

Advanced CartoCSS Tricks

Alan McConchie

Stamen Design
@mappingmashups
@stamen

with thanks to
Seth Fitzsimmons and Kate Watkins

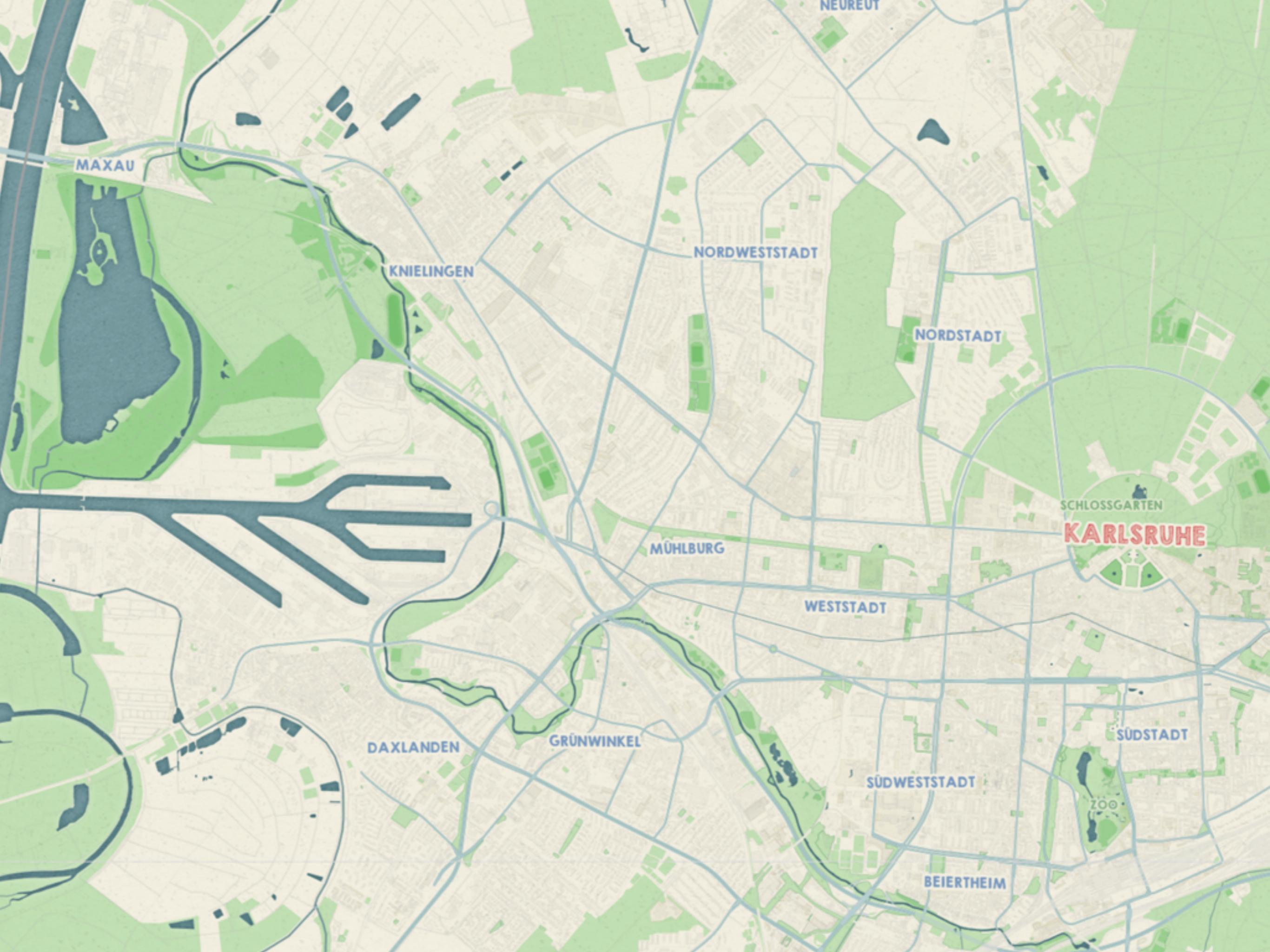
**Maps with distinct
personalities**

Pinterest

Goal: Playful, handcrafted







NEUREUT

MAXAU

KNIELINGEN

NORDWESTSTADT

NORDSTADT

MÜHLBURG

WESTSTADT

SCHLOSSGARTEN
KARLSRUHE

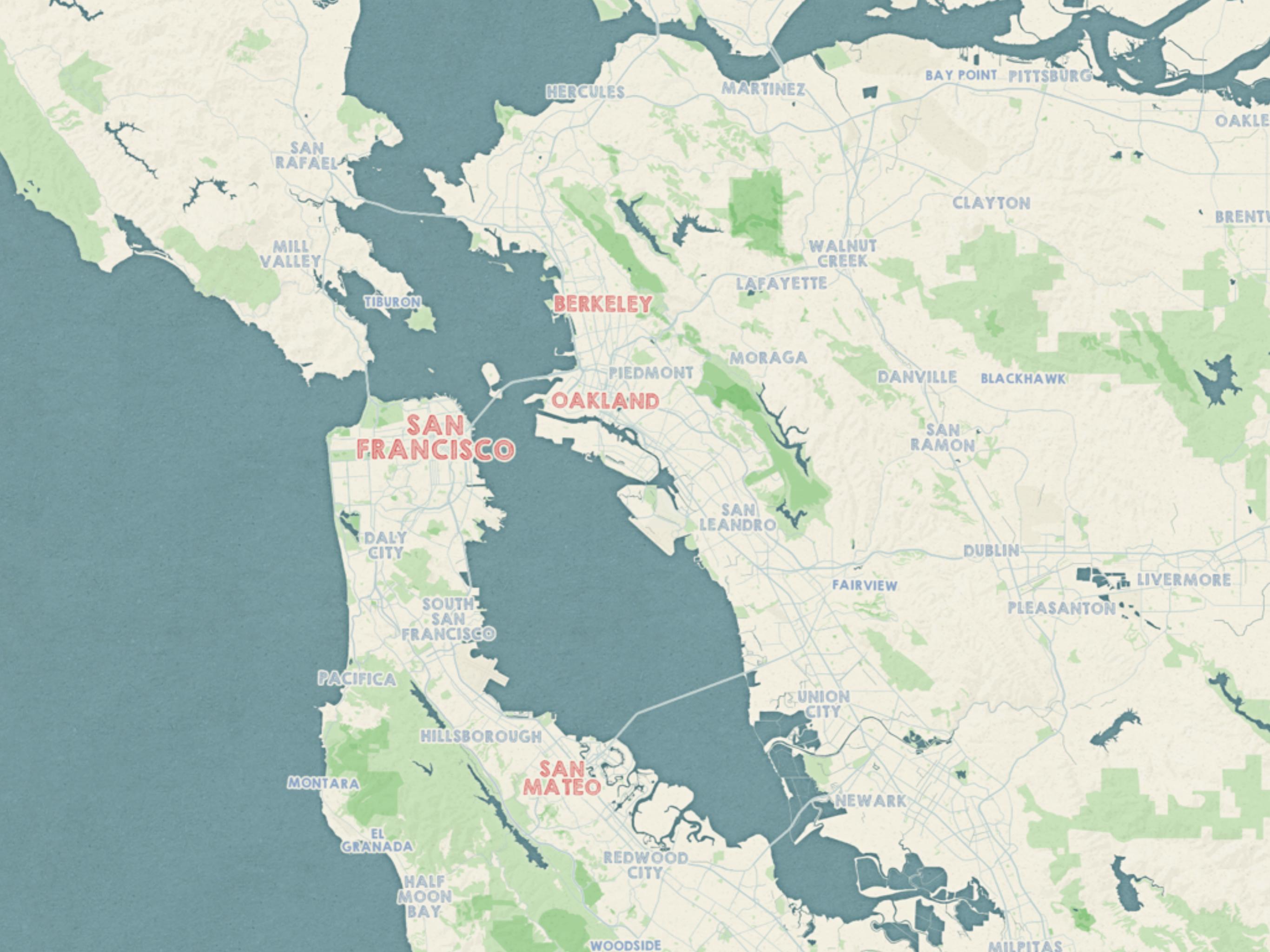
DAXLANDEN

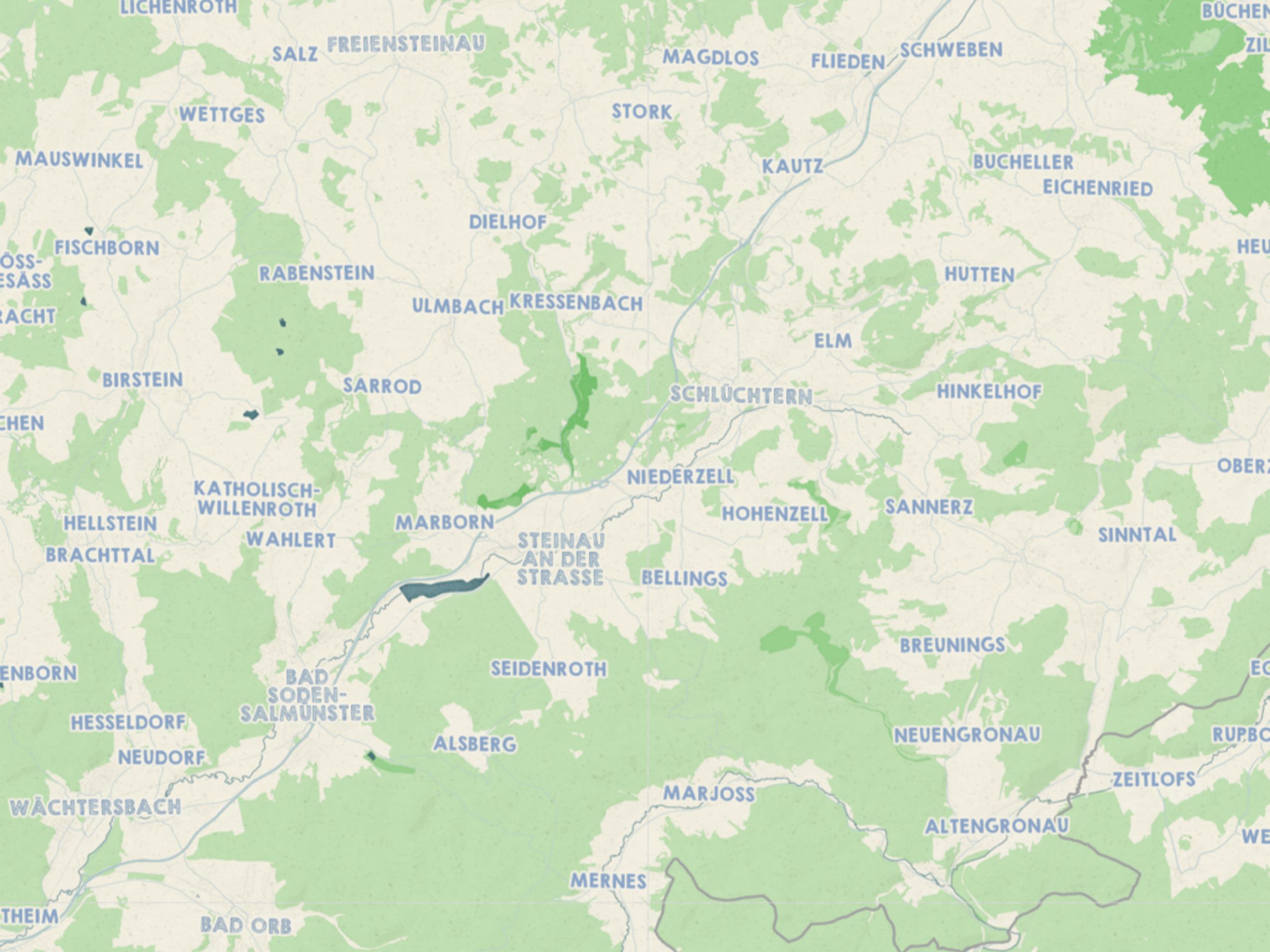
GRÜNWINKEL

SÜDWESTSTADT

BEIERTHEIM

SÜDSTADT





LICHENROTH

SALZ FREIENSTEINAU

MAUSWINKEL

WETTGES

ÖSS-
ESÄSS

RACHT

FISCHBORN

BIRSTEIN

EHEN

HELLSTEIN

BRACHTTAL

KATHOLISC-
WILLENROTH

WAHLERT

ENBORN

HESELDORF

NEUDORF

WÄCHTERSBACH

BAD
SODEN-
SALMUNSTER

ALSBERG

SEIDENROTH

MARJOSS

MERNES

THEIM

BAD ORB

ULMBACH KRESSENBACH

RABENSTEIN

SARROD

MARBORN

STEINAU
AN DER
STRASSE

BELLINGS

NIEDERZELL

HOHENZELL

SANNERZ

SINTAL

BREUNINGS

NEUENGRONAU

ALTENGRONAU

RUPBC

ZEITLOFS

WE

MAGDLOS

STORK

FLIEDEN SCHWEBEN

KAUTZ

BUCHELLER

EICHENRIED

HUTTEN

ELM

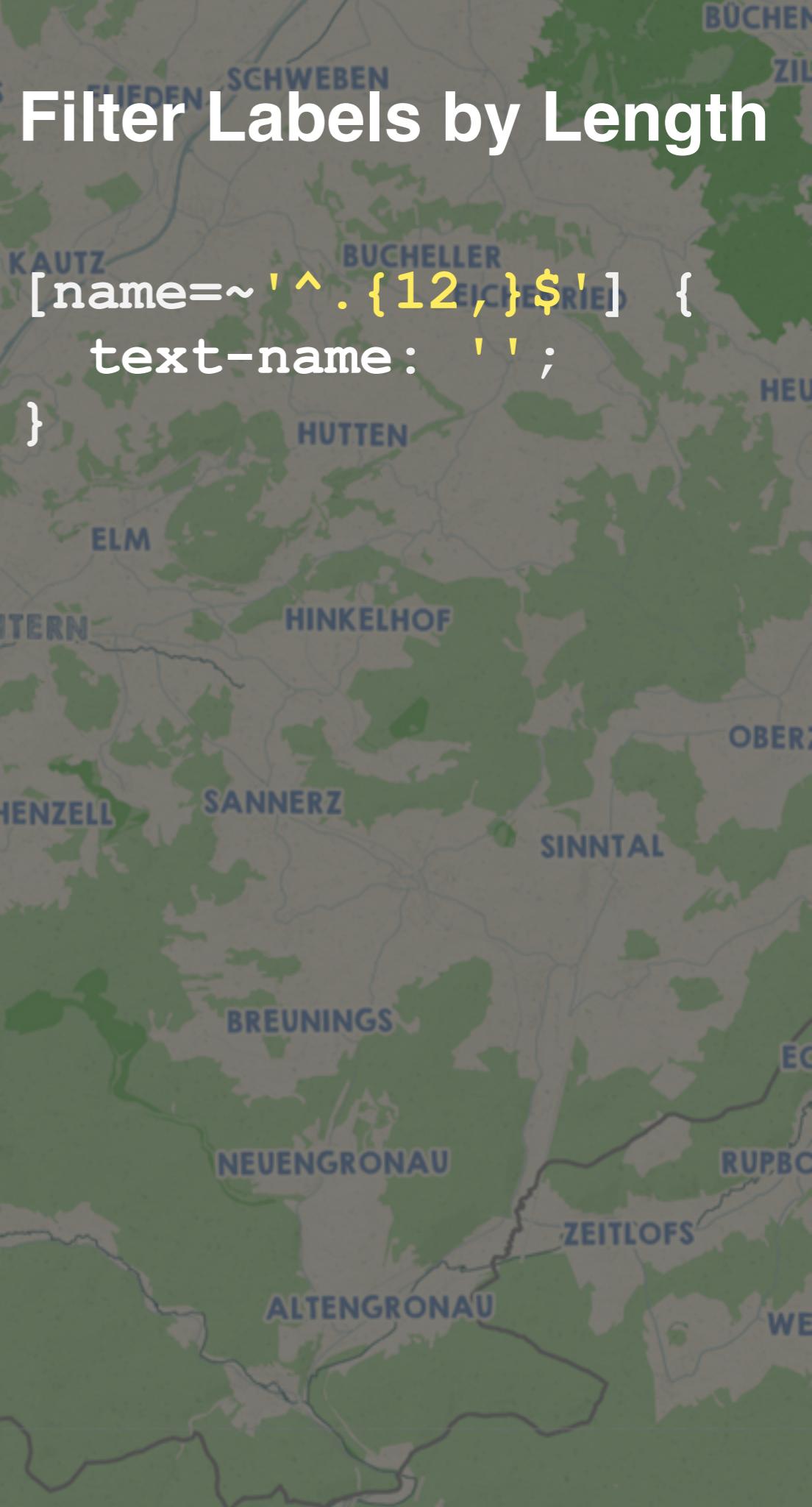
HINKELHOF

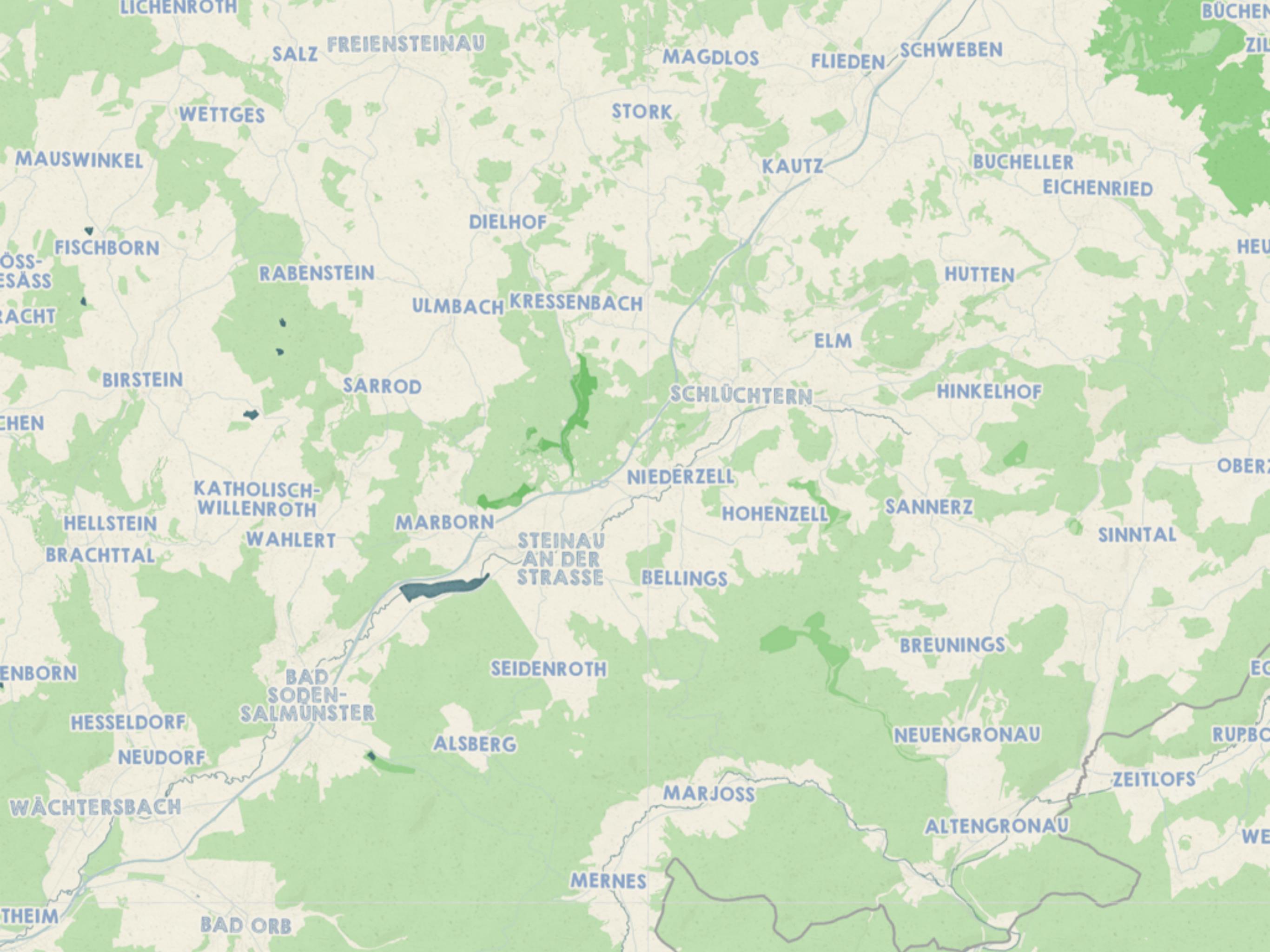
OBER

EG

ZIL

BÜCHEN





LICHENROTH

SALZ FREIENSTEINAU

MAUSWINKEL

WETTGES

ÖSS-
ESÄSS
RACHT

FISCHBORN

RABENSTEIN

BIRSTEIN

EHEN

HELLSTEIN

BRACHTTAL

KATHOLISC-
WILLENROTH

WAHLERT

ENBORN

HESELDORF

NEUDORF

WÄCHTERSBACH

BAD
SODEN-
SALMUNSTER

ALSBERG

SEIDENROTH

MARJOSS

MERNES

THEIM

BAD ORB

MAGDLOS

STORK

FLIEDEN SCHWEBEN

KAUTZ

BUCHELLER

EICHENRIED

DIELHOF

ULMBACH KRESSENBACH

SARROD

SCHLÜCHTERN

ELM

NIEDERZELL

HOHENZELL

SANNERZ

SINTAL

BELLINGS

BREUNINGS

NEUENGRONAU

ALTENGRONAU

RUPBC

ZEITLOFS

WE

BÜCHEN

ZIL

HEU

OBER

NIGER

CHAD

SUDAN

ERITRE

NIGERIA

CENTRAL
AFRICAN
REPUBLIC

SOUTH
SUDAN

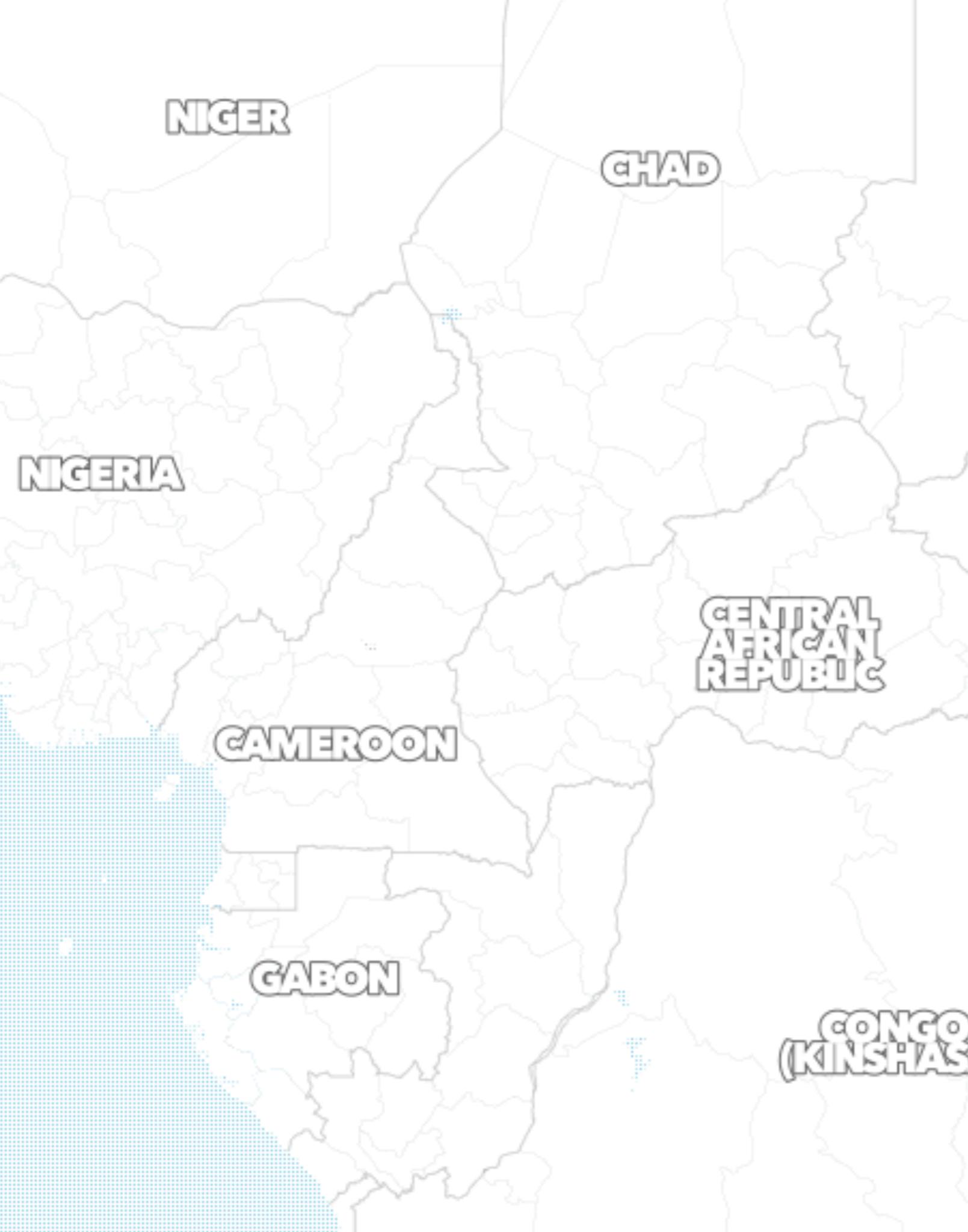
CAMEROON

UGANDA

KENY

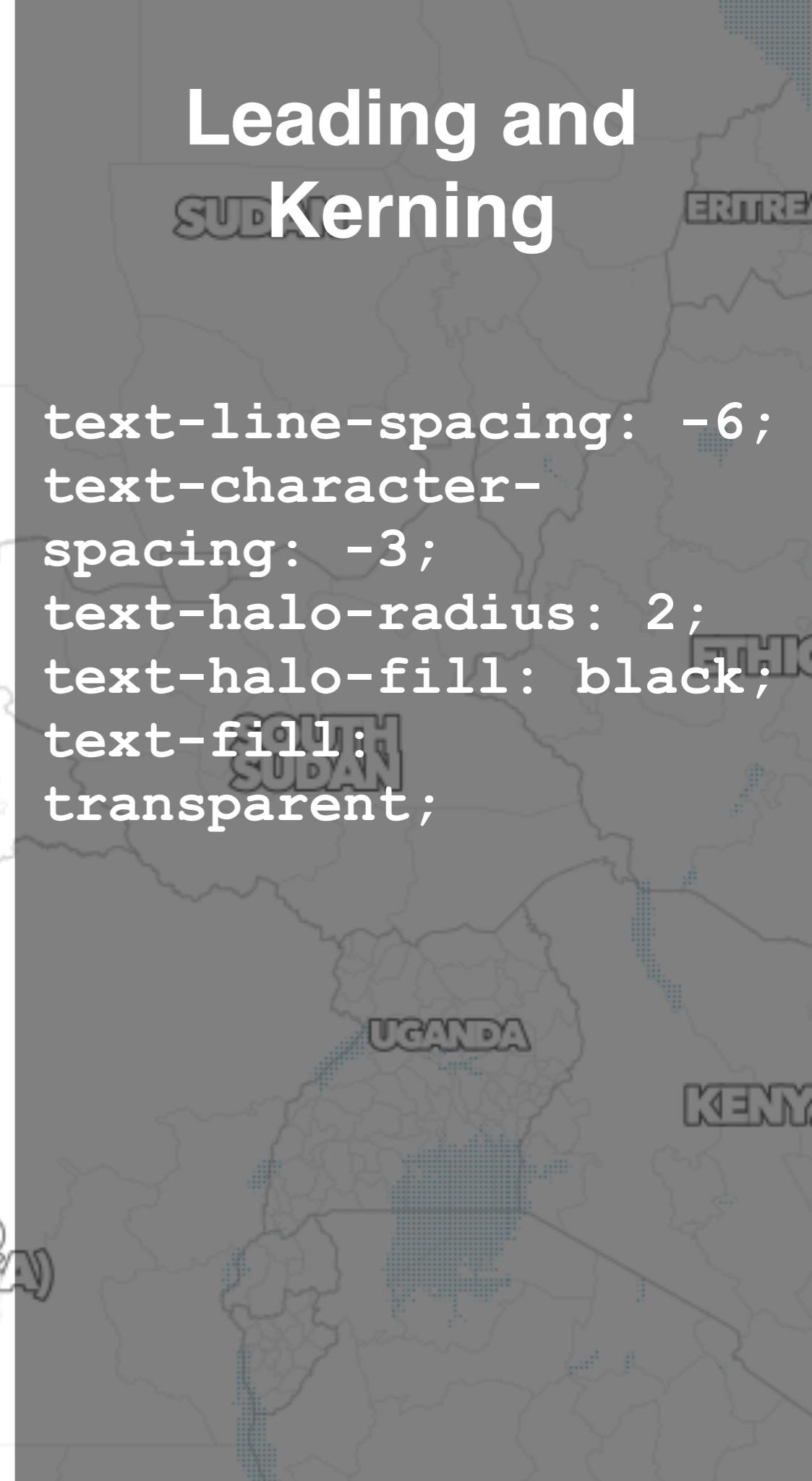
GABON

CONGO
(KINSHASA)



Leading and Kerning

```
text-line-spacing: -6;  
text-character-  
spacing: -3;  
text-halo-radius: 2;  
text-halo-fill: black;  
text-fill:  
transparent;
```



NIGER

CHAD

SUDAN

ERITRE

NIGERIA

CENTRAL
AFRICAN
REPUBLIC

SOUTH
SUDAN

CAMEROON

UGANDA

KENY

GABON

CONGO
(KINSHASA)





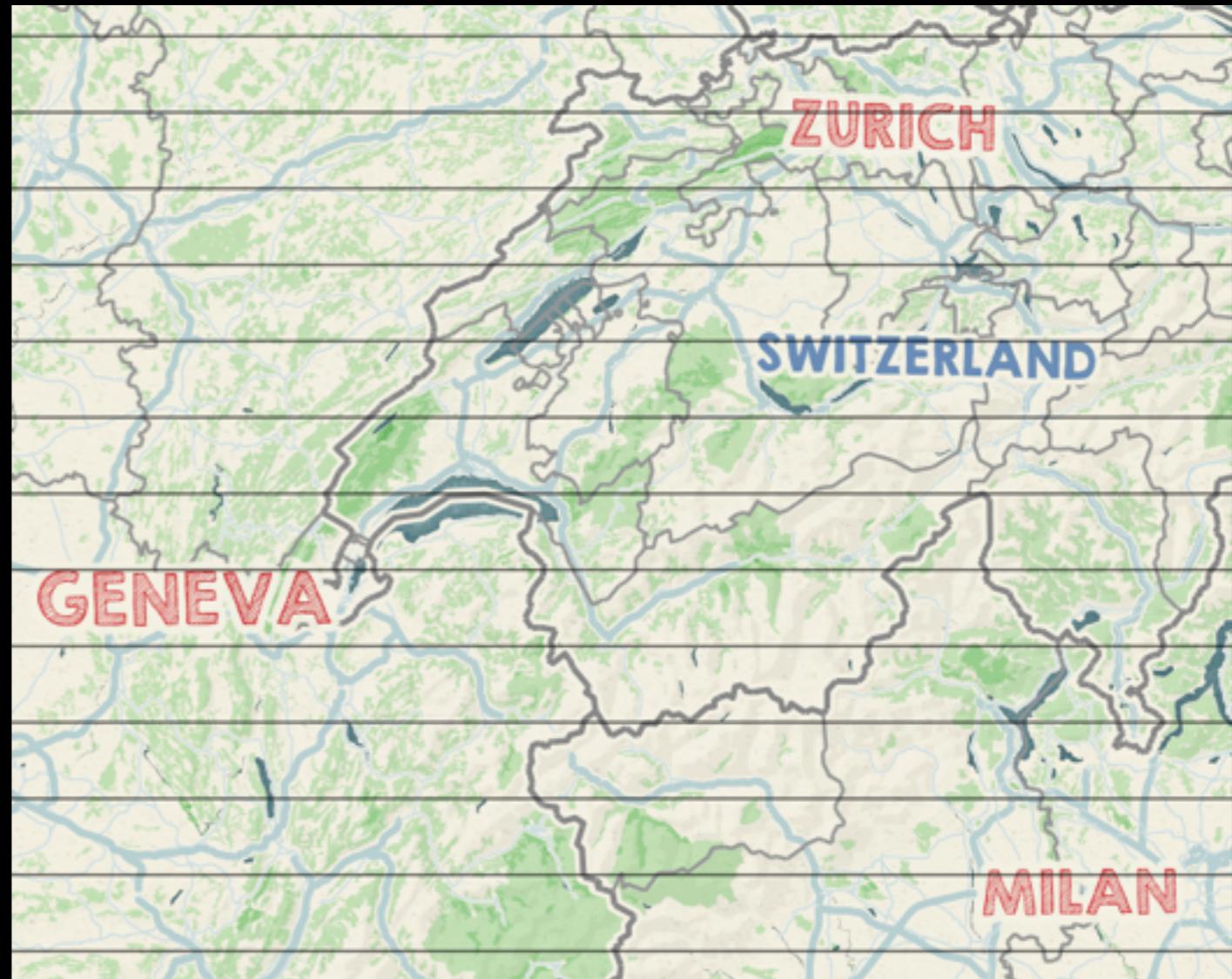
Position Overrides

```
#state_label {  
  [name='California'] {  
    text-orientation:  
      -44;  
    text-size: 20;  
  }  
}
```





Entropy and Labeling



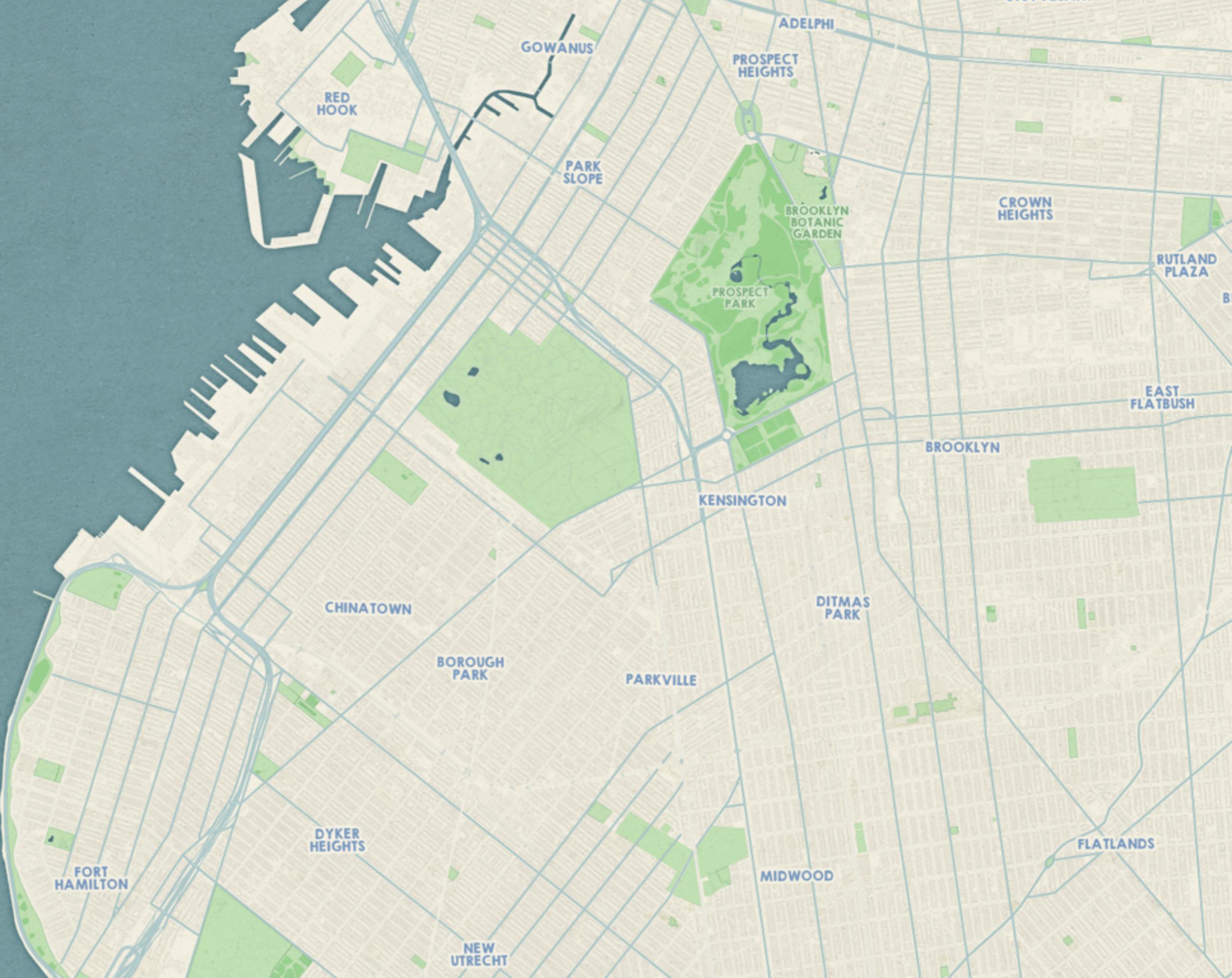
```
#place_label {  
    text-orientation: [osm_id] % 3 - 1.5;  
  
    [osm_id<0] {  
        text-orientation: ([osm_id] * -1) % 3 - 1.5;  
    }  
}
```

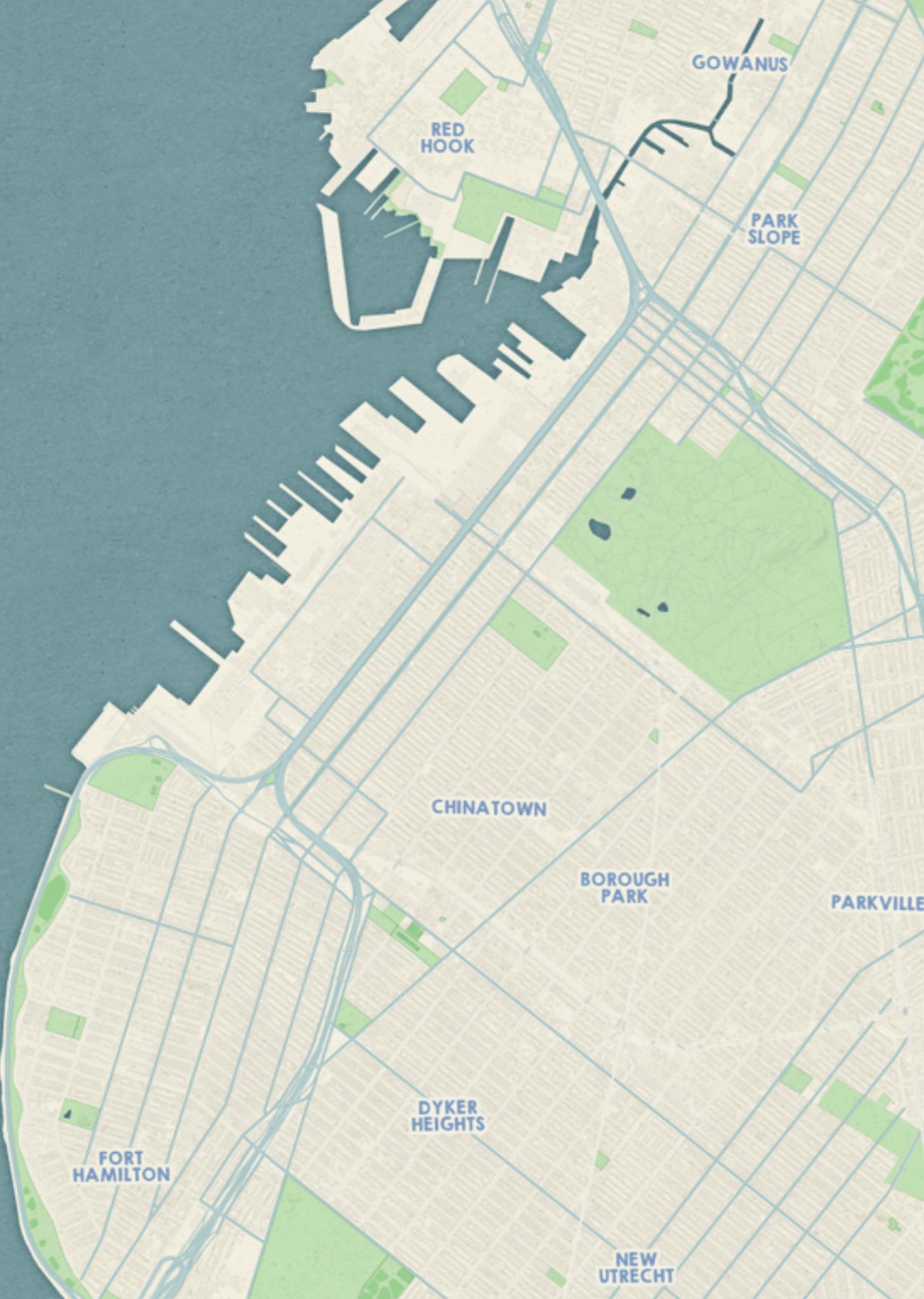






Texturing





Drop Shadows

```
#water {
  ::shadow {
    polygon-fill:
      lighten(#444, 1%) ;
  }
  ::fill {
    polygon-fill: #fff;
    comp-op: soft-light;
    image-filters:
      agg-stack-blur(10,10);
  }
  ::background {
    polygon-pattern-file:
      url("images/bg.png");
    comp-op: hard-light;
  }
}
```

Parks Conservancy

Goal: Get people to the Parks!





The Marine Mammal Center

LAGOON/VALLEY

Miwok Trail

NatureBridge
(formerly Headlands
Institute)

Lagoon Trail

Scotty's Bluff

FORT CRONKHITE

RODEO BEACH

Marin Headlands
Visitor Center

MARIN HEADLANDS

Presidio Riding
Club

Historic Balloon
Hangar

Coastal Trail
Coastal Trail

NIKE Missile Site

Bicentennial
Campground



Point Bonita YMCA

Battery Mendell

BONITA COVE



Point Bonita Lighthouse

POINT BONITA

Coastal

+

-



github.com/parks-conservancy/map-labels

github.com/parks-conservancy/map-features

github.com/parks-conservancy/map-background

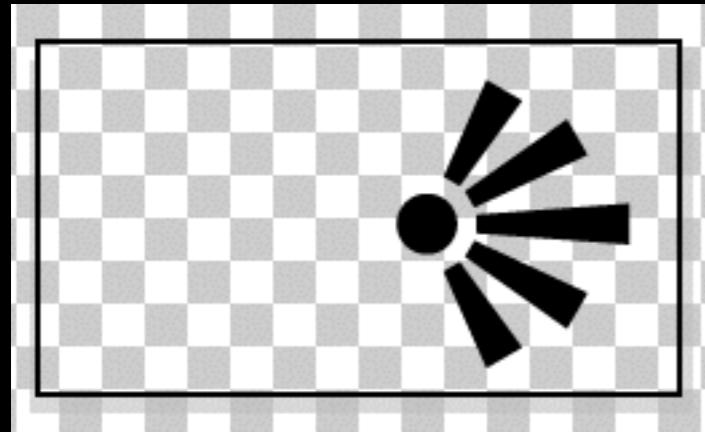
Shield and Marker trick



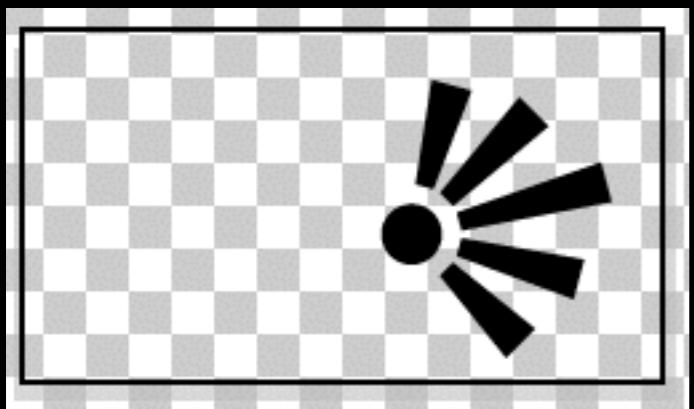




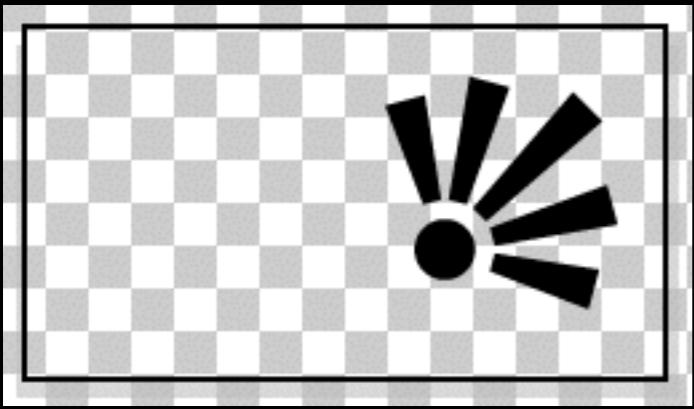
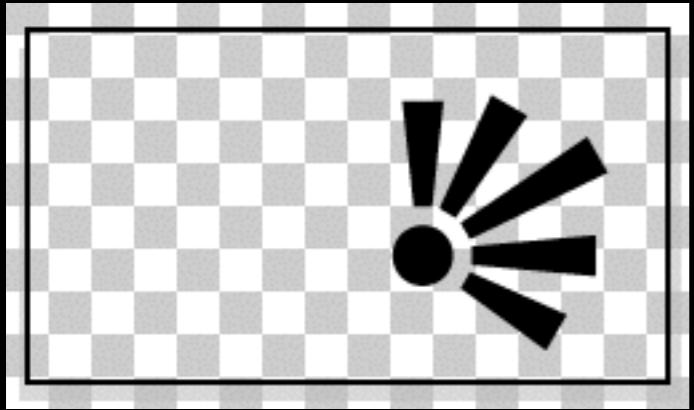




Marker Transformations



```
[type='Overlook'] {
  [orientation=15] {
    marker-file:
      url("images/
overlook2_36x18px_invert_buffer_15.svg");
  }
  [orientation=45] {
    marker-file:
      url("images/
overlook2_36x18px_invert_buffer_45.svg");
  }
  ...
}
```



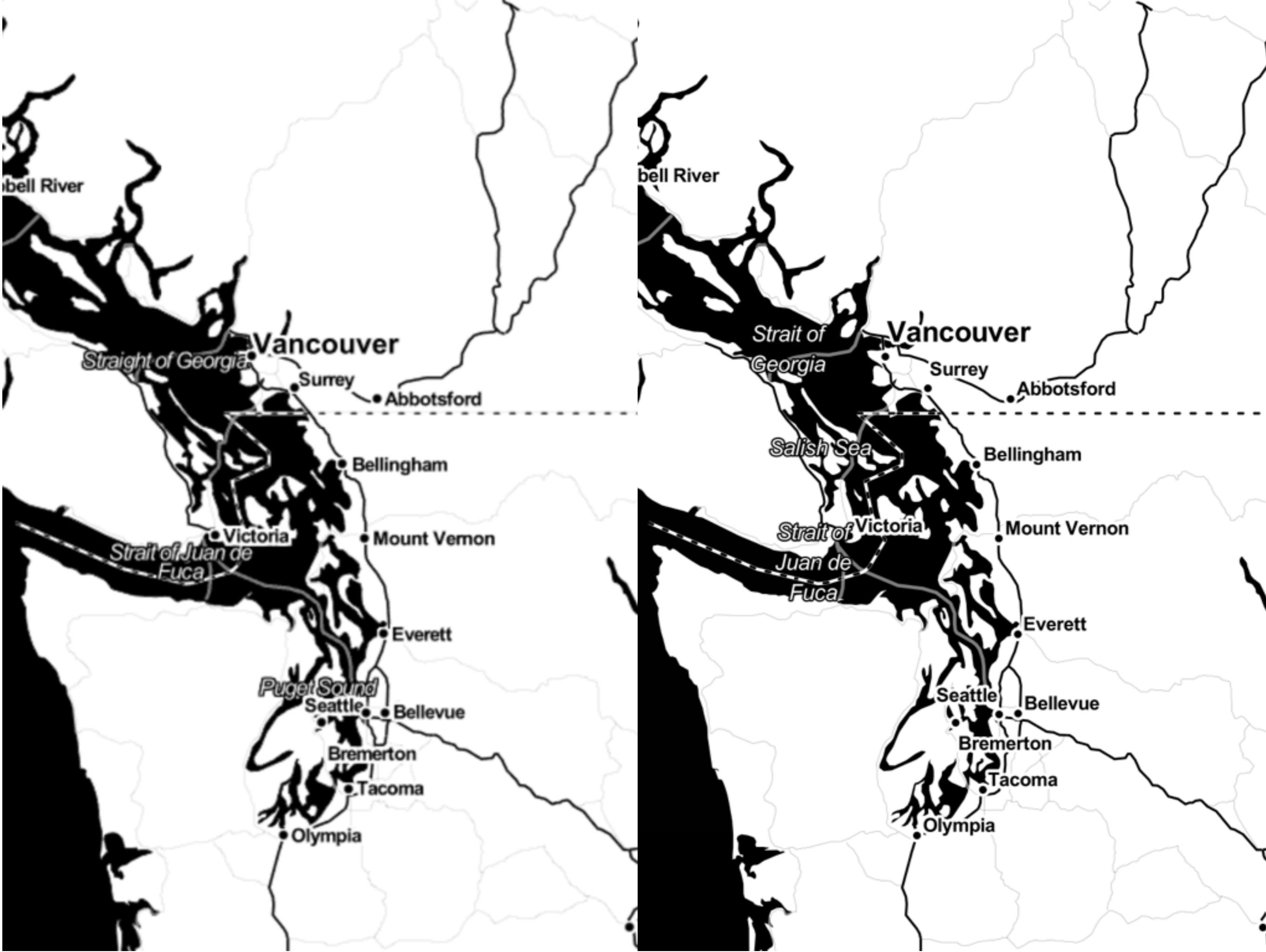
Updated Toner

Migrating from Cascadenik to CartoCSS

github.com/stamen/toner-carto

with lots of work from Brandon Liu (@bdon)

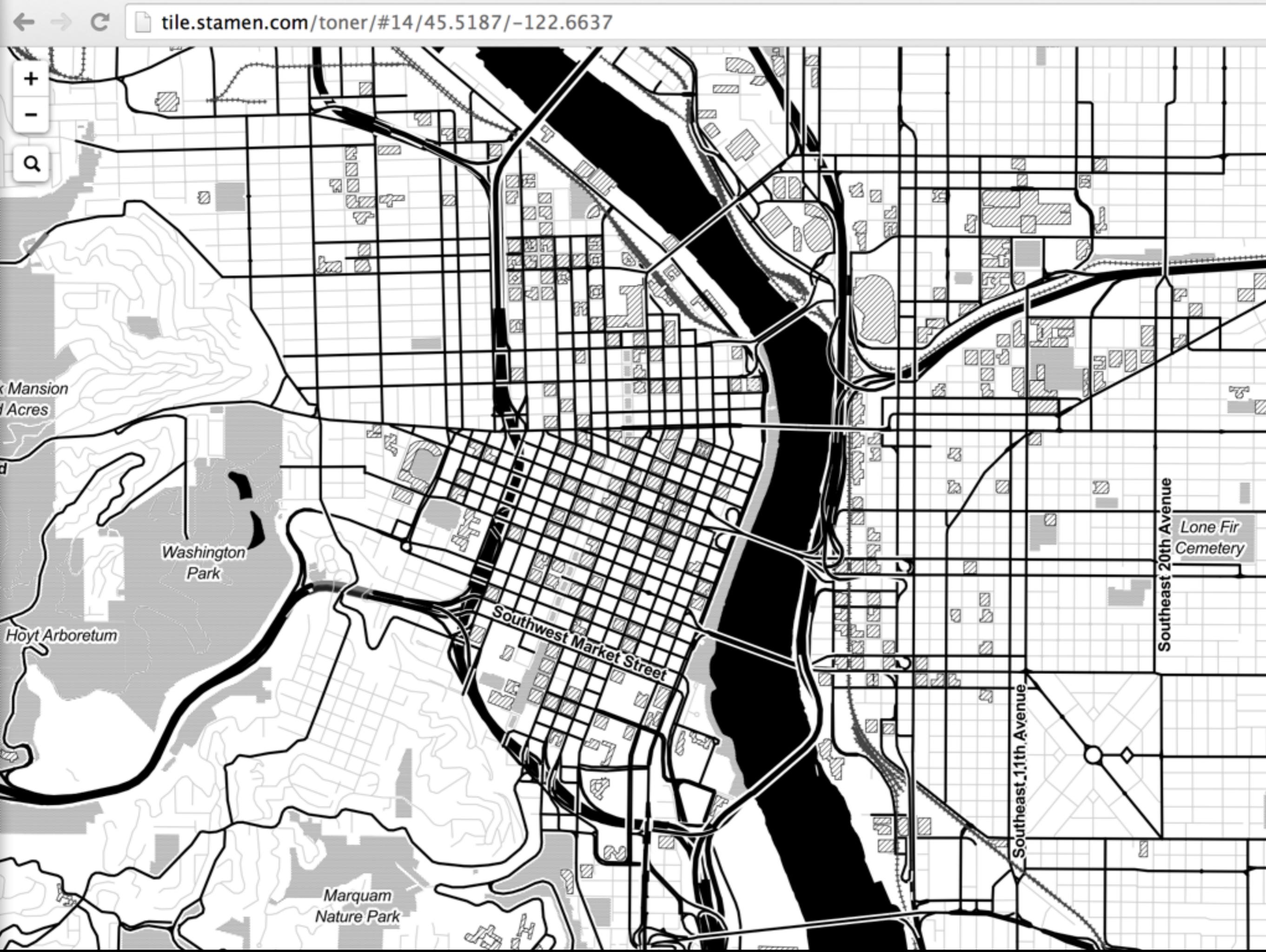


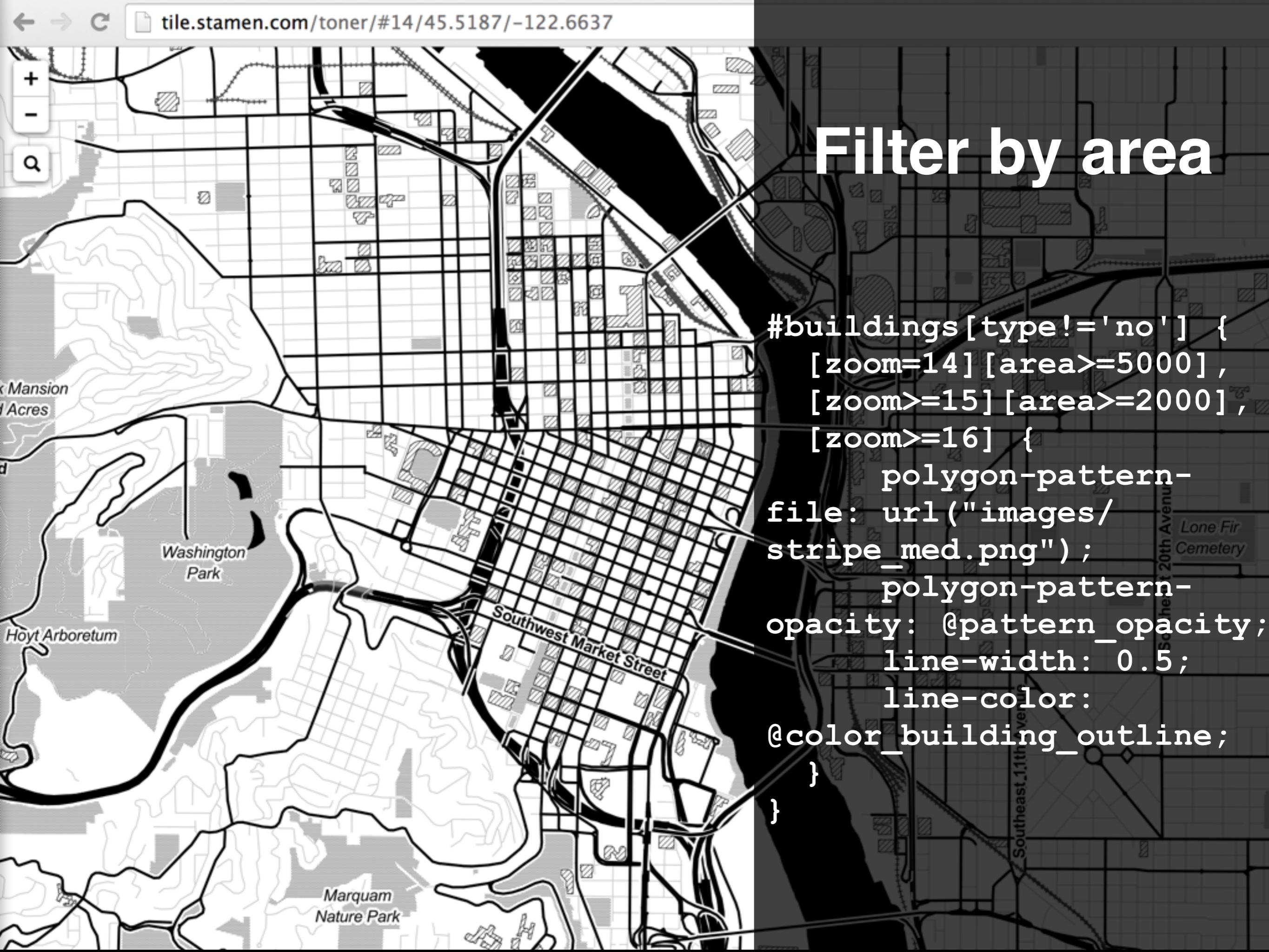


Special-case overrides

```
[name = 'Hecate Strait'] {  
    text-name: 'Hecate Strait' + [namealt];  
    // Because we know namealt is empty  
}  
[name = 'Straight of Georgia'] {  
    text-name: 'Strait of Georgia' + [namealt];  
}
```

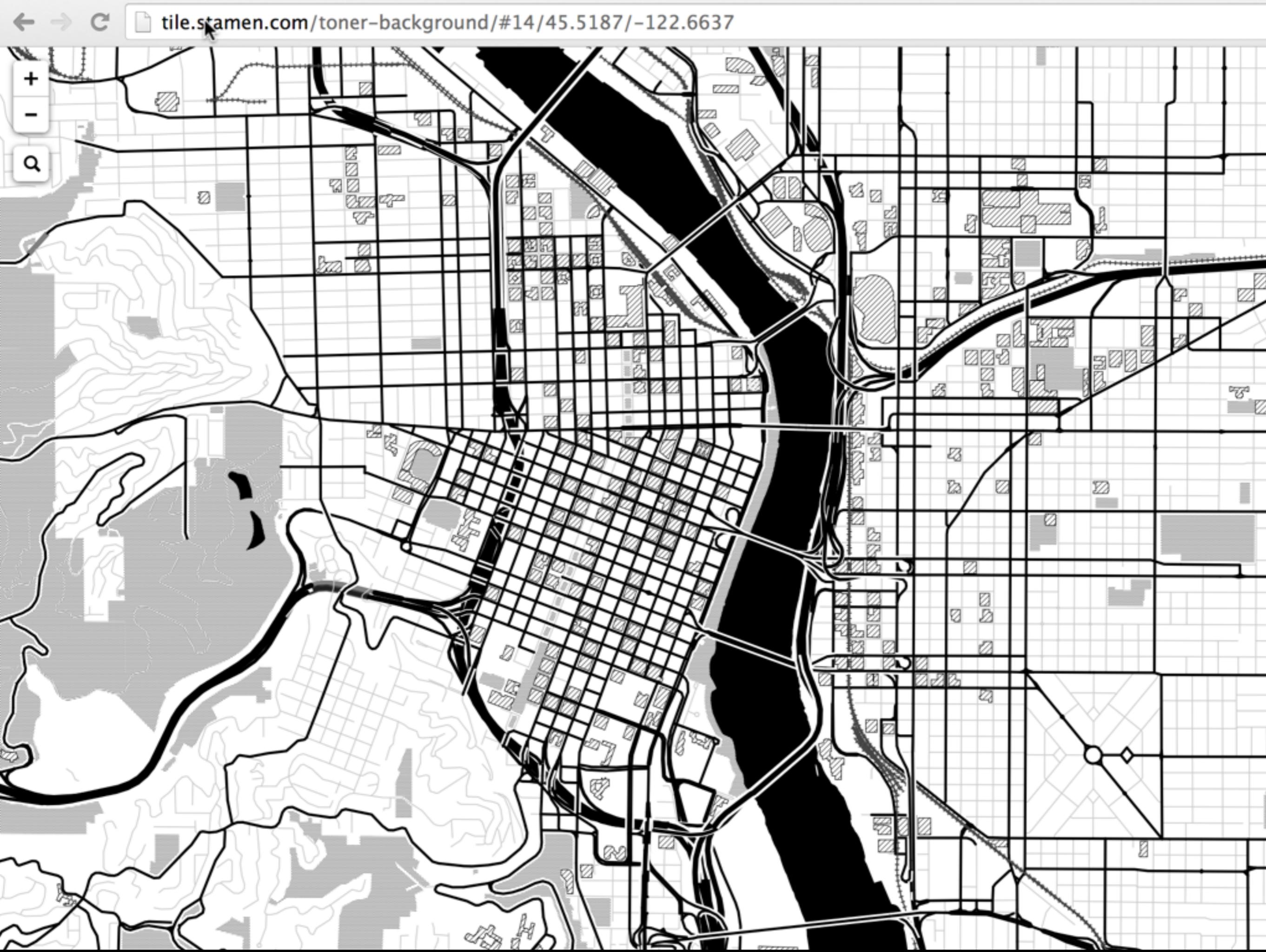


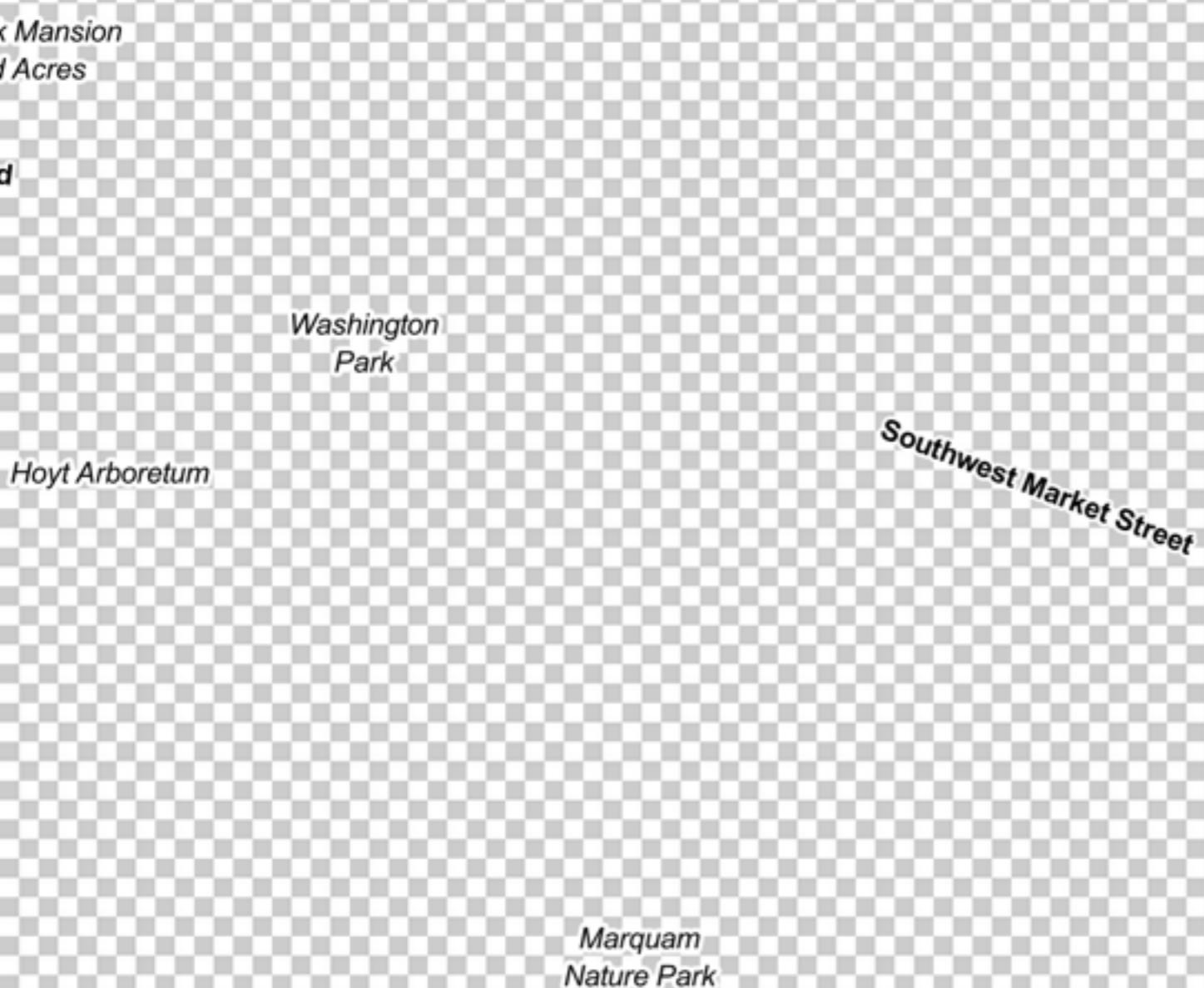




Filter by area

```
#buildings[type != 'no'] {  
  [zoom=14][area>=5000],  
  [zoom>=15][area>=2000],  
  [zoom>=16] {  
    polygon-pattern-  
    file: url("images/  
    stripe_med.png");  
    polygon-pattern-  
    opacity: @pattern_opacity;  
    line-width: 0.5;  
    line-color:  
    @color_building_outline;  
  }  
}
```





toner-labels.mss

```
Map {  
  background-color:  
  transparent;  
}
```

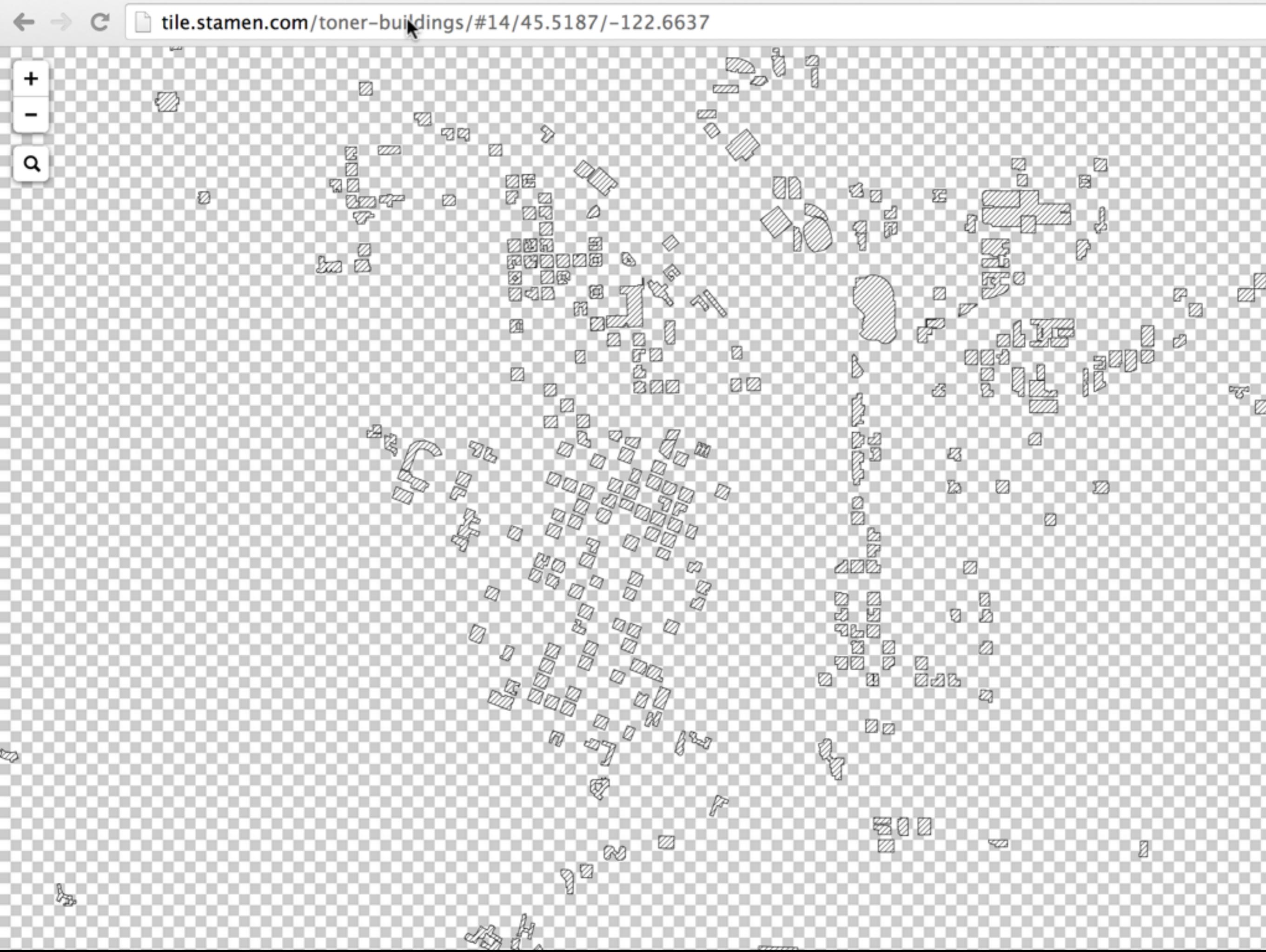
Southeast 11th Avenue

Lone Fir
Cemetery
Southeast 20th Avenue



toner-lines.mss

```
Map {  
  background-color:  
  transparent;  
}
```



+

-

🔍



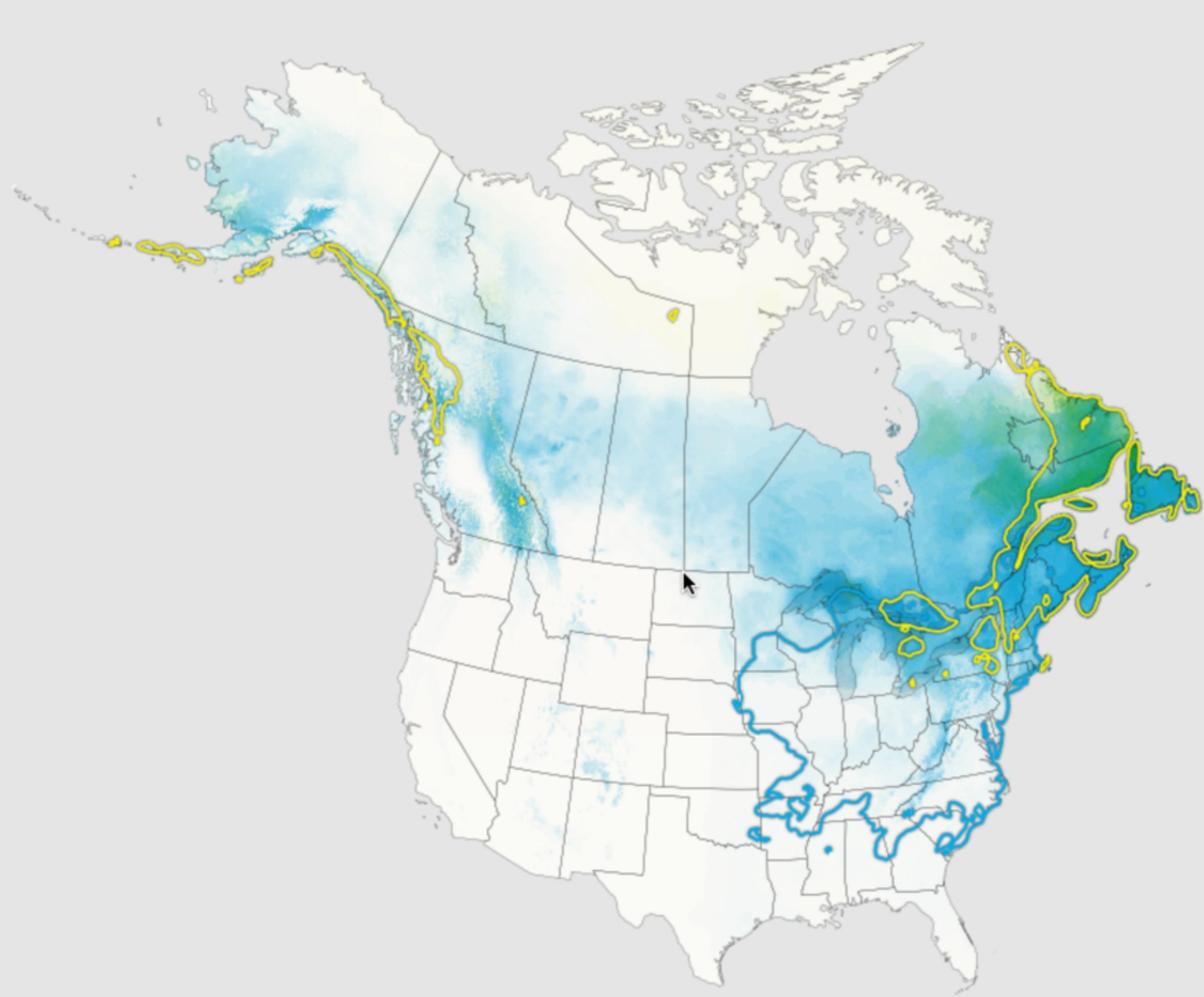


toner-lite.mss

```
@color_physical: lighten(#000, 85%);  
@color_physical_bright: #fff;  
@color_water: lighten(#000, 85%);  
@color_administrative_lowzoom: #000;  
@color_administrative_dark: lighten(#000,  
55%);  
@color_administrative_bright: #fff;  
@color_administrative_medium_low:  
lighten(#000, 55%);  
@color_administrative_medium_high:  
lighten(#000, 55%);  
@color_administrative_medium_high2:  
lighten(#000, 55%);  
@color_transport: lighten(#000, 55%);  
@color_transport_casing: #fff;  
@color_transport_inline: #fff;  
@color_transport_tunnel: lighten(#ccc, 55%);  
@color_transport_minor: #ccc;  
@color_transport_rail: #afafaf;  
@color_transport_path: #eddeded;  
@color_building_outline: lighten(#000, 85%);  
@color_building_outline_special:  
lighten(#00aeef, 85%);  
@color_airport_runways: #eee;  
@color_airport_runways_detail: #f2f2f2;  
@pattern_opacity: 0.15;
```

Audubon Society

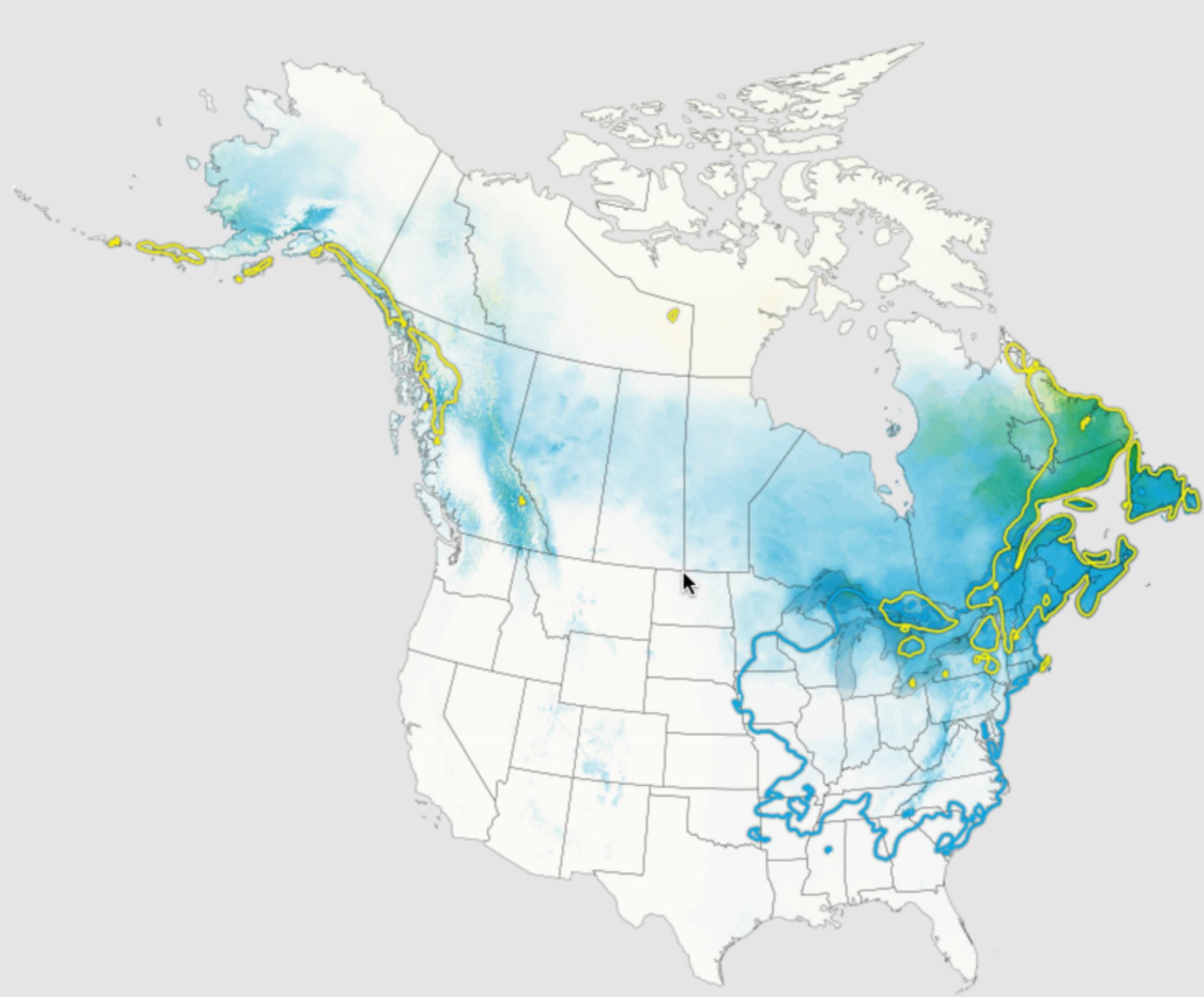
Mapping the Impact of Climate Change
on Bird Ranges

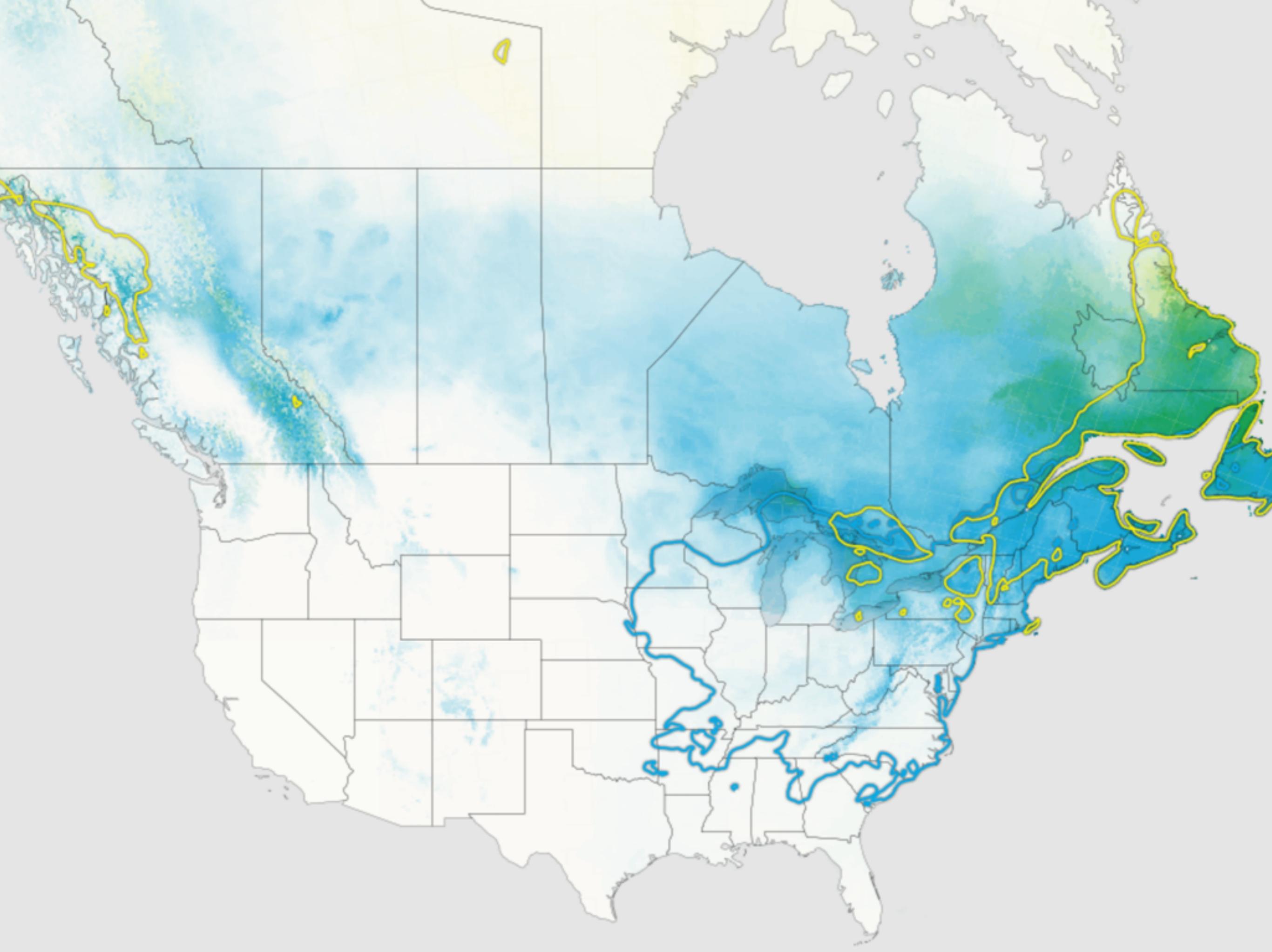


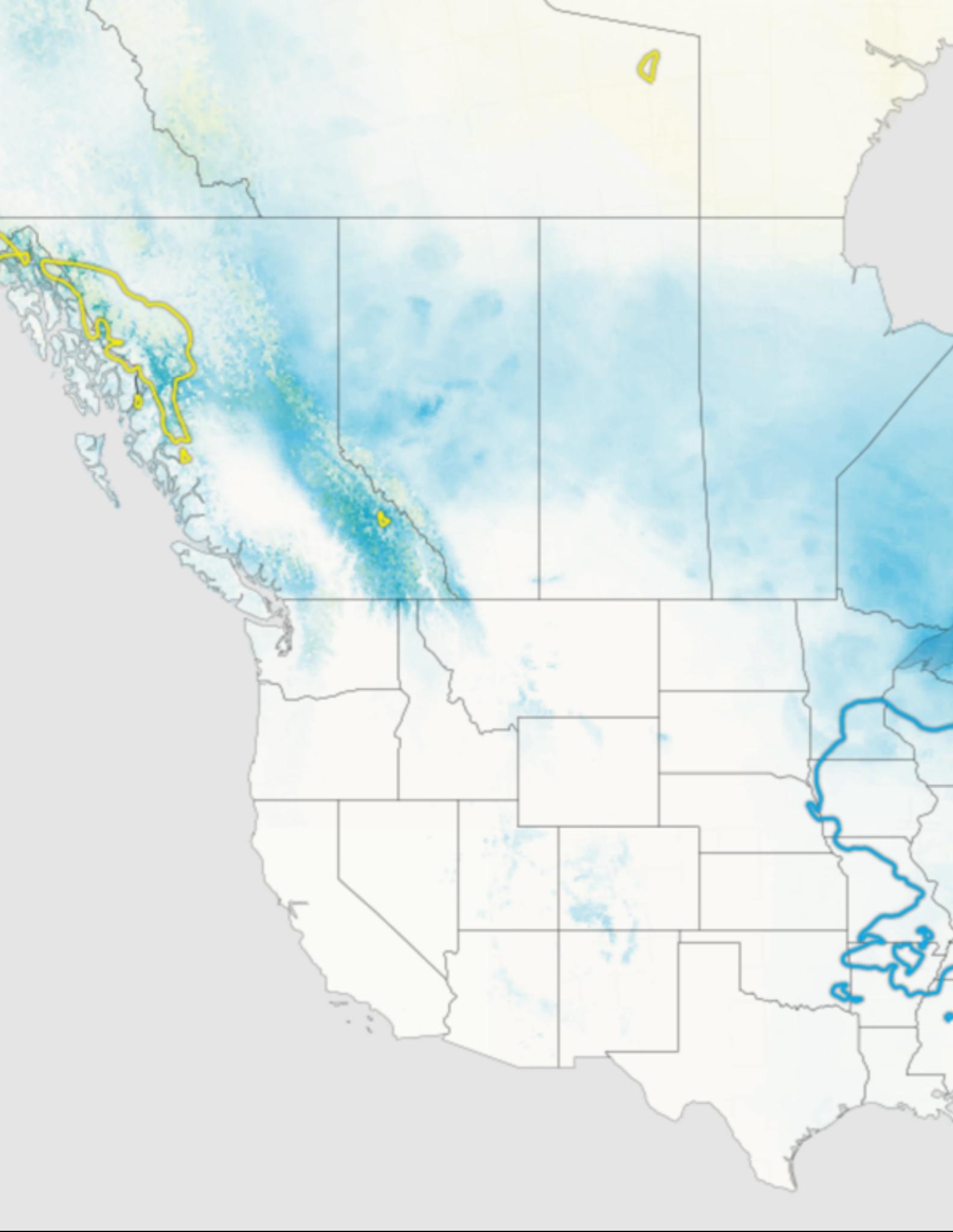
Blending rasters



```
@winterzero:  
rgba(10,168,227,0);  
@winterhigh:  
rgba(10,168,227,1);  
  
.winterraster {  
  raster-opacity:1;  
  raster-comp-op: multiply;  
  raster-colorizer-default-  
  mode:linear;  
  raster-colorizer-default-  
  color: transparent;  
  raster-colorizer-stops:  
    stop(0,@winterzero)  
    stop(1,@winterhigh)  
    stop(9999, transparent);  
}
```







Inside your project.mml

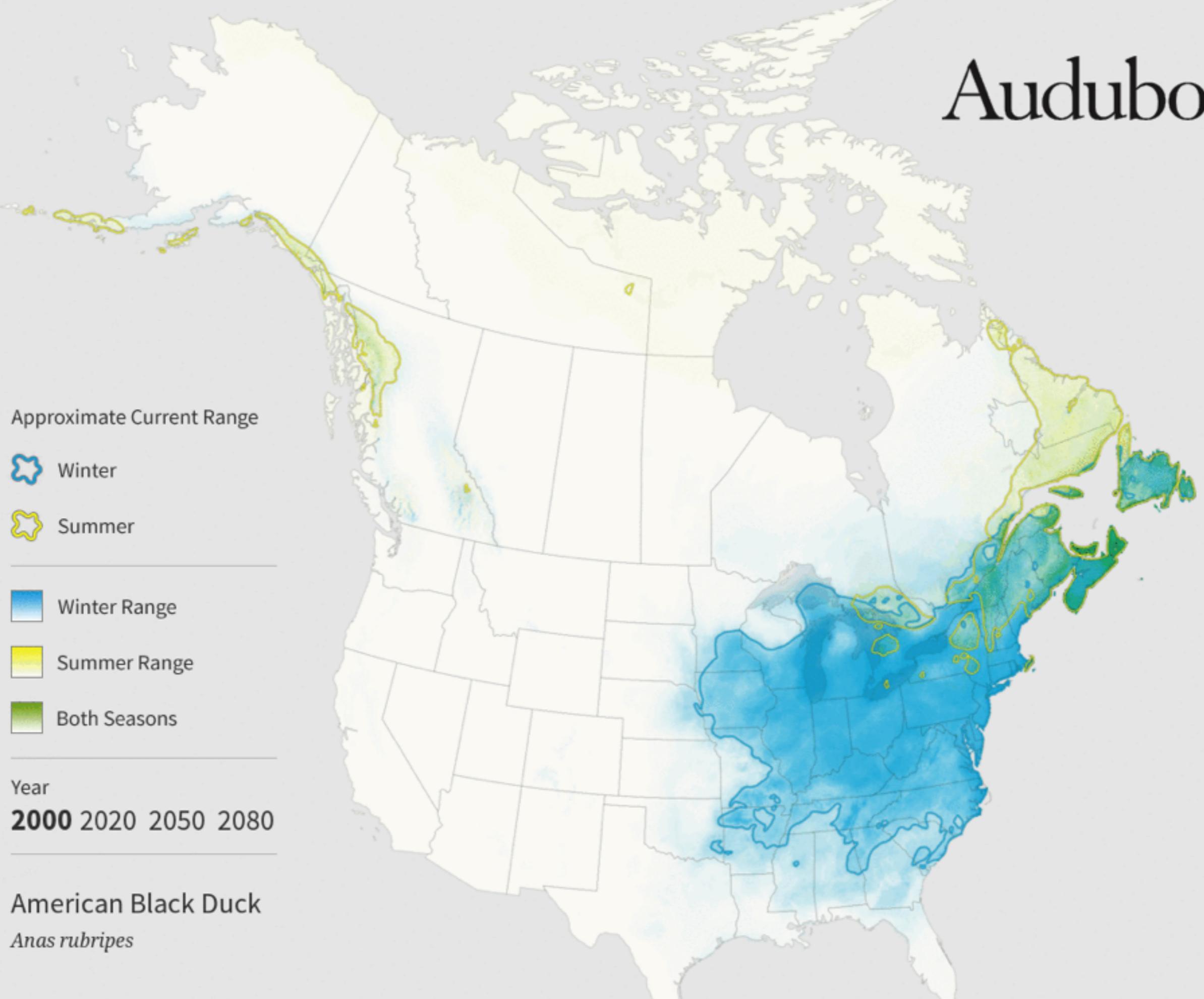
```
...
  "format": "png8",
  "interactivity":
false,
  "minzoom": 4,
  "maxzoom": 7,
  "srs": "+proj=merc
+a=6378137 +b=6378137
+lat_ts=0.0 +lon_0=0.0
+x_0=0.0 +y_0=0.0 +k=1.0
+units=m +nadgrids=@null
+wkttext +no_defs +over",
  "Stylesheet": [
    "style.mss"
  ],
  ...
}
```



Hack your project.mml

```
...
  "format": "png8",
  "interactivity":
false,
  "minzoom": 4,
  "maxzoom": 7,
  "srs": "+proj=aea
+lat_1=20 +lat_2=60
+lat_0=40 +lon_0=-96
+x_0=0 +y_0=0
+datum=NAD83 +units=m
+no_defs",
  "Stylesheet": [
    "style.mss"
  ],
  ...
}
```

Audubon



Scripted TileMill

Audubon

```
node  
Applications/TileMill/Contents/Resources/index.js  
export  
[tilemillproject]  
--format=png --width=1024 --height=768  
map.png
```

Approximate Current Range

 Winter

 Summer

 Winter Range

 Summer Range

 Both Seasons

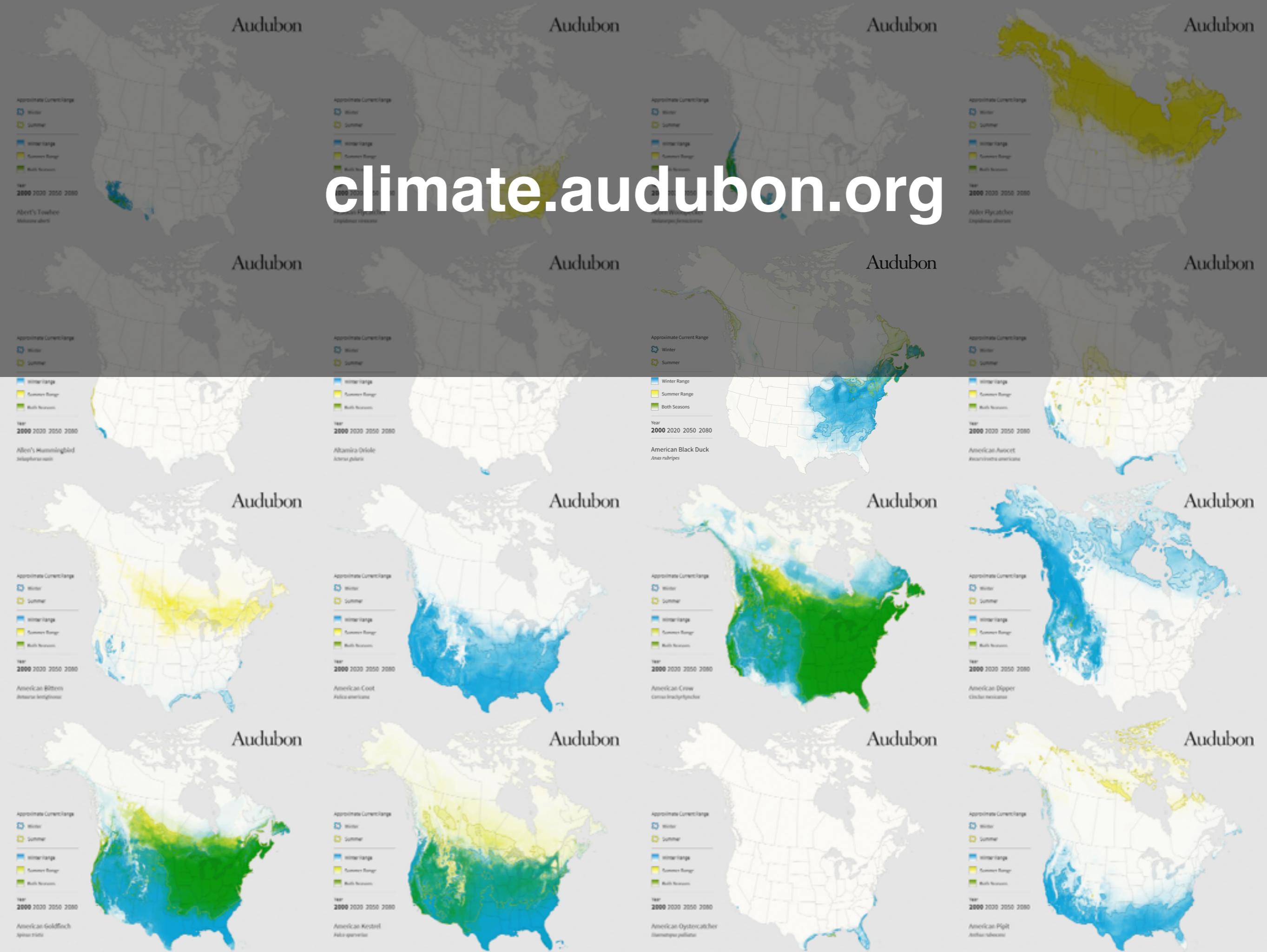
Year

2000 2020 2050 2080

American Black Duck

Anas rubripes





Map Scraps

washington

montana

oregon

idaho

wyoming

nevada

utah

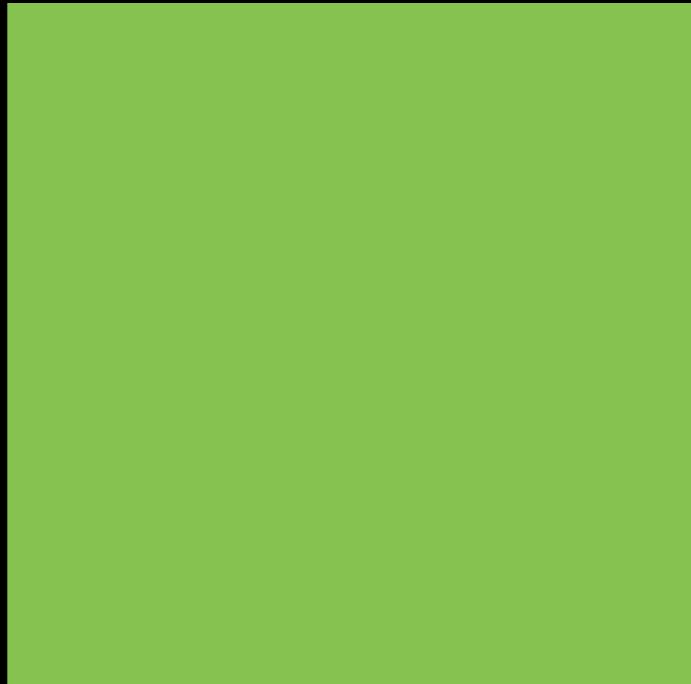
colorado

california

arizona

new
mexico

```
polygon-fill: #86c250;
```



+

=



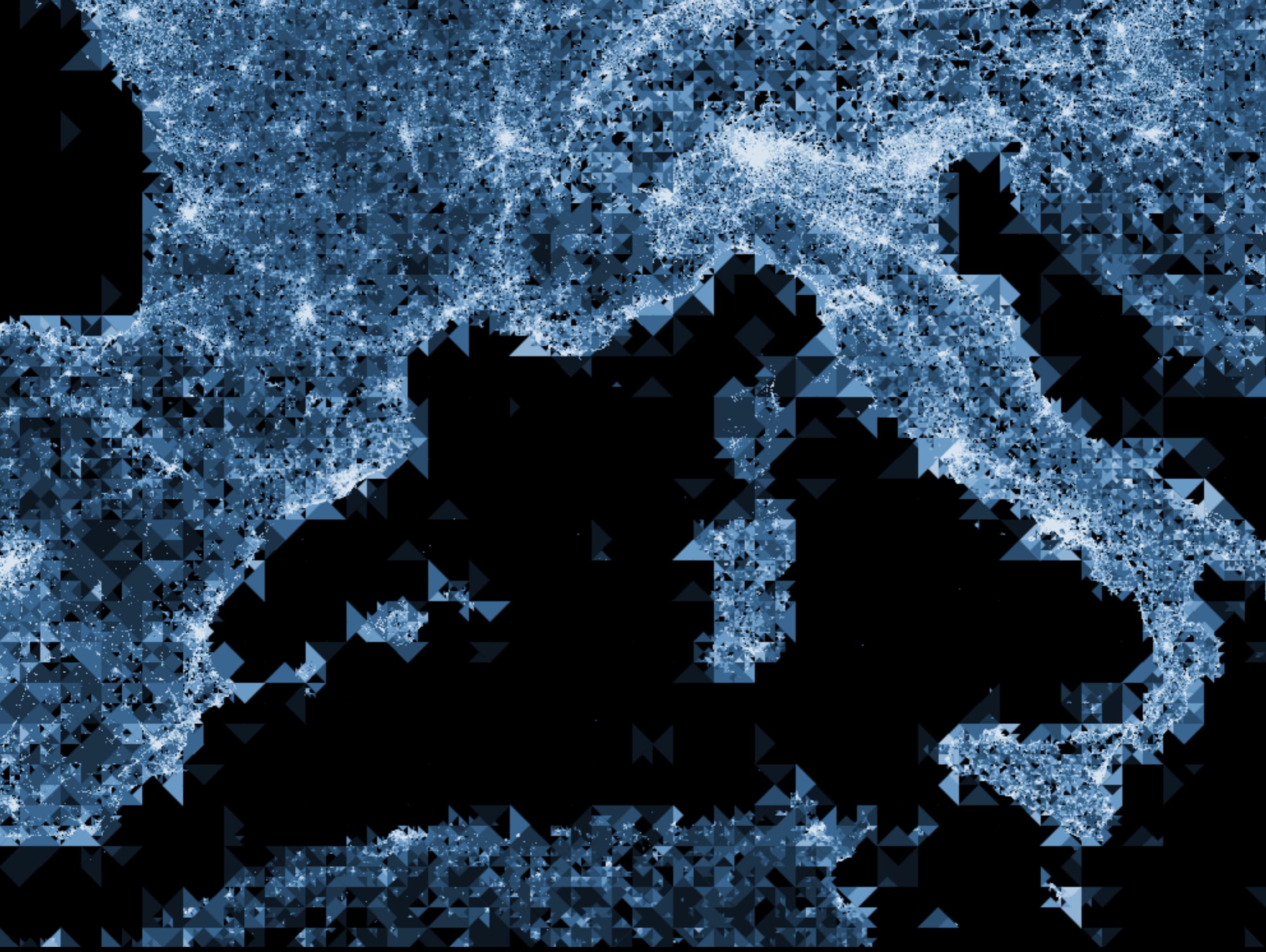
```
polygon-pattern-file: url("dot.png");  
polygon-pattern-alignment: global;
```

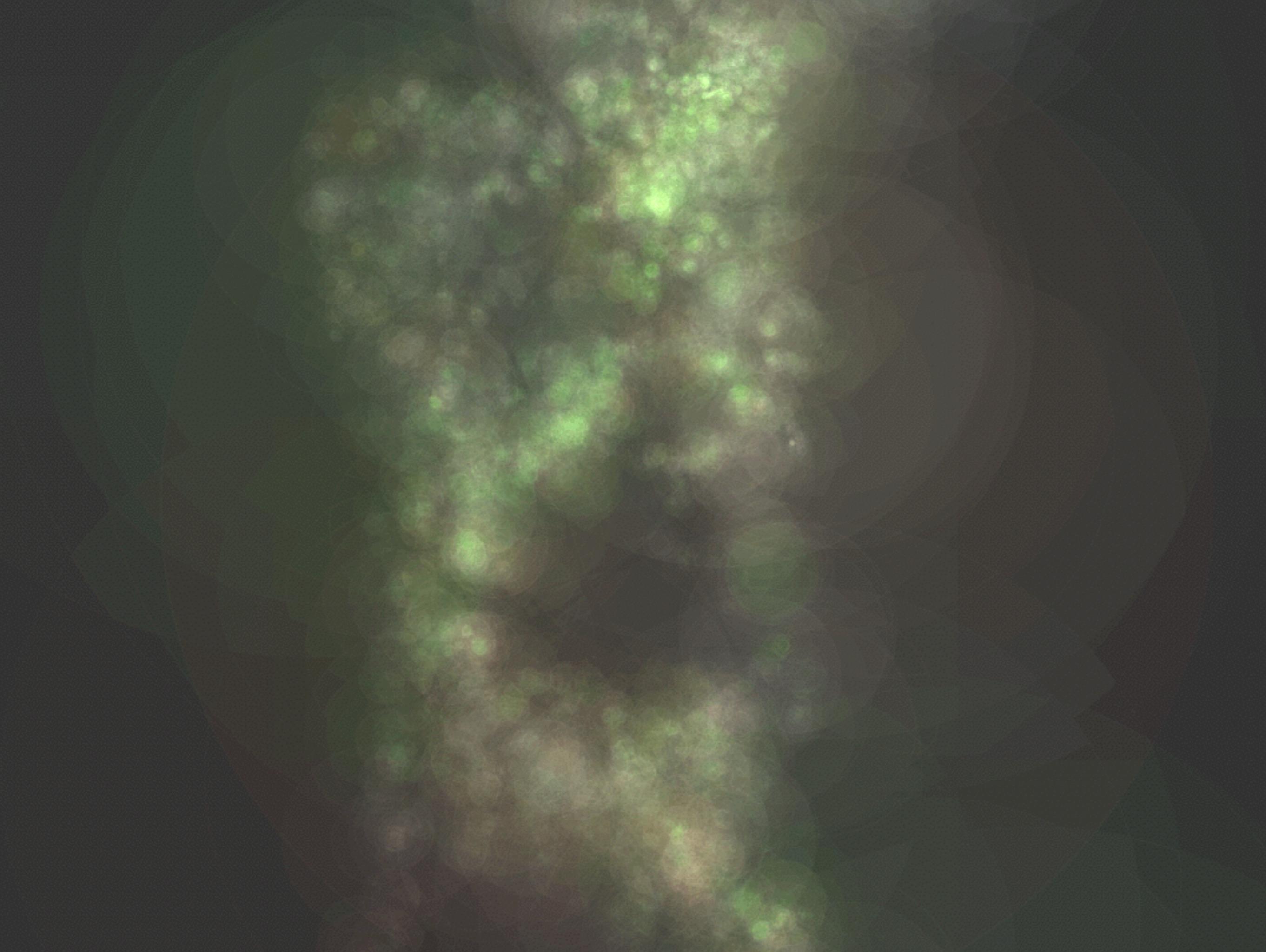


Symbol Fonts and Unicode Characters

```
#place_label {  
    text-name: '\x272a' +  
    [undefined]; // star  
}
```







Thank you



**Alan McConchie
@mappingmashups**

**with thanks to
Seth Fitzsimmons @mojodna
Kate Watkins @kateyw**