Lab 0: Introducing Ourselves to QGIS

In this warm up exercise, we'll be introducing ourselves to QGIS, our geographic information system of choice for the semester (👋👋). We'll explore available basemaps---non-interactive, but very useful, maps that help provide context for our analysis. We will also download spatial data from OpenStreetMap, and export a map of **a place that is important to you**---this could be your current residence, your home, a place from which you or your ancestor emigrated, or a favorite neighborhood in a favorite city.

The lab builds toward Exercise 0: Locating Ourselves, which will place the quick map we make today in conversation with other datasets and mapping platforms.

Installing QGIS

If you haven't yet installed QGIS, doing so is quite simple. Navigate to the QGIS website and click 'Download Now.'

If you are a **Windows user**, you should download the **Standalone Installer** for **Version 3.10** (the long-term release). The OSGeo4W Network Installer includes a number of other utilities that might make your life more difficult in the future, so let's keep it simple.

If you are a **Mac user**, simply download **version 3.10** (the long-term release), mount the .dmg (i.e., double-click the icon - it may take a couple of minutes!), and drag QGIS to your apps folder.

Opening QGIS
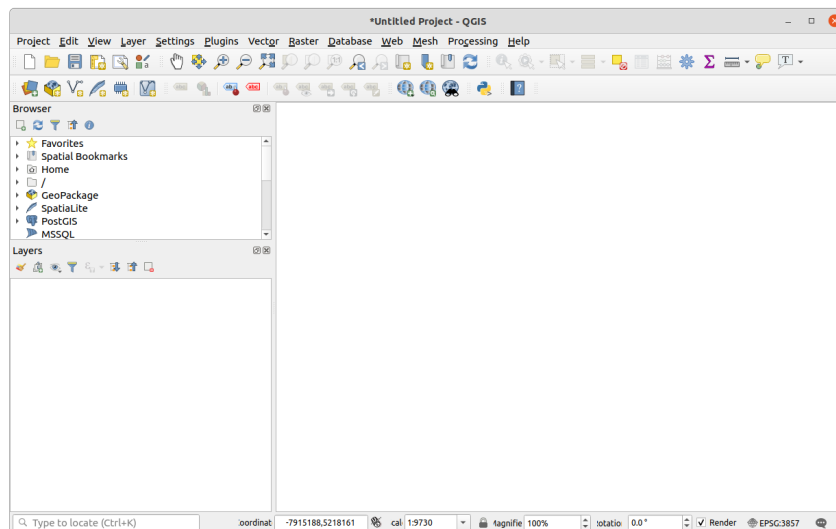
When you open QGIS, you'll see a screen like the above; you should see a...

- **Browser panel**, which is where your files and other data sources are displayed.
- **Layers panel,** which displays data sources that have been loaded into the project, and a
- **Map panel,** which--though it is currently empty---will display your spatial information.
  - At the outset, this right-side area have other panels with past project icons, QGIS-news, project templates, etc.

If either of these windows is missing, you can add them by clicking the 'view' dropdown menu, hovering over the 'panels' option, and selecting any panels you may be missing.

# Add a Basemap with QuickMapServices

Now, let's add a **basemap** - this is a map that is not interactive, and that cannot be used in analysis, but that is a huge time-saver when making informative maps. To see what we mean, let's add a plug-in to QGIS that will allow us to access dozens of useful basemaps.

Click the 'plugins' dropdown menu, and select 'Manage and install plugins.' Search for 'QuickMapServices', and install it by clicking the 'install button'.   Then, close the plugin window.
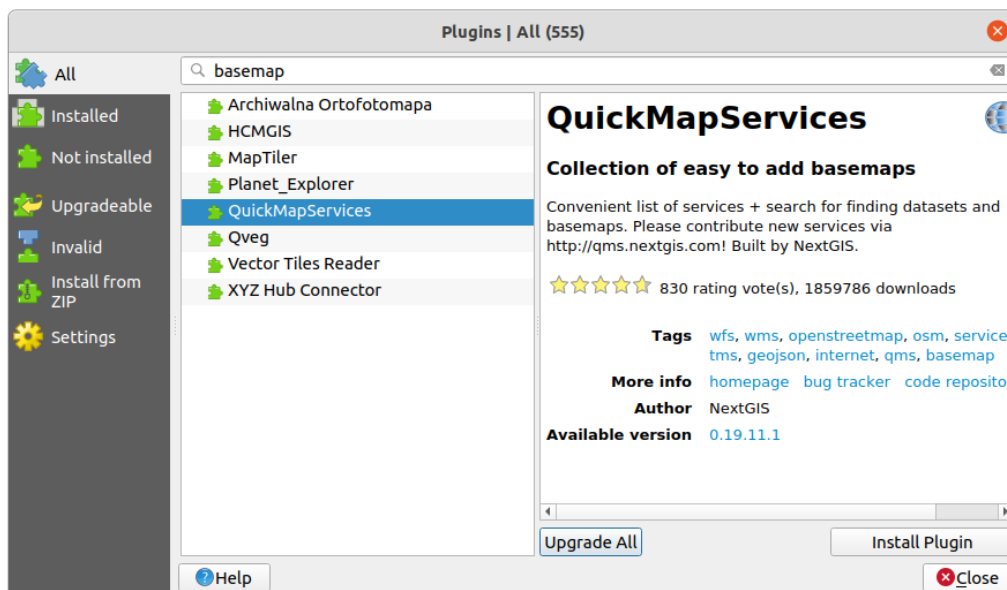
Now, click the 'web' dropdown menu, and hover over 'QuickMapServices'. You'll see a relatively short list of available basemaps. But this plug-in actually gives us access to many more basemaps through user-contributions! Let's add these now. While hovering over 'QuickMapServices', click 'Settings.' Under the 'More Services' tab, click 'Get contributed pack'. Then, move to the 'Visibility' tab and check out the list of available basemaps again - you should see many more!

Go ahead and add one of the maps produced by [Stamen design](#). You should see something like this...
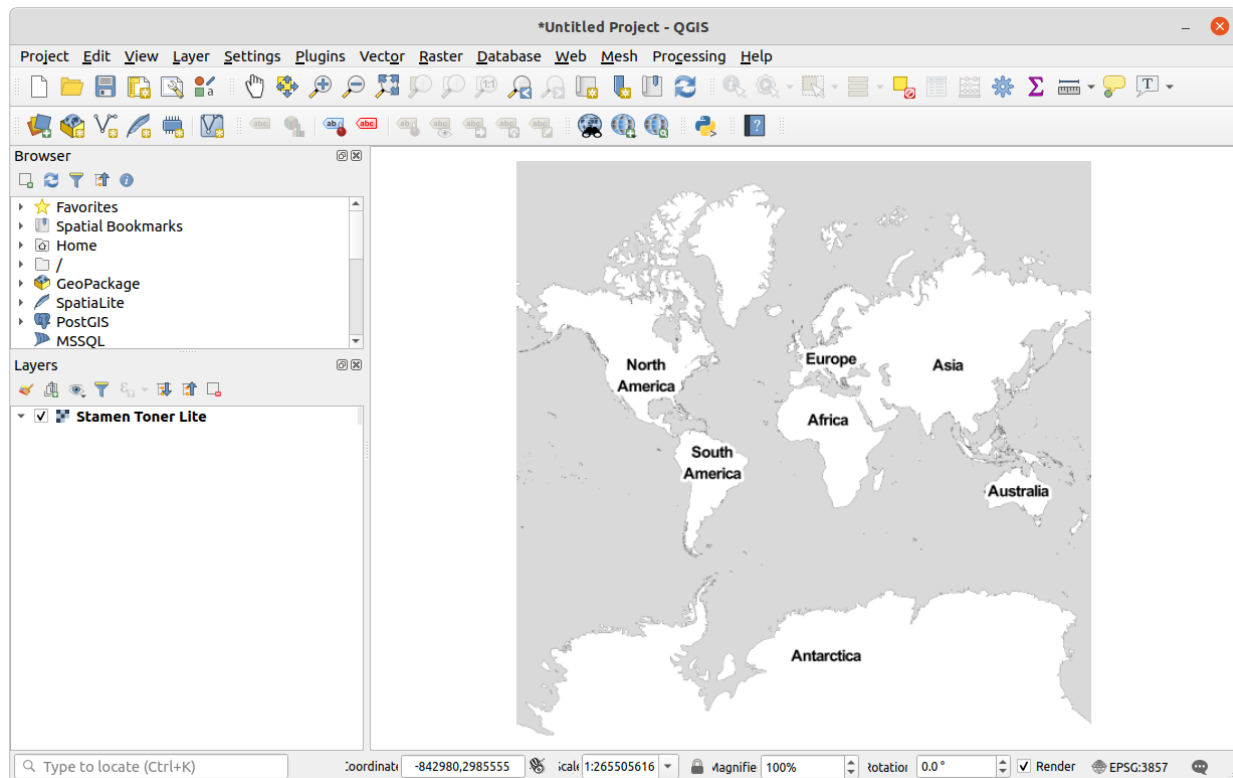
> ***Pause for Reflection:*** *What do you notice about this map? Where does it center, by default? What are the labels that are visible? Whose labels are they?*

Go ahead and play around a bit - zooming in, zooming out, etc. Get cozy! Basemaps like this are what we call 'slippy maps': they're based on tiles which are downloaded incrementally to your QGIS as they are needed. The interface should feel somewhat familiar if you've worked with any contemporary map-based application.

Add OpenStreetMap Data using OSMDownloader

You'll realize pretty quickly that, even though this map is useful, you can't interact with it - you don't have access to the data that the map is visualizing, only the images! It turns out that, if you've loaded a Stamen Basemap, you've loaded a map that is based on [OpenStreetMap](#) data.

OpenStreetMap (or 'OSM', if you want to get in with the cool kids at the maps table) is a crowd-sourced map that aspires to complete coverage of the entire world. Because it is open source and can be easily updated in real-time based on changing ground conditions, it is frequently used by humanitarian organizations to track developments and route aid in the wake of disasters.

It is also frequently used in research to compare the built environments of places that don't otherwise appear in the same datasets.

We don't have time to do a deep dive into OpenStreetMap here … but suffice it to say, for now, it's a truly amazing data source and a labor of love that is also not without its problems.

> ***Pause for Reflection:*** *There are problems with OSM data - for example, the 'crowd' from which it is crowd-sourced overwhelmingly comprises affluent, American and European men. How might this affect what it shows?*

Anyway, because OSM is free, we can download the data right into QGIS, where we can interact with and analyze it. We'll do this using the 'OSMDownloader' plugin.

Just like you added the QuickMapServices plugin, add the OSMDownloader plugin. (Plugins > Manager and Install Plugins). You should see a small icon appear on the bottom of your toolbars at the top of your QGIS interface.
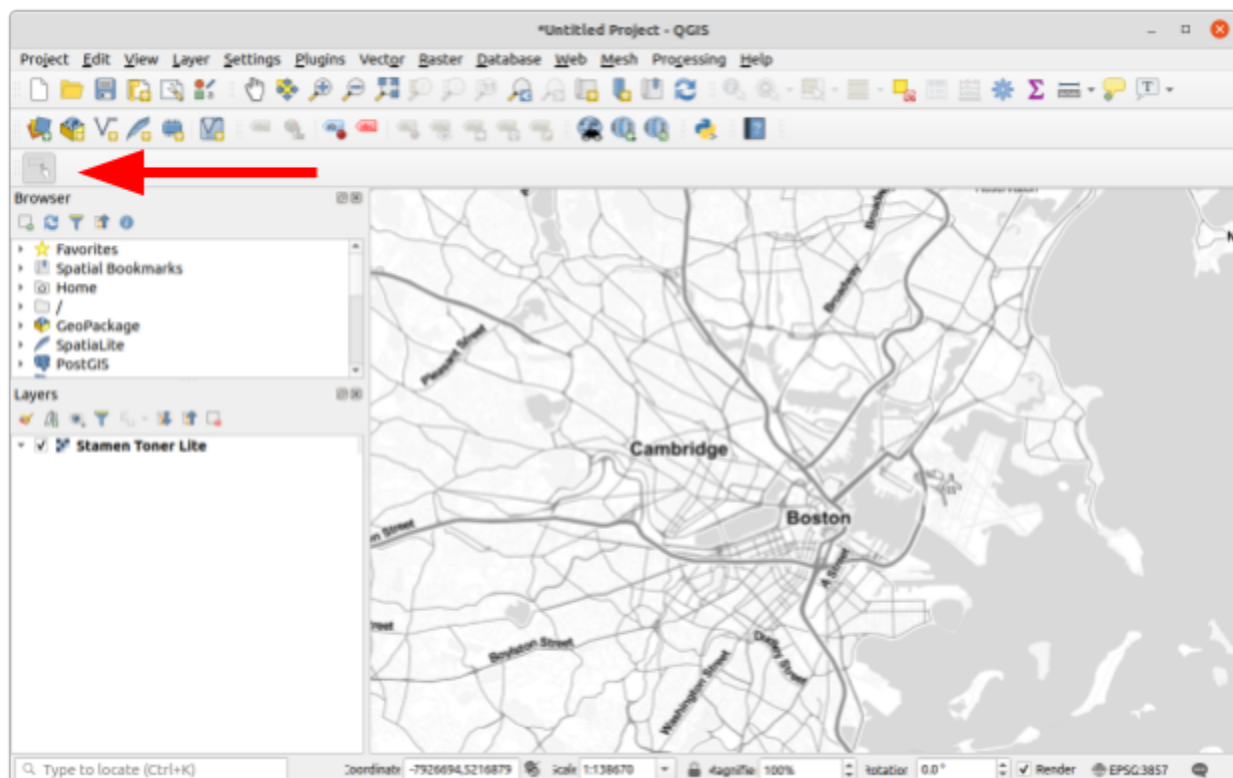
Click it and drag around a small area that is **personally significant to you**---again, this could be, for example, your current residence, your home, a place from which you or your ancestor emigrated, a favorite neighborhood in a favorite city. You should see a screen that reflects the edges of your selected area in latitude (i.e., South-North) and longitude (i.e., East-West) coordinates. Ensure that the 'Load layer after download' button is checked and that you select a sensible place to store your data.
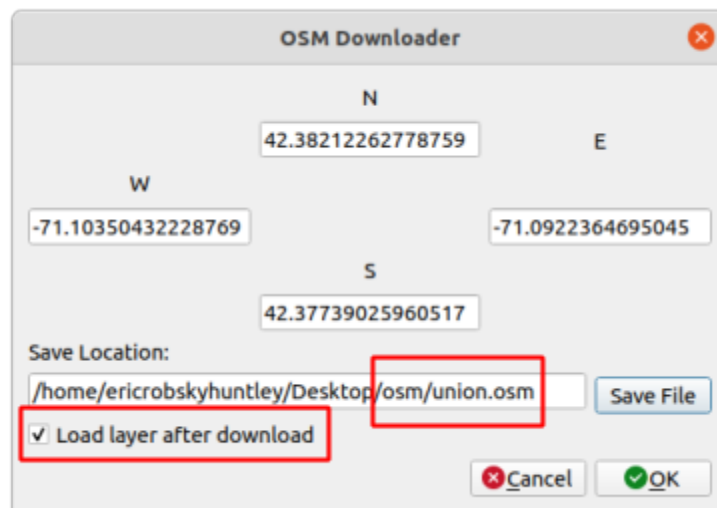
After waiting a moment for the OpenStreetMap data to download, you should see the region you've selected visualized. (Note that it's visualized using a scheme that mirrors that of the OpenStreetMap default).
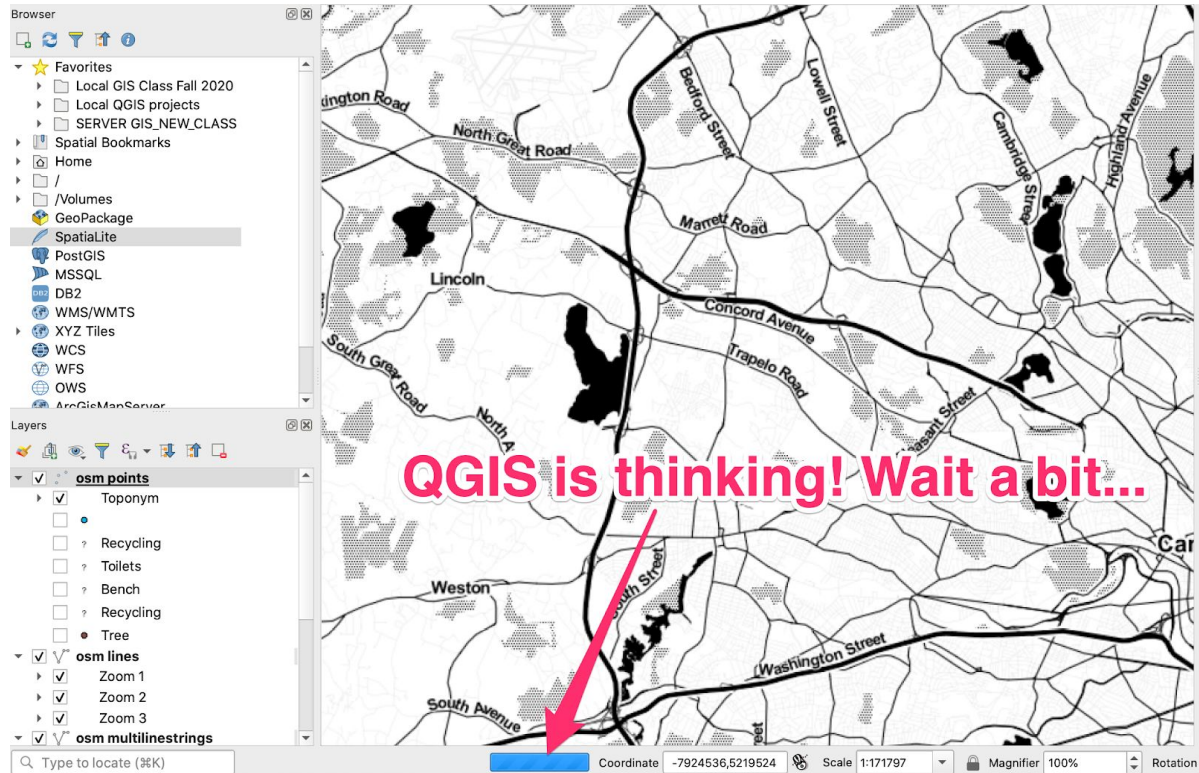
Note that if the geographic region you selected is on the larger side it may take a good amount of time to download and to render on your basemap. You can tell that QGIS is working by looking at the blue progress bar at the bottom of the window.
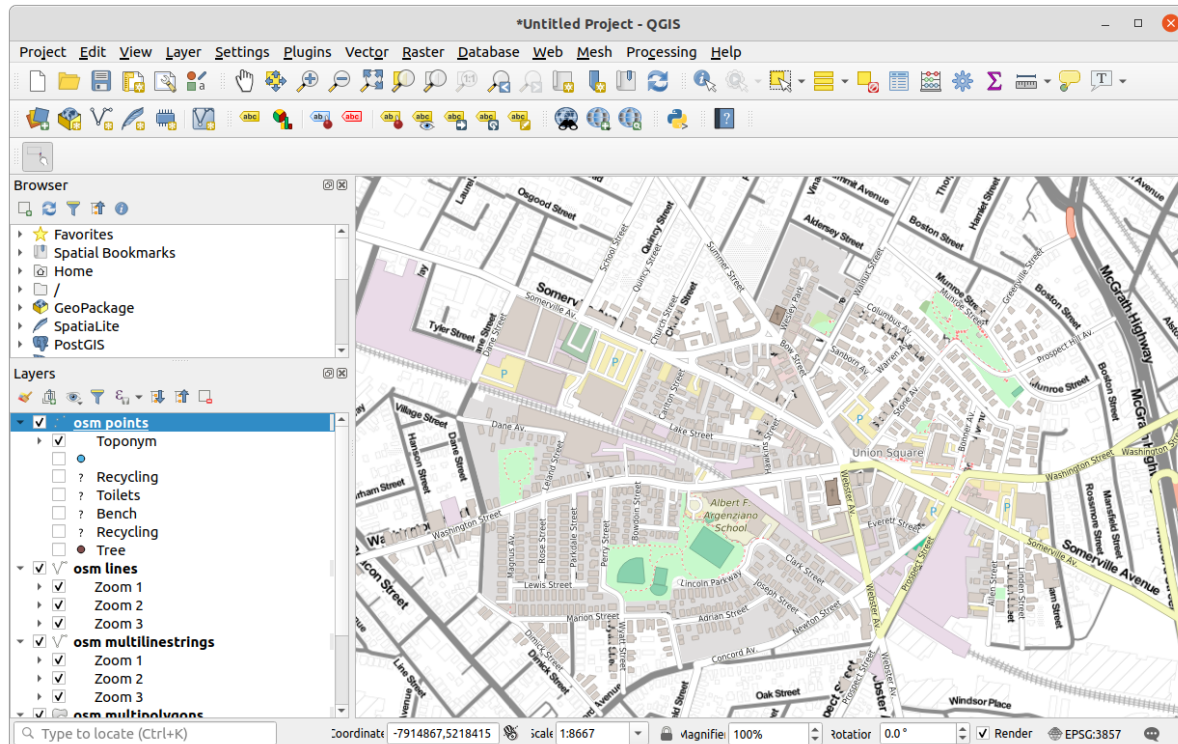
Note that the visible features match those displayed on the basemap - that makes sense! This is the data that is used to create the basemap. But the difference is that we can select, analyze, and query these downloaded features. We'll get into these operations in later weeks... though if you want, you can explore the use of the 'identify features' button to explore the attributes of the data you've downloaded.

For now, we'll export our work and move on!

Export a Map

We'll get into some cartographic considerations next week, but for now, we're going to export a very quick map. To quickly export your map view, click the 'Project' dropdown menu. Under 'Import/Export' choose 'Export Map to Image'. The defaults settings should be fine for our purposes. Give it a file name, and export - congratulations! You just produced your first map.

Now turn to Exercise 0...

That is all for the warm up Exercise. There is nothing to turn in, but do try to get this far *before* the first Lab session on Monday, February 22. Also, think about how well the city features included in OSM and the various basemaps match the features that we might want to record in order to understand your place, the community, urban problems, and urban planning opportunities.