



Canadian Urban Environmental Health Research Consortium

CANUE Metadata NDVI AVHRR V1.0
2017-10-23

DATA SET INFORMATION

Data Set Title:	Normalized Difference Vegetation Index (NDVI) AVHRR Time Series
Description:	<p>The National Oceanic and Atmospheric Administration (NOAA) AVHRR series satellites were used to generate 1 km, NDVI composites based on surface reflectance data, annually producing 36 composites every 10-days for all of Canada from 1985 to 2013 (Latifovic et al., 2005).</p> <p>Resulting cloud free NDVI composites were used to derive NDVI metrics both annually and for the growing season (defined as May 1st through August 31st) for all 6-digit DMTI Spatial single link postal code locations in Canada.</p>
Theme Keywords:	Greenness, AVHRR, NDVI, satellite monitoring, normalized difference vegetation index, annual,
Place Keywords:	Canada national
Data preparation date:	10/16/2017
File Names	GRAVH_A_YY.csv, where YY is the last two digits of a specific year
File Type:	Comma separated values (.csv)
Beginning Date:	1985
End Date:	2013
Sampling Frequency of Data:	Annual
Number of Data Files:	29 files
File Size	Individual year files range from 13 MB to 19 MB in size, all files total 480 MB in size.
Data Sources:	AVHRR satellite product downloaded from NEODF (https://neodf.nrcan.gc.ca/neodf_cat3/index.php?lang=en)
Spatial Resolution:	1 kilometer
Detection Range or Limit:	-1 to +1
Log of Changes:	N/A
Maintenance Description:	Indices for subsequent years will be added when 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



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QUALITY ASSESSMENT	
QA/QC procedures:	CANUE did not assess the quality of the AVHRR 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 V1.0.pdf
Vertical Positional Accuracy:	N/A
Attribute Accuracy:	N/A
Data Validity :	NoData or Null values = -9999
Associated Files:	N/A
Data Comment:	Maximum NDVI values of +1 may indicate residual cloud contamination or other image anomalies. Interannual anomalies in NDVI values may be reduced through the use of temporal averaging.

SUPPORTING DOCUMENTATION	
Additional documentation:	<p>Additional citations on AVHRR processing are available from the reference list below:</p> <p>[1] Cihlar, J., Latifovic, R., Chen J., Trishchenko, A., Du, Y., Fedosejevs, G., & Guindon, B. 2004. Systematic corrections of AVHRR image composites for temporal studies. Remote Sensing of Environment 89:217-233.</p> <p>[2] Khlopenkov K. and Trishchenko A. 2006. SPARC: New Cloud, Snow, and Cloud Shadow Detection Scheme for historical 1-km AVHRR data over Canada. Journal of Atmospheric and Oceanic Technology, vol. 24.</p> <p>[3] Latifovic, R., Cihlar, J., & Chen, J. 2003. A comparison of BRDF models for the normalization of satellite optical data to a standard sun-target-sensor geometry. IEEE Transactions on Geoscience and Remote Sensing 41:1889-1898.</p> <p>[4] Latifovic, R., Trishchenko, A., Chen, J., Park, W., Khlopenkov, K., Fernandes, R., Pouliot, D., Ungureanu, C., Luo, Y., Wang, S., Davidson, A., & Cihlar, J. 2005. Generating historical AVHRR 1-km baseline satellite data records over Canada suitable for climate change studies. Canadian Journal of Remote Sensing, vol. 31:324-346.</p> <p>[5] Latifovic, R., Pouliot, D., & Dillabaugh, C. 2012. Identification and correction of systematic error in NOAA AVHRR long-term satellite data record, Remote Sensing of Environment, 127:84-97.</p> <p>[6] Teillet, P., & Holben, B. 1994. Towards operational radiometric calibration of NOAA AVHRR imagery</p>

DATA DICTIONARY		
Field Name (YY = last two digits of specific year of data)	Description	Data Type
GRAVHYY_PC	6-digital postal code with no space between the FSA and LDU. (i.e. L1R2H2)	Text
GRAVHYY_AMX	Annual maximum NDVI (range -1 to +1)	Numeric
GRAVHYY_AAV	Annual average NDVI (range -1 to +1)	Numeric
GRAVHYY_GSA	Growing season average NDVI (range -1 to +1)	Numeric



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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 AVHRR data in general:
Email:	LTSDR@nrcan.gc.ca
Phone:	N/A
First Name:	N/A
Last Name:	N/A
Affiliated Organization:	Natural Resources Canada, Earth Sciences Sector, Canada Centre for Mapping and Earth Observation, Canada Centre for Remote Sensing
City:	Ottawa
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, 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, with those members who have access to a Research Data Centre (RDC) or are affiliated with an academic institution 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.



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Required Citation:

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

[1] Latifovic, R., Trishchenko, A., Chen, J., Park, W., Khlopenkov, K., Fernandes, R., Pouliot, D., Ungureanu, C., Luo, Y., Wang, S., Davidson, A., and Cihlar, J. 2005. Generating historical AVHRR 1-km baseline satellite data records over Canada suitable for climate change studies. *Canadian Journal of Remote Sensing*, vol. 31:324-34.

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

Acknowledgment:

Include the following acknowledgements:

1. NDVI metrics, indexed to DMTI Spatial Inc. postal codes , were provided by CANUE (Canadian Urban Environmental Health Research Consortium);

2. AVHRR data were provided by the Canada Center for Mapping and Earth Observation, Natural Resources Canada.