



Green in the City

Toronto, Ontario, Canada

Technical manual

Colofon

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Remote Sensing | Spatial Analysis lab, Universiteit Gent

Imagery

Landsat, USGS and NASA

Sentinel-2, Copernicus program, ESA



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QGIS

Download

QGIS (formerly QuantumGIS) is an open-source GIS software package. That means you can download and install the software for free from the [QGIS website](https://qgis.org). The most recent software version with which the workshop material was successfully tested is QGIS 3.22.15 **Białowieża** - LTR (Long Term Release). Because QGIS is regularly updated, we recommend that you install the most recent LTR version of the software*. Go to the QGIS website <https://qgis.org> and download the latest stable version (LTR) available for Windows or macOS.

Save the correct installation file in the *Downloads* folder.

Windows Installation

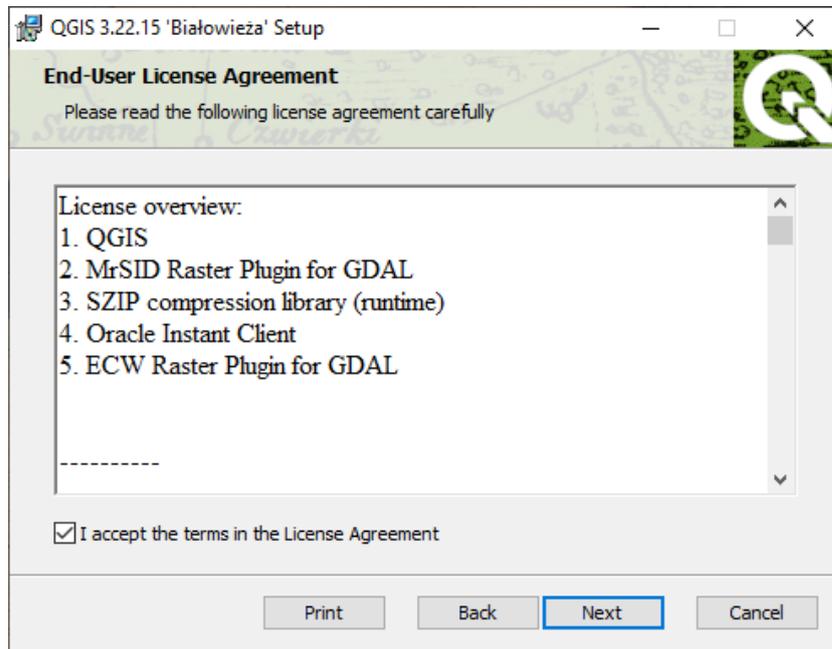
QGIS installation is very simple; just follow the instructions of the setup wizard. Start the installation by double-clicking on the installation file.

- 1) Setup wizard home screen. Click **Next**.

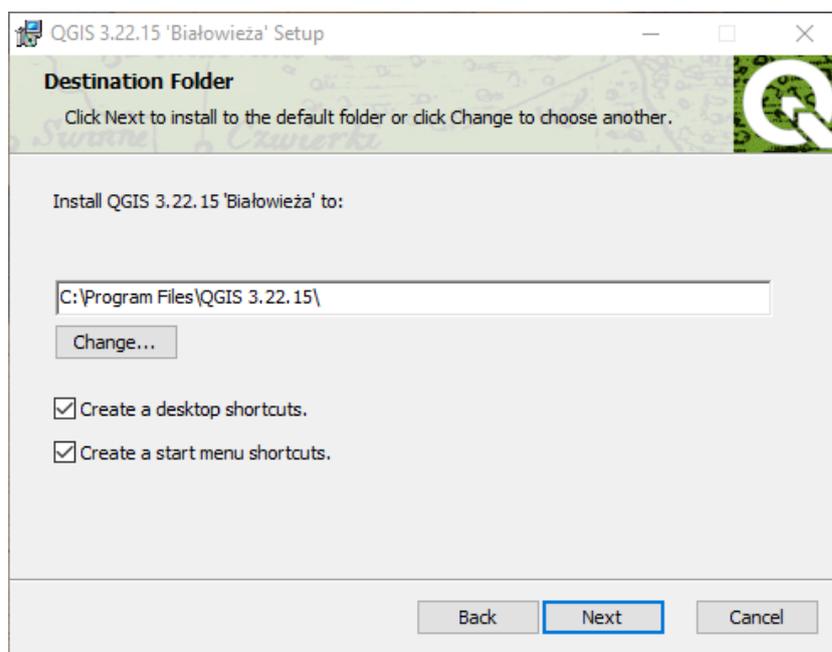


* Disclaimer: when working with a more recent version of the software it is possible that one may experience small changes in the appearance or in the functioning of the user interface compared to what is shown or explained in the tutorial.

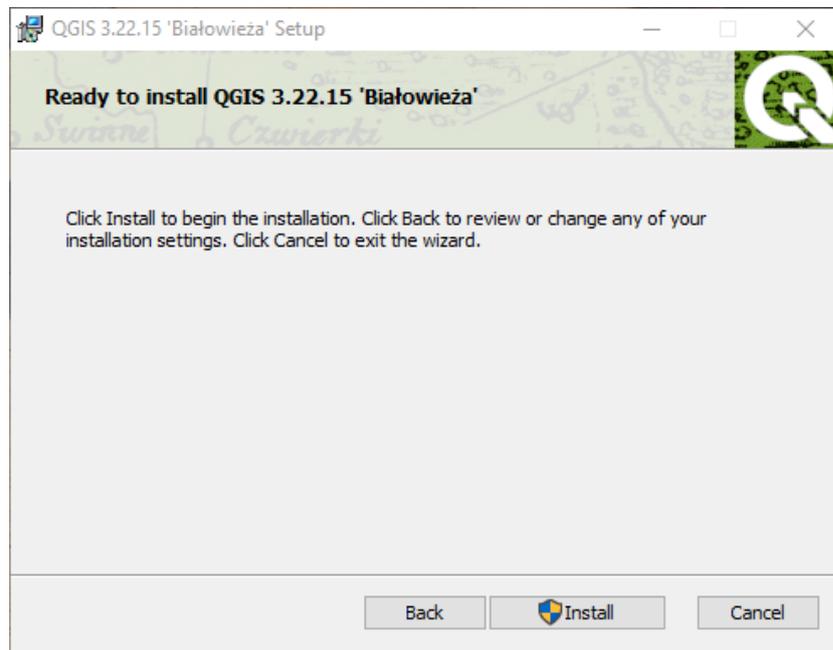
- 2) Software license agreement. Accept the terms of the License Agreement and click **Next** to continue.



- 3) This step determines the folder in which you will install QGIS. The default setting for the installation location is **C:\Program Files**. Keep the specified default setting. Check both boxes to create a desktop and a start menu shortcut. Click **Next** to continue.



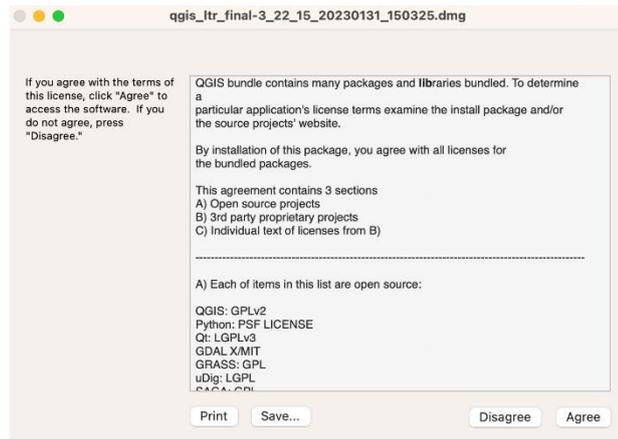
- 4) The wizard is ready to start the installation. Click **Install** to begin. The wizard now extracts all the Toronto to the specified installation location. When the installation is complete, click **Next** (this may happen automatically).



- 5) After the installation is complete, you will need to restart your computer before you can start using QGIS.

Mac Installation

- 1) QGIS installation is very simple, just follow the instructions of the installation wizard. Start the installation by double-clicking on the installation file.
- 2) Setup wizard home screen. Click **Agree**.



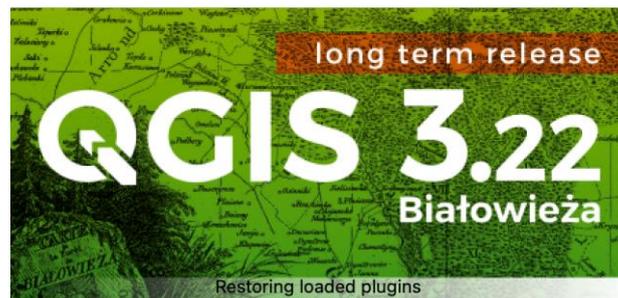
- 3) Once the installation is finished, you should click and drag the package into the "Applications" folder. This may take some time.



Start up

 To start QGIS, double-click the QGIS shortcut on the desktop. QGIS will then open, but without the data layers you need for the workshop. Before you get started with the workshop, you should prepare your PC/laptop and QGIS for use. This is explained on page 10.

 On Mac, QGIS is started from the **Applications** folder (via the Finder). Again, before you can get started with the workshop, you need to add the data layers.



REMEMBER!

At this point the software is installed and opened, but you are not yet ready to start the workshop. Read on and follow the next steps to prepare the data you will work with and to install the custom user interface settings for QGIS.

PREPARING FOR THE WORKSHOP

Downloading the data

Before you can start the workshop, you must first download the project data files. Start by creating a folder for your project where you will keep all the files. Give this folder a clear **name**. If you are working alone on the project, it could be your own name. If you are working on the project with other students, choose an easily recognizable name for your group.

Download the **Toronto-data** zip-file of the Green in the City project.



Right-click on this file and choose *7-Zip > Extract here*. Move the **Toronto-data** folder which you just unzipped from the “Downloads” folder to the **name** folder.



By default, files you download are placed in the “Downloads” folder. Double-click this file and save the **Toronto-data** folder in the **name** folder.

Be well-organized!



In *Windows Explorer*, go to the **name** folder and open it.



Go via *Finder* to the **name** folder.

In the **name** folder, create a new folder called **project**. Copy all the files in the **Toronto-data** folder into the **project** folder and use these files during the workshop.

Why? During the workshop session, it is possible that one or more files may be overwritten or edited (incorrectly). Don't worry if this happens – the original files will still be available in the **Toronto-data** folder and can be copied at any time to the **project** folder if necessary.

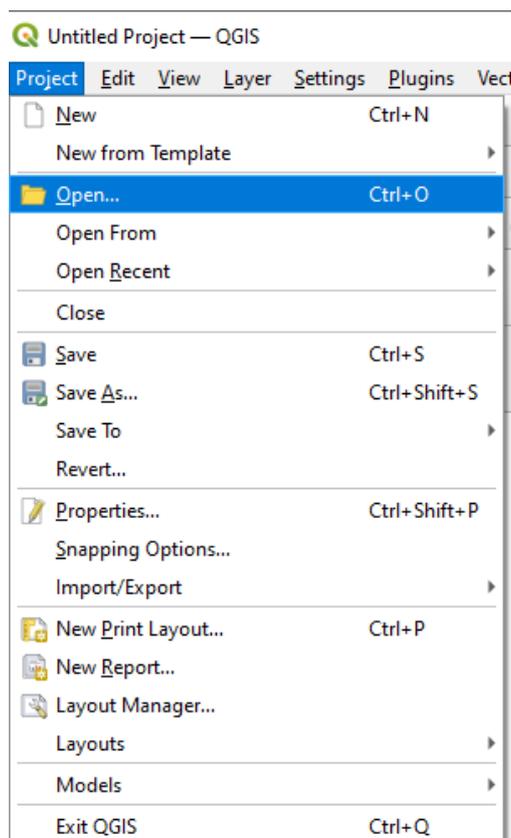
Tip for the teacher: if several students (or groups of students) work on the same computer (e.g. students from different classes), there is no need for each student (or group) to create a **Toronto-data** folder and a **project** folder separately. The teacher can then provide one **Toronto-data** folder per computer in which the original data is stored and from which the necessary files can be copied to the students' individual **project** folder. That way, the students do not have to download the files themselves, but only have to create a **name** folder with a **project** subfolder. The teacher or the students themselves can then copy the files from the **Toronto-data** folder to their individual or group **project** folder.

Preparing QGIS for use

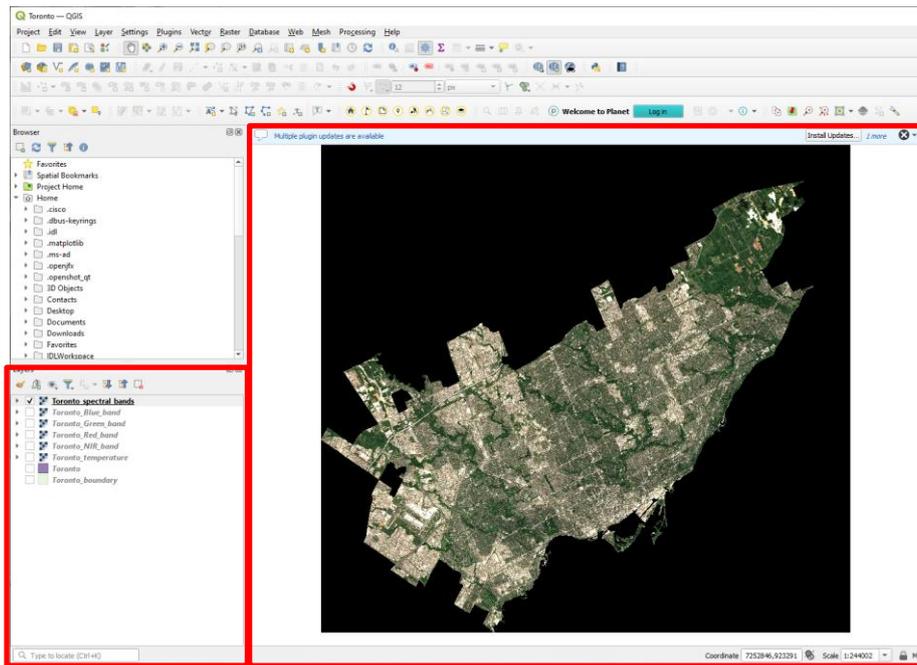
To prepare QGIS for use, you need to load the data files into the program. To do so, QGIS uses the concept of project files. A QGIS project file has the extension ".qgs" and contains all the information necessary to display, analyse, and manage geographic data within QGIS. A QGIS project file hence serves as a container that holds various components, such as layers, styles, symbology, map layouts, and other settings specific to a particular GIS project. When you open a QGIS project file, it restores the saved workspace configuration, including the loaded data layers, their properties, and their spatial relationships.

  The procedure and screenshots are the same for Mac and Windows.

The data files for this workshop are saved in the project file **Toronto.qgs**. To open the Toronto project double click on the **QGS Toronto** icon. The QGIS program will start and the Toronto project will be opened. Alternatively, you can load the existing project by first starting the QGIS program (see page 8) and then open the Toronto project.



When the Toronto project is opened, the loaded data layers are shown in the layers panel (bottom left) and the first layer 'Toronto_spectral_bands' is visualised in the map canvas.



layers panel

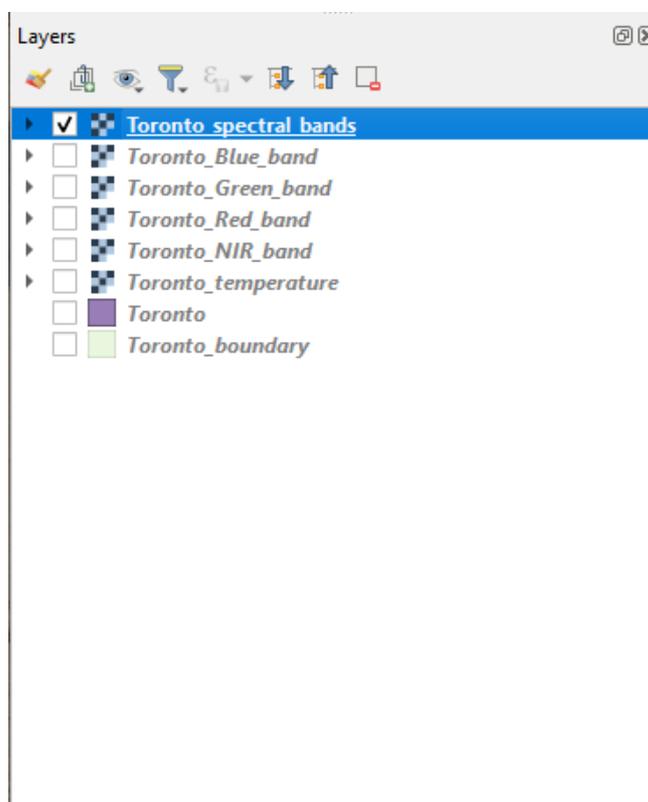
map canvas

Now the data layers are loaded, there is one more setting to adjust. The next paragraph explains what you need to do. This step will improve the ease of use of QGIS for the workshop.

Setting up the identification tool

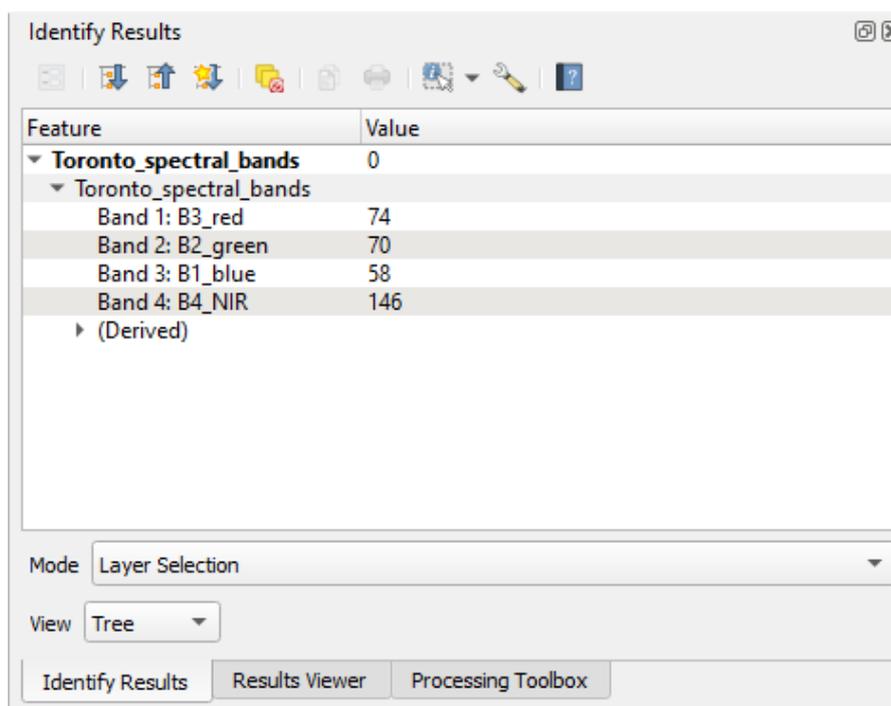
In the layers panel at the bottom left, uncheck all layers except the layer **Toronto_spectral_bands** and select this layer with a single click on the layer name (see figure below). Then go to the toolbar at the

top and click  to activate the **Identify Features** tool. Click on any location in the satellite image. A window will appear. If this window appears as a new **Identify Results** panel in the left column below or above the layers panel, grab this new panel by left-clicking on the panel title (hold the button down), and drag the panel out of the left column and release it. A floating window (instead of one that is fixed) is more manageable to work with. You can now move this window wherever you want.



To adjust the size of the window, grab one of the corners of the window and, when the mouse turns into a diagonal arrow, drag the corner until you reach the desired window size.

Now, at the bottom left of the window, you should adjust the **Mode** of the identification tool. by selecting **Layer Selection**. You will only have to apply this setting once.



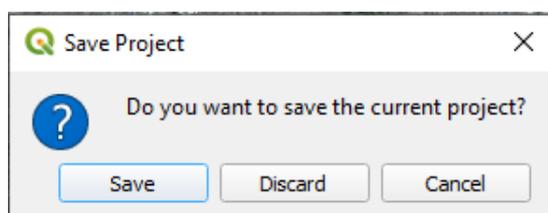
Shutting down: what next?

 When the workshop is over, close QGIS ()

 For Mac, click the red circle in the upper-left corner .

A window will appear asking if you want to save the project. If you have not made any changes to the project since the last time you saved the project, this window will not appear and QGIS will close immediately.

If you do not want to exit QGIS, click **Cancel**. If you do want to exit the session, click **Save** (changes will be saved) or **Discard** (exiting without saving changes).



How do you start QGIS if you want to continue working on your project later?

Go to the *project* workbook and double-click the file *Toronto.qgs*. QGIS will open and load all the layers as they were last saved in the project.