Time Series Proportional Symbol Maps with Leaflet and jQuery

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Richard G. Donohue, University of Kentucky | rgdonohue@uky.edu

Carl M. Sack, University of Wisconsin–Madison | cmsack@wisc.edu

Robert E. Roth, University of Wisconsin–Madison | reroth@wisc.edu

ASSUMED SKILLS AND LEARNING OUTCOMES

The following tutorial describes how to make a time series proportional symbol map using the Leaflet (leafletjs.com) and jQuery (jquery.com) code libraries. The tutorial is based on a laboratory assignment created in Spring of 2013 for an advanced class on Interactive Cartography and Geovisualization at the University of Wisconsin–Madison (www.geography.wisc.edu/courses/geog575). This is the first of two *On the Horizon* tutorials on the topic of web mapping, with the next tutorial covering multivariate choropleth mapping using the D3 library. Commented source code for the tutorial is available through a Creative Commons license at geography.wisc.edu/cartography/tutorials.

The tutorial assumes a basic understanding of the open web platform, particularly the HTML, CSS, and JavaScript standards. It also is assumes that you are familiar with the manipulation of JavaScript objects as well as jQuery-style DOM element selection. Tutorials and reference documentation for HTML, CSS, and JavaScript are available at such resources as developer.mozilla.org, www.lynda.com, www.codecademy.com, and www.w3schools.com. Further, it is assumed that you are familiar with in-browser development tools such as Chrome Developer Tools (developers.google.com/chrome-developer-tools) or Firebug (getfirebug.com). Finally, the tutorial assumes that you have access to a web server, either running remotely or as a local host; MAMP for Mac (www.mamp.info/en) and WAMP for Windows (www.wampserver.com/en) are useful for this.

After completing the tutorial, you will be able to:

- Work with the GeoJSON data format
- Use the Leaflet library to publish a time series proportional symbol map to the web
- Create interactivity using mouseover popup windows and range sliders

GETTING STARTED WITH LEAFLET

Leaflet is one of many code libraries now available for publishing slippy maps to the web. Leaflet is a JavaScript library pioneered and maintained by Vladimir Agafonkin (agafonkin.com/en), and quickly is growing in popularity within the web development community because it is both lightweight (only 33kb of code at the time of this writing) and open source (meaning you can both view how it functions and extend it to fit your needs). Maps produced using Leaflet can load a variety of basemap tile services and can draw vector features atop these tiles using the SVG (Scalable Vector Graphics) standard. Leaflet is also bundled with Mapbox.js (www.mapbox.com/mapbox.js), allowing for simple loading and manipulation of custom tilesets. Because of the small file size and support of touch-based interactions, Leaflet is considered among the best web mapping libraries when designing for mobile devices.

The Leaflet library is an open-source project on GitHub (github.com/Leaflet) and can be extended through numerous open plugins (leafletjs.com/plugins.html). The goal of this tutorial is to provide you with a broad introduction to using Leaflet for Web Cartography. The following tutorial extends the reference and tutorials