Hydro temporal variability - metadata
"HTV.tif"
ABMI Geospatial Centre
December, 2017

Photo credit: ABMI

Contents

1. Overview

1.1 Summary

This Hydro Temporal Variability (HTV) dataset represents a summary of variability in surface water extent in Alberta during the 2014-2017 time period. The layer values demonstrate the percent of time a given pixel was identified as water. It is intended to support monitoring of lake level fluctuations and identify recurring and permanent lakes in Alberta. Full details for this dataset can be seen in the publication DeLancey *et al.* (2018).

1.2 Description

This layer is calculated with Sentinel-1 C-band Synthetic Aperture Radar (SAR) from the Copernicus Program (Copernicus Sentinel data [2014, 2015, 2016, 2017]). The algorithm was developed and implemented in Google Earth Engine (Google Earth Engine Team, 2015). Sentinel-1 data became available in 2014 and therefore this dataset shows surface water fluctuations during 2014-2017 in ice free months (April-October). Sentinel-1 orbital path covers the entirety of Alberta and therefore each 10m pixel in Alberta has a value.

1.3 Credits

This dataset was developed and generated by the ABMI's Geospatial Centre Research Team.

1.4 Citation

This product should be cited as:

DeLancey, E.R., Kariyeva, J., Cranston, J., and Brisco, B. 2018. "Monitoring hydro temporal variability in Alberta, Canada with multi-temporal Sentinel-1 SAR data." *Canadian Journal of Remote Sensing,* Vol. 44(No.1): pp.1-10.

1.5 Contact Information

If you have questions or concerns about the data, please contact:
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1.6 Keywords

Alberta, geospatial, remote sensing, temporal, synthetic aperture radar, surface water, lakes, rivers, hydro-period, variability, wetlands, Sentinel-1.

2. Use Limitations

The HTV dataset is based on freely available open source Sentinel-1 data. This data may freely be used if cited properly. Version 1 of the HTV layer may be limited in data coverage for the 2014-2017 time period and thus some areas of Alberta may not have accurate data, such as Lake Athabasca.

2.1 Open Sourced Data

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3. Data Product Specifications

3.1 Spatial resolution

The algorithm was run on original Sentinel-1 spatial resolution of slightly under 10m (smaller in the north and larger in the south). The final product was resampled to a consistent 10m spatial resolution.

3.2 Processing Environment

Google Earth Engine code editor and Microsoft Windows 7 Version 6.1 (Build 7601) Service Pack 1; Esri ArcGIS 10.3.0.4322.

3.3 Extents

West: -120.90°
East: -108.45°
North: 60.09°
South: 48.89°

3.4 Resource Maintenance

Maintenance will be done annually to include the Sentinel-1 images of the previous year, e.g., the 2017 release represents data from 2014-2016 and the 2018 release will represent data from 2014-2017.

3.5 Spatial Reference

NAD_1983_10TM_AEP_Forest
WKID: 3400 Authority: EPSG
Projection: Transverse Mercator

False Easting: 500000.0
False Northing: 0.0
Central Meridian: -115.0
Scale Factor: 0.9992
Latitude of Origin: 0.0
Linear Unit: Meter (1.0)
Geographic Coordinate System: GCS_North_American_1983
Angular Unit: Degree (0.0174532925199433)
Prime Meridian: Greenwich (0.0)
Datum: D_North_American_1983
Spheroid: GRS_1980
Semimajor Axis: 6378137.0
Semiminor Axis: 6356752.314140356
Inverse Flattening: 298.257222101

4. Lineage

The HTV dataset was built with and processed with open source data and freely available processing environment. This dataset represents the first attempt at monitoring surface water fluctuation over time. The accuracy of the HTV layers will increase as more Sentinel-1 data becomes available.

5. Methods and results

Please see Hydro temporal variability – technical documentation or DeLancey *et al.* (2018) for full details.

6. References

Copernicus Sentinel-1 data [2014, 2015, 2016, 2017], European Space Agency.

DeLancey, E.R., Kariyeva, J., Cranston, J., and Brisco, B. 2018. "Monitoring hydro temporal variability in Alberta, Canada with multi-temporal Sentinel-1 SAR data." *Canadian Journal of Remote Sensing,* Vol. 44(No.1): pp.1-10.

Google Earth Engine Team. 2015. "Google Earth Engine: A planetary-scale geospatial analysis platform." https://eathengine.google.com.