geoSYS

Webmapping und Geoverarbeitung: Turf.js

FOSSSGIS, Bonn, 22. März 2018

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Geoverarbeitung im Web

Geoverarbeitung im Web: WPS

- **Web Processing Service**

- **OGC Standard**

http://www.opengeospatial.org

- **Braucht:**
  - (komplexe) serverseitige Infrastuktur
  - Requests (Anfragen)
  - Internet

http://www.opengeospatial.org/standards/wps

Geoverarbeitung im Web: WPS

Turf.js

WPS – ja oder nein?

- **WPS ist sinnvoll wenn:**
  - Analysen und Berechnung sind komplex
  - Daten sind groß

- **Allerdings:** oft benutzt, um sehr einfache Aufgaben zu erledigen

... es geht auch anders!

TURF

Was ist Turf?

Turf is a JavaScript library for spatial analysis.

… JavaScript!

Turf: GIS for web maps

By Morgan Herlocker on December 23 2014 | DEVELOPER TOOLS

Turf business intelligence

Turf is GIS for web maps. It's a fast, compact, and open-source JavaScript library that implements the most common geospatial operations: buffering, contouring, triangular irregular networks (TINs), and more. Turf speaks GeoJSON natively, easily connects to Leaflet, and is now available as a Mapbox.js plugin on our cloud platform. We're also working to integrate Turf into our offline products and next-generation map rendering tools.

https://www.mapbox.com/blog/turf-gis-for-web-maps/

Ursprünge

- **Morgan Herlocker, 2013**
  - http://morganherlocker.com
  - @morganherlocker

- **Mapbox, seit 2014**
  - https://www.mapbox.com
  - @Mapbox

Mapbox.js?

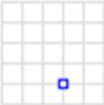
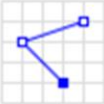
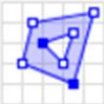
- Offizielle Beispiele benutzen Mapbox.js
- Aber: die Karte ist **optional**
- Bzw.: jeder Mapping Client der GeoJSON unterstützt kann benutzt werden

GeoJSON in, GeoJSON out

- **GeoJSON:** das Datenformat in Turf

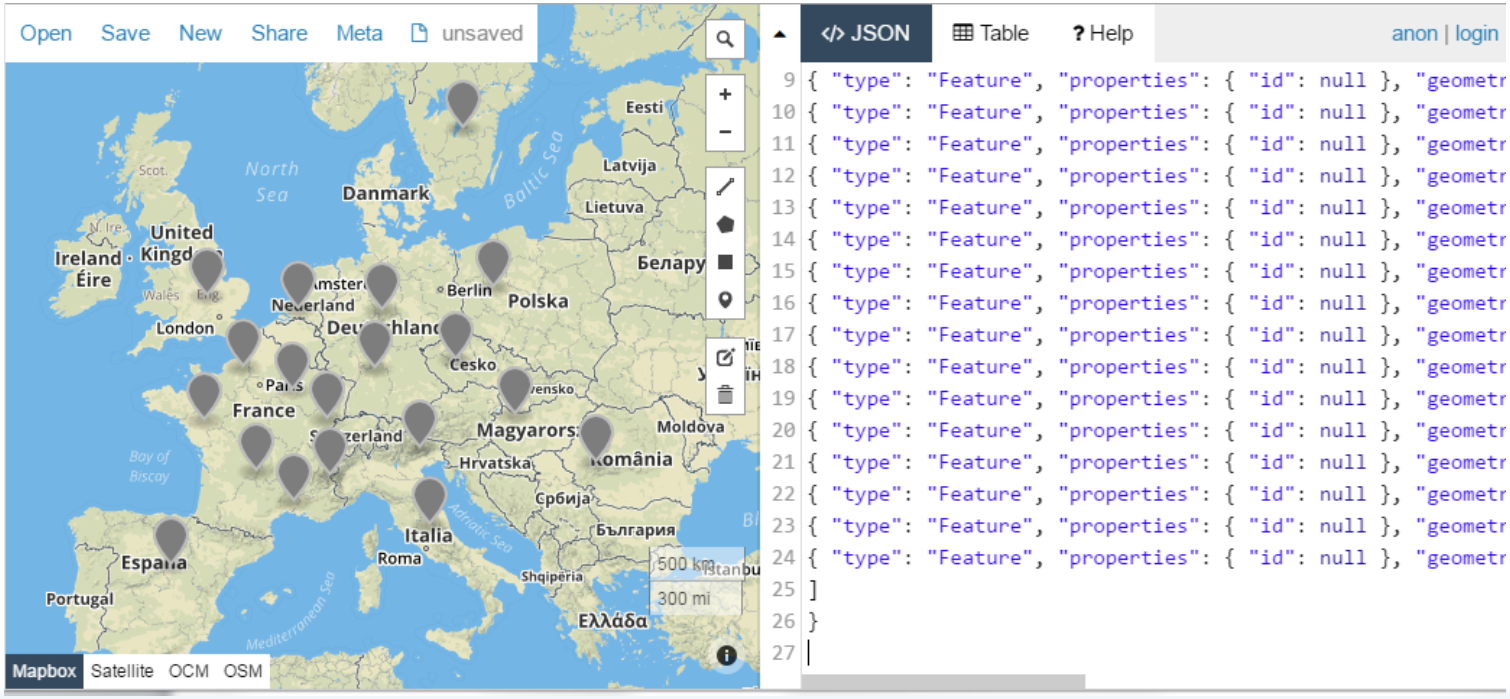
- **Alles in einer Datei:**
  - Geometrie
  - Attribute
  - Koordinatensystem
    (eig. Immer WGS 84, EPSG:4326)

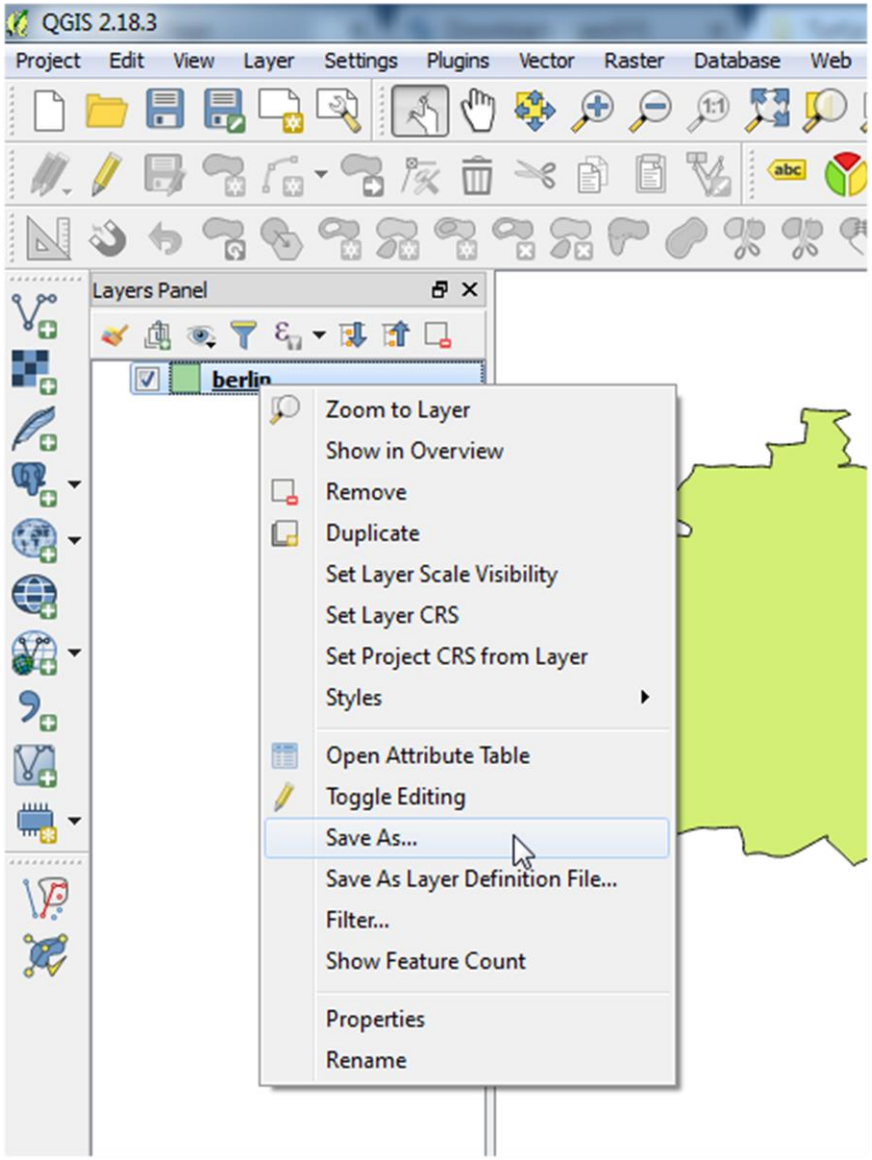
Geometry primitives

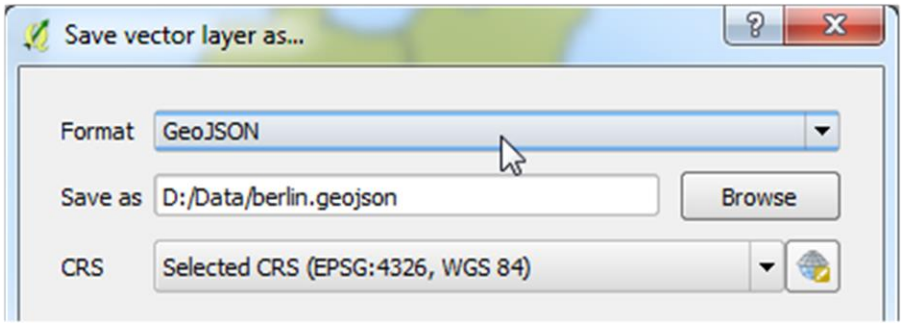
Type	Examples	
Point		`{ "type": "Point", "coordinates": [30, 10] }`
LineString		`{ "type": "LineString", "coordinates": [ [30, 10], [10, 30], [40, 40] ] }`
Polygon		`{ "type": "Polygon", "coordinates": [ [[30, 10], [40, 40], [20, 40], [10, 20], [30, 10]] ] }`
		`{ "type": "Polygon", "coordinates": [ [[35, 10], [45, 45], [15, 40], [10, 20], [35, 10]], [[20, 30], [35, 35], [30, 20], [20, 30]] ] }`

Where to get a GeoJSON?

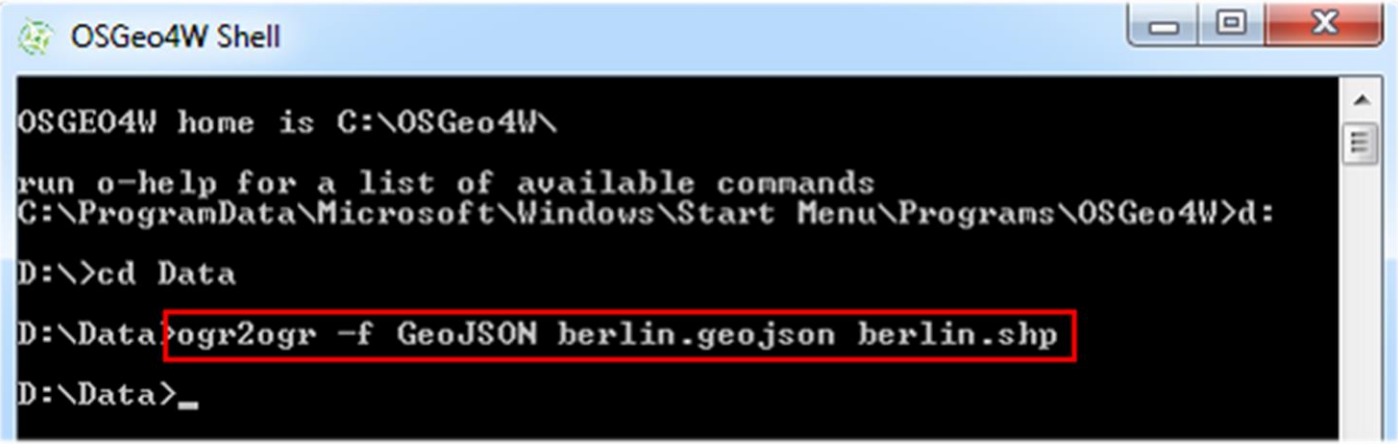
- Von Hand schreiben ☺
- http://geojson.io/
- QGIS, OGR, usw.




QGIS 2.18.3
Project Edit View Layer Settings Plugins Vector Raster Database Web
Layers Panel
berlin
Zoom to Layer
Show in Overview
Remove
Duplicate
Set Layer Scale Visibility
Set Layer CRS
Set Project CRS from Layer
Styles
Open Attribute Table
Toggle Editing
Save As...
Save As Layer Definition File...
Filter...
Show Feature Count
Properties
Rename


Save vector layer as...
Format
GeoJSON
Save as
D:/Data/berlin.geojson
Browse
CRS
Selected CRS (EPSG:4326, WGS 84)

ogr2ogr


OSGeo4W Shell
OSGEO4W home is C:\OSGeo4W\
run o-help for a list of available commands
C:\ProgramData\Microsoft\Windows\Start Menu\Programs\OSGeo4W>d:
D:\>cd Data
D:\Data>ogr2ogr -f GeoJSON berlin.geojson berlin.shp
D:\Data>_

A modular geospatial engine written in JavaScript http://turfjs.org/

javascript algorithm computational-geometry geojson turf gis

3,145 commits | 37 branches | 86 releases | 76 contributors | MIT

Branch: master | New pull request | Find file | Clone or download

DenisCarriere Refactor @turf/length to Typescript ... Latest commit cff89b3 5 days ago

.github	Updated .github/ISSUE_TEMPLATE.md (optional)	17 days ago
examples	Add turf.bbox to browser example	2 months ago
packages	Refactor @turf/length to Typescript	5 days ago
releases	Create 5.2.0.md	3 months ago
rollup-plugins	Update typescript-export.js	5 months ago
scripts	Ponyfill Object.assign - fix for #1157	3 months ago
.eslintignore	Add skmeans as dependency	8 months ago
.eslintrc.js	Fix linting issue	5 months ago
.gitignore	Add gitignore's	26 days ago
.travis.yml	Update yarn lock files	6 months ago
CHANGELOG.md	Update CHANGELOG.md	4 months ago
CODE_OF_CONDUCT.md	add code of conduct (#495)	a year ago
CONTRIBUTING.md	Updated CONTRIBUTING.md (optional)	17 days ago

Installation

- CDN
- npm
- Download

http://turfjs.org/getting-started

Modularität

Every turf function has been broken into its own seperate module, so you can install what you need and nothing else.

05.06.2014, http://morganherlocker.com/

Gute Doku!

bezierSpline

Takes a line and returns a curved version by applying a Bezier spline algorithm.

Arguments

Argument	Type	Description
line	Feature <LineString>	input LineString
options	Object	Optional parameters: see below

Options

Prop	Type	Default	Description
resolution	number	10000	time in milliseconds between points
sharpness	number	0.85	a measure of how curvy the path should be between splines

Returns

Feature <LineString> - curved line

Methoden

center centroid distance destination

envelope midpoint bezierSpline buffer

concave convex difference intersect

simplify union combine explode

flip kinks randomPoint

sample tin booleanWithin isolines

Exportieren

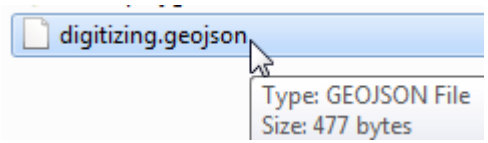
JSON.stringify(*ergebnisVonTurf*);

*new 3 - Notepad++

File Edit Search View Encoding Language Settings Macro Run TextFX Plugins Window ?

new 3


```
1 {"type":"Feature","geometry":{"type":"Polygon",
"coordinates":[[[13.428426,52.493939],[13.424006,
52.490098],[13.425035,52.487354],[13.431387,52.485211],[
13.437223,52.484244],[13.441086,52.486622],[13.442202,
52.488869],[13.441429,52.491665],[13.440399,52.494252],[
13.438725,52.495585],[13.436322,52.496316],[13.433833,
52.496708],[13.430657,52.496734],[13.42731,52.496473],[
13.426194,52.496081],[13.425465,52.495062],[13.425722,
52.494461],[13.428426,52.493939]]]},"properties":{}}
```

DEMO

turf.booleanWithin

Point 18 is in **Nevada**

Point 7 is in **Ohio**

Point 11 is in **Colorado**

Point 12 is in **Colorado**

Point 13 is in **Colorado**

Point 14 is in **Colorado**

Point 15 is in **Colorado**

Point 17 is in **Idaho**

Point 6 is in **Indiana**

Point 4 is in **Iowa**

Point 2 is in **Kansas**

Point 8 is in **Mississippi**

Point 3 is in **Missouri**

Point 5 is in **Nebraska**

Point 10 is in **New Mexico**

Point 9 is in **Oklahoma**

Point 1 is in **Oregon**

Point 16 is in **Wyoming**

turf.booleanWithin

Point 18 is in **Nevada**

Point 7 is in **Ohio**

Point 11 is in **Colorado**

Point 12 is in **Colorado**

Point 13 is in **Colorado**

Point 14 is in **Colorado**

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Point 8 is in **Mississippi**

Point 3 is in **Missouri**

Point 5 is in **Nebraska**

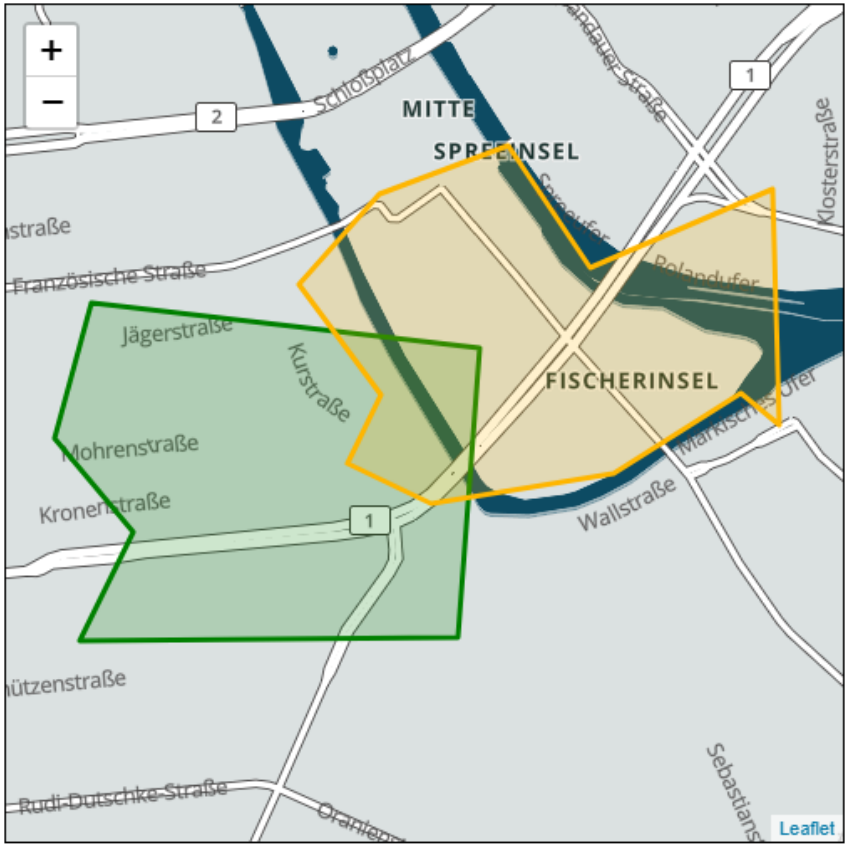
Point 10 is in **New Mexico**

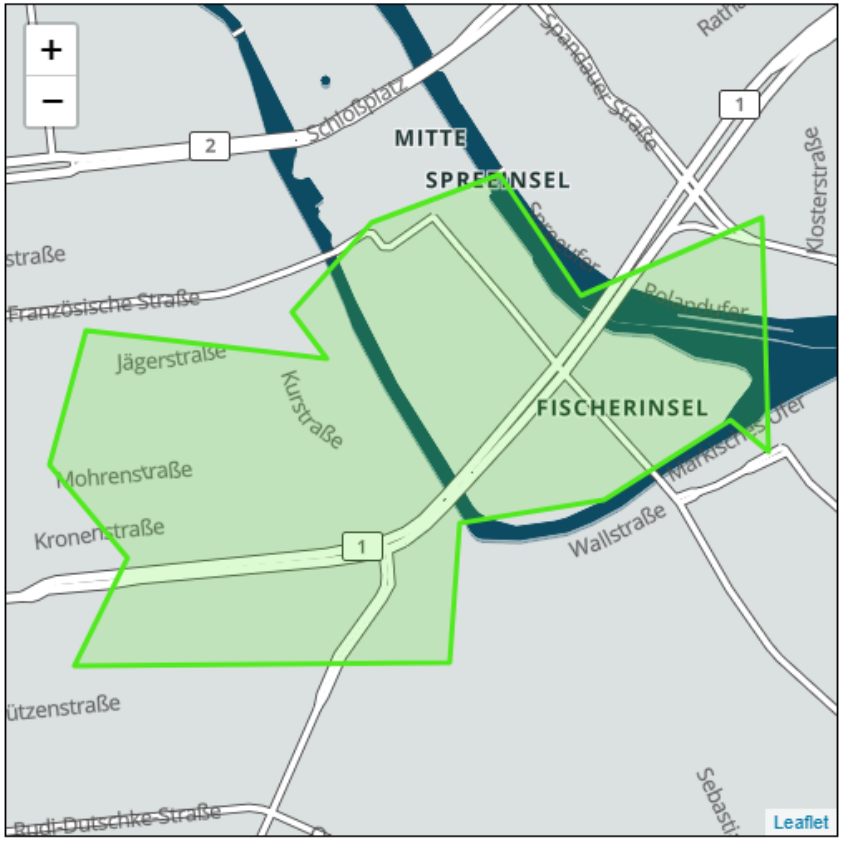
Point 9 is in **Oklahoma**

Point 1 is in **Oregon**

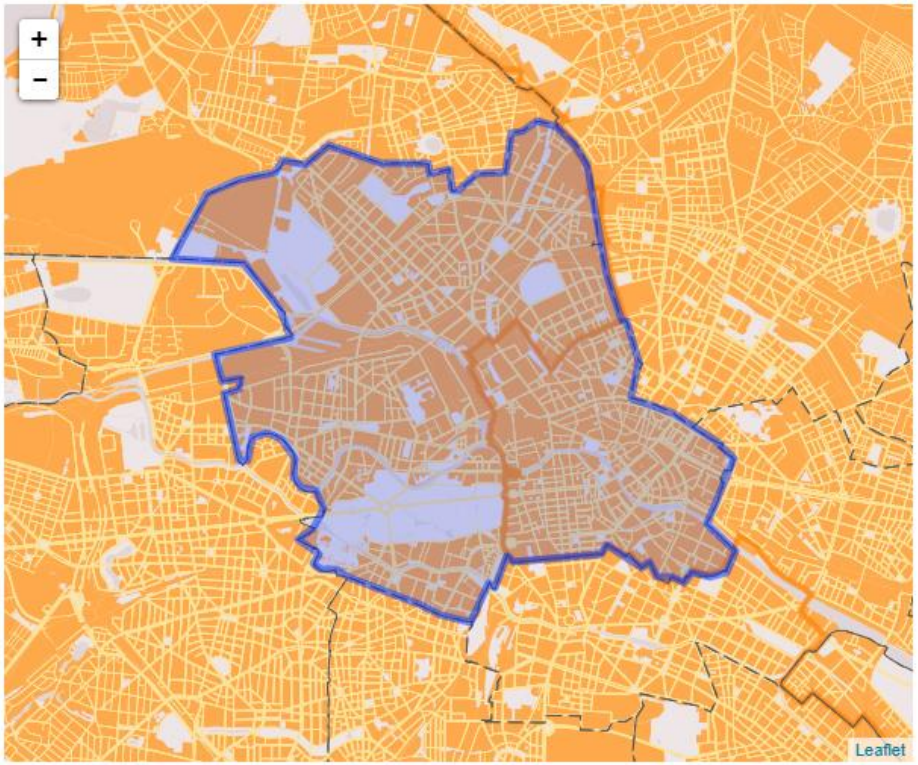
Point 16 is in **Wyoming**

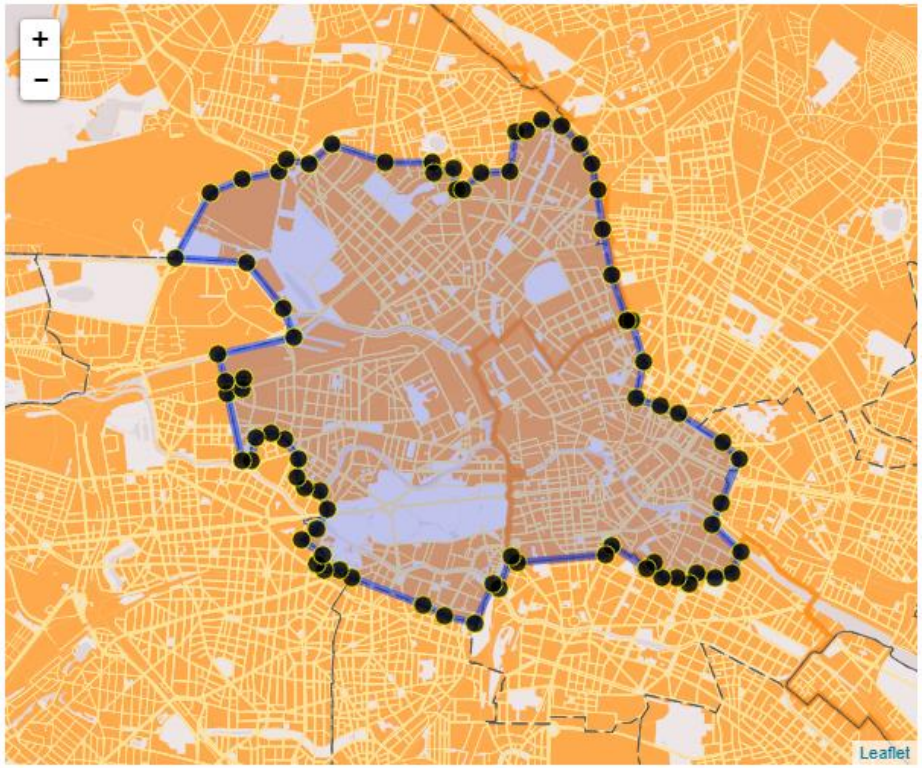
turf.union


MITTE
SPREEINSEL
FISCHERINSEL
Schloßplatz
Französische Straße
Jägerstraße
Kurstraße
Mohrenstraße
Kronenstraße
Wallstraße
Klosterstraße
Rudi-Dutschke-Straße
Leaflet


MITTE
SPREEINSEL
FISCHERINSEL
Schloßplatz
Französische Straße
Jägerstraße
Kurstraße
Mohrenstraße
Kronenstraße
Wallstraße
Klosterstraße
Leaflet

turf.explode

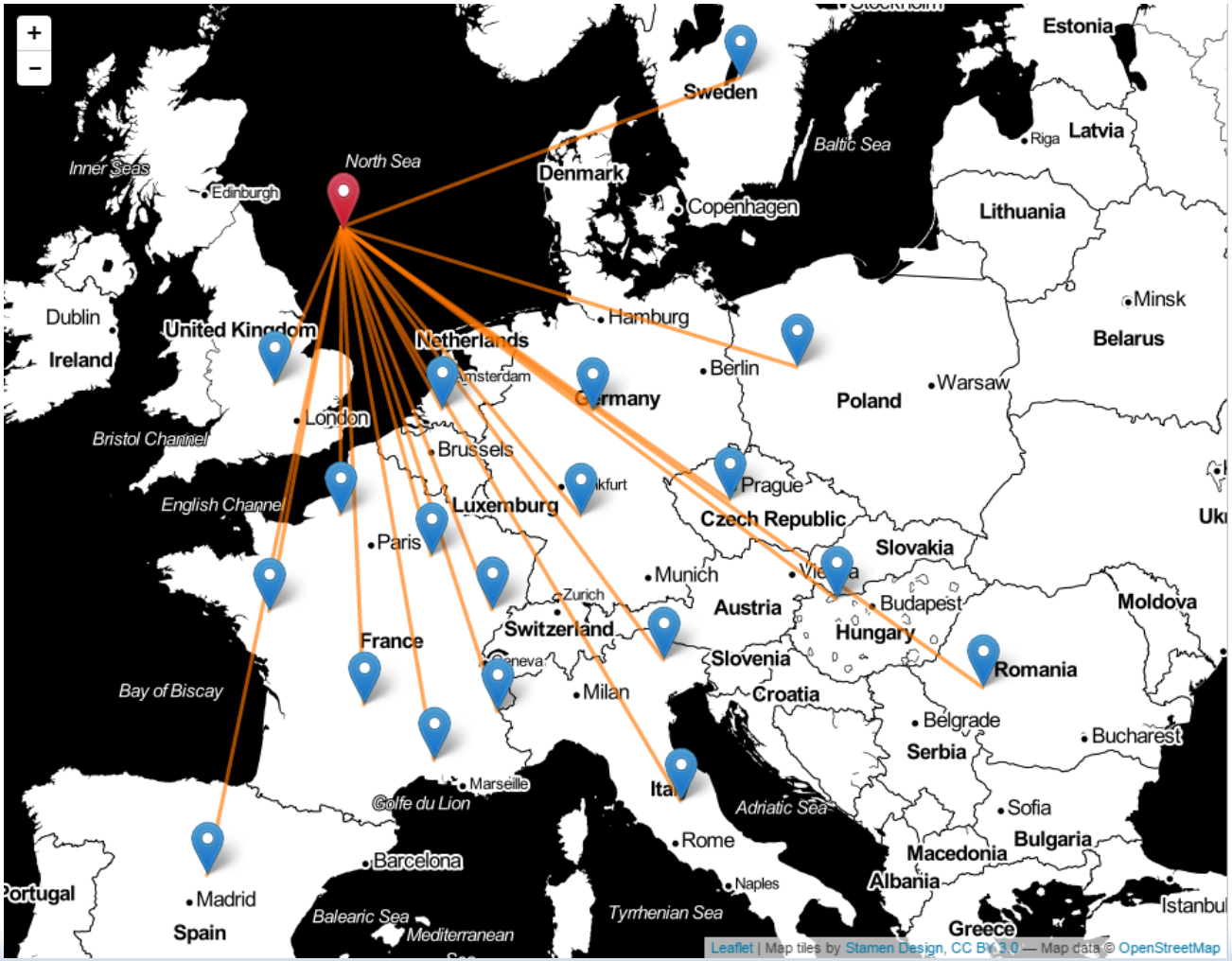




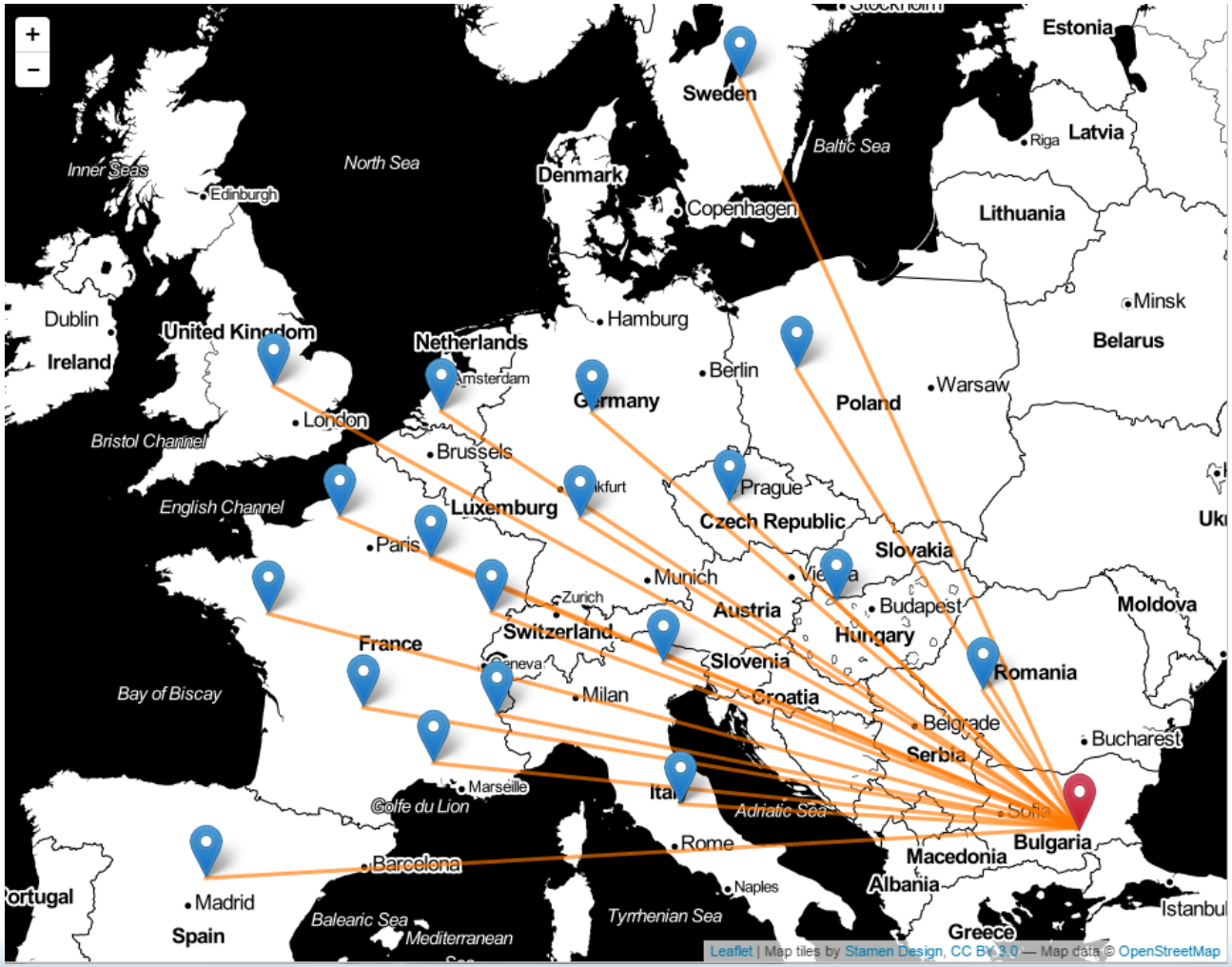
turf.bezierSpline


```
var bezier = turf.bezierSpline(spree.features[0]);
```

turf.point, turf.lineString



turf.point, turf.lineString



geosysnet.com/demos/dashboard

Intersect Erase Union Merge Combine Buffer Flip Random Kinks Tutorial & About

Paste or drag and drop a GeoJSON

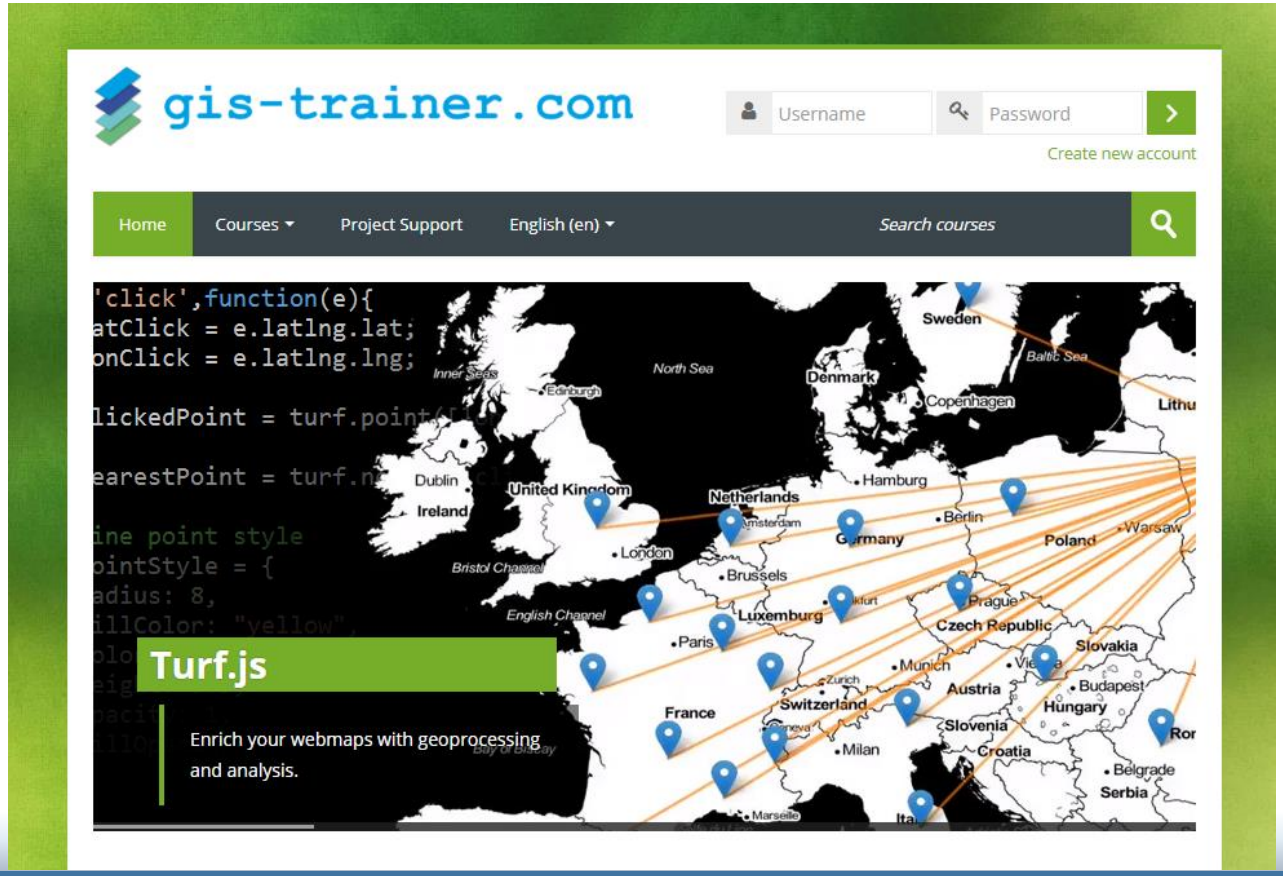
Output GeoJSON

Add to map Clear input

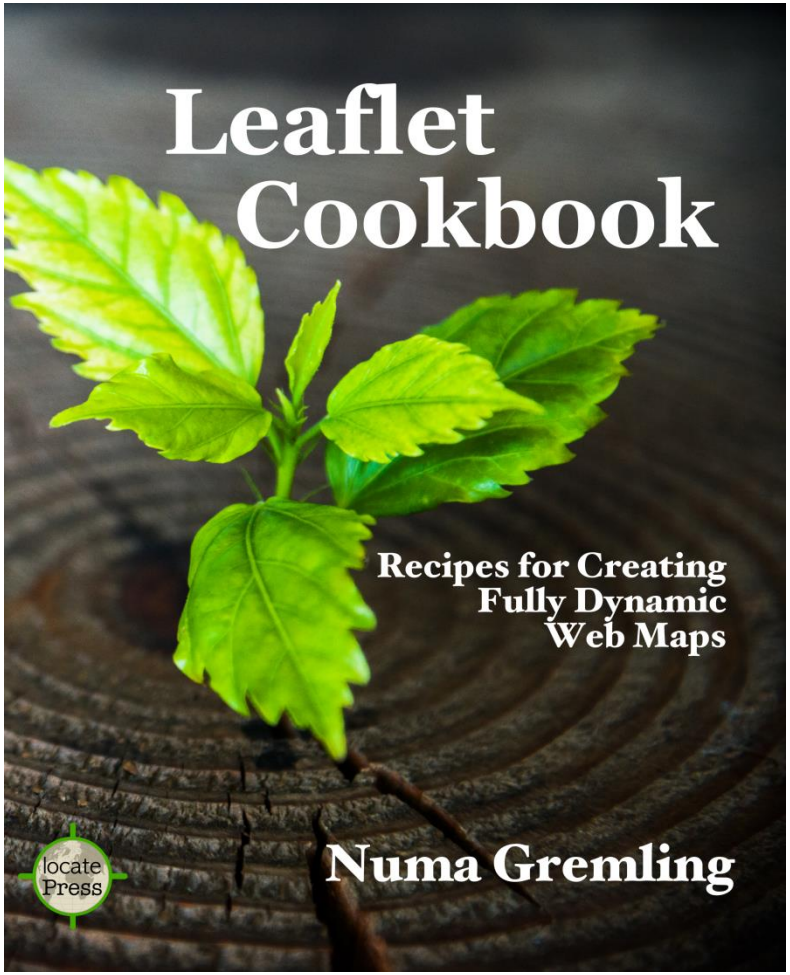
Generate output Clear output

Online Kurs

https://learn.gis-trainer.com/



Leaflet Cookbook



- Locate Press
- Über 150 Rezepte
- Ende 2018
- Top Weihnachtsgeschenk
- https://locatepress.com/lcb

console.log('Danke!');

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