

DATE: 6 September 1999

TO: LAII ATLAS Investigators, NSF, PICO

FROM: Ken Hinkel and Fritz Nelson

RE: August field activities

During August, air and soil temperature data loggers were downloaded and serviced at Barrow, Atkasuk, West Dock, Betty Pingo, Deadhorse, Flux Study plots 95-3 and 95-4 in the Sagwon upland, Happy Valley, Imnavait Creek and Toolik Lake. In collaboration with Ron Paetzold (USDA), soil moisture data were also downloaded and are being processed. Thaw depth was measured across the grids as part of the project's ongoing responsibilities for monitoring and modeling spatial and temporal patterns of soil thaw at many of the Alaskan CALM sites.

In addition to these ongoing efforts, several field experiments were conducted during the August field work. Graduate student Claire Gomersall (University of Cincinnati) measured thaw depth and near-surface soil moisture along transects at several Foothills and Coastal Plain sites to augment our existing work on the scale dependence of thaw and soil moisture variability in differing vegetation/ landscape units. Geostatistical methods are being incorporated into our suite of spatial analytic procedures to more accurately represent patterns on the grids. University of Delaware graduate student Anna Klene installed instrumentation at several sites to supplement information contained in her recently completed master's thesis on the n-factor in natural landscapes.

In May, (with Jim Doolittle, John Kimble, and Ron Paetzold, USDA-NRCS, and Ramona Travis, NASA), we collected high resolution ground penetrating radar (GPR) profiles across East-West transects on the Barrow CALM grid. Supplementary work on soils was performed by Jim Bockheim and Jim O'Brien (University of Wisconsin) and Chien-Lu Ping (University of Alaska), and about 15 georeferenced cores were collected to provide verification of signal interpretation. In August, high resolution topographic profiles and thaw depth were obtained across the same transects to enhance signal interpretation.

We also conducted extensive sampling from three zones near the newly-erected snow fence: beneath the 4-m high drift, in the scour zone ~60 m downwind from the fence, and in a control plot about 500 m south of the fence. A minimum winter ground surface temperature of -6°C was observed beneath the drift in June 1999, and soil thaw did not commence until snow meltout in late July. Conversely, a minimum temperature of -30°C was observed in late March in the leeward scour zone; this is about 10°C colder than that experienced in the control plot beneath 45 cm of snow. These soil temperature measurements largely explain the observed pattern of thaw depth; about 25 cm of thaw occurred beneath the drift and nearly twice that in the scour zone. These results demonstrate the dominance of summer thaw duration over winter soil temperature at this site. Additional instrumentation was installed in all zones, and vegetation and soil sampling plots were established by Kim Peterson and Jim Bockheim.

Finally, we have continued to maintain the CALM web site. We are currently loading archived data that are more than 4 years old, but expect an influx of data collected during the 1999 summer field season to arrive soon.