

# An Introduction to Geographic Information Systems

# An introduction to QGIS

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## Search MOOC



## Video



# An introduction to QGIS

## Objectives of the lecture

- To get familiar with the bases of QGIS, the GIS software we will use throughout the lecture

## After this lecture you should be able

- To manage a QGIS project, to import and export data, to manipulate the projection systems and the symbology, and to produce maps

An introduction to Geographic Information Systems

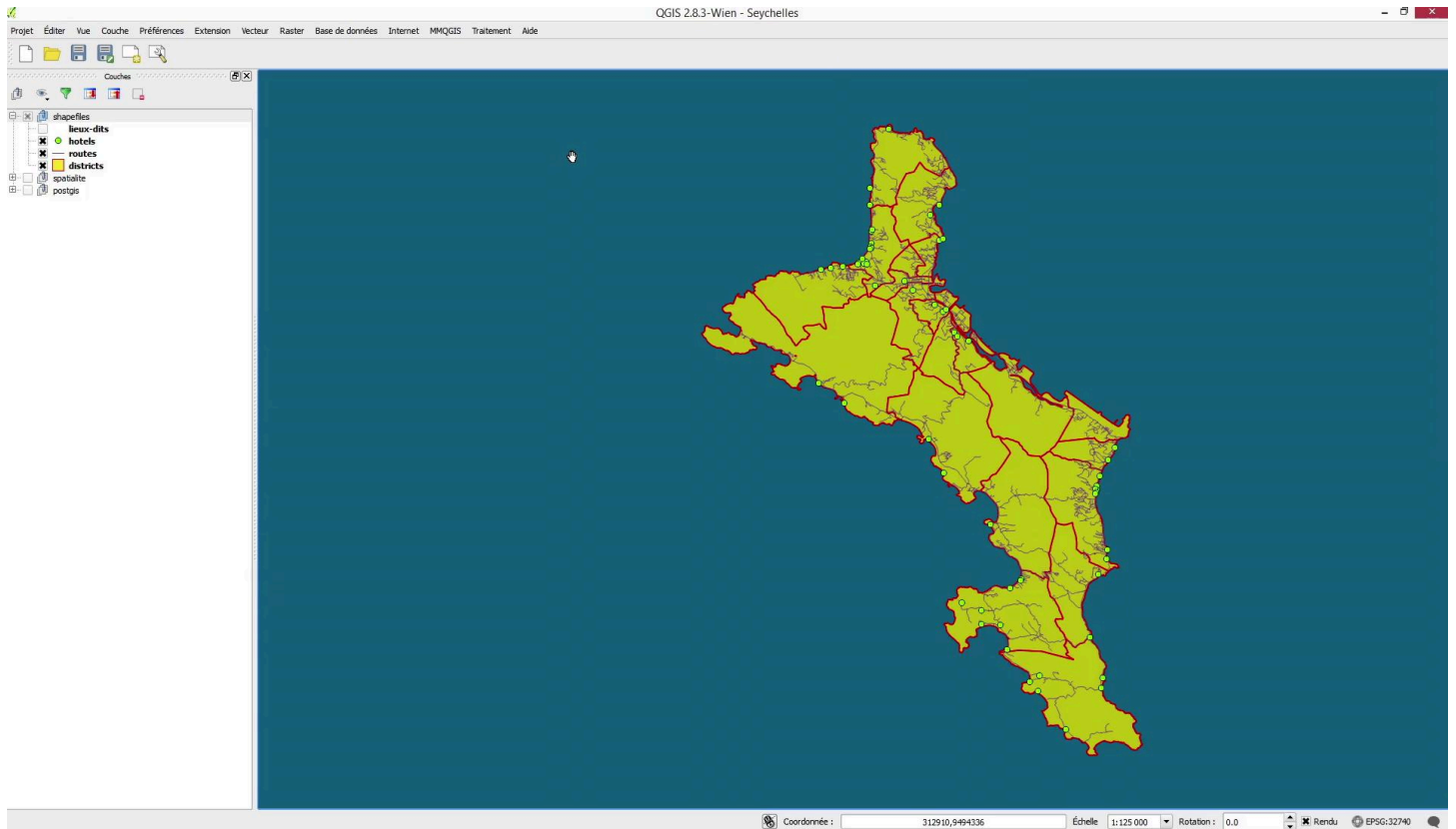
Welcome to this introduction course on QGIS. QGIS is a free software downloadable for free on internet that we will use throughout this MOOC. As you have noticed, this MOOC includes a number of special lessons excluding the table of contents, lessons that are either about QGIS, the GIS software that we will use throughout the course, or about case studies which illustrate some aspects presented as part of the theoretical course.

Notes

Summary



0m 24s



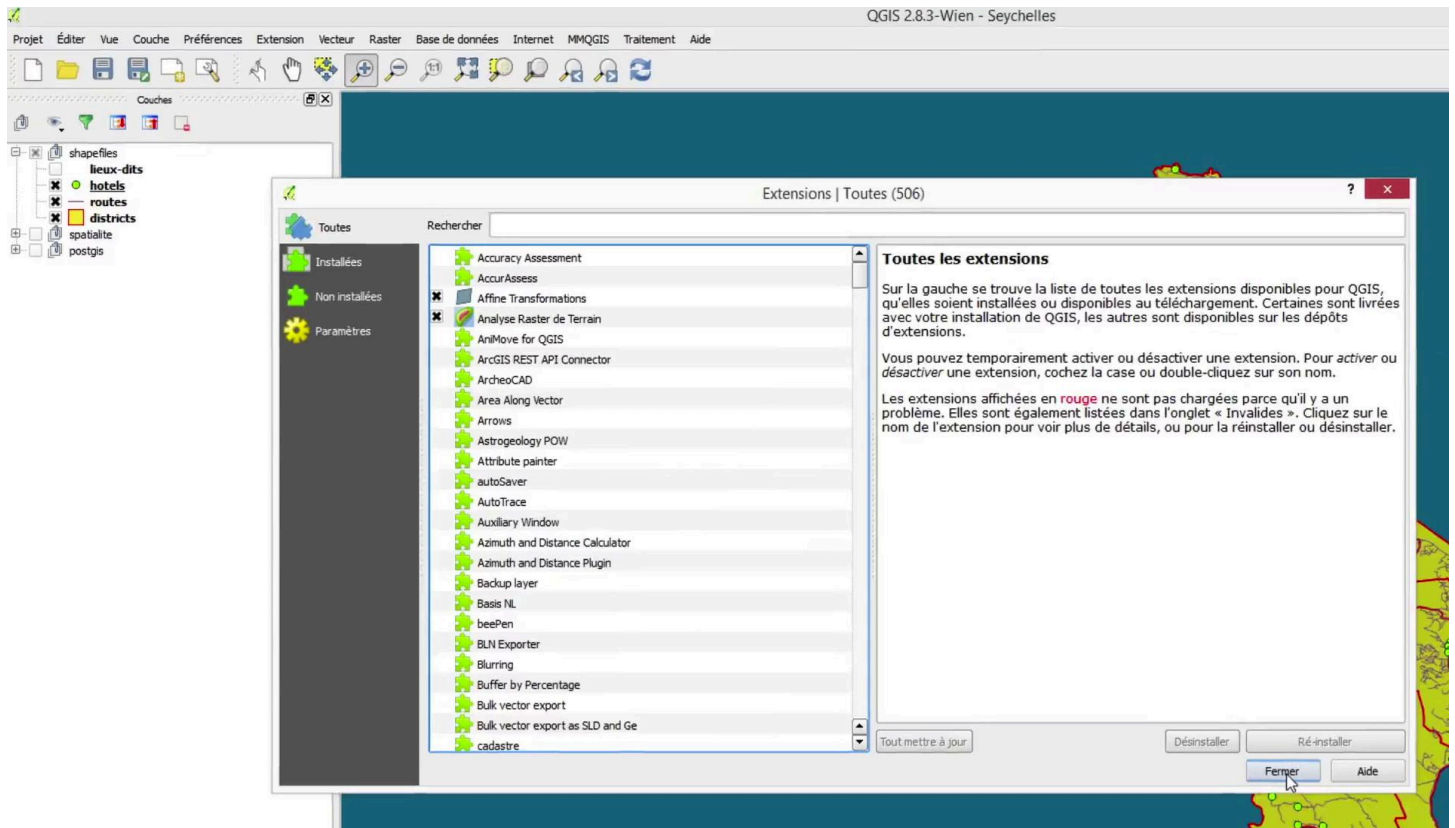
The first of these special lessons is an introduction to the use of the QGIS software and aims to become familiar with the most basic foundations of this software. at the end of the lesson, you should be able to to manage a QGIS project, import and export data, manipulate the projection system, the symbology and the card manufacturing process. In this lesson, we will address successively the elements of the interface, the management of projection systems, the data management aspects, the symbology and finally, card printing. Here is the QGIS interface in which a project about the island of Mahe in the Seychelles was opened. This interface includes a map area, a menu area, an area with toolbars, a number of side panels and a footer. The mouse allows you to manipulate the map directly by moving it to the left and to the right and with the wheel, to activate the zoom function.

Notes

Summary



0m 54s



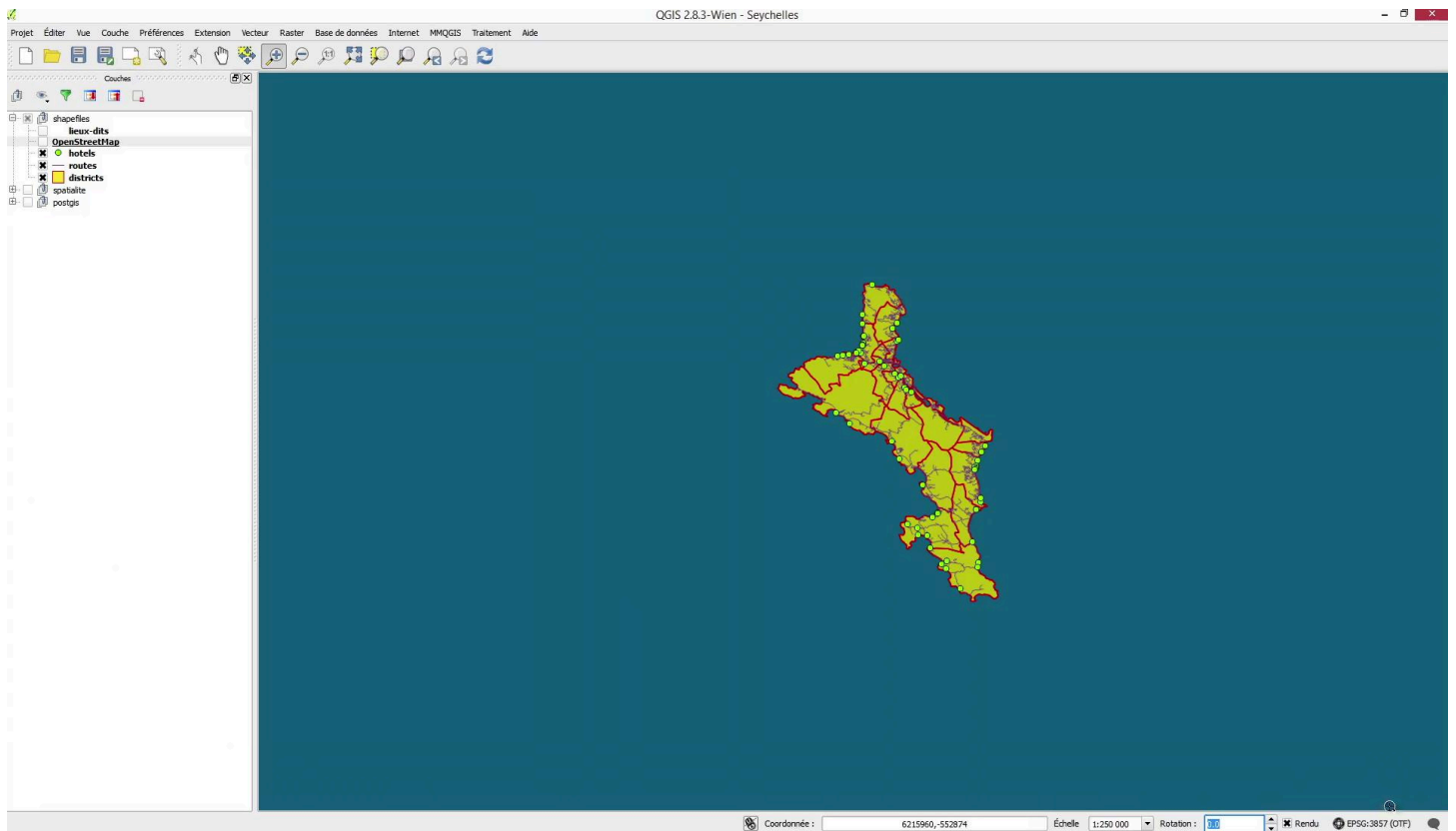
The information is structured into projects which are accessible through the appropriate menu, so we can re-open a recent project, which is what I did earlier to load the project we have before us, and we find these same features in the corresponding toolbar, this toolbar can be detached and reinserted in the interface, same thing for the side panels, here the layer management panel which allows to mask or display the different layers and to manage their superposition, the layer of districts is moved here above the others and we lose it on the way. Here it is again. And so like the toolbars, these side panels can be unhooked and put back in their place in the interface. The "view" menu allows to manage the display of the various side panels or toolbars. Here we activate the toolbar called "map navigator", which provides a number of tools intended to facilitate navigation, here a zoom tool which allows you to select a sector and zoom in on that sector. The reverse tool, of unzooming, is the navigation tool between the different successive zooms. The QGIS basic functionalities can be enhanced by extensions that are very numerous.

Notes

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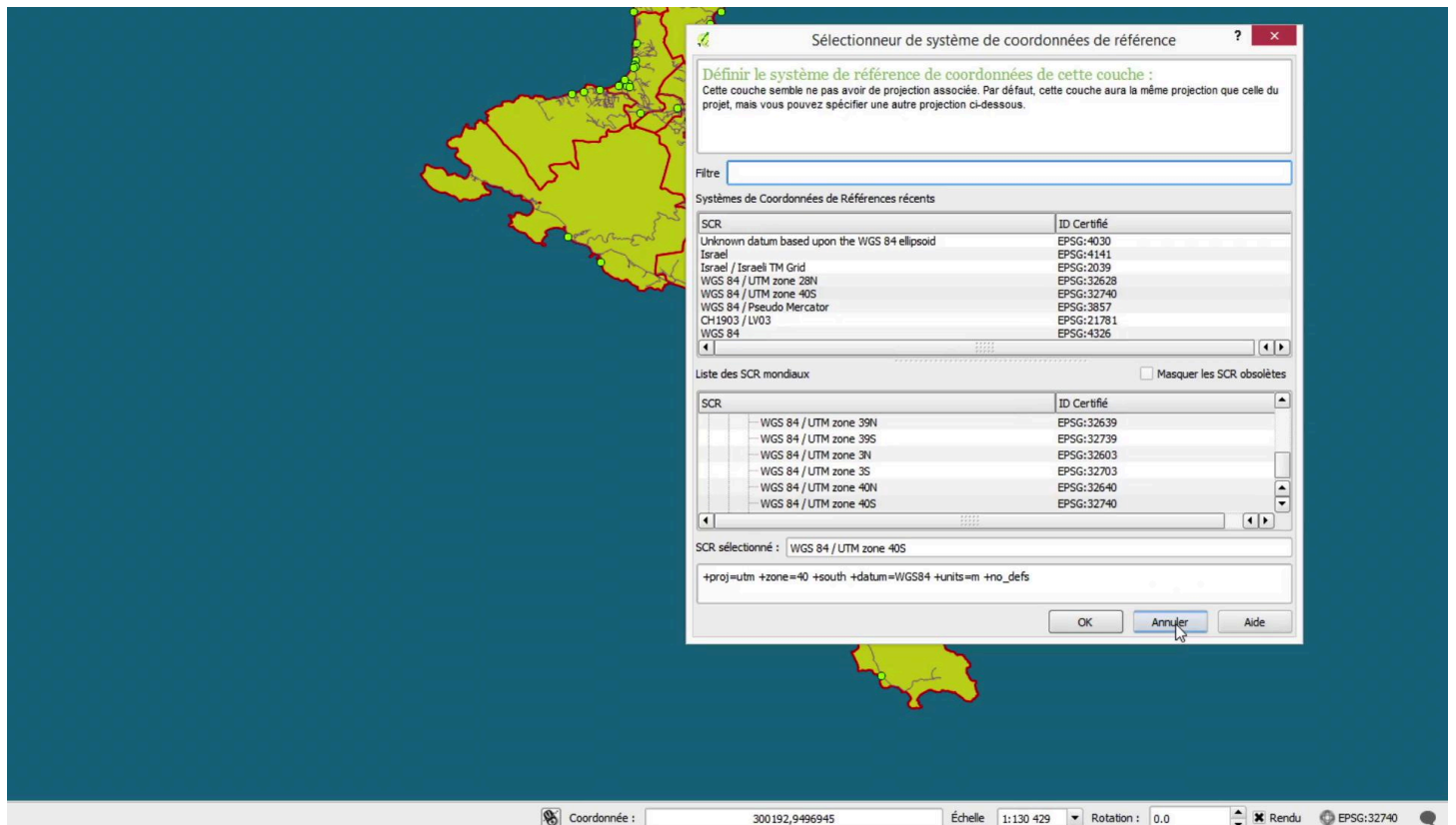
An example of these extensions is the Open Layers plugin that allows to add maps from the virtual globes, here the Open Street Map for the island of Mahe in the Seychelles. The footer includes the display tool of the mouse coordinates or the grip of the map, the management of the scale, if we go to 50'000 then back to a scale of 250'000, the possibility to change the orientation of the map and finally a zone in which the possible messages of the software are displayed.

Notes

Summary



3m 41s

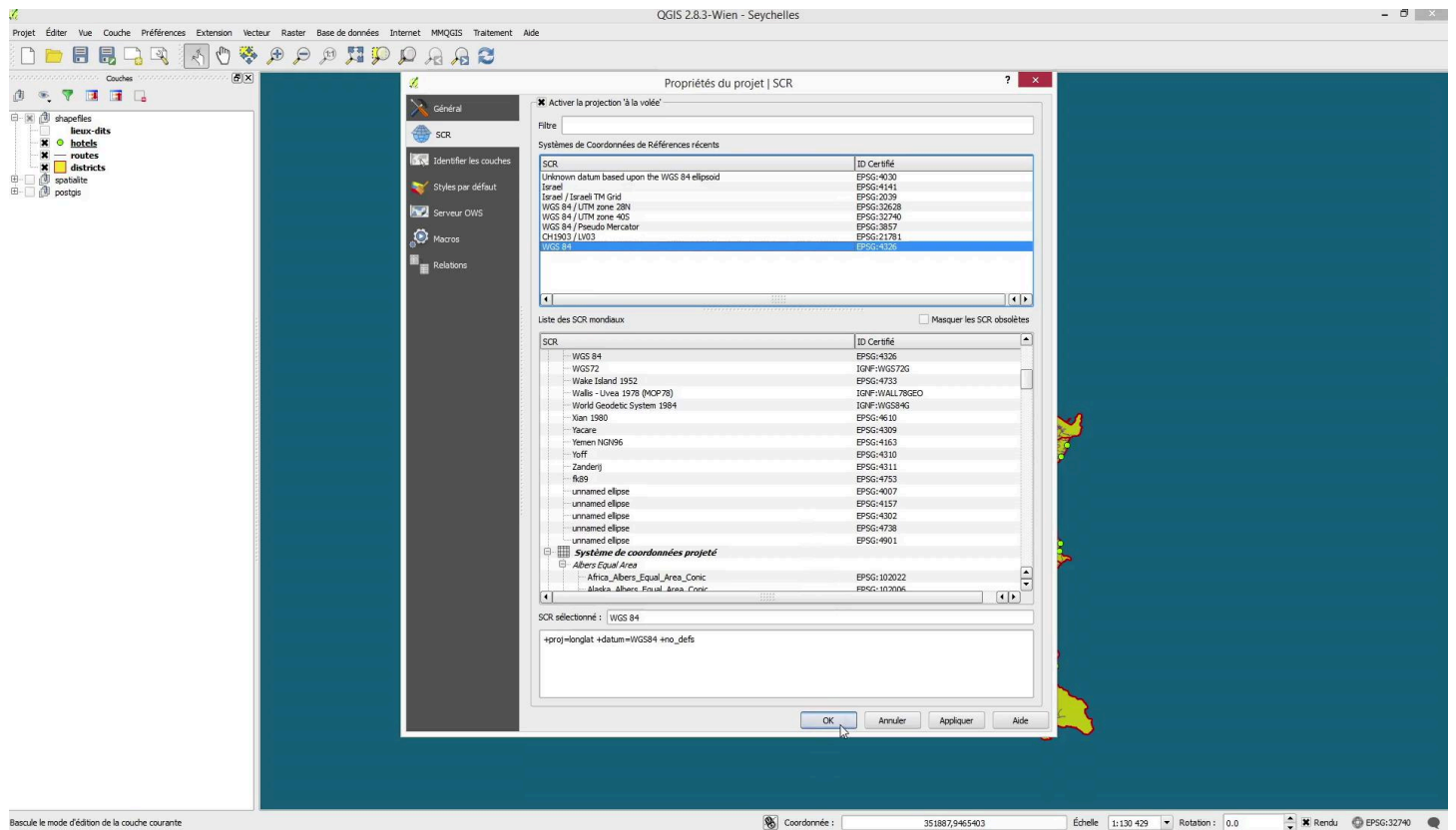


We will see in the second lesson of this course that the various objects which we wish to integrate to a geographic information system must be positioned on the surface of the globe, which can be done with their longitude latitude coordinates, or when the surface is projected in a cartographic space-map by their coordinates x y. Geographical information systems must therefore allow to define and manipulate the projection system attached to a data set. We will now see how these elements are organized in the QGIS software. By right-clicking on a data layer, you can access the properties of the layer and among these properties, under the general tab, we will find the projection system used, here UTM 40 South. When the projection system is not yet defined, it is possible to use the definition function which offers a wide choice of projection systems, which allows to filter them by name or by EPSG code, the meaning of which we will see in lesson 2.

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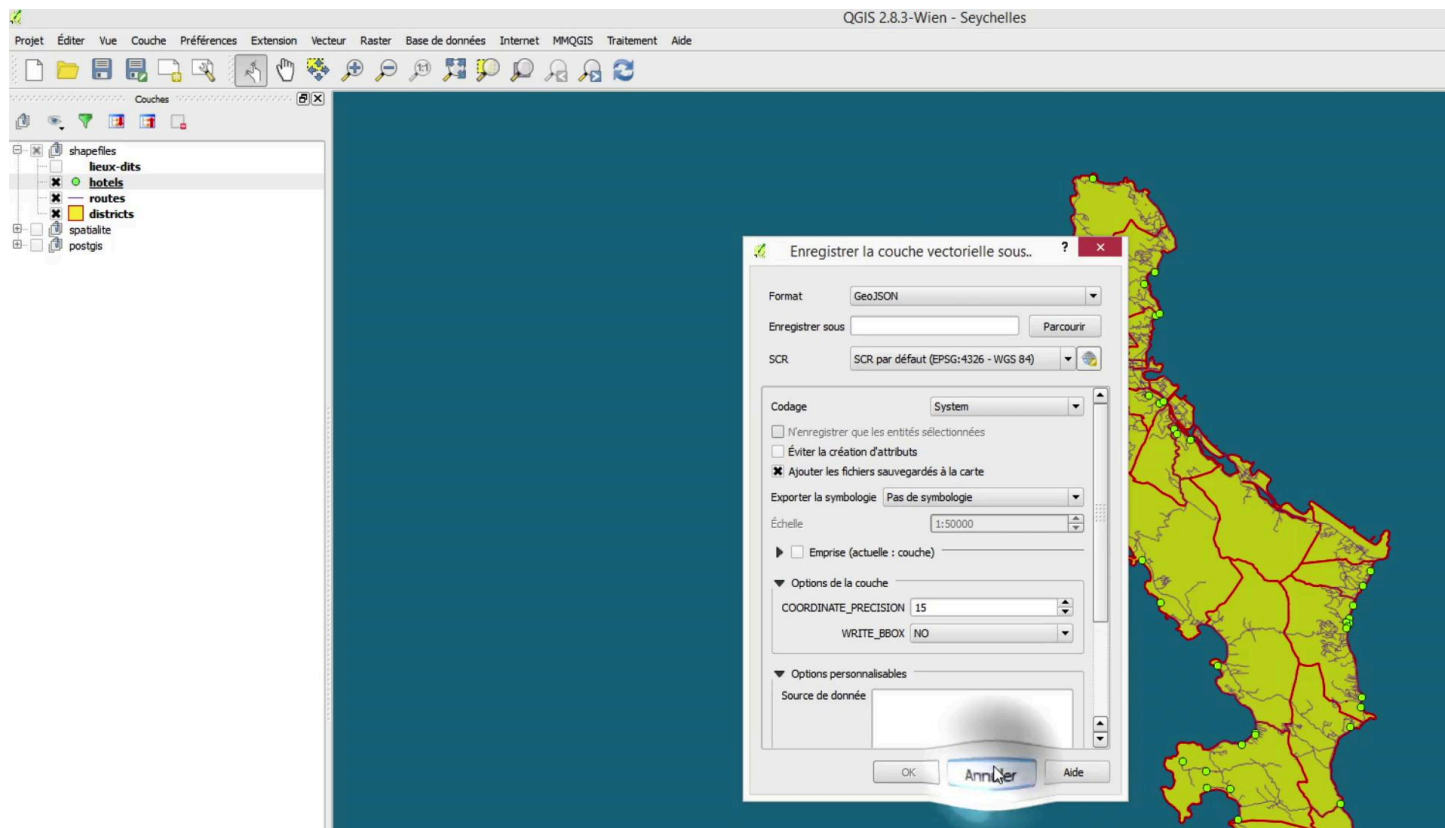


We see here that the map has the same projection system as the hotel layer, the projection of the map can be modified by activating the on-the-fly projection, which means that the different layers will be corrected to adapt to the projection system of the card.

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Here we have selected the WGS84 projection system, so latitude, longitude, and we see that indeed, the coordinates are displayed in latitude and longitude. It is also possible to save a copy of a data layer in a different format and with a different projection system.

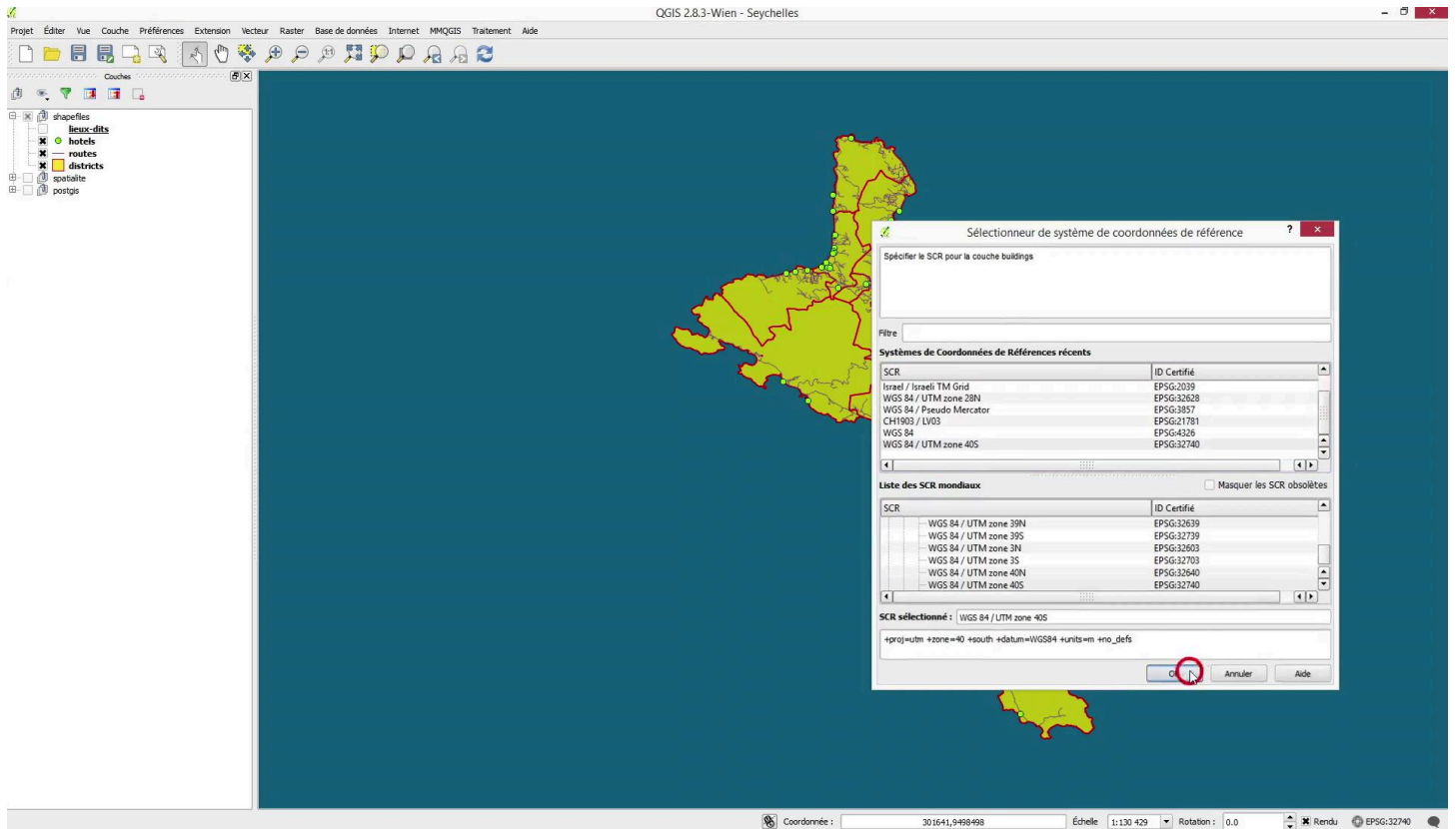
Notes

Summary



5m 58s



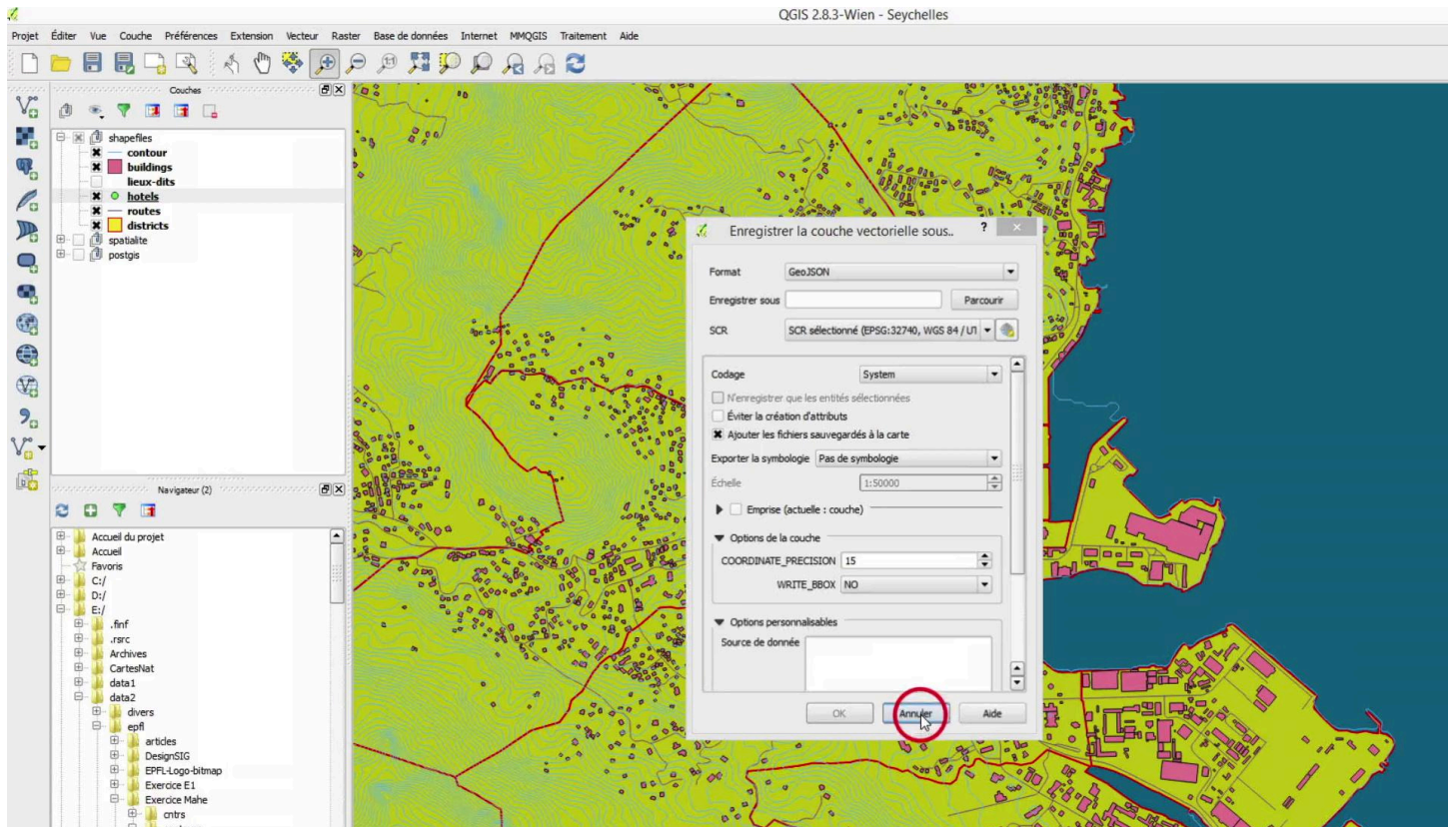


we could for example, convert the coordinates UTM 40 South in latitude longitude. The addition of layers is done through the "layer" menu. We can create a new layer of shapefile or SpatiaLite type of different formats, or add existing data, here a vector layer that we will look in the file tree, we choose here the layer of the buildings of the island of Mahé.

Notes

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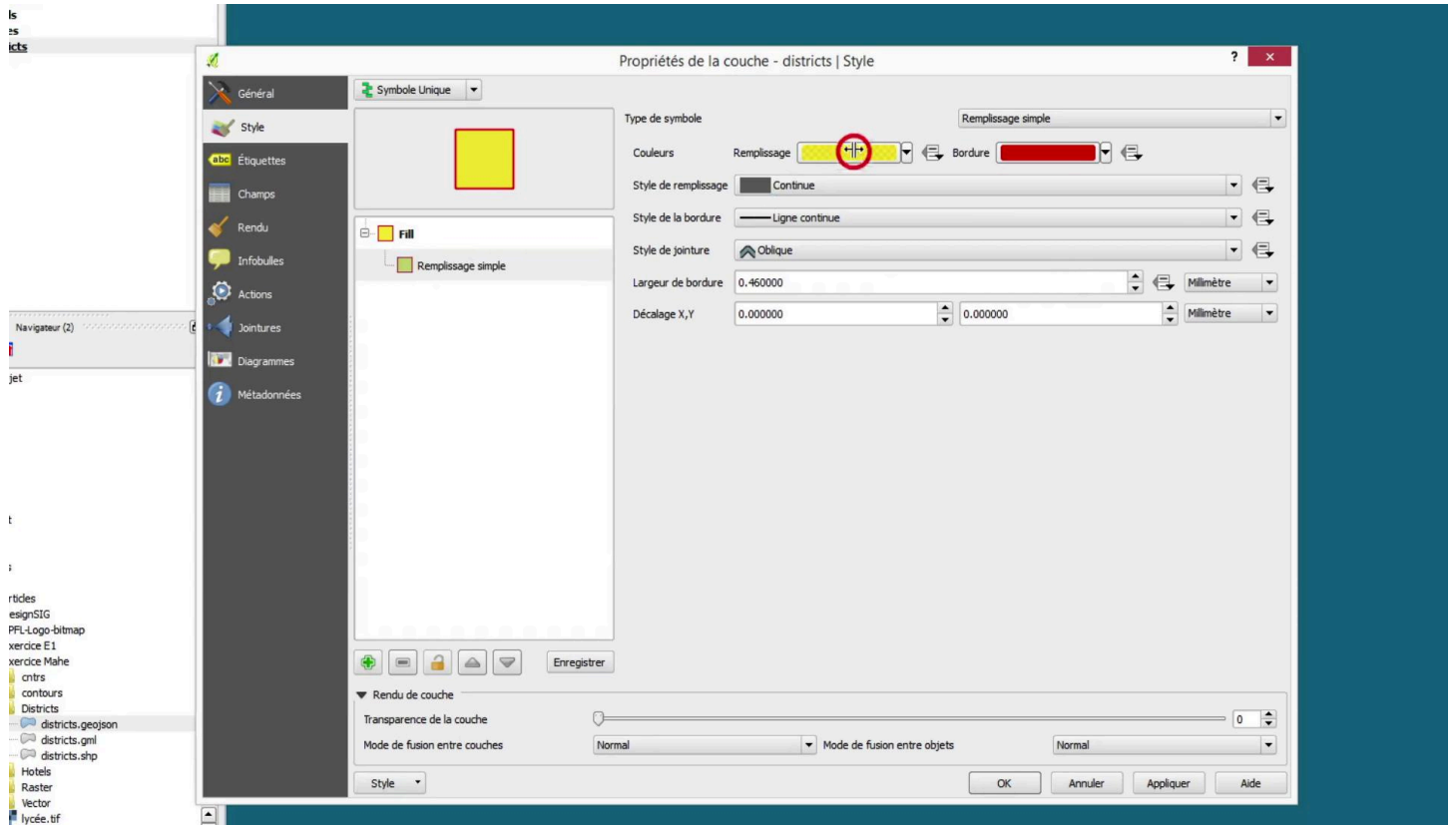
It is necessary to specify the projection system used, here again UTM 40 South and we can then use the zoom navigation tool to zoom in on the center of Victoria, the capital. A right click in the toolbar area allows to add the toolbar which offers the same functionality of adding layers of vector type, raster type, etc. Another right click in the toolbars allows you to add the navigation side panel that gives access to the file tree and there we can enter, drag and drop one of these files, here the contour lines. It is necessary again to define its projection system, again UTM 40 South, so that this layer appears in the map area. A right click on a layer provides access to the attribute table associated with it. Here in the hotels, we see that we have recorded the names, the number of rooms, the number of beds, the status, an identifier, things like that. Still with a right click, we see that we can, as we saw earlier, save a file or a data layer in another format, with here a great richness of possible formats and also by modifying its projection system.

Notes

Summary



7m 00s

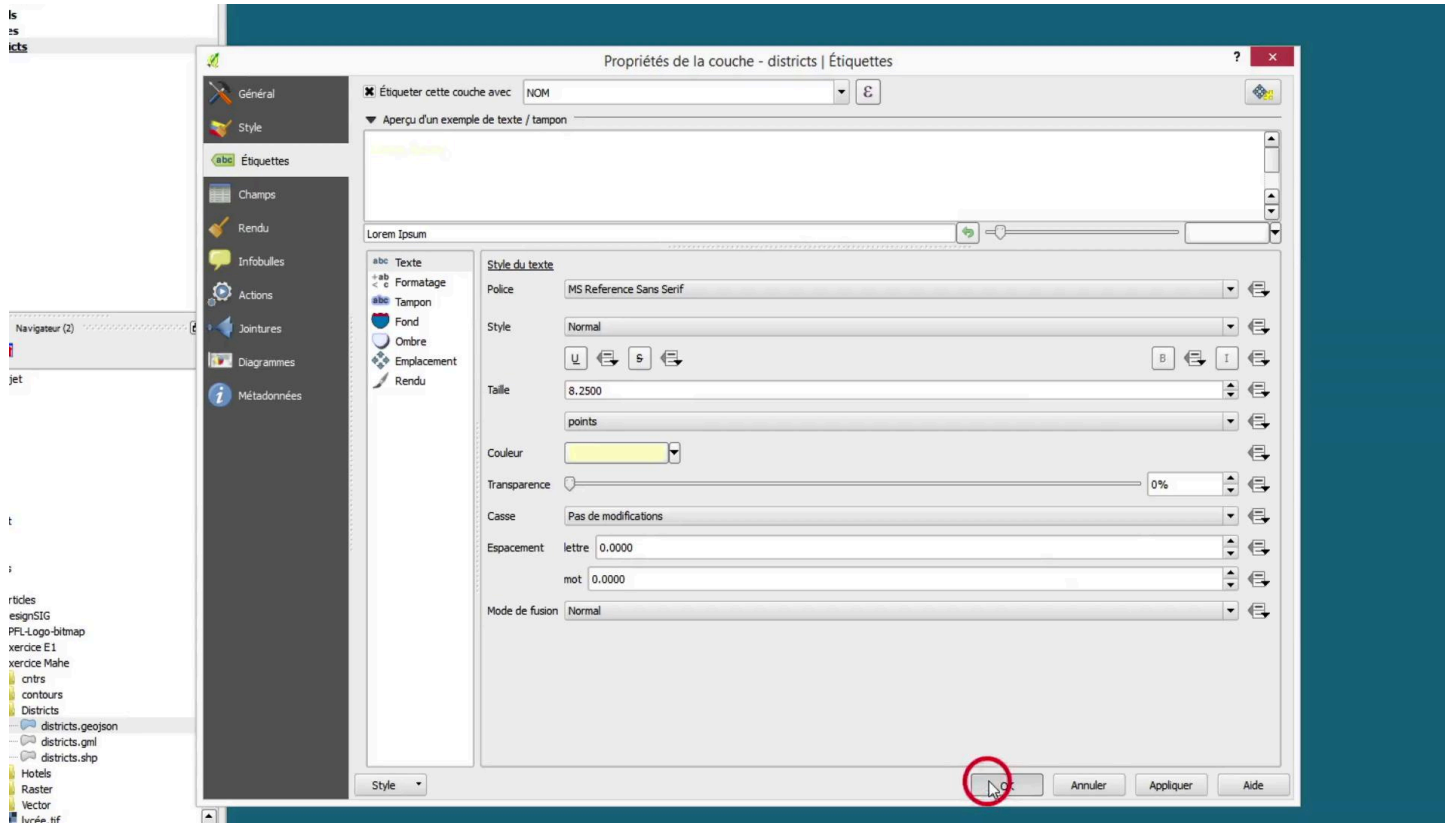


The symbology is the set of parameters which defines the graphic appearance of a layer. It is accessible in QGIS by a right click on the layer and the "layer properties" heading.

Notes

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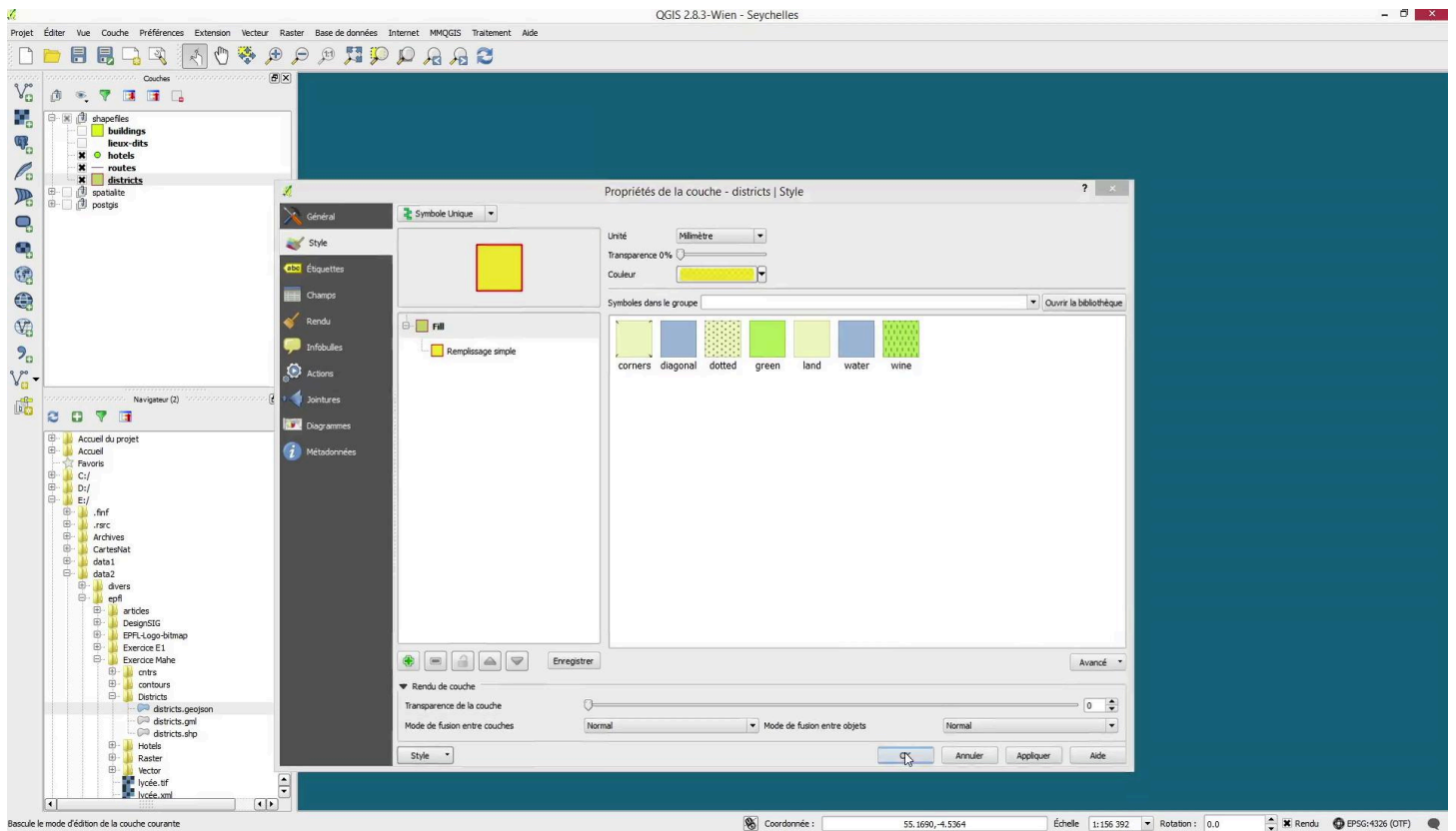


Under the "style" tab, we find the different elements which in fact define the appearance of this layer, starting with the filling with its color, the color of the border, the style of filling, here diagonal bars. The filling may be simple or more complex, faded or in a pattern with lines, and in this case we can adjust the angle with which the lines are drawn, the spacing of the different lines, their gap, a whole bunch of parameters which enable to refine considerably the filling shape of our layer. The unique symbol can also be replaced by a scale of values when we have a variety of parameters. If we take here the names of the districts and we associate a scale of colors that goes from blue to green with this scale of names, a classification in alphabetic order which in fact gives the lightest colors to the first district in alphabetical order. Another form of representation, the graduated representation, where the elements are no longer classified in categories but with a continuous scale of values. It is possible to add labels by choosing the attribute table field which will be used for the label, the font with which these labels will be displayed, their size, possibly the color.

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And we see here what it looks like on the map with districts colored in alphabetical order and light yellow labels. The symbology properties can be saved, they can be registered as part of QGIS in the form of a style file, and it is possible to reload them later here we find the style file that we had at the beginning of the exercise.

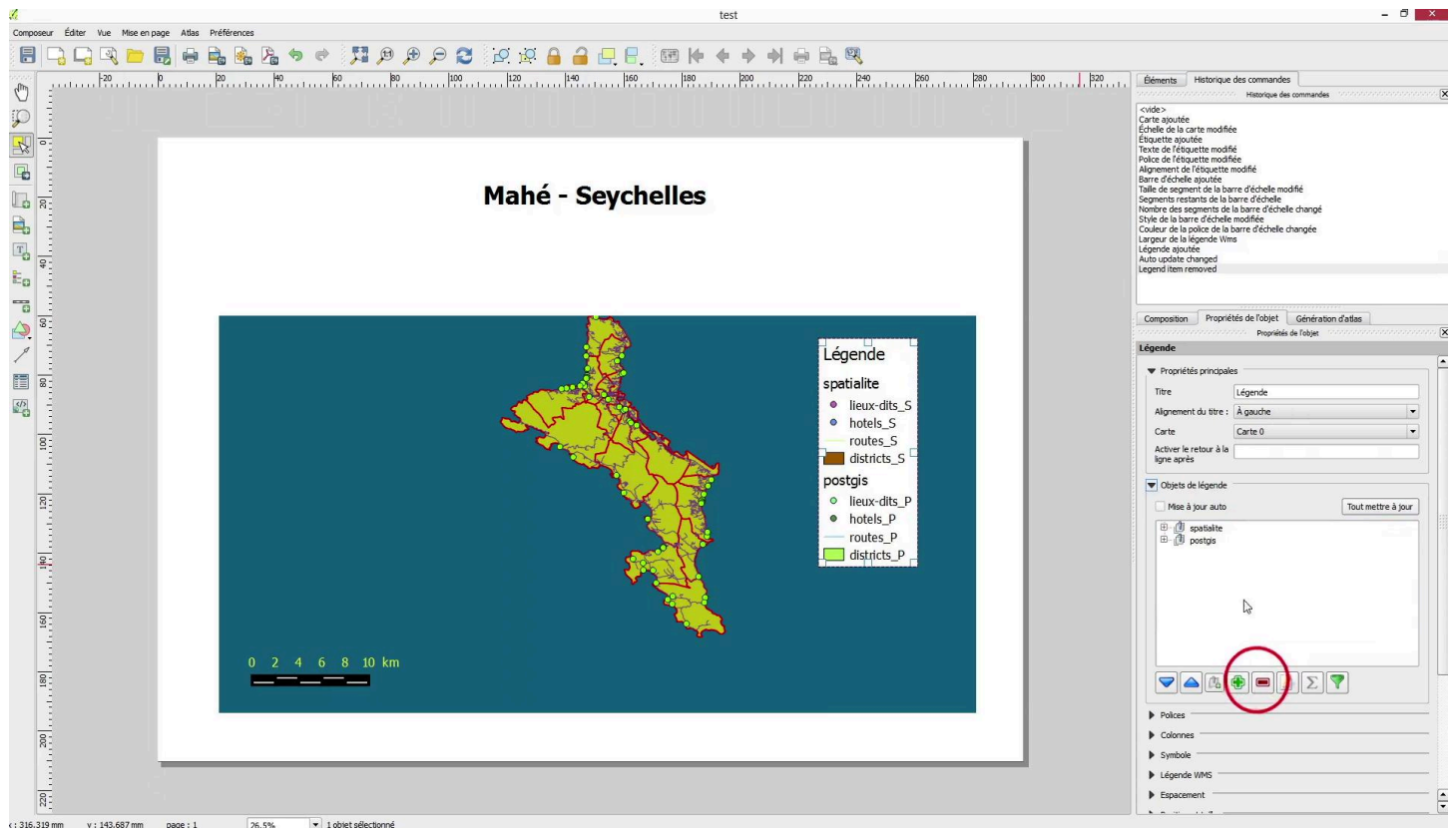
Notes

Summary

10m 26s





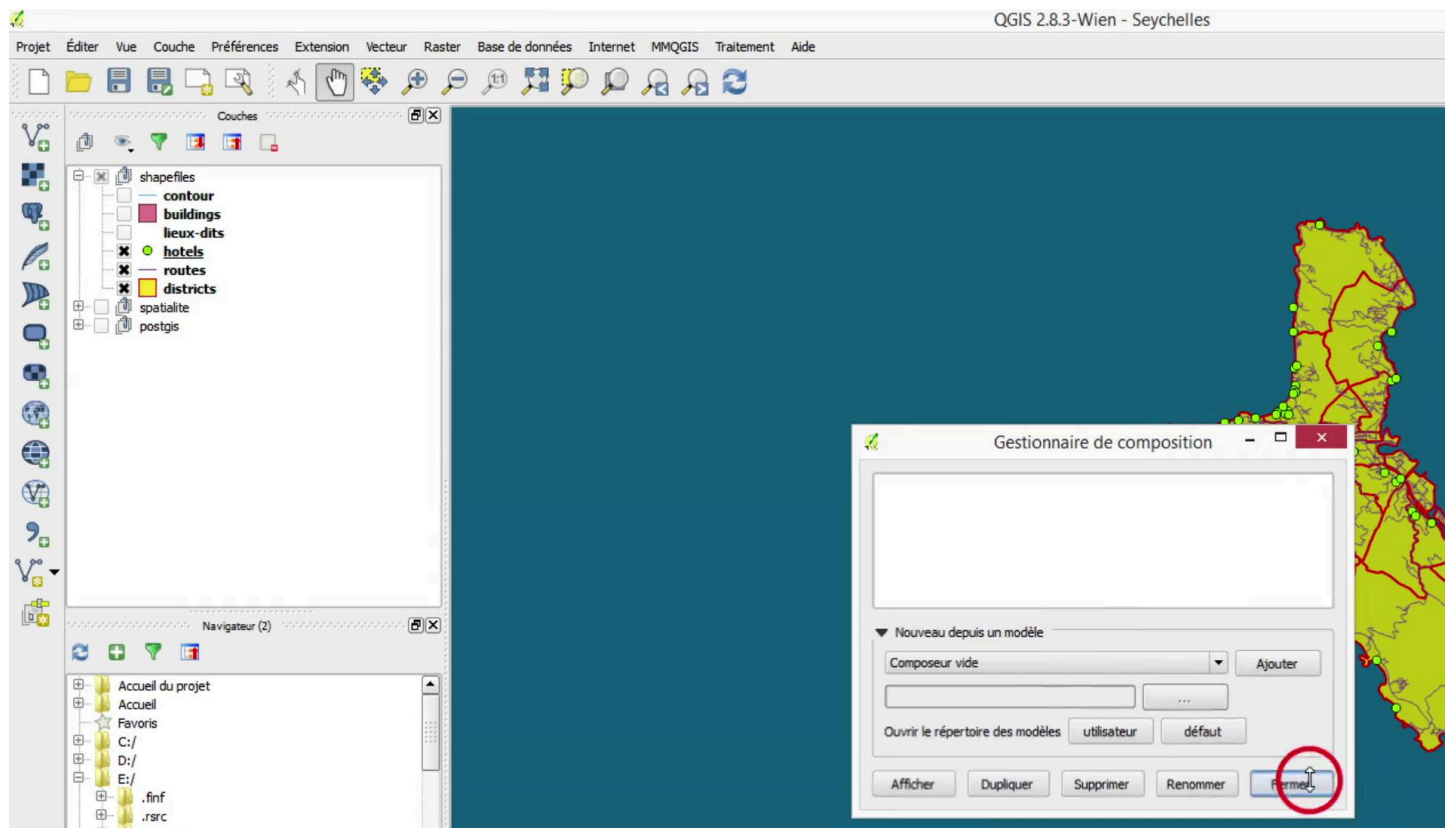


The creation of a paper map is ultimately one of the important functions of a geographical information system. In QGIS, It goes through a printing dialer, accessible under the "project" menu and which gives access to a new window in which it is possible to build a map by first adding a map element that can be configured by defining its scale, or the hold, so the area covered by the map, we can add a label, a title. Here we will call this map Mahé - Seychelles. This title can also be configured by modifying the type of font used, the size of this font, by changing the centering of the title to put it in the middle of the page. It is then possible to add a scale which allows to get a sense of the distances, by adjusting the settings of this scale, in particular its size, we can adjust its height, adjust the way the scale is represented, the number of graduations, Here we decide to have five graduations from zero. The symbology is used here, a double box as opposed to a single box. To manage the color of the writings, here the values are yellow again. To this we can add a legend which we place here in the upper right corner of the map.

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The automatic update is disabled and we actually remove all the contents of the legend to be able to choose what we want to show here what interests us, is to have only the three layers represented on the map, so hotels, roads and districts. This legend can also be configured a little in all the settings, the font size, including the title, here we take a smaller size, 11, and then the font size legend elements, so objects, here we take a size 9. The format, the size of the legend area can also be adjusted, as well as the transparency of the background. at the rendering level. Here it was the map that was active. If we activate the legend, we modify its transparency to melt it a little in the decor. Finally, all these settings allow to nicely build a map which will actually be stored in the composition manager to be reactivated, duplicated or deleted.

Notes

Summary



12m 56s

## In summary



We have seen in this first lesson of introduction to QGIS some of the basic foundations of the use of this software, in particular how to import/export data, how to manage their projection system, how to change their appearance by accessing the settings that manage their symbology and finally; how to compose maps to integrate them in reports or other documents.

Notes

Summary



14m 16s