

CALM Project at Baker Lake, Nunavut.

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ABSTRACT

In September 1997, four, 3m deep, holes were drilled through gravel and granitic bedrock on a gentle, South-facing slope above the Baker Lake community (64°10' N; 95°30'W), Nunavut, Canada. The holes, each equipped with a thermistor cable were dedicated for a long-term, circum-annual monitoring of the active layer and upper permafrost temperatures. They formed a line transect and were established approximately 100m apart from each other. One of the holes (No2) was established in the middle of a zone covered in winter by a huge snowdrift, caused by a 6m tall snowfence further up the slope. This hole was designed to monitor an anomalous situation due to snow accumulation, while the other three represented the usual situation along the slope with only a shallow snow cover in winter. The inserted cables were equipped with thermistor sensors mounted 50 cm apart. This arrangement allowed establishment of a 3m deep temperature profile to monitor its kinetics year-round with good accuracy. The temperatures have been taken biweekly, manually with a Fluke Multimeter since September 1997. The project was registered with the Circumpolar Active Layer Monitoring (CALM) program and data on the active layer temperatures have been shared with this organization. Preliminary evaluation of the permafrost temperatures indicate that the ground under the snow drift is getting warmer than the ground in the exposed tundra. Provided that minimal funds will remain available, monitoring will continue. In the continuous permafrost zone, trends of ground temperatures represent the best integrator and indicator of the ongoing climate change. The Baker Lake CALM project is also an excellent educational tool for local students who are involved in measurements and the community at large.