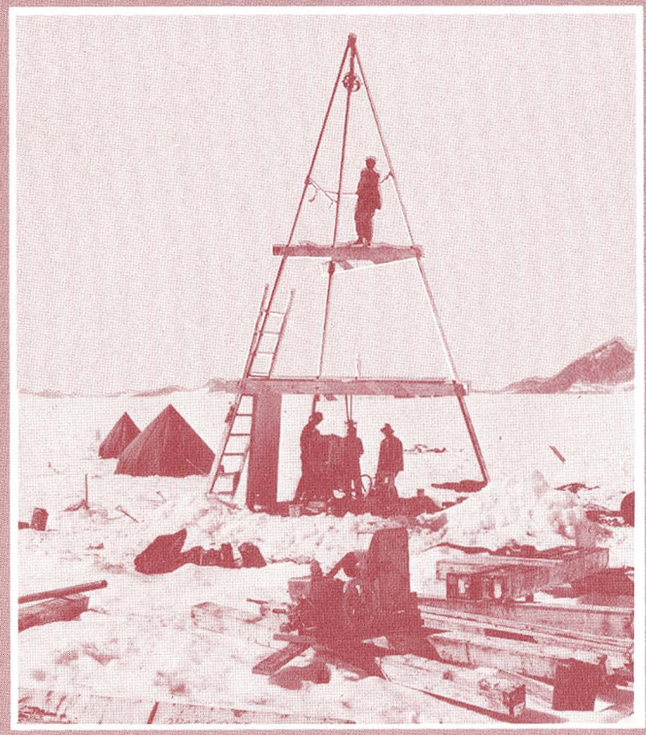
Adiunct Lecturers and Research Affiliates: Dr. D. Brew, Dr. A. Ford, and V. Berwick, U.S. Geological Survey (bedrock geology, Alaska hydrology); Dr. E. Little, Univ. of Alaska (ice physics); Dr. Will Siri, Donner Biophysics Lab., Univ. of Calif. (polar and mountain physiology); A. E. Helmers, Institute of Northern Forestry, U.S. Forest Service (glacio-hydrology); J. Bauer, U.S. Weather Bureau (Alaskan climatology); Dr. T. H. Wu, Institute of Polar Studies, Ohio State Univ. (glacier mechanics); B. W. Prather, Foundation for Glacier and Field Research (glacier geophysics and expedition techniques); A. Tallman (glacial geology), J. H. Anderson (Geobotany), L. Miller (surveys and structural glaciology) and D. Lietzke (Arctic pedology), Michigan State University; Dr. W. A. Wood, Icefield Ranges Research Project.

THE GLACIOLOGICAL INSTITUTE
DEPARTMENT OF GEOLOGY
MICHIGAN STATE UNIVERSITY

10TH SUMMER INSTITUTE OF GLACIOLOGICAL AND ARCTIC SCIENCES

JULY 7 - AUGUST 31, 1969
JUNEAU ICEFIELD, ALASKA, AND ADJACENT REGIONS

Sponsored by the NATIONAL SCIENCE FOUNDATION in cooperation with the Foundation for Glacier & Field Research and the Juneau Icefield Research Program



Rotary core drilling research at Camp 10B on upper Taku Glacier

PURPOSE

The Summer Institute of Glaciological and Arctic Sciences was organized in 1960, and since then it has been held each year to provide academic and field training, primarily at the graduate level, for potential polar and mountain scientists. Students gain appreciation of the significance of the interdisciplinary investigational approach by attending lectures at pertinent field sites, by participating in demonstrations with instruments and materials in the field, and by taking and recording scientific measurements under supervision as part of an actual field research program. Through this approach students gain a more realistic understanding of glacio-climatological, glacio-geological and glacio-ecological relationships. In addition to academic offerings, the Institute also provides practical field work training and experience in a variety of sub-Arctic to high-Arctic and mountain expeditionary environments. These aspects of the Institute's program make its contribution to the learning process especially meaningful.

DATE

The Institute will be held for eight weeks, from July 7 to August 31, 1969. For qualified students interested in participation in the affiliated Juneau Icefield Research Program or desiring field work on thesis problems, up to four weeks additional field time can be arranged.

THE CURRICULUM

Catalogued courses are offered in *Field Glaciology, Periglacial Geomorphology, Glacio-ecology, Glacio-meteorology, Glacio-hydrology, Glacier Geophysics, Glacier Mechanics, Glacier Surveying, Terrestrial and Glacier Photogrammetry* and *Field Problems* in these and related topics. The courses are designed to take full advantage of the glacial, periglacial and mountain environments of the region in terms of field and "laboratory" instruction.

Additionally, special lectures, field studies and problem sessions will be held on adjunct topics such as mapping and surveying, snow physics, glacier physics and continuum mechanics, lichenology, glacio-oceanography, permafrost, glacio-fluvial processes, Arctic geobotany, glacial geology, mountain geology, and Arctic soil science.

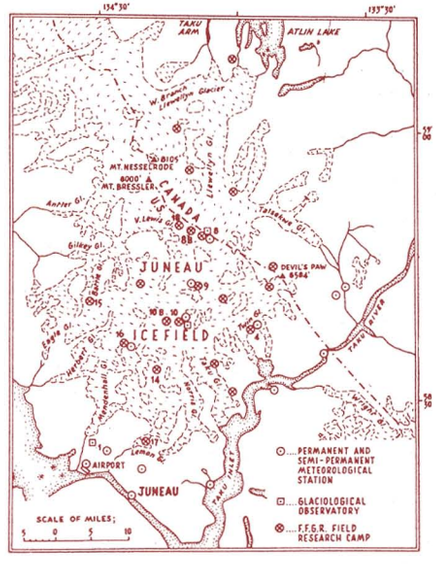
All offerings will be given concurrently during a five-week session on the Juneau Icefield. A sixth week will be used for a specific field problem depending on the student's aims and interests. The seventh and eighth weeks of observation will be conducted in an area of deglaciated terrain. For those wishing to ally the instruction program with a specific thesis program, or equivalent research, including postdoctoral research, field problems may be developed and, where pertinent, variable credit obtained.

PARTICIPANTS

Fourteen National Science Foundation field participantships are available at the graduate and *postdoctoral* levels, plus four Institute grants, one affiliated NDEA scholarship, and two FGFR undergraduate research participant grants for qualified undergraduates. Places for additional participants without Institute support are available. The fee in such cases is $1200 per student. Two graduate teaching assistantships and four research assistantships in connection with on-going research programs are also offered each year to outstanding previous participants, or others with equivalent field experience.

LOCATION

The main field sites lie on or near the Juneau Icefield in the Alaska-Canada Coast Range near Juneau, Alaska. Field trips are also conducted to observe phenomena in the deglaciated coastal environs, such as Glacier Bay, the Chilkat region, the forested fiords of Lynn Canal, the Taku River Valley or in the Dezadeash and Atlin Lake areas on the continental side of the Coast Range. Special emphasis is given to the Atlin District lying adjacent to the icefield on the north. For this part of the program a headquarters station is maintained at Atlin, B. C. from which field trips are also made to the Southwestern Yukon for glacial geological observations.



Juneau Icefield and vicinity showing meteorological and glacier research stations. Logistics headquarters at Juneau. Field headquarters at Camp 8 (elev. 7200 ft.), Camp 10 (elev. 4000 ft.), and Camp 17 (elev. 4200 ft.). The Atlin station lies north of the map on the eastern shore of Atlin Lake.

FACILITIES AND LOGISTICS

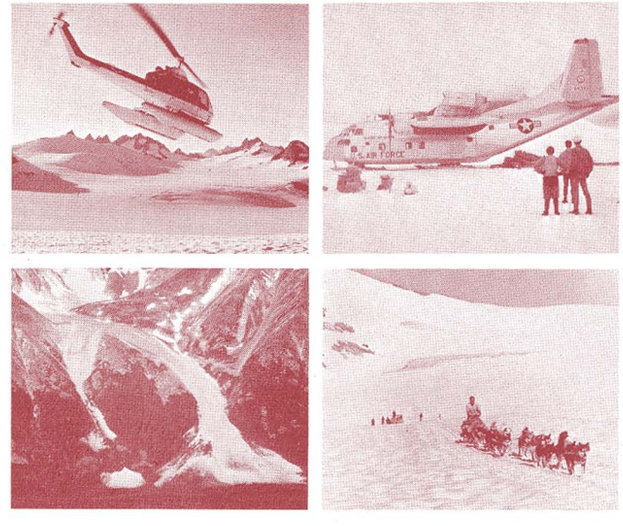
Thirteen main stations and 17 lesser camps and research facilities are located on the icefield and its peripheral areas. Insulated and aluminum-sheathed buildings exist at the field sites. At trail camps, wooden shelters and tents are used. A 1500-volume library containing pertinent research materials, maps, aerial photos and basic references is maintained at the three main icefield stations, with an additional small research library at the Atlin base. 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 Juneau and Atlin is handled by radio. Helicopter and ski-plane transport is used, with ground transport depending on oversnow vehicles and skis.

Permanent installations are provided by the Juneau Icefield Research Program via its sponsor, the Foundation for Glacier and Field Research, Seattle, Washington.

AWARDS AND ALLOWANCES

The NSF participants receive free tuition and are furnished round-trip air travel expenses, Seattle/Juneau, plus all food, lodging and facilities during the eight-week session. These participants can use the $150 allowance in lieu of Seattle/Juneau round-trip air fare for their own arrangements to and from Juneau. The Institute can put participants in touch with each other to facilitate combined travel.



(1) Helicopter operations on the icefield; (2) Alaska Air National Guard ski-plane at Camp 10; (3) Rock glacier in the Atlin area; (4) Dog team on the Taku Névé.