



# Custom basemap tiles with CartoCSS

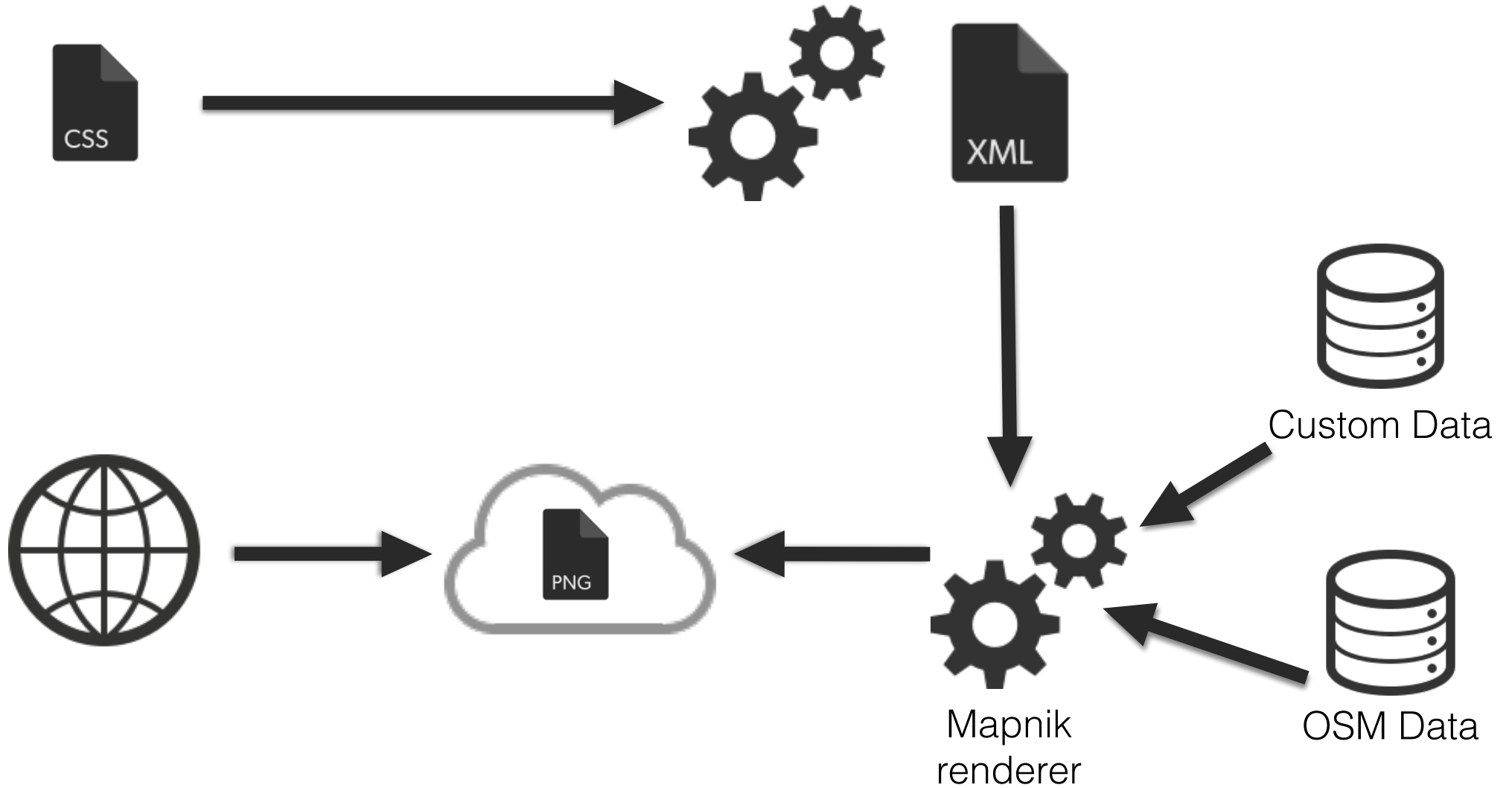
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2014, Comem+

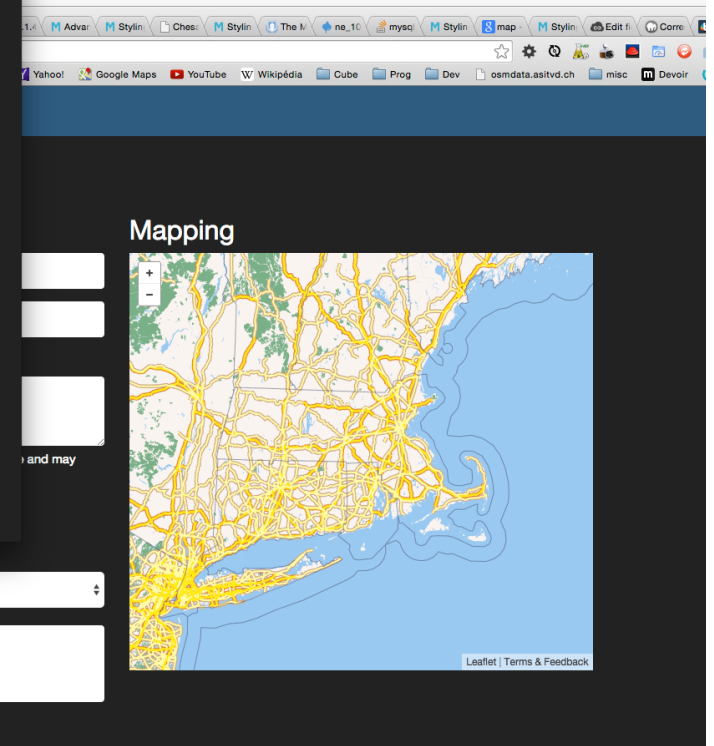
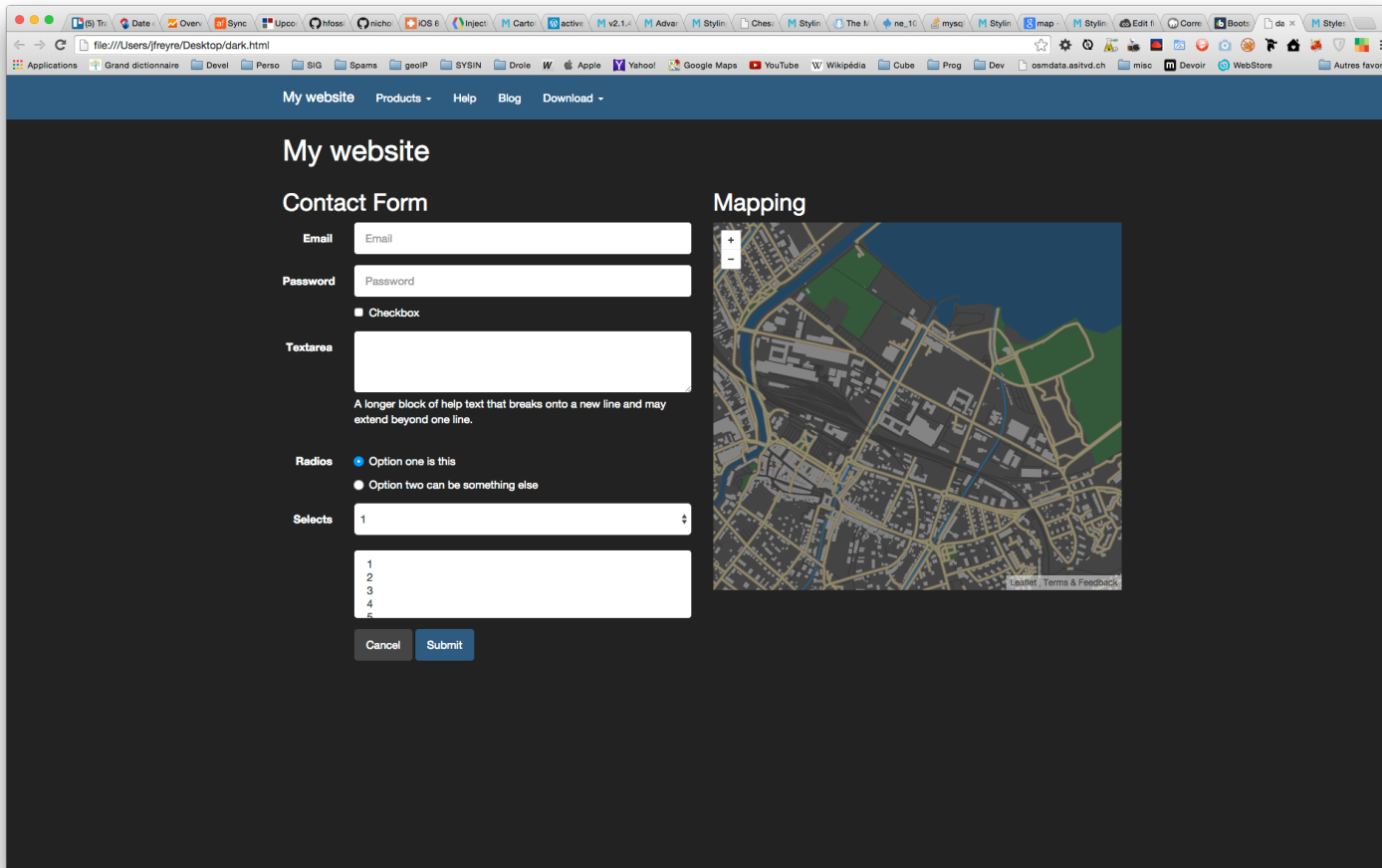


like CSS...  
but different...

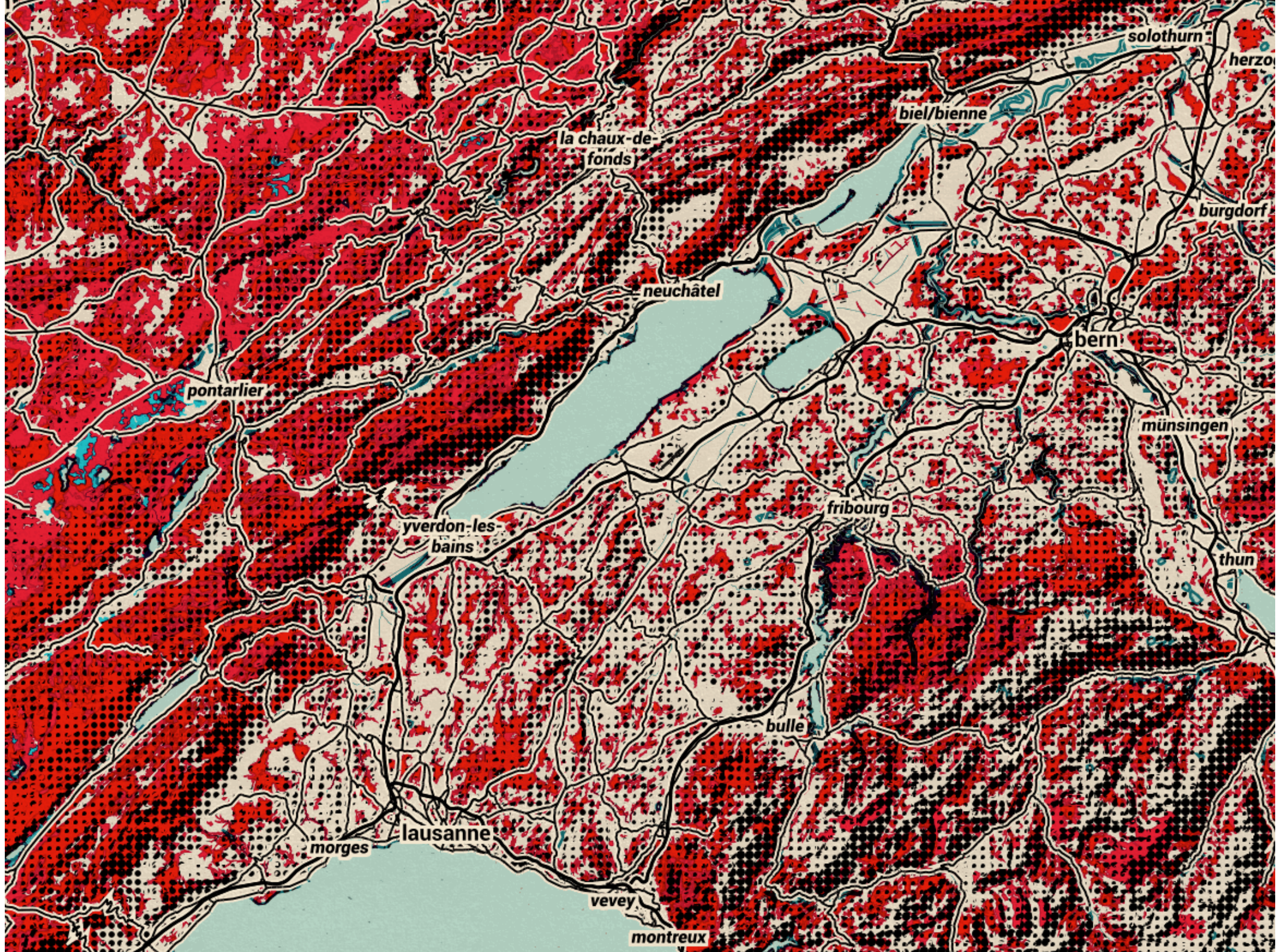
# How it works



# Maps are part of the design



Maps can be  
beautiful...





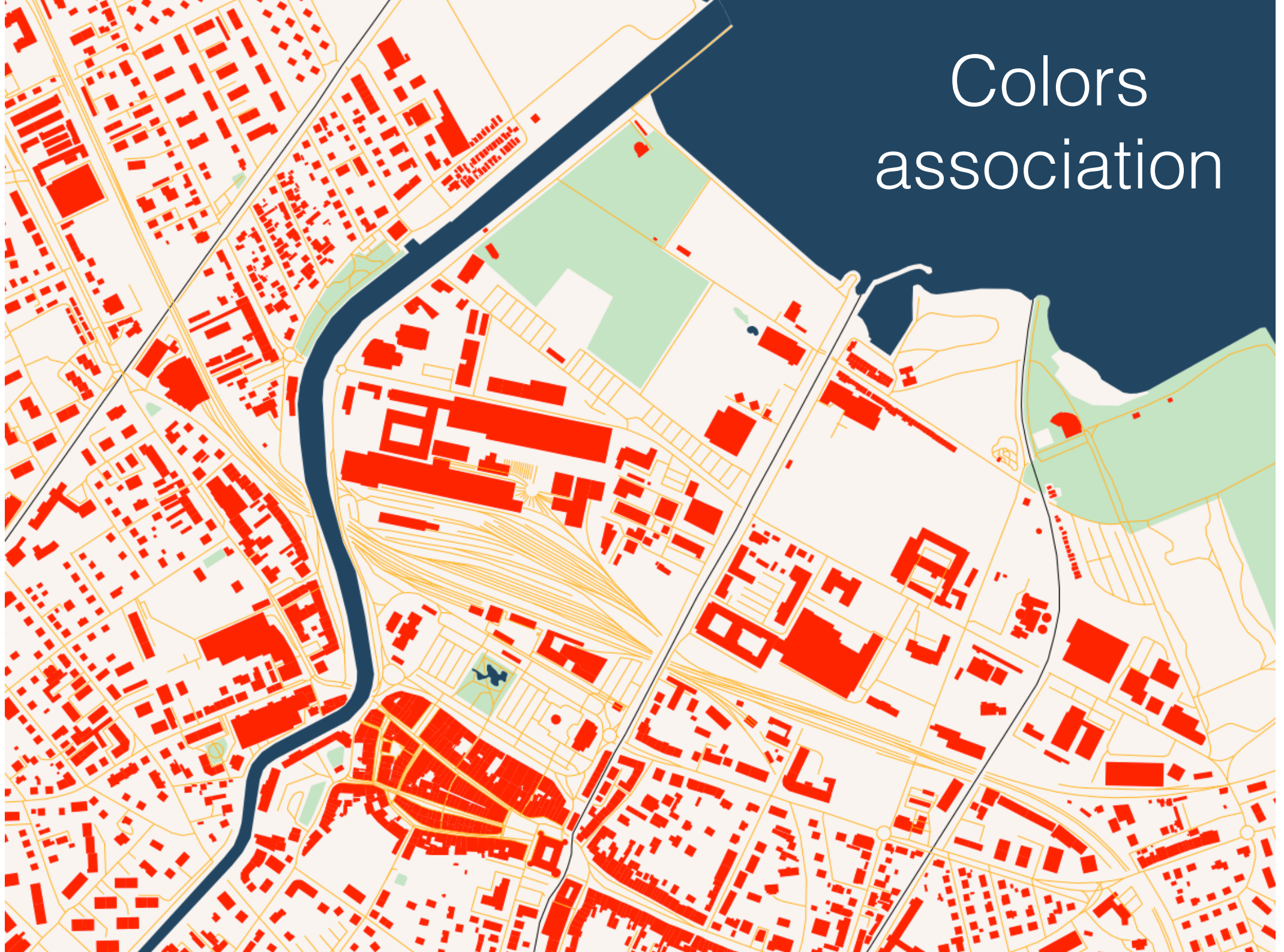
Be careful...



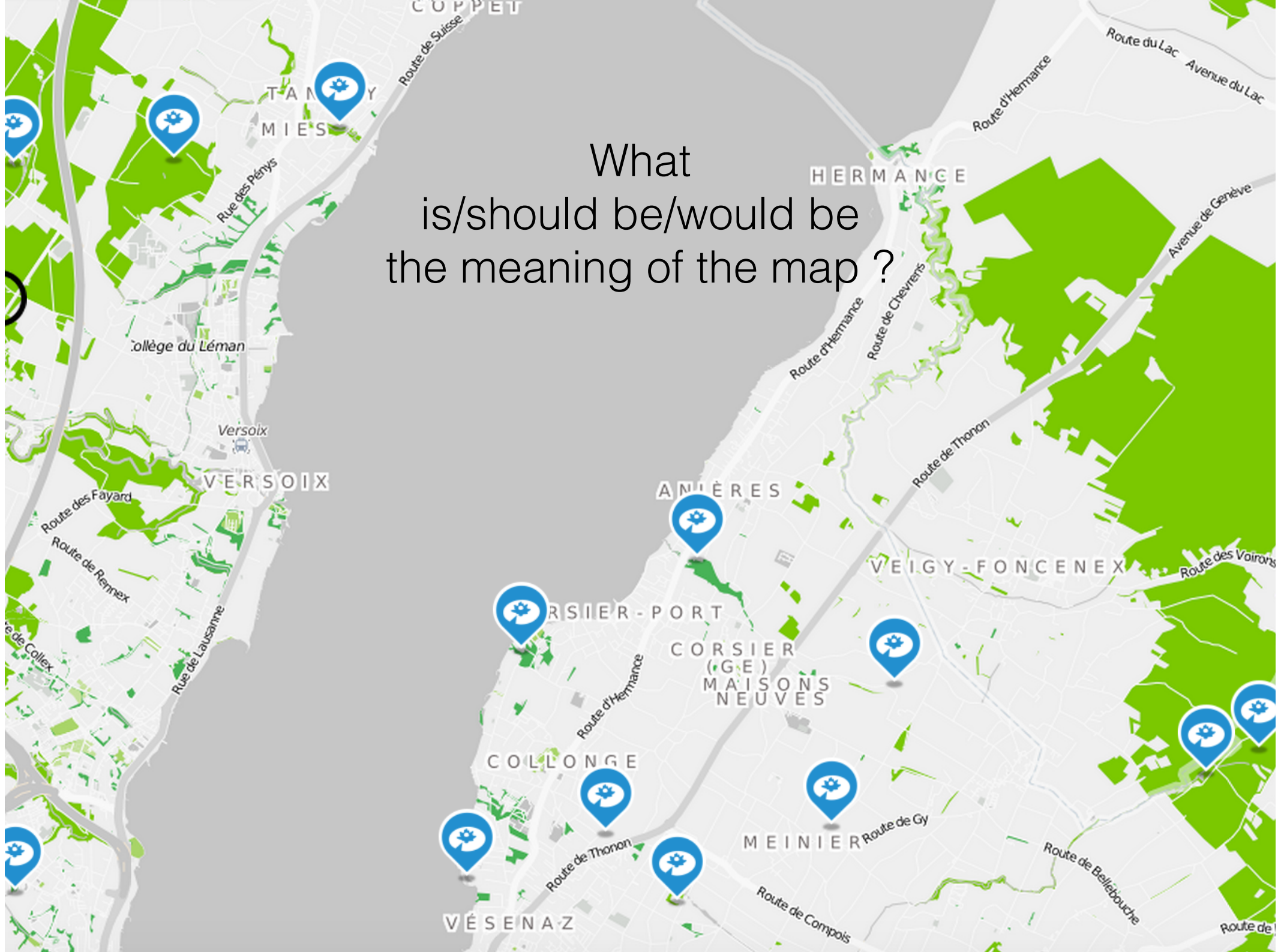
meaning  
of colors



# Colors association



What  
is/should be/would be  
the meaning of the map ?





Let's map

# Selectors

```
#layer_1,
#layer_2 {
  /* styles will apply to all the objects in both layers */
}

.roads {
  /* styles will apply to all layers with a class of 'roads' */
  /* Not available with mapbox */
}

#layer[zoom=0] {
  /* styles will apply to #layer at lvl 0 */
}

#layer[zoom>=4][zoom<=10] {
  /* styles will apply to #layer at lvl 4 to 10 */
}

#cities[name=".* city"] {
  /* styles will apply to objects in #cities with a name ending by "city" */
}

#cities[population>10000] {
  /* styles will apply to objects in #cities with population attributes > 10000 */
}

#cities [zoom>=4][population>1000000],
#cities [zoom>=5][population>500000],
#cities [zoom>=6][population>100000] {
  /* styles will apply .... hum... let's you guess :) */
}
```

# Variables

```
@fallback: 'Open Sans Regular';  
@sans: 'Open Sans Regular', @fallback;
```

```
@water: #a0c8f0;  
@river: darken(@water, 30%);
```

```
@land: #f8f4f0;  
@forest: mix(#00ae14, @land, 40%);
```

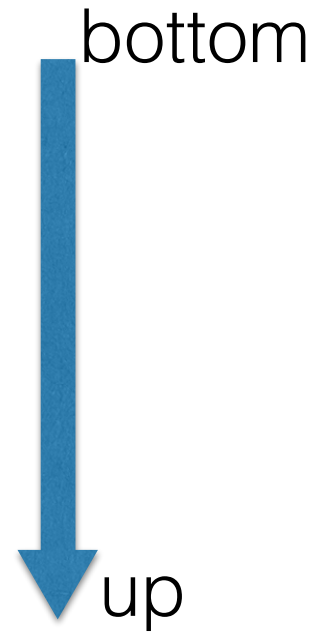
# Inheritance

```
#cities {  
  [zoom>=4][population>1000000],  
  [zoom>=5][population>500000],  
  [zoom>=6][population>100000] {  
  
  }  
}
```

```
#roads {  
  [Type="Major Highway"] { }  
  
  [Type="Secondary Highway"] { }  
  
  [Type=~".* Highway"] { }  
  
  [Type="Ferry Route"] { }  
}
```

# Sub-layers

```
#road[class='motorway'] {  
  ::case {  
    line-width: 5;  
    line-color:#d83;  
  }  
  ::fill {  
    line-width: 2.5;  
    line-color:#fe3;  
  }  
}
```





# Painter's algorithm

```
#layer {  
  line-width: 6;  
  polygon-fill: #aec;  
  polygon-opacity: 0.8;  
}
```



```
// Vs ?
```

```
#layer {  
  polygon-fill: #aec;  
  polygon-opacity: 0.8;  
  line-width: 6;  
}
```



polygon-pattern-comp-op  
polygon-pattern-clip marker-simplify-algorithm  
shield-line-spacing marker-geometry-transform  
marker-ignore-placement line-pattern-opacity shield-label-position-tolerance  
point-allow-overlap line-geometry-transform shield-placement-type  
shield-halo-opacity background-image-comp-op  
text-min-path-length polygon-pattern-smooth shield-justify-alignment  
shield-allow-overlap raster-colorizer-default-mode text-allow-overlap  
polygon-comp-op polygon-pattern-opacity shield-min-padding  
raster-comp-op shield-text-transform line-pattern-offset text-transform  
shield-repeat-distance polygon-simplify-algorithm text-halo-radius  
text-face-name text-horizontal-alignment line-pattern-simplify-algorithm  
point-placement point-comp-op polygon-pattern-geometry-transform  
marker-spacing marker-line-width point-ignore-placement polygon-opacity  
marker-height shield-min-distance shield-placements polygon-pattern-file  
text-repeat-distance shield-vertical-alignment text-wrap-before text-min-distance line-comp-op  
shield-text-dy raster-colorizer-stops line-simplify-algorithm polygon-clip  
building-fill text-placements font-directory text-halo-fill text-clip text-align  
line-smooth text-ratio shield-opacity marker-line-opacity marker-comp-op  
text-wrap-width point-file text-min-padding polygon-fill text-dy line-miterlimit line-pattern-smooth  
marker-clip line-simplify marker-avoid-edges text-name shield-halo-fill line-cap  
polygon-smooth line-offset marker-simplify shield-transform maximum-extent  
text-halo-transform text-spacing line-width line-join line-pattern-clip text-comp-op  
shield-halo-radius shield-placement text-halo-comp-op line-gamma text-fill  
text-line-spacing text-size text-max-char-angle-delta shield-halo-rasterizer text-halo-opacity  
marker-fill image-filters building-height text-orientation line-opacity  
marker-fill-opacity text-dx text-label-position-tolerance shield-dx shield-file  
marker-file raster-scaling text-opacity opacity comp-op buffer-size marker-type  
point-opacity base marker-width text-margin debug-mode line-color  
shield-face-name text-font-feature-settings srs shield-comp-op  
shield-clip shield-fill marker-smooth shield-size marker-opacity marker-line-color  
raster-mesh-size polygon-pattern-simplify-algorithm shield-dy line-pattern-file  
text-halo-rasterizer marker-multi-policy shield-name line-clip polygon-gamma  
point-transform image-filters-inflate text-character-spacing text-placement  
shield-spacing line-pattern-comp-op shield-halo-transform line-dasharray  
background-color line-pattern-geometry-transform marker-offset  
text-wrap-character text-placement-type marker-transform shield-text-dx  
line-dash-offset polygon-pattern-gamma shield-margin shield-halo-comp-op  
line-gamma-method polygon-simplify marker-placement marker-allow-overlap  
building-fill-opacity shield-horizontal-alignment shield-wrap-character  
raster-opacity text-avoid-edges shield-wrap-width shield-wrap-before  
shield-avoid-edges raster-colorizer-default-color line-rasterizer  
shield-unlock-image shield-text-opacity background-image  
polygon-pattern-simplify raster-colorizer-epsilon direct-image-filters  
text-vertical-alignment line-pattern-simplify  
polygon-gamma-method shield-character-spacing  
polygon-pattern-alignment marker-max-error  
background-image-opacity polygon-geometry-transform  
raster-filter-factor

# Basic map properties

- `background-color: #rrggbb;`
- `background-image: url('directory/file.png');`
- `background-image-opacity: float [0..1];`

# Basic point properties

- `marker-fill: #rrggbb;`
- `marker-width: size;`
- `marker-opacity: float [0..1];`
- `marker-line-color: #rrggbb;`
- `marker-line-width: size;`
- `marker-line-opacity: float [0..1];`

# Basic line properties

- `line-color: #rrggbb;`
- `line-opacity: float [0..1];`
- `line-width: size;`
- `line-dasharray: dash_length,  
gap_length;`

# Basic polygon properties

- `polygon-fill: #rrggbb;`
- `polygon-opacity: float [0..1];`
- `building-fill: #rrggbb;`
- `building-fill-opacity: float[0..1];`
- `building-height: size;`

# Basic text properties

- `text-name: [some_field];`
- `text-face-name: font name;`
- `text-size: size;`
- `text-fill: #rrggbb;`
- `text-halo-fill: #rrggbb;`
- `text-halo-radius: size;`

# MapBox Studio Demo



# Exercise 1

- Create a new project using *basic* default style
  1. Change *buildings* fill color to **#c1b0ad**
  2. Display *parks* from **landuse** in **#6db569**
  3. Using **poi\_label** display attribute *name* when zoom is **≥19**
  4. Display motorways (inc. tunnels, bridges and links) in **#fc8** with a size of **3px**

# Exercise 2

- Change source to `mapbox.mapbox-terrain-v1, mapbox.mapbox-streets-v5`
- Add a style to display *contours* with named labels
  - Find a way to display every **50m** in bolder

# Exercise 3

1. Download shape file at <http://heig.ch/hogu>
2. Create a new project "Blank source"
3. Add a new layer and select the downloaded shape file
4. Save the project
5. Upload the project to mapbox
6. Copy the generated layer name

# Exercise 4

- With a blank project
  - Create a map style "for the night" using layers `mapbox.mapbox-terrain-v1`, `mapbox.mapbox-streets-v5`, `your_custom_layer_name`
  - Use layer `#SCR3857_COMMUNES`

# Usage with "geoweb frameworks" ?

- OpenLayers 2.x  
<http://heig.ch/rodi>
- OpenLayers 3.x  
<http://heig.ch/bimubu>
- LeafLet  
<http://heig.ch/bibipe>

# Pro & Cons

- + Understandable
- + Relatively fast
- + Updatable
- + It is the little things that make the difference
- One more thing to maintain
- Data update ?