The Canadian Urban Environmental Health Research Consortium

Canue Metadata - Weather Climate Metrics
2022-05-10

DATA SET INFORMATION

Dataset Code: WTHNRC_A_YY

Description:

Each annual file contains 35 metrics calculated by CANUE staff using base data provided by the Canadian Forest Service of Natural Resources Canada.The base data consist of interpolated daily maximum temperature, minimum temperature and total precipitation for all unique DMTI Spatial Inc. postal code locations in use at any time between 1983 and 2015. These were generated using thin-plate smoothing splines, as implemented in the ANUSPLIN climate modeling software. The earliest applications of thin-plate smoothing splines were described by Wahba and Wendelberger (1980) and Hutchinson and Bischof (1983), but the methodology has been further developed into an operational climate mapping tool at the ANU over the last 20 years. ANUSPLIN has become one of the leading technologies in the development of climate models and maps, and has been applied in North America and many regions around the world. ANUSPLIN is essentially a multidimensional "nonparametric" surface fitting method that has been found particularly well suited to the interpolation of various climate parameters, including daily maximum and minimum temperature, precipitation, and solar radiation.Equations for calculating the included metrics, based on daily minimum and maximum temperature, and total precipitation were developed by Pei-Ling Wang and Dr. Johannes Feddema at the University of Victoria, Geography Department, and implemented by CANUE staff Mahdi Shooshtari.

Keywords: annual climate parameters|precipitation|rain|snow|temperature|heat|interpolated surface

Place Keywords: Canada|national

GEOSPATIAL REFERENCE

Upper Left Corner: 65.14N , -141.02W
Lower Right Corner: 41.68N , -52.62W
Coordinate System: GCS_WGS84 - EPSG:4326
Geometry Type: POINT - Units: Decimal Degree
Geometry Data Source: DMTI Spatial Inc. (postal codes)

QUALITY ASSESSMENT

QA/QC Procedures:

CANUE did not assess the quality of the base data. Users should review the supporting documentation and any recommended citations.

Geographic Coordinate Positional Accuracy:

These metrics are linked to the corresponding annual postal codes files for mapping and analysis purposes. Refer to the postal code metadata file in Supporting Documentation for more information.

Vertical Positional Accuracy: N/A
Attribute Accuracy: N/A
Data Validity: NoData = -9999 (for numeric fields) - NoData=null (for category fields) - Data insufficient to calculate value = -1111
Associated Files: N/A
Data Comment:

Elevations were assigned to postal code locations by NRCAN CFS staff. Where coastal locations were not assigned an elevation, a default of 10 m above sea level was assigned.

DATA SOURCE

Data Source

Daily Interpolated precipitation and temperature, DMTI Spatial Inc. postal codes. See supporting documentation.

Spatial Resolution: Postal code locations

Data Preparation Date: 2017-10-01

Beginning Date: 1983

End Date: 2015

Sampling Frequency of Data: Annual

Years Available:

1983 - 1984 - 1985 - 1986 - 1987 - 1988 - 1989 - 1990 - 1991 - 1992 - 1993 - 1994 - 1995 - 1996 - 1997 - 1998 - 1999 - 2000 - 2001 - 2002 - 2003 - 2004 - 2005 - 2006 - 2007 - 2008 - 2009 - 2010 - 2011 - 2012 - 2013 - 2014 - 2015

MAINTENANCE

Description: N/A

File Type: Comma separated values(.csv)

File Size: Between 170 MB to 260 MB

Number of Data Files: 33

DATA USE CONDITIONS

The Data User is REQUIRED:

(i) to acknowledge data sources listed under Acknowledgement(s)

(ii) cite the publication(s) listed under Recommended Citation(s) as the providers and source of these data when using them in support of research, analysis, operations, policy decision or any other undertaking including publication

(iii) complete and sign the CANUE Data Use and Sharing Agreement (available at http://canue.ca/data/), in which the name and signature of the researcher/analyst who takes responsibility for ensuring all conditions are met.

Data Sharing Restrictions:

These data files are provided solely for the purposes stated in the CANUE Data Sharing and Use Agreement and should not be re-distributed for any reason. These data also contain proprietary postal code data and may only be used for the project named in the CANUE Data Sharing and Use Agreement. Data can be shared only within a project team for the exclusive purposes of teaching, academic research and publishing, and/or planning of educational services in accordance to DMTI End User Agreement associated with the Spatial Mapping Academic Research Tools (SMART) Program.

Include the following references in any publications resulting from the use of these data:

[1] Customized spatial climate data files prepared for the CanadianUrban Environmental Health Research Consortium by the Canadian Forest Service of Natural Resources Canada, October 2017.

[2] CanMap Postal Code Suite v2015.3. [computer file] Markham: DMTI Spatial Inc., 2015.

Include the following acknowledgements:

1. Weather-related indicators were developed bu Dr. Johannes Feddema, Pei-Ling Wang, and Mahdi Shooshtari for CANUE, based on custom data from Natural Resources Canada. These indicators were indexed to DMTI Spatial Inc. postal codes and provided by CANUE (Canadian Urban Environmental Health Research Consortium).

SUPPORT DOCUMENTATION

1 - NRCAN customized data document (http://canue.ca/wp-content/uploads/2017/10/NRCAN-BAMS-Customized-climate-data.pdf)

2 - Wahba, G., 1990: Spline Models for Observational Data. CBMS-NSF Regional Conference Series in Applied Mathematics, Vol. 59, Society for Industrial and Applied Mathematics, 169 pp. ()

3 - Hutchinson, M. F., 1991: The application of thin plate smoothing splines to continent-wide data similation. ()

4 - Data assimilation systems: Papers presented at the Second BMRC Modelling Workshop, J. D. Jasper, Ed., Bureau of Meteorology Research Centre Research Rep. 27, 104–113. ()

5 - Documentation in preparation from PLWang/Mshooshtari. Contact info@canue.ca for more information. ()

6 - Postal Code metadata (https://canue.ca/wp-content/uploads/2019/09/CANUE-Browser-Metadata-PostalCodes.pdf)

VARIABLES

WTHNRCYY_01 - Annual Highest Temperature (celsius)

Annual highest temperature (celsius)

WTHNRCYY_02 - Annual Lowest Temperature (celsius)

Annual lowest temperature (celsius)

WTHNRCYY_03 - Annual Average Temperature (celsius)

Annual average temperature (celsius)

WTHNRCYY_04 - Annual Average of Daily Maximum Temperature (celsius)

Annual average of daily maximum temperature (celsius)

WTHNRCYY_05 - Annual Average of Daily Minimum Temperature (celsius)

Annual average of daily minimum temperature (celsius)

WTHNRCYY_06 - Annual Average of Difference Between Maximum and Minimum Temperatures (celsius)

Annual average of difference between maximum and minimum temperatures (celsius)

WTHNRCYY_07 - Annual Total Precipitation as Rain (mm)

Annual total precipitation as rain (precipitation on all days with minimum temperature $> = 0$) (millimeters)

WTHNRCYY_08 - Annual Number of Rain Events

Annual number of rain events (consecutive days with rain , including single day events)

WTHNRCYY_09 - Annual Number of Days with Rain

Annual number of days with rain (precipitation on all days with minimum temperature $> = 0$)

WTHNRCYY_10 - Annual Average Amount of Rain per Event (mm)

Annual average amount of rain per event (millimeters)

WTHNRCYY_11 - Annual Average Length of Rain Events (days)

Annual average length of rain events (days)

WTHNRCYY_12 - Annual Total Precipitation as Snow (mm)
Annual total precipitation as snow (precipitation on all days with minimum temperature
WTHNRCYY_13 - Annual Number of Snow Events
Annual number of snow events (consecutive days with snow, including single day events)
WTHNRCYY_14 - Annual Number of Days with Snow
Annual number of days with snow (precipitation on all days with minimum temperature
WTHNRCYY_15 - Annual Average Amount of Snow per Event (mm)
Annual average amount of snow per event (millimeters)
WTHNRCYY_16 - Annual Average Length of Snow Events (days)
Annual average length of snow events (days)
WTHNRCYY_17 - Annual Number of Heat Event Starts Based on Maximum Temperature
Annual number of heat event starts based on maximum temperature (where there are three or more consecutive days with maximum daily temperature > 95th percentile of daily normal maximum temperatures; normal distribution based on daily maximum temperatures 1985-2015)
WTHNRCYY_18 - Annual Number of Days in Heat Events Based on Maximum Temperature
Annual number of days in heat events based on maximum temperature (where there are three or more consecutive days with maximum daily temperature > 95th percentile of daily normal maximum temperatures; normal distribution based on daily maximum temperatures 1985-2015)
WTHNRCYY_19 - Annual Average Length of Heat Events Based on Maximum Temperature
Annual average length of heat events based on maximum temperature (where there are three or more consecutive days with maximum daily temperature > 95th percentile of daily normal maximum temperatures; normal distribution based on daily maximum temperatures 1985-2015)
WTHNRCYY_20 - Annual Number of Cool Event Starts Based on Maximum Temperature
Annual number of cool event starts based on maximum temperature (where there are three or more consecutive days with maximum daily temperature
WTHNRCYY_21 - Annual Number of Days in Cool Events Based on Maximum Temperature
Annual number of days in cool events based on maximum temperature (where there are three or more consecutive days with maximum daily temperature
WTHNRCYY_22 - Annual Average Length of Cool Events Based on Maximum Temperature
Annual average length of cool events based on maximum temperature (where there are three or more consecutive days with maximum daily temperature
WTHNRCYY_23 - Annual Number of Heat Event Starts Based on Minimum Temperature
Annual number of heat event starts based on minimum temperature (where there are three or more consecutive days with minimum daily temperature > 95th percentile of daily normal minimum temperatures; normal distribution based on daily minimum temperatures 1985-2015)
WTHNRCYY_24 - Annual Number of Days in Heat Events Based on Minimum Temperature
Annual number of days in heat events based on minimum temperature (where there are three or more consecutive days with minimum daily temperature > 95th percentile of daily normal minimum temperatures; normal distribution based on daily minimum temperatures 1985-2015)
WTHNRCYY_25 - Annual Average Length of Heat Events Based on Minimum Temperature
Annual average length of heat events based on minimum temperature (where there are three or more consecutive days with minimum daily temperature > 95th percentile of daily normal minimum temperatures; normal distribution based on daily minimum temperatures 1985-2015)
WTHNRCYY_26 - Annual Number of Cool Event Starts Based on Minimum Temperature
Annual number of cool event starts based on minimum temperature (where there are three or more consecutive days with minimum daily temperature
WTHNRCYY_27 - Annual Number of Days in Cool Events Based on Minimum Temperature
Annual number of days in cool events based on minimum temperature (where there are three or more consecutive days with minimum daily temperature
WTHNRCYY_28 - Annual Average Length of Cool Events Based on Minimum Temperature

SUPPORT CONTACT

Data Set Support Contact: info@canue.ca

Affiliated Organization:
CANUE (Canadian Urban Environmental Health Research Consortium)
Dalla Lana School of Public Health, University of Toronto

WebSite: https://www.canue.ca

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DATA SOURCE CONTACT

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