Boreal Surface water inventory - metadata

“BorealSurfaceWaterInventory.gdb”
ABMI Geospatial Centre
December, 2017
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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:

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: abmigc@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>
<thead>
<tr>
<th>Field</th>
<th>Values</th>
<th>Data type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>-</td>
<td>text</td>
<td>The name of the waterbody taken from the GoA Base Features Hydrography Polygons (Government of Alberta, 2004 layer).</td>
</tr>
<tr>
<td>SPOT2016_QC</td>
<td>“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.</td>
<td>text</td>
<td>The accuracy status of the polygon with reference to SPOT 2016 imagery.</td>
</tr>
<tr>
<td>AREA_HA</td>
<td>-</td>
<td>float</td>
<td>The area of the polygon in hectares.</td>
</tr>
<tr>
<td>HTV</td>
<td>1 - 100</td>
<td>integer</td>
<td>The mean HTV value taken from the hydro temporal variability data set (DeLancey et al., 2018). HTV describes the percent of time a 10-m pixel is defined as water.</td>
</tr>
<tr>
<td>PERMANENT</td>
<td>“YES” = the waterbody was permanent from 2014-2017. “NO” = the waterbody was not permanent through the 2017-2017 period.</td>
<td>text</td>
<td>The permance of the waterbody. HTV values of 61-100 correspond to permanent waterbodies and 10-60 correspond to ephemeral or recurring waterbodies.</td>
</tr>
<tr>
<td>Volume</td>
<td>Volume in millions of cubic meters or NULL</td>
<td>float</td>
<td>The volume of lakes over 10ha in millions of cubic meters. Data taken from the WWF HydroLAKES version 1.0 data (Messager et al., 2016).</td>
</tr>
<tr>
<td>AvgDepth</td>
<td>Average depth in meters or NULL</td>
<td>float</td>
<td>The average depth of lakes over 10ha in meters. Data taken from the WWF HydroLAKES version 1.0 data (Messager et al., 2016).</td>
</tr>
</tbody>
</table>
6. Methods and results

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


Copernicus Sentinel-1 and -2 data [2016], European Space Agency.


