MOBIDATALAB

Labs for prototyping future mobility data sharing solutions in the cloud

QGIS guide

access mobility data and learn about available basic tools

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mobidatalab.eu

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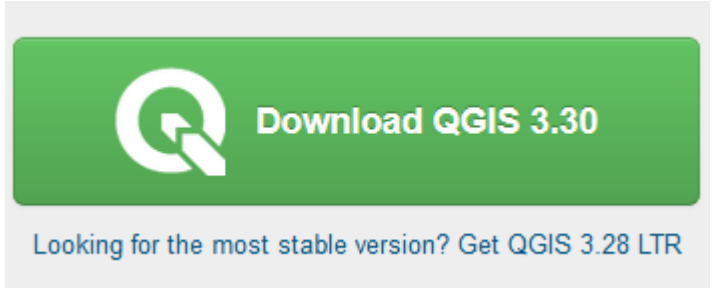
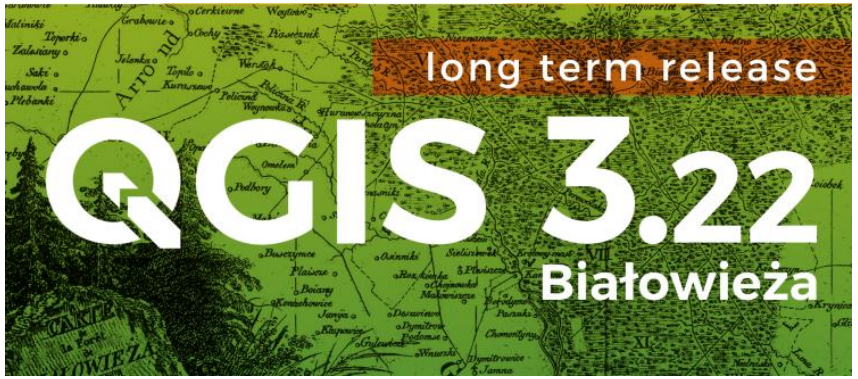
QGIS

QGIS is a user-friendly Open Source Geographic Information System (GIS) that runs on Linux, Unix, Mac OSX, and Windows. QGIS supports vector, raster, and database formats. QGIS is licensed under the GNU General Public License. QGIS lets you browse and create map data on your computer. It supports many common spatial data formats (e.g. ESRI ShapeFile, geotiff). QGIS supports plugins to do things like display tracks from your GPS. QGIS is an Open Source software and its free of cost.

1. QGIS Installation

1. Download QGIS
   (it is recommended to select the long-term release : currently 3.28 LTR)
2. Follow the installation instructions
3. Launch the program
   QGIS DESKTOP 3.28



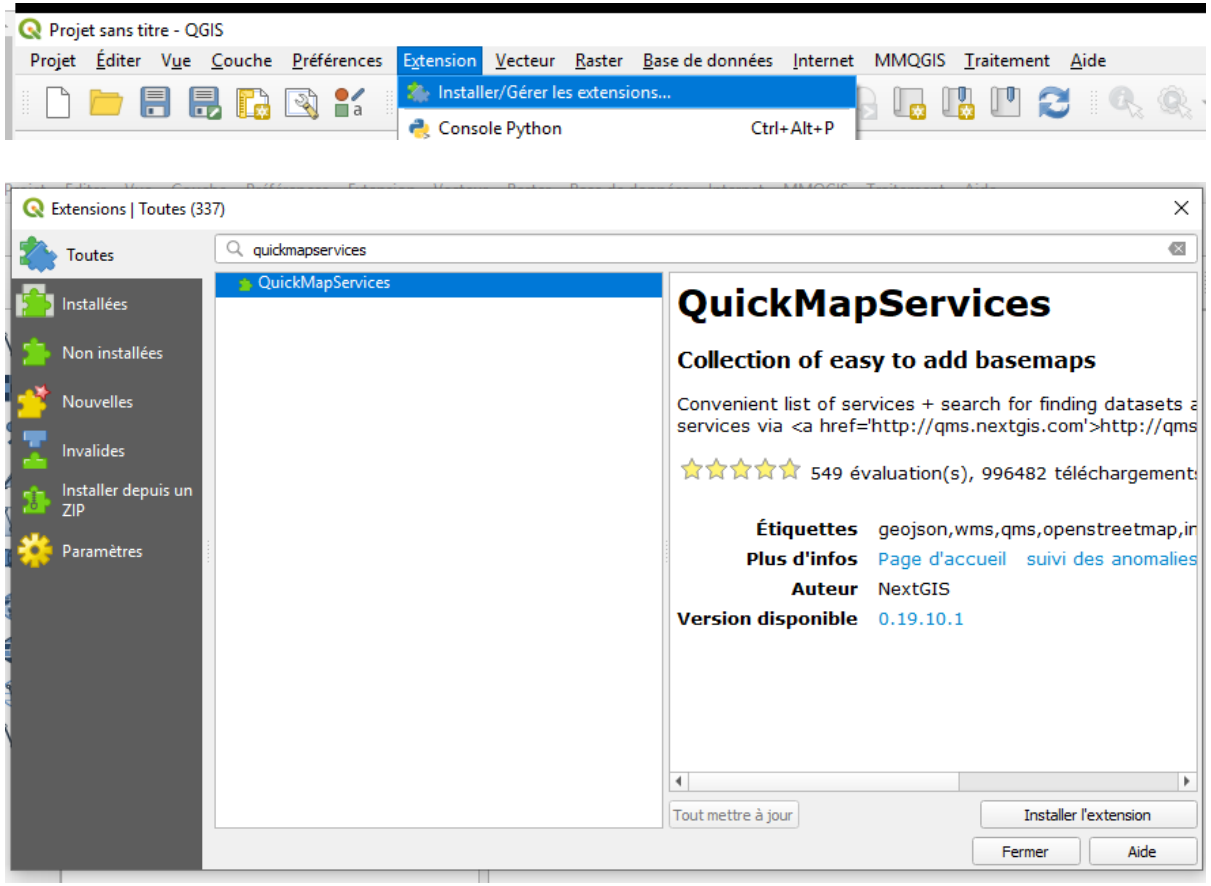


Background basemaps, services and datasets

2. Quick Map Services extension installation

The **QuickMapServices** extension provides background basemaps, services and datasets to help place you on a map and provide you with basic information when creating your projects and visualizing datasets.

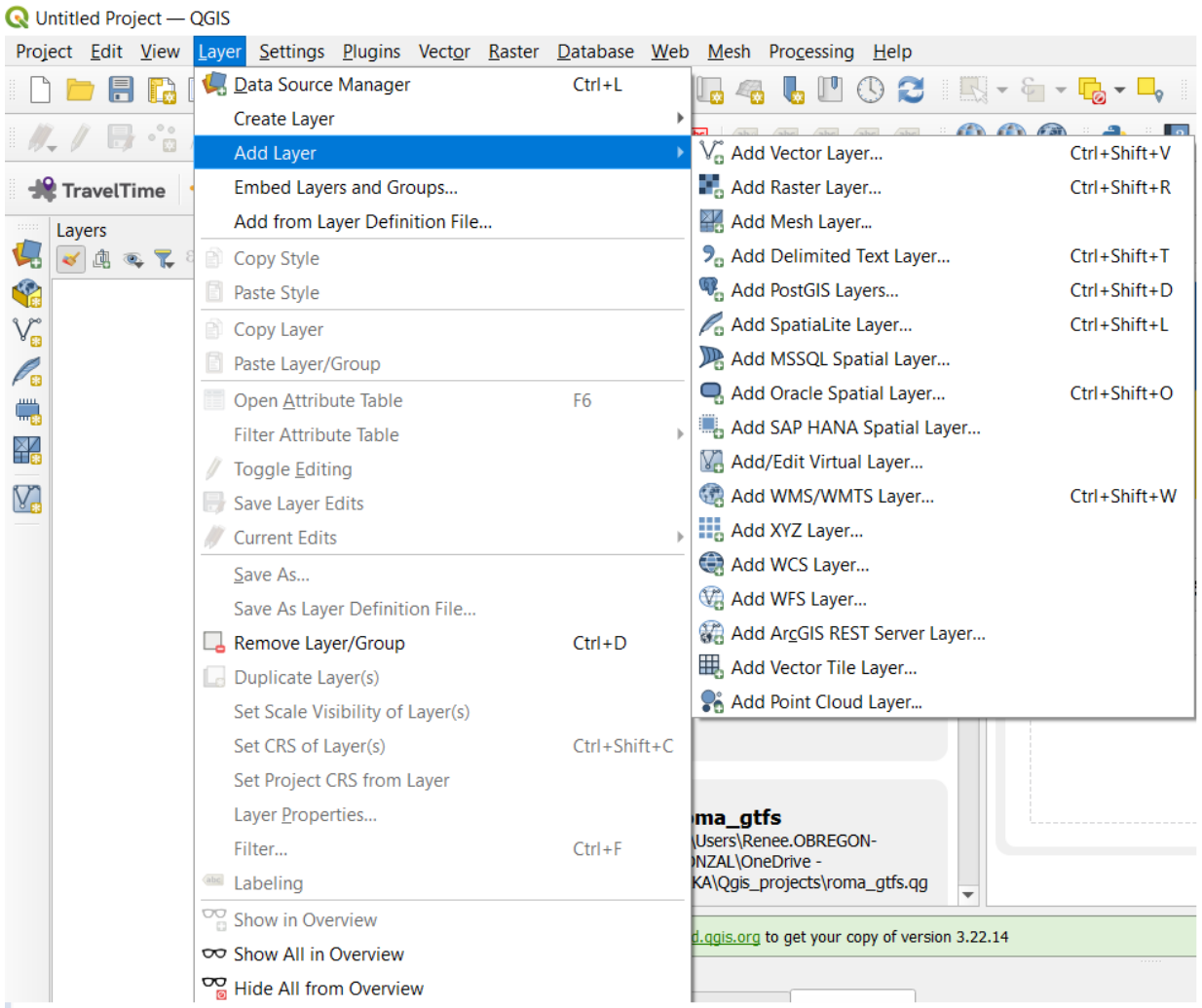
1. Click on extension
2. Search for QuickMapServices
3. Install the extension



Add layers, services and connect to servers

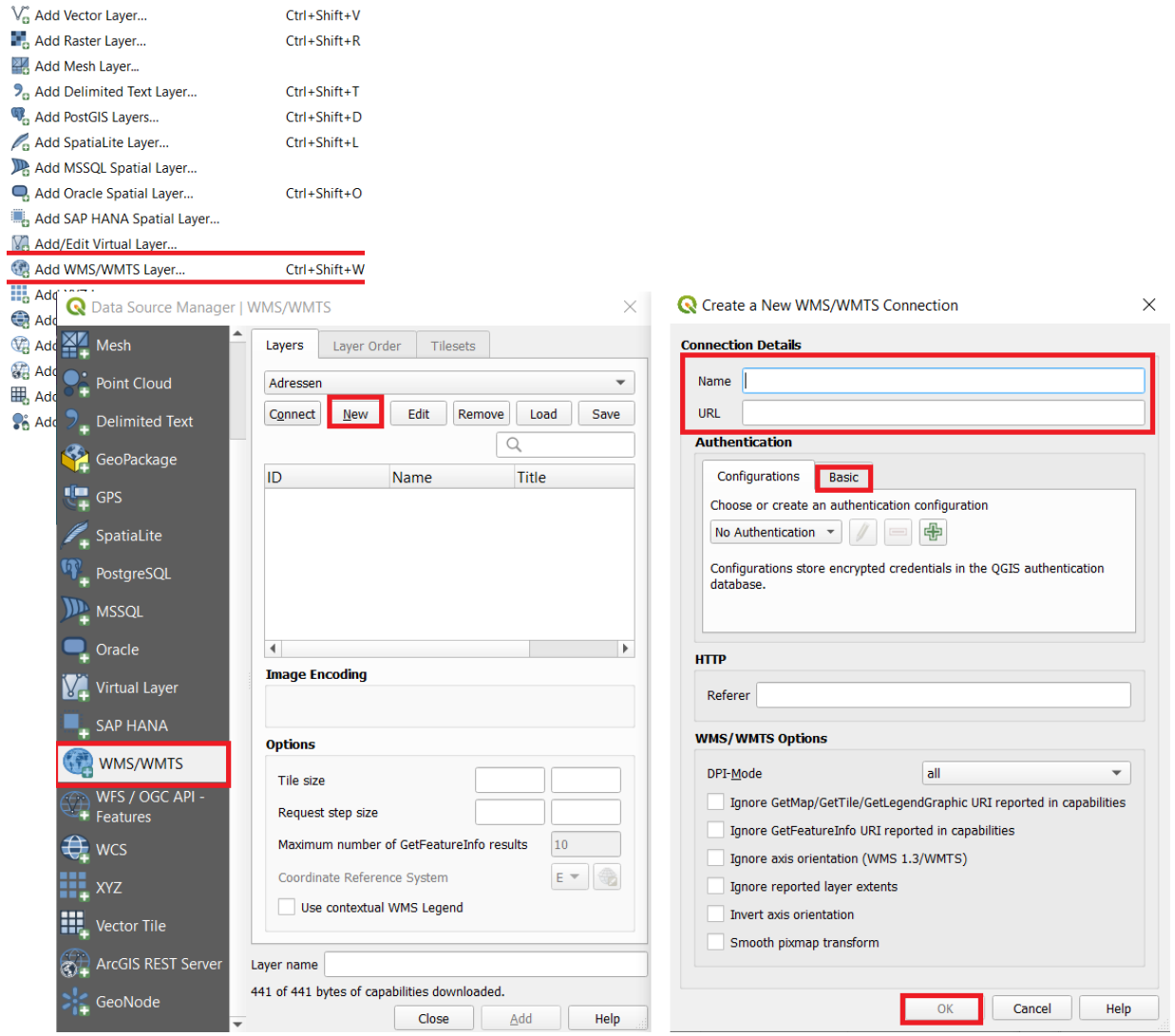
3. Add a layer to Qgis or connect to a web service

To add or access a web service layer on Qgis manually, it is possible to connect to it via the “Layer” Menu ➡ “Add Layer”.



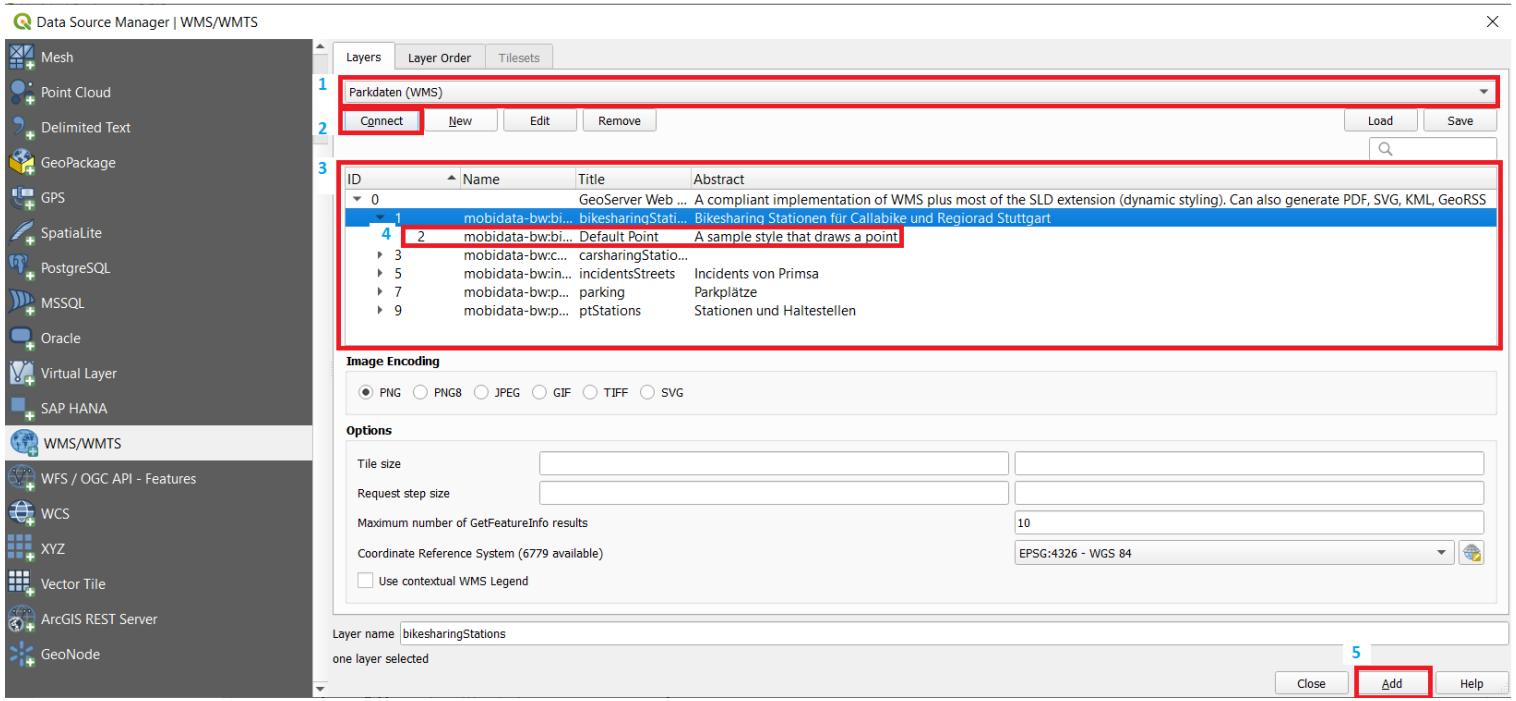
4.1 Connect to a WMS/WMTS layer

1. On the “Layer” menu, select “Add WMS/WMTS Layer”
2. Create a “New” connection or connect to a service previously saved
3. Add or edit the connection details and click “OK”, if an authentication is necessary and you want to save it “click on the “Basic” tab and save the authentication details that you wish to save.



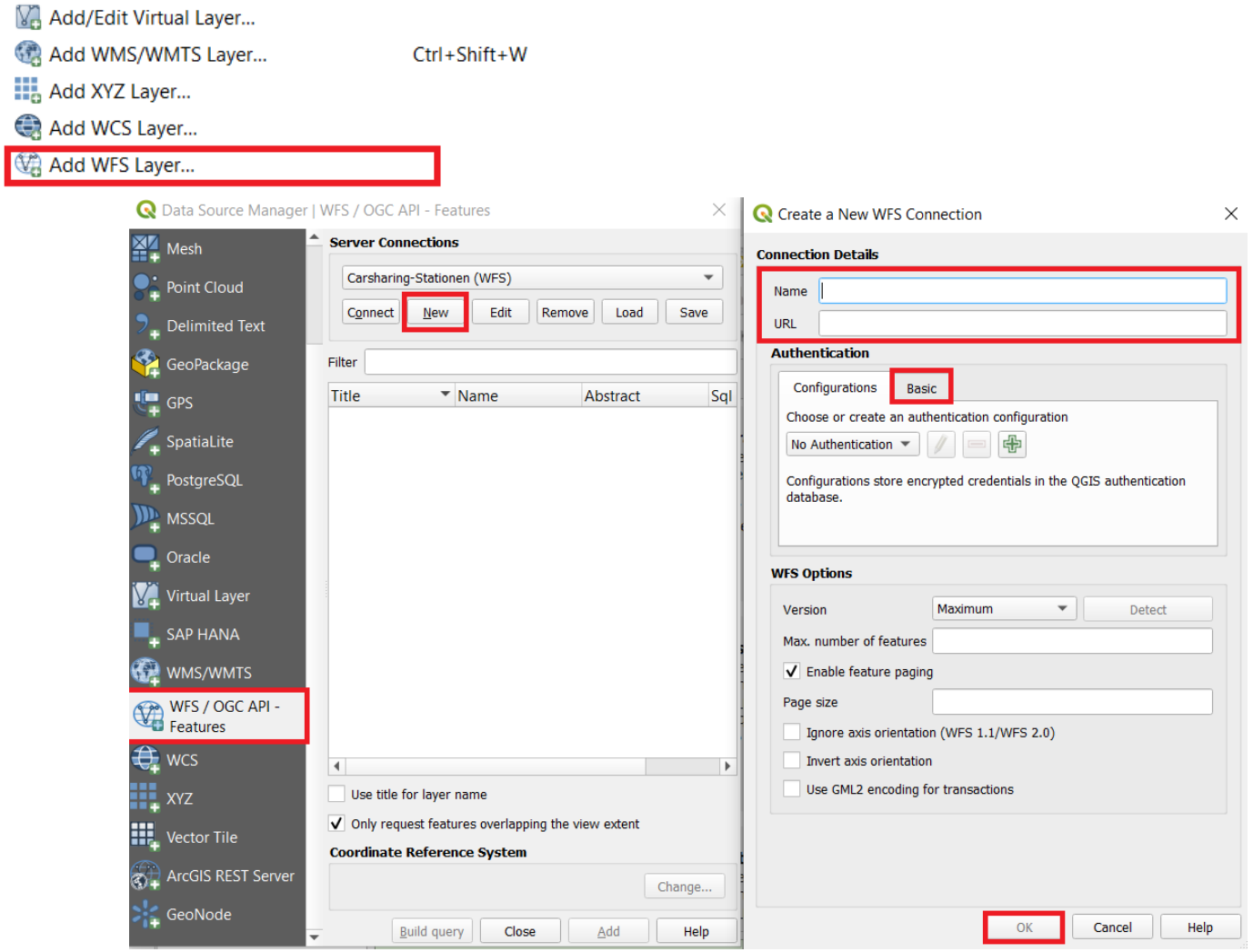
4.2 Connect to a WMS/WMTS layer

1. Select the service saved
2. Connect to the service
3. Search for the desired dataset on the bounding box
4. Select the wished dataset
5. Click on add or slide the dataset into your Qgis project



5. Connect to a WFS/OGC API – Features layer

1. On the “Layer” menu, select “Add WFS Layer…”
2. Create a “New” connection
3. Add the connection details and click “OK”, if an authentication is necessary and if you want to save it “click on the “Basic” tab and save the authentication details that you wish to save.



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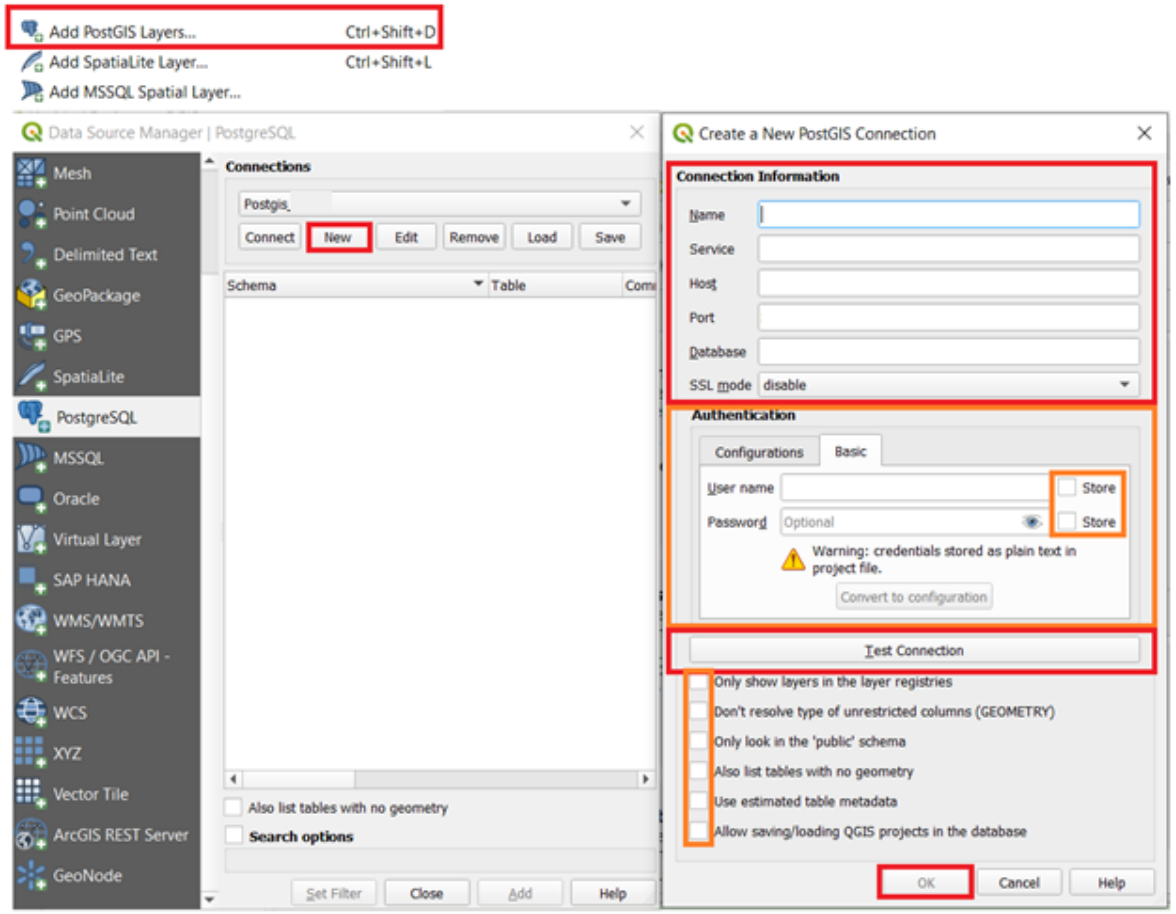
6. Connect to a Postgres server

1. On the “Layer” menu, select “Add PostGIS Layer…”
2. Create a “New” connection
3. Add the connection details and click “OK”, if an authentication is necessary and you want to save it “click on the “Basic” tab and save the authentication details that you wish to save.
4. Test the connection



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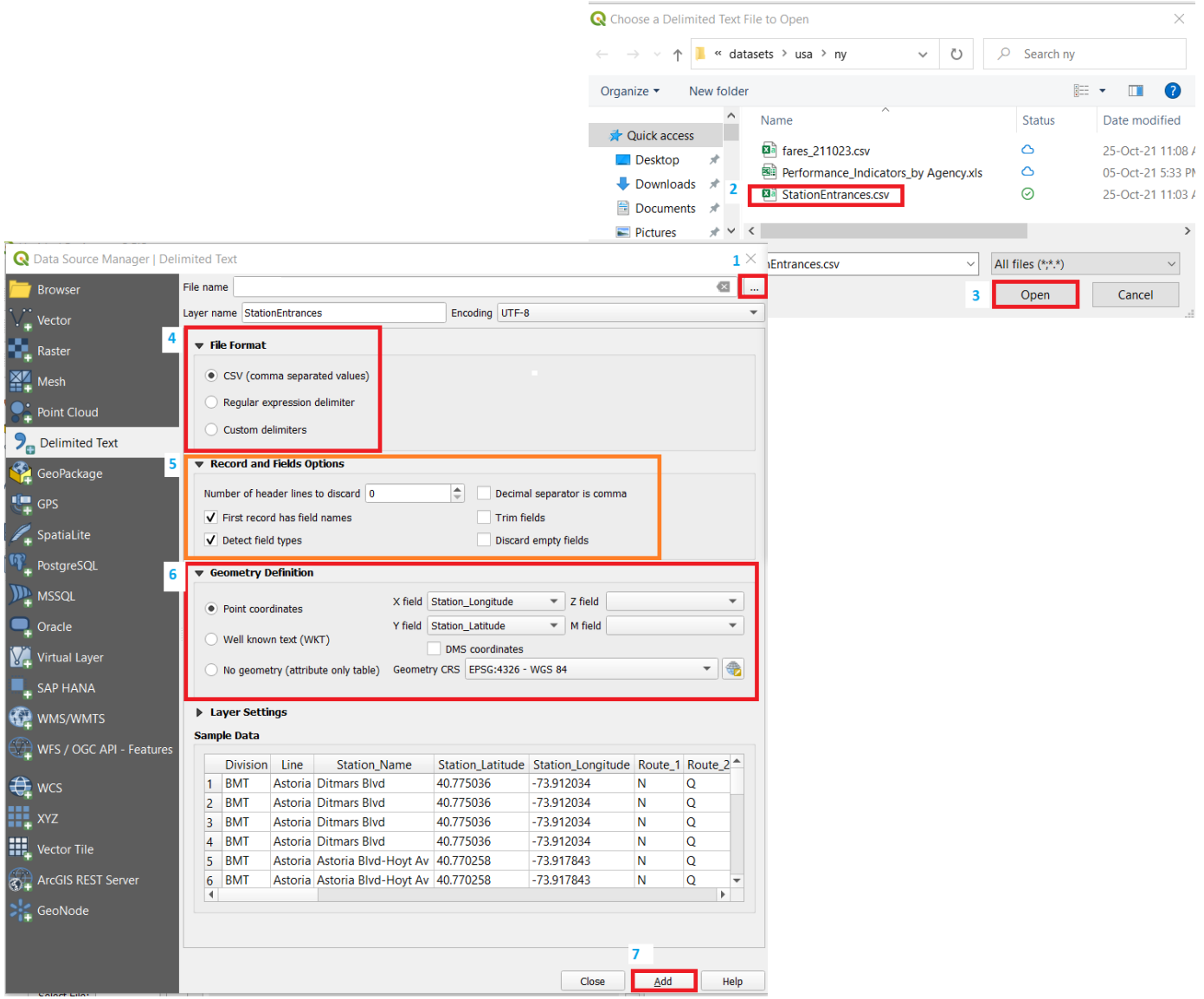
7. Add a delimited text file (such as csv file)

1. On the “Layer” menu, select “Delimited Text”
2. Search for your dataset
3. Select it
4. Click “OK”
5. Verify if the file format is displayed correctly on the sample data box, if not adapt the format
6. Modify, if necessary, the records and fields options
7. Select the right “Geometry definition” according to your dataset
8. Add or slide your dataset to your QGIS project



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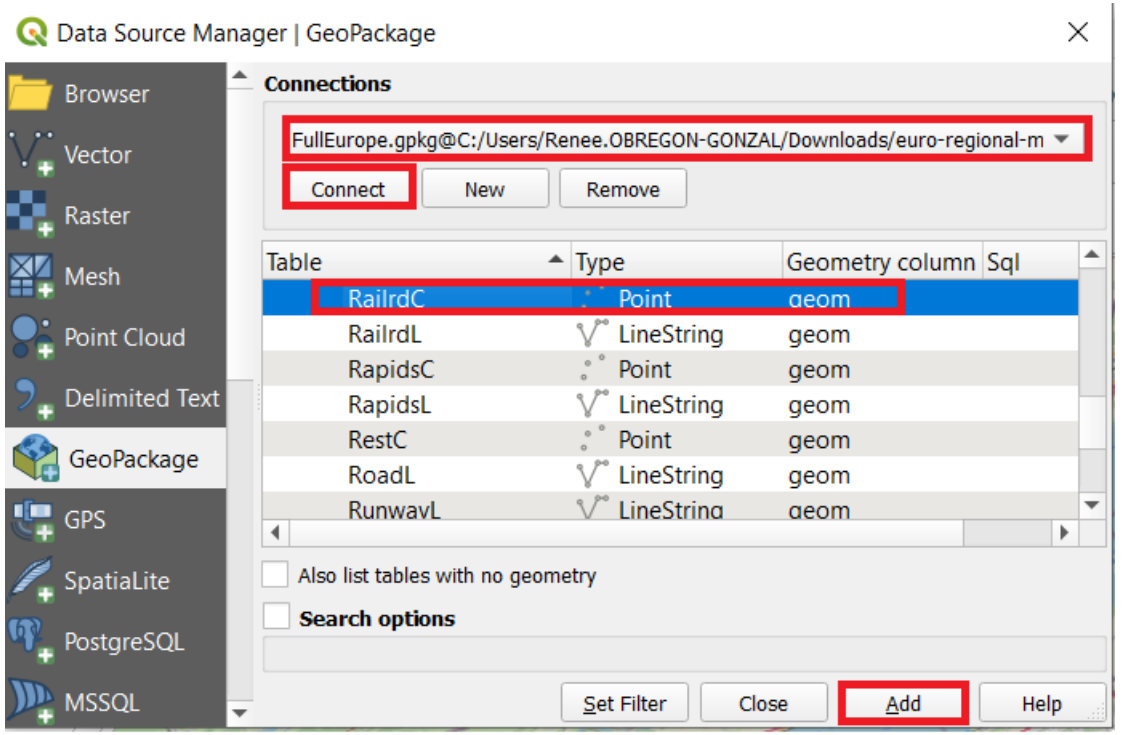
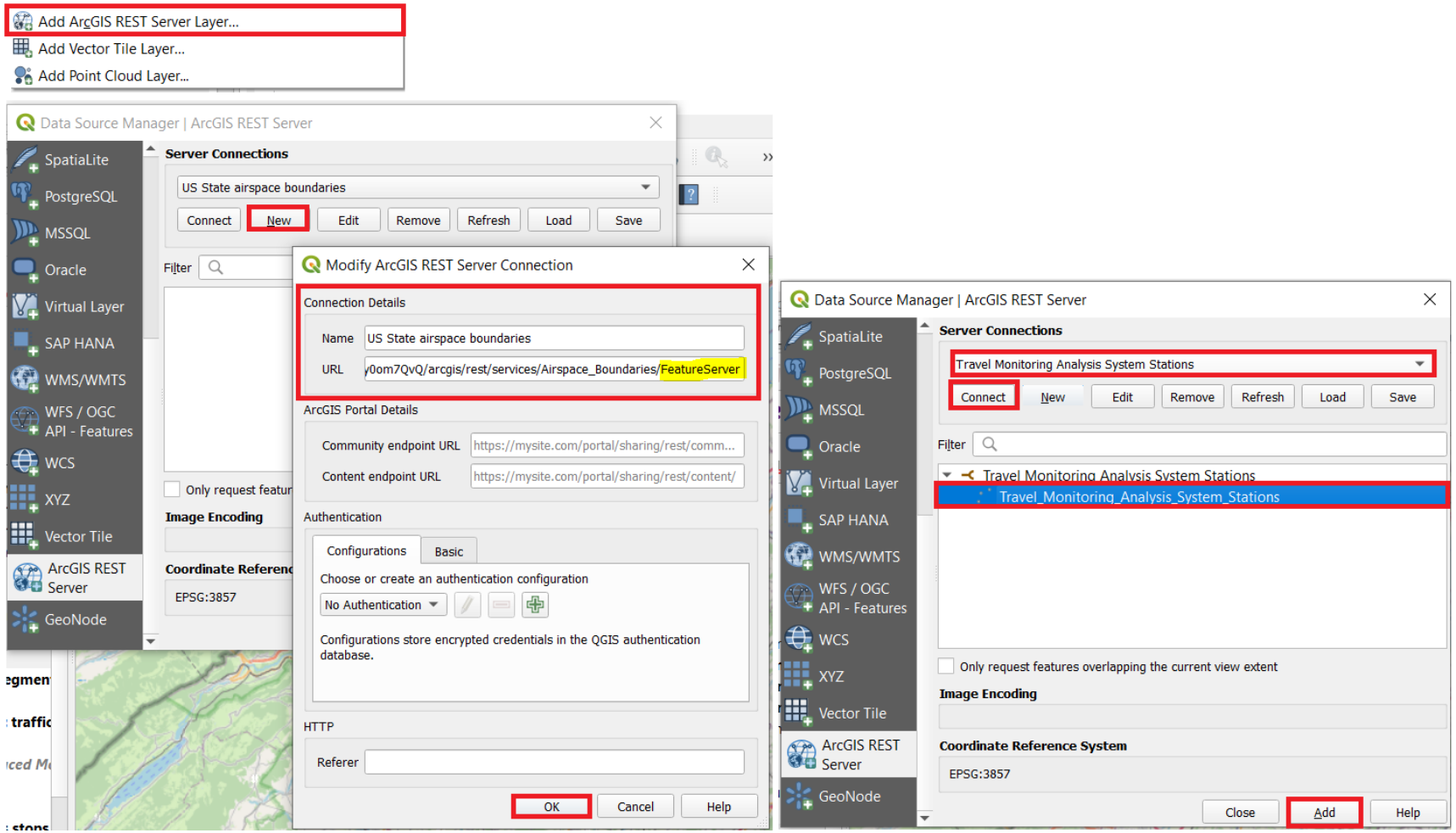
8. Add a GeoPackage

1. On the “Layer” menu, select “Add GeoPackage”
2. Create a “New” connection
3. Add the connection details and click “OK”, if an authentication is necessary and you want to save it “click on the “Basic” tab and save the authentication details that you wish to save.
4. Search for the right connection and select it
5. Connect
6. Select the desired dataset
7. Add or slide it into you QGIS project



9. Connect to an ArcGIS REST Server

1. On the “Layer” menu, select “Add ArcGIS REST Server Layer”
2. Create a “New” connection
3. Add the connection details. The URL must finish at “/FeatureServer/”. For example: https://services1.arcgis.com/Hp6G80Pky0om7QvQ/arcgis/rest/services/Travel_Monitoring_Analysis_System_Stations/FeatureServer/
4. Click “OK”, if an authentication is necessary and you want to save it “click on the “Basic” tab and save the authentication details that you wish to save.
5. Search for the right connection and select it
6. Connect
7. Select the desired dataset
8. Add or slide it into you QGIS project



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Access CKAN data catalogue

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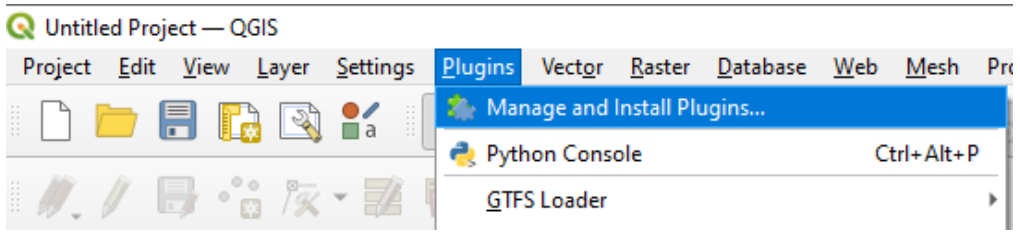
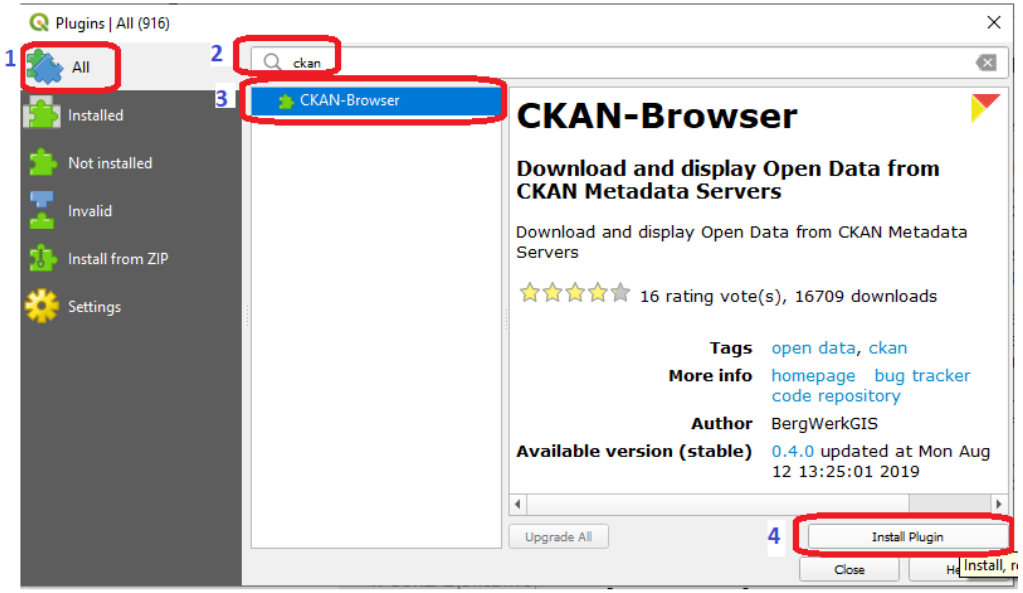
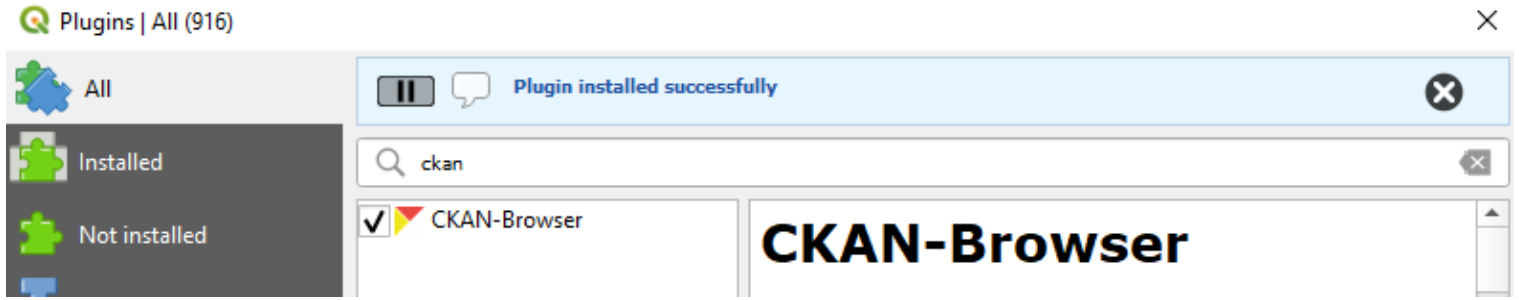
10.1 CKAN browser plugin installation

1. Do a left click on the “Plugins” menu (on the Qgis menu bar)
2. Select “Manage and Install Plugins”
3. Search for the CKAN-Browser
4. Install the plugin





10.2 Ckan browser plugin installation



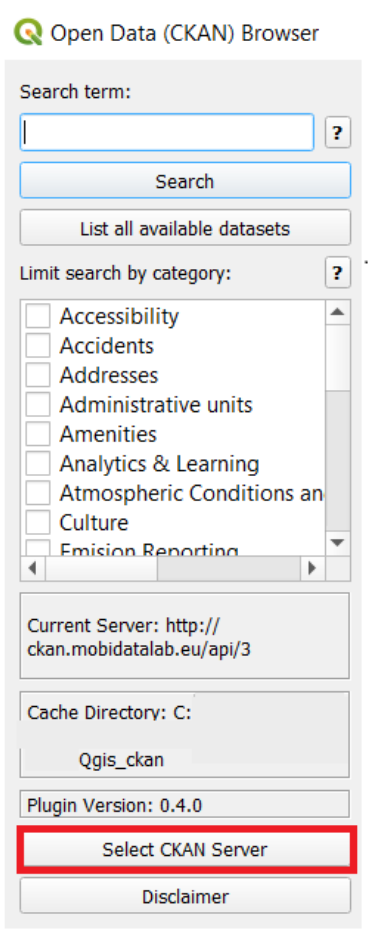
11. Find and access available metadata on CKAN

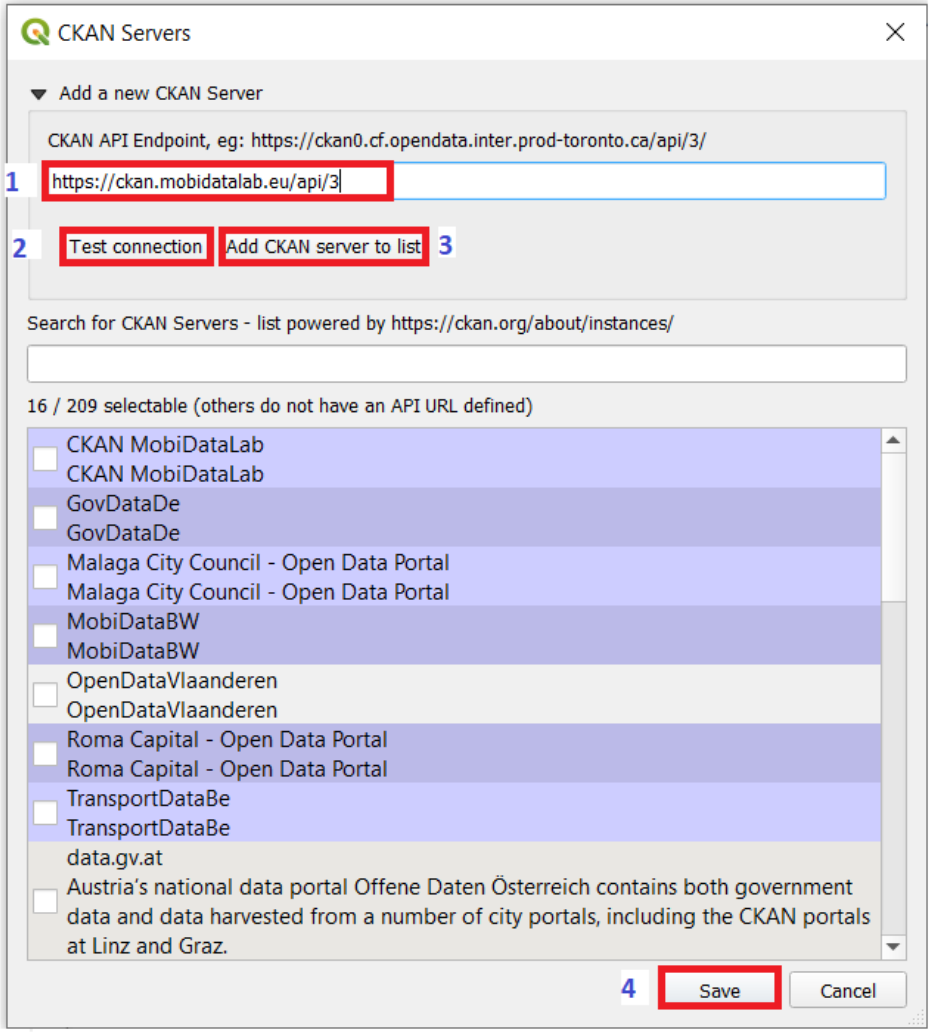
Launch the CKAN Browser

1. Clicking on the CKAN icon (on the Qgis toolbar)

Select “CKAN Server”

1. Enter the URL of the CKAN instance (in this case https://ckan.mobidatalab.eu/api/3/).
2. Test the connection, to make sure that the right URL was used
3. If the connection was successful, add it to the CKAN server list. Otherwise verify the URL entered before.
4. Save the link to the server on the list.





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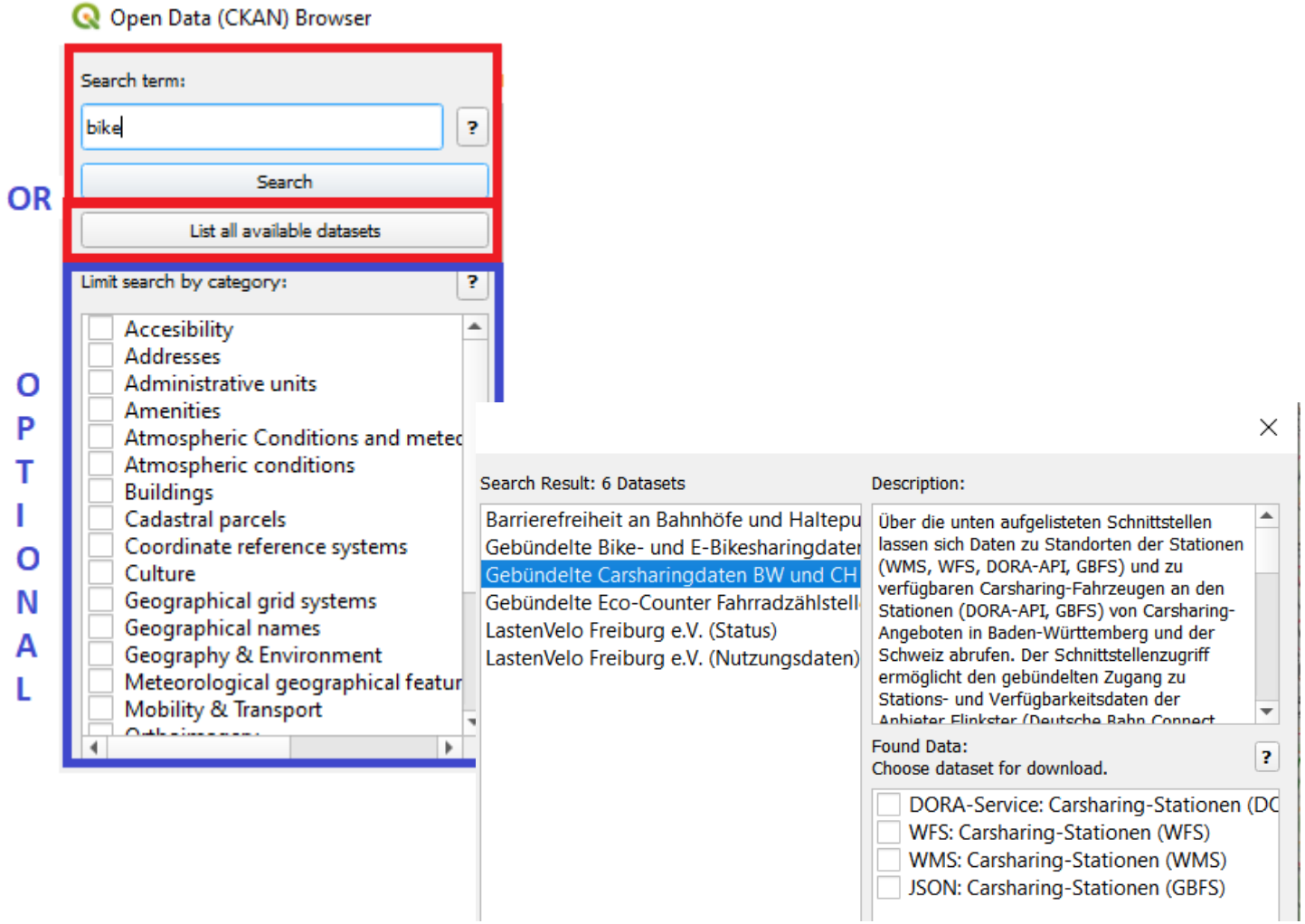
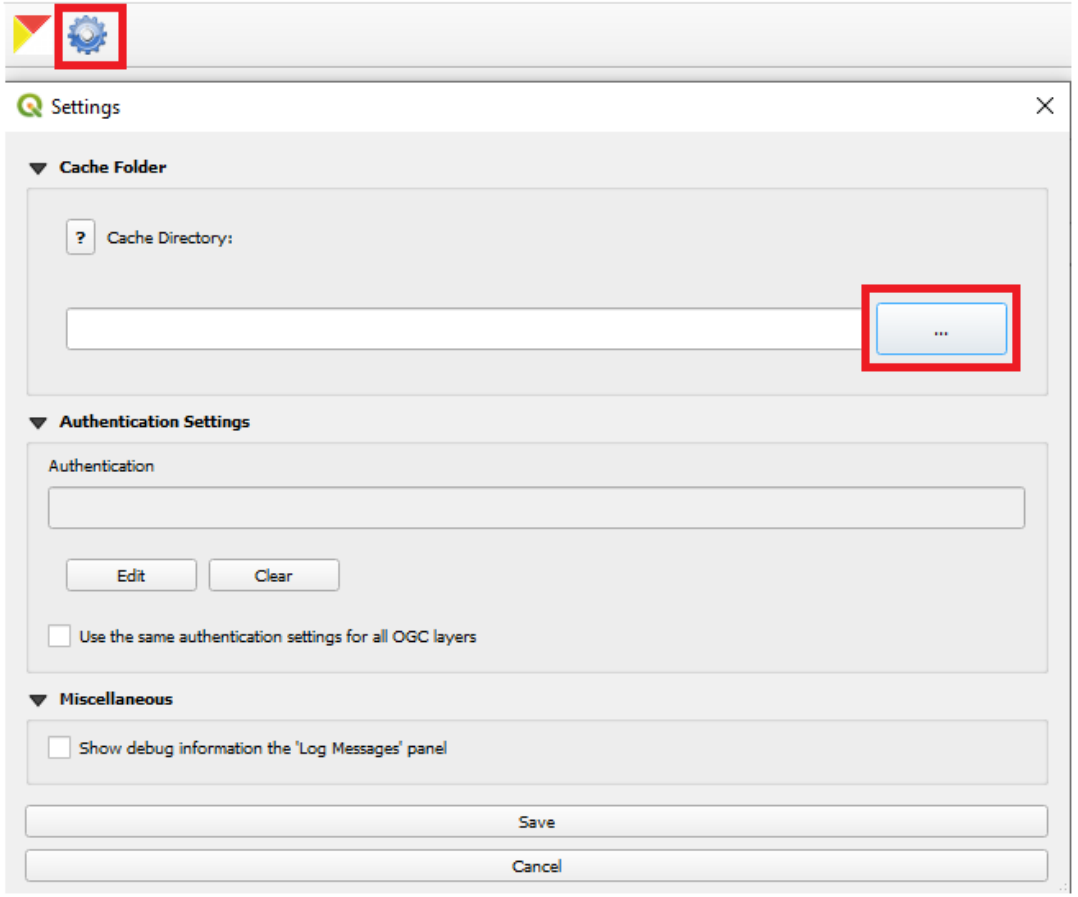
12. Download and display Open Data

- Search for a particular term or for all the datasets available on CKAN.
- The categories assigned on CKAN can be found here as well, to filter the datasets according to the CKAN group categories. When selecting a particular dataset, the description and the format will be showed on the right boxes.
- When the datasets are in a format that can be read directly by QGIS, it will be possible to select them and load them. Otherwise, there is often the possibility to download the data to consult it by other means.

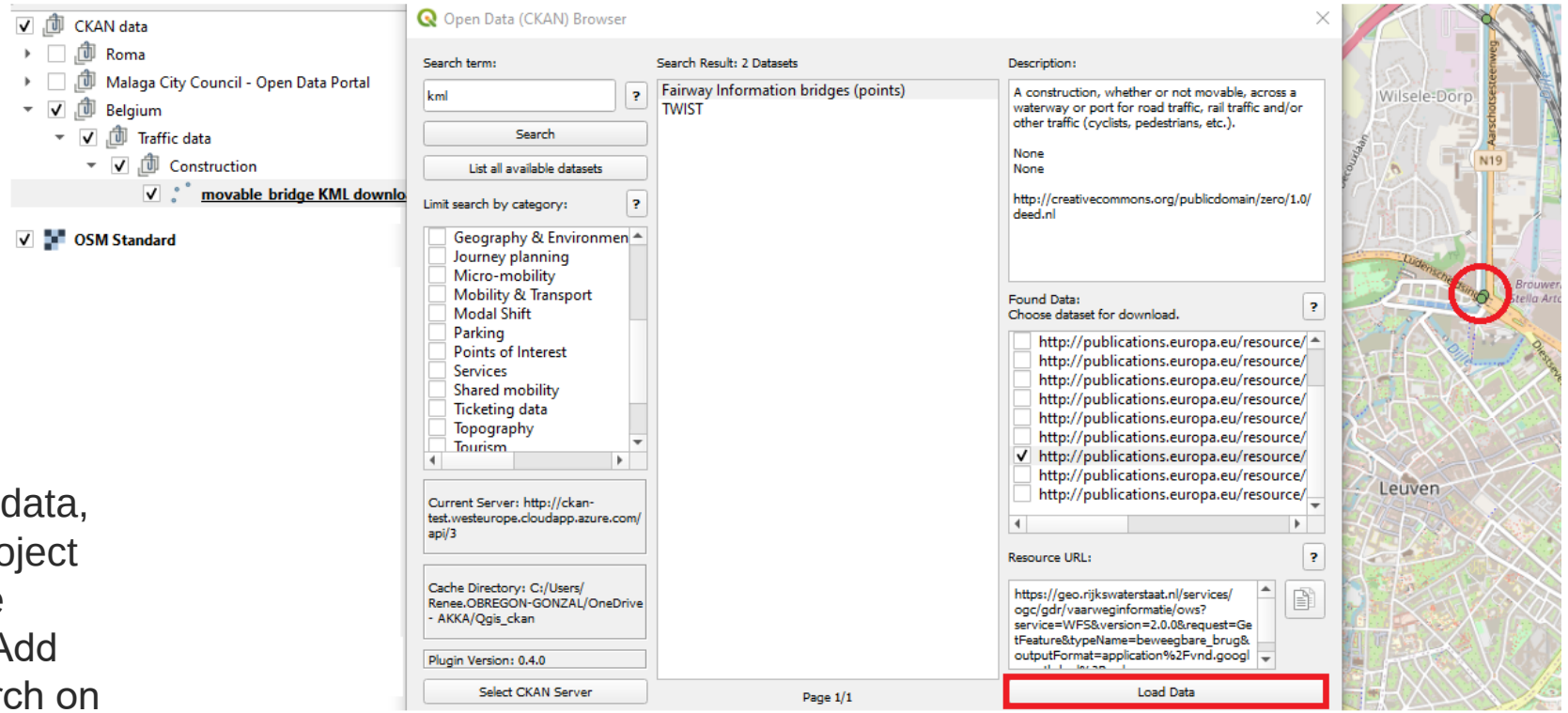


13. Save the downloaded datasets

1. Go to the CKAN plugin settings
2. Create or select a folder “cache directory” where the downloaded data will be stored.
3. Save



14. Add a KML layer – Dangerous points



1. Load the data from the CKAN browser
2. If you downloaded the data, slide it into the Qgis project or add the layer via the “Layer” menu, select “Add Vector Layer” and search on the cache directory the downloaded kml file

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Catalogue Services for the Web (CSW) & GeoNetwork access

GeoNetwork opensource

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Metasearch

MetaSearch is a QGIS plugin to interact with metadata catalog services, supporting the OGC Catalog Service for the Web (CSW) standard. MetaSearch provides an easy and intuitive approach and user-friendly interface to searching metadata catalogs within QGIS.

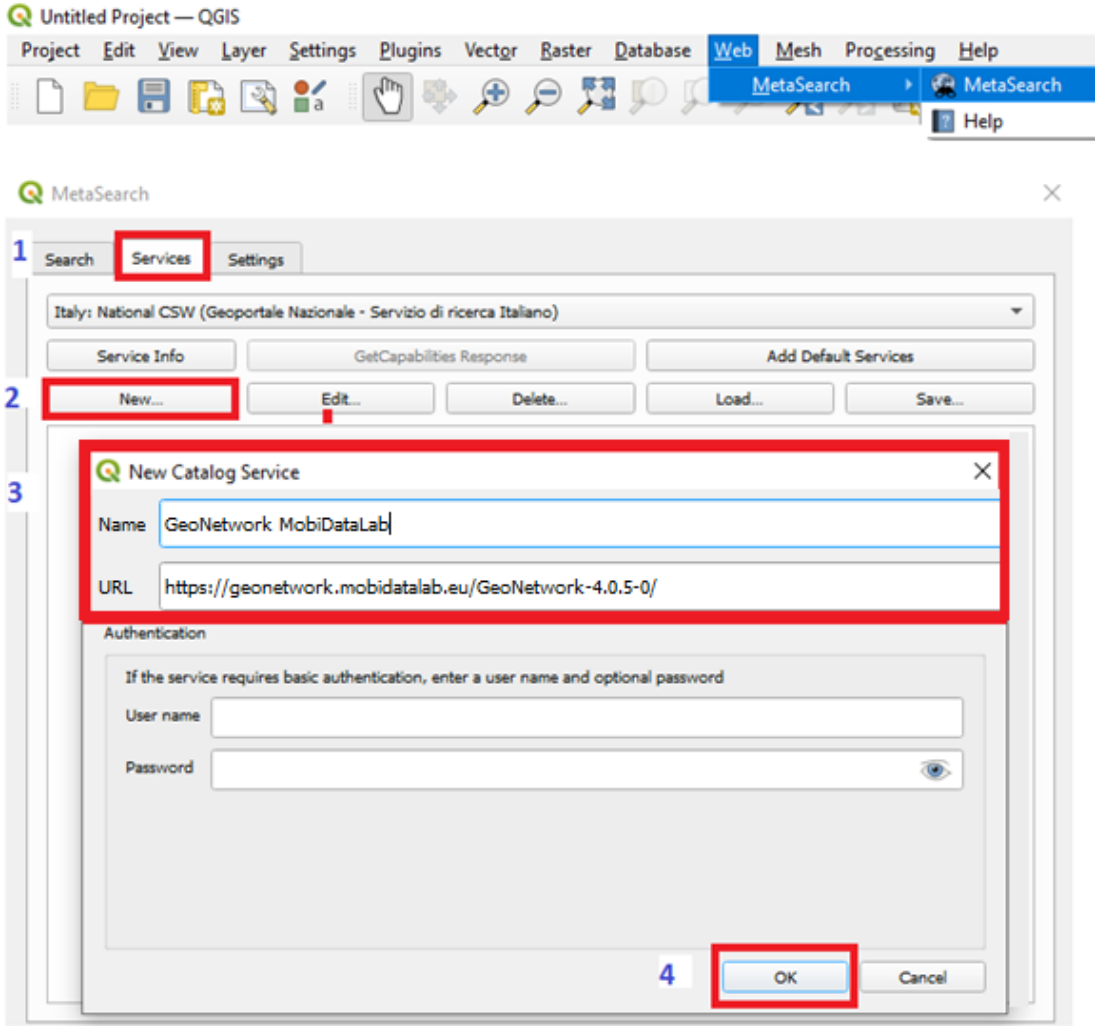
15. Qgis plugin for Metasearch

Launch the MetaSearch plugin

1. Consult the “Web Menu” (on top of the Qgis menu) and select MetaSearch and then MetaSearch again.

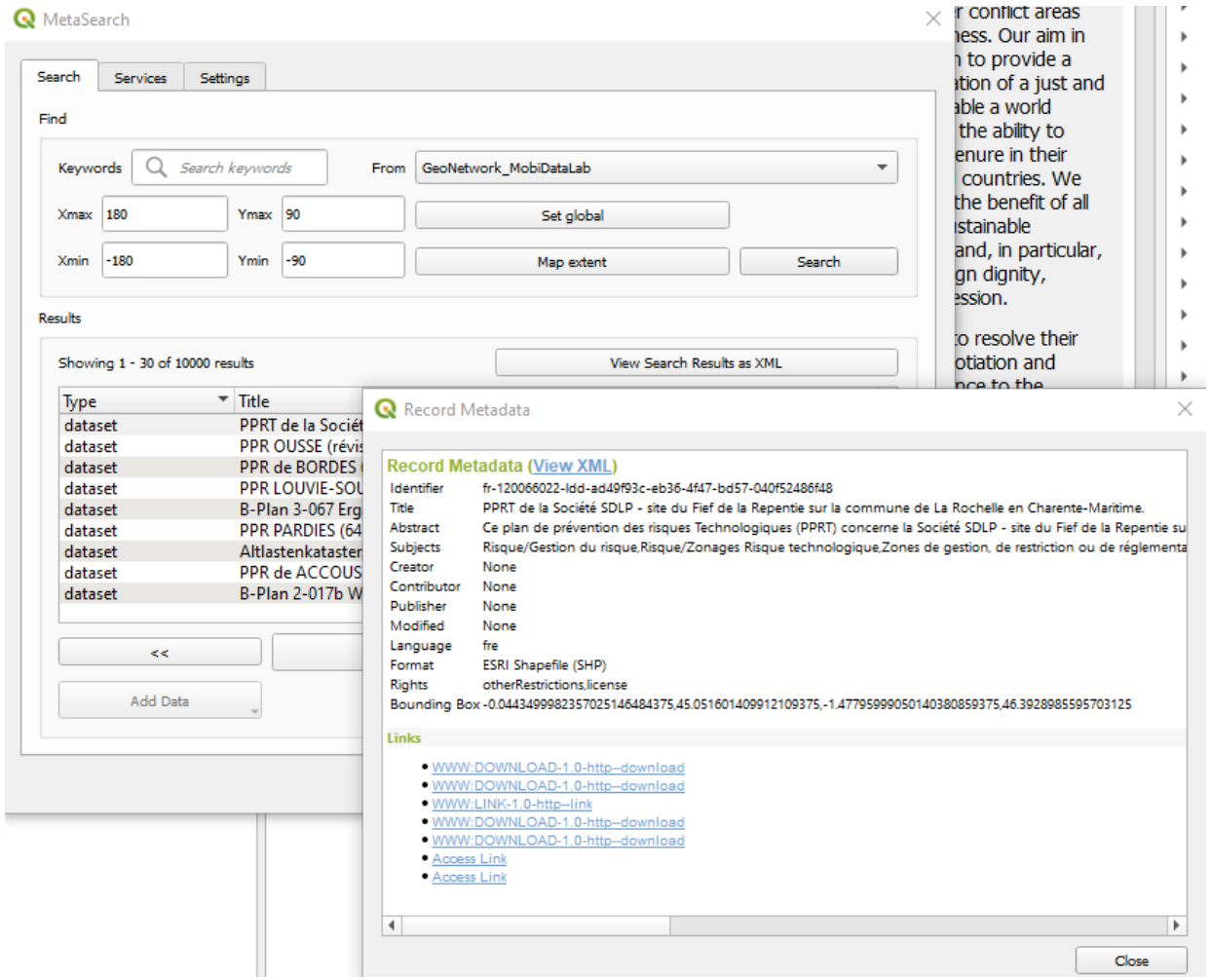
Add the Catalog Web Service (CWS)

1. Click on the “Services” tab
2. Click on “New”
3. Add the CWS URL (https://geonetwork.mobidatalab.eu/GeoNetwork-4.0.5-0/srv/eng) on the “Service” tab, assign a name to the portal and save it.
4. Click on “OK”



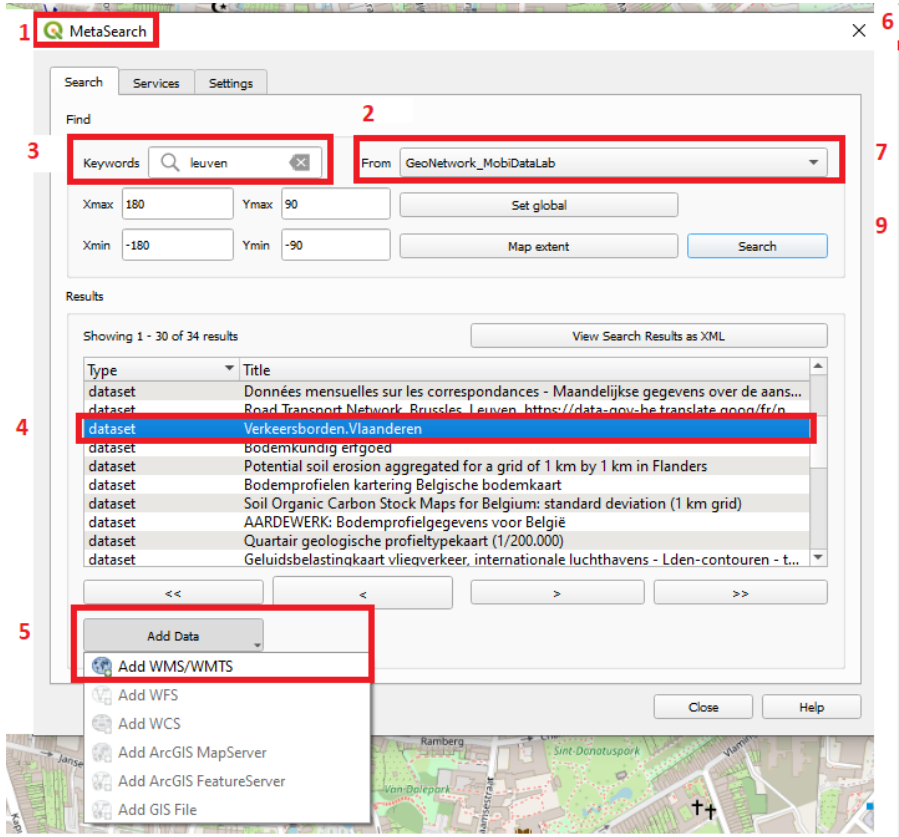
16. Search for Metadata

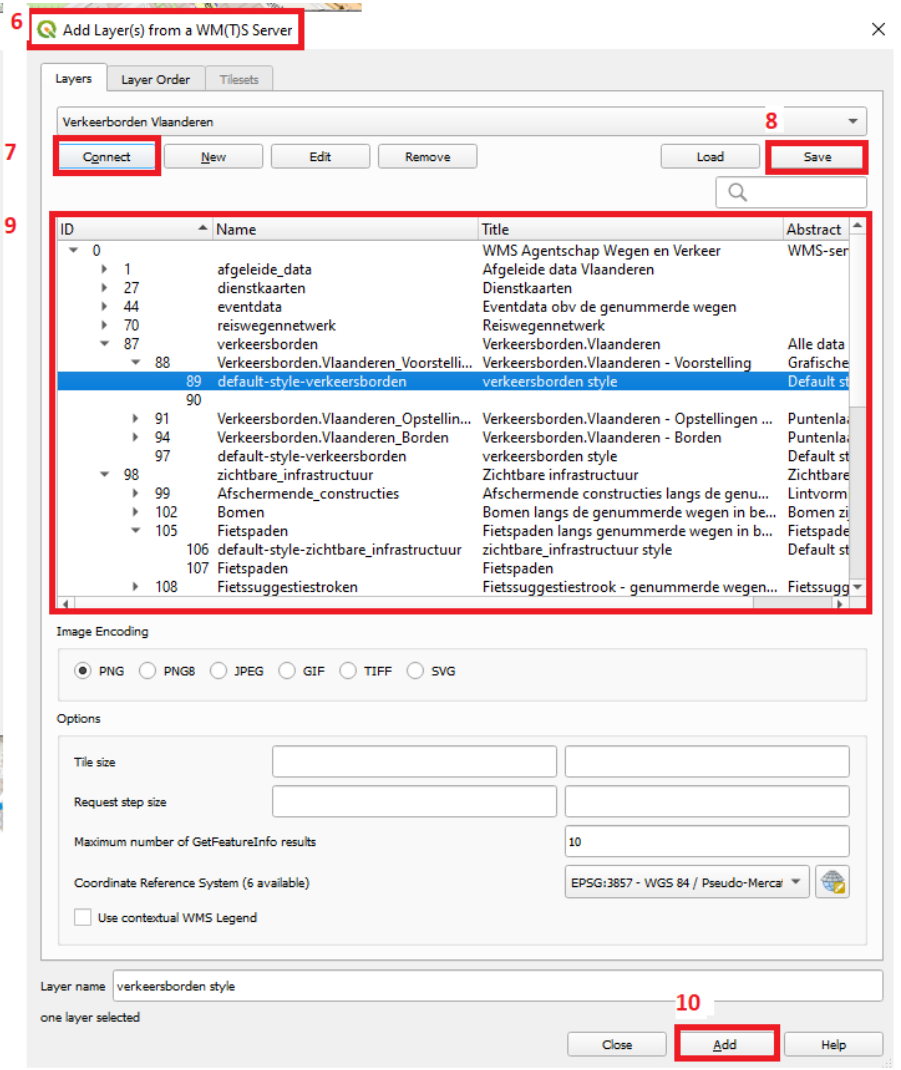
- To search for specific keyworks (type them on the search bar and click on search) or to see all the available datasets on the portal (leave empty the search bar and click on search).
- To filter your data on a particular area of the world, change the map coverage according to the area on which your QGIS project is focused with the button “map extent” or to access the metadata all over the world by using the “set global” button.
- It is possible to download the results as XML.
- When selecting a service or a dataset, it is possible to get the metadata record, which provides the link to access the source of the data.
- If the service or the dataset is in the right format to be read by QGIS, it will be possible to load the data.



17. Add a WMS/WMTS via the Metasearch

1. Open the Metadata search
2. Select the desired CSW
3. Search for a keyword
4. Select a dataset in WMS/WMTS format
5. Add data
6. On the layer from WMTS Server
7. Connect
8. Save it (optional)
9. Select it
10. Add it





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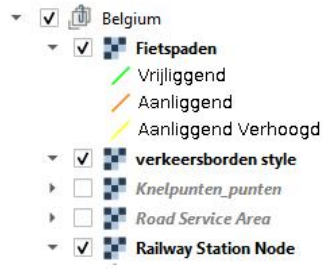
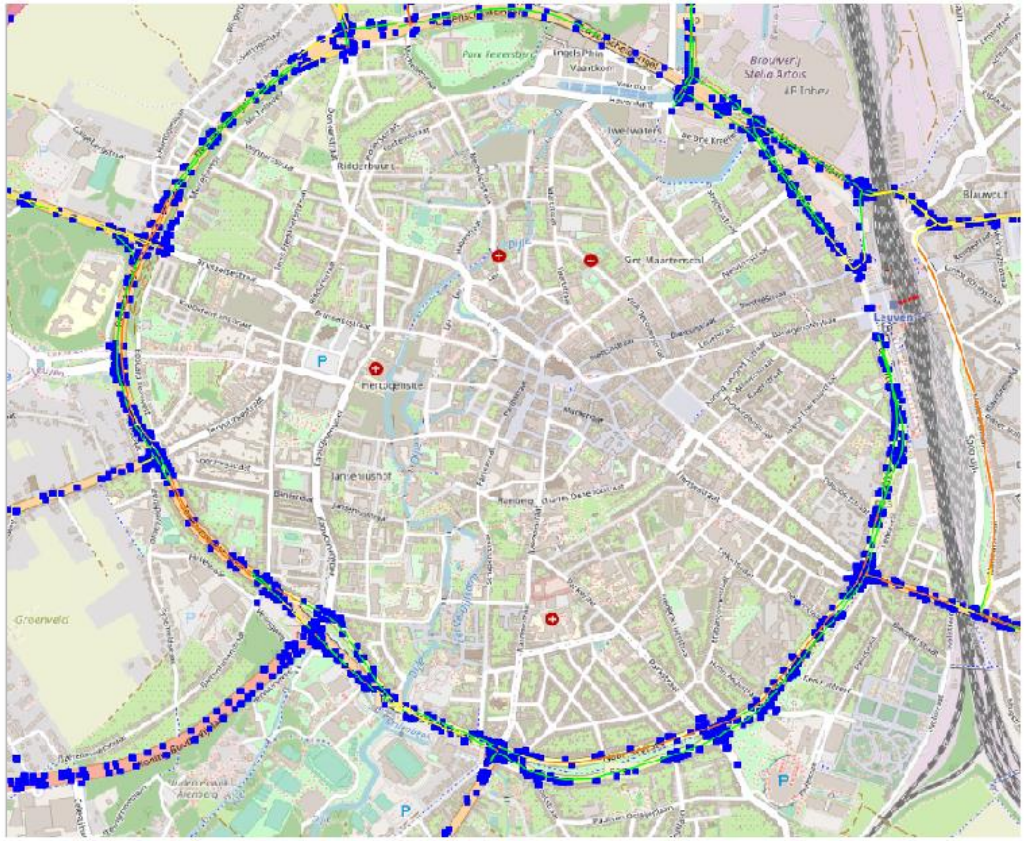
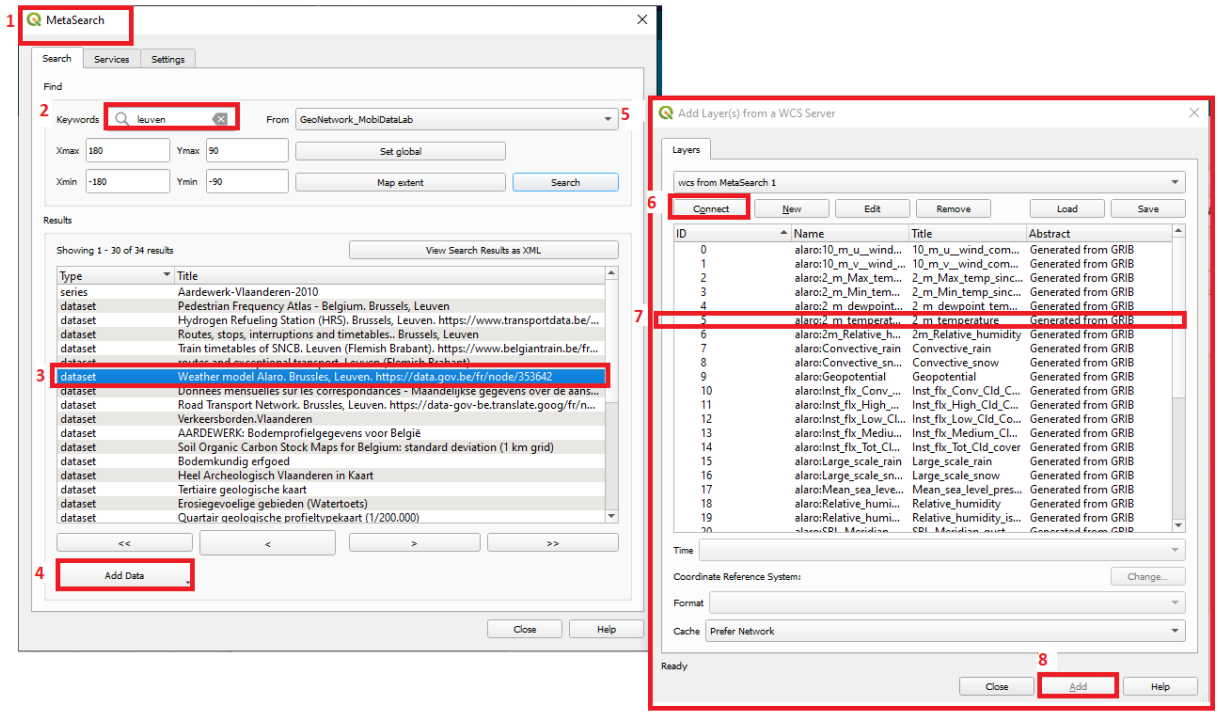
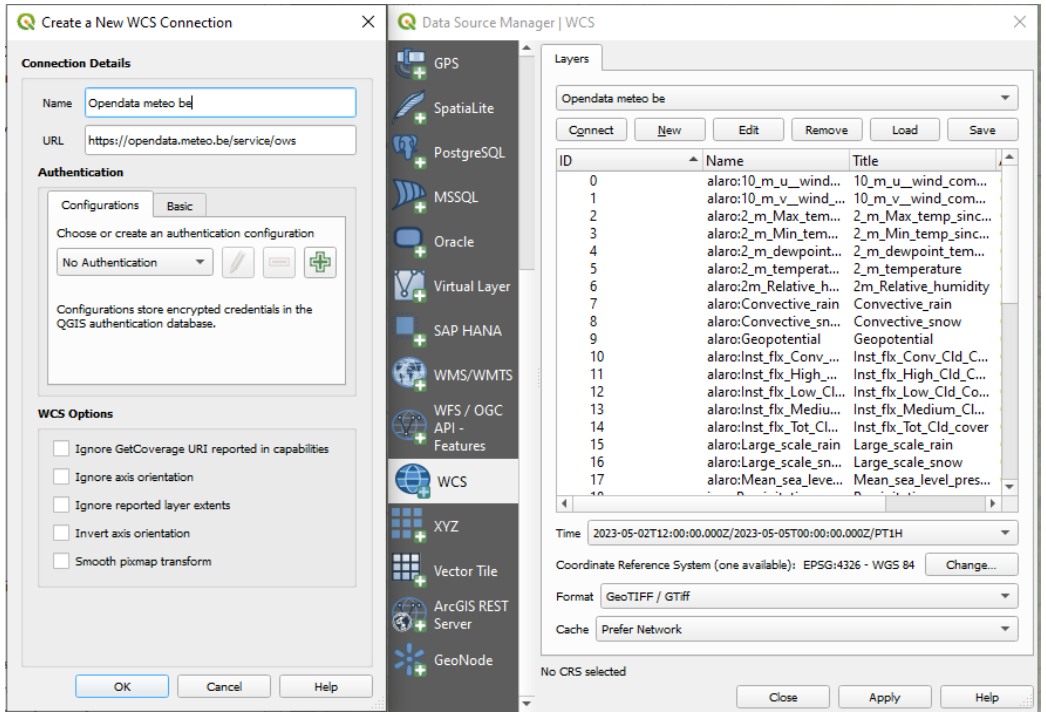
WMS of bike paths, road signs and railway nodes around Leuven

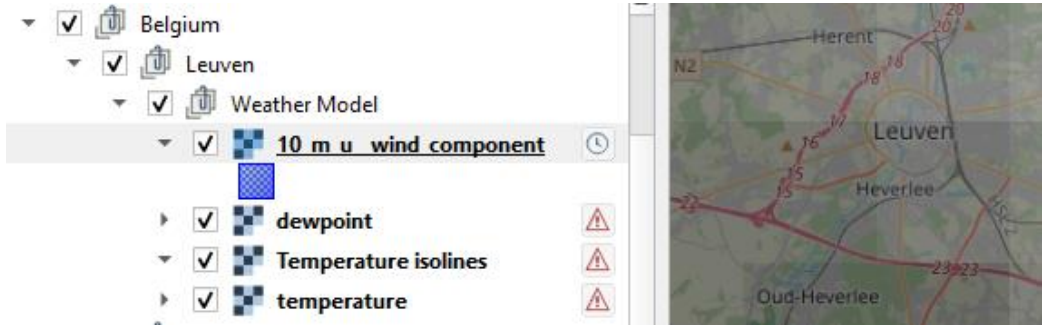




18. Add a WCS/OWS – Weather model







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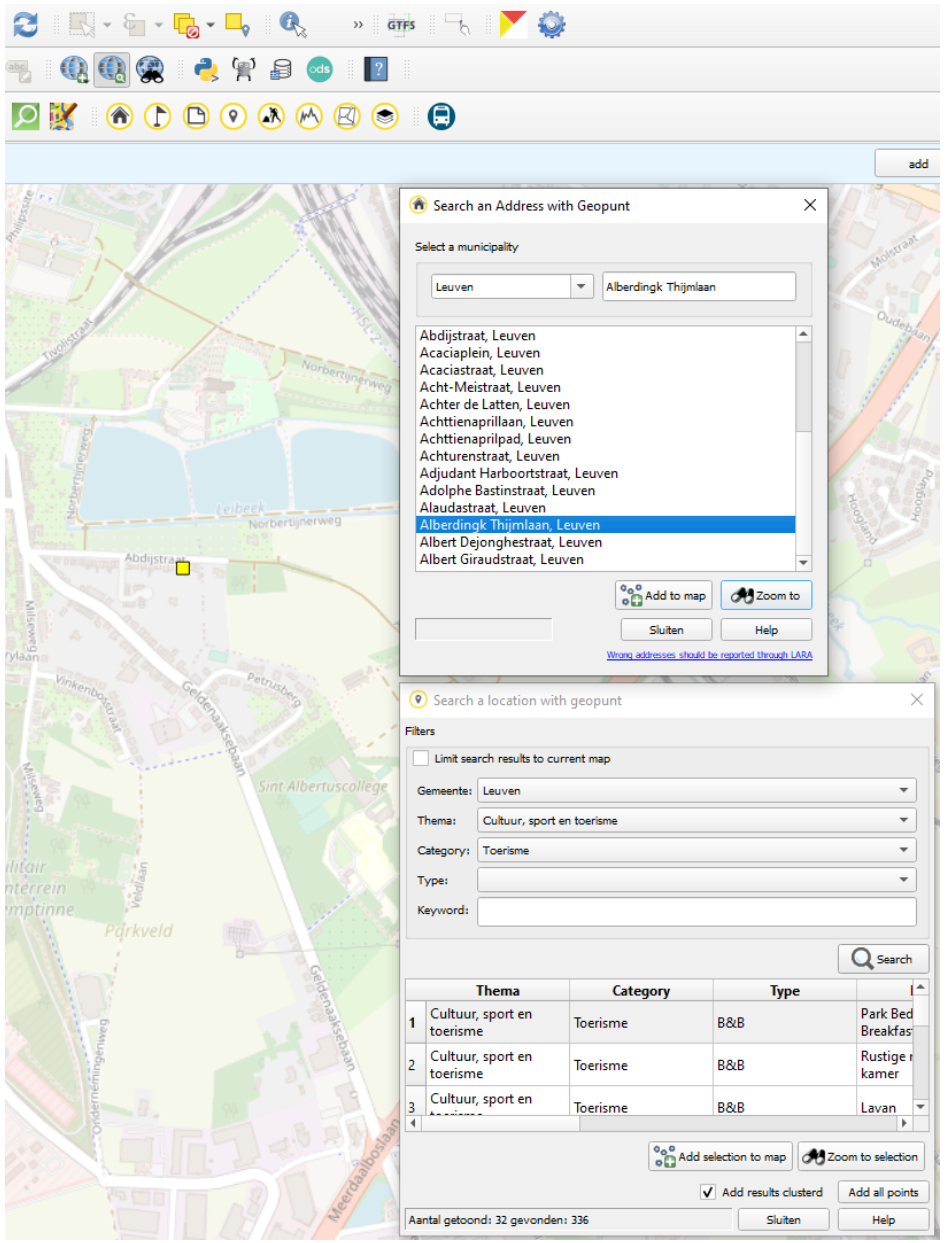
Plugins and other portals

19. Flemish geoportal : geopunt4Qgis

- Geopunt for QGIS is a plugin for the QGIS open source desktop GIS, which opens the web services of the Flemish geoportal Geopunt users. The Flemish Geoportal Geopunt offers several geographic services (web services) that may be used by third parties such as other governments and companies.
  - Geocoding [regular, batch and reverse] based on the address registry of Flanders
  - Search for POI in geopunt
  - Search for traffic obstructions in GIPOD
  - Draw elevation profiles
  - Search for Parcels
  - Search for layers in the geopunt catalog



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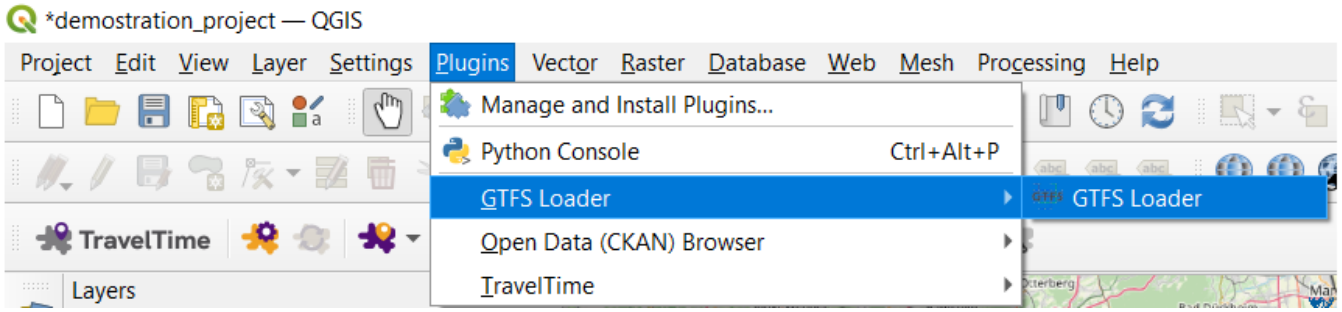
20. GeoPortal.rlp Metadata Search

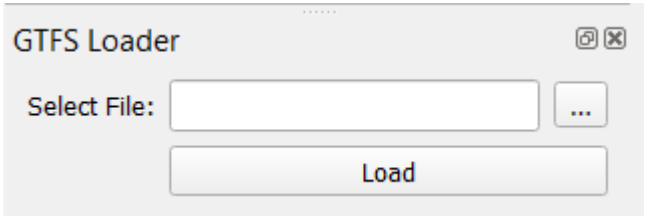
- This plugin uses the REST search interface of GeoPortal.rlp for searching spatial datasets and services. It has also an option to search in remote CSW-based catalogues (e.g. in the INSPIRE Geoportal Catalogue and the german Geodatenkatalog.DE). WMS/WFS and OGC API Features interfaces can direct be loaded into the QGIS Browser.

- All technical data can be found on Github : https://www.vlaanderen.be/geopunt/plug-ins/qgis-plug-in

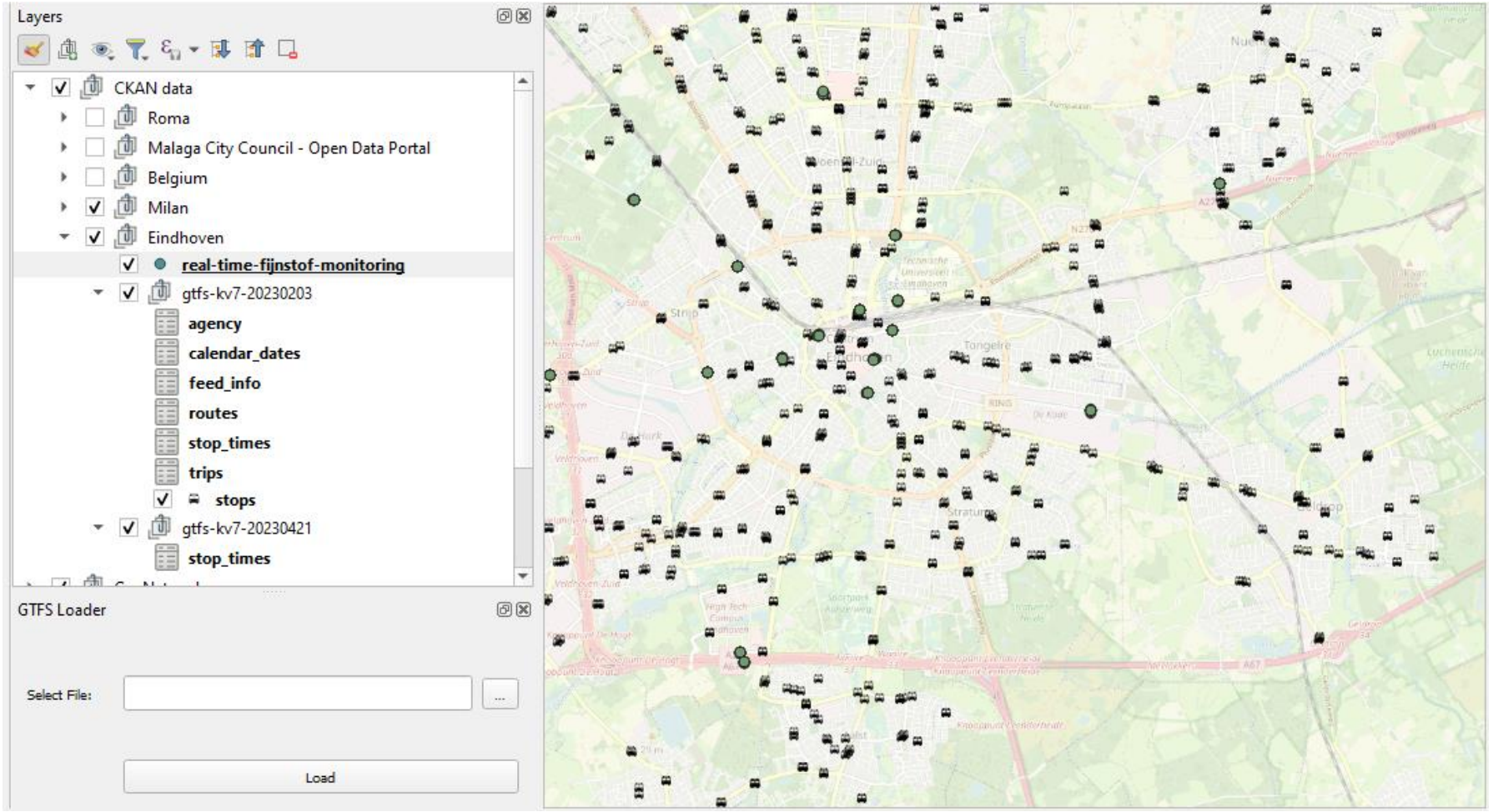
21. GTFS Loader plugin

1. Via the “Plugins” Menu, install the GTFS Loader plugin
2. Open the plugin by going to the plugins Menu
3. Search for the folder containing a GTFS file
4. Load the file





22. GTFS of transports in Eindhoven

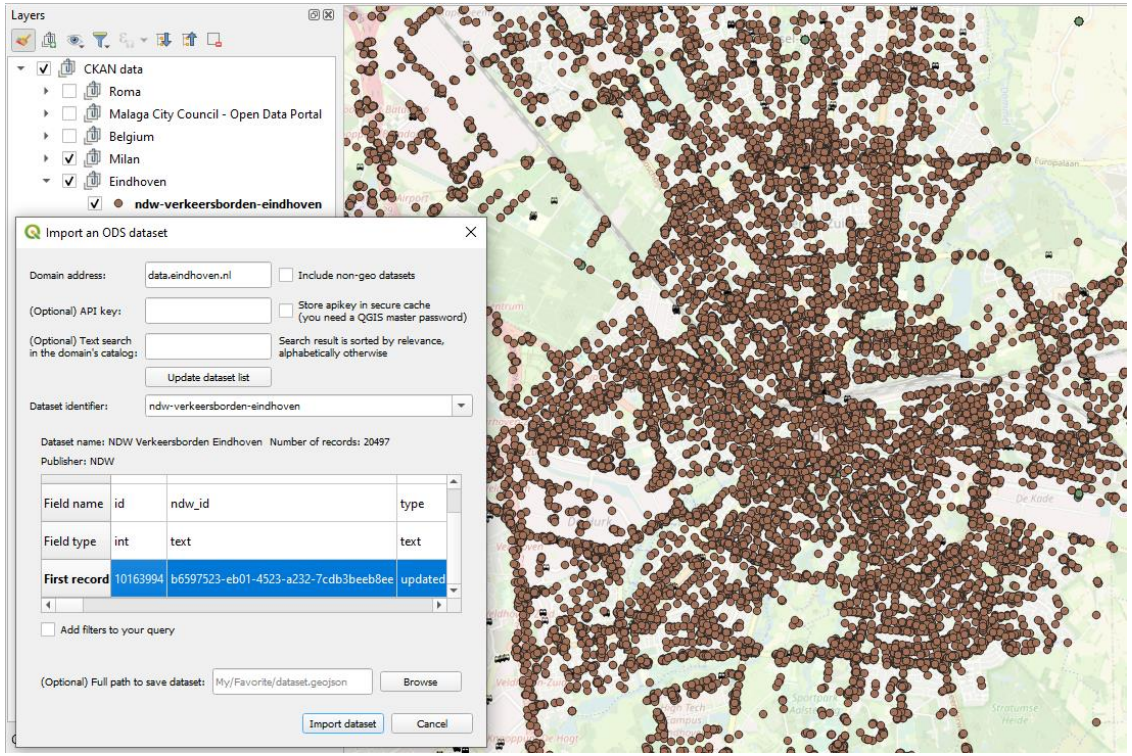


23. Opendatasoft plugin

Download datasets from Opendatasoft-powered data catalogs.

- This plugin allows one to directly import, in the GeoJSON format, any dataset from a private or public Opendatasoft portal. It uses the web Explore API v2 to fetch the data, thus you will find this plugin in the web menu.

NDW transport information of Eindhoven



24. Here Route API Plugin

- Hqgis ➡ Routing, Geocoding, POI search, Isochrones with the HERE API.
- Impact toolbox ➡ This plugin automates access to the ANYWAYS API by :
  - Taking a set of Points of Interest (POIs) and returning routings between all of them based on a given routing profile
  - Taking two sets of POIs as Origins and Destinations and returning routings from all origins to all Destinations based on a given routing profile

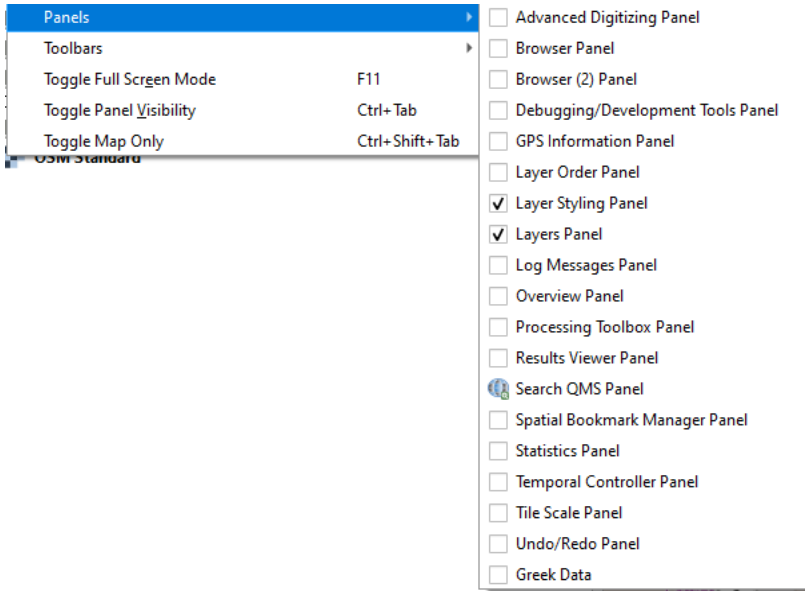
25. Other plugins to explore

- Travel Time
- Mobility Areas
- PosiView
- GBFS-NOW
- QGIS Cloud Plugin
- Networks
- OpenTripPlanner
- Tempus
- MapTiler
- QuickOSM
- OSMDowloader
- Pelias Geocoding
- Valhalla
- OSM place search
- QBan(o)
- AdressesFr
- Google Maps geocoder
- OS search for addresses
- OS Translator II
- GeoPortal.rlp Metadata Search
- Qweather
- XYZ Hub Connector : Connect QGIS to your personal space on HERE Data Hub and to your Interactive Map Layer inside the HERE Platform.
- Greek Data

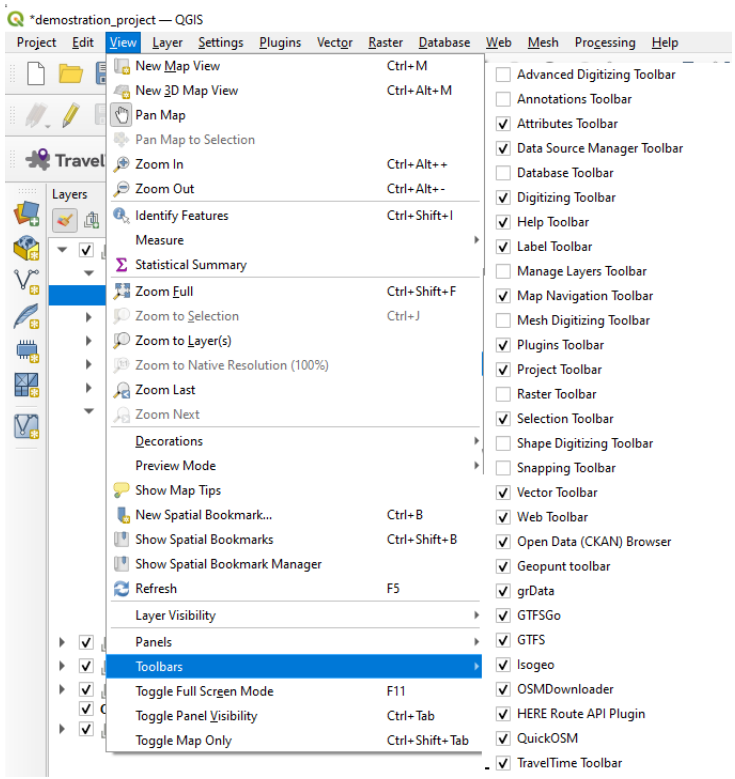
Basic tools

26. Basic tools

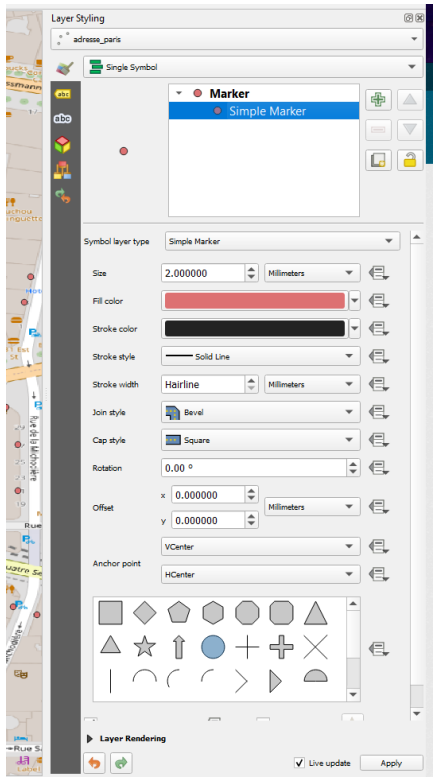
Pannels



Toolbars



Layer Styling



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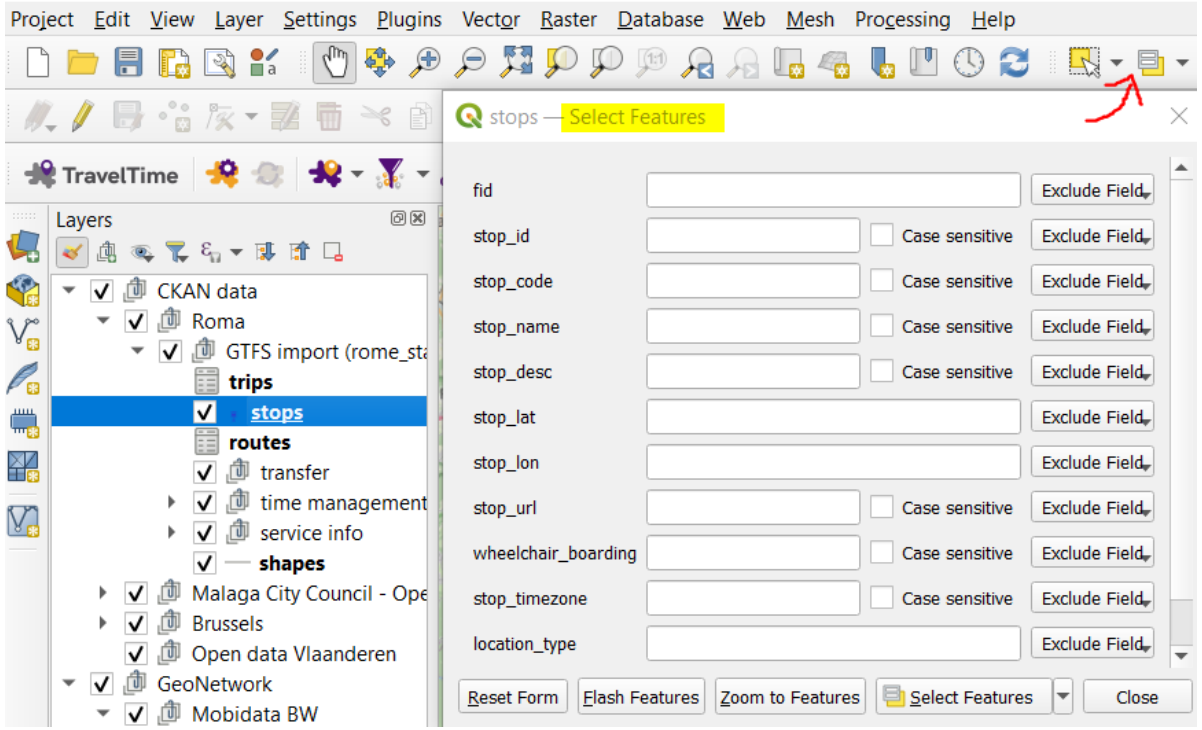
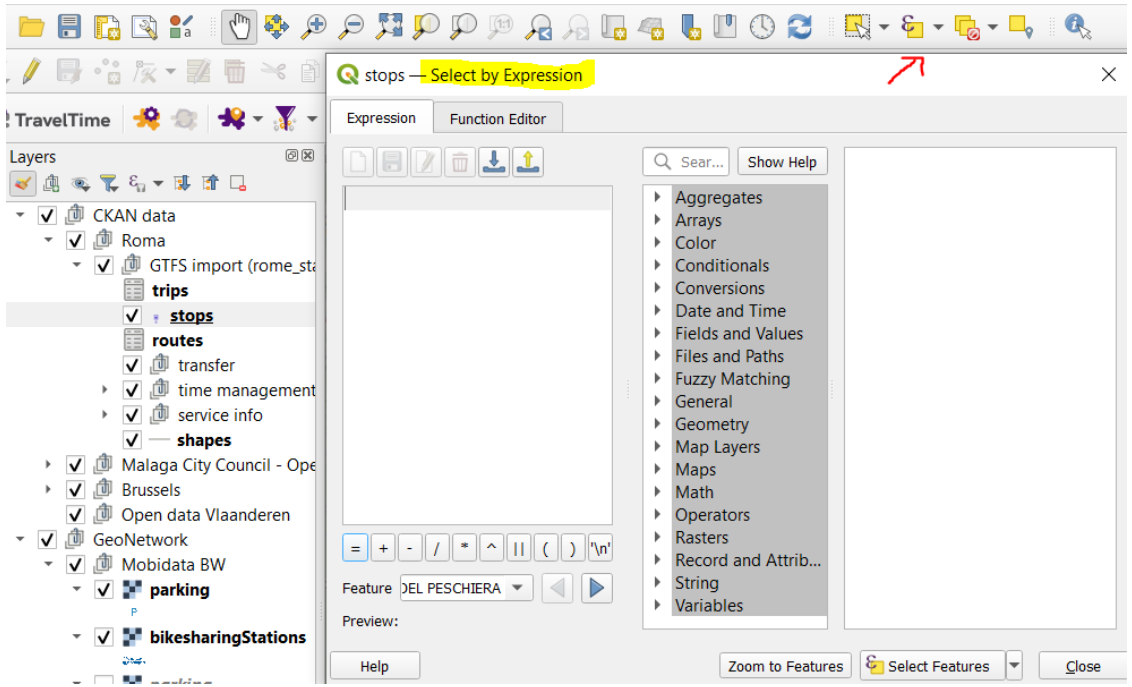
27.1 Selection feature tools



Select and highlight data by value or by expression with the selection tools



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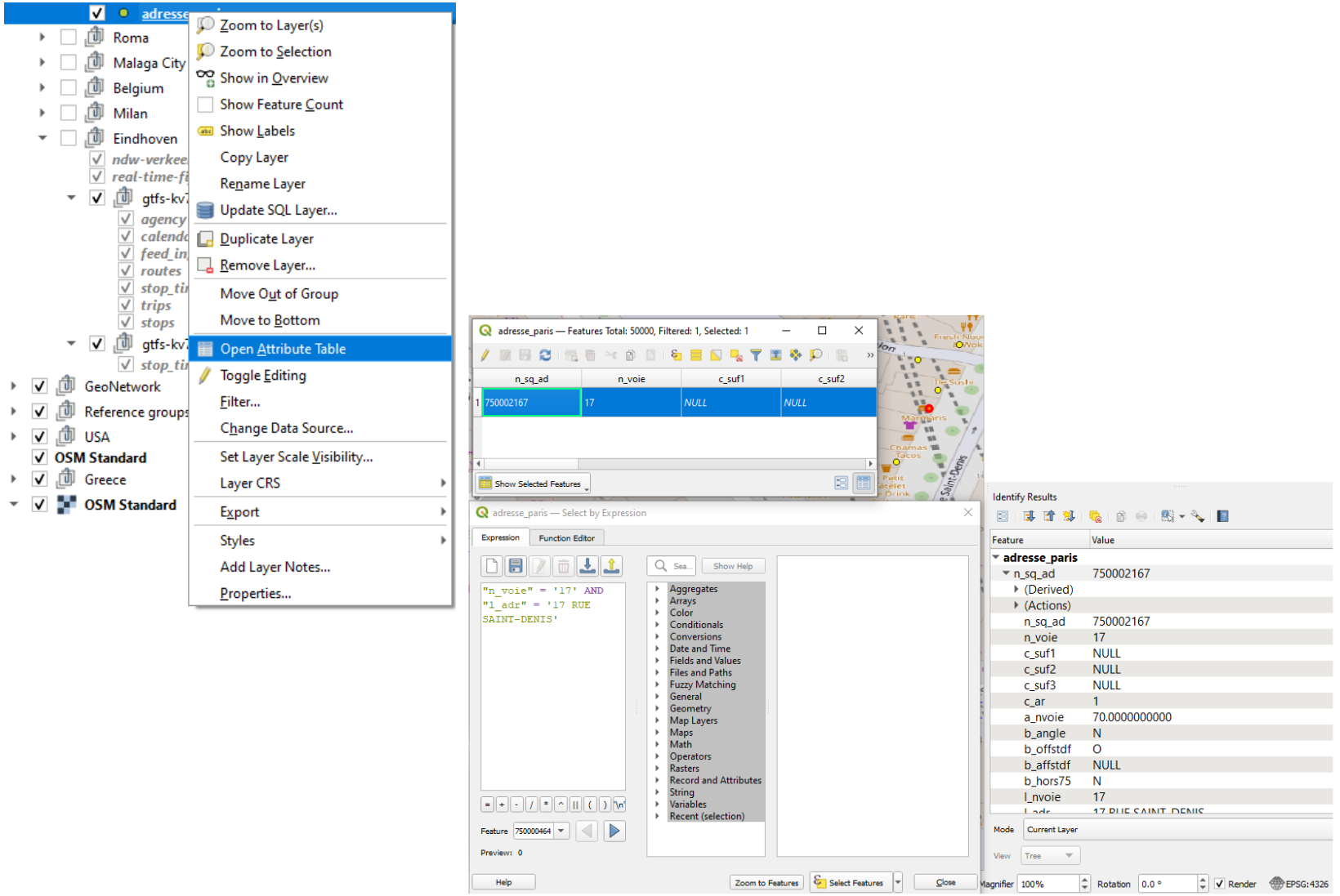
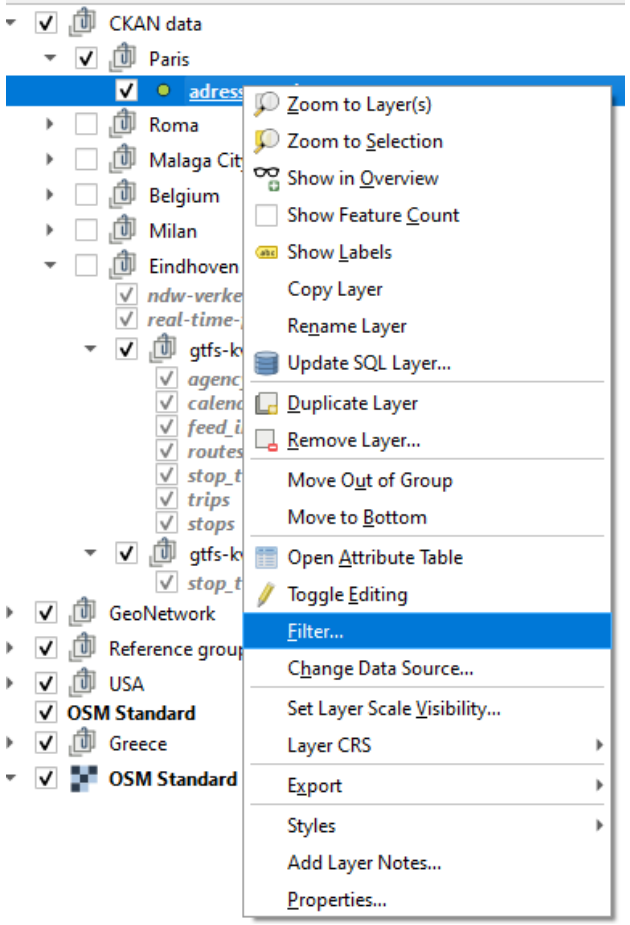
27.2 Selection feature tools

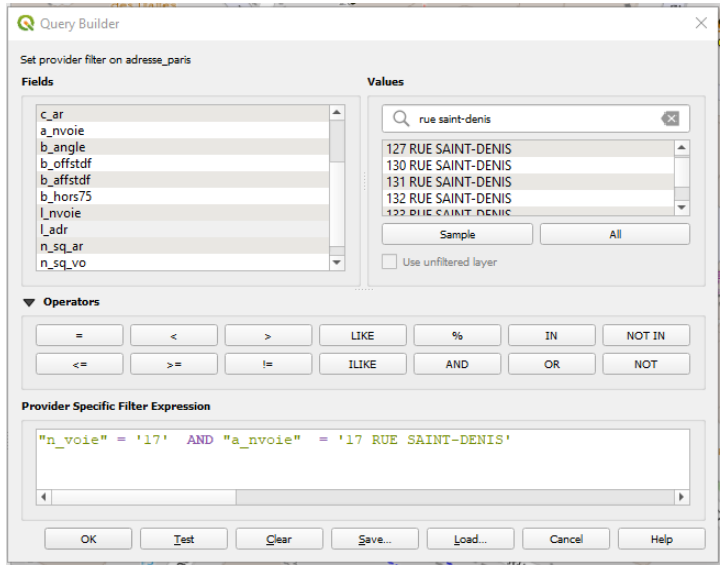
Find an address on a map and on a table on Qgis with an address layer.



28.1 Query builder and filter

1. Right click on the address layer ➡ filter…
2. Left click on the field of interest, followed by a left click on the button All
3. Filter by a search
4. Double left click to select the searched fields and values (using the operators “=“, “OR”, “AND”), followed by a left click on OK

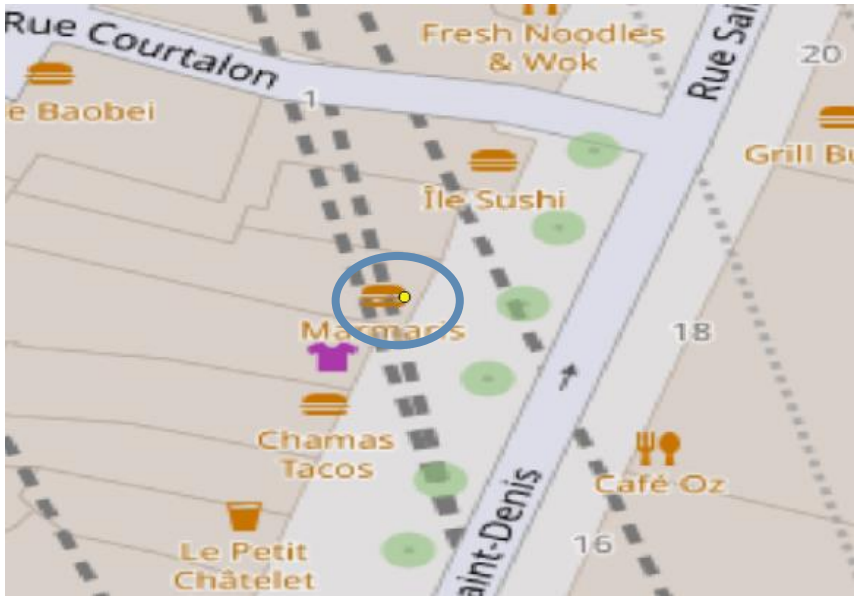




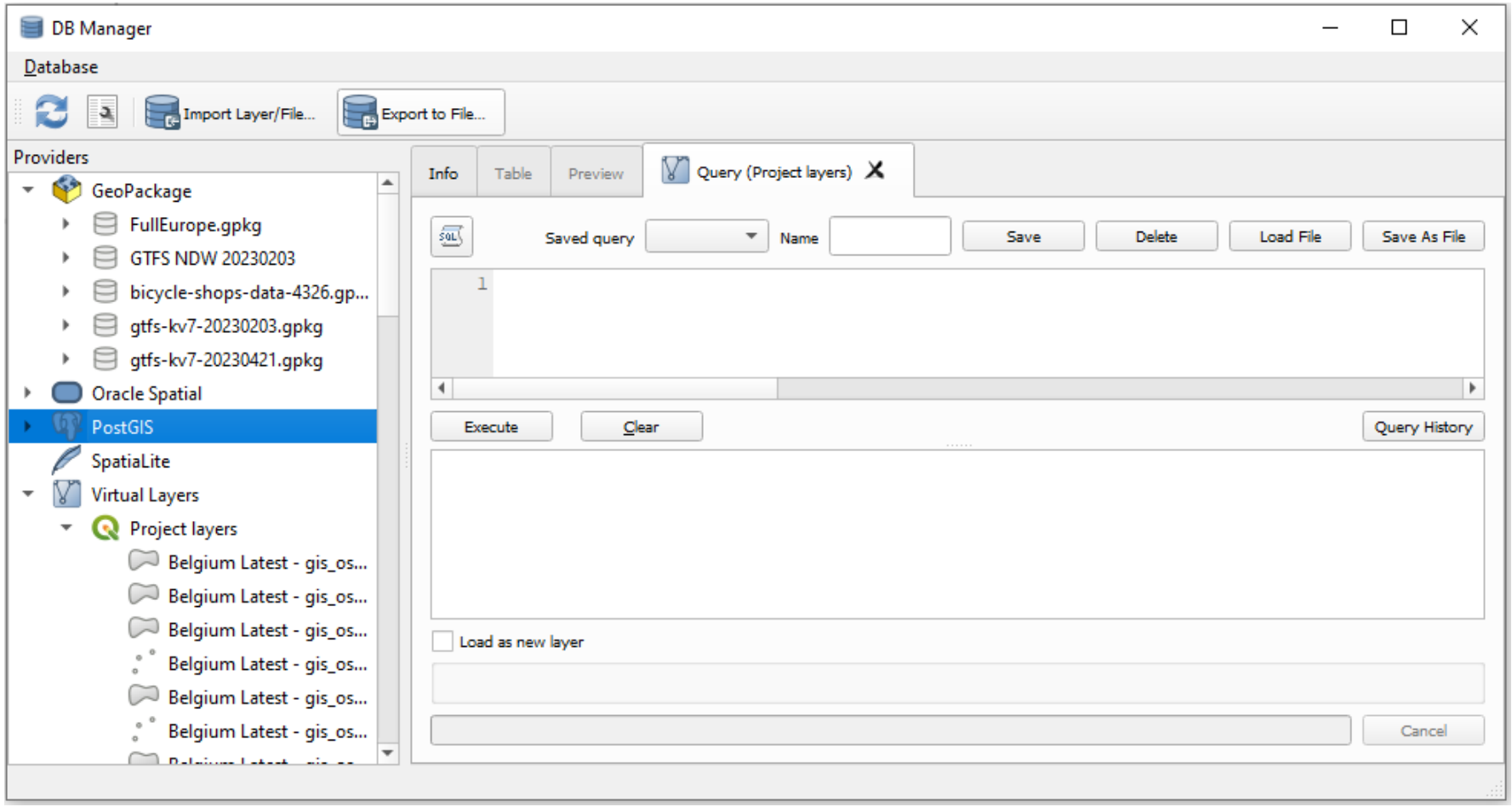
28.2 Query builder result

- You can do the same with the other layers according to their fields to find your target more easily.

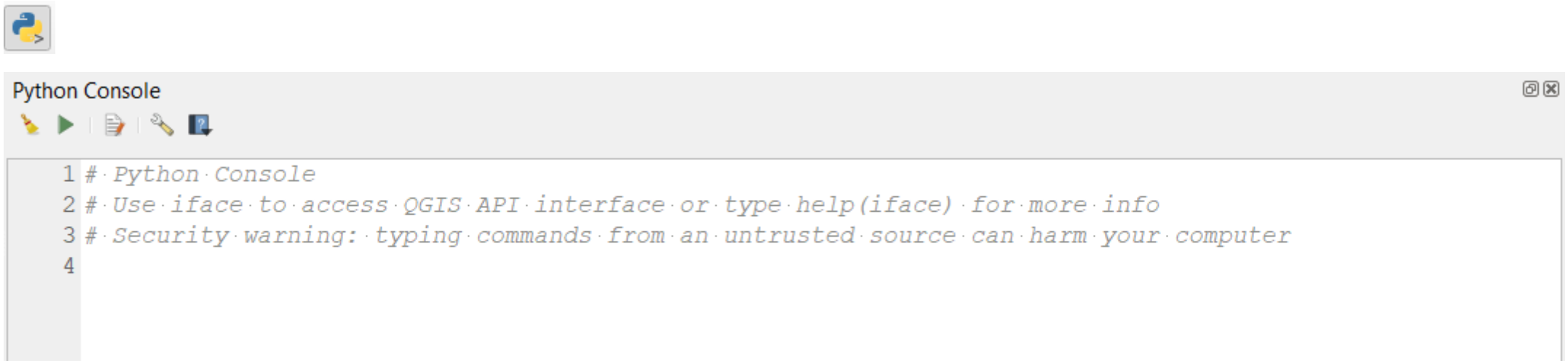
- At the end of your consultation, you must remove the filter so that the rest of the information is visible.



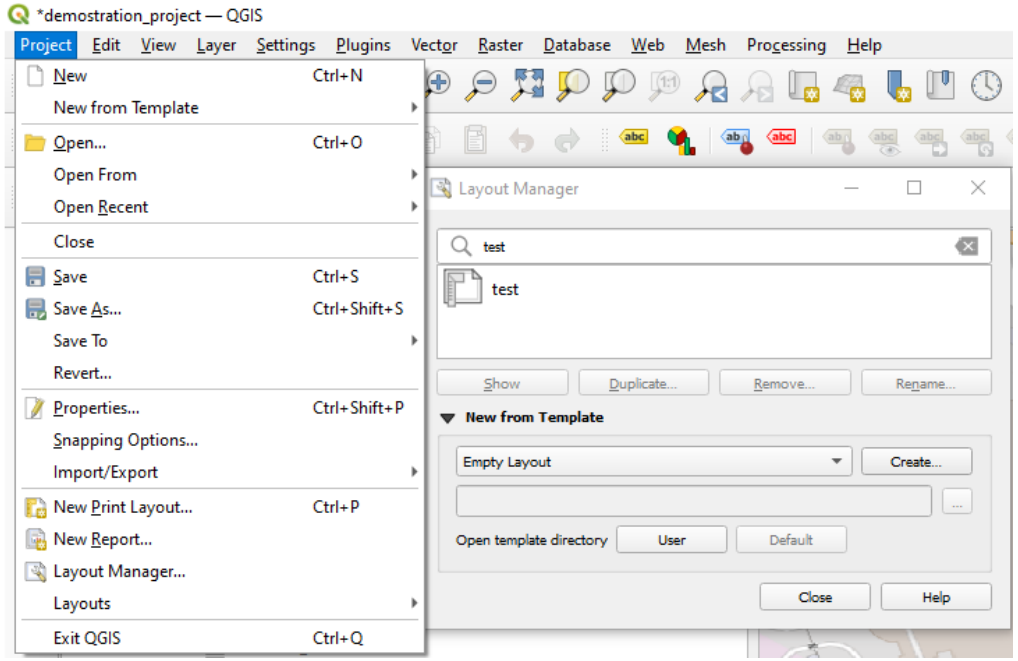
28. DB Manager and SQL

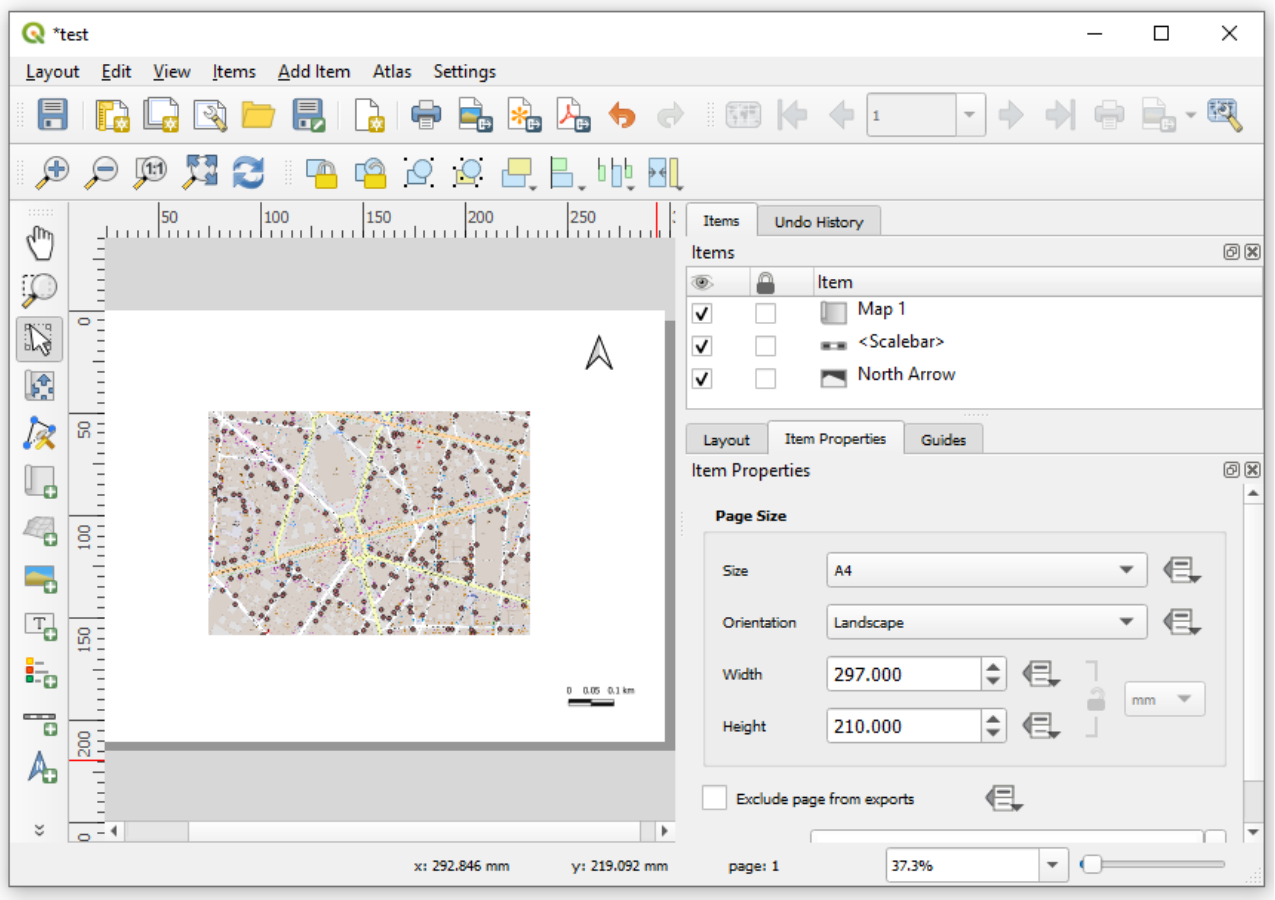


29. Python console



30. Map layout





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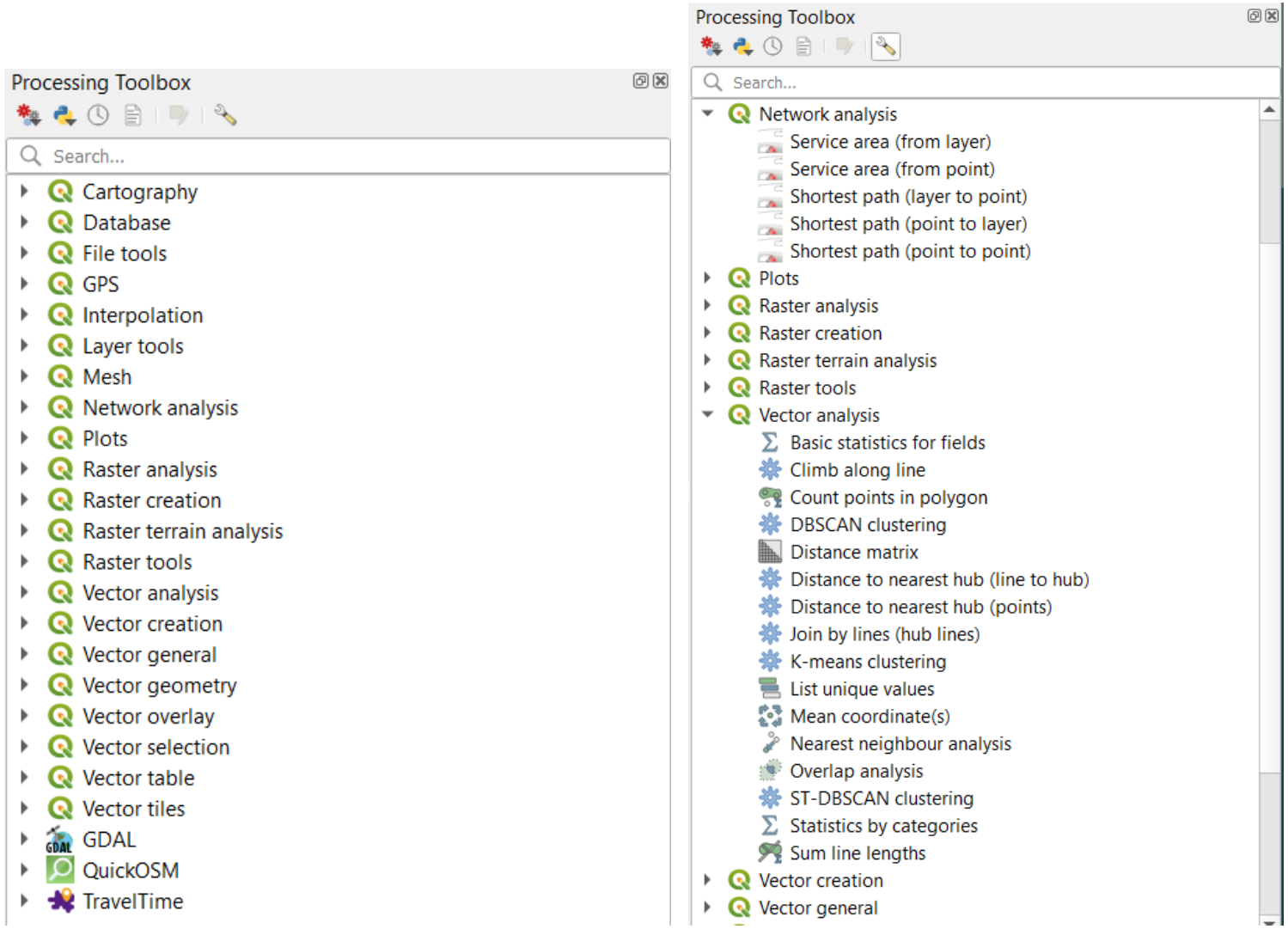
Tools to analyze the data

30. Analysis/Processing Tools

- GDAL (supports OpenAPI, Modular OGC API Workflows MOAW)
- Shortest path
- Distance to nearest hub
- Distance matrix
- Nearest neighbour analysis



Thank you for listening

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