



2008 Member Activities

The U.S. Permafrost Association (USPA) served as the parent organization for the Ninth International Conference on Permafrost. A U.S. National Committee was established under the USPA to assist the University of Alaska's Local Organizing Committee as a co-sponsor and co-organizer of NICOP. Approximately 700 people, including 160 young investigators, from 30 countries participated.

The 2008 Fall Meeting of the American Geophysical Union took place in San Francisco, California, December 15–19. There were over 60 presentations dealing specifically with frozen ground amongst the 686 abstracts presented in 34 Cryosphere sessions. Additional 45 cryospheric presentations took place in four Union sessions, as well as additional presentations in other focus groups. Reports and posters covered climate change in Polar Regions, rapid Arctic change, the International Polar Year, and remote sensing, specifically including terrestrial permafrost. The U.S. Permafrost Association held its annual meeting during AGU and voted on its new Board of Directors. New officers elected were James W. Rooney as president-elect, Oliver Frauenfeld as secretary, and Tom Douglas as board member at-large. The USPA treasurer Michael Lilly, upon his retirement, was recognized for his dedicated services and contributions to permafrost communities. John Zarling was appointed by the USPA board to serve the remaining year of Lilly's term.

The 2008 Annual Meeting of the Association of American Geographers took place April 15–19 in Boston. The AAG's Cryosphere Specialty Group (CrSG) sponsored 15 sessions on topics including cryospheric student field work, paleoclimatology, soils, the Arctic carbon and water cycles, glaciers, hydroclimatology, and mountain environments. The annual CrSG awards were presented. The 2008 *Francois Emile Matthews* Award went to Jerry Brown, President of the International Permafrost Association in recognition of his contributions to permafrost, and cryospheric science in general. The *R. S. Tarr* Illustrated Student Paper Award went to Texas A&M University's Jennifer Morris, for her presentation on "Impurities in Snow: Effects on Spectral Albedo of Prairie Snowpacks," with co-author Andrew Klein.

Tom Krzewinski reports the Technical Council on Cold Region Engineering (TCCRE) contributed significantly to NICOP as cosponsors, paper reviewers, in field trips, and facilitating publication of the ASCE TCCRE Frozen In Time – Permafrost and Engineering Problems. Krzewinski was appointed as the U.S. Representative to the IPA. Upcoming TCCRE-related events include the ASCE's 14th International Specialty Conference on Cold Regions Engineering in Duluth, Minnesota, September of 2009; CSCE "Circum-Polar Engineering Conference 2010" in Yellowknife in September; ISCORD 2010 in July in Yakutia, Russia, with plans for hosting ISCORD 2013 in Anchorage, Alaska; ASCE's 15th International Specialty Conference on Cold Regions Engineering in 2011 in Quebec; and participation in TICOP in 2012. TCCRE Committee Meetings were held in Fairbanks during NICOP. TCCRE, represented by T. Krzewinski and E. Clarke, is participating in the Standards Committee, responsible for updating the Standard on Frost Protected Shallow Foundations (FPSF). TCCRE Technical and Administrative Committees are accepting new members, (contact tkrzewinski@golder.com or 907-341-6103). TCCRE, representing ASCE, is supporting a new PBS Documentary "Challenges of Transportation Infrastructure Design and Construction in Alaska," with a focus on highways and railroads. Together with B. Connor of UAF, K. Korri of ADOT, and T. Brooks of the Alaska Railroad, T. Krzewinski is leading the efforts for ASCE.

Publications include the Quarterly Journal on Cold Regions Engineering (ASCE), Proceedings of ISCORD 2007 (available on CD from RIL), and Proceedings of the 13th Conference (on CD from ASCE). The 2004 TCCRE Monograph "Thermal Analysis, Construction and Monitoring Methods for Frozen Ground" is available through ASCE, with future ones in preparation.

Ken Hinkel (University of Cincinnati) and collaborators J. Lenters (University of Nebraska) and Y. Sheng (University of California, Los Angeles) began work on the NSF-funded project on dynamics of lakes on the Alaskan Arctic Coastal Plain. Wendy Eisner and C. Cuomo continued to explore the intersection of Inupiat knowledge and environmental change on the North Slope by interviewing elders from Barrow and Nuiqsuit. Richard Beck and his IT group (University of Cincinnati) installed a 700 Mhz long-range (16-mile diameter) wireless Internet system at the new Barrow Arctic Research Center (BARC) to be used for NSF projects, U.S. Coast Guard ships, aircraft, and field scientists. They also developed and tested a solar and wind power system for remote monitoring sites, developed and tested a GPS-enabled real-time satellite tracking system for lake surface current monitoring, developed a TCP/IP-based geo-referenced video and high-resolution still imaging system, developed a low-cost, networked ground camera and meteorological station, installed a real-time permafrost temperature monitoring system for the BARC foundation.

Kolia Shiklomanov, Fritz Nelson, Dima Streletskiy (University of Delaware Permafrost Group-UDPG), Anna Klene (University of Montana), and Cathy Seybold (USDA Natural Resources Conservation Service) visited the main CALM sites in Alaska's North Slope and Seward Peninsula during August and September. Ph.D. student Mark Demitroff continues his paleoperiglacial studies in the Mid-Atlantic States of USA with Hugh French. Demitroff and Streletskiy both gave invited lectures recently at the Smithsonian Institution in Washington DC. Nelson and Demitroff were invited attendees at the "Tough Choices" conference in Berlin during early October, where they presented on permafrost and its interrelations with land-use decisions in the USA. UDPG graduate students Andrea Wedo, Melanie Schimek, and Silvia Cruzatt are nearing completion of their M.S. theses dealing, respectively, with periglacial blockfields in Pennsylvania, topoclimatic effects on the active layer in northern Alaska, and the soil climate of the high Peruvian Andes. UDPG students and staff contributed to ten NICOP presentations and *Proceedings* papers. With assistance from Streletskiy and Nelson, Shiklomanov organized the second CALM Workshop in conjunction with NICOP. In cooperation with the American Geographical Society, the University of Delaware is sponsoring the *W.S. Carlson International Polar Year Events*, a series of lectures, seminars, films, museum exhibitions, and other activities celebrating the current IPY and the University's multiple contributions to it. The series, named for a former UD President with extensive field experience in Greenland and Alaska, was organized by Nelson.

Vladimir Romanovsky and the UAF permafrost group at the Geophysical Institute and International Arctic Research Center (Kenji Yoshikawa, Sergei Marchenko, Dmitri Nicolsky, Ronnie Daanen, Guido Grosse, and Alexander Kholodov) reports continued activities on permafrost and active layer projects in Alaska, instrumentation of boreholes and acquisition of subsurface temperature data from circum-arctic permafrost regions (Thermal State of Permafrost-TSP), and permafrost modeling in Alaska, Siberia, and Greenland. Under the NSF TSP-sponsored project a network of boreholes are being instrumented for long-term temperature observations in the Russian Arctic, Antarctic, and Alaska. More than 90 new boreholes were instrumented in Russia, and more than 60 existing Alaskan permafrost observatories were continued. Marchenko, in collaboration with a team from the Kazakhstan Institute of Geography, conducted mountain permafrost research in the Northern Tien Shan Mountains. A map of permafrost temperature distribution was generated for the Altai Mountain region. A. Kholodov, in collaboration with the Institute of Physical-Chemical and Biological

Problems of Soil Science RAS, participated in an expedition to Northern Yakutia where a new borehole was instrumented and 2006–2007 data from the loggers were downloaded. G. Grosse conducted fieldwork in the Seward Peninsula with colleagues from Alfred Wegener Institute on Polar and Marine Research, Germany, to study thermokarst lake dynamics and landscape processes employing GIS and multi-temporal remote sensing data. Grosse is maintaining and developing the Permafrost Young Researchers Network Thesis Bibliography (PYRN-Bib, <http://pyrn.org>). R. Daanen modeled the Greenland permafrost history, driven by high-resolution climate simulations, in collaboration with Danish permafrost researchers from the Technical University of Denmark, Greenland (ASIAQ) and the Danish Meteorological Institute (DMI). A new EPSCoR study to understand lobate debris flows in the Brooks Range was initiated. Work continued on the Alaska Peatland Experiment (APEX), focusing on hydrology and cold climate effects on carbon accumulation.

Kenji Yoshikawa (UAF Institute of Northern Engineering) and fellow researchers visited 92 native village schools in Alaska to install shallow (up to 6 meters deep) permafrost cables and active-layer frost tubes. The stations are adjacent to schools in Alaska as well as in schools in several other countries. Monitoring permafrost temperature and seasonal thaw allows students to collect, analyze, and share data. In spring 2008 25 villages in Western Alaska (Emmonak-Kivalina) were visited by snow machines and with a light-weight, rotary percussion drill. A movie-based permafrost education curricula and lessons are developed in the “TunnelMan Series” (<http://www.uaf.edu/permafrost>). This outreach project is supported by the University of Alaska’s EPSCoR, NASA, and NSF IPY-TSP programs.



Kenji Yoshikawa demonstrates field methods to Alaskan village students (photograph provided by K. Yoshikawa).

Colleagues Tingjun Zhang, Oliver W. Frauenfeld, Roger G. Barry, Kevin Schaefer, and Mark Parsons at the National Snow and Ice Data Center (NSIDC), University of Colorado at Boulder,

continue to document changes in permafrost and seasonally frozen ground in the Siberian Arctic and Subarctic. Together with D. Gilichinsky from the Russian Academy of Sciences they have digitized and archived soil temperatures from more than 420 stations across Russia (available from the Frozen Ground Data Center). Frauenfeld and Zhang continue to study the impact of synoptic-scale circulation on the soil thermal regime and frozen ground over the Eurasian high latitudes. Zhang and Schaefer are working on soil temperature reemergence, and impacts of soil freezing and thawing processes and snow cover on carbon exchange between the land surface and the atmosphere in cold seasons/cold regions using a coupled SibCASA model. As part of an IPY project, Zhang joined N. Panikov (Dartmouth College) to investigate microbial processes in permafrost. Zhang is working closely with Q. Wu and colleagues from Lanzhou, China on changes in permafrost along the Qinghai-Tibetan Railway. Zhang and colleagues continue work on detecting soil freeze/thaw status using passive microwave remote sensing data and ultimately developing a comprehensive frozen soil algorithm for global soil freeze/thaw studies. Zhang, with help from H. Baker (Canada) and G. Cheng (CAREERI/CAS, China), was guest editor for a special permafrost engineering issue of *Cold Regions Science and Technology*. Zhang and B. Sheffield developed a frozen ground outreach website entitled "All About Frozen Ground" to be available in early 2009. The NSIDC FGDC continues to serve permafrost and cold regions science communities, and the general public with data and information issues. Roger Barry, NSIDC Director since 1982, retired from the position in April 2008, but remains as Director, WDC for Glaciology, Boulder and Distinguished Professor of Geography.

The High Alpine and Arctic Research Program (HAARP) at Texas A&M University is co-directed by J. Rick Giardino and Jack Vitek. H. Zhan, R. Kaiser, and J. Degenhardt are working with HAARP, as are graduate research assistants N. Regmi, K. Zhuang, A. Lee, D. Rodosovich, and T. Brunk. Researchers continue to focus on multiscale aspects of alpine and arctic landscapes in Colorado and Alaska and on monitoring global warming impacts on rock glaciers in the San Juan Mountains. Ground penetrating radar and electromagnetic induction meters are employed to investigate internal structure and water pathways of rock glaciers in Yankee Boy Basin in the San Juan and California rock glacier, and Mount Mestas in the Sangre de Cristo mountains. HAARP is also using 3-D visualization of GPR data to model landslide movement along the slopes of Grand Mesa. Researchers continue to monitor stone polygons to extend the existing thirty-year record. Investigations also include climate change-watershed relationships and water quality issues in Bering Land Bridge National Preserve and Cape Krusenstern National Monument and mapping rock glaciers and debris flows in the Savage River basin in Denali National Park.

A sequence of IPY Polar Day activities were organized including press releases, contacts with experts in several languages, activities for teachers, on-line community participation, web-conferencing events, and links to researchers. The June 18 IPY Day focused on Land and Life, with permafrost research as a focal point. J. Brown prepared an introduction to permafrost for a general audience. Three live web events took place. The Live from IPY Event, hosted through ARCUS' PolarTREC program, included an overall summary of the global importance of permafrost (V. Romanovsky, UAF), followed by coastal erosion (C. Wobus, University of Colorado), and information on how life can exist within permafrost and other polar terrestrial environments (J. Baeseman, McMurdo Dry Valleys LTER). In addition to these, and live events in Europe, a classroom activity was designed for teachers that demonstrate the concept of ice wedges within permafrost and how thawing permafrost can affect ecosystems. For more information on this Polar Day or to listen to the archived events and download the activity, visit: http://www.ipy.org/index.php?/ipy/detail/land_life.



Jenny Baeseman with a group of 4th graders from Lisle, IL after a presentation on the importance of learning more about Land and Life in the Polar Regions (photograph provided by J. Baeseman).

N. Mölders and D. PaiMazumder (University of Alaska Fairbanks) have examined the impact of ecosystem albedo changes on permafrost distribution and dynamics using the Community Climate System Model (CCSM). The albedo change data used in these investigations stem from Terrestrial Ecosystems Model (TEM) simulations provided by E. Euskirchen (UAF). Preliminary results show that the TEM-simulated albedo changes over the Pan-Arctic affect soil temperatures year-round and not only in summer when the ecosystem has a different albedo. The greatest soil temperature changes occur in fall and decrease towards spring, then increase again. Mölders and G. Kramm (UAF) also examined the performance of the Hydro-Thermodynamic Soil Vegetation Scheme (HTSVS) using data from a site in Yakutsk, Siberia.

Guy Doré, (Laval University) and Hannele Zubeck (University of Alaska Anchorage) have co-authored a book on Cold Regions Pavement Engineering published by McGraw-Hill and ASCE Press (available from ASCE or online bookstores). The book, aimed at practicing civil engineers and upper level/graduate students, covers the unique environment, performance challenges, testing, design, management, and rehabilitation of cold regions pavements including permafrost areas. The Thematic Network on Arctic Engineering and Science (TN AES) has been established at the University of the Arctic. The focus of the network is to develop sustainable technologies through engineering and science that improve the quality of life and allow for natural resource development in the North. For more information, contact S. Knutsson (Sven.Knutsson@ltu.se) from Luleå University of Technology, or H. Zubeck (Hannele.Zubeck@uaa.alaska.edu). The ASTM International subcommittee D.18.19 on Frozen Soil and Rock is looking for new members, officers, and volunteers for reviewing or authoring standards (contact H. Zubeck).

Jessica Cherry (UAF's International Arctic Research Center and the Institute of Northern Engineering) manages the hydrometeorological station network on the Seward Peninsula, Alaska. This network was built by Larry Hinzman and collaborators during the NSF-supported Arctic Transitions in the Land-Atmosphere System (ATLAS). With funding from the Alaska Experimental Program to Stimulate Competitive Research (EPSCoR) and NSF's Arctic Research Support and Logistics program, Cherry is upgrading, recalibrating, and replacing sensors at these sites in Northwestern Alaska, and collaborating with the University of Delaware and UAF to maintain active layer and soil temperature monitoring at sites on the Seward Peninsula.



Research Engineer Bob Busey excavates a new shallow borehole to replace soil thermistors near the Council CALM grid, Seward Peninsula (photograph provided by J. Cherry).

Kevin Bjella (CRREL Fairbanks) reports that an estimated 400 NICOP participants visited the Permafrost Tunnel in Fox, Alaska. At the CRREL Fairbanks Permafrost Experiment Station (FPES or Farmers Loop Site), a laterally loaded pile investigation was initiated by UAF personnel and funded by State of Alaska DOT. Bjella conducted a subsurface investigation of permafrost at Thule Air Force Base, Greenland, utilizing geophysical techniques and test pits to ascertain the distribution and depth of massive ice under the runway. Beth Astley and Jon Zufelt (CRREL Anchorage) are investigating permafrost at Shishmaref, as part of an erosion control study for the U.S. Army Corps of Engineers, Alaska District. Astley mapped the depth to permafrost at a groundwater contamination site on Fort Wainwright to determine local groundwater flow pathways and to test the applicability of several geophysical techniques. Matthew Sturm (CRREL Fairbanks) and his partners at the University of Alaska and Colorado State are studying snow cover in Barrow and Toolik Lake to understand the winter water balance. These results will be the first detailed descriptions of the winter blanket of snow in polygonal ground, and will be useful in assessing the thermal insulation value of the snow.

The U.S. permafrost community mourns the passing of USGS Geologist George Gryc on April 27, 2008; James V. Drew of the University of Alaska Fairbanks on July 9, 2008; botanist and forest ecologist Leslie “Les” A. Viereck on August 31, 2008; and Bertrand Dee Tanner of Campbell Scientific on September 16, 2008.

Submitted by Oliver W. Frauenfeld, Secretary, U.S. Permafrost Association