CSCI E-79: The Art and Design of Information
Spring 2019

LAB 6

Maps

Carto + Illustrator

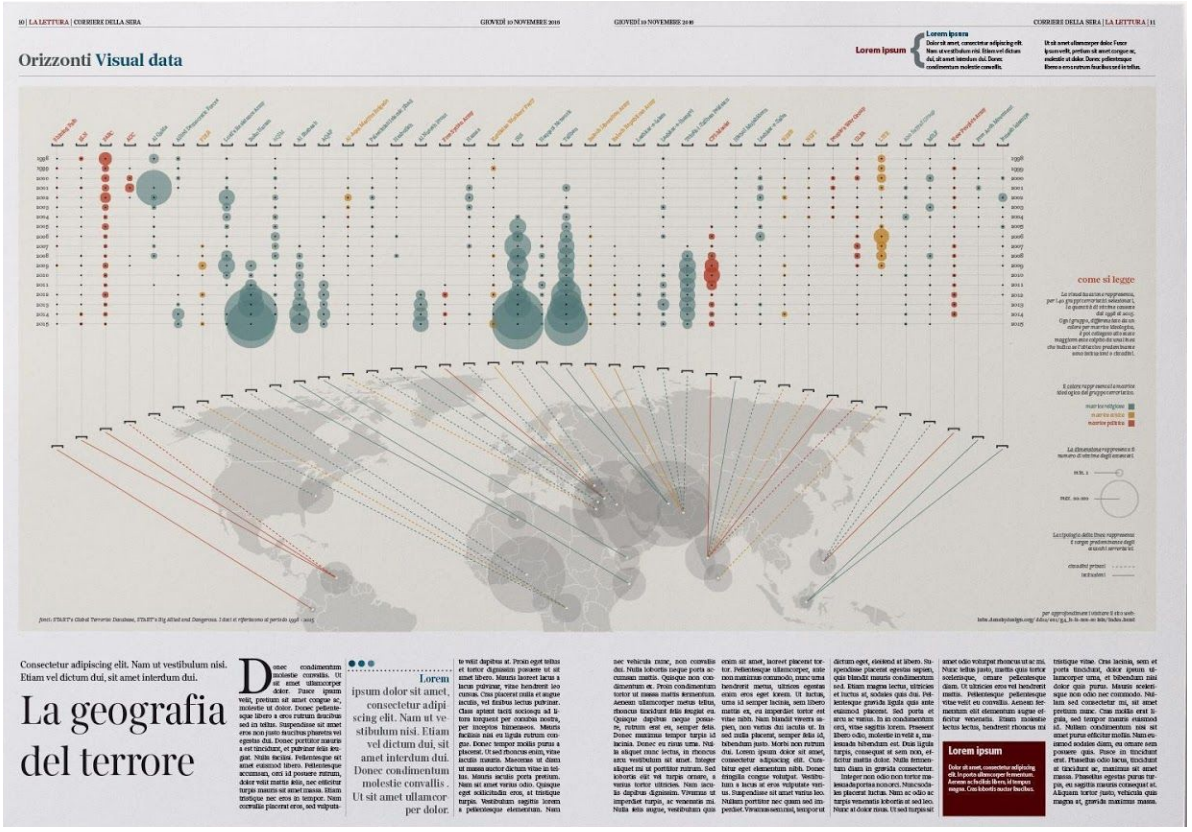

***Figure 1**: Geography of terror — F. Cosmai, G. Flaim, F. Giudice, B. Nardella, G. Zerbini*
See the full project [here]

The picture above ***(figure 1)*** is an example of a visualization created using Carto. It also includes a scatterplot created with RawGraphs. Everything has been redesigned using Illustrator.

Introduction

Welcome to E-79 Lab 6!

This lab is entirely focused on Maps. During this tutorial we will learn how to plot geographical data on a map using Carto. Later, we will refine and redesign visualization in the Illustrator.

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1. Getting started with Carto
2. Refine designs using Illustrator
3. Export a single artboard as a jpg file

Learning Objectives

The expected learning objectives are:

- Creating a map with Carto
- Editing and redesigning a map with Illustrator
- Layout the visualization in Illustrator
- Enriching and customizing the information with Illustrator
- Exporting a single artboard as a jpg file in Illustrator

Expected Outcome

The expected outcome of the Lab 5 is:

A single visualization that contains a map created with Carto, customized or redesigned in Illustrator.

Dataset

Terrorism Victims 1998-2000
Download CSV HERE

For this Lab we are going to use a simple dataset composed of 25 rows, since you might have a monthly limit of data points that can be plotted with Carto. Each row contains data about the victims caused by terrorist attacks in a specific country from 1998 to 2000. The dataset is an excerpt of the GTD (Global Terrorism Database). In the dataset, you can find a geographical data (latitude and longitude) and additional column called “the_geom” calculated by Carto using latitude and longitude. That features will be used to plot the data points on the map.

For this lab we decided to use a small dataset to avoid the data limit problem and to allow you experimenting with different maps or import your data multiple times.

Dataset: 25 Rows
Columns:

- Id
- Latitude
- Longitude
- Number of Victims
- Country

Getting started with Carto

Carto is a web-based application for generating maps. It is a very intuitive and simple to use tool, that helps creating nice custom designs. You can choose the style and easily explore the best option to visualize your data. Carto is a powerful tool to build interactive visualizations and to analyze continuous flows. In order to use Carto's advanced options, you will need a premium account as well as a specific set of skills that are outside of the focus of this course.

In this tutorial we are going to focus on static visualization you can easily create with a free account and without any additional analytical skills. In the next step, we will briefly analyze Carto's interface and then explore the process of importing datasets and creating visualizations.

Note!

The free Carto version doesn't allow you to export an editable map, but allows you to create nice and polished maps by customizing the style inside the tool. Carto also helps with an easy and fast way to correctly plot a data on a map, that can be easily imported in an illustrator artboard for a further redesigning.

Dashboard

When you log into the Carto's platform you will access the main dashboard. The dashboard contains all of your previously created projects: maps and datasets.

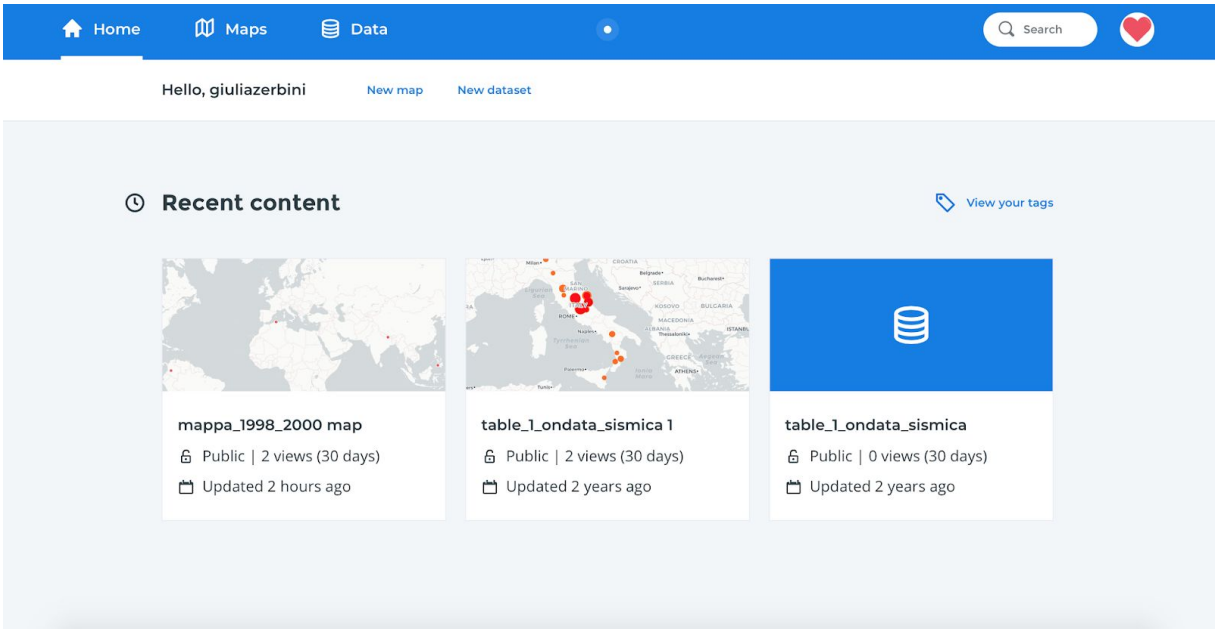

***Figure 2**: Carto Dashboard*

Create a new dataset

By clicking on the *new dataset* button you will be redirected to a new interface where you can import the dataset from your computer or other sources on the Web.

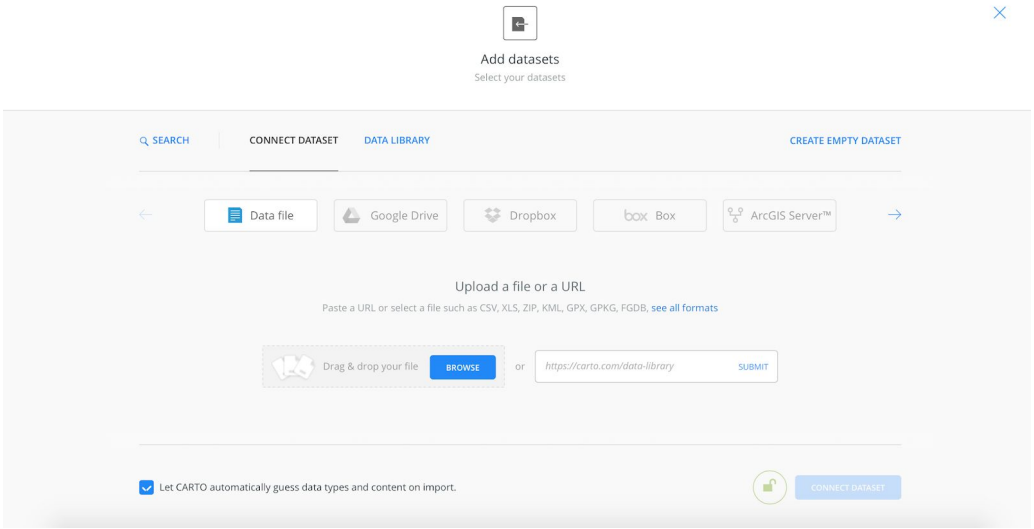

***Figure 3**: Adding a new dataset*

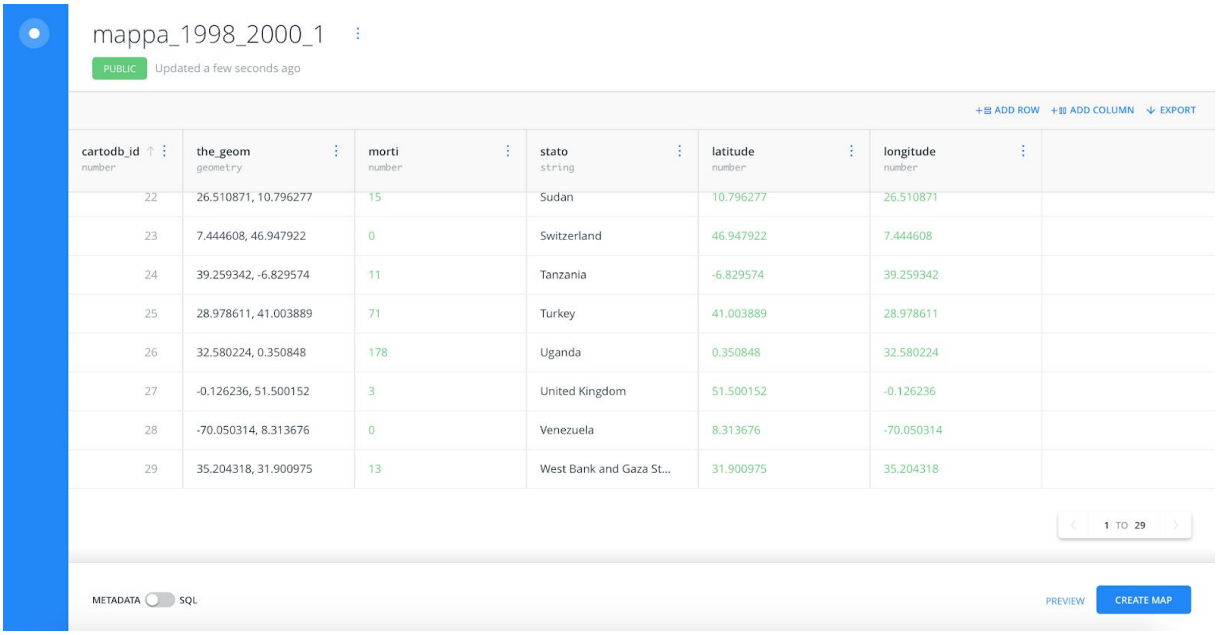

***Figure 4**: Creation of the dataset*

Once the dataset is imported you will see a preview of the data. At this point you can click on the *create map* button to start crafting your map.

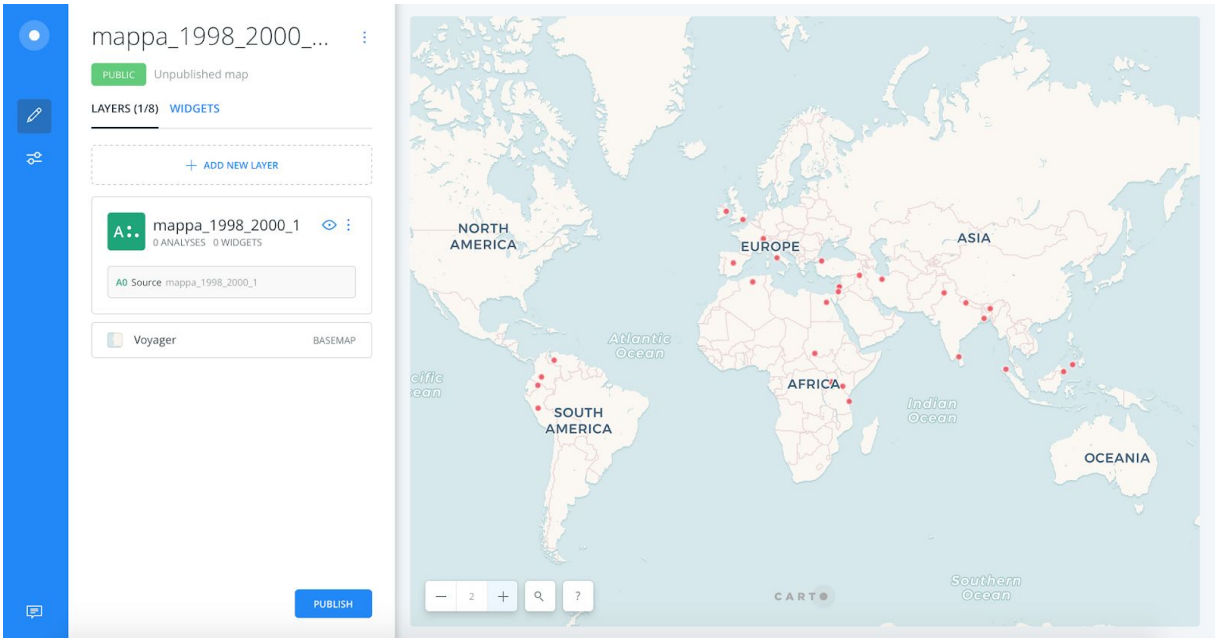

***Figure 5**: Map overview*

Carto will automatically redirect you to the map-interface and will display your data using predefined options.

Map-Interface Overview

Carto map-interface is quite simple and intuitive. It is composed of the three main elements:

- a fixed toolbar, where you can navigate between dashboard, map and settings
- an editor-toolbar
- the map area

The toolbar provides options to access your dashboard (A), edit your map (B), and configure your settings (C).

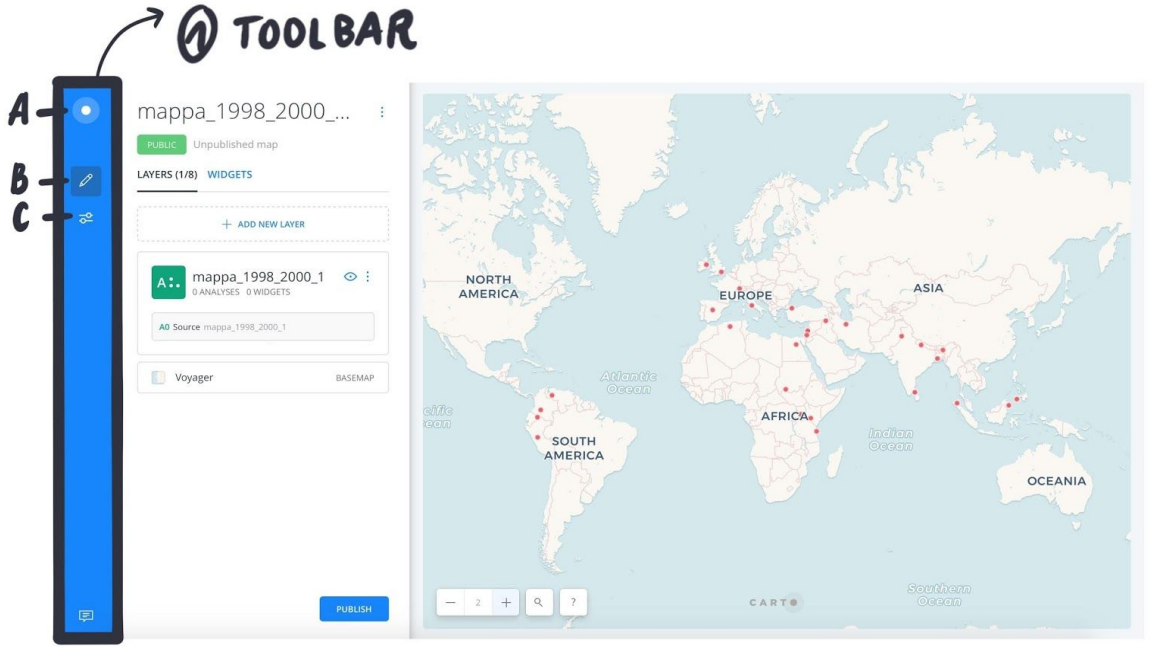

***Figure 6**: Toolbar*

From the edit-toolbar you can manage all the components of your map. Add layers and widgets, import datasets, change styles.

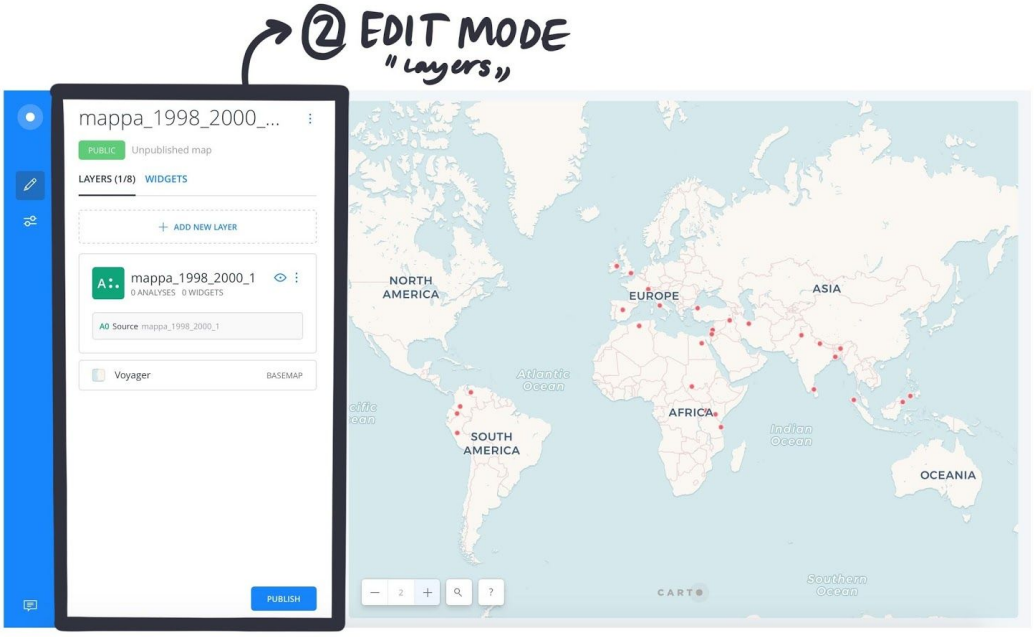

***Figure 7**: Edit Mode*

In the map area, you will see in real time the result of your editing.

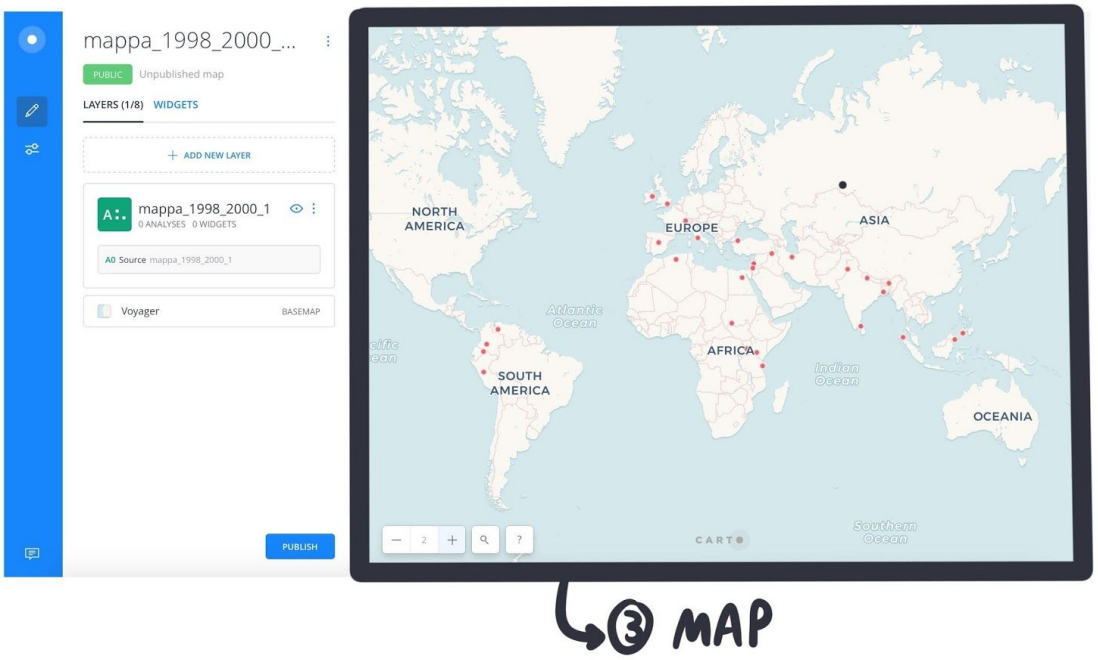

***Figure 8**: Map*

Edit mode

In the “edit mode” you will be able to:

- add new layers to the map
- edit the layers options
- edit the style of the map

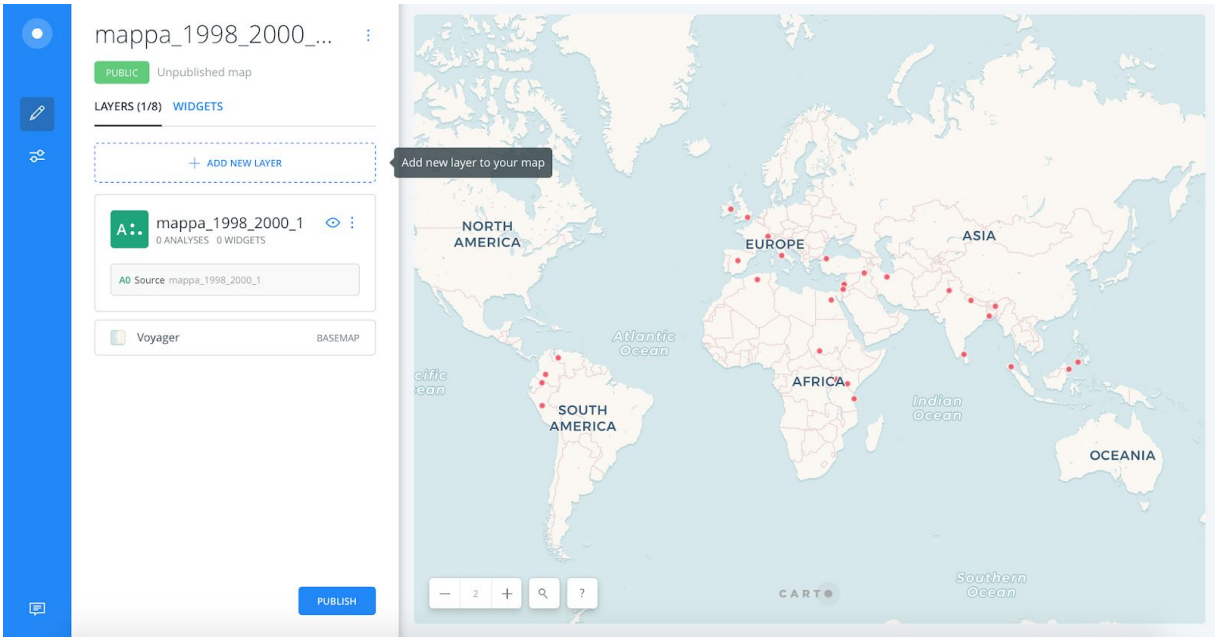

***Figure 9**: Add new layer button*

You can easily add another layer of data (similar to layers in the Illustrator). For example, you can add an extra layer with different years range. This is particularly useful if you want to create dynamic interactive visualizations.

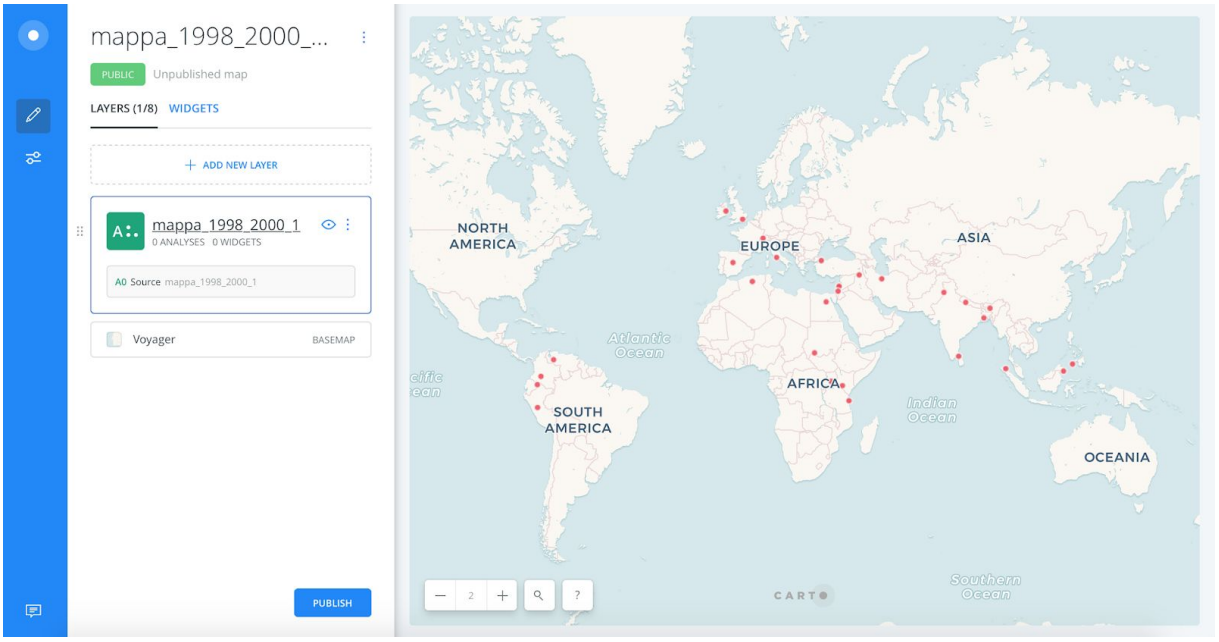

***Figure 10**: Edit data points*

The following figure shows probably the most important functionality in Carto. You can choose the way you want your data to be visualized on the map.

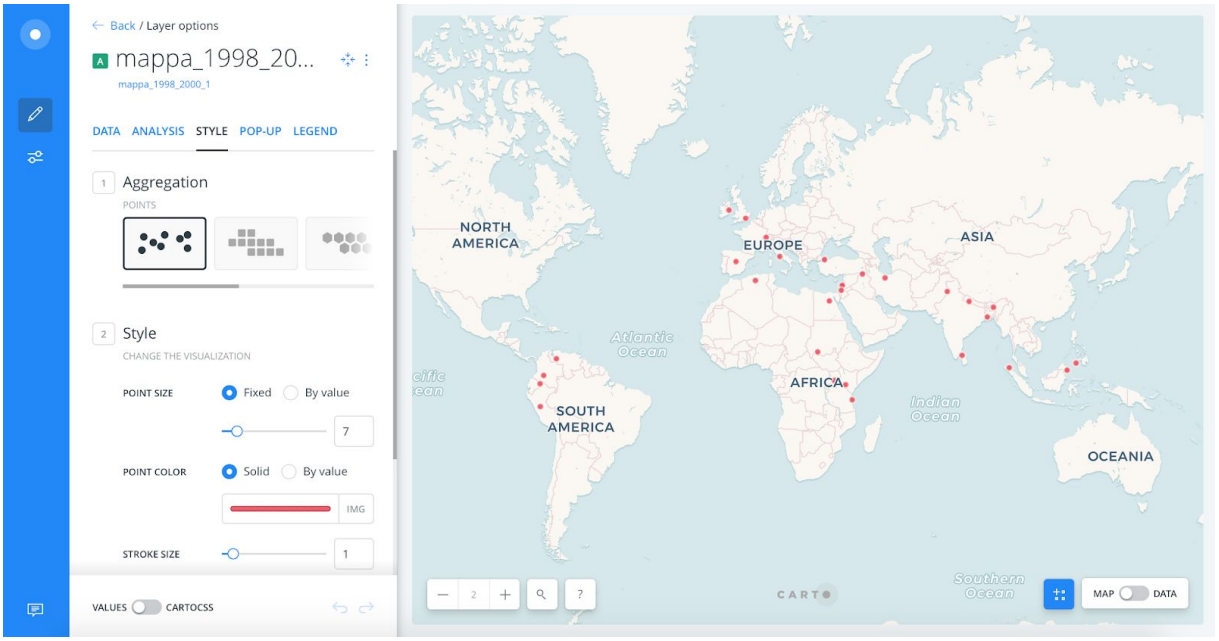

***Figure 11**: Layer Options*

From the palette on the left you can choose how to visualize your data from different types of visualization. In this case the data on the map is shown as points. We want to maintain this type of visualization, but change the size of the bubbles according to the amount of victims.

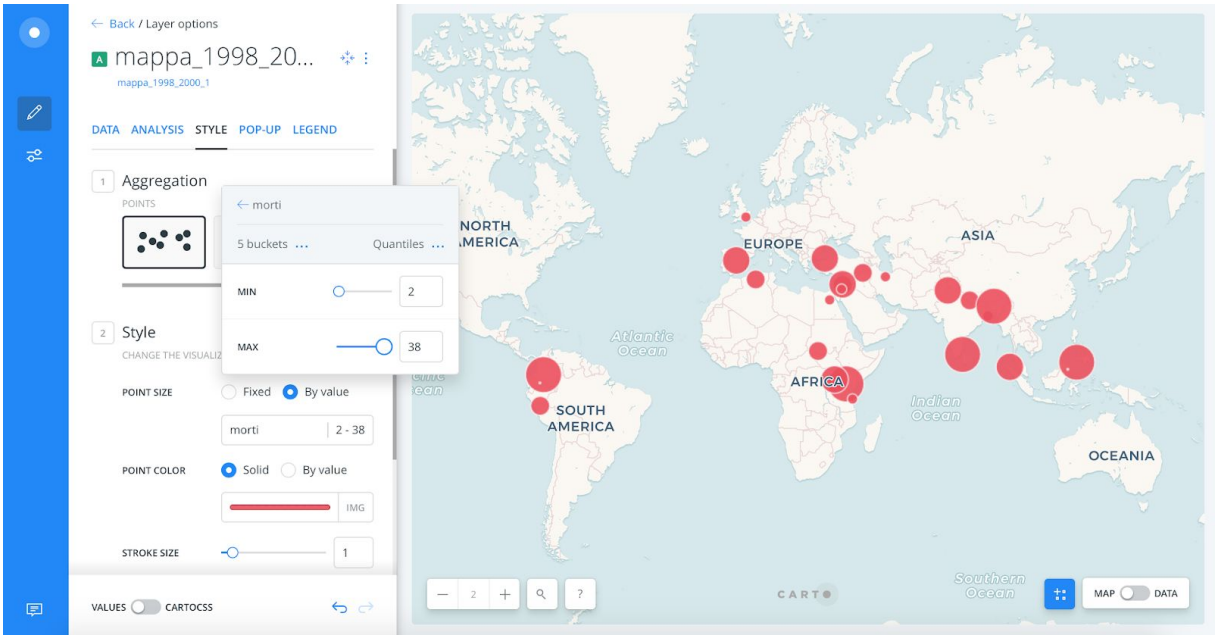

***Figure 12**: Point Size: Fixed / By Value*

If you set ***point size*** to ***By Value,*** the dimension of points will change according to a specific value. We are going to set this value equal to *number of victims* and change the *min* and *max* values to emphasise the difference between the bubbles.

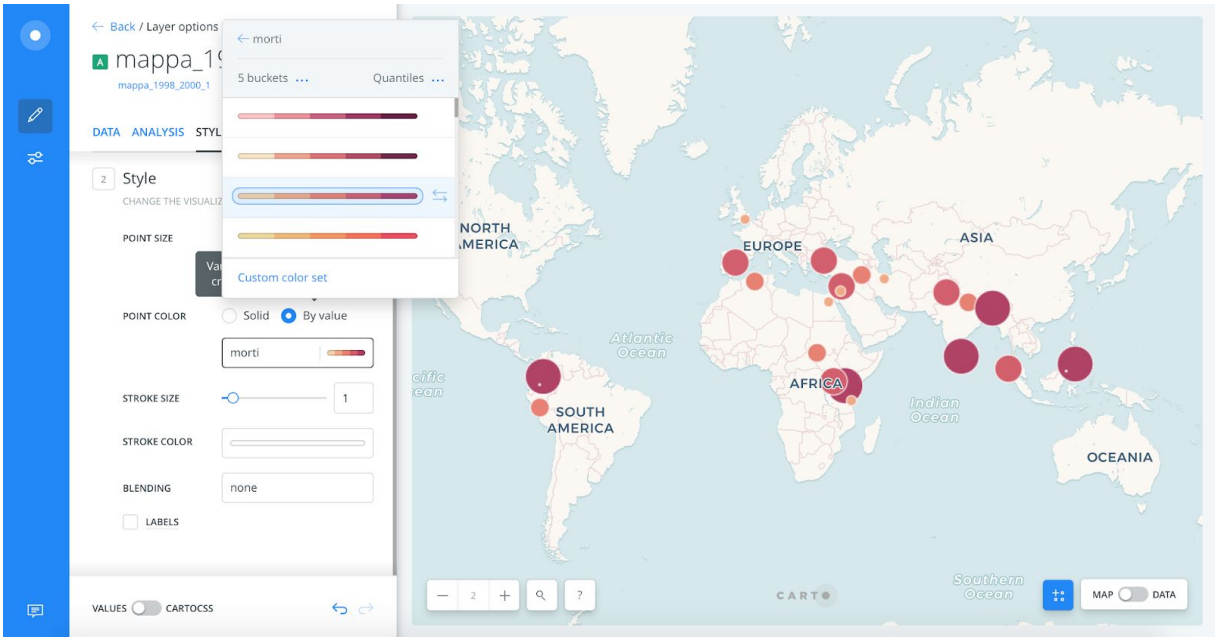

***Figure 13**: Point Color*

Also, we want to change the colors of the bubbles to reflect the same variable (number of victims). In order to do this, you have to set the variable and then choose the color scale you want to use.

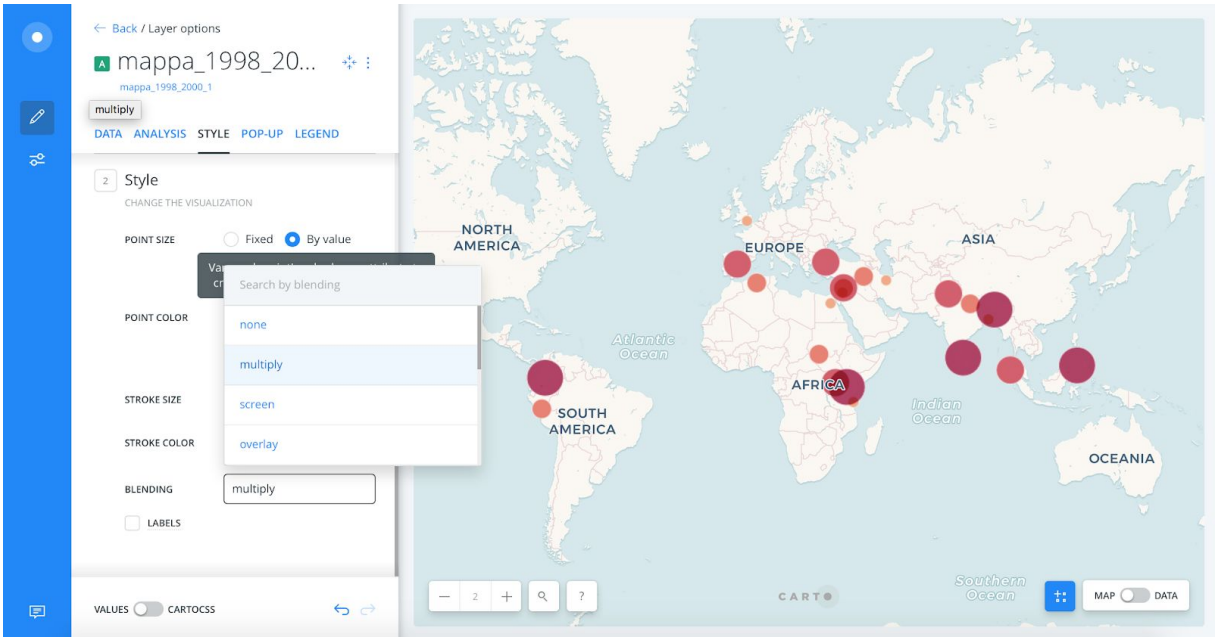

***Figure 14**: Blending*

Another important option to set, especially if you have overlapping points, is the *blending* mode. Let us set the blending mode to *multiply* in order to see the overlapping bubbles.

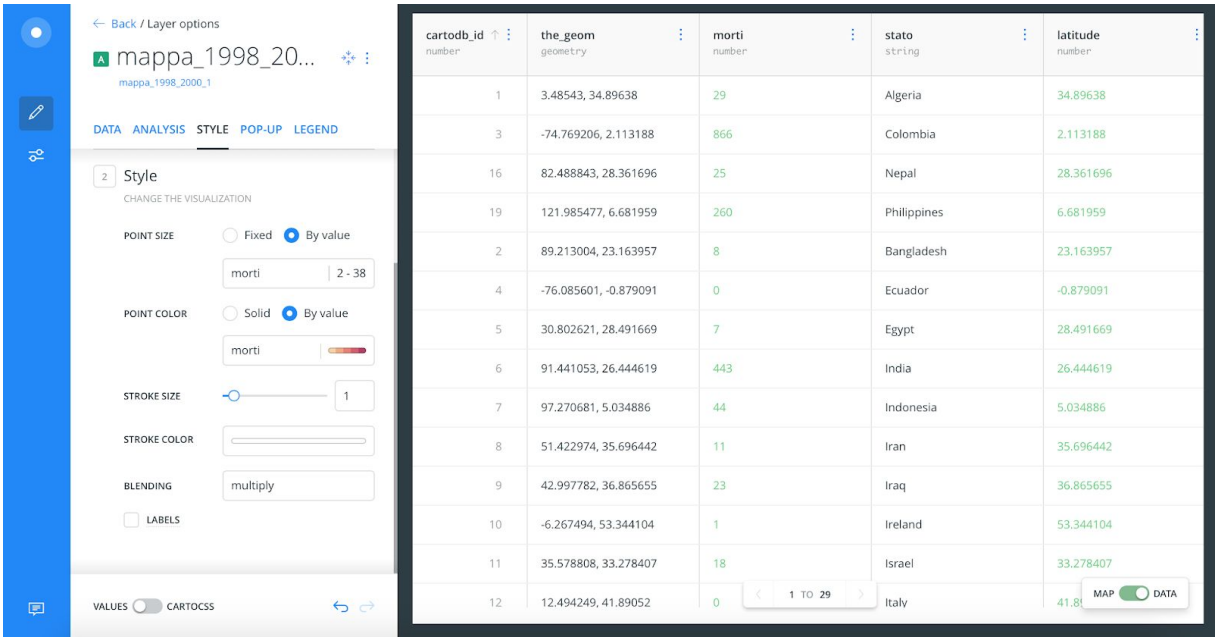

***Figure 15**: Switch view MAP / DATA*

On the right-bottom side of the screen there is a fixed button where you can switch the view from map to data. The data you will see is still editable.

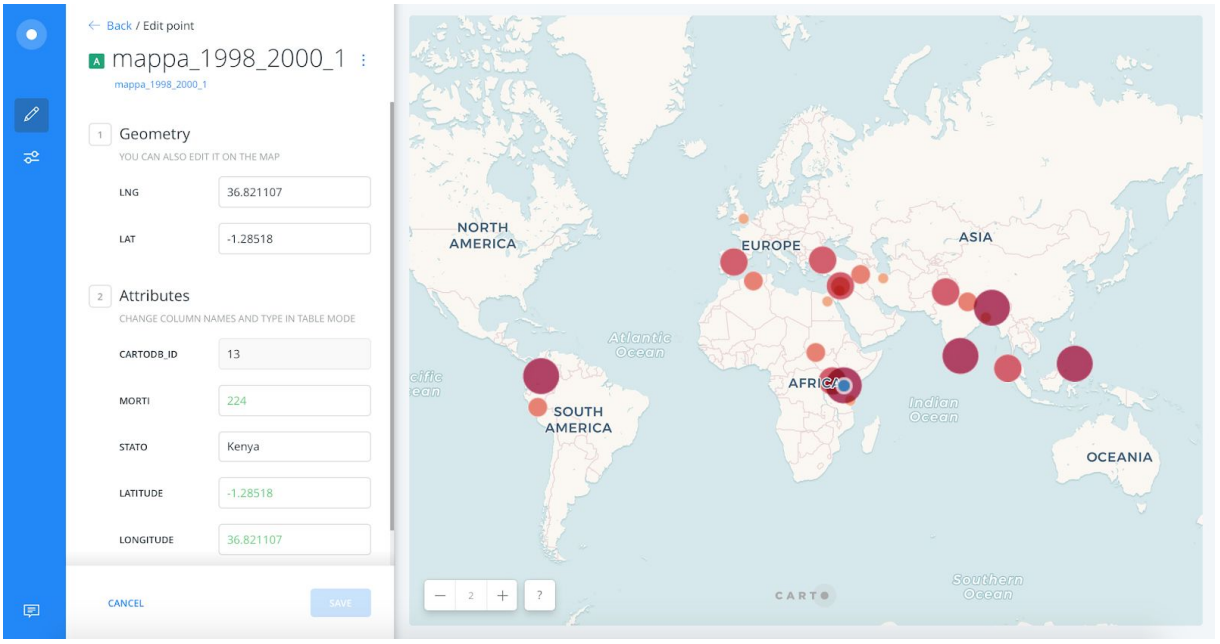

***Figure 16**: Edit single data points*

By clicking on a single data point you can check and edit the point data that will appear on the left-hand side.

Publish your map

Once you are done with your work, click on *Publish* and your map will be published on your profile, accessible from your dashboard.

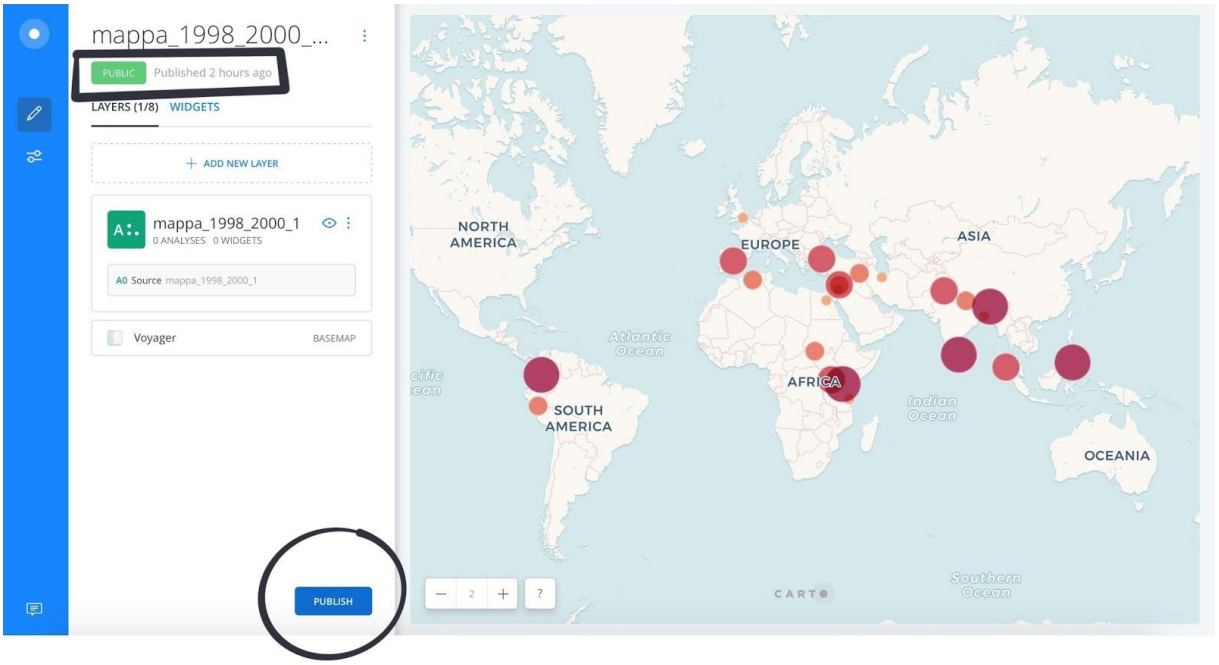

***Figure 17**: Publish your map*

After publishing your project you will have two link options - to share or embed the project. If you open the first one you will see a full screen version of your map.

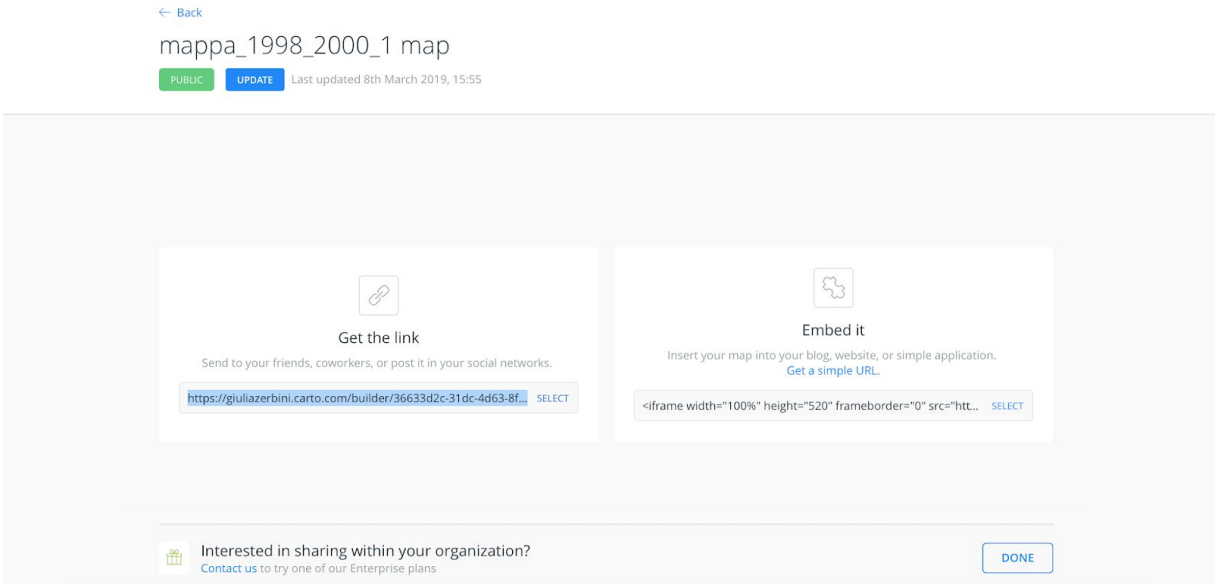

***Figure 18**: Sharing options*

Refine the map with Illustrator

Since we are using a free version of Carto, there isn't an official way to export a vector image to be edited in Illustrator. On the other side, Carto creates very nice and polished maps that you could present without any further redesign. For this week's Lab, we are going to explore 2 options to import your Carto map in Illustrator and create your final visualization.

First, set up your Illustrator workspace using the presets we selected for the last week's lab, and create your artboard.

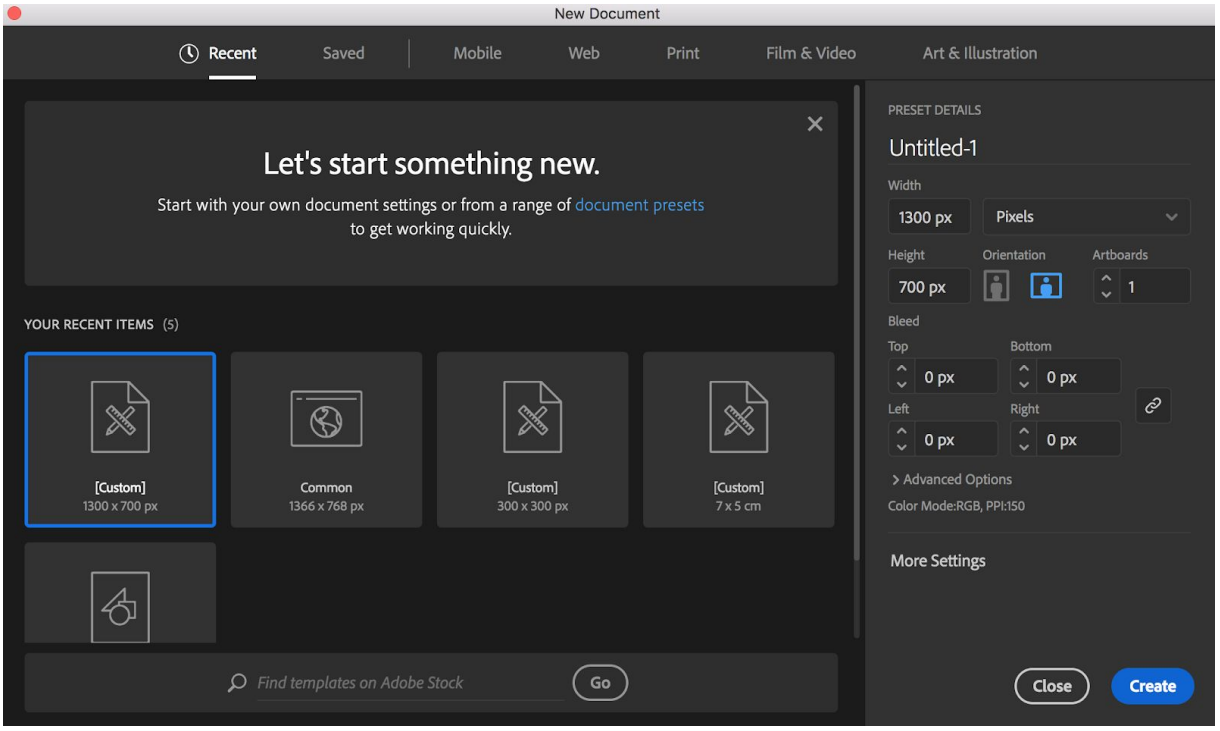

***Figure 19**: Set up your Illustrator file*

Guides!

Once you have created your artboard, set up the margins using the rulers and guides. A nice way to create a perfect margin to your artboard is to draw squares of the same dimensions in the corners of the artboard and then create guides that will perfectly align to the squares, as shown with the figure below.

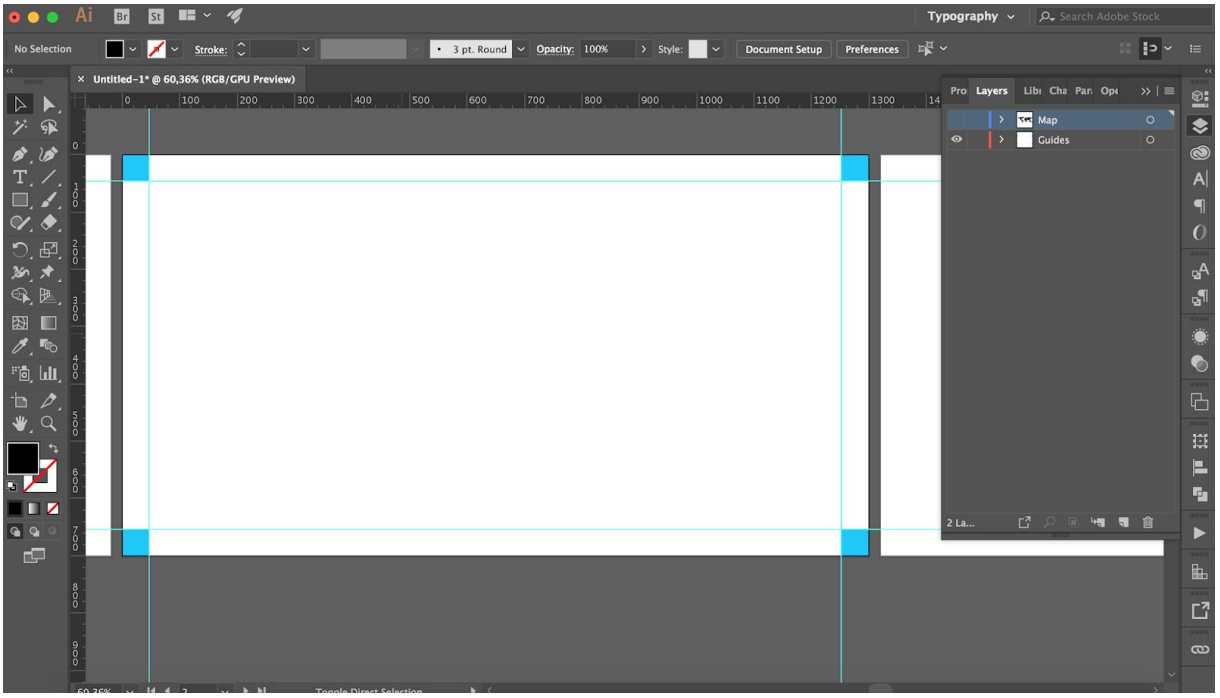

***Figure 20**: Create margins with guides and squares*

Layers!

In order to have a clean workspace select all guides and squares and move them to a specific layer called “guides” that you can block or hide while working. Create also another layer that will contain the map.

Note!

Make sure to have your workspace clean and organized! This will help you saving a lot of time to select and edit objects! Also, duplicate artboards or objects especially if you are experimenting with different layouts! Keep different versions of the work -- pick the one you prefer. Once you have selected the best option, edit, clean, and refine it before the final export takes place.

Import Option 1

This process is very simple and follows these three steps:

1. Open the link of your map
2. Take a print screen of the visualization
3. Import it (or drag and drop it) in Illustrator

If you edit the style of the map and of the data points as you like you will have a nice and polished result. At this point you can add a title and a legend in Illustrator.

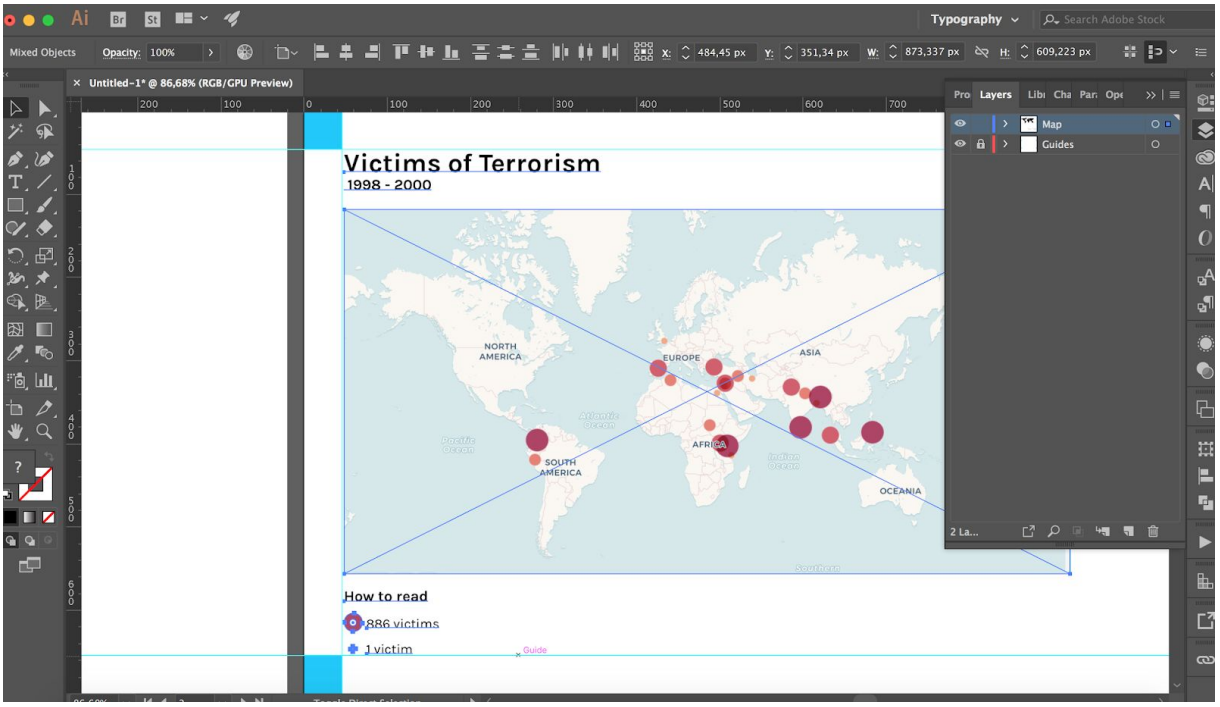

***Figure 21**: Map, guides, title and legend*

Refine and align the elements on the artboard. If you are drawing the legend by hand, make sure the dimensions of the data are correct! When everything is designed and set up in one single artboard, proceed to export the artboard.

Import Option 2

Another way to create your map is a bit more complex and requires more work and editing in the Illustrator. However, it will provide a better result. The steps are the following:

1. From the edit-toolbar select the *map style options*.
2. Select the color-fill mode and choose a white background.
3. Publish your work in Carto.
4. Open the external link.
5. Take a print screen of the entire map (zoom if necessary).

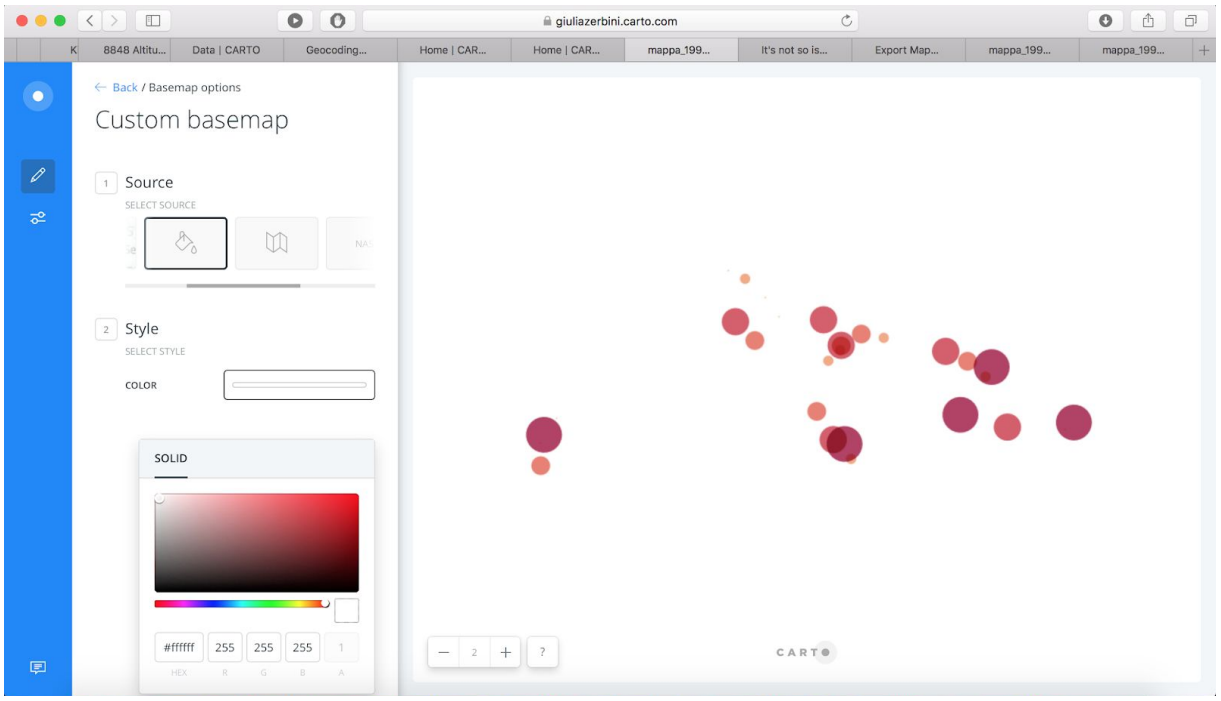

***Figure 22**: Change map style*

6. Import the PNG of the print screen in Illustrator
7. Trace the image in Illustrator

Tracing Images!

Tracing images is the process that convert raster images into vector images. It's a tricky process which result depends on the image quality and image type you are trying to trace! In general, the result is usually good only with simple shapes, simple paths, and few colors.

In this case of our example, we have circles filled with 4 different colors that needs to be traced. The steps are the following:

1. Select *Image Trace* and play with the *settings* (figure below) to see how the result changes.
2. Select mode: color.
3. Once you are satisfied with the result, click on the *Expand.*

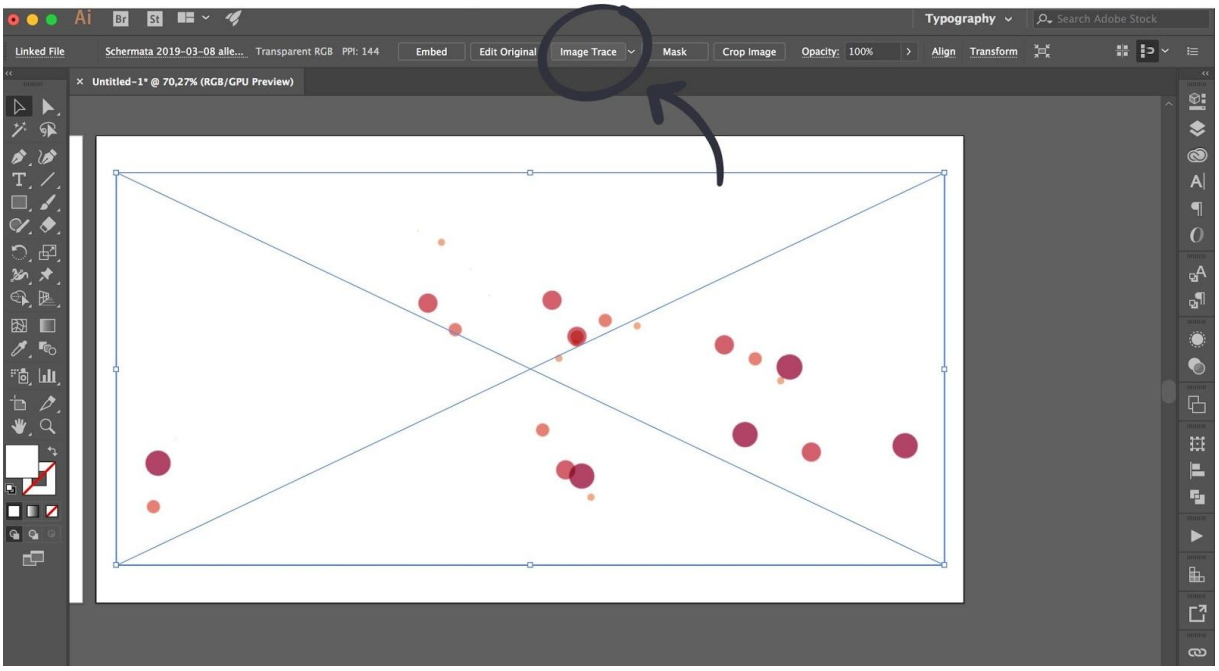

***Figure 23**: Import the png in Illustrator*

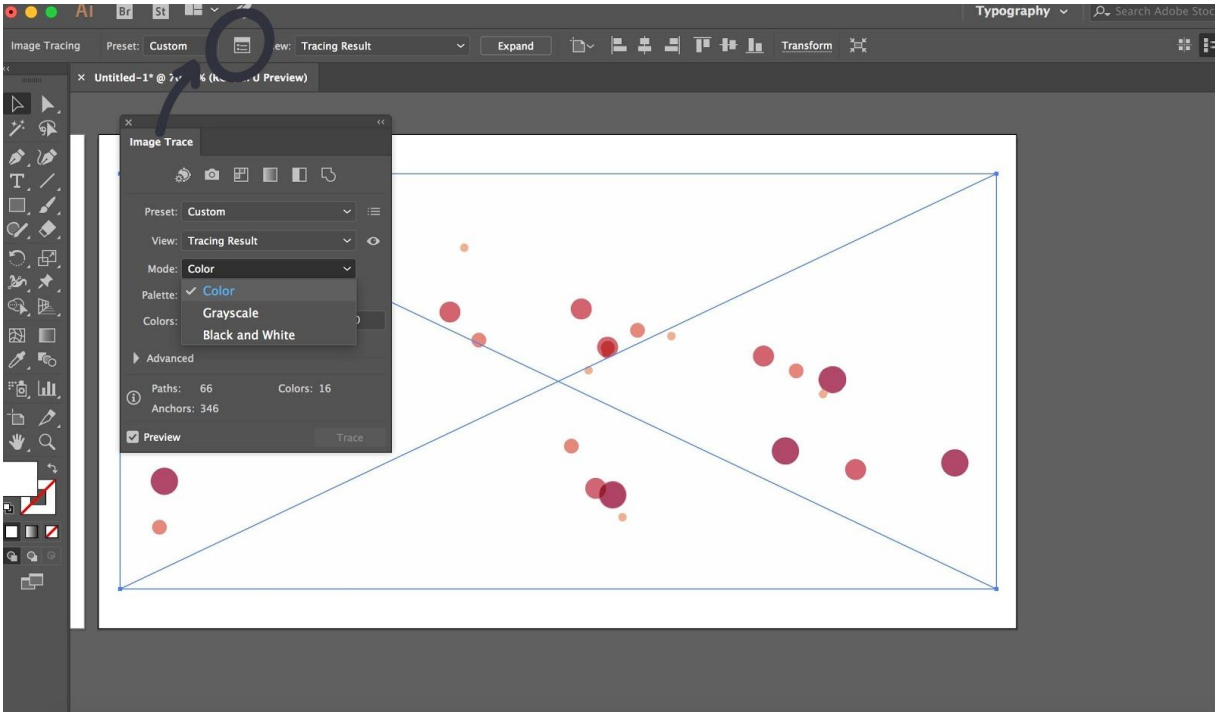

***Figure 24**: Change the settings*

Now that you have vector data points, next step is to provide a map for the points to be placed. Use this link to download “world map PNG” with transparent background and than:

1. Download and import map in the Illustrator.

2. Given the high-quality resolution, you don’t have to choose thacing with too many details.

3. Place your objects one on top of the other respecting proportions.

   Remember to use Layers to keep your workspace organized!

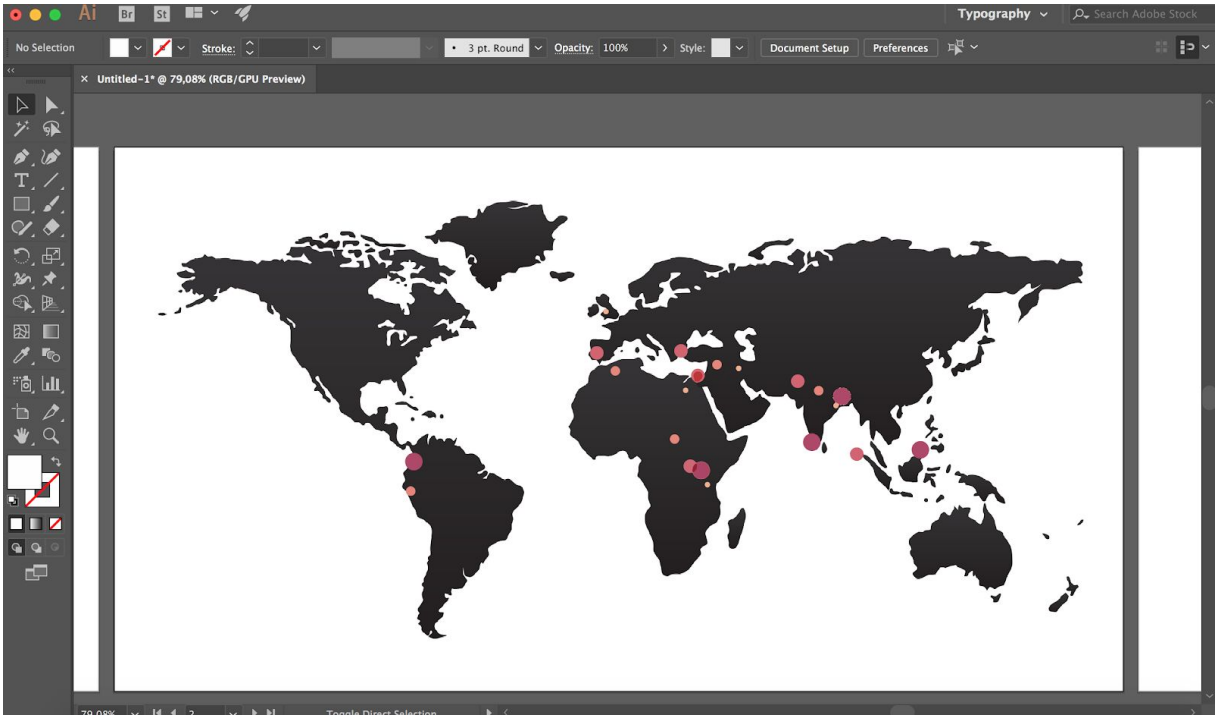

***Figure 25**: Overlap the objects*

4. Align your elements in the artboard, add a title and a legend.

   You can also add other information, change colors or add highlights on specific data points.

5. Customize colors and objects as you wish.

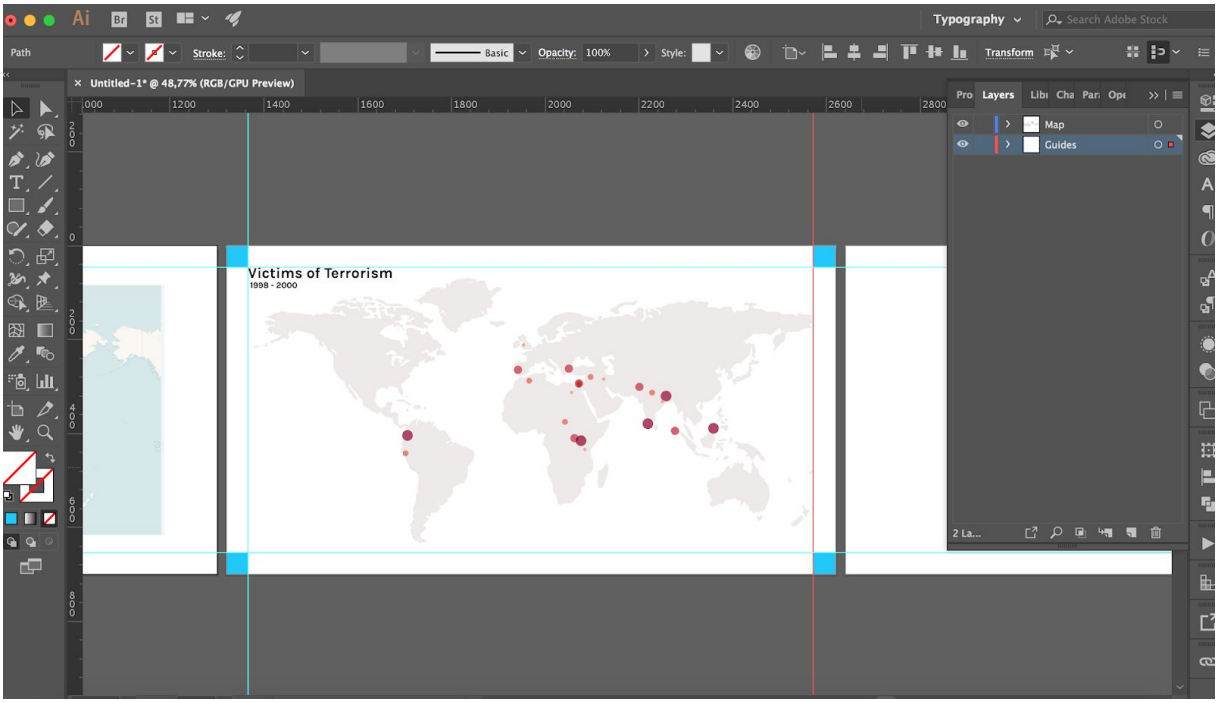

***Figure 26**: Map, guides, title*

When you are satisfied with your designs, proceed to export the final artboard as a jpg file.

***Figure 27**: Final design*

Export an artboard as a jpg file

If you are working with multiple artboards, at the end of your design process you will have to export only final design.

To export the artboard as jpg follow these steps:

1. Select File > Export as.

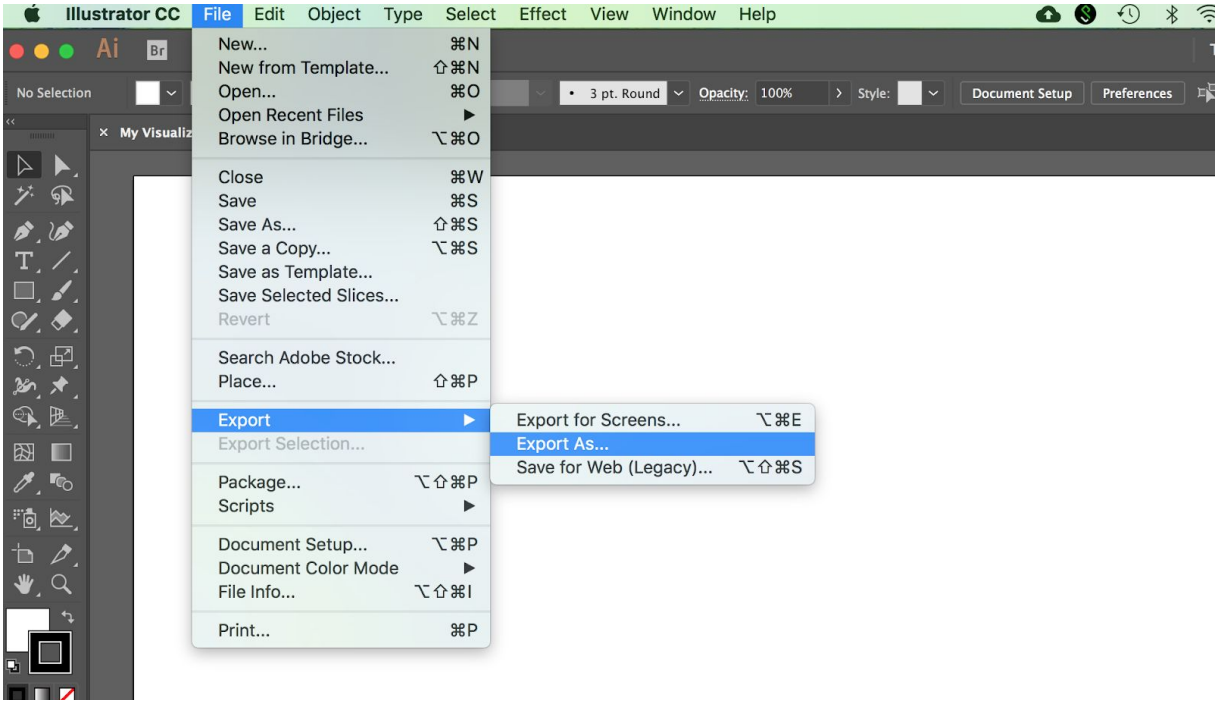

***Figure 28**: Export an artboard*

2. Choose a location for the file, and enter a filename. Select the format JPG, Select ***Use Artboards*** and type the number of the artboard you want to export in ***Range***. Click Export

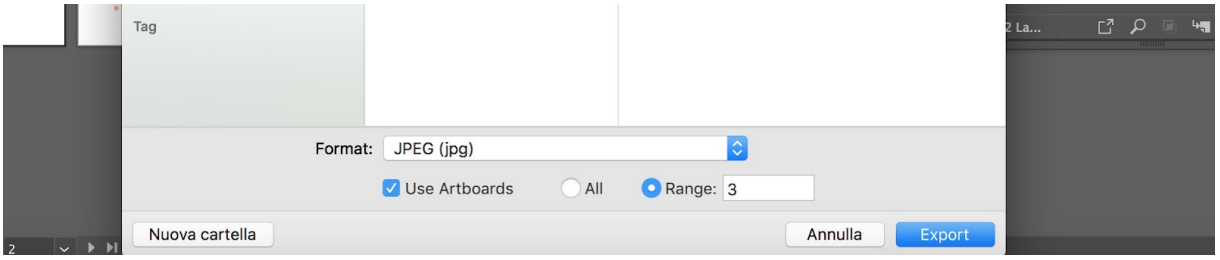

***Figure 29**: Select file type and artboard*

3. Set the JPEG options:

    a. Color Mode: RGB
    b. Quality: medium or high
       (make sure your jpg size is is note above 1mb)
    c. Resolution: Medium 150ppi

   Select ok!

Credits and additional resources

01. Carto Tool
Turn location data into design
Url: Here

02. Carto Tutorials
Learn more about Carto
Url: Here

03. Carto Gallery
Explore similar projects
Url: Here