

מפות אינטראקטיביות עם QGIS2Web ואיך לשדרג אותן בקלות

דרור בוגין, כנס האגודה לכרטוגרפיה וממ"ג 2023

מי אני?

- דרור בוגין
- נשוי לדיאנה, אבא של נגה ורוני
- מפתח ויועץ GIS, בעיקר בקוד פתוח
- אוהב: לשחק עם QGIS, להכין מפות ווב ולהתווכח עם אנשים על GIS
- הבחור במשרד שלא סותם את הפה לגבי QGIS

מה זה QGIS2Web?

QGIS2Web

אחד הפלאגינים הכי פופולריים לQGIS

Featured plugins

22 records found — [Click to toggle descriptions.](#)

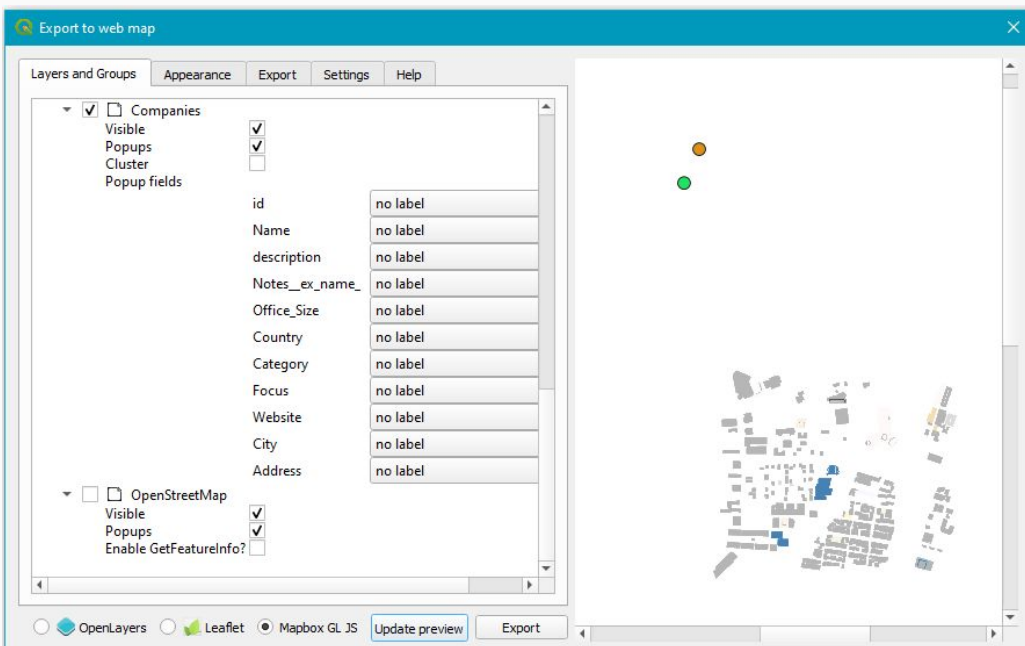
Name	 	Author	Latest Plugin Version	Created on
 QuickMapServices	✓ 4084197	NextGIS	Nov. 2, 2022	Jan. 11, 2015
 Semi-Automatic Classification Plugin	✓ 1300963	Luca Congedo	Nov. 12, 2022	Feb. 14, 2013
QuickOSM	✓ 1095278	Etienne Trimaille	Aug. 21, 2022	July 31, 2014
 qgis2web	✓ 840156	Tom Chadwin , Riccardo Klinger , Victor Olaya , Nyal Dawson	June 15, 2020	April 23, 2015
 Qgis2threejs	✓ 754059	Minoru Akagi	April 6, 2022	Dec. 23, 2013

*נחנחים מנובמבר 2022

QGIS2Web - יתרונות

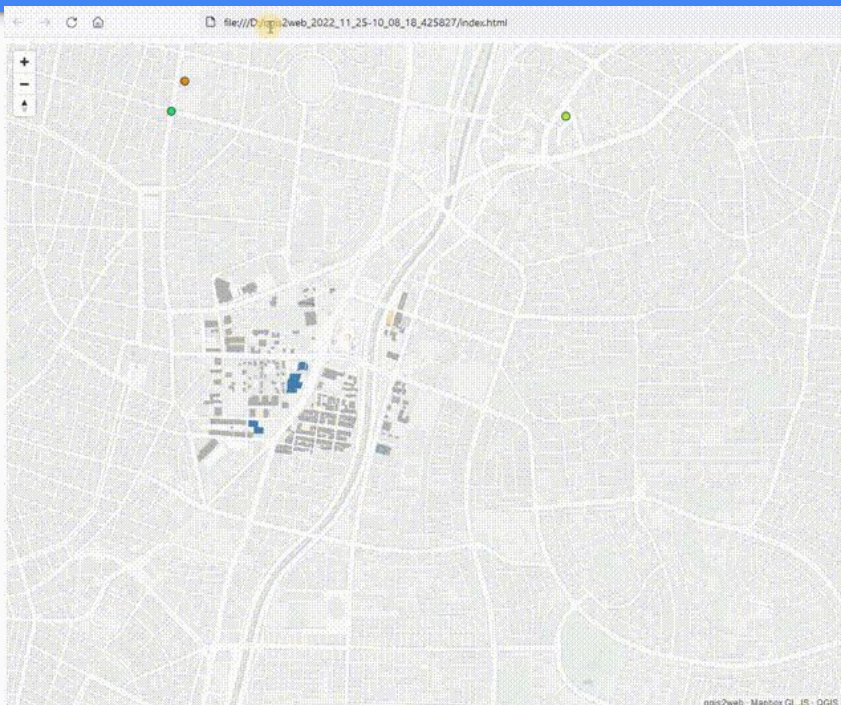
מאפשר הפיכה של מפות ב-QGIS למפות
ווב אינטראקטיביות בכמה לחיצות.

הייצוא נתמך על ידי שלוש ספריות מיפוי
פופולריות בקוד פתוח



QGIS2Web - יתרונות

את המפות ניתן לפרסם בכל שרת
אינטרנטי מיידית לאחר יצירתן.



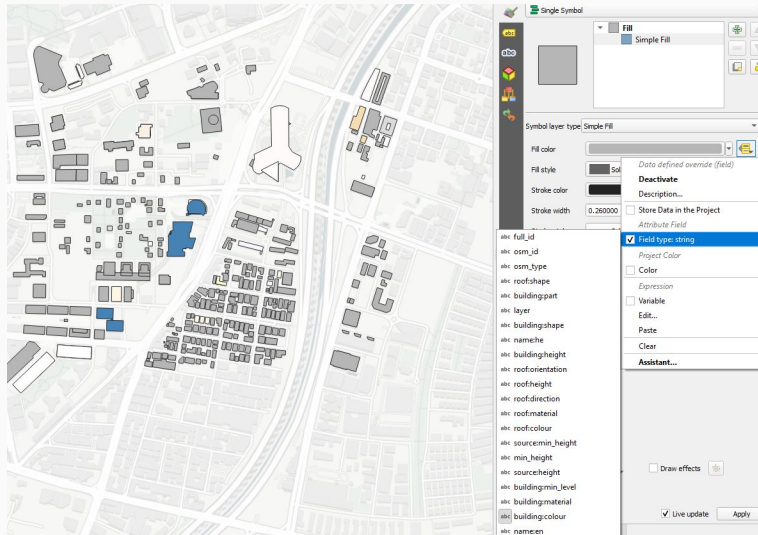
חסרונות - QGIS2Web

המידע לא מתעדכן*

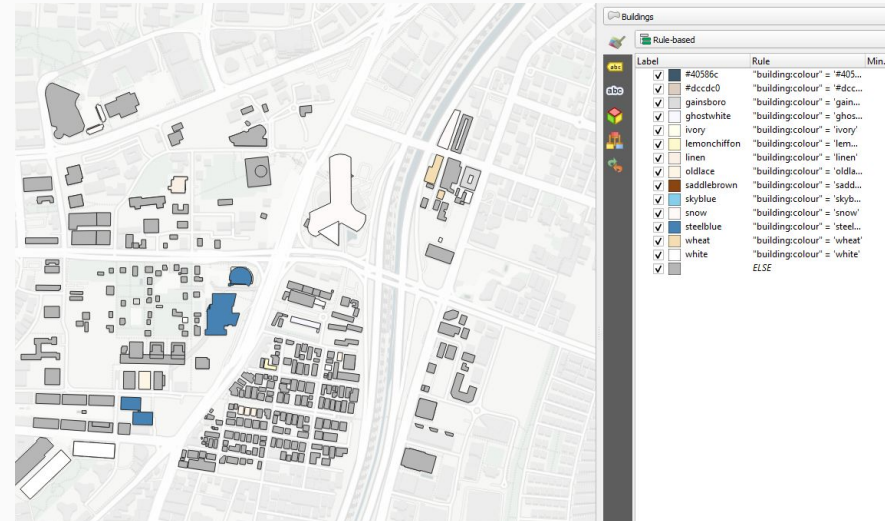
* אם לא השתמשתם בסרביס

חסרונות - QGIS2Web

לא תומך בכל אפשרויות העיצוב 😞



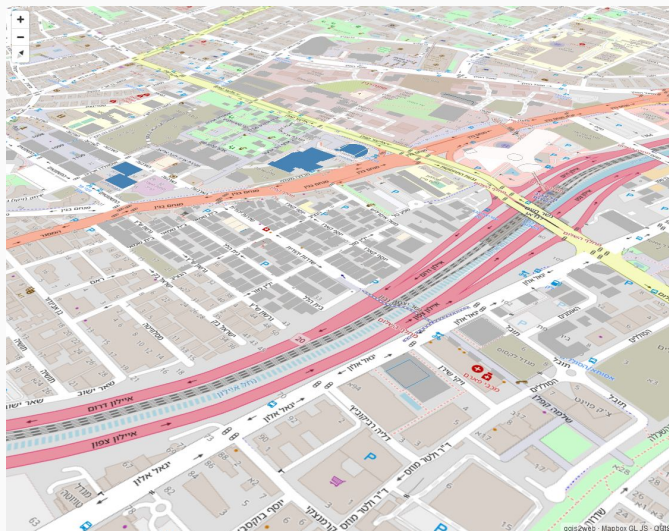
אין תמיכה - שימוש בשדה צבע



יש תמיכה - הגדרת כלל בשביל כל צבע

QGIS2Web - חסרונות

לא מציג תלת מימד גם כשספריית הייצוא תומכת ב3D



אותו מידע
בשני הצדדים



איך מתגברים על (חלק מ) החסרונות?

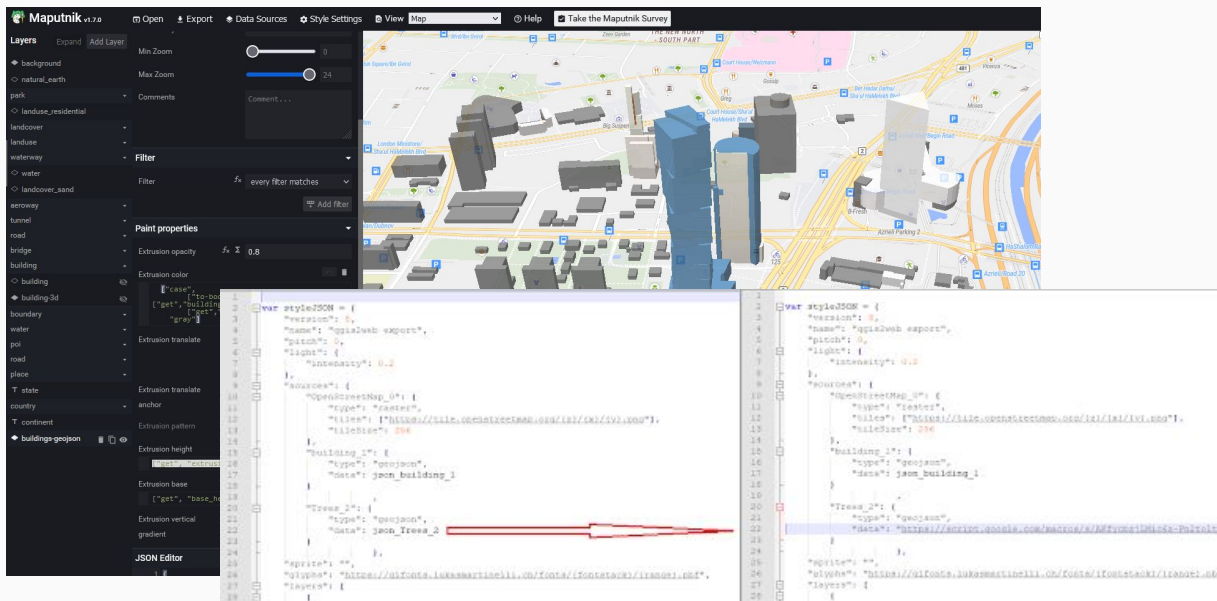
איך מקבלים תוצאות יותר טובות?

לומדים לכתוב קוד

- אפשר לבנות מפות ווב לבד - לוקח יותר זמן, אין ממשק פשוט ומהיר כמו עם השילוב של QGIS ו qgis2web
- תורמים קוד לפרויקט - מומלץ, אבל לא פותר את הבעיות שלנו עכשיו

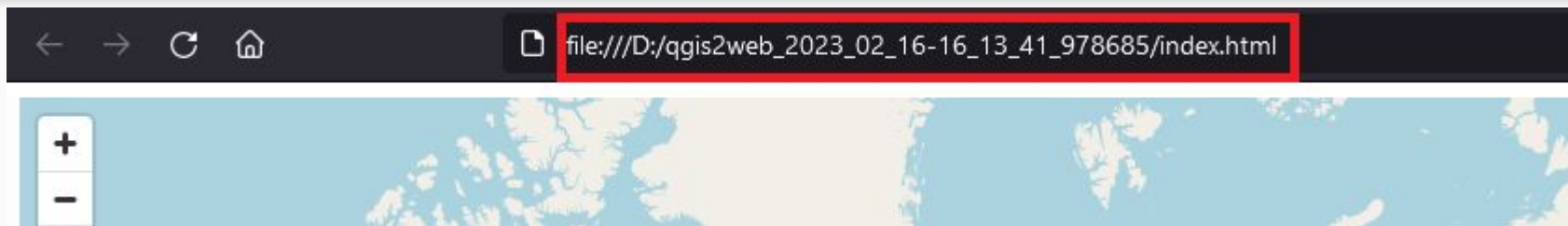
איך מקבלים תוצאות יותר טובות?

לומדים לכתוב קוד לערוך את התוצר



- עריכות פשוטות של חלק מהקבצים בייצוא
- משתמשים בכלים ייעודיים כמו Maputnik בשביל עריכות מתקדמות של סימבולוגיה

הצגת נתונים מעודכנים



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2 var styleJSON = {
3   "version": 2,
4   "name": "qgisweb-export",
5   "pitch": 0,
6   "light": {
7     "intensity": 0.2
8   },
9   "sources": {
10     "OpenStreetMap_0": {
11       "type": "vector",
12       "tiles": ["https://tile.openstreetmap.org/{z}/{x}/{y}.png"],
13       "tileSize": 256
14     },
15     "building_1": {
16       "type": "geojson",
17       "data": json_building_1
18     },
19     "Tree_1": {
20       "type": "geojson",
21       "data": json_trees_2
22     }
23   },
24   "sprite": "",
25   "glproto": "https://glfonts.lucasartisticli.ch/fonts/fontstack/iransol.woff",
26   "layers": [

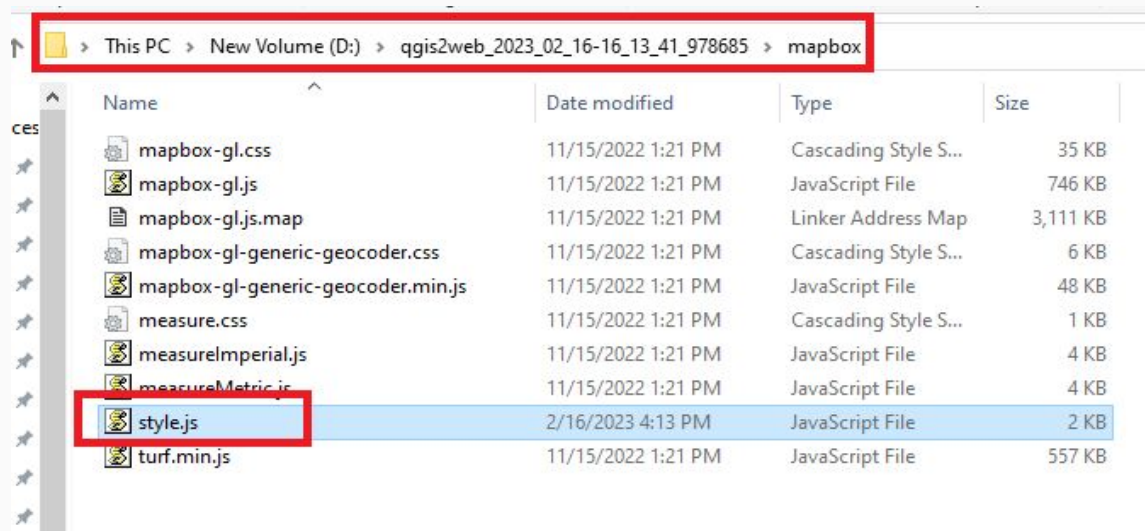
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```

1 var styledJSON = {
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3   "name": "qgisWeb export",
4   "pitch": 0,
5   "light": {
6     "intensity": 0.8
7   },
8   "sources": [
9     "OpenStreetMap_0": {
10      "type": "vector",
11      "tiles": ["https://tile.openstreetmap.org/{z}/{x}/{y}.png"],
12      "tileSize": 256
13    },
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15      "type": "geojson",
16      "data": "geom_building_1"
17    }
18  ],
19  "Tree_2": {
20    "type": "geojson",
21    "data": "https://script.google.com/macros/s/KJfjcmrWlGsc-PdRtlt"
22  },
23  },
24  "sprite": "",
25  "style": "https://afbooks.lakeserialslibri.ch/fonts/afbookstack/afbook.st",
26  "layers": [
27    {

```

הצגת נתונים מעודכנים



This PC > New Volume (D:) > qqis2web_2023_02_16-16_13_41_978685 > mapbox

Name	Date modified	Type	Size
mapbox-gl.css	11/15/2022 1:21 PM	Cascading Style S...	35 KB
mapbox-gl.js	11/15/2022 1:21 PM	JavaScript File	746 KB
mapbox-gl.js.map	11/15/2022 1:21 PM	Linker Address Map	3,111 KB
mapbox-gl-generic-geocoder.css	11/15/2022 1:21 PM	Cascading Style S...	6 KB
mapbox-gl-generic-geocoder.min.js	11/15/2022 1:21 PM	JavaScript File	48 KB
measure.css	11/15/2022 1:21 PM	Cascading Style S...	1 KB
measureImperial.js	11/15/2022 1:21 PM	JavaScript File	4 KB
measureMetric.js	11/15/2022 1:21 PM	JavaScript File	4 KB
style.js	2/16/2023 4:13 PM	JavaScript File	2 KB
turf.min.js	11/15/2022 1:21 PM	JavaScript File	557 KB

```

var styleJSON = {
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      "data": "json_25_day_1"
    },
  },
  "sprite": "",
  "glyphs": "https://glfonts.lukasmartinelli.ch/fonts/{font}",
  "layers": [
    {
      "id": "background",
      "type": "background",
      "layout": {},
      "paint": {
        "background-color": "#cecece"
      }
    },
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      "type": "raster",
      "source": "OpenStreetMap_0"
    },
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      "type": "circle",
      "source": "25_day_1",
      "layout": {},
      "paint": {'circle-radius': ['/', ['*', 3.571428571

```

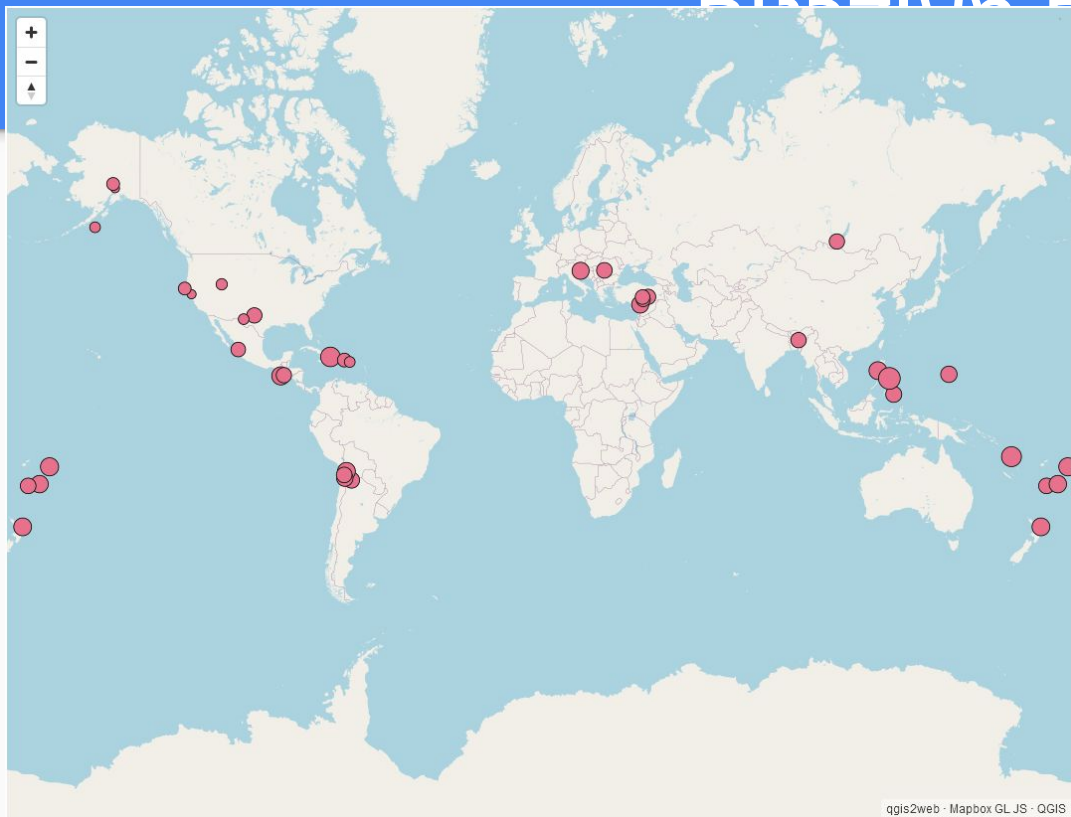


```

var styleJSON = {
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  "name": "qgis2web export",
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  "light": {
    "intensity": 0.2
  },
  "sources": {
    "OpenStreetMap_0": {
      "type": "raster",
      "tiles": ["https://tile.openstreetmap.org/{z}/{x}/{y}.png"],
      "tileSize": 256
    },
    "25_day_1": {
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      "data": "https://earthquake.usgs.gov/earthquakes/feed/v1.0/summary/2.5_day.geojson"
    },
  },
  "sprite": "",
  "glyphs": "https://glfonts.lukasmartinelli.ch/fonts/{fontstack}/{range}.pbf",
  "layers": [
    {
      "id": "background",
      "type": "background",
      "layout": {},
      "paint": {
        "background-color": "#cecece"
      }
    },
    {
      "id": "lyr_OpenStreetMap_0_0",
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      "source": "OpenStreetMap_0"
    },
    {
      "id": "lyr_25_day_1_0",
      "type": "circle",
      "source": "25_day_1",
      "layout": {},
      "paint": {'circle-radius': ['/', ['*', 3.571428571428571, ['get', 'mag']], 2], 'circl

```

הצגת נתונים מרחבית



הצגת נתונים מעודכנים

https://bogind.github.io/isrcartogis2023_demos/live/

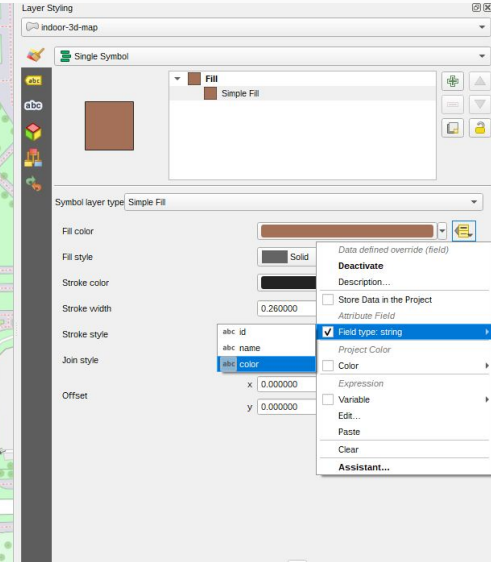
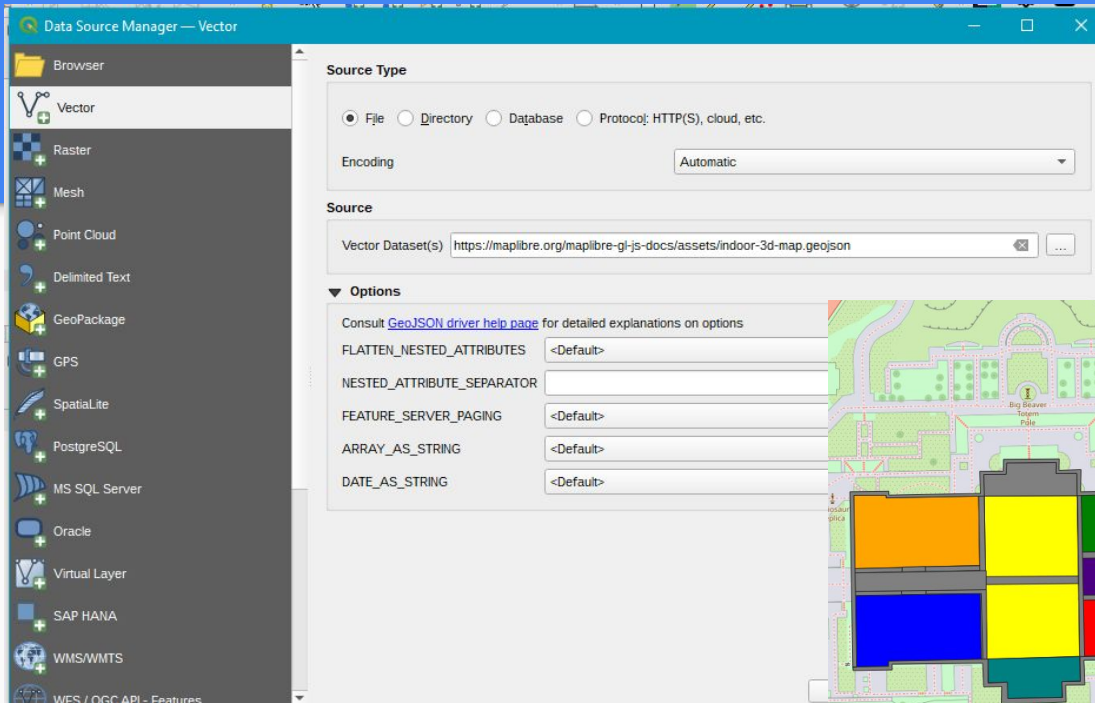
הצגת תלת מימד

<https://maplibre.org/maplibre-gl-js-docs/assets/indoor-3d-map.geojson>

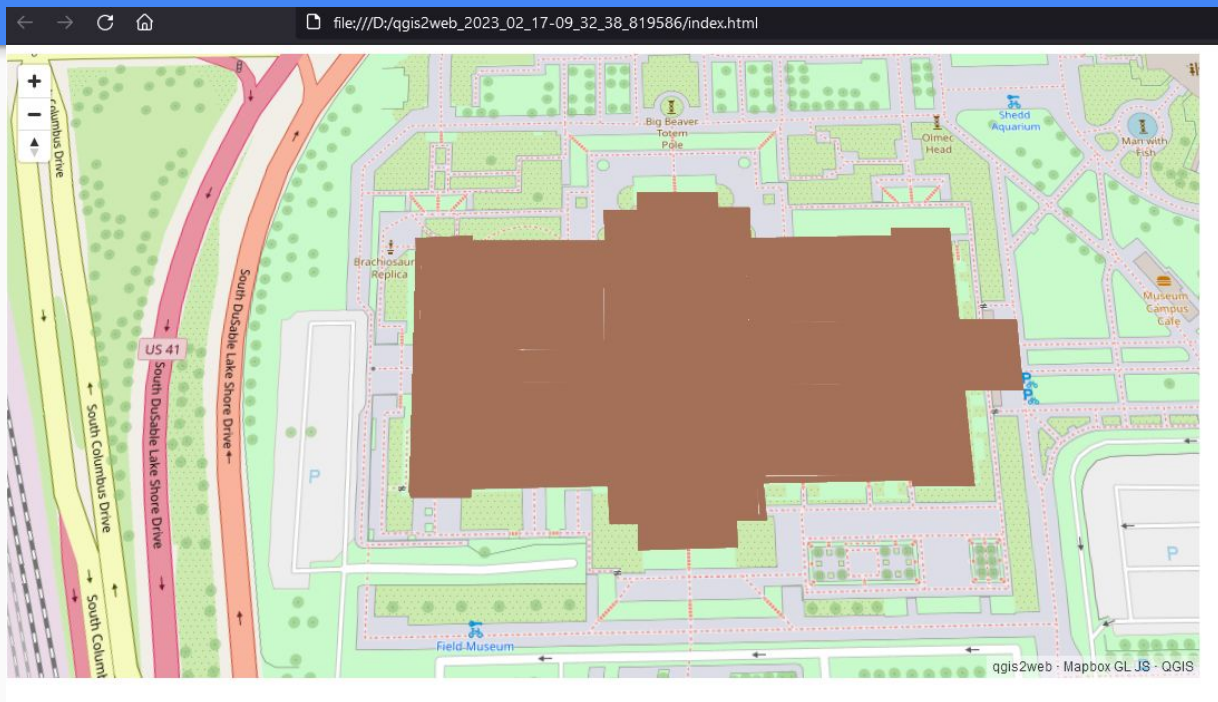


<https://maplibre.org/maplibre-gl-js-docs/example/3d-extrusion-floorplan/>

הצגת תלת מימד



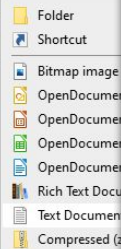
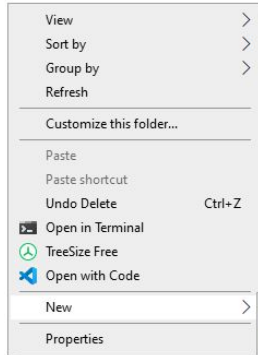
הצגת תלת מימד



הצגת תלת מימד

This PC > New Volume (D:) > qgis2web_2023_02_17-09_32_38_819586 > mapbox

Name	Date modified	Type	Size
mapbox-gl.css	11/15/2022 1:21 PM	Cascading Style S...	35 KB
mapbox-gl.js	11/15/2022 1:21 PM	JavaScript File	746 KB
mapbox-gl.js.map	11/15/2022 1:21 PM	Linker Address Map	3,111 KB
mapbox-gl-generic-geocoder.css	11/15/2022 1:21 PM	Cascading Style S...	6 KB
mapbox-gl-generic-geocoder.min.js	11/15/2022 1:21 PM	JavaScript File	48 KB
measure.css	11/15/2022 1:21 PM	Cas	
measureImperial.js	11/15/2022 1:21 PM	Jav	
measureMetric.js	11/15/2022 1:21 PM	Jav	
style.js	2/17/2023 9:32 AM	Jav	
turf.min.js	11/15/2022 1:21 PM	Jav	



```
1  var styleJSON = {  
2    "version": 8,  
3    "name": "qgis2web export",  
4    "pitch": 0,  
5    "light": {  
6      "intensity": 0.2  
7    },  
8    "sources": {  
9      "OpenStreetMap_0": {  
10        "type": "raster",  
11        "tiles": ["https://tile.openstreetmap.org/{z}/{x}/{y}.png"],  
12        "tileSize": 256  
13      },  
14      "indoor3dmap_1": {  
15        "type": "geojson",  
16        "data": "https://maplibre.org/maplibre-gl-js-docs/assets/indoor-3d-map.geojson",  
17      },  
18    },  
19    "sprite": "",  
20    "glyphs": "https://glfonts.lukasmartinelli.ch/fonts/(fontstack)/(range).pbf",  
21    "layers": [  
22      {  
23        "id": "background",  
24        "type": "background",  
25        "layout": {},  
26        "paint": {  
27          "background-color": "#cecece"  
28        }  
29      },  
30      {  
31        "id": "lyr_OpenStreetMap_0_0",  
32        "type": "raster",  
33        "source": "OpenStreetMap_0"  
34      },  
35      {  
36        "id": "lyr_indoor3dmap_1_0",  
37        "type": "fill",  
38        "source": "indoor3dmap_1",  
39        "layout": {},  
40        "paint": {  
41          "fill-opacity": 1.0, 'fill-color': '#a47158'  
42        }  
43      }  
44    ]  
45  }
```

הצגת תלת מימד

```
1 var styleJSON = {
2   "version": 8,
3   "name": "ggis2web export",
4   "pitch": 0,
5   "light": {
6     "intensity": 0.2
7   },
8   "sources": {
9     "OpenStreetMap_0": {
10       "type": "raster",
11       "tiles": ["https://tile.openstreetmap.org/{z}/{x}/{y}.png"],
12       "tileSize": 256
13     },
14     "indoor3dmap_1": {
15       "type": "geojson",
16       "data": "https://maplibre.org/maplibre-gl-js-docs/assets/indoor-3d-map.geojson"
17     },
18   },
19   "sprite": "",
20   "glyphs": "https://glfonts.lukasmartinelli.ch/fonts/{fontstack}/{range}.pbf",
21   "layers": [
22     {
23       "id": "background",
24       "type": "background",
25       "layout": {},
26       "paint": {
27         "background-color": "#cecece"
28       },
29     },
30     {
31       "id": "lyr_OpenStreetMap_0_0",
32       "type": "raster",
33       "source": "OpenStreetMap_0"
34     },
35     {
36       "id": "lyr_indoor3dmap_1_0",
37       "type": "fill",
38       "source": "indoor3dmap_1",
39       "layout": {},
40       "paint": {'fill-opacity': 1.0, 'fill-color': '#a47158'}
41     },
42   ],
43 }
```

Name

- mapbox-gl.css
- mapbox-gl.js
- mapbox-gl.js.map
- mapbox-gl-generic-geocoder.css
- mapbox-gl-generic-geocoder.min.js
- measure.css
- measureImperial.js
- measureMetric.js
- style.js
- style.json
- turf.min.js

```
1 {
2   "version": 8,
3   "name": "ggis2web export",
4   "pitch": 0,
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6     "intensity": 0.2
7   },
8   "sources": {
9     "OpenStreetMap_0": {
10       "type": "raster",
11       "tiles": ["https://tile.openstreetmap.org/{z}/{x}/{y}.png"],
12       "tileSize": 256
13     },
14     "indoor3dmap_1": {
15       "type": "geojson",
16       "data": "https://maplibre.org/maplibre-gl-js-docs/assets/indoor-3d-map.geojson"
17     },
18   },
19   "sprite": "",
20   "glyphs": "https://glfonts.lukasmartinelli.ch/fonts/{fontstack}/{range}.pbf",
21   "layers": [
22     {
23       "id": "background",
24       "type": "background",
25       "layout": {},
26       "paint": {
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29     },
30     {
31       "id": "lyr_OpenStreetMap_0_0",
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33       "source": "OpenStreetMap_0"
34     },
35     {
36       "id": "lyr_indoor3dmap_1_0",
37       "type": "fill",
38       "source": "indoor3dmap_1",
39       "layout": {},
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41     },
42   ],
43 }
```

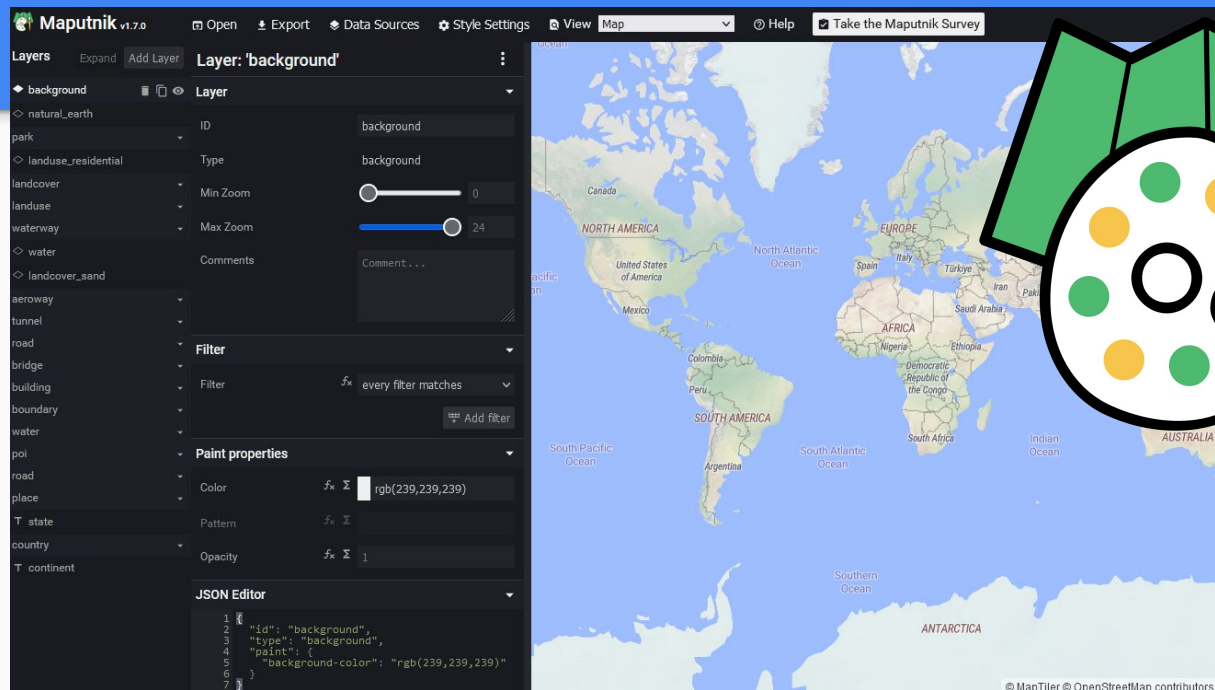
הצגת תלת מימד

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4   "pitch": 0,
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6     "intensity": 0.2
7   },
8   "sources": {
9     "OpenStreetMap_0": {
10       "type": "raster",
11       "tiles": ["https://tile.openstreetmap.org/{z}/{x}/{y}.png"],
12       "tileSize": 256
13     },
14     "indoor3dmap_1": {
15       "type": "geojson",
16       "data": "https://maplibre.org/maplibre-gl-js-docs/assets/indoor-3d-map.geojson"
17     }
18   },
19   "sprite": "",
20   "glyphs": "https://glfonts",
21   "layers": [
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24       "type": "background",
25       "layout": {},
26       "paint": {
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28       }
29     },
30     {
31       "id": "lyr_indoor3dmap_1_0",
32       "type": "fill",
33       "source": "indoor3dmap_1",
34       "layout": {},
35       "paint": {
36         "fill-opacity": 1.0,
37         "fill-color": "#a47158"
38       }
39     },
40     {
41       "id": "lyr_OpenStreetMap_0",
42       "type": "raster",
43       "source": "OpenStreetMap_0"
44     }
45   ]
46 }
```

```
"id": "lyr_indoor3dmap_1_0",
"type": "fill",
"source": "indoor3dmap_1",
"layout": {},
"paint": {'fill-opacity': 1.0, 'fill-color': '#a47158'}
```

להחליף גרש בודד בגרשיים

הצגת תלת מימד



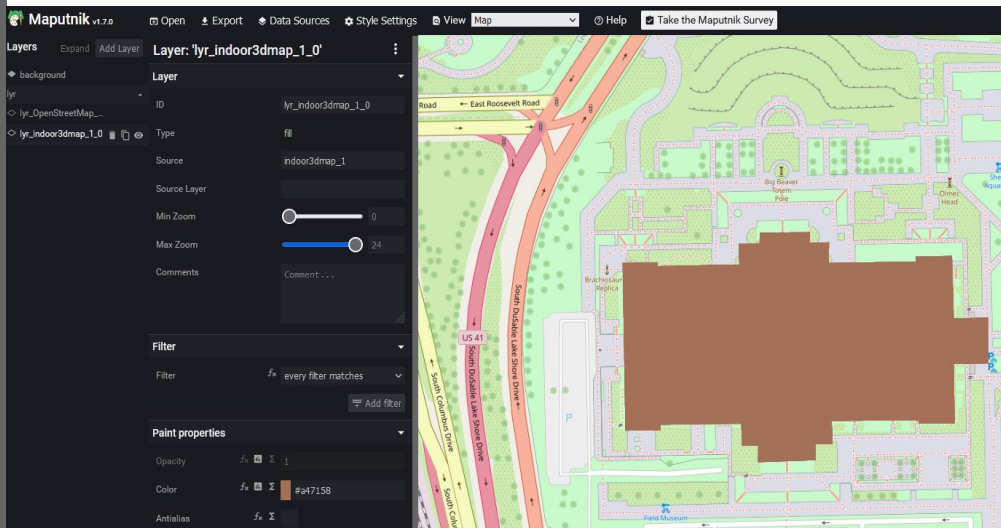
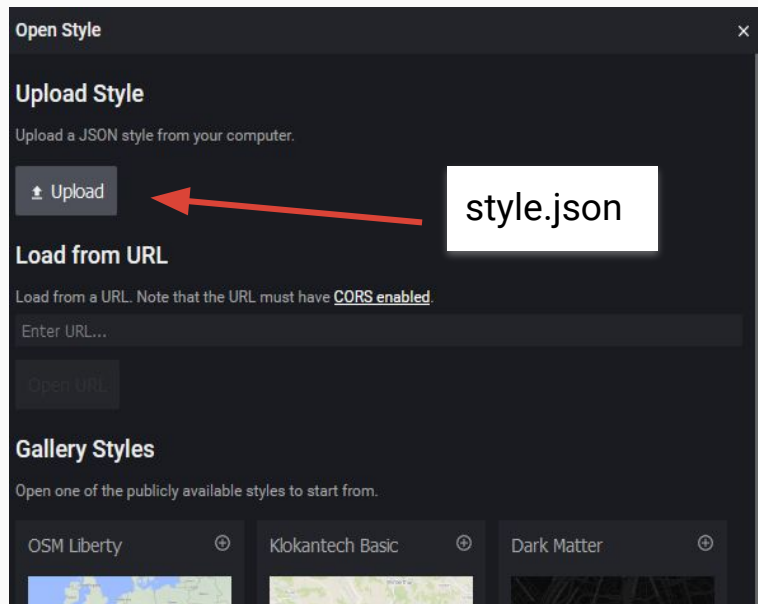
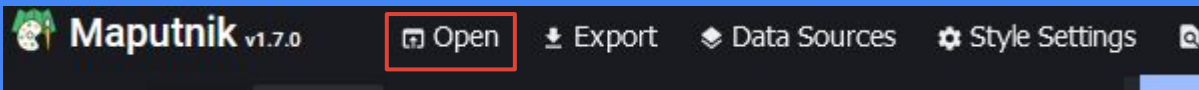
Maputnik

עורך סגנונות MapBox בקוד פתוח
עם עורך אינטרנטי פתוח

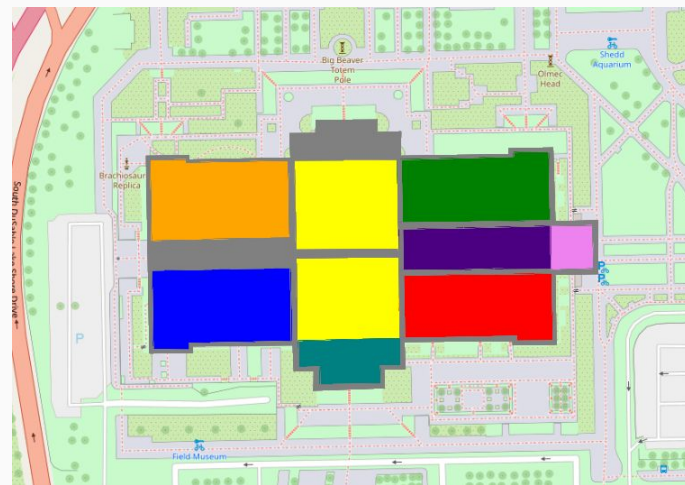
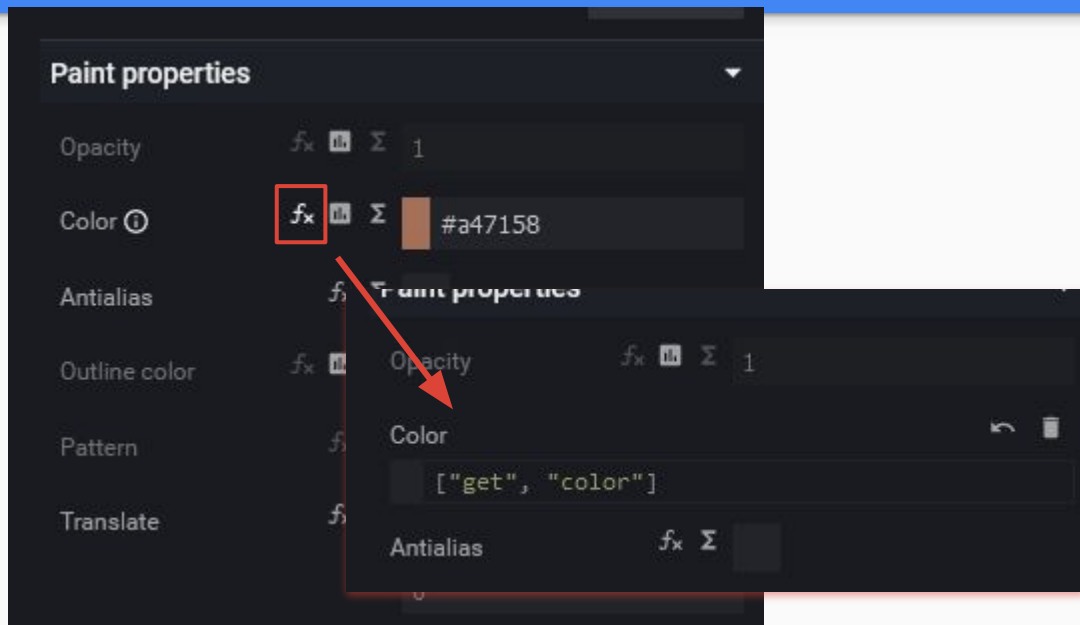
* כמו MapBox studio, רק בלי
להעלות את המידע שלכם לשרתים
של MapBox

<https://maputnik.github.io/editor/>

עריכה עם Maputnik

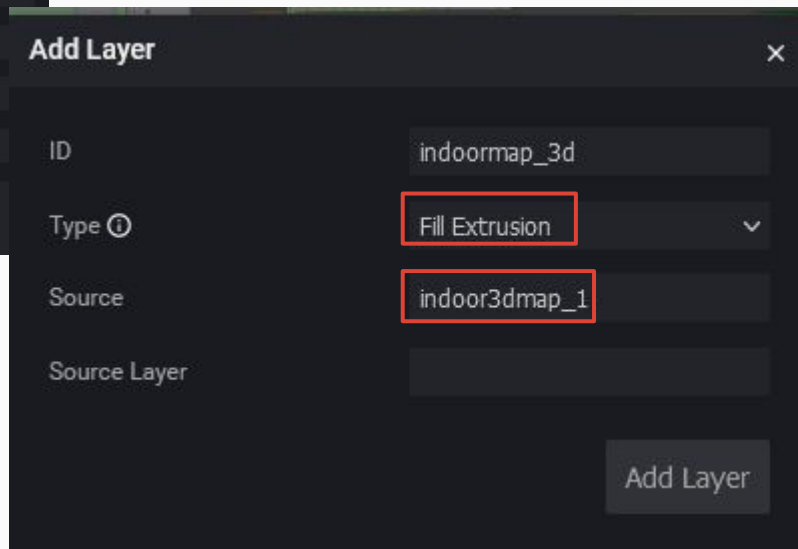
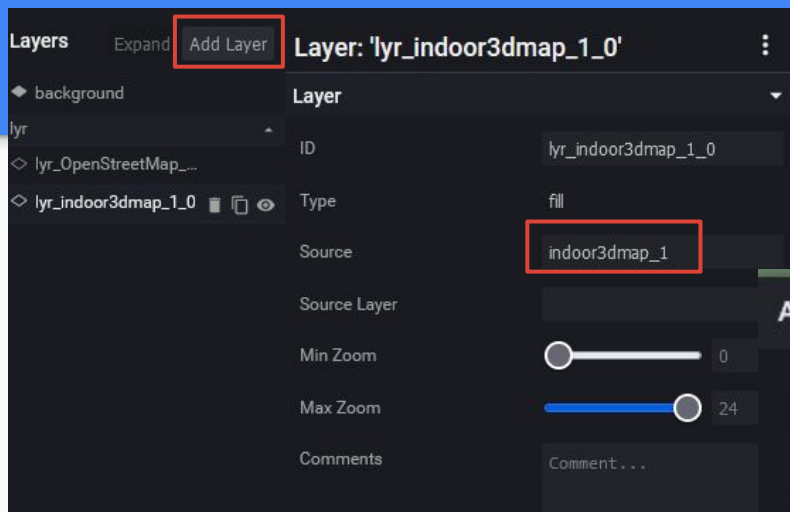


סימבולוגיה משדה

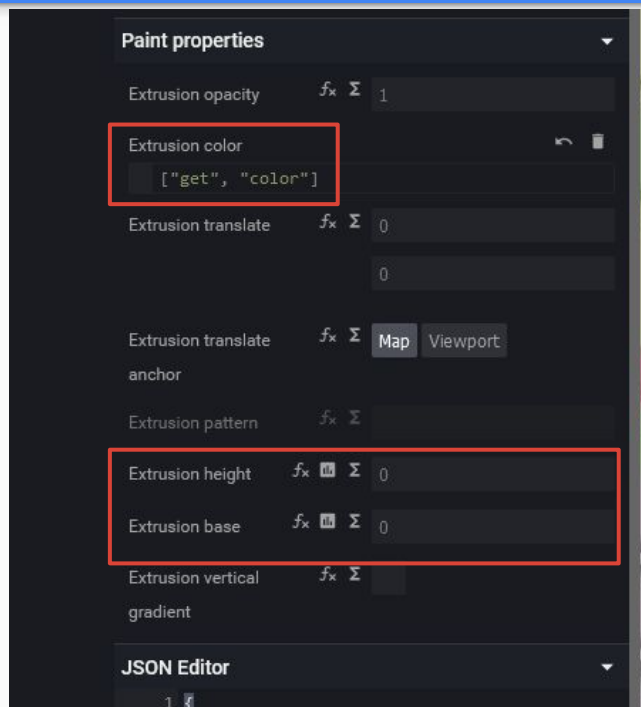


<https://maplibre.org/maplibre-gl-js-docs/example/data-driven-lines/>

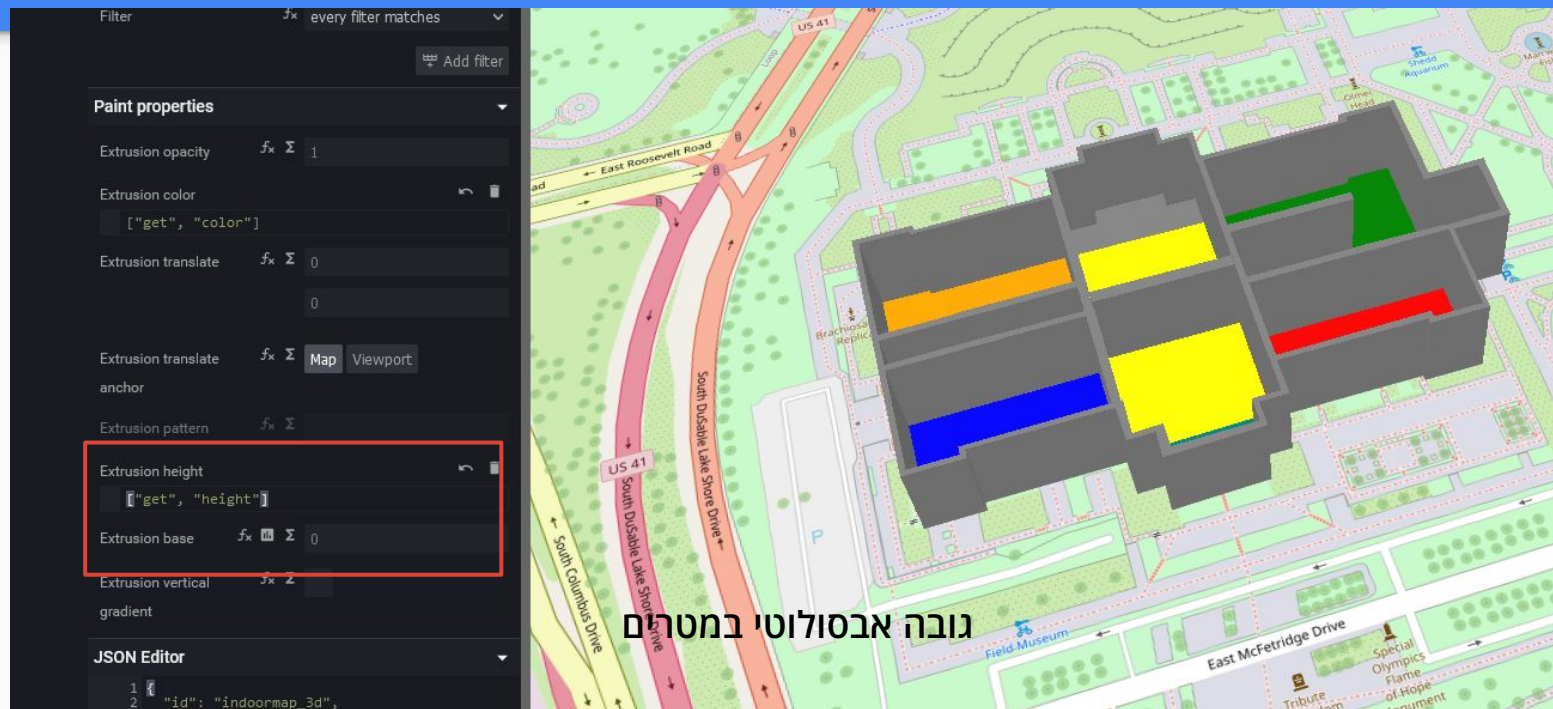
הצגת תלת מימד



הצגת תלת מימד וסימבולוגיה משדה



הצגת תלת מימד וסימבולוגיה משדה



הצגת תלת מימד וסימבולוגיה משדה

Paint properties

Extrusion opacity $f_x \Sigma 1$

Extrusion color Σ 
["get", "color"]

Extrusion translate $f_x \Sigma 0$
0

Extrusion translate $f_x \Sigma$ Map Viewport
anchor

Extrusion pattern $f_x \Sigma$

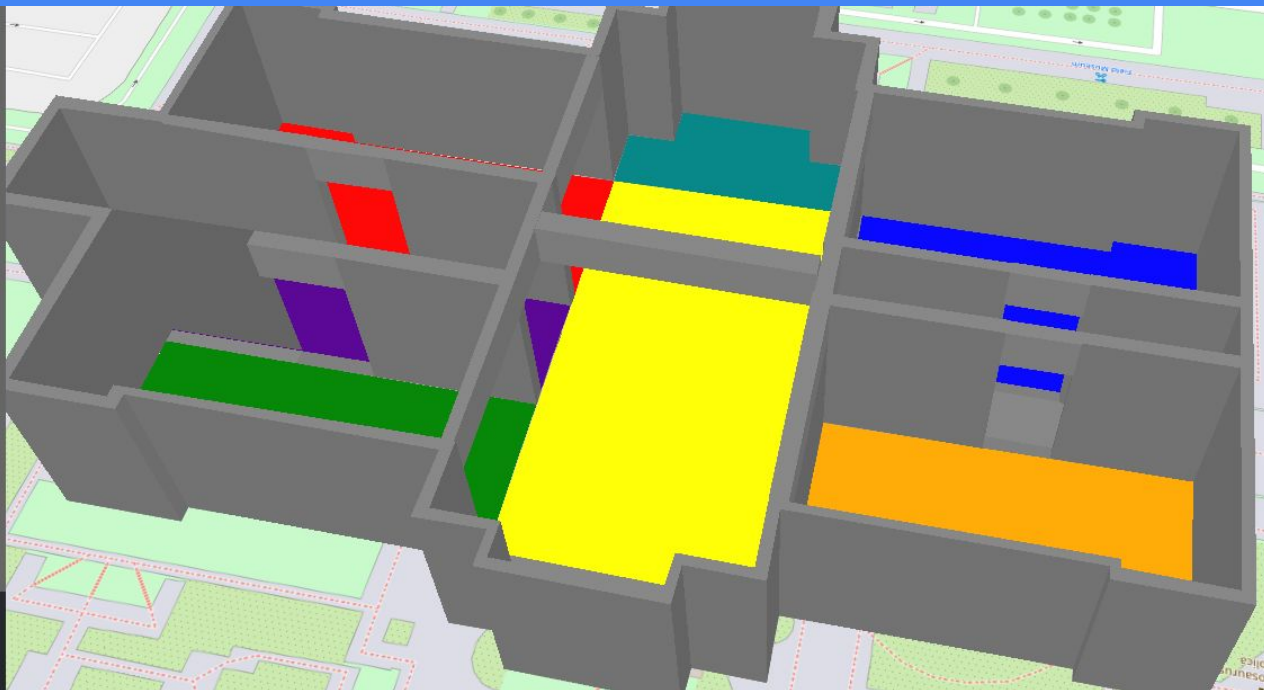
Extrusion height Σ 
["get", "height"]

Extrusion base $\bigcirc$ Σ 
["get", "base_height"]

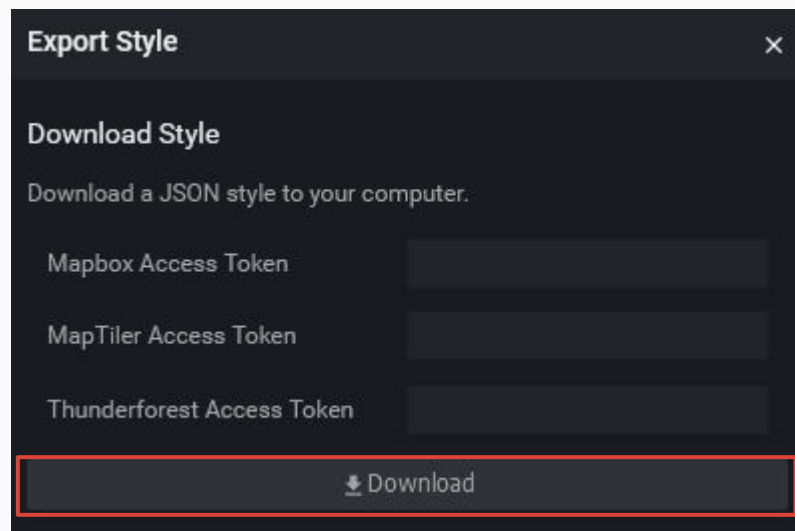
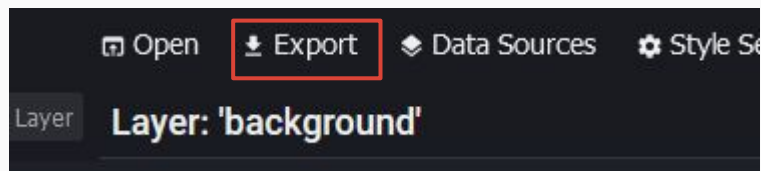
Extrusion vertical $f_x \Sigma 2$
gradient

JSON Editor

```
1 {  
2   "id": "indoor3d",  
3   "type": "fill-extrusion",  
4   "source": "indoor3dmap_1",  
5   "paint": {  
6     "fill-extrusion-color": ["  
7     "get",
```



חזרה למפה שלנו



חזרה למפה שלנו

```
1 {
2   "version": 8,
3   "name": "qgis2web export",
4   "metadata": {"maputnik:renderer": "mbgljs"},
5   "pitch": 0,
6   "light": {"intensity": 0.2},
7   "sources": {
8     "OpenStreetMap_0": {
9       "type": "raster",
10      "tiles": ["https://tile.openstreetmap.org/{z}/{x}/{y}.png"],
11      "tileSize": 256
12    },
13    "indoor3dmap_1": {
14      "type": "geojson",
15      "data": "https://maplibre.org/maplibre-gl-js-docs/assets/indoor-3d-map.geojson"
16    }
17  },
18  "sprite": "",
19  "glyphs": "https://glfonts.lukasmartinelli.ch/fonts/{fontstack}/{range}.pbf",
20  "layers": [
21    {
22      "id": "background",
23      "type": "background",
24      "layout": {},
25      "paint": {"background-color": "#cecece"}
26    },
27    {
28      "id": "lyr_OpenStreetMap_0_0",
29      "type": "raster",
30      "source": "OpenStreetMap_0"
31    },
32    {
33      "id": "lyr_indoor3dmap_1_0",
34      "type": "fill",
35      "source": "indoor3dmap_1",
36      "layout": {},
37      "paint": {"fill-opacity": 1, "fill-color": ["get", "color"]}
38    },
39    {
40      "id": "indoormap_3d",
41      "type": "fill-extrusion",
42      "source": "indoor3dmap_1",
43      "paint": {
44        "fill-extrusion-color": ["get", "color"],
45        "fill-extrusion-height": ["get", "height"],
46        "fill-extrusion-base": ["get", "base_height"]
47      }
48    }
49  ],
50  "id": "z65z08167"
51 }
```

Name

-  mapbox-gl.css
-  mapbox-gl.js
-  mapbox-gl.js.map
-  mapbox-gl-generic-geocoder.css
-  mapbox-gl-generic-geocoder.min.js
-  measure.css
-  measureImperial.js
-  measureMetric.js
-  style.js
-  style.json
-  turf.min.js

חזרה למפה שלנו



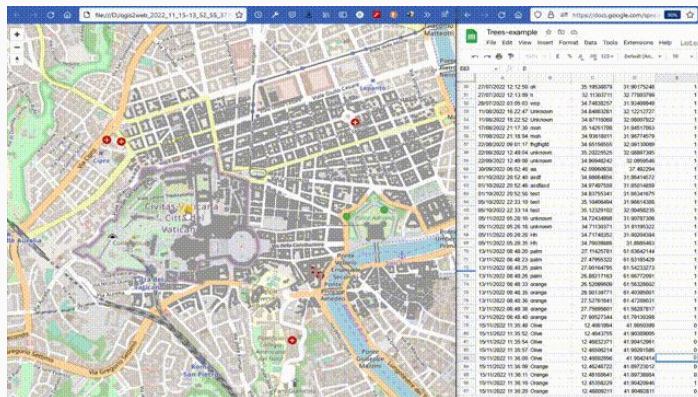
חזרה למפה שלנו

https://bogind.github.io/isrcartogis2023_demos/3D/

Extra Reading



[Open Source Workflows: QGIS2Web and 3D Extrusion Maps](#)



[Open Source Workflows: Keeping QGIS2Web Maps Up To Date](#)



It's always better to map together

[Collaborative Mapping With Leaflet And Google Sheets](#)

איפה למצוא אותי



<https://twitter.com/bogind2>



<https://github.com/bogind>



@bogind@mapstodon.space



<https://bogind.blogspot.com/>



<https://www.linkedin.com/in/dror-bogin/>

שאלות?