FIRST NATIONS LAND MANAGEMENT RESOURCE CENTRE

GIS – FREQUENTLY ASKED QUESTIONS

GIS research

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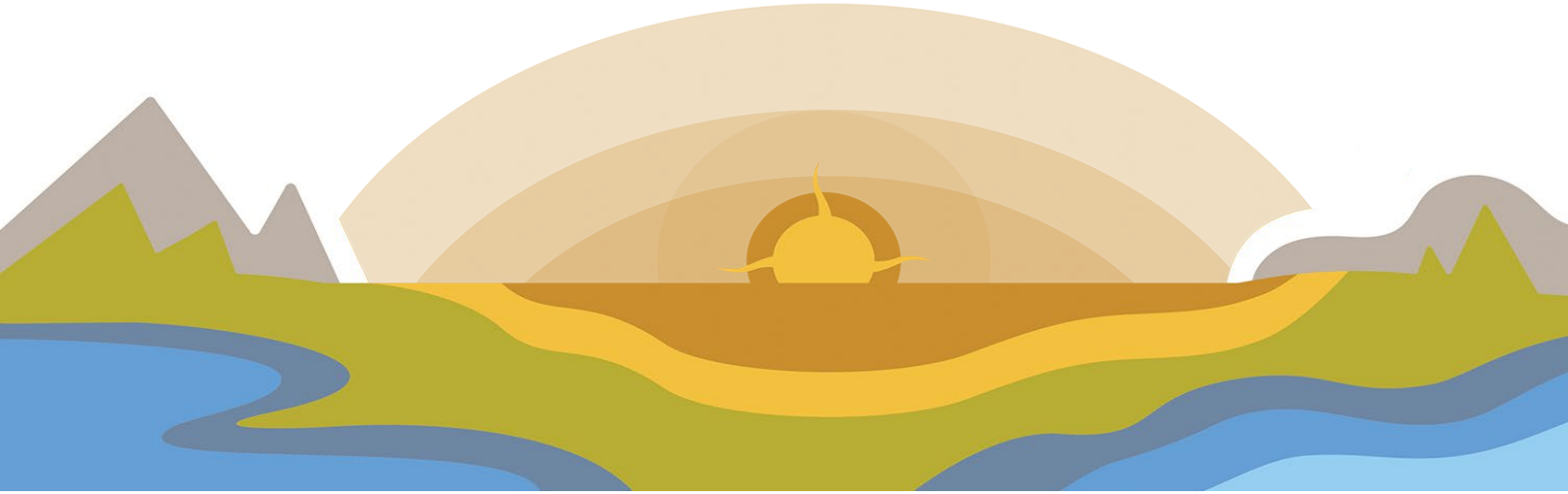

Disclaimer: This document is designed to be a quick reference to answer some of the most frequently asked questions. We have summarized key information and included relevant links to assist you in further research.

Credit for the following software related answers must go to the companies that sell the software, the GIS gurus and the people who like to share their successes online. These sources are cited within the document for your reference.

Geographic Information Systems (GIS) can be a powerful tool for Land Governance under the Framework Agreement. It can serve as a database for Lands-related information, a tool for creating maps, other data visualizations relevant to Land Governance decision-making and can assist in conducting Lands-related planning.

"Most of the Geographical Information System (GIS) questions that the RC receives surrounds capacity building, available software, top GIS software, the differences between software types, and how to use Google Earth Pro plus other various tools." While the Resource Centre cannot make specific equipment or software recommendations, we can assist in identifying best practices that may work for a First Nation's land code governance needs.

Building Capacity

The Resource Centre cannot assist in funding your GIS endeavors, but rather can assist in determining what components should be considered for building capacity, if you choose to budget for and maintain a GIS office, with the tools, equipment and of course the technician to operate it.

1. Research online for opportunities to apply for GIS/Governance grant funding, to manage your electronic land management and data files for e.g. GIS mapping layers like land use planning data. Regional funding opportunities are posted online with detailed access protocols, which include a budget template. See the Source page for a couple of Grant Funding Opportunities in Canada.

2. When there is a mapping component within your annual budget or land governance proposals, you can add a line item in the budget a percentage to put towards your GIS software/hardware.

3. If a staff/community member is interested in learning GIS, they could job share with the GIS contractor, to develop and strengthen their skills to help your community to achieve the goal of acquiring a GIS office.

4. Where there is a choice of free software or proprietary software, it's best to know that nothing is ever free and the time it takes your GIS Technician to customize the free software to your organization's specific needs, could equal or exceed the cost of the proprietary software. One advantage of customizing the software is this will always start with your community's design, mapping standards and symbology.

5. Networking about GIS with other communities promotes learning and collaboration opportunities on areas of common interest and knowledge sharing that can lead to learning new practices or techniques and improve existing skills.

Most Common Esri Software Questions

What does Esri stand for? What is Esri?

Environmental Systems Research Institute (Esri) is a company that supply GIS software, web GIS and geodatabase management applications internationally. 46% of our signatories that participated in our GIS Survey currently use an Esri product.

What is a license or a software license?

A software license is needed when using a proprietary (vender or dealer) software and allows you to upgrade that purchased software on a annual maintenance plan.

What are some of the differences between Esri Single Use Licenses and Concurrent Use Licenses?

Single Use Licenses

A single use license generally restricts use of a software product to one user/machine that has rights for the software, data, or documentation. A single use license is sometimes referred to as a "node-locked license," but single use is the preferred Esri terminology.

Concurrent Use Licenses

A concurrent use license allows multiple users to gain access to the software from any computer on the network on which the software is installed. A license server manager administers a pool of licenses to be shared. The number of concurrent licenses determines the number of users who can run the applications at the same time. A concurrent use license is not locked to a single computer and, as such, can float on a network. This is sometimes referred to as a "floating license," but concurrent use is the preferred Esri terminology.

(You will find the detailed answer in a PDF report from 2010 at https://www.esri.com/library/whitepapers/pdfs/arcgis10-licensing.pdf)

What software allows the organization to share maps, data, tools and how?

ArcGIS Server

ArcGIS Server is software that makes geographic information, such as land based and land uses, within an organization and can also enable sharing of the geographic information outside of the organization too. This is accomplished through web services, which allow a powerful server computer to receive and process requests for information sent by other devices. You can develop your own web or desktop applications that will access the ArcGIS Server services. ArcGIS Online is a bit like a CMS (Content Management System) for web mapping.

ArcGIS Server supports the leading enterprise database management systems (DBMS): Oracle, SQL Server, DB2, Informix, and PostgreSQL.

It is available on Windows or Linux servers on-site or in cloud configurations. ArcGIS Server provides the core technology for implementing large-scale GIS in organizations and businesses worldwide.

What is the Cloud and what are cloud configurations?

The cloud is an online way to store and access your data, photos, and other documents from any device you are currently using. "It is hardware and software service from a provider on the internet" quoted from PC_Mag Encyclopedia.
Cloud configurations are types of setup options for the user of the cloud to incorporate or customize to their preference. If you would like to share your documents, they can be stored on the cloud and you can assign password to allow access.

What is ArcGIS Online?

Arc GIS Online is a complete cloud-based, collaborative, content management system for working with geographic information. The ArcGIS Online platform is a key capability of ArcGIS and is leveraged throughout the ArcGIS system. Anyone can use ArcGIS Online to find, create and share maps by visiting the www.ArcGIS.com website. This website provides free access to authoritative maps (your own maps) and data published by Esri, its partners and the GIS community. Anyone can log in and create their own web maps by mashing up this data with beautiful built-in base maps, loading their own data in from files and spreadsheets, or creating features using drawing tools.

Are there security issues with ArcGIS Online?

ArcGIS Online is a reliable, secure geographic information system delivered using the Software-as-a-Service (SaaS) model. ArcGIS Online is built using secure design principles, Esri's security strategy is based on an industry-standard, defense-in-depth approach that provides security controls at every level, for every user, including the application, network, and facilities. In accordance with Esri's security principles help ensure that 'ArcGIS Online' provides confidentiality, integrity, and availability of data.

(Check this link out for more information: https://www.esri.com/content/dam/esrisites/en-us/media/pdf/G92578_ArcGISOnlineSecurity_Flr_4-18.pdf)

How do I find out what Esri tool to use when I do not know what it is called?

Using a GIS can be exciting, scary, fun, and confusing all at the same time! Even the most proficient GIS user can sometimes get nervous when first using new software or a new tool within a map. Many technicians keep more than one copy of maps and data files to ensure that they do not accidentally destroy the original "good" file when performing unfamiliar functions. Before using a tool or a GIS function, no matter what software you use, it is best to know what it can do and why you want to use it.

The "Help" section of any GIS software is the quickest way to find a tool, even if you are unsure of the name. Simply describe what you want to do, and the software will then give you some available options, and then you can decide which is the right tool for the job at hand.

Most GIS software come with huge manuals on what tools are available and this is great! However, most of the time, you may only need a quick answer or a heads up that this is even the tool that

you actually need. Quite often the time that it takes to find the exact tool you need is too long, especially when you are facing a deadline.

The data I received from my contractor does not overlay with my existing NRCan Data. Do I use Projection or Transformation as a tool to fix this?

Esri has a tool called Transformation which can transform any projection to another, make sure you know what projection it is in before you start. The only time you would use the Esri tool Projection, is when there is no defined projection to this new file.

If Transformation does not correct the problem, send your data back to your contractor and get them to put your data into a projection that you specify. You do not have to use their customized projections if their data does not overlay any of your existing layers.

I have a huge directory consisting just shape files which I need access to, but no longer have access to my Esri software. What software would you suggest opening the files with?

Shape Viewer

If you have a lot of shapefiles to browse quickly and you don't want to use expensive software such as ArcGIS or Map Info, then Shape Viewer® will be your choice.
Shape Viewer® is a free and light viewer, which can be used to browse and view shape files easily.

To download the zip file click here,
http://web.archive.org/web/20140407141623/http://www.qarah.com/shapeviewer/files/shape_viewer.zip
this needs Visual Basic Runtime files to work. https://sourceforge.net/projects/vb6extendedruntime/

If your database (.dbf or .shx) files are missing or corrupted, then you can use Shape Viewer® to generate new ones, so that you will not lose your spatial data.
You can associate (.shp) file type with Shape Viewer®, so that you can open any (.shp) file in Shape Viewer® by double-click the file in Windows Explorer.

Most Common Software Questions

Which GIS Software are the best?

When looking at top ten lists, best to research who put these lists together. If a proprietor or GIS company put the list together, of course their product will be on the top 10. The link here is from G2 a GIS research company who research all types of GIS software to help you with your software decision, they tend to be non-biased.

The Top 10 are

1. Esri ArcGIS
2. ArcGIS Online
3. Google Earth Pro
4. ArcGIS Pro
5. Google Maps API
6. Maptitude

7. MapInfo Pro
8. Surfer
9. QGIS
10. Collector for ArcGIS

G2 has also compiled answers to more common GIS questions such as:

- What You Should Know About GIS Software
- What is Geographic Information System?
- Who Uses GIS software?
- Why Use GIS software?
- GIS Features
- Potential Issues with GIS Software
- Trends Related to GIS Software
- Related Software Categories

(You will find more information at https://www.g2.com/categories/gis
Also visit the GIS Lounge under Learn GIS https://www.gislounge.com/about-gis-lounge/)

Are there free Software out there?
With any GIS software there is a steep learning curve. If you already have GIS capabilities, you will find most open source software require some setting up of menus, displays, and screens, before using the software. This is all pre-customization on your part, where a proprietary product, such as ESRI, sets the page, Layouts and Table of Contents up for you.
There are several open source options available, but the two that come to mind are QGIS 3 and Grass GIS.
QGIS 3(Quantum GIS3) is a sister project to GRASS GIS. ... They compliment each other well and you can even use the QGIS GRASS Toolbox to load in GRASS data directly and
run GRASS processing commands from the QGIS menus.
Whereas GRASS GIS focuses more on data processing and analysis, QGIS 3 focuses more on cartography and map making and is now in 3D.

(See complete list at https://gisgeography.com/free-gis-software/)
This link is very useful, it gives you ratings of each software and they illustrate why the ratings are given.
Can QGIS 3 work on a network?

The **Network** Analysis tools are now part of **QGIS 3** Algorithms. You can access them by activating the Processing Toolbox. These functionalities let you compute least cost paths and service areas (distance or time) taking into consideration your own network data.

What is the Difference between ArcGISPro and QGIS?
ArcGISPro features are as follows:

- Commercial Software-Starting at $12,000 with 10% every year maintenance costs. Tools and extensions are extra for a single user license. Concurrent Licenses will depend on how many users will be using the software within your organization.
- Responsive and helpful technical support for that 10% cost.
- Start-up programs available, free 21-day tutorials to try it out.
- Brings native 64 Bit support up from 32bit

- Extensive range of analytical tools available via toolboxes (basic to advanced depends on what you purchased)
- 2D and 3D views within the same software package, you may need 3Danalysis toolbox.
- ArcGIS Online interactive web maps and Story Maps allow multiple users to access making this a preferable option for communication to cross country organizations.
- Slicker more modern interface
- Online Living Atlas and enhanced data functions
- Bottomline – ArcGIS-PRO is best when time is money (no customization involved), and the benefits of ESRI's online services justifies the initial software expense.

QGIS 3 Features are as follows:

- Completely free and open source.
- Active user community for support (no maintenance costs), just google your problem and you will find someone else who has encountered the problem and posted the fix online.
- Paid support contracts are available if the issue is not resolved.
- Brings native 64-Bit support.
- Extensive and broader range of analytical tools available via base install, GRASS, SAGA and plugins. Both available as standalone and plugin to QGIS3 programs.
- 2D and 3D capabilities, clunky but development is underway to fix this.
- Open source gives ability to modify your menus, setup your specs and develop tools yourself.
- Bottomline – Best for most users who want powerful tools for spatial analysis (GRASS) and visualization with minimal cost. Time will be used to customize the software to the user's preference.

(GIS Geography has performed some awesome research on this exact same subject. Full answer found at this site https://gisgeography.com/qgis-arcgis-differences/ or on YouTube https://www.youtube.com/watch?v=49QydETVNwg)

Training Opportunities

A majority of training opportunities will depend upon the software that you are using and the best practice is to get trained on the program you have invested in. Most of the proprietors offer training on their software, which may appear costly, but they will cover the necessary basics and give you the manuals during the course.

Taking the online courses also has benefits for your GIS employee as they can learn on their own schedule.

There are numerous manuals available for GIS. Here are a few different software links to download some manuals:

https://researchguides.dartmouth.edu/gis/manuals
https://desktop.arcgis.com/en/documentation/
https://www.gislounge.com/arcgis-10-manual/
https://grass.osgeo.org/learn/manuals/

Create Building Locations

I have been asked to create a point file of our existing building locations and unit numbers, for our emergency plan, which will be shared with our Regional District. How do I go about doing this, I do not have GIS software or any mapping experience?

1) Print a hard copy map of the area you will be working on.
2) Take a GPS unit or Pad and Paper and drive to this location.
3) Start gathering/manually recording building locations and noting the unit number. Record full address Unit#, Sample Ave, Reserve Name. For example, 4232 Mighty Thunder Road, Your Reserve #1.
4) Once all your buildings (houses, industrial, schools, rec centers, parks etc.) have been recorded, download the information from your GPS unit to your main computer in a format that is compatible with your GIS software.
5) If no GPS and all this information is on paper map skip to #7.
6) If no GIS software, use Google Earth Pro to get your points recorded on the reserve they pertain to.
7) Refer to our Google Earth-Pro download instructions on our LABRC Website FNLMRC Google Earth Instructions this booklet shows you how to put points, lines and polygons on a map.
8) Save your points (building location layer) to your hard drive.
9) You can send the "KML" file to your Regional District or local municipality, they can import in a format that works with their GIS software.

SOURCES are hyper linked

BUILDING CAPACITY INITIATIVE GRANT

MEMORIAL UNIVERSITY DATA MANAGEMENT GRANT FUNDING

ESRI LIBRARY

ArcGIS ONLINE

SHAPE FILE VIEWERS

VISUAL BASIC RUNTIME

G2 (AKA GEOGRAPHY TOO)

GIS GEOGRAPHY

DARTMOUTH UNIVERSITY

ESRI MANUALS

GIS LOUNGE ArcGIS Manual

GRASS GIS

FNLMRC Google Earth Instructions

COMMON GIS TERMINOLOGY

GIS	-Geographic Information System.
CMS	-Content Management System.
DBMS	-Database Management System some examples include MySQL, PostgreSQL, Microsoft Access, SQL Server, FileMaker, Oracle and dbase4.
POSTGRESQL	-open source relational DBMS that uses and extends the SQL Language.
OPEN SOURCE	-denoting software for which the original source code is made freely available and may be redistributed and modified.
QGIS	-an official project of the Open Source Geospatial Foundation, Q stands for Quantum.
MAP PROJECTION	-representation of the globe on a flat surface, transferring a 3d area to 2d.
PROJECTION Tool	-giving a latitudes and longitudes to a digital layer that sits in limbo.
TRANSFORM Tool	-systematically changing the latitude and longitude of the globe to locations on a plane (flat surface).
SAAS	-Software-as-a-Service this is a cloud-based software solution in which software providers deliver applications to users over the internet.
.SHP	GIS layer extension short for Shape file.
.SHX	GIS layer extension created by Autodesk and equivalent to aa AutoCAD file.
.PRJ	GIS layer extension and proves this file has been projected.

If you need further assistance in any of your GIS and mapping endeavors, please contact your FNLMRC GIS Specialist. She offers direct community support with GIS development such as implementing GIS, creating community GIS standards, advice, trouble shooting, digital data management and several suggestions towards Cultural & Heritage and Land Use Plan mapping.
Email: leeanna.rhodes@labrc.com