

# Hatch Fill on Webmaps – to Do or Not to Do, and How to Do

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## Abstract:

Hatch fill is a common solution in traditional thematic cartography. It is widely used for monochrome maps, or when the intent is to indicate the presence of two (or more) different qualities in a specific area. On printed, static maps, hatch fill is easy to use: although map designers have to pay attention to concerns such as line density compared to minimum object sizes or hatch angle interfering with other straight line elements, due to the static scale, a well designed map will be easily readable. Furthermore, decent GIS software provide all the tools for hatch (and other pattern-based) fills. In the case of dynamic web maps, however, using hatch fill brings several questions.

First, should the hatch density change together with the scale (resulting in an image similar to static maps), or should it remain the same – which means that zooming the map changes the number of lines filling a specific object. The problem with the first solution is that zooming in to a map detail may result in an image on which hatch lines are so far from each other that from the viewer's perspective they seem to be independent objects, not a pattern. Also, it might be hard to find the matching hatch pattern on the map legend.

If the hatch density is independent of scale, another problem may occur. At low zoom levels, object details that are in the same size magnitude that hatch line distance might be illegible.

Another question is technical implementation of hatch fill. Server-side mapping software such as MapServer or GeoServer support hatch fills long ago, but in many cases, a simple web map would not need such complex server backend. Client-side mapping libraries, however, usually does not natively support pattern fills. Due to the concerns above, one can find very few examples of dynamic, zoomable web maps using hatches.

To overcome the implementation issue and to facilitate publishing thematic web maps using hatch fills, the author developed a simple extension to the popular open-source mapping library Leaflet. This extension, *leaflet-hatchclass* (<https://github.com/samanbey/leaflet-hatchclass>) takes advantage of the fact that Leaflet using SVG objects for visualizing vector overlays, and it is possible to assign a class name to these graphical objects. Therefore, the solution is to create SVG patterns defining the hatch fill and corresponding CSS rules assigning these patterns to class names. Users can set line colours, line width and hatch angle when creating a new hatch pattern. The number of different colour lines is not limited. Figure 1 displays an example web map using this extension.

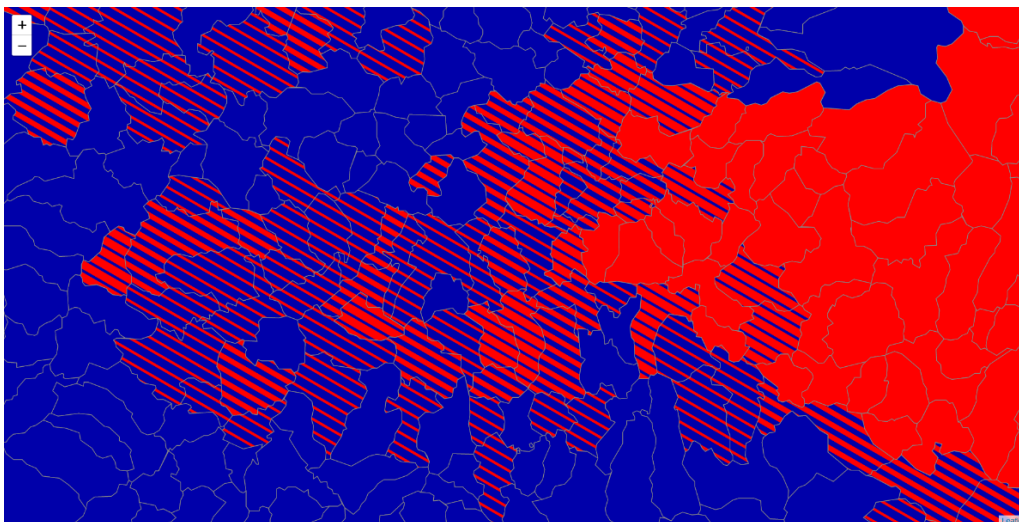


Figure 1. Hatch fill example indicating the proportions of two nationalities in a mixed population area.