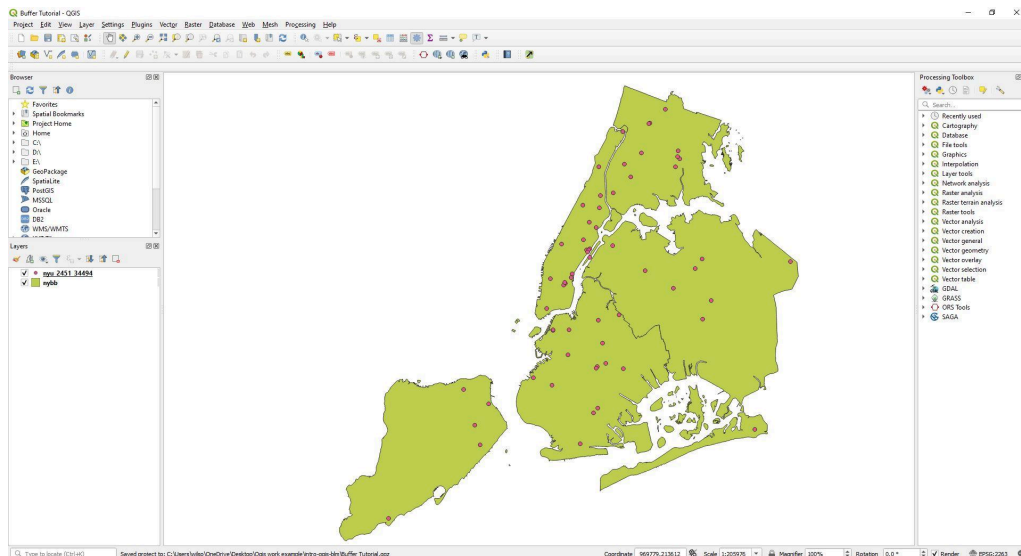


Proximity Analysis: Buffering In QGIS

Within QGIS, you can use the Buffer geoprocessing tool to create polygon buffers around features of interest. For example, you may be an emergency management planner interested in determining critical areas within the area of a bridge collapse. Or, as in the example below, you might be a social worker looking to discover if there is a spatial relationship between hospital locations and underprivileged communities. You might ask the question: Do service areas of the current hospitals reach areas where underprivileged people reside? For this exercise, we'll be working off of the [Department of City Planning's map of NYC's borough boundaries](#) clipped to shorelines, and [NYC's hospitals](#) which can be accessed through NYU. Below is an example of what your map should look like once you've brought in all of your data.



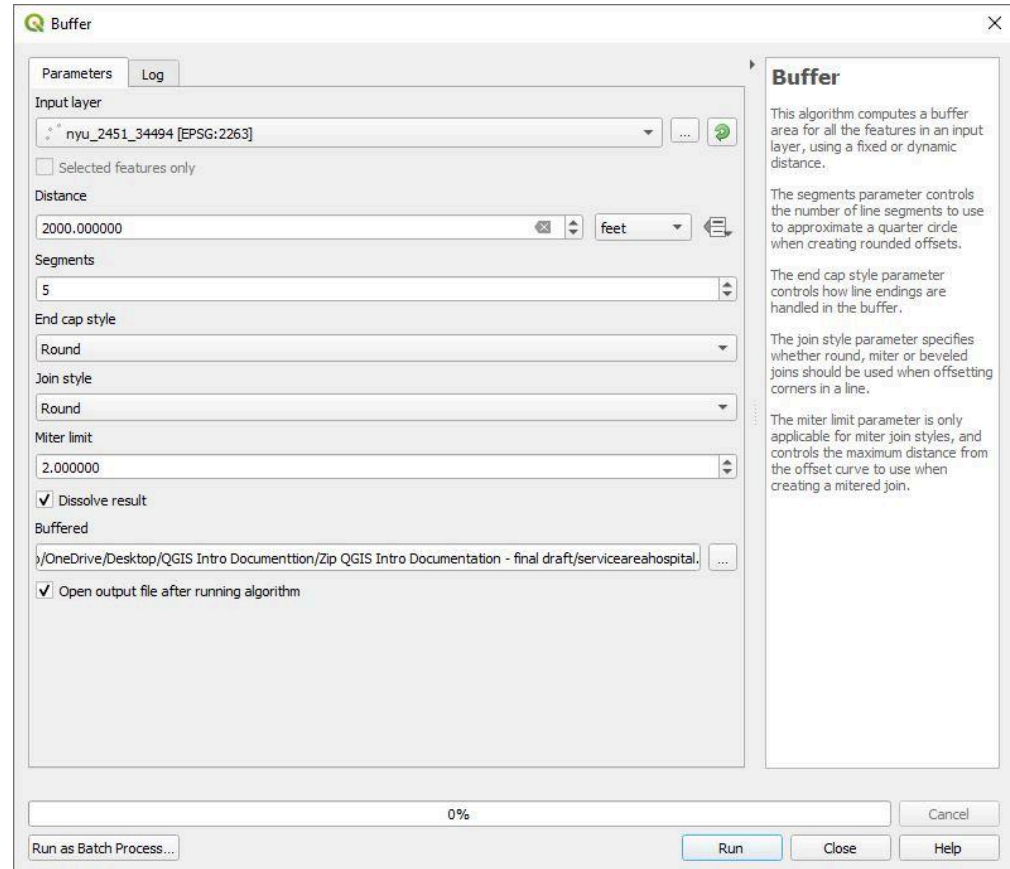
If you are new to QGIS and trying to figure out how to add data, you can simply **open the folder** in your file manager where all of your data is located, and **drag and drop** it into the layers menu. Another option is to use the file browser located above your layers menu on the left where you can **navigate to**, and **open** a specific folder for easy access to your data & files. Remember to keep everything together! A final method, and perhaps one of the most useful depending on what you're importing, and that's by going through our **Layer** menu on the ribbon in the upper left, so from **Layer** → **Add Layer** → (here you can choose which specific type of layer you want to add but for our purposes you can use **Add Vector Layer** to bring in our shapefiles). You can see an example of how things should look in the photo above you. You can also select the check marks on the side of the maps to toggle if they are turned on and appear on your map or not! If there's a check they appear, if there isn't they don't.

Use the Buffer Tool (from the Vector → Geoprocessing menu)

1. Once the shapefile you wish to buffer is added to the Layers Panel, click on the Vector menu at the top of the QGIS interface, select Geoprocessing Tools, and then Buffer. (**Vector** → **Geoprocessing Tools** → **Buffer**).

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2. In the Buffer dialogue box (see the figure below), use the dropdown menu to select the shapefile around which you'd like to create buffers. Alternatively, if you have not added a shapefile to QGIS you can use the browse icon (three dots in a box) on the right to find the shapefile you'd like to buffer. Choose the distance you want to use for your buffer, alternatively, you can also select the measurement for



the buffer, there are options ranging from feet to kilometers, but specifics for this tutorial and example will be listed below. After you've chosen the distance then choose the output location for your new buffer shapefile by pressing the browse icon (the three dots in a box). You must name your file if saving this way, also note that you want to choose *.SHP as the output, it's the most commonly used GIS file and thus can be run almost anywhere. If you leave this part blank, it will create a temporary file that will be deleted when you close QGIS, but you can save this temporary file through **right clicking** it and selecting **save feature as**, or **make permanent**, from there you can save. Lastly, click on the **Run** button. You can see an example of how it should be set up in the menu above.

- a. It should be noted that you may need to reproject your file as certain CRS like EPSG: 4269 can only be projected in degrees, so try to reproject to a broader CRS such as EPSG: 2263 or something that measures feet / meters as they provide more options

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- b. Usually it's important to keep all of your files housed together so I recommend creating a folder on your desktop named GIS and then a subfolder for this tutorial to save your file to, make sure you save your new buffered file.
3. For this example, a buffer with a 2000 foot radius will be created around each hospital point to indicate the hospitals' service area. You can also choose to dissolve buffers (by checking **Dissolve result**), or to leave an individual buffer for each point. See the result shown below:



At this point, you can conduct a visual scan or conduct further analysis using this new polygon shapefile to determine if the underprivileged areas are being served by the hospitals where they are currently located, in our case the orange dots represent service areas, while green represents NYC's boundaries.

For more information on buffering in QGIS, click [here](#).