

## Carto, Surveillance, & Crime Mapping

Description: This week, you will explore the online mapping platform Carto using Crime Statistics, census boundary layers, as well as hosted raster images of Chicago during the era of red lining. This will be a short exercise intended to introduce you to Carto that can help you begin thinking about map styling in preparation for your final project.

Instructions:

1. Go to Carto's website. <https://carto.com>
  2. Make a free account.
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3. Take a moment to explore Carto. Carto is an interactive database and mapping tool (in other words, a GIS). Its offers an intuitive platform to easily move between your database (your attribute table) and the visualization of that data (shapefiles). At the top, you'll see two important options, "Maps" and "Datasets." Click on Maps. A click "New Map" and "Create Empty Map."



4. The global projection is nice, but there are a number of different options you can choose from. The default is voyager positron (on the left side of the screen). Take a look through your other options.



5. You can also import your own basemap. Carto doesn't allow you to simply input raster data (like a georeferenced image). That would require more hosting space than you have available. There are workarounds, however. You can use Mapbox <https://www.mapbox.com/> to create what's called a "Tileset" so that you can zoom in and out of a hosted image. In order to do this, you need to create a raster file that has embedded georeferenced data (called a GeoTIFF). You can do this in QGIS or you can do this using the free web app <http://mapwarper.net/>

**KEEP THIS IN MIND IF YOU WANT TO USE A GEOREFERENCED HISTORICAL MAP IN YOUR FINAL PROJECT**

6. I've already done this step for you. Let's add the hosted tileset now.



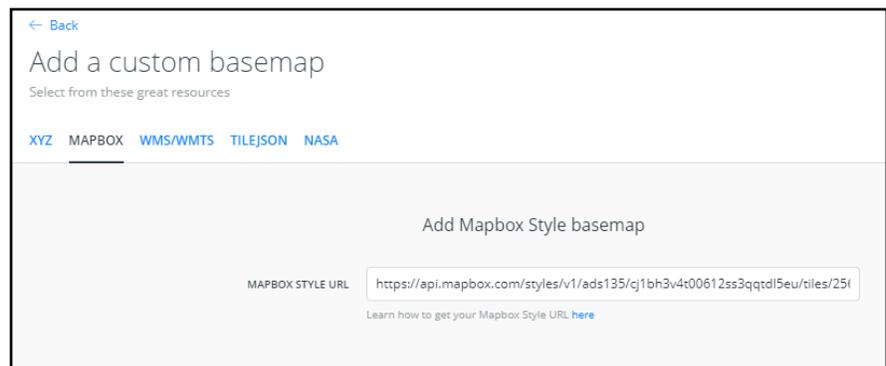
7. Click "basemap" and below the "1. Source" option, scroll to the "mapbox" option. Click it to select it, then click the "+" sign under "style". In the next dialogue, copy and paste the following code:

[https://api.mapbox.com/styles/v1/ads135/cj1bh3v4t00612ss3qqtdl5eu/tiles/256/{z}/{x}/{y}@2x?access\\_token=pk.eyJ1IjoieWRzMTM1IiwiaSI6ImNpaGpxZ2lkMTBuZTV0dGx6emxnN3N5MGciQ.FU\\_cuKT6zlcMdlLqPRahqQ](https://api.mapbox.com/styles/v1/ads135/cj1bh3v4t00612ss3qqtdl5eu/tiles/256/{z}/{x}/{y}@2x?access_token=pk.eyJ1IjoieWRzMTM1IiwiaSI6ImNpaGpxZ2lkMTBuZTV0dGx6emxnN3N5MGciQ.FU_cuKT6zlcMdlLqPRahqQ)

8. Click "add basemap" It looks like there's nothing, but zoom into Chicago.

9. This is a redlining map of Chicago produced by the Homeowner's Loan Corporation (HOLC) at the behest of the federal government in 1940. Part of the legacy of redlining has been entrenched segregation, particularly in large urban areas like Chicago (also OMAHA!)

10. Let's see how we can combine this map with modern census data.



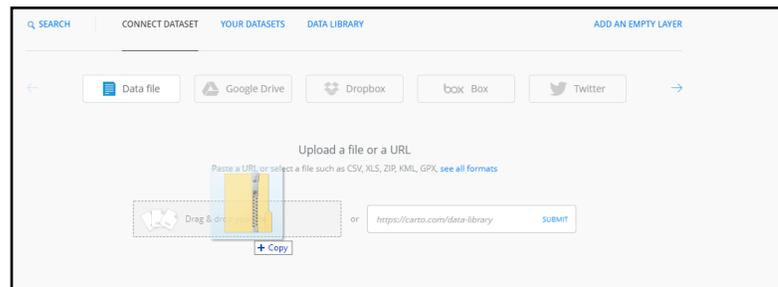
11. Unless you've used Carto before, you likely don't have any datasets, so let's go ahead and add one. Many of you are likely using census data for your final projects. Censuses were some of the first systematic attempts by governments to surveil their citizens. You probably downloaded them from the national historical geographic information system (or NHGIS). You can also easily obtain modern census data from the US Census Bureau using two tools: the Tiger/Line Shapefiles tool (to download your boundary layer shapefiles, i.e. counties, states, census blocks...) [<https://www.census.gov/geo/maps-data/data/tiger-line.html>] and the American FactFinder, where you can download the census tables based on what you're interested in [<https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>]

12. I've already downloaded both and "joined" them together. You don't have a complete census (it's massive), I've only included data by census tract of race and population.



Let's add that to the map.

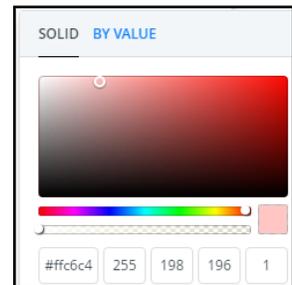
13. Click the "add new layer" button on the left menu. Then click "connect dataset".



14. You have a number of options now. Go to the shared google drive, "week 11 Surveillance," and download the

"Racecook\_1.zip" This is a shapefile of census tracts with attached demographic data. Do NOT cut and paste this copy. Once you have saved it to your computer, click and drag the *zipped file* to the Carto window to upload it. Click "add layer."

15. This map shows the entirety of cook county (more than the redlining map, but it's all the same color. Click on racecook\_1. Click "style." and click on the "color" bar. If you click "by value" on the subsequent screen, you'll be able to classify data. select a category to classify? You can choose other classification schemes here (quantiles, natural breaks "jenks," equal interval, etc.), also color schemes.



18. One of the nice things about carto is that its very interactive. You can add "widgets" to change your visualizations on the fly. If we want to visualize only those areas with a high percentage of African American inhabitants we can create a widget for that.

On your main left toolbar, click "data", go down to the census category/column "black\_alon" and "add as a widget" You can use widgets to perform any number of analyses in real time. On the right, you'll see a histogram that has all of the values between 0 and 6.9k. Click the histogram and drag the bars to exclude all but the lowest values. We are simply going to use it to clean up our map



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so we can more easily see the legacy of redlining.

19. Go back to the main map page by clicking "back" at the top left. Under your map title, you should see two options: 1. layers and 2. widgets. You have one already, but let's add another. Under "add new widgets," select "histogram" and click the box beside "black\_alon," "continue."

20. Carto also allows you to visualize point data. We will be adding one more dataset to our Chicago map to visualize this.

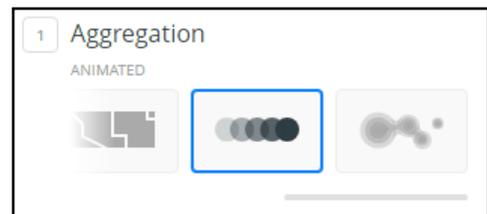
22. Go back to "add new layer" and this time connect our other dataset, a zipped file of crime data in Chicago in 2015 called "crimeschi.zip" It is also available in the google drive. Add the data to your map.

23. Now we need to style this. What styling makes the most sense to you? Experiment with some of the options. Can you add a widget to get a sense of the "primary types" of crimes?

24. What if all we're interested in are arson offenses? On your main layer pane, click your "crimeschi" layer. Click "data" and "add primary\_ty" as a widget. Search for arson and it will select them for you. You can perform the same analysis by click "analysis" in the main bar, "add new analysis" and filter by crime type (or column value). Under column, select "primary\_ty" and Parameters, select "arson". Click Apply. Now we have just the points associated with arson in 2015.

25. One of the most interesting parts of Carto is its ability to use the date column to show where and WHEN features occur along a timeline, creating an animated map.

26. Under "style", select aggregation and animated. Under column, select date.



When you're done, title it, click "Publish," then embed the map in the blog with a legend and appropriate title. This is both a practicum AND your weekly blog post, so categorize it accordingly. Because it is a weekly blog post, you should use images from the map YOU created to answer the following questions. The best responses will draw on Dr. McHendry's lecture and your own work on redlining in Omaha.

Questions:

1. Redlining highly influenced segregation in Chicago. What other features may have historically influenced this demographic distribution?

2. Are these specific to Chicago? Would similar patterns exist in Omaha? What data would we need to make this connection?

3. How might we use crime statistics in conjunction with demographic data to evaluate the cause and consequences of segregation? What additional data would you like to have to make a richer cartographic connection?

4. Would the data you have available reveal whether minorities are likely to experience disproportionate surveillance? If not, what additional data would you like to obtain?

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