Exercise 01a
Exploring QGIS
Assigned Jan. 26, 2018

Before class next Friday, using either the ESB1006 machines or a copy of QGIS on your personal machine, repeat the steps from todays class demonstration, plus a few further operations explained below. Explore using the tools in QGIS to pan and zoom the images. If you're feeling adventurous, try editing the points which make up the track point layer.

The **Reference Material and Links page** on the class website <http://geofaculty.uwyo.edu/rhowell/classes/gis_intro> now contains links from which you can download QGIS or locate documentation for it.

1) Download the **demo_1_data.zip** file from the class website to your **H:** drive. Right click on it and unzip (extract) the gps data files within it. (Don't try to have QGIS open the contents of the still-zipped "folder" directly as that will confuse it.)

2) Start QGIS Desktop (not the browser or other programs). The currently installed version is 2.18.

3) Load one or more of the GPX tracks into QGIS. To do that, from the main menu select **Layer/Add Layer/Add Vector Layer**. Click the **Browse** button and navigate to and select one of the gpx files you just unpacked. Now back in the previous window, click **Open**. You will be presented with a list of possible data to import. Select **tracks** then click **OK**. Repeat the process with the same data file but this time in the last step select **track points**. The first operation imported the data as a continuous curve, the second as a collection of discrete points. We'll see later the significance of the difference, and how to convert from one to the other.

4) Install the **OpenLayers Plugin**. On your own machine you should simply be able to simply select **Plugins / Manage and Install Plugins** on the main menu. If you click **All** on the left panel it will open a list of all available plugins on the central repository. Search for (or just scroll down to) the **Openlayer Plugin**, select it, and click the **Install Plugin** button.

Once the OpenLayers Plugin is installed be sure it is enabled. Once again go to the window opened by **Plugins / Manage and Install Plugins.** Select **Installed** on the right panel to show just the installed plugins. If the checkbox next to **OpenLayers Plugin** is not already selected, click it to enable the plugin. At this point you can now use special OpenLayer Plugin commands which appear under the **Web / OpenLayers plugin** menu.

5) Starting from that **Web / OpenLayers plugin** menu try adding **OpenStreemap/OpenStreetmap** and **Bing/Bing Aerial** layers to your project. When you add a new layer like this on top of you existing track, it hides that track. In the **QGIS Layers** panel which should by default be visible on the left of the main QGIS window, try dragging your tracks or points upward so they appear on top of the other layers.

6) Try modifying the display style of the layers. In the **Layers** panel double click on the track layer. A **Properties** dialog will open. Select **Style** on the left. Try modifying the color and thickness of the line. For points, try modifying the size of the dots. There are lots of other options -- for example controlling the style of display based on the "attributes" discussed below.

7) Use the pan (the hand) and zoom (magnifying glass) tools to zoom and pan around the map. Try loading additional gpx tracks and see how well (or how poorly) they overlap.

8) Right click on the **track_points** layer in the **Layers Panel** and select **Open Attribute Table**. A spreadsheet opens showing information on each point. The columns created are some generic default for information which MIGHT be present in a GPX file although my phone only fills in a few. Later we'll learn how to delete these empty columns. Try select one or more rows (points) by clicking on the row number at the left and see how those points are highlighted on the map. (With this many points it can be hard to see which is actually highlighted as adjacent points might cover it up. However you can use a button at the top of the table to zoom to the selected rows.) Examine some of the data in the table. Present but hidden from view is the x,y (longitude,latitude) position of each point. We'll see next time how to use the data in the table.

9) Save your project (that is, a list of what layers are loaded and how they are displayed) by selecting **Project / Save** from the main menu then giving it a file name located on your H drive.