

Die "OGC API Family" – Neue Standards des OGC

16. Dezember 2021 | Astrid Emde | Where2B-Konferenz Online

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OSGeo Board, FOSSGIS e.V., Mapbender PSC,
OSGeoLive PSC, QGIS-DE

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Open Geospatial Consortium

► <https://www.ogc.org/>



- ▶ <https://www.ogc.org/about>



Open
Geospatial
Consortium

Community

- 500+ International Members
- 110+ Member Meetings
- 60+ Alliance and Liaison partners
- 50+ Standards Working Groups
- 45+ Domain Working Groups
- 25+ Years of Not for Profit Work
- 10+ Regional and Country Forums

Innovation

- 120+ Innovation Initiatives
- 380+ Technical reports
- Technology Forecasting to drive innovation

Standards

- 65+ Adopted Standards
- 300+ products with 1000+ certified implementations
- 1,800,000+ Operational Data Sets Using OGC Standards

- ▶ @Video: FOSSG4G - OGC APIs: background, current state, what's next Gobe Hobana

Wandel beim OGC

- ▶ Beeing webby!
- ▶ Orientierung an Spatial Data on the Web Best Practices - W3C Working Group Note 28 September 2017
- ▶ Menschenlesbar & maschinenlesbar
- ▶ Keine komplizierten Spezifikationen
- ▶ Entwicklerfreundlich - REST, JavaScript Object Notation, HTTP-Konventionen, OpenAPI
- ▶ Modulare Entwicklung Core und Extension
- ▶ Transparente Entwicklung auf Github: Spezifikationen, Tickets, Diskussion
<https://github.com/opengeospatial>
- ▶ Offene Community, Hacking Events, Gitter-Chat

Approved and Candidate OGC API Standards

OGC API – Discrete Global Grid Systems



OGC API – Records



OGC API - Maps



OGC API - Styles

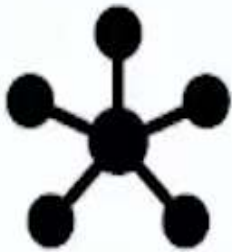


OGC API - Tiles




Tile Matrix Set

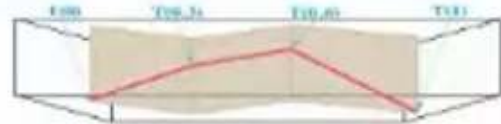
OGC API - Common



OGC API - Routes

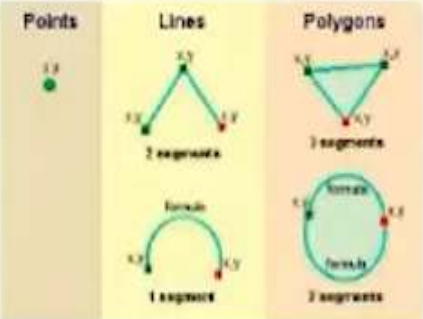


OGC API – Environmental Data Retrieval



Trajectory

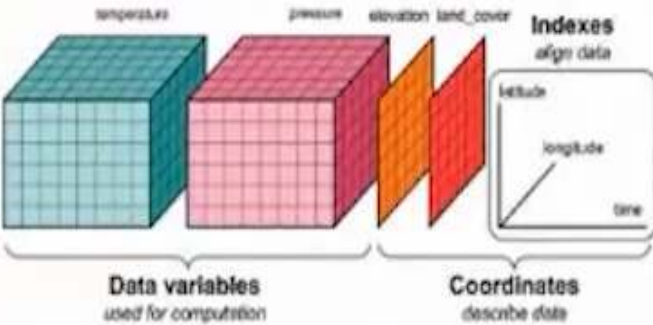
OGC API - Features



OGC API - Processes



OGC API – Coverages



Green border means approved

OGC API Standards

Die API-Family

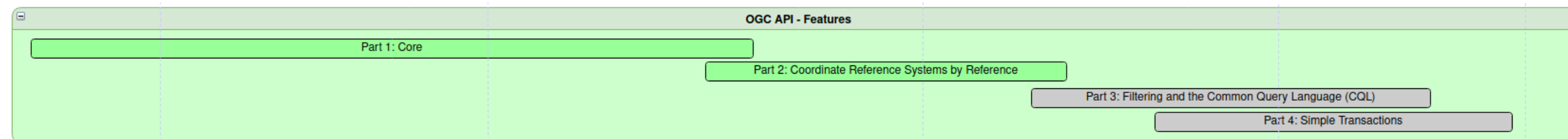
- ▶ <https://ogcapi.org/> (Video)
- ▶ <https://ogcapi.org/#standards>
- ▶ Übersicht der OGC Dokumente <http://docs.opengeospatial.org/>
- ▶ Ziel: Aufbau eines RESTful OGC API Endpoints unter Verwendung von OpenAPI, GeoJSON und HTML.

- ▶ OGC API - Common (OWS Common)
- ▶ OGC API - Features (WFS)
- ▶ OGC API - Coverages (WCS)
- ▶ OGC API - Maps (WMS)
- ▶ OGC API - Tiles (WMTS)
- ▶ OGC API - Processes (WPS)
- ▶ OGC API - Records (CSW)
- ▶ OGC API - Styles (SE/SLD)
- ▶ OGC API - Discrete Global Grid Systems
- ▶ OGC API - Routes
- ▶ OGC API - Environmental Data Retrieval



OGC API Roadmap

- ▶ 2017 OGC API Whitepaper
- ▶ 2019-2021: OGC API Hackathons
- ▶ 6. November 2019 OGC API - Features Part 1: Core 1.0 is an OGC Standard. Copyright (c) 2019
- ▶ 4x im Jahr OGC Hackathons, parallel Treffen der Arbeitsgruppen.
- ▶ OGC API Roadmap
- ▶ OGC API - Features - Part 1: Core (2019-09-09)
- ▶ OGC API - Features - Part 2: Coordinate Reference Systems by Reference (2020-10-27)



Die OGC API Family

Wo finden sich Informationen?

- ▶ OGC API - Features
- ▶ OGC API - Features Implementations
- ▶ OGC API - Features Implementations Servers
- ▶ OGC API - Features Implementations Clients
- ▶ OGC API - Features Extensions
- ▶ OGC API - Records
- ▶ OGC API - Styles
- ▶ OGC API - Features Maps
- ▶ usw.

Die neue OGC API Family

- ▶ OGC API - Features - Part 1: Core Press Release 6. November 2019
- ▶ Der neue OGC-API-Standard ist da! Primin Kalberer FOSSGIS 2020
- ▶ An OGC Api to get geospatial data Angelos Tzotsos, Paul van Genuchten, Tom Kralidis FOSS4G 2019
- ▶ pygeoapi, an OGC API and STAC implementation Angelos Tzotsos, Paul van Genuchten, Tom Kralidis INSPIRE Conference 2020
- ▶ pygeoapi: an OSGeo community project implementing OGC API standards Tom Kralidis INSPIRE Conference 2020
- ▶ OGC API - Features (Neue Chancen für die GDI-DE) Armin Retterath GDI-DE AP Workshop 2019
- ▶ MapScaping Podcast 101 - Dr. Nadine Alameh CEO OGC: Open geospatial standards, open GIS data formats
- ▶ FOSSGIS 2021 Der neue OGC API Features Standard, wie ist der Stand und was ist mit Open Source Geospatial Software möglich <https://www.fossgis-konferenz.de/2021/sessions/QPMXBR.php>
- ▶ Videos FOSS4G 2021
- ▶ INSPIRE Conference 2021

OGC API - Features Standard

- ▶ <https://ogcapi.org/features/>
- ▶ Übernimmt die Aufgabe des WFS, aber anders.
- ▶ Abfragen, Erzeugen und Verändern von Daten.
- ▶ WFS feature_type - wird zu collection
- ▶ WFS feature - wird zu item
- ▶ Feature werden bereitgestellt über eine eindeutige Adresse.
- ▶ ~~/ows?request=GetFeature&typename=roads&featureid=5~~
- ▶ </api/collections/roads/items/5>
- ▶ JSON/GeoJSON
- ▶ HTML-Anzeige mit Karte und Sachdaten
- ▶ Paging
- ▶ Findbar über Google Data Search
- ▶ & mehr

Alles wird viel leichter.

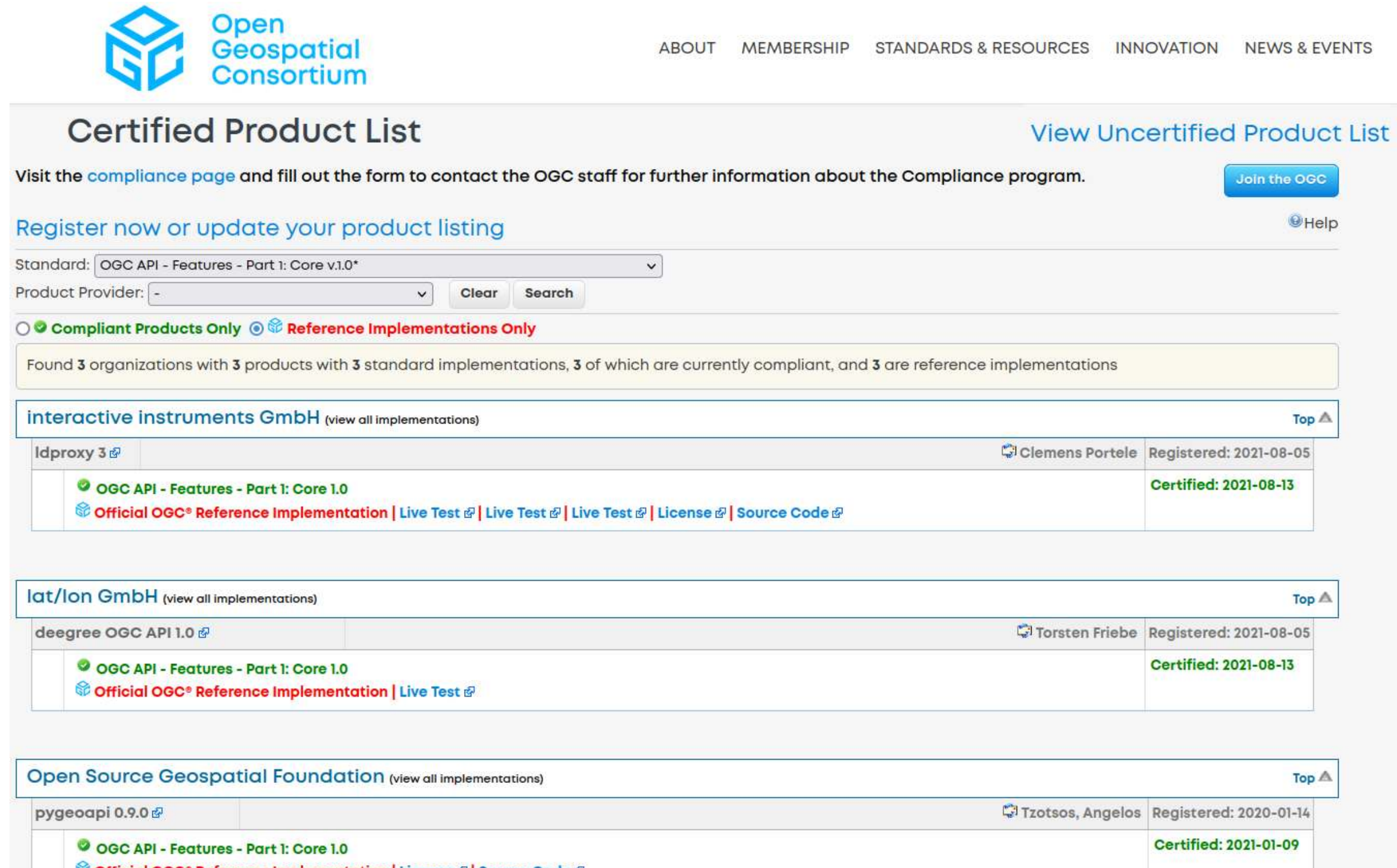
OGC API - Features Server

Software zum Aufbau von OGC API - Features Diensten

OGC API - Features Server

OGC Compliance Page

- ▶ https://www.ogc.org/resource/products/compliant?display_opt=1&specid=1022



The screenshot shows the 'Certified Product List' page on the Open Geospatial Consortium website. The page includes a navigation menu with links for 'ABOUT', 'MEMBERSHIP', 'STANDARDS & RESOURCES', 'INNOVATION', and 'NEWS & EVENTS'. Below the navigation, there is a search bar with a dropdown menu for 'Standard' (set to 'OGC API - Features - Part 1: Core v1.0*') and a 'Product Provider' dropdown (set to '-'). There are 'Clear' and 'Search' buttons. Below the search bar, there are radio buttons for 'Compliant Products Only' (selected) and 'Reference Implementations Only'. A summary box states: 'Found 3 organizations with 3 products with 3 standard implementations, 3 of which are currently compliant, and 3 are reference implementations'. The main content area lists three organizations: 'interactive instruments GmbH', 'lat/ion GmbH', and 'Open Source Geospatial Foundation'. Each organization entry includes a product name, a 'Top' link, a contact person, a registration date, and a certification date. For 'interactive instruments GmbH', the product is 'Idproxy 3' and the contact is 'Clemens Portele'. For 'lat/ion GmbH', the product is 'deegree OGC API 1.0' and the contact is 'Torsten Friebe'. For 'Open Source Geospatial Foundation', the product is 'pygeoapi 0.9.0' and the contact is 'Tzotsos, Angelos'. Each entry also includes a 'Certified' date and a 'Live Test' link.

Certified Product List [View Uncertified Product List](#)

Visit the [compliance page](#) and fill out the form to contact the OGC staff for further information about the Compliance program. [Join the OGC](#)

[Register now or update your product listing](#) [Help](#)

Standard: Product Provider: [Clear](#) [Search](#)

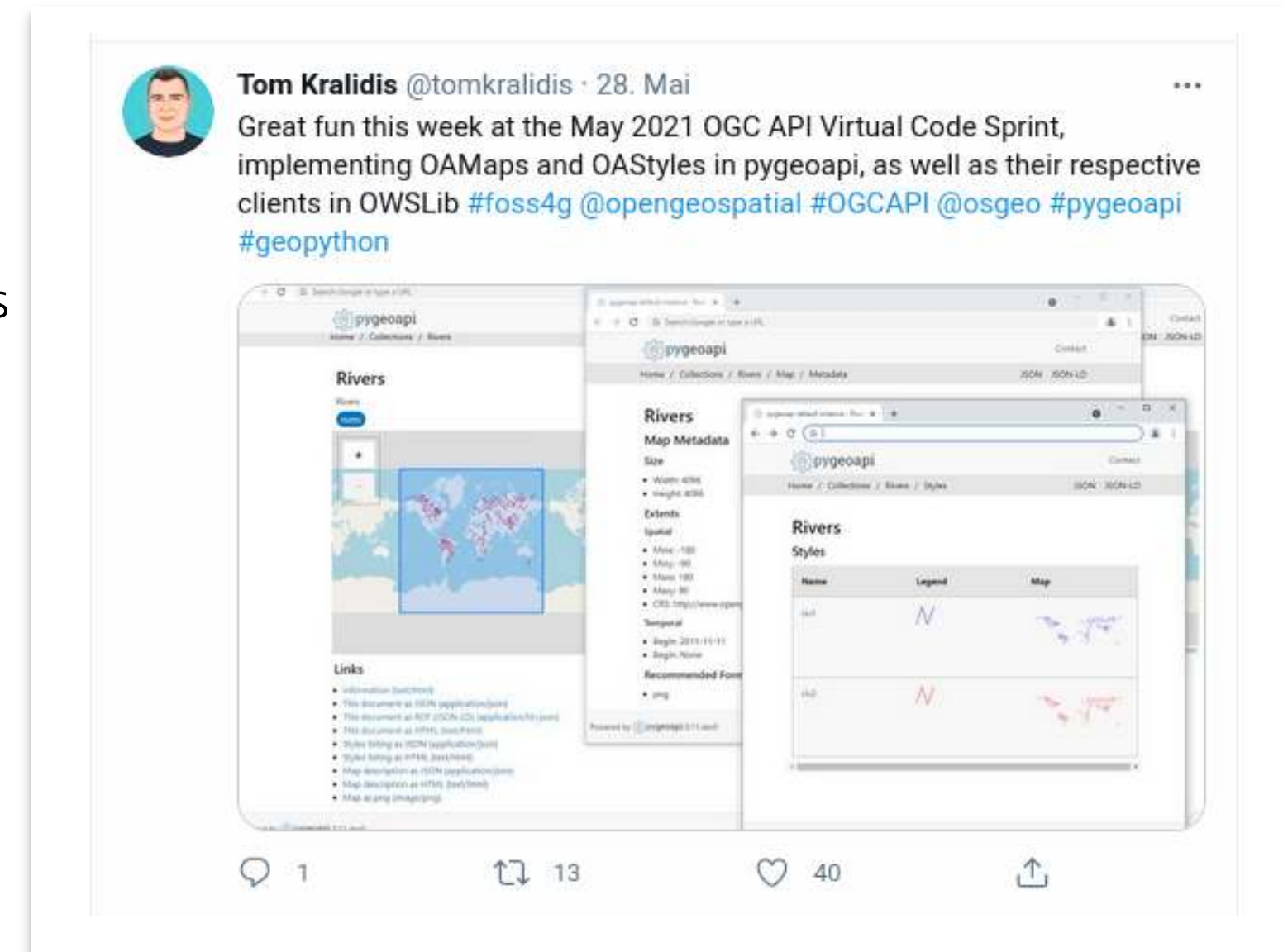
Compliant Products Only **Reference Implementations Only**

Found 3 organizations with 3 products with 3 standard implementations, 3 of which are currently compliant, and 3 are reference implementations

Organization	Product	Contact	Registered	Certified
interactive instruments GmbH (view all implementations) Top ▲	Idproxy 3	Clemens Portele	Registered: 2021-08-05	Certified: 2021-08-13
lat/ion GmbH (view all implementations) Top ▲	deegree OGC API 1.0	Torsten Friebe	Registered: 2021-08-05	Certified: 2021-08-13
Open Source Geospatial Foundation (view all implementations) Top ▲	pygeoapi 0.9.0	Tzotsos, Angelos	Registered: 2020-01-14	Certified: 2021-01-09

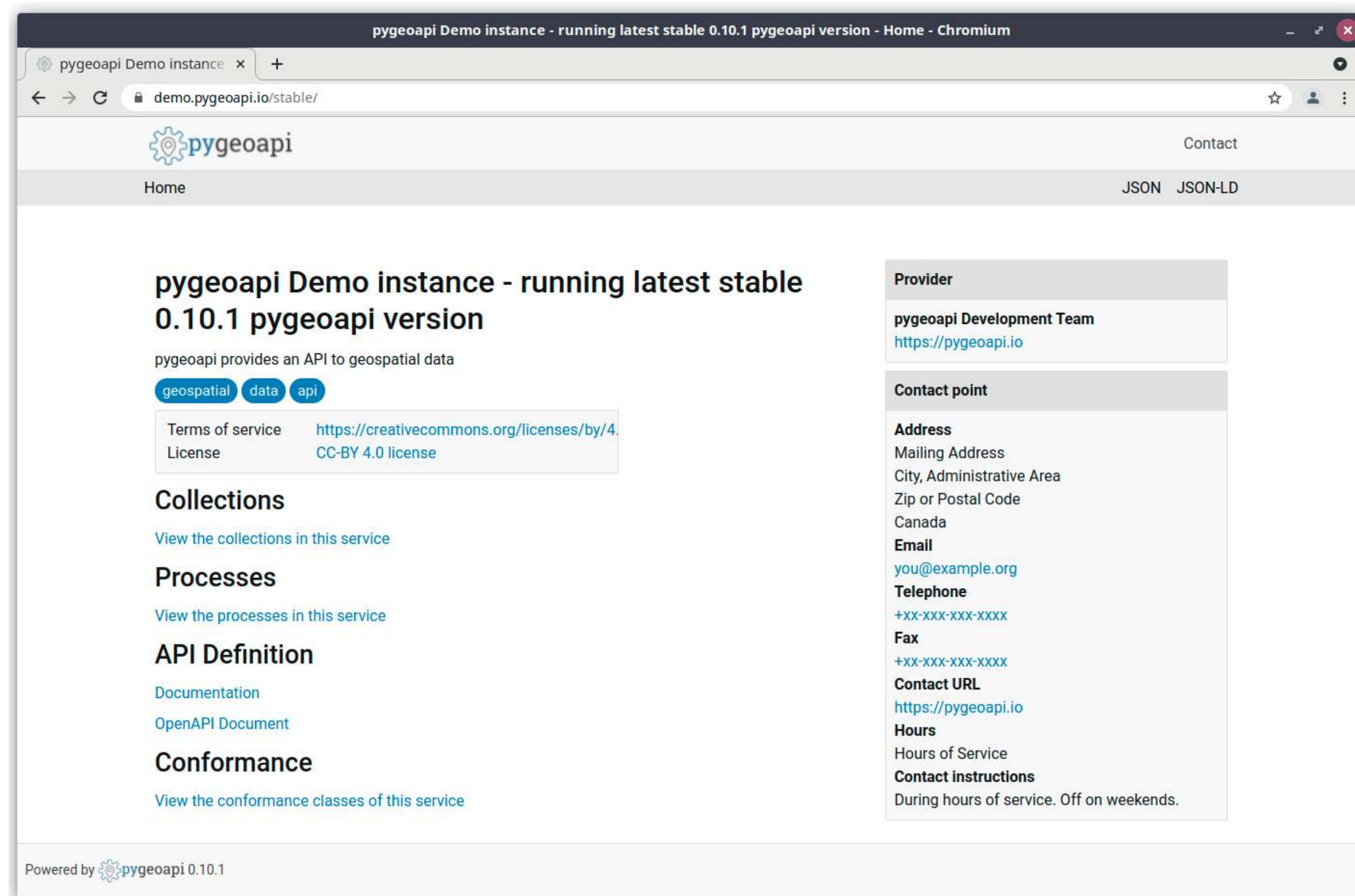
pygeoapi

- ▶ Python Server Implementation des OGC API Suite of Standards
- ▶ Referenzimplementierung
- ▶ Sehr aktives weltweites Team.
- ▶ @Tom Kralidis und Angelos Tzotzos sind OGC Mitglieder und im OSGeo Board of Directors.
- ▶ Setzt die neuen Anforderungen direkt im Projekt um.
- ▶ <https://pygeoapi.io/>
- ▶ <https://demo.pygeoapi.io/>
- ▶ <https://www.ogc.org/resource/products/details/?pid=1606>



pygeoapi Demo

- ▶ <https://demo.pygeoapi.io/stable/>
- ▶ https://github.com/geopython/demo.pygeoapi.io/blob/master/services/pygeoapi_stable/local.config.yml#L124



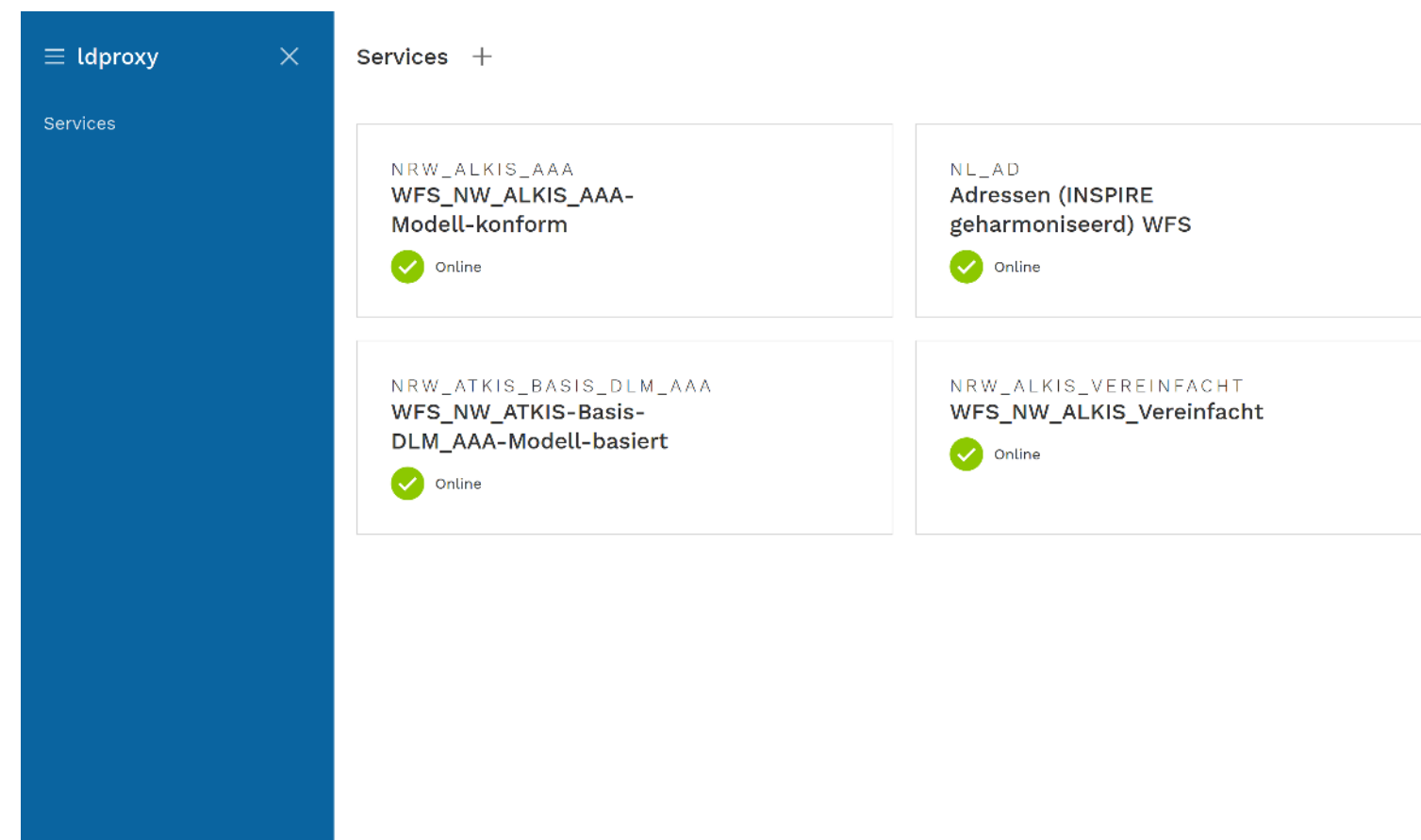
The screenshot shows a web browser window displaying the pygeoapi Demo instance. The browser title is "pygeoapi Demo instance - running latest stable 0.10.1 pygeoapi version - Home - Chromium". The address bar shows "demo.pygeoapi.io/stable/". The page features a navigation bar with "Home" and "Contact" links, and a secondary bar with "JSON" and "JSON-LD" options. The main content area includes a header "pygeoapi Demo instance - running latest stable 0.10.1 pygeoapi version" and a sub-header "pygeoapi provides an API to geospatial data". Below this are three tags: "geospatial", "data", and "api". A box contains "Terms of service" and "License" with a link to "https://creativecommons.org/licenses/by/4.0". The page is organized into sections: "Collections" (with a link to "View the collections in this service"), "Processes" (with a link to "View the processes in this service"), "API Definition" (with links to "Documentation" and "OpenAPI Document"), and "Conformance" (with a link to "View the conformance classes of this service"). On the right side, there is a "Provider" section with "pygeoapi Development Team" and a link to "https://pygeoapi.io", and a "Contact point" section with fields for "Address" (Mailing Address, City, Administrative Area, Zip or Postal Code, Canada), "Email" (you@example.org), "Telephone" (+xx-xxx-xxx-xxxx), "Fax" (+xx-xxx-xxx-xxxx), "Contact URL" (https://pygeoapi.io), "Hours" (Hours of Service), and "Contact instructions" (During hours of service. Off on weekends.). The footer indicates "Powered by pygeoapi 0.10.1".

pygeoapi OGC API Unterstützung

- ▶ OGC API - Features
- ▶ OGC API - Coverages
- ▶ OGC API - Tiles
- ▶ OGC API - Processes
- ▶ OGC API - Records
- ▶ OGC API - Environmental Data Retrieval
- ▶ STAC - SpatioTemporal Asset Catalog
- ▶ Documentation Provider Overview

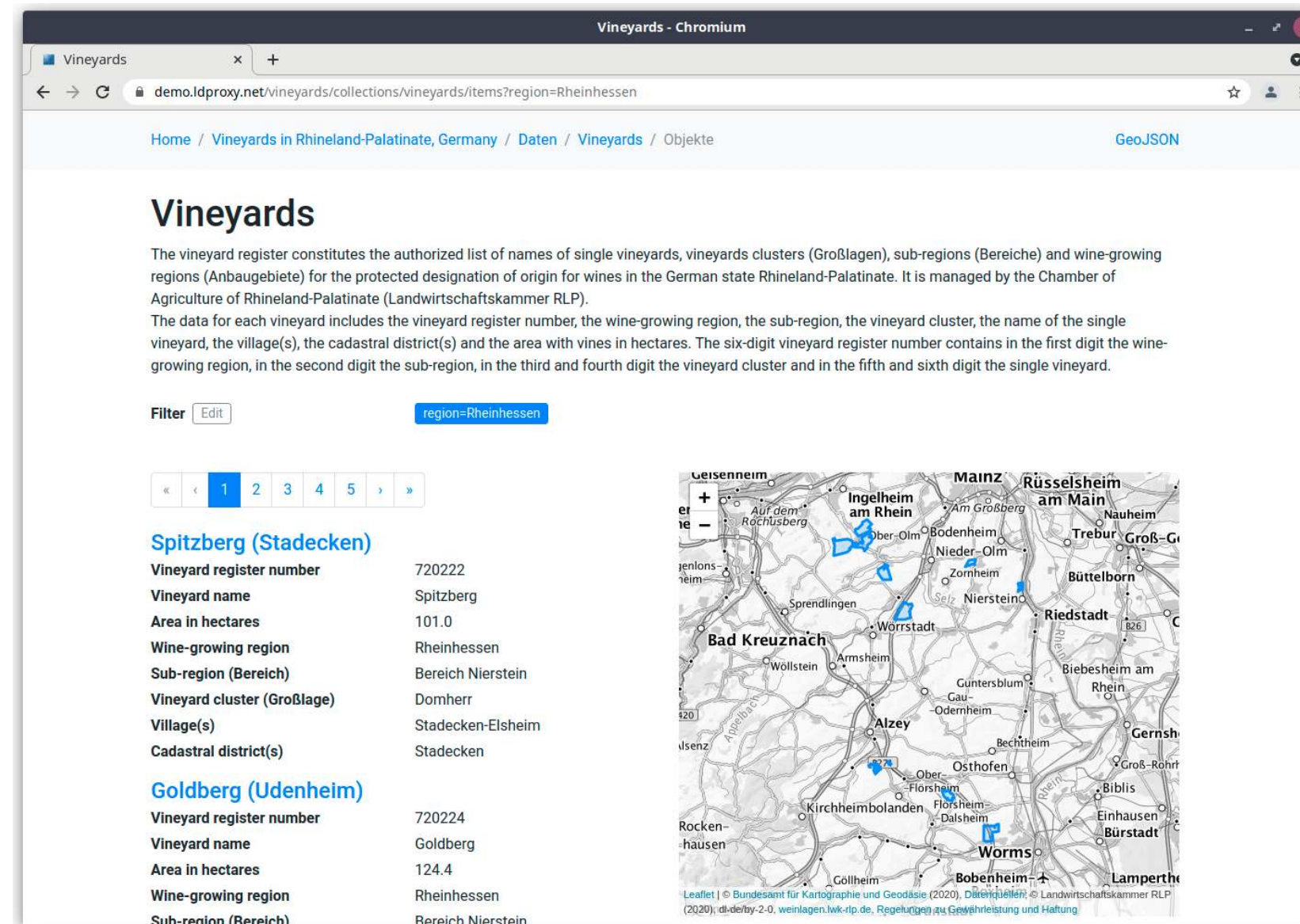
ldproxy

- ▶ ldproxy -Dokumentation
- ▶ Code auf GitHub <https://github.com/interactive-instruments/ldproxy>
- ▶ Referenzimplementierung für OGC API Features
- ▶ Java-Anwendung, erweiterbar durch modularen Aufbau.
- ▶ Unterstützt PostgreSQL/PostGIS und WFS als Datenquelle
- ▶ OGC API Records ab Version 3.0.0 (2021-05-07)
- ▶ Entwicklung durch interactive instruments - Clemens Portele



Idproxy Demo

- ▶ Idproxy Landingpage
- ▶ Beispiel: Weinberge in RLP
- ▶ API - Ansicht über Swagger UI oder JSON
- ▶ Umsetzung: Weinberge in RLP - Datenquelle PostgreSQL/PostGIS
- ▶ APIs für Geodatenätze in NRW



Vineyards

The vineyard register constitutes the authorized list of names of single vineyards, vineyards clusters (Großlagen), sub-regions (Bereiche) and wine-growing regions (Anbaugebiete) for the protected designation of origin for wines in the German state Rhineland-Palatinate. It is managed by the Chamber of Agriculture of Rhineland-Palatinate (Landwirtschaftskammer RLP).
The data for each vineyard includes the vineyard register number, the wine-growing region, the sub-region, the vineyard cluster, the name of the single vineyard, the village(s), the cadastral district(s) and the area with vines in hectares. The six-digit vineyard register number contains in the first digit the wine-growing region, in the second digit the sub-region, in the third and fourth digit the vineyard cluster and in the fifth and sixth digit the single vineyard.

Filter

« 1 2 3 4 5 »

Spitzberg (Stadecken)

Vineyard register number	720222
Vineyard name	Spitzberg
Area in hectares	101.0
Wine-growing region	Rheinhausen
Sub-region (Bereich)	Bereich Nierstein
Vineyard cluster (Großlage)	Domherr
Village(s)	Stadecken-Elsheim
Cadastral district(s)	Stadecken

Goldberg (Udenheim)

Vineyard register number	720224
Vineyard name	Goldberg
Area in hectares	124.4
Wine-growing region	Rheinhausen
Sub-region (Bereich)	Bereich Nierstein

QGIS Server

- ▶ In QGIS Server verfügbar ab Version 3.10
- ▶ Unterstützt sogar Transaktionen für OGC API Features
- ▶ Unterstützt Datums- und Zeitfilter
- ▶ Konfiguration erfolgt über QGIS Desktop
- ▶ <https://blog.qgis.org/2020/05/13/qgis-server-and-ogc-api-features/> Paul Blottiere / Alessandro Pasotti (QCooperative)

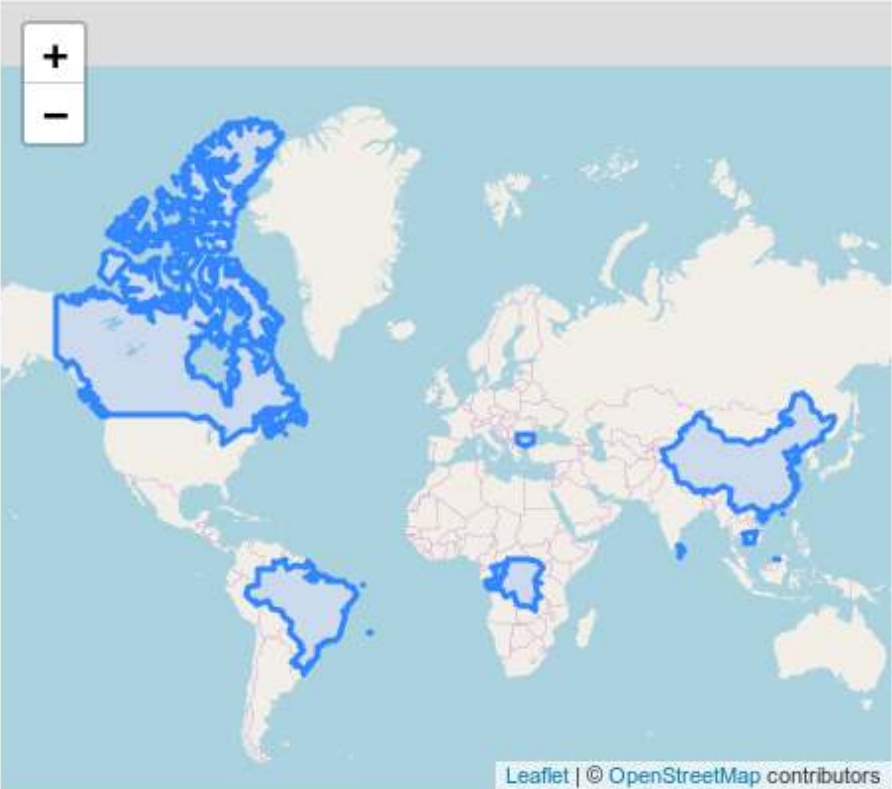
[Landing page](#) / [Collections](#) / [world](#) / Features in layer world GEOJSON

[Previous](#) [Next](#)

Features in layer world

world 20

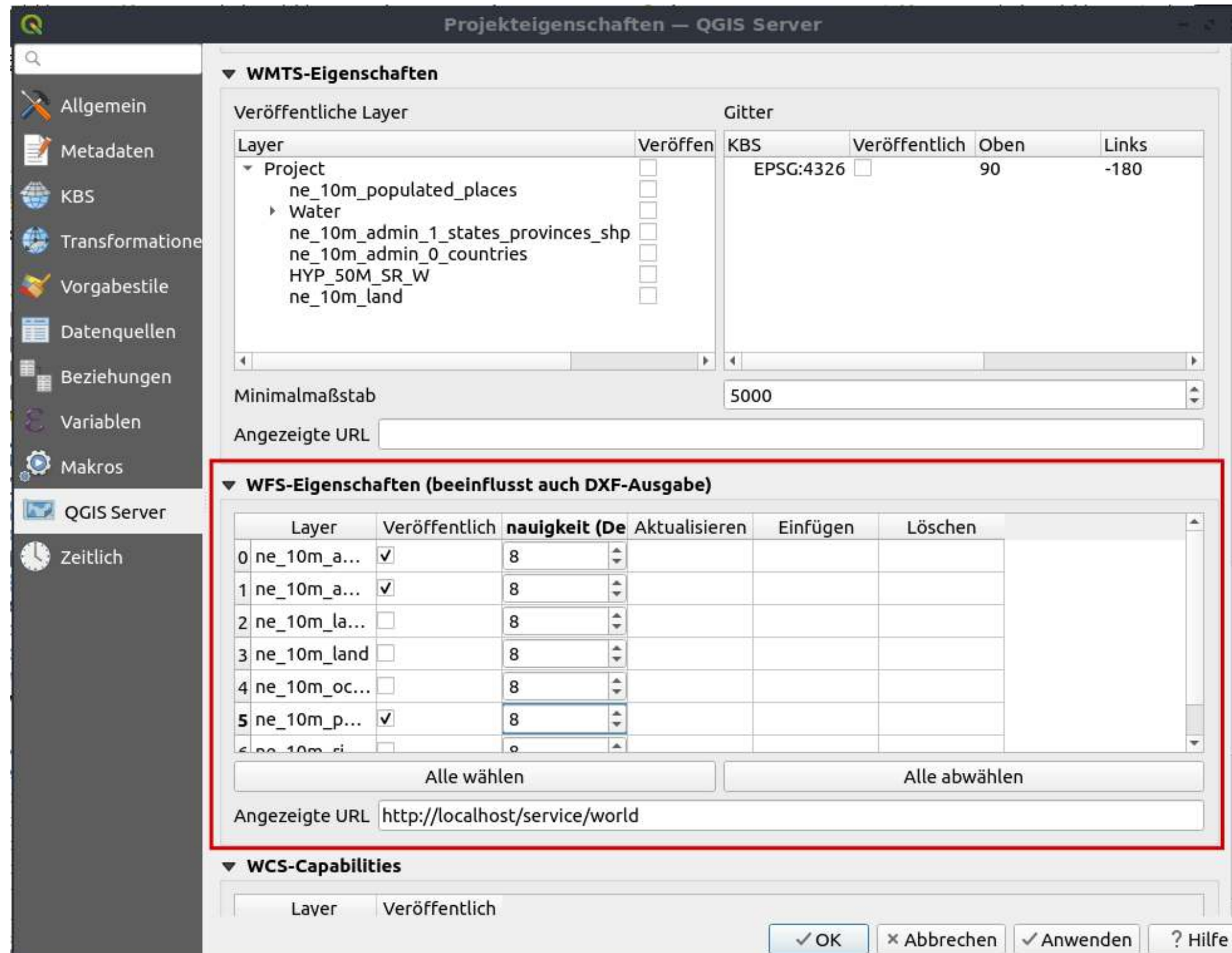
AREA	845942
FIPS	BR
ISO2	BR
ISO3	BRA
LAT	-10.772
LON	-53.089
NAME	Brazil
POP2005	186830759
REGION	19
SUBREGION	5
UN	76



Leaflet | © OpenStreetMap contributors

QGIS Server

- ▶ Konfiguration erfolgt über QGIS Desktop.
- ▶ Rewrite muss im Webserver aktiviert werden, damit Parameter map nicht übergeben werden muss.
- ▶ QGIS Dokumentation zu OGC API Features



The screenshot shows the 'Projekteigenschaften – QGIS Server' dialog box. The 'WMTS-Eigenschaften' section is expanded, showing a table of layers to be published. The 'WFS-Eigenschaften (beeinflusst auch DXF-Ausgabe)' section is also expanded and highlighted with a red box, showing a table of layers with their publication status and zoom levels. The 'Angezeigte URL' field is set to 'http://localhost/service/world'.

Layer	Veröffen	KBS	Veröffentlichen	Oben	Links
Project		EPSG:4326	<input type="checkbox"/>	90	-180
ne_10m_populated_places	<input type="checkbox"/>				
Water	<input type="checkbox"/>				
ne_10m_admin_1_states_provinces_shp	<input type="checkbox"/>				
ne_10m_admin_0_countries	<input type="checkbox"/>				
HYP_50M_SR_W	<input type="checkbox"/>				
ne_10m_land	<input type="checkbox"/>				

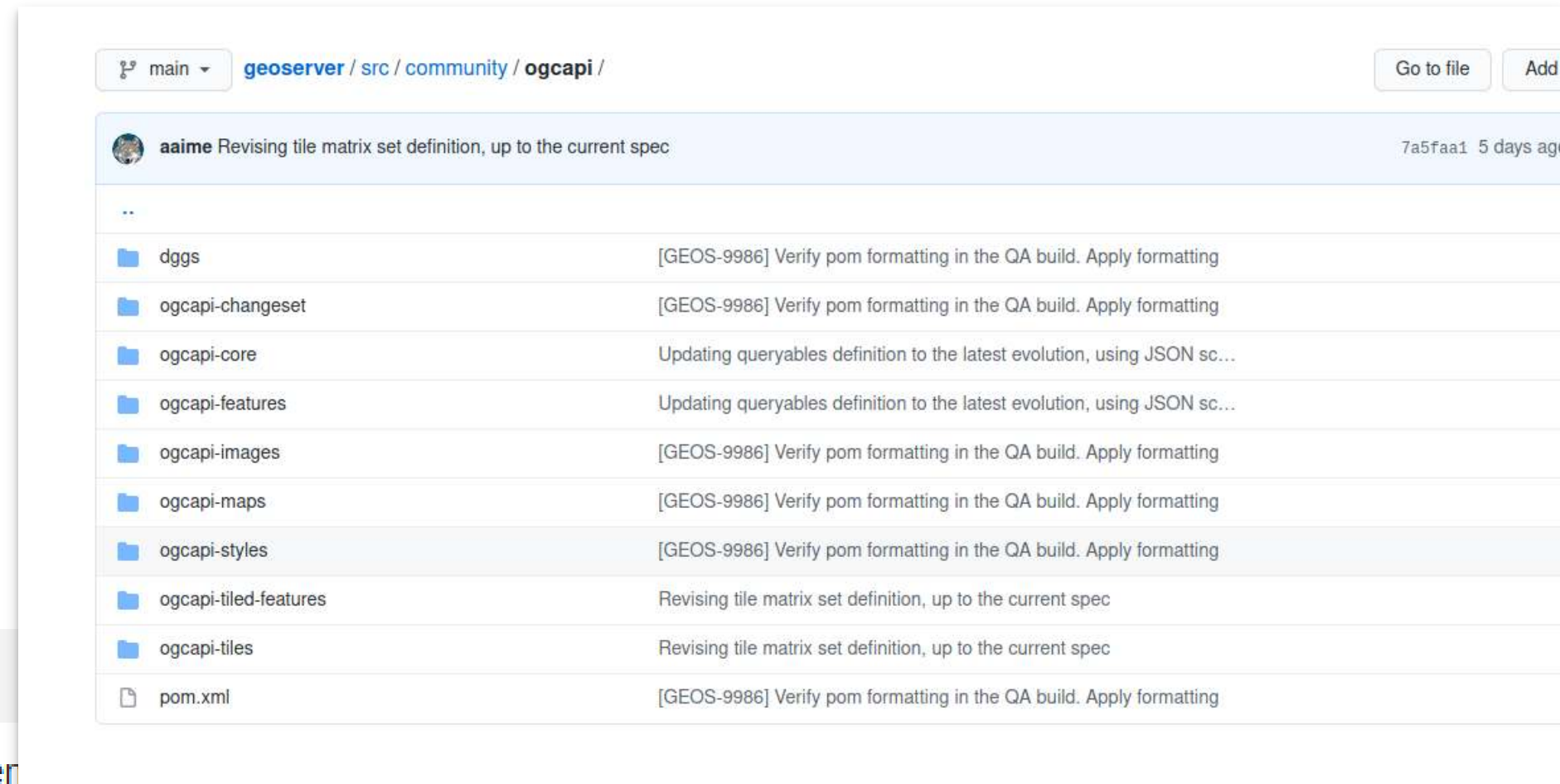
Layer	Veröffentlichen	naugkeit (De	Aktualisieren	Einfügen	Löschen
0 ne_10m_a...	<input checked="" type="checkbox"/>	8			
1 ne_10m_a...	<input checked="" type="checkbox"/>	8			
2 ne_10m_la...	<input type="checkbox"/>	8			
3 ne_10m_land	<input type="checkbox"/>	8			
4 ne_10m_oc...	<input type="checkbox"/>	8			
5 ne_10m_p...	<input checked="" type="checkbox"/>	8			
6 ne_10m_i...	<input type="checkbox"/>	8			

GeoServer

- ▶ Derzeit als Community-Extension verfügbar
- ▶ OGC API Extension
- ▶ Dokumentation GeoServer OGC API
- ▶ GitHub Erweiterung OGC API

OGC API Features

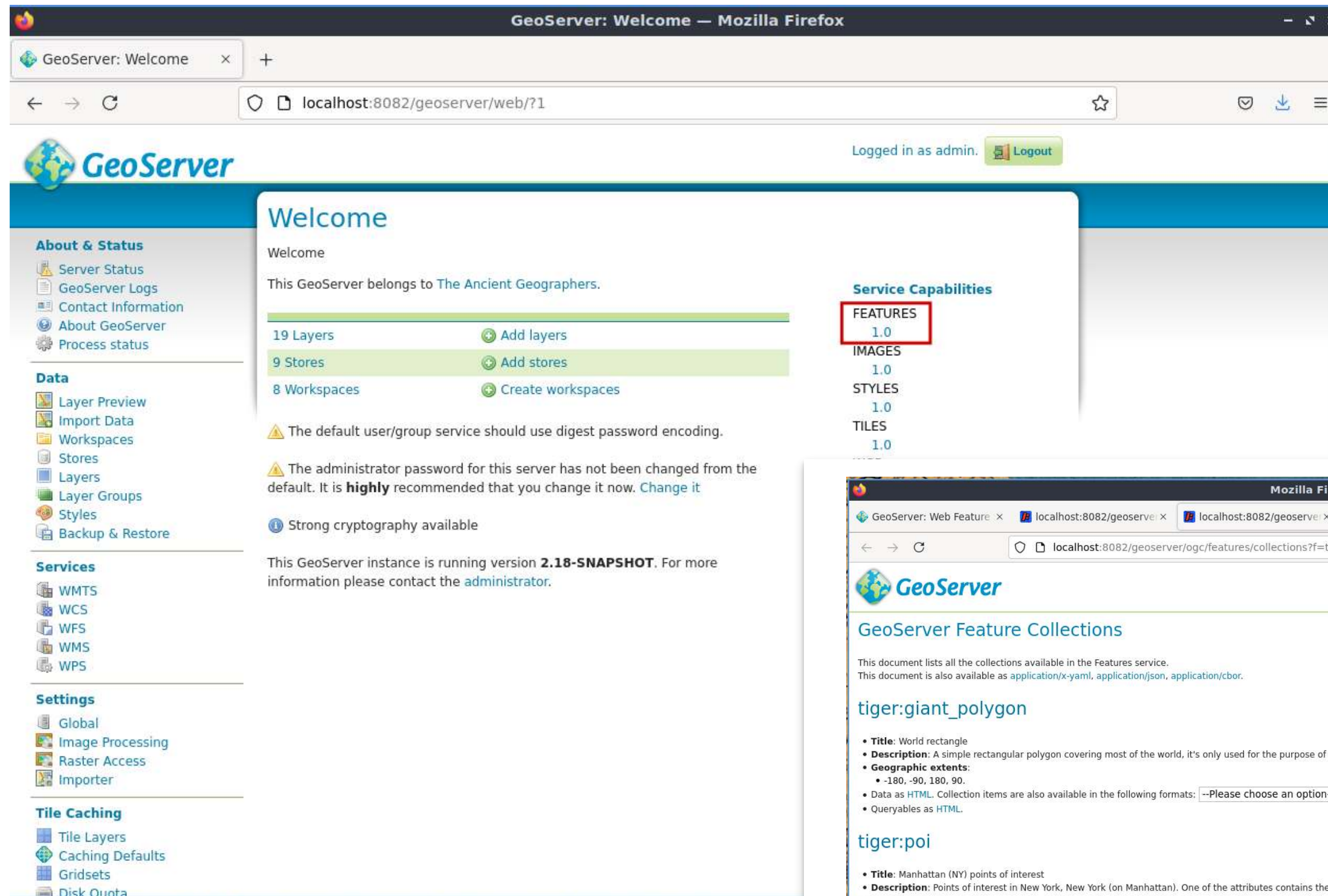
An [OGC Features API](#) publishing feature data using an Open



<u>OGC API - Features</u>	Version	Implementation status
Part 1: Core	<u>Editor's draft</u>	Additional errata and clarifications not yet reviewed.
	<u>1.0.0</u>	Up to date with 1.0.0 release version.
Part 2: CRS by Reference	<u>1.0.0</u>	Not yet implemented
	Draft	Draft implemented, update to final release required.
Part 3: Filtering and CQL	<u>Draft</u>	Draft implemented

GeoServer

- ▶ Feature - neu auf der Welcome-Seite



GeoServer: Welcome — Mozilla Firefox

GeoServer: Welcome x +

localhost:8082/geoserver/web/?1

Logged in as admin. Logout

Welcome

Welcome

This GeoServer belongs to The Ancient Geographers.

19 Layers [Add layers](#)

9 Stores [Add stores](#)

8 Workspaces [Create workspaces](#)

⚠ The default user/group service should use digest password encoding.

⚠ The administrator password for this server has not been changed from the default. It is **highly** recommended that you change it now. [Change it](#)

🔒 Strong cryptography available

This GeoServer instance is running version **2.18-SNAPSHOT**. For more information please contact the [administrator](#).

Service Capabilities

FEATURES
1.0

IMAGES
1.0

STYLES
1.0

TILES
1.0

GeoServer Feature Collections

This document lists all the collections available in the Features service.
This document is also available as [application/x-yaml](#), [application/json](#), [application/cbor](#).

tiger:giant_polygon

- Title:** World rectangle
- Description:** A simple rectangular polygon covering most of the world, it's only used for the purpose of providing a background (WMS bgcolor could be used instead)
- Geographic extents:**
 - 180, -90, 180, 90.
- Data as HTML. Collection items are also available in the following formats:
- Queryable as HTML.

tiger:poi

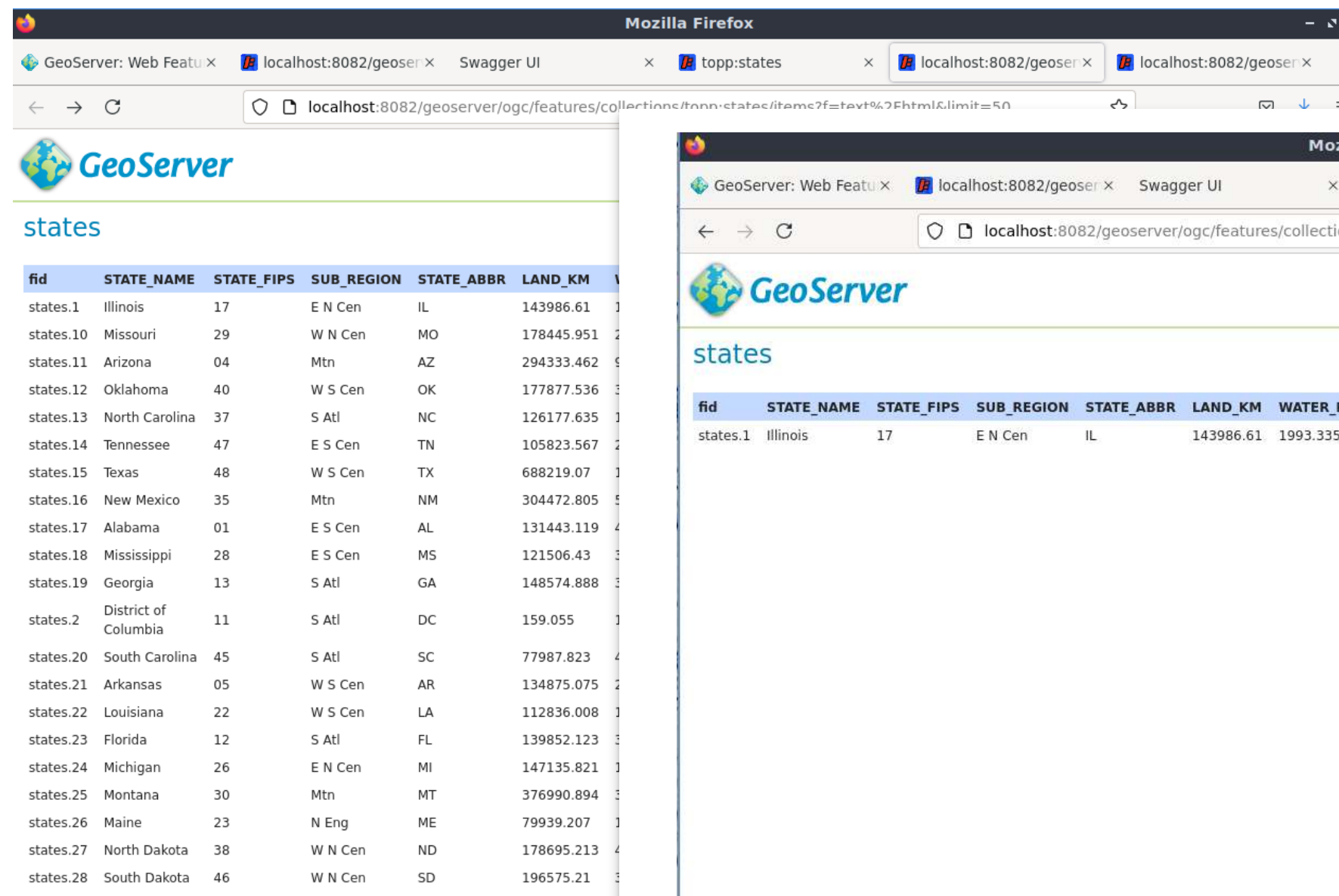
- Title:** Manhattan (NY) points of interest
- Description:** Points of interest in New York, New York (on Manhattan). One of the attributes contains the name of a file with a picture of the point of interest.
- Geographic extents:**
 - 74.012, 40.708, -74.009, 40.712.
- Data as HTML. Collection items are also available in the following formats:
- Queryable as HTML.

tiger:poly_landmarks

- Title:** Manhattan (NY) landmarks
- Description:** Manhattan landmarks, identifies water, lakes, parks, interesting buildings

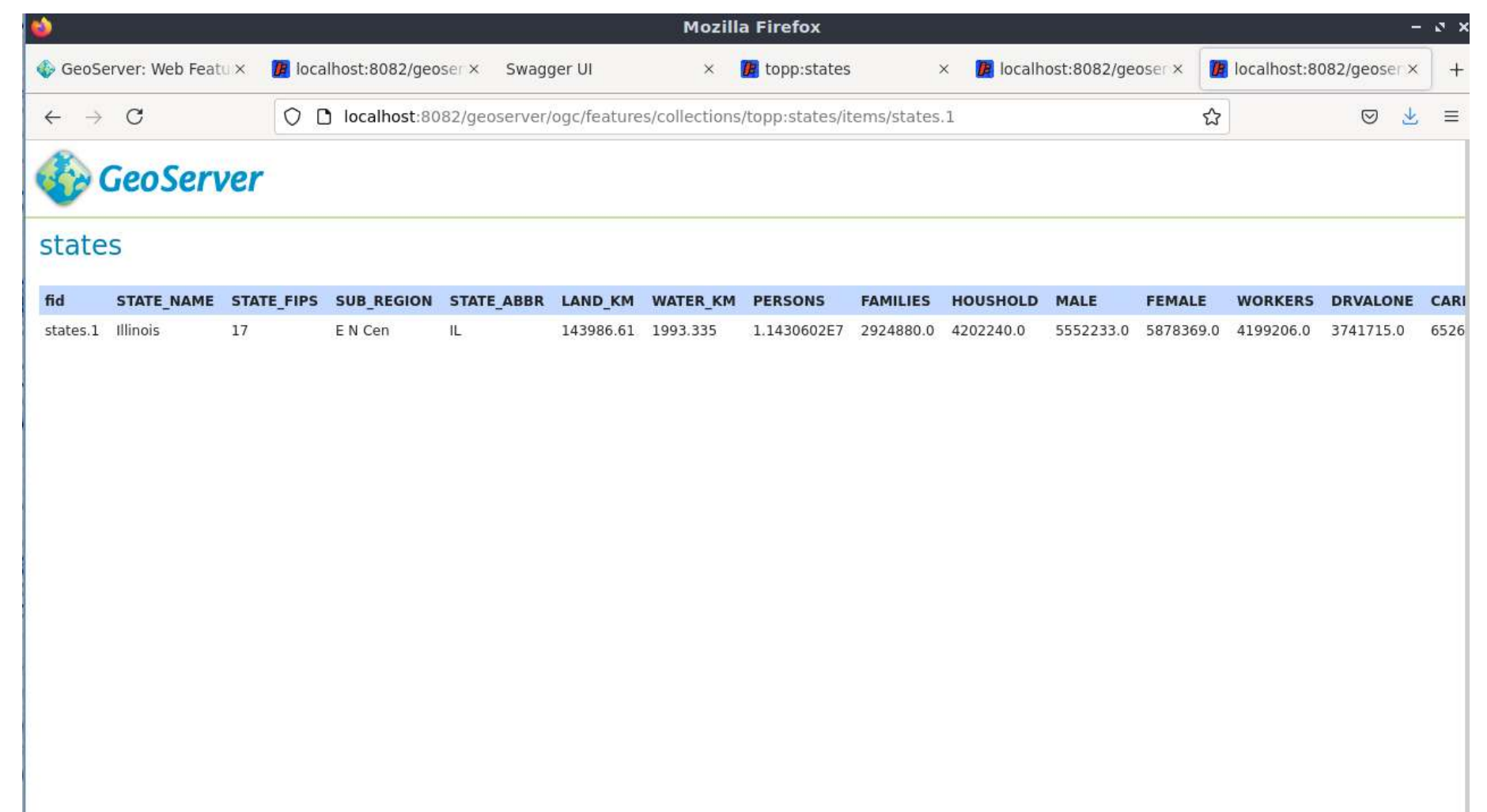
GeoServer

- ▶ items - Übersicht der Feature
- ▶ items/states.1 - Anzeige eines Objektes
- ▶ Anpassung der Anzeige kann über FreeMarker Templates erfolgen
- ▶ GitHub Erweiterung OGC API



The screenshot shows the GeoServer web interface in Mozilla Firefox. The browser address bar shows the URL: localhost:8082/geoserver/ogc/features/collections/topp:states/items?format=html&limit=50. The page displays a table with the following data:

fid	STATE_NAME	STATE_FIPS	SUB_REGION	STATE_ABBR	LAND_KM
states.1	Illinois	17	E N Cen	IL	143986.61
states.10	Missouri	29	W N Cen	MO	178445.951
states.11	Arizona	04	Mtn	AZ	294333.462
states.12	Oklahoma	40	W S Cen	OK	177877.536
states.13	North Carolina	37	S Atl	NC	126177.635
states.14	Tennessee	47	E S Cen	TN	105823.567
states.15	Texas	48	W S Cen	TX	688219.07
states.16	New Mexico	35	Mtn	NM	304472.805
states.17	Alabama	01	E S Cen	AL	131443.119
states.18	Mississippi	28	E S Cen	MS	121506.43
states.19	Georgia	13	S Atl	GA	148574.888
states.2	District of Columbia	11	S Atl	DC	159.055
states.20	South Carolina	45	S Atl	SC	77987.823
states.21	Arkansas	05	W S Cen	AR	134875.075
states.22	Louisiana	22	W S Cen	LA	112836.008
states.23	Florida	12	S Atl	FL	139852.123
states.24	Michigan	26	E N Cen	MI	147135.821
states.25	Montana	30	Mtn	MT	376990.894
states.26	Maine	23	N Eng	ME	79939.207
states.27	North Dakota	38	W N Cen	ND	178695.213
states.28	South Dakota	46	W N Cen	SD	196575.21



The screenshot shows the GeoServer web interface in Mozilla Firefox. The browser address bar shows the URL: localhost:8082/geoserver/ogc/features/collections/topp:states/items/states.1. The page displays a detailed view of the state object for Illinois, with the following data:

fid	STATE_NAME	STATE_FIPS	SUB_REGION	STATE_ABBR	LAND_KM	WATER_KM	PERSONS	FAMILIES	HOUSHOLD	MALE	FEMALE	WORKERS	DRVALONE	CARI
states.1	Illinois	17	E N Cen	IL	143986.61	1993.335	1.1430602E7	2924880.0	4202240.0	5552233.0	5878369.0	4199206.0	3741715.0	6526

GeoServer

Unterstützung für weitere OGC API Standards

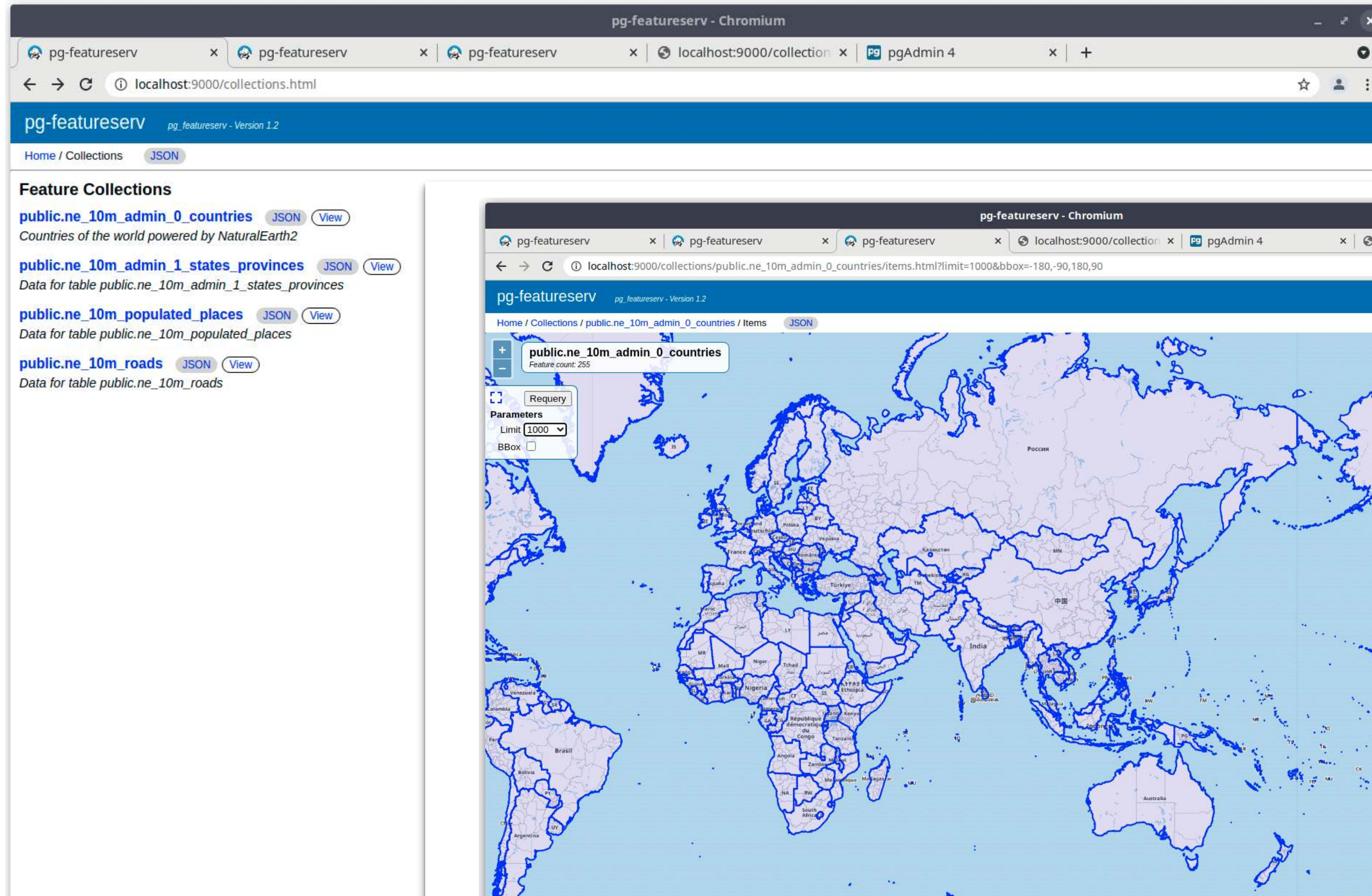
- ▶ OGC API Features
- ▶ OGC API Tiles
- ▶ OGC API - Maps
- ▶ OGC API Styles
- ▶ FOSS4G 2021 Andrea Aime - Demystifying OGC APIs with GeoServer: introduction and status of implementation

pg_featureserv

- ▶ PostGIS FTW - PostGIS for the Web
- ▶ Zwischenschicht Datenbank & Web Mapping Applikation
- ▶ Automatische Konfiguration über Datenbankberechtigungen
- ▶ Programmierung in Go, Entwicklung von CrunchyData
- ▶ Leichte Installation, einfache Konfiguration über toml-Datei
- ▶ https://github.com/CrunchyData/pg_featureserv

```
export DATABASE_URL=postgres://fossGIS:fossGIS@localhost:5433/natural_earth2
./pg_featureserv
```

pg_featureserv



The image shows two screenshots of the pg_featureserv web interface. The left screenshot displays the 'Feature Collections' page, listing several data tables with 'JSON' and 'View' buttons. The right screenshot shows a map view of the 'public.ne_10m_admin_0_countries' collection, with a detailed attribute table for a selected feature (Germany).

Feature Collections

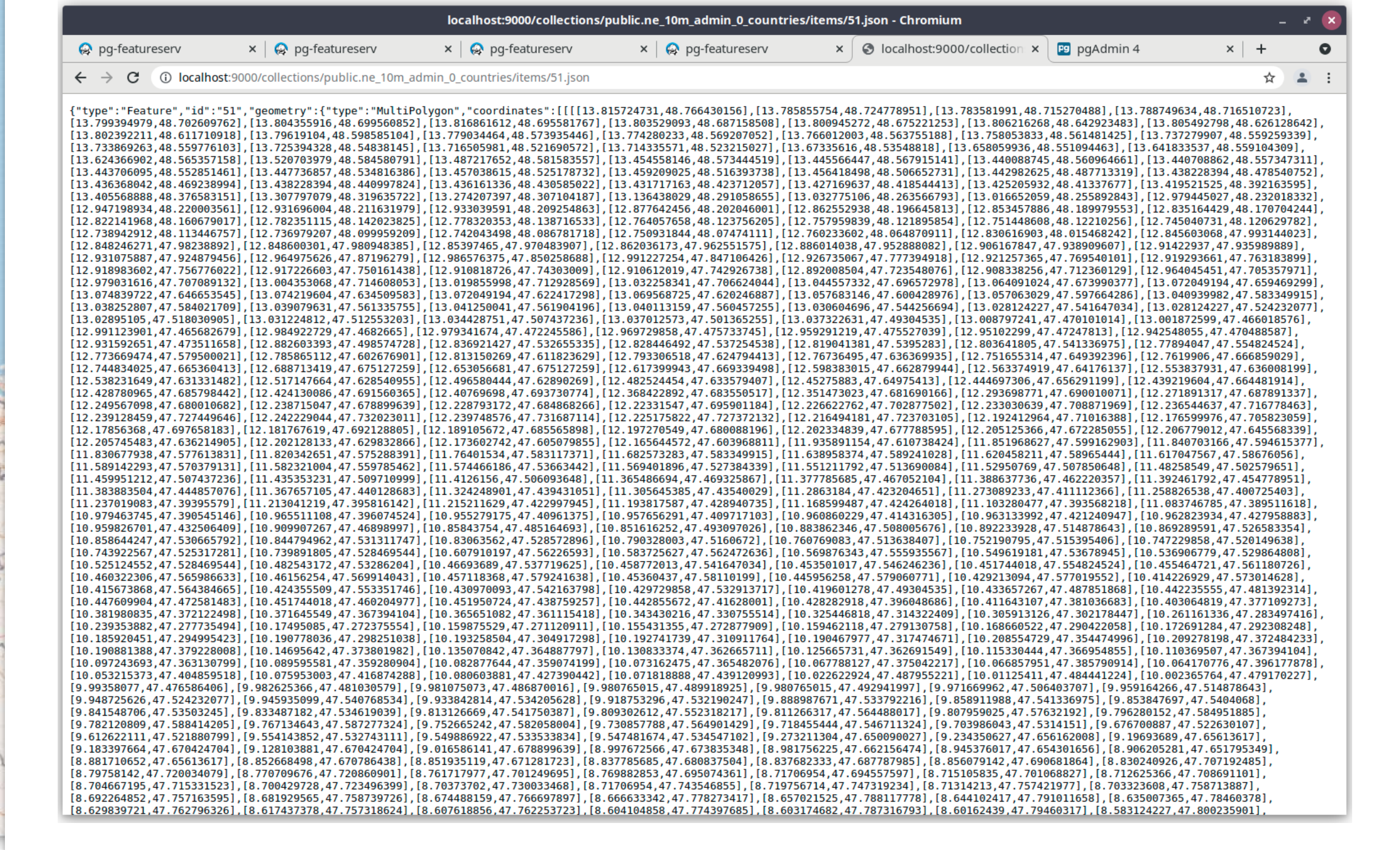
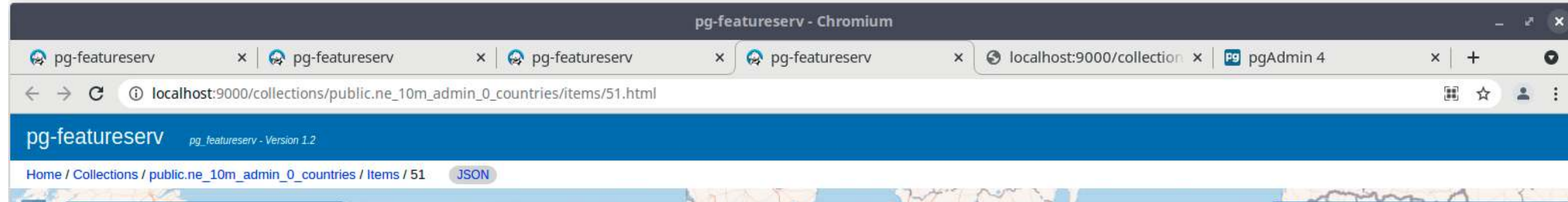
- [public.ne_10m_admin_0_countries](#) (JSON) (View)
Countries of the world powered by NaturalEarth2
- [public.ne_10m_admin_1_states_provinces](#) (JSON) (View)
Data for table public.ne_10m_admin_1_states_provinces
- [public.ne_10m_populated_places](#) (JSON) (View)
Data for table public.ne_10m_populated_places
- [public.ne_10m_roads](#) (JSON) (View)
Data for table public.ne_10m_roads

Map View: public.ne_10m_admin_0_countries
Feature count: 255

Parameters: Limit 1000, BBox []

Name	Value
abbrev	Ger.
abbrev_len	4
adm0_a3	DEU
adm0_a3_is	DEU
adm0_a3_un	-99
adm0_a3_us	DEU
adm0_a3_wb	-99
adm0_dif	0
admin	Germany
brk_a3	DEU
brk_dif	0
brk_group	
brk_name	Germany
continent	Europe
economy	1. Developed region: G7
featurecla	Admin-0 country
fips_10	GM
formal_en	Federal Republic of Germany
formal_fr	
gdp_md_est	3979000
gdp_year	2016
geou_dif	0
geounit	Germany
gid	51
gu_a3	DEU
homepart	1
income_grp	1. High income: OECD
iso_a2	DE
iso_a3	DEU
iso_a3_eh	DEU
iso_n3	276
labelrank	2
lastcensus	2011

pg_featureserv



deegree

- ▶ OGC API Features
- ▶ OGC API Features Dokumentation
- ▶ OGC API Features Demo

MapServer

- ▶ Geplant für Version 8.0 - 28. Januar 2022
- ▶ <https://github.com/mapserver/mapserver/wiki/OGC-API-RFC-Draft#current-status>
- ▶ <https://github.com/mapserver/mapserver/wiki/MapServer-8.0-Release-Plan>
- ▶ "oga_enable_request" "OGCAPI"
- ▶ Neuer Metadaten-Namespace - oga_description oga_keywords,
- ▶ OGCAPI_HTML_TEMPLATE_DIRECTORY - Verweis auf Dateien für die HTML-Ausgabe

Current Status

Support	Status
Features: Landing page	✓
Features: JSON & HTML output	✓
Features: Collections (layer listing)	✓
Features: Collections (single layer: links (summary))	✓
Features: Collections (single layer: query)	✓
Features: Collections (single layer: list queryable fields)	✗
Features: Collections (single layer: map)	✗
Features: API docs	✗
Features: msautotests	✗
Features: user docs on mapserver.org	✗

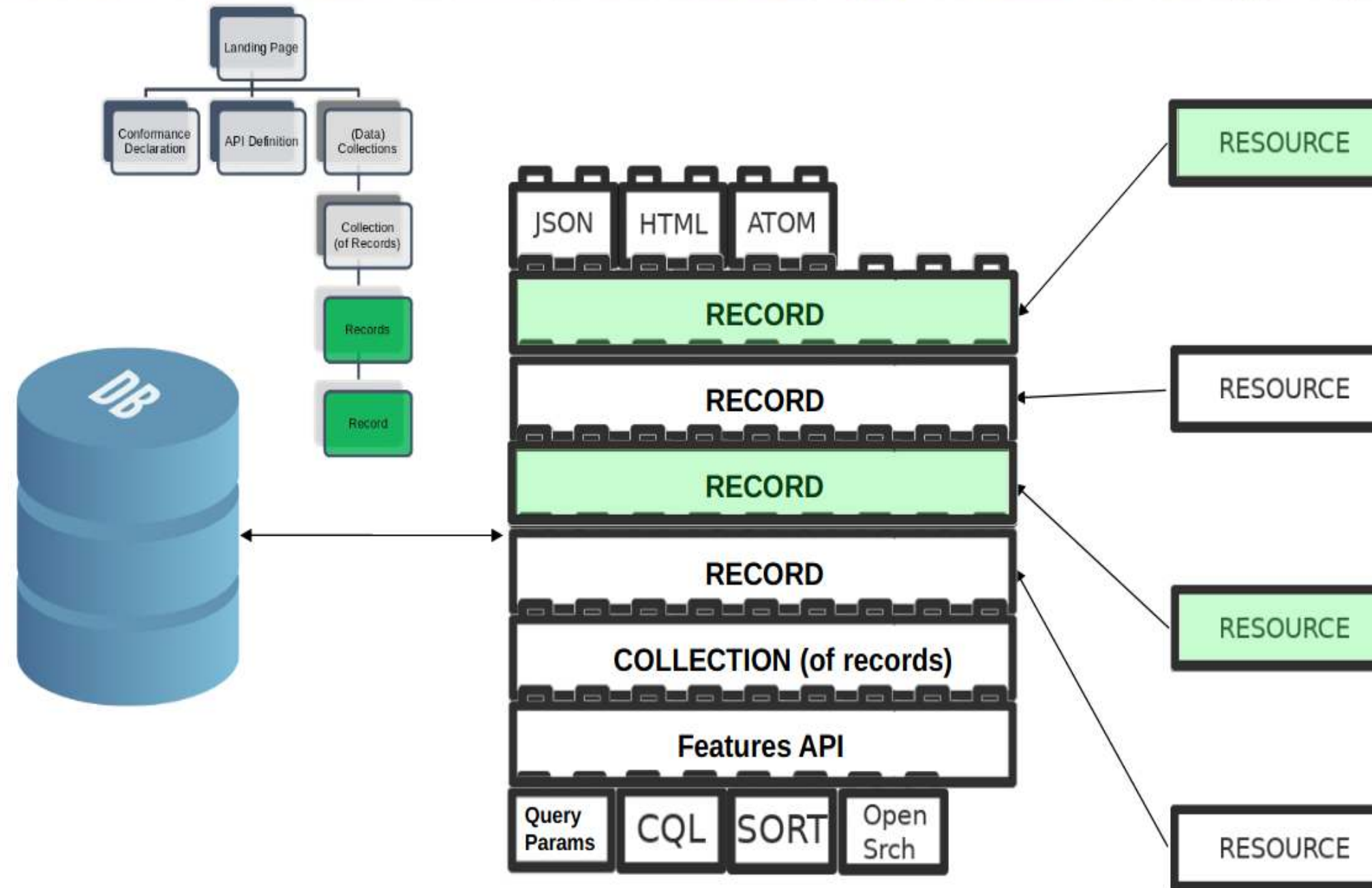
pycsw OGC API Records

- ▶ OGC API Records
- ▶ pycsw OSGeo Projekt
- ▶ Python-Entwicklung
- ▶ Referenzimplementierung für CSW 2.0.2 und 3.0
- ▶ Demo OGC API Records <http://demo.pycsw.org/>
- ▶ Präsentation Angelos Tzotsos
https://inspire.ec.europa.eu/sites/default/files/05_angelostzotsos_ogc_api_-_records_-_inspire_2021.pdf

Searchable Catalogue

12 : 45 : 87
 FEB - 05 - 3254
 167 78 894

OGC



GET /collections/MyCat/items?bbox=-69.64,37.76,-56.12,46.63&datetime=2020-01-11T00:00:00/2020-01-12T00:00:00

OGC API - Features Clients

Anwendungen die OGC API - Features Dienste ansprechen können

GDAL/OGR

- ▶ Treiber OAPIF
- ▶ Ab Version 2.3. Vor der GDAL Version 3.1 hieß der Treiber WFS3
- ▶ <https://gdal.org/drivers/vector/oapif.html>

```
$ ogrinfo OAPIF:https://www.ldproxy.nrw.de/rest/services/kataster

INFO: Open of `OAPIF:https://www.ldproxy.nrw.de/rest/services/kataster'
      using driver `OAPIF' successful.
1: flurstueck (Multi Polygon)
2: gebaeudebauwerk (Multi Polygon)
3: verwaltungseinheit (Multi Polygon)
```

```
$ ogrinfo -al -so OAPIF:https://www.ldproxy.nrw.de/rest/services/kataster flurstueck
```

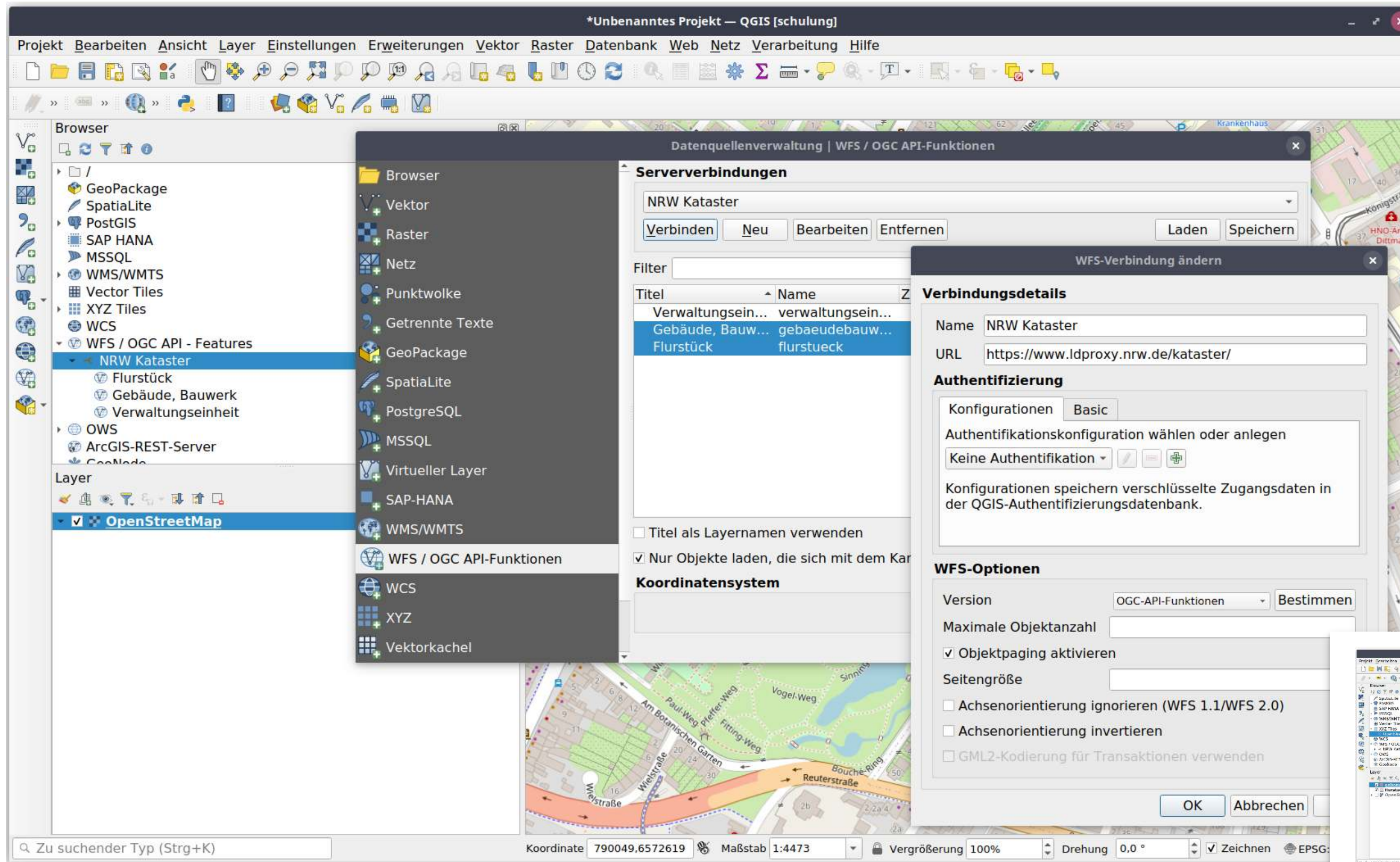
```
Layer name: flurstueck
Metadata:
  TITLE=Flurstück
Geometry: Multi Polygon
Feature Count: 9308456
Extent: (5.612726, 50.237351) - (9.589634, 52.528630)
Layer SRS WKT:
GEOGCS["WGS 84",
  DATUM["WGS_1984",
    SPHEROID["WGS 84",6378137,298.257223563,
      AUTHORITY["EPSG","7030"]],
    AUTHORITY["EPSG","6326"]],
  PRIMEM["Greenwich",0,
    AUTHORITY["EPSG","8901"]],
  UNIT["degree",0.0174532925199433,
    AUTHORITY["EPSG","9122"]],
  AUTHORITY["EPSG","4326"]]
id: String (0.0)
aktualit: Date (0.0)
flaeche: Real (0.0)
flstkennz: String (0.0)
land: String (0.0)
gemarkung: String (0.0)
flur: String (0.0)
flurstnr: String (0.0)
gmdschl: String (0.0)
regbezirk: String (0.0)
kreis: String (0.0)
gemeinde: String (0.0)
lagebeztxt: String (0.0)
tntxt: String (0.0)
```

```
$ ogrinfo OAPIF:https://www.ldproxy.nrw.de/rest/services/kataster flurstueck -al -q -where "flur = '028'"
```

```
Layer name: flurstueck
Metadata:
  TITLE=Flurstück
OGRFeature(flurstueck):1
  id (String) = DENW19AL0000geMFFL
  aktualit (Date) = 2017/04/26
  flaeche (Real) = 1739
  flstkennz (String) = 05297001600193
  land (String) = Nordrhein-Westfalen
  gemarkung (String) = Wünnenberg
  flur (String) = 016
  flurstnr (String) = 193
  gmdschl (String) = 05774040
  regbezirk (String) = Detmold
  kreis (String) = Paderborn
  gemeinde (String) = Bad Wünnenberg
  lagebeztxt (String) = Bleiwäscher Straße
  tntxt (String) = Platz / Parkplatz;1739
  MULTIPOLYGON (((8.71191 51.491084,8.7123 51.491067,8.712385 51.491645,8.712014 51.491666,8.711993 51.491603,8.71196 51.491396,8.711953 51.4
```

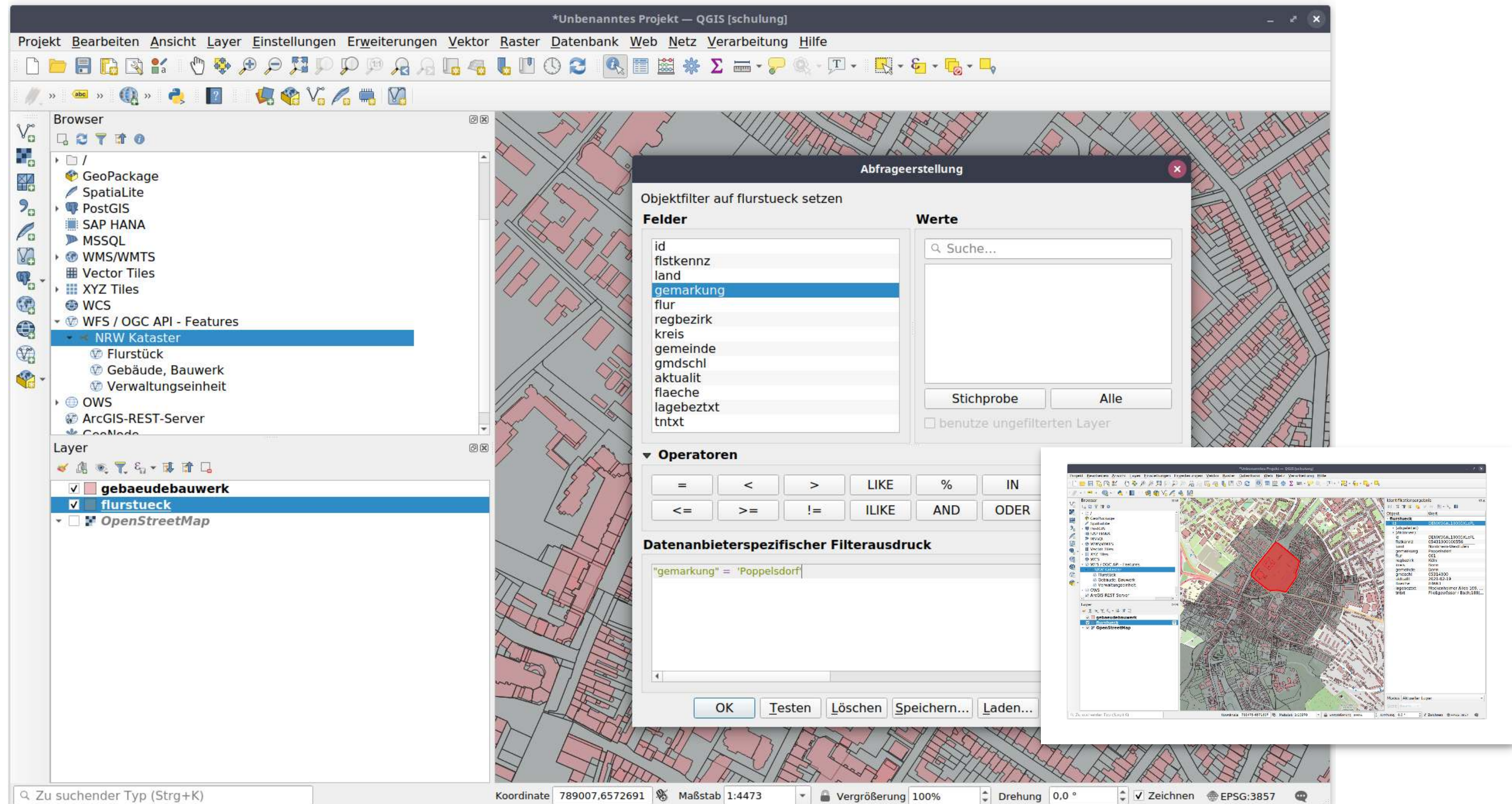
[...]

QGIS Desktop



- <https://github.com/opengeospatial/ogcapi-features/blob/master/implementations/clients/qgis.md>

QGIS Desktop



The screenshot shows the QGIS Desktop interface with the 'Abfrageerstellung' (Query Builder) dialog box open over a map of buildings. The dialog is used to create a query filter for the 'flurstueck' layer.

Abfrageerstellung

Objektfilter auf flurstueck setzen

Felder	Werte
id	Suche...
flstkennz	
land	
gemarkung	
flur	
regbezirk	
kreis	
gemeinde	
gmdschl	
aktualit	
flaeche	
lagebeztxt	
tntxt	

Operatoren

=	<	>	LIKE	%	IN
<=	>=	!=	ILIKE	AND	ODER

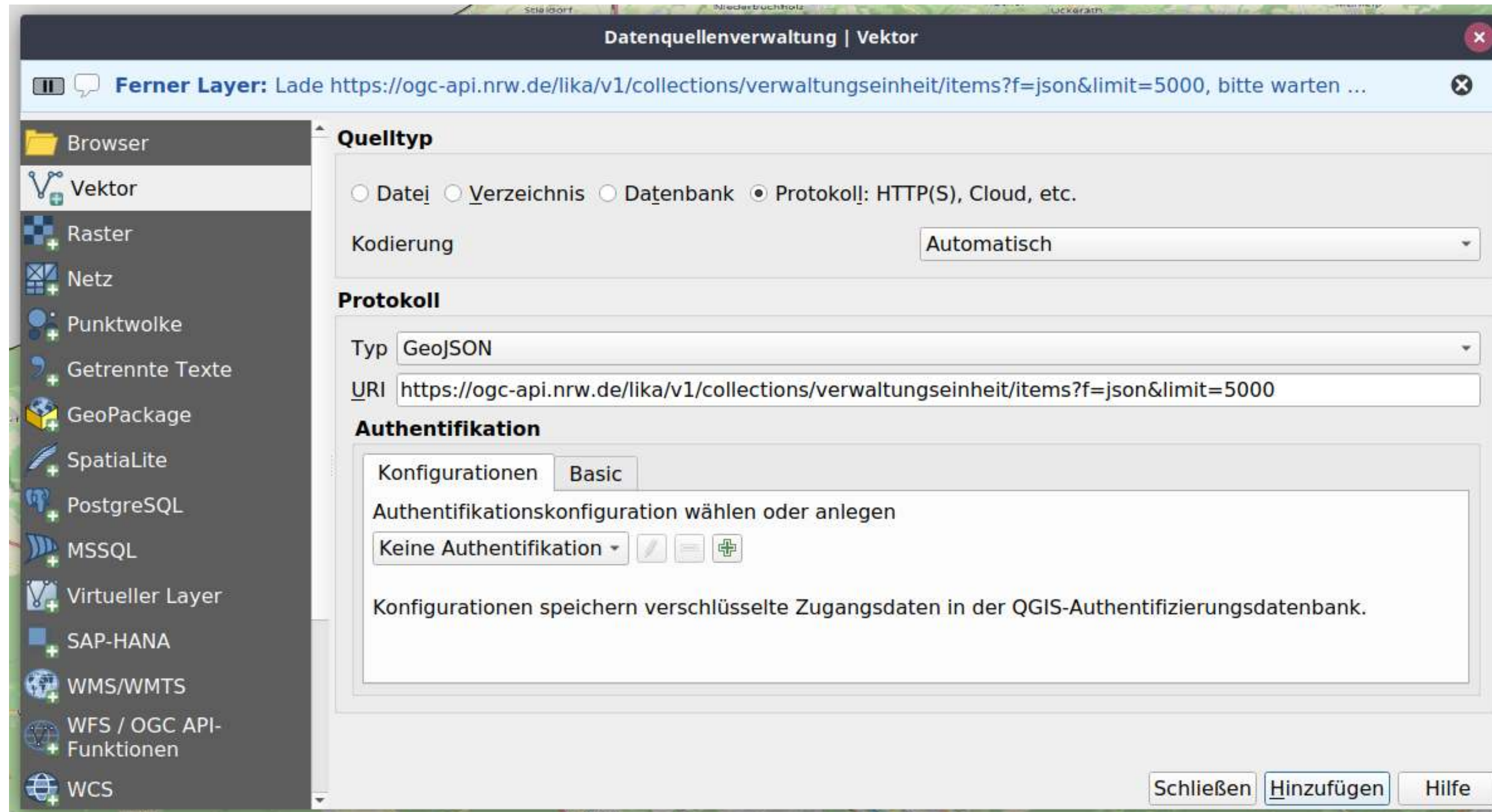
Datenanbieterspezifischer Filterausdruck

"gemarkung" = 'Poppelsdorf'

Buttons: OK, Testen, Löschen, Speichern..., Laden...

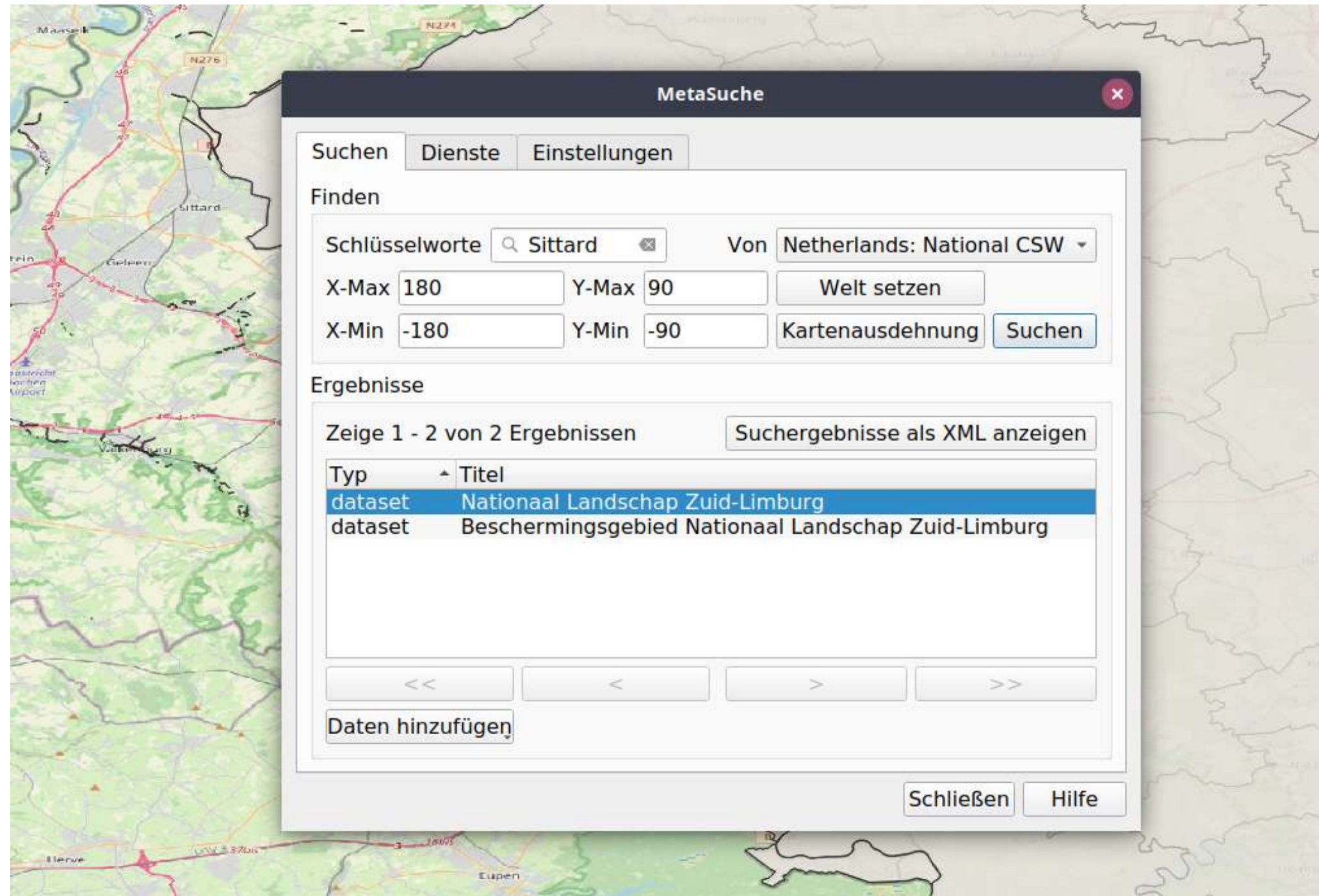
The background map shows a street grid with buildings highlighted in red. The 'Layer' panel on the left shows the 'flurstueck' layer selected. The 'Browser' panel shows the 'NRW Kataster' folder expanded.

QGIS Desktop



QGIS Desktop

- ▶ MetaSearch: Unterstützung für OGC API Records ab Version QGIS 3.24
- ▶ Pull Request Tom Kralidis



- ▶ <https://pypi.org/project/OWSLib/>
- ▶ <https://www.osgeo.org/projects/owslib/>
- ▶ Python-Bibliothek
- ▶ Client für zahlreiche OGC Dienste - WMS, WFS, WCS, CSW, WMC, WPS, SOS 1.0, SOS 2.0, SensorML, WMTS & mehr
- ▶ Anwendungsbeispiele finden sich in der Dokumentation <http://geopython.github.io/OWSLib/usage.html#ogc-api>

```
In [1]: from owslib.ogcapi.features import Features
```

```
In [2]: w = Features('https://demo.pygeoapi.io/master')
```

```
In [3]: w.url
```

```
Out[3]: 'https://demo.pygeoapi.io/master/'
```

```
In [4]: conformance = w.conformance()
```

```
In [5]: conformance
```

```
Out[5]: {'conformsTo': ['http://www.opengis.net/spec/ogcapi-common-1/1.0/conf/core',  
                        'http://www.opengis.net/spec/ogcapi-common-2/1.0/conf/collections',  
                        'http://www.opengis.net/spec/ogcapi-features-1/1.0/conf/core',  
                        'http://www.opengis.net/spec/ogcapi-features-1/1.0/conf/oas30',  
                        'http://www.opengis.net/spec/ogcapi-features-1/1.0/conf/html',  
                        'http://www.opengis.net/spec/ogcapi-features-1/1.0/conf/geojson',  
                        'http://www.opengis.net/spec/ogcapi-coverages-1/1.0/conf/core',  
                        'http://www.opengis.net/spec/ogcapi-coverages-1/1.0/conf/oas30',  
                        'http://www.opengis.net/spec/ogcapi-coverages-1/1.0/conf/html',  
                        'http://www.opengis.net/spec/ogcapi-tiles-1/1.0/conf/core',  
                        'http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/core',  
                        'http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/sorting',  
                        'http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/opensearch',  
                        'http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/json',  
                        'http://www.opengis.net/spec/ogcapi-records-1/1.0/conf/html',  
                        'http://www.opengis.net/spec/ogcapi-edr-1/1.0/conf/core']}]
```

```
In [9]: api = w.api()
```

```
In [12]: lakes = w.collection('lakes')  
lakes['id']
```

```
Out[12]: 'lakes'
```

```
In [13]: lakes['title']
```

```
Out[13]: 'Large Lakes'
```

```
In [14]: lakes['description']
```

```
Out[14]: 'lakes of the world, public domain'
```

```
In [19]: lakes_query = w.collection_items('lakes')
```

```
In [20]: lakes_query['features'][0]['properties']
```

```
Out[20]: {'id': 0,  
          'scalerank': 0,  
          'name': 'Lake Baikal',  
          'name_alt': 'https://en.wikipedia.org/wiki/Lake_Baikal',  
          'admin': None,  
          'featureclass': 'Lake'}
```

GRASS GIS

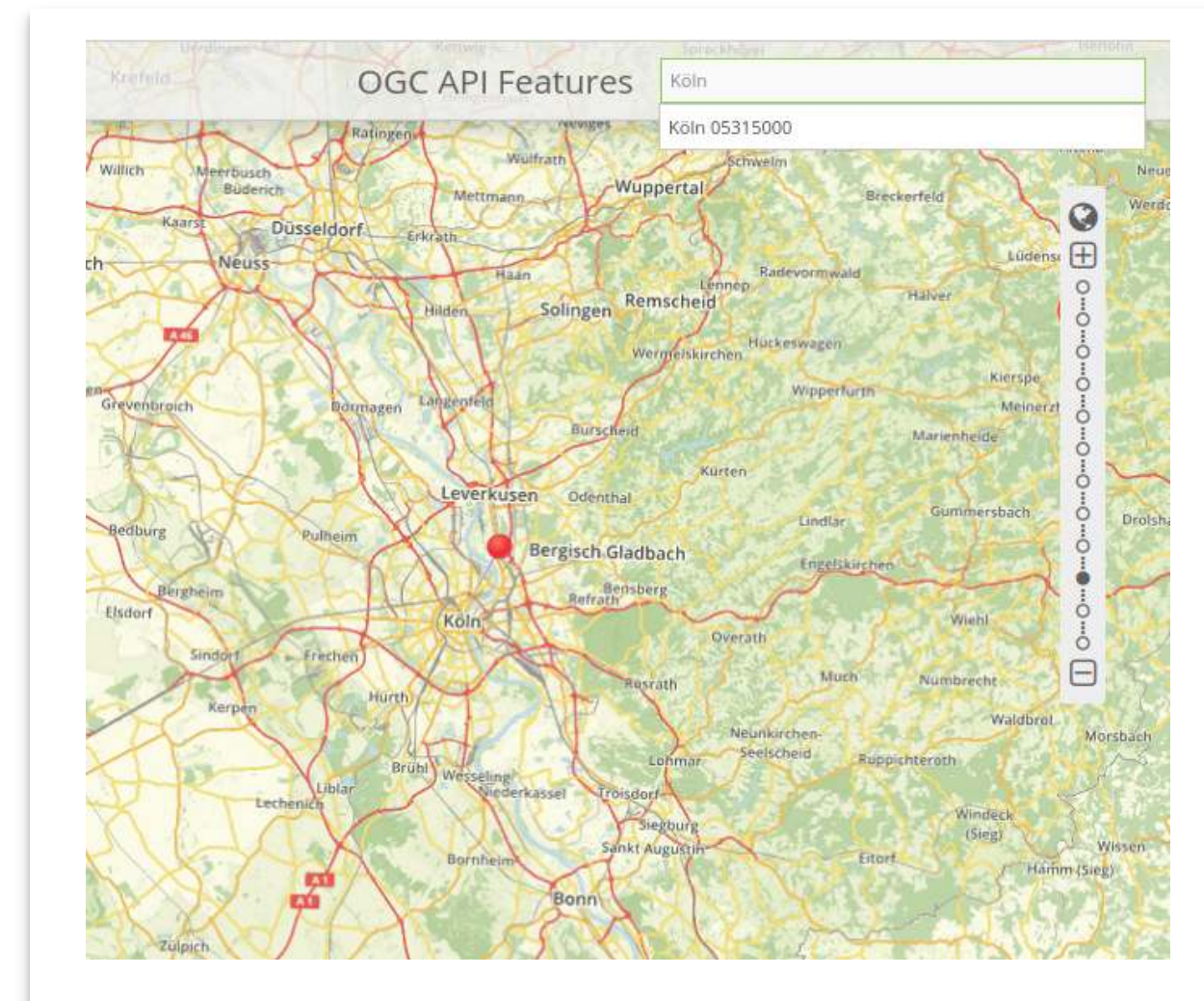
- ▶ v.in.ogc.features - Downloads and imports data from OGC API Features server.
- ▶ Nutzt owslib Python
- ▶ <https://grass.osgeo.org/grass78/manuals/addons/v.in.ogc.features.html>

Mapbender

- ▶ <https://mapbender.org>
- ▶ Mapbender Einfache Suche (SimpleSearch) kann OGC API Features Collection ansprechen.

Element bearbeiten

Title	SimpleSearch OGC API Features Kreise und kreisfreie Städte
Query URL *	https://www.ldproxy.nrw.de/dvg/collections/nw_dvg2_krs/items?f=geojson&
Query URL key *	name
Query Whitespace replacement	
pattern *	
Query key format *	%s
Token (JavaScript regex)	[^a-zA-Z0-9äöüÄÖÜß]
Token search (JavaScript regex)	([a-zA-ZäöüÄÖÜß]{3,})
Token replace (JavaScript regex)	\$1*
Collection path	features
Label attribute *	\$(properties.Name) \$(properties.Amtlicher Gemeindeschlüssel)
Geom attribute *	geometry
Geom format *	GeoJSON
Quell-SRS	EPSG:4326



OpenLayers

Kein built-in Support für OGC API Features

- ▶ Direktes Anfordern der Daten der Collection als GeoJSON
- ▶ <https://github.com/opengeospatial/ogcapi-features/blob/master/implementations/clients/openlayers.md>

Leaflet

Kein built-in Support für OGC API Features

- ▶ Direktes Anfordern der Daten der Collection als GeoJSON
- ▶ <https://github.com/opengeospatial/ogcapi-features/blob/master/implementations/clients/leaflet.md>

Mapbox / MapLibre

Kein built-in Support für OGC API Features

- ▶ Direktes Anfordern der Daten der Collection als GeoJSON
- ▶ <https://github.com/opengeospatial/ogcapi-features/blob/master/implementations/clients/mapbox-gl-js.md>

Wer nutzt OGC API schon?

Geoportal NRW

- ▶ <https://www.ldproxy.nrw.de/>
- ▶ <https://www.ldproxy.nrw.de/kataster>

Geobasisdaten des amtlichen Vermessungswesens in Nordrhein-Westfalen

Die Geobasisdaten des amtlichen Vermessungswesens in Nordrhein-Westfalen werden als öffentliche Aufg Open Data-Prinzipien über online-Verfahren bereitgestellt.

INSPIRE Download Service Adressen Gebaedereferenz

Dieser Dienst stellt für das INSPIRE-Thema Adressen aus Hauskoordinaten umgesetzte Daten bereit.

INSPIRE Download Service Adressen Gebaedereferenz

Dieser Dienst stellt für das INSPIRE-Thema Adressen aus Hauskoordinaten umgesetzte Daten bereit.

Liegenschaftskataster (NRW)

Das Liegenschaftskataster wird in elektronischer Form im Amtlichen Liegenschaftskatasterinformationssystem (ALKIS) geführt. Der vorliegende Web Feature Service ermöglicht das gezielte Herunterladen von in ALKIS geführten Geo-Objekten auf Basis einer Suchanfrage (Direktzugriffs-Downloaddienst). Der Dienst stellt ausschließlich folgende Geo-Objekte beschränkt auf die wesentlichen Eigenschaften im Format eines vereinfachten Datenaustauschschemas bereit, das in dieser Produktspezifikation festgelegt ist: Flurstücke und Verwaltungseinheiten. Der Dienst ist konzipiert zur Nutzung in einfachen praxisgängigen GIS-Clients ohne komplexe Funktionalitäten.

Liegenschaftskataster (NRW)

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Collections

- Flurstück
- Gebäude, Bauwerk
- Verwaltungseinheit

API Definition [OpenAPI 3.0](#)

Flurstück

Räumliche Suche

Bonn Eifelstraße 7 **Suchen**

Filter [Edit](#)

« 1 »

Bonn, Bonn, 070

Flurstückskennzeichen	05430207000115				
Land	Nordrhein-Westfalen				
Gemarkung	Bonn				
Flur	070				
Regierungsbezirk	Köln				
Kreis	Bonn				
Gemeinde	Bonn				
Gemeindeschlüssel	05314000				
Letzte Aktualisierung	21.02.2018				
Fläche (Quadratmeter)	2992.00				
Bezeichnung der Lage	Eifelstr.				
anteilige Nutzung	<table><tr><td>Nutzung</td><td>Fläche</td></tr><tr><td>Straßenverkehr</td><td>2992</td></tr></table>	Nutzung	Fläche	Straßenverkehr	2992
Nutzung	Fläche				
Straßenverkehr	2992				

Bonn, Bonn, 070

Flurstückskennzeichen 05430207000024

Map showing the location of the plot in Bonn, Germany, with a blue pin on Eifelstraße 7. The map includes street names like Vorgebirgsstraße, Eifelstraße, Bornheimer Straße, and Taunusstraße. A blue rectangle highlights the plot area.

Geoportal NRW

- ▶ <https://ogc-api.nrw.de/>
- ▶ <https://ogc-api.nrw.de/likav1/>

[Home](#) / [Daten des Liegenschaftskatasters in NRW](#)

Daten des Liegenschaftskatasters in NRW

Dieser Dienst stellt Geodaten des Liegenschaftskatasters in einem vereinfachten Datenaustauschschemata über eine Web-API bereit.

Hinweis: Diese API liefert amtliche Koordinaten nur im standardmäßigen Koordinatenreferenzsystem mit dem EPSG-Code 25832 aus. Werden andere unterstützte Koordinatensysteme zur Kartendarstellung gewählt, wird serverseitig eine entsprechende Transformation vorgenommen, die Ungenauigkeiten unterliegt. Für die per Transformation gelieferten nicht amtlichen Koordinaten übernimmt Geobasis NRW keine Gewähr.

Links auf die wichtigsten Ressourcen

- [Zu den Daten](#)
- [Zu einer Webkarte mit den Daten](#)
- [Zu den Daten als Vector Tiles](#)
- [Styles zur Darstellung der Daten in Karten](#)

Informationen über die API

API-Beschreibung [Formale Beschreibung der API in OpenAPI 3.0](#)
[Dokumentation der API](#)

API-Anbieter Geobasis NRW
geobasis@bezreg-koeln.nrw.de

Datenlizenz Datenlizenz Deutschland - Zero
<https://www.govdata.de/dl-de/zero-2-0>

Räumlicher Bereich



Weitere Details

Weitere Links [Implementierte OGC-API-Konformitätsklassen](#)
[Liste der von dieser API implementierten Tile Matrix Sets](#)

[Home](#) / [Daten des Liegenschaftskatasters in NRW](#) / [Unterstützte Spezifikationen](#)

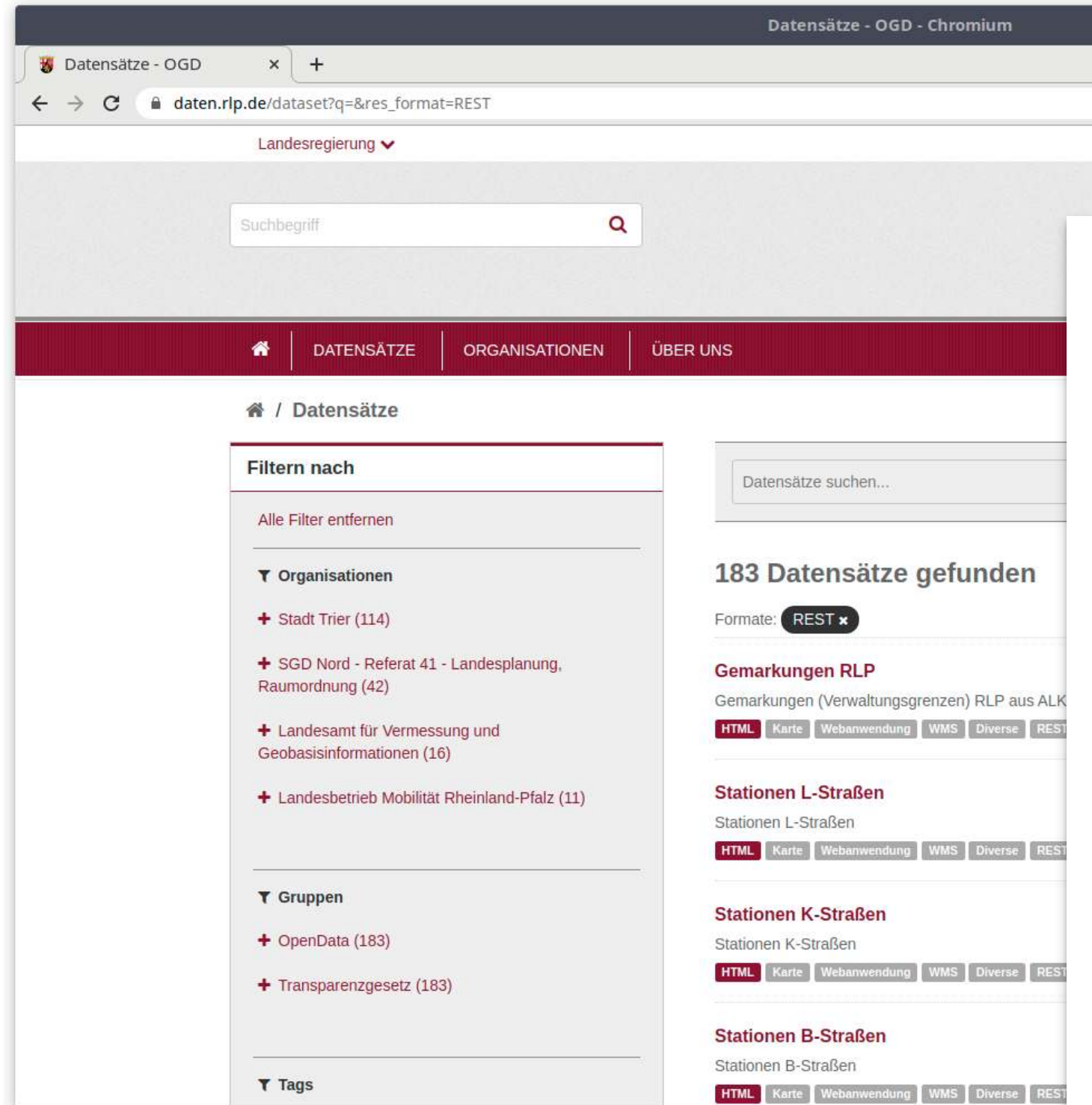
Unterstützte Spezifikationen

Diese API implementiert die aufgeführten Konformitätsklassen aus Standards und Spezifikationen. Konformitätsklassen werden über ein URI identifiziert.

- <http://www.opengis.net/spec/ogcapi-common-1/0.0/conf/core>
- <http://www.opengis.net/spec/ogcapi-common-1/0.0/conf/html>
- <http://www.opengis.net/spec/ogcapi-common-1/0.0/conf/json>
- <http://www.opengis.net/spec/ogcapi-common-1/0.0/conf/oas30>
- <http://www.opengis.net/spec/ogcapi-common-2/0.0/conf/collections>
- <http://www.opengis.net/spec/ogcapi-common-2/0.0/conf/html>
- <http://www.opengis.net/spec/ogcapi-common-2/0.0/conf/json>
- <http://www.opengis.net/spec/ogcapi-features-1/1.0/conf/core>
- <http://www.opengis.net/spec/ogcapi-features-1/1.0/conf/geojson>
- <http://www.opengis.net/spec/ogcapi-features-1/1.0/conf/html>
- <http://www.opengis.net/spec/ogcapi-features-1/1.0/conf/oas30>
- <http://www.opengis.net/spec/ogcapi-features-2/1.0/conf/crs>
- <http://www.opengis.net/spec/ogcapi-features-3/0.0/conf/cql-json>
- <http://www.opengis.net/spec/ogcapi-features-3/0.0/conf/cql-text>
- <http://www.opengis.net/spec/ogcapi-features-3/0.0/conf/enhanced-spatial-operators>
- <http://www.opengis.net/spec/ogcapi-features-3/0.0/conf/features-filter>
- <http://www.opengis.net/spec/ogcapi-features-3/0.0/conf/filter>
- <http://www.opengis.net/spec/ogcapi-features-3/0.0/conf/simple-cql>
- <http://www.opengis.net/spec/ogcapi-records-1/0.0/conf/core>
- <http://www.opengis.net/spec/ogcapi-records-1/0.0/conf/html>
- <http://www.opengis.net/spec/ogcapi-records-1/0.0/conf/json>
- <http://www.opengis.net/spec/ogcapi-styles-1/0.0/conf/core>
- <http://www.opengis.net/spec/ogcapi-styles-1/0.0/conf/mapbox-styles>
- <http://www.opengis.net/spec/ogcapi-tiles-1/0.0/conf/dataset-tilesets>
- <http://www.opengis.net/spec/ogcapi-tiles-1/0.0/conf/geodata-selection>
- <http://www.opengis.net/spec/ogcapi-tiles-1/0.0/conf/geodata-tilesets>
- <http://www.opengis.net/spec/ogcapi-tiles-1/0.0/conf/tileset>
- <http://www.opengis.net/spec/ogcapi-tiles-1/0.0/conf/tilesets>
- <http://www.opengis.net/spec/ogcapi-tiles-2/0.0/conf/tmxs>

Geoportal RLP

► https://daten.rlp.de/dataset?q=&res_format=REST



Datensätze - OGD - Chromium

Datensätze - OGD

Landesregierung ▾

Suchbegriff

[Home](#) | [DATENSÄTZE](#) | [ORGANISATIONEN](#) | [ÜBER UNS](#)

Home / Datensätze

Filtern nach

Alle Filter entfernen

Organisationen

- Stadt Trier (114)
- SGD Nord - Referat 41 - Landesplanung, Raumordnung (42)
- Landesamt für Vermessung und Geobasisinformationen (16)
- Landesbetrieb Mobilität Rheinland-Pfalz (11)

Gruppen

- OpenData (183)
- Transparenzgesetz (183)

Tags

Datensätze suchen...

183 Datensätze gefunden

Formate: **REST**

Gemarkungen RLP

Gemarkungen (Verwaltungsgrenzen) RLP aus ALK

Stationen L-Straßen

Stationen L-Straßen

Stationen K-Straßen

Stationen K-Straßen

Stationen B-Straßen

Stationen B-Straßen



Offene Geodaten des Landes Rheinland-Pfalz - Chromium

geoportal.rlp.de/spatial-objects/314

Datasets / Verwaltungsgrenzen Rheinland-Pfalz

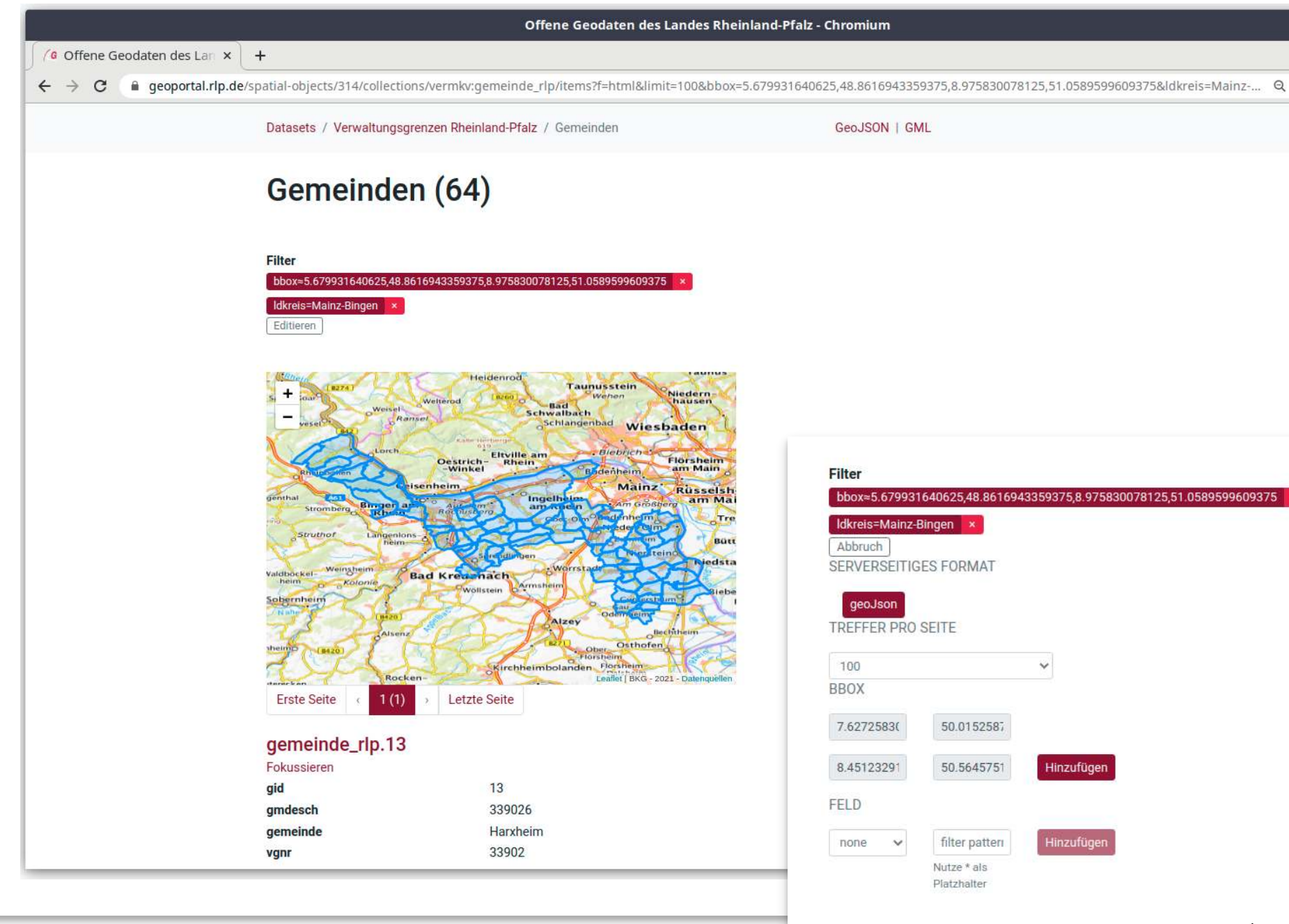
GeoJSON | XML

Verwaltungsgrenzen Rheinland-Pfalz

Geoportal Rheinland Pfalz. Administrative Grenzen.

Collections

- Fluren
- Gemarkungen
- Gemeinden
- Verbandsgemeinden
- Landkreise
- VermKA_Bezirke
- Landesgrenze



Offene Geodaten des Landes Rheinland-Pfalz - Chromium

geoportal.rlp.de/spatial-objects/314/collections/vermkv:gemeinde_rlp/items?f=html&limit=100&bbox=5.679931640625,48.8616943359375,8.975830078125,51.0589599609375&ldkreis=Mainz-...

Datasets / Verwaltungsgrenzen Rheinland-Pfalz / Gemeinden

GeoJSON | GML

Gemeinden (64)

Filter

bbox=5.679931640625,48.8616943359375,8.975830078125,51.0589599609375

ldkreis=Mainz-Bingen

Abbrechen

SERVERSEITIGES FORMAT

geoJson

TREFFER PRO SEITE

100

BBOX


7.62725830 50.0152587

8.45123291 50.5645751 **Hinzufügen**

FELD

none filter pattern **Hinzufügen**

Nutze * als Platzhalter



Erste Seite < 1 (1) > Letzte Seite

gemeinde_rlp.13

Fokussieren

gid	13
gmdesch	339026
gemeinde	Harxheim
vgnr	33902

INSPIRE

- ▶ Good Practice OGC API - Features
<https://inspire.ec.europa.eu/good-practice/ogc-api-%E2%80%93-features-inspire-download-service>
- ▶ Datenanbieter mit OGC API - Features
<https://github.com/INSPIRE-MIF/gp-ogc-api-features/tree/master/deployments>
- ▶ Diskussion zu Entwicklung eines INSPIRE Download Services auf Grundlage von OGC API - Feature
<https://github.com/INSPIRE-MIF/gp-ogc-api-features/blob/master/spec/oapif-inspire-download.md>
- ▶ INSPIRE-Dienste benötigen zusätzliche Angaben!

Overview of deployments

- [French Geological Survey](#)
- [Danish Meteorological Institute](#) - Lightning data
- [Danish Meteorological Institute](#) - Ocean observations
- [Finnish Meteorological Institute](#)
- [Italian Institute for Environmental Protection and Research](#)
- [National Land Survey of Finland](#)
- [multiple data providers from North-Rhine Westphalia, Germany](#)
- [SDI Rhineland-Palatinate](#) - different providers

OGC API Family

- ▶ Diverse Software-Implementationen für unterschiedliche Architekturen liegen bereits vor.
- ▶ Leichter Zugang für Anwender:innen und Entwickler:innen.
- ▶ Vielversprechende Standards sind im Aufbau.

Vielen Dank

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