

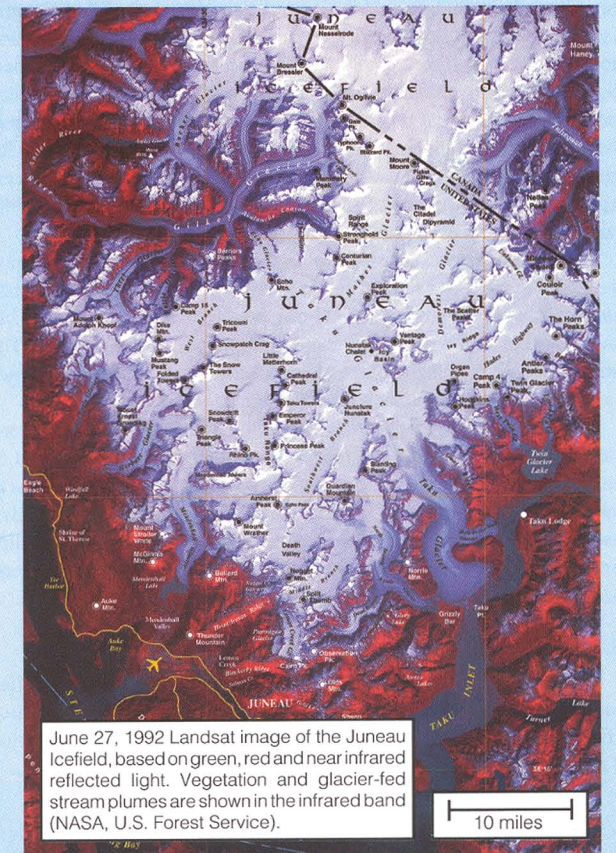
EXPEDITIONARY FIELD TRAINING,
RESEARCH PARTICIPATION
AND SEMESTER CREDITS IN

ARCTIC AND MOUNTAIN SCIENCES

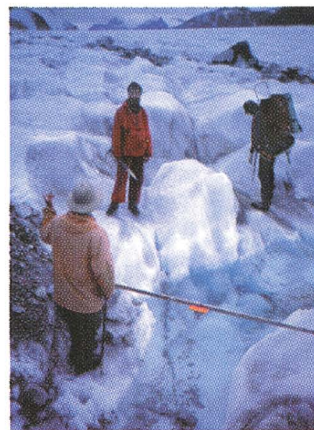
45th to 47th Summer Sessions in Earth Systems
Science Emphasizing Glaciological, Alpine and Arctic
Environments with Geoscience Field Experience

July 1 - August 24 in 2004, 2005 and 2006, with an
additional two week option to September 7th on the
Juneau Icefield, Alaska & the Atlin Wilderness Park and
Atlin Lake region, B.C.-Yukon, Canada

This program is sponsored by The Foundation for Glacier and Environmental
Research, Seattle, WA. and Juneau AK, in academic cooperation with the
Glaciological and Arctic Sciences Institute, University of Idaho and the Environmental
Sciences Program, University of Alaska Southeast. Among supporting agencies
are the National Aeronautics & Space Administration (NASA); the U.S. Army
Research Office; U.S. Department of the Air Force; the Office of Naval Research;
the U.S. Forest Service; and the Juneau Icefield Research Program (JIRP).



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A student project to monitor
supraglacial stream hydrology
on Vaughan Lewis Glacier near
Camp 19. (M. M. Miller photo)

- DR. MAURI PELTO, Associate Professor, Environmental Science, Nichols College, Dudley, MA. (mass balance, FGER Cascades project).
- DR. ALFRED C. PINCHAK (Ph.D.; M.D.), Dept. of Mechanical Sciences, Case Western Reserve University, Cleveland, OH (fluid mechanics).
- CAPT. STEFAN PINCHAK USAF (arctic logistics, survival and safety training).
- DR. JOAN RAMAGE, Dept. of Environmental Sciences, Creighton University, Omaha, NE (remote sensing, ground truth and satellite imaging).
- DR. ROBERT SCHUSTER, US Geological Survey (Ret.), Denver, CO (mass wastage).
- DR. HEINZ SLUPETZKY, Institute of Geography, Salzburg University, Austria (glaciology).
- DR. KENNETH F. SPRENKE, Department of Geology, University of Idaho (geophysics).
- DR. WERNER STEMPFHUBER, Dept. of Surveying, Bundeswehr University, Munich, Germany (GPS surveys, geodetic technology).
- DR. DAVID E. STOCK, Mechanical Engineering, Washington State University, (continuum mechanics, environmental engineering).
- DR. CHARLES SWITHINBANK, Scott Polar Research Institute, University of Cambridge, England (polar glaciology, Antarctic research).
- DR. ANN M. TALLMAN, Geologist, Science Applications International, Richland, WA, and Found. for Glacier & Environmental Research, Seattle, WA (environmental geomorphology).
- PABLO WAINSTEIN (Jaeger), Instituto Chileno de Campos de Hielo, Santiago, Chile. JIRP Associate Scientist, Safety Dir. (glacial limnology, hydrology operations and survival training).
- DR. WALTER WELSCH, Institute for Geodesy, Bundeswehr University, Munich, Germany (geodesy, field surveying, photogrammetry, GPS surveys).
- DR. SCOTT WOOD, Professor of Geology, University of Idaho (geochemistry, hydro-geology).
- PROF. GEORGE WRAY, College of Art & Architecture, University of Idaho (science and humanities, landscape aesthetics, environmental art, geologic sketching).
- DOUGLAS C. WYATT, Foundation for Glacier and Environmental Research and attorney, New York City (field science policy and environmental law).

LOGISTICS AND SERVICE SUPPORT

Field Headquarters Operations:

- ANN FOSTER, FGER Administrative Manager, FGER Alaska Office, Juneau, AK.
- DR. LANCE D. MILLER, President, Foundation for Glacier and Environ. Research, Juneau, AK.
- AL CLOUGH, GARY MENDIVIL AND MARY ANN PARKE, FGER, Juneau, AK.
- JOAN W. MILLER, FGER, University liaison, personnel and fiscal adviser.
- CICELY WINGATE, FGER Treasurer.

Field Staff and Facilities:

- GUY ADEMA and NATALIE SILVERTON (Operations Advisers), DAVID POTERE, PABLO WAINSTEIN, NATHAN FITZPATRICK and MATT BEEDLE (Operations Management), POLLY BASS (Projects Coordinator) BEN PARTAN and ANDREW YOUNG (Facilities & Mechanics). Other: G. Barcaza, Robert Brown, Alison Criscitiello, D. Ervin, Chris Haagen, N. Hamn, Dr. Jack Helle, J. Konigseder, R. Lang, Mark Mansfield, Justus Meyer, P. Pearson, L. Roth, G. Smith, G. Thoma, J. Thoma, Heather Whitney, Erin Whitney, S. Williams.

Medical and Terrain/Survival Instruction:

- W. Cox, M.D., Jack Ellis, M.D., H. Garzon, M.D., T.R. Haley, M.D., Chad Harris, M.D., Mark Stinson, M.D., A.C. Pinchak, M.D., Pablo Wainstein, Gary Mendivil, Phil Druker.

FGER Administration and Liaison:

- DR. M. M. MILLER; DR. L.D. MILLER; J.W. MILLER; Norman Graham, John Harvey, Ken Loken, Lock Miller, Mary Ann Parke, Tom Stewart, Gary Thoma, John Thoma, Norman Vig, Jim Wilson, Dot Wilson, Dean and Edna Williams.

Science Teacher Component:

- DR. JOHN DAVIS, Division of Science Education, University of Idaho, College of Education; ZACHARY SMITH AND LARRY VOLKENING, Found. for Glacier and Envir. Research.

Research Advisers:

- R. HAMMOND, Bureau of Land Management, Fairbanks, (ice radar); DR. DAVID BREW and DR. ART FORD, USGS, Menlo Park, CA (Alaska geology); DR. RICHARD CARLSON, Texas A & M University (geophysics); DR. EARL BENNETT, DR. DENNIS GEIST and DR. MICKEY GUNTER, Dept. of Geology, University of Idaho (field geology); DR. KEVIN HALL, University of Northern B.C., (periglacial geomorphology); MARTIN LANG, University of Munich (GPS); CLIVE ASPINALL, JOHN HARVEY and JIM WALLIS, FGER, Atlin, B.C. (economic geology); DR. ALAN ROHAY, Battelle NW Labs, Richland, WA (geophysics); DR. DOUGLAS SWANSTON, FGER, Anchorage, AK (engin. geology); DON THOMAS, USGS, Juneau, AK (hydrology); DR. GEORGE WILLIAMS, Univ. of Idaho (geology).

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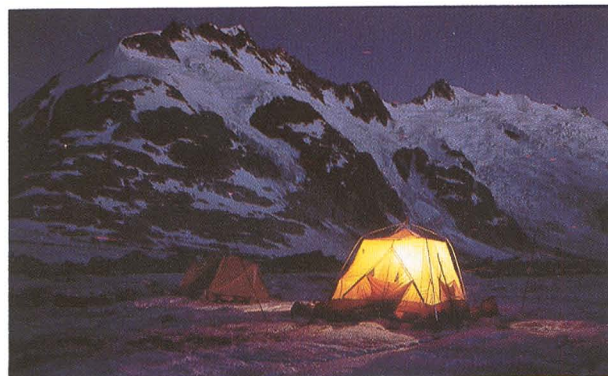
Glaciological and Arctic Sciences Institute
phone: 208-885-6382 and 885-6192
University of Idaho, Moscow, Idaho 83844-3022

(also see Alaska address on previous page)
The Foundation for Glacier and Environmental Research (FGER)
514 E. 1st St., Moscow, Idaho 83843 (ph. 208-882-1237)
E-MAIL: glacier@uidaho.edu or jirp@uidaho.edu FAX: 208-882-6207
Internet: http://www.mines.uidaho.edu/glacier

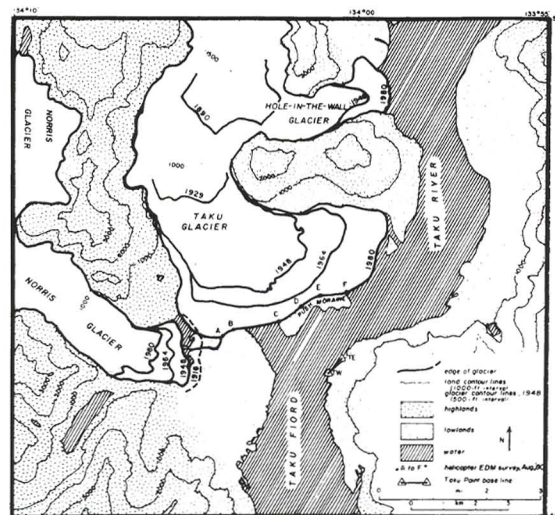
ACADEMIC AND RESOURCE SCIENTISTS

(see website for updated faculty changes)

- DR. MAYNARD M. MILLER, Professor of Geology and Director, Glaciological and Arctic Sciences Institute, University of Idaho. Chairman, Foundation for Glacier and Environmental Research, and Director Juneau Icefield Research Program (JIRP)(earth systems science).
- GUY W. ADEMA, M.S., Physical Scientist, Denali National Park, AK.; Research Associate, Glaciological and Arctic Sciences Institute, University of Idaho (operations and geophysics).
- PROF. WILLIAM A. DITTRICH, Head, Dept. of Physics, Portland Community College, Portland, OR (ice physics, glaciology, mass balance, projects coordination).
- DR. JAMES H. ANDERSON, Institute of Arctic Biology, University of Alaska, Fairbanks, AK (arctic geobotany, palynology, lichenometry, dendroglaciology, ecology mentor).
- DR. MATTHIAS BECKER, Professor, Institute for Geodesy, Bundeswehr University, Munich, Germany (geodesy, kinematic surveying).
- DR. MARK BRANDRISS, Geology Dept., Smith College, Northampton, MA (field mapping, metamorphic and igneous geology).
- DR. MINDY BRUGMAN, Columbia Mountains Applied Ecology Institute, Revelstoke, B.C. (glaciology, hydrology, mountain weather).
- ALBERT CLOUGH, Foundation for Glacier & Environmental Research, Juneau, AK (economic geology, regional geology, aerial glacier monitoring).
- DR. FRANK COLBY, Professor of Meteorology, University of Massachusetts, Lowell, MA (micro-meteorology, mountain wind research, climate systems).
- DR. BRADLEY COLMAN, Research Meteorologist, NOAA Environmental Research Laboratory, Seattle, WA (atmospheric sciences, glacio-climatology, meteorology mentor).
- DR. CATHY CONNOR, Associate Professor of Geology and Coordinator, Environmental Science Program, University of Alaska Southeast, Juneau, AK (geology, environmental studies).
- PHILLIP DRUKER, Department of English, University of Idaho (research plans and organization, technical report preparation, projects mentor, safety staff).
- PETRA HAEFELI, Dipl.-Ing., Institute for Geodesy, Bundeswehr University, Germany (GPS).
- KENNETH HOWARD, Project Manager, NOAA National Storm Research Laboratory, Norman, OK (mountain meteorology, katabatic winds, research mentor).
- PAUL ILLSLEY, Centre of Geographic Sciences, Lawrencetown, Nova Scotia (satellite and air photo interpretation, digital mapping).
- DR. WILLIAM ISHERWOOD, Senior Scientist, Lawrence Livermore National Laboratory, Berkeley, CA (geophysics, energy and environmental science issues, research mentor).
- DR. RICHARD KEEN, Instructor, Meteorology, University of Colorado. Meteorology Consultant, Golden, CO (meteorology, micro-meteorology, radiation, synoptic climatology).
- DR. GREGG LAMOREY, Assistant Research Professor, Desert Research Institute, University of Nevada, Reno (FGER-JIRP Research Coordinator, polar glaciology, paleoclimatology).
- DR. RICHARD MARSTON, Professor, School of Geology and Geography, Oklahoma State University, Stillwater, OK (geomorphology, glacier hydrology, remote sensing).
- SCOTT MCGEE, Found. for Glacier & Environmental Research, US Fish & Wildlife Service, Anchorage, AK (GPS surveys, GIS, station mgt.).
- DR. LANCE D. MILLER, Foundation for Glacier & Environmental Research. Exploration geologist, Juneau, AK (economic geology, regional geology, foundation liaison, senior mentor).
- ROSS M. MILLER, FGER, Juneau, AK and Atlin, B.C. (projects development and creativity).
- DR. BRUCE MOLNIA, Earth Surfaces Processes Program, U.S. Geological Survey, Reston, VA (glaciology, regional glacier variations, glacio-oceanography, remote sensing).



Night scene at avalanche research camp on Gilkey Glacier in the
Heritage Range, Juneau Icefield. (R. Benedict photo)



Advancing Taku and Hole-in-the-Wall Glaciers and receding Norris Glacier, 1890 to 2003.

PURPOSE

“We shall not cease from exploration and the end of all our exploring will be to arrive where we started and know the place for the first time.” –T.S. Eliot

The Juneau Icefield Research Program (JIRP) was organized in 1946 to pursue long-term field research on interrelationships of all of the scientific disciplines necessary to understand the total environment of arctic and mountain regions. A key emphasis was research on the global glacier-climate problem. Stemming from this the Summer Institute of Glaciological and Arctic Sciences was organized in 1959 to provide combined academic and field training at the graduate and undergraduate level, and as well for selected secondary school science teachers. The basic aim is total systems experience for potential polar and mountain scientists and practical field training for careers in any or all of the field sciences.

Participants observe and study sub-aerial processes in a dynamic region of existing glaciers and rugged mountain terrain. The goal is to appreciate inter-science investigations not only in pristine wilderness regions but assessments of environmental problems even in rural and urban areas. The program especially enlarges the professional effectiveness of school science teachers. Increased emphasis will soon be given to this aspect.

Students also attend lectures at field sites, participate in demonstrations with instruments, and take and record scientific measurements as part of long-range research from high-elevation and continental periglacial areas to low-level temperate maritime regions. A special understanding is gained of glacio-climatological, glacio-geological and glacio-ecological relationships in natural systems. Because the activities strongly stress research involvement, the participants gain irreplaceable field work experience.

DATES

The Institute will be conducted from **July 1 to August 24**. For qualified students interested in participation in JIRP and allied regional research projects, or for those desiring further field work or thesis research, a period of additional field activity may be arranged.

THE PROGRAM

“Nature without learning is a blind thing—and learning without Nature is an imperfect thing.” –Plutarch

The program theme is earth systems science via expeditionary experience and research participation, with relevant demonstrations and lectures. Interdisciplinary emphasis is on field geology, geophysics, atmospheric sciences, arctic ecology, glaciology, hydrology, applications geomorphology, surveying, environmental sciences and resource planning. These topics are coordinated by the Institute through its faculty and experienced staff members.

Up to 9 academic credits can be arranged through the Geology and Geography Departments, University of Idaho, or the environmental science



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



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



Palynology sampling in glacial bogs of the Atlin Lake sector, Alaska-Yukon border. (Photos by FGER)

program at the UI and the University of Alaska. By special arrangement additional credits may be earned in the post-season autumn term.

Subsidiary topics considered as part of the Earth Systems Science program include: Environmental Geosciences; Terrestrial and Glacial Photogrammetry; GPS Surveys and Mapping; Structural Glaciology; Arctic Geobotany; Lichenometry; Tundra Ecology; Periglacial Geomorphology; Pleistocene Stratigraphy; Continuum Mechanics; Radiation Meteorology; Mountain Climatology; Glacio-hydrology; Exploration Geophysics; Mineral Prospecting; Remote Sensing and Geological Mapping.

Through field instruction, the offerings take advantage of a classical glacial, periglacial and alpine and arctic environment.

The courses are provided under aegis of the **University of Idaho**. Some also via the **University of Alaska**. All credits are transferable to other institutions.

Lectures, field studies and problem sessions are held on adjunct topics. The 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 coastal geology field trips, and field methods, and safety and survival techniques. Two to five weeks may be used for work on a field problem, dependent on the participant's aim, interest and abilities. The last week is concentrated in the Atlin area where glaciated terrain provides opportunities for study of Cordilleran Pleistocene chronology and Holocene periglacial environments. For those wishing to ally the program with a specific thesis project or equivalent independent study, including post-doctoral research, field problems can be developed. An optional additional two weeks to **September 7th** may be arranged for those desiring a **10-week** field season ending up with research in the Atlin sector.

PARTICIPANTSHIPS AND AWARDS

Although most students attend on the fee-paying base, some field scholarships are available for undergraduate students, depending on what student category pertains at the time of the summer session. NASA provides some undergraduate student support on a competitive basis. A limited number of awards are also available to outstanding junior and senior high school students. Partial grants for these upper class (secondary) students are supported by the DOD and the U.S. Army Research Office in its Research in Engineering Apprenticeship Program (REAP) in association with the Academy of Applied Science. Special scholarships for graduate students and secondary school science teachers are supported by the Foundation for Glacier and Environmental Research (FGER), the Glaciological and Arctic Sciences Institute, and the Rotary Club of Juneau, AK. Other sources of applicant support are available, for which students can apply. With appreciation, since 1962, this program has received 79 grants from NASA and the National Science Foundation for undergraduate and graduate student support. Proposals to continue some of these scholarships are pending from federal agencies.

Research assistantships in ongoing programs are offered to outstanding previous participants. Post-doctoral application is also encouraged. Participation of minorities and females is actively sought. The basic fee is **\$4,400** for the 8-week session, with an additional \$1,100 in real cost per participant provided by FGER. Costs are pro-rated if a 10-week session. Participants cover travel expenses to Juneau, Alaska and return home from Atlin, B.C., via Juneau.

LOCATION

The main glacierized area lies on the Juneau Icefield in the Tongass National Forest and the Atlin Provincial Wilderness Park in the Alaska-Canada Boundary Range between Juneau, Alaska and Atlin, B.C. Attention is also given to the Lemon Creek Glacier sector on the icefield's southwestern periphery and to the Cathedral Massif Glacier in the Atlin Lake area to the north. Here arrays of Wisconsinan deglaciation and periglacial features are especially abundant.

FACILITIES AND LOGISTICS

Thirteen main stations and 17 lesser camp and research facilities are located in the field. Permanent metal-sheathed and well-insulated wooden buildings exist at the main field sites. Temporary shelters and tents are used at trail camps. A 7000-volume library containing pertinent research materials, maps, satellite imagery, aerial photos and other basic references is maintained at the main base camp, with smaller libraries at other field stations, as well as a comprehensive geosciences research library at the Atlin base. A wide range of field and laboratory equipment for geophysical, glaciological, surveying, photogrammetric, botanical, meteorological, and geological work is available for teaching and research. JIRP scientific data-bases are on the internet.

Communication between camps and with the Juneau and Atlin bases is handled by radio. Helicopters and charter aircraft are used for supply transportation, with logistic ground transport carried out by oversnow vehicles. Participants travel on the icefield by using cross-country skis.

Permanent field installations are provided by **The Foundation for Glacier and Environmental Research, Seattle, WA**; with liaison to the **Glaciological Institute** (see next page), and the **Pacific Science Center, 200 2nd Ave. North, Seattle, Washington, 98109**. Alaska headquarters office: **FGER, P.O. Box 20298, Juneau, Alaska, 99802-0298, ph. 907-723-4606**; also at the **Subarctic Research Station, P.O. Box 99, Atlin, B.C., Canada, V0W-1A0**.

ELIGIBILITY

Participants must be enrolled in, or admitted for, work as candidates for a degree. Exceptions are made when students are between programs in a long-term academic plan. High scholastic record or potential is expected. Weight is placed on personal character, interest, and professional motivation. High school students with university plans can also be included. Some experience in mountain and outdoor living is expected.

The University of Idaho, the University of Alaska and The Foundation for Glacier and Environmental Research do not discriminate on the grounds of race, creed, color, sex, or national origin.

APPLICATION

A completed application form will include an up-to-date transcript, evidence of school or university status, a statement of professional goals, a physician's medical certification, and three letters of recommendation regarding scholarship, character and compatibility.



Students roped up on the lower Llewellyn Glacier near Camp 26.



Seismic geophysics ice depth recording, upper Taku Glacier.