How to use OSM data in QGIS?

Vector, raster, database, docker, Overpass, tiles and so on...

Which one can I use?

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3Liz

- **Open Source** forever, check our [GitHub](https://github.com)
- Contributors in QGIS, server side mainly, plugins
- ♥ QGIS Desktop ♥ QGIS Server ♥ PostGIS ♥
- Opensource solution for publishing QGIS Project on the web, Lizmap Web Client

[3Liz Logo]
QGIS, the powerful desktop app

**OSM vector data with different symbologies**
QGIS, the powerful desktop app

Isochrone analysis
QGIS, the powerful desktop app

Remote data with temporal controller
QGIS, the powerful desktop app
OSM data model

- Different primitive objects

<table>
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<th>OSM</th>
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<td>Way</td>
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- A OSM way can either be a GIS line or GIS polygon according to its OSM tags (key/values)
- A OSM relation can be point, line, multilinestrings, multipolygons, mixed geometry...
OSM data model

Another difference ➔ attributes

- In GIS, the layer has one or many fields, defining all features in this specific layer.
- In OSM, the layer does not exist. Each feature is individual and has its own fields.
Therefore

OSM data in QGIS will be different from raw OSM data
Moreover, there are a few questions
Do you need ...

- to have up to date OSM data?
- to work with small extent or a big extent?
  - By the way, what is a small and big extent? (for online API)
  - Density of data in different part of the worlds
- to have OSM metadata such as contributor, changeset, timestamp?
- data designed for display or analysis or routing or geocoding or ...
- all OSM keys and values or just the "most common ones"?
There isn't a single answer
Let's see what is possible
With QGIS only

- Add the default mapnik style as a raster, from the QGIS Browser
With QGIS only

- Some online tools are already transforming the data into GIS formats (SHP, Geopackage...)
- [https://download.geofabrik.de/](https://download.geofabrik.de/)
- [https://www.data.data-wax.com/](https://www.data.data-wax.com/) France and other countries, QGIS style, GitHub (this screenshot)
- Opendata portals (such as the French one [https://www.data.gouv.fr](https://www.data.gouv.fr)). Look in your country 😞
- ...

SOTM - Firenze 2022
With QGIS only

- Load OSM XML or PBF files
  - Thanks to OGR in the background
- Different websites to download these files with worldwide coverage:
  - [https://download.geofabrik.de/](https://download.geofabrik.de/)
  - [http://download.openstreetmap.fr/extracts/](http://download.openstreetmap.fr/extracts/)
  - ...
With QGIS only

- It starts to be an issue if you want some **specific** fields
- This is called an **HStore** field
Use Processing Explode HStore

Explode HStore Field

This algorithm creates a copy of the input layer and adds a new field for every unique key in the HStore field.

The expected field list is an optional comma separated list. By default, all unique keys are added. If this list is specified, only these fields are added and the HStore field is updated.
Or use QGIS Expression

for selection, labelling ...
Using QGIS Plugins

A few plugins in the QGIS plugin manager among the 914 plugins available (August 2022)
QuickMapServices plugin

*OpenTopoMap* in the background, based on OSM, designed for hiking 🏞️
QuickMapServices plugin

In QuickMapServices, go in Settings ➡️ More services ➡️ Get contributed pack to enable a lot of basemaps 🚀.
QuickOSM plugin

- Download the data on the fly
- Making requests to the Overpass API, similar to Overpass-Turbo
  - Server API to retrieve raw OSM data based on queries (OQL)
- QuickOSM 2.2.1 is on its way
- Targeting both
  - non OSM contributors
  - and OSM OverpassAPI experts
- It's removing the HStore field other_tags by exploding it
- As it's using an API, limited amount of data
- Let's make an overview of this new version
Quick Query

- Search in your native language
  - 🇬🇧 Bakery
  - 🇮🇹 Panetteria
  - 🇫🇷 Boulangerie
  - 🇺🇸 shop=bakery in OSM

- Multi key/value support with AND / OR operator

- Thanks to the JOSM and Vespucci community to share these presets on GitHub
Quick Query

French people love 🍞 and 🧀
Map presets

- Download many layers, many OSM objects, with a QGIS symbology at the same time with 2 clicks
Map presets

A few steps to make new presets, with a QGIS style
Map presets

Bicycle map, landuse... map presets

https://docs.3liz.org/QuickOSM/user-guide/map-preset/
QuickOSM in Processing

- Available in Processing *Toolbox* and *Modeler*
- Batch processing
- Example: downloading fire hydrants, reprojecting in meters projection, buffering and QGIS Style
QuickOSM in Processing
Local OSM file

- Having a PBF/OSM file on your computer?
- You can still filter it
Some quick tips in QuickSOM
Reload the query to get latest update from OSM
Query many named places with

In: montpellier ; paris

All OSM objects with the key 'amenity'='restaurant' in montpellier and paris are going to be downloaded.
Default QGIS Actions available

JOSM, Wikipedia, URL, Mapillary
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JOSM, Wikipedia, URL, Mapillary
Translations

- Web interface: https://www.transifex.com/quickosm/gui/dashboard/
- Statistics: https://docs.3liz.org/QuickOSM/translation-stats/
OSM relations

Issues with OSM relations

- The underlying library (OGR) can only display relations = route, multilinestrings, multipolygons or boundary.
- Other relations need some post-processing to manage geometries for a GIS software.
Geocoding

- New in QGIS 3.20 🌟
- No more plugin required
- https://nominatim.qgis.org
- Processing algorithm for batch geocoding
Geocoding

- New in QGIS 3.20 🌟
- No more plugin required
- [https://nominatim.qgis.org](https://nominatim.qgis.org)
- Integrated in the locator bar (without plugin)
Routing

- ORS Tools
- API based on OpenStreetMap data
- isochrones and matrix calculations
Importing OSM in a database?

https://wiki.openstreetmap.org/wiki/Databases_and_data_access_APIs#Database_Schemas

- Mainly **osm2pgsql**, used for rendering, very old project and used
- **Imposm**, version 3 is updatable. Each layer has a **mapping configuration**
Database with docker

- Docker and Docker Compose
- https://github.com/kartoza/docker-osm
- Docker-compose project:
  - PostgreSQL container
  - Imposm container
  - OSMUpdate container: to download OSM diff files
- Workflow:
  - Drop a PBF file in the folder
  - Drop the area of interest for clipping (recommended) in the folder
  - Copy `.example.env` to `.env` for local settings
  - `make run`
et voila!

Possible to customize the configuration:

- Different **mapping**
- Generalization for different scales
- Updated every two minutes by default
- SQL Triggers, views
- Styles included in the QGIS `layer_styles` table
Vector tiles

- Vector tile support, new in QGIS 3.14 🌟
- MapTiler / OpenMapTiles [https://openmaptiles.org/](https://openmaptiles.org/)
- Presentation from Jiri Komarek and Wladimir Szczerban *yesterday* at the **SOTM** or at the FOSS4G next week
Questions

This was just a *subset* of capabilities. There are still other plugins, other ways etc.

*Etienne*

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