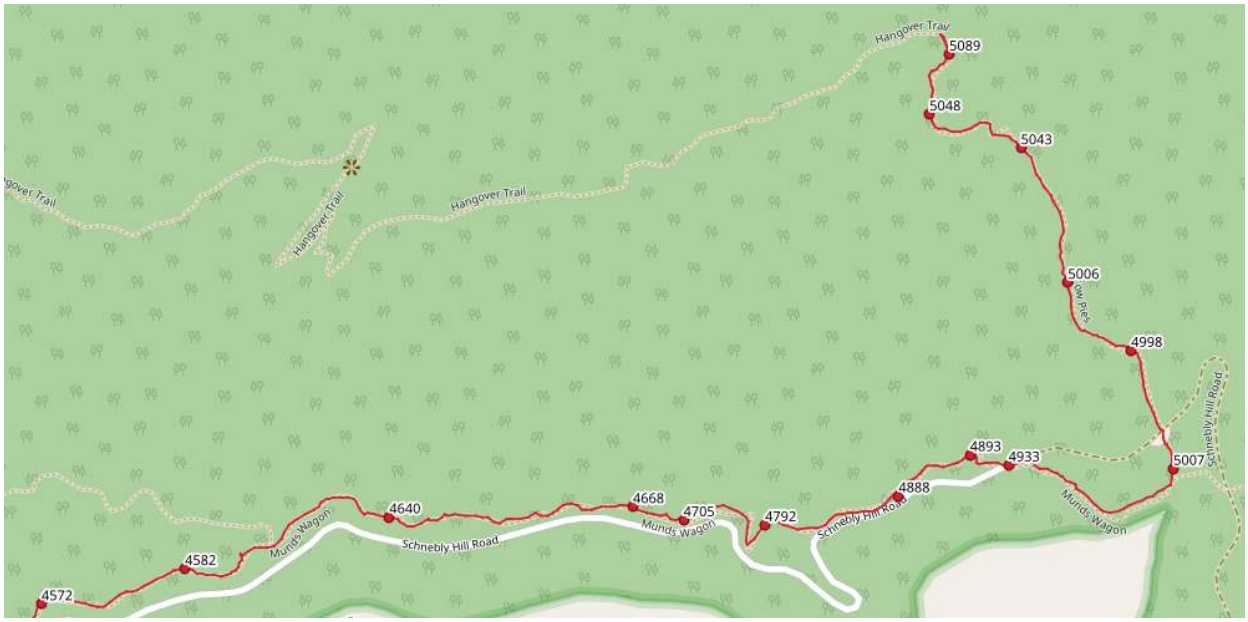
At These Coordinates

Dispatches from the Geospatial Data World



XYZ Tiles and WMS Layers in QGIS 3

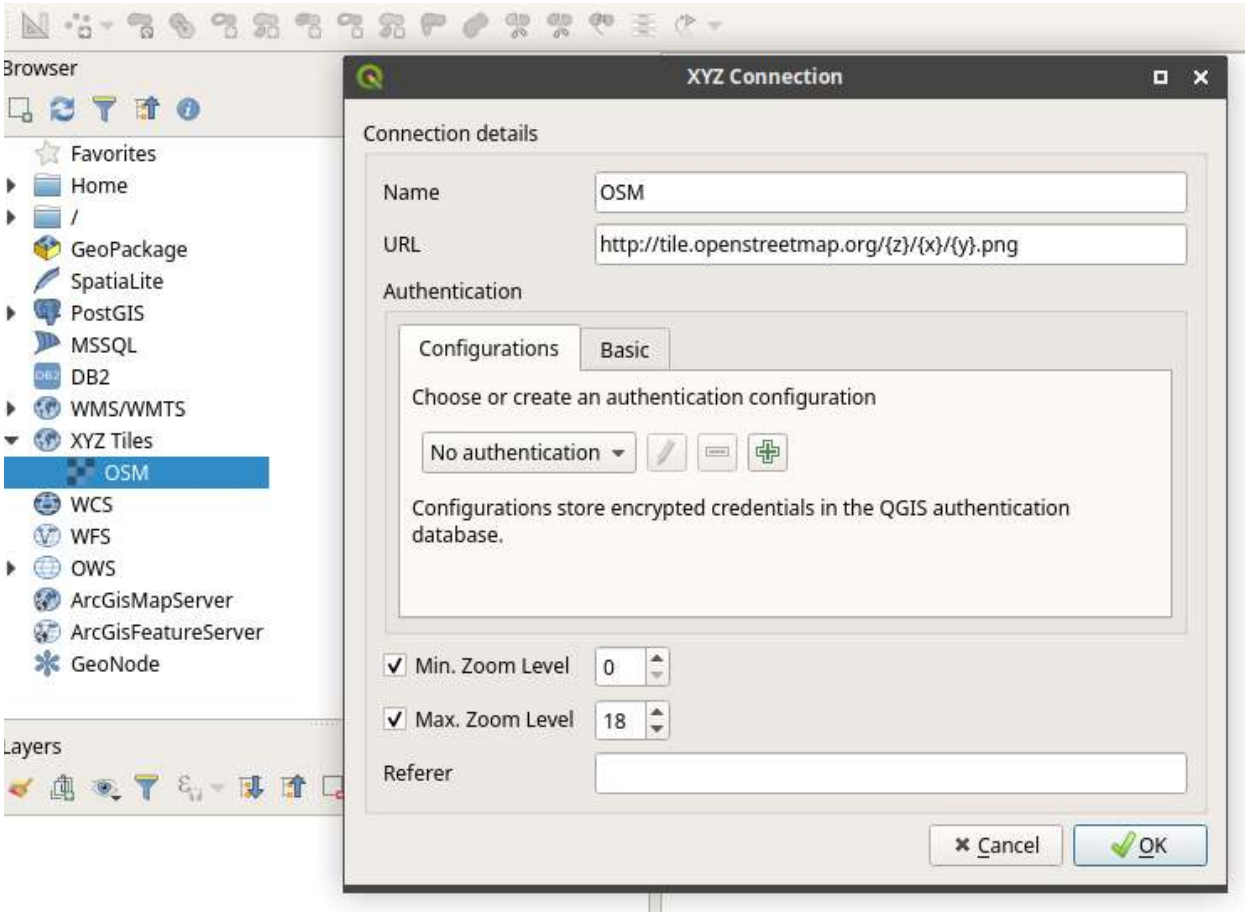
I did a lot of hiking around Sedona, Arizona a few weeks ago, and wanted to map my GPS way points and tracks in QGIS over some WMS (web mapping service) base map layers. I recently switched to QGIS 3 since I need to use that in my book (by the time it comes out 2.18 will be old news), and had to spend time starting from scratch since the plugin I always used was no longer available (ahhh the pitfalls of relying on 3rd party plugins – see my last post on SQLite). I thought I'd share what I learned here.

I was using the OpenLayers plugin in QGIS 2.x as an easy resource to add base maps to my projects. You could pull in layers from OSM, Google, Bing, and others. It turns out that plugin is no longer available for QGIS 3.x. So I searched around and found some suggestions for a different plugin called QuickMapServices which was a great replacement. But alas, that worked in QGIS 3.0 but is not compatible (as of now) for QGIS 3.2.

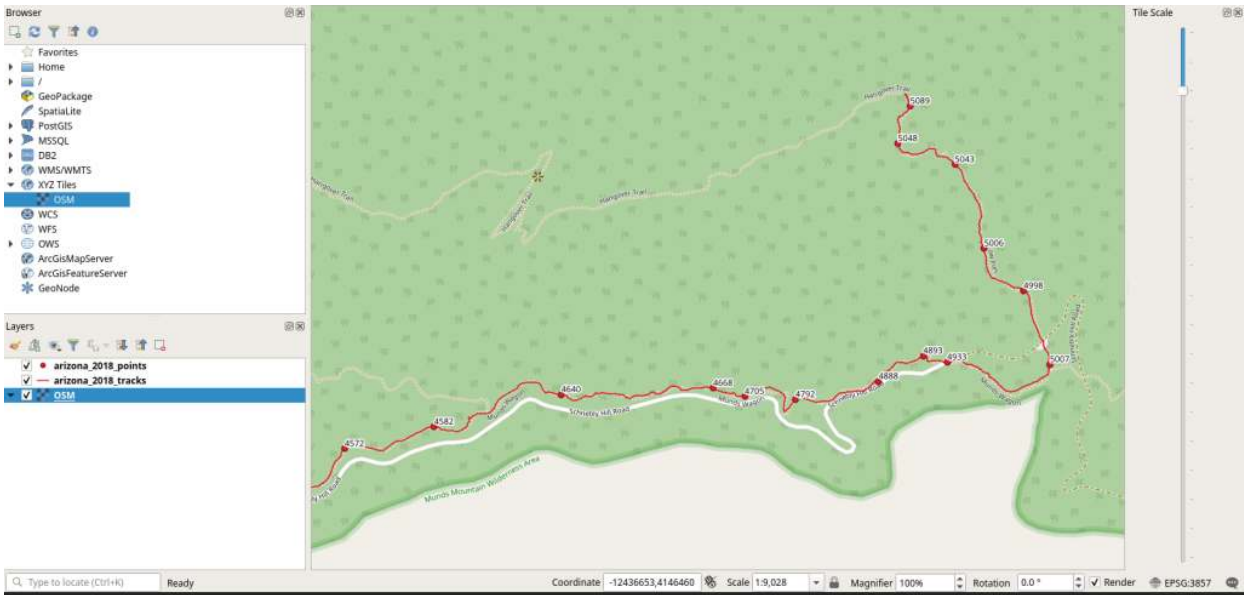
So I'm back to adding WMS layers manually. There is a new feature in QGIS for adding XYZ Tiles; this is a little better than WMS because the base map can be rendered a bit quicker. I found a tip in the Stack Exchange that you can add an OSM tiles layer with this url:

```
http://tile.openstreetmap.org/{z}/{x}/{y}.png
```

Select XYZ Tiles in the Browser, right click, New connection, give it a name, add the URL. You can modify the X Y Z coordinates where the map centers and zooms by default. Once you've created the connection, you can simply drag the OSM layer into the map window to render it.



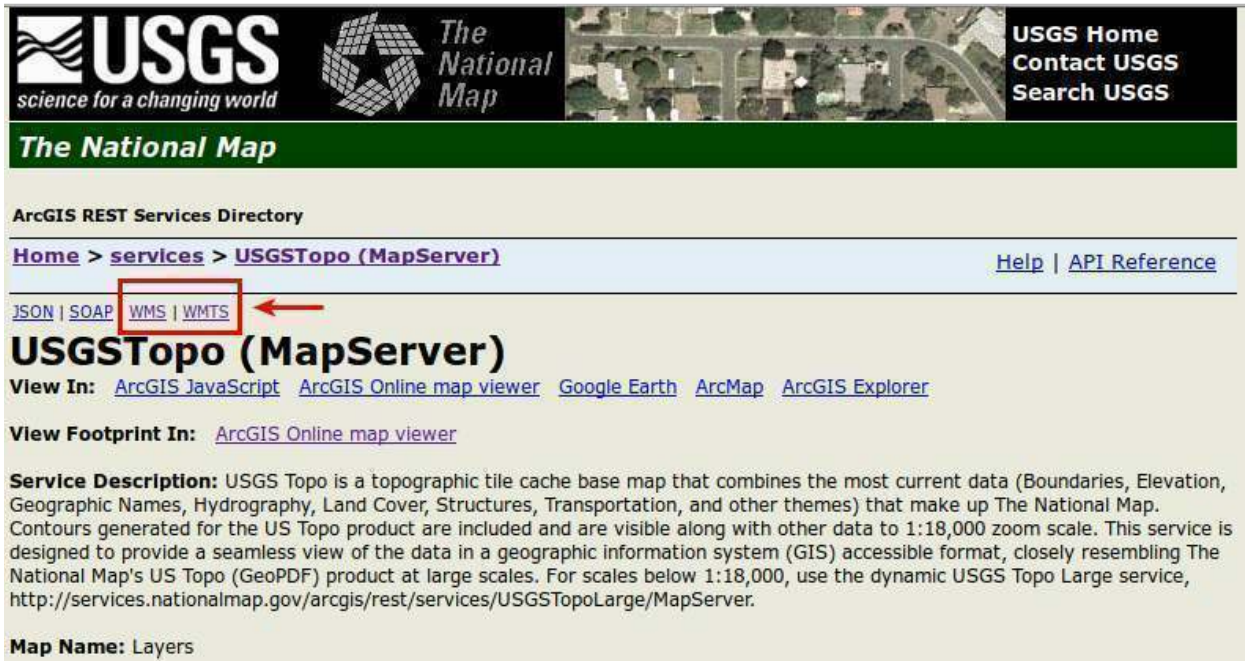
One problem that always creeps up: when you add other layers and adjust the zoom, sometimes the rendering of the base map looks poor, i.e. the features and labels look blurry or blocky. When you're pulling data from a web map layer, as you zoom in it swaps out the tiles for more detailed ones appropriate for that scale. But when you're zooming in QGIS things can get out of synch, as your map window zoom may not be enough to trigger the switch in the map tiles, or those map tiles are just not meant to be rendered at that scale. If you right click on a blank area of the toolbar, you can activate the Tile Scale panel and can use the slider to adjust the window zoom in synch with the tiles, so you can operate at the scales that are appropriate for the tiles. The way points and track for our hike alongside Schnebly Hill Road are shown below, and the labels for the points represent our elevation in feet.



If the slider is grayed out, select the OSM layer in the Layers menu, right click, and select Set CRS – Set Project CRS From Layer. Web mapping services typically use EPSG 3857 Pseudo Mercator as the coordinate reference system / map projection by default. If your other vectors layers aren't in that system, you can have the base map draw to their system or vice versa by selecting the layer, right clicking, and choosing Set CRS. But for the tile scale to work properly EPSG 3857 must be the project CRS.

Lastly, I've always liked the USGS WMS layers, which are never included in the plugins that I've seen. The USGS provides layers for: imagery, imagery with topographic features, shaded relief, and the USGS topographic map layer:

https://basemap.nationalmap.gov/arcgis/rest/services (https://basemap.nationalmap.gov/arcgis/rest/services)



You can click on one of the services, and at the top (in small print) are urls for their services in WMS and

WMTS. The last one is a web mapping tile service, which is a bit faster than WMS. Click on the WMTS link, and copy the url from the address in the browser. Then in QGIS select WMS / WMTS layers, right click, add a new connection, give it a name and paste the url. This is url for the topographic map:

```
https://basemap.nationalmap.gov/arcgis/rest/services/USGSTopo/MapServer
/WMTS/1.0.0/WMTSCapabilities.xml
```

Once again, you can drag the layer into the map window to render it, and you can use the Tile Scale panel to adjust the zoom. Here's our hike with the topo map as the base:

Posted in gis, maps and tagged osm, qgis, usgs, wms on June 26, 2018 by Frank.