The Canadian Urban Environmental Health Research Consortium

Canue Metadata - Greenness Landsat - Annual

2021-02-02

DATA SET INFORMATION

Dataset Code: GRLAN_AMN_YY

Description:

Top of Atmosphere (TOA) reflectance data in bands from the USGS Landsat 5 and Landsat 8 satellites were accessed via Google Earth Engine. CANUE staff used Google Earth Engine functions to create cloud free annual growing season composites, and mask water features, then export the resulting band data. NDVI indices for each time period were then calculated as (band 4 - Band 3)/(Band 4 Band 3) for Landsat 5 data, and as (band 5 - band 4)/(band 5 Band 4) for Landsat 8 data. Annual maximum NDVI calculated by Google from Landsat 5 and Landsat 8 were also accessed via Google Earth Engine. These composites are created from all the scenes in each annual period beginning from the first day of the year and continuing to the last day of the year. All the images from each year are included in the composite, with the greenest pixel as the composite value, where the greenest pixel is the maximum value of the Normalized Difference Vegetation Index (NDVI). No data were available for 2012, due to decommissioning of Landsat 5 in 2011 prior to the start of Landsat 8 in 2013. No cross-calibration between the sensors was performed, please be aware there may be small bias differences between NDVI values calculated using Landsat 5 and Landsat 8. Final NDVI metrics both annually and for the growing season (defined as May 1st through August 31st) were linked to all 6-digit DMTI Spatial single link postal code locations in Canada, and for surrounding areas within 100m, 250m, 500m, and 1km.

Keywords: greenness|landsat|ndvi|satellite monitoring|normalized difference vegetation index|annual

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 Landsat data. Users should review the documentation provided in the recommended citation, and in the supporting documentation listed.

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.

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:

Maximum NDVI values of 1 may indicate residual cloud contamination or other image annomalies. Interannual annomolies in NDVI values may be reduced through the use of temporal averaging.

DATA SOURCE

Data Source
LandSat 5 and 8, accessed via Google Earth Engine, July 2017; DMTI Spatial Inc (postal codes). See supporting documentation.

Spatial Resolution: 30 metres

Data Preparation Date: 2017-08-01

Beginning Date: 1984

End Date: 2019

Sampling Frequency of Data: Annual (except 2012)

Years Available:
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 - 2013 - 2014 - 2015 - 2016 - 2017 - 2018 - 2019

MAINTENANCE

Description: N/A

File Type: Comma separated values(.csv)

File Size: Individual year files range from 47 MB to 70 MB in size

Number of Data Files: 35

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] Gorelick, N., Hancher, M., Dixon, M., Ilyushchenko, S., Thau, D., Moore, R. (2017). Google Earth Engine: Planetary-scale geospatial analysis for everyone. Remote Sensing of Environment.
[2] USGS Landsat 5 TM TOA Reflectance (Orthorectified), 1984 to 2011, accessed July 2017 from https://explorer.earthengine.google.com/detail/LANDSAT/LT5_L1T_TOA.
[3] USGS Landsat 8 TOA Reflectance (Orthorectified), 2013 to 2017, accessed July 2017 from https://explorer.earthengine.google.com/detail/LANDSAT/LC8_L1T_TOA.
[4] Landsat 5 TM Annual Greenest-Pixel TOA Reflectance Composite, 1984 to 2012, accessed July 2017 from https://explorer.earthengine.google.com/detail/LANDSAT/LT5_L1T_ANNUAL_GREENEST_TOA.
[5] Landsat 8 Annual Greenest-Pixel TOA Reflectance Composite, 2013 to 2015, accessed July 2017 from https://explorer.earthengine.google.com/detail/LANDSAT/LC8_L1T_ANNUAL_GREENEST_TOA.
[6] CanMap Postal Code Suite v2015.3. [computer file] Markham: DMTI Spatial Inc., 2015.

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

SUPPORT DOCUMENTATION

1 - Landsat 5 (https://landsat.usgs.gov/landsat-5)
2 - LANDSAT 8 (L8) Data Users Handbook Version 2.0 March 29, Department of the Interior, U.S. Geological Survey. (https://landsat.usgs.gov/landsat-8-l8-data-users-handbook)
3 - Robinson, N.P.; Allred, B.W.; Jones, M.O.; Moreno, A.; Kimball, J.S.; Naugle, D.E.; Erickson, T.A.; Richardson, A.D. A Dynamic Landsat Derived Normalized Difference Vegetation Index (NDVI) Product for the Conterminous United States. Remote Sensing. 2017, 9, 863. ()
4 - Gyanesh Chander, Brian L. Markham, Dennis L. Helder. Summary of current radiometric calibration coefficients for Landsat MSS, TM, ETM , and EO-1 ALI sensors, Remote Sensing of Environment, Volume 113, Issue 5, 2009, Pages 893-903. ()
5 - Google Earth Engine - Landsat 5 (https://explorer.earthengine.google.com/#detail/LANDSAT/LT5_L1T_TOA)
6 - Google Earth Engine - Landsat 8 (https://explorer.earthengine.google.com/#detail/LANDSAT/LC8_L1T_TOA)
7 - Google Earth Engine - Annual Greenest Landsat 5 (https://explorer.earthengine.google.com/#detail/LANDSAT/LT5_L1T_ANNUAL_GREENEST_TOA)
8 - Google Earth Engine - Annual Greeenest Landsat 8 (https://explorer.earthengine.google.com/#search/LANDSAT/LC8_L1T_ANNUAL_GREENEST_TOA)
9 - Postal Code metadata (https://canue.ca/wp-content/uploads/2019/09/CANUE-Browser-Metadata-PostalCodes.pdf)

VARIABLES

GRLANYY_01 - Annual Mean Value at Postal Code

Annual mean NDVI at postal code (range -1 to 1)

GRLANYY_02 - Annual Mean of Means 100m

Mean of annual mean NDVI within 100 m (range -1 to 1)

GRLANYY_03 - Annual Mean of Means 250m

Mean of annual mean NDVI within 250 m (range -1 to 1)

GRLANYY_04 - Annual Mean of Means 500m

Mean of annual mean NDVI within 500 m (range -1 to 1)

GRLANYY_05 - Annual Mean of Means 1000m

Mean of annual mean NDVI within 1000 m (range -1 to 1)

GRLANYY_06 - Annual Max of Means 100m

Maximum of annual mean NDVI within 100 m (range -1 to 1)

GRLANYY_07 - Annual Max of Means 250m

Maximum of annual mean NDVI within 250 m (range -1 to 1)

GRLANYY_08 - Annual Max of Means 500m

Maximum of annual mean NDVI within 500 m (range -1 to 1)

GRLANYY_09 - Annual Max of Means 1000m

Maximum of annual mean NDVI within 1000 m (range -1 to 1)

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

Data Set Support Contact: For questions relating to LandSat data in general

Email: custserv@usgs.gov

Affiliated Organization:
Department of the Interior, U.S. Geological Survey (USGS)

Sioux Falls - South Dakota - USA