Leaflet JS

For Dataviz

https://leafletjs.com/

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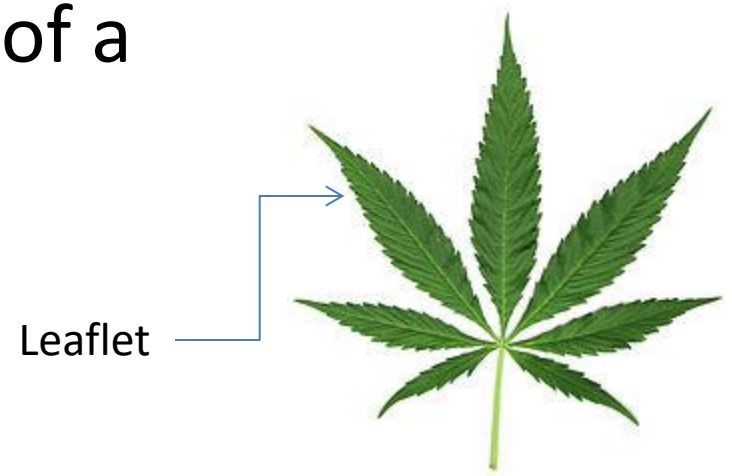
What is a Leaflet?

A leaflet is a leaf-like part of a compound leaf made of many smaller leaves.



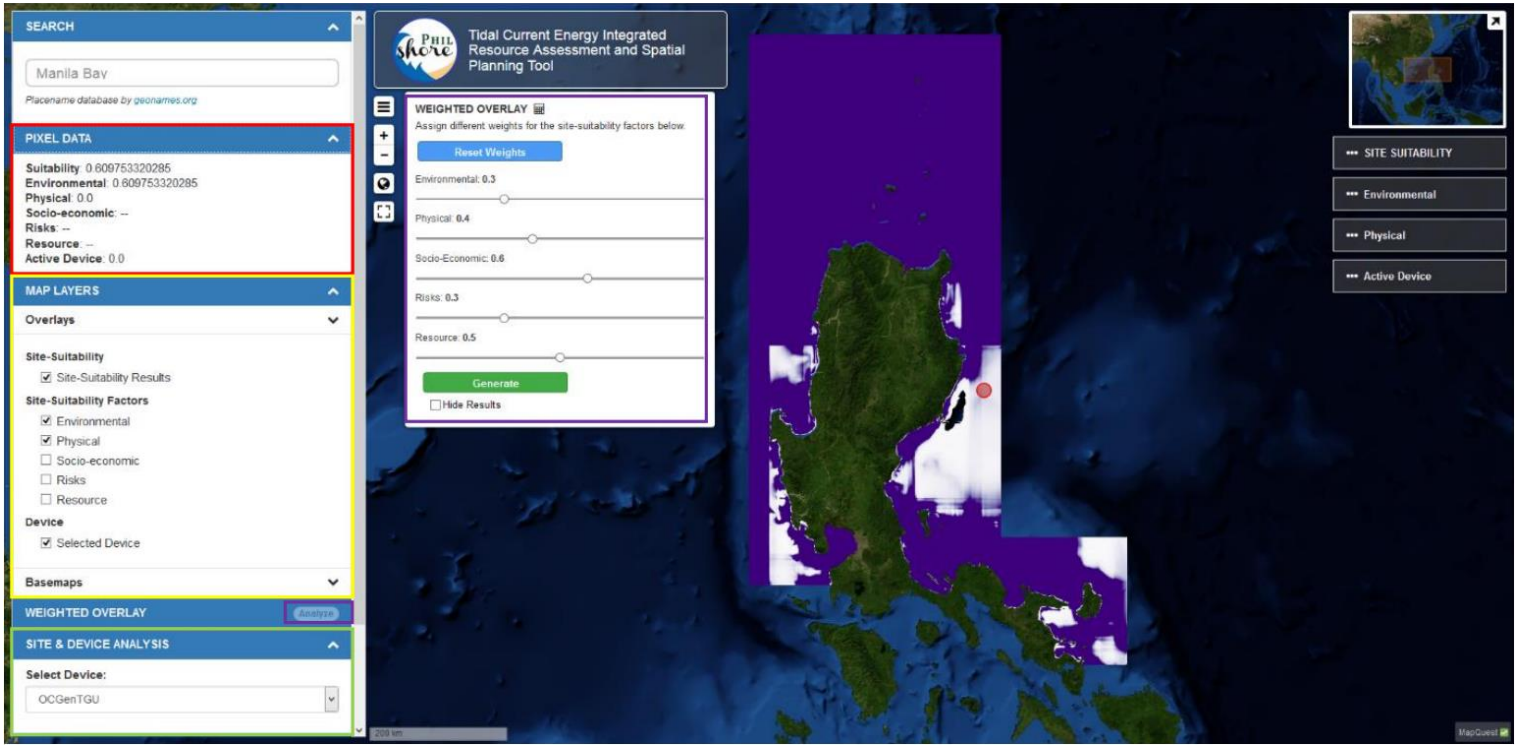
Hemp is an example.

What is LeafletJS?

- Marketing: “an open-source JavaScript library for mobile-friendly interactive maps”
- Lets you display points and shapes on map(s) of your choosing
- Free & Open source (BSD 2-Clause "Simplified" License)
- Compact (38kb) alternative to OpenLayers, and (closed source) Google Maps API

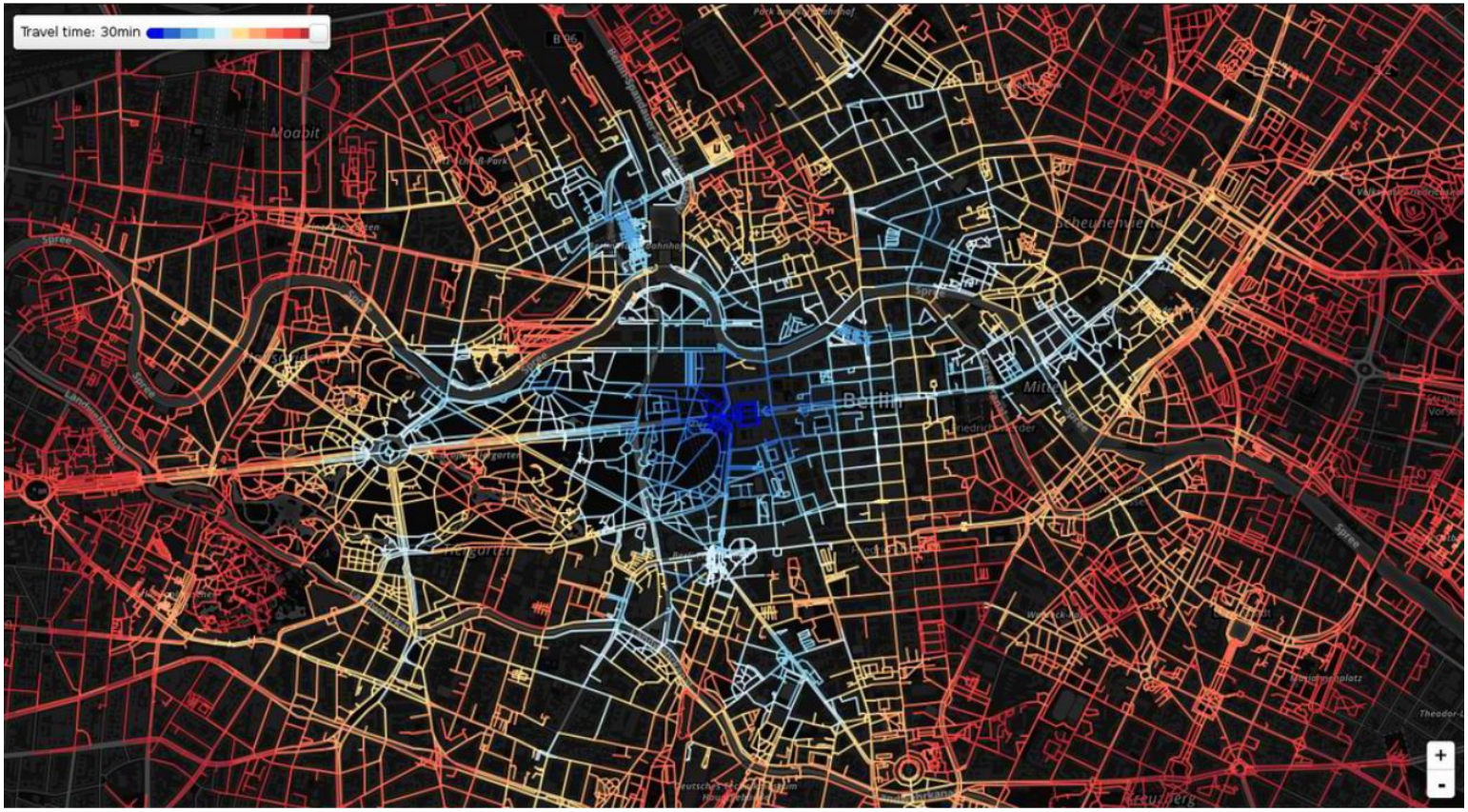
What can Leaflet do?

Example: PhilSHORE Site Suitability Map



What can Leaflet do? (Cont'd)

Transit Station Accessibility Mapping



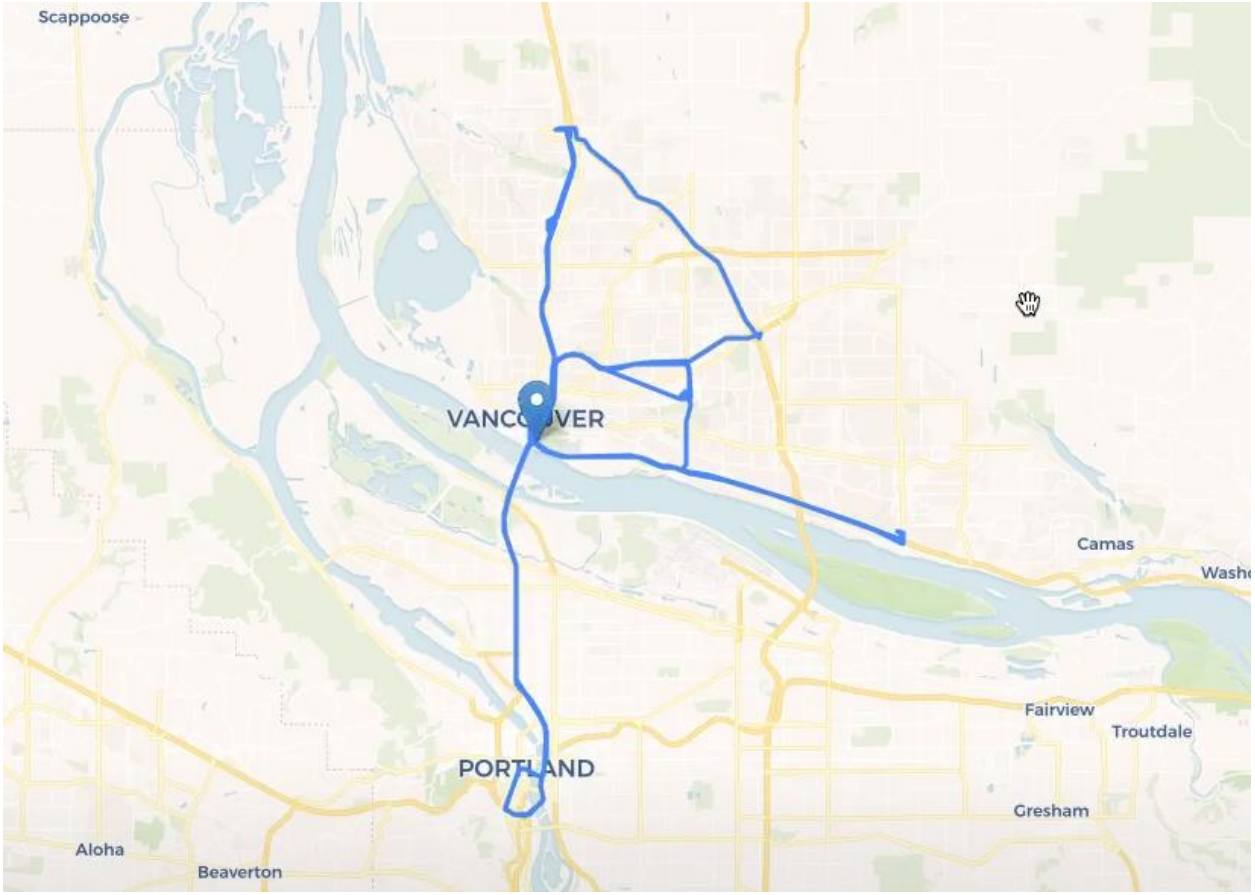
What can Leaflet do? (Cont'd)

Quick Covid-19 Spread Visualization

https://medium.com/@Ovilia/making-a-covid-19-map-with-echarts-and-leaflet-30fdcd8739c6 (Tutorial)

What can Leaflet do? (Cont'd)

Sam Gomena's 2019 Project



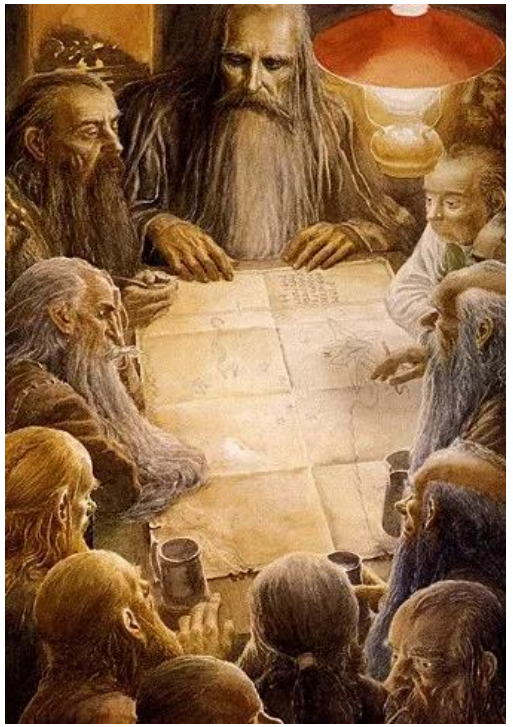
We've Seen Cool Maps Before

Most of this is stuff we've all seen before—what we have here are examples showing simply that Leaflet can be an effective dataviz tool.

So that's the "what", let's dig into the "how" this product works.

Maps Providers

If you want actual geographic data about the planet's surface someone has to provide it.

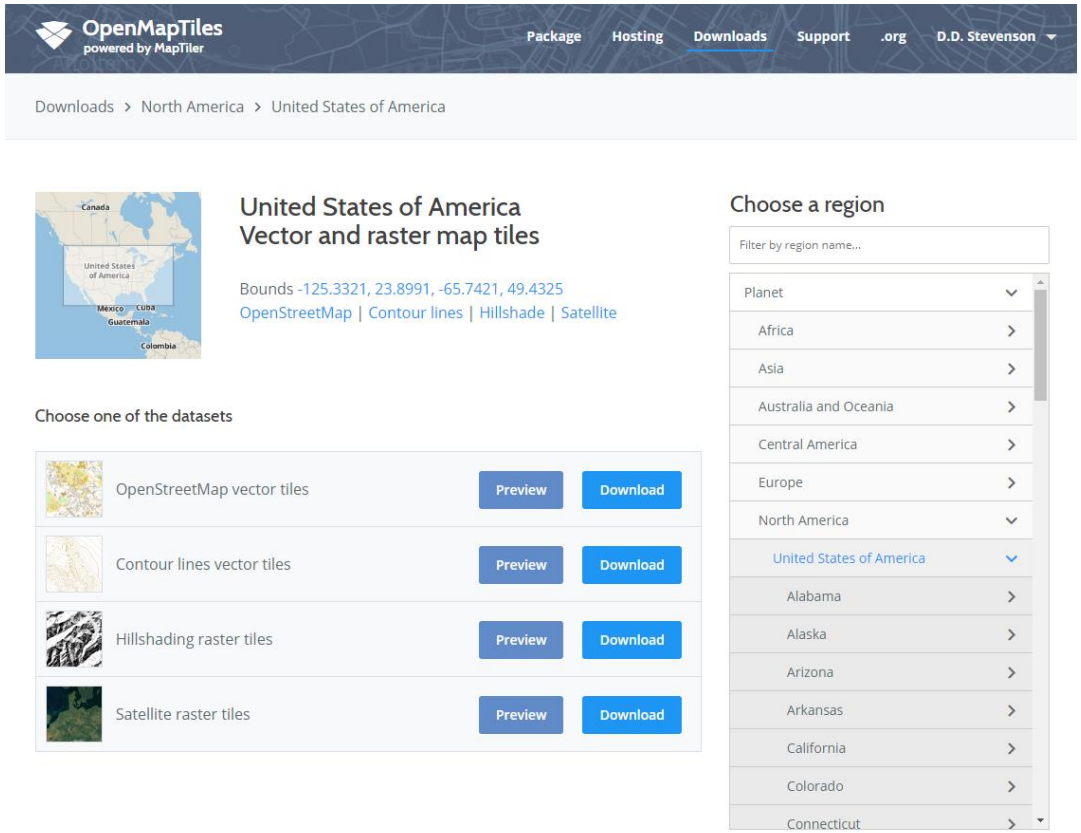


This "someone" is called the provider. Most providers charge money, but offer the first *n* downloads/month for free.

You usually need to sign up with a credit card number to receive a provider access token.

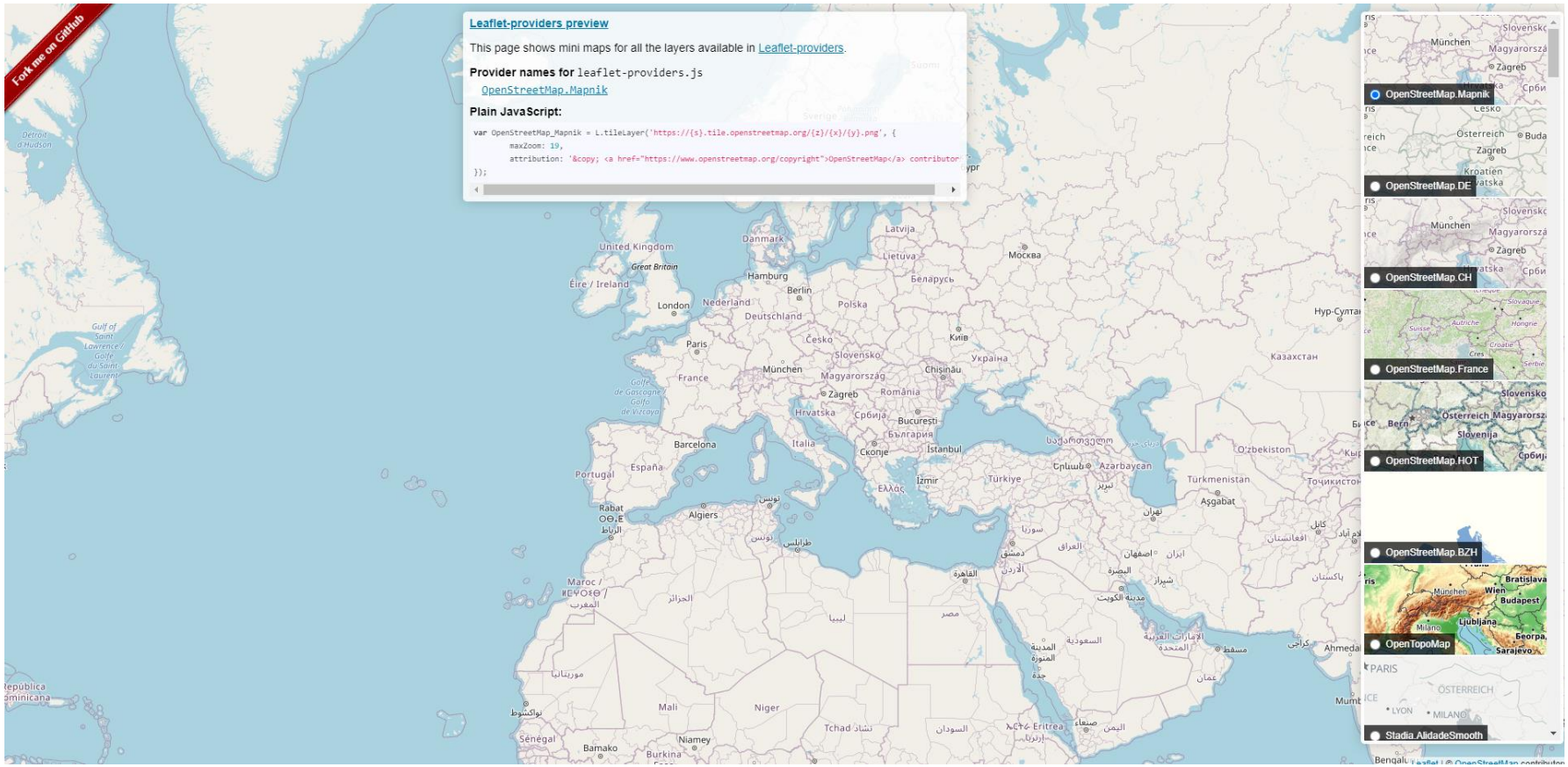
Open Map Tiles

One free provider for static tiles is OpenMapTiles. https://openmaptiles.com/



Other Leaflet Maps Providers

https://leaflet-extras.github.io/leaflet-providers/preview/



CONSIDER USING LEAFLET

- Clear tutorial available on Leaflet's site
- Leaflet is a web technology – web programming is something we all should be somewhat comfortable with
- Also has a very useful collection of modules that can be used for dataviz

Leaflet Vs. Google Maps

Leaflet	Google Maps API
Most maps providers	Google maps only
JS Only	Most languages
Calls provider when live data required	Calls provider for most cases ($$$)
Can't use Google traffic data	Best live traffic data in world (arguably)

Leaflet Basics

Layer – a control that groups map effects.

Point—a latitude/longitude pair indicating a map location.

Segment—a pair of points

Raster Layers

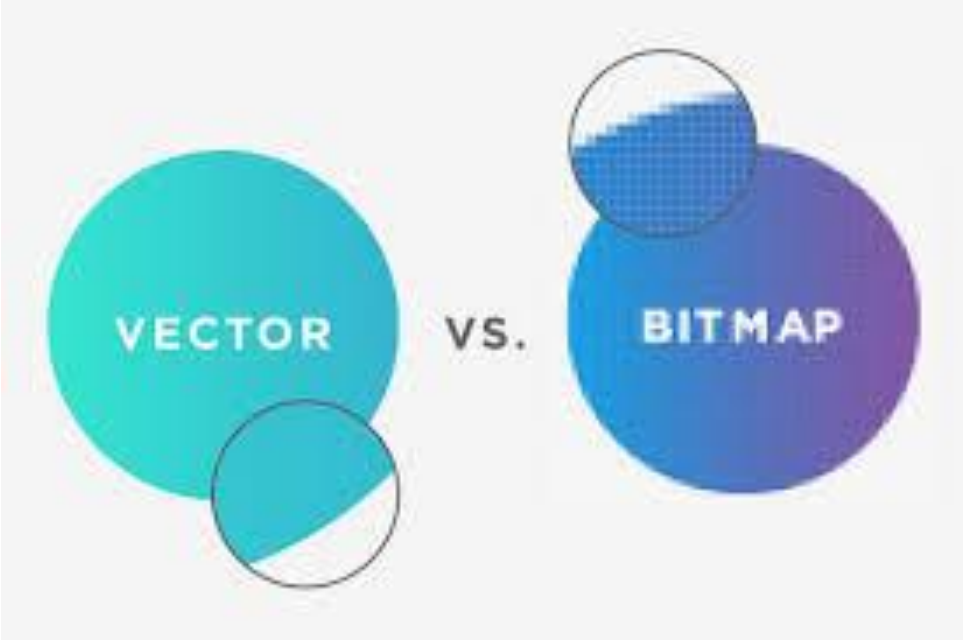
(For our purposes, a raster is basically the same thing as a bitmap.)

- Tile Layer – map tiles are loaded here
- Image Layer—images that aren't map tiles
- Video Layer—self-explanatory

The opacity, clickability, ordering, and height of these layers may all be adjusted.

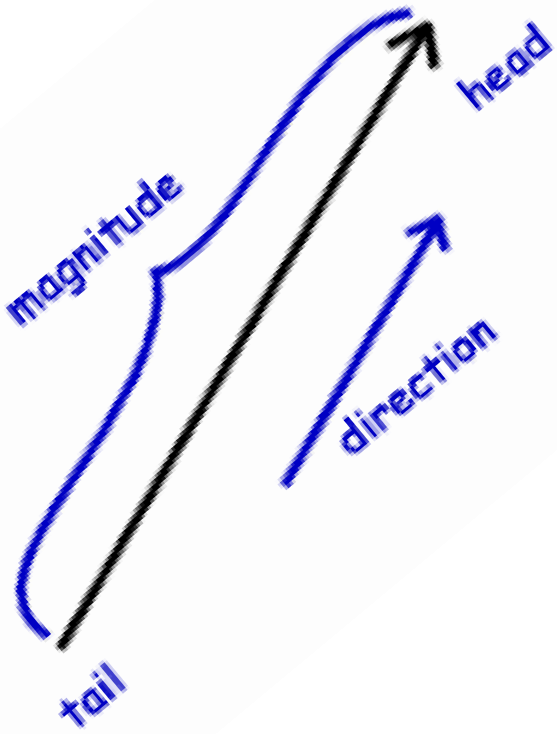
Vector Vs. Raster

Vectors have sharp edges no matter how far you zoom in, because these edges are stored as abstract equations.



Vector Layers

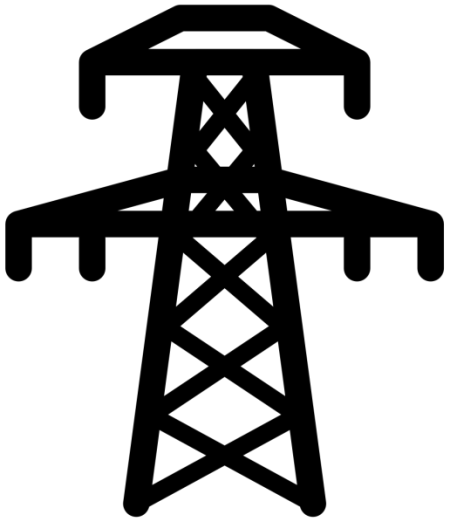
- Polyline – an ordered set of points; i.e., a path
- Polygon—a closed polyline (last pt == first pt)
- Circle—point and radius
- SVG—vector image files can be displayed too



All these layers come with options for color, scale, width, line style, etc.

Utility Functions

- pointToSegmentDistance() – the distance between point and closest point on segment
- closestPointOnSegment() – the closest point on the segment (surprise!)
- simplify() – dramatically reduce number of points in polyline



Limitations of Leaflet

- LeafletJS is a small library—if you need more functions, consider OpenLayers.
- LeafletJS is tied to JS. If you don't want to use JS, LeafletJS might be the wrong choice.
- LeafletJS depends on the maps provider for functionality. If you don't want the extra hassle of integration, consider Google.

Works Cited/Referenced

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Thanks for listening!

Questions?