

TOTAL Camp
June 13-14, 2016
Introduction Exercises using GeoBuilder

❖ Objective

The objective of these exercises is to learn how to use GeoBuilder to explore, visualize, and analyze geo-referenced datasets. GeoBuilder is a wizard based tool that allows scientists to easily configure and display geospatial data on a map interface and share the data view with collaborators or the public. There are various types of geospatial data that can be used in GeoBuilder. In these exercises we will focus on spreadsheet type of data that have latitude and longitude information.

GeoBuilder URL: <https://mygeohub.org/tools/geobuilder>

Array of Things URL: <http://plnar.io/> (this web site has a lot of urban sensor data that are georeferenced and downloadable)

Here are examples of interesting data found on the website:

- Chicago Police Department Crimes data
- City of Chicago 331 Service Requests – Tree Trims
- New York Police Department (NYPD) – NYPD Motor Vehicle Collisions
- The Water Quality Sampling Data for “City of Austin Watershed Protection Environmental Resource Management”

Exercise List

Adding and Editing layers: Adding a georeferenced spreadsheet to GeoBuilder as a map layer.

Configuring the display and dynamic plotting function.

- 1: Importing data
- 2: Editing the pin and placard display
- 3: Adding an auxiliary data and how to graph it

Map Functions: how to zoom and select multiple points

Importing data of choice (optional)

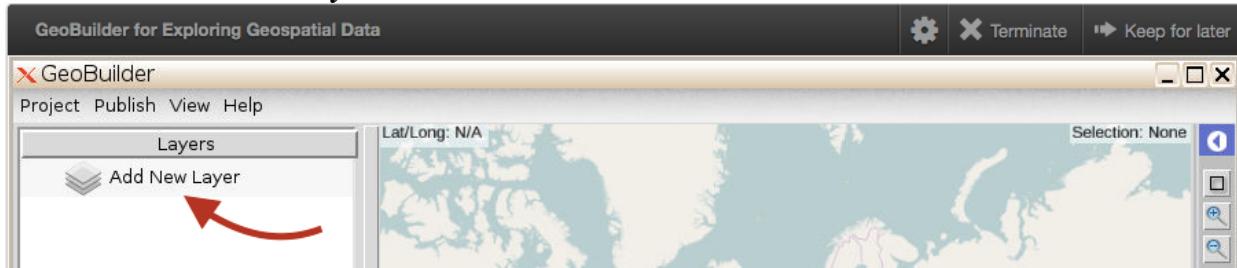
- 5: Download files from <http://plnar.io/>
- 6: Importing downloaded data into GeoBuilder

EXERCISE 1: ADDING AND EDITING A LAYER

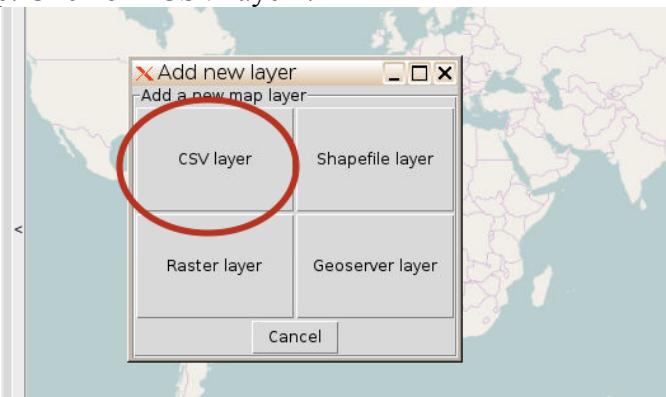
❖ How to add a new layer using data from iData

1.1 Go to <https://mygeohub.org/tools/geobuilder> and click **Launch** to open GeoBuilder.

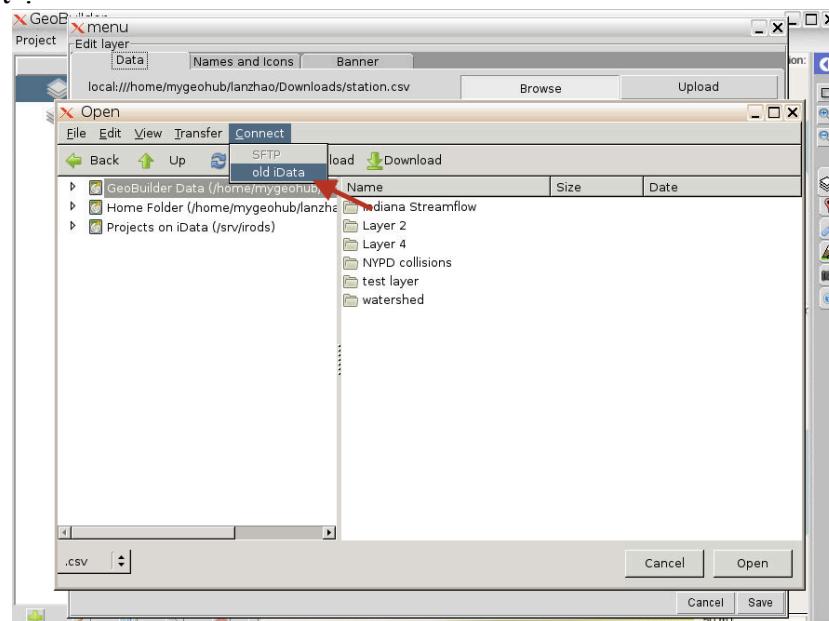
1.2 Click on the *Add New Layer* link on the left.

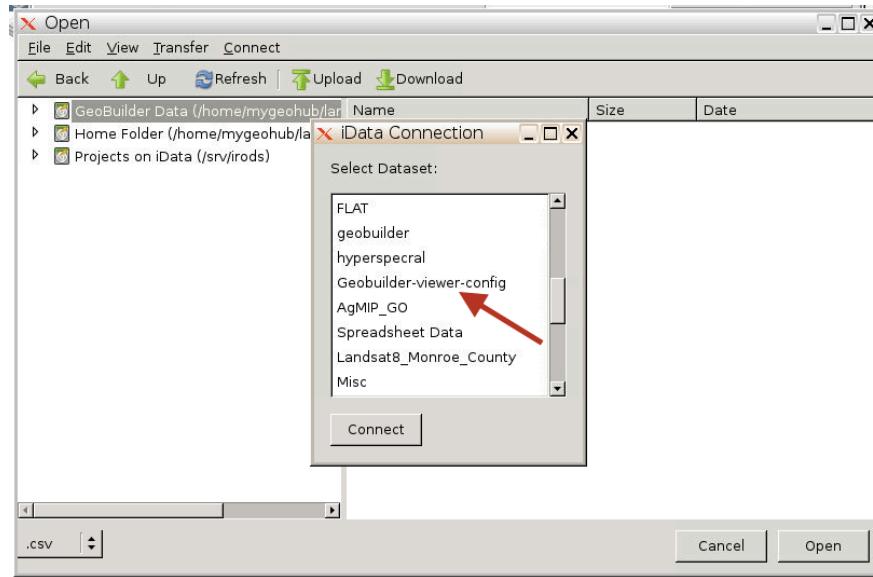


1.3 A new dialog box pops up. Click on “CSV layer”.

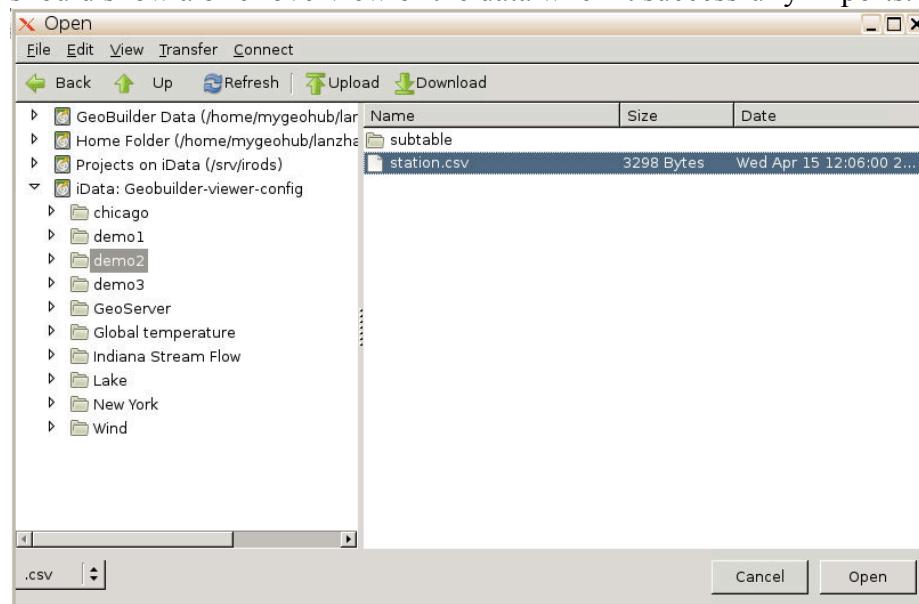


1.4 Another dialog box shows up. Click on **Browse**. Then click on “Connect” from the menu bar at the top and select “old iData”. Select “Geobuilder-viewer-config” in the popup box, and click “connect”.





- 1.5 Double click on “***Indiana Stream Flow***” to expand the folder. click on ***station.csv*** and click ***Open***. It should show a brief overview of the data when it successfully imports.

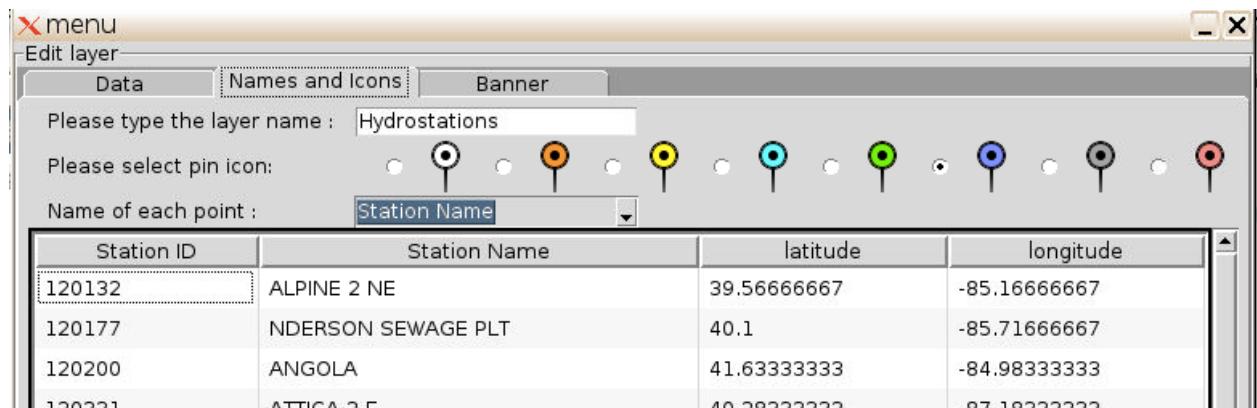


❖ Editing the pin and data

2.1 Click on ***Names and Icons*** tab at the top. Rename the layer name to ***Hydrostations***.

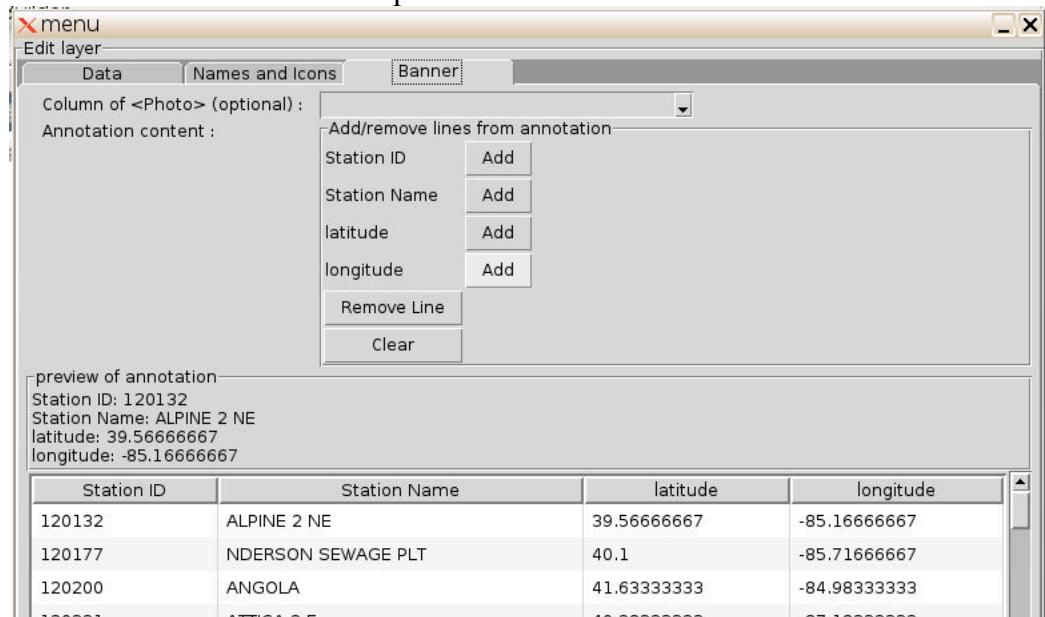
2.2 Choose a pin color you wish to use. Do this by clicking on the blank circle to the left of the pin.

2.3 Select ***Station Name*** for ***Name of each point***.



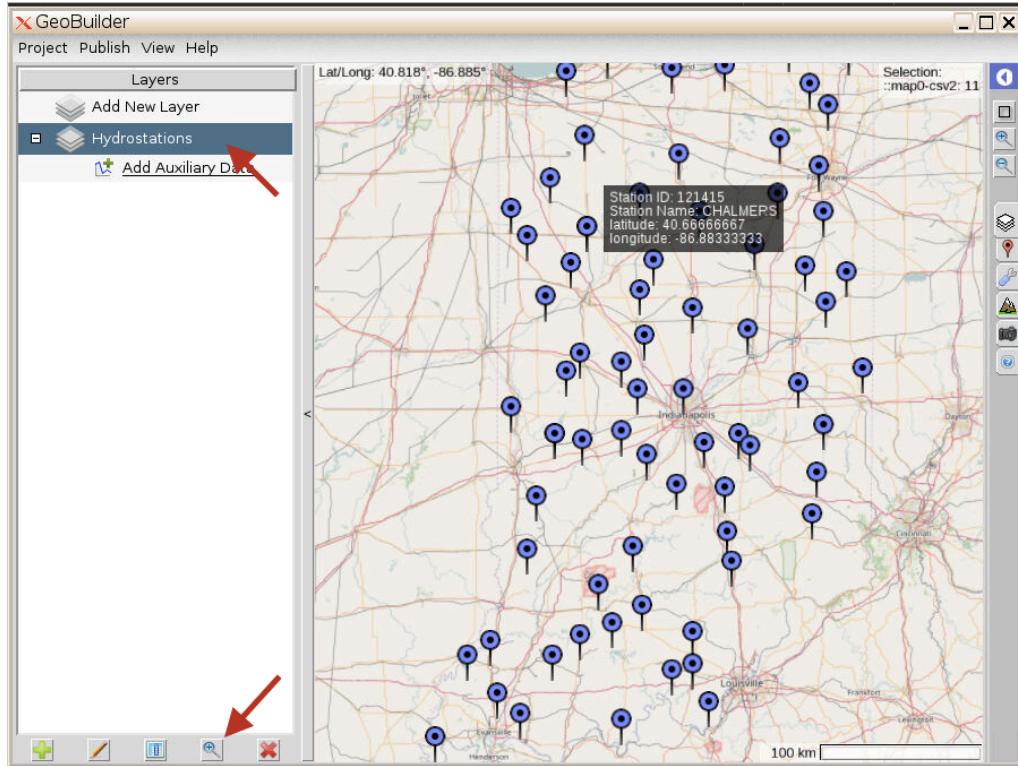
2.4 Click the **Banner** tab.

2.5 Click the **Add** button to select the attributes you want to display in a placard when clicking on a station icon on the map. The selected attributes will show in the preview pane below. Click **Save** to return to the map view.

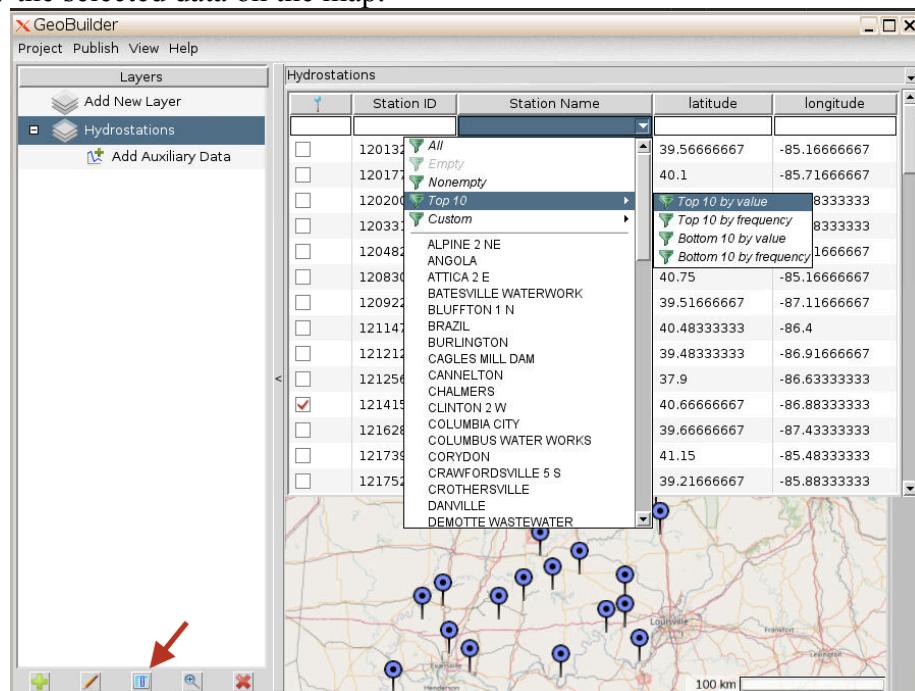


2.6 Zoom in to the layer by clicking on the hydrostations layer at the left side and the zoom square (+) at the bottom of the layer panel.

2.7 Click on a station icon to view the placard.

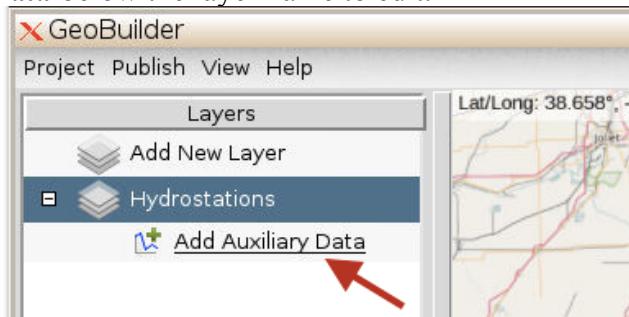


2.8 Bring up the data table of the hydro stations by clicking on the table square () at the bottom of the layer panel. Click on the column names to sort the data by column. Click on the row below each column name to bring up a drop down menu for further filtering the data based on several customized queries. Click on the table square again to hide the data table and view the selected data on the map.



❖ Adding an auxiliary data and how to graph it

3.1 Click **Add Auxiliary Data** below the layer name to edit.



3.2 Change **New Column Name** to **Streamflow**.

3.3 Click **Browse**. Click “**Connect → old iData**”, select **Geobuilder-viewer-config**, click **Connect**. Expand the **demo2** folder, click on the **subtable** folder and click **Open**. A preview of the files can be seen on the top right of the screen.

3.4 Now we need to associate both data. Fill out the blanks as shown in the picture below.

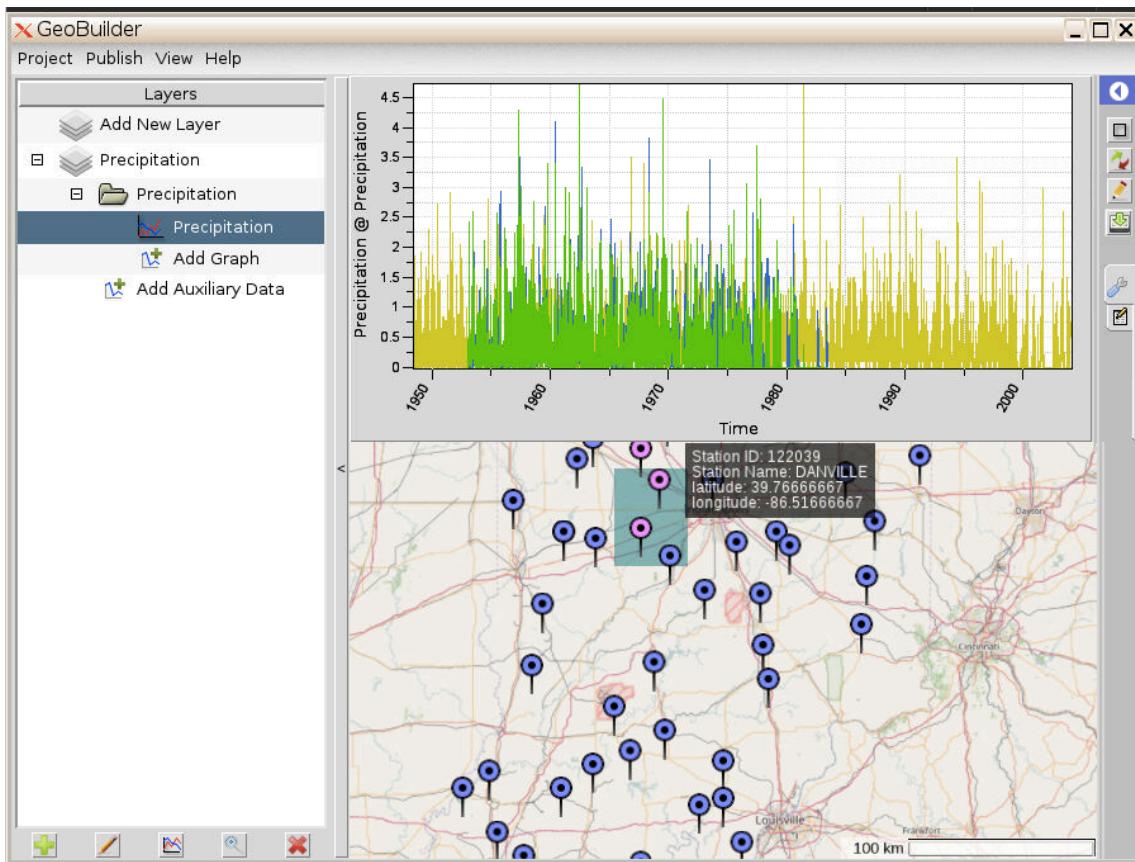
id	longitude	Precipitation
66667	-85.16666667	local:///srv/irods/gabbsrel1/dataset/geobuilder/IN_precipitation/hr120132.csv
	-85.71666667	local:///srv/irods/gabbsrel1/dataset/geobuilder/IN_precipitation/hr120177.csv
33333	-84.98333333	local:///srv/irods/gabbsrel1/dataset/geobuilder/IN_precipitation/hr120200.csv

3.5 Click on **Graphs** at the top and click **Yes** when it asks if you would like to plot graphs upon selection.

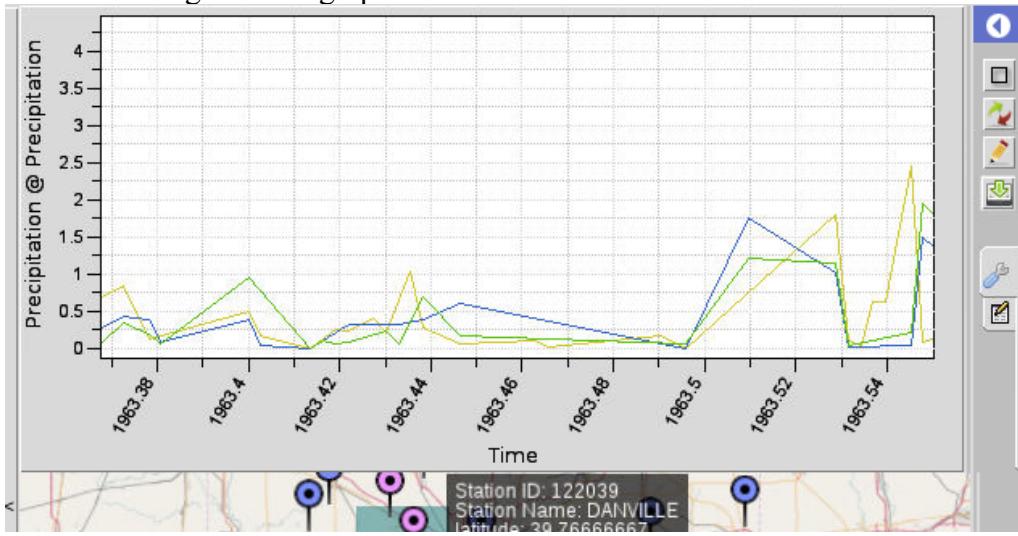
3.6 Select “**linechart**” in field 1. Set **Precipitation @Precipitation** as the y-axis and the **Time @Precipitation** as the x-axis.

3.7 Click **Save**.

3.8 To view the graph with the points, click on **Precipitation** to the right of the graph icon () below the precipitation layer. Select one station pin or multiple pins (by holding the shift key and use left mouse to select a region on the map). Click on the graph button at the bottom of the Layer panel to show the graph.



3.9 Draw a rectangle on the graph to zoom into the area selected.



What area has the highest precipitation?

Do you think there's an area in the state that needs additional stations to gather more accurate data?

MAP FUNCTIONS

Zoom

- Scrolling with the mouse or trackpad.
- Pinching on the trackpad.
- Magnifying glass icons with + for zoom in and – for zoom out.

Moving the view

- Left-click hold and drag.

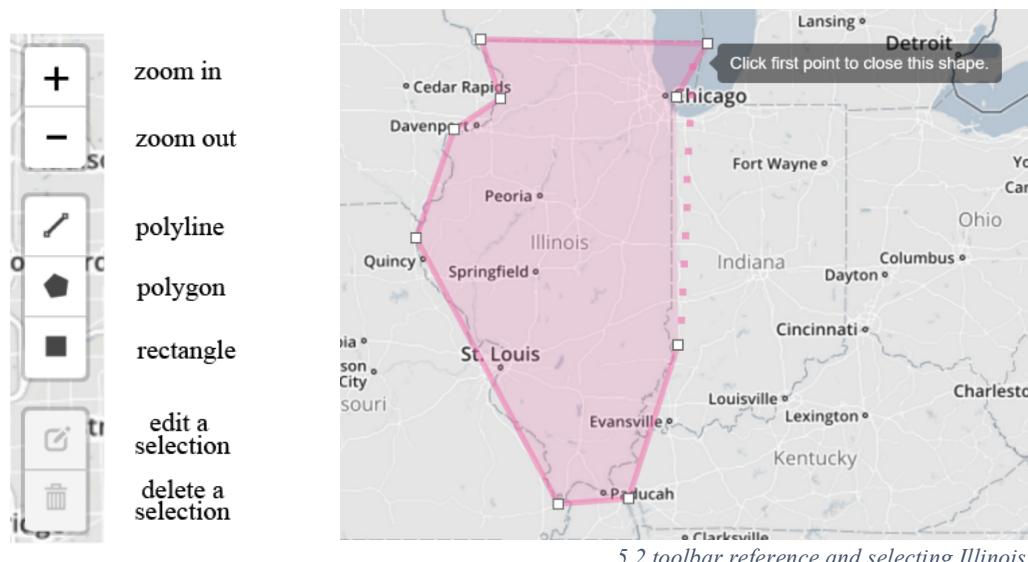
Multiselect

- Hold shift, hold the left-click button and drag the desired area.

EXERCISE 2: Downloading files from <http://plnar.io/> (optional)

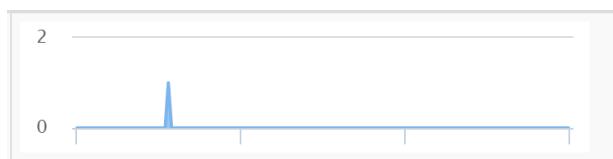
4.1 Go to <http://plnar.io/> and click on explore.

4.2 Select an area on the map that you want the data from by clicking on **draw a polygon** or **draw a rectangle**. For example, to see data only from Illinois, select the polygon icon and click around the state. To finish making the shape, click on the first point plotted.

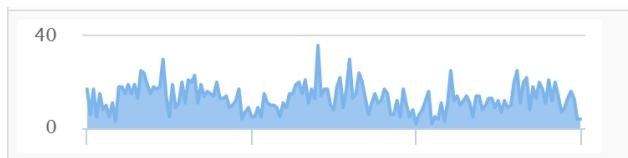


4.3 Then, select your start and end date. For this example, the start date is 01/01/13 and the end date is 01/01/16. Aggregate by week and click **submit**. You should see the datasets load on the bottom of the screen.

4.4 Pick a source that has a high **count**. You can see this in one of the columns on the table.



vs.



The source on the top is preferred compared to the bottom.

4.5 If you want to sort the list by count, click on **count** on the table until the arrow is pointing upwards.

Source	Dataset Name	Count ▲	Trend	Download
Chicago Police Department	Crimes - 2001 to present	833649		
Chicago Police Department	Crimes - 2001 to present	833649		
Chicago Tribune	Red Light Camera Tickets	628600		
City of Chicago	Transportation Department Permits	436995		
City of Chicago	311 Service Requests - Graffiti Removal	416292		
City of Chicago	Building Violations	372434		

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5.6 show more data

4.6 To show more than 5 data at one time, scroll down and click on the dropdown (that has 5 by default) under the list, you have the ability to show 5, 10, 25, or 50 data.

4.7 Once you've chosen a source, click **download** and click **CSV**.

4.8 Save it in a place where you can access it later.

4.9 Check the data to make sure it has a column named “latitude” and a column named “longitude” and if not changes them to exactly match “latitude” and “longitude”. (This is a requirement of the current version of GeoBuilder. It will be more flexible for the next release.)

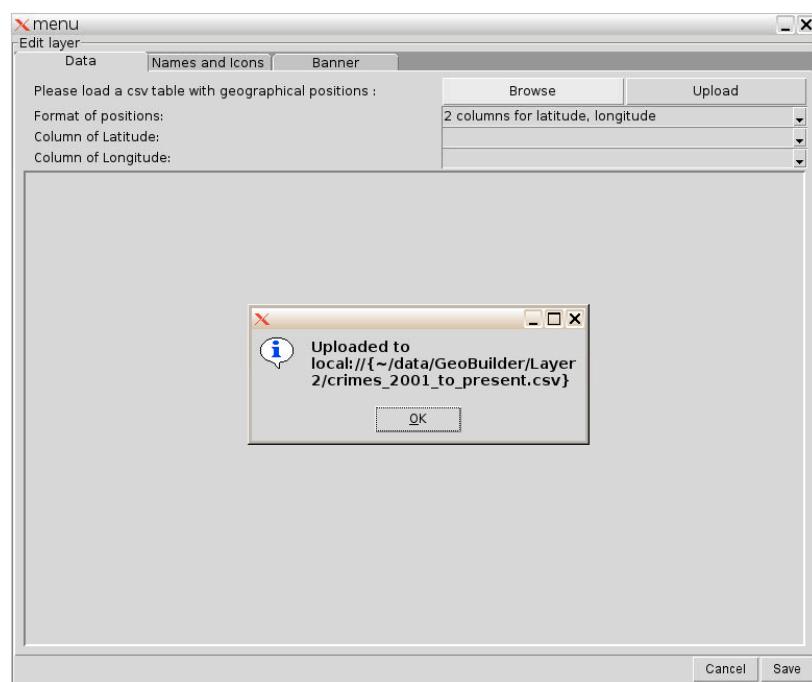
Read exercise 3 to see how to upload it into GeoBuilder.

❖ **Exercise 3: Uploading downloaded data into GeoBuilder (optional)**

5.1 Click on “**Add New Layer**” in the Layers panel at the left hand side.

5.2 A new dialog box pops up. Click on “**CSV layer**”.

5.3 Click on Upload and a pop up window will show up. Click on **Choose File** (for Chrome) and **Browse** (for Firefox) and look for the file downloaded. Click **Upload**. Once the file is uploaded, a success message will be displayed in the popup window. Dismiss the popup window.



5.4 A message should appear on GeoBuilder that shows where the file can be located within GeoBuilder. Click **OK**.

5.5 Click **Browse** at the top and select “**GeoBuilder Data**” on the left side. Expand the directory tree by clicking on “**Layer 2**” on the right hand side. Click on the file you uploaded click **OK**. You should see the data displayed in the preview table.

Make sure that the column for latitude and longitude matches the options at the top where it asks to select column of latitude/longitude.

5.6 Configure the layer name, pin, placard settings as in steps 2.1-2.5.

5.7 Explore the data by filtering using the data table using different queries as shown in steps 2.6-2.8