THEMATIC MAPS

a small guide for (non-professional) map makers

Topic:

What kind of data will be visualized?

It is important to think about the data first. The level of measurement leads to the right choice of visualization method and color.
There are four main differenciations:

nominal

showing qualitative differences of elements. No element is worth more than another.

ordinal

qualitative elements can be ordered according to a certain logic, but there is no relative size or degree of difference.

ratio

measured quantities. The numerical data has a absolute zero value (e.g. %).

smooth and continuous data (e.g. rainfall or climate) is best visualized with a contour map

interval

measured quantities with a range from negative to positive values.

Basemap:

How to choose a nice background?

A basemap can be everything between satellite imagery, topographic map, just outlines of political regions, or ...
It must not distract the reader, but complement the topic and provide orientation. The basemap should help the reader to understand the geographic extent.

Geometries:

What elements built a thematic map?

point

to represent a location with a marker.

Points are very popular on webmaps, probably because they are the easiest to display: one marker for each datapoint with geographic coordinates... Markers can be differentiated using color, shape, or symbols and signs.
At the latest when there are many points overlapping and hiding other points, another representation should be considered. Visualization offers various different possibilities, for example charts (pie, bar, spider...).




Bear in mind that charts can represent data values either at a location or for a whole area.

line

to show routes, ways, connections, or flow and direction.

A famous example for the usage of lines on a thematic map is the public transport network plan. It usually shows the conntections between stations.
Lines can also form an arrow and indicate a direction of flow. The thickness of a line can represent a certain amount of flow.

area

to devide regions in, e.g. political or geometric, subparts. Or: to represent large objects.


Depending on the choice of subdivision method, the understanding of the map can be influenced. When merging several small units to one bigger cell, data differentation gets lost.
When visualizing data on areal units of different size (usually the case with political districts), it needs to be standardized first! Otherwise the result will bias the understanding of the data.

Color:

Why is this even important?

Many maps look ugly or unpleasing just because of a disturbing choice of color. This is something that can be easily avoided. If you don't have a natural sense for beautiful colors, you can help your map to a nicer color scheme using some tools. For example:

`http://www.palettebuilder.com` or `http://colorbrewer2.org`

qualitative color schemes

...for nominal data

Example: European Countries

Hint: qualitative color schemes can be created be changing the hue of a color to another tone, keeping constant brightness and satuation values.

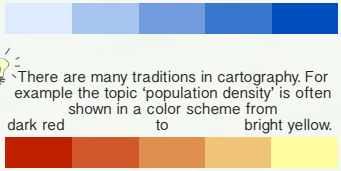
Be careful, the arrangement of colors can imply a ranking or order.

This effect can be used for data with an ordinal level of measurement.

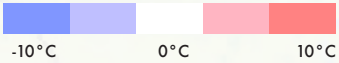
By the way, in Adobe Illustrator you can find the tool 'Edit Colors > Blend...' – this helps you to quickly create a sequence from one color to another

quantitative color schemes

Sequential color schemes represent ratio scaled data sets. To create them, mostly saturation and/or brightness of the color are changed only.
In rare cases, the color changes its hue to a brighter tone.



There are many traditions in cartography. For example the topic 'population density' is often shown in a color scheme from dark red to bright yellow.



The two directions of intervall scaled data are represented by divergent color schemes. An illustrative example is the temperature, where convention dyes the cold minus degrees in blue and warm positive degrees in red.

Other colors can be used to create bipolar schemes, too. It is just important that the two colors represent this twofold character. To be sure, choose colors that are complementary (have a look at the color wheel for help).

multivariate color schemes

Sometimes the data requires color schemes with three or even more 'poles'. These are a bit more complex to understand, but the procedure to create them is easy: Just choose the pole colors (their position in the color wheel should form a geometric shape) and blend the colors between.

Design:

How to avoid mistakes?

size

The size of the screen influences the appearance of the map and the way users read it. Think about the purpose of your map.

geographic extend

The geographic extend can be bigger than on traditional maps, pan and zoom allow to cover the whole world. Of course the extend depends on the purpose. Nevertheless the first view should help to user to understand the geographic region.

map scale

Zooming in web maps leads to a variable scale. The ideal scale depends on the object density and the accuracy of details.

map projection

The map projection of web maps is currently Mercator in most cases. But this will change with new technologies coming! It is important to know that data in different projections can be far off when overlaid.

color

Even if you choose awesome colors for your map as explained previously, there can be problems with colors since monitors, browsers and even operating systems handle colors differently. Some people recommend to use the 'web safe color palette'.

symbols

The dimension of symbols should carefully be considered. Too large symbols hide a lot of map content while too small symbols can fall below the perceptive border of humans and therefore not be readable anymore. To improve readability a good contrast helps to distinguish the symbol from the background.

typography

For small text on screen a sans-serif font is always recommended. Good screen fonts have a low contrast and simple strokes with a consistent weight and thickness, a generous x-height, width and letter spacing, and also a generous punch width (space within letters).

resolution

With improving technologies the screen resolution gets less and less important. But not every possible interested map reader owns a high end device.

advanced design

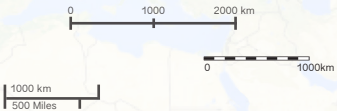
Using transparency some kind of fogginess can be expressed. And shading helps to improve the figure-ground organization.

Map Elements:

Things that should not be missing

legend

There has to be an explanation for all the colors and symbols on the map. This must not necessarily be an extra legend panel. Using interaction, web maps allow to include information in tool-tips or pop-up windows. For a complex map with several colors a legend panel is still recommended.



scale bar

It is good to have the scale mentioned somewhere, but a graphical scale still helps people to better understand the geographic extend.

orientation

Since most maps point up north anyway, the orientation can be missed out it that case. In all other cases, the orientation must be indicated with an north arrow.

"My Favorite Places"

title

The title (and sometimes also subtitle) explains the whole map and is very important for the understanding. You should avoid the word 'map' in the title. One can see it's a map...

sources

Name all your sources and credits.

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