



## 2007 Member Activities

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Planning activities for the Ninth International Conference on Permafrost (NICOP) included the review of 625 abstracts and over 400 manuscripts. A meeting of an international review team met at the U.S. Geological Survey, Menlo Park, California, in December 2007. In addition to paper and poster sessions, a series of 20 plenary presentations will cover topics on Alaskan permafrost, global thermal state of permafrost, engineering challenges, hydrologic and terrestrial processes, and polar and alpine periglacial processes. See [www.nicop.org](http://www.nicop.org) for late-breaking conference news and field trip registration. The U.S. Permafrost Association ([www.uspermafrost.org](http://www.uspermafrost.org)), with over 200 individual and corporate members, is providing the administrative support for NICOP. The USPA Board and members meet annually at the AGU in San Francisco to elect new officers and conduct the Association's other business.

The 2007 Fall Meeting of the American Geophysical Union was held in San Francisco, California, December 10–14, 2007. There were 392 abstracts presented in 29 Cryosphere sessions, as well as 14 IPY presentations in two Union sessions and a number of permafrost and carbon abstracts in Biogeosciences. Reports and posters covered cold region hydrology, surface and subsurface processes including permafrost, seasonally frozen ground, interactions between snow cover and soil, as well as periglacial processes. The IPY sessions covered progress in high latitude research. The focus on seasonal frozen ground and permafrost at AGU continues to expand as indicated by the interdisciplinary nature of presentations at the 2007 AGU Fall Meeting.

The 2007 Annual Meeting of the Association of American Geographers was held April 17–21 in San Francisco. The AAG's Cryosphere Specialty Group (CrSG) sponsored 18 paper sessions on topics including periglacial processes, glaciology, snow science, the effects of climate change on cryospheric environments, and human adaptation in polar regions. The CrSG made two awards for 2007: the *F. E. Matthes Award* was presented to Professor Roger G. Barry (University of Colorado, NSIDC) in recognition of a half-century of contributions to cryospheric science. Dima Streletskiy (University of Delaware) received the *R. S. Tarr Award* for best student paper, titled "Monitoring frost heave and thaw subsidence in northern Alaska with differential GPS" with coauthors J. Little, N. Shiklomanov, and F. Nelson.

A symposium entitled "Permafrost on a Warming Planet" was organized by Jerry Brown at the 58<sup>th</sup> AAAS Arctic Science Conference held in Anchorage, Alaska, September 24–26, 2007. Seven reports were presented on topics of state and fate of permafrost, thermokarst in Alaska, methane emission from lakes, retrogressive thaw slumps, patterned ground distribution, subsea permafrost, and carbon storage in soils.

Tom Krzewinski, chair of the Technical Council on Cold Regions Engineering (TCCRE) of the American Society of Civil Engineers (ASCE) reported the following:

- Members attended the ISCORD 2007 conference (September 25–27 in Tampere, Finland), sponsored by the Finnish Association of Civil Engineers (RIL) and by ASCE–TCCRE. 150 participants attended, with 118 papers published in the proceedings. Meetings of the TCCRE committees were held in Tampere and in San Francisco in December of 2007 in association with

the NICOP and USPA meetings. TCCRE is a cosponsor of NICOP and is assisting in technical reviews and in developing several permafrost engineering sessions.

- TCCRE contributed to updating the ASCE Standard on Frost Protected Shallow Foundations, FPSF (2008 release). Tom Krzewinski and Ed Clarke provided recent revisions. TCCRE is representing ASCE in a new PBS Documentary “Challenges of Transportation Infrastructure Design and Construction in Alaska.” Tom Krzewinski is leading the effort for ASCE with help from Billy Connor of UAF, Keith Korri of Alaska Department of Transportation, and Tom Brooks of the Alaska Railroad.
- The ASCE’s 14th International Specialty Conference on Cold Regions Engineering will be held in Duluth, Minnesota, September 2009.
- Recent, current, and future ASCE publications include: Quarterly Journal on Cold Regions Engineering; Proceedings of the 13th Conference available on CD; and TCCRE monograph “New and Unconventional Foundations/State of the Practice—Permafrost Foundations,” with authors including Ed Clarke, Duane Miller, Mark Musial, John Zarling, and Bryan Borjesson. TCCRE monographs in process: Field Properties and Site Investigations—Frozen Ground; Hydraulics and Hydrology; River Ice In Cold Regions; Water Treatment in Cold Regions; Cold Regions Ports and Harbors.
- Current TCCRE Committee members are: Chairman Tom Krzewinski, Vice Chair John Woodworth, Secretary Joel Ullring, Past Chair Jay Bergman, Member Jim Allen, ASCE Staff Contact John Segna, Journal Editor Jon Zufelt. Incoming Chair of the Technical Activities Committee and representing TCCRE is David Prusak.

At the University of Colorado’s National Snow and Ice Data Center (NSIDC) Oliver W. Frauenfeld, together with Tingjun Zhang and Mark C. Serreze, are investigating the interactions between synoptic-scale atmospheric circulation variability and the soil thermal regime (soil temperatures, active layer thickness, and seasonal freeze depths) in the Russian Arctic. This NSF funded project provides a synthesis of observational surface-atmosphere interactions in the high latitudes of Eurasia over the last ~70 years. Feedbacks from the soil thermal regime to the overlying atmosphere are also investigated, using both statistical and modeling approaches.

Ron Sletten, University of Washington, reports that a special seminar on periglacial processes is planned in honor of Link and Tao Washburn at the Quaternary Research Center, February 2008. The NSF-funded Greenland biocomplexity project is completed; however, data logging instrumentation for active layer thermal characteristics, soil creep monitoring, and microclimate is being maintained. A new NSF project focuses on ground ice in Antarctica (R. Sletten, B. Hagedorn, B. Hallet). Two new meteorological stations will be established and permafrost cores will be collected along a transect from sea level to over 2500 m. A collaborative project with M. Prentice, Indiana University, continues in Taylor Valley, using soils and geomorphology to study the history of the West Antarctic Ice Sheet excursion into the valley. A NASA project on remote sensing to study snow cover using microwave, visible spectra, and thermal properties complements the Dry Valley ground ice study (D. Winebrenner, R. Sletten, B. Hallet, J. Putkonen, B. Hagedorn). For further information and research updates visit: <http://depts.washington.edu/icylands>.

On October 3, 2007, the University of Colorado’s National Snow and Ice Data Center hosted former U.S. Vice President Al Gore for a private science briefing at the request of Mr. Gore (see photo below). After brief presentations by NSIDC scientists concerning the latest research on Arctic sea ice, snow, glaciers, permafrost, and ice sheets, an extensive discussion ensued. Mr. Gore expressed particular interest in climate interactions and changes occurring in our planet’s cold regions, including changes in permafrost.



Vice President Al Gore and researchers of the National Snow and Ice Data Center; Roger Barry on the right and Tingjun Zhang on the left of the Vice President. Photograph provided by Zhang/Frauenfeld.

Fritz Nelson and Kolia Shiklomanov (University of Delaware Permafrost Group, UDPG) report that the CALM sites in northern Alaska were visited by Anna Klene, University of Montana, Cathy Seybold, U.S. Natural Resources Conservation Service (NRCS), and UD grad students Dima Streletskiy, Melanie Schimek, and Ryan Ippolito. Kolia Shiklomanov and Anna Klene, with students Streletskiy and Wallace (UM), participated in an international permafrost field course in Russia (see Other News). We continued our work with Jim Doolittle (NRCS) on applications of three-dimensional ground-penetrating radar (GPR) images of the active layer and shallow permafrost (see *Permafrost and Periglacial Processes* 18(4)). Doolittle has been working closely with UD graduate student Mark Demitroff on applications of 3D GPR imaging for resolving networks of fossil cryogenic sediment-filled wedges in southern New Jersey. With Tingjun Zhang (NSIDC) and Stephan Gruber (University of Zurich), Nelson was guest editor of a collection of permafrost papers in *Journal of Geophysical Research—Earth Surface* (2007, 112(F2)). The second International CALM Workshop is being planned, to be held in Barrow in late June 2008. Hugh French and Fritz Nelson have completed editing a “lost” book manuscript from the early 1960s written by legendary permafrost scientist Siemon W. Muller (Stanford University). The volume, of great historical interest, is planned to be available at NICOP.

Wendy Eisner, Ken Hinkel, Chris Cuomo, and colleagues (Kim Peterson, Eric Maurer, Richard Beck, Jim Bockheim, and Ben Jones) are continuing a multidisciplinary study of landscape processes on the Arctic Coastal Plain, focusing on the thousands of thaw lakes of northern Alaska. A recent article in *JGR-Earth Surface* described the comparison of Landsat-1 (MSS) imagery from the mid-1970s to Landsat-7 ETM+ imagery from around 2000; 50 lakes completely or partially drained over the 25-year period which indicates landscape stability. The lake-specific drainage mechanism can be inferred in some cases, but efforts to understand landscape processes and identify drainage events

have been enhanced by interviewing Iñupiaq elders and others practicing traditional subsistence lifestyles.

Vladimir Romanovsky and the University of Alaska Fairbanks permafrost group at the Geophysical Institute/International Arctic Research Center (Kenji Yoshikawa, Sergei Marchenko, Dmitri Nicolsky, Ronnie Daanen, Guido Grosse, and Alexander Kholodov) continue to work on permafrost and active layer dynamics in Alaska, the instrumentation of boreholes and acquisition of subsurface temperatures from circum-arctic permafrost regions (IPY TSP project), and modeling permafrost in Alaska, Siberia, and Greenland. Under the NSF-sponsored Russia-United States TSP project, coordinated by Alexander Kholodov, a network of boreholes was instrumented for long-term temperature observation in the Russian Arctic (48 boreholes in 2006, 50 more in 2007). Observations in the 60+ existing Alaskan permafrost observatories continued. Sergei Marchenko continued research in the Northern Tien Shan Mountains, Kazakhstan, and with Ghent University (Belgium) and Gorno-Altai State University (Russia) in the Altai Mountains, Russia. Guido Grosse's fieldwork in the Kobuk Valley National Park (with NPS Alaska), Yakutsk (with K. Yoshikawa), and in Cherskii (with S. Zimov, Northeast Science Station Cherskii) focuses on thermokarst lake dynamics and landscape processes employing GIS and multi-temporal remote sensing. Guido Grosse is maintaining and developing the Permafrost Young Researchers Network Thesis Bibliography. Ronald Daanen is collaborating with Danish permafrost researchers at the Technical University of Denmark, Greenlandic permafrost researchers (ASIAQ), and the Danish Meteorological Institute on modeling the Greenland permafrost history using high resolution climate simulations. Field and laboratory studies in Alaska were performed to understand the effects of differential insulation on soil freezing processes and especially on soil movement due to differential ice accumulation.

In support of the TSP project, Gary Clow and Frank Urban (U.S. Geological Survey) re-measured temperatures in nearly all the deep boreholes in northwestern Alaska. The remaining wells, located in the foothills of the Brooks Range, will be relogged during 2008. The DOI/GTN-P active-layer network was serviced and a number of improvements were made to the radio telemetry system in the eastern portion of the U.S. National Petroleum Reserve (NPR-A) and in the Arctic National Wildlife Refuge (ANWR). High-resolution dynamical downscaling experiments were initiated using the Weather Research & Forecasting Model (WRF) for federal lands in northern Alaska.

Kevin Bjella (CRREL Hanover), reports that modifications to the cooling system in the Permafrost Tunnel in Fox, Alaska, are underway. Outdoor air was brought in starting in early February. The forced circulation lowered permafrost temperatures to  $-4.5$  to  $-3.5^{\circ}\text{C}$ , depending on the season, which subsequently slowed the creep rate by a factor of three. This will help insure the continued use of the facility for research and outreach into the foreseeable future.

Kenji Yoshikawa and Tohru Saito, University of Alaska Fairbanks, have visited 35 native village schools to install shallow (to 6 m depth) permafrost cables and active layer frost tubes. The stations are adjacent to schools in Alaska and several other countries. Monitoring permafrost temperature and seasonal thaw provides students the opportunity to collect, analyze, and share data. In spring 2007, they visited 12 villages along the Yukon River by snow machines, bringing a light-weight rotary percussion drill. All data are shared online: <http://www.uaf.edu/permafrost>. This outreach project is supported by the University of Alaska's EPSCoR, NASA, and NSF IPY (TSP) programs.



Students participating in the installation of thermistor cables. Photograph provided by Kenji Yoshikawa.

Tom Douglas (CRREL Fairbanks) reports that at the Farmer's Loop permafrost research site near Fairbanks, Alaska, a 3-m borehole was drilled in the late spring of 2007 and 10 thermistors, provided by Vladimir Romanovsky, were installed. A meteorological tower (provided by Charles Collins) and a series of snow depth and temperature probes (provided by Matthew Sturm) were also installed at the site, part of the CALM network. In August 2007 a group lead by Kenji Yoshikawa and Yuri Shur measured electrical resistivity along three lines in the two previously disturbed plots adjacent to the CALM site which was probed again in October.

Jim Bockheim, University of Wisconsin, continues to work with the New Zealand Antarctic Programme and will spend the austral summer in the Darwin Glacier region.

By using high-resolved simulated soil temperature data (10500 values) Nicole Mölders and Debasish PaiMazumder (University of Alaska Fairbanks) theoretically examined how network density and design affect regional averages of soil temperatures. Permafrost networks that have sites non-randomly distributed may overestimate regional soil temperatures compared to the regional soil temperature determined from all data. Network density also plays a role. Networks with 400 or more sites will capture the regional average and trends well, if they are randomly distributed over the entire region.

Zhaohui (Joey) Yang, He Liu, and Utpal Dutta from the School of Engineering, University of Alaska Anchorage, continued research of seasonally frozen ground effects on the engineering structures in cold regions. With the support of two grants from the Advanced National Seismic System of U.S. Geological Survey, they recently completed instrumentation of a bridge and a high-rise RC-type building in Anchorage, Alaska. State-of-the-art seismic sensors and data acquisition systems were installed in the spring 2007 for collecting building performance data during seismic events. Together with Dr. Kenan Hazirbaba of UAF, they have successfully obtained support from the Alaska University Transportation Center and Alaska DOT & PF to study the effects of permafrost and seasonally frozen ground on the seismic input to infrastructures.

Nicole and Bryan Shumaker, BeadedStream, announced a new ultra-rugged portable (handheld) data collector for its temperature acquisition cables (TACs). The TACs are being used throughout Alaska for tundra access studies, refrigerated foundation systems, monitoring permafrost temperatures, and for geotechnical engineering projects, among other applications. The all-digital TACs provide options for Internet access.

Finally, we congratulate Professor J. C. F. Tedrow, Rutgers University, on the celebration of his 90th birthday (April 21, 2007), and we recognize his many past and continuing contributions to polar soil science.

Lynn Everett ([everett.2@osu.edu](mailto:everett.2@osu.edu)) and Oliver W. Frauenfeld