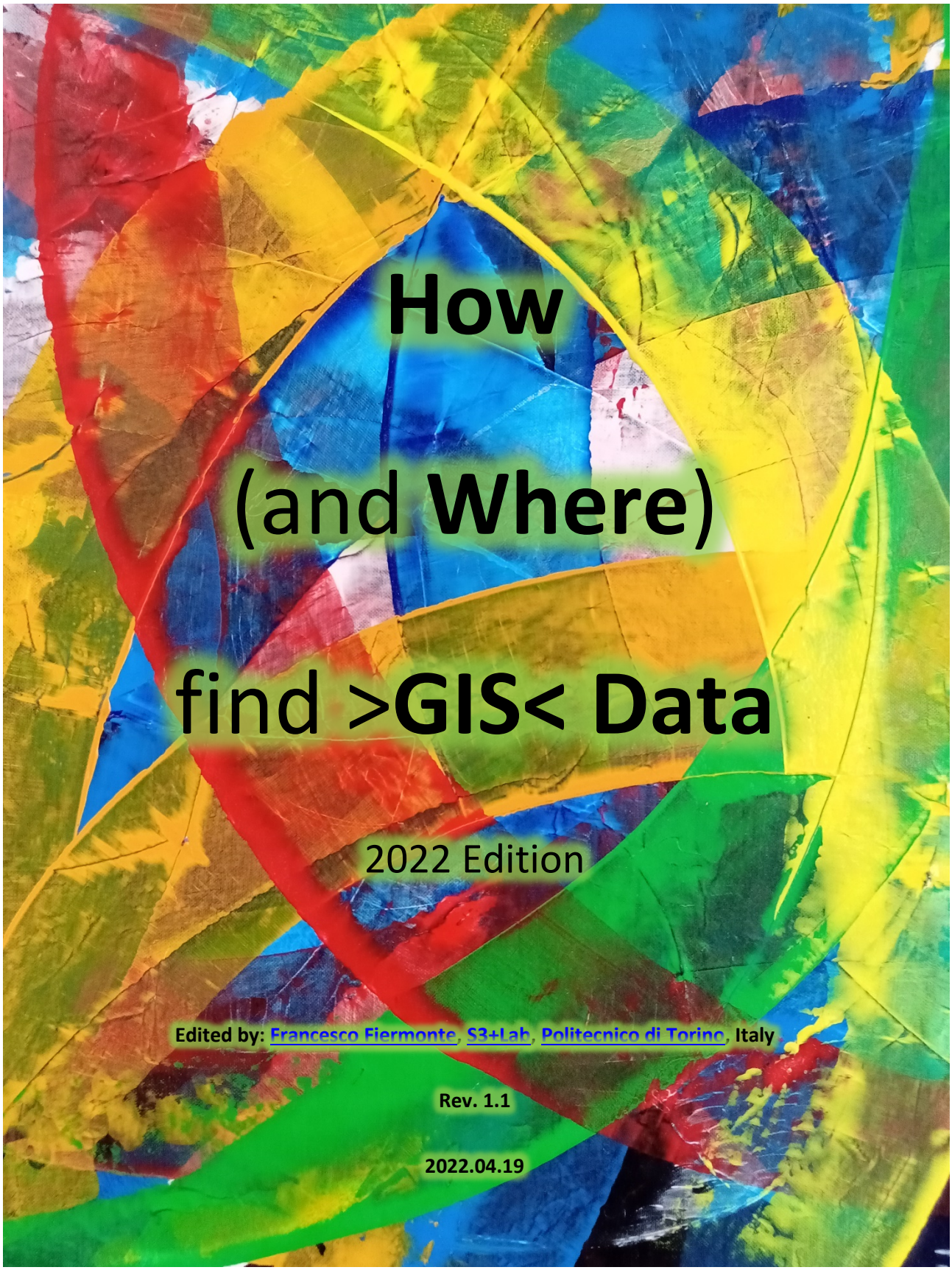

Summary

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This work

These notes are for the sole purpose of describing the **GIS data discovery** process.

Please refer to the QGIS software manuals (tutorials, guides…) for getting help on how:

- load data
- manage GIS data
- geoprocessing
- and so on

Consider also to **Join** your local **QGIS Community**: participation (and sharing ideas) is better than <walls> and <mind solitudes>.

Drop me a line[1] to give me your feedback or if you need more information.

License

How to search (and where)

Maybe, some <data paradise> really exist…

But… Even if there are many web sites that share, in the <same place>, a variety of data and information:

- Eurostat- GISCO
- FiveThirtyEight
- Google Dataset Search
- Google Open Data Explorer
- I dati aperti della pubblica amministrazione[3]
- National Institute of Statistic (ISTAT) and Geographic Data
- Maryland's GIS Data Catalog

[1] francesco.fiermonte[at]polito.it
[2] Creative Commons — Attribution 4.0 International — CC BY 4.0
[3] Open Data of the italian public sector (PA)

- NASA's clearinghouse site for open-data provided to the public
- Open Data Australia
- Registry of Open Data on AWS
- The official portal for European data
- U.S. Census Bureau
- U.S. Government's open data

other times, data is in the depths of the network or, better, simply <hidden> on the WEB…

Broadly speaking, in order for searching <GIS data> is convenient to browse the web for resources named as <Geoportal> or <Open Data> (case is not sensitive).

> *"A geoportal is a type of web portal used to find and acess geographic information (geospatial information) and associated geographic services (display, editing, analysis, etc.) via the Internet. Geoportals are important for effective use of geographic information systems (GIS) and a key element of Spatial Data Infrastructure (SDI).*
>
> *Geographic information providers, including government agencies and commercial sources, use geoportals to publish descriptions (geospatial metadata) of their geographic information. Geographic information consumers, professional or casual, use geoportals to search and access the information they need. Thus geoportals serve an increasingly important role in the sharing of geographic information and can avoid duplicated efforts, inconsistencies, delays, confusion, and wasted resources."*[4]

> *"Open data is data that is openly accessible, exploitable, editable and shared by anyone for any purpose, even commercially. Open data is licensed under an open license."*[5]

It is better specify what to search (on the thematic portals) by adding one or more keywords, for example:

- "Building footprint"
- "Green areas"
- "Hospitals"
- "Land use"
- "Rivers"
- "Roads"

[4] Geoportal - Wikipedia
[5] Open data - Wikipedia

- And so on

At the same time, is possible to limit the domain or search for particular file type (i.e. extension).

In the following example, using **Google** search engine:

Buildings filetype:SHP site:geoportale.regione.*.it

we ask for the (italian) "buildings" into shapefile format but only at <regional scale> (on the regional sites). Since the <*> means all values, in this case (valid for Italy only) this search will be limited only on the <*geoportal*> that belong to the Italian regions (if they exist, of course):

- *geoportale.regione.**piemonte**.it*
- *geoportale.regione.**lombardia**.it*
- *geoportale.regione.**lazio**.it*
- *And so on.*

Google search engine is useful for searching a variety of file formats. For examples

rivers filetype:gpkg

will return <all> the existing layers published into **Geopackage (GPKG)** file format.

opendata filetype:pdf

will return <all> the existing documents published into **PDF** file format.

population filetype:xls site:europa.eu

will return <all> the existing spreadsheets published (on Europa.eu sites) into **XLS** file format.

For a complete <**Google Guide**> (syntax, examples…) see the References or take a look at <**Google Search Central**>[6].

[6] Google Search Operators | Google Search Central | Docs | Google Developers

GIS file formats

Even if the shapefile[7] is an old (GIS) vector format[8] is still a GIS standard that allows us to get and manage geospatial data.

Nevertheless it is possible to access data published into other formats or shared via web services. Just to give an idea, QGIS[9] is able to manage more than fifty vector file formats and more than eighty raster file format (plus a variety of OGC[10] standard services[11], database connections[12,13,14] and so on). This means that it is possibile to discover "other" data types:

- Comma Separated Value (CSV)[15]
- Geopackage (GPKG)[16]
- SpatiaLite[17]
- PostgreSQL[18]
- Image (raster) data[19]

Regarding <web > resources, OGC services can share information establishing a connection between the server and the user client:

- WMS, WCS, WFS, WPS... (OGC services)

Note that CSV files[20] can be used into separate ways if the file contains:

1. <coordinates> fields (columns that contains, for examples <Longitude> and <Latitude> values)
2. <addresses> fields (columns that contains the "physical address": Piccadilly Circus no. 12, London, UK).

In the former case, in order to add CSV, is possible to use the "Delimited Text" tool into QGIS "Open Data Source Manager"[21]. The <X> and the <Y> will be <Longitude>

[7] Shapefile - Wikipedia
[8] Shapefile must die!
[9] Welcome to the QGIS project!
[10] Finding OGC WMS, WFS, WCS services | OGC
[11] OGC Standards | OGC
[12] GeoPackage - Wikipedia
[13] PostgreSQL: The world's most advanced open source database
[14] About PostGIS | PostGIS
[15] Comma-separated values - Wikipedia
[16] OGC GeoPackage
[17] SpatiaLite: SpatiaLite (gaia-gis.it)
[18] Managing a PostgreSQL Database with QGIS — Hanson GIS
[19] 14.3. Exploring Data Formats and Fields — QGIS Documentation documentation
[20] A CSV file is a text database in which fields are separated by a <special character>. Generally, this character is a comma but, if current language use it for the separate the decimal part of numbers commonly is used a semicolon (or the |, pipe) instead.
[21] Importing Spreadsheets or CSV files (QGIS3) — QGIS Tutorials and Tips

and <Latitude> value (if data is into geographic coordinates, for examples **EPSG=4326**[22]). In the latter one, we can transform <addresses> into a couple of coordinates: this operation is called <**geocoding**>[23]. On the WEB exist several <free> (with some limitations) services:

- Geoapify[24],
- BatchGeo[25]
- And others

The QGIS community published superb guides[26] and a great tutorial[27] in order to show how use and manage all these resources (do not forget that the WEB contains other great resources[28]…).

Using QGIS

Among the several **QGIS** functionalities, exist the so called "**MetaSearch**" Catalog Client (Menu: **Web**, **MetaSearch**):

[22] WGS 84: EPSG Projection -- Spatial Reference
[23] https://en.wikipedia.org/wiki/Address_geocoding
[24] Online Geocoding Free tool | Geoapify, Only the first 500 rows will be processed. Please split larger datasets if necessary.
[25] Free Online Batch Geocoding - Geocoding - Research Guides at University of Oregon Libraries (uoregon.edu)
[26] Documentation for QGIS 3.22
[27] QGIS Training Manual
[28] QGIS Tutorials and Tips — QGIS Tutorials and Tips

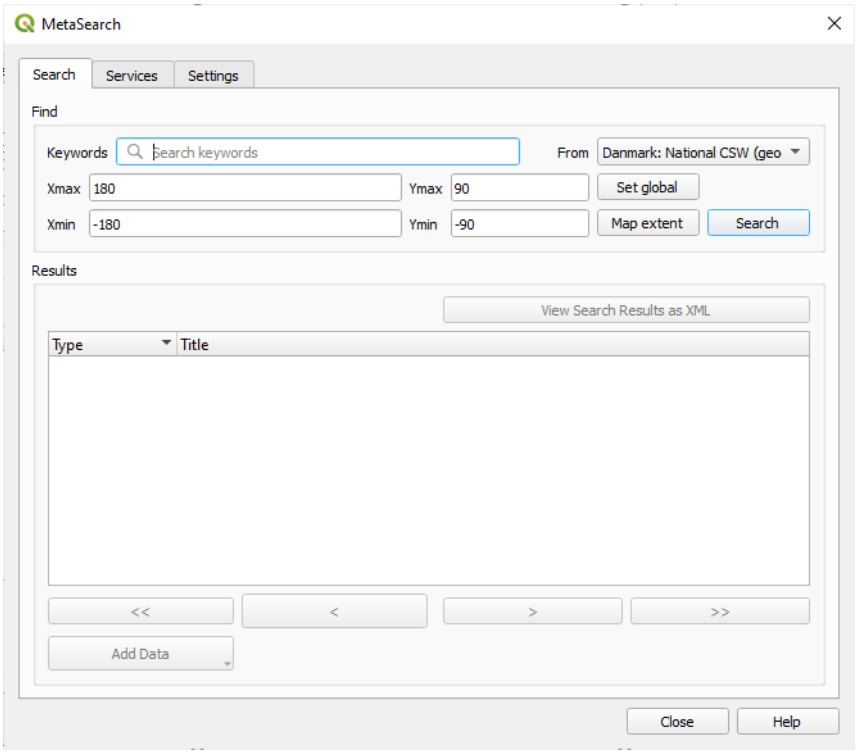

Figure 1 - MetaSearch

> *"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"*[29]*.*

Broadly speaking, by configuring this tool, User can browse the CSW (Catalog Service for the Web)[30] in order to explore these service.

It is not possible to browse to WEB using GOOGLE functions such as:

> ***gis data catalogue filetype.csw***

because the filetype CSW is not “recognized” at well. However, MetaSearch allows to “Add Default Services”:

29 https://docs.qgis.org/3.22/en/docs/user_manual/plugins/core_plugins/plugins_metasearch.html?highlight=metasearch

30 "CSW (Catalog Service for the Web) is an OGC (Open Geospatial Consortium) specification that defines common interfaces to discover, browse and query metadata about data, services, and other potential resources". Source: QGIS

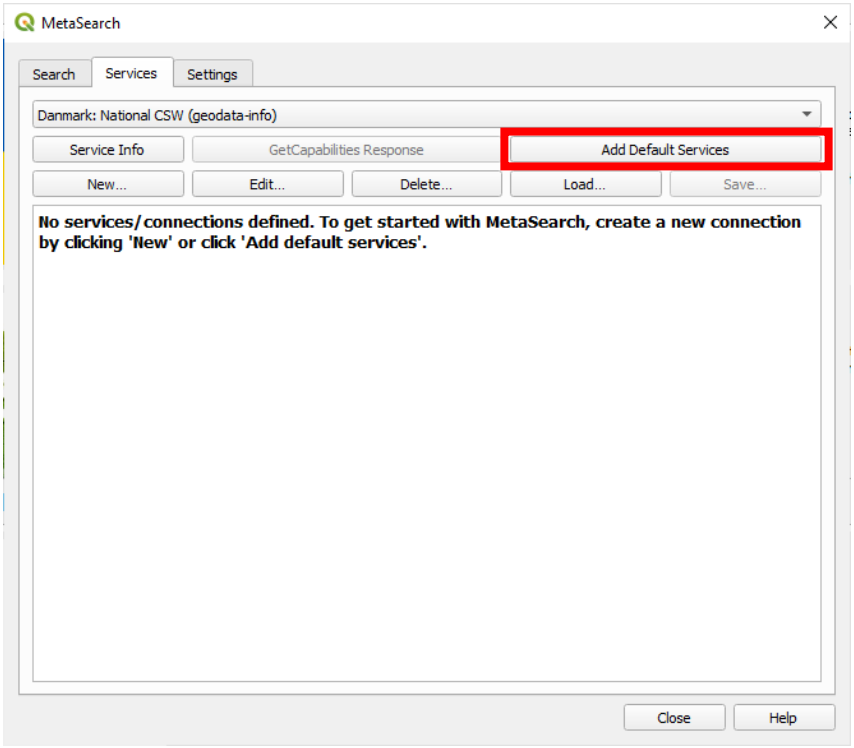

Figure 2 - MetaSearch - Add Default Services

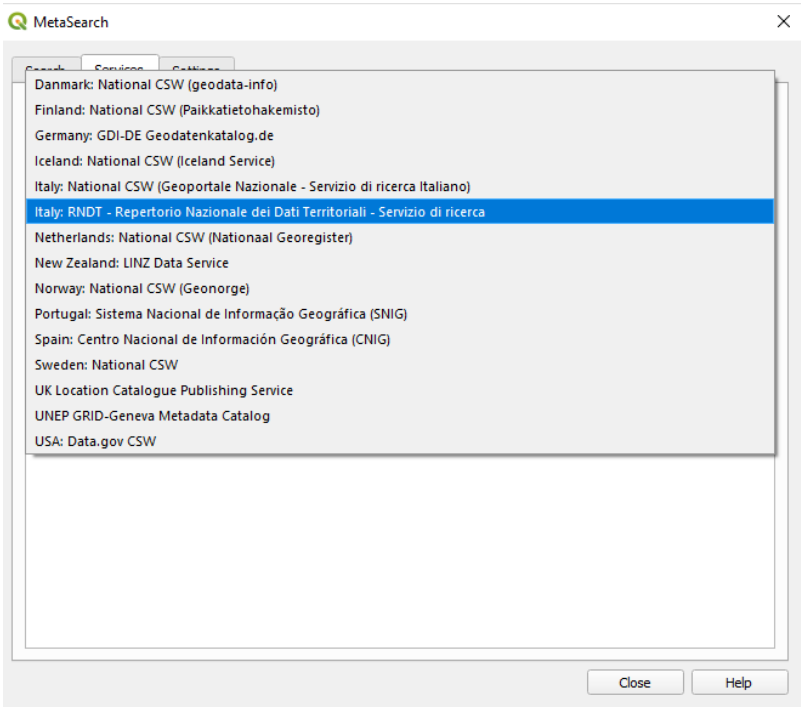

Figure 3 - MetaSearch - Add Default Services

Setting up the “search option”, User can browse the archive for related services

Many Geoportals show a link to their Metadata Catalogue. For example:

- British Geological Survey, OGC Catalogue service for the web (CSW)
- Emilia-Romagna Region, Catalogue Service for the Web (CSW)
- Piedmont Region, Metadata Catalogue
- And so on.

For more info, refer to the QGIS Guide.

Adding a base map

The easiest way to add a basemap into QGIS is:

- Add a "**XYZ Tiles**" service
- Add a **WMS** service
- Add ArgGIS **REST** Servers
- Add **your own data** (raster or vector)

If the QGIS <Data Browser> does not contains any **XYZ Tiles** services, it is <simple> to work on it by adding a variety of resources. Thanks to **Klas Karlsson**[31], **Github**[32] show a python script that works for us. The first row of the script says "This script should be run from the Python consol inside QGIS". If we do not remember how to do this, please follows this tutorial[33].

Taking into account that the following script was copied from the WEB and pasted into a Word file, pasting it into the **QGIS** Python console could give you some <problems>. For a better results, please, use the source file and, if you desire to save it, use a notepad or a text editor.

```
(the script starts from the next line)
"""
This script should be run from the Python consol inside QGIS.
It adds online sources to the QGIS Browser.
Each source should contain a list with the folowing items (string type):
[sourcetype, title, authconfig, password, referer, url, username, zmax, zmin]
You can add or remove sources from the sources section of the code.
Script by Klas Karlsson
Sources from https://qms.nextgis.com/
Some services require you to supply your own API key for the services to work.
Licence GPL-3
Regarding the terms of use for these background maps YOU will need to verify that you
follow the individual EULA that comes with the different services,
Most likely they will restrict how you can use the data.
Example:
For Esri basemaps you will need a valid ArcGIS online subscription to use the maps.
"""


# Sources
sources = []
```

[31] Klas Karlsson (@klaskarlsson) / Twitter
[32] QGIS_resources/qgis_basemaps.py at master · klakar/QGIS_resources · GitHub
[33] 26.3. QGIS Python console — QGIS Documentation documentation

```
sources.append(["connections-xyz","Google
Maps","","","","https://mt1.google.com/vt/lyrs=m&x=%7Bx%7D&y=%7By%7D&z=%7Bz%7D","","19","
0"])
sources.append(["connections-xyz","Google Satellite", "", "", "",
"https://mt1.google.com/vt/lyrs=s&x=%7Bx%7D&y=%7By%7D&z=%7Bz%7D", "", "19", "0"])
sources.append(["connections-xyz","Google Terrain", "", "", "",
"https://mt1.google.com/vt/lyrs=t&x=%7Bx%7D&y=%7By%7D&z=%7Bz%7D", "", "19", "0"])
sources.append(["connections-xyz","Google Terrain Hybrid", "", "", "",
"https://mt1.google.com/vt/lyrs=p&x=%7Bx%7D&y=%7By%7D&z=%7Bz%7D", "", "19", "0"])
sources.append(["connections-xyz","Google Satellite Hybrid", "", "", "",
"https://mt1.google.com/vt/lyrs=y&x=%7Bx%7D&y=%7By%7D&z=%7Bz%7D", "", "19", "0"])
sources.append(["connections-xyz","Stamen Terrain", "", "", "Map tiles by Stamen Design,
under CC BY 3.0. Data by OpenStreetMap, under ODbL",
"http://tile.stamen.com/terrain/%7Bz%7D/%7Bx%7D/%7By%7D.png", "", "20", "0"])
sources.append(["connections-xyz","Stamen Toner", "", "", "Map tiles by Stamen Design,
under CC BY 3.0. Data by OpenStreetMap, under ODbL",
"http://tile.stamen.com/toner/%7Bz%7D/%7Bx%7D/%7By%7D.png", "", "20", "0"])
sources.append(["connections-xyz","Stamen Toner Light", "", "", "Map tiles by Stamen
Design, under CC BY 3.0. Data by OpenStreetMap, under ODbL",
"http://tile.stamen.com/toner-lite/%7Bz%7D/%7Bx%7D/%7By%7D.png", "", "20", "0"])
sources.append(["connections-xyz","Stamen Watercolor", "", "", "Map tiles by Stamen
Design, under CC BY 3.0. Data by OpenStreetMap, under ODbL",
"http://tile.stamen.com/watercolor/%7Bz%7D/%7Bx%7D/%7By%7D.jpg", "", "18", "0"])
sources.append(["connections-xyz","Wikimedia Map", "", "", "OpenStreetMap contributors,
under ODbL", "https://maps.wikimedia.org/osm-intl/%7Bz%7D/%7Bx%7D/%7By%7D.png", "", "20",
"1"])
sources.append(["connections-xyz","Wikimedia Hike Bike Map", "", "", "OpenStreetMap
contributors, under ODbL",
"http://tiles.wmflabs.org/hikebike/%7Bz%7D/%7Bx%7D/%7By%7D.png", "", "17", "1"])
sources.append(["connections-xyz","Esri Boundaries Places", "", "", "Requires ArcGIS
Onlinesubscription",
"https://server.arcgisonline.com/ArcGIS/rest/services/Reference/World_Boundaries_and_Plac
es/MapServer/tile/%7Bz%7D/%7By%7D/%7Bx%7D", "", "20", "0"])
sources.append(["connections-xyz","Esri Gray (dark)", "", "", "Requires ArcGIS
Onlinesubscription",
"http://services.arcgisonline.com/ArcGIS/rest/services/Canvas/World_Dark_Gray_Base/MapSer
ver/tile/%7Bz%7D/%7By%7D/%7Bx%7D", "", "16", "0"])
sources.append(["connections-xyz","Esri Gray (light)", "", "", "Requires ArcGIS
Onlinesubscription",
"http://services.arcgisonline.com/ArcGIS/rest/services/Canvas/World_Light_Gray_Base/MapSe
rver/tile/%7Bz%7D/%7By%7D/%7Bx%7D", "", "16", "0"])
sources.append(["connections-xyz","Esri National Geographic", "", "", "Requires ArcGIS
Onlinesubscription",
"http://services.arcgisonline.com/ArcGIS/rest/services/NatGeo_World_Map/MapServer/tile/%7
Bz%7D/%7By%7D/%7Bx%7D", "", "12", "0"])
sources.append(["connections-xyz","Esri Ocean", "", "", "Requires ArcGIS
Onlinesubscription",
"https://services.arcgisonline.com/ArcGIS/rest/services/Ocean/World_Ocean_Base/MapServer/
tile/%7Bz%7D/%7By%7D/%7Bx%7D", "", "10", "0"])
sources.append(["connections-xyz","Esri Satellite", "", "", "Requires ArcGIS
Onlinesubscription",
"https://server.arcgisonline.com/ArcGIS/rest/services/World_Imagery/MapServer/tile/%7Bz%7
D/%7By%7D/%7Bx%7D", "", "17", "0"])
sources.append(["connections-xyz","Esri Standard", "", "", "Requires ArcGIS
Onlinesubscription",
"https://server.arcgisonline.com/ArcGIS/rest/services/World_Street_Map/MapServer/tile/%7B
z%7D/%7By%7D/%7Bx%7D", "", "17", "0"])
sources.append(["connections-xyz","Esri Terrain", "", "", "Requires ArcGIS
Onlinesubscription",
"https://server.arcgisonline.com/ArcGIS/rest/services/World_Terrain_Base/MapServer/tile/%
7Bz%7D/%7By%7D/%7Bx%7D", "", "13", "0"])
sources.append(["connections-xyz","Esri Transportation", "", "", "Requires ArcGIS
Onlinesubscription",
"https://server.arcgisonline.com/ArcGIS/rest/services/Reference/World_Transportation/MapS
erver/tile/%7Bz%7D/%7By%7D/%7Bx%7D", "", "20", "0"])
sources.append(["connections-xyz","Esri Topo World", "", "", "Requires ArcGIS
Onlinesubscription",
```

```
"http://services.arcgisonline.com/ArcGIS/rest/services/World_Topo_Map/MapServer/tile/%7Bz
%7D/%7By%7D/%7Bx%7D", "", "20", "0"])
sources.append(["connections-xyz","OpenStreetMap Standard", "", "", "OpenStreetMap
contributors, under ODbL", "http://tile.openstreetmap.org/%7Bz%7D/%7Bx%7D/%7By%7D.png",
"", "19", "0"])
sources.append(["connections-xyz","OpenStreetMap H.O.T.", "", "", "OpenStreetMap
contributors, under ODbL",
"http://tile.openstreetmap.fr/hot/%7Bz%7D/%7Bx%7D/%7By%7D.png", "", "19", "0"])
sources.append(["connections-xyz","OpenStreetMap Monochrome", "", "", "OpenStreetMap
contributors, under ODbL", "http://tiles.wmflabs.org/bw-
mapnik/%7Bz%7D/%7Bx%7D/%7By%7D.png", "", "19", "0"])
sources.append(["connections-xyz","OpenTopoMap", "", "", "Kartendaten: © OpenStreetMap-
Mitwirkende, SRTM | Kartendarstellung: © OpenTopoMap (CC-BY-SA)",
"https://tile.opentopomap.org/%7Bz%7D/%7Bx%7D/%7By%7D.png", "", "17", "1"])
sources.append(["connections-xyz","Strava All", "", "", "OpenStreetMap contributors,
under ODbL", "https://heatmap-external-
b.strava.com/tiles/all/bluered/%7Bz%7D/%7Bx%7D/%7By%7D.png", "", "15", "0"])
sources.append(["connections-xyz","Strava Run", "", "", "OpenStreetMap contributors,
under ODbL", "https://heatmap-external-
b.strava.com/tiles/run/bluered/%7Bz%7D/%7Bx%7D/%7By%7D.png?v=19", "", "15", "0"])
sources.append(["connections-xyz","Open Weather Map Temperature", "", "", "Map tiles by
OpenWeatherMap, under CC BY-SA 4.0",
"http://tile.openweathermap.org/map/temp_new/%7Bz%7D/%7Bx%7D/%7By%7D.png?APPID={your_API_
key}", "", "19", "0"])
sources.append(["connections-xyz","Open Weather Map Clouds", "", "", "Map tiles by
OpenWeatherMap, under CC BY-SA 4.0",
"http://tile.openweathermap.org/map/clouds_new/%7Bz%7D/%7Bx%7D/%7By%7D.png?APPID={your_AP
I_key}", "", "19", "0"])
sources.append(["connections-xyz","Open Weather Map Wind Speed", "", "", "Map tiles by
OpenWeatherMap, under CC BY-SA 4.0",
"http://tile.openweathermap.org/map/wind_new/%7Bz%7D/%7Bx%7D/%7By%7D.png?APPID={your_API_
key}", "", "19", "0"])
sources.append(["connections-xyz","CartoDb Dark Matter", "", "", "Map tiles by CartoDB,
under CC BY 3.0. Data by OpenStreetMap, under ODbL.",
"http://basemaps.cartocdn.com/dark_all/%7Bz%7D/%7Bx%7D/%7By%7D.png", "", "20", "0"])
sources.append(["connections-xyz","CartoDb Positron", "", "", "Map tiles by CartoDB,
under CC BY 3.0. Data by OpenStreetMap, under ODbL.",
"http://basemaps.cartocdn.com/light_all/%7Bz%7D/%7Bx%7D/%7By%7D.png", "", "20", "0"])
sources.append(["connections-xyz","Bing VirtualEarth", "", "", "",
"http://ecn.t3.tiles.virtualearth.net/tiles/a{q}.jpeg?g=1", "", "19", "1"])


# Add sources to browser
for source in sources:
   connectionType = source[0]
   connectionName = source[1]
   QSettings().setValue("qgis/%s/%s/authcfg" % (connectionType, connectionName),
source[2])
   QSettings().setValue("qgis/%s/%s/password" % (connectionType, connectionName),
source[3])
   QSettings().setValue("qgis/%s/%s/referer" % (connectionType, connectionName),
source[4])
   QSettings().setValue("qgis/%s/%s/url" % (connectionType, connectionName), source[5])
   QSettings().setValue("qgis/%s/%s/username" % (connectionType, connectionName),
source[6])
   QSettings().setValue("qgis/%s/%s/zmax" % (connectionType, connectionName), source[7])
   QSettings().setValue("qgis/%s/%s/zmin" % (connectionType, connectionName), source[8])

# Update GUI
iface.reloadConnections()
```
(**the script ends with the previous line**)

For **ArcGIS REST Server**, browse the WEB searching for them. A new world will be appear! How to manage them? Another time, take a look on the WEB[34,35]…

Create a WEB map on the scratch

Why limit our map functionalities? No time? Need a web map in minutes? Taking into account the uMap[36] service. "uMap lets you create maps with Openstreetmap layers in a minute and embed them in your site".

uMap lets to:

- "Choose the layers of your map"
- "Add POIs: markers, lines, polygons..."
- "Manage POIs colours and icons"
- "Manage map options: display a minimap, locate user on load…"
- "Batch import geostructured data (geojson, gpx, kml, osm...)"
- "Choose the license for your data"
- "Embed and share your map"

uMap is open source!

Global Resources

A non-exaustive list of <geoportal>, <open data> sites and other resources follows. Some of the links are coming from Openstreetmap[37], Geofabrik[38], Wikipedia or, simply, by browsing the *WEB*.

Name	Type	Country	Date	Year
4TU.ResearchData	Global	World		
CKAN	Global / Local	World / Local		
Global Administrative Areas - GADM maps and data	Global	World		

[34] QGIS: Adding An ArcServer Rest Service • North River Geographic Systems Inc
[35] How to Use ArcGIS REST API Service in QGIS (geodose.com)
[36] uMap (openstreetmap.fr)
[37] Openstreetmap
[38] GEOFABRIK // Downloads

Global Forest Watch Open Data Portal	Global	World		
Global Open Data Index	Global	World		
IPUMS INTERNATIONAL - GIS Boundary Files	Global	World		
IPUMS INTERNATIONAL - Spatially harmonized first-level geography	Global	World		
ISRIC – World Soil Information	Global	World		
Natural Earth	Global	World		
OpenTopography - High-Resolution Topography Data and Tools	Global	World		
ORNL DAAC Soil Collection	Global	World		
Soil Geographic Databases	Global	World		
SolarGIS	Global	World		
The Humanitarian Data Exchange	Global	World		
Trusted Data Services for Global Science	Global	World		
Universal Transverse Mercator (UTM) 1km Polyline Shapefile	Global	World		Shapefile

Table 1 - Where are GIS data? Global Resources

Local Resources, listed by geographic area or arguments

ADRiatic Ionian maritime spatial PLANning	Local	Adriatic & Ionian Sea		

Administrative boundaries in Africa	Local	Africa		
AFRICAN OPEN DATA	Local	Africa		
Arctic SDI Geoportal Services	Local	Artic		
Copernicus ED-DEM	Local	Europe		
Copernicus Imagery and Reference Data	Local	Europe		
Copernicus Open Access Hub	Local	Europe		
Corine Land Cover EU	Local	Europe	GPKG	2018
data.europa.eu	Local	Europe		
European Commission, Eurostat, GISCO, Geodata	Local	Europe		
European Environment Agency (EEA)	Local	Europe		
GeoSUR	Local	Geospatial network of Latin America and the Caribbean		
Global mangrove soil carbon: dataset and spatial maps	Local	Mangrove Forest		
ICPAC Geoportal	Local	Eastern Africa		
INSPIRE geoportal	Local	Europe		

Table 2 - Where are GIS data? Local Resources (listed by geographic area or arguments)

Local Resources, listed by country

ALBANIA GEOPORTAL	Local	Albania		
IDE Andorra	Local	Andorra		
AUSTRALIAN CENSUS GEOPACKAGES	Local	Australia		GPKG

Geomorphology Smartline Geopackage	Local	Australia		GPKG
Geoland	Local	Austria		
Open Data Österreich	Local	Austria		
Geoportal Belarus	Local	Belarus		
Geoportal of the Belgian federal institutions	Local	Belgium		
Geoportal of the Brussels Capital Region	Local	Belgium, Brussels		
Urbis Digital Mapping	Local	Belgium, Brussels		
GIS Dataset Brasil	Local	Brasil		
GeoSampa	Local	Brasil, Sao Paulo		
Instituto Brasileiro de Geografia e Estatística (IBGE)	Local	Brasil		
Cambodian Open GIS Data	Local	Cambodia		
Onemap Cambodia	Local	Cambodia		
Geoportal Praha	Local	Česká republika, Praha		
Geoportal de Chile	Local	Chile		
Geoportal del Departamento Nacional de Estadística Colombia	Local	Colombia		
Mapas Bogotá	Local	Colombia, Bogotá		
Geoportal Croatia	Local	Croatia		
Geodata-info Denmark	Local	Denmark		

Egyptian Geospatial Information Portal	Local	Egypt		
Geoportal Estonia	Local	Estonia		
Tallin Spatial Data	Local	Estonia, Tallin		
Geoportal Finland	Local	Finland		
Corine Land Cover France	Local	France		GPKG
Geoportail France	Local	France		
Geoportail France - tablet version	Local	France		
Geoportail France - mobile version	Local	France		
Geoportal Germany	Local	Germany		
Geoportal Baden-Württemberg	Local	Germany, Baden-Württemberg		
Geoportal Bavaria	Local	Germany, Bavaria		
Geoportal Brandenburg	Local	Germany, Brandenburg		
Geoportal Hesse	Local	Germany, Hesse		
Geoportal Lower Saxony	Local	Germany, Lower Saxony		
Geoportal North Rhine-Westphalia	Local	Germany, North Rhine-Westphalia		
Geoportal Rhineland Palatinate	Local	Germany, Rhineland Palatinate		
Geoportal Saarland	Local	Germany, Saarland		
Geoportal Saxony	Local	Germany, Saxony		
Geoportal Schleswig-Holstein	Local	Germany, Schleswig-Holstein		
Geoportal Thuringia	Local	Germany, Thuringia		
GeoData	Local	Greece		
GeoVisitGuatemala	Local	Guatemala		

Geoportal	Local	HRVATSKA		
India NSDI Portal	Local	India		
Indian GeoSpatial Opendata Portal	Local	India		
Geoportal Ireland	Local	Ireland		
Epa Geo Portal	Local	Ireland		
Dati.Gov.It	Local	Italy		
Portale Cartografico Nazionale	Local	Italy		
Geoportale	Local	Italy, ABRUZZO		
Geoportale	Local	Italy, ALTO ADIGE		
Geoportale	Local	Italy, BASILICATA		
Geoportale	Local	Italy, CALABRIA		
Geoportale	Local	Italy, CAMPANIA		
Geoportale	Local	Italy, EMILIA-ROMAGNA		
Geoportale	Local	Italy, FRIULI VENEZIA GIULIA		
Geoportale	Local	Italy, LAZIO		
Geoportale	Local	Italy, LIGURIA		
Geoportale	Local	Italy, LOMBARDIA		
Geoportale	Local	Italy, MARCHE		
Geoportale	Local	Italy, MOLISE		
Geoportale	Local	Italy, PIEMONTE		
Geoportale	Local	Italy, PUGLIA		
Geoportale	Local	Italy, SARDEGNA		
Geoportale	Local	Italy, SICILIA		
Geoportale	Local	Italy, TOSCANA		
Geoportale	Local	Italy, TRENTINO		
Geoportale	Local	Italy, UMBRIA		
Geoportale	Local	Italy, VDA		

Geoportale	Local	Italy, VENETO		
Open data catalogue information portal	Local	Japan		
Geoportal Kyzylorda	Local	Kazakhstan, Kyzylorda Region		
Geoportal Lithuania	Local	Lithuania		
Geoportal Luxembourg	Local	Luxembourg		
Geoportal Mongolia	Local	Mongolia		
Malaysia SDI Portal	Local	Malaysia		
National Geoportal of Nepal	Local	Nepal		
PDOK - Publieke Dienstverlening Op de Kaart Loket	Local	Netherlands		
UNSDI Netherlands GeoNetwork portal	Local	Netherlands		
Geospatial Data Service Centre	Local	Netherlands		
Land Information New Zealand (LINZ) Data Service	Local	New Zealand		
GeoNorge	Local	Norway		
Geoportal Poland	Local	Poland		
Open Data Poland	Local	Poland		
SNIG - Sistema Nacional de Informação Geográfica	Local	Portugal		
Geoportal of RosKosmos	Local	Russian Federation		
Geoportal Serbia	Local	Serbia		
Data.gov	Local	Singapore		

SLOVENSKI GEOPORTAL	Local	Slovenia		
Geoportal Patrimonio Natural y de la Biodiversidad del Estado español	Local	Spain		
Geoportal Spain is Culture	Local	Spain		
Geoportal Pueblos Arquitectura Negra Guadalajara	Local	Spain		
Geoportal hotelmapspain-madrid	Local	Spain, Madrid		
Geoportal Campiña de Jerez	Local	Spain		
Geoportal Madrid	Local	Spain, Madrid		
IDEE - Infraestructura de Datos Espaciales de España	Local	Spain		
ideAGE - Infraestructura de Datos Espaciales de la Administración General del Estado	Local	Spain		
Instituto Geográfico Nacional	Local	Spain		
Sistema de Información Geográfica de Parcelas Agrícolas	Local	Spain		
IDEC, Spatial Data Infrastructure of Catalonia	Local	Spain, Catalonia		
geoEuskadi, Spatial Data Infrastructure of Basque Country	Local	Spain, Basque Country		

Geoportal Barcelona	Local	Spain, Barcelona		
Geoportal Bund	Local	Switzerland		
Abu Dhabi Spatial Data Infrastructure	Local	UAE, Abu Dhabi		
GoGeo	Local	United Kingdom		
NATURAL ENGLAND OPEN DATA	Local	United Kingdom, England		
UK DataPortal	Local	United Kingdom		
Data.gov	Local	United States		
Geospatial Platform	Local	United States		
NatCarb, National Carbon Sequestration Geoportal	Local	United States		
NSDI Clearinghouse Network	Local	United States		
GeoStor	Local	USA, Arkansas		
CaSIL - California Spatial Information Library	Local	USA, California		
New Mexico Resource GIS	Local	USA, New Mexico		
GeoData@Wisconsin	Local	USA, Wisconsin		
Geoportal Simón Bolívar	Local	Venezuela		
Caracas En Un Click	Local	Venezuela, Caracas		

Table 3 - Where are GIS data? Local Resources (listed by country)

Local Resources, listed by region, provinces, municipalities, districts (valid for Italy only)

Even if the following example applies for Italy only it is easy, using a search engine, browse the web and get desired data:

Piedmont Region	Local	Italy, Piedmont Region (**Geoportal**)		
Metropolitan City of Turin	Local	Italy, Metropolitan City of Turin (**Geoportal**)		
Turin Municipality	Local	Italy, Turin Municipality (**Geoportal**)		
Turin Municipality	Local	Italy, Turin Municipality (**Open Data Portal**)		
ISTAT Section Census	Local	Italy (polygon boundaries and relative **census data**)		

Table 4 - Local Resources, listed by region, provinces, municipalities, districts...

Openstreetmap (download) data (not only "roads")[39]

"OpenStreetMap[40] is a map of the world, created by people like you and free to use under an open license".

The power of Openstreetmap is simple: when people contribute with the project this improvements are shared within the Community (no fees are required in order to download data).

Hundreds of applications are based on Openstreetmap and here it is possible to browse a list of OSM-based services[41].

It is possible to download "Point of Interest" (POI) by a specific geographic location (area[42] or country[43]) or a complete dataset[44], For example, at the "Openstreetmap Data Extract" page:

Sub Region			
	.osm.pbf	.shp.zip	.osm.bz2
Africa	[.osm.pbf]	✖	[.osm.bz2]
Antarctica	[.osm.pbf]	[.shp.zip]	[.osm.bz2]
Asia	[.osm.pbf]	✖	[.osm.bz2]
Australia and Oceania	[.osm.pbf]	✖	[.osm.bz2]
Central America	[.osm.pbf]	✖	[.osm.bz2]

[39] These links are from the "Geofabrik Download Server"
[40] Openstreetmap
[41] List of OSM-based services - OpenStreetMap Wiki
[42] overpass turbo (overpass-turbo.eu)
[43] OSM POI Export (ekibox.net)
[44] GEOFABRIK // Downloads

Europe	[.osm.pbf]	✖	[.osm.bz2]
North America	[.osm.pbf]	✖	[.osm.bz2]
South America	[.osm.pbf]	✖	[.osm.bz2]

Table 5 - OSM Sub Region

Browsing by "geographic regions" a list of countries will be appear. For example, for Italy it is possibile to download <small packages>:

Sub Region			
Italy	[.osm.pbf]	✖	[.osm.bz2]
Center	[.osm.pbf]	[.shp.zip]	[.osm.bz2]
Islands	[.osm.pbf]	[.shp.zip]	[.osm.bz2]
North-East	[.osm.pbf]	[.shp.zip]	[.osm.bz2]
North-West	[.osm.pbf]	[.shp.zip]	[.osm.bz2]
South	[.osm.pbf]	[.shp.zip]	[.osm.bz2]

Table 6 - OSM Sub Region - Second (and third) Level

Last but not least, user can download particular <sub region> such as:

Sub Region	Quick Links		
	.osm.pbf	.shp.zip	.osm.bz2
Alps	[.osm.pbf]	✖	[.osm.bz2]
British Isles	[.osm.pbf]	✖	[.osm.bz2]
Germany, Austria, Switzerland	[.osm.pbf]	✖	[.osm.bz2]

Please, remember that **Openstreetmap** is a <**Community**> database: to maintain (and improve) the (quality of the) layers need volunteers. So, register yourself[45] and add missing features (roads, names, building, points of interest… and so on).

[45] Register | OpenStreetMap

References (last visit: 2022.04.11)

- A gentle introduction in GIS
- Creative Commons — Attribution 4.0 International — CC BY 4.0
- GEOFABRIK // Home
- GEOFABRIK // Downloads
- Google Guide Cheat Sheet
- List of OSM-based services - OpenStreetMap Wiki
- OpenStreetMap
- OSM POI Export (ekibox.net)
- overpass turbo (overpass-turbo.eu)
- QGIS Guide (PDF)
- QGIS User Manual
- QGIS Training manual
- uMap (openstreetmap.fr)
- Understanding Free Cultural Works - Creative Commons