

# Permafrost Databases

## Sharon Smith Geological Survey of Canada

Today I will discuss the national permafrost databases that the GSC maintains. Monitoring data collected by many of you may eventually reside in these databases. There are two: a permafrost thickness database, and a ground temperature database. These can be useful for a number of activities:

- These provide baseline data that is relevant to climate change studies. For monitoring the climate change signal in permafrost for example, the data provides a baseline against which we can measure the influence of climate change.
- They provide input data and validation data for climate change and permafrost models.
- They provide useful information for climate change impact assessment studies.
- They support the needs of national and international climate change programs (GCOS, GTOS, IPCC, CRYSYS, etc.).

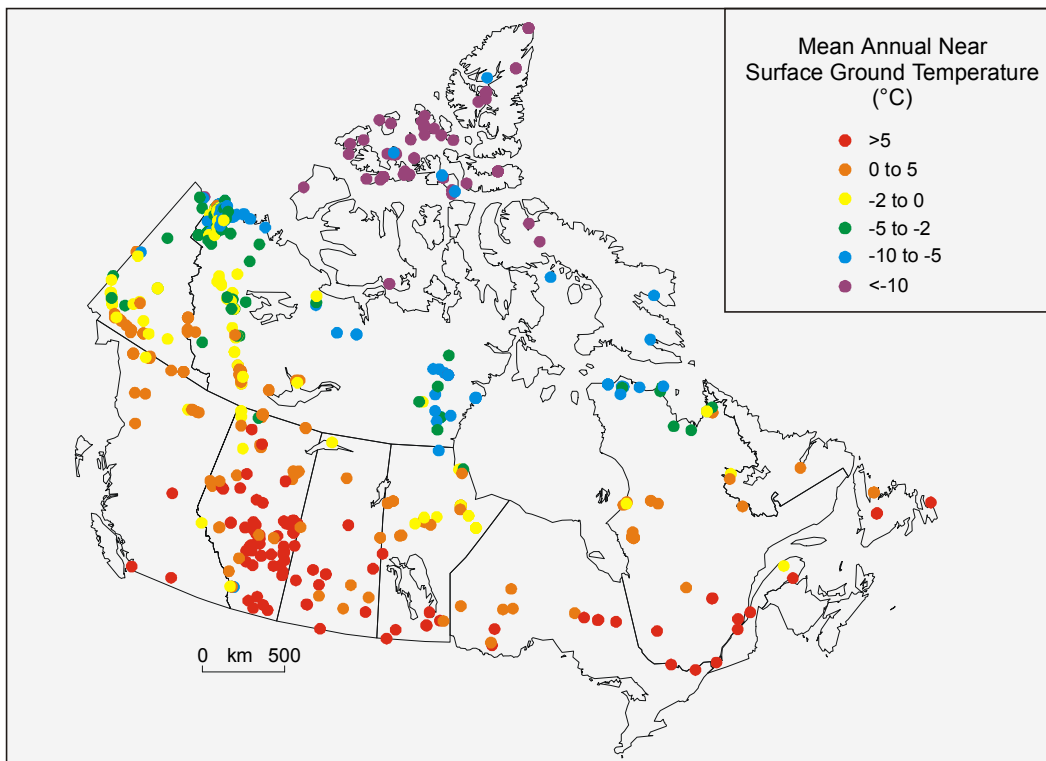
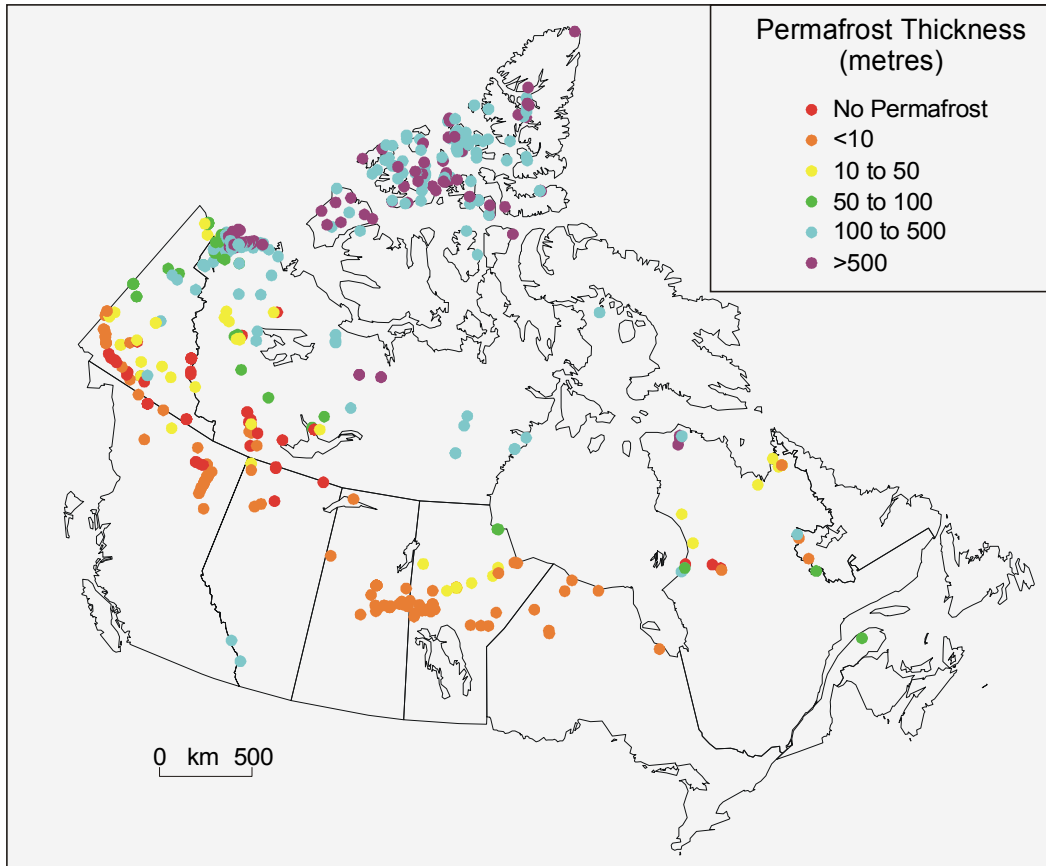
Alan Judge originally compiled these databases about 15 years ago. In the last few years, Margo Burgess and I have been updating the databases. They are a compilation of publicly available, published and unpublished information for over 500 sites in northern Canada. The data have been collected by government agencies (federal, provincial, and territorial), university researchers, and private companies.

The ground temperature database contains mainly shallow ground temperature data, although extrapolated surface temperatures and deep geothermal data are also included. Active and inactive monitoring sites are in the database, including CALM sites, Norman Wells Pipeline monitoring sites, the GSC geothermal data collection, and other databases. A lot of information comes from Roger Brown's studies done for the National Research Council Division of Building Research.

Additional information is available for many of these sites. Climatic information, snow cover, vegetation, surficial materials, active layer thickness, and the source of the published record are all fields in the database. Maps of permafrost thickness and near surface ground temperature have been compiled using the information in these databases.

These databases will be released as GSC open file reports. The portions of the data set that are part of the global geocryological database (the geothermal data collection and the CALM site data) are already available on the CAPS (Circumpolar Active Layer Permafrost System) CD, available from the IPA.

The database is incomplete. We hope to maintain it and update it annually, although this requires a commitment of resources that is uncertain.



A significant but unknown quantity of data is currently sitting in filing cabinets, in paper form or in digital formats that are not compatible with current standards. We have funding from the federal government's Climate Change Action Fund (CCAF) for rescuing some of these data. This includes the data for the McGill subarctic field station at Schefferville, which is currently on 9-track tape. Al Taylor mentioned the Alert data: this includes over 20 years of data but measurements obtained in the last 10 years have not been converted to temperatures and entered in the digital database. Over the next two months we hope to convert the raw measurements to temperature, and do some preliminary analysis of these data. The data from these and other sources will be added to the geothermal database.

We frequently receive requests for permafrost thickness and ground temperature information. Funding has been obtained from CCAF and ResSources GSC to allow us to make the databases more accessible, as part of the permafrost component of the *National Arctic Geoscience Database Supporting Climate Change Research*. At this stage we are unsure whether the database itself or just the metadata will be made available on the World Wide Web.

Access to the databases will be through the GSC permafrost site:

**[sts.gsc.nrcan.gc.ca/permafrost/](http://sts.gsc.nrcan.gc.ca/permafrost/)**

The site will include links to CRYSYS and GTNet-P sites. The GSC will be responsible for maintaining the databases and the web site.

It is important to maintain these databases as a central depository for permafrost data. To date however, this has happened in an ad hoc way, with no guarantee of continuity.