

Glaciological and Arctic Sciences Institute  
 phone: 208-885-6382 or 208-885-6192  
 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.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; also Chairman, Foundation for Glacier and Environmental Research, and Director Juneau Icefield Research Program (JIRP), (earth systems science, glaciology).  
 GUY W. ADEMA, M.S., Physical Scientist, Denali National Park, AK.; Research Associate, Glaciological & Arctic Sciences Institute, University of Idaho (field operations and geophysics).  
 DR. JAMES H. ANDERSON, Inst. of Arctic Biology, University of Alaska, Fairbanks (geobotany).  
 ASST. PROF. POLLY BASS, Earth Science, Sheldon Jackson College, Sitka, AK (field ecology).  
 DR. MARK BRANDRISS, Geology Dept., Smith College, Northampton, MA (geol. mapping).  
 SUSANN BÜETTNER, Lehrstuhl für Geodäsie, Tech. Universität München, (GPS glacier surveys).  
 ALBERT CLOUGH, Foundation for Glacier & Environmental Research, Juneau, AK (economic geology, regional geology, annual aerial glacier monitoring).  
 DR. FRANK COLBY, Professor of Meteorology, University of Massachusetts (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).  
 PROF. WILLIAM A. "TOBY" DITTRICH, Dept. of Physics, Portland Community College, Portland, OR (ice physics, glaciology, mass balance, projects coordination).  
 PHILLIP DRUKER, Lead Instructor, Department of English, University of Idaho (JIRP research organization, technical report preparation, projects mentor, safety staff).  
 PETRA HAEFELI, Dipl.-Ing., Institute für Geodesy, Bundeswehr University, Germany (GPS).  
 PAUL ILLSLEY, Centre of Geographic Sciences, Lawrencetown, Nova Scotia (digital mapping).  
 DR. WILLIAM ISHERWOOD, Lawrence Livermore National Laboratory, Berkeley, CA, and FGER headquarters, Seattle. (geophysics, energy and environmental science issues, research mentor).  
 DR. RICHARD KEEN, Instructor, Meteorology, University of Colorado (meteorology, radiation).  
 DR. GREGG LAMOREY, Research Professor, Desert Research Institute, University of Nevada, Reno (FGER-JIRP Research Coordinator, polar glaciology, paleoclimatology).  
 HOWARD LANGEVELD, Found. for Glacier & Environmental Research, Seattle, WA (glaciology project plans and field administration).  
 GARY LINDER, M.S., Foundation for Glacier and Environmental Research, Associate Director for Personnel and Field Program Integration (JIRP Plans, glaciology, climate change).  
 DR. RICHARD MARSTON, Professor and Head, Dept. of Geography, Kansas State University, Manhattan, KS (geomorphology, glacier hydrology, remote sensing).  
 DR. PAUL McDANIEL, Soils and Land Resources Program, College of Agricultural and Life Sciences, University of Idaho (pedology, soils research, projects advisor).  
 SCOTT MCGEE, Found. for Glacier & Environmental Research; US Fish & Wildlife Service, Anchorage, AK: Associate Field Director for JIRP Survey Projects (GPS surveys, GIS, mass balance profiles, station mgt., and projects coordination).  
 DR. LANCE D. MILLER, President, Foundation for Glacier & Environmental Research, Exploration geologist, Juneau, AK (economic and regional geology, foundation liaison, long-term plans).  
 ROSS M. MILLER, FGER, Boston MA, Juneau, AK and Atlin, B.C. (field science and humanities).  
 DR. BRUCE MOLNIA, Earth Surfaces Processes, U.S. Geological Survey, Reston, VA (glacier variations, Alaska regional glaciology, and glacio-oceanography).



End of season 2006 institute staff, faculty and participants at C-30, Atlin, on Aug. 21. Twelve others departed earlier from Juneau. (Archie Knill photo)

DR. MAURI PELTO, Environmental Science, Nichols College, MA. (Cascades Glacier Survey, WA).  
 DR. ALFRED C. PINCHAK (Ph.D.; M.D.), Dept. of Mechanical Sciences, Case Western Reserve University, Cleveland, OH (fluid mechanics).  
 MAJOR STEFAN PINCHAK USAF (logistics, survival, safety training, USAF liaison).  
 DR. JOAN RAMAGE, Dept. of Environ. Sciences, Creighton Univ., Omaha, NE (remote sensing).  
 NATALIE SILVERTON, Assoc. Field Director for operations, FGER (field surveys and program management, emergency medicine, logistics).  
 DR. HEINZ SLUPETZKY, Institute of Geography, Salzburg University, Austria (glaciology).  
 DR. KENNETH F. SPRENKE, Department of Geology, University of Idaho (field geophysics).  
 DR. DAVID E. STOCK, Mechanical Engineering, Wash. State University, (continuum mechs.).  
 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 V.P. Found. for Glacier Research, Seattle, WA (Advisory Board, environmental geomorphology).  
 PABLO WAINSTEIN, Dept. of Geography, University of Calgary, Alberta, Canada (teleconnection hydrology of arctic glaciers, survival training and liaison with Univ. of Chile).  
 DR. WALTER WELSCH, Institute for Geodesy, Bundeswehr University, Munich, (photogrammetry).  
 RONNY WENZEL, Survey Faculty, Bundeswehr Institute, Munich, Germany (field surveys, GPS).  
 DR. SCOTT WOOD, Professor of Geology, University of Idaho (geochemistry, hydro-geology).  
 PROF. GEORGE WRAY, College of Art & Architecture, Univ. of Idaho (field and landscape art).  
 DOUGLAS C. WYATT, Foundation for Glacier and Environmental Research Board and advisory attorney, New York City (field science policy and environmental law).



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

## LOGISTICS AND SERVICE SUPPORT

### Field Headquarters Operations:

MATT BEEDLE and SUE HAZLETT, FGER Administrative Managers, FGER Alaska Office, Juneau, AK (glaciology and program environmental council). BOB BROWN, Field Operations Director.  
 DR. LANCE D. MILLER, President, Foundation for Glacier and Environ. Research, Juneau, AK.  
 AL CLOUGH, Board Trustee, FGER, Juneau, AK.  
 JOAN W. MILLER, FGER, University liaison, long-term personnel recorder and foundation programs.  
 CICELY WINGATE, Treasurer and fiscal records, FGER, Pullman, WA.

### Field Staff and Facilities:

GUY ADEMA, GARY LINDER, SCOTT MCGEE and NATALIE SILVERTON (Field Operations and Research), PABLO WAINSTEIN, CAL LLOYD and MATT BEEDLE (Operations Management), BOB BROWN, HOWARD LANGEVELD, BEN PARTAN, STEVE WILSON and ANDREW YOUNG (Facilities & Mechanics). Others: Alison Criscitiello, Chris Haagen, Nathan Hamm, Dr. Jack Helle, Hiram Henry, Martin Lang, Terry Loving, Scott MacGowan, Dan Rogers, Lance Roth, Emily Thiem, Jim and Dot Wilson.

### Medical and Terrain/Survival EMT Instruction:

W. Cox, M.D., JACK ELLIS, M.D., T.R. HALEY, M.D., CHAD HARRIS, M.D., MARK STINSON, M.D., A.C. PINCHAK, M.D., N. SILVERTON, GARY MENDIVIL, PHIL DRUKER, BOB BROWN.

### FGER Administration:

DR. M. M. MILLER; DR. L.D. MILLER, DR. A. TALLMAN; Logistics: Norman Graham, John Harvey, Ken Loken, Lock Miller, Mary Ann Parke, Tom Stewart, Norman Vig, Jim and Dot Wilson, Dean and Edna Williams. Katie Grauke, GASI office, Moscow, ID.

### 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 and Liaison:

R. HAMMOND, Bureau of Land Management, Fairbanks, (ice radar); 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., (glaciology, 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).

Non-Profit  
 Organization  
 U.S. Postage  
 PAID  
 University of Idaho



JIRP remote research camp, Gilkey Glacier Trench.

University of Idaho  
 Glaciological & Arctic Sciences Institute  
 College of Science  
 PO Box 443022  
 Moscow, Idaho 83844-3022



www.uidaho.edu/glacier  
 and www.juneauicefield.org

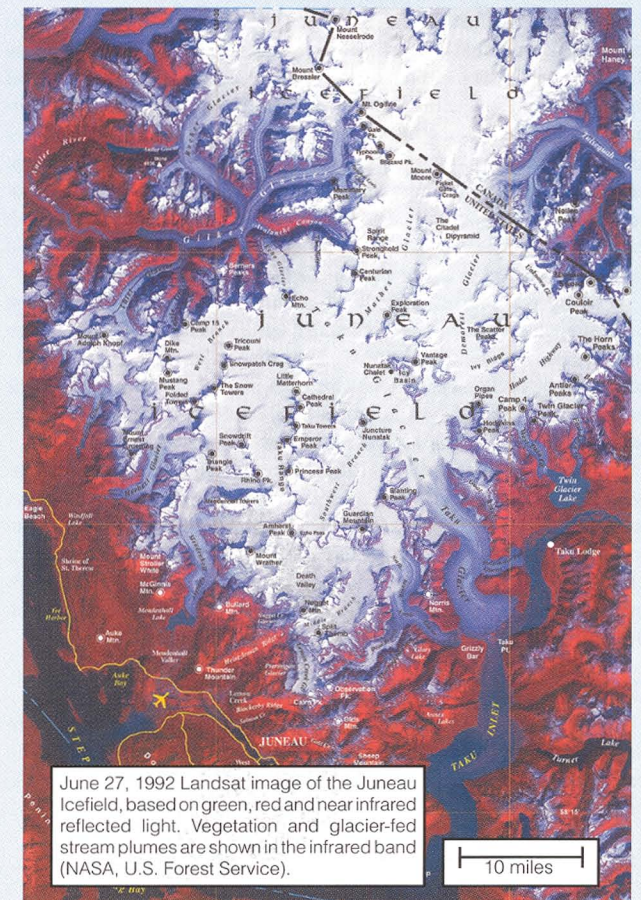
EXPEDITIONARY FIELD TRAINING,  
 RESEARCH PARTICIPATION  
 AND SEMESTER CREDITS IN

# ARCTIC AND MOUNTAIN SCIENCES

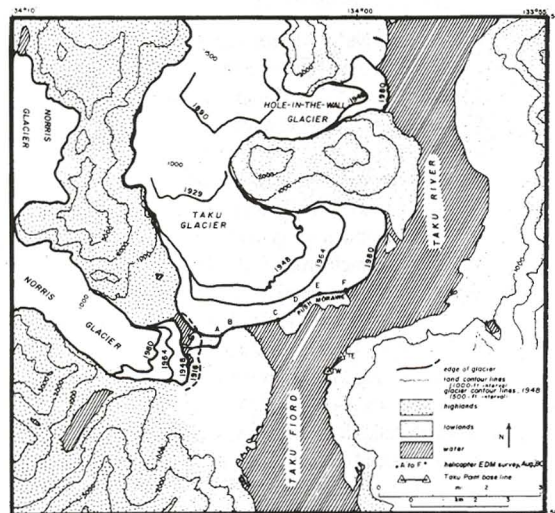
48th to 50th Field Seasons in Earth Systems Science  
 Emphasizing Glaciological, Alpine and Arctic Environ-  
 ments and related Geoscience Studies and Research

July 1 - August 23 in 2007, 2008 and 2009, with a 2-  
 week individual option in September — Juneau Icefield,  
 Alaska and in Atlin Wilderness Park, 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 (ARO); U.S. Department of the Air Force; the Office of Naval Research (ONR); the U.S. Forest Service; and the Juneau Icefield Research Program (JIRP). Over many years also support from NSF.



June 27, 1992 Landsat image of the Juneau Icefield, based on green, red and near infrared reflected light. Vegetation and glacier-fed stream plumes are shown in the infrared band (NASA, U.S. Forest Service).



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



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)

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.