

Glaciological and Arctic Sciences Institute (GASI) and the Juneau Icefield Research Program (JIRP) P.O. Box 20298, Juneau, Alaska 99801

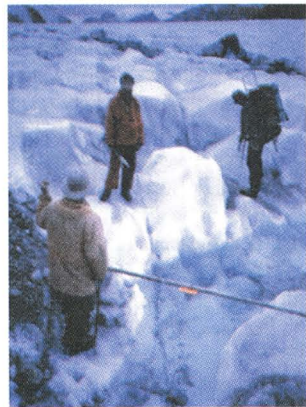
The Foundation for Glacier and Environmental Research (FGER) 514 E. 1st St., Moscow, Idaho 83843 (ph. 208-882-1237) E-MAIL: jirp@fger.edu FAX: 208-882-6207

ACADEMIC AND RESOURCE SCIENTISTS

(see website for updated faculty changes)

- DR. MAYNARD M. MILLER, Director, Glaciological and Arctic Sciences Institute, and Chairman, Foundation for Glacier and Environmental Research (earth systems science, glaciology). GUY W. ADEMA, M.S., Physical Scientist, Denali National Park, AK.; Research Associate, Glaciological & Arctic Sciences Institute, and President, the Foundation of Glacier and Environmental Research (field operations and geophysics). DR. POLLY BASS, Foundation for Glacier Research, Juneau, AK (JIRP operations and arctic ecology research). DR. MARK BRANDRISS, Geology Dept., Smith College, Northampton, MA (geol. mapping). BOB BROWN, M.S., Glaciological Institute, Juneau, AK (field operations and periglacial soils). DR. MINDY BRUGMAN, Pacific Storm Prediction Centre, Meteorological Service of Canada, Environment Canada, Vancouver, B.C. (glacio-hydrology and glacier regimes) SUSANN BÜETTNER, Lehrstuhl für Geodäsie, Tech. Universität Munchen, (GPS glacier systems). ALBERT CLOUGH, Foundation for Glacier & Environmental Research, Juneau, AK (economic geology, aerial glacier monitoring, Juneau liaison). 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 (technical report preparation, projects mentor, safety staff). PETRA HAEFELI, Dipl.-Ing., Institute für Geodesy, Bundeswehr University, Germany (GPS). DR. JACK HELLE, NOAA, Marine Sciences Lab; Anke Bay, Juneau, AK (ocean climate change). PAUL ILLSLEY, Centre of Geographic Sciences, Lawrencetown, Nova Scotia (digital mapping). DR. WILLIAM ISHERWOOD, Lawrence Livermore National Laboratory, Berkeley, CA, and FGER, 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). GARY LINDER, M.S., Foundation for Glacier and Environmental Research, Juneau, AK (JIRP, glaciology, climate change, field project management). 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 Director for JIRP Survey Projects (GPS surveys, GIS, mass balance). DR. LANCE D. MILLER, Senior Adviser and past president, Foundation for Glacier & Environmental Research. Exploration geologist, Anchorage and Juneau, AK (economic and regional geology, foundation liaison, FGER long-term plans). ROSS M. MILLER, FGER, Boston MA, Juneau, AK and Atlin, B.C. (field science and allied humanities, FGER-JIRP Advisory Board and long-term plans).

- DR. BRUCE MOLNIA, Earth Surfaces Processes, U.S. Geological Survey, Reston, VA (glacier variations, Alaska regional glaciology, teleconnection and glacio-oceanography). DR. MAURI PELTO, Environmental Science, Nichols College, MA. (Cascades Glacier Survey project). 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, Lehigh Univ., Bethlehem, PA (remote sensing). DR. NATALIE SILVERTON, Assoc. Field Director, operations, FGER (field surveys and program management, emergency medicine M.D.). DR. HEINZ SLUPETZKY, Institute of Geography, Salzburg University, Austria (glaciology). 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, Science Applications International, Richland, WA, and Treasurer/Found. for Glacier Research (geomorphology). PABLO WAINSTEIN, Dept. of Geography, University of Calgary, Alberta, Canada (teleconnectional hydrology of arctic glaciers, survival training and liaison with Univ. of Chile). RONNY WENZEL, Survey Faculty, Bundeswehr Institute, Munich, Germany (field surveys, GPS). PROF. GEORGE WRAY, College of Art & Architecture, Univ. of Idaho (field and landscape reports adviser).



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

LOGISTICS AND SERVICE SUPPORT

- Field Headquarters Operations: DR. MAYNARD MILLER, DR. NATALIE SILVERTON and SUE HAZLETT, FGER Administration, FGER Alaska Office, Juneau, AK. BOB BROWN, Field Operations Coordinator. DR. LANCE D. MILLER, Senior Adviser and Board, Foundation for Glacier and Environ. Research, Juneau, AK. ROSS M. MILLER, FGER Senior Adviser, JIRP history, FGER Advisory Board. AL CLOUGH, Air Logistics and Board Trustee, FGER, Juneau, AK. KATIE GRAUKE, Institute Secretary. DR. ANN TALLMAN, Treasurer and fiscal management, FGER Board member.

- Field Staff and Facilities: GUY ADEMA, DR. POLLY BASS, GARY LINDER, SCOTT MACGOWAN, and SCOTT McGEE (Operations and Research), PABLO WAINSTEIN, CAL LLOYD and MATT BEEDLE (Operations Coordination), BOB BROWN, BEN PARTAN, KEVIN VOLKENING, STEVE WILSON and ANDREW YOUNG (Facilities & Mechanics). Others: Elaine Beauvais, Evan Burgess, C. Burnstein, P. Flynn, Chris Haagen, Ruth Heindel, Nathan Hamm, Martin Lang, Keith Laskowski, Marie McLane, Wally Miller, Pat Monahan, Brooks Prather, Mattie Schmidt, Emily Thiem.

- Medical and Terrain/Survival EMT Instruction: W. Cox, M.D., JACK ELLIS, M.D., T.R. HALEY, M.D., CHAD HARRIS, M.D., A.C. PINCHAK, M.D., N. SILVERTON, M.D., GARY MENDIVIL, PHIL DRUKER, BOB BROWN.

- FGER Operations and Mangement: DR. M. M. MILLER; DR. L.D. MILLER, R.M. MILLER, DR. A.M. TALLMAN; K. GRAUKE: Norman Graham, John Harvey, Lock Miller, Ken Loken, Mary Ann Parke, Norman Vig, Jim and Dot Wilson, Dean and Edna Williams. Katie Grauke, GASI office.

- Science Teacher Component: Advisers: DR. JOHN DAVIS, Foundation for Glacier and Envir. Research; ZACHARY SMITH AND LARRY VOLKENING, Foundation for Glacier and Envir. Research.

- Research Advisers and Liaison: DR. ART FORD, USGS, Menlo Park, CA (Alaska geology); DR. RICHARD CARLSON, Texas A & M University (geophysics); DR. KEVIN HALL, University of Northern B.C., (glaciology); HOWARD LANGEVELD (FGER, Seattle); 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. WALTER WELSCH, Inst. for Geodesy, Bundeswehr Univ., Munich, Germany (photogrammetry).



JIRP remote research camp, Gilkey Glacier Trench.

Foundation for Glacier and Environmental Research Glaciological & Arctic Sciences Institute 514 East First St Moscow, Idaho 83843



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)

EXPEDITIONARY FIELD TRAINING WITH RESEARCH PARTICIPATION AND 9-WEEK SEMESTER CREDITS IN

ARCTIC AND MOUNTAIN SCIENCES

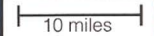
53rd to 55th Field Seasons in Earth Systems Science Emphasizing Glaciological, Alpine and Arctic Environments and related Geoscience Studies and Research

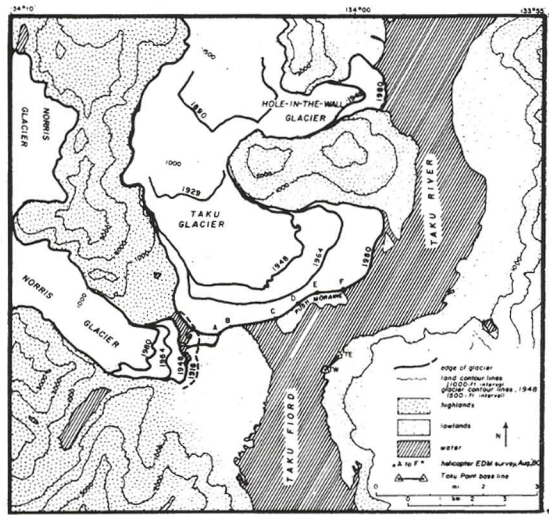
June 23 - August 23 in 2009, 2010 and 2011 — Juneau Icefield, Alaska and in Atlin Wilderness Park, B.C.-Yukon, Canada

This not for profit educational and research program is sponsored by The Foundation for Glacier and Environmental Research, Seattle, WA, the Glaciological and Arctic Sciences Institute, Moscow, ID and Juneau AK, and the University of Alaska Southeast. Other cooperating agencies include the National Aeronautics & Space Administration (NASA); the U.S. Army Research Office (ARO); the U.S. Department of the Air Force; the Office of Naval Research (ONR); the National Science Foundation; the U.S. Forest Service; and the Juneau Icefield Research Program (JIRP).



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 2007.

## 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 the scientific disciplines necessary to understand the total environment of arctic and mountain regions. A key emphasis is 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 levels, and as well for selected secondary school science teachers. The aim is total systems experience for polar and mountain scientists and training in 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 enlarges effectiveness of school science teachers and university professors. Increased emphasis is given to the global warming issue.

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. Because the activities strongly stress research involvement, participants gain irreplaceable field work experience.

## DATES

The Institute will be conducted from **June 23 to August 23**. For qualified students interested in participation in JIRP and allied regional research projects, or for those desiring further field work or thesis research, 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, field hydrology, applications geomorphology, surveying and resource planning. These topics are coordinated through the faculty and experienced staff members.

Up to 9 academic credits can be arranged through the University of Idaho, or the environmental science program at the University of Alaska. By special arrangement additional credits may be arranged 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; and relevant aspects of 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 may be provided under aegis of 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, **9-week** session on the Juneau Icefield, emphasizing Neoglacial conditions. Participants in the general courses are exposed to all offerings. The initial two weeks are devoted to coastal geology field trips, field methods, and exploratory research, plus intensive safety and survival training at Camp 17. Two to six 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 thesis project or equivalent independent study, including post-doctoral research, field problems can be developed.

## 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 over 90 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 **\$4,800** for the 9-week session, with an additional \$1,200 in real cost per participant subsidized by FGER. 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 Wisconsin deglaciation and periglacial features are especially abundant.

## FACILITIES AND LOGISTICS

Thirteen main stations and 17 lesser camp 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 also 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 and Juneau, AK**; with liaison to the **Glaciological Institute** (see next page), and the **Pacific Science Center, 200 2nd Ave. North, Seattle, Washington, 98109**. The Alaska headquarters office is: **FGER, P.O. Box 20298, Juneau, Alaska, 99802-0298, ph. 907-723-4606**; also at the **FGER Arctic Research Station on the Yukon border, P.O. Box 99, Atlin, B.C., Canada, V0W-1A0**.

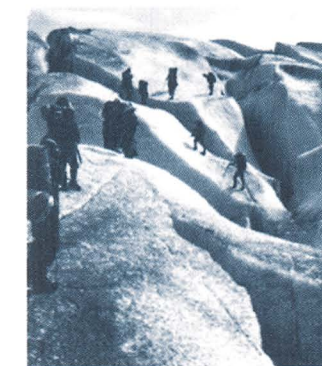
## ELIGIBILITY

Participants must be enrolled in or admitted for work as candidates for a college or university 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, strong interest, and professional motivation. High school students with university plans can also be included. Some experience in mountain and outdoor living is expected.

The Glaciological Institute, 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.