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Vector Tiles Cartography

MapTiler 서비스 플랫폼 소개

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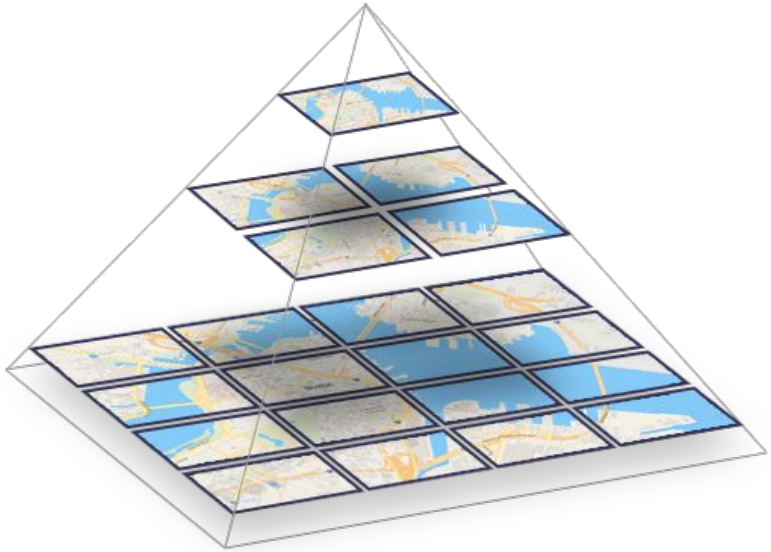
Cartography Lead

Hi, We're back
FOSS4G
KOREA 2022

Vector tiles

- Zoom levels pyramid
- Usually Pseudo-Mercator (EPSG:3857)
- Each tile can be found by Z/X/Y



https://www.maptiler.com/news/2019/02/what-are-vector-tiles-and-why-you-should-care/

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Vector tiles

- Points, lines and polygons
  - Encoded in pbf
  - Packed in mbtiles or geopackage
- **Lightweight**
  - World: 100 GB
  - South Korea: 530 MB
  - **Seoul: 74 MB**
- Keeps just data, style is rendered by the client

https://data.maptiler.com/downloads/tileset/osm/asia/south-korea/seoul/

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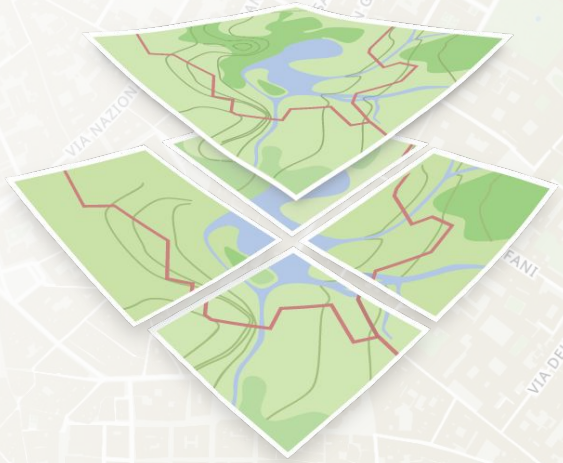
OpenMapTiles

- **Open-source** Vector Tile Schema
- Applicable to any vector geodata
  - OpenStreetMap
  - Wikidata
  - Natural Earth
- OpenMapTiles v3.13.1 (06-05-2022)
  - OpenMapTiles v3.14 coming up
  - Tom Pohanka & contributors



https://openmaptiles.org/
https://github.com/openmaptiles

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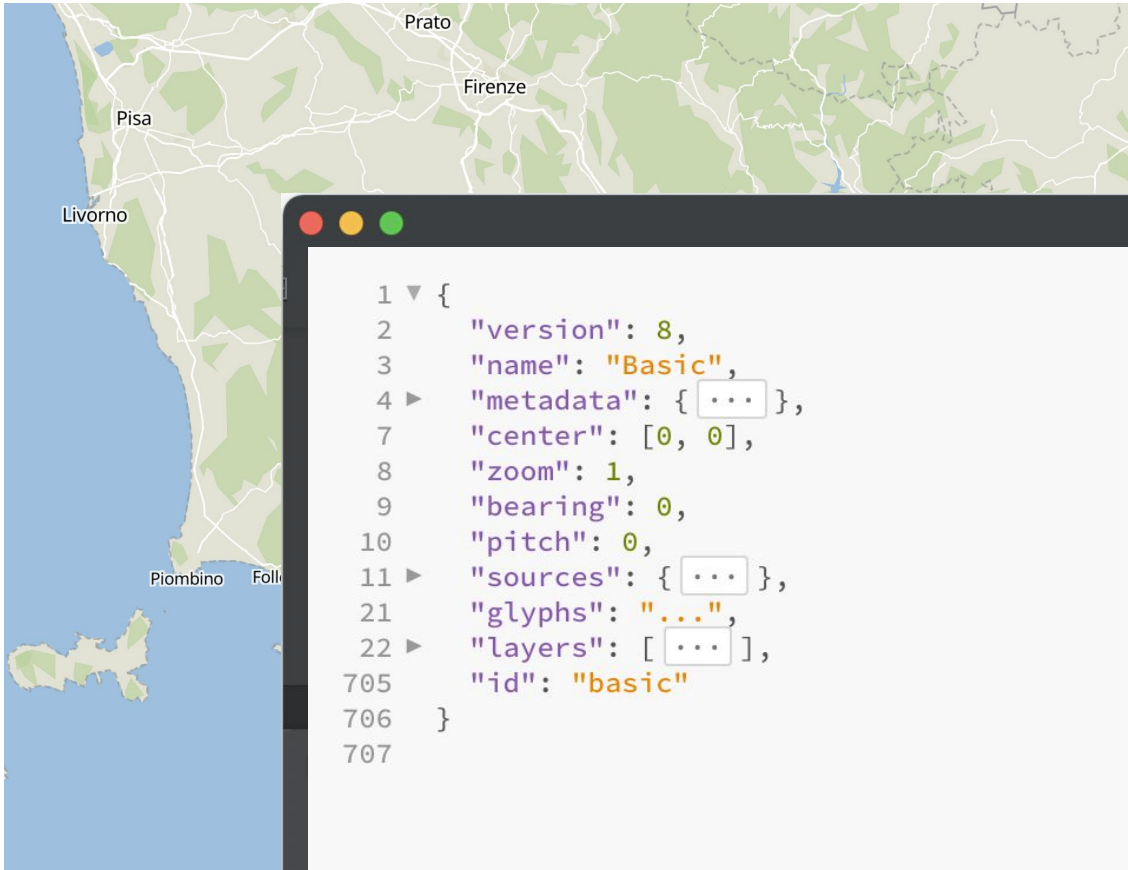
Vector tiles style

- The map visual appearance is defined in a **style.json** file, interpreted by the client.

- **style.json** includes
  - *layers*
  - *sources*
  - *glyphs*
  - *sprite*
  - *metadata*
  - ...



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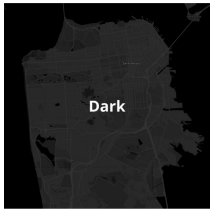
Style editor

An infinity of map styles with the same tileset!



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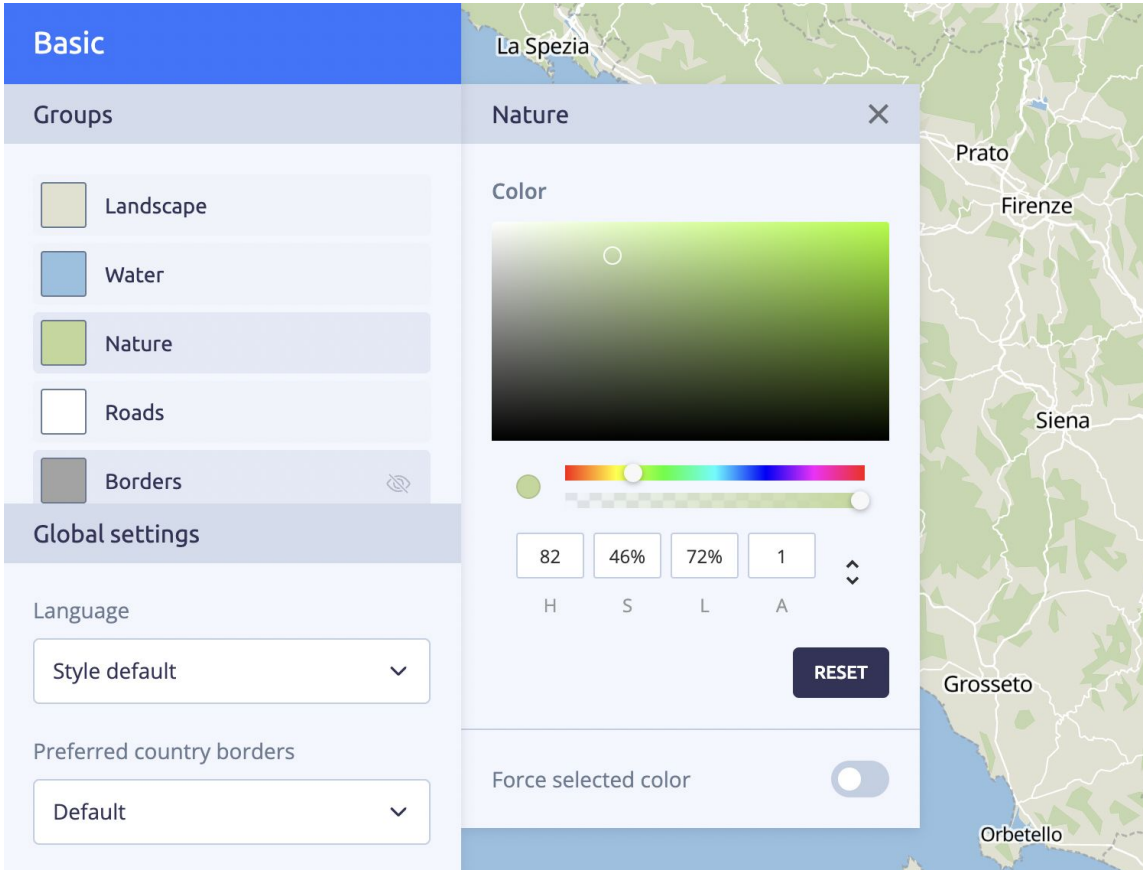
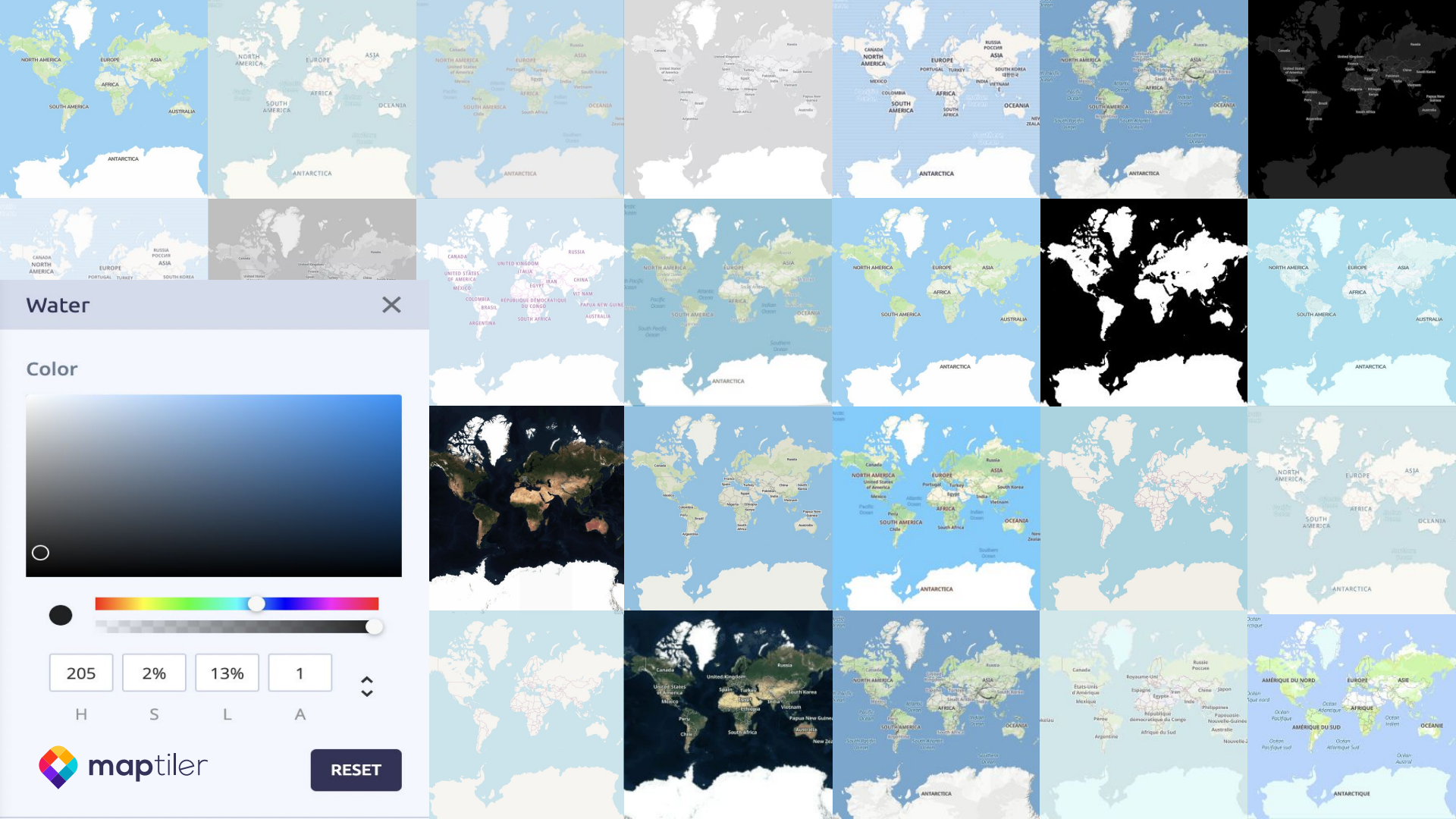
https://cloud.maptiler.com/maps/basic-v2/customize




Water
Color
205
2%
13%
1
H
S
L
A
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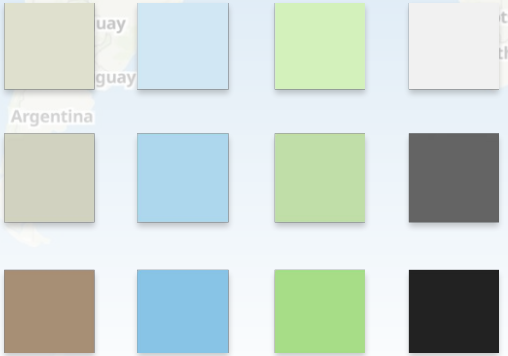
RESET

https://cloud.maptiler.com/maps/basic/

Basic

25 layers
700 lines



London

Soho

Leicester sq.

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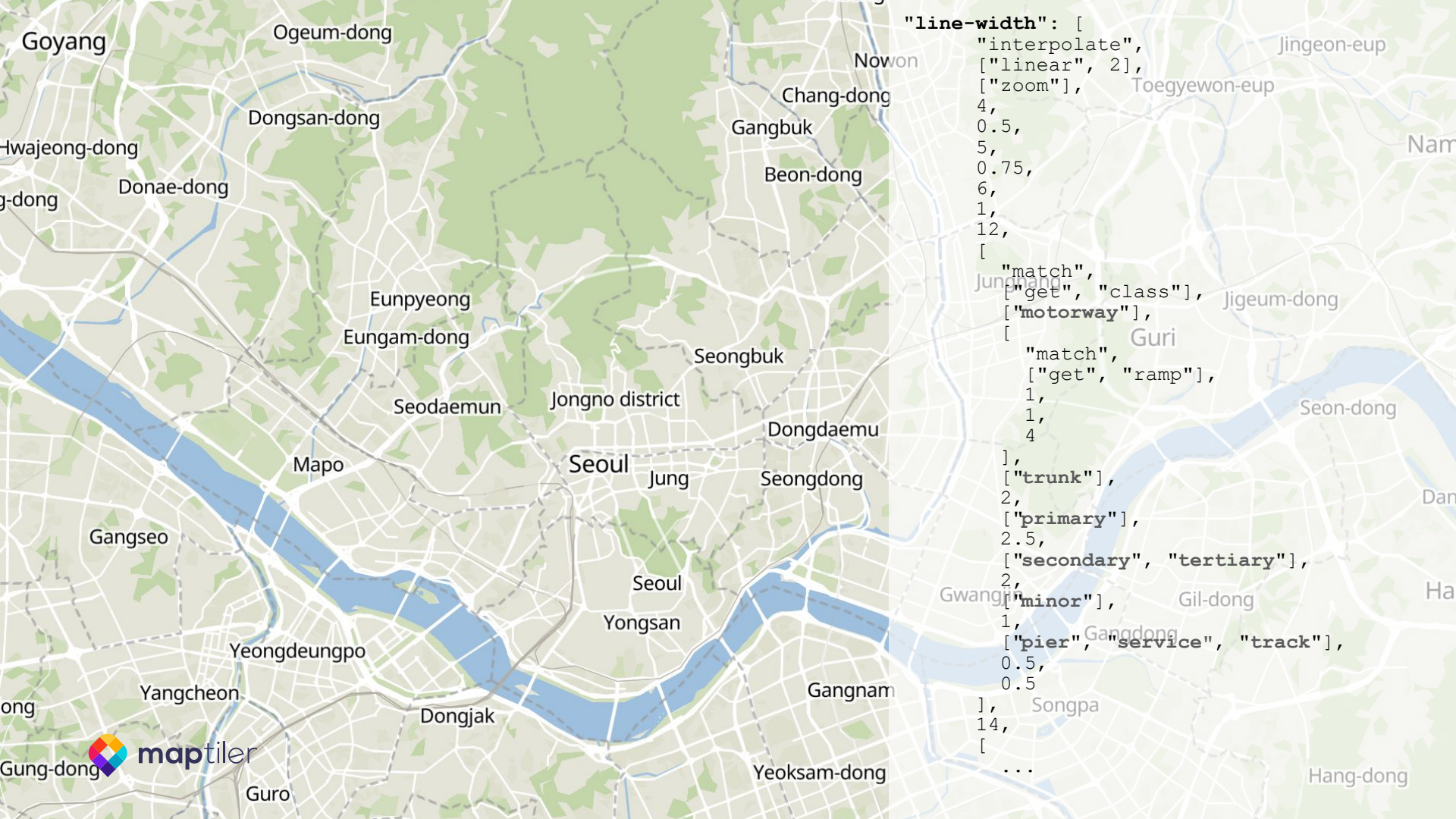
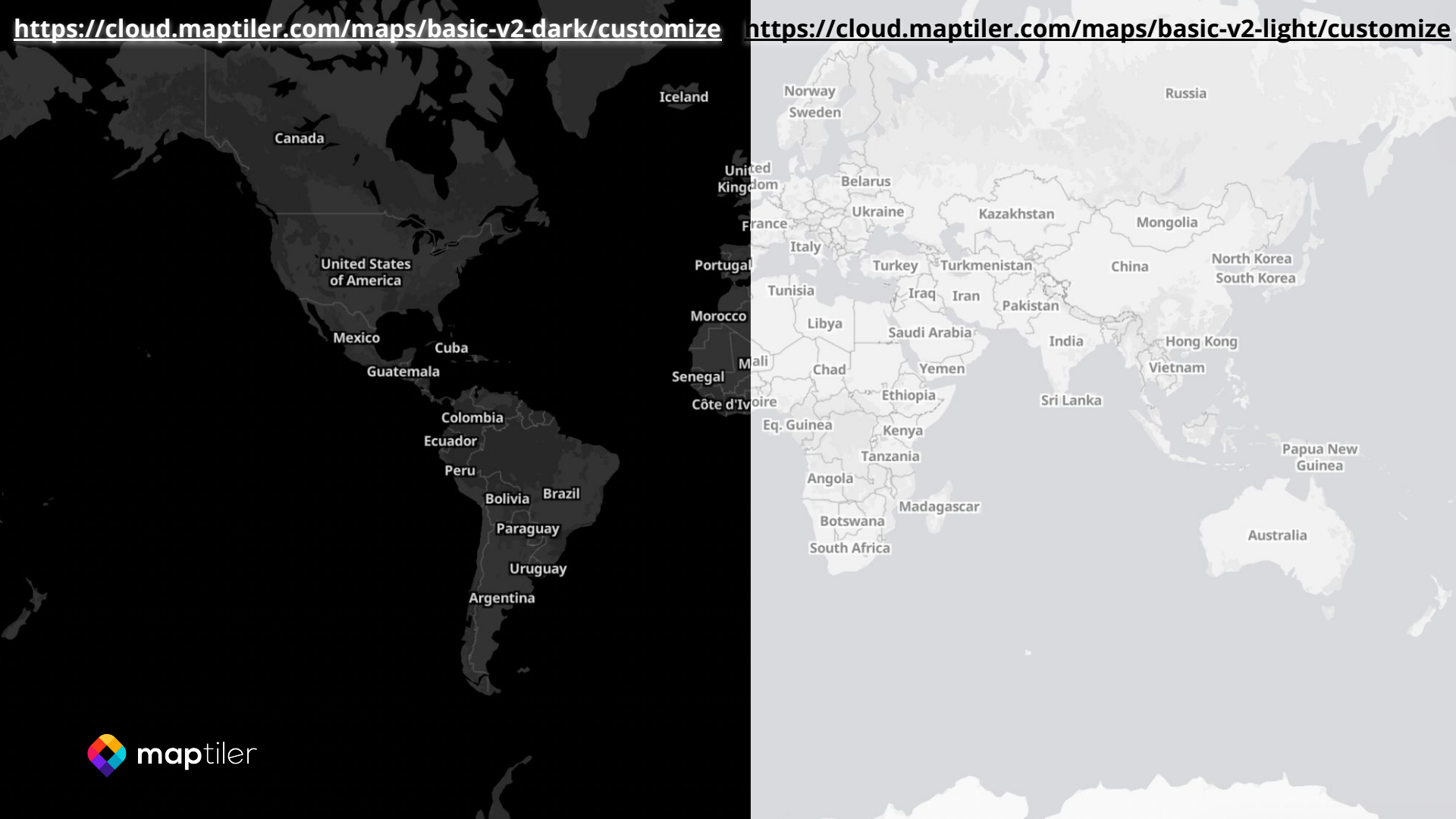



```
"line-width": [
      "interpolate",
      ["linear", 2],
      ["zoom"],
      4,
      0.5,
      5,
      0.75,
      6,
      1,
      12,
      [
        "match",
        ["get", "class"],
        ["motorway"],
        [
          "match",
          ["get", "ramp"],
          1,
          1,
          4
        ],
        ["trunk"],
        2,
        ["primary"],
        2.5,
        ["secondary", "tertiary"],
        2,
        ["minor"],
        1,
        ["pier", "service", "track"],
        0.5,
        0.5
      ],
      14,
      [
        ...
```


https://cloud.maptiler.com/maps/basic-v2-dark/customize
https://cloud.maptiler.com/maps/basic-v2-light/customize
Iceland
Canada
United States of America
Mexico
Cuba
Guatemala
Colombia
Ecuador
Peru
Bolivia
Brazil
Paraguay
Uruguay
Argentina
Portugal
Morocco
Senegal
Mali
Côte d'Ivoire
Norway
Sweden
Russia
Belarus
Ukraine
France
Italy
Kazakhstan
Mongolia
Turkey
Turkmenistan
China
North Korea
South Korea
Tunisia
Iraq
Iran
Pakistan
Libya
Saudi Arabia
India
Hong Kong
Vietnam
Chad
Yemen
Sri Lanka
Ethiopia
Eq. Guinea
Kenya
Tanzania
Papua New Guinea
Angola
Madagascar
Botswana
South Africa
Australia
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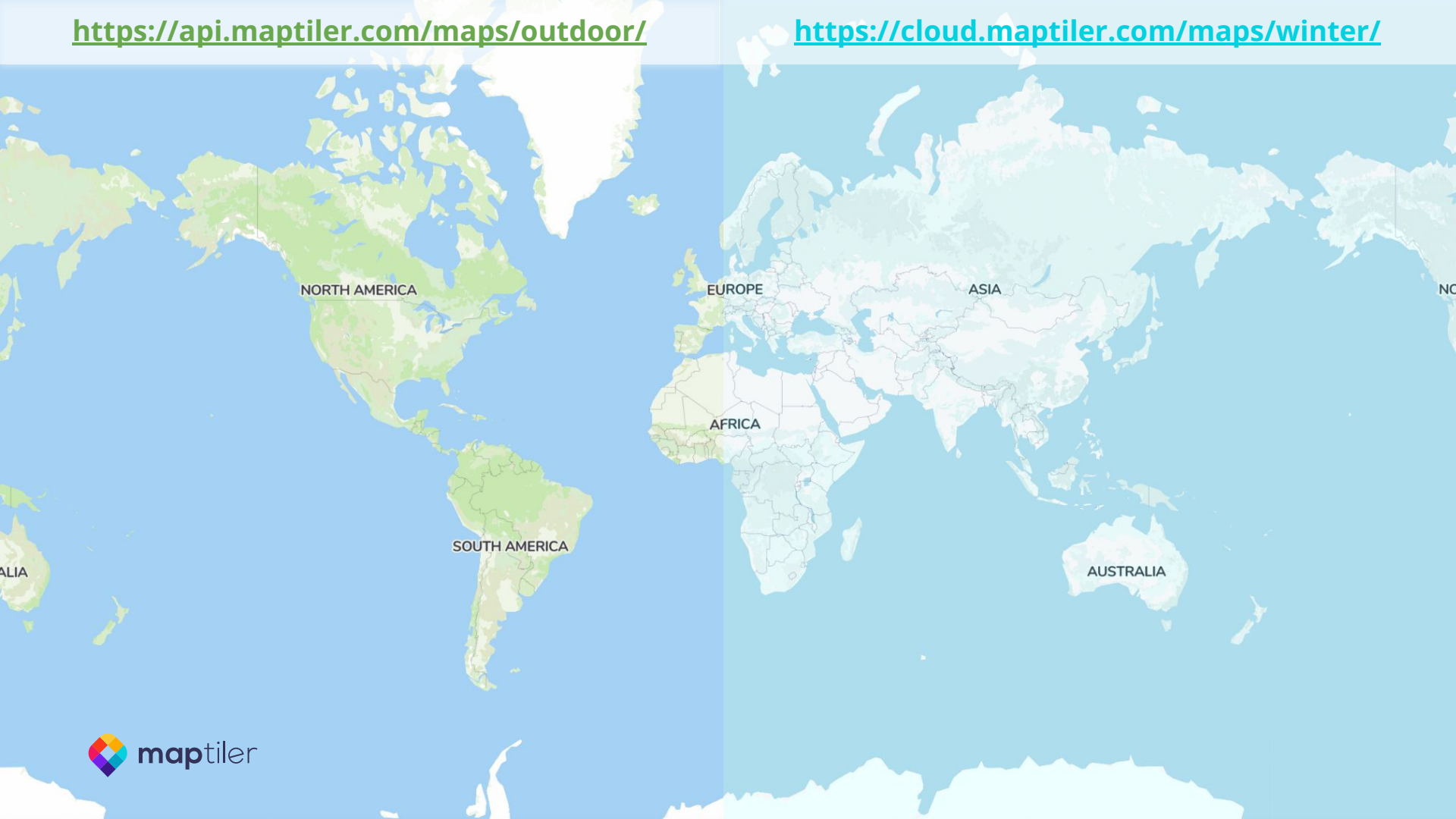
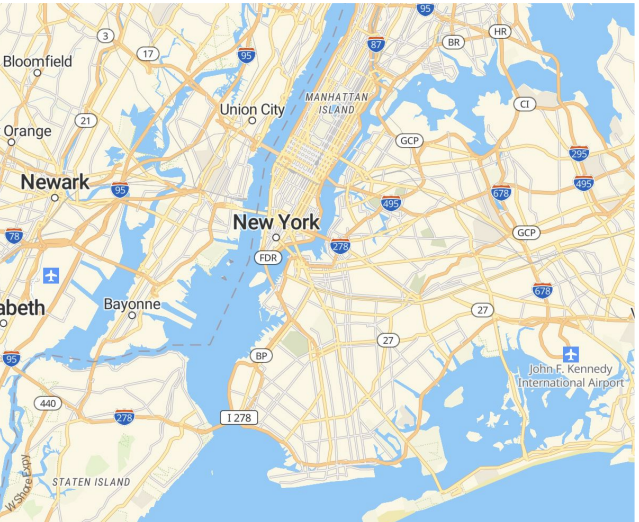
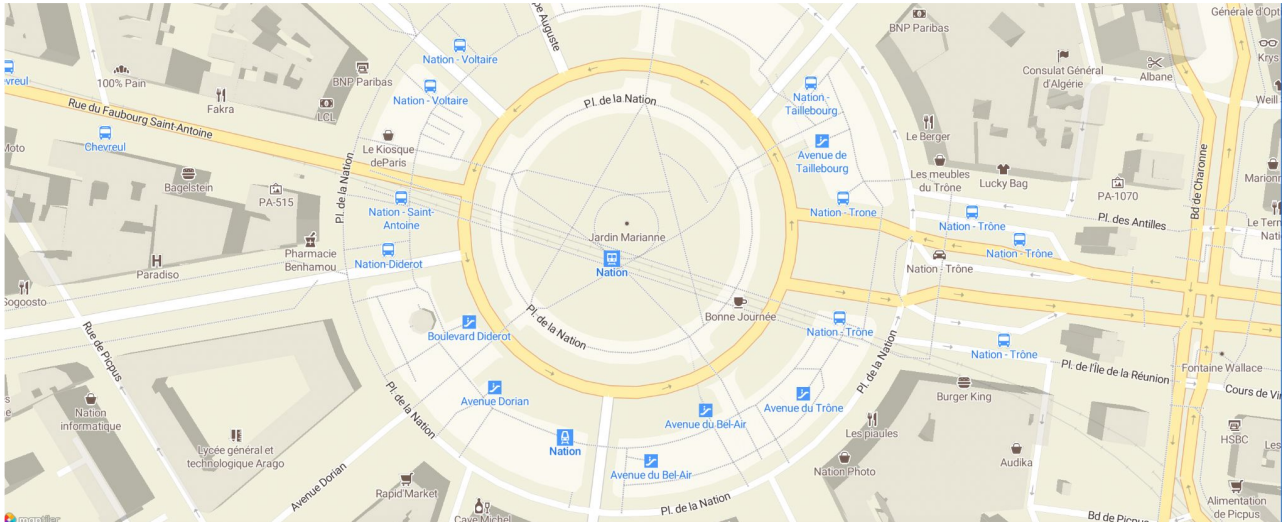
https://api.maptiler.com/maps/outdoor/

https://cloud.maptiler.com/maps/winter/



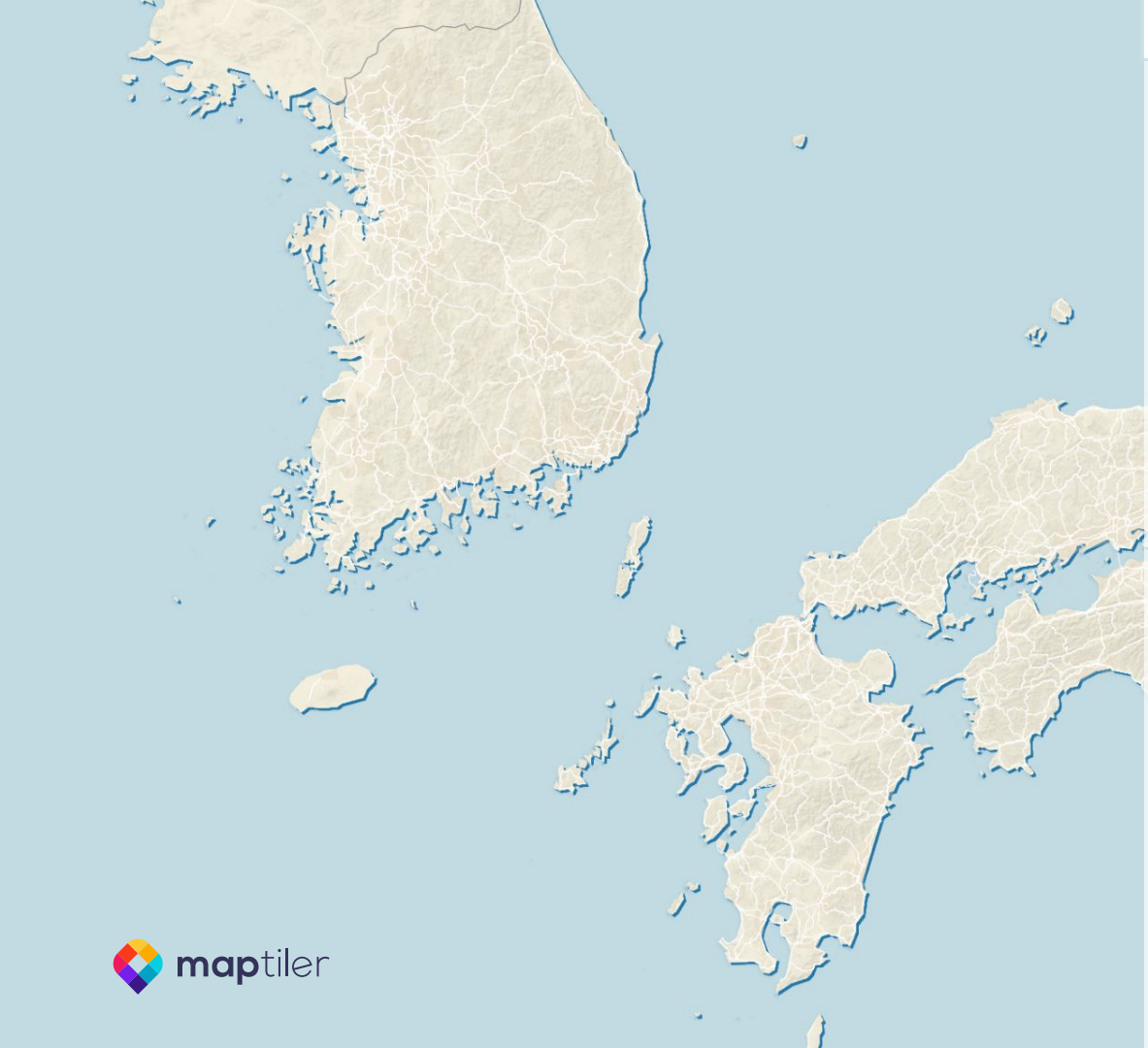
https://cloud.maptiler.com/maps/streets/





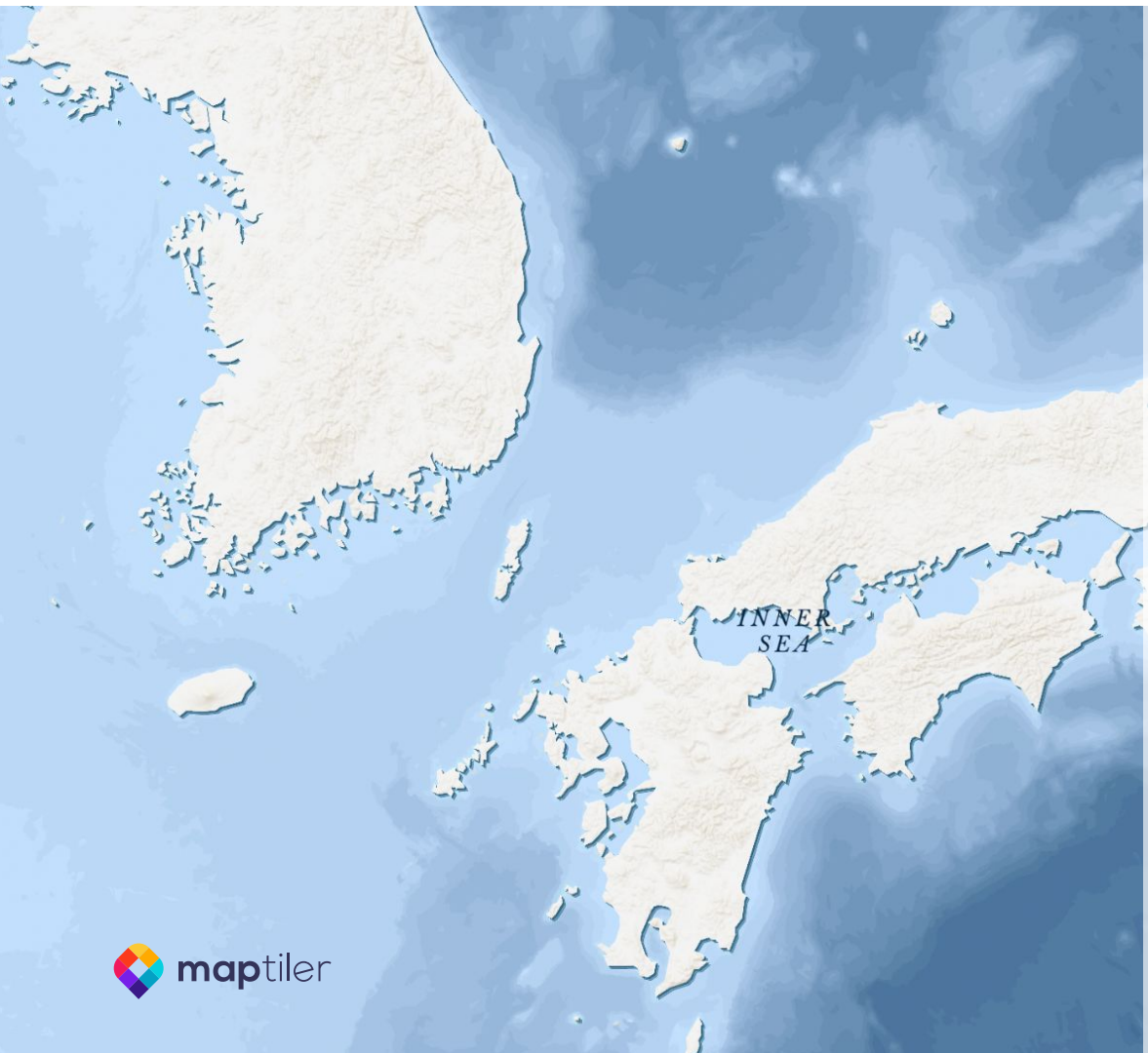
```
{
  "id": "landscape",
  "type": "fill",
  "source": "openmaptiles",
  "source-layer": "globallandcover",
  "maxzoom": 8,
  "paint": {
    "fill-color": [
      "match",
      ["get", "class"],
      "crop",
      "hsl(50,67%,86%)",
      "scrub",
      "hsl(97,51%,80%)",
      "grass",
      "hsl(75,51%,85%)",
      "hsl(0,0%,100%)"
    ]
...
}
```

```
{
  "id": "forest",
  "type": "fill",
  "source": "openmaptiles",
  "source-layer": "globallandcover",
  "maxzoom": 8,
  "layout": {"visibility": "visible"},
  "paint": {
    "fill-color": [
      "match",
      ["get", "class"],
      "forest",
      "hsl(119,38%,76%)",
      "tree",
      "hsl(99,42%,76%)",
      "hsl(0,0%,100%)"
    ...
```

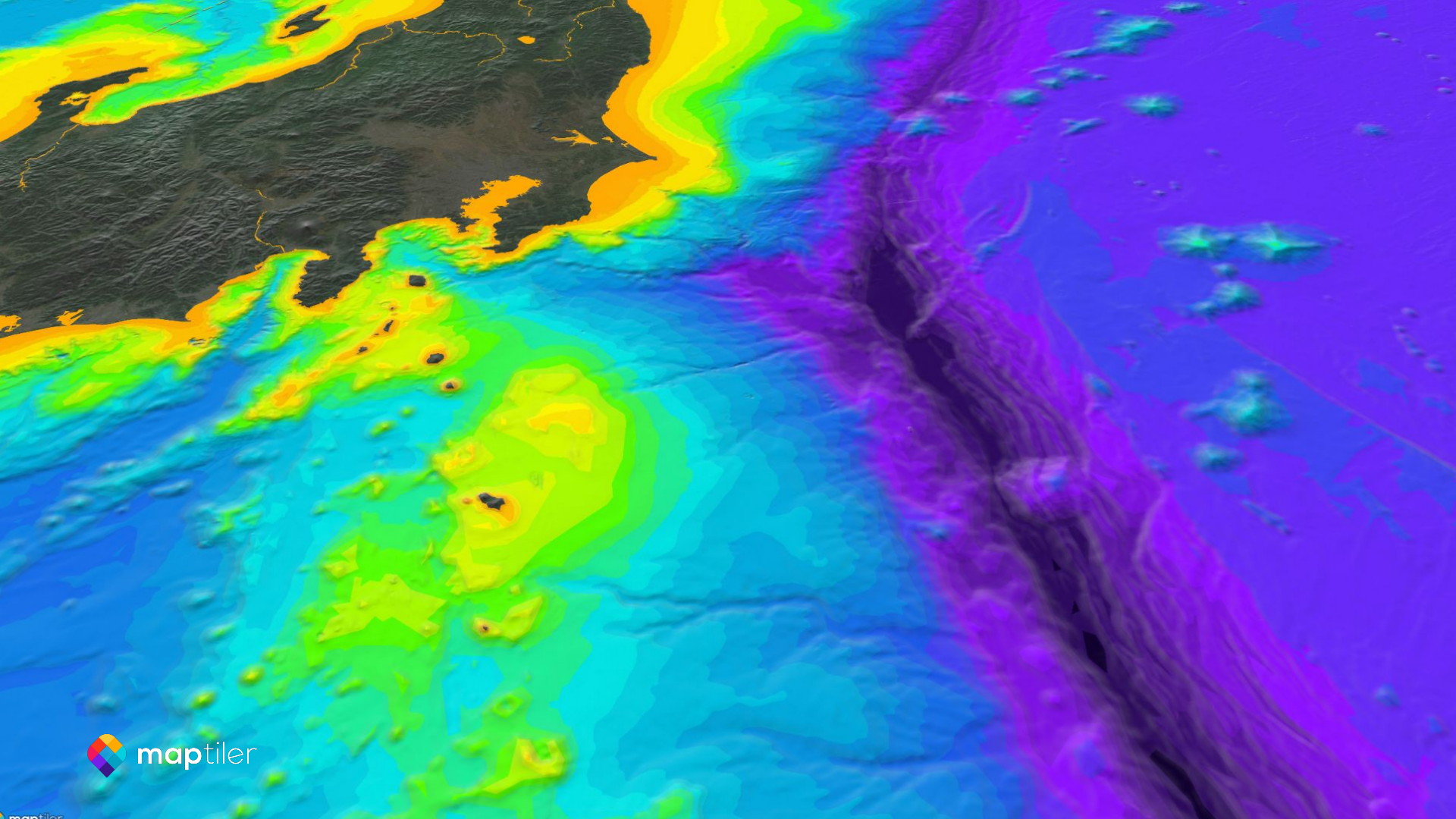


https://labs.maptiler.com/showcase/land-drop-shadow/

```
{
  "id": "land-shadow-fill",
  "type": "fill",
  "source": "land",
  "source-layer": "land",
  "layout": {"visibility": "visible"},
  "paint": {
    "fill-color": "rgba(36, 119, 170, 1)",
    "fill-opacity": {
      "stops": [[6, 1], [14, 0.5]]
    },
    "fill-antialias": true,
    "fill-translate": {
      "stops": [
        [2, [1, 1]],
        [6, [1.5, 1.5]],
        [11, [2, 2]],
        [14, [2.2, 2.2]],
        [17, [1.6, 1.6]],
        [18, [1, 1]]
      ]
    }
  }
},
{
  "id": "land-fill",
  "type": "fill",
  "source": "land",
  "source-layer": "land",
  "layout": {"visibility": "visible"},
  "paint": {
    "fill-color": "rgba(243, 239, 222, 1)",
    "fill-antialias": true
  }
}
```




```
{
        "id": "bathymetry",
        "type": "fill",
        "source": "ocean",
        "source-layer": "contour",
        "layout": {"visibility": "visible"},
        "paint": {
            "fill-color": [
                "interpolate",
                ["linear", 2],
                ["zoom"],
                3,
                [
                  "match",
                  ["get", "depth"],
                  0,
                  "hsl(210, 71%, 83%)",
                  [-50, -100, -150, -200, -250],
                  "hsl(210, 62%, 78%)",
                  [-500, -750, -1000],
                  "hsl(210, 55%, 74%)",
                  [-1250, -1500, -1750, -2000],
                  "hsl(210, 50%, 70%)",
                  [-2500, -3000, -3500],
                  "hsl(210, 46%, 66%)",
                  [-4000, -4500],
                  "hsl(210, 44%, 62%)",
                  [-5000, -5500],
                  "hsl(209, 42%, 57%)",
                  [-6000, -6500],
                  "hsl(209, 40%, 53%)",
                  [-7000, -7500],
                  "hsl(208, 40%, 49%)",
                  [-8000, -8500],
                  "hsl(208, 45%, 40%)",
                  "hsl(208, 45%, 40%)"
                ],
                4,
                ...
```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https://cloud.maptiler.com/start

Create your own maps

- **Vector tiles** (TileJSON)
- Raster tiles (XYZ)
- OGC WMTS
- Static maps API

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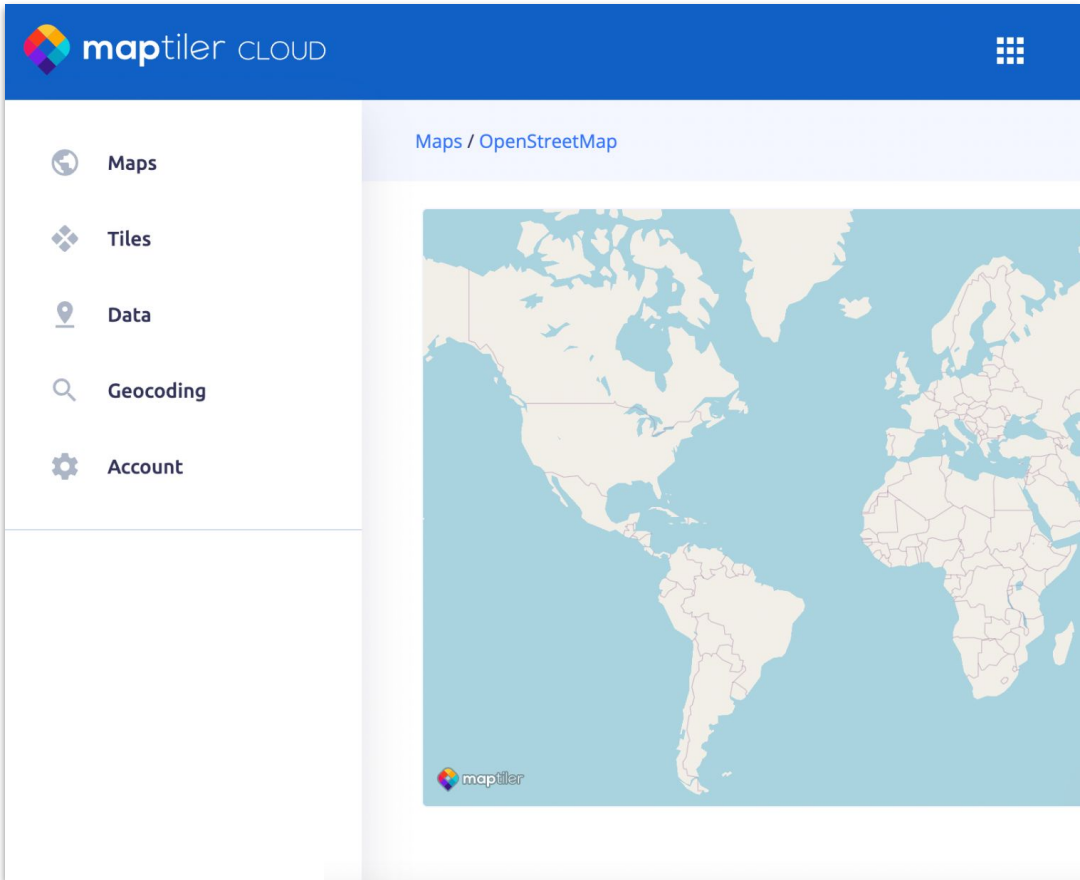

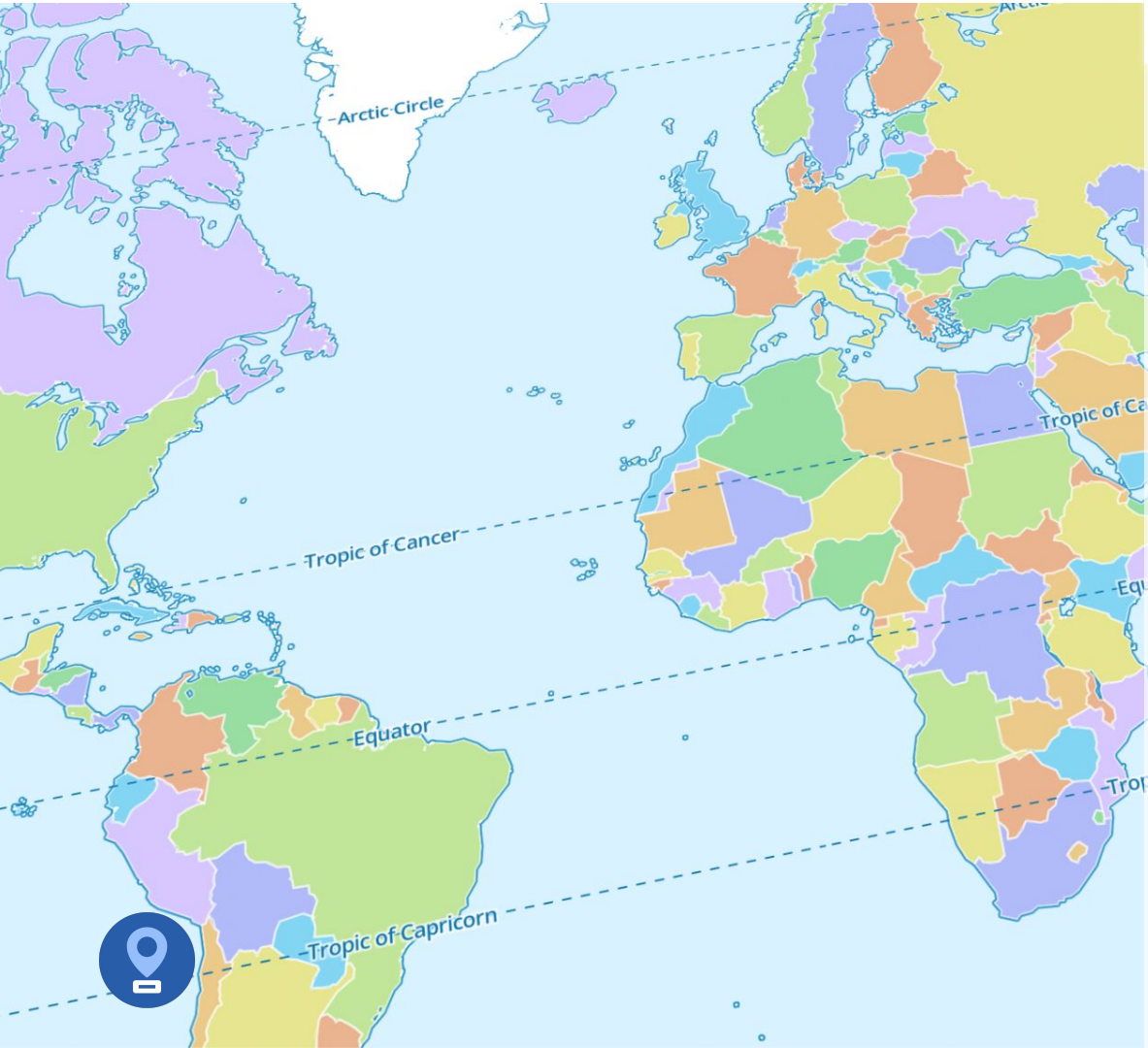

https://demotiles.maplibre.org/style.json

```
"paint": {
  "fill-color": [
    "match", [
      "get","ADM0_A3"],
      [
      "ARM","ATG","AUS","BTN",
      "CAN","COG","CZE","GHA","GIN","HTI","IS
      L","JOR","KHM","KOR","LVA","MLT","MNE",
      "MOZ","PER","SAH","SGP","SLV","SOM","TJ
      K","TUV","UKR","WSM"
      ],
      "#D6C7FF",
      [
      "AZE","BGD","CHL","CMR","CSI","DEU",
      "DJI","GUY","HUN","IOA","JAM","LBN",
      "LBY","LSO","MDG","MKD","MNG","MRT",
      "NIU","NZL","PCN","PYF","SAU","SHN",
      "STP","TTO","UGA","UZB","ZMB"
      ],
      "#EBCA8A",
      [
      "AGO","ASM","ATF","BDI",BFA","BGR",
      "BLZ","BRA","CHN","CRI","ESP","HKG",
      "HRV","IDN","IRN","ISR","KNA","LBR",
      "LCA","MAC","MUS","NOR","PLW","POL",
      "PRI","SDN","TUN","UMI","USA","USG",
      "VIR","VUT"
      ],
      "#C1E599",
      [
      "ARE","ARG","BHS","CIV","DMA","ETH",
      "GAB","GRD","HMD","IND",  "IOT","IRL",
      "IRQ","ITA","KOS","LUX","MEX","NAM",
      ...
      ...
```

```
<script src='https://unpkg.com/maplibre-gl@2.4.0/dist/maplibre-gl.js'></script>
<link href='https://unpkg.com/maplibre-gl@2.4.0/dist/maplibre-gl.css'
  rel='stylesheet' />
```

```
<div id='map' style='width: 400px; height: 300px;'></div>
<script>
var map = new maplibregl.Map({
    container: 'map',
    style: 'https://demotiles.maplibre.org/style.json', // stylesheet location
    center: [-74.5, 40], // starting position [lng, lat]
    zoom: 9 // starting zoom
});
</script>
```

MapLibre

Open-source TypeScript library for publishing maps on your website

https://maplibre.org/

https://maplibre.org/maplibre-gl-js-docs/api/

https://docs.maptiler.com/maplibre-gl-js/how-to-use-maplibre/

https://docs.maptiler.com/maplibre-gl-js/

Get Started With JavaScript Maps API

This is the easiest and fastest way to use your MapTiler maps in JavaScript. Simply use the code below the map and replace the text `YOUR_MAPTILER_API_KEY_HERE` with your MapTiler API KEY.

JavaScript Maps API

Tutorials

Video tutorials

https://www.youtube.com/channel/UCubcQeWuBKvqpMu172CLEXw

1 

MapLibre | Map with a marker using JavaScript #1

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2 

MapLibre | Add GeoJSON to your map and change a point icon using JavaScript #2

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3 

MapLibre | Add Polygons and Popups to your Map using JavaScript #3

MapTiler

1 

Leaflet Tutorial #1: Create a map with a marker using JavaScript

MapTiler

2 

Leaflet Tutorial #2: Circles, Polygons and PopUps with JavaScript

MapTiler

3 

Leaflet Tutorial #3: Change marker icon, add shadow

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Open Source

MapLibre

https://maplibre.org/

OpenMapTiles

https://openmaptiles.org/

QGIS MapTiler plugin

https://github.com/maptiler/qgis-maptiler-plugin

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감사합니다

thank you

ありがとう

merci

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https://maptiler.com

nicolas.bozon@maptiler.com

@MapTiler

SIGN-UP FOR FREE!

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