Ivitak Cove Permafrost Soil Data

Gabriel Casillas

University of Denver

LIS4220 Data Curation

Doctor Mayernik

March 4, 2021

**Metadata and Data Profile**

**Ivitak Cove Permafrost Soil Data**

The data that is being looked at is the soil temperature readings in Celsius at varying depths through the permafrost layer of Ivitak Cove’s watershed which is located on the Torngat Mountains. The Torngat Mountains are part of the Torngat National Park in Canada. The depths at which the data was taken is 0.5, 1, 2, 3, 4, 5, and 7 meters deep. The date and time are recorded from 2010 to 2017, progressing from daily 6 hour readings to daily 8 hour readings to monthly readings. There are 8,031 rows within the data file, which can then further be expanded to roughly 56,000 measurements across the seven depth points. Minimal comments are made on the file for the data itself, mostly relating to the status of the cables. On the site hosting the data, some conclusions have been drawn about how the temperatures fluctuated due to seasonal changes.

Darroch Whitaker is the creator of the data according to the metadata. And based on their email provided, they appear to work for Parks Canada in some capacity. Parks Canada is the current publisher of the data. The data is being hosted on the government of Canada’s site where open data/open government information is housed. The data was most likely collected by Whitaker and or their team, or is at least currently being managed by Whitaker.

The data is currently open and available to the public. It is available through Open Government Licence – Canada. The license is non-exclusive to use the information and data and is royalty free. Beneath the license, users are able to “copy, modify, publish, translate, adapt, distribute, or otherwise use the information in any medium, mode or format for any lawful purpose” (Government of Canada). The license does not appear to cover the republishing of data unless it falls beneath ‘publish’; users may need to contact Whitaker at Parks Canada to obtain permission. When using this data, the license stipulates that the user must specify—“contains information licensed under the Open Government Licence – Canada”—and link to the Open Government Licence – Canada (Ibid). The licensure does not grant the public the right to use personal information, third party rights, names or official symbols in the information, intellectual property rights, nor does the license provide endorsement by Whitaker or Parks Canada.

The data was recorded in both French and English in accordance with standard Canadian documentation. The file format, .csv/excel, is widely available to any user. There is no special or specific program that is required to be able to access the data, nor is there a paywall. The thermistors themselves and their current readings are only accessible to Parks Canada, but can reasonably be assumed that as the data will be published when time/funding/readings are made available. Since the contact information for Whitaker is made available on the site, end users may be able to contact them for more information on current data and readings.

Regarding accessing the data, the file format makes data access easy. Searching Canada’s open data is easy as well due to numerous keywords/subject access terms: permafrost, active layer depth, soil temperature, Ivitak Cove, and Labrador. Users can also search by subject, such as Nature and Environment. Through a ‘similar records’ function, users can end up navigating to the page. While the data itself is not accessible through the National Snow and Ice Data Center (NSIDC), a permafrost map of Canada and the historical data is accessible; through ‘similar records’, users can access the permafrost data for the Torngat Mountains readings of Ivitak Cove.

In terms of what is missing from the data is a legend or key on the site or within the dataset on some of the information. Within the dataset, two fields are labeled ‘Logger NAD83 Zone 20V UTM Easting’ and ‘Logger NAD83 Zone 20V UTM Northing’. Users that are familiar with geospatial data would be able to infer these are coordinates for the thermistors, but without a key or legend the average layperson would need to Google what UTM Northing and Easting is where they could then input the coordinates provided in the dataset. The dataset is also only speaking to soil temperature and is not measuring the thickness or depth of the permafrost layer. The dataset also does not account for weather conditions, above ground temperature, or water temperature. Due to the distance between the coordinates and the McCormick River, during seasonal fluctuations in snowmelt and rising tides, the soil temperatures taken may be affected by water. The site also does not provide any context in terms of why the data was measured.

For usability of the data, tracking the changes in temperature at the different depths would be beneficial to seeing how the temperature of the permafrost fluctuates throughout the year. If other data from the region could be located, it could be cross referenced with weather conditions and daily temperature readings above ground to show a wider interpretation of how above ground phenomena can potentially affect underground soil readings of the permafrost. Based on the map of permafrost that was initially located through the search, the Ivitak Cove region experiences roughly 90-100% continuous permafrost, which could further expand on that percentage and give a better depiction as to what is transpiring underground with the permafrost layer at varying depths, especially since the map was compiled in 1995. Comparisons with data from the Geological Survey of Canada could also be used to further expand on soil temperatures of the permafrost layer.

**Repository Profile**

**Arctic Permafrost Geospatial Centre**

The Arctic Permafrost Geospatial Centre (APGC) is an Open Access data catalogue that ‘promotes, describes, and visualizes’ permafrost data and metadata. The Centre provides access to data, but also supports the archival of the information hosted. APGC is hosted and maintained by the Alfred-Wegener-Institut (AWI)’s Helmholtz Centre for Polar and Marine Research. APGC is an initiate project of the European Research Council (ERC)’s Rapid Permafrost Thaw in a Warming Arctic and Impacts on the Soil Organic Carbon Pool (PETA-CARB), as well as the European Space Agency (ESA)’s GlobPermafrost project.

The repository, APGC, was chosen because the data—Permafrost Active Layer Depth in the Torngat Mountains—measures permafrost soil temperature in the Ivitak Cove of the Torngat Mountains of Labrador, Canada and APGC supports and hosts permafrost data from around the Arctic, including regions in Canada. In the holdings APGC currently has there are numerous Canadian geospatial datasets that deal with various aspects of the permafrost layer. The dataset is currently being hosted by Canada’s Open Government, which is a repository that hosts government data and digital records across numerous departments. Open Government is a large non-specific repository full of numerous subjects of open data and datasets. By selecting APGC, the dataset on the permafrost in the Torngat Mountains, Labrador, Canada, would be able to be made more accessible to researchers and users researching permafrost.

As part of the APGC’s Help Guide document, it tells end users that data cannot be entered by a user but that they can email APGC. APGC will then determine whether the data meets their requirements. If the data does meet the requirements, the data will be accepted into the catalogue free of cost. Based on the content already in the repository, the data is hosted on external sites where users can then download and access the data via the link-thru or on APGC’s dataset page. APGC acts more so as a special collection or disciplinary specific collection that provides an access point for data on geospatial permafrost in other repositories.

Since the repository is relatively closed to general submissions, the data catalogued on the site comes from numerous countries and researchers around the globe. The repository itself is hosted and maintained by the Alfred-Wegener-Institut (AWI)’s Helmholtz Centre for Polar and Marine Sciences in Germany.

There are not many criteria for APGC hosted data. The researchers at APGC require potential uploaders to contact and submit their data to them in order for the data to be validated in an accuracy assessment; those at APGC assess the metadata, descriptive metadata, and reproducible data for the following criteria. When considering having data hosted, the data should focus directly or indirectly on permafrost and permafrost characteristics; if the data does not focus on permafrost, it would be necessary to find another repository to host the data. A second criterion would be that the data must address an important problem in the field; this would be subject to the approval process and not much scope is given to expand upon what problems or issues this may include. Data is also considered if the data is new or has improved upon measurements for the permafrost or permafrost characteristics. Since APGC only hosts data in a discipline specific special collection, APGC requires potential uploaders’ data and metadata to already be hosted within an open access repository. If APGC approves the data post-evaluation, it will be catalogued, made searchable, and given an access point within their highly specific collection of permafrost data.

Due to the data being hosted in other repositories, there is no mention of copyright or licensing of data. Since the data is hosted at other repositories, it would be necessary for the user to look into the licensing and copyright concerning uploading their data there. A requirement of the APGC is that the data be open access, which means users would have to consider open access repositories before looking to have their data catalogued at APGC. Each of the datasets provides the type of access it has through a Creative Commons link-thru.

There are no special requirements for end users to access data catalogued with APGC. The data for each dataset can be accessed along with any resources, supplements, and metadata by viewing the dataset. The data is downloadable from the dataset page; the user is not forced to follow a link-thru to the hosting repository. There is a link-thru for the DOI where the data is hosted where it can also be downloaded. The metadata standard for many of the datasets is DCAT—Data Catalog Vocabulary—which supports metadata from multiple vocabularies and metadata standards to increase discoverability and ease of access to the metadata.

The Dissemination Information Package (DIP) for APGC users is a series of metadata, data, and resources files that end users can download through an on-line delivery response. The DIPs are typically labeled with the title of the file and file type to further identify what files have been received. The naming conventions follow the metadata provided on the dataset page.

**Additional Information**

**Data Citation**

The recommended citation for using the Permafrost Active Layer Depth of the Torngat Mountains would be in APA as follows:

Parks Canada. (2017). Permafrost active layer depth—Torngat Mountains [.csv]. Retrieved from https://open.canada.ca/data/en/dataset/fca3a8b2-bc4f-45df-b1f3-75d20e9ef6d7.

**Preservation**

The preservation of the Permafrost Active Layer Depth of the Torngat Mountains’ Ivitak Cove data for long term preservation would be the continuous checksum of the .json and .xml metadata files as well as the .csv data file. In terms of proprietary formatting types, the file types are all accessible currently and do not require any external programs; the metadata can be opened within browser and the data file can be opened with Microsoft Excel or another similar app that deals with spreadsheets.

**Related Files**

Mentioned within the data analysis if the Permafrost Map of Canada that would aid users in what can be done with the data or changes in permafrost data between 1995 and 2017. The National Snow and Ice Data Center (NSIDC)’s and National Atlas of Canada’s map can be located here: https://nsidc.org/data/GGD604/versions/1. The data file types are .jpeg and .pdf; the metadata record is structured in .xml. Other metadata information is viewable on NSIDC’s site, along with how to cite and use the data.

References

Alfred Wegener Institut (n.d). *Arctic Permafrost Geospatial Centre (APGC).* Arctic Permafrost

Geospatial Centre. https://apgc.awi.de/.

Heginbottom, J. (1995). Permafrost map of Canada, Version 1. *National Atlas of Canada.*

https://nsidc.org/data/GGD604/versions/1.

Government of Canada (n.d.). Open government licence – Canada. *Open Government of*

*Canada.* https://open.canada.ca/en/open-government-licence-canada.

Whitaker, D. (2017). Permafrost active layer depth – Torngat Mountains. *Parks Canada.*

https://open.canada.ca/data/en/dataset/fca3a8b2-bc4f-45df-b1f3-75d20e9ef6d7.