Turf JS

Geospatial Analysis for the Browser, Desktop & Server

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GISMATTERS

What is TurfJS?

Advanced **geospatial analysis** for browsers and Node.js

Modular => Area, Bounding Box, Buffer, Grids, Intersect, Isolines, Length, Random, Sample, Voroni, Within...

JavaScript functions that speak **GeoJSON**

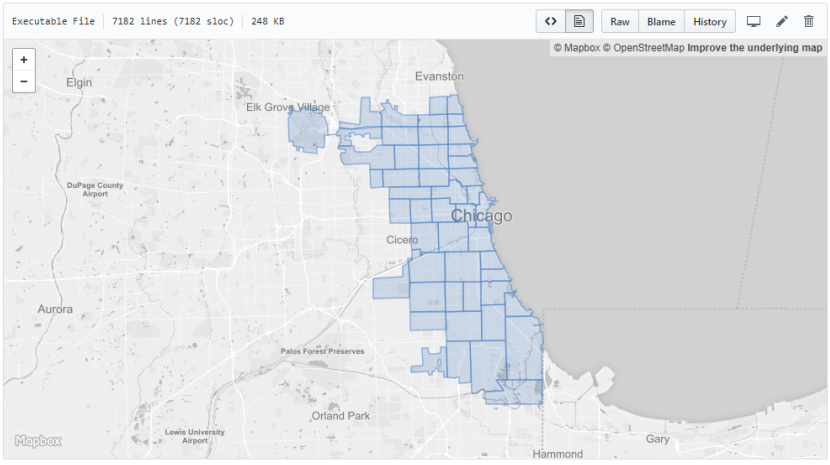
What is GeoJSON?

```
/** GeoJSON is a single JSON file containing one or more features */
{
  "type": "FeatureCollection",
  "features": [
    {
      "type": "Feature",
      "geometry": {
        "type": "Point",
        "coordinates": [-82, 39] /*WGS 84*/
      },
      "properties": {
        "field": "value"
      }
    }
  ]
}
```

GeoJSON is Everywhere

ArcGIS Feature to JSON
USGS Earthquake Feed
DATA.GOV (1,600+ Datasets)
AGOL Query Response & Exports
geojson.xyz (Natural Earth Data+)
Native Support in QGIS

GitHub Support (2013)



Free & Open **Source Software**

github.com/Turfjs

Include in your HTML

```
https://cdnjs.cloudflare.com/ajax/libs/Turf.js/5.1.5/turf.min.js
```

Install via NodeJS

```
npm install @turf/turf --OR-- npm install @turf/bbox
```

Why use TurfJS?

Simple geospatial queries

Complex

geospatial analysis (in NodeJS)

Creating spatial metadata (bounding box)

A Few Examples

Turf Within

```
turf.booleanWithin(point, polygon)
```

Where am I?

```
var result = "";
counties.features.map(function(county) {
  var point = turf.point([x,y]);
    if (turf.booleanWithin(point, county) {
      result = county.properties.NAME;
    }
});
```

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Click the Submit button on the previous page

😒😭😕

Practical Applications

Local Authoritative

Open Data

Turf Nearest

```
Array.filter()
```

```
turf.nearestPoint(point, points)
```

Find the Closest Playground

```
var data = amenities.features.filter(function(a) {
  return a.properties.TYPE === 'Playground'
})

var playgrounds = turf.featureCollection(data);
```

```
var result = turf.nearestPoint(point, playgrounds)
```

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Loading...

😍😍😍

Advanced Analysis in TurfJS

🐷😴💤

Visualizing Crashes in Muskingum County (>7k)

Hexgrids

```
turf.hexGrid(bbox, size, opts)
```

Intersect

```
turf.intersect(a,b)
```

Collect

```
turf.collect(p, pts, field, name)
```

Turf Hexgrids

```
var bbox = [-82.5, 39.7, -81.5, 40.18];
var size = 1;
var options = {
  units: 'miles'
};
```

```
var hexgrid = turf.hexGrid(bbox, size, options)
```

Turf Intersect

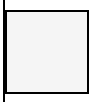
```
// loop through each grid
// add the intersecting areas to the clippedGrid
// calculate the area in sq miles

var clippedGrid = { “type”:”FeatureCollection”, “features”:[] }
```

```
hexgrid.features.map(function(grid) {
  var toFt = 0.00000386102159
  var intersect = turf.intersect(grid, muskingum);
  if (intersect) {
    intersect.properties.area = (turf.area(intersect)) * toFt;
    clippedGrid.features.push(intersect);
  }
});
```

Turf Collect

```
turf.collect(clippedGrid, crashes, "count", "total")
```



Turf in Node JS

Find the Nearest  National Park

45MB GeoJSON Park Boundary File

```
var points = turf.explode(polygon)
```

```
turf.nearestPoint(point, points)
```

Query NodeJS

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Submit

No Node JS Server Running! Tested Benchmark ~ 2 seconds

No Coding
Dropchop

Support
TurfJS

Thanks!
Malcolm Meyer
@getbounds