pygeoapi: an OGC API implementation in Python providing schema.org annotations

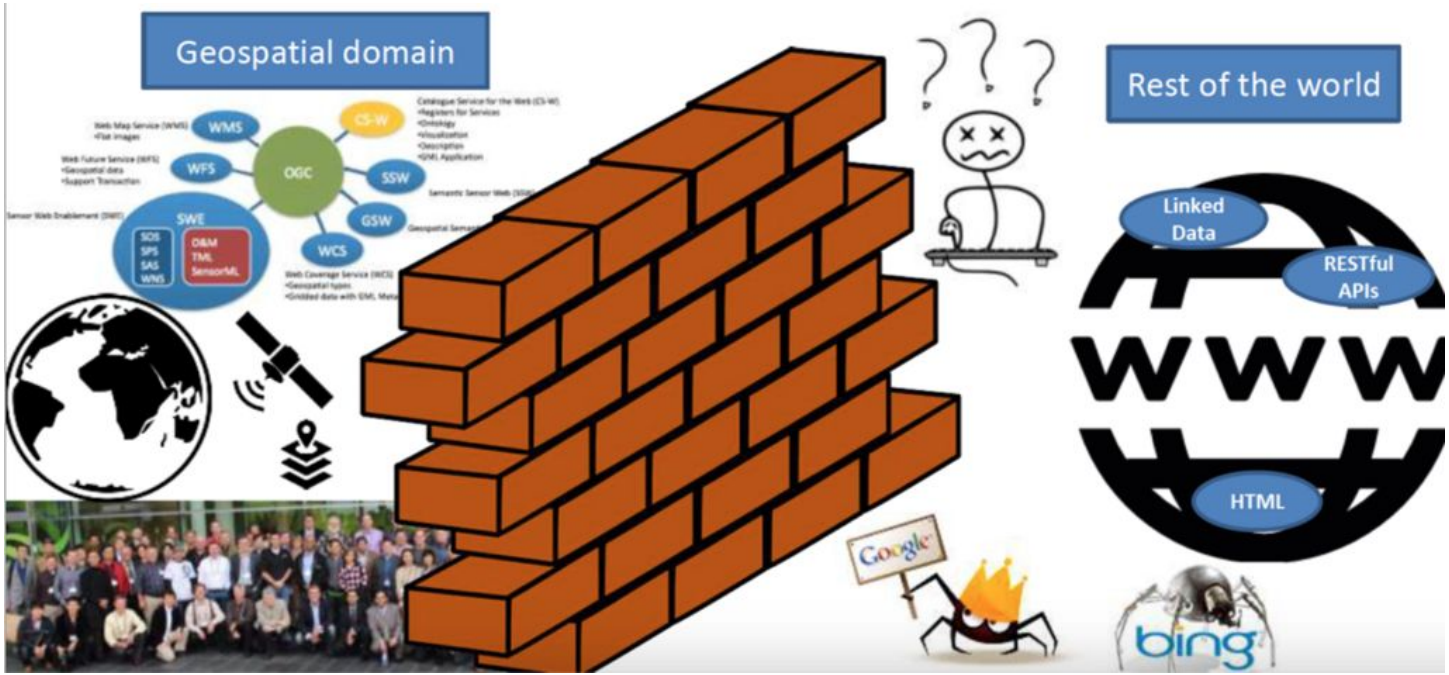
Workshop on SEO

Paul van Genuchten

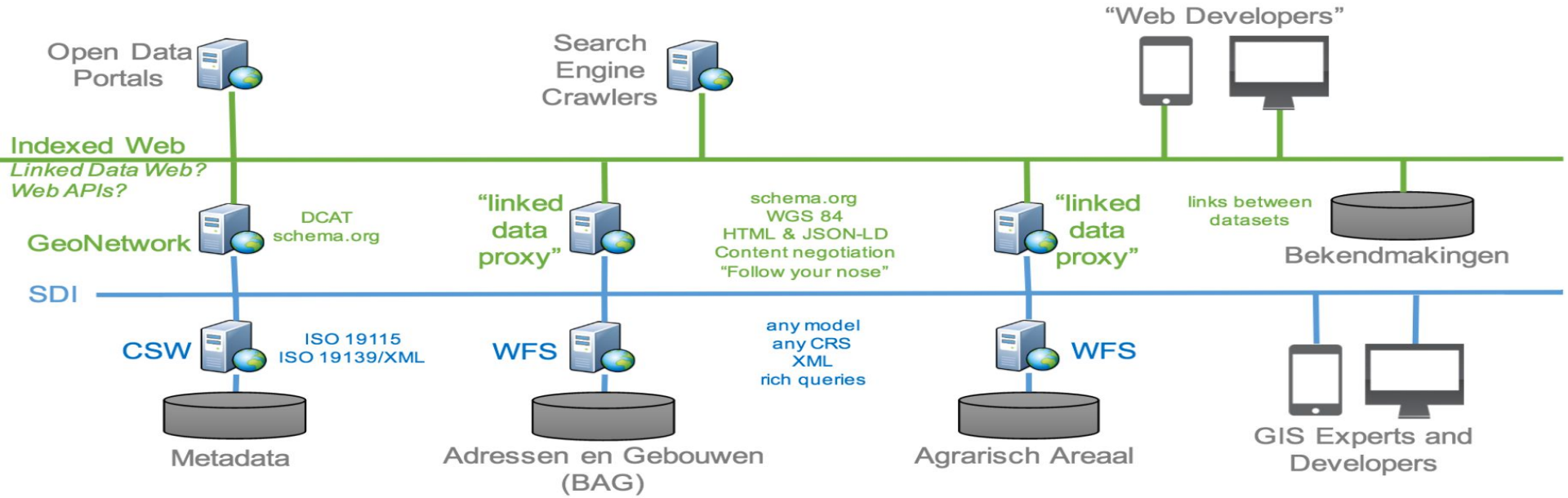
Linda van den Brink

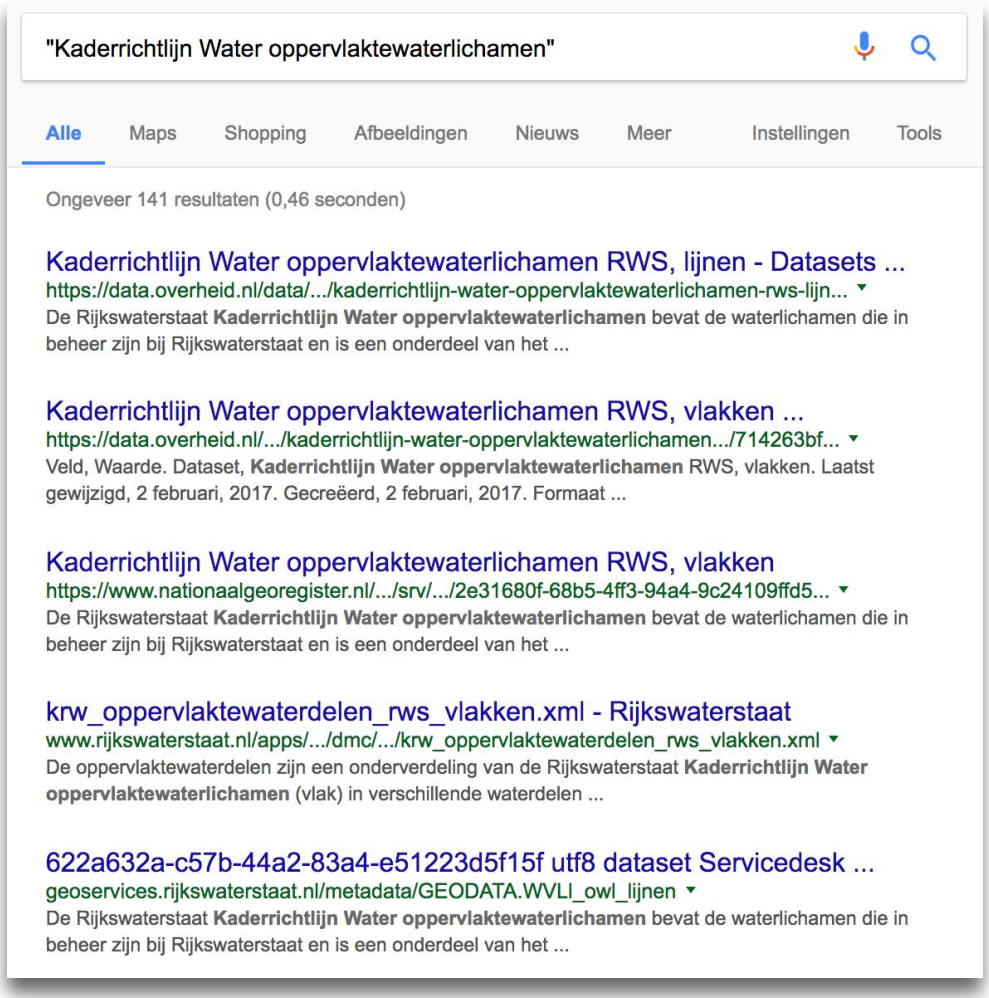
Jorge Mendes de Jesus

Tom Kralidis



Spatial data on the web, 2016, OGC/Geonovum


Open Data Portals
Search Engine Crawlers
"Web Developers"
Indexed Web
Linked Data Web?
Web APIs?
GeoNetwork
DCAT
schema.org
"linked data proxy"
schema.org
WGS 84
HTML & JSON-LD
Content negotiation
"Follow your nose"
"linked data proxy"
links between datasets
Bekendmakingen
SDI
CSW
ISO 19115
ISO 19139/XML
WFS
any model
any CRS
XML
rich queries
WFS
Metadata
Adressen en Gebouwen (BAG)
Agrarisch Areaal
GIS Experts and Developers


"Kaderrichtlijn Water oppervlaktewaterlichamen"
Alle
Maps
Shopping
Afbeeldingen
Nieuws
Meer
Instellingen
Tools
Ongeveer 141 resultaten (0,46 seconden)
Kaderrichtlijn Water oppervlaktewaterlichamen RWS, lijnen - Datasets ...
https://data.overheid.nl/data/.../kaderrichtlijn-water-oppervlaktewaterlichamen-rws-lijn...
De Rijkswaterstaat Kaderrichtlijn Water oppervlaktewaterlichamen bevat de waterlichamen die in beheer zijn bij Rijkswaterstaat en is een onderdeel van het ...
Kaderrichtlijn Water oppervlaktewaterlichamen RWS, vlakken ...
https://data.overheid.nl/.../kaderrichtlijn-water-oppervlaktewaterlichamen.../714263bf...
Veld, Waarde. Dataset, Kaderrichtlijn Water oppervlaktewaterlichamen RWS, vlakken. Laatst gewijzigd, 2 februari, 2017. Gecreëerd, 2 februari, 2017. Formaat ...
Kaderrichtlijn Water oppervlaktewaterlichamen RWS, vlakken
https://www.nationaalgeoregister.nl/.../srv/.../2e31680f-68b5-4ff3-94a4-9c24109ffd5...
De Rijkswaterstaat Kaderrichtlijn Water oppervlaktewaterlichamen bevat de waterlichamen die in beheer zijn bij Rijkswaterstaat en is een onderdeel van het ...
krw_oppervlaktewaterdelen_rws_vlakken.xml - Rijkswaterstaat
www.rijkswaterstaat.nl/apps/.../dmc/.../krw_oppervlaktewaterdelen_rws_vlakken.xml
De oppervlaktewaterdelen zijn een onderverdeling van de Rijkswaterstaat Kaderrichtlijn Water oppervlaktewaterlichamen (vlak) in verschillende waterdelen ...
622a632a-c57b-44a2-83a4-e51223d5f15f utf8 dataset Servicedesk ...
geoservices.rijkswaterstaat.nl/metadata/GEODATA.WVLl_owl_lijnen
De Rijkswaterstaat Kaderrichtlijn Water oppervlaktewaterlichamen bevat de waterlichamen die in beheer zijn bij Rijkswaterstaat en is een onderdeel van het ...

Pagina 3 van ongeveer 18.500 resultaten (0,17 seconden)

Lopik, Lopikerweg west 50 - Services

www.ldproxy.net/bag/inspireadressen/inspireadressen.2414293/

Lopik, Lopikerweg west 50. id: inspireadressen.2414293. streetAddress: Lopikerweg west 50. addressLocality: Lopik. postalCode: 3411AP.

Groesbeek, Hommelstraat 10 - Services

www.ldproxy.net/bag/inspireadressen/inspireadressen.8795076/

Groesbeek, Hommelstraat 10. id: inspireadressen.8795076. streetAddress: Hommelstraat 10. addressLocality: Groesbeek. postalCode: 6561ZH.

Groningen, Oosterkade 1001 - Services

www.ldproxy.net/bag/inspireadressen/inspireadressen.236/

Groningen, Oosterkade 1001. id: inspireadressen.236. streetAddress: Oosterkade 1001. addressLocality: Groningen. postalCode: 9711RS.

Joure, Sjoerd Wiersmahof 21 - Services

www.ldproxy.net/bag/inspireadressen/inspireadressen.8794864/

Joure, Sjoerd Wiersmahof 21. id: inspireadressen.8794864. streetAddress: Sjoerd Wiersmahof 21. addressLocality: Joure. postalCode: 8501VA.

7. Best Practices Summary

Best Practice 1: Provide metadata

Best Practice 2: Provide descriptive metadata

Best Practice 3: Provide structural metadata

Best Practice 4: Provide data license information

Best Practice 5: Provide data provenance information

Best Practice 6: Provide data quality information

Best Practice 7: Provide a version indicator

Best Practice 8: Provide version history

Best Practice 9: Use persistent URIs as identifiers of datasets

Best Practice 10: Use persistent URIs as identifiers within datasets

Best Practice 11: Assign URIs to dataset versions and series

Best Practice 12: Use machine-readable standardized data formats

Best Practice 13: Use locale-neutral data representations

Best Practice 14: Provide data in multiple formats

Best Practice 15: Reuse vocabularies, preferably standardized ones

Best Practice 16: Choose the right formalization level

Best Practice 17: Provide bulk download

Best Practice 18: Provide Subsets for Large Datasets

Best Practice 19: Use content negotiation for serving data available in multiple formats

Best Practice 20: Provide real-time access

Best Practice 21: Provide data up to date

Best Practice 22: Provide an explanation for data that is not available

Best Practice 23: Make data available through an API

Best Practice 24: Use Web Standards as the foundation of APIs

Best Practice 25: Provide complete documentation for your API

Best Practice 26: Avoid Breaking Changes to Your API

Best Practice 27: Preserve identifiers

Best Practice 28: Assess dataset coverage

Best Practice 29: Gather feedback from data consumers

Best Practice 30: Make feedback available

Best Practice 31: Enrich data by generating new data

Best Practice 32: Provide Complementary Presentations

Best Practice 33: Provide Feedback to the Original Publisher

Best Practice 34: Follow Licensing Terms

Best Practice 35: Cite the Original Publication

§ Best Practices Summary

Best Practice 1: Use globally unique persistent HTTP URIs for Spatial Things

Best Practice 2: Make your spatial data indexable by search engines

Best Practice 3: Link resources together to create the Web of data

Best Practice 4: Use spatial data encodings that match your target audience

Best Practice 5: Provide geometries on the Web in a usable way

Best Practice 6: Provide geometries at the right level of accuracy, precision, and size

Best Practice 7: Choose coordinate reference systems to suit your user's applications

Best Practice 8: State how coordinate values are encoded

Best Practice 9: Describe relative positioning

Best Practice 10: Use appropriate relation types to link Spatial Things

Best Practice 11: Provide information on the changing nature of spatial things

Best Practice 12: Expose spatial data through 'convenience APIs'

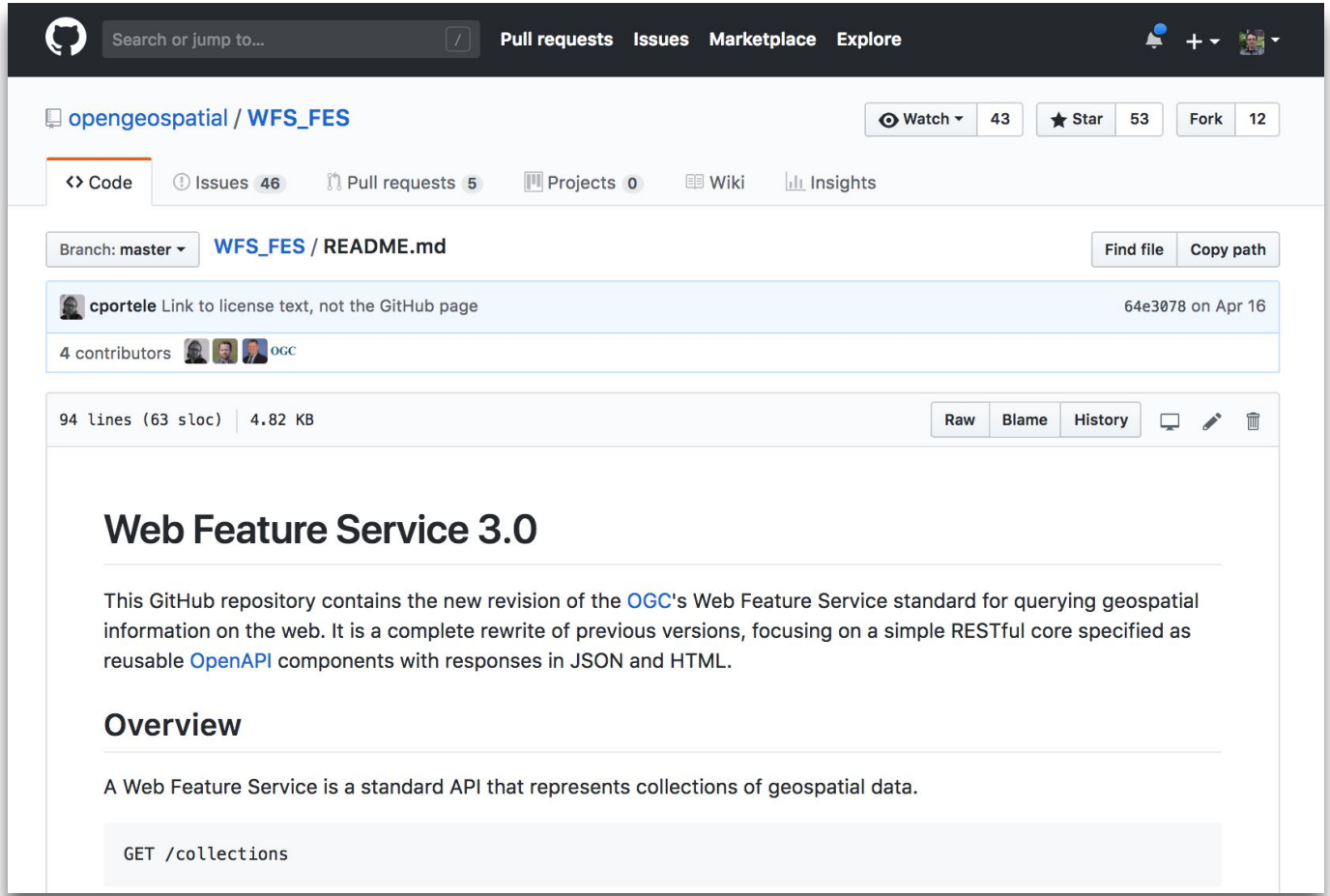
Best Practice 13: Include spatial metadata in dataset metadata

Best Practice 14: Describe the positional accuracy of spatial data

OGC standards use the web..

..but they are not part of the web

https://hackercombat.com/the-best-10-deep-web-search-engines-of-2017/


Search or jump to...
Pull requests
Issues
Marketplace
Explore
opengeospatial / WFS_FES
Watch 43
Star 53
Fork 12
Code
Issues 46
Pull requests 5
Projects 0
Wiki
Insights
Branch: master
WFS_FES / README.md
Find file
Copy path
cportele Link to license text, not the GitHub page
64e3078 on Apr 16
4 contributors
OGC
94 lines (63 sloc) 4.82 KB
Raw
Blame
History
Web Feature Service 3.0
This GitHub repository contains the new revision of the OGC's Web Feature Service standard for querying geospatial information on the web. It is a complete rewrite of previous versions, focusing on a simple RESTful core specified as reusable OpenAPI components with responses in JSON and HTML.
Overview
A Web Feature Service is a standard API that represents collections of geospatial data.
GET /collections

- Code marathon in Ft. Collins (USA)

opengeospatial / oapi_common

Watch 15 | Star 6 | Fork 2

Code | Issues 21 | Pull requests 0 | Projects 1 | Wiki | Insights

No description, website, or topics provided.

23 commits | 4 branches | 0 releases | 3 contributors | View license

Branch: master | New pull request | Create new file | Upload files | Find File | Clone or download

cmheazel Misspelling ... Latest commit 5567b1b 14 days ago

OAPI-Common	Misspelling	14 days ago
OAPI-Elements	March 6 update	3 months ago
CONTRIBUTORS.md	March 6 update	3 months ago
DEVELOPMENT.md	March 6 update	3 months ago
LICENSE	March 6 update	3 months ago
README.md	Cleanup May 7	15 days ago
implementations.md	March 6 update	3 months ago
index.adoc	Initial population	8 months ago

README.md

OGC API (OAPI) Common Specification

OGC API standards define modular API building blocks to spatially enable Web APIs. The OGC API family of standards is organized by resource type. Each resource has an associated API standard. These resource-specific API standards share a common core. This OGC API Common standard specifies requirements which are shared by all OGC API standards. The OGC API Common standard is maintained on this GitHub repository.

OpenAPI Specification

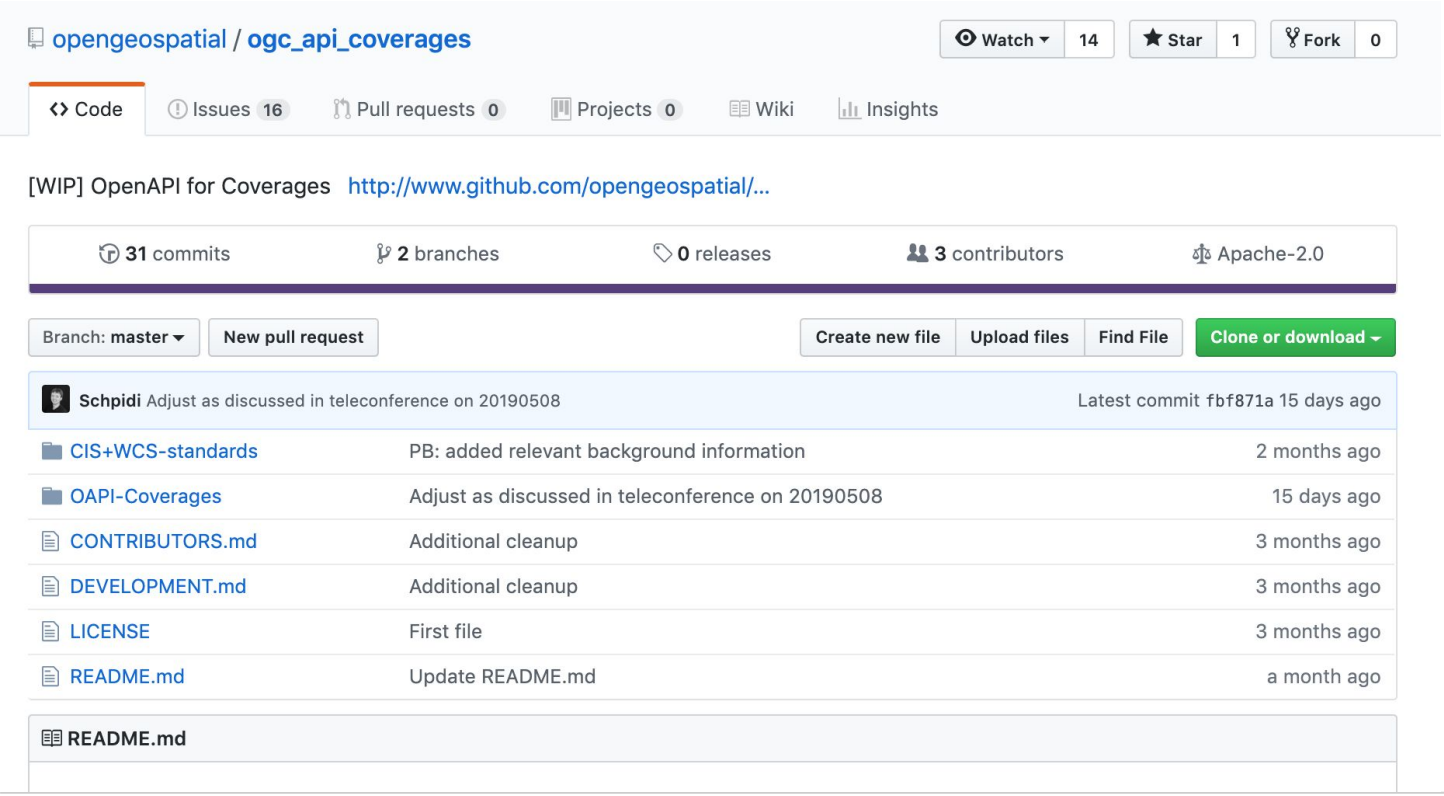
Version 3.0.2

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 RFC2119 RFC8174 when, and only when, they appear in all capitals, as shown here.

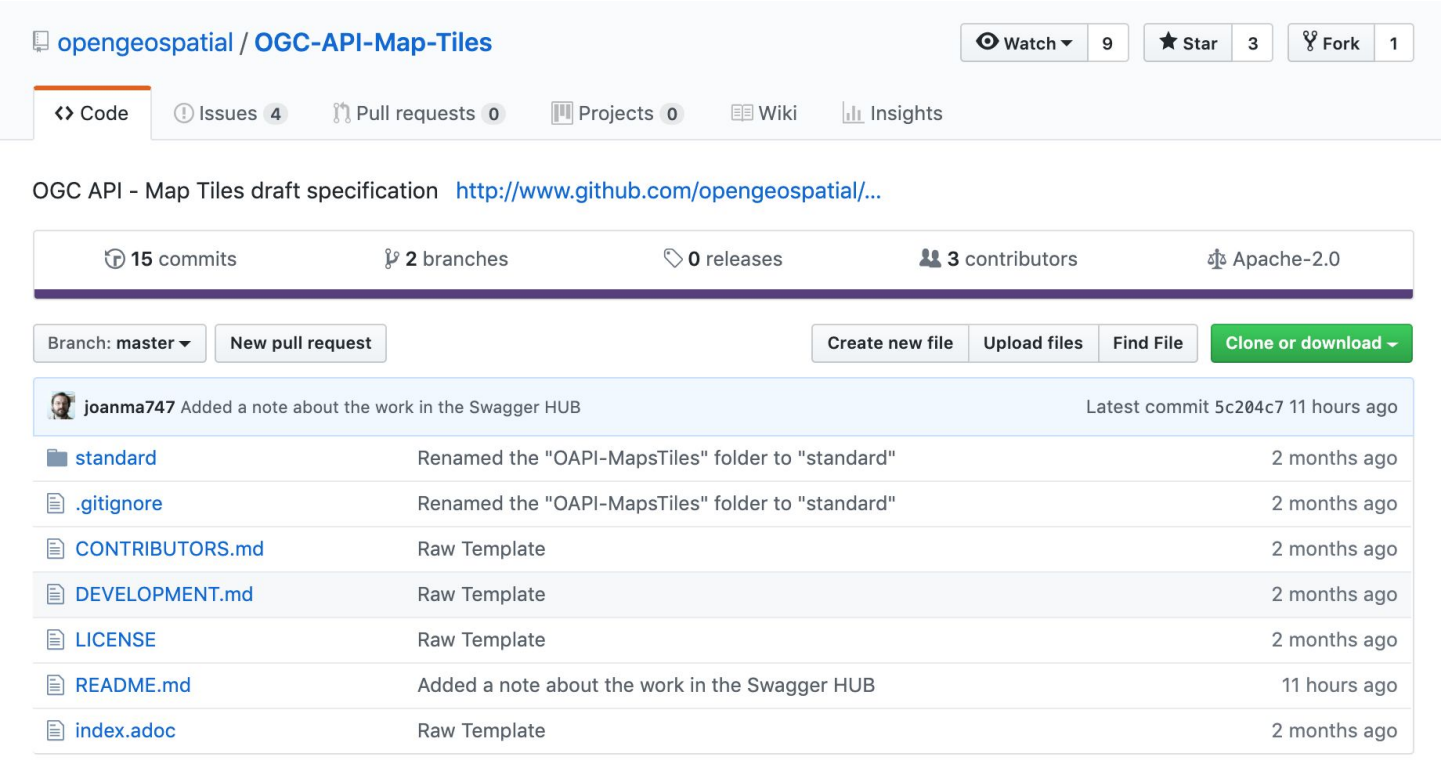
Introduction

The OpenAPI Specification (OAS) defines a standard, language-agnostic interface to RESTful APIs which allows both humans and computers to discover and understand the capabilities of the service without access to source code, documentation, or through network traffic inspection. When properly defined, a consumer can understand and interact with the remote service with a minimal amount of implementation logic.

OAPI Coverages



OAPI Tiles


opengeospatial / OGC-API-Map-Tiles
Watch 9
Star 3
Fork 1
Code
Issues 4
Pull requests 0
Projects 0
Wiki
Insights
OGC API - Map Tiles draft specification http://www.github.com/opengeospatial/...
15 commits
2 branches
0 releases
3 contributors
Apache-2.0
Branch: master
New pull request
Create new file
Upload files
Find File
Clone or download
joanma747 Added a note about the work in the Swagger HUB
Latest commit 5c204c7 11 hours ago
standard Renamed the "OAPI-MapsTiles" folder to "standard" 2 months ago
.gitignore Renamed the "OAPI-MapsTiles" folder to "standard" 2 months ago
CONTRIBUTORS.md Raw Template 2 months ago
DEVELOPMENT.md Raw Template 2 months ago
LICENSE Raw Template 2 months ago
README.md Added a note about the work in the Swagger HUB 11 hours ago
index.adoc Raw Template 2 months ago

pygeoapi

pygeoapi

pygeoapi is a Python server implementation of the emerging OGC WFS 3.0 standard

Code

GitHub repository

Repository with code and docker compositions

GitHub

Install and README

How to install pygeoapi

Instructions and explanations on how to install pygeoai

README

Docker images

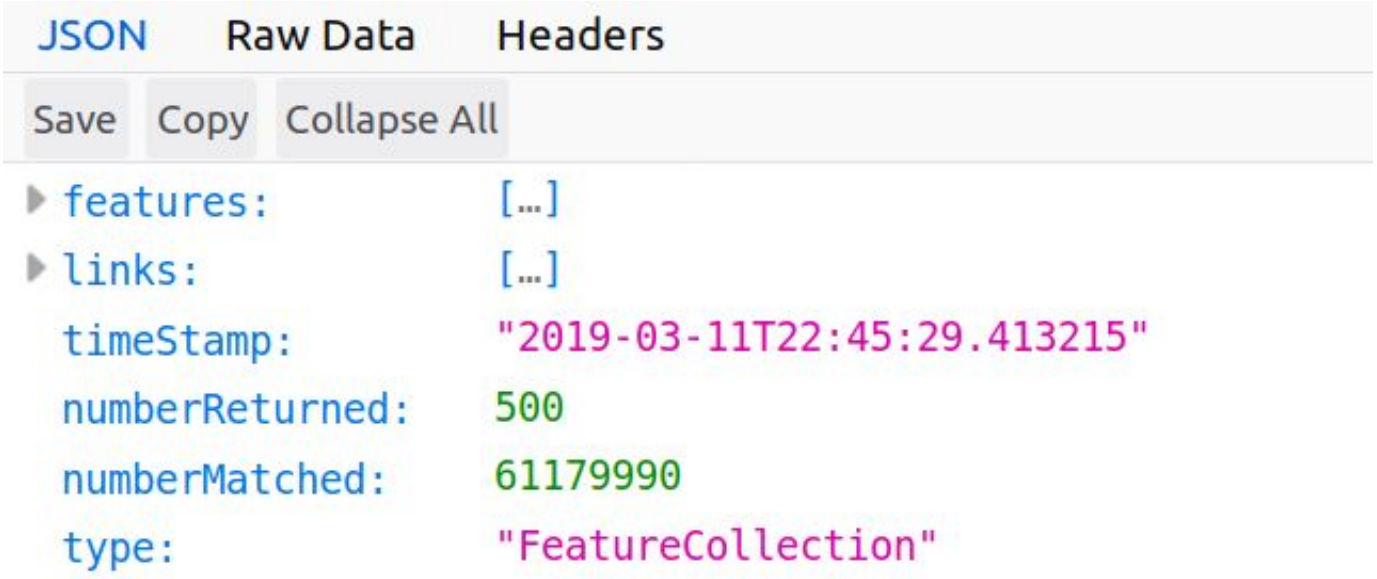
Images hosted in dockerhub

Docker images/composition to run pygeoapi

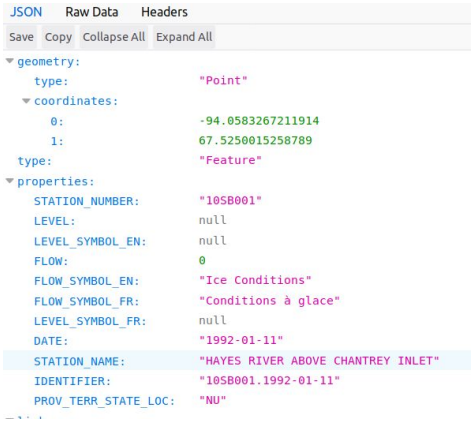
Coming Soon

First implementations online

Canadian National Water Data Archive


JSON
Raw Data
Headers
Save
Copy
Collapse All
features: […]
links: […]
timeStamp: "2019-03-11T22:45:29.413215"
numberReturned: 500
numberMatched: 61179990
type: "FeatureCollection"

http://geo.weather.gc.ca/geomet-beta/features/**collections**/**hydrometric-daily-mean**/**items**/**10SB001.1992-01-11**



HTML as format

pygeoapi Demo instance - running latest GitHub version Contact

Home / Collections / Windmills Within The Netherlands / Items JSON

Items

id	gid	NAAM	PLAATS	CATEGO...
Molens.1	1	De Trouwe Waghter of Trouwe Wachter	Tienhoven	windmolen
Molens.2	2	Molen Gabriël of Voorste Molen	Kortenhoef	windmolen
Molens.3	3	Loenderv... Molen	Loenen aan de Vecht	windmolen

OGC API's and search engines

schema.org in pygeoapi

site:demo.pygeoapi.io/master/collections

Alle | Afbeeldingen | Nieuws | Shopping | Maps | Meer | Instellingen | Tools

Ongeveer 421 resultaten (0,18 seconden)

Google-advertentie

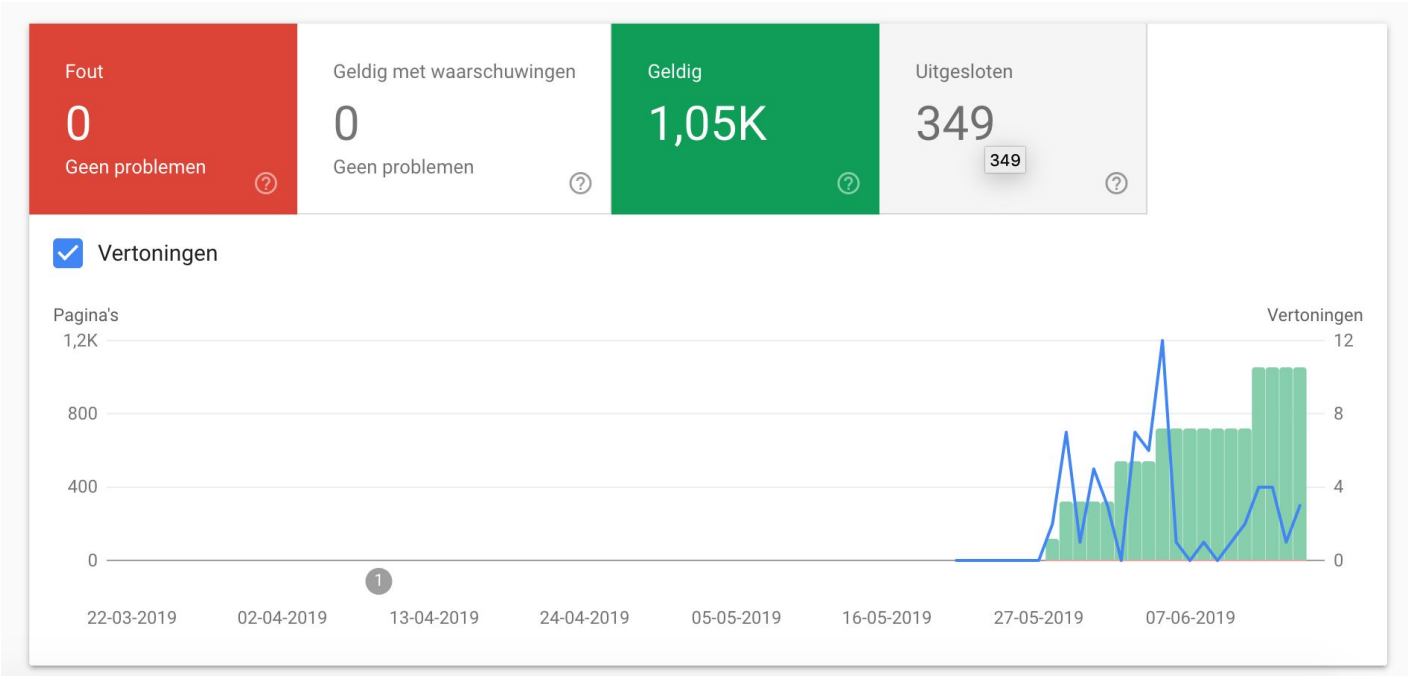
Probeer Google Search Console
www.google.com/webmasters/
Ben je de eigenaar van **demo.pygeoapi.io/master/collections**? Meer informatie van Google over indexering en rangschikking.

pygeoapi Demo instance - running latest GitHub version - Collections
https://demo.pygeoapi.io/master/collections ▾ Vertaal deze pagina
pygeoapi Demo instance - running latest GitHub version.

pygeoapi Demo instance - running latest GitHub version - Portuguese ...
https://demo.pygeoapi.io/master/collections/ogr_gpkg_poi ▾ Vertaal deze pagina
Portuguese Points of Interest obtained from OpenStreetMap. Dataset includes Madeira and Azores islands. Uses GeoPackage backend via OGR provider.

Dutch addresses (subset Otterlo). OGR GeoPackage Driver
https://demo.pygeoapi.io/master/collections/ogr_addresses_gpkg ▾ Vertaal deze pagina
pygeoapi Demo instance - running latest GitHub version.

Dutch Georef Stations via OGR WFS - pygeoapi Demo Server
https://demo.pygeoapi.io/master/collections/dutch_georef_stations ▾ Vertaal deze pagina
Locations of RD/GNSS-reference stations from Dutch Kadaster PDOK a.k.a RDInfo. Uses MapServer WFS v2 backend via OGRProvider.


Fout
0
Geen problemen
Geldig met waarschuwingen
0
Geen problemen
Geldig
1,05K
Uitgesloten
349
349
Vertoningen
Pagina's
1,2K
800
400
0
Vertoningen
12
8
4
0
1
22-03-2019
02-04-2019
13-04-2019
24-04-2019
05-05-2019
16-05-2019
27-05-2019
07-06-2019

schema.org

Custom Search

Home Schemas Documentation

Dataset

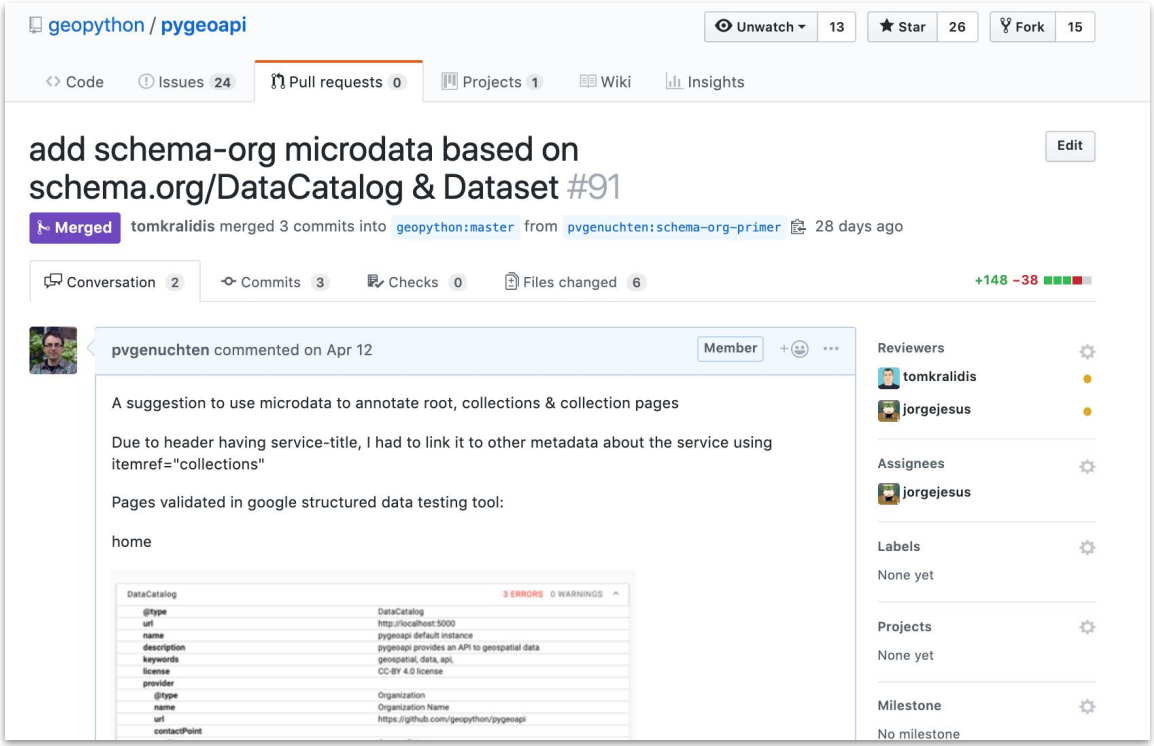
Thing > CreativeWork > Dataset

A body of structured information describing some topic(s) of interest.

[more...]

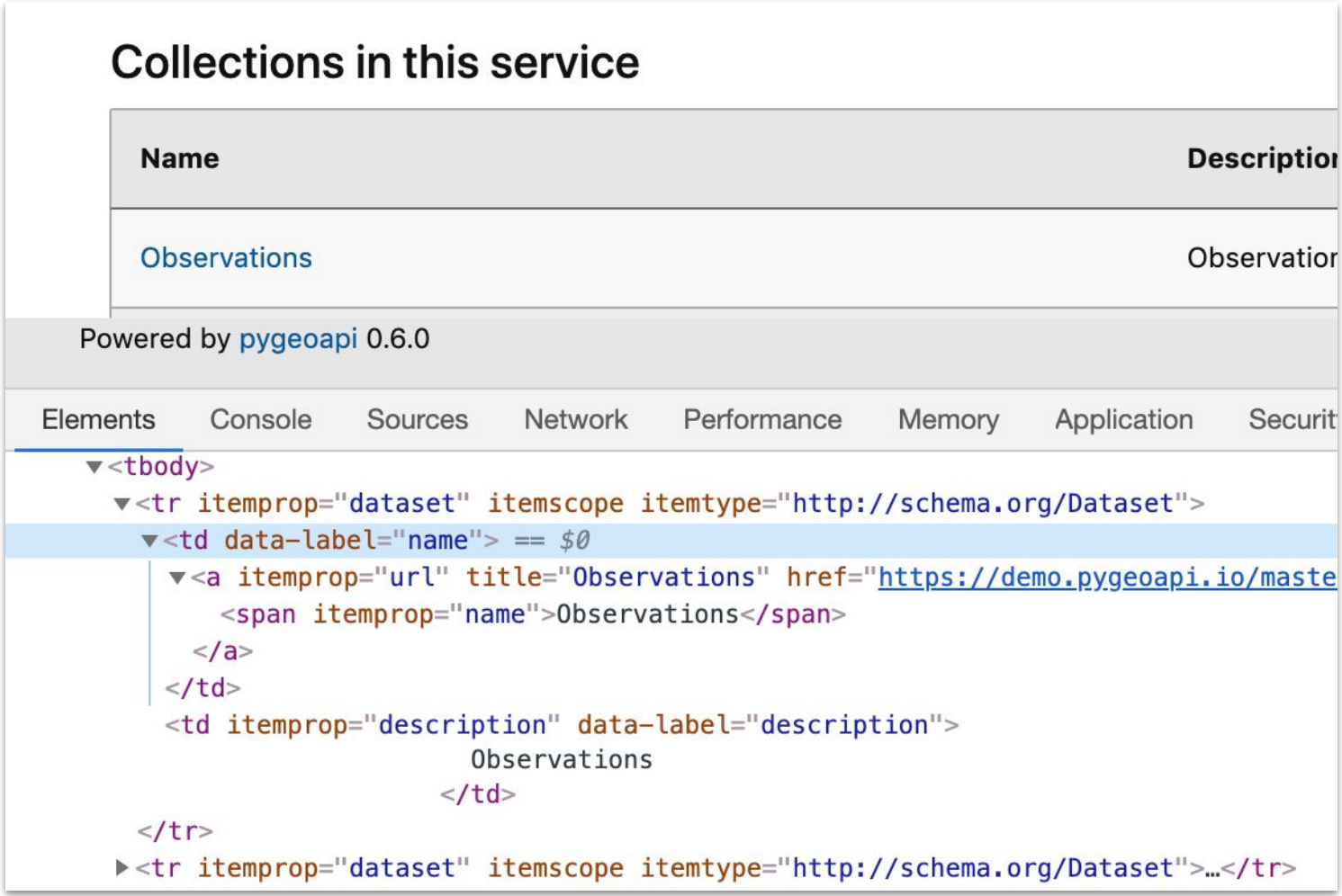
Property	Expected Type	Description
Properties from Dataset		
distribution	DataDownload	A downloadable form of this dataset, at a specific location, in a specific format.
includedInDataCatalog	DataCatalog	A data catalog which contains this dataset. Supersedes catalog, includedDataCatalog. Inverse property: dataset.
issn	Text	The International Standard Serial Number (ISSN) that identifies this serial publication. You can repeat this property to identify different formats of, or the linking ISSN (ISSN-L) for, this serial publication.
	Text or URL	A technique or technology used in a Dataset (or DataDownload, DataCatalog), corresponding to the method used for measuring

Schema.org annotations

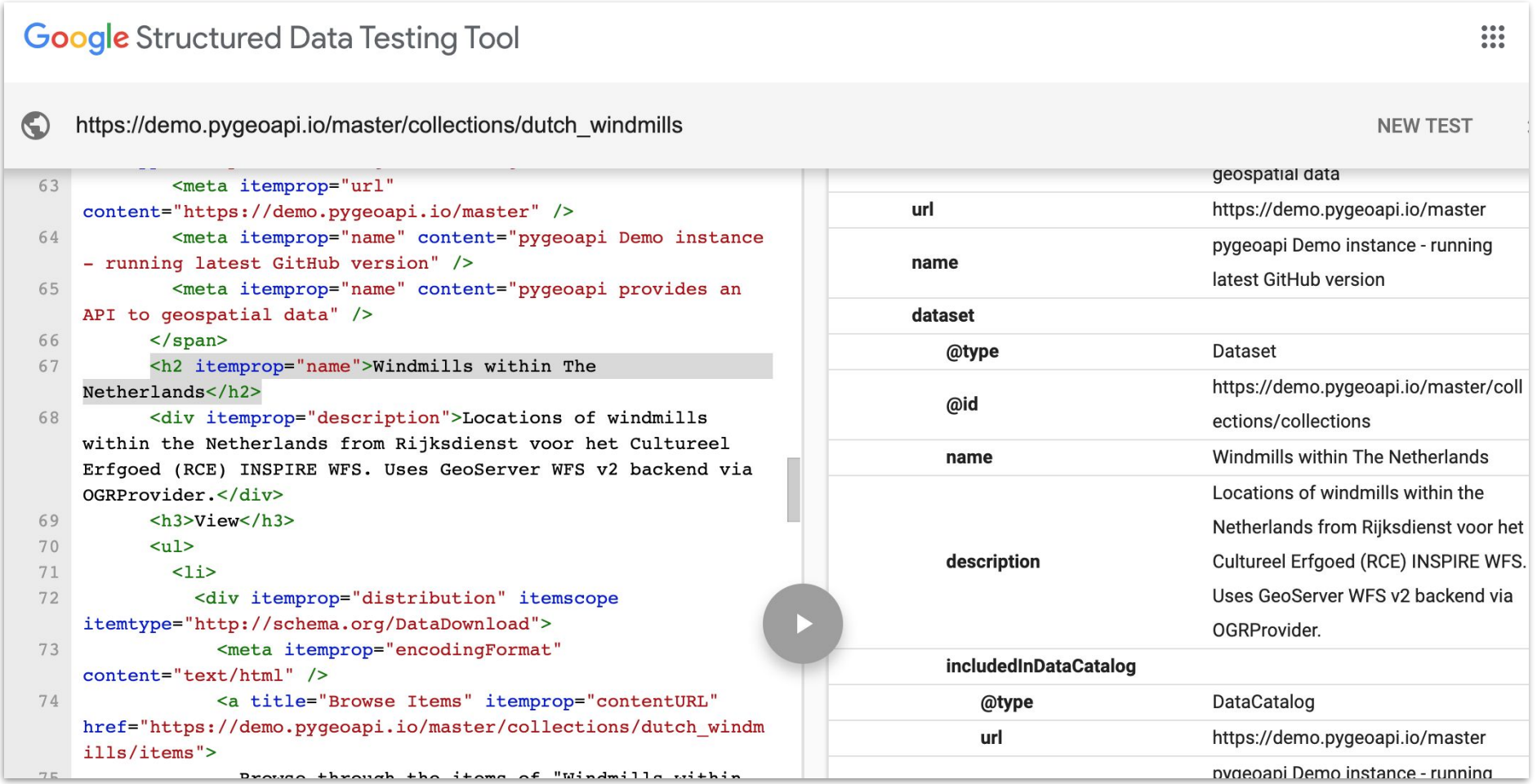


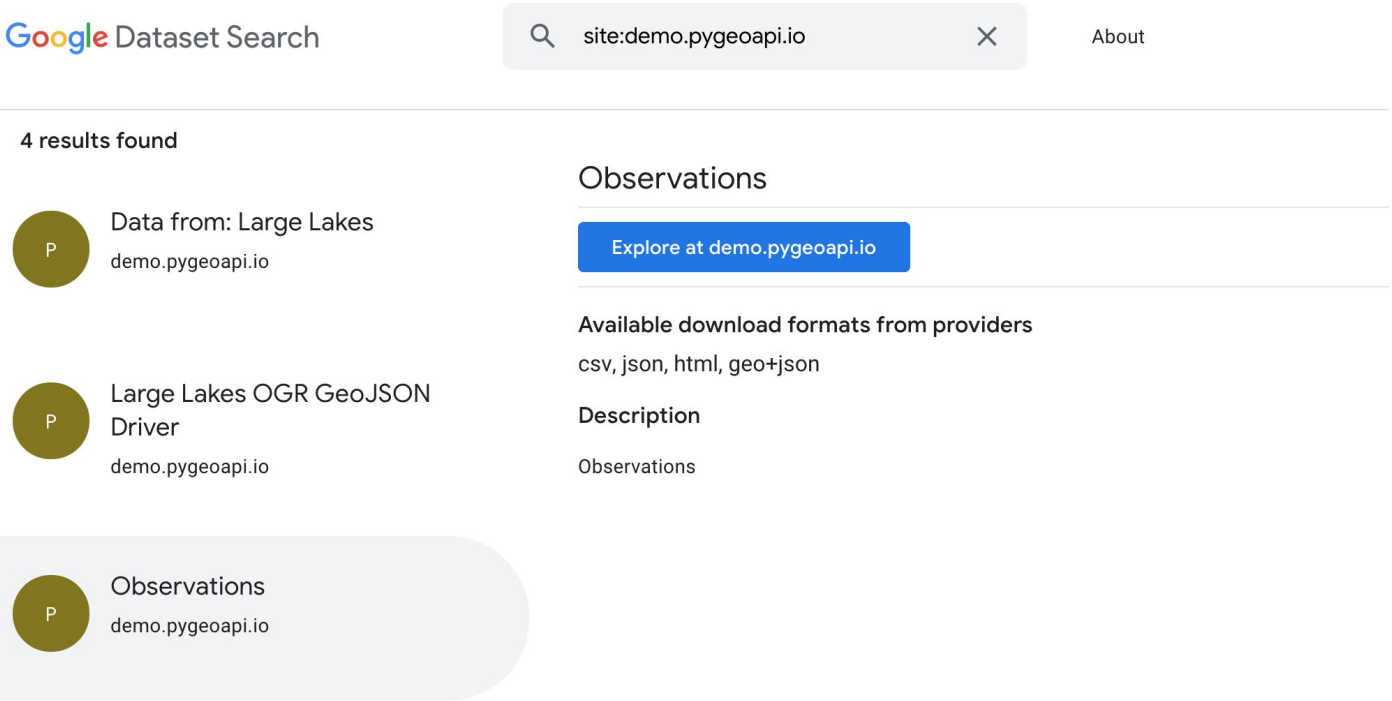
Collections in this service

Name	Description
Observations	Observations
Large Lakes	lakes of the world, public domain
Windmills within The Netherlands	Locations of windmills within the Netherlands from Rijksdienst voor het Cultureel Erfgoed (RCE) INSPIRE WFS. Uses GeoServer WFS v2 backend via OGRProvider.
Castles within The Netherlands	Locations of castles within the Netherlands from Rijksdienst voor het Cultureel Erfgoed (RCE) INSPIRE WFS. Uses GeoServer WFS v2 backend via OGRProvider.
Dutch Georef Stations via OGR WFS	Locations of RD/GNSS-reference stations from Dutch Kadaster PDOK a.k.a RDInfo. Uses MapServer WFS v2 backend via OGRProvider.


Collections in this service
Name
Description
Observations
Observation
Powered by pygeoapi 0.6.0
Elements
Console
Sources
Network
Performance
Memory
Application
Securit
<tbody>
<tr itemprop="dataset" itemscope itemtype="http://schema.org/Dataset">
<td data-label="name"> == $0
<a itemprop="url" title="Observations" href="https://demo.pygeoapi.io/maste
Observations

</td>
<td itemprop="description" data-label="description">
Observations
</td>
</tr>
<tr itemprop="dataset" itemscope itemtype="http://schema.org/Dataset">…</tr>


Google Structured Data Testing Tool
https://demo.pygeoapi.io/master/collections/dutch_windmills
NEW TEST
63 <meta itemprop="url" content="https://demo.pygeoapi.io/master" />
64 <meta itemprop="name" content="pygeoapi Demo instance - running latest GitHub version" />
65 <meta itemprop="name" content="pygeoapi provides an API to geospatial data" />
66
67 <h2 itemprop="name">Windmills within The Netherlands</h2>
68 Locations of windmills within the Netherlands from Rijksdienst voor het Cultureel Erfgoed (RCE) INSPIRE WFS. Uses GeoServer WFS v2 backend via OGRProvider.
69 <h3>View</h3>
70
71
72 <div itemprop="distribution" itemscope itemtype="http://schema.org/DataDownload">
73 <meta itemprop="encodingFormat" content="text/html" />
74 <a title="Browse Items" itemprop="contentURL" href="https://demo.pygeoapi.io/master/collections/dutch_windmills/items">
geospatial data
url https://demo.pygeoapi.io/master
name pygeoapi Demo instance - running latest GitHub version
dataset
@type Dataset
@id https://demo.pygeoapi.io/master/collections/collections
name Windmills within The Netherlands
description Locations of windmills within the Netherlands from Rijksdienst voor het Cultureel Erfgoed (RCE) INSPIRE WFS. Uses GeoServer WFS v2 backend via OGRProvider.
includedInDataCatalog
@type DataCatalog
url https://demo.pygeoapi.io/master


Google Dataset Search
site:demo.pygeoapi.io
About
4 results found
P
Data from: Large Lakes
demo.pygeoapi.io
P
Large Lakes OGR GeoJSON Driver
demo.pygeoapi.io
P
Observations
demo.pygeoapi.io
Observations
Explore at demo.pygeoapi.io
Available download formats from providers
csv, json, html, geo+json
Description
Observations

Paul van Genuchten @pvangenuchten · Jun 8

You can now discover datasets served by pygeoapi (ogc:wfs3) via Google dataset Search toolbox.google.com/datasetsearch/… thanx to schema.org microdata

1 9 16

Chris Gorgolewski @chrisgorgo · Jun 8

Super cool! You can add a DataCatalog property if you want to change the name on the blue data provider buttons.

1 1

Best practices still relevant

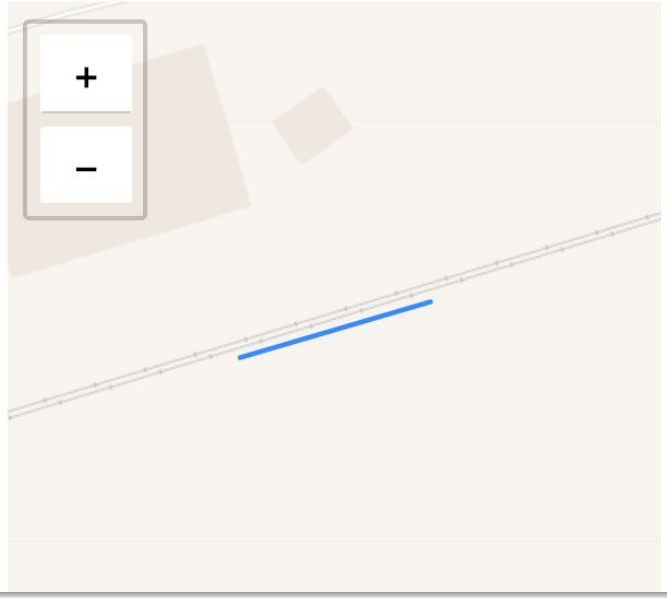
Use URIs to identify things

Many geo data are plain; add links

pygeoapi Demo instance - running latest GitHub version Contact

Home / Collections / Railway Lines In Wales (UK) Via OGR GPKG / Items / 38556 JSON

Item 38556



Property	Value
id	38556
type	Multi Track

Far future?

With one of the next geoserver upgrades, ogc apis will be available by default.

Questions like these will be relevant:

- Does a html representation of oapi features request require my organisation logo and privacy statement?
- Should i deactivate crawling for my service in robots.txt?

Thank you!