



# **Decoding the Geospatial Web: An Introduction to GIS for JavaScript Developers**



Courtney Yatteau



# What We'll Cover



***[bit.ly/cityjs-medellin-2024-geospatial](https://bit.ly/cityjs-medellin-2024-geospatial)***

**1**

**GIS Fundamentals**

**2**

**Mapping/GIS Libraries**

**3**

**Demos & Use Cases**

**4**

**Resources**



# Courtney Yatteau

Developer Advocate, Esri

# What is GIS?

*GIS - Geographic Information System*



***Maps***

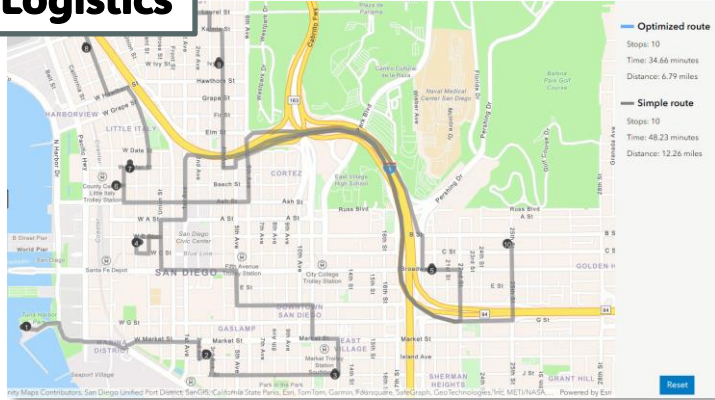


***Data***

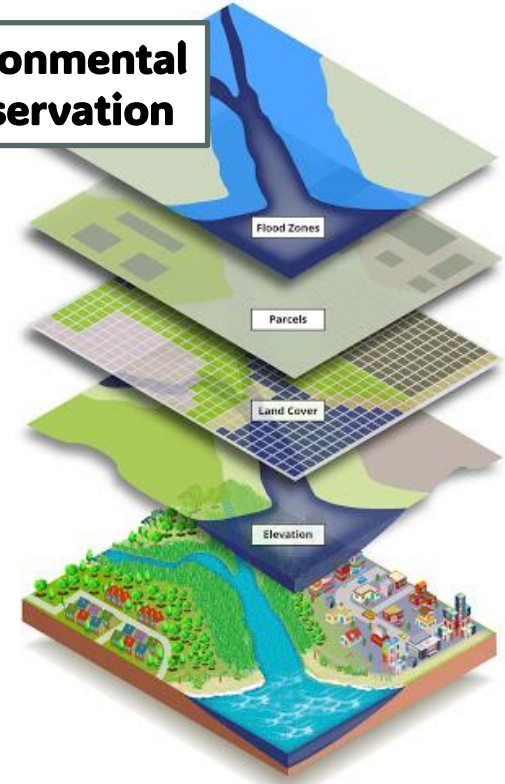


# Why Use GIS?

## Logistics



## Environmental Conservation



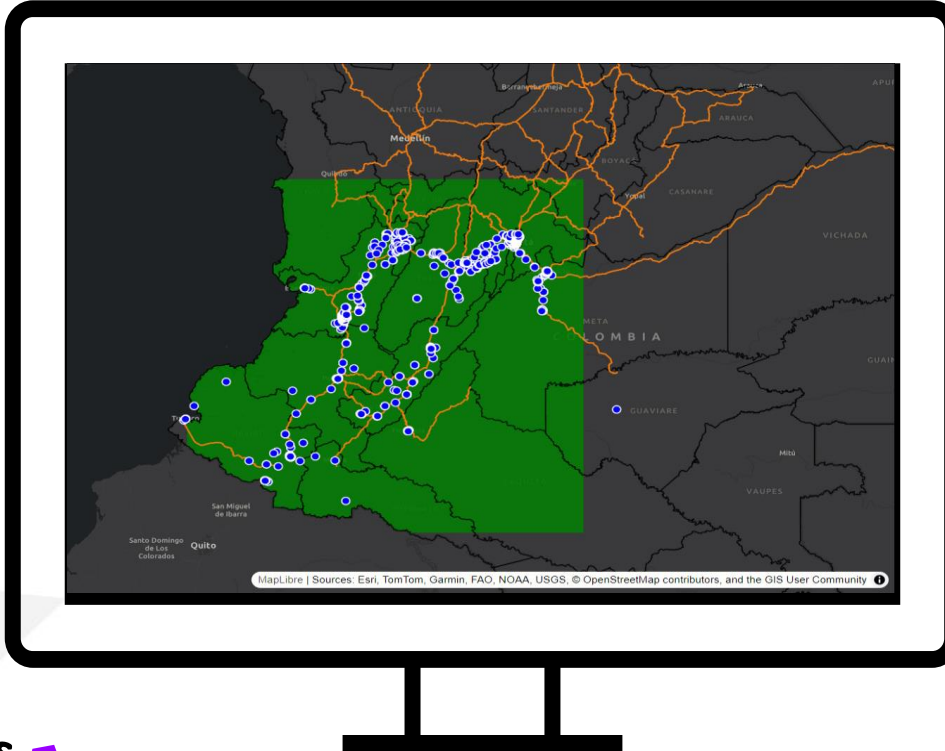
## Urban Planning



# GIS Data

Layers of Information

Points 



Polylines 

Polygons 



# What is MapLibre GL JS?



## Community plugins



MapLibre GL JS

Search

GitHub v4.7.1 6.5k 695

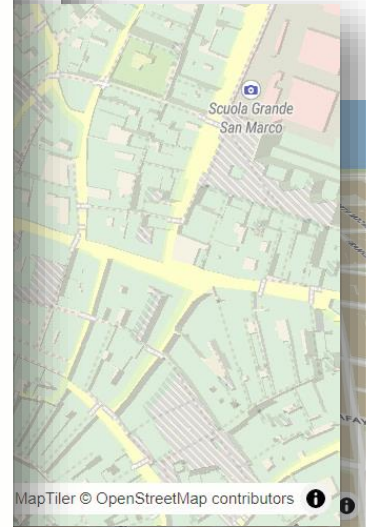
### Plugins

#### User Interface Plugins

- [any-routing](#) - A modular plugin for calculating routes.
- [Gauge Legend](#) - Dynamic gauge legend for MapLibre GL JS
- [mapbox-gl-controls](#) - Adds controls for a ruler, style inspector, localization, and style switcher.
- [mapbox-gl-draw](#) - Adds support for drawing and editing features on maps.
- [mapbox-gl-elevation](#) - Adds a control to retrieve altitude from terrain RGB tilesets.
- [mapbox-gl-infobox](#) - Adds a control to display an infobox or a gradient.
- [mapbox-gl-legend](#) - Adds a control that shows a legend generated from the map style.
- [mapbox-gl-valhalla](#) - Adds a control to provide isochrone features from valhalla server.
- [mapboxgl-minimap](#) - Adds a control to show a miniature overview of the current map.
- [maplibre-compass-pro](#) - old fashioned compass (with compass rose) for Maplibre GL. [demo](#)
- [maplibre-preload](#) - A tiny zero-configuration plugin for preloading tiles and smoothen the experience when using targeted movements in MapLibre GL JS.
- [maplibre-gl-basemaps](#) - A plugin for switching between raster basemaps.
- [maplibre-gl-compare](#) - Enables users to compare two maps by swiping left and right.
- [maplibre-gl-export](#) - Adds a control that exports the map as a PDF or images such as PNG, JPEG and SVG.
- [maplibre-gl-measures](#) - A plugin for taking measures on the map.
- [maplibre-gl-opacity](#) - A plugin to switch layer like Leaflet control layers, and update opacities

Table of contents

- User Interface Plugins
- Geocoding & Search Plugins
- Map Rendering Plugins
- Layer Types Plugins
- Utility Libraries
- Development Tools Plugins
- Framework Integrations

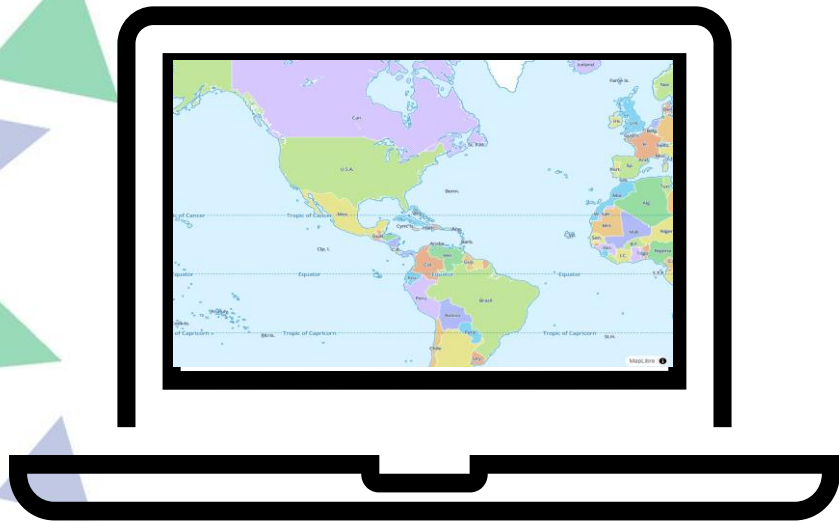


MapTiler © OpenStreetMap contributors

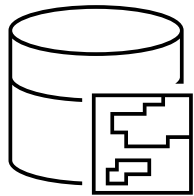
# Setting up MapLibre GL JS

	CDN	npm
Use	Prototypes, small apps	Large apps, frameworks
Setup	No install	Install required
Code	<code>&lt;script&gt;</code> & <code>&lt;link&gt;</code> tags	<code>npm i maplibre-gl</code>
Pros	Quick, easy	Package control
Cons	Hard to scale	Slower setup





# MapLibre GL JS: Demo



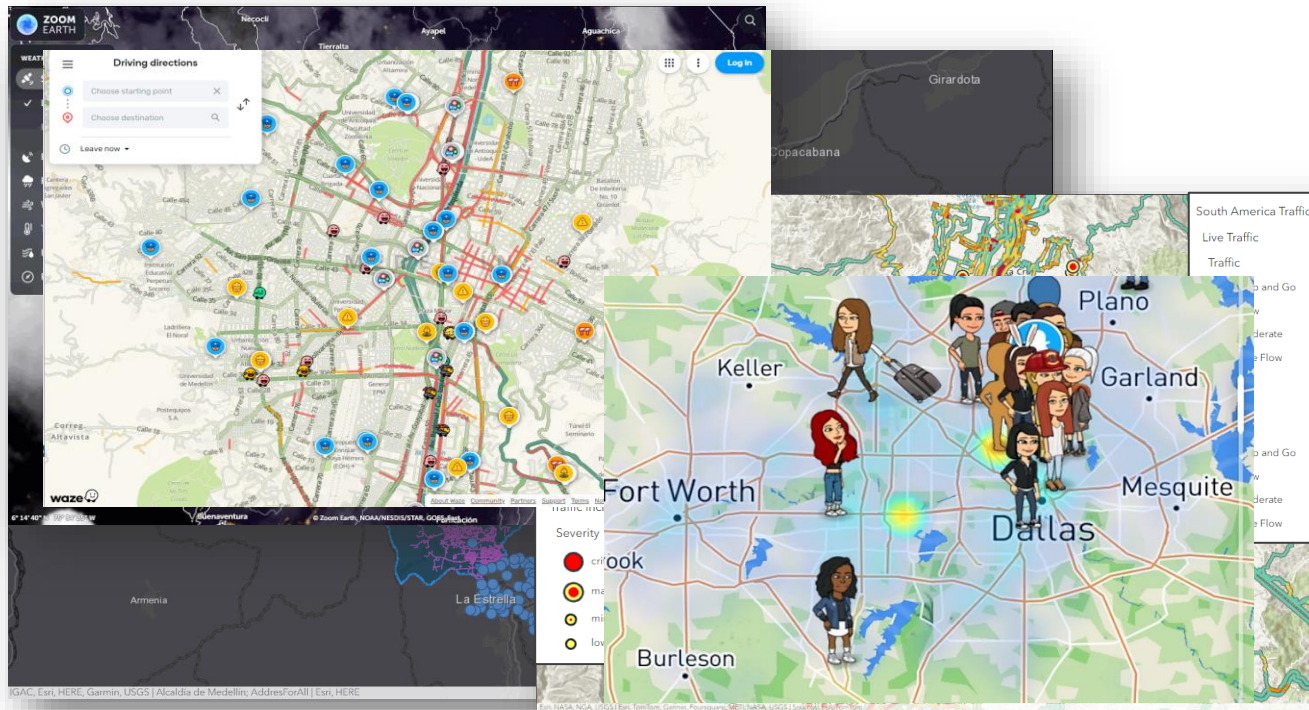
# Feature Layers

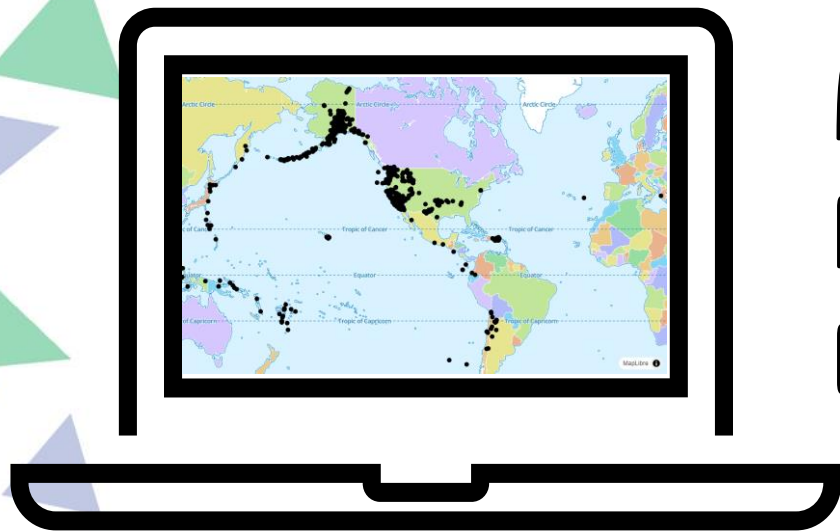
## Types of GIS Layers

**Interactive**

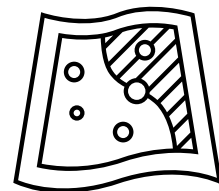
**Real-time data**

**Dynamic data**





# MapLibre GL JS: Feature Layer Demo



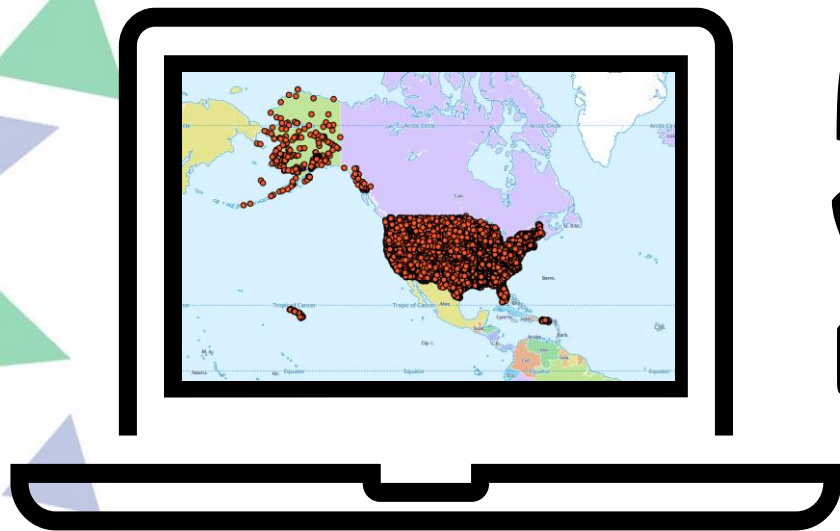


## Types of GIS Layers

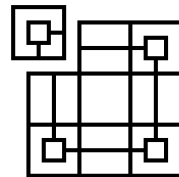
# Large datasets



Powered by Es



# MapLibre GL JS: Vector Tile Layer Demo





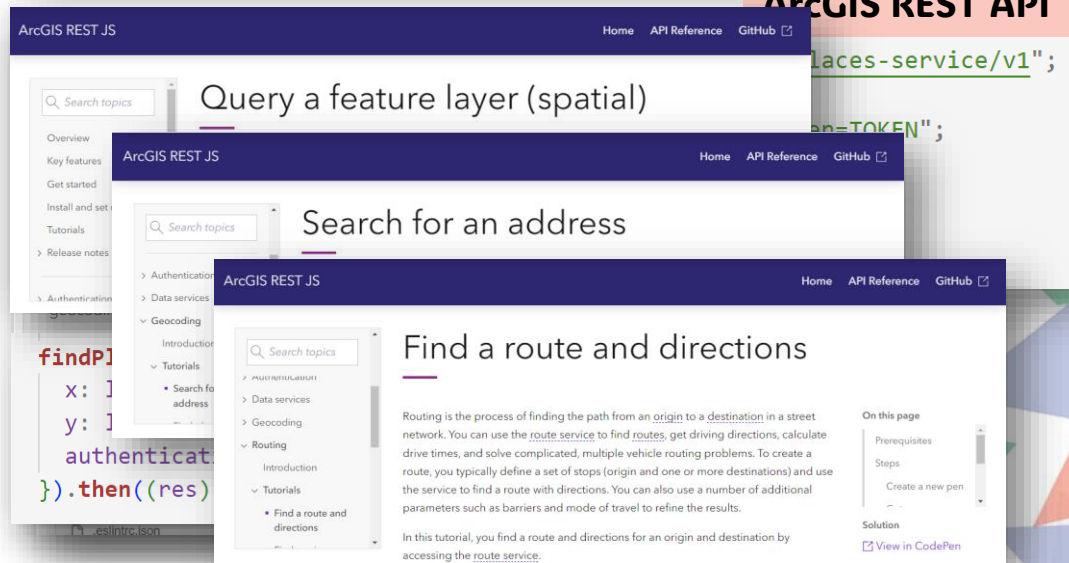
# What is ArcGIS REST JS?

Open source

Lightweight &  
modular

ArcGIS REST API  
wrapper

Location services  
*(no map!)*





# Setting up ArcGIS REST JS

Install: npm or CDN

Modular packages

No CSS needed

Authentication required

Esri/arcgis-rest-js

compact, modular JavaScript wrappers for the  
ArcGIS REST API





```
watchConsoleLogs.8258a5d6.js:6
▼ {spatialReference: {...}, candidates: Array(2), geoJson: {...}} ⓘ
  ▼ candidates: Array(2)
    ▼ 0:
      address: "ibis Medellin"
      ▶ attributes: {}
      ▶ extent: {xmin: -75.5796586, ymin: 6.2192009, xmax: -75.569651, ymax: 6.2242009}
      ▶ location: {x: -75.5746586, y: 6.2242009, spatialReference: {wkid: 4326}}
      score: 100
      ▶ [[Prototype]]: Object
    1: {address: 'Ibis', location: {...}, score: 100, attributes: {...}}
      length: 2
      ▶ [[Prototype]]: Array(0)
  ▼ geoJson:
    ▶ features: (2) [{...}, {...}]
      type: "FeatureCollection"
      ▶ [[Prototype]]: Object
    ▶ spatialReference: {wkid: 4326, latestWkid: 4326}
    ▶ [[Prototype]]: Object
  >
```

# ArcGIS REST JS: Geocoding Demo



# ArcGIS Vector Tile Style Editor

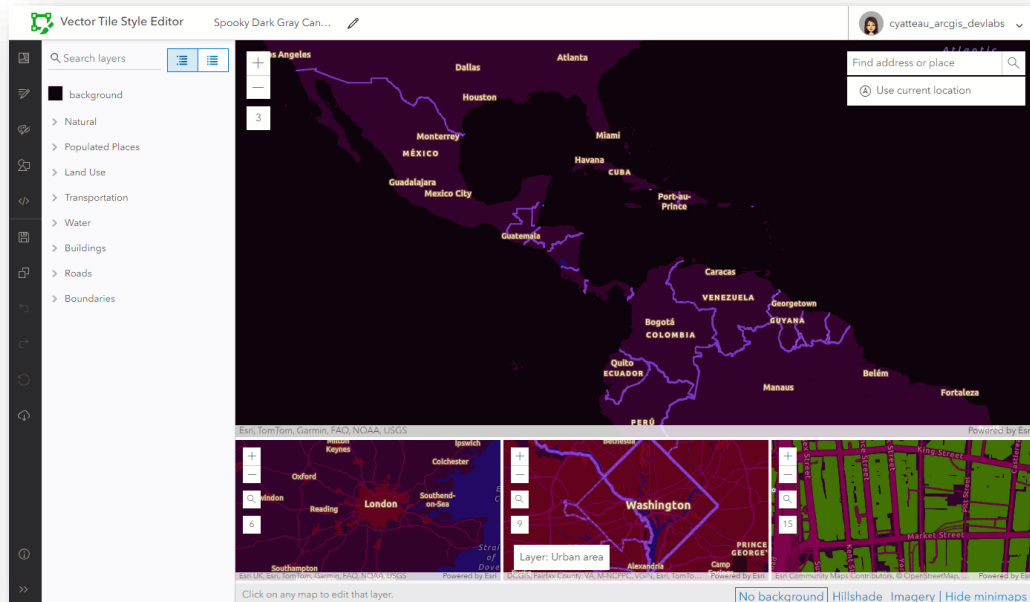
[vtse.arcgis.com](https://vtse.arcgis.com)

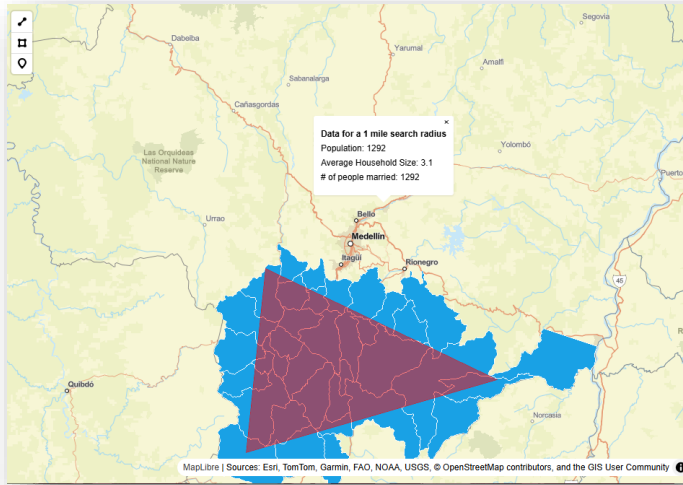
Custom styling

Easy interface

Server processing

ArcGIS account  
(Location Platform or Online)





# Integration of MapLibre GL JS + ArcGIS REST JS + ArcGIS VTSE Demo

# Resources

Additional learning tools

01

## MapLibre GL JS

- [Documentation](#)
- [ArcGIS documentation](#)
- [Repository](#)

02

## Esri & ArcGIS

- [VTSE](#)
- [Local data finder](#)
- [Location Platform account](#)

03

## ArcGIS REST JS

- [Documentation](#)
- [Repository](#)

04

## Spatial Querying

- [Terraformer](#)
- [Draw tools](#)



**Thank you,  
CityJS Medellin!**



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