

Boreal Surface water inventory - metadata

“BorealSurfaceWaterInventory.gdb”

ABMI Geospatial Centre

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1. Overview

1.1. Summary

The Boreal Surface water inventory is a polygon based data set describing the location and extent of waterbodies. It also provides attributes of the waterbodies such as name, temporal variability, average depth, and volume. It is created using 10-m resolution Sentinel-1 and -2 imagery.

1.2 Description

This layer was developed from Sentinel-1 and -2 imagery from 2016 and 2017 (Copernicus Sentinel data [2016, 2017]). Variables from these images were used in a boosted regression tree modelling framework (Elith *et al.*, 2008) in R Statistical Software (R Core Team, 2013). ABMI 3x7 photo plots (ABMI, 2016) were used as training data for the model. Results were quality controlled with SPOT6 2016 1.5m resolution RGB images.

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 with reference to the following document:

The Alberta Biodiversity Monitoring Institute Geospatial Centre. 2017. "Boreal Surface water inventory – technical documentation." Edmonton, Alberta, Canada.

1.5 Contact Information

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

Geospatial Centre

Alberta Biodiversity Monitoring Institute

CW 405 Biological Sciences Centre

University of Alberta Edmonton, Alberta, Canada, T6G 2E9

Email: abmipc@ualberta.ca

1.6 Keywords

Alberta, Boreal Natural Region, remote sensing, water, wetlands, lakes, rivers, spatial modelling.

2. Use Limitations

This dataset was based on freely available open source Sentinel-1 and -2 data. This data may be freely used if cited properly.

2.1 Open Sourced Data

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3. Data Product Specifications

3.1 Spatial resolution

The Sentinel-1 and -2 bands used for this product have a resolution of 10m.

3.2 Processing Environment

Google Earth Engine code editor (Google Earth Engine Team, 2015), R 3.3.1 (R Core Team, 2013) and Microsoft Windows 7 Version 6.1 (Build 7601) Service Pack 1; Esri ArcGIS 10.3.0.4322.

3.3 Extents

West: -120.73°

East: -109.08°

North: 60.10°

South: 51.43°

3.4 Resource Maintenance

Maintenance will be implemented as needed if errors are noticed. The boundaries of polygons will remain the same but removal of false water polygons will be done as frequently as necessary. New versions will be completed on an annual basis.

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 Boreal Surface water inventory was built with and processed with open source data and freely available processing environment. This is the first version of this dataset and developed methodology is intended to be improved and enhanced in future versions. Results will be released for other areas of Alberta as they become available.

5. Fields

The Boreal Surface water inventory contain seven fields. The description of these attribute can be seen in Table 1.

Table 1: The fields in the Boreal Surface water inventory and their corresponding information.

Field	Values	Data type	Description
Name	-	text	The name of the waterbody taken from the GoA Base Features Hydrography Polygons (Government of Alberta, 2004 layer).
SPOT2016_QC	“CORRECT” = Polygon was found to be accurate with SPOT 2016 imagery. “INACCURATE” = Polygon correctly identified that there was water but the waterbody boundaries was mapped incorrectly.	text	The accuracy status of the polygon with reference to SPOT 2016 imagery.
AREA_HA	-	float	The area of the polygon in hectares.
HTV	1 - 100	integer	The mean HTV value taken from the hydro temporal variability data set (DeLancey <i>et al.</i> , 2018). HTV describes the percent of time a 10-m pixel is defined as water.
PERMANENT	“YES” = the waterbody was permanent from 2014-2017. “NO” = the waterbody was not permanent through the 2017-2017 period.	text	The permance of the waterbody. HTV values of 61-100 correspond to permanent waterbodies and 10-60 correspond to ephemeral or recurring waterbodies.
Volume	Volume in millions of cubic meters or NULL	float	The volume of lakes over 10ha in millions of cubic meters. Data taken from the WWF HydroLAKES version 1.0 data (Messenger <i>et al.</i> , 2016).
AvgDepth	Average depth in meters or NULL	float	The average depth of lakes over 10ha in meters. Data taken from the WWF HydroLAKES version 1.0 data (Messenger <i>et al.</i> , 2016).

6. Methods and results

Please refer to the Boreal Surface water inventory – technical documentation.

7. References

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