

APPLICATION

Applications should include information on outdoor experience and adaptability to rugged field conditions, transcripts, evidence of school or university status, your academic plan, and letters of recommendation from a supervisory head and two other individuals regarding scholarship, character and compatibility.

Make Application to:

Glaciological and Arctic Sciences Institute

Dr. Maynard M. Miller, Director (208-885-6382 or 885-6192)

University of Idaho, Moscow, Idaho 83844

or University of Alaska Southeast, Juneau, AK 99801

also

Foundation for Glacier and Environmental Research

514 E. 1st St., Moscow, Idaho 83843 (ph. 208-885-6382 or 882-1237)

ACADEMIC AND RESOURCE SCIENTISTS

- DR. MAYNARD M. MILLER, Professor of Geology; Director, Glaciological and Arctic Sciences Institute, University of Idaho (institute director, geomorphology, glaciology, Quaternary geology, economic geology, NSF-REU YSP projects).
- DR. JAMES H. ANDERSON, Institute of Arctic Biology, University of Alaska, Fairbanks, AK (botany, palynology, dendroglaciology, lichenometry, mentor).
- DR. PETER ANGUS-LEPPAN, Professor, Survey Engineering Dept., University of New South Wales, Australia (field surveys, photogrammetry, YSP mentor).
- DR. JAMES E. BUGH, Dept. of Geology, NY State University College, Cortland, NY (geomorphology, glacio-hydrology, mass balance, NSF-REU projects mentor).
- DR. DONALD A. BURROWS, Dept. of Atmospheric Services, Univ. of North Dakota, Grand Forks, N.D. (glacio-meteorology, meteorological instrumentation).
- ALBERT CLOUGH, State of Alaska, Dept. of Commerce & Economic Development, Juneau, AK (mineral exploration, environmental geology, project management).
- DR. BRADLEY COLMAN, Research Meteorologist, NOAA Environmental Research Laboratory, Seattle, WA (atmospheric sciences, glacio-climatology, REU mentor).
- DR. CATHY CONNOR, Asst. Professor of Geology, University of Alaska SE (field geology, geology mentor, UAKSE liaison).
- DR. JOHN FODOR-DAVIS, Division of Science Education, College of Education, University of Idaho (science teacher program director, education strategies).
- DR. ARTHUR GITTINS, Dept. of Entomology, and Glaciological Institute, University of Idaho (arctic ecology, environmental science, YSP mentor).
- DR. MICKEY E. GUNTER, Dept. of Geology, University of Idaho (field geology, mineralogy, REU mentor).
- DR. KEVIN HALL, Head, Dept. of Geography, University of Northern B.C., Prince George, B.C. Canada (periglacial geomorphology, weathering, polar studies).
- DR. GREGG LAMOREY, Found. for Glacier, Environ. Research; Research Associate, Glaciological and Arctic Sciences Institute, University of Idaho (glaciology, paleo-climatology, field program assistant director).
- ING. MARTIN LANG, Institute of Geodesy, Federal University of the Armed Forces, Neuburg, Germany (field surveying, EDM, GPS).

- DR. RICHARD A. MARSTON, Professor of Physical Geography, University of Wyoming (glacio-hydrology, GIS & environmental geography, NSF projects mentor).
- SCOTT McGEE, Foundation for Glacier & Environmental Research and US Fish & Wildlife Service, Anchorage, AK (surveying and logistics, mass balance surveys).
- DR. LANCED. MILLER, Foundation for Glacier & Environmental Research and Echo Bay Mines, Juneau, AK (geology, structure, mineral deposits, field methods).
- ROSS M. MILLER, Foundation for Glacier & Environmental Research, Seattle, WA (project plans, research creativity and innovation, YSP adviser).
- DR. HAIM B. PAPPO, Dept. of Civil Engineering, Israel Institute of Technology, Haifa, Israel (geodesy and surveying).
- DR. ALFRED PINCHAK (Ph.D.; M.D.), Dept. of Mechanical Sciences, Case Western Reserve Univ., Cleveland, OH (continuum mechanics, glaciology, field statistics).
- DR. ALAN ROHAY, Senior Geophysicist, Battelle NW Labs, Richland, WA (geophysics, seismic research, NSF projects mentor).
- DR. PETER SIEMS, Dept. of Geology, University of Idaho (exploration geology, field mapping, geochemistry, REU mentor).
- DR. KENNETH F. SPRENKE, Department of Geology and Geological Engineering, University of Idaho (geophysics, seismology, gravimetry, computer geology).
- DR. GEORGE A. WILLIAMS, Professor of Geology, Research Associate, Glaciological Institute, University of Idaho (geologic mapping, senior YSP-REAP mentor).

LOGISTICS AND SERVICE SUPPORT STAFF

- JOAN W. MILLER, Administrative Coordination and Adviser, Foundation for Glacier and Environmental Research, Moscow, ID (logistics, personnel and fiscal mgmt.).
- DONALD McCULLY, Glaciological Institute, Univ. of Idaho (facilities).
- GRETCHEN WEEKS, Found. for Glacier & Environ. Research, Seattle, WA (safety & terrain training; mountaineering instruction, logistics & junior staff coordinator).
- ANDREW YOUNG, Found. for Glacier & Environmental Research (mechanics).

Other Project Mentors and Affiliate Scientists:

- DR. RICHARD L. CARLSON, Dept. of Geophysics, Texas A & M University (exploration and glacier geophysics, tectonophysics); ROBERT HAMMOND, U.S. Geological Survey, Geophysical Institute, University of Alaska, Fairbanks; (ice radar, Alaska earthquake network); DR. PAUL KLIPFEL, Mineral Resources Services, Arvado, CO (geology, mineral economics); DR. MELVIN G. MARCUS, Dept. of Geography, Arizona State University (arctic geomorphology, glaciology, glacio-climatology); DR. IAN MEIKLEJOHN, Dept. of Geography, Pretoria University, S.A.; DR. BRUCE MOLNIA, Chief, International Polar Programs, U.S. Geological Survey, Washington, D.C. (glaciology, remote sensing); DR. MAURI PELTO, Research Associate, FGER (FGER Cascades and Olympics glacier project); DR. DOUGLAS SWANSTON, Principal Geologist, Tongass National Forest, U.S. Forest Service, Juneau, AK (engineering geology); DR. ANN TALLMAN, Research Fellow, Kaiser Hanford, Richland, WA; DON THOMAS, USGS Juneau (hydrology); DR. A.H. THOMPSON, Research Associate, FGER (meteorology, climatology).

Medical, Safety and Terrain/Survival Instruction:

- Terry Carr, M.D., Bill Cox, M.D., T.R. Haley, M.D., Quinn Smith, M.D., Alfred C. Pinchak, M.D., Gary Mendivil, Carl Byers, Gretchen Weeks, Andrew Young.

Administration and Liaison:

- Joan Miller, Rebecca Dayton, Anna Pinchak, Al Clough, R. Neier, R. Kaufman, L.D. Miller, Ross Miller, N. Graham, B. Thoma, N. Vig, J. Wilson, W. Zeman.

Camp and Field Operations:

- Rebecca Dayton, Jeff Barbee, T. Benedict, Guy Adema, R. Flanders, B. Frewen, A. Friedmann, Dan Hartman, L. Hey, Chris Hewitt, Dr. Jack Helle, Howard Langeveld, Ben Loomam, Rick Neier, A. Pinchak, Natalie Silvertan, J. Stevens, G. Thoma, J. Thoma, Cicely Wingate.

Science Teacher Component:

- Dr. John Fodor-Davis, Asst. Prof. of Science Educ., (Univ. of Idaho, College of Education); Dr. C. MacMillan, Consultant (Univ. of Alaska); W.A. Marineau (Education Technology, Moscow, ID, School District); L.W. Volkening (Science Teacher, Moscow H.S., Moscow, ID); Dr. Cathy Connor, College of Education, Univ. of Alaska SE, Juneau, AK; Prof. William A. Dittrich, Dept. of Physics, Portland Community College, OR (Science teacher adviser, YSP projects coordination).

Research Associates and Science Advisers (not in field):

- Calvin E. Anderson, D. Molenaar, Dr. A.W. Thompson, Found. for Glacier and Environmental Research, Seattle, WA; Dr. David Brew, Dr. Arthur Ford, Dr. Rich Goldfarb, U.S. Geological Survey; Dr. Robert B. Forbes, former State Geologist for Alaska; Dr. Harley Johansen, Univ. of Idaho; Dr. Jack Helle, Nat'l Marine Fisheries Service, NOAA, Atke Bay, AK; Austin E. Helmers, Found. for Glacier Research, Juneau, AK; Dr. Heinz Miller, and Dr. W. Jokat, Alfred Wegener Polar Inst., Germany; Dr. Bjorn Kaltenborn, Univ. of Oslo, Norway; Dr. Gottfried Konecny, Inst. of Surveying, Univ. of Hannover, Germany; Dr. David Lietzke, Univ. of Tennessee; Dr. Vernon Jones, Western Michigan Univ.; Dr. W. Mahaney, Dept. of Geog., York University, Ontario; Douglas McDonal, National Weather Service, NOAA, Seattle; Dr. Frederick Nelson, Dept. of Geog., SUNY, Albany, NY; Dr. Gunnar Ostrem, Norwegian Water Resources & Energy Admin.; Richard M. Shaw, Geophysics, Exxon Co., U.S. Denver; Dr. Heinz Stupetzky, Inst. of Geography, Univ. of Salzburg, Austria; W. Brent Liddle, Chief Interpreter, Kluane National Park, Yukon, Canada; Dr. Charles Waag and Dr. Monte Wilson, Geol. Dept., Boise State Univ.; Dr. Gordon Warner, General Motors Corp., Pontiac, MI; Dr. Walter Welsch, Institute of Geodesy, Federal Univ. of the Armed Forces, Munich, Germany; Jim Wallis and John Harvey, FGER, Atlin, B.C.; Dr. David F. Woolnough, Nova Scotia Land Survey College, N.S., Canada.




University of Idaho
Glaciological & Arctic Sciences Institute
College of Mines & Earth Resources
Moscow, Idaho 83844

EXPEDITIONARY FIELD TRAINING,
RESEARCH PARTICIPATION
AND SEMESTER CREDITS IN

ARCTIC AND MOUNTAIN SCIENCES

36th Summer Institute of
Glaciological and Arctic Sciences

June 29 - August 21, 1995
Juneau Icefield, Alaska
and the Atlin Lake Region,
B.C.-Yukon, Canada

University of Idaho, the University of
Alaska Southeast, the Juneau Icefield Research
Program, the National Science Foundation
and the Foundation for Glacier and
Environmental Research, Seattle, WA

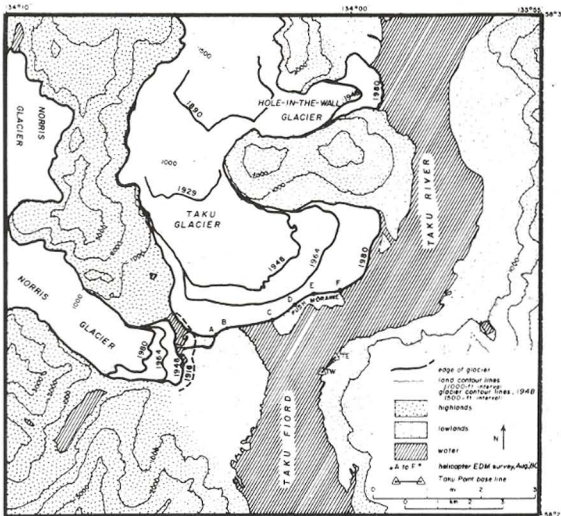


Research team on a high plateau of the Juneau Icefield, Alaska-Canada, during August. (all photos FGER)



Ice stalactite in Lemon Creek Glacier cave near Camp 17. (FGER-Asher)

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Advancing Taku and Hole-in-the-Wall Glaciers and receding Norris Glacier, 1890 to 1990.

PURPOSE

The Juneau Icefield Research Program (JIRP) was organized in 1946 to pursue long-term research on interrelationships of scientific disciplines necessary to understand the total environment of arctic and mountain regions. 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 total systems competence in potential polar and mountain scientists and practical field training for geologists, hydrologists, geophysicists, atmospheric scientists, resource planners, ecologists and surveyors.

Students have the opportunity to observe and study sub-aerial processes in a dynamic region of existing glaciers and rugged mountain terrain, and to appreciate the inter-science investigational approach in the field studies applicable not only to pristine wilderness regions but to scientific assessments of environmental problems even in rural and urban areas.

Participants attend lectures at pertinent field sites, participate in demonstrations with instruments and materials in the field, and take and record scientific measurements under supervision or via their own scientific competence as part of long-range research from high-elevation and continental periglacial areas to low-level temperate and maritime regions. A realistic understanding is gained of glacio-climatological, glacio-geological and glacio-ecological relationships in natural systems. In addition, the Institute provides practical field experience in a variety of personally challenging projects.

DATE

The Institute will be conducted from June 29 to August 21. For qualified students interested in participation in JIRP and allied regional research projects, or for those desiring 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. Courses are offered in field geology, glaciology, geomorphology, surveying and selected environmental sciences, coordinated by Dr. M.M. Miller with visiting scientists assisting.

Up to 12 academic credits can be arranged through the Geology and Geography Departments, University of Idaho, and the summer school program of the University of Alaska Southeast.



View across the Twin Glaciers' source region and S.E. portion of the Juneau Icefield to Devil's Paw (8584').



Fully equipped a scientist skis to Camp 14, Juneau Icefield.



Palynology sampling in glacial bogs of the Atlin Lake sector.

Special topics considered are: Environmental Sciences; Terrestrial and Glacial Photogrammetry; Glacier Surveys and Mapping; Glacio-ecology; Lichenometry; Periglacial Geomorphology and Pleistocene Stratigraphy; Continuum Mechanics; Glacio-meteorology; Mountain Climatology; Glacio-hydrology; Exploration Geophysics; Mineral Prospecting; and Bedrock Geological Mapping.

Offerings take advantage of a classical glacial, periglacial and mountain and arctic environment in field and "laboratory" instruction.

The courses are offered under the aegis of the **University of Idaho** and the **University of Alaska Southeast**, being double listed in each institution's summer catalogue.

Lectures, field studies and problem sessions are held on adjunct topics. All offerings are concurrent during a concentrated, 8 week session on the Juneau Icefield, emphasizing Neoglacial conditions. Participants in the general courses are exposed to all offerings. The initial week is devoted to indoctrination in field methods, and safety and survival techniques. Two to five weeks may be used for work on a field problem, dependent on participant's aim, interest and abilities. The last week can be concentrated in the Atlin area where deglaciated terrain provides opportunities 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 independent studies, including post-doctoral research, field problems may be developed.

PARTICIPANTSHIPS AND AWARDS

Participantships and field scholarships are available at the high school, undergraduate and graduate student levels. The National Science Foundation Young Scholars Program offers full and partial scholarships for outstanding high school juniors. A few scholarships are available for high school seniors through the U.S. Army Research Office's Research in Engineering Apprenticeship Program and the Rotary Club of Juneau, Alaska. There are additional awards for undergraduates and graduate students supported by the Foundation for Glacier and Environmental Research and the University of Idaho. Research assistantships in on-going programs are offered to outstanding previous participants or those with equivalent experience. Participation of minorities and females is actively sought.

A selected number of additional places are available at a subsidized field fee of \$3,300 for the 8-week session. All participants cover travel expenses between their home and Juneau, Alaska and return from Atlin, B.C., via Juneau, back home.

LOCATION

The main glacierized area lies on the Juneau Icefield in the Tongass National Forest and the Atlin Provincial Wilderness Park of the Alaska-Canada Boundary Range between Juneau, Alaska and Atlin, B.C. Attention is also given to the Lemon Glacier sector on the southern periphery and to the Cathedral Massif in the Atlin District adjacent to the icefield on the north. Here arrays of Wisconsinan deglaciation and periglacial features are observed. Permanent headquarters are maintained in Juneau, AK and Atlin, B.C.

FACILITIES AND LOGISTICS

Thirteen main stations and 17 lesser camp and research facilities are located in the field. Permanent aluminum-sheathed and well-insulated wooden buildings exist at some field sites. Temporary shelters and tents are used at trail camps. A 6000-volume library containing pertinent research materials, maps, aerial photos and other basic references is maintained at five main field stations, as well as in the geosciences 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, skis, oversnow vehicles and sometimes a dog team.

Permanent installations are provided by the **Foundation for Glacier and Environmental Research, Pacific Science Center, 200-2nd Ave. North, Seattle, Washington, 98109**. The summer field address is **F.G.E.R., P.O. Box 20298, Juneau, Alaska, 99802-0298**; and also **Subarctic Research Station, P.O. Box 99, Atlin, B.C. Canada VOW 1A0**.

ELIGIBILITY

Participants must be enrolled in, or officially admitted for, work as candidates for a degree at their respective institutions. Exceptions are permitted where students are between programs and institutions in a long-term academic plan. A high scholastic record or potential is expected. Weight is placed on personal character, demonstrated interest and professional motivation. High ability high school students with university plans can also be included. Experience in mountain and outdoor living is given emphasis in the selection process.

In administering this program the University of Idaho, the University of Alaska Southeast, and the Foundation for Glacier and Environmental Research will not discriminate on the grounds of race, creed, color, sex, or national origin.



On the lower Llewellyn Glacier near Camp 26.



Measuring snow & firn stratigraphy at test pit site.