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Graphab for QGIS

User Guide

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Introduction

## About Graphab for QGIS

The *Graphab for QGIS* plugin is a tool that allows you to use the *Graphab[[1]](#footnote-1)*software on *QGIS[[2]](#footnote-2)*. This plugin integrates the basic functionalities of Graphab:

* Graphab projects visualization
* Graphs creation from a landscape map with an identification of habitat spots and links (Euclidean distance or least cost path)
* Metrics of usual connectivity calculation

But it also adds:

* Landscape map creation from rasters and vectors

## Authors

The *Graphab for QGIS* plugin has been developed by Robin Marlin-Lefebvre and Gilles Vuidel in the ThéMA laboratory (University of Franche-Comté – CNRS).

## Terms of use

The *Graphab for QGIS* plugin is available freely under GPL license. *Graphab for QGIS* users are invited to quote the reference below in their works:

« Foltête, J.-C., Vuidel, G., Savary, P., Clauzel, C., Sahraoui, Y., Girardet, X., & Bourgeois, M. (2021). Graphab : An application for modeling and managing ecological habitat networks. *Software Impacts, 8*, 100065. »[[3]](#footnote-3)

## Required configuration

*Graphab for QGIS* works on all computers that support Java 8 or more (PC under Linux, Windows, Mac…). Some functions can work without the need of Java.

Plugin installation

If needed, download and install Java[[4]](#footnote-4) 8 or more. Preferably install the 64 bits version of Java.

Once Java is installed, please run QGIS and go to the *Plugins* menu.



Then select the *Manage and Install Plugins…* option.



A window will open as following. If you are not on the *All* tab, select this one. Search for the term *Graphab* in the search bar, select the plugin and click on the *Install Plugin* or *Reinstall Plugin* button*.*



Landscape map creation

For this part, we will learn how to use the plugin using a simple example that contain a raster file and a vector file to create one landscape map.

To begin, make sure you have the *Graphab for QGIS* extension. Once the plugin installation done, you should have several buttons displayed on your toolbar. To use the module, it will suffice to use only one button .



## Load a raster file

A window must have opened. By default, we start on the *Layers* tab that contain two tables. We will first be interested in the left table with the *Rasters* label just above. As you can see there are buttons a little to the left of this label. On the start only  is activated. We will use this one to add raster files.



Once the button clicked, a new window will open that allows you to load a raster file of your choice with the ** button. Once the file loaded properly, a table below will activate with the raster unique codes.



The table contain two columns, the first one called *Code* is not editable and correspond of the codes found in the loaded layer. The second column *Final code* is editable and allows you to change the raster original code value. In the next example we delete the existence of code 2 by replacing it with a *nodata* value that we will see later and we replace the code 3 and 4 by the code 2 and 3.



We validate the changes by pressing  and we are back on our main window with the loaded file and a summary of it. Once the row selected, two buttons of the raster table are activated.



The  button allows you to edit the selected layer encoding by displaying the last window seen to load a raster. The last  button allows you to remove a layer in the table.

## Load a vector file

To load a vector layer the procedure is the same as for rasters. You have to press the  button above the second table with the *Vectors* label and a new window will open.



The window to load a vector file is a little more complex than the raster window. First of all, you have to load a file by clicking on the ** button which will activate the rest of the available options.



This window allows you to select the value used to rasterize your vector layer either by a field present in the layer or by a unique value. You also have advanced options like make all the pixels touch (useful for representing roads) or add a buffer with a size in meters.



Once the desired values ​​have been entered, press the  button and a new line in the vector table will be added. This summarizes the values ​​of the loaded layer. By selecting the layer new buttons will activate like  whose action is the same as the raster table one, it opens a window displaying the encoding of the selected vector file and allows you to edit it. Then the  button will display a window with vector options in order to edit them. So, the last button  allows you to remove a row of the table.

## Order the different layers

Once after loading multiple layers, it is important to be able to order these according to their encoding in order to have the desired landscape map. This is why to the left of all the tables you can find arrows like the following: , ,  or . These arrows are used to move a row of the table up or down and thus give priority to certain encodings which will be in the first position of the table.

Moving the layers in the raster and vector table allows you to do a rather general first sorting by moving the entire encoding of the same layer. Consider that the two tables are then grouped into a single table in the next tab and that the vectors have priority over the rasters by default.

When you have downloaded the desired layers in the correct order, you can go to the *Merge* tab.



In this tab you will therefore find all the different possible codes of the different layers. A **drag and drop** functionality is available to move codes. In addition, it is possible to select several lines at the same time using keyboard shortcuts. (Ctrl + click or Shift + click).



So, for each code we can see to which layer it belongs, what was its original value and its new value. The last column is editable if you want to change the final value of a code.

## Configure the output map

Once the ordering is complete, you can determine the output options for your landscape map. To do this click on the *Output* tab.



Most of the options are automatic, but be careful not all of them. For example, the choice of the resolution of a pixel is a default value.



For automatic values, there is the choice of the layer used for the extent of the output and the projection of the Coordinate Reference System (CRS) which is if possible the first of the loaded rasters or the first of the loaded vectors. A value indicating the number of total pixels of the output layer is displayed depending on the resolution and extent.



To finish with the output options, it is possible to indicate a path where to save your landscape map but it is not mandatory because the file is automatically loaded into QGIS on generation.



## Start the creation

Once you have completed the configuration steps, all you have to do is press the *Start* button at the bottom right and you will be redirected to the tab *Log* which provides information on the operations in progress with their output.





So, if all goes well your landscape map will be loaded into QGIS and displayed on the screen.



Some other features

In this part we will describe the functionality of some buttons and how to use them.

## Export or import a configuration

Using the buttons , it is possible to save your progress to reuse it later. The floppy disk allows you to save your progress in a JSON file and the file allows you to select a JSON file.

## Reset the window

The bouton  allows you to erase all entries made since you started using the OsRaster module. When you click on it, a window will ask you for confirmation in case this was not done on purpose.

Open a Graphab project

To open a Graphab project by the *Graphab for QGIS* plugin, you just have to click on the button .



Create a Graphab project

To create a Graphab project from QGIS you can click on the button  that will open you a Graphab project creation window.



Create a link set

For creating link sets on an already existing project, you can click on the button .



Remove a link set

For removing link sets from an already existing project, you can click on the button .



Create a graph

To create graphs on an already existing project, you can click on the button .



Remove a graph

To delete graphs on an already existing project, you can click on the button .



Create a corridor

To create corridors on an already existing project, you can click on the button .



Calculate a local metric

To calculate local metrics on an already existing project, you can click on the button .



Calculate a global metric

To calculate global metrics on an already existing project, you can click on the button .



Change the symbology

To change the symbology of an already existing project, you can click on the button .



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Use the latest version of the plugin in development

*Graphab for QGIS* has a Gitlab repository which may be a newer version than the plugin downloadable from *QGIS.* So, in order to be able to use it, you will have to go to the repository *Gitlab MSHE[[5]](#footnote-5)* of the project to be able to download the ZIP archive.

## Download

Once on the main page of the Gitlab repository, you can download the plugin directly as a ZIP file via the tab  in top right.



## Installation

To continue, please run QGIS and head to the *Extensions* menu.



Then select the option *Install/Manage extensions*.



A window will open as follows. If you are not on the *Install from ZIP* tab, select this one.



To complete the installation, simply click on the button **, select the ZIP you downloaded and click on the *Install plugin* button*.*



1. <https://sourcesup.renater.fr/www/graphab/download/manual-2.6-en.pdf> [↑](#footnote-ref-1)
2. <https://www.qgis.org/en/docs/index.html> [↑](#footnote-ref-2)
3. <https://doi.org/10.1016/j.simpa.2021.100065> [↑](#footnote-ref-3)
4. <https://adoptopenjdk.net/> [↑](#footnote-ref-4)
5. <https://gitlab-mshe.univ-fcomte.fr/thema/graphab4qgis> [↑](#footnote-ref-5)