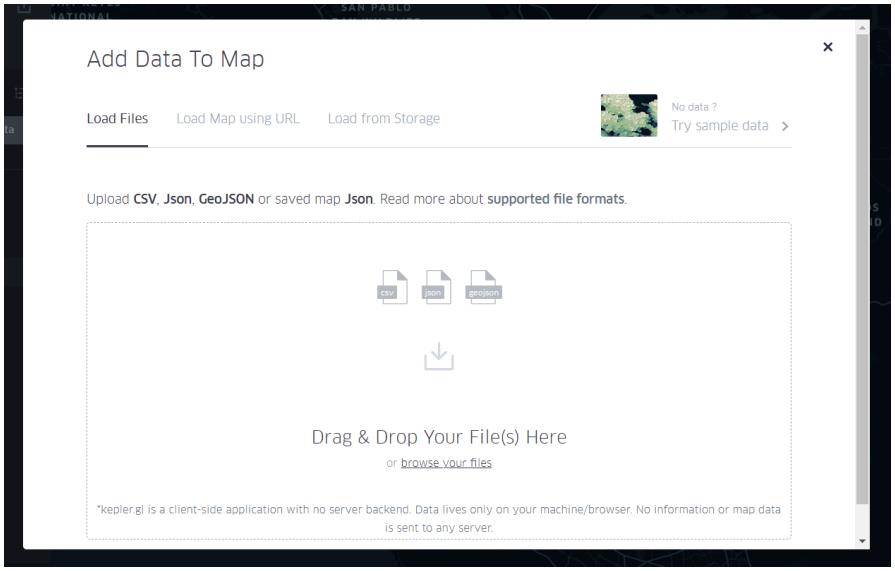
Lab 5: 3D Mapping with kepler.gl

Introduction

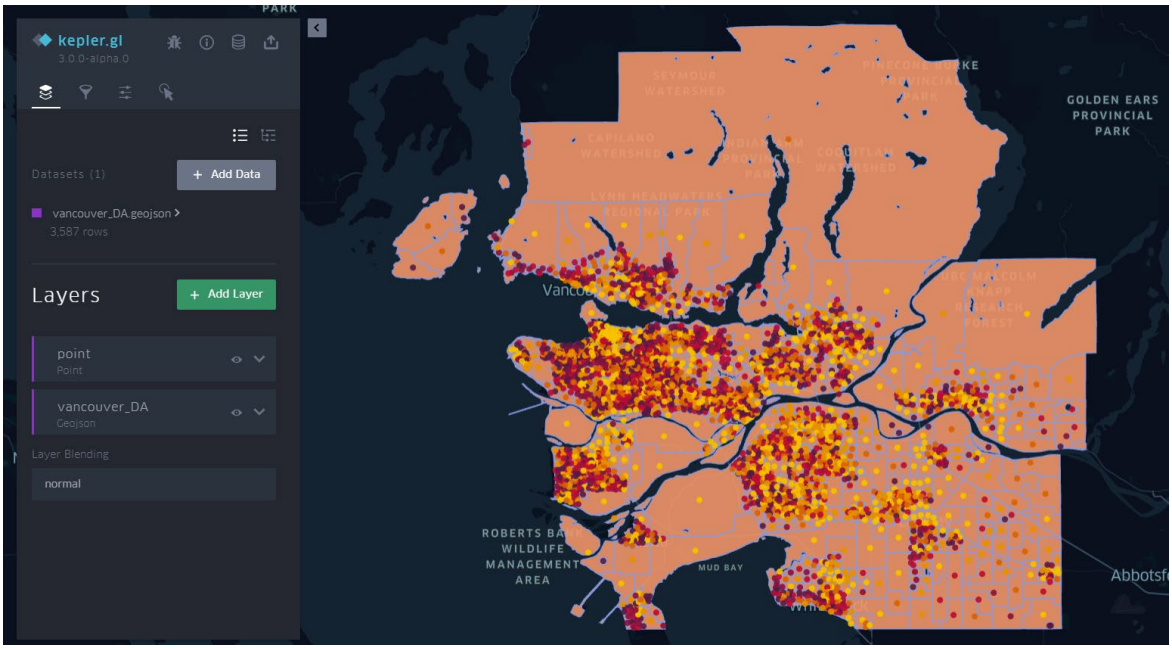
In this lab, you'll be creating a 3D map of cell phone activity using a powerful and easy-to-use data visualization platform called kepler.gl. The cell phone data is from Spectus, and has already been aggregated by dissemination area.

Load and examine your data

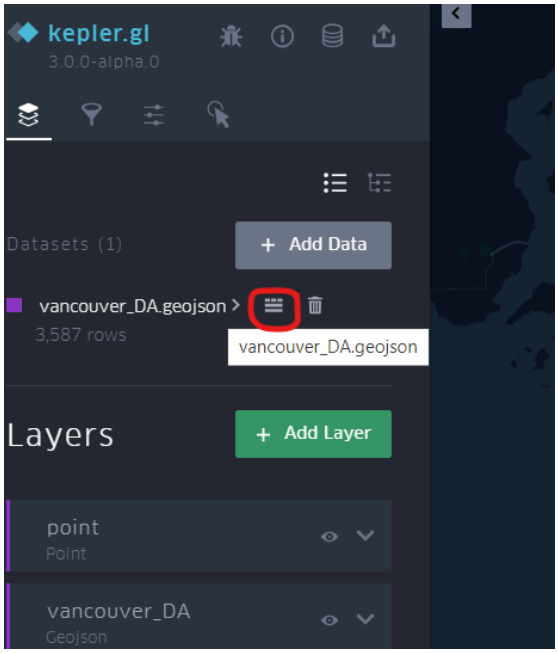
1. Go to the kepler.gl website. Click on the blue 'GET STARTED' button.
2. To load the data, drag the shapefile (`cp101.github.io/labs/lab05/lab05_data/vancouver_DA.geojson`), which is in **geojson** format, into the window.



3. Your screen should look something like this:



4. In the side panel, click on the 'Show data table' button next to the dataset name:

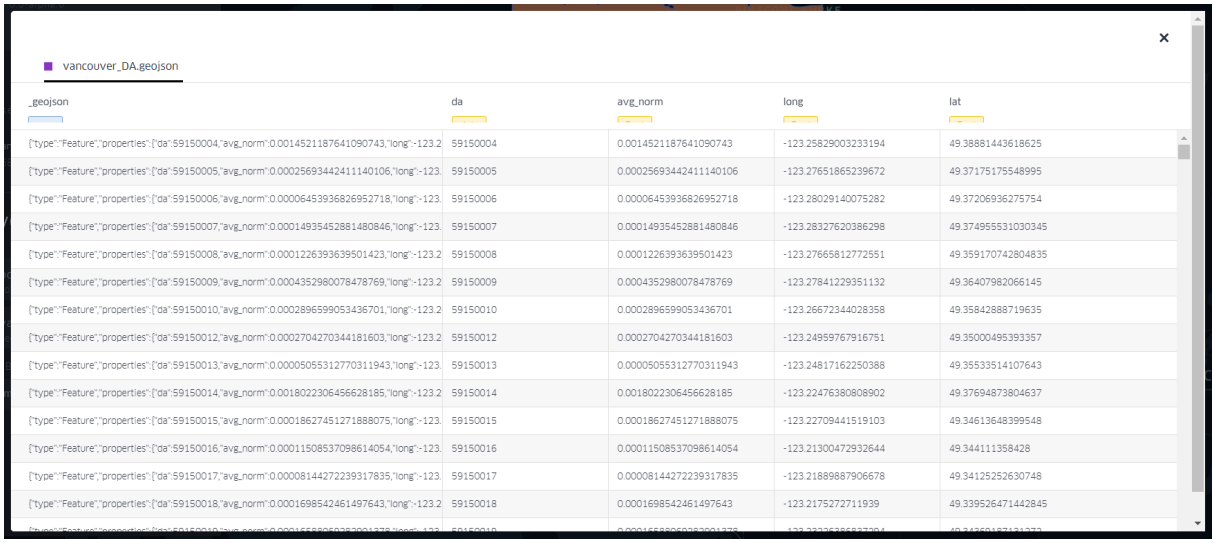


5. This allows you to look at the contents of the dataset. There are multiple variables:
    a. **.geojson** = the spatial information (geometry) of each polygon
    b. **da** = the dissemination area ID
    c. **avg_norm** = the daily average "normalized" mobile device count (i.e., # of unique mobile devices in the dissemination area divided by the # of unique devices in all of British Columbia) for May, 2023

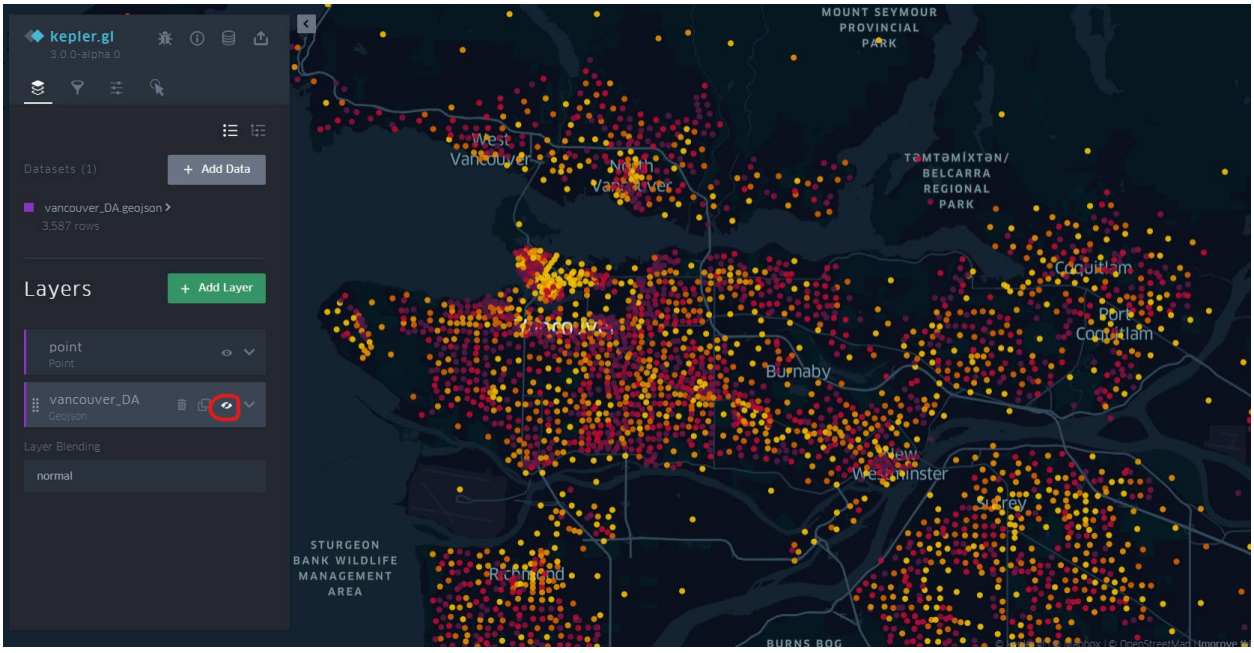
i. This is the variable you'll be mapping

d. **long** = the longitude of the "centroid" (i.e., geographic center) of the dissemination area – this has already been created for you

e. **lat** = the latitude of the "centroid" of the dissemination area – this has already been created for you



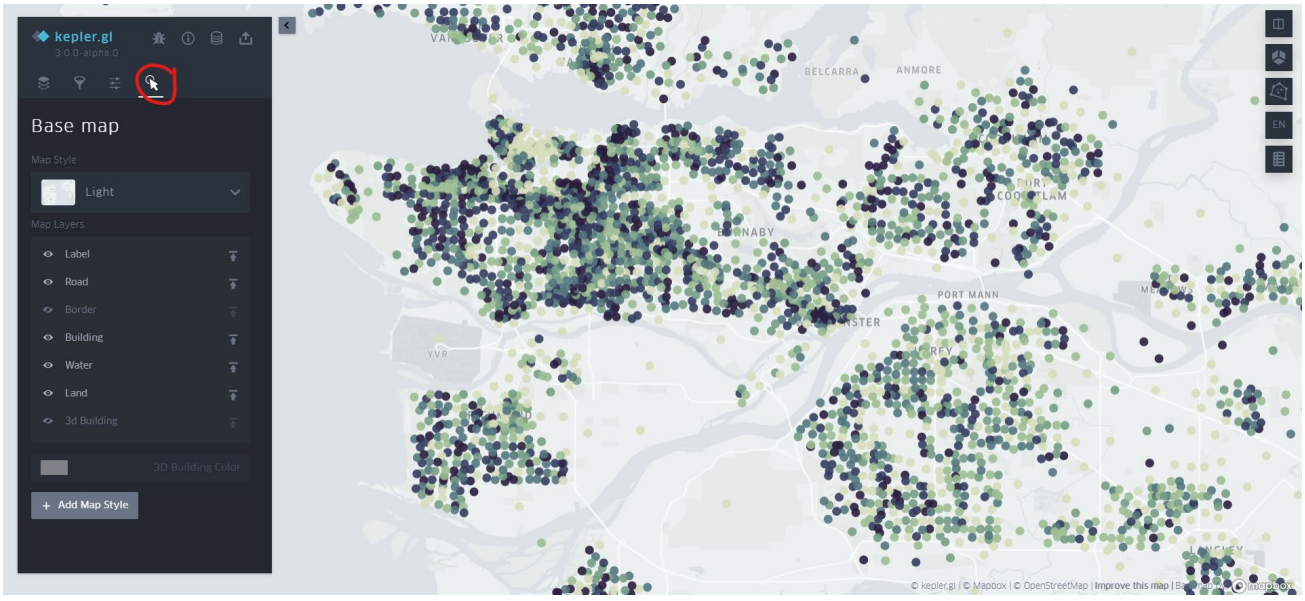
6. As you can see in the 'Layers' side panel, since we provided lat/long columns in the data, kepler.gl automatically creates two layers: one with the point data and another with the polygon data. To look at one layer at a time, click on the eye symbol next to the layer you want to turn off (see circled in red below):



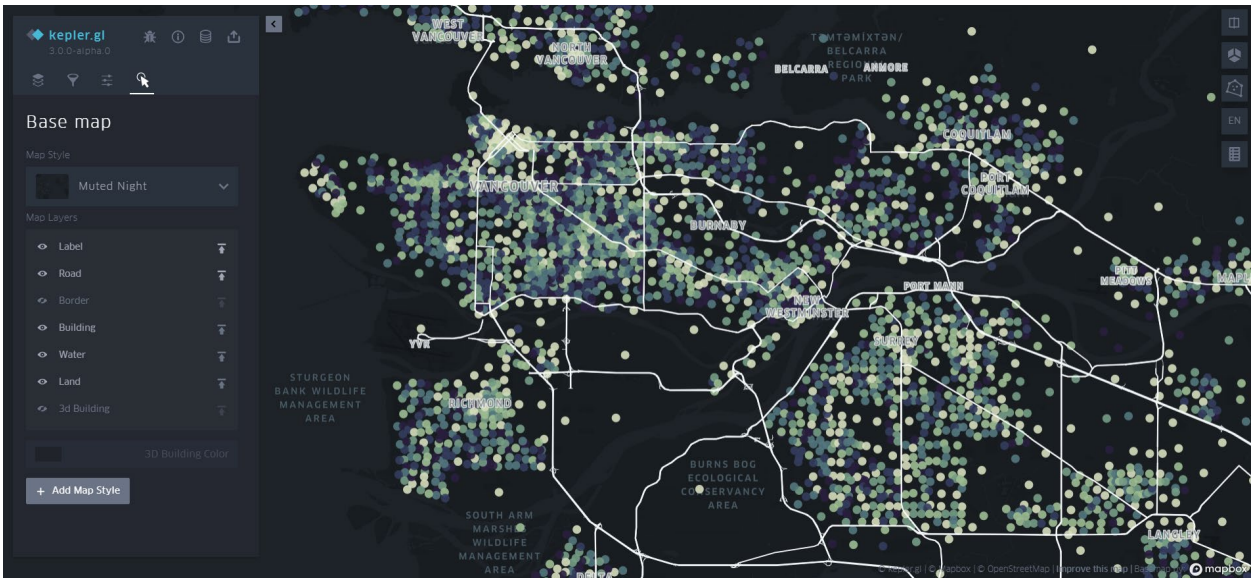
Customize your point layer

1. If you click on the arrow to the right of the point layer name (which you can edit by clicking on the name itself), you will see options to customize your map. For example, you can change the colors or increase the size of the points:

2. If you navigate to the ‘base map’ panel (see symbol circled in red below), you can change the underlying base map.

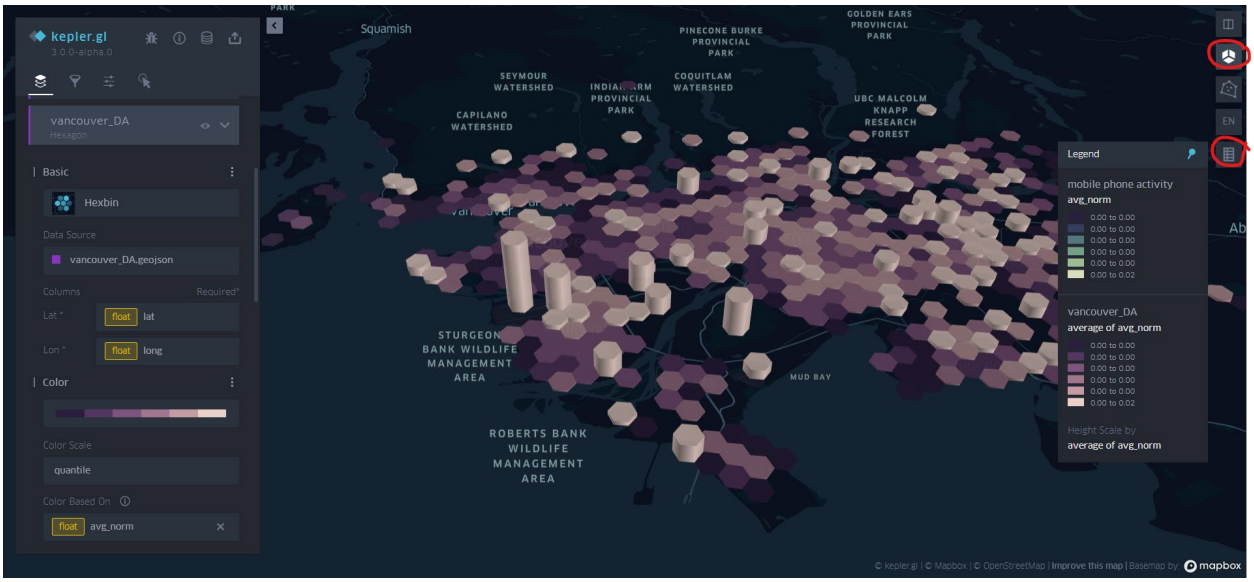


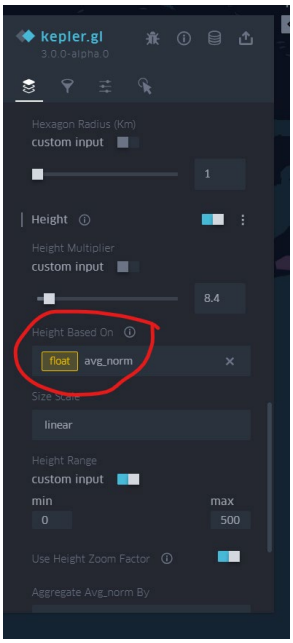
3. You can also adjust features like roads and place name labels to make them more visible by bringing them on top of, rather than below, the points:



Create a 3D map

1. Click on the eye symbol for both layers so that you now see the polygon layer (`vancouver_DA.geojson`) and not the point layer.
2. Click on the arrow to the right of the layer name, and adjust the following:
    a. Click on the '3D Map' symbol at the top right of the screen (see 3D box circled in red in below screenshot) to view the map at an angle
    b. Select 'Hexbin' as the shape to display. Hex bins divide maps into hexagonal areas and display information according to the aggregate values in those hexagons
        i. Set Lat to the 'lat' variable and Lon to 'long'
    c. Select a color scale you like and make sure 'Color Based On' (see first screenshot) and 'Height Based On' (see second screenshot) are both set to `avg_norm`. This means the colors – and the heights of the hex bins – correspond to the average activity level in each dissemination area
        i. Taller, whiter bars mean more activity
    d. To view the legend, click on the 'Legend' symbol (see circled in red below)





3. You're done! See kepler.gl's documentation for more on how to customize your map and create other kinds of maps.