Soil Temperature Station Data from Permafrost Regions of Russia (Selection of Five Stations), 1915 - 2000, Version 1

USER GUIDE

How to Cite These Data

As a condition of using these data, you must include a citation:

Zhang, T. Z. and O. W. Frauenfeld. 2011. *Soil Temperature Station Data from Permafrost Regions of Russia (Selection of Five Stations), 1915 - 2000, Version #1*. [Indicate subset used]. Boulder, Colorado USA. NSIDC: National Snow and Ice Data Center. https://doi.org/10.7265/N5C24TC5. [Date Accessed].

FOR QUESTIONS ABOUT THESE DATA, CONTACT NSIDC@NSIDC.ORG

FOR CURRENT INFORMATION, VISIT https://nsidc.org/data/AUTHID

National Snow and Ice Data Center

TABLE OF CONTENTS

1 DATA DESCRIPTION

1.1 Summary

This data set includes soil temperature data from boreholes located at five stations in Russia: Yakutsk, Verkhoyansk, Pokrovsk, Isit', and Churapcha. The data have been compiled into five Microsoft Excel files, one for each station.

There are two different versions of the Excel files: a complete version and a subsetted version. Both versions exist for each of the five stations for a total of 10 files. The complete version is more applicable to scientific investigation. The subset version is provided for K-12 teachers and is featured in a classroom activity called "How Permanent is Permafrost?"

We have included air temperature measured at these five stations when it is available. There are two sources for the surface air temperature data: NCAR World Monthly Surface Station Climatology, 1738-cont and NOAA Global Historical Climatology Network (GHCN) Monthly data sets. These two sources both draw from the same original source which is data from the World Meteorological Organization (WMO) station network. The complete files have data from one or both sources, while the subset files only include data from the source with the most complete record.

These soil temperature data are a selection from a larger collection of 36 stations that have not been published as a data set. F. Fetterer, NOAA@NSIDC program manager, made the selection and added surface air temperature with the assistance of others at NSIDC.

1.2 Parameters

The parameters of this data set are soil temperature and surface air temperature.

1.3 File Information

1.3.1 Format

The data files are provided in Excel file format plus a Google Earth KMZ file.

1.3.2 File Contents

The complete versions of the Excel data files contain borehole temperature data in degrees C at all available standard depths: 0.2 m, 0.4 m, 0.6 m, 0.8 m, 1.2 m, 1.6 m, 2.0 m, 2.4 m, and 3.2 m. The subsetted versions of the files contain data from the 0.8 m and 3.2 m depths only. Both versions also contain a column for surface air temperature. Missing data are indicated by the value *-999.0*.

Each Excel file contains three worksheets:

- **G02189info**: Contains information about the stations used to collect the data including WMO station number, station name, latitude and longitude, and notes on the stations
- **Jan soil & surface temp**: Contains winter (January) soil temperature and surface air temperature (except for the Churapcha Excel file that only contains soil temperature - air temperature was not available)
- **Jul soil & surface temp**: Contains summer (July) soil temperature and surface air temperature (except for the Churapcha Excel file that only contains soil temperature - air temperature was not available)

There is also a Google Earth file (permafrost_eet.kmz) that shows the location of the bore hole stations, surface temperature trend maps, and permafrost maps.

1.3.3 Directory Structure

The complete versions of the files reside in the directory called `complete` and the subsetted versions of the files reside in the `subset` directory. The Google Earth file resides in the `google_earth` directory.

1.3.4 Naming Convention

The Excel data files are named according to the following convention and as shown in Table 1:

`HPIP_StationName_type.xls`

Table 1. File Naming Convention Description

Variable	Description
HPIP	Indicates that this is part of the “How Permanent is Permafrost” classroom activity
StationName	Indicates the station that the data were acquired. Possible station names are the following: `Churapcha`, `Isit`, `Pokrovsk`, `Verkhoyansk`, and `Yakutsk`
type	Indicates whether the data are the complete files or the subsetted files. `full` = complete `subset` = subsetted
.xls	File extension that indicates that this is a Microsoft Excel file.

1.4 Spatial Information

The data cover five WMO stations in Russia. The latitude and longitude of each is given in Table 2.

Table 2. Station Locations

Station Name	Latitude	Longitude
Yakutsk	62.0	129.7
Verkhoyansk	67.6	133.4
Pokrovsk	61.5	129.2
Isit'	60.8	125.3
Churapcha	62.0	132.6

1.5 Temporal Information

The data span 1915 to 2000, however, not all station data span the full time period. Table 3 lists temporal coverage details for each station.

Table 3. Temporal Coverage for each Station

Station Name	Time Period
Yakutsk	1915 – 2000
Verkhoyansk	1935 – 2000
Pokrovsk	1931 – 2000
Isit'	1956 – 2000
Churapcha	1957 – 2000

2 VERSION HISTORY

Table 4. Version History Summary

Version	Release Date	Description of Changes
1	February 2011	Initial release

3 REFERENCES

Chudinova, S. M., O. W. Frauenfeld, R. G. Barry, T. Zhang, and V. A. Sorokovikov. 2006. Relationship Between Air and Soil Temperature Trends and Periodicities in the Permafrost Regions of Russia. Journal of Geophysical Research 111, F02008. doi:10.1029/2005JF000342.

Frauenfeld, O. W., T. Zhang, R. G. Barry, and D. Gilichinsky. 2004. Interdecadal Changes in Seasonal Freeze and Thaw Depths in Russia. Journal of Geophysical Research 109, D05101. doi:10.1029/2003JD004245.

Gilichinsky, D. A., S .S. Bykhovets, V. A. Sorokovikov, D. G. Fedorov-Davydov, R. G. Barry, T. Zhang, M. K. Gavrilova, O .I. Alexeeva. 2000. Use of the Data of Hydrometeorological Survey for Century History of Soil Temperature Trends in the Seasonally Frozen and Permafrost Areas of Russia, Kriosfera Zemli. The Earth Cryosphere 4(3): 59-66.

Gilichinsky, D. A., R. G. Barry, S. S. Bykhovets, V. A. Sorokovikov, T. Zhang, S. L. Zudin, and D. G. Fedorov-Davydov. 1998. A Century of Temperature Observations of Soil Climate: Methods of Analysis and Long-term Trends. Proceedings of the 7th International Conference on Permafrost, Yellowknife, Canada, June 22-27, 1998, p. 313-317.

Zhang, T., O. W. Frauenfeld, M. C. Serreze, A. Etringer, C. Oelke, J. McCreight, R. G. Barry, D. Gilichinsky, D. Yang, H. Ye, F. Ling, and S. Chudinova. 2005. Spatial and Temporal Variability of Active Layer Thickness over the Russian Arctic Drainage Basin. Journal of Geophysical Research 110, D16101. doi:10.1029/2004JD005642.

Zhang, T., Roger G. Barry, D. Gilichinsky, S. S. Bykhovets, V. A. Sorokovikov, and Jingping Ye. 2001. An Amplified Signal of Climatic Change in Soil Temperatures During the Last Century at Irkutsk, Russia. Climatic Change 49(1-2): 41-76.

4 DOCUMENT INFORMATION

4.1 Publication Date

February 2011

4.2 Revision History

November 2021: A. Windnagel put the documentation into the latest user guide template.