February 11, 2025 | 10:30 am
Virtual Workshop

Finding, Accessing, and Adding GIS Data to Your Project

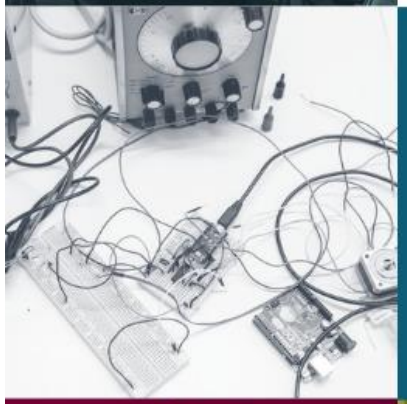
u.mcmaster.ca/scds-events

Data Analysis Support Hub

Sherman Centre for Digital Scholarship

Library | McMaster University

Sherman Centre for Digital Scholarship



Finding, Accessing, and Adding GIS Data to Your Project

Christine Homuth, Spatial Information (GIS) Specialist

February 11, 2025

McMaster University Library

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

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

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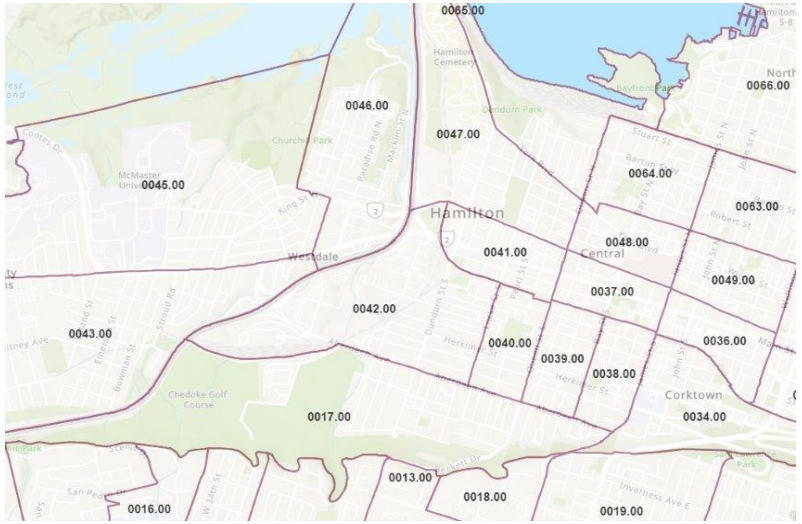
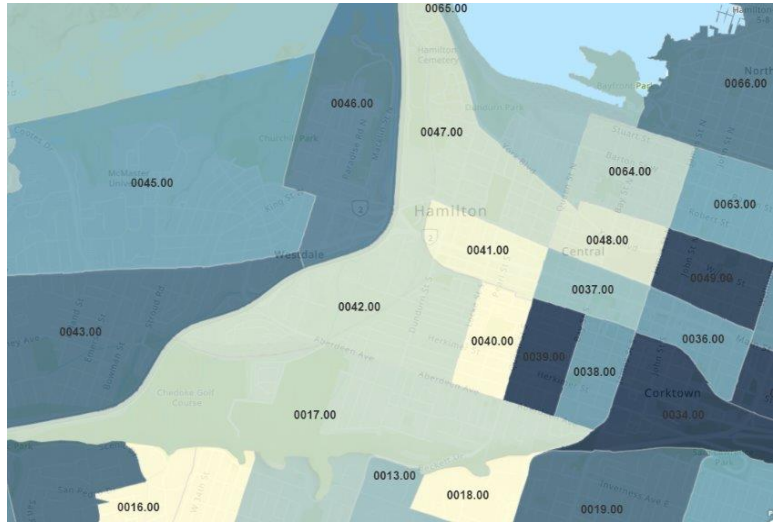
0051.00	409	4,225
0052.00	334	3,881
0053.00	220	3,070
0054.00	211	2,670
0055.00	287	2,989
0056.00	312	3,260
0057.00	276	3,022
0058.00	201	2,545
0059.00	260	3,062
0060.00	195	2,691
0044.00	305	3,917

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)

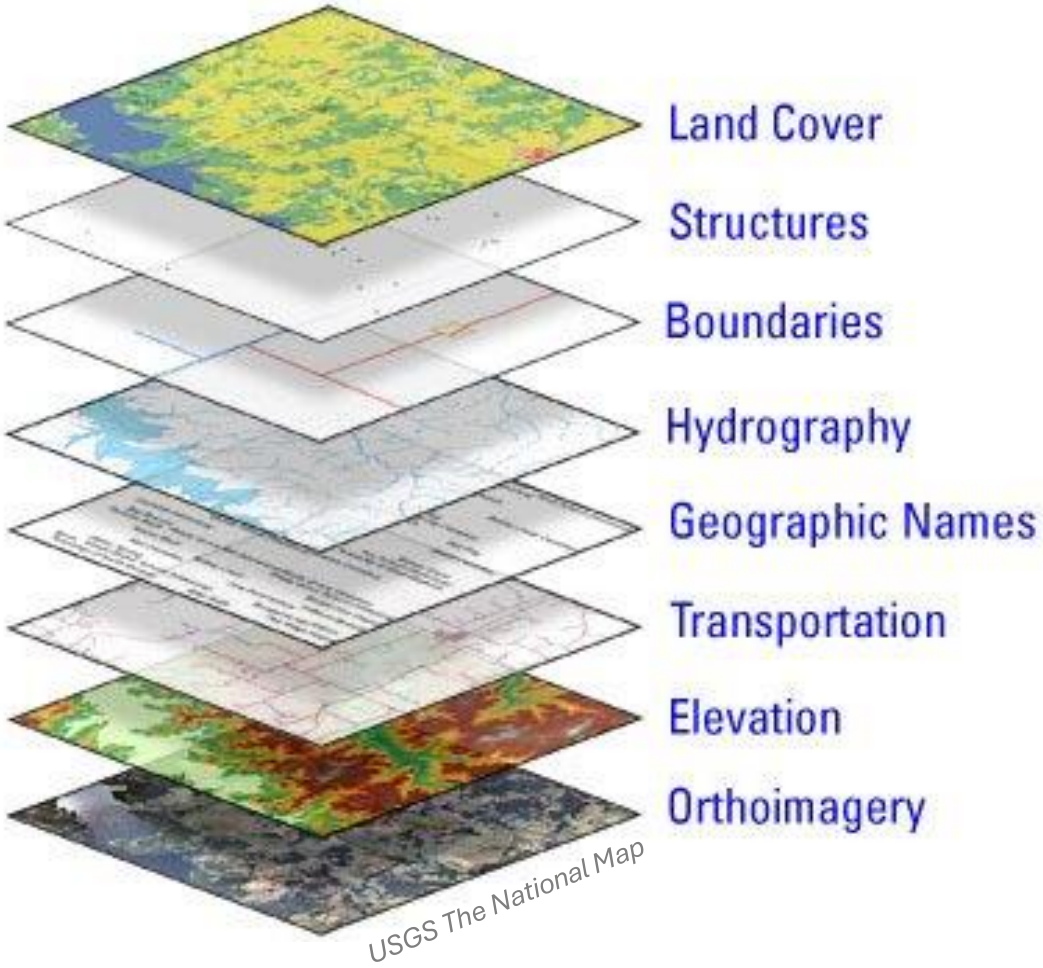




COVID19 Case counts by census tract, Open Hamilton

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



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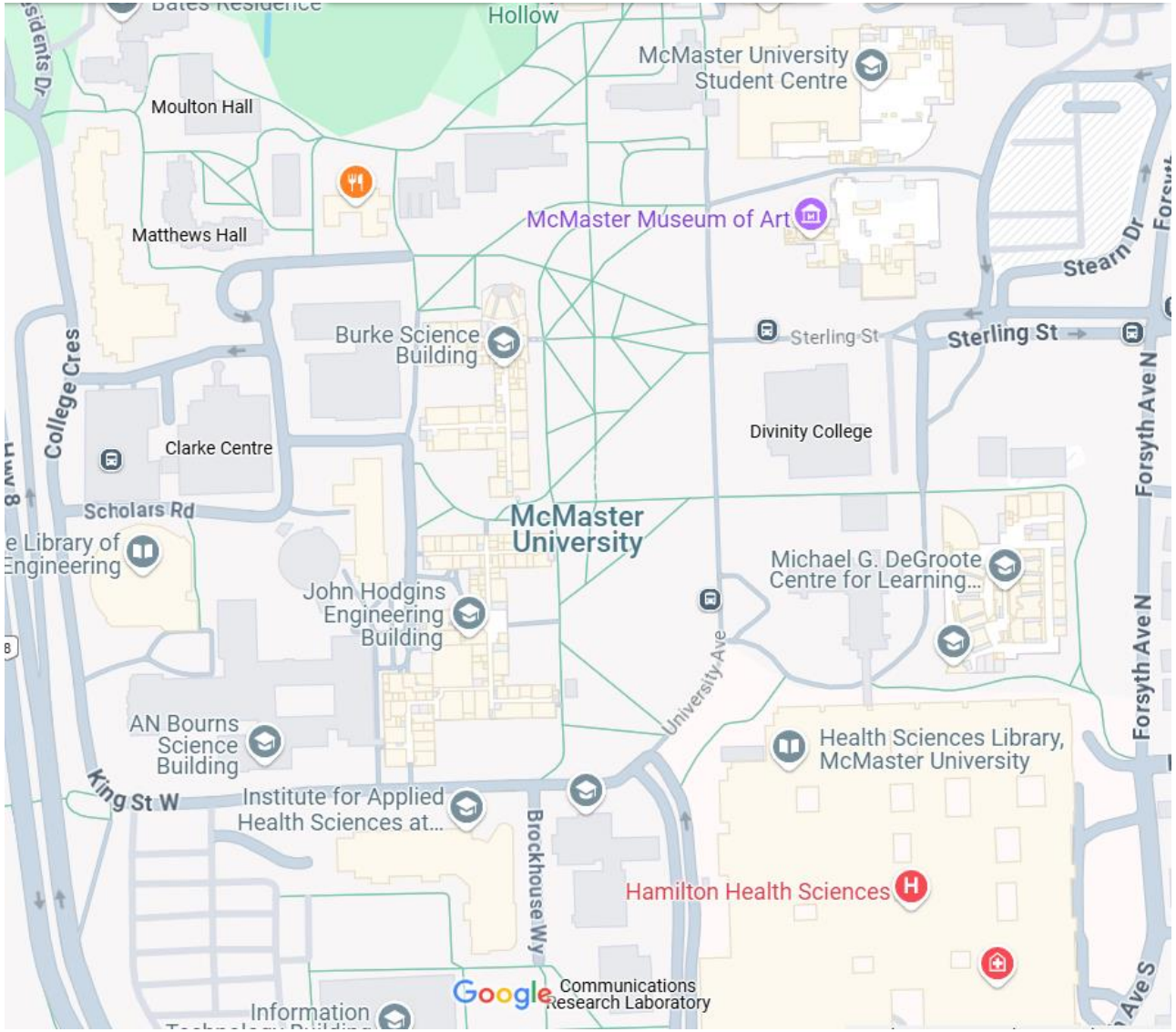
Vector Data

Points, lines, and polygons

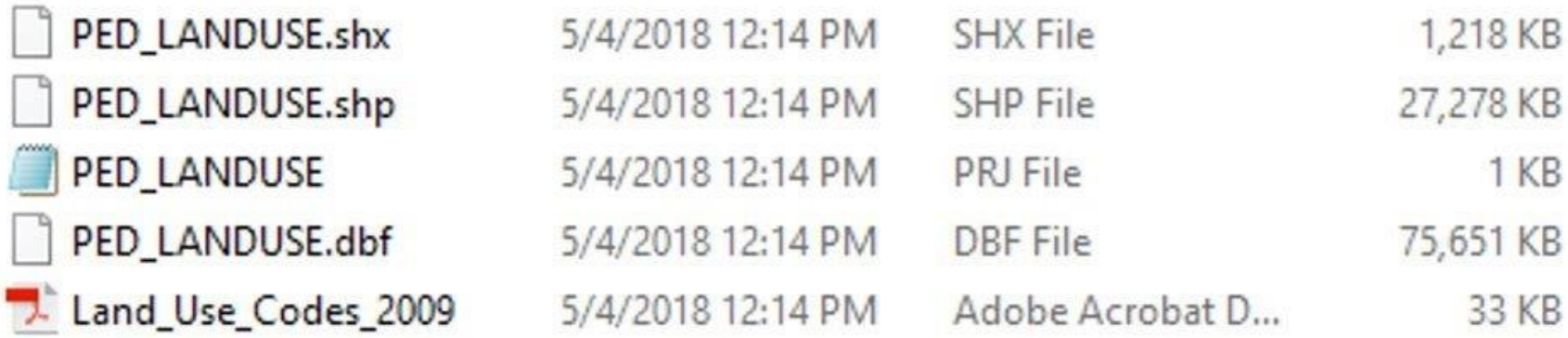
- **Points** – x,y locations
- **Lines** – linear features (connected x,y locations)
- **Polygons** – closed figures or areas (multiple connected x,y locations forming a closed figure)
- Good for representing *clearly defined objects*

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



Vector Data – File Structure

Format – shapefile (.shp)



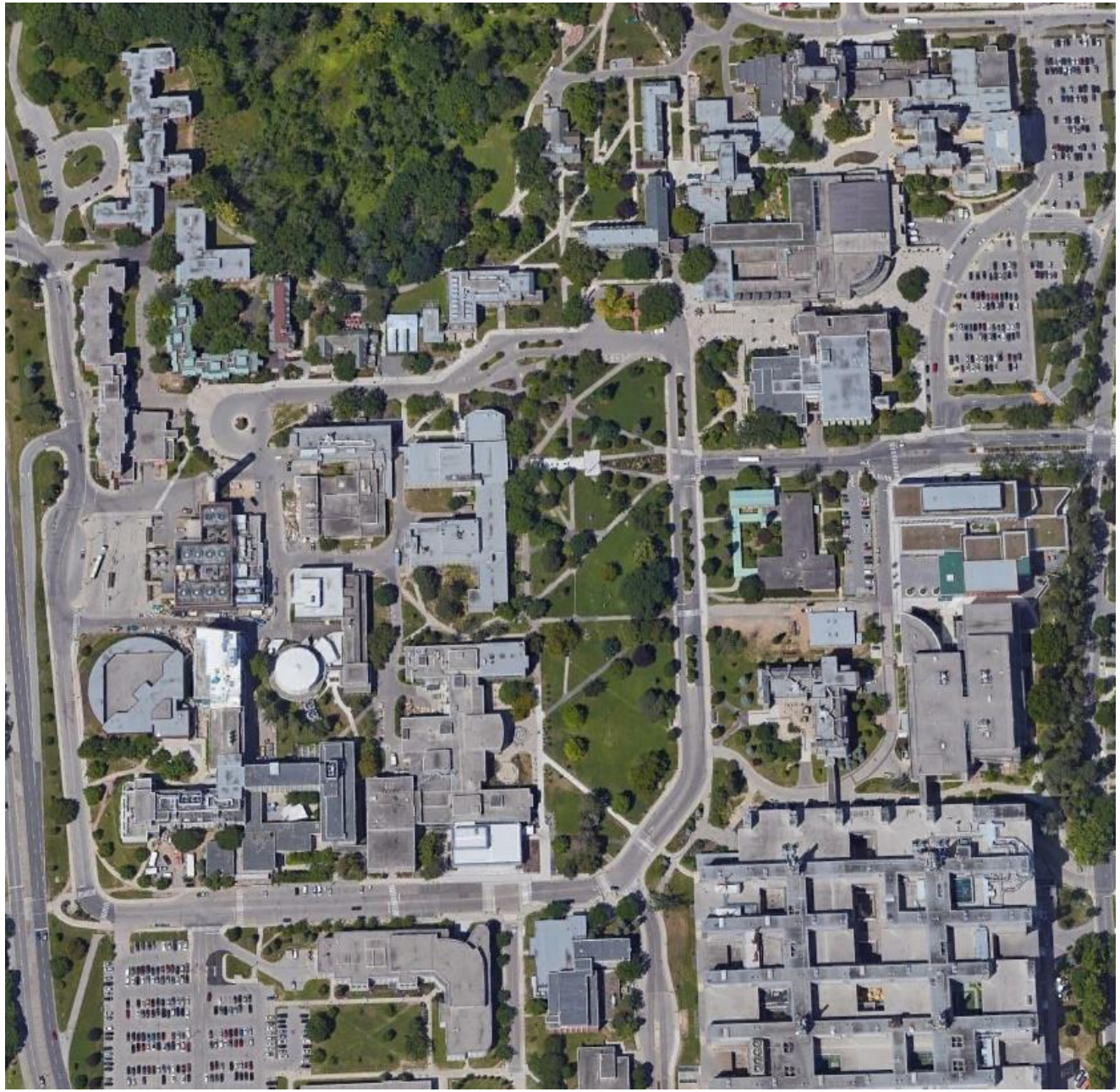
PED_LANDUSE.shx	5/4/2018 12:14 PM	SHX File	1,218 KB
PED_LANDUSE.shp	5/4/2018 12:14 PM	SHP File	27,278 KB
PED_LANDUSE	5/4/2018 12:14 PM	PRJ File	1 KB
PED_LANDUSE.dbf	5/4/2018 12:14 PM	DBF File	75,651 KB
Land_Use_Codes_2009	5/4/2018 12:14 PM	Adobe Acrobat D...	33 KB

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)

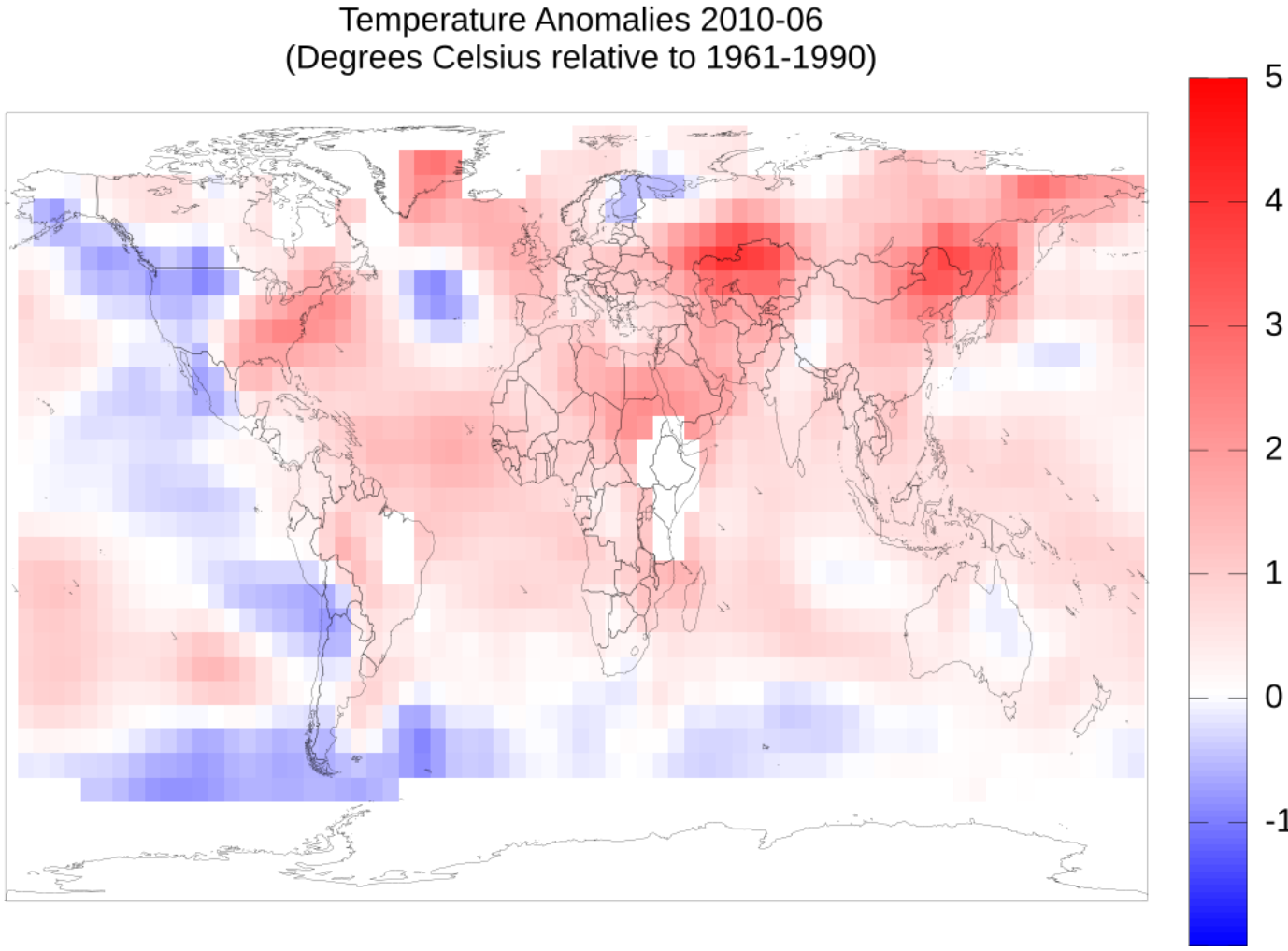


Raster Data

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)



Raster Data – File Structure

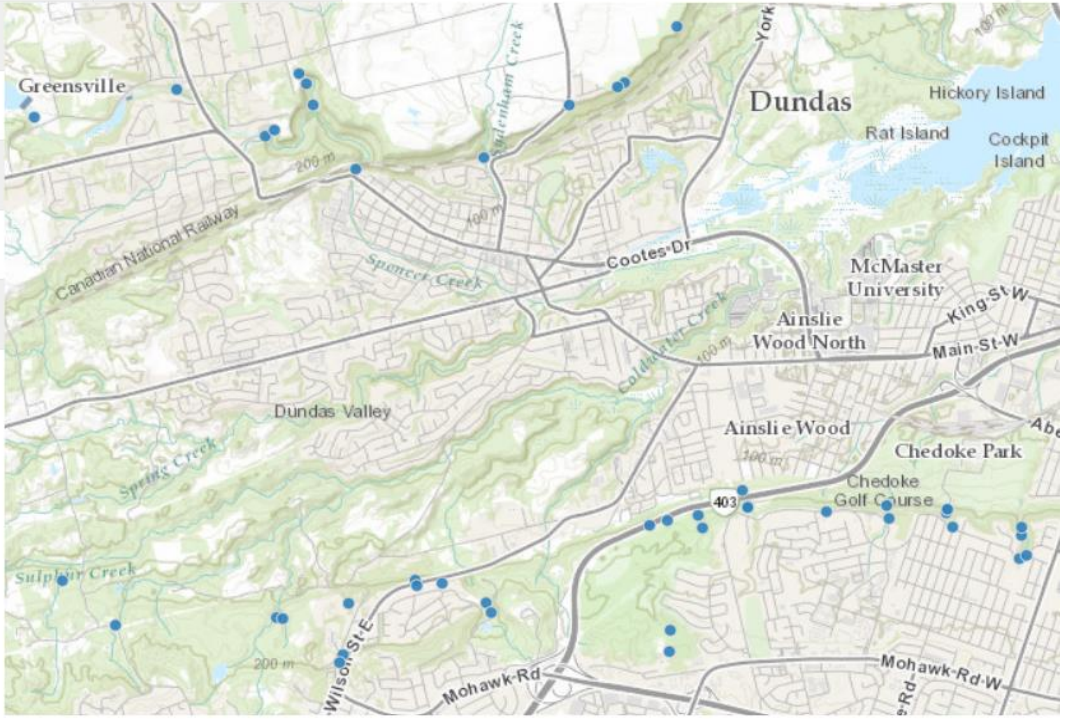
Format – image file formats (e.g. tif, jpg)

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



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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

Geospatial Data Sources

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

McMaster University

- 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

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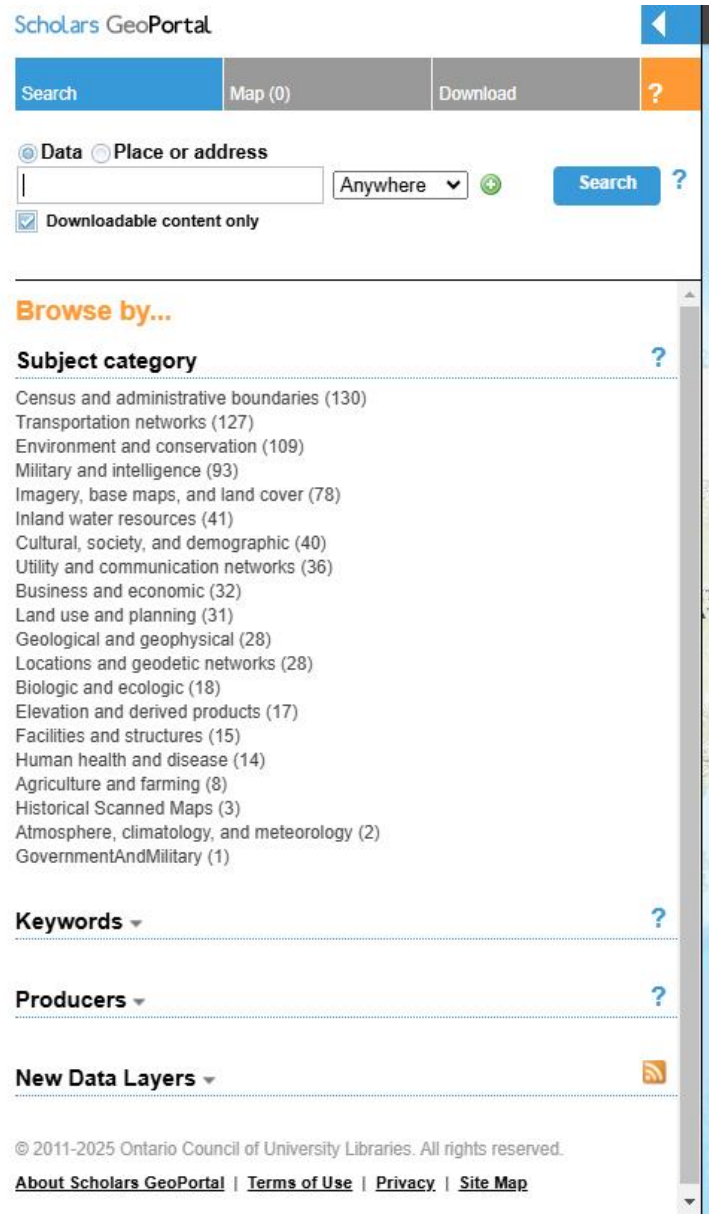
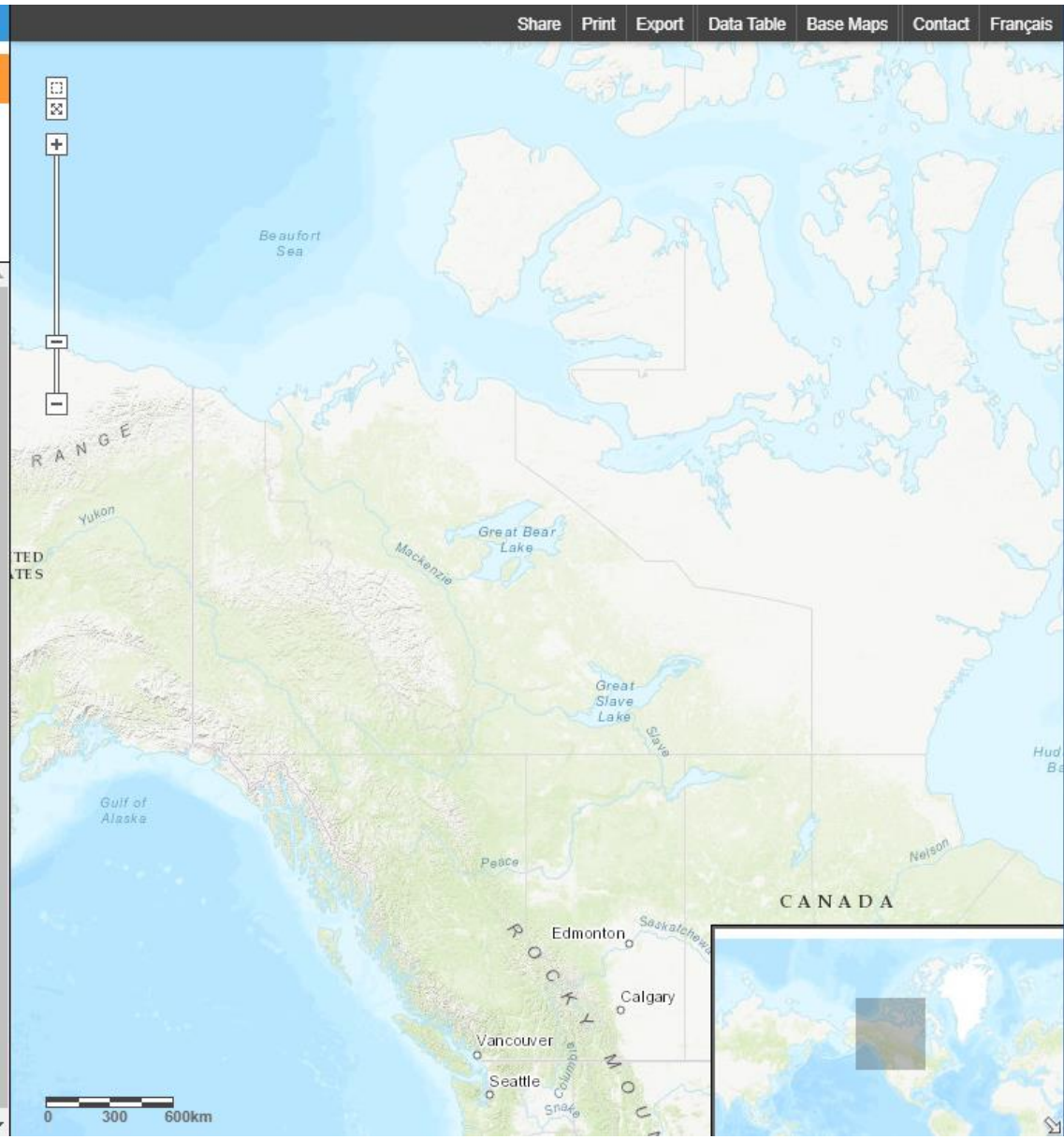
Scholars GeoPortal

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*





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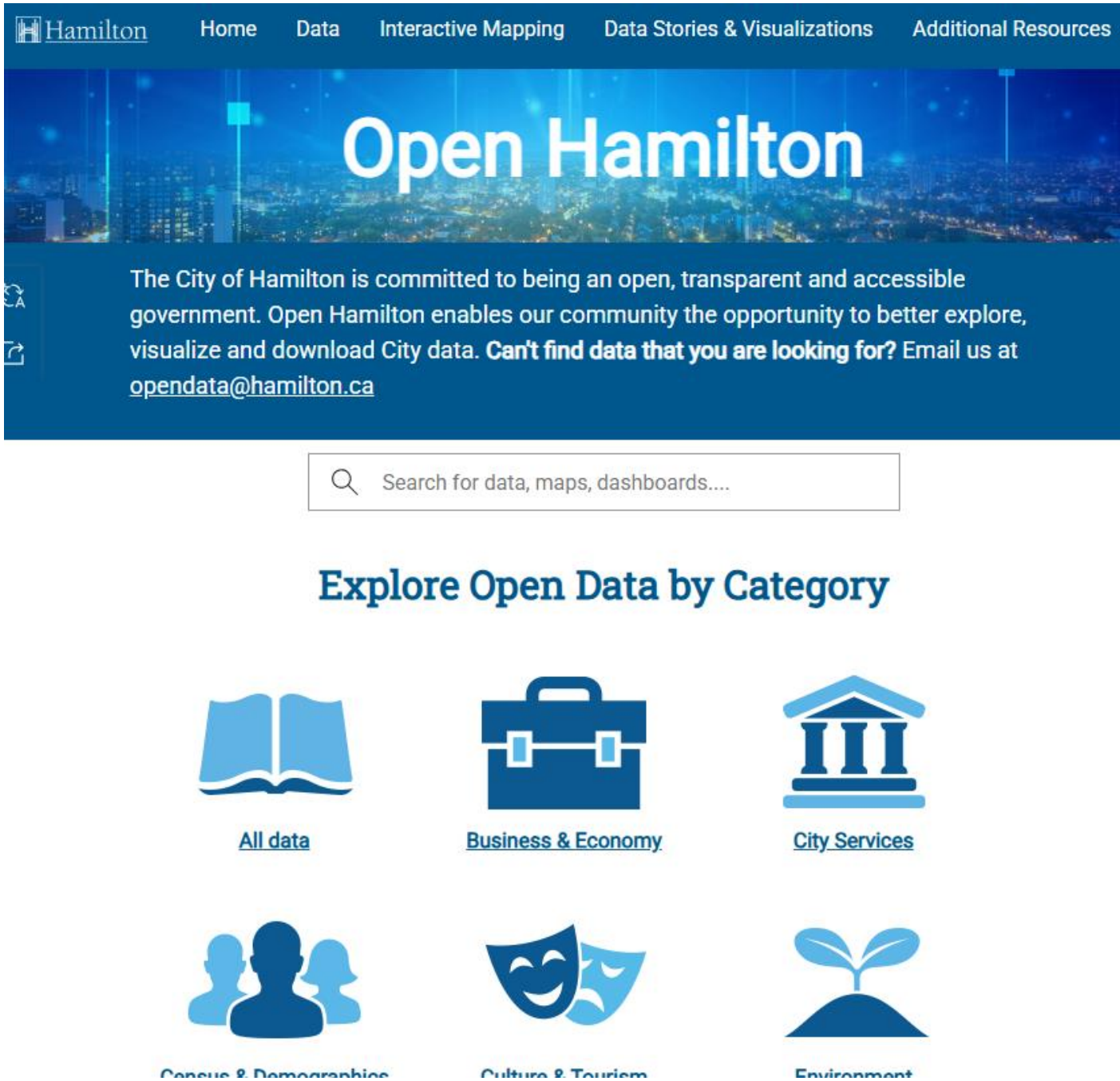
Open Data Portals

https://open.hamilton.ca/

- Open Hamilton
- Ontario GeoHub
- Open Canada



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Evaluate a Dataset

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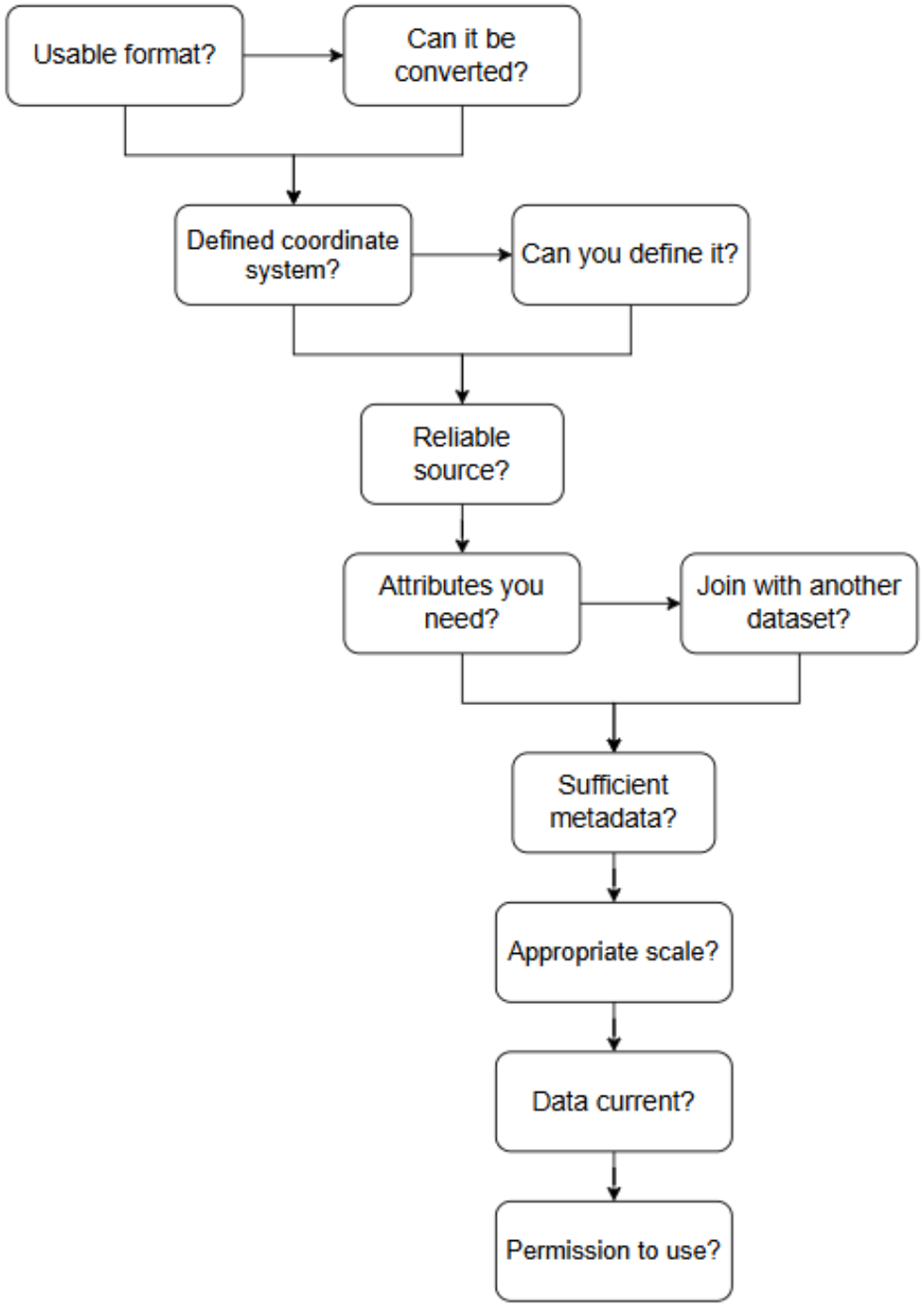
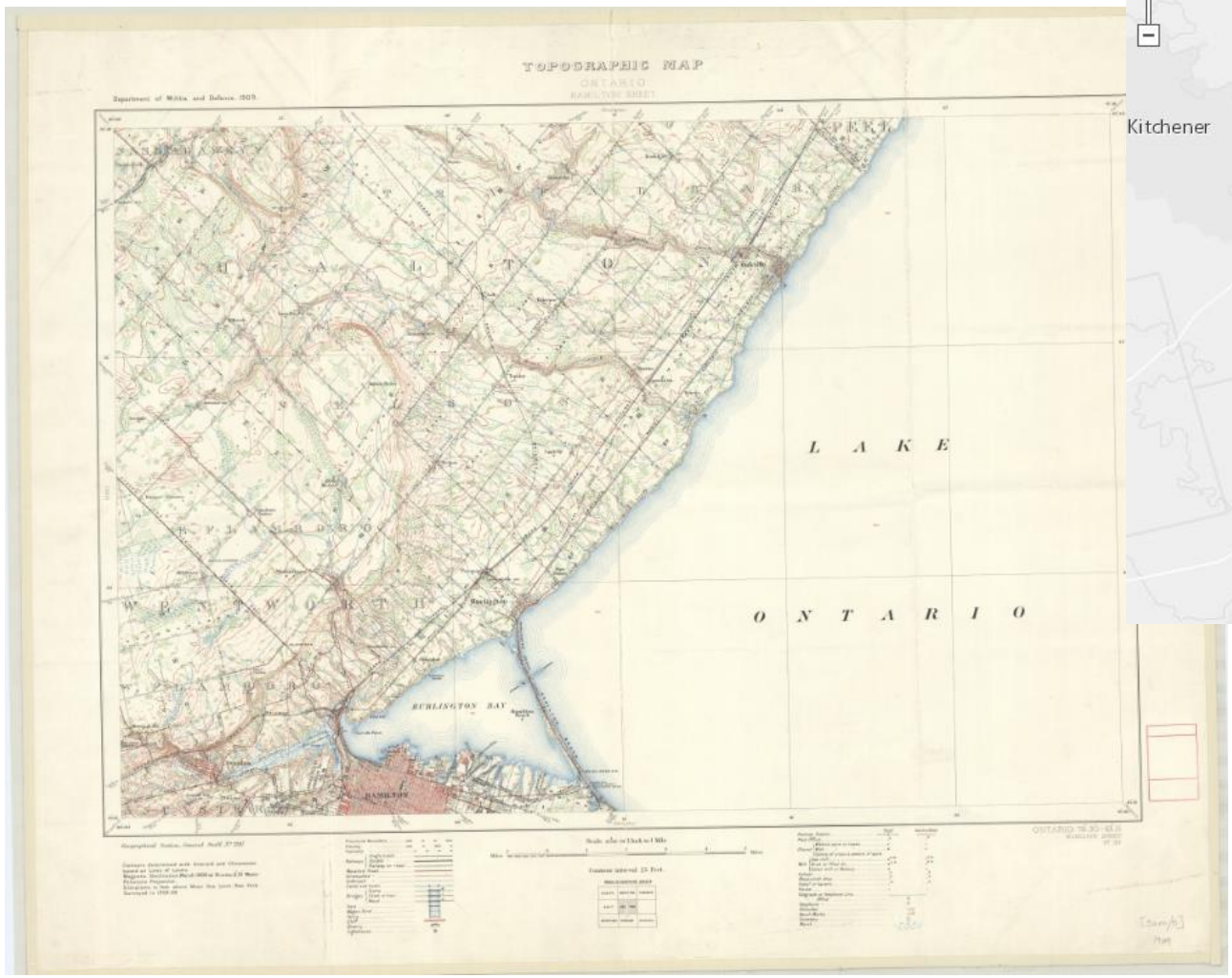
Will the data meet your needs?

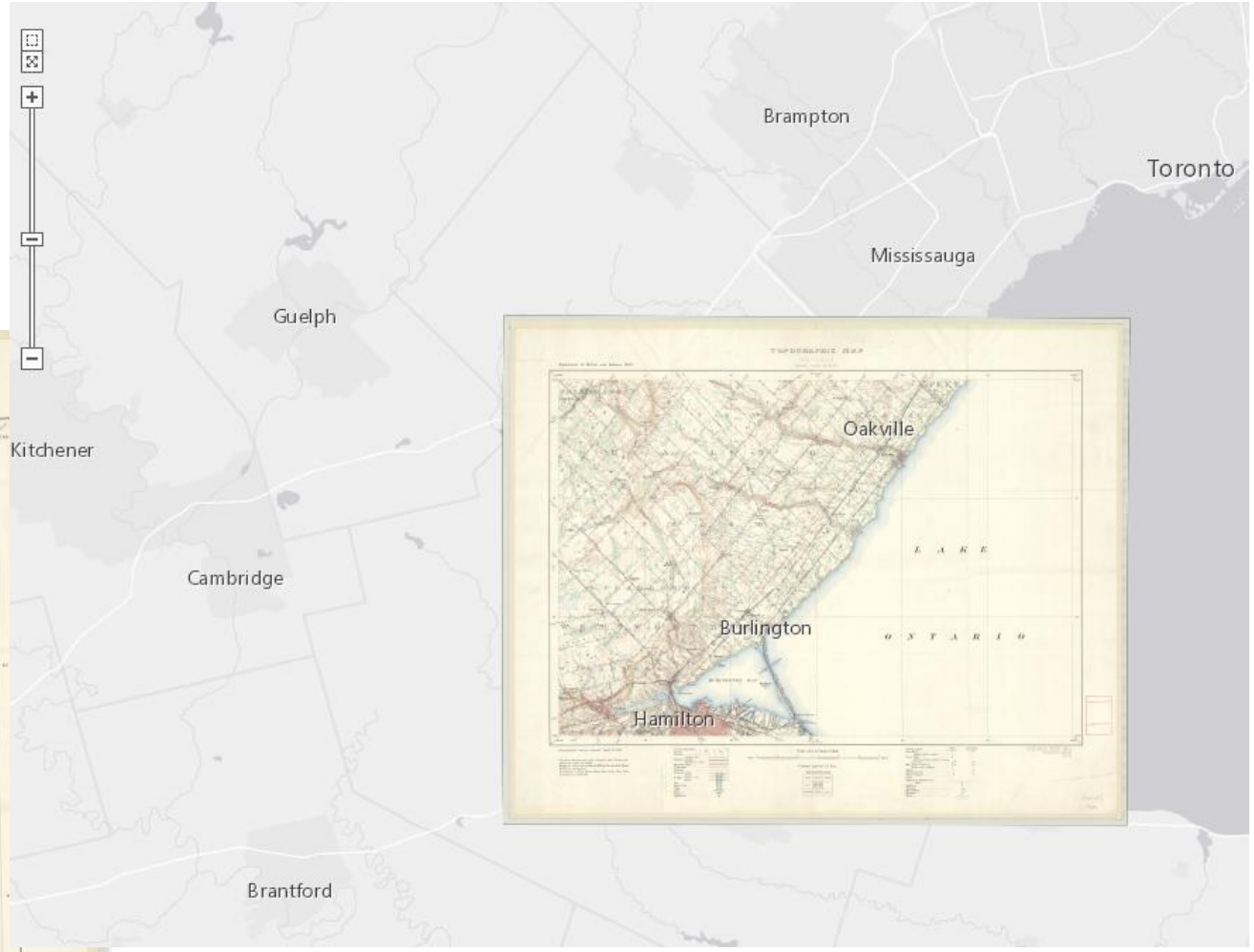
Spatial Reserves Blog, Joseph Kerski

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

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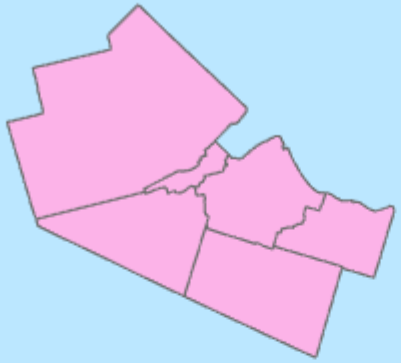
Coordinate System



Unknown Coordinate System

"Map" data source is missing coordinate system information.
Click here to view details.

Mediterranean Sea

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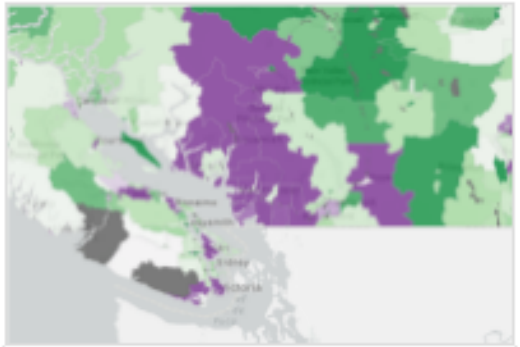
Reliable Source

Canadian Shelter Costs 2021



☆ Add to Favorites

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

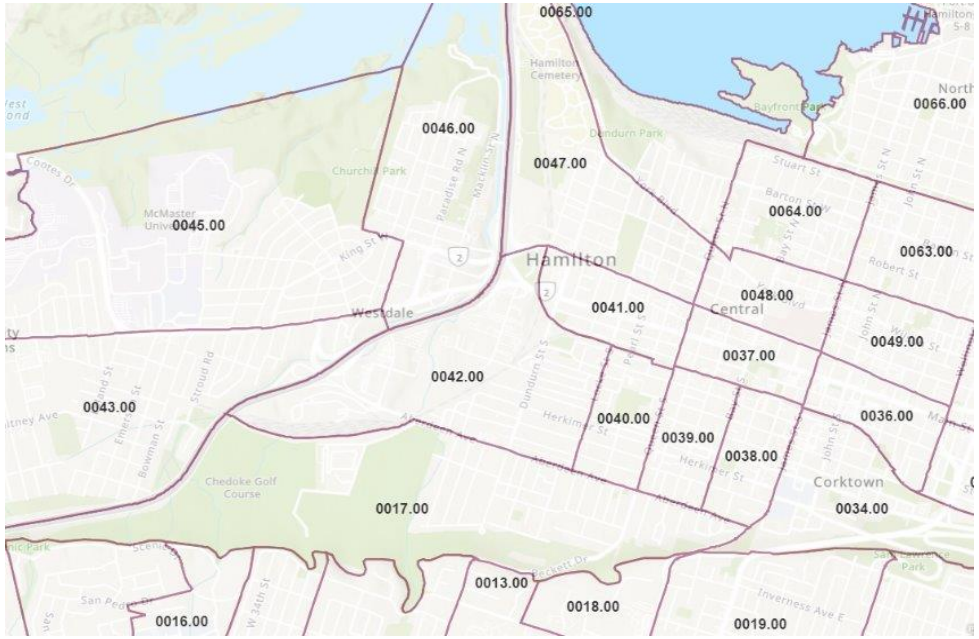
Feature layer from Esri Canada
Managed by EsriCanadaContent

Item created: Feb 21, 2023 Item updated:

Authoritative Living Atlas

Terms of Use

Please refer to Statistics Canada's General Terms and Conditions



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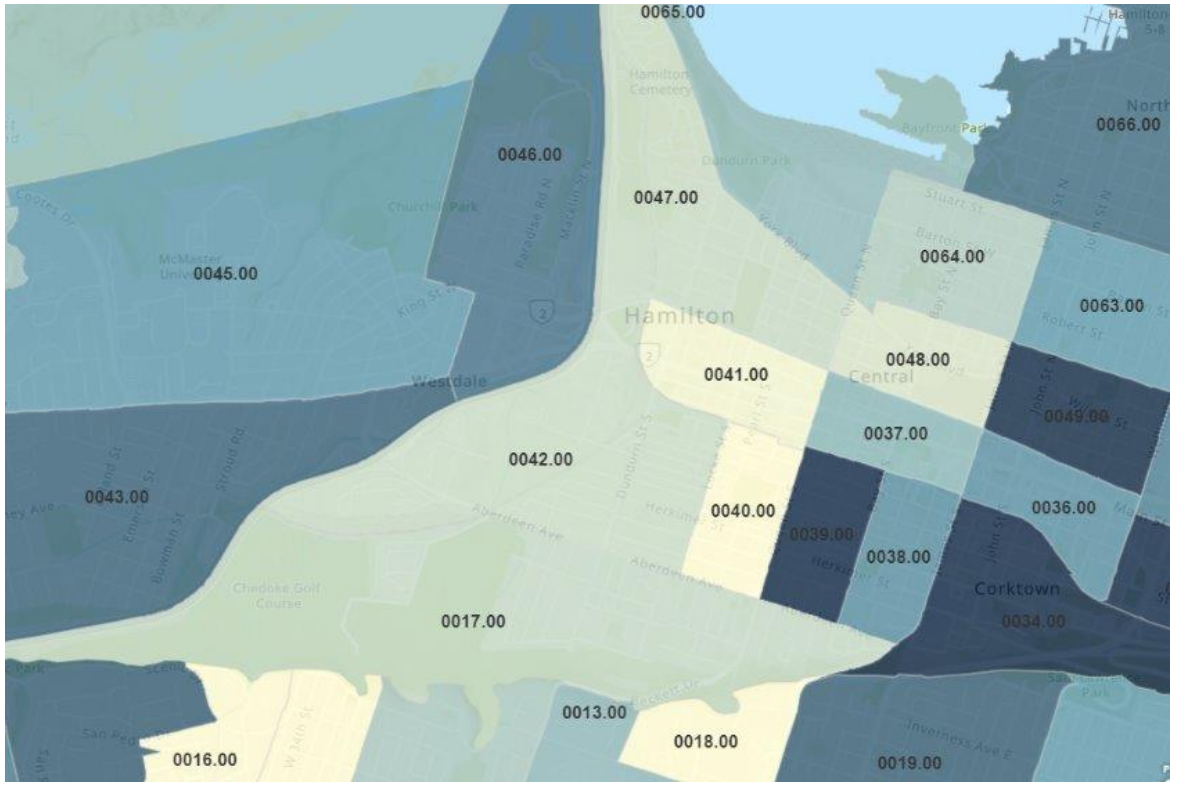

COVID19 Case counts by census tract, Open Hamilton

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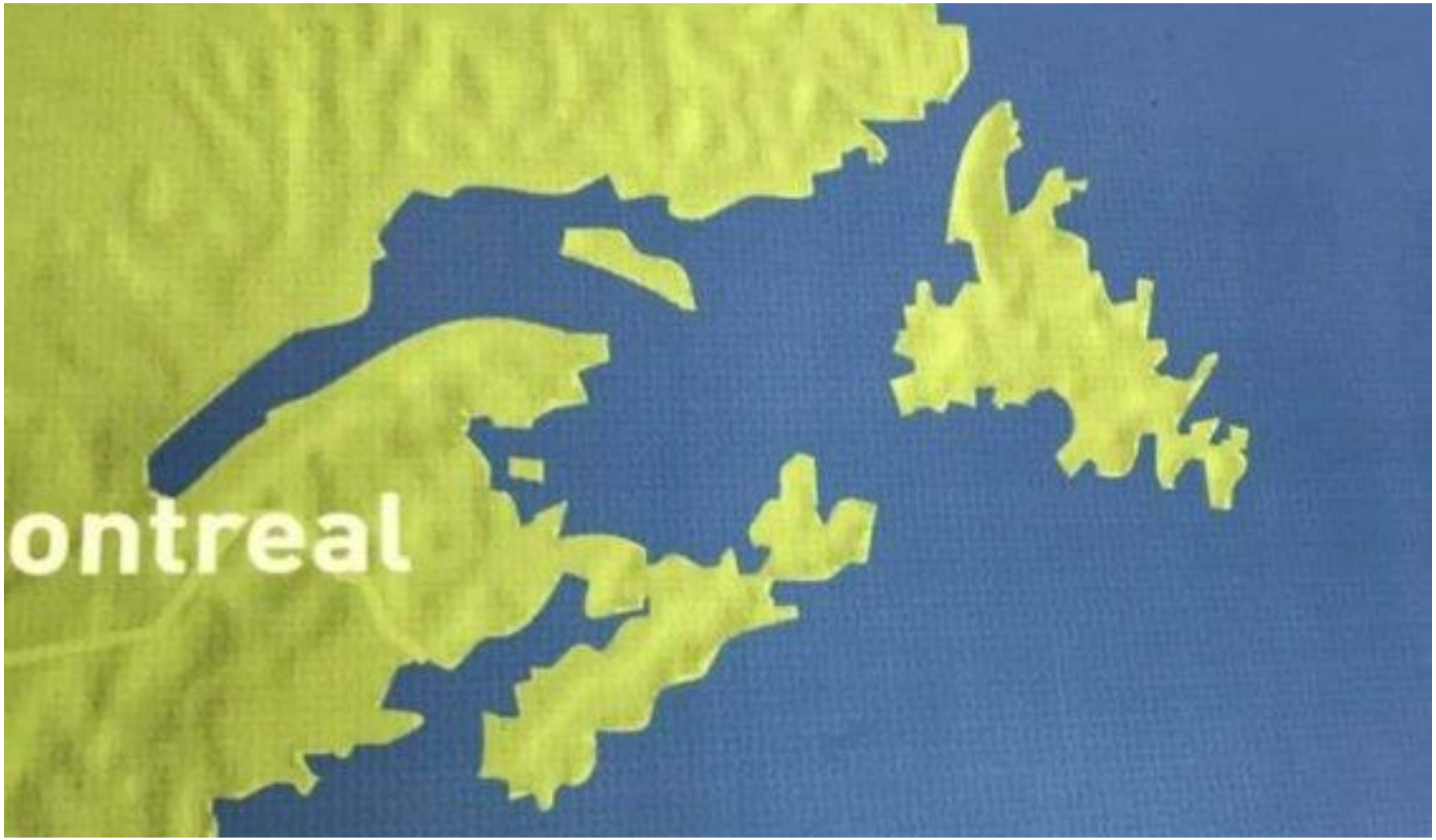
Scale



Source: CBC

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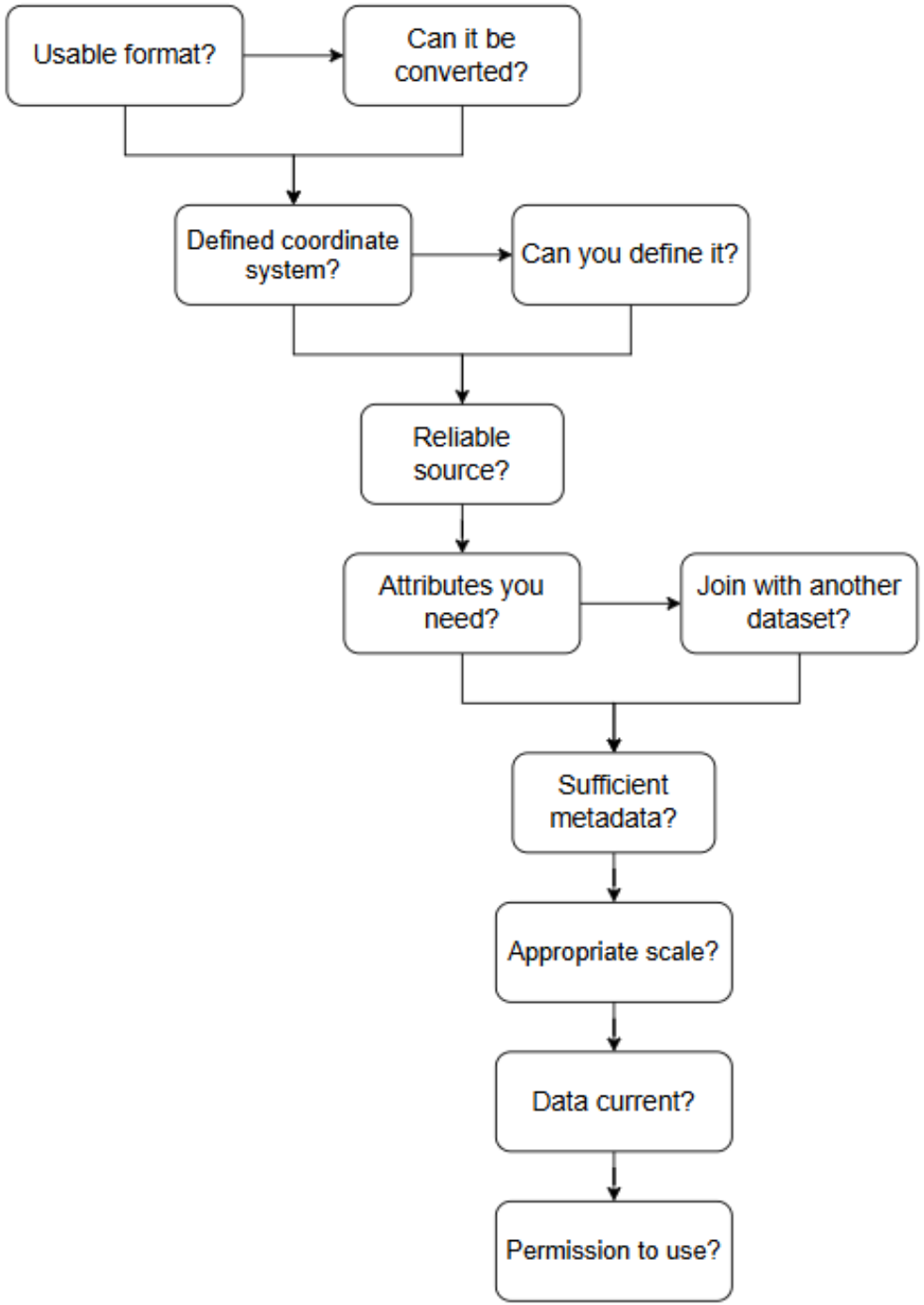

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GIS Services

Send GIS Services an Email:

libgis@mcmaster.ca

GIS Services Website:

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

Schedule a Consultation:

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

SCDS Links

Send SCDS an Email:

scds@mcmaster.ca

Register for a Workshop:

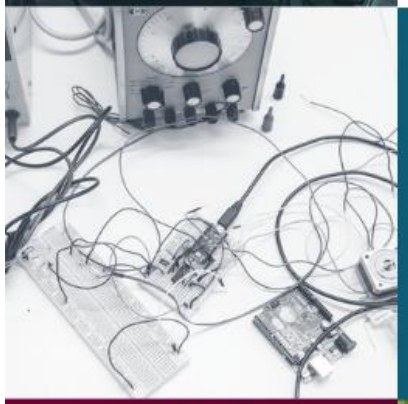
https://u.mcmaster.ca/scds-workshops

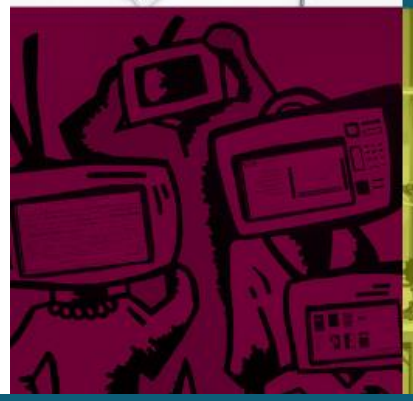
Subscribe to our Newsletter:

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

Schedule a Consultation:

https://libcal.mcmaster.ca/appointments





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