



Canadian Urban Environmental Health Research Consortium

CANUE Metadata Monthly Water Balance Model NRCAN
2018_05_22

DATA SET INFORMATION

Data Set Title:	Monthly water balance model metrics
Description:	<p>Each annual file contains 24 metrics developed by the CANUE Weather and Climate Team, and calculated by CANUE staff using base data provided by the Canadian Forest Service of Natural Resources Canada.</p> <p>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.</p> <p>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.</p> <p>The water balance model was developed by Pei-Ling Wang and Dr. Johannes Feddema at the University of Victoria, Geography Department, and implemented by CANUE staff Mahdi Shooshtari.</p>
Theme Keywords:	Temperature, rain, snow, precipitation, surplus, deficit, max, min, events, annual
Place Keywords:	Canada, national
Data preparation date:	2018-09-01
File Names	WBNRC_M_YY_XX.csv (where YY is the last two digits of a specific year and XX indicates the variable number, as listed below).
File Type:	Comma separated values (.csv)
Beginning Date:	1985
End Date:	2015
Sampling Frequency of Data:	Monthly
Number of Data Files:	24 files per year (7844 files in total). Each file is a specific variable for each of 12 months.
File Size	All files for each year total 1.3 to 1.6 GB; all files for all years total ~ 40GB
Data Sources:	See Data Description and Supporting Documentation
Spatial Resolution:	Individual 6-digit postal code locations
Detection Range or Limit:	N/A
Log of Changes:	
Maintenance Description:	New annual files will be added as they become available.
GEOSPATIAL REFERENCE	
Geographic Coverage	Canada
West Bounding Coordinate	N/A
East Bounding Coordinate	N/A
North Bounding Coordinate	N/A
South Bounding Coordinate	N/A
Geometry Type:	N/A
Point Data Source:	N/A
Coordinates have Z values:	N/A
Geographic Coordinate System:	N/A
Datum	N/A
Unit:	N/A



Canadian Urban Environmental Health Research Consortium

CANUE Metadata Monthlyl Water Balance Model NRCAN
2018_05_22

QUALITY ASSESSMENT

QA/QC procedures:	CANUE did not assess the quality of the base data. Users should review the documentation provided in the recommended citation, and in the supporting documentation listed below.
Geographic Coordinate Positional Accuracy:	These metrics can be linked to the corresponding annual postal codes files for mapping and analysis purposes, using the 6-digit postal code as a unique identifier in both files. Refer to the following metadata file for additional information on opportunities for assessing the spatial representativeness of postal code locations when these metrics are linked: CANUE Metadata Postal Codes.pdf
Vertical Positional Accuracy:	N/A
Attribute Accuracy:	N/A
Data Validity :	NoData = -9999 for numeric fields
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.

SUPPORTING DOCUMENTATION

Additional documentation:	NRCAN BAMS Customized climate data.pdf
	<p>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.</p> <p>Hutchinson, M. F., 1991: The application of thin plate smoothing splines to continent-wide data simulation.</p> <p>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.</p>
	In preparation: Water balance model description document. Please contact CANUE (info@canue.ca) for additional information.

DATA DICTIONARY

Field Name:	Description	Data Type
POSTALCODEYY	6 digital postal code with no space between the FSA and LDU. (i.e. L1R2H2)	Text
WB_MMMYY_01	Average monthly temperature	Numeric
WB_MMMYY_02	Average daily maximum temperature of the month (celsius)	Numeric
WB_MMMYY_03	Highest daily maximum temperature of the month (celsius)	Numeric
WB_MMMYY_04	Lowest daily maximum temperature of the month (celsius)	Numeric
WB_MMMYY_05	Average daily minimum temperature of the month (celsius)	Numeric
WB_MMMYY_06	Highest daily minimum temperature of the month (celsius)	Numeric
WB_MMMYY_07	Lowest daily minimum temperature of the month (celsius)	Numeric
WB_MMMYY_08	Monthly total precipitation (rain + snow) (mm)	Numeric
WB_MMMYY_09	Monthly total rainfall(mm)	Numeric
WB_MMMYY_10	Total monthly snowfall (mm)	Numeric
WB_MMMYY_11	Number of days in the month with precipitation >0	Numeric
WB_MMMYY_12	Number of days with snowfall	Numeric
WB_MMMYY_13	Number of days with snow on the ground	Numeric
WB_MMMYY_14	Average snow pack thickness of the month (mm)	Numeric
WB_MMMYY_15	Monthly total snow melt (mm)	Numeric
WB_MMMYY_16	Monthly total potential evapotranspiration (mm) or water demand	Numeric
WB_MMMYY_17	Monthly total actual evapotranspiration (mm)	Numeric
WB_MMMYY_18	Monthly total surplus (mm). Amount of excess water in the soil--from surface runoff, through flow, or groundwater recharge	Numeric
WB_MMMYY_19	Number of days surplus occurs	Numeric
WB_MMMYY_20	Monthly total deficit (mm)	Numeric
WB_MMMYY_21	Number of days deficit occurs	Numeric
WB_MMMYY_22	Monthly average soil moisture (%)	Numeric
WB_MMMYY_23	Minimum monthly soil moisture (%)	Numeric
WB_MMMYY_24	Relative index of wetness/dryness. Ranges from -1 (absence of precipitation) to 1 (absence of evapotranspiration); 0 means precipitation equals evapotranspiration	Numeric



Canadian Urban Environmental Health Research Consortium

CANUE Metadata Monthlyl Water Balance Model NRCAN
2018_05_22

DATA SET CONTACTS

Data Support:	Contact CANUE via the email below.
Email:	info@canue.ca
Affiliated Organization:	CANUE (Canadian Urban Environmental Health Research Consortium)
	Dalla Lana School of Public Health, University of Toronto
Website:	www.canue.ca
City:	Toronto
Prov/State:	Ontario
Country:	Canada
Exposure Data Source Contact:	Dr. Dan McKenney
Email:	dan.mckenney@canada.ca
Phone:	705-541-5569
First Name:	Dan
Last Name:	McKenney
Affiliated Organization:	Canadian Forest Service, Natural Resources Canada
City:	Sault Ste. Marie
Prov/State:	Ontario
Country:	Canada

DATA USE CONDITIONS

Conditions of Use:	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; and (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 Use and Sharing 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 Use and Sharing Agreement. Data can be shared 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.
Required Citation:	Include the following references in any publications resulting from the use of these data: [1] Wang PL, Feddema J, Shoostari M. 2018. Water balance model for CANUE. Please contact CANUE (info@canue.ca) for additional information. [2] CanMap Postal Code Suite v2015.3. [computer file] Markham: DMTI Spatial Inc., 2015.
Acknowledgment:	Include the following acknowledgements: Weather-related indicators, based on custom data from Natural Resources Canada, were indexed to DMTI Spatial Inc. postal codes and provided by CANUE (Canadian Urban Environmental Health Research Consortium).