Open Source GIS data in Context

"GIS data is categorised as vector and raster data. GIS is heavily reliant on quality data to produce meaningful maps and analysis."

Spatial data can either be vector or raster. Each type of spatial data can further be differentiated by the format in which the data it provides. Each GIS software has the ability to read and write different data source types. At the heart of any GIS analysis is spatial data. In the open-source world, the emphasis is on empowering users with the tools(QGIS) and data to do analysis and create maps. Whilst data is freely available care should also be taken in identifying data that is clean and useable within any analysis. Users should also read the metadata that describes the characteristics of the data and the license agreement that comes with the data.

The data sources provided above are not exhaustive and users should try to search the web for other additional data sources but this provides a starting point when looking for open-source data.

In this module, we look at the various sources of GIS data that can be used in any GIS software.

South Africa

The list below shows open-source data source available in South Africa.
1. NGI - Custodian of 1:50 K,1:250 K vector, and raster data sources. NGI also provides raster data sources namely DEM of various resolutions.
2. Surveyor General - provides a map of all land parcels and administrative boundaries in South Africa. It shows the relationship of every piece of land to those adjoining it. In addition, other surveyed real rights such as servitudes and leases are also included in this map.
3. Demarcation Board - provides all administrative data for South Africa.
4. Government Departments - Most government departments have websites that provide access to data in the specific domains they specialise in e.g. Water Affairs.
5. Municipalities - Various municipalities in South Africa provide online portals where users can download data. For example, Cape Town.

Global Data sources

1) Natural earth - is a public domain map dataset available at 1:10m, 1:50m, and 1:110 million scales. Featuring tightly integrated vector and raster data.
2) OSM - Open Street Map is a collaborative project where users capture data and upload it online. This data can be downloaded directly in QGIS using plugins ie Quick OSM.
3) Landsat - provides remote sensing data.
4) Open Topography - provides a portal to high spatial resolution topographic data and tools.
5) Esri Open Data
6) USGS Earth Explorer - provides remote sensing data.
7) NASA's Socioeconomic Data and Applications Center (SEDAC) - provides data that deals with human interactions with the environment.

You try:

Goal: To explore OSM data and add various map backgrounds

NB You need to be connected to the internet in order to download plugins and fetch base maps from the provided URL.

1. Navigate to the plugin menu and install the Quick OSM plugin.
2. Use the Quick query option to find (highways =primary) that are within South Africa.
3. Close the plugin and inspect your data. Open the attribute data to understand the information that is contained within the loaded layers.
4. Zoom to the extent of the road layer loaded in QGIS.
5. Using the browser panel add XYZ tiles so that you can have different backgrounds. You the options provided in the table below.
6. Create group layers and put the base maps in their own groups. Change the layer rendering order so that your lines are always on top of your base maps.

To Do: Play around with the Quick OSM plugin and add various query combinations so that you can understand more about OSM data.

Name	Expectation
NGI TopoSheets	https://htonl.dev.openstreetmap.org/ngi-tiles/tiles/50k/{z}/{x}/{-y}.png
OpenStreet Map	http://a.tile.openstreetmap.org/{z}/{x}/{y}.png
Carto Positron	https://cartodb-basemaps-a.global.ssl.fastly.net/light_all/{z}/{x}/{y}.png

Check your knowledge:

1. Which of the following statement is true ?:
   a. *Openstreet map data is strictly restricted to accessing roads data.*
   b. *Openstreet map data has no quality control measures.*
   c. *Any user can contribute their data to Openstreet map.*
2. Which statement is true regarding open source data:
   a. *The quality is generally poor and you have to spend more time cleaning it.*
   b. *There is not quality assurance and the metadata is generally non existent.*
   c. *There are no cost associated with downloading the data.*
3. When using Open source data users should abide by the licensing rules.:
   a. *True*
   b. *False*

Module video tutorial:

- https://www.youtube.com/watch?v=PrBJEb29zRI

Further reading:

- XYZ Tiles https://mariosmsk.com/2019/07/01/how-to-add-xyz-tiles-with-two-ways-qgis/

- Open_data: https://en.wikipedia.org/wiki/Open_data