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What is GIS, and why use QGIS?

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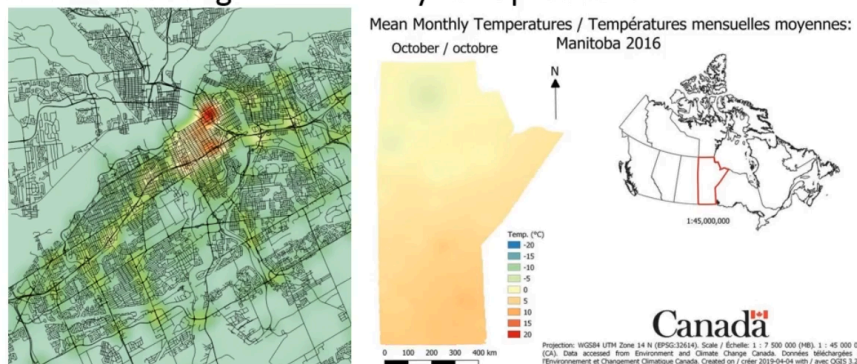
Issue number: 2019001

Release date: February 17, 2020

QGIS Demo 1

Why Use GIS?

- Powerful and versatile programs with diverse uses
 - Interactive tool for data analysis, integration and visualization
 - Convey information in an intuitive and accessible way
 - Derive new information by overlaying and combining datasets
 - Assess spatial and temporal trends or variable relations
 - Derive meaningful and timely data products



A heat map of traffic collisions (2017) in Ottawa (Left) and a time-series of mean monthly temperatures in Manitoba (2016) (Right).

▼ What is GIS, and why use QGIS? - Video transcript

(The Statistics Canada symbol and Canada wordmark appear on screen with the title: "Demo 1 - What is GIS, and why use QGIS?")

Hello everyone, I'm Alex Foster and I work as a data analyst at Statistics Canada. As the first video in our series, today I'll introduce what Geographic Information Systems - or GIS for short - are, discuss their relevance and their potential integration in your areas of work and expertise.

There are two items to cover. The first is some definitions and applications of GIS using spatial data. The second is to contextualize why we're using QGIS, an open-source GIS, for the tutorials.

These training materials are targeted for new GIS users with no formal training using GIS. So we'll start with foundational concepts and skills, and build towards more advanced applications and topics throughout. These skills and procedures can then be extended to datasets that are thematically relevant to you. We'll show you how with a few relatively easy steps you can get quite a lot out of GIS, and how you can integrate Statistics Canada and other public datasets to address challenges or tasks faced in your day-to-day work.

Geographic Information Systems, or GIS, are programs that can store, process, combine and visualize spatial data, which is any dataset with coordinate information used to position and render it within GIS.

So if you have ever used a mapping tool or GPS to find the fastest route between locations or looked at weather maps of a storm, shown in the figures below, you've interacted with GIS and geospatial data.

So why use GIS? Well GIS programs are powerful tools for data linking, analysis and visualization, enabling spatial datasets to be overlaid, integrated, and mapped in an interactive and multi-scalar format. As such, GIS is the go-to-tool for disseminating data, and is the industry standard for decision-making – informing disparate topics from targeting social and economic development programs and policies; to optimizing marketing, business and service deliveries; to improving environmental and land-use management practices. GIS has many uses from simple analysis and mapping to highly advanced functions,

scripting and modelling. We anticipate most uses of interest to new GIS users can be accomplished in a few easy steps - requiring little effort to get the most out of the data.

In general GIS can visualize multidisciplinary information in an intuitive and accessible format, which can be used to support and enhance documents, or act as a standalone product. You know, much like a picture is worth a thousand words, an interactive map is worth a thousand data tables in terms of interpretability and accessibility.

They can also be used to derive new information through overlaying and combining multiple datasets and variables and take advantage of finer resolution and frequency datasets.

The figure shows two visualizations I created in GIS. On the right is a heat map of traffic collision frequency in Ottawa for 2017 and on the left shows a time-series of the mean monthly temperatures across Manitoba in 2016. Both demonstrate the power of visualizing spatial data to convey information, and were produced using a few simple steps.

So why use QGIS? Well open-source GIS was traditionally restricted to technically trained users. Yet, technological developments have increased the immersion of GIS in our day-to-day lives, and made the software increasingly accessible and usable to new GIS users.

And this is epitomized by QGIS. As an open-source program it is free to download online with underlying codes also provided. It is advantageous as it emphasizes its graphical-user interface, resulting in an intuitive and easy-to-use program. It integrates its own toolset with those from other established open-source GIS such as SAGA and GRASS toolsets, as well as integrating user-created plugins, resulting

in diverse functionality. It also has a smaller installation size and computational requirements than other GIS programs. And the significant user-base provides rapid updates, plugins and patches for the program, which in conjunction with online documentation can be consulted to perform or parametrize a variety of functions.

QGIS has been significantly expanded and improved upon with its newest releases.

So let's go and download QGIS. Use the link provided in the video description or search online as I'm doing right now. [QGIS link](#)

There are two main options for download on Windows: the OSGEO4W Package and the stand-alone Installers. The first is best suited for advanced users, as it automates updates and avoids duplicating packages used by multiple GIS programs.

We will download the stand-alone installer of which there are two versions. At the time of recording there is v. 3.6 The Most Recent Feature Rich Release and the new long-term release v. 3.4.

To enable the most up-to-date functions and adopt the next generation of QGIS, we will download the newest long-term release – version 3.4 – which was released in February 2019.

For users with other operating systems, the stand-alone installers can be downloaded by expanding the drop-downs below.

Once downloaded, use the default installation settings – hitting Next until Finish.

Once installed, open the QGIS Desktop application from the Start Bar or shortcut. In the pop-up box we will select the Fresh Start, instead of importing settings from QGIS 2.

The download procedures can be reapplied as needed when updating the program.

Stay tuned for the next series of videos, where we will download spatial data, and start to work through a few different procedures - so you can begin to analyze and visualize data within the program, and create products relevant to you. In the next demo we will introduce the common categories and file formats of spatial datasets, as well as procedures for navigating and downloading these datasets from Open Maps, the integrated federal archive for storing and disseminating spatial data.

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Date modified:

2024-12-31