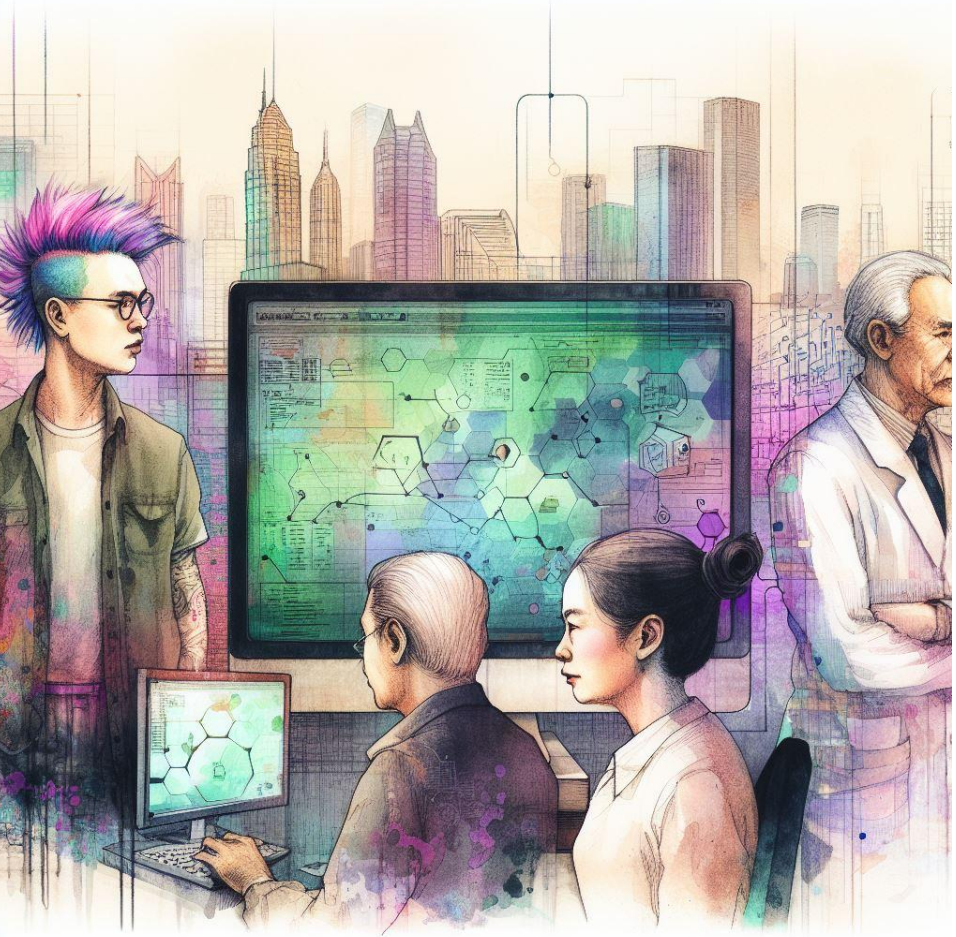
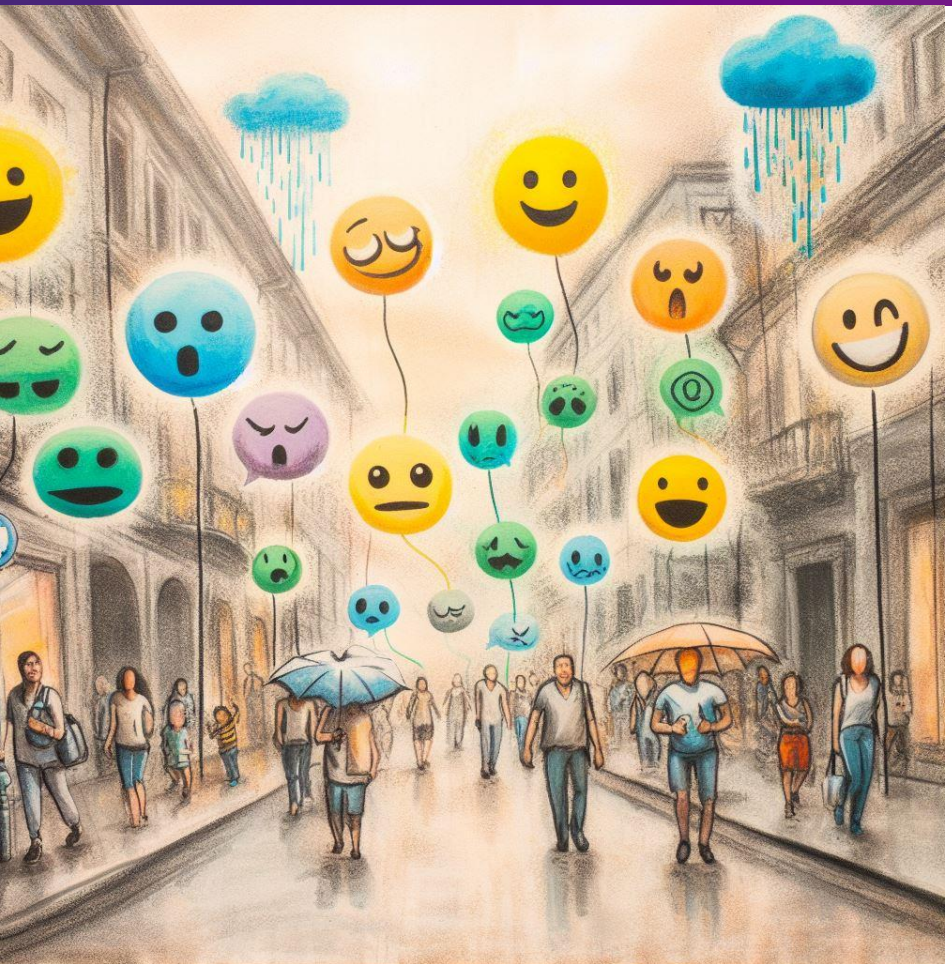
Publish Vector Data with #OGCAPI

Antonio Cerciello & Joana Simoes



Agenda

1. The eMOTIONAL Cities Project
2. The Spatial Data Infrastructure
3. Outline demonstration

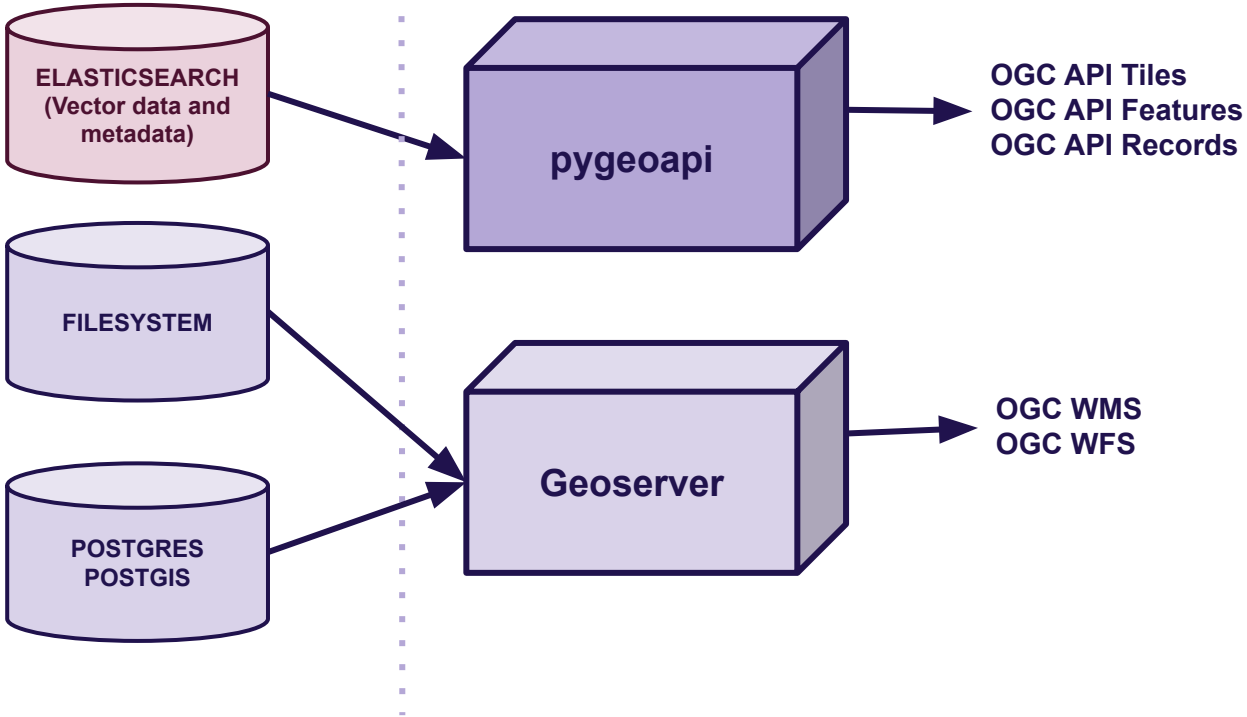


eMOTIONAL Cities

Provide robust scientific evidence on how the natural and built urban environment shapes the neural system underlying human cognitive and emotional processing.

https://emotionalcities-h2020.eu

SDI Schema

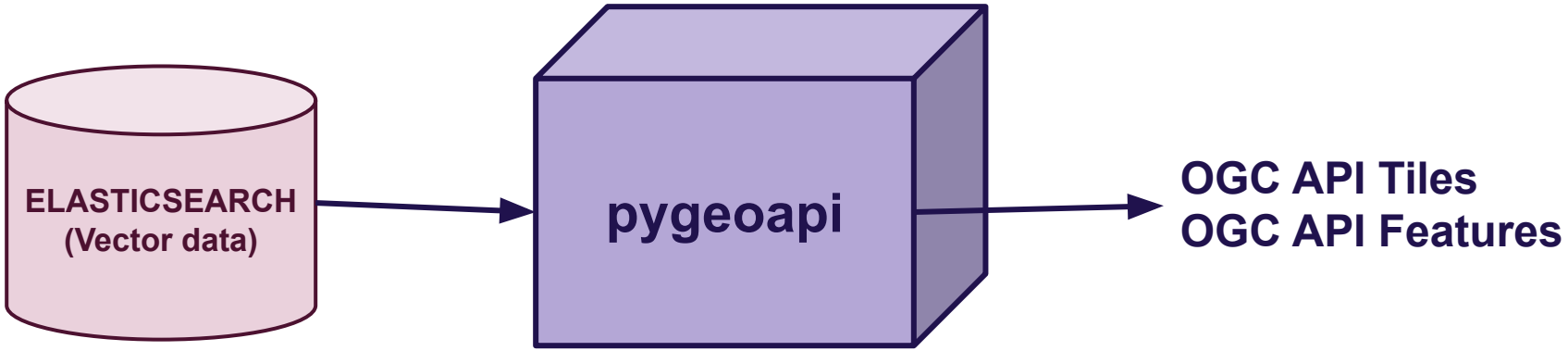


QGIS

Leaflet

ArcGIS

On this workshop



elasticsearch

pygeoapi

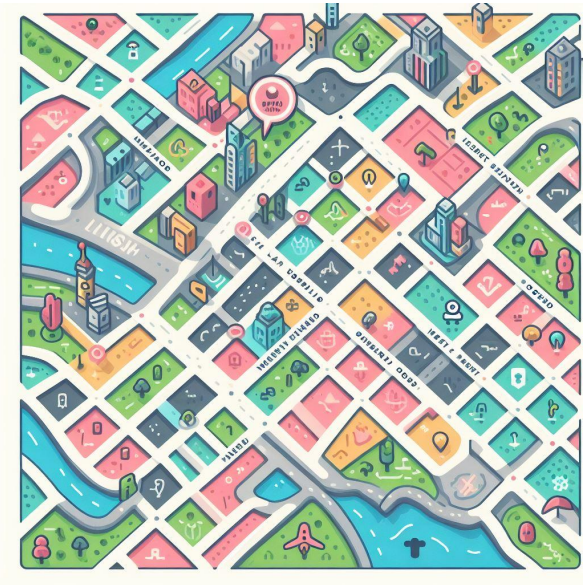
OGC API - Features

A REST API allowing requests for geographical features across the web using platform-independent calls

What is a feature?
A feature is an entity that retains its geographic depiction, commonly expressed as a point, line, or polygon, within one of its attributes (or fields) in the dataset row.

OGC API - Tiles

A REST API standard for serving pre-rendered or run-time computed georeferenced map tiles over the Internet.



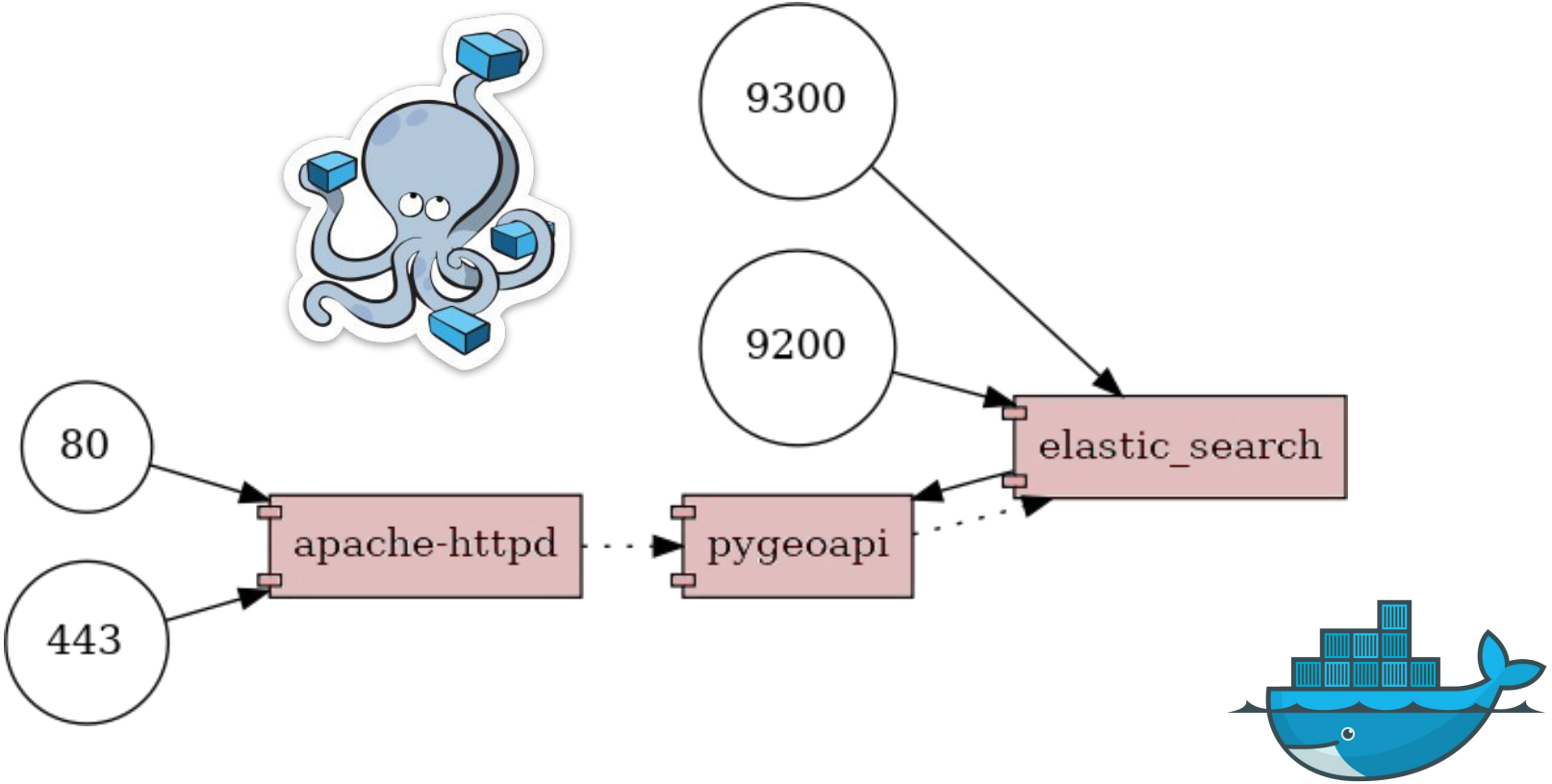
What is a tile?
A structure to organize a spatial dataset, raster or vector data, into rectangular blocks of pixels, usually employed to enhance data accessibility for extensive datasets.

Vector Tiles

Geographic data, packaged into pre-defined roughly-square shaped "tiles" for transfer over the web.

- **Fast delivery.**
- **Design flexibility.**
- **Protobuf/MVT (vector-tile-spec)**

Software Stack



Software Stack

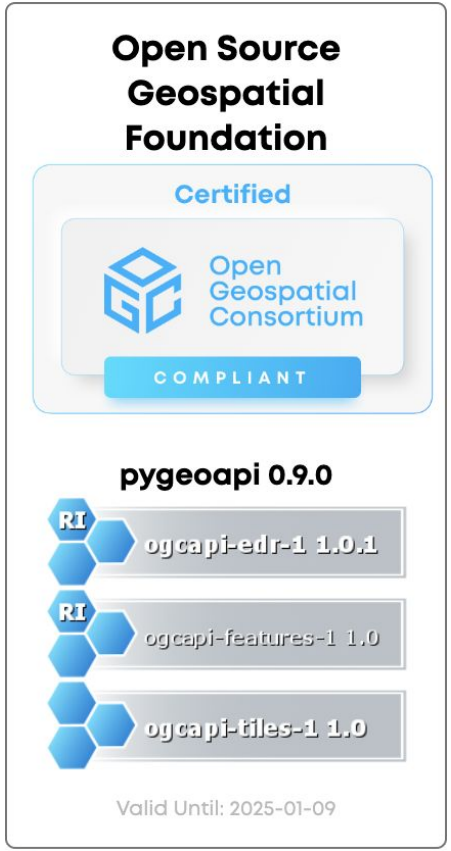
pygeoapi

OSGeo Project

- Python server implementation of the OGC API suite of standards.
- FOSS (MIT).
- Certified OGC compliant, reference implementation.
- Plugin architecture

https://pygeoapi.io/

https://github.com/geopython/pygeoapi



Software Stack

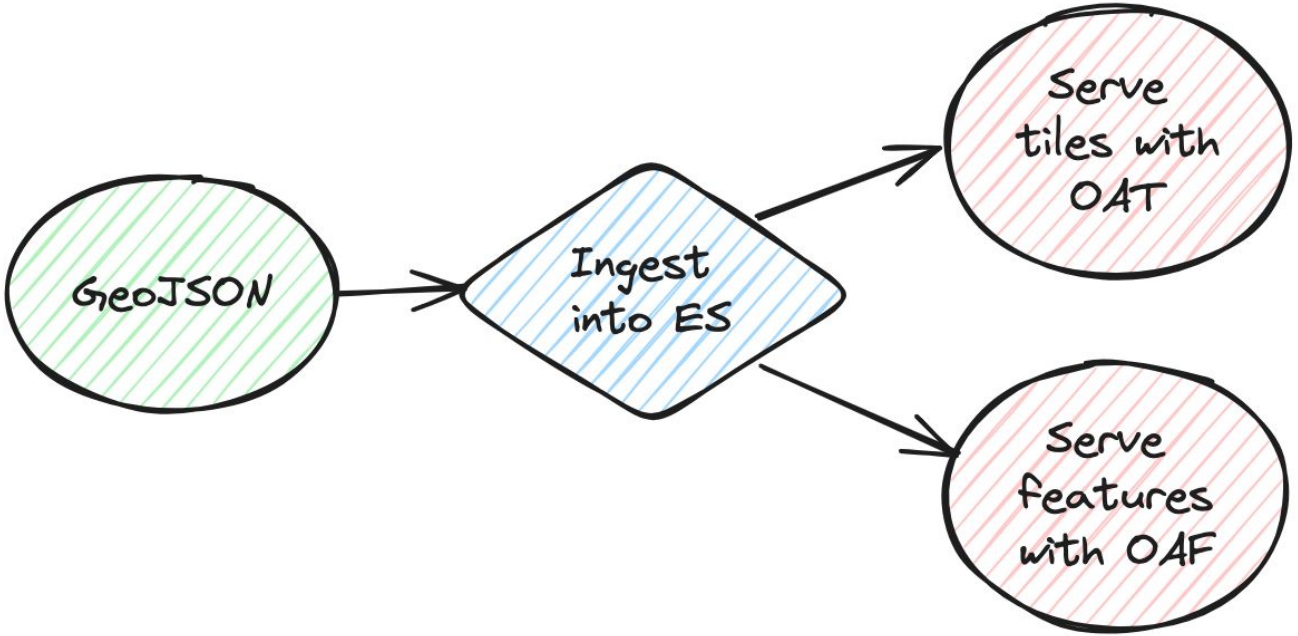
elasticsearch

- Search engine based on the Lucene library.
- Dual licensed.
- Fast and scalable.
- >8: Elasticsearch vector tile search API

https://www.elastic.co/elasticsearch/

https://github.com/elastic/elasticsearch

Software Stack



Leaflet

ArcGIS

GDAL

EC Datasets

- Lisbon outdoor walk: test data (5773 features).
- Particulate Matter - PM10 (3516 features).

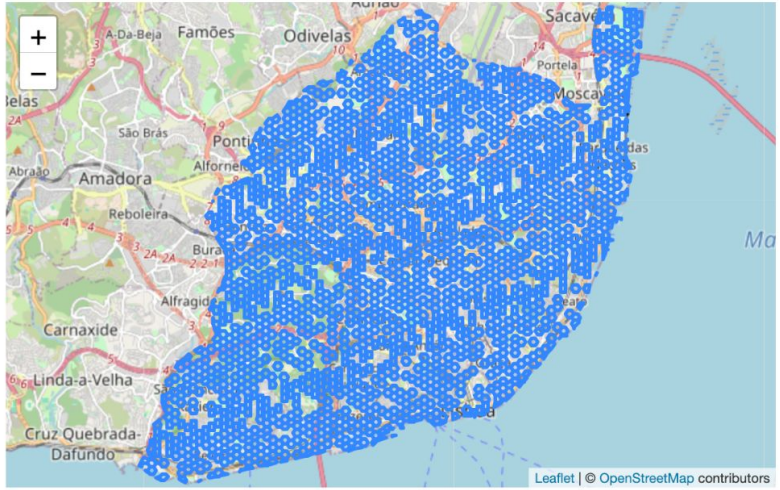
https://emotional.byteroad.net/collections/ec_catalog/items/lisbon_20210912_pr

https://emotional.byteroad.net/collections/ec_catalog/items/pm10

Particulate Matter (PM10)

Particulate Matter (PM10)

Items in this collection.



Warning: Higher limits not recommended!

Limit: 2,000

Next

id	GRID_ID	pm10
0	AJ-17	15.355799675
1	X-50	14.4497995377
2	BO-43	16.9032993317
3	BA-49	14.9940004349
4	BA-57	15.3579998016
5	AH-20	14.428899765
6	BY-18	15.4228000641
7	BV-37	16.224199295
8	BN-12	17.4648990631
9	BB-24	16.5284996033
10	BO-52	14.8404998779

Lisbon outdoor walk: test data

Lisbon outdoor walk: test data

Items in this collection.

Warning: Higher limits not recommended!

Limit: 1,000

Next

id	datetime	DRd_Altitude-Altitude_cm	DRd_Altitude-Geoidal Separation_cm	DRd_Motion-Course_deg
ba9fc3fd5...	2021/09/12 08:35:31			55.36
33ba154c9...	2021/09/12 08:35:32	3040.0	5070.0	55.36
26648056f...	2021/09/12 08:35:33	3040.0	5070.0	37.54
5a5d98263...	2021/09/12 08:35:34	3030.0	5070.0	50.53
2040cc539...	2021/09/12 08:35:35	2930.0	5070.0	270.78
44fdc99c2...	2021/09/12 08:35:36	2830.0	5070.0	264.31
e8d5abedb...	2021/09/12	2770.0	5070.0	266.33

What we will use in this demo

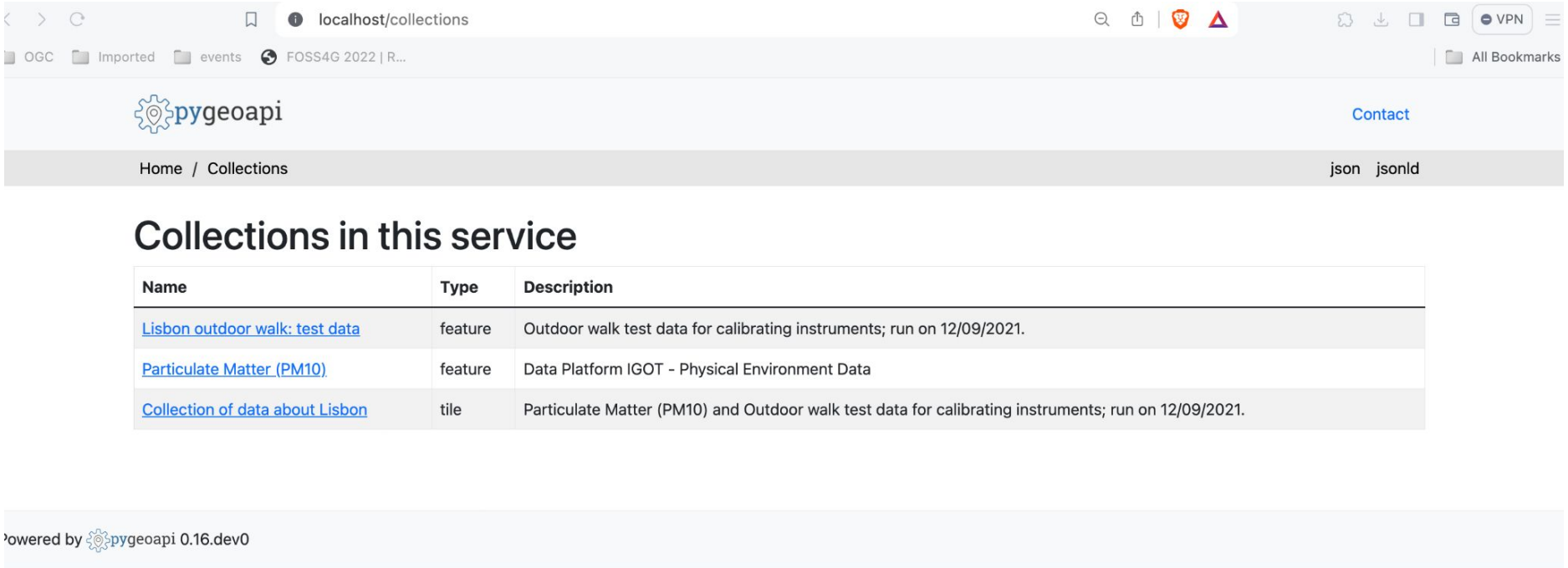
Server:

```
git clone -b vector-ws
https://github.com/emotional-cities/openapi-sdi
```

Client:

```
git clone -b vector-ws
https://github.com/emotional-cities/vtiles-example
```

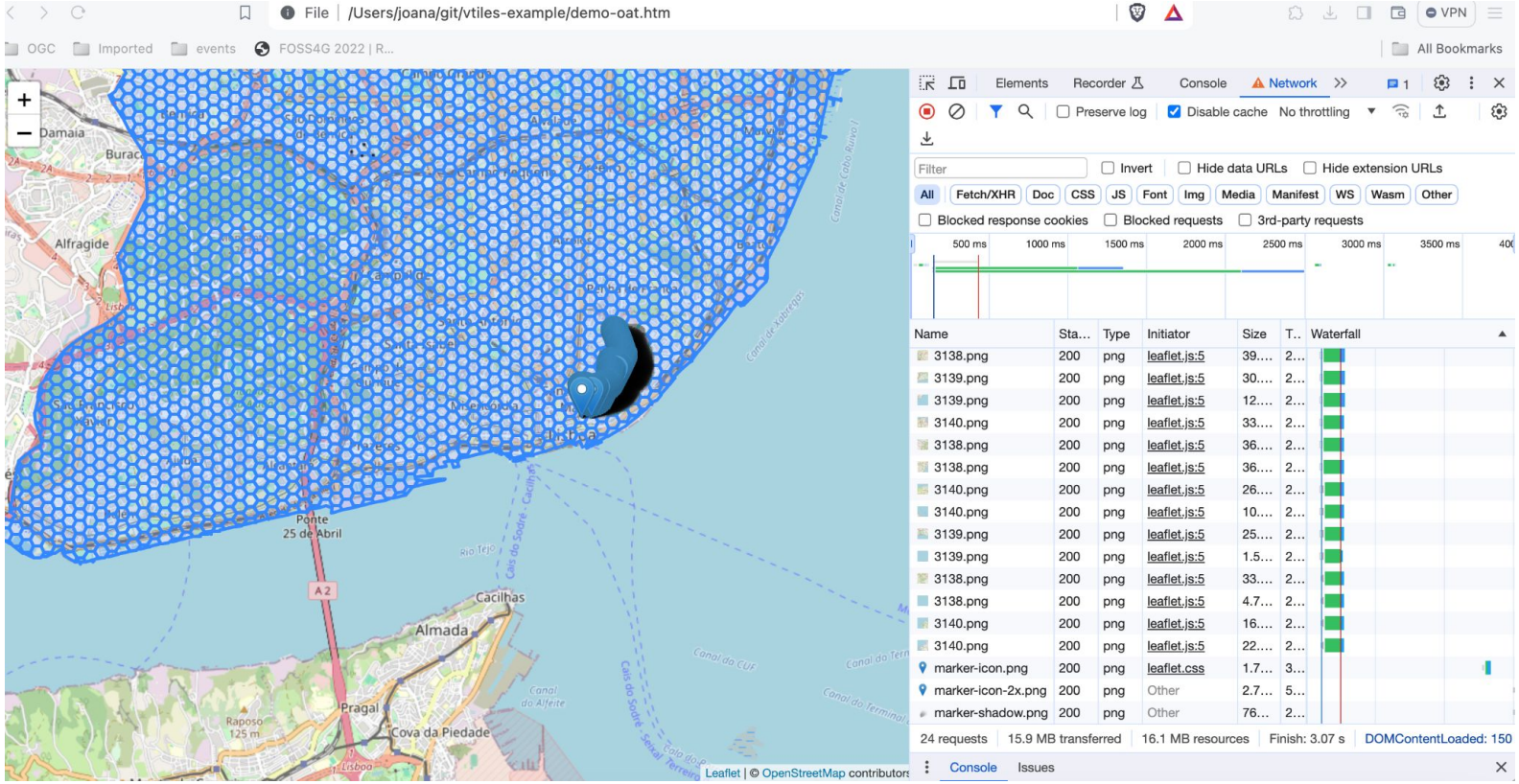
Publish the data




```
git clone -b vector-ws https://github.com/emotional-cities/openapi-sdi
```

BYTEROAD
connecting data

Explore the data




```
git clone -b vector-ws https://github.com/emotional-cities/vtiles-example
```

Possible improvements/limitations

- Elastic non FOSS license
- Limitations on the free version of elastic
- Elastic performance on a single node cluster
- Limitations of the Mvt-elastic provider

Acknowledgments

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@pascallike

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https://byteroad.net

eMOTIONAL Cities

https://emotionalcities-h2020.eu

https://emotional.byteroad.net

Thank you !

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