



# Canadian Urban Environmental Health Research Consortium

CANUE Metadata Local Climate Zones

2018-11-01

## DATA SET INFORMATION

Data Set Title:	<b>Local Climate Zones</b>
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 low-rise 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 (1km<sup>2</sup>) around each postal code has been calculated.</p> <p>For more information, see the Local Climate Zones Supplementary Methods document in the Supporting Documentation section below.</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, 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:	See Data Description and Supporting Documentation
Spatial Resolution:	100 meters
Detection Range or Limit:	NA
Log of Changes:	
Maintenance Description:	Indices for subsequent census years will be added when available.



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### 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

### QUALITY ASSESSMENT

QA/QC procedures:	CANUE did not assess the quality of the input Landsat 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:  <a href="#">CANUE Metadata Postal Codes.pdf</a>
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.  <a href="#">Stewart and Oke 2012 Local Climate Zones</a>
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### 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
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 <sup>2</sup> neighbourhood identified as Compact High-Rise or Compact Mid-Rise	Numeric
LCZYY_03	Open Urban Category: Percent of pixels in a 1km <sup>2</sup> neighbourhood identified as Open High-Rise or Open Mid-Rise	Numeric
LCZYY_04	Residential Category: Percent of pixels in a 1km <sup>2</sup> neighbourhood identified as Open Low-Rise	Numeric
LCZYY_05	Industrial-Commercial-Paved Category: Percent of pixels in a 1km <sup>2</sup> 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 <sup>2</sup> neighbourhood identified as Sparsely Built, Dense Trees, Scattered Trees, or Low Plants	Numeric
LCZYY_07	Water Category: Percent of pixels in a 1km <sup>2</sup> neighbourhood identified as Water	Numeric
LCZYY_08	Unknown Category: Percent of pixels in a 1km <sup>2</sup> neighbourhood identified as Unknown	Numeric
LCZYY_09	GROUP: Category with the highest percentage of pixels in a 1km <sup>2</sup> 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



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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% fo 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:	<a href="mailto:info@canue.ca">info@canue.ca</a>
Affiliated Organization:	CANUE (Canadian Urban Environmental Health Research Consortium)
	Dalla Lana School of Public Health, University of Toronto
Website:	<a href="http://www.canue.ca">www.canue.ca</a>
City:	Toronto
Prov/State:	Ontario
Country:	Canada
Exposure Data Source Contact:	For questions relating to the Local Climate Zone data in general:
Email:	<a href="mailto:info@canue.ca">info@canue.ca</a>
Phone:	
First Name:	Eleanor
Last Name:	Setton
Affiliated Organization:	CANUE - University of Victoria
City:	Victoria
Prov/State:	BC
Country:	Canada



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### DATA USE CONDITIONS

<p>Conditions of Use:</p>	<p>The Data User is REQUIRED:</p> <ul style="list-style-type: none"> <li>(i) to acknowledge data sources listed under Acknowledgement(s);</li> <li>(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</li> <li>(iii) complete and sign the CANUE Data Use and Sharing Agreement (available at <a href="http://canue.ca/data/">http://canue.ca/data/</a>), in which the name and signature of the researcher/analyst who takes responsibility for ensuring all conditions are met.</li> </ul>
<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> <p>[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.</p> <p><b>[2] METHODS report - CANUE staff in preparation (please contact <a href="mailto:info@canue.ca">info@canue.ca</a> for citation information)</b></p> <p>[3] CanMap Postal Code Suite v2015.3. [computer file] Markham: DMTI Spatial Inc., 2015.</p>
<p>Acknowledgment:</p>	<p>Include the following acknowledgements:</p> <p>1. Local Climate Zone metrics, indexed to DMTI Spatial Inc. postal codes , were provided by CANUE (Canadian Urban Environmental Health Research Consortium);</p>