

February 11, 2025 | 10:30 am
Virtual Workshop

Finding, Accessing, and Adding GIS Data to Your Project

u.mcmaster.ca/scds-events



Data Analysis
Support Hub

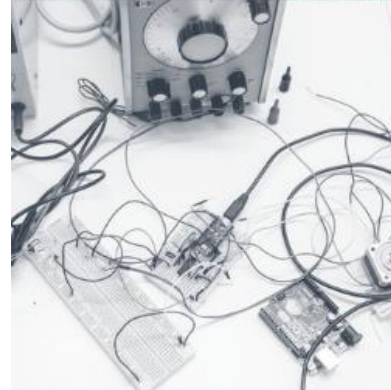
 Sherman
Centre
for Digital Scholarship

Library

McMaster
University 

Finding, Accessing, and Adding GIS Data to Your Project

Christine Homuth, Spatial Information (GIS) Specialist
February 11, 2025





Land Acknowledgement

McMaster University is located on the traditional Territories of the Mississauga and Haudenosaunee Nations, and within the lands protected by the “Dish With One Spoon” wampum agreement.

[CARE Principles for Indigenous Data Governance](#)

[First Nations Principles of OCAP](#)

Code of Conduct

The Sherman Centre and the McMaster University Library are committed to fostering a supportive and inclusive environment for its presenters and participants.

As a participant in this session, you agree to support and help cultivate an experience that is collaborative, respectful, and inclusive, as well as free of harassment, discrimination, and oppression. We reserve the right to remove participants who exhibit harassing, malicious, or persistently disruptive behaviour.

Please refer to our code of conduct webpage for more information: <https://scds.ca/code-of-conduct/>



Certificate Programs

The Sherman Centre for Digital Scholarship Certificate of Attendance

The Sherman Centre's certificate program recognizes attendance at our workshops. It complements degree training, supports the development of critical competencies in data analysis, research data management, and digital scholarship, and formalizes core skills fostered by our workshops.

Participants are invited to attend seven workshops and receive a certificate of attendance. To verify your participation in today's workshop, we will provide a code and additional instructions at the end of the session.

You can learn more about the certificate program at scds.ca/certificate-program

The Canadian Certificate for Digital Humanities

This workshop is also eligible for the Canadian Certificate for Digital Humanities. To learn more about the certificate, visit ccdhhn.ca. You can also contact local liaison Alexis-Carlota Cochrane at scds@mcmaster.ca

scds.ca

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Winter 2025: Upcoming Workshops

Data Analysis Support Hub

February 19: Visualize with R gganimate

March 11: Introduction to creating and sharing maps with ArcGIS Online

Digital Research

March 26: Electronic Lab Notebooks

Research Data Management

February 12: Sensitive Data Management

May 13: Data Management Plan Bootcamp

May 20: Data Deposit Bootcamp

Do More with Digital Scholarship

March 5: Introduction to Critical Digital Humanities

Register for Upcoming Workshops: <https://u.mcmaster.ca/scds-workshops>

Library



Learning Objectives

By the end of this workshop, you should be able to:

- Differentiate between geospatial data models
- Locate datasets using common sources for geospatial data
- Evaluate a dataset for use

Geospatial Data

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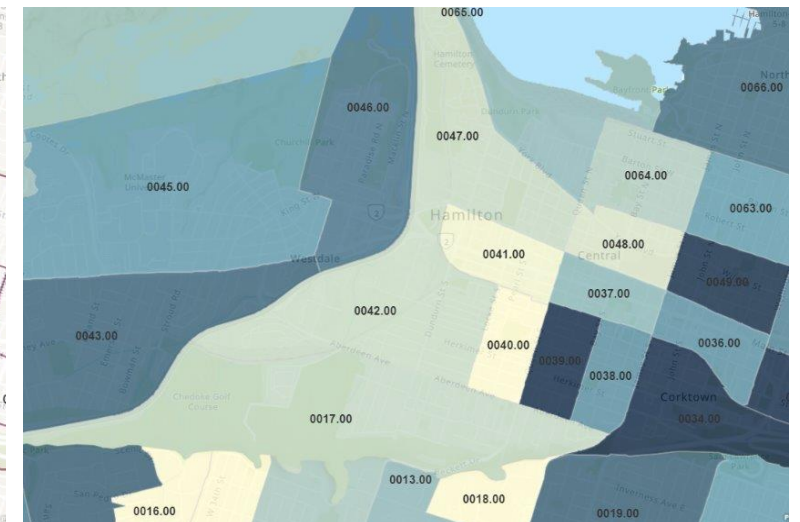
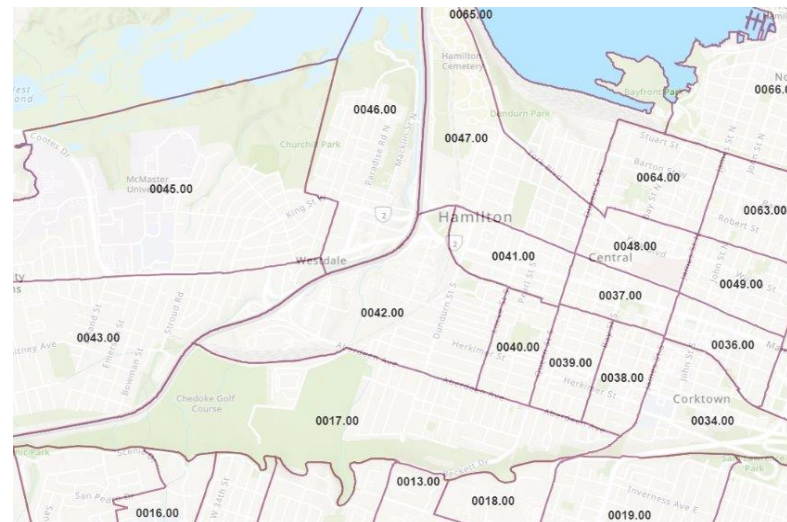
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GIS

- Geographic Information Systems
- “Computer-based tools used to store, visualize, analyze, and interpret geographic data” (CDC)
- “Connects data to a map, integrating location data (where things are) with all types of descriptive information” (Esri)

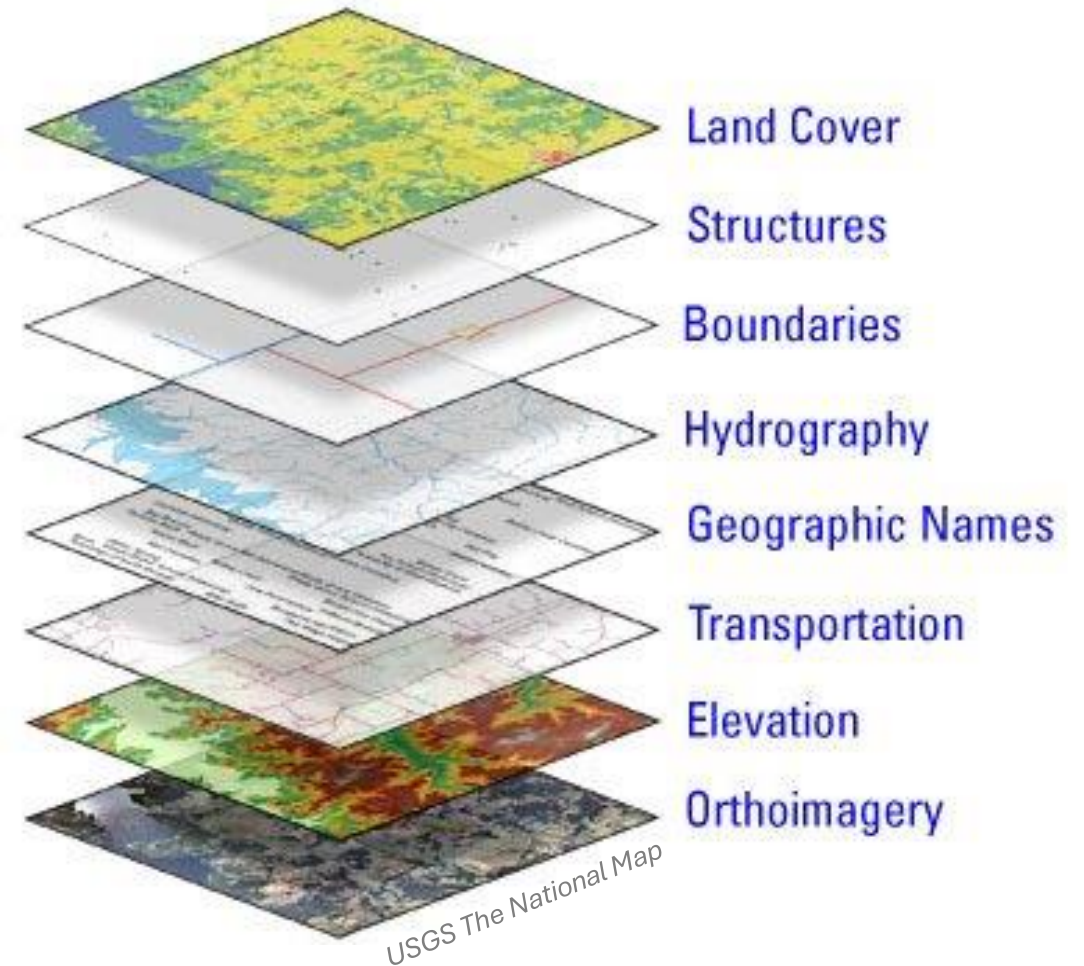
0051.00	409	4,225
0052.00	334	3,881
0053.00	220	3,070
0054.00	211	2,670
0055.00	287	2,989
0056.00	312	3,260
0057.00	276	3,022
0058.00	201	2,545
0059.00	260	3,062
0060.00	195	2,691
0044.00	305	3,917



[COVID19 Case counts by census tract, Open Hamilton](#)

Geospatial Data

- Vector and raster data models used to represent the real world
- Spatial or geographic component
- Multiple datasets are stacked or layered
- Tabular data can also be "joined" to spatial data and displayed on a map
- Not restricted to the outdoors or the Earth's surface

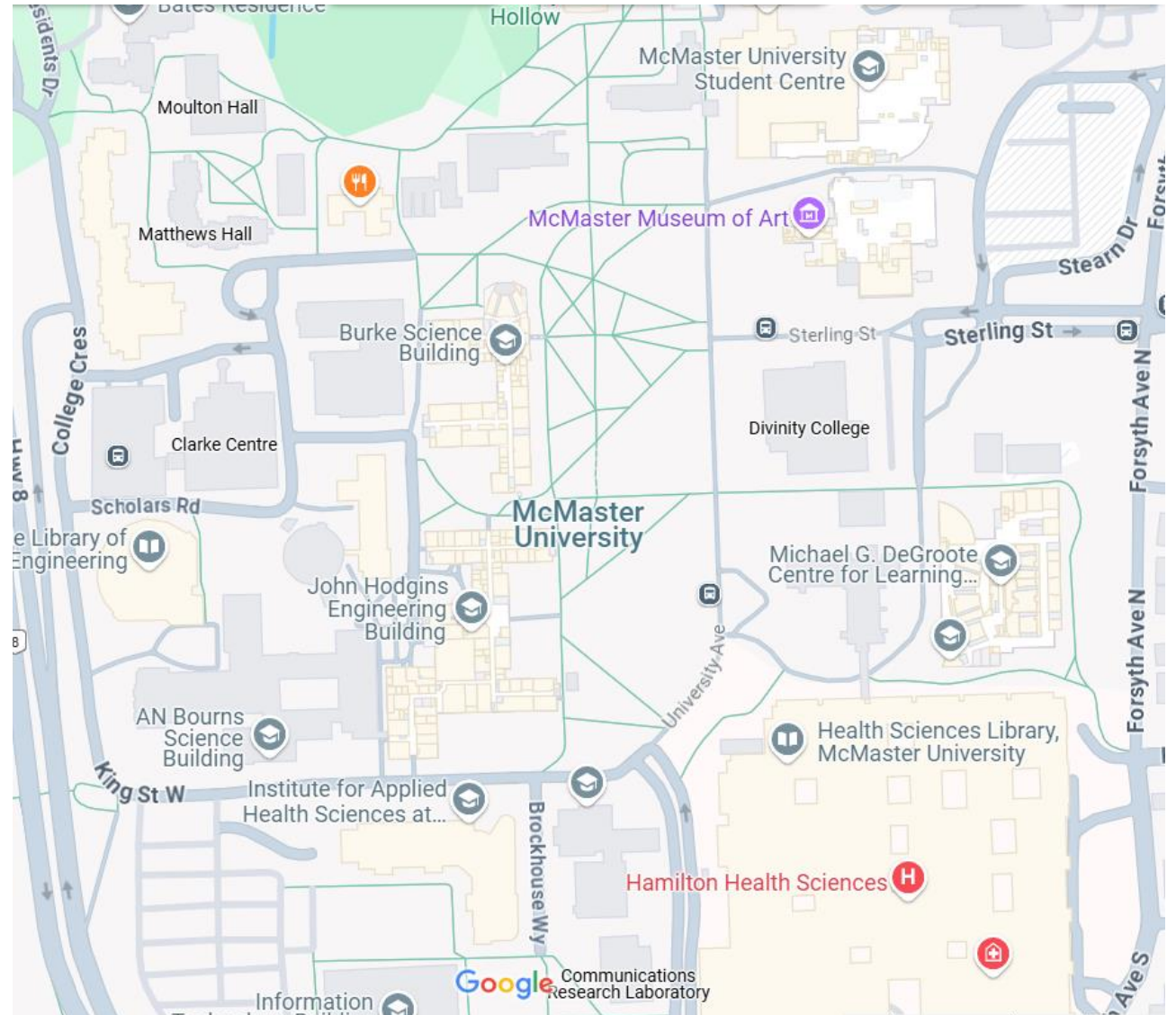


Vector Data

Points, lines, and polygons






- **Points** – x,y locations
- **Lines** – linear features (connected x,y locations)
- **Polygons** – closed figures or areas (multiple connected x,y locations forming a closed figure)
- Good for representing *clearly defined objects*

Example – Google Maps (google.ca/maps) view of McMaster campus.



Vector Data – File Structure

Format – shapefile (.shp)

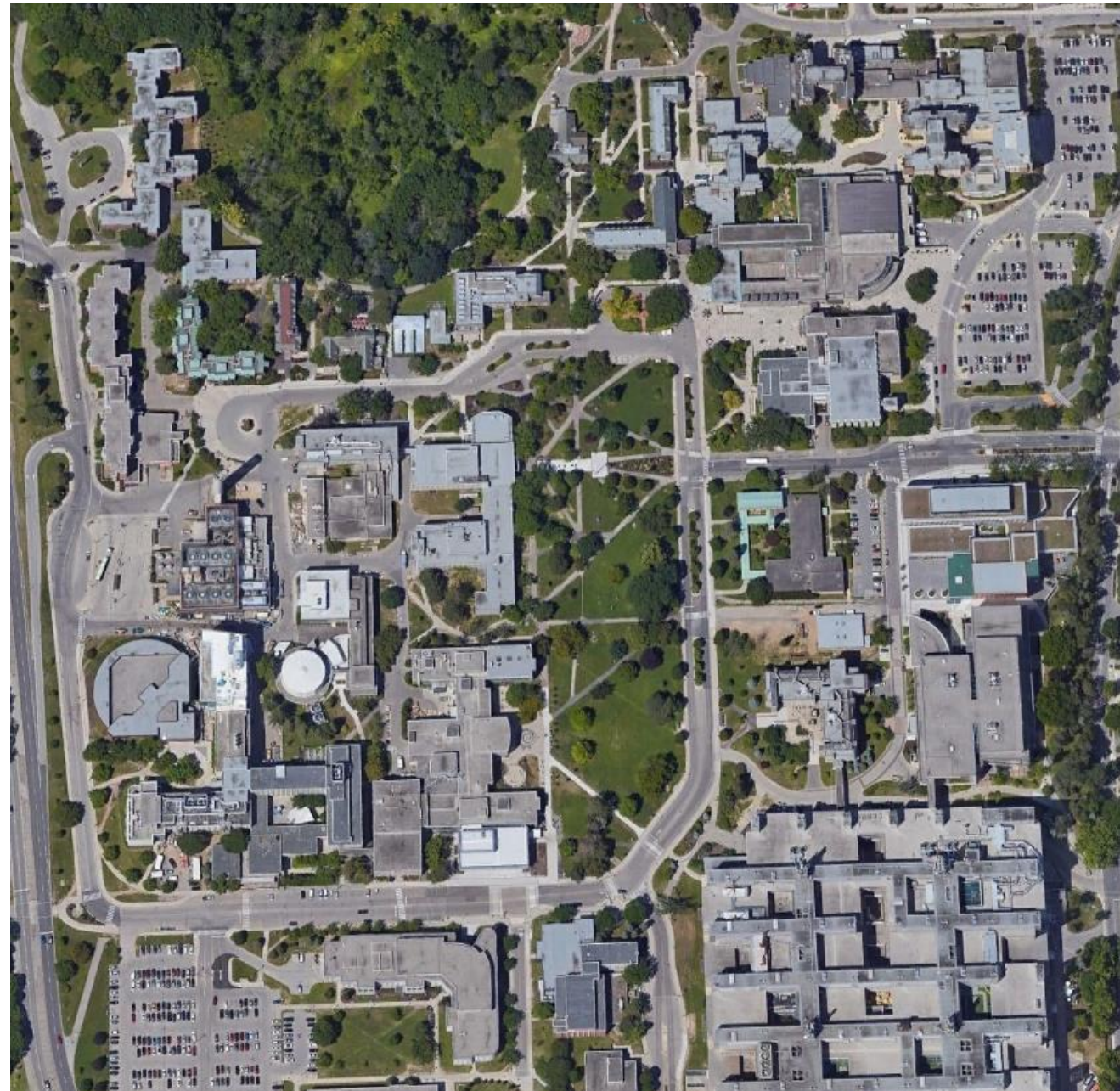
 PED_LANDUSE.shx	5/4/2018 12:14 PM	SHX File	1,218 KB
 PED_LANDUSE.shp	5/4/2018 12:14 PM	SHP File	27,278 KB
 PED_LANDUSE	5/4/2018 12:14 PM	PRJ File	1 KB
 PED_LANDUSE.dbf	5/4/2018 12:14 PM	DBF File	75,651 KB
 Land_Use_Codes_2009	5/4/2018 12:14 PM	Adobe Acrobat D...	33 KB

Raster Data

Grid of cells

- Number assigned to each cell or pixel that represents the data
- **Categorical** – land use, e.g.
- **Continuous** – temperature, e.g.
- Good for representing *continuously changing* attributes

Example – satellite image of McMaster campus (Google Earth)



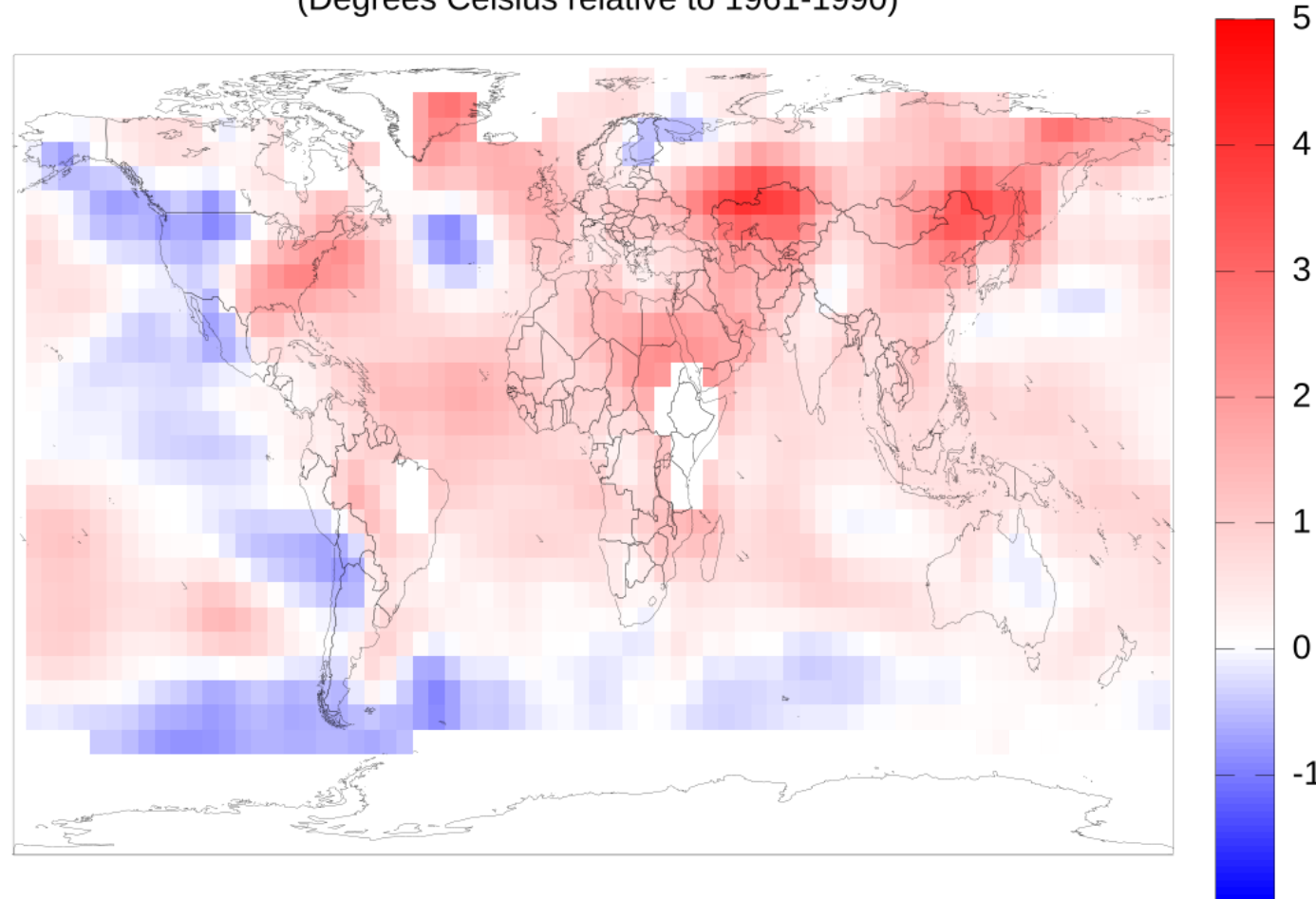
Raster Data

Grid of cells

- Number assigned to each cell or pixel that represents the data
- **Categorical** – land use, e.g.
- **Continuous** – temperature, e.g.
- Good for representing *continuously changing* attributes

Example – map of temperature anomalies (NOAA)

Temperature Anomalies 2010-06
(Degrees Celsius relative to 1961-1990)



Raster Data – File Structure

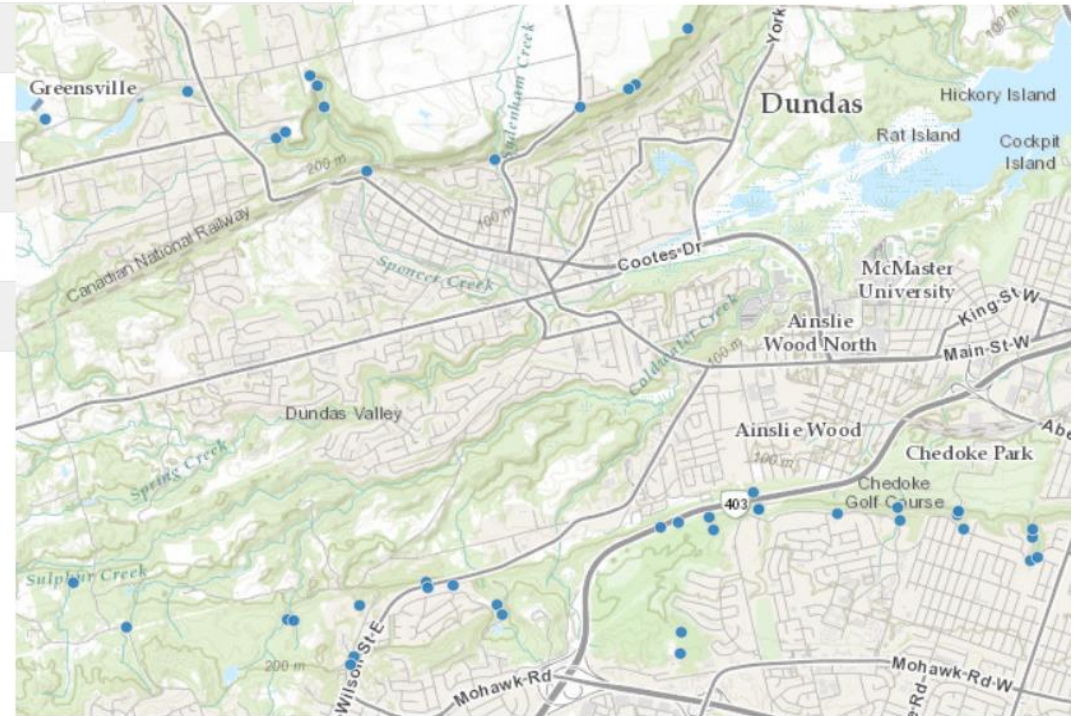
Format – image file formats (e.g. tif, jpg)

PDEM_South	2,017,400 KB
PDEM_South.tif.aux	3 KB
PDEM_South.tif.ovr	552,684 KB

Attributes

NAME	COMMUNITY	TYPE	RANKING	HEIGHT_IN_M	WIDTH_IN_M	OWNERSHIP
Wesley Cascade	Dundas	Cascade	C	4	1	public inaccessible
West Iroquoia Falls	Hamilton	Waterfall	B	19.8	1	public
West Moss Cascade	Flamborough	Cascade	C	3	1	public inaccessible
West of Fifty Upper Cascade	Stoney Creek	Cascade	C	8	1.5	
Westcliffe Falls	Hamilton	Cascade	A	15	2	
Albion Falls	Hamilton	Cascade	A	19	18	
Ancaster Heights Falls	Ancaster	Cascade	B	13.4	1.8	
Auchmar Falls	Hamilton	Waterfall	C	12	1.5	

[City Waterfalls, Open Hamilton](#)



Summary – Data Models

Vector Data

- Points
- Lines
- Polygons
- Clearly defined objects

Raster Data

- Grid of cells
- Each cell / pixel represents a data value
- Categorical or continuous
- Continuously changing data

Data Sources

scds.ca
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Geospatial Data Sources

- Surveys, statistics, data tables
- Fieldwork
- Remote sensing/imagery
- Shapefiles
- Scanned and georeferenced maps
- Digitizing

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- [Scholars GeoPortal](#)
- [McMaster University Libraries](#)
- Contact us!

Online Data Portals

- Open data portals
 - [Open Hamilton](#)
 - [Ontario GeoHub](#)
 - [Open Canada](#)
- ArcGIS Online and Living Atlas
- Online data providers
 - Thematic
 - Imagery
- ...


McMaster University Libraries

<https://library.mcmaster.ca/maps/geospatial>

- Restricted data that can't be made available online
- Links to other data portals and open data
- Example datasets
 - City of Hamilton parcel/land use data, tree inventory, licensed data not available through open data portal
 - Teranet Ontario parcel boundaries
 - Large imagery datasets
- Data Request Form

Geospatial Data

Search geospatial data  Example: Hamilton Airphotos

All Subjects 

All Locations 

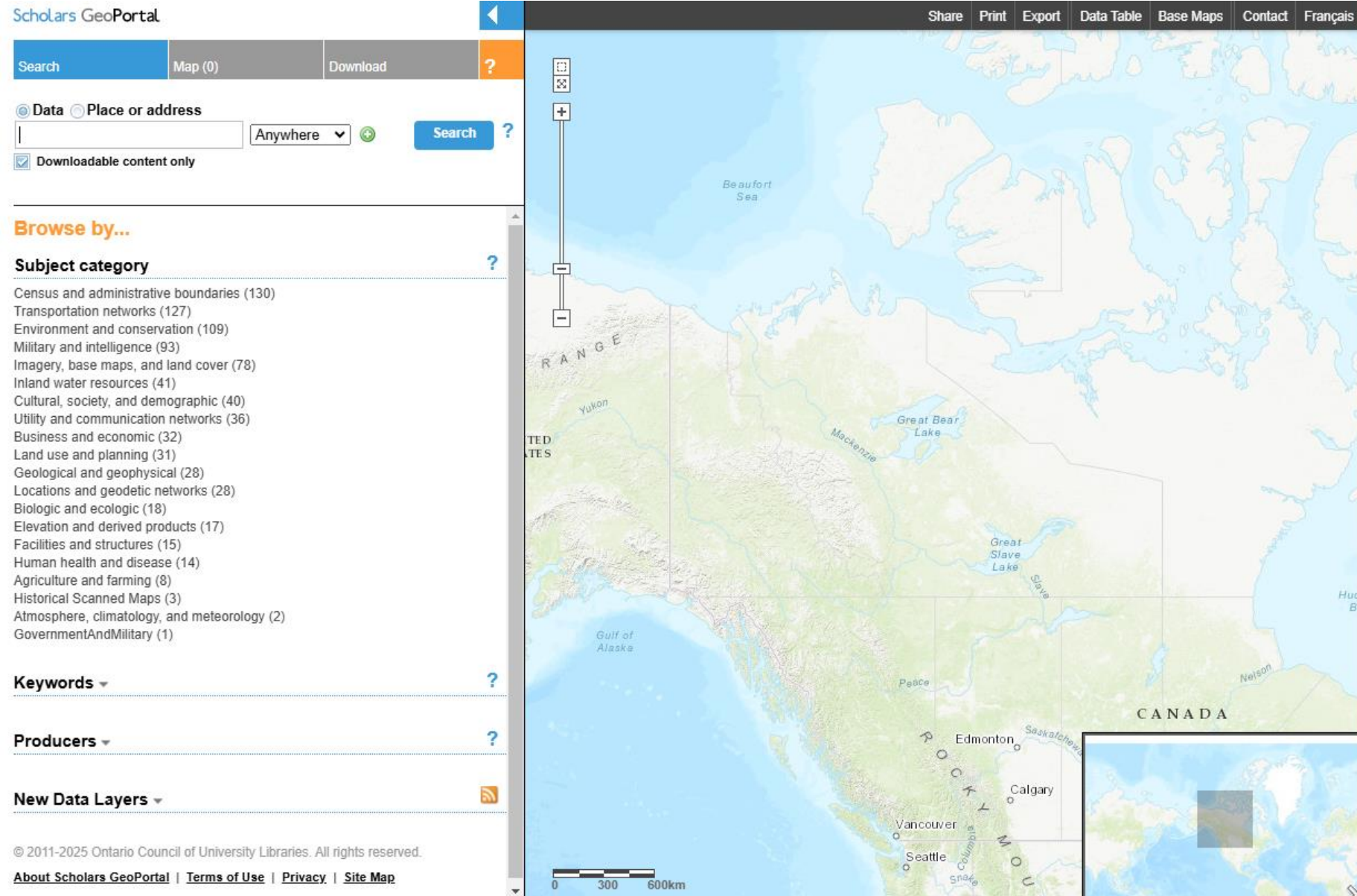
Title ^	Author	Year	Sample
"Make a Topographic Map" Utility	Ontario Ministry of Natural Resources and Forestry	2014	
1934 Air Photos of Niagara Region	Canada Department of Energy, Mines, and Resources	1934 - 2017	

Scholars GeoPortal

geo.scholarsportal.info

- Access to open and restricted* geospatial data for Ontario and Canada
- Search, view, download, share, and export (PDF, JPG, e.g.) capabilities
- Login for off-campus access

* *Restricted* = McMaster community for teaching and research purposes

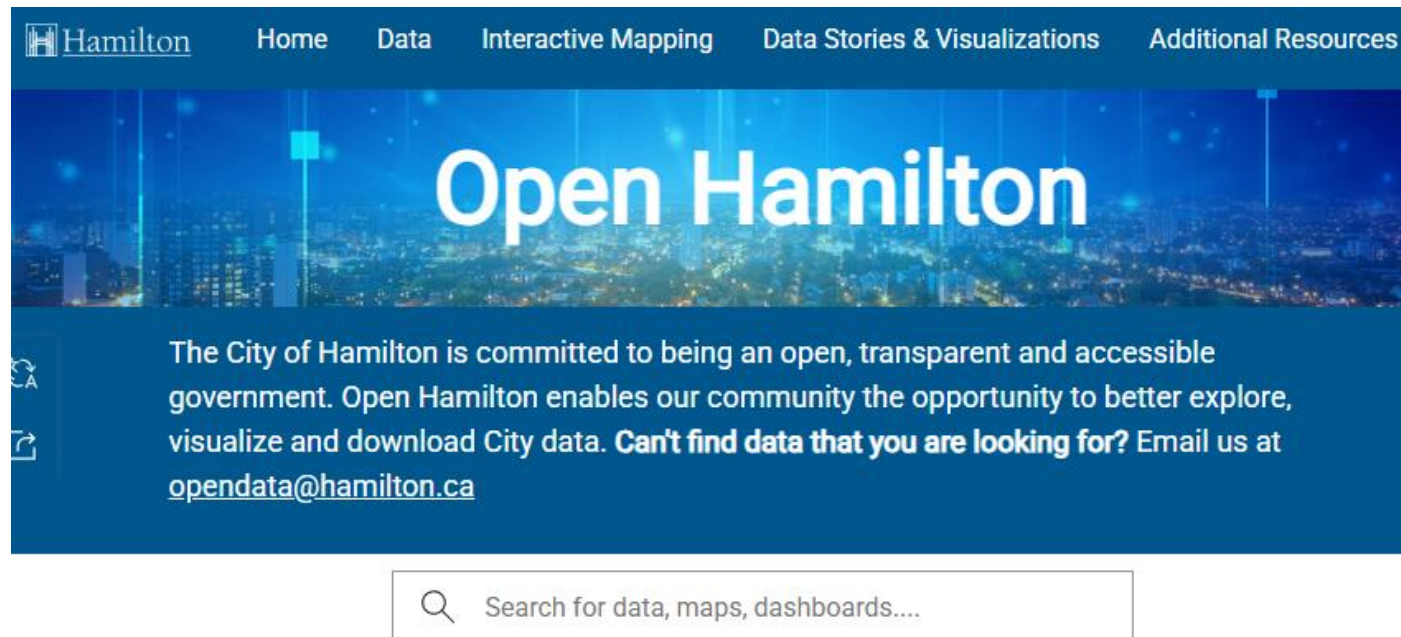


The screenshot displays the Scholars GeoPortal interface. At the top, there are navigation links for 'Share', 'Print', 'Export', 'Data Table', 'Base Maps', 'Contact', and 'Français'. Below this is a search bar with a 'Search' button and a 'Map (0)' indicator. The search criteria are set to 'Data' and 'Anywhere'. A 'Downloadable content only' checkbox is checked. The 'Browse by...' section lists various subject categories with their respective counts, such as 'Census and administrative boundaries (130)'. There are also sections for 'Keywords', 'Producers', and 'New Data Layers'. The main area is a map of Canada with a scale bar at the bottom. The map shows geographical features like the Yukon, Mackenzie, and Great Bear Lake, and cities like Vancouver, Seattle, and Edmonton. An inset map in the bottom right corner shows the location of the main map area within North America.

Open Data Portals

<https://open.hamilton.ca/>

- [Open Hamilton](#)
- [Ontario GeoHub](#)
- [Open Canada](#)



The screenshot shows the homepage of the Open Hamilton website. At the top, there is a navigation bar with the following links: Home, Data, Interactive Mapping, Data Stories & Visualizations, and Additional Resources. The main header features the text "Open Hamilton" in large white font against a blue background with a cityscape at night. Below the header, a paragraph states: "The City of Hamilton is committed to being an open, transparent and accessible government. Open Hamilton enables our community the opportunity to better explore, visualize and download City data. **Can't find data that you are looking for?** Email us at opendata@hamilton.ca". A search bar is located below the text, containing the placeholder text "Search for data, maps, dashboards....".

Explore Open Data by Category



[All data](#)



[Business & Economy](#)



[City Services](#)



[Census & Demographics](#)



[Culture & Tourism](#)



[Environment](#)

Evaluate a Dataset

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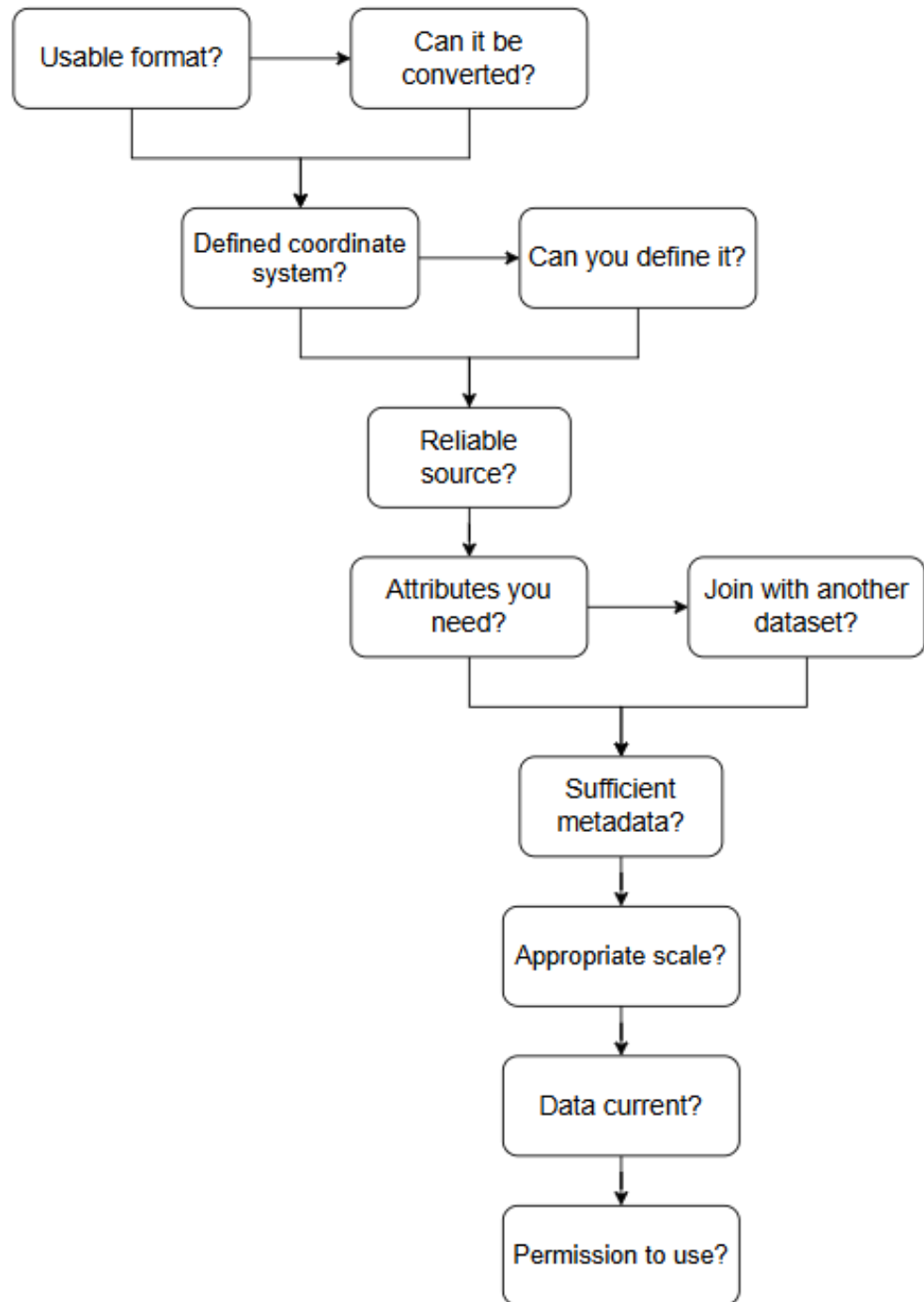
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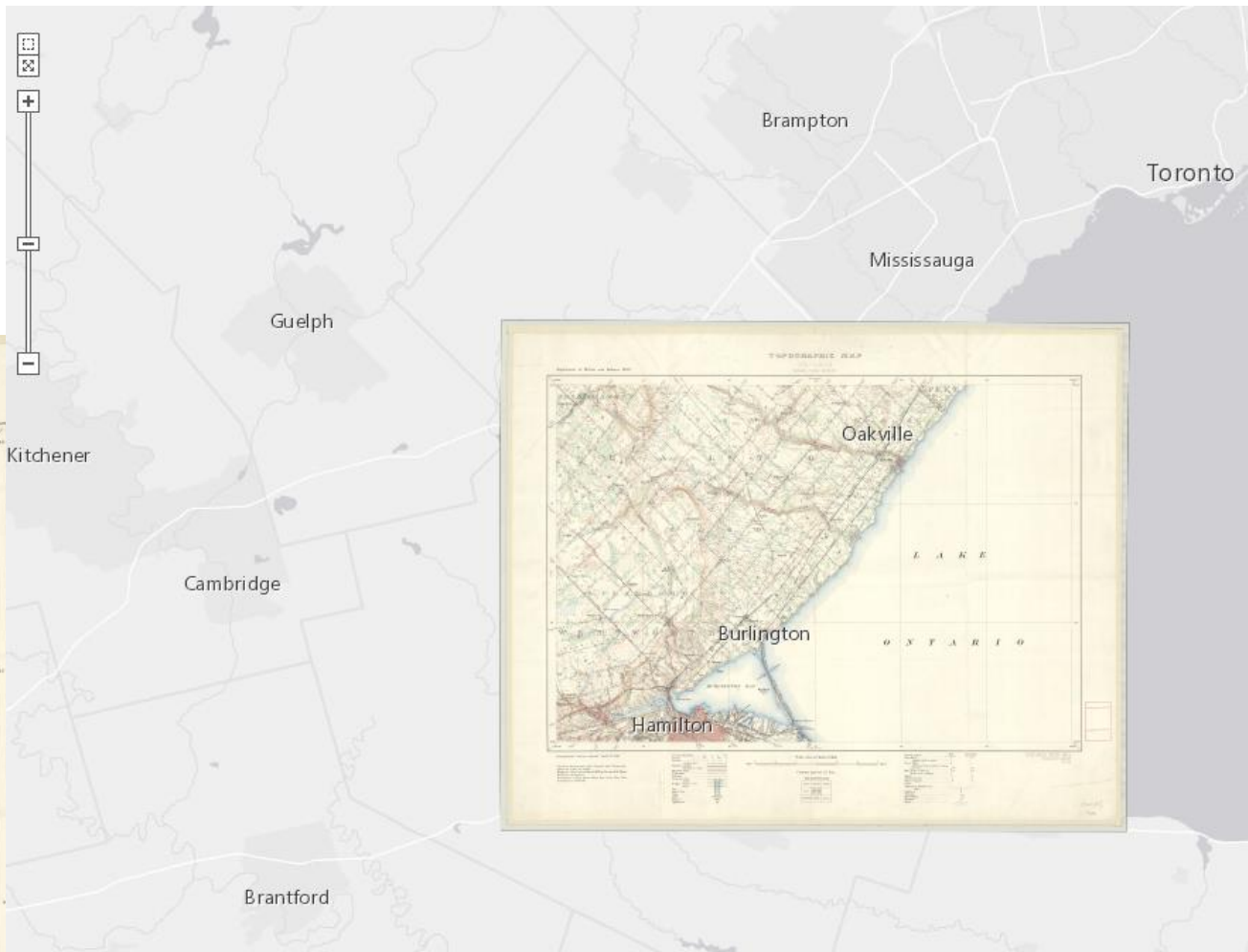
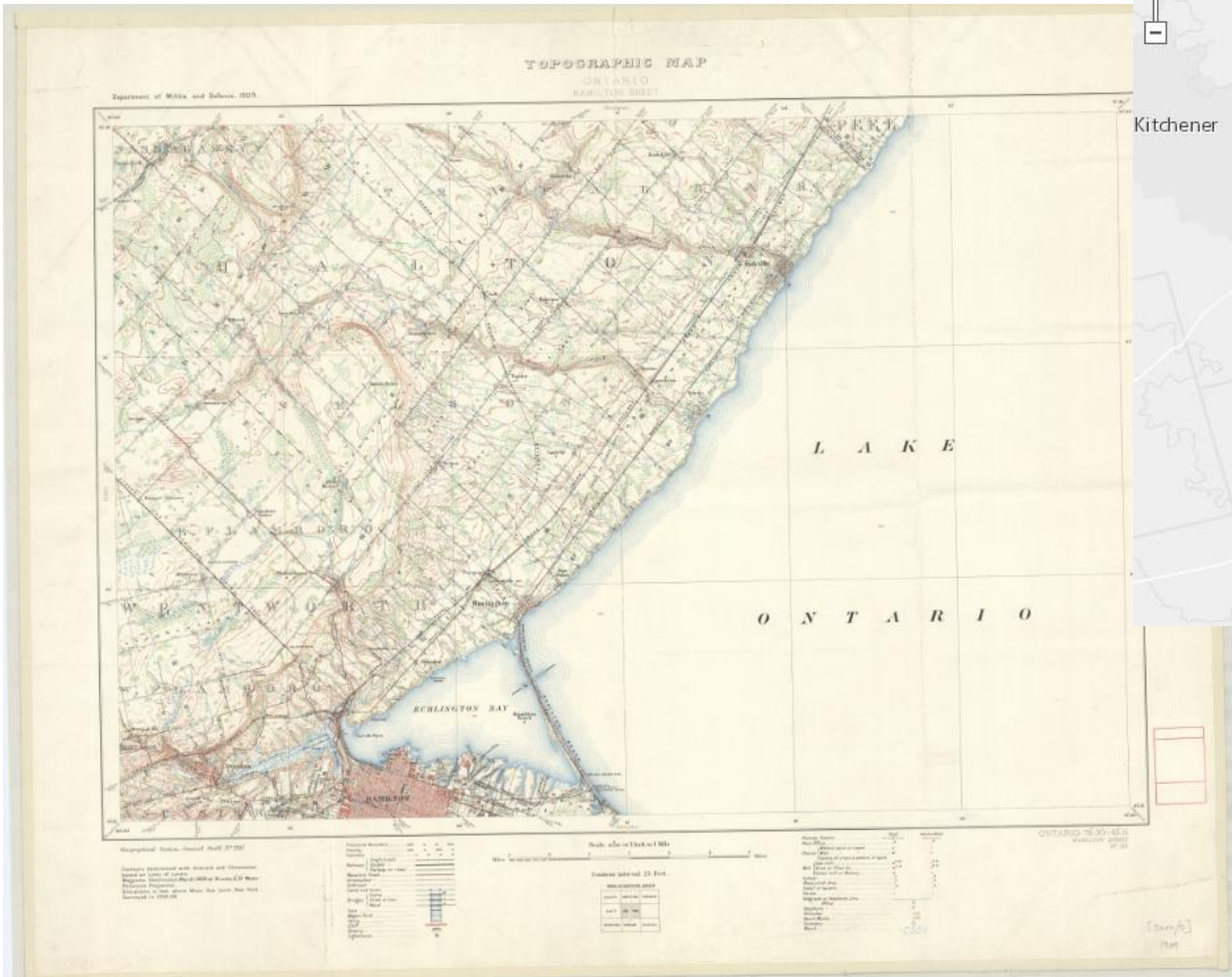
Will the data meet your needs?

Spatial Reserves Blog, Joseph Kerski

For a more detailed analysis, see Nathan Heazlewood's Garbage In Garbage Out checklist of data errors.

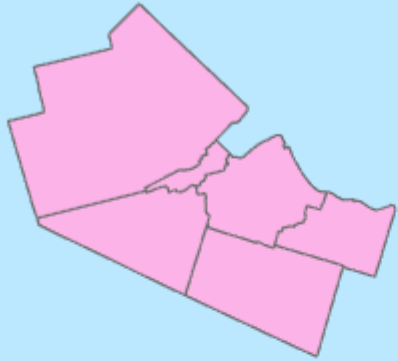


Usable format



Hamilton, Ontario. 1:63,360. Map Sheet 030M05, [ed. 1], 1909

Coordinate System



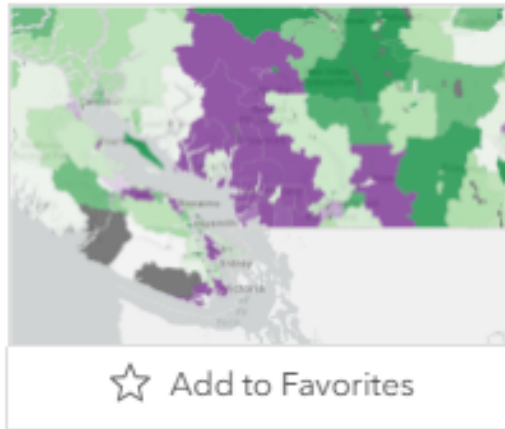
Unknown Coordinate System ✕

"Map" data source is missing coordinate system information.
[Click here to view details.](#)

*Mediterranean
Sea*

Canadian Shelter Costs 2021

Reliable Source



Shelter cost-to-income ratios for house Division (CD) and Census Subdivision (CSD)

Feature layer from [Esri Canada](#)
Managed by [EsriCanadaContent](#)

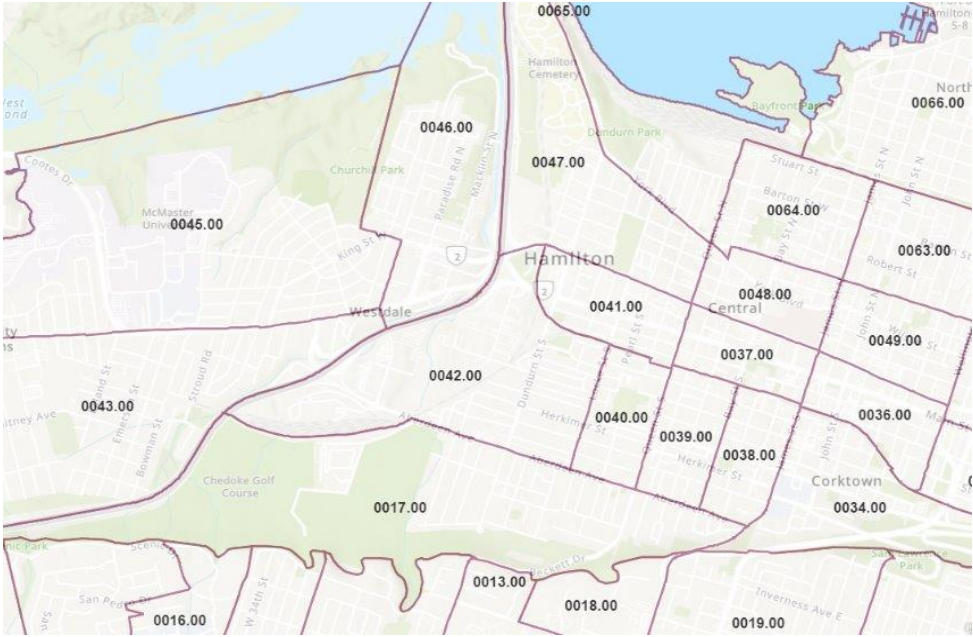
Item created: Feb 21, 2023 Item updated:

✓ Authoritative

🔄 Living Atlas

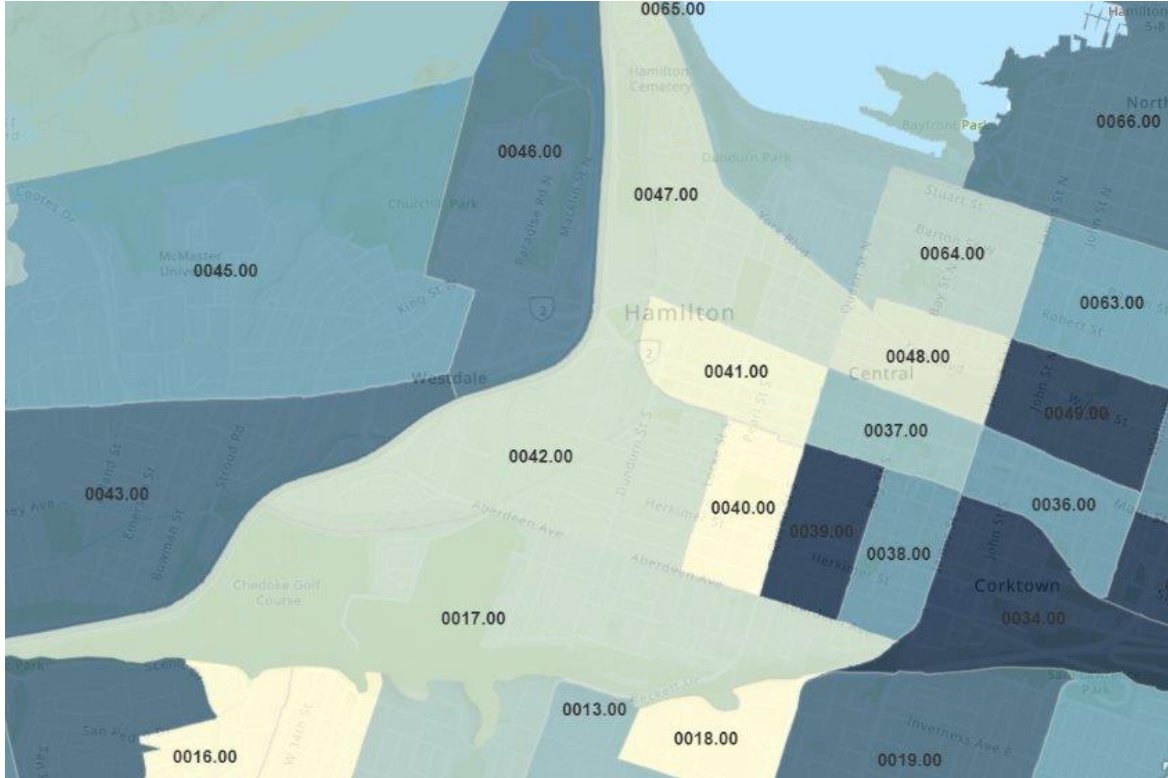
Terms of Use

Please refer to Statistics Canada's [General Terms and Conditions](#)



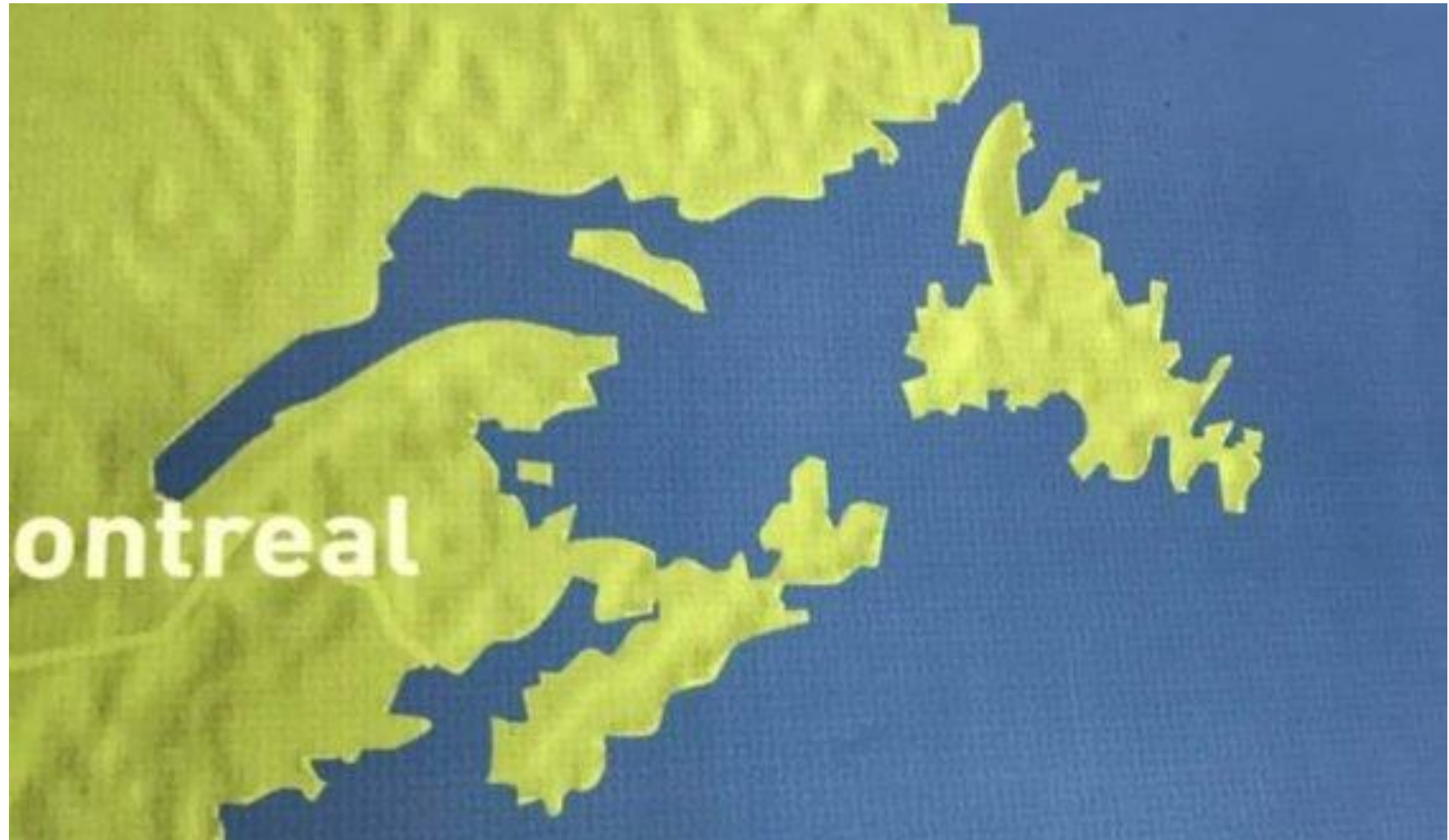
Attributes

0051.00	409	4,225
0052.00	334	3,881
0053.00	220	3,070
0054.00	211	2,670
0055.00	287	2,989
0056.00	312	3,260
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0058.00	201	2,545
0059.00	260	3,062
0060.00	195	2,691
0044.00	305	3,917



COVID19 Case counts by census tract, Open Hamilton

Scale

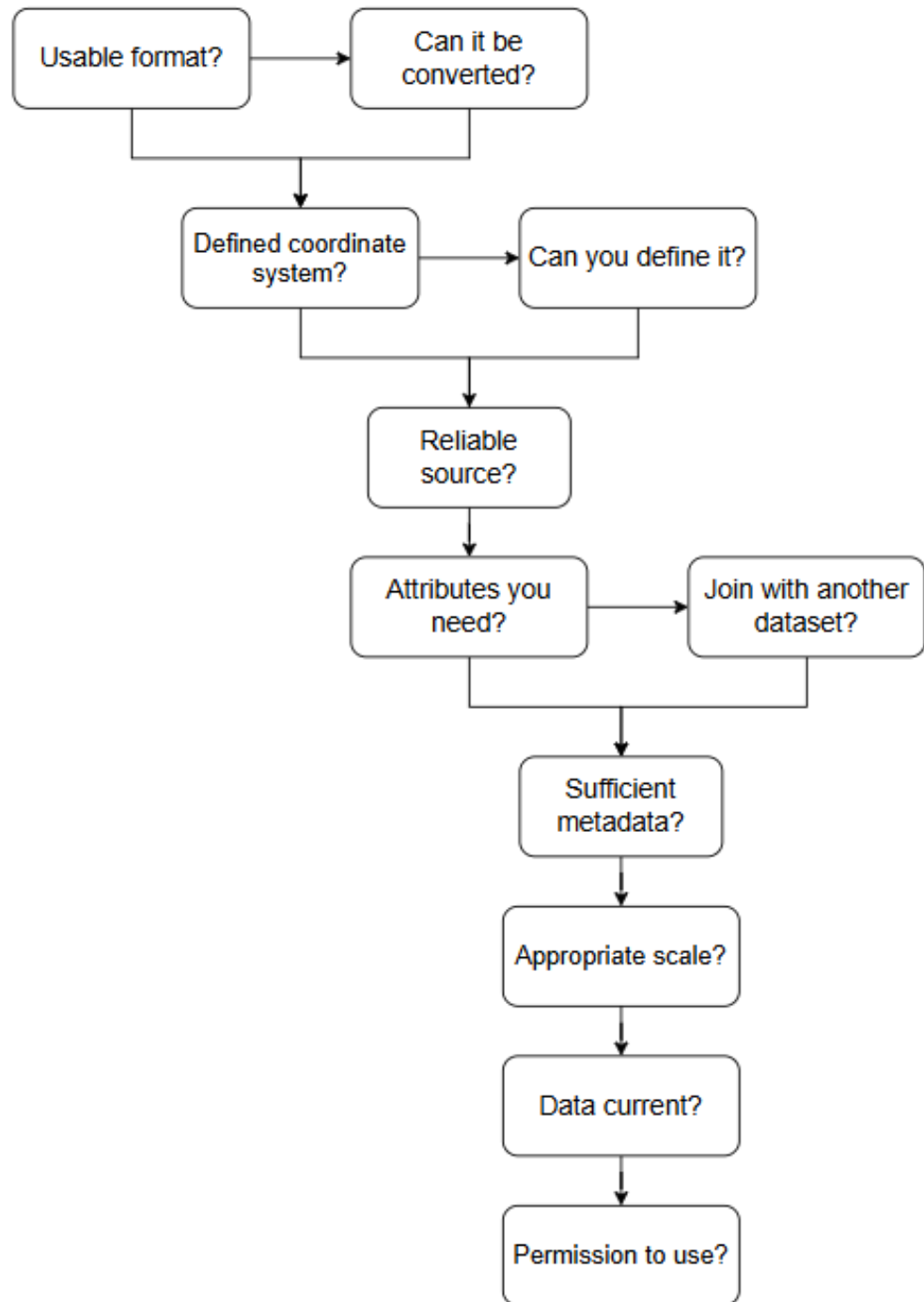


Source: CBC

Will the data meet your needs?

Spatial Reserves Blog, Joseph Kerski

For a more detailed analysis, see Nathan Heazlewood's Garbage In Garbage Out checklist of data errors.



GIS Services

Send GIS Services an Email:

libgis@mcmaster.ca

Schedule a Consultation:

<https://libcal.mcmaster.ca/appointments/gis>

SCDS Links

Send SCDS an Email:

scds@mcmaster.ca

Subscribe to our Newsletter:

<https://u.mcmaster.ca/sign-up>

GIS Services Website:

<https://library.mcmaster.ca/services/gis>

Register for a Workshop:

<https://u.mcmaster.ca/scds-workshops>

Schedule a Consultation:

<https://libcal.mcmaster.ca/appointments>

