



Canadian Urban Environmental Health Research Consortium

CANUE Metadata Local Climate Zones

Browser August 2019

DATA SET INFORMATION

Data Set Title:	Local Climate Zones
Description:	<p>Local climate zones have been developed in the climatology field to characterize the landscape surrounding climate monitoring stations, toward adjusting for local landscape influences on measured temperature trends. For example, a station surrounded by tall buildings may be influenced by the urban heat island effect compared to a station in an agricultural area.</p> <p>The local climate zone classification system was developed by Iain Stewart and Tim Oke at the University of British Columbia. The classification scheme has been adopted by the World Urban Database Access and Tools Portal (WUDAPT) project, which aims to produce local climate zone maps for the entire world at a scale of ~ 100m.</p> <p>Local climate zones take building and vegetation type and height into account, and therefore serve as indicators of urban form, from dense urban (high building with little vegetation) to industrial/commercial (large lowrise buildings with paved areas) and natural (dense trees, low plants, water). How local climate zones are related to human health is a new area of research.</p> <p>CANUE staff and students worked in collaboration with WUDAPT researchers to map local climate zones for Canada, using scripts developed in Google Earth Engine and applied to LandSat imagery for key time periods. Each postal code has been assigned to one of 14 local climate zone classes. In addition, seven groups have been created by aggregating similar local climate zones, and the percentage of group in the neighbourhood (1km²) around each postal code has been calculated.</p>
Theme Keywords:	climate, land use, residential, urban, natural, water, neighbourhood
Place Keywords:	Canada national
Data preparation date:	2018-10-01
File Names	lcz_a_YY.csv; where YY is the last two digits of a specific year
File Type:	Comma separated values (.csv)
Beginning Date:	1986
End Date:	2016
Sampling Frequency of Data:	Census Years (1986, 1991, 1996, 2001, 2006, 2011, 2016)
Number of Data Files:	7 files
File Size	Individual year files range from 48 MB to 68 MB in size, all 7 files are 405 MB in size.
Data Sources:	LandSat8 and LandSat5 via Google Earth Engine, DMTI Spatial Inc. postal codes.
Spatial Resolution:	1000 meters, around each postal code location.
Detection Range or Limit:	NA
Log of Changes:	
Maintenance Description:	Indices for subsequent census years will be added when available.



Canadian Urban Environmental Health Research Consortium

CANUE Metadata Local Climate Zones

Browser August 2019

GEOSPATIAL REFERENCE	
Geographic Coverage	Canada
West Bounding Coordinate	-140.875303 dd
East Bounding Coordinate	-52.654112 dd
North Bounding Coordinate	76.410808 dd
South Bounding Coordinate	41.735230 dd
Geometry Type:	Point
Coordinates have Z values:	No
Geographic Coordinate System:	GCS_WGS_1984
Datum	D_WGS_1984
Unit:	Decimal degrees
QUALITY ASSESSMENT	
QA/QC procedures:	CANUE did not assess the quality of the input Landsat 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 :	N/A
Associated Files:	N/A
Data Comment:	
SUPPORTING DOCUMENTATION	
Additional documentation:	In preparation - Local Climate Zone supplementary methods document. Please contact CANUE (info@canue.ca) for more information.
	Stewart and Oke 2012 Local Climate Zones



Canadian Urban Environmental Health Research Consortium

CANUE Metadata Local Climate Zones

Browser August 2019

DATA DICTIONARY

Field Name (YY = last two digits of specific year of data)	Description	Data Type
postalcodeYY	6-digital postal code with no space between the FSA and LDU. (i.e. L1R2H2)	Text
province	Province code (AB, BC, MB, NB, NL, NS, NT, NU, ON, PE, QC, SK, YT)	Text
latitude	Latitude in decimal degrees	Numeric
longitude	Longitude in decimal degrees	Numeric
lczYY_01	Local climate zone at postal code point: Bare Rock or Paved Bare Soil or Sand Compact High-Rise Compact Mid-Rise Open High-Rise Open Mid-Rise Open Low-Rise Large Low-Rise Heavy Industry Low Plants Dense Trees Scattered Trees Sparsely Built Unknown Water	Text
lczYY_02	Dense Urban Category: Percent of pixels in a 1km ² neighbourhood identified as Compact High-Rise or Compact Mid-Rise	Numeric
lczYY_03	Open Urban Category: Percent of pixels in a 1km ² neighbourhood identified as Open High-Rise or Open Mid-Rise	Numeric
lczYY_04	Residential Category: Percent of pixels in a 1km ² neighbourhood identified as Open Low-Rise	Numeric
lczYY_05	Industrial-Commercial-Paved Category: Percent of pixels in a 1km ² neighbourhood identified as Large Low-Rise, Heavy Industry, Bare Rock or Paved, or Bare Soil or Sand	Numeric
lczYY_06	Natural Category: Percent of pixels in a 1km ² neighbourhood identified as Sparsely Built, Dense Trees, Scattered Trees, or Low Plants	Numeric
lczYY_07	Water Category: Percent of pixels in a 1km ² neighbourhood identified as Water	Numeric
lczYY_08	Unknown Category: Percent of pixels in a 1km ² neighbourhood identified as Unknown	Numeric



Canadian Urban Environmental Health Research Consortium

CANUE Metadata Local Climate Zones

Browser August 2019

lczYY_09

GROUP: Category with the highest percentage of pixels in a 1km² neighbourhood, regardless of the total percentage (i.e., in a neighbourhood with many different categories present, the highest percentage might be a relatively low number):

Dense Urban

Ind-Com-Pvd

Mixed (when more than one group has the same percentage)

Natural

Open Urban

Residential

Unknown

Water

Text



Canadian Urban Environmental Health Research Consortium

CANUE Metadata Local Climate Zones

Browser August 2019

lczYY_10	<p>CLASS: Categories with the highest percentage of pixels annotated with _S when there are less than 50% of the pixels in a 1km² neighbourhood. For example, Dense Urban indicates this category has the highest percentage of pixels, and the percentage is 50% or more, while Dense Urban_S indicates that this category has the highest percentage of pixels, but the percentage is less than 50% of the total. This helps to identify locations where the neighbourhood is more homogeneous or more mixed.</p>	Text
lczYY_11	<p>INFLUENCE: Category with the second highest percentage of pixels in a 1km² neighbourhood, as an influence factor: Majority indicates that the category listed as LCZ_YY_CLASS has 75% or more of the pixels and no influence is reported. Mixed indicates more than one category is tied for second highest value.</p> <p>These values can be used in combination with LCZ_YY_CLASS to develop more specific characterizations of the 1km² neighbourhood, depending on the research question. For example, if interested in natural areas, postal codes could be characterised using composites of Class and Influence, i.e., Class = Natural and Influence = Majority (at least 75% in the neighbourhood are natural); Class = Natural and Influence = Water (50 to 74% of the pixels are natural and Water has the next highest percentage), etc.</p>	Text

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:	For questions relating to the Local Climate Zone data in general:
Email:	info@canue.ca
Phone:	
First Name:	Eleanor
Last Name:	Setton
Affiliated Organization:	CANUE - University of Victoria
City:	Victoria
Prov/State:	BC
Country:	Canada



Canadian Urban Environmental Health Research Consortium

CANUE Metadata Local Climate Zones

Browser August 2019

DATA USE CONDITIONS

<p>Conditions of Use:</p>	<p>The Data User is REQUIRED:</p> <ul style="list-style-type: none"> (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.
<p>Data Sharing Restrictions:</p>	<p>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.</p> <p>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.</p>
<p>Required Citation:</p>	<p>Include the following references in any publications resulting from the use of these data:</p> <ul style="list-style-type: none"> [1] Bechtel, B.; Alexander, P.J.; Böhner, J.; Ching, J.; Conrad, O.; Feddema, J.; Mills, G.; See, L.; Stewart, I. Mapping Local Climate Zones for a Worldwide Database of the Form and Function of Cities. ISPRS Int. J. Geo-Inf. 2015, 4, 199-219. [2] METHODS report - CANUE staff in preparation (please contact info@canue.ca for citation information) [3] CanMap Postal Code Suite v2015.3. [computer file] Markham: DMTI Spatial Inc., 2015.
<p>Acknowledgment:</p>	<p>Include the following acknowledgements:</p> <ul style="list-style-type: none"> 1. Local Climate Zone metrics, indexed to DMTI Spatial Inc. postal codes , were provided by CANUE (Canadian Urban Environmental Health Research Consortium);