

DATE: 4 September 2000  
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, Atqasuk, West Dock, Betty Pingo, Deadhorse, Flux Study plots 95-3 and 95-4 in the Sagwon upland, Happy Valley, Imnavait Creek and Toolik Lake. Soil moisture data were also downloaded and are being processed. Thaw depth and soil moisture were 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. This year, thaw depth was reduced by about 10% across the North Slope and near-surface soil moisture was near saturation conditions that reflect the generally cool and wet summer.

We also conducted extensive sampling near the snow fence at Barrow. Soil temperature loggers were collected from 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  $-10^{\circ}\text{C}$  was observed beneath the drift in June 2000, and soil thaw did not commence until snow meltout in late July. Conversely, a minimum temperature of  $-20^{\circ}\text{C}$  was observed in late March in the leeward scour zone; this is about  $10^{\circ}\text{C}$  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 15 cm of thaw occurred beneath the drift and nearly twice that in the scour zone. Six frost-defended bench marks were installed, and serve as end-points for laser survey transects that are 60 m in length. Surveying is used to monitor ground subsidence in the area affected by drifting.

Finally, we initiated a new project under the direction of Wendy Eisner. The field report is appended below.

Field Report: Collaborative research: Preliminary investigation of paleoenvironment, processes, and carbon stocks of drained thaw-lake basins, Arctic Coastal Plain, Alaska  
The field work, which took place from 8-21 August 8, resulted in the intensive sampling of drained thaw-lake basins in the Barrow region. The research team consisted of Wendy Eisner, Ken Hinkel, and Robert Frohn (University of Cincinnati), Kim Peterson (University of Alaska Anchorage), Nick Balster (University of Wisconsin), and two graduate students. We conducted intensive sampling of 35 lake basins of varying age, including soil samples for pollen analysis, soil development, radiocarbon dating, and for the determination of carbon accumulation rates. We also took measurements of active layer depth and made detailed vegetation descriptions at each sampling location. Twenty-nine of the drained lake basin sites were accessed by helicopter. Satellite images (Landsat 7) were georectified and we initiated the process of the correlating surface vegetation to hyperspectral signature at each location. Eisner and Frohn also visited the Geophysical Institute in Fairbanks and acquired archived digital images of the study region.