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Mapping Political Economies over Time

A Primer of Regional Systems Theory and Methods for the Study of Historical Economies, Societies and Polities, and their Integration into the Modern World System

Exercise 2: Cities and Water Transportation in 19th Century France

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First Edition, 2017

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Exercise 2: Cities and Water Transportation in 19th Century France

Learning Objectives

1. Select by Attribute: Select all Cities with a total population in 1831 over 25,000, and create a new GIS shapefile.
2. Select by Location: Identify all Communes with a total population in 1831 over 2,500 located within 2 miles of the sea or a navigable waterway.

Files used in this exercise:

Datasets referenced in this exercise may be downloaded from the Harvard Dataverse repository at <https://dataverse.harvard.edu/dataverse/mpe>. We suggest that instructors provide a shared directory for students to access these files on their local network.

<u>File Name</u>	<u>Description</u>
1. FranceOut	Outline of France for reference
2. Waterways_1848	Navigable rivers and canals of France c. 1848
3. France_Waterways	Coastline of Europe with navigable waterways of France
4. watersheds.shp	Watersheds of France for reference
5. systems.shp	Skinnerian Macroregions of France c. 1850 for reference
6. City1831	Commune points, with more than 2500 persons in 1831

New Files created in this exercise

- | | |
|---------------|--|
| 1. 1831 Metro | Communes with a total population in 1831 over 25,000 |
| 2. WaterCity | Communes with a total population in 1831 over 2500 located within 2 miles of the sea or a navigable waterway |

Data sources

This exercise makes use of data developed by the Institut National de la statistique et des études économiques (INSEE)/ National Institute of Statistics and Economic Studies, the National Aeronautics and Space Administration (NASA), and by G. William Skinner and his research team at the University of California, Davis, now archived at the Harvard University Center for Geographic Analysis.

Claude Motte, Isabelle Séguy, and Christine Thère (2003). *Communes d'hier, communes d'aujourd'hui. Les communes de la France métropolitaine, 1801-2001. Dictionnaire d'histoire administrative*. Paris: Institut National d'Études Démographiques.

Mark Henderson and Merrick Lex Berman, ed.s (2016). *Skinner Regional Systems Analysis Dataverse*. Cambridge: Harvard University.

<https://dataverse.harvard.edu/dataverse/hrs>.

Martí-Henneberg, J. '1848 France waterways shapefile' (2017).

This dataset was created thanks to the funding of the Spanish Ministry of Science and Education (CSO2015-65733-P). <http://europa.udl.cat/projects/inland-waterways/>

Getting Started

This exercise shows examples from ArcMap version 10.5. If you're using a different version, or different GIS software, your results may vary. We assume that you're familiar with the basic layout of your GIS software and are ready to try some new techniques.

Start ArcMap and create a new ArcMap project. From the Menu Bar click on File / Save As, and name your ArcMap document **France-Lab2**.

Consult with your instructor to determine the best location to save your .mxd document file. Remember, the .mxd file is only an array of pointers to the actual GIS data files that must also be present where you save your work for the file to correctly open again later.

I. Mapping Urban Centers in Relation to Navigable Waterways

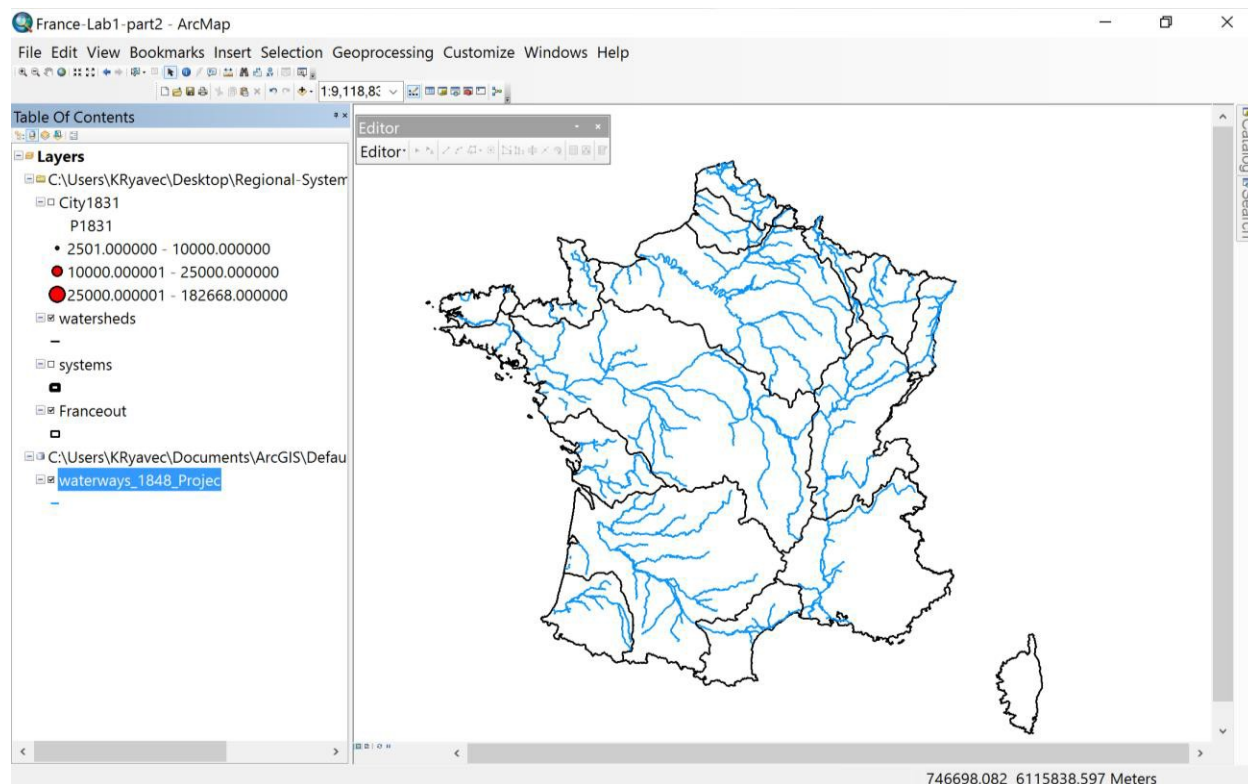
The economic history of states and societies shows strong inter-relationships between cheap transport by water, improved market access, cheaper raw materials and economic and demographic growth. These inter-relationships of navigable waterways with economic and demographic developments can be explored in new ways using GIS (Geographic Information Systems) models of the navigable rivers and canals of France.

According to Satchell's historical analysis of the navigable waterways and the economy of England and Wales ca. 1600-1835, towns were only able to grow beyond a population of 25,000 if they had access to navigable waterways, the sea, or both.¹ We will test this hypothesis with France in 1831 before the advent of Railroads in the 1840s changed the traditional agrarian economy based on land and water transport.

¹Max Satchell, "Navigable Waterways and the Economy of England and Wales 1600-1835" (Working Paper, The Online Historical Atlas of Transport, Urbanization and Economic Development in England and Wales c. 1680-1911.) Cambridge: Cambridge University, Cultural and Historical Geography.

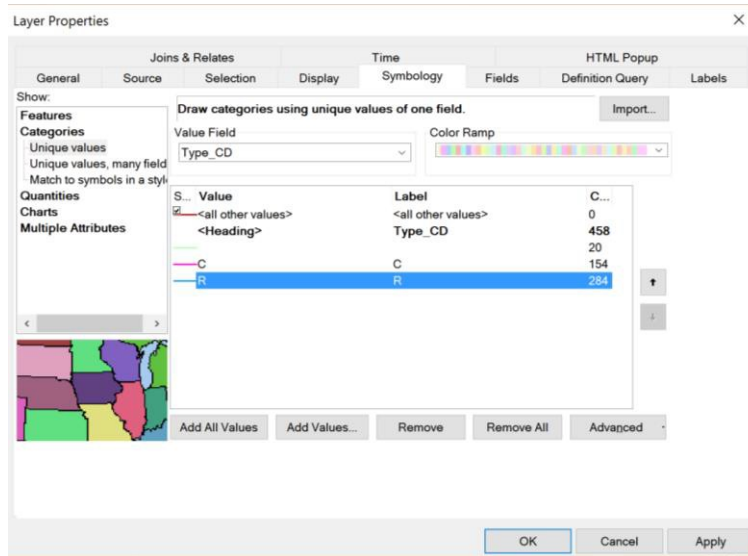
Step 1. Add the Outline of France, Navigable Waterways, and Watersheds.

Add the shapefiles Franceout, Waterways_1848_Projec, and Watersheds. Your map should look like this:

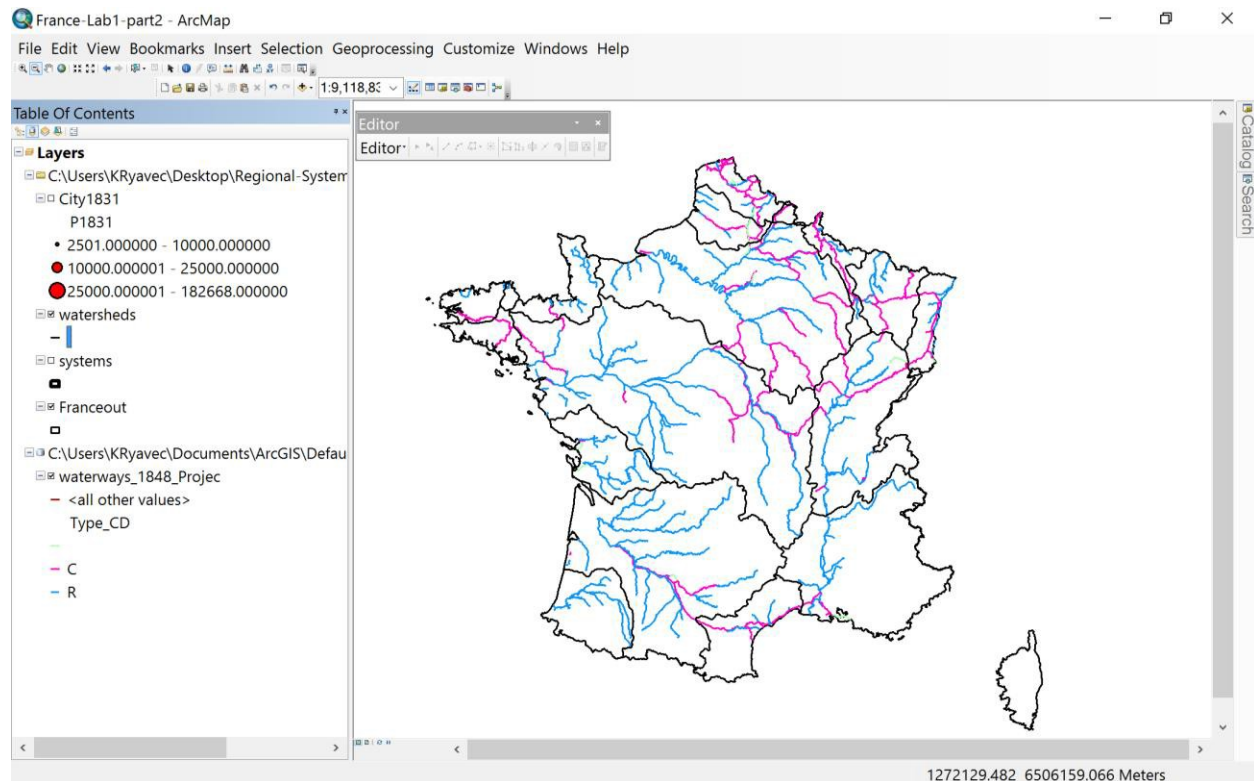


Step 2. Symbolize the Navigable Waterways.

Right-click on Waterways_1848_Projec, and under Layer Properties open the Symbology tab. Choose Categories, Unique Values. Select Type_CD for the Value Field, and then click on Add All Values.

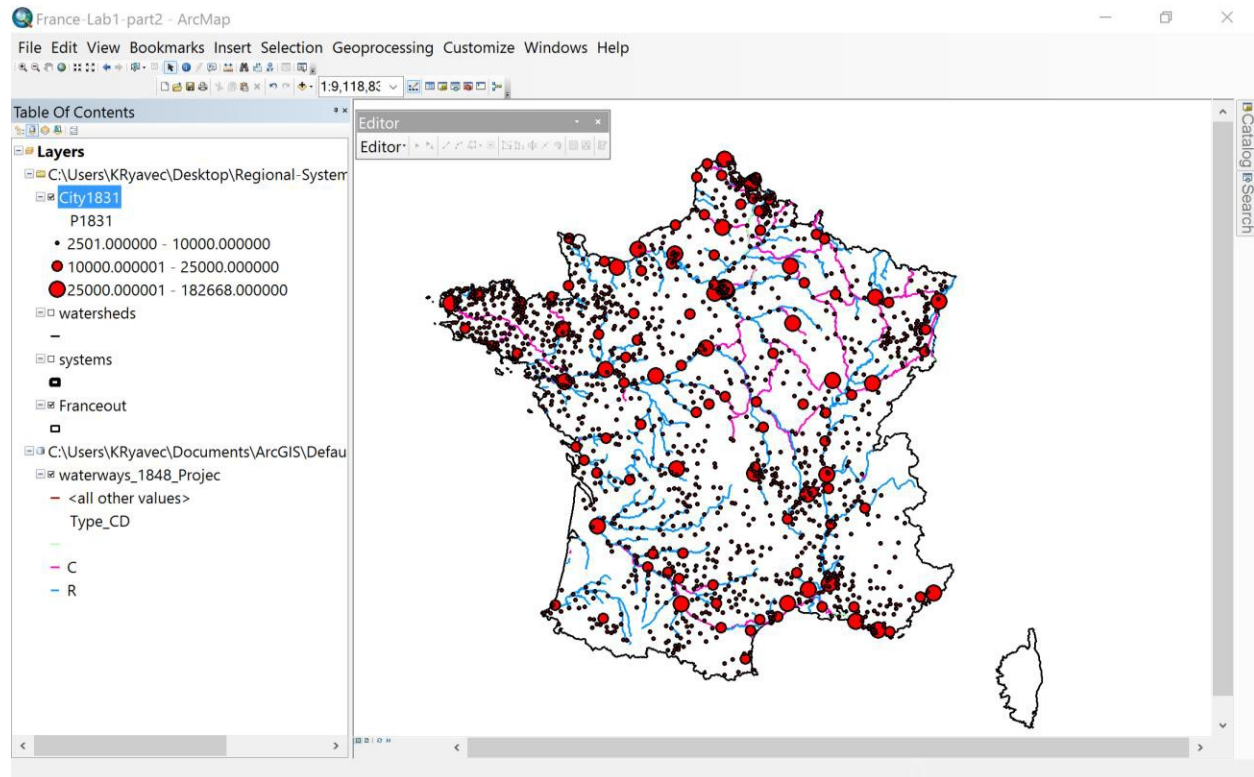
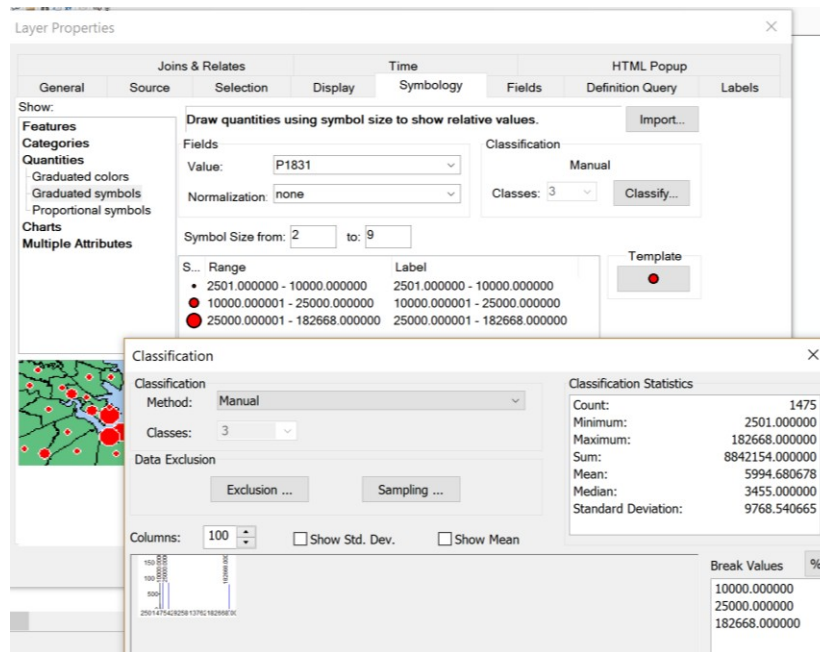


Make the Canals (C) one color to distinguish from the Navigable Rivers (R) such as shown below:



Step 3. Open and Symbolize the 1831 Cities

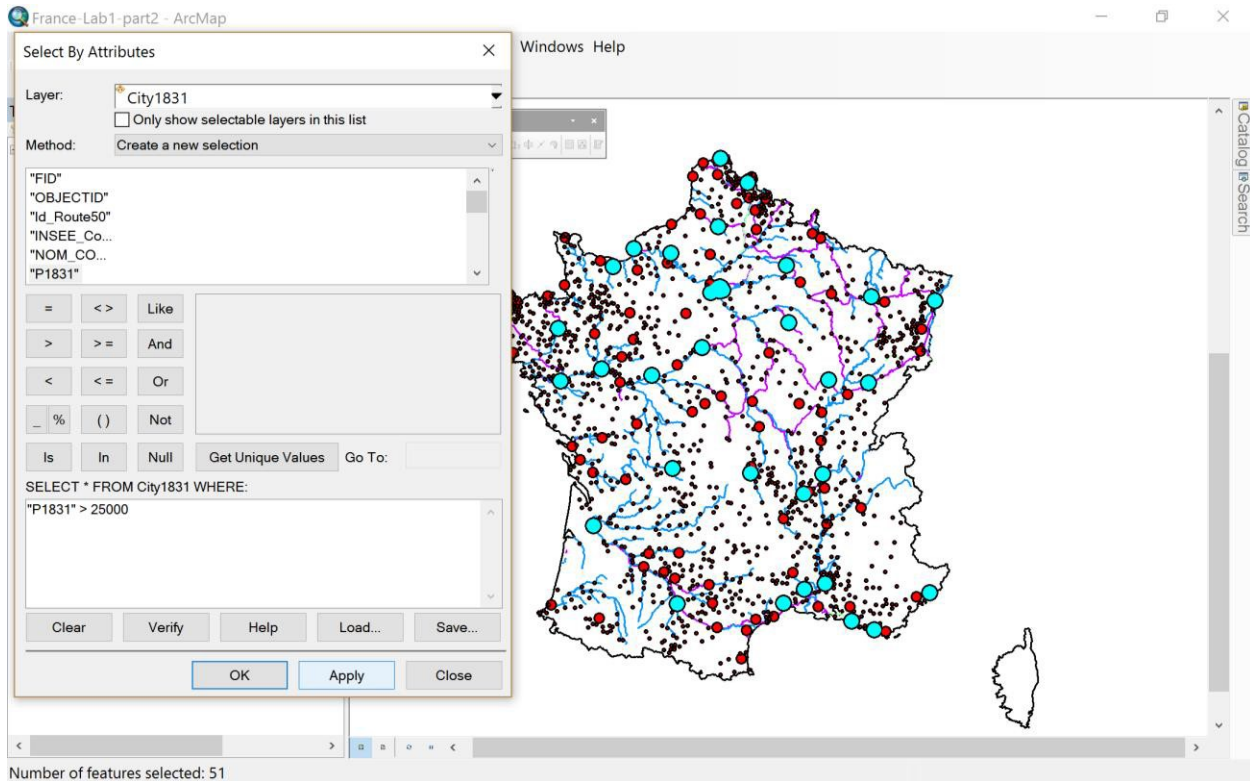
Choose a point symbology for the City1831 layer. Here, we're choosing graduated symbols that increase with population size.



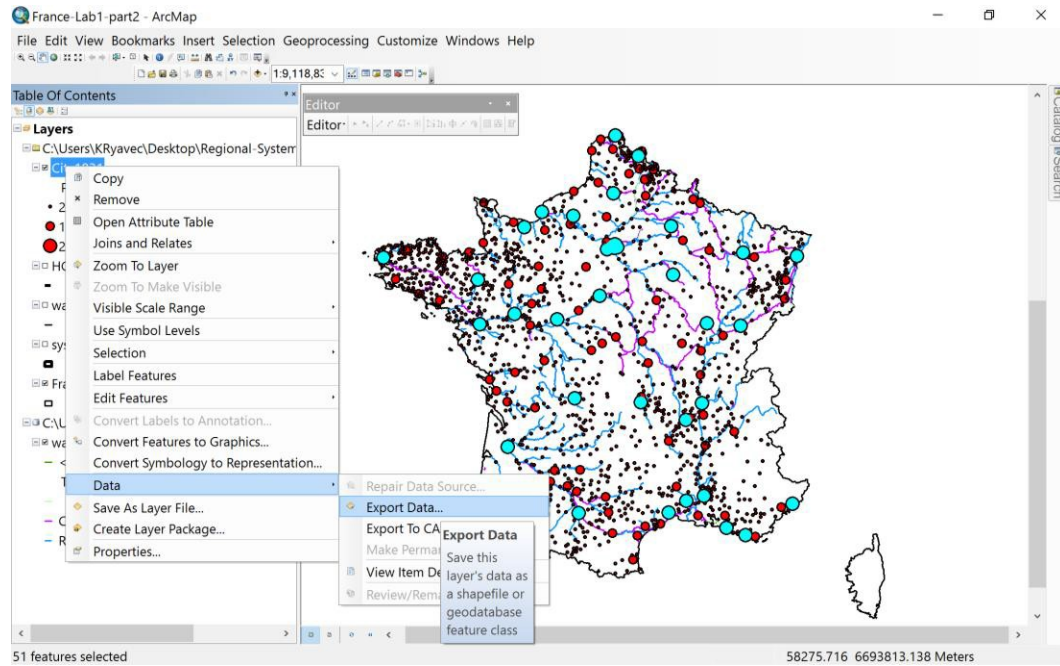
II. Selecting by Attributes

Step 4. Make a New Shapefile of Cities with a Total 1831 Population of Over 25,000

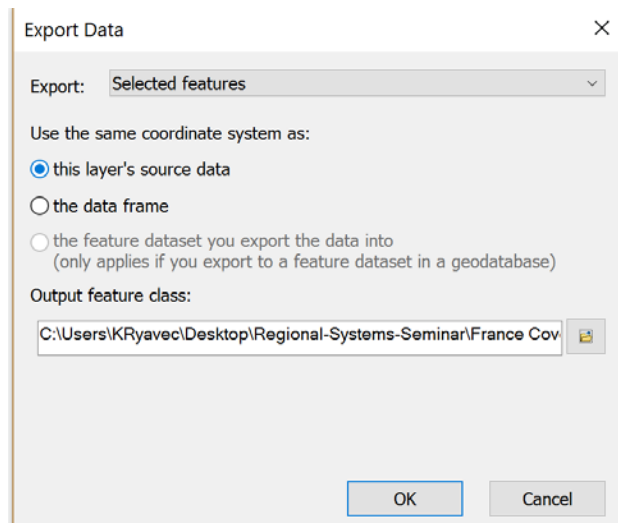
At the Top Menu Bar, go to Selection, and Choose Select By Attributes. Choose City1831 as the Layer, then double-click on the value field "P1831." Choose > and then enter 25000 as shown below. (Note the space after the > sign.) Click Apply and the Cities should be highlighted as below:



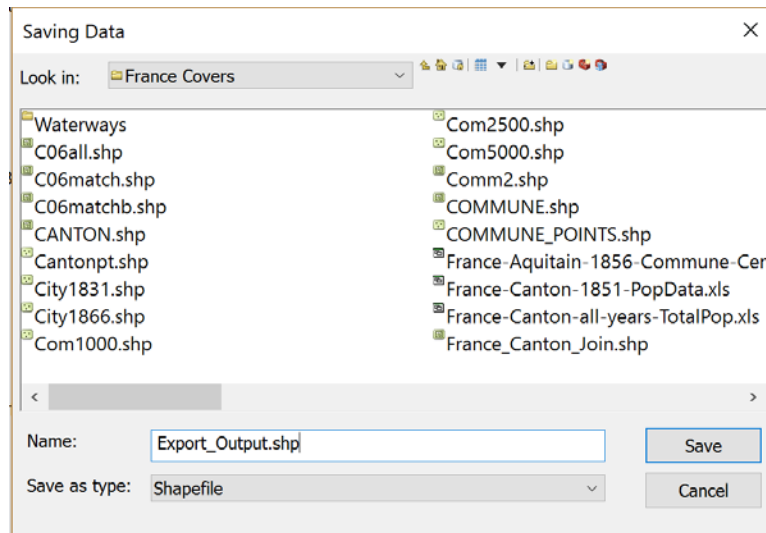
Next, right-click on the City1831 shapefile and choose Data – Export Data



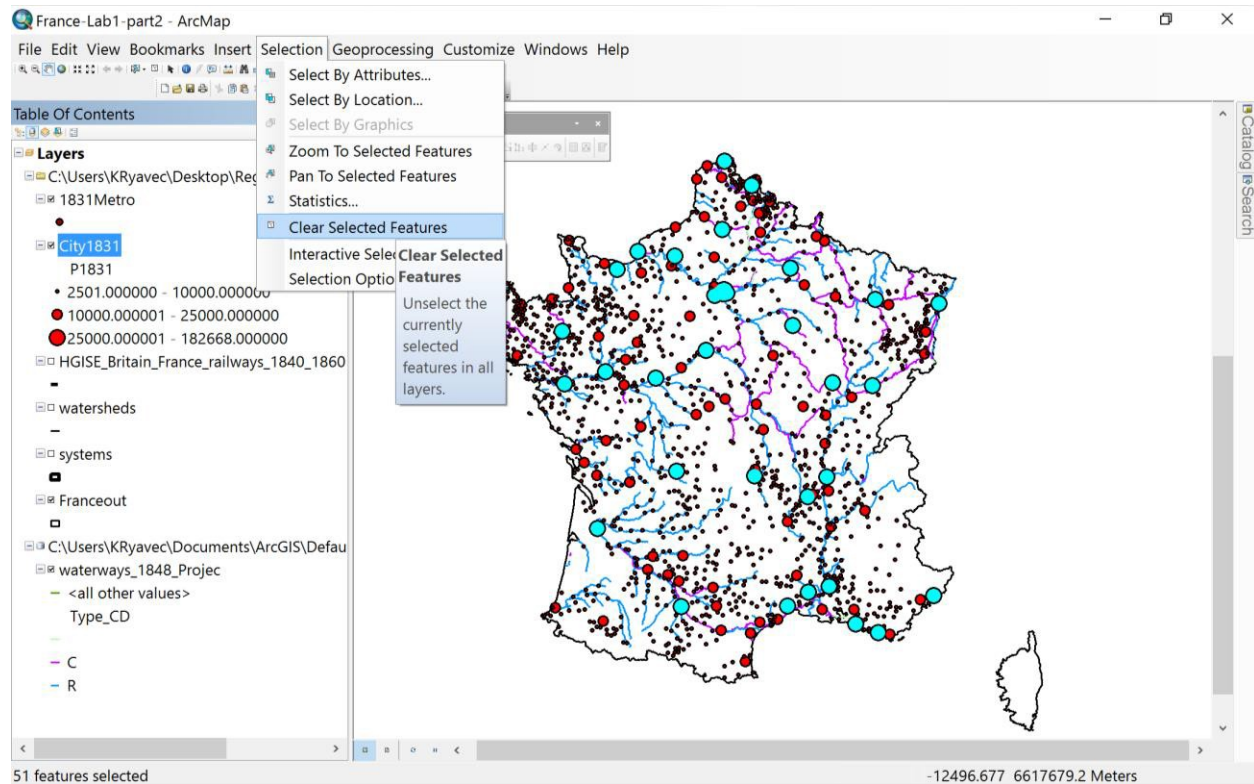
Select 'this layer's source data' and navigate to your France folder to save the new file:



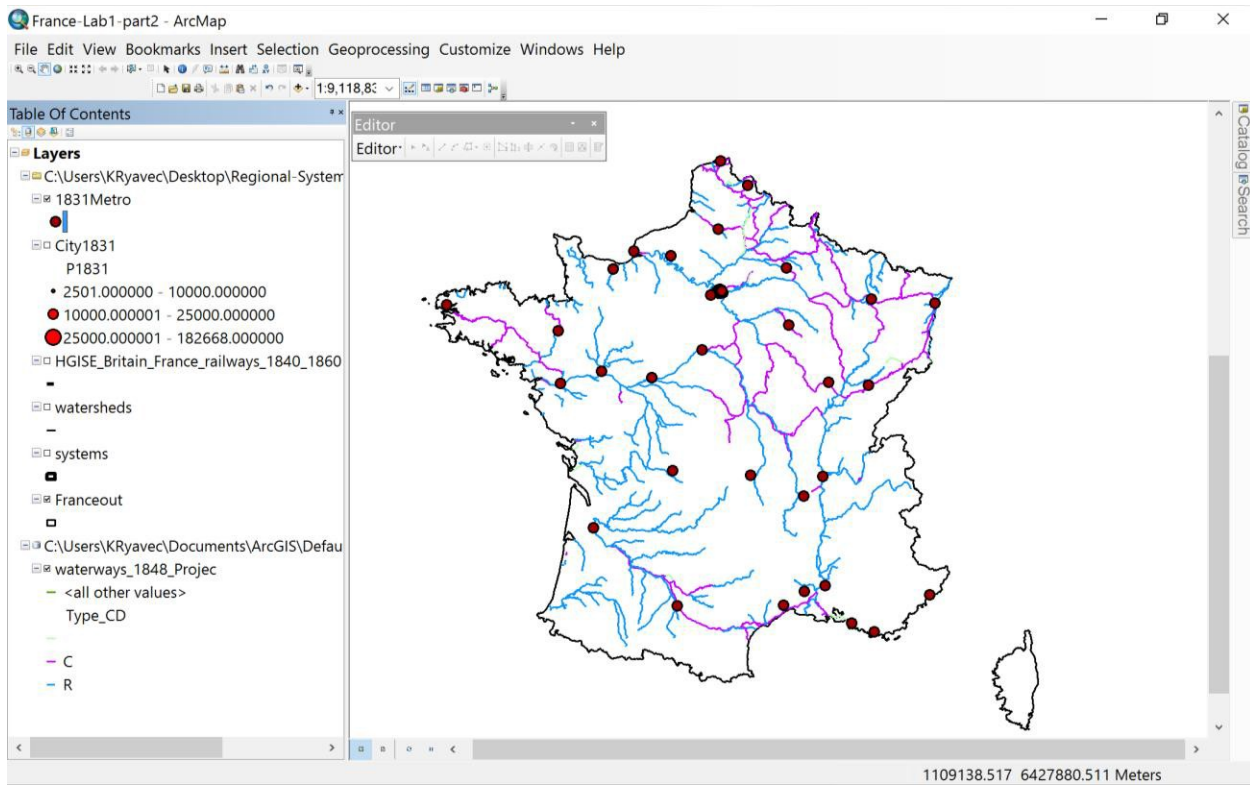
Replace the default name of **Export_Output.shp** with **1831Metro.shp**, and click Save



Tip: If you leave map features highlighted, they may remain selected in the attribute table and cause problems later on. Never leave anything selected or highlighted—it can come back to haunt you! Go to Selection and choose Clear Selected Features.



Your Data View should look like this. Do you find that all cities over 25,000 were near the coast, a navigable river or canal?

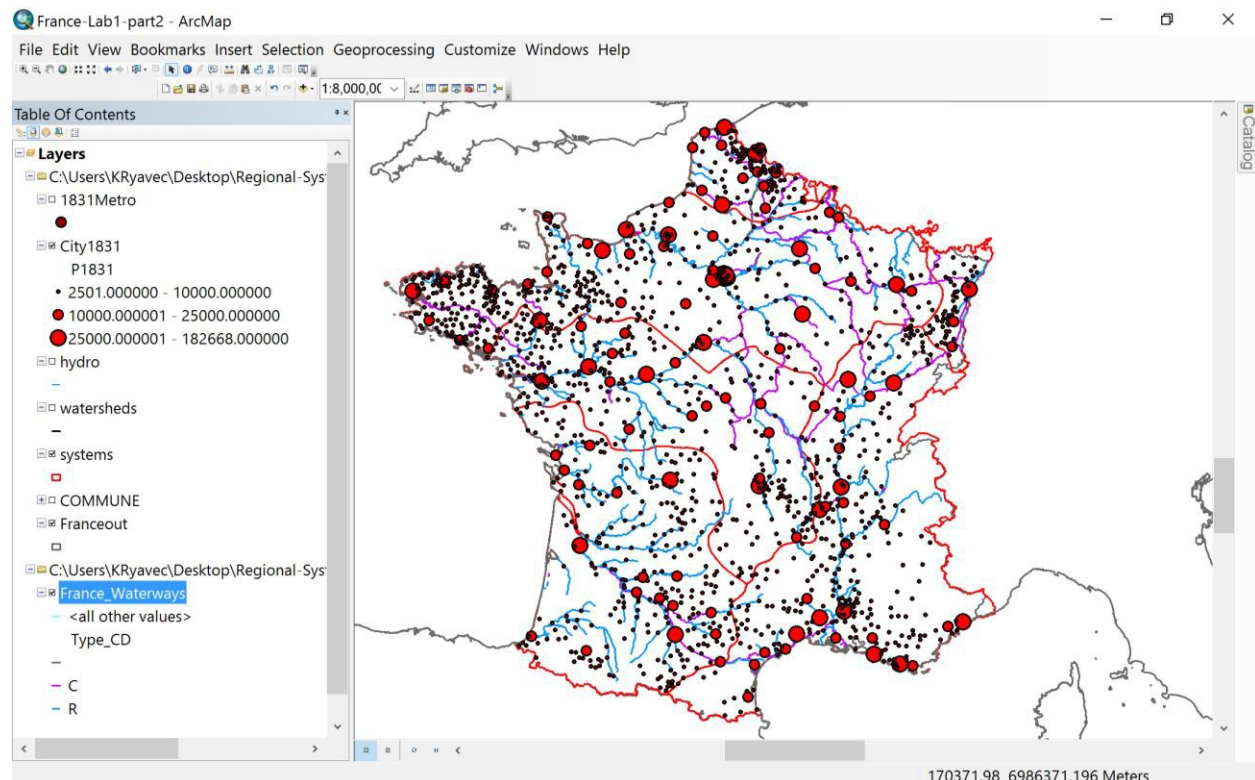


III. Selecting by Location

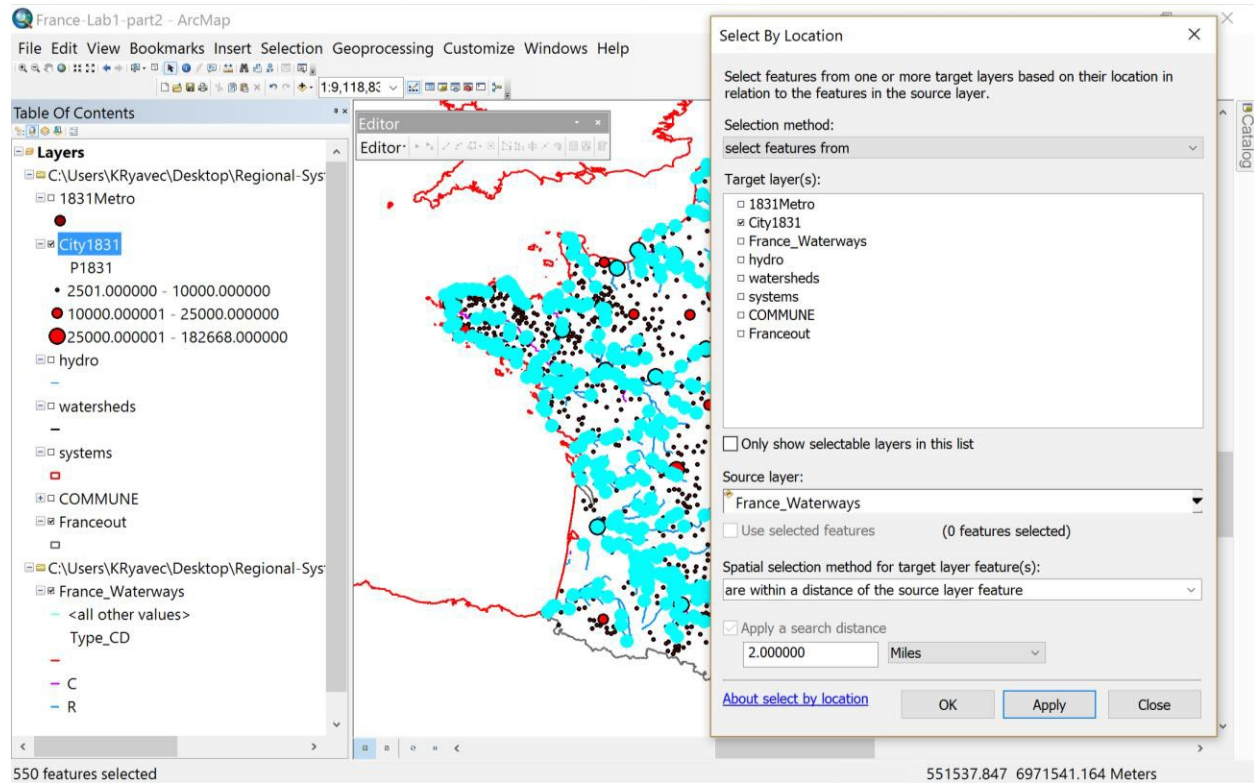
Step 5. Make a New Shapefile of Towns and Cities in 1831 within 2 miles of the Coast, a Navigable River or Canal

Turn off 1831Metro. Turn on City1831, Systems, and France_Waterways.

Notice how some clusters of urban centers were closer to more distant Metropolises based on cheaper water transport costs for moving goods than closer Metropolises located across watershed divides. This economic reasoning is part of the rationale behind Skinner's spatial model of the main Macro-Regional Economies of France in the 19th century we studied in part 1 of this exercise. An unanswered question concerns to what extent did the movement of goods via Canals across the boundaries (largely based on watersheds) of these Macro-Regional Economies alter or negate their relevance as areas defined by the bulk of most trade and marketing transactions? We simply don't have enough data to prove or disprove this question now, but we can isolate only those urban centers along the navigable waterways to study how they were similar or different to urban centers lacking water transport at the time.

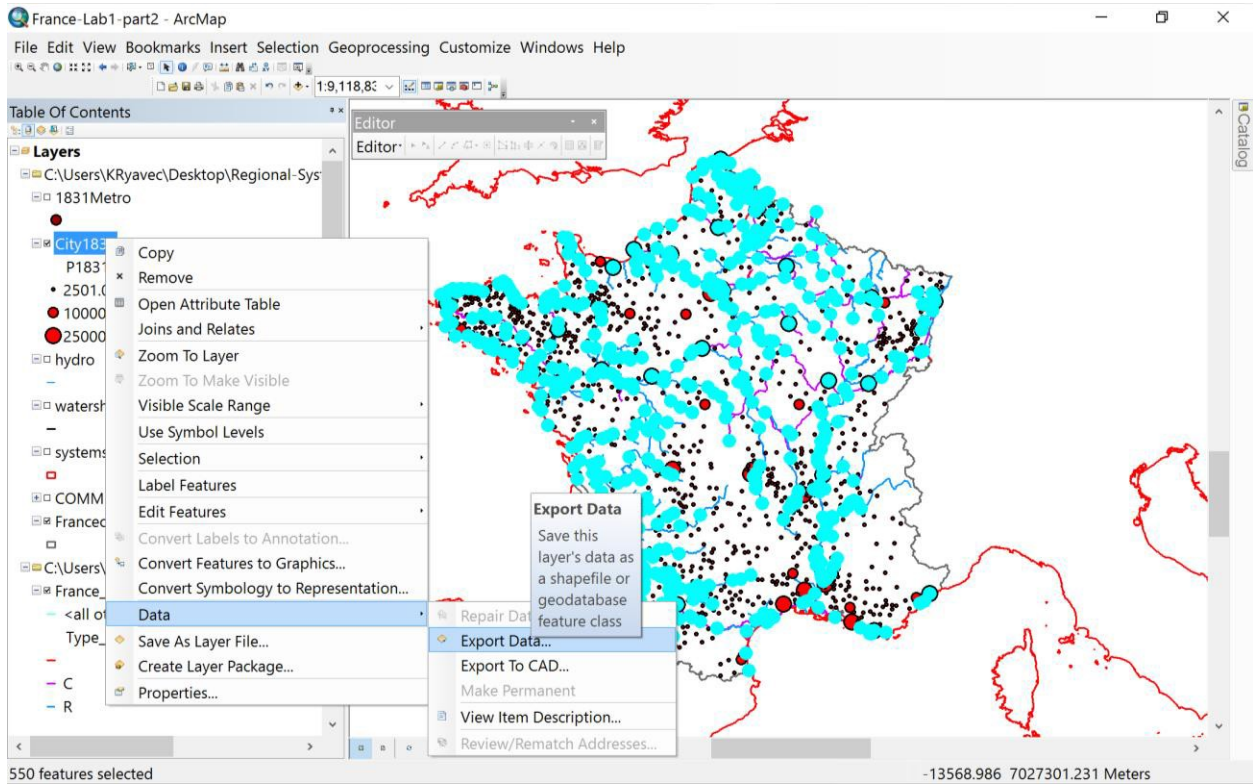


Under Selection, choose Select By Location. For the Selection Method, choose 'select features from.' For the Target layer check City1831. Choose France_Waterways for the Source layer. For the Spatial Selection method choose 'are within a distance of the source layer feature.' Apply a search distance of 2.0 Miles, then click Apply. The relevant towns should become highlighted as shown:

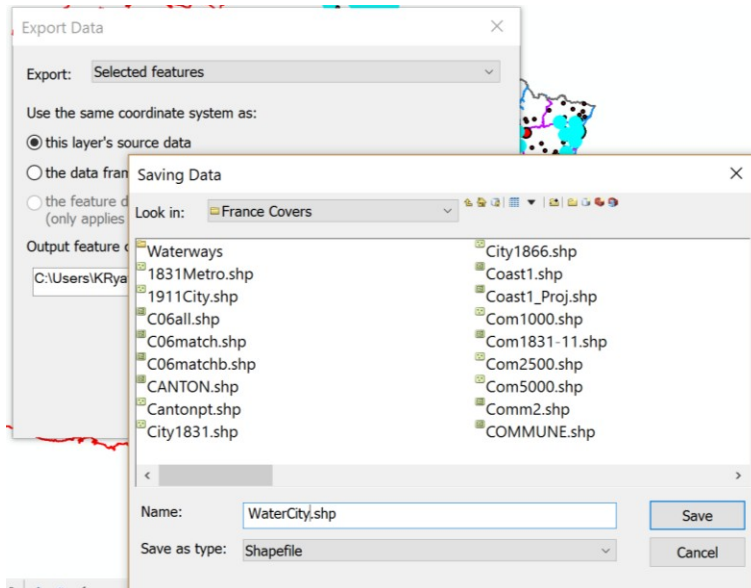


Note how several large cities on the Mediterranean Coast, such as Marseille, turn out to be more than 2 miles from the coastline.

Next, export your selected city points:

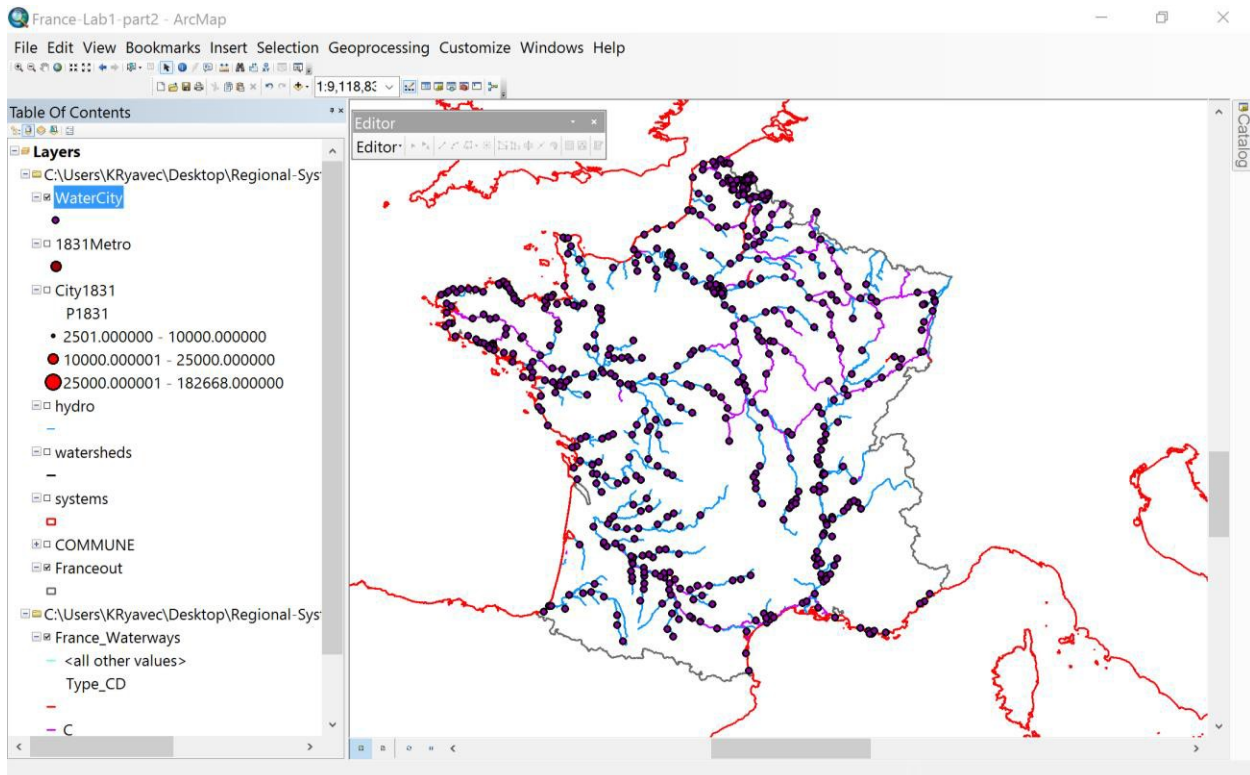


Name your new point shapefile **WaterCity.shp**.



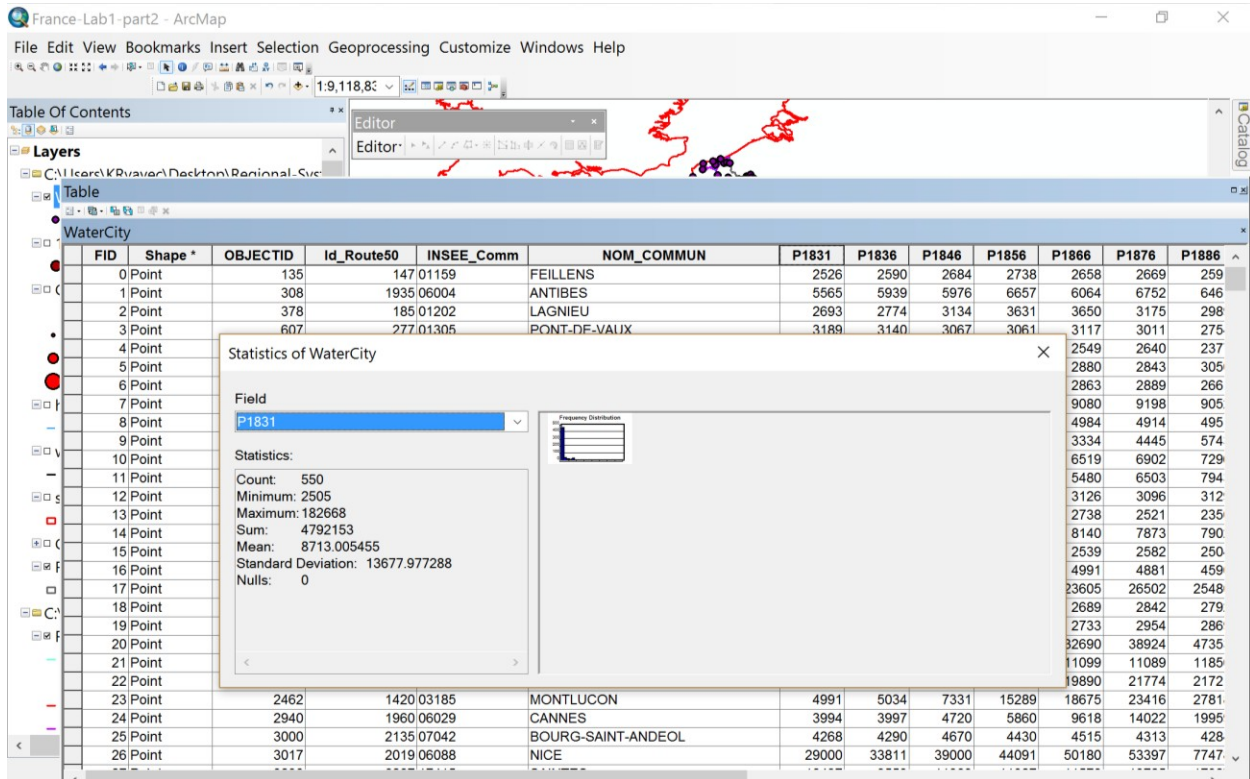
Remember to Clear Selected Features after saving your new shapefile.

Your new shapefile WaterCity should look like this:

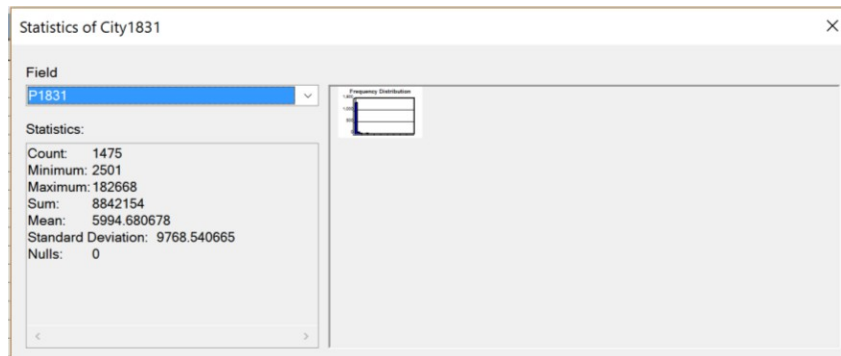


Step 6. Compare Statistics

One easy way to quickly learn some basic statistics about these places is to right-click and open the attribute table of WaterCity, then click on the top of the Field (Column) P1831 and choose Statistics:



Note how, compared to the total number of 1,475 urban centers in France during the year 1831, these 550 'Water Cities' had a larger mean population: 8,713 compared with 5,994.



Try it on your own: Another useful analysis would be to isolate the urban centers distant from Navigable Waterways, such as those located more than 15 miles away. How does their average population compare with the countrywide average, or the coastal cities? Are any large or historically important towns or cities included?