RDSC Workshop #5
Introduction to Web Mapping

April 3, 2017
Sarah Watson
Overview

• What is Web Mapping
• OpenStreetMap Overview
• Brief Tutorials of:
  • Social Explorer
  • StoryMap
  • Carto
Difference Between “Digital” and “Web”

• Digital – involves a computer, but may not be accessible via the internet
• Web Map – a type of digital map that is accessible in a web browser:
  • Maps.google.com
  • Openstreetmap.org
• Web maps are connected to but different from maps made for mobile devices or for a digital globe (Google Earth)
• Development really took off after the emergence of Google Maps
• Many different platforms now exist
OpenStreetMap

• Sometimes referred to as the “Wikipedia of Maps”
  • Can be edited by anyone
  • Licensed under the Open Database License

• Two ways to edit:
  • Web editor ID
  • Advanced editor JOSM
OpenStreet Map

• **OpenStreetMap Task Manager**
  From the website: “A mapping tool designed and built for the Humanitarian OSM Team collaborative mapping. The purpose of the tool is to divide up a mapping job into smaller tasks that can be completed rapidly. It shows which areas need to be mapped and which areas need the mapping validated.”

• **MapRoulette**
  • From [OpenStreetMap wiki](https://wiki.openstreetmap.org/wiki/MapRoulette): “A gamified approach to fixing OSM bugs that breaks common OpenStreetMap data problems into micro tasks.”
Creating a Web Map

While there are many different programs to create web maps, many require coding knowledge.

Leaflet is a common, open-source JavaScript library used by many to create interactive, web maps

Today, I want to highlight a couple different non-coding options.
Social Explorer

• Available for free through the library

Good if you:
• Plan to primarily use U.S. census data
• Need information to display at Country, State, County, Census Tract, Census Block Group
• Situate in a larger on the “story” of a map rather than produce a fully customized map
• Want to share online maps

Can produce Choropleth, Sized Point/Bubble, and Dot Density Maps
Change Map
Variables/Data

Pick between Shaded Area, Bubbles, or Dot Density (if available)

Customize/Annotate Map, Create Report

Edit Data Breaks and Colors
Social Explorer Tutorial

• Restrict Zoom
  • Navigate to “Customize Map” → “Settings” → “Restrict Zoom Levels” → Change to 11

• Let’s select a Data Category:
  • Find and select “Travel Time to Work”

• Now go to the “Visualization Type”
  • Shaded area (Chromatic – colored map) – Categorized Data
  • Bubbles (Graduated circles) – Numeric/Categorized data
  • Dot density – Numeric data

Be aware that depending on the type of data, not all visualization types are available.
Social Explorer

Colorizing and Cutoffs

- The “Colors” button and Edit Cutoff points are both useful tools to showcase the data in ways that are more relevant for you.

Tips:

- Use a sequential scheme when you want to stress changes in your data relative to each other.
- Use a diverging scheme when wanting to show a change beyond a certain threshold.
- A good guide can be found at colorbrewer2.org
Due to the default settings, sometimes information will not be presentable as a choropleth map.
Social Explorer Tutorial

Setting breakpoints or “cutoffs”

• Different breakpoints will affect how the audience understands your map
  • What the audience is supposed to understand from your map (i.e. “This place has a higher work
    from home population” or the “medium income is lower here compared to neighboring zip codes”)

• The following methods are available:
  • Natural breaks – Emphasizes distinct “natural” drop offs in the data
  • Quantile – Puts the same number of data points in each group
  • Equal Interval – Separate the data range equally
  • Custom – Allows you to manually set your breakpoints

• Tip: Try to use between 4 to 6 classes, as that number of colors are easily readable on a map without being distracting.
Color Hue

Color hue refers to different colors such as red and green. Symbols with different hues readily imply differences in quality. Red is not more or less than green, but is different in kind.

Use of color hue

**Total Iraq & Afghanistan War Casualties**
Casualties per million population, as of Feb. 2010

- **80 – 230**
- **42 – 79**
- **26 – 41**
- **13 – 25**
- **16 – 12**

Hue is a poor choice for showing quantitative data. Using hue makes it difficult to see the patterns on the map, as the colors do not suggest the order (low to high) in the data.

Use of color hue

- **McCain Win**
- **Obama Win**

Color hue is a good choice for showing qualitative data. Qualitatively different hues parallel the qualitatively different data.

Taken from *Making Maps* Krygier and Wood (2011)
Color Value

Color value refers to different shades of one hue, such as dark and light red. Map symbols with different values readily imply differences in quantity. Dark red is more than light red.

Use of color value

- Total Iraq & Afghanistan War Casualties
- Casualties per million population, as of Feb. 2010

- Value is a good choice for showing quantitative data. The use of one hue varying in value parallels the order in the data.

Taken from *Making Maps* Krygier and Wood (2011)
Color Intensity

Color intensity (or saturation) is a subtle visual variable that is best used to show subtle data variations, such as binary (yes or no) data that are not really qualitative or quantitative.

Use of color intensity

Iraq & Afghanistan War Casualties
Casualties per million population, as of Feb. 2010

- Intensity is a poor choice for showing quantitative data. Intensity may suggest order, but due to the lack of variation in value the sense of order is weak.

African-American Absence, 2000

- Intensity is a good choice for showing binary (yes/no) data. Intensity, like binary data, is neither qualitative nor quantitative.

Taken from Making Maps Krygier and Wood (2011)
Choropleth Map Design: Value, Legend, and Boundaries

Taken from *Making Maps* Krygier and Wood (2011)
Social Explorer Tutorial

Annotating

• After clicking on the “Annotate map” tab, you will access the set of options for adding your information to the map.
Story Mapping

Another style of web mapping without coding is “Story Mapping”

• Combine maps with narrative text, images, multimedia content to tell a story

• StoryMap JS - Knight Lab

• VisualEyes

• ArcGIS Story Maps – requires a paid subscription
StoryMapJS Tutorial

• A web mapping tool designed by Northwestern University’s KnightsLab
  • Free
  • Requires a Google account
    • TO USE - Must give permissions to access Google Drive (functions as a repository of files)

• Can produce both a linear narrative (audience move from specific location to location or nonlinear (audience can jump around location)

• Can incorporate a series of media – Wikipedia, video, tweets, photos, etc.
  • The map icons indicates the type of media

• Example
StoryMapJS

- Change background information
- Table of Contents
- Upload Media – video, photo, Wikipedia page

**UPLOAD MEDIA**

- URL to your media
- Upload an Image

**DESCRIPTION**

- Credit
- Caption

**PLACES I’VE LIVED**

- Insert Quote: Full of Wisdom - Perhaps, from Emerson
Carto Builder

- Online platform to create web maps – limited options for free

**CARTO Builder enables drag and drop analysis and visualization of location data through the creation of insightful apps. Available as a Free or Personal account, or pay-per-seat licensing model for your entire organization.**

<table>
<thead>
<tr>
<th><strong>FREE</strong></th>
<th><strong>PERSONAL</strong></th>
<th><strong>ENTERPRISE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Get started with Location Intelligence</td>
<td>Location Intelligence for individual use</td>
<td>Scalable and Collaborative Location Intelligence</td>
</tr>
<tr>
<td><a href="#">SIGN UP</a></td>
<td><a href="#">SIGN UP</a> $149/month/year</td>
<td><a href="#">CONTACT US</a></td>
</tr>
<tr>
<td>Public data</td>
<td>Private data</td>
<td>Private data &amp; location app internal sharing</td>
</tr>
<tr>
<td>Shared resources</td>
<td>Shared resources</td>
<td>Dedicated resources or <strong>on-premises</strong></td>
</tr>
<tr>
<td>Limited <a href="#">Location Data Services</a></td>
<td>4x <a href="#">Location Data Services</a> quota</td>
<td>8x <a href="#">Location Data Services</a> quota</td>
</tr>
<tr>
<td>Community support</td>
<td>Email support</td>
<td>SLA and Enterprise support</td>
</tr>
<tr>
<td></td>
<td>Data synchronization</td>
<td>SQL Server, MySQL, and Oracle connectors</td>
</tr>
<tr>
<td></td>
<td></td>
<td><a href="#">Data Observatory</a> access</td>
</tr>
</tbody>
</table>
Carto Builder Tutorial

• Click on “New Map”
• Click on “Connect Dataset”
• Drag “Bars_Lexington_Geocoded” on to the upload area
• Click “Create Map”
Conclusion

• So there are many different ways to produce effective web maps.
• The type of platform you will use will depend on many factors:
  • Cost
  • Style/Narrative Purpose
  • Where will it be displayed
  • Type of Data Available
  • Time to complete the map