

# Geonovum

## Gebruik van de nieuwe OGC API's

Auteur Geonovum

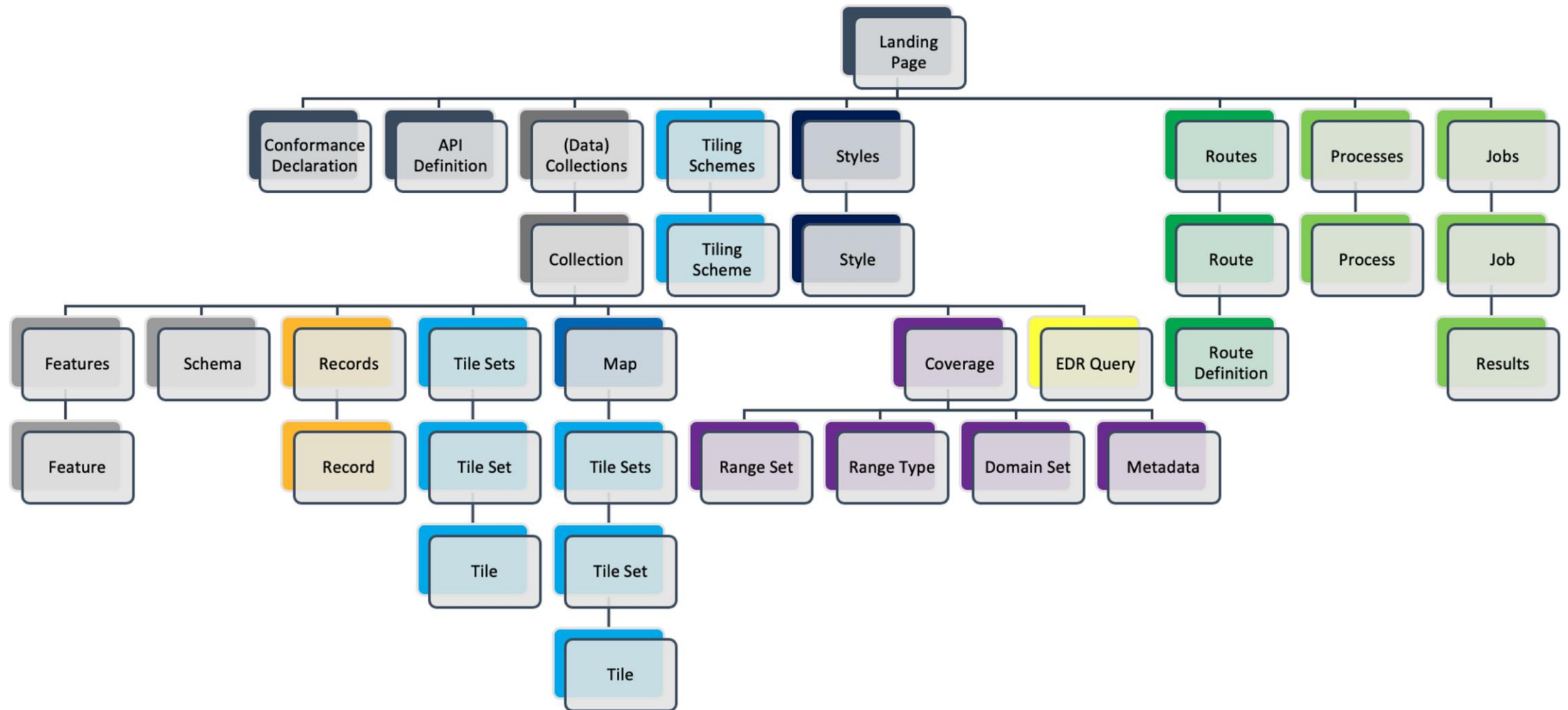
Datum 2 juli 2025



# Uitgelichte API's

- Features
- Tiles
- Maps
- Records
- Processes

# Resource architecture in OGC API





# OGC API Features

- Landing page <https://api.pdok.nl/lv/bgt/ogc/v1>
- OAS <https://api.pdok.nl/lv/bgt/ogc/v1/api>
- Collections <https://api.pdok.nl/lv/bgt/ogc/v1/collections>
- Collection-id <https://api.pdok.nl/lv/bgt/ogc/v1/collections/bak>
- Items <https://api.pdok.nl/lv/bgt/ogc/v1/collections/bak/items>
- Item-id:

<https://api.pdok.nl/lv/bgt/ogc/v1/collections/bak/items/5d394ef5-6a5d-5011-a729-29def1c51dd9>

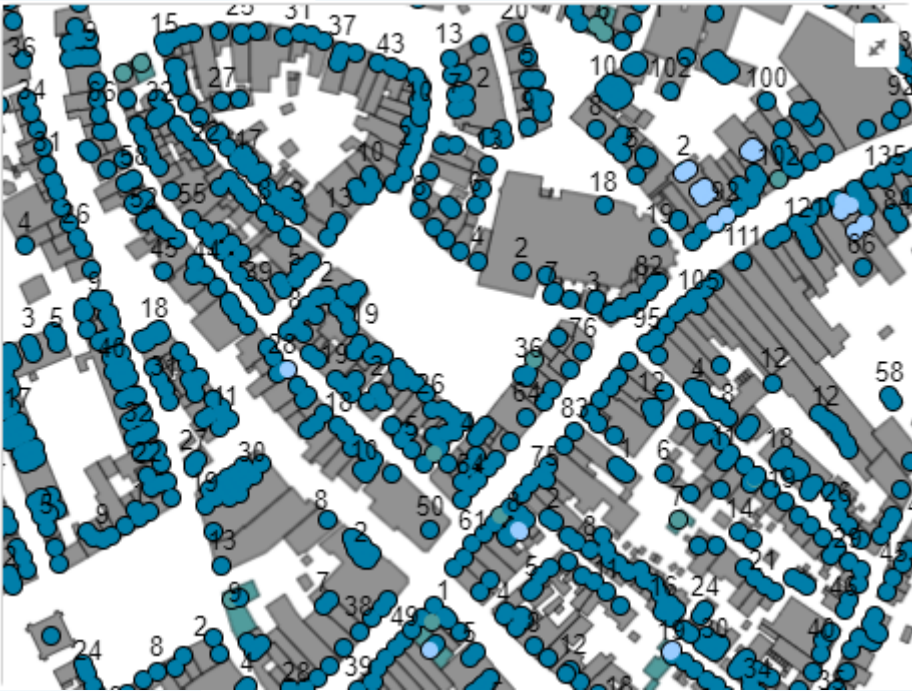
Parameters ?f=json or ?f=html

# OGC API Tiles

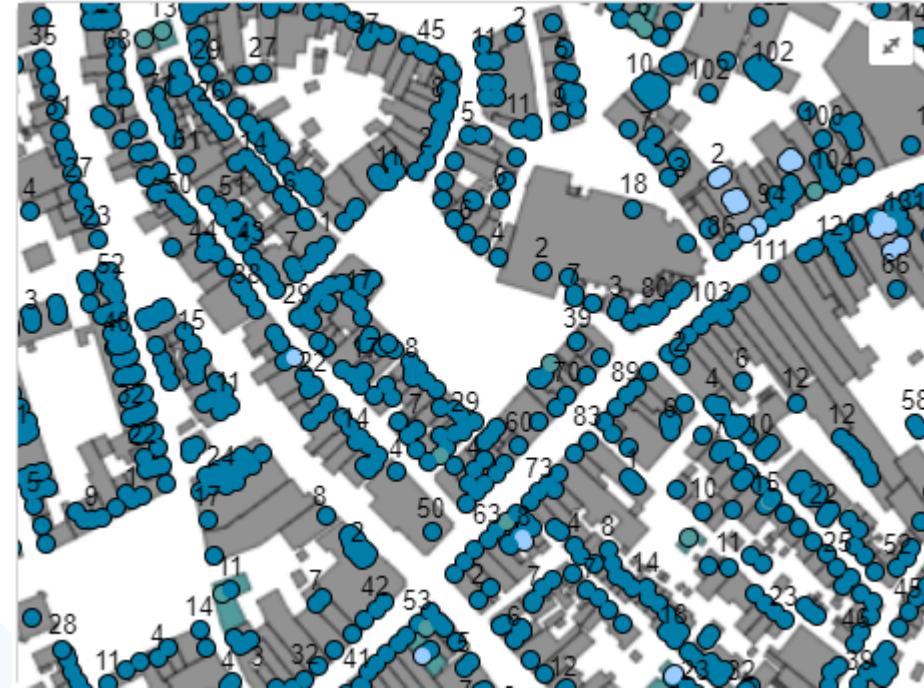
- Landing page <https://api.pdok.nl/lv/bgt/ogc/v1>
- OAS <https://api.pdok.nl/lv/bgt/ogc/v1/api>
- Tiles [https://api.pdok.nl/lv/bag/ogc/v1\\_0/tiles](https://api.pdok.nl/lv/bag/ogc/v1_0/tiles)
- Tile Matrix Set  
[https://api.pdok.nl/lv/bag/ogc/v1\\_0/tiles/NetherlandsRDNewQuad](https://api.pdok.nl/lv/bag/ogc/v1_0/tiles/NetherlandsRDNewQuad)
- URL template  
[https://api.pdok.nl/lv/bag/ogc/v1\\_0/tiles/NetherlandsRDNewQuad/{z}/{Y}/{X}?f=mvt](https://api.pdok.nl/lv/bag/ogc/v1_0/tiles/NetherlandsRDNewQuad/{z}/{Y}/{X}?f=mvt)
- Tile  
[https://api.pdok.nl/lv/bag/ogc/v1\\_0/tiles/NetherlandsRDNewQuad/12/2046/2048?f=mvt](https://api.pdok.nl/lv/bag/ogc/v1_0/tiles/NetherlandsRDNewQuad/12/2046/2048?f=mvt)
- Styles [https://api.pdok.nl/lv/bag/ogc/v1\\_0/styles](https://api.pdok.nl/lv/bag/ogc/v1_0/styles)

Parameters ?f=json or ?f=html

# BAG Vector Tiles



[https://api.pdok.nl/lv/bag/ogc/v1\\_0/tiles/  
NetherlandsRDNewQuad/12/2046/2047?f=  
mvt](https://api.pdok.nl/lv/bag/ogc/v1_0/tiles/NetherlandsRDNewQuad/12/2046/2047?f=mvt)



[https://api.pdok.nl/lv/bag/ogc/v1\\_0/tiles/  
EuropeanETRS89\\_LAEAQuad/14/8237/7  
303?f=mvt](https://api.pdok.nl/lv/bag/ogc/v1_0/tiles/EuropeanETRS89_LAEAQuad/14/8237/7303?f=mvt)

# BAG Vector Tiles



[https://api.pdok.nl/lv/bag/ogc/v1\\_0/tiles/  
NetherlandsRDNewQuad/12/2046/2047?f=  
mvt](https://api.pdok.nl/lv/bag/ogc/v1_0/tiles/NetherlandsRDNewQuad/12/2046/2047?f=mvt)



[https://api.pdok.nl/lv/bag/ogc/v1\\_0/tiles/  
EuropeanETRS89\\_LAEAQuad/14/8237/7  
303?f=mvt](https://api.pdok.nl/lv/bag/ogc/v1_0/tiles/EuropeanETRS89_LAEAQuad/14/8237/7303?f=mvt)

# Point of origin

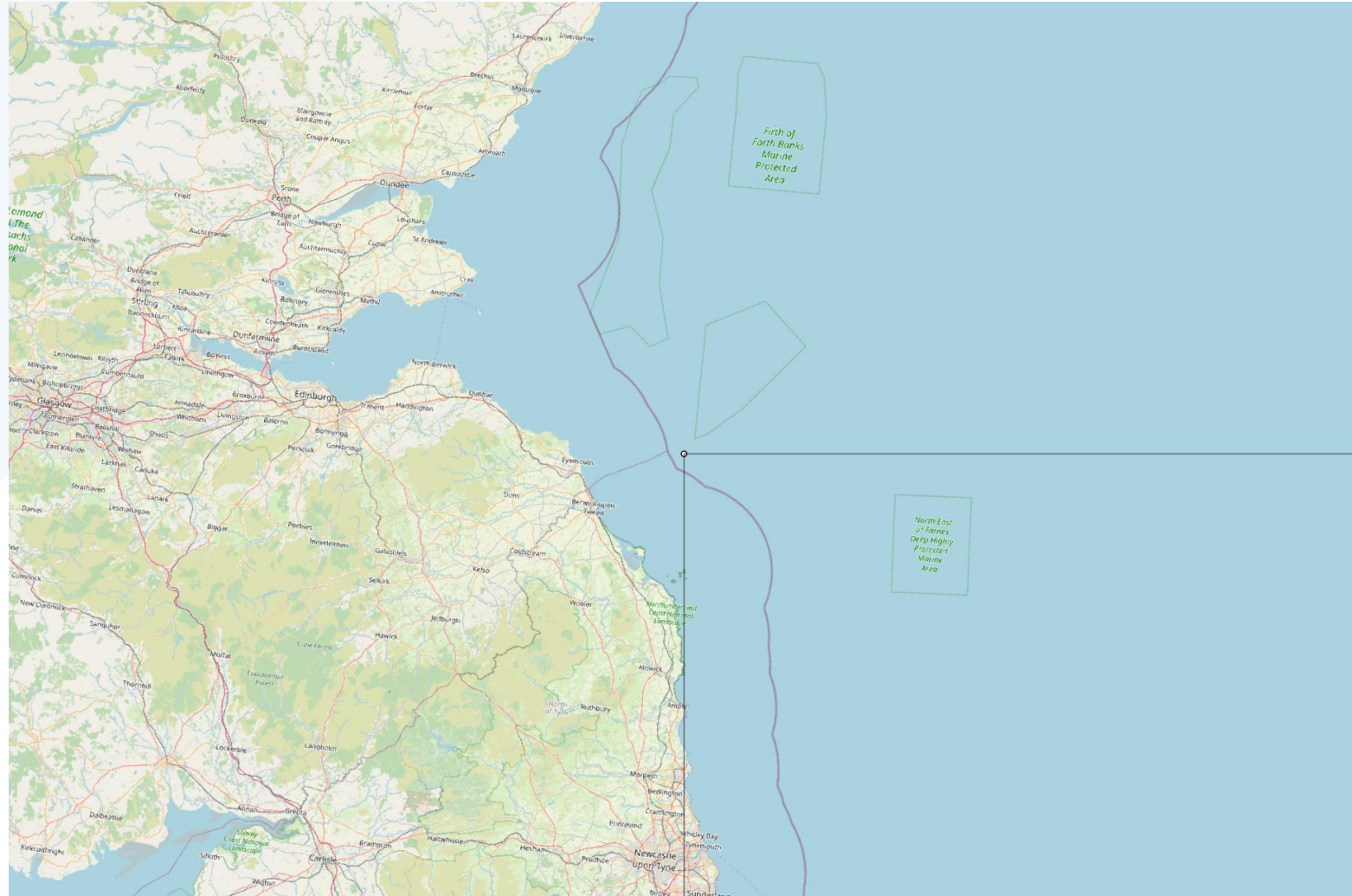




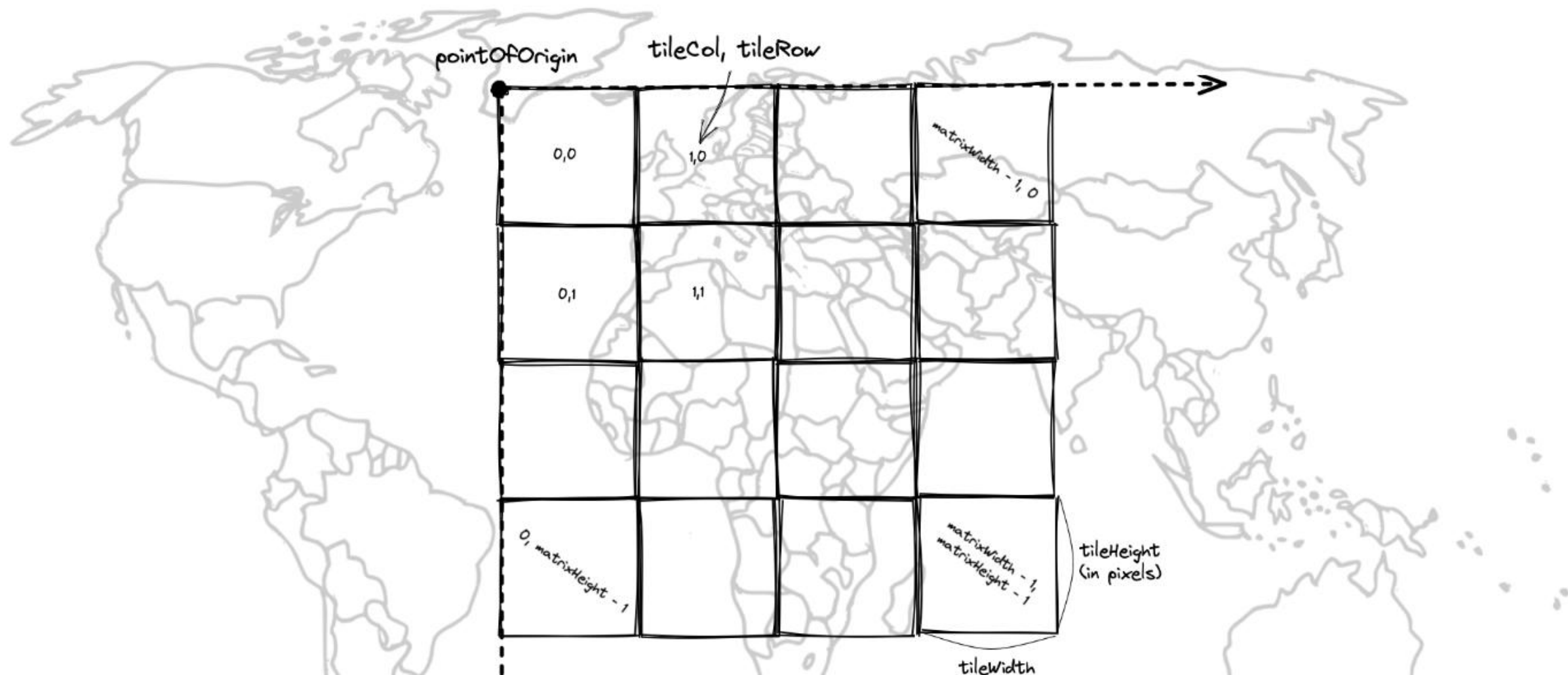
# Point of origin



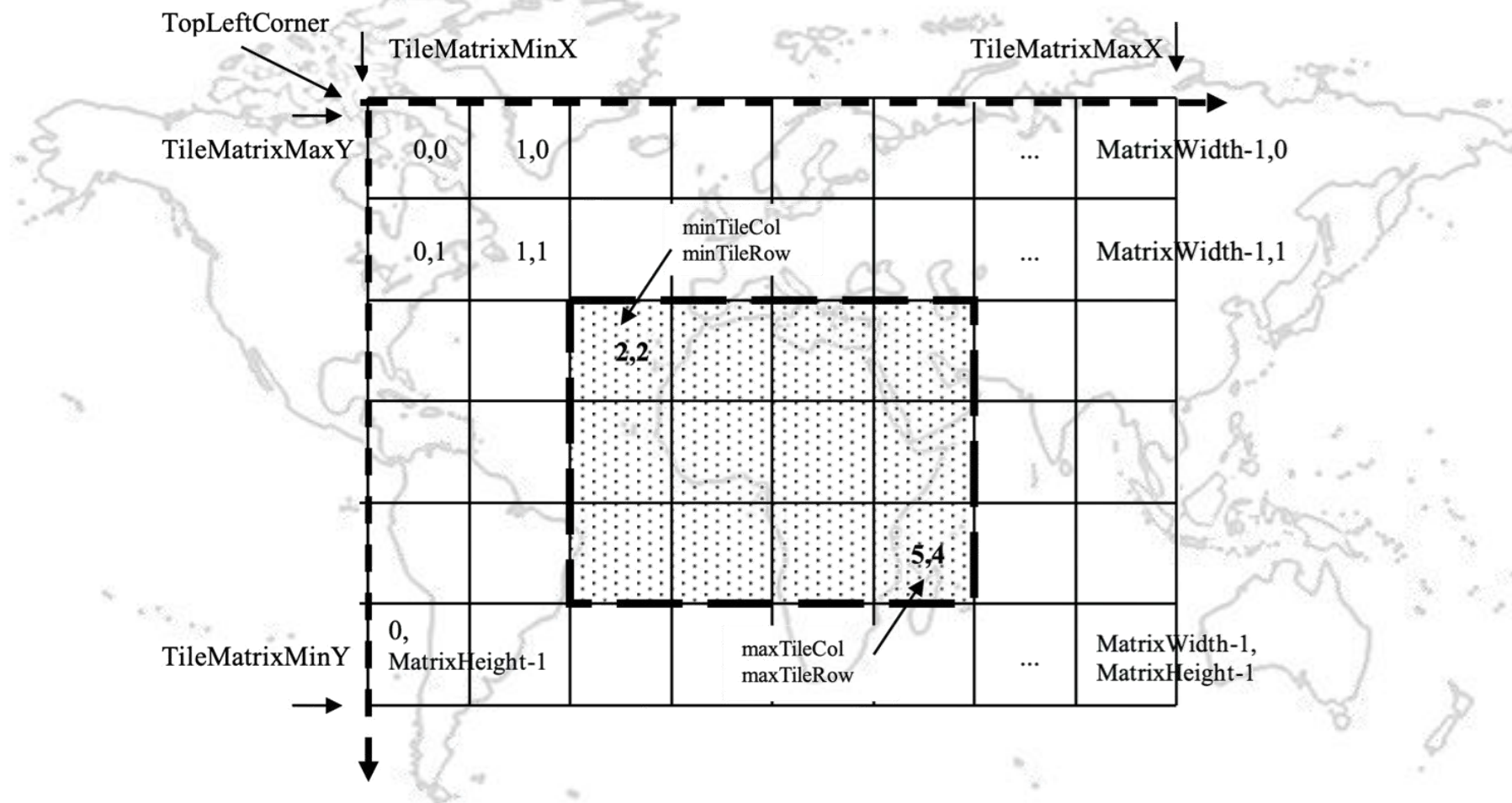
# Point of origin



# Tile matrix



# TileMatrixSet



<https://docs.ogc.org/is/17-083r2/17-083r2.html>



# OGC API Maps

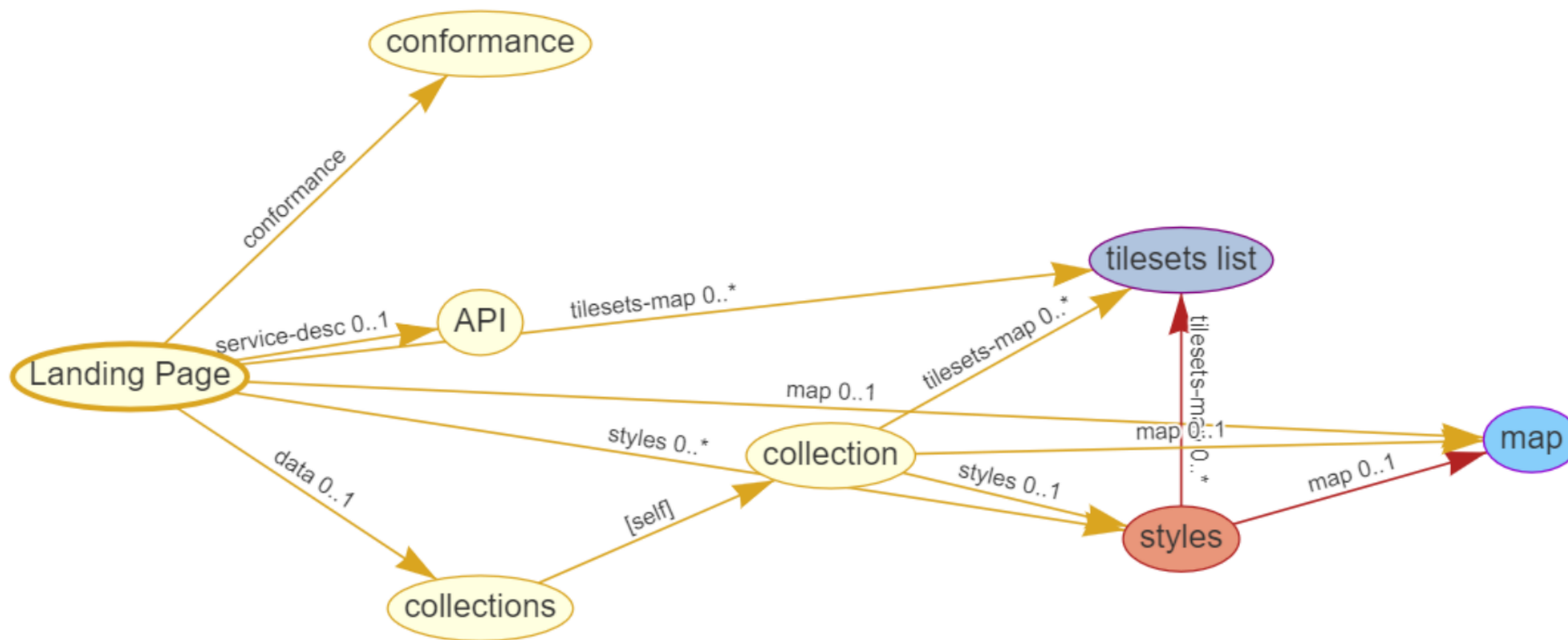


Figure 2. Resources and relations to them via links

# OGC API Maps

Resource name	Common path
Landing page <sup>4</sup>	{datasetRoot}/
Conformance declaration <sup>4</sup>	{datasetRoot}/conformance
<b><i>Dataset Maps</i></b>	
Dataset maps in the default style <sup>1</sup>	{datasetRoot}/map
Dataset maps <sup>1,2</sup>	{datasetRoot}/styles/{styleId}/map
Dataset map tiles <sup>1,3</sup>	{datasetRoot}/map/tiles/{tileMatrixSetId}/...
<b><i>Geospatial data collections<sup>5</sup></i></b>	
Collections <sup>5</sup>	{datasetRoot}/collections
Collection <sup>5</sup>	{datasetRoot}/collections/{collectionId}
Collection maps in the default style	{datasetRoot}/collections/{collectionId}/map
Collection maps <sup>2</sup>	{datasetRoot}/collections/{collectionId}/styles/{styleId}/map
Collection map tiles <sup>3</sup>	{datasetRoot}/collections/{collectionId}/map/tiles/{tileMatrixSetId}/...

# OGC API records

Specificatie om Metadata te vinden en ontsluiten.

*OGC API - Records supports 3 main deployment patterns:*

- *Crawlable catalog: browse and navigation of a set of metadata records via links*
- *Searchable catalog: API capability to query and filter a collection of metadata records based on search criteria (bbox, datetime, q, etc.)*
- *Local resources catalog: searchable catalog functionality applied at the collection level of an API*

Landing page	<a href="https://demo.pygeoapi.io/stable">https://demo.pygeoapi.io/stable</a>
OAS	<a href="https://demo.pygeoapi.io/stable/openapi?f=html">https://demo.pygeoapi.io/stable/openapi?f=html</a> (strikt genomen /api)
Collections	<a href="https://demo.pygeoapi.io/stable/collections">https://demo.pygeoapi.io/stable/collections</a>
Collection-id	<a href="https://demo.pygeoapi.io/stable/collections/dutch-metadata">https://demo.pygeoapi.io/stable/collections/dutch-metadata</a>
Items	<a href="https://demo.pygeoapi.io/stable/collections/dutch-metadata/items">https://demo.pygeoapi.io/stable/collections/dutch-metadata/items</a>
Item-id	<a href="https://demo.pygeoapi.io/stable/collections/dutch-metadata/items/0ec79c96-898f-40da-adc7-673eb4749685">https://demo.pygeoapi.io/stable/collections/dutch-metadata/items/0ec79c96-898f-40da-adc7-673eb4749685</a>

Parameters ?f=json of ?f=html

# OGC API processes

- Voorbeeld processing list: <https://demo.pygeoapi.io/stable/processes?f=html>

Resource	Path	HTTP method	Information delivered
Landing page	/	GET	General information about the service, links to API endpoints
Conformance classes	/conformance	GET	List of conformance classes
Process list	/processes	GET	Process identifiers, links to process descriptions
Process description	/processes/{processID}	GET	Information about a process, e.g. inputs/outputs
Process Execution	/processes/{processID}/execution	POST	execute the process with input/output parameter
Job status info	/jobs/{jobID}	GET	Status info, links to results or exceptions
Job results	/jobs/{jobID}/results	GET	Job results
Job list	/jobs	POST/GET*	List of job ids and status info, links to results or exceptions



# Gebruik

- Processes in python
- Features in QGIS
- Maps in QGIS
- Features in ArcGis Online
- Features in Leaflet
- Tiles in Maplibre in handson

# Voorbeeld aanroepen process API in Python

```
def calc_lof(feet):  
    url = "http://localhost:5000/processes/localoutlier/execution"  
    data = {"inputs": {"dataset": feet}}  
    headers = {"Content-Type": "application/json"}  
    response = requests.post(url, json=data, headers=headers)  
    return handle_response(response)
```

n\_neighbors en leaf\_size hebben default values,  
dus worden hier niet meegegeven...

```
input = 'http://localhost/collections/knmi_meetstations/items?f=json&limit=1000'  
result = calc_lof(input)  
print(result)
```

```
{'id': 'output_dataset', 'value': '{"type": "FeatureCollection", "features": [{"id": "0", "type": "Feature", "properties": {"STN": 201, "TYPE":  
"Platform/AWS", "abnormality": -1}, ...
```

## Local outlier factor (LOF)

The local outlier factor (LOF) algorithm computes a score indicating the degree of abnormality of each input (observation), in a set of such observations. It measures the local density deviation of a given data point with respect to its neighbors. It considers as outliers the samples that have a substantially lower density than their neighbors.

local outlier factor LOF outlier detection

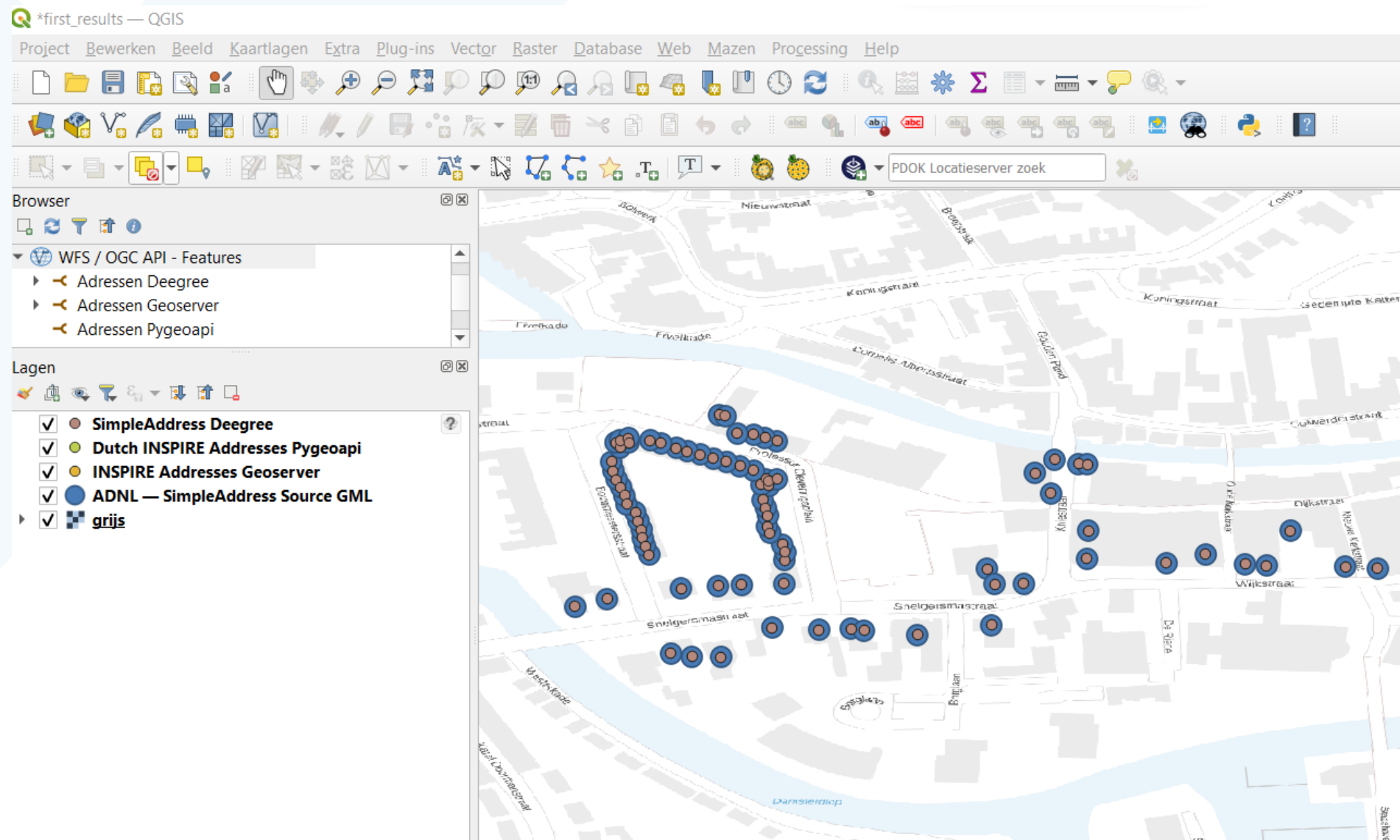
Id	Title	Data Type	Description
dataset	Dataset	string	geojson dataset of points, in one CRS, for which LOF scores should be computed.
n_neighbors	Number of neighbors		Number of neighbors to use by default for 'kneighbors' queries. If 'n_neighbors' is larger than the number of samples provided, all samples will be used.
leaf_size	Leaf size		Leaf size passed to BallTree or KDTree. This can affect the speed of the construction and query, as well as the memory required to store the tree. The optimal value depends on the nature of the problem.

Inputs

Id	Title	Description
output_dataset	Output Dataset	output

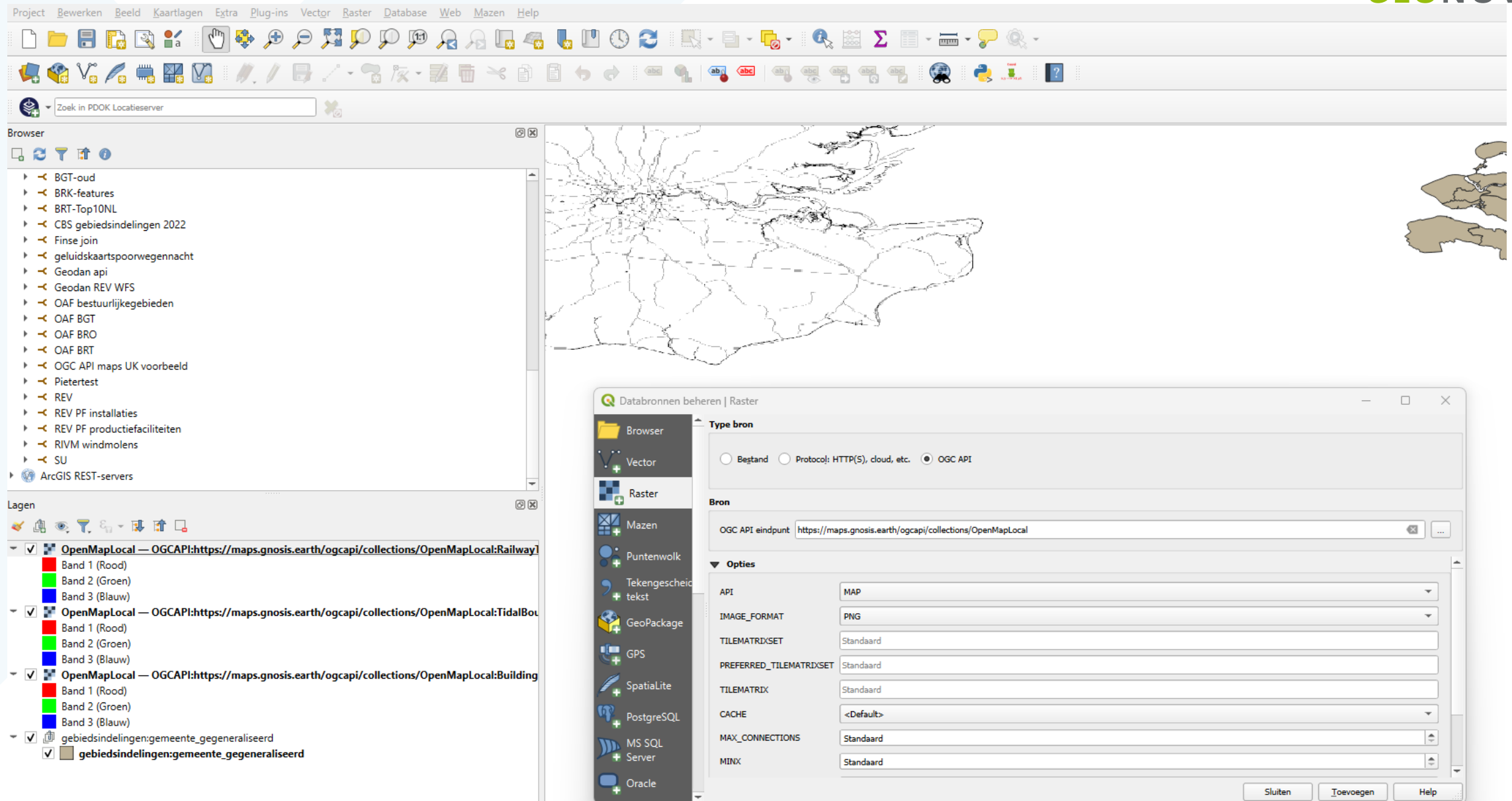
Outputs

# Demo OGC-API-Features in QGIS



# Demo OGC-API-Maps in QGIS

<https://maps.gnosis.earth/ogcapi/collections/OpenMapLocal>



The screenshot displays the QGIS desktop environment. The top menu bar includes Project, Bewerken, Beeld, Kaartlagen, Extra, Plug-ins, Vector, Raster, Database, Web, Mazon, and Help. Below the menu is a toolbar with various icons for map navigation and editing. The left sidebar contains the 'Browser' panel, which lists several data sources, including 'OGC API maps UK voorbeeld'. The 'Lagen' (Layers) panel on the left shows three layers added from the OGC API: 'OpenMapLocal — OGC API:https://maps.gnosis.earth/ogcapi/collections/OpenMapLocal:Railway', 'OpenMapLocal — OGC API:https://maps.gnosis.earth/ogcapi/collections/OpenMapLocal:TidalBou', and 'OpenMapLocal — OGC API:https://maps.gnosis.earth/ogcapi/collections/OpenMapLocal:Building'. The main map area shows a vector map of a coastal region. The 'Databronnen beheren | Raster' dialog box is open, showing the 'Type bron' (Data Source Type) as 'OGC API'. The 'Bron' (Data Source) field contains the URL 'https://maps.gnosis.earth/ogcapi/collections/OpenMapLocal'. The 'Opties' (Options) section includes fields for API, IMAGE\_FORMAT, TILEMATRIXSET, PREFERRED\_TILEMATRIXSET, TILEMATRIX, CACHE, MAX\_CONNECTIONS, and MINX.

Project Bewerken Beeld Kaartlagen Extra Plug-ins Vector Raster Database Web Mazon Help

Zoek in PDOK Locatieserver

Browser

- BGT-oud
- BRK-features
- BRT-Top10NL
- CBS gebiedsindelingen 2022
- Finse join
- geluidskaartspoorwegennacht
- Geodan api
- Geodan REV WFS
- OAF bestuurlijkegebieden
- OAF BGT
- OAF BRO
- OAF BRT
- OGC API maps UK voorbeeld
- Pietertest
- REV
- REV PF installaties
- REV PF productiefaciliteiten
- RIVM windmolens
- SU
- ArcGIS REST-servers

Lagen

- OpenMapLocal — OGC API:https://maps.gnosis.earth/ogcapi/collections/OpenMapLocal:Railway
  - Band 1 (Rood)
  - Band 2 (Groen)
  - Band 3 (Blauw)
- OpenMapLocal — OGC API:https://maps.gnosis.earth/ogcapi/collections/OpenMapLocal:TidalBou
  - Band 1 (Rood)
  - Band 2 (Groen)
  - Band 3 (Blauw)
- OpenMapLocal — OGC API:https://maps.gnosis.earth/ogcapi/collections/OpenMapLocal:Building
  - Band 1 (Rood)
  - Band 2 (Groen)
  - Band 3 (Blauw)
- gebiedsindelingen:gemeente\_gegeneraliseerd
- gebiedsindelingen:gemeente\_gegeneraliseerd

Databronnen beheren | Raster

Type bron

☐ Bestand ☐ Protocol: HTTP(S), cloud, etc. ☒ OGC API

Bron

OGC API eindpunt

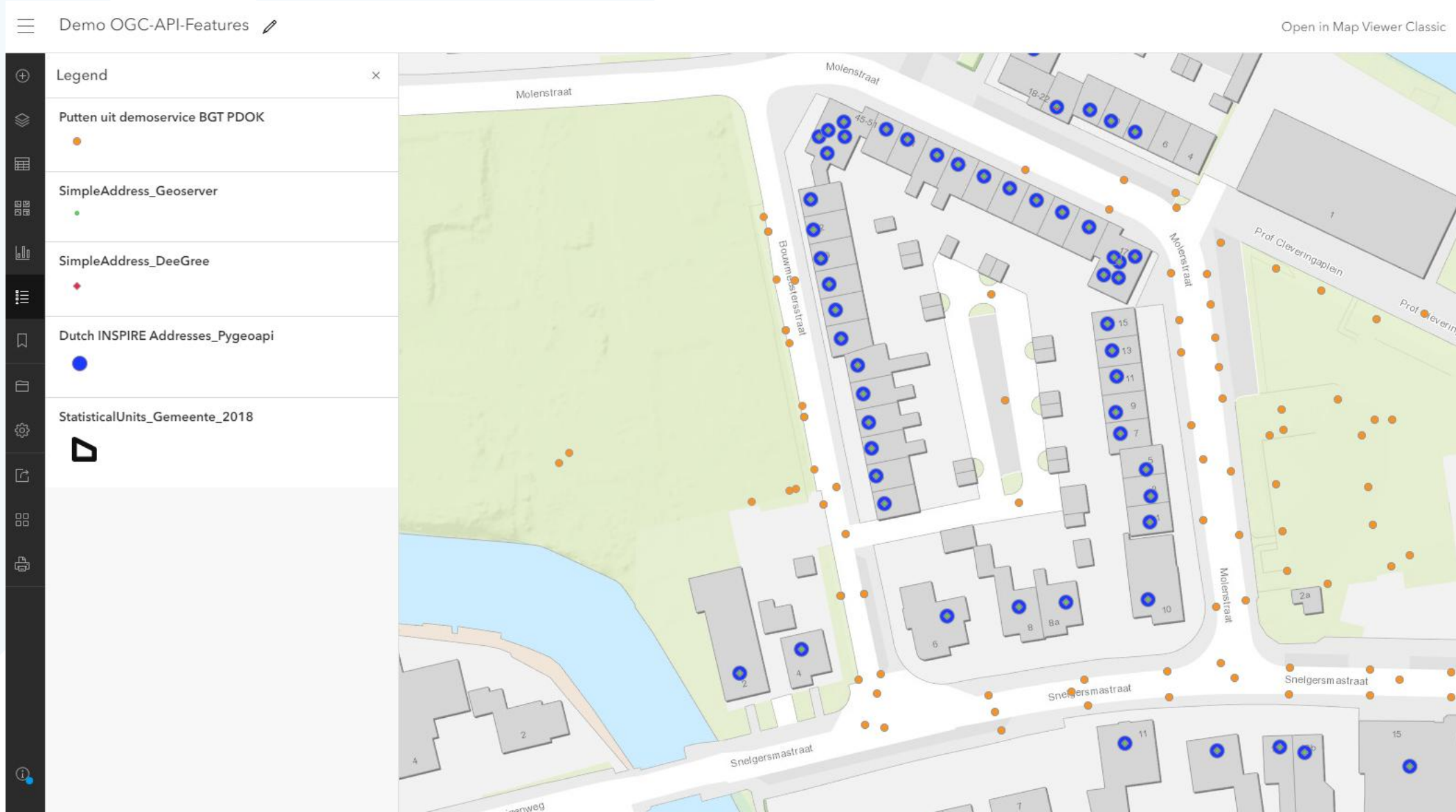
Opties

API	MAP
IMAGE_FORMAT	PNG
TILEMATRIXSET	Standaard
PREFERRED_TILEMATRIXSET	Standaard
TILEMATRIX	Standaard
CACHE	<Default>
MAX_CONNECTIONS	Standaard
MINX	Standaard

Sluiten Toevoegen Help



# Demo OGC-API-features in ArcGIS Online



# OGC-API-Features in Leaflet

```
<!DOCTYPE html>
<html>
<head>
  <title>BGT-bakken in Watergrasbuurt Gouda</title>
  <meta charset="utf-8" />
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <link rel="stylesheet" href="https://unpkg.com/leaflet@1.7.1/dist/leaflet.css" integrity="sha512-xodZBNTC5n17Xt2a
  <script src="https://unpkg.com/leaflet@1.7.1/dist/leaflet.js" integrity="sha512-XQoYMqMTK8LvdxXYG3nZ448hOEQiglfq)
  <style>
    html, body {
      height: 100%;
      margin: 0;
    }
    #map {
      width: 100%;
      height: 100%;
    }
  </style>
</head>
<body>

  <div id='map'></div>

<script>
  var map = L.map('map').setView([52.031, 4.715], 17);

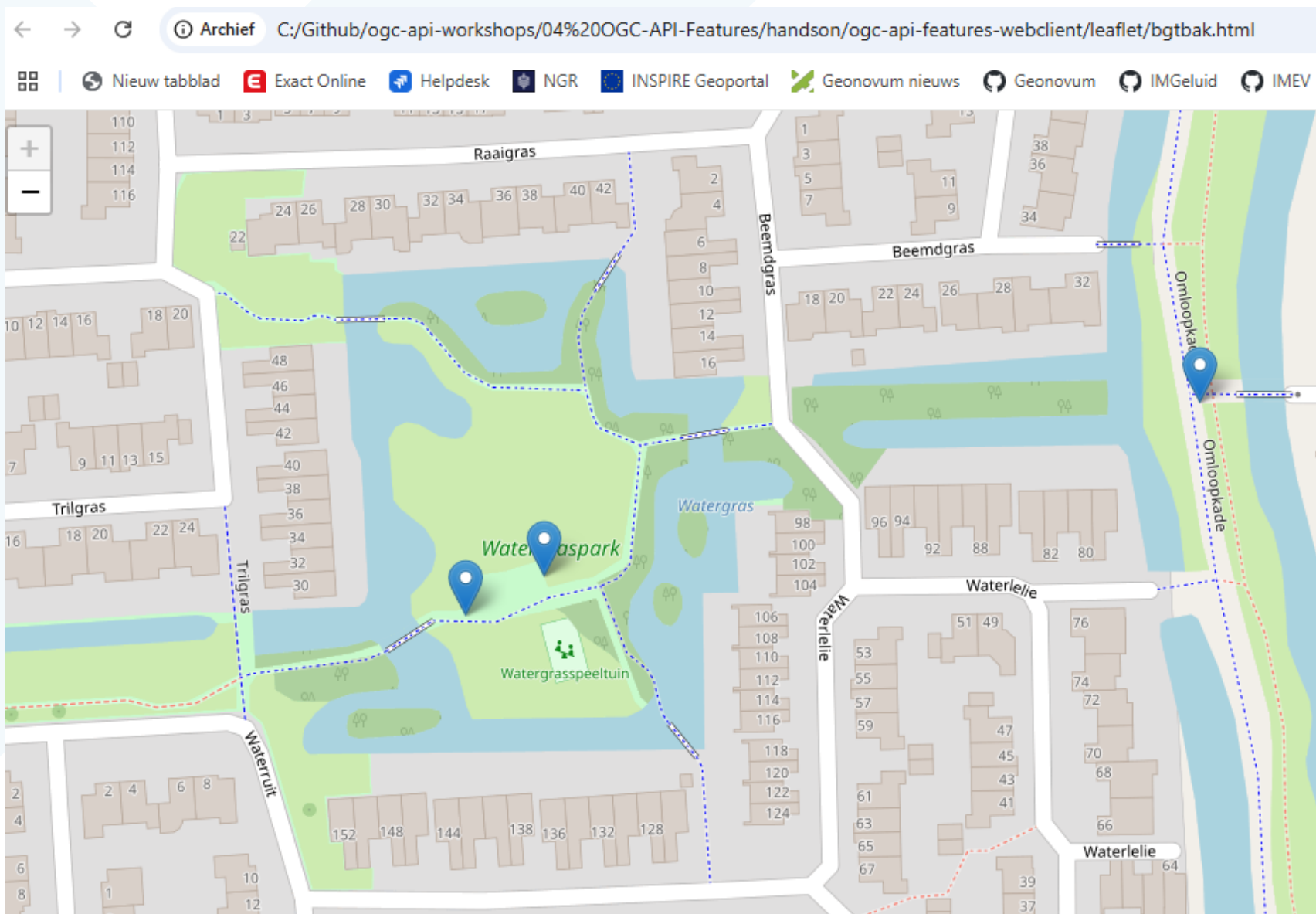
  L.tileLayer('https://{s}.tile.openstreetmap.org/{z}/{x}/{y}.png', {
    attribution: 'Map data &copy; <a href="https://www.openstreetmap.org/copyright">OpenStreetMap</a> contributors,
      'Contains OS data &copy; Crown copyright and database right 2021.'
  }).addTo(map);

  (async () => {
    const BGTbak = await fetch('https://api.pdok.nl/lv/bgt/ogc/v1/collections/bak/items?f=json&bbox=4.710,52.028,4.
      headers: {
        'Accept': 'application/geo+json'
      }
    }).then(response => response.json());

    L.geoJSON(BGTbak, {
      pointToLayer: function (feature, latlng) {
        return L.marker(latlng,
      },
      onEachFeature: onEachFeature
    }).addTo(map);
  })();

  function onEachFeature(feature, layer) {
    var popupContent = "<a href='https://api.pdok.nl/lv/bgt/ogc/v1/collections/bak/items/' + feature.id + '" ta
    if (feature.popupContent) {
      popupContent += feature.popupContent;
    }
    layer.bindPopup(popupContent);
  }
</script>
```

# OGC-API-Features in Leaflet





# Dank voor de aandacht!

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