



FOSS4G
AUCKLAND 2025

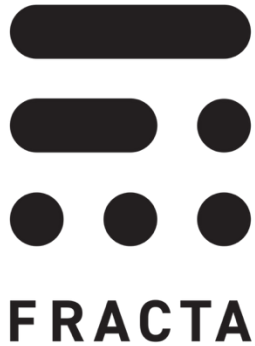
maplibre-gl-terrastyle - new drawing plugin for maplibre-gl-js

19 November 2025

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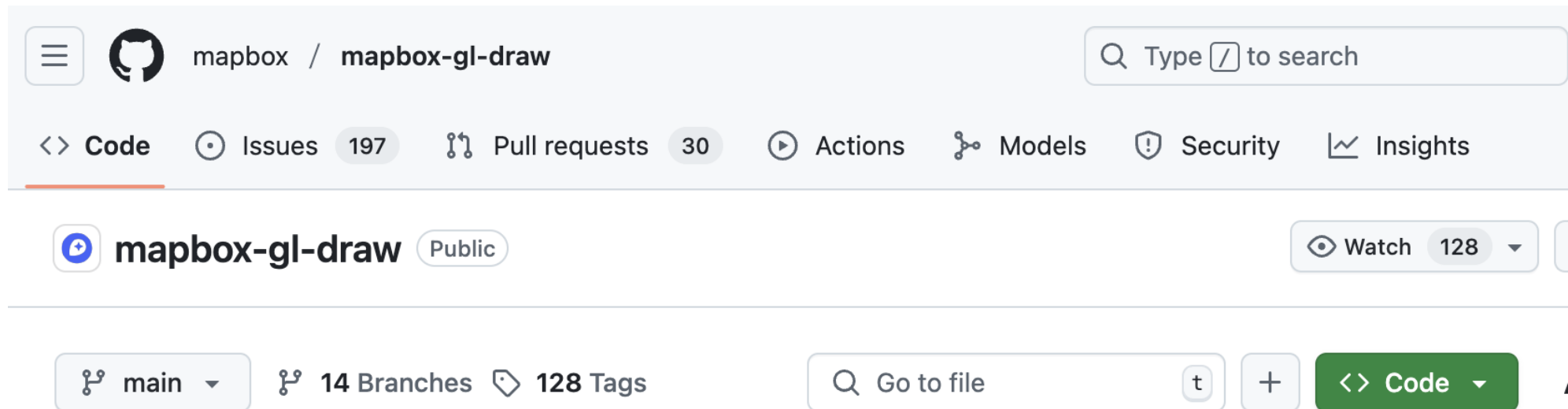
maplibre-gl-export
maplibre-gl-legend
maplibre-gl-terrastyle

<https://github.com/waterrgis>

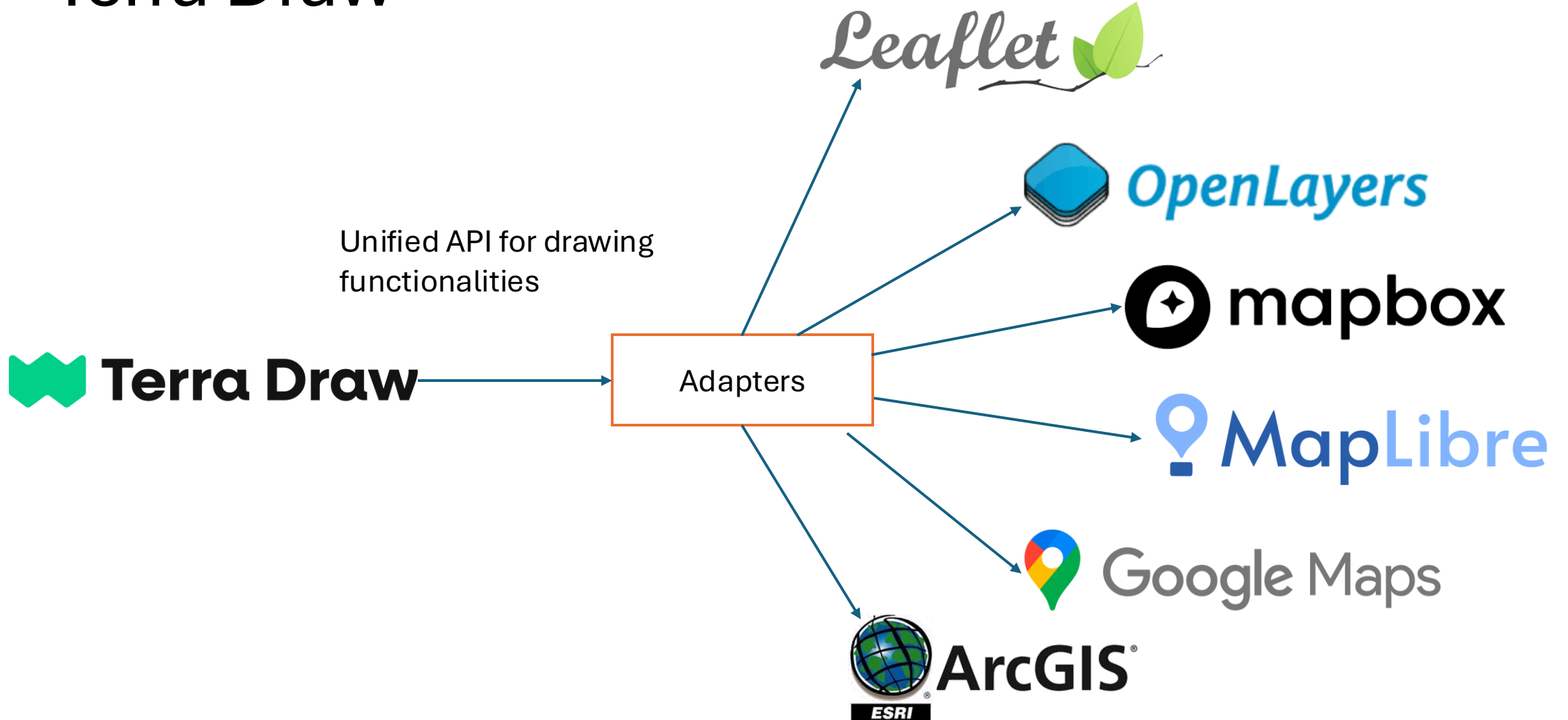
OSS to help water utilities to manage assets

mapbox-gl-draw

- Mapbox-gl-draw has been used for long time to provide drawing features for both Mapbox and Maplibre
- However, the use of mapbox-gl-draw is sometimes tricky and several issues associated with Maplibre



Terra Draw





More details about Terra Draw

- Check the recording of “Terra Draw: 3 Years of Open Source Map Drawing” conducted by @JamesLMilner
- <https://talks.osgeo.org/foss4g-europe-2025/talk/XHMYBK/>

Terra Draw: 3 Years of Open Source Map Drawing



07-18, 14:00–14:30 (Europe/Sarajevo), CA01 

Drawing on web maps can be surprisingly complex, especially when handling diverse mapping libraries and intricate user requirements. Three years ago, Terra Draw was created to simplify and standardize user drawing functionality across popular web mapping platforms, including Leaflet, OpenLayers, Google Maps, MapboxGL JS, and MapLibreGL JS. Since then, it has evolved into a robust open-source library, offering a range of built-in drawing modes for simple geometries like points, lines, and polygons, as well as advanced features like snapping, rotation, and scaling that "just work" across different mapping ecosystems.

What is maplibre-gl-terrastyle?

What controls are available?

Maplibre
TerraDraw
Control

Provide standard drawing
tools to maplibre

Maplibre
Measure
Control

Provide measuring features
to maplibre

Maplibre
Valhalla
Control

Provide easy intergration
with Valhalla Routing and
Isochrone API

What features are available?

Mode name		Description	Mode name		Description
render		Main button	Freehand-linestyl		Add a line with freehand
point		Add a point	angled-rectangle		Add a angled rectangle
marker		Add a marker	sensor		Add a sensor polygon
linestring		Add a line	sector		Add a sector polygon
polygon		Add a polygon	select		Select & modify a feature
rectangle		Add a rectangle	delete-selection		Delete selected feature
circle		Add a circle	delete		Delete all feature
freehand		Draw a freehand polygon	download		Download features

12 modes from Terra Draw API, and 4 modes from the plugin API itself



Plugin own feature

New **marker** and **freehand-linestring** has been added recently!!

Motivation to develop the plugin

- Terra Draw offers a unified API for drawing, however, you still need to write more code to bring it to a map application
- For instance, you need to do followings by yourself:
 - Making buttons for each Terra Draw mode
 - Adding icons
 - Implementing Integration with your selected map library
- I wanted to have a maplibre plugin to be added simply without any configuration

Get yourself started

Select a control

Select modes you want

MAPLIBRE GL TERRA DRAW

CONTROL TYPE

Default control is MaplibreTerraDrawControl.
If you want to use measure control, enable to choose MaplibreMeasureControl.

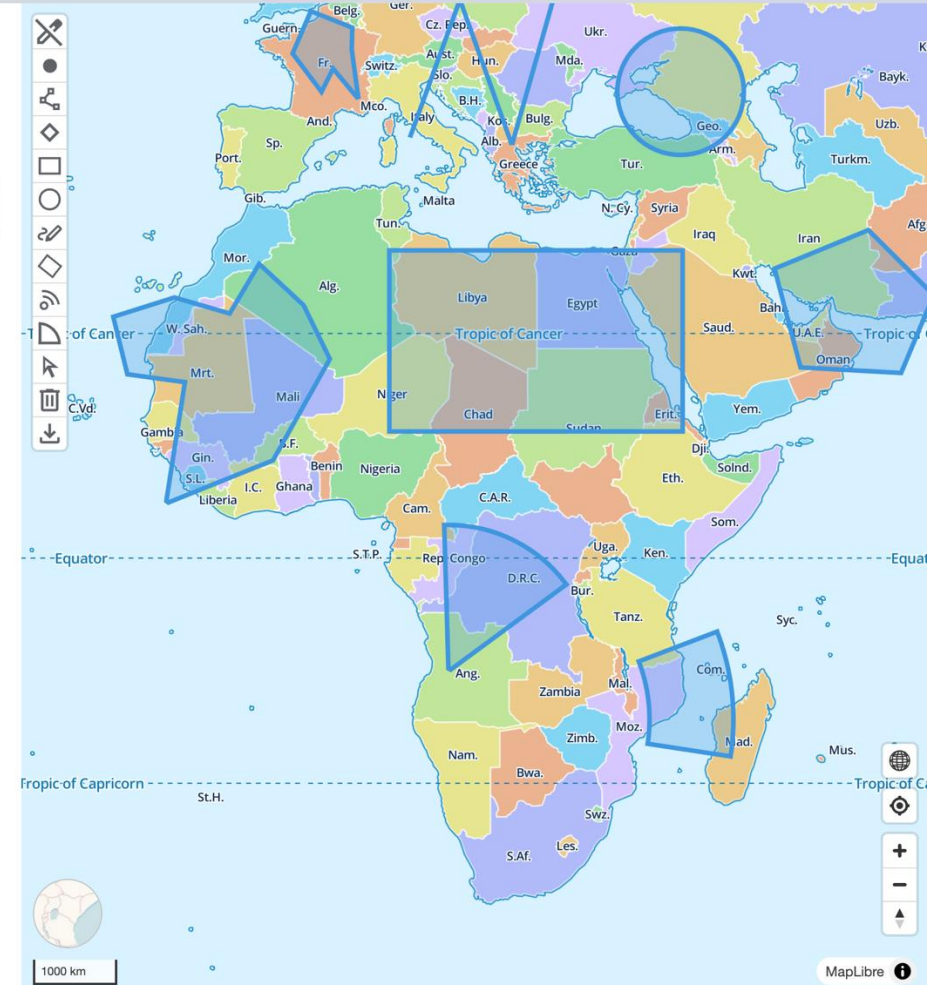
Default Control

Measure Control

MODE SELECTION

OPEN AS DEFAULT

Getting Started





Simple installation

Code is available based on
your selected options!
Just copy and paste!

```
import { Map } from 'maplibre-gl';  
import 'maplibre-gl/dist/maplibre-gl.css';  
import { MaplibreTerraDrawControl } from '@watergis/maplibre-gl-terraDraw'  
import '@watergis/maplibre-gl-terraDraw/dist/maplibre-gl-terraDraw.css'
```

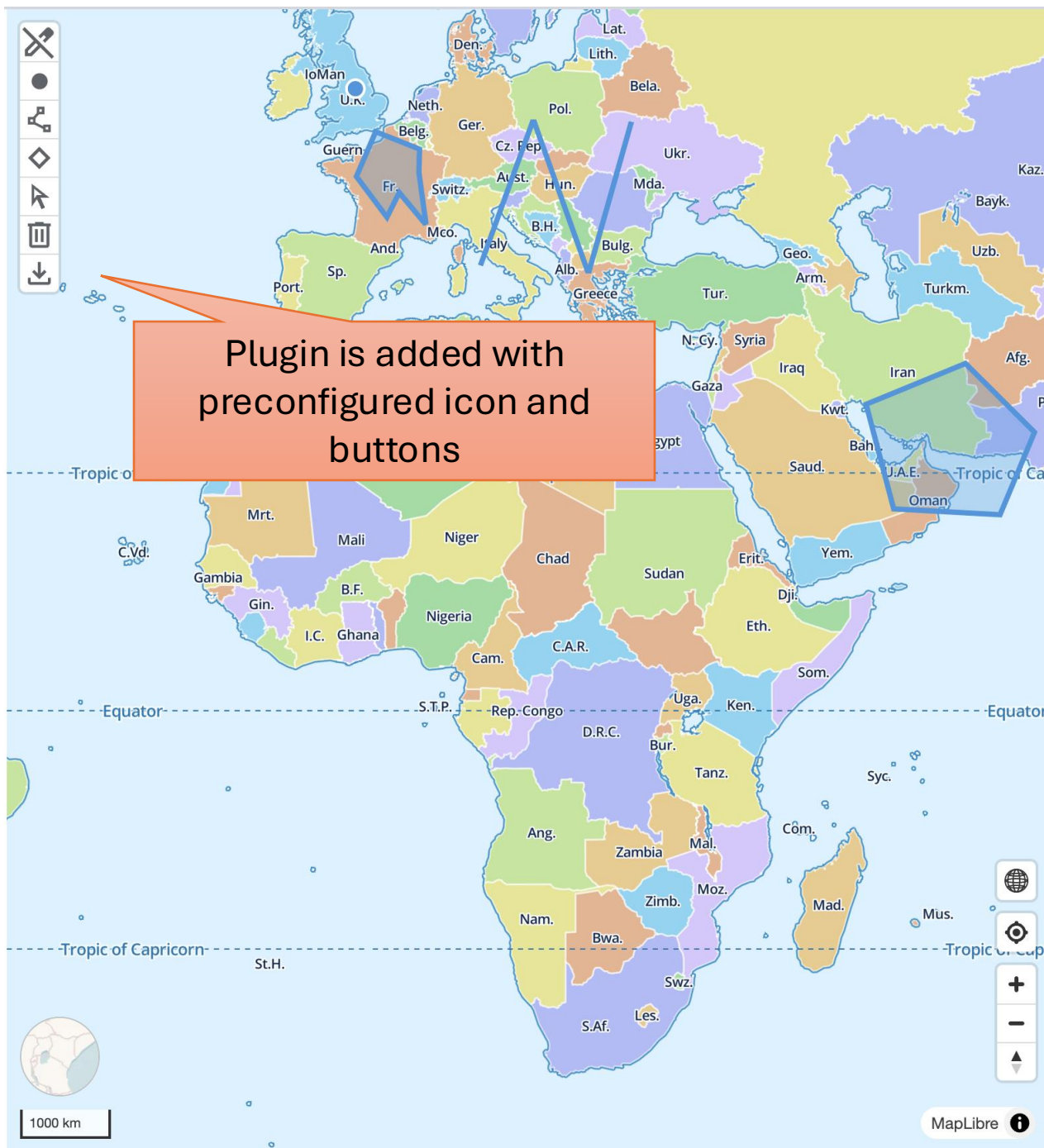
Import library and css

```
const map = new Map({  
  container: 'map',  
  style: 'https://demotiles.maplibre.org/style.json',  
  center: [0, 0],  
  zoom: 1,  
});
```

```
// As default, all Terra Draw modes are enabled,  
// you can disable options if you don't want to use them.
```

Use map.addControl

```
const draw = new MaplibreTerraDrawControl({  
  modes: ['render', 'point', 'linestring', 'polygon', 'select', 'delete-selection', 'delete', 'download'],  
  open: true,  
});  
map.addControl(draw, 'top-left');
```





Measuring distance, area and elevation

Measure control

```
import { Map } from 'maplibre-gl';
import 'maplibre-gl/dist/maplibre-gl.css';
import { MaplibreMeasureControl } from '@watergis/maplibre-gl-terra draw'
import '@watergis/maplibre-gl-terra draw/dist/maplibre-gl-terra draw.css'

const map = new Map({
  container: 'map',
  style: 'https://demotiles.maplibre.org/style.json',
  center: [0, 0],
  zoom: 1,
});

// As default, all Terra Draw modes are enabled,
// you can disable options if you don't want to use them.
const draw = new MaplibreMeasureControl({
  modes: ['render', 'point', 'linestring', 'polygon', 'select', 'delete-selection', 'delete', 'download'],
  open: true,
  distanceUnit: 'kilometers', distancePrecision: 2, areaUnit: 'metric', areaPrecision: 2, computeElevation: true
});
map.addControl(draw, 'top-left');
```

Simply switch
MaplibreTerra drawControl to
MaplibreMeasureControl

MEASURE CONTROL OPTIONS

DISTANCE UNIT

km mi ° rad

AREA UNIT

metric imperial

MEASURE PRECISION

Distance precision (Line)



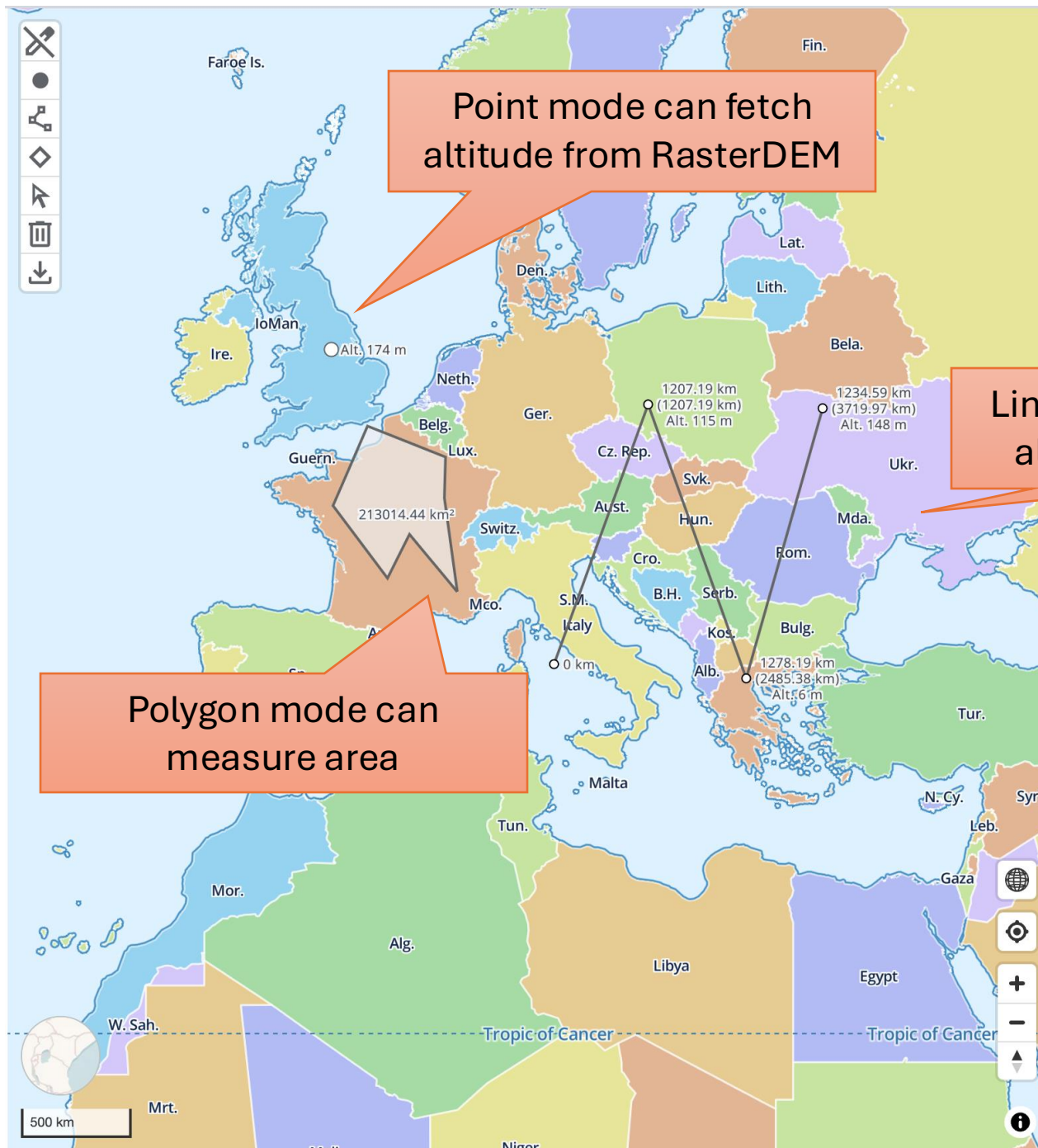
Area precision (Polygon)



COMPUTE ELEVATION

enabled disabled

19 July 2025



Line mode can measure altitude and distance

Polygon mode can measure area

Using turf.js for measuring area and distance

TURF

How can it fetch altitude dynamically?



Render altitude as label layer

Longitude/Latitude

maplibre-gl-terrain-draw

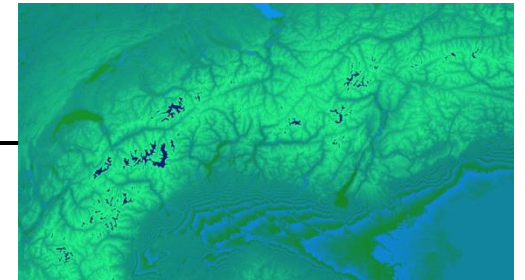
@watergis/terrain-rgb

<https://github.com/watergis/terrain-rgb>

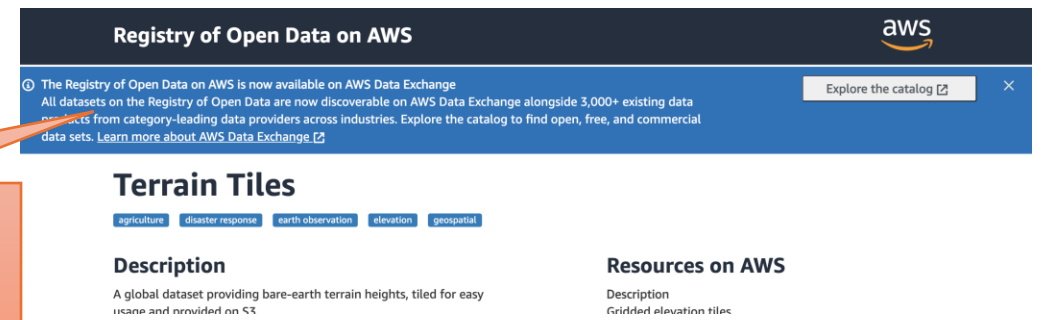
Get elevation tile from
/z/x/y.{webp|png}

Terrain RGB or
Terrarium

Raster-dem



As default, the plugin use
terrarium DEM hosted in AWS



Registry of Open Data on AWS

The Registry of Open Data on AWS is now available on AWS Data Exchange. All datasets on the Registry of Open Data are now discoverable on AWS Data Exchange alongside 3,000+ existing data products from category-leading data providers across industries. Explore the catalog to find open, free, and commercial data sets. [Learn more about AWS Data Exchange](#)

Terrain Tiles

agriculture disaster response earth observation elevation geospatial

Description

A global dataset providing bare-earth terrain heights, tiled for easy use and provided on S3

Resources on AWS

Description
Gridder elevation tiles

Bring your own raster-dem

```
const drawControl = new MaplibreTerradrawControl.MaplibreMeasureControl({
  modes: ['point', 'linestring', 'delete', 'download'],
  open: true,
  // enable the flag to compute elevation
  computeElevation: true,
  // set your own terrainRGB or terrarium source.
  // PNG or WEBP is supported.
  terrainSource: {
    url: 'https://wasac.github.io/rw-terrain-webp/tiles/{z}/{x}/{y}.webp',
    tileSize: 512,
    minzoom: 5,
    maxzoom: 15,
    encoding: 'mapbox'
  }
});
```

This example uses 10m
resolution DEM provided by
land authority of Rwanda

Query elevation directly from TerrainRGB

This example shows how you can calculate length of line and query elevation from custom TerrainRGB DEM dataset.



<https://terrastack.water-gis.com/examples/query-elevation-terrainrgb>

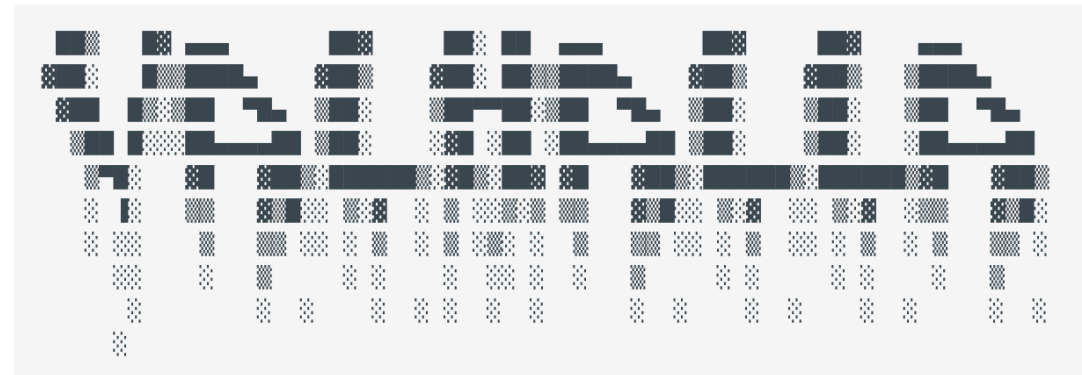


Integration with Valhalla API

The plugin can integrate with Valhalla Isochrone and Routing API

What is Valhalla?

- Valhalla is an open source routing engine by using OpenStreetMap data.
- It provides various APIs such as
 - Route API <- plugin supports
 - Isochrone API <- plugin supports
 - Matrix API
 - Elevation Api
 - Etc...



<https://valhalla.github.io/valhalla/>

Routing API with Terra Draw

MAPLIBRE GL TERRA DRAW

OPEN AS DEFAULT

VALHALLA CONTROL OPTIONS

VALHALLA API URL

<https://valhalla.water-gis.com>

Note. the example api URL of Valhalla control only supports the country of Kenya, Uganda and Rwanda in this demo. You need to deploy your own Valhalla API server for your application.

Routing Isochrone

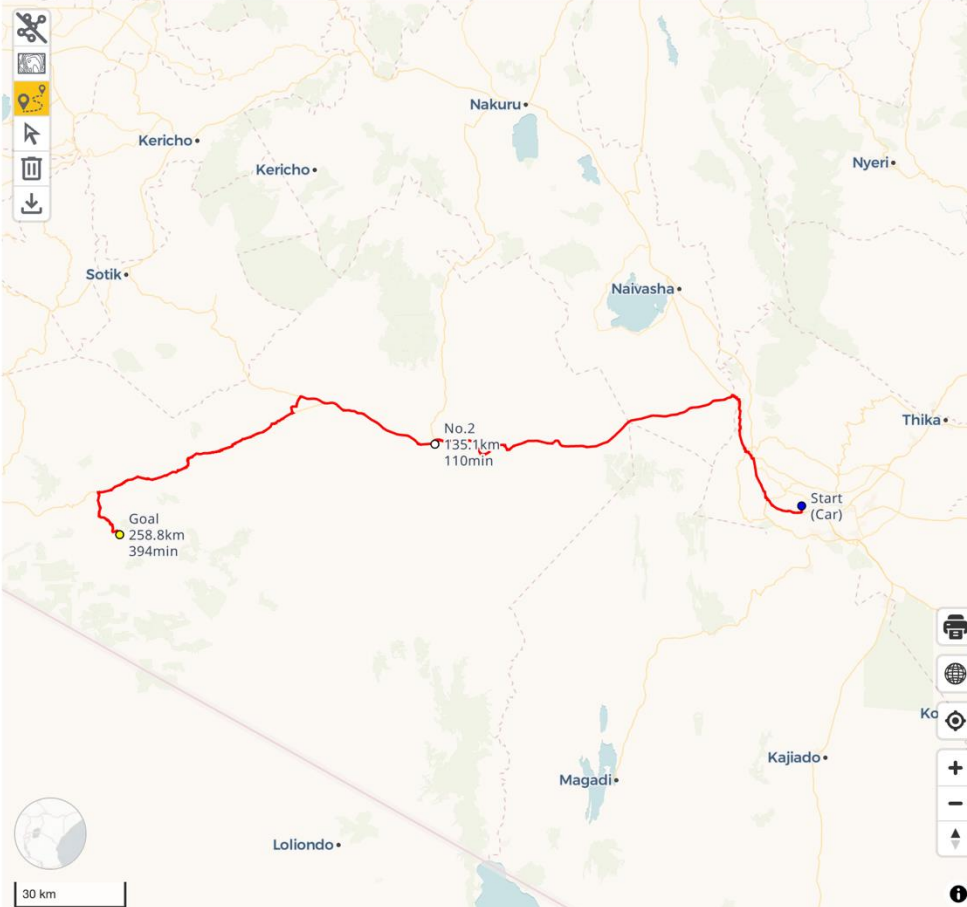
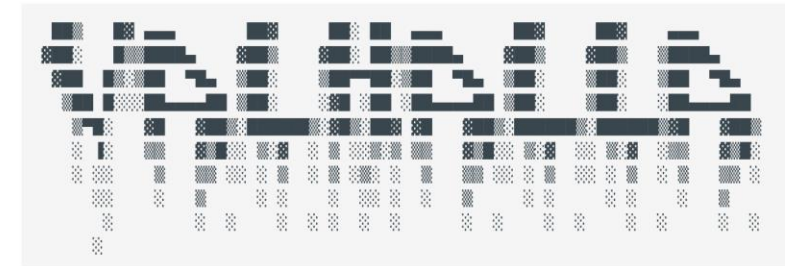
MEANS OF TRANSPORT

Pedestrian Bicycle **Car**

DISTANCE UNIT

km mile

Getting Started

Draw a line by
Terra Draw,
Request to
Valhalla

- By Car
- By Bicycle
- On foot

Valhalla
returns
Optimised
route

maplibre-gl-terra draw

Isochrone API with Terra Draw

MAPLIBRE GL TERRA DRAW

OPEN AS DEFAULT

VALHALLA CONTROL OPTIONS

VALHALLA API URL

<https://valhalla.water-gis.com>

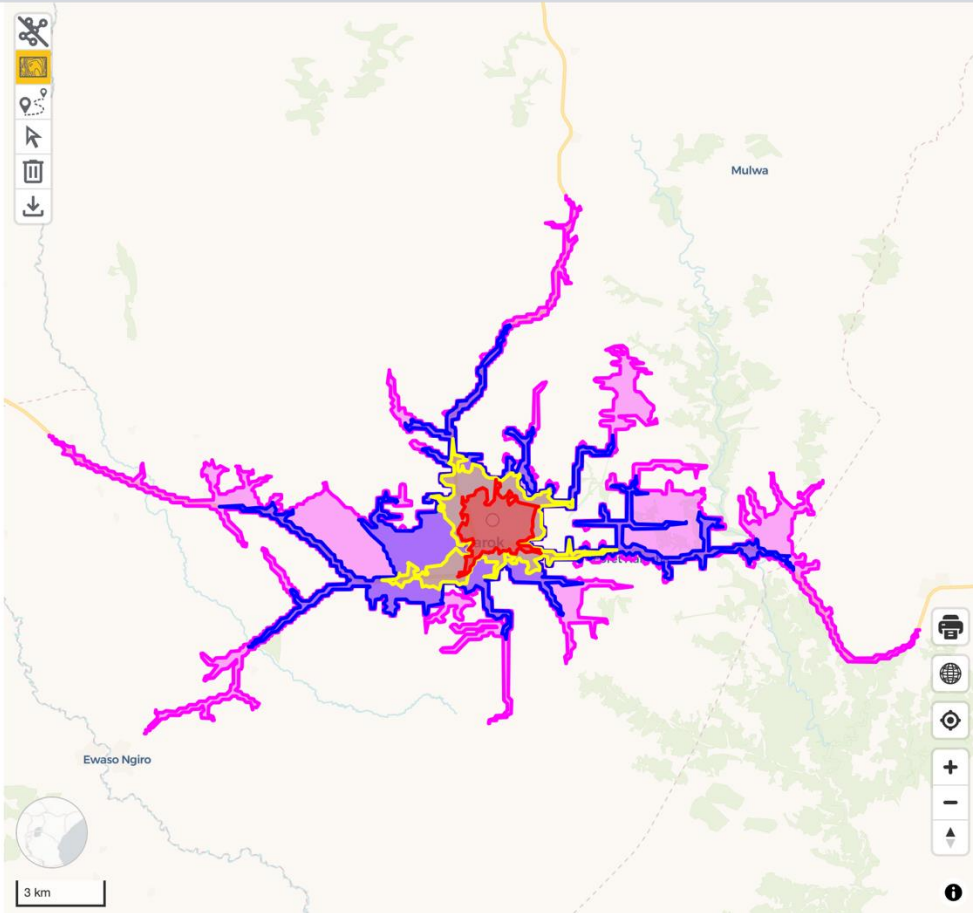
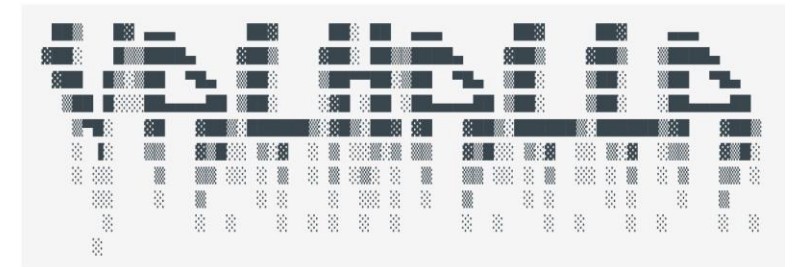
Note. the example api URL of Valhalla control only supports the country of Kenya, Uganda and Rwanda in this demo. You need to deploy your own Valhalla API server for your application.

Routing Isochrone

MEANS OF TRANSPORT

DISTANCE UNIT

[Getting Started](#)

Draw a
starting point
for isochrone

- By Car
- By Bicycle
- On foot

Returns
Isochrone
contours

maplibre-gl-terra-draw

Customization with Terra Draw API

The plugin supports integrating all Terra Draw APIs for full customization

Access to Terra Draw API

- The plugin provides you an API to access Terra Draw instance directly from your code.
- Use `getTerraDrawInstance()` to access to Terra Draw directly

This is an example of how to add GeoJSON in advance.

```
map.once('load', () => {  
  const drawInstance = drawControl.getTerraDrawInstance();  
  if (drawInstance) {  
    // geojson data to be added  
    const geojson = [  
      {  
        id: '6b438f48-f6da-4649-9212-76f5a1506296',  
        type: 'Feature',  
        geometry: {  
          type: 'Polygon',  
          coordinates: [  
            [26.938972246, 25.217617825],  
            [-4.045232861, 25.217617825],  
            [-4.045232861, -7.839055615],  
            [26.938972246, -7.839055615],  
            [26.938972246, 25.217617825]  
          ]  
        },  
        properties: {  
          // make sure you put terradraw mode for geojson  
          mode: 'polygon'  
        }  
      }  
    ];  
    drawInstance?.addFeatures(geojson);  
  }  
});
```



You can access all APIs of Terra Draw

Terra Draw Home API Docs

terra-draw-monorepo

> Settings

- M terra-draw-monorepo
 - M terra-draw
 - N TerraDrawExtend
 - C TerraDraw
 - C TerraDrawAngledRectangleMode
 - C TerraDrawCircleMode
 - C TerraDrawFreehandMode
 - C TerraDrawLineStringMode
 - C TerraDrawPointMode
 - C TerraDrawPolygonMode
 - C TerraDrawRectangleMode
 - C TerraDrawRenderMode
 - C TerraDrawSectorMode
 - C TerraDrawSelectMode
 - C TerraDrawSensorMode
 - I TerraDrawAdapterStyling

terra-draw-monorepo /

terra-draw-monorepo

Index

Modules

M terra-draw	M terra-draw-arcgis-adapter	M terra-draw-google-maps-adapter
M terra-draw-leaflet-adapter	M terra-draw-mapbox-gl-adapter	M terra-draw-maplibre-gl-adapter
M terra-draw-openlayers-adapter		

Examples

Search examples...



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Measure distance and length of feature

This example shows how you can calculate length of line and area of polygon by using...



Using custom font for measure control

This example shows how you can change font glyphs used in MaplibreMeasureControl other than...



Adding default GeoJSON feature to TerraDraw

You can add GeoJSON features by using addFeatures() function in the TerraDraw instance which can be...



Adding GeoJSON feature to TerraDraw custom style

You can add GeoJSON features with custom style by using addFeatures() function in the TerraDraw instance...



Subscribe select event of TerraDraw

This plugin provides a function getTerraDrawInstance to fetch the instance of TerraDraw itself. Using thi...



Customising drawing options

This plugin tries to optimise the better drawing options for each Terra Draw mode. However, preconfigured drawi...



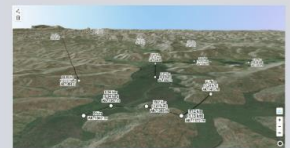
Use different coordinate precision

TerraDraw used 9 digits as default coordinate precision. You can use different coordinate precision instead.



Using custom icon

This plugin provides default icons for each TerraDraw mode button. You can change default icon if you would like t...



Query elevation from Maplibre Terrain

This example shows how you can calculate length of line and query elevation from maplibre raster-dem...



Query elevation directly from TerrainRGB

This example shows how you can calculate length of line and query elevation from custom TerrainRGB DE...

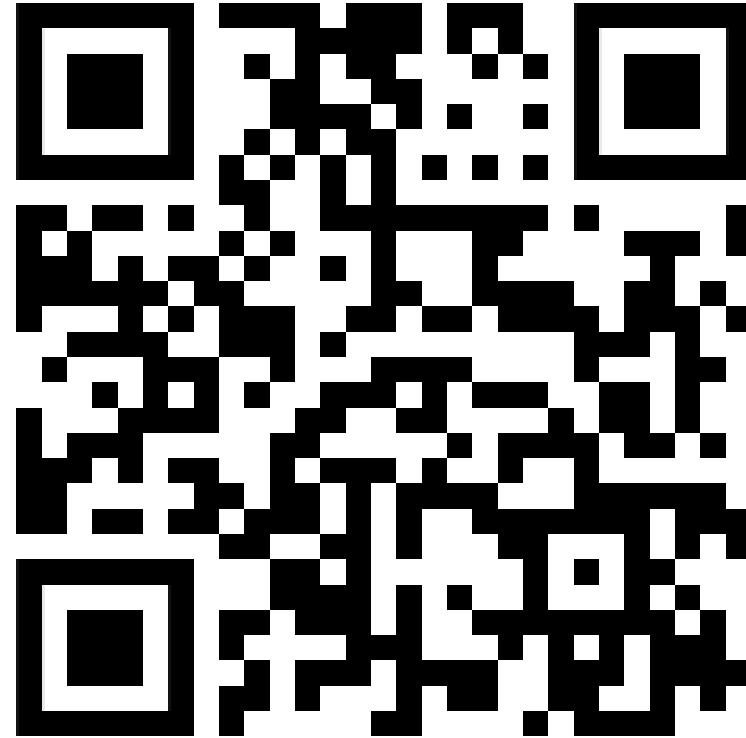


Customising drawing style

The plugin use default color styling provided by TerraDraw. This example shows you how to customise drawing...

13 examples of the plugin usage are available

Live demo



<https://terrdraw.water-gis.com>



GitHub

<https://github.com/watergis/maplibre-gl-terrastyle>

Thank you for your attention!