Background

Geographic Information Systems (GIS) connects many different types of data to real world maps, and it is a crucial tool for everything related to land and nature. For conservation organizations, utilizing GIS can help to unlock the potential for public outreach, land management, eco-tourism, and much more. But for many land trusts and smaller NGOs without specialized GIS expertise, dealing with necessary spatial data can be a challenge. The following section provides a basic introduction of GIS, some FAQs, and some useful resources for everyone interested.

What is spatial data and how to view it?

Spatial data refers to data that contain information on where it is physically located on the planet: this location can be a point, a line, or a polygon. There are different types of formats for spatial data to be stored. The most common formats are shapefiles or geodatabases, but they need specialized GIS software to be displayed or used. If you do not have access to GIS software, the easiest way is to ask someone to convert it to a kml file. KML can be displayed on google maps using the tutorial below. https://support.google.com/earth/answer/7365595?hl=en&co=GENIE.Platform%3DDesktop

GIS in the land trust context:

All land trust properties involve surveys that outline the exact boundaries of a property, but survey maps are hard to read or present. Transcribing a survey map to a custom-made thematic map can present precise boundaries, notable features on the property, as well as important locations in close proximity.

OLTA provides the service of **Baseline Documentation Reports** for newly acquired properties; our staff first use the GIS software to see where the boundary of a property is, collect data about features on the field, and then they are processed back into maps, statistics, and reports with GIS software.

Evaluating a property this way allows land trusts to assess the ecological and financial value of each property. After spatial data is stored, a land trust can then continue to monitor the property and track the changes on it.

Finally, GIS enables long-term planning. Land trusts can use open-source statistics from sources like universities and federal, provincial or municipal governments to inform their decision making on acquiring future properties and managing existing ones.

Where can I get those open-source data?

Many important data are collected by government agencies and released for free. This includes datasets critical for land trust operations such as census data, municipal boundaries, geological profiles, and more.

> Statistics Canada https://www12.statcan.gc.ca/census-recensement/2021/geo/sip-pis/index-eng.cfm
>
> Canada federal government https://open.canada.ca/en/open-maps

Ontario Geohub https://geohub.lio.gov.on.ca/

If a land parcel is located within a municipality, zoning map is another key resource stored by the municipal governments, either open for download or available upon request.

A particularly useful open-source dataset for the land trusts is the land parcel shapefile. It is maintained by the government of Ontario and covers all subdivisions in the province where land surveys have been performed.

https://geohub.lio.gov.on.ca/datasets/lio::lot-fabric-improved

What GIS software are out there, and are they free to use?

The most popular GIS software is ArcGIS by Esri, and it does not have a free version. https://www.arcgis.com

If you want to make a simple map to be shared with the general public, a simple option is to make a custom map in Google Maps: Create or open a map - Computer - My Maps Help (google.com)

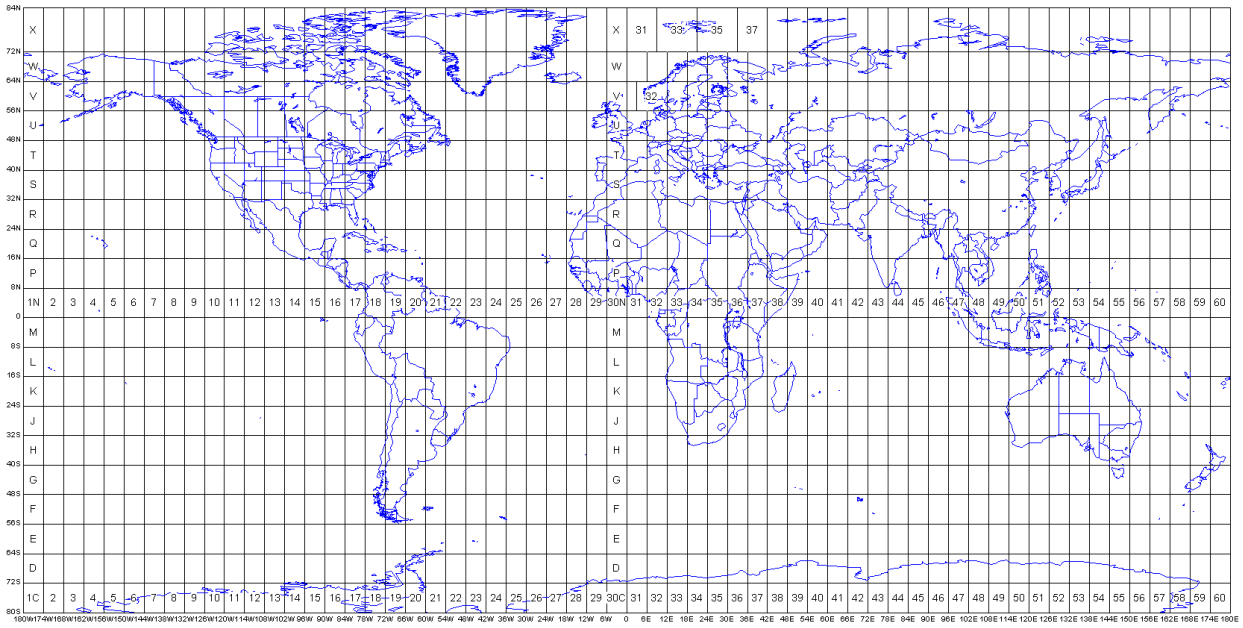
Google Earth Pro is also free and contains some more advanced functions https://www.google.com/earth/versions/#earth-pro

Last but not least, QGIS is a free and open-source software that has many similarities to the popular ArcGIS system. However, it has limited documentation or tutorial so it requires a high degree of computer proficiency to use. Welcome to the QGIS project!

What do the coordinates on a survey mean?

There are several types of coordinates commonly seen in Ontario. The first is the standard longitude-latitude system, but be aware that some may be denoted in decimals while other in degrees/minutes/seconds. They can be converted at Degrees Minutes Seconds to/from Decimal Degrees | Federal Communications Commission (fcc.gov)

The other common coordinate system is Universal Transverse Mercator (UTM). It projects local areas onto a Mercator map, making it suitable for surveying. Each coordinate starts with a zone code (like 17N) followed by eastings and northings towards the reference point of that zone.



(Picture credit - https://tmackinnon.com/)

Where can I learn more about GIS?

A series of relatively affordable online courses offered by the University of Toronto can be found on Coursera: https://www.coursera.org/specializations/gis-mapping-spatial-analysis at an approximated cost of $180 assuming completion within 3 months.

ESRI GIS Resources - https://community.esri.com/t5/esri-training-documents/esri-mooc-program-available-courses/ta-p/906931

YouTube Resources

ArcGIS Pro Quick-Start Tutorials - https://www.youtube.com/watch?v=soBtBP6aZ60&list=PLGZUzt4E4O2IJFxX_Bhp98MJEw5ItRtvb

ArcGIS Pro: Tips and Tricks - https://www.youtube.com/watch?v=Y_o4D5Z4nB8

ArcGIS Pro: Mapping and Visualization - https://www.youtube.com/watch?v=pcuypggs0yY

How to Create a polygon in Google Earth Pro - https://encounteredu.com/cpd/subject-updates/how-to-create-a-polygon-in-google-earth-pro

How to Organize, save and tour placemarks in Google Earth Pro - https://encounteredu.com/cpd/subject-updates/how-to-organise-save-and-tour-placemarks-in-google-earth-pro

Geography Awareness Week and GIS Day

Every November, organizations, educators, and GIS professionals get together to celebrate Geography Awareness Week and GIS Day. These celebrations focus on the importance of geography and the use of mapping to understand issues in our interconnected world.

In 2023, the theme of GIS Day in Canada "Celebrating the GIS Professional" highlighted the contributions of Canadian GIS users working to create a positive change in their communities through geospatial approaches. Here are some of the amazing projects that happened across Canada:

- (Interactive Map) York Region Child Care Program Finder
- (Interactive Map) Indian Residential School Mapping Application and Historical Air Photos
- (Real-time Updates) Trailblazing with GIS: A 38-Day Hike from Adirondacks to Algonquin Park

These projects' keys to success include the sharing of accurate and relevant data, cultivating a digital mindset with staff and partners, and implementing the Government of Canada's digital standards throughout the project phases.

*OLTA is not affiliated with any external resources aforementioned.