



Open  
Geospatial  
Consortium

# OGC API in QGIS

**Current support and proposed  
developments**

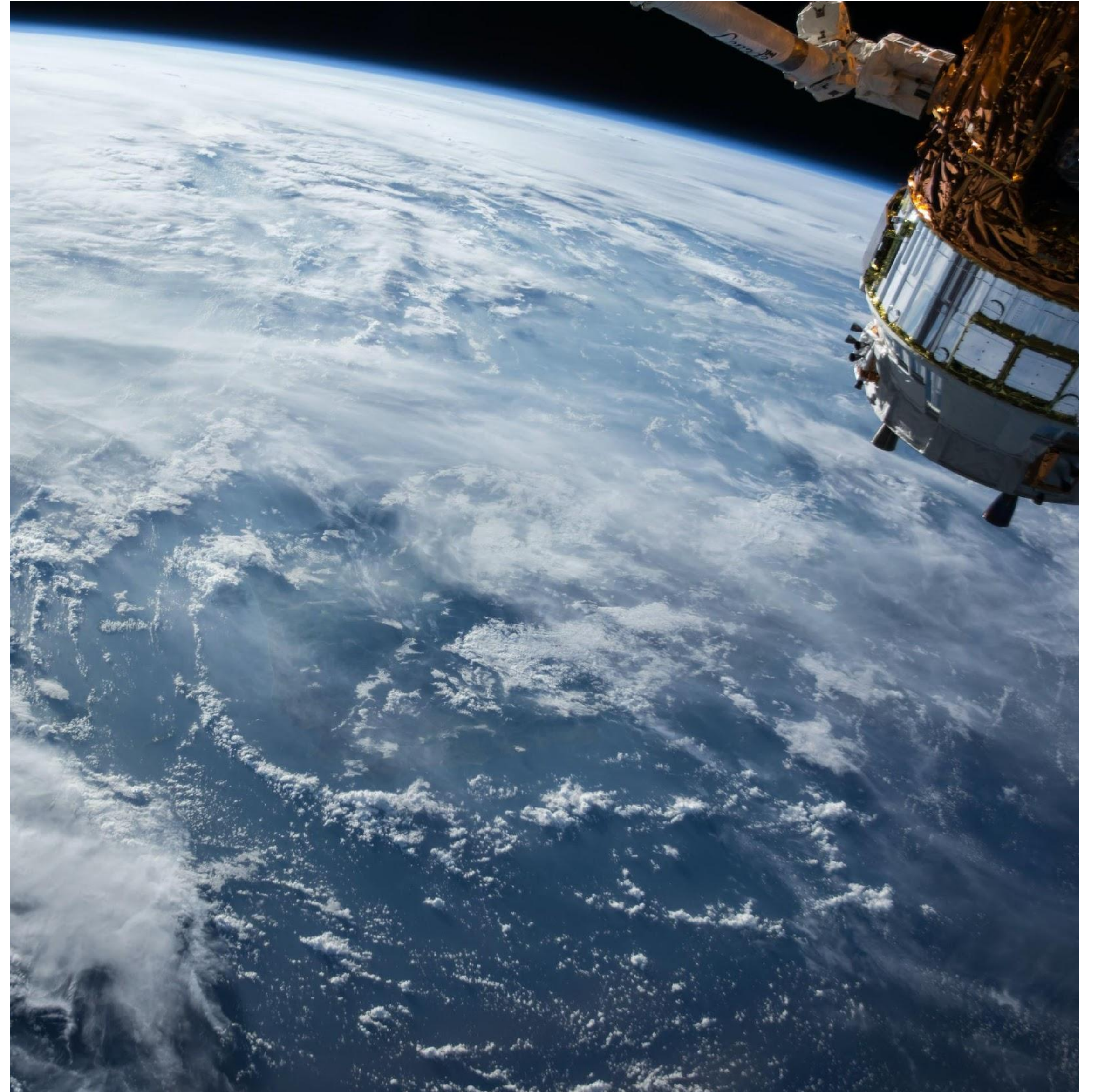
Joana Simoes - Developer Relations @OGC





# Agenda

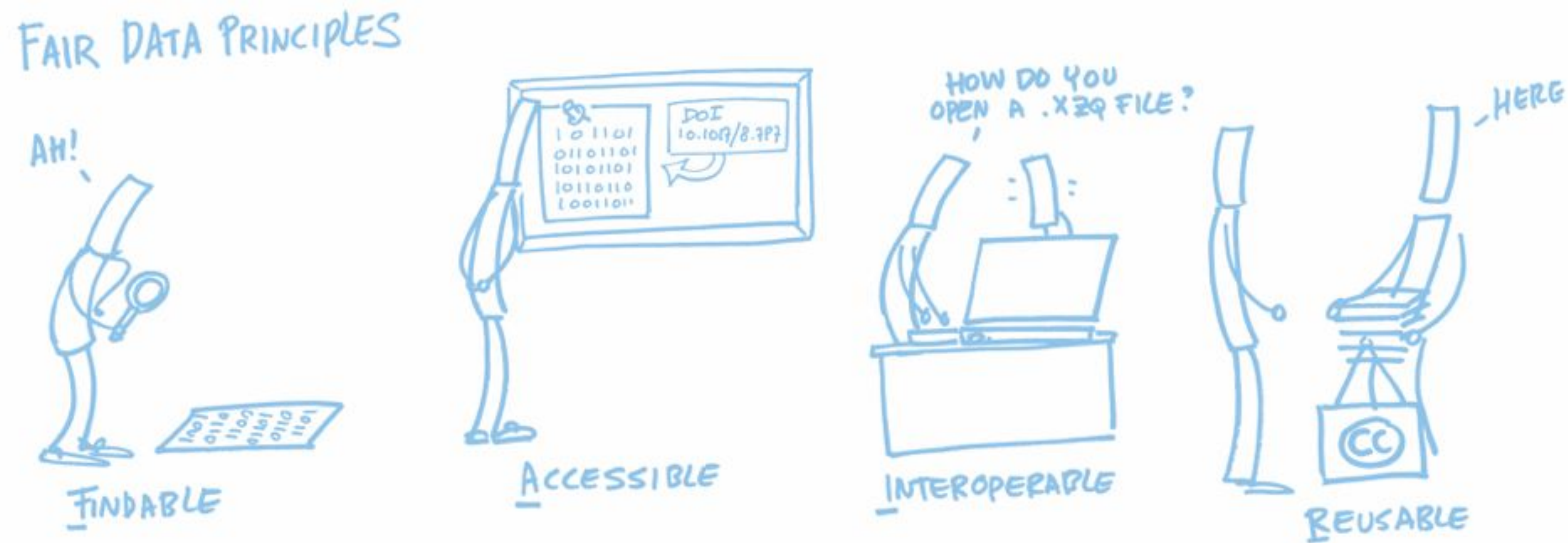
- **Standards and OGC**
- **OGC APIs**
- **Support to OGC APIs in QGIS Desktop: the “obvious” & the “hidden”**
- **Proposed developments**
- **OGC & OSGeo**
- **Upcoming Code Sprint**





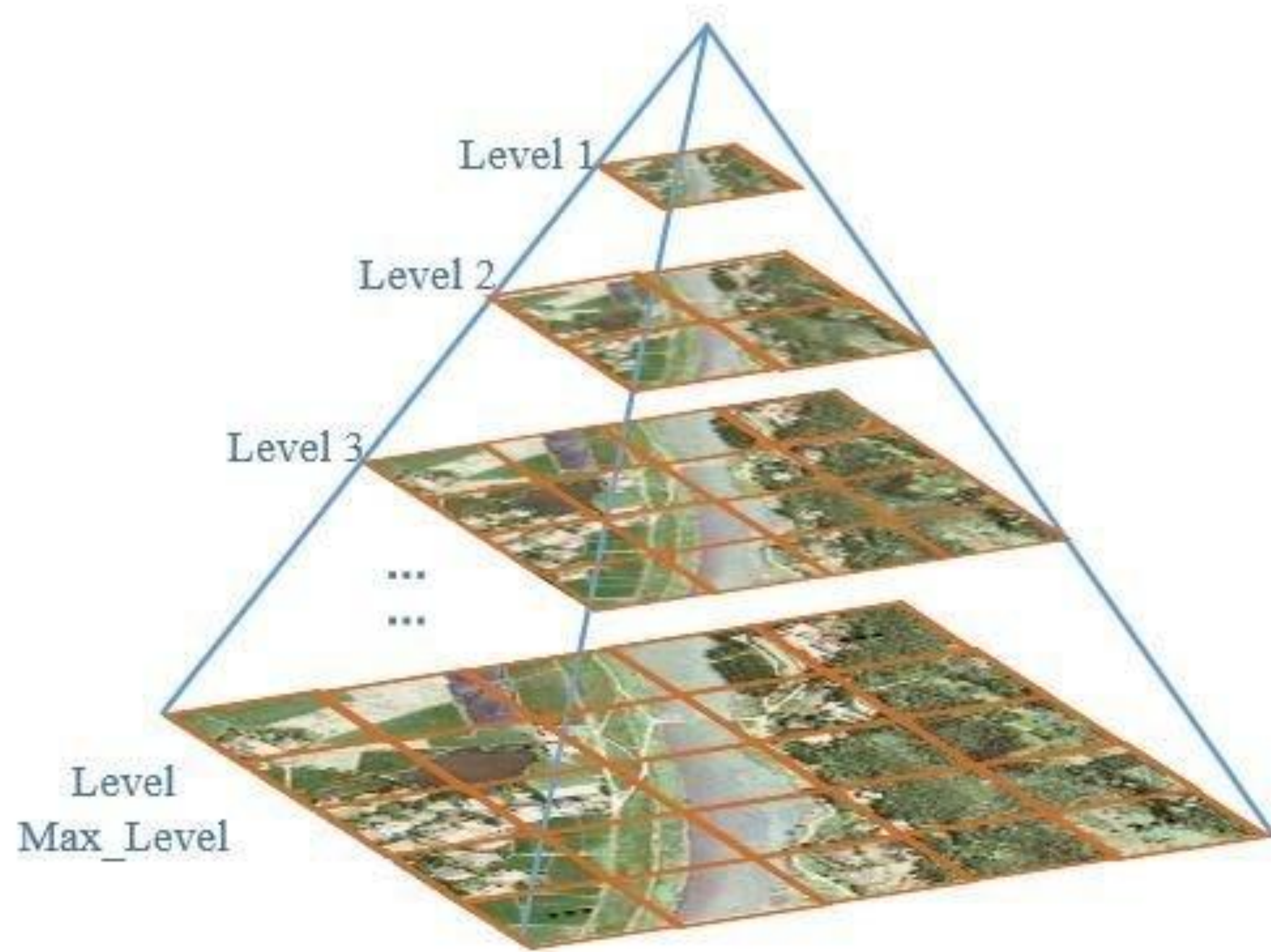
# Why using standards for sharing geospatial information?

- To optimise data sharing and reuse by humans and machines.



Source: <https://www.openaire.eu/how-to-make-your-data-fair>

# Tiled Maps

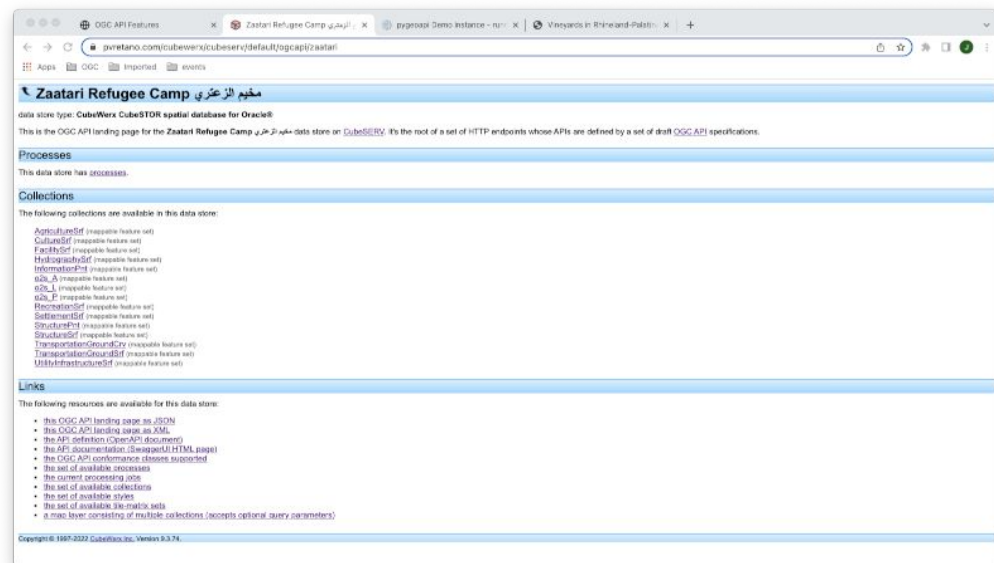
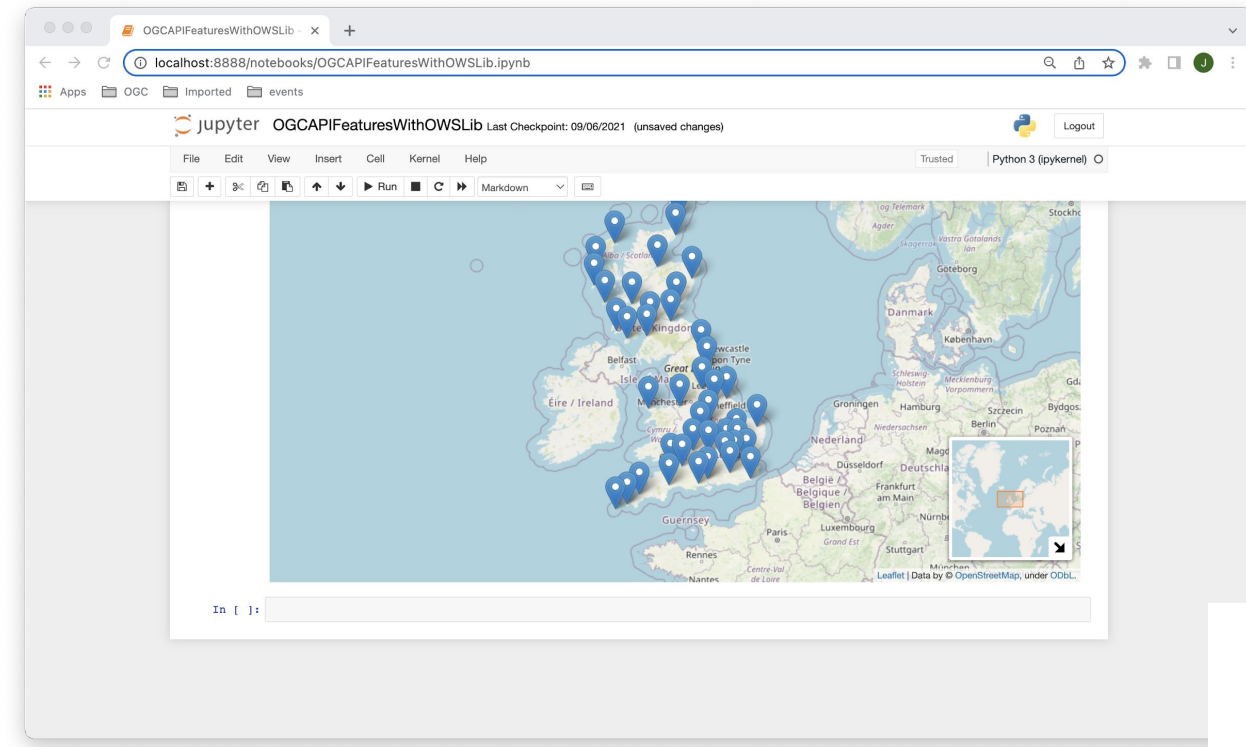






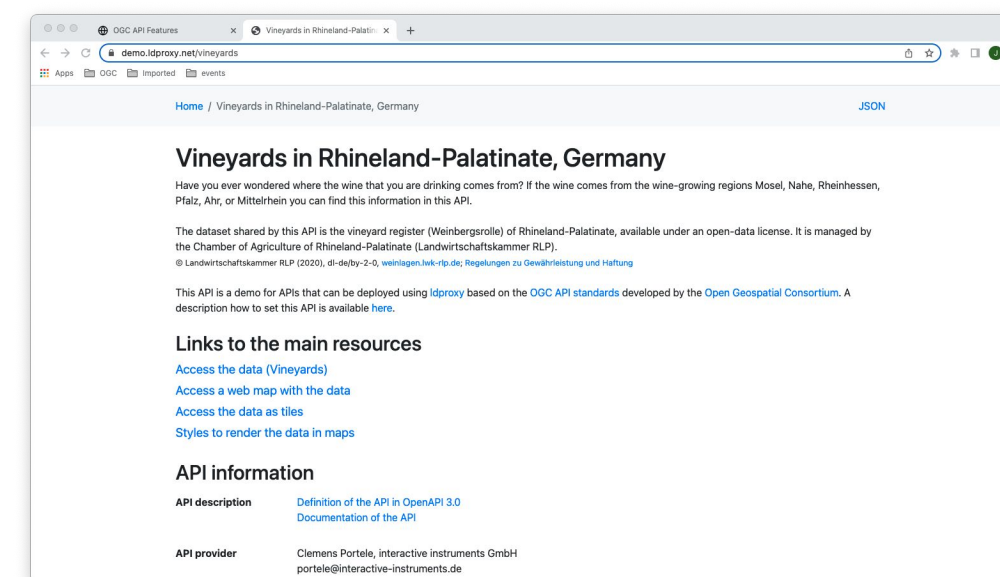
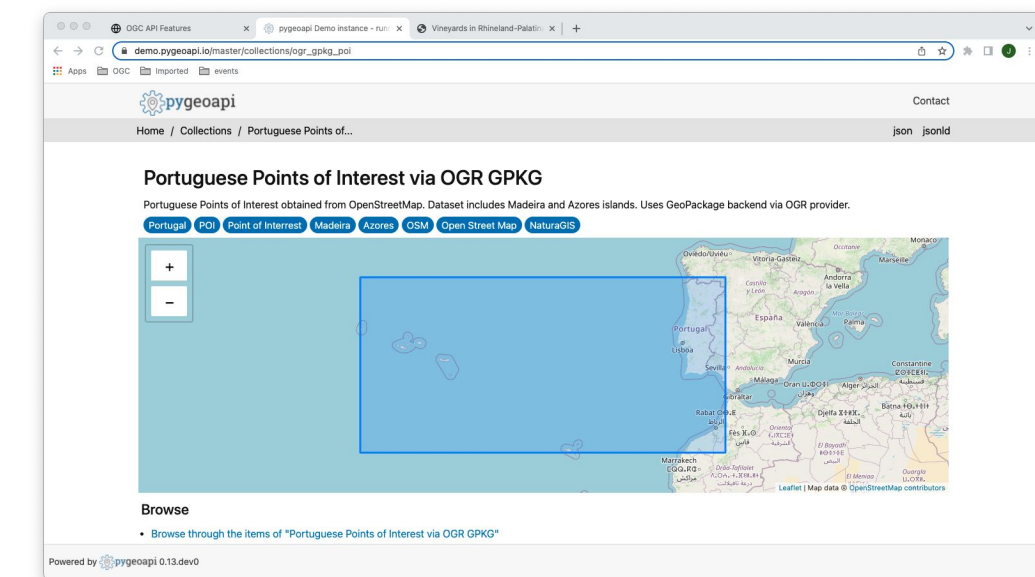
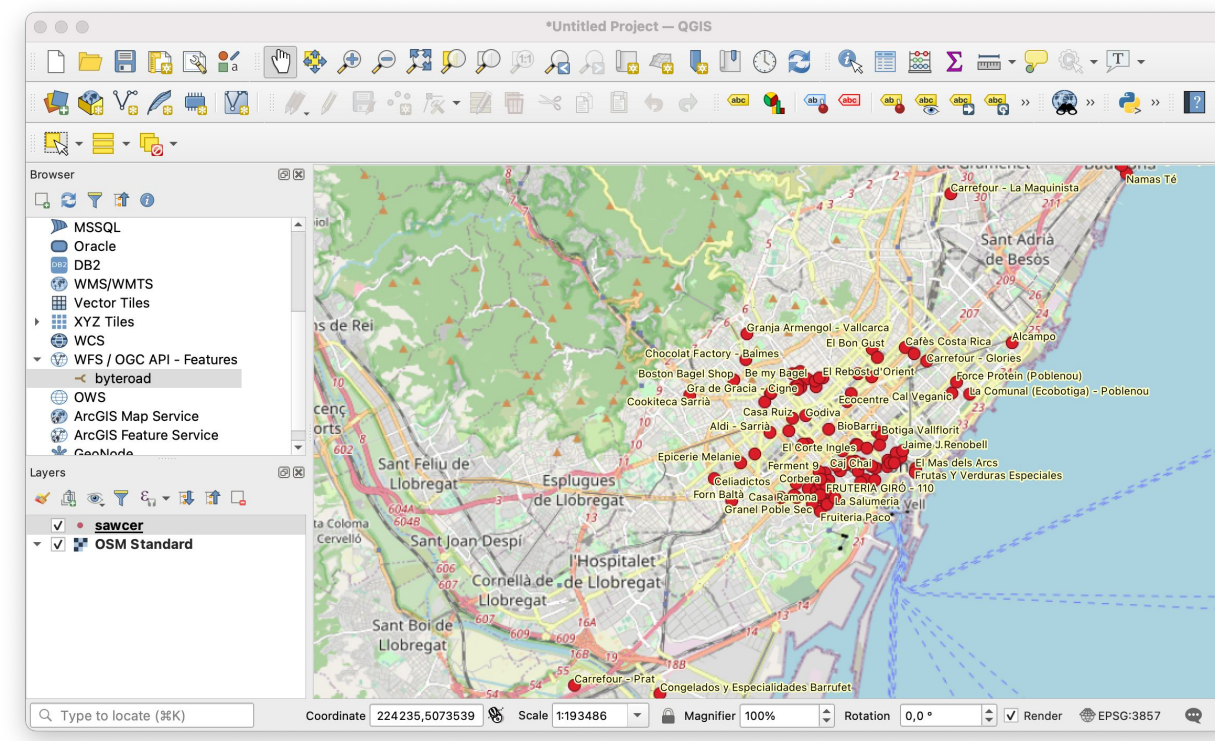


# Using a standard



OGC API Features

CCO - Public Domain - Source: <https://pxhere.com/en/photo/1446103>



Idproxy



# More data access, less coding

- Server side: enable a wide range of clients to consume services (e.g.: no need to create custom clients).
- Client side: being able to consume services from a wide range of servers (e.g.: add support to more sources with minimal coding).

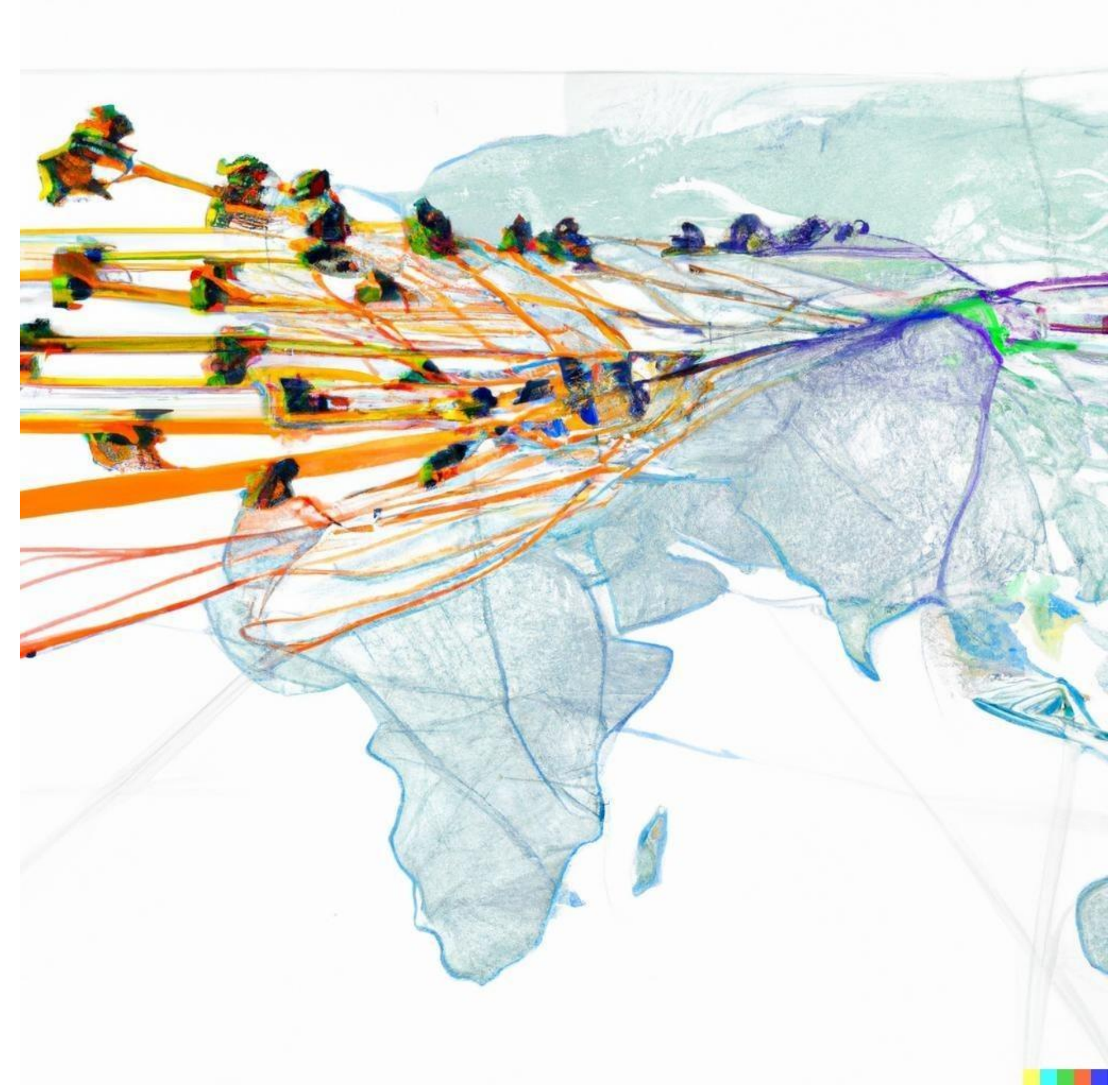
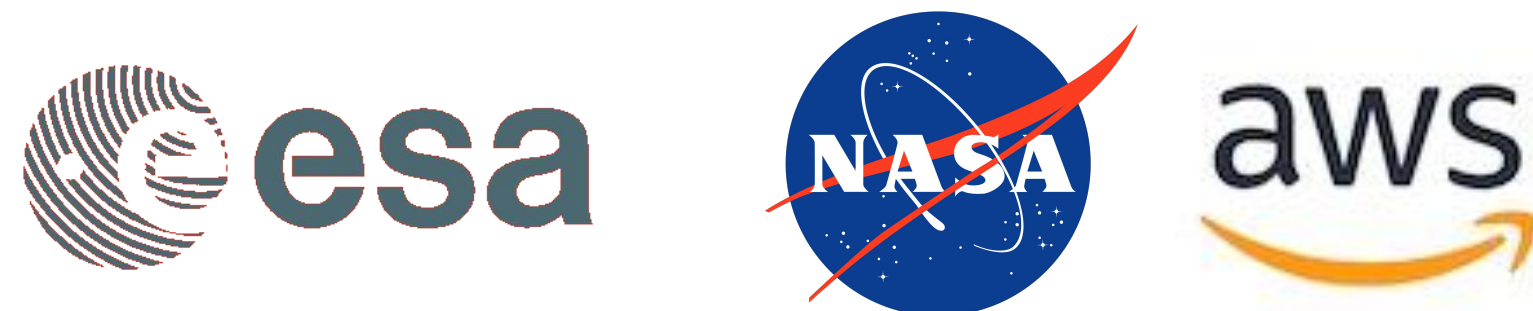


Image generated with DALL.E 2 :<https://openai.com/dall-e-2/>



# Open Geospatial Consortium (OGC)

- Member organisation.
- Focused on developing and maintaining standards for geospatial data services.
- Collaborative, agile, consensus based process.
- OSGeo and QGIS.org are OGC members.





# 1st Generation of OGC Web Services

	WMS	WFS	WCS	WPS	SOS	SPS	CSW	WMTS
Use HTTP methods explicitly.	Y	N	Y*	N	N	N	N	Y
Be stateless.	Y	Y	Y	Y	Y	Y	Y	Y
Expose directory structure-like URIs.	N	N	N	N	N	N	N	Y
Use HTTP Error codes	N	N	N	N	N	N	N	N
Transfer XML, JavaScript Object Notation (JSON), or image.	Image	XML	Any	Any	XML	XML	XML	Image

QGIS Desktop is a WMS Web Map Service (WMS/WMTS), Web Map Tile Service (WMS/WMTS), Web Feature Service (WFS and WFS-T), Web Coverage Service (WCS), Web Processing Service (WPS) and Catalog Service for the Web (CSW) client.

Source: OGC 15-052r1r1

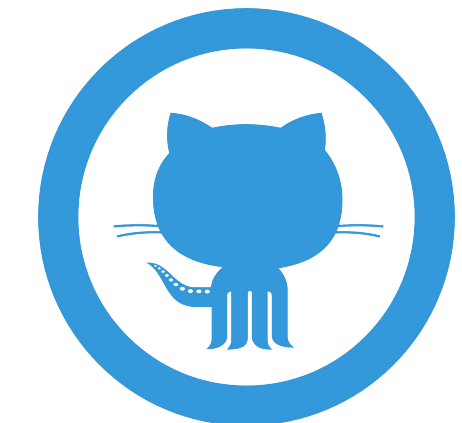


# OGC APIs are built on modern web development practices

- REST architecture.
- http methods, status codes, errors.
- Content negotiation.
- Recommended encodings: JSON, HTML.
- schema.org annotations.
- Defined in OpenAPI/Swagger
- Developed in GitHub

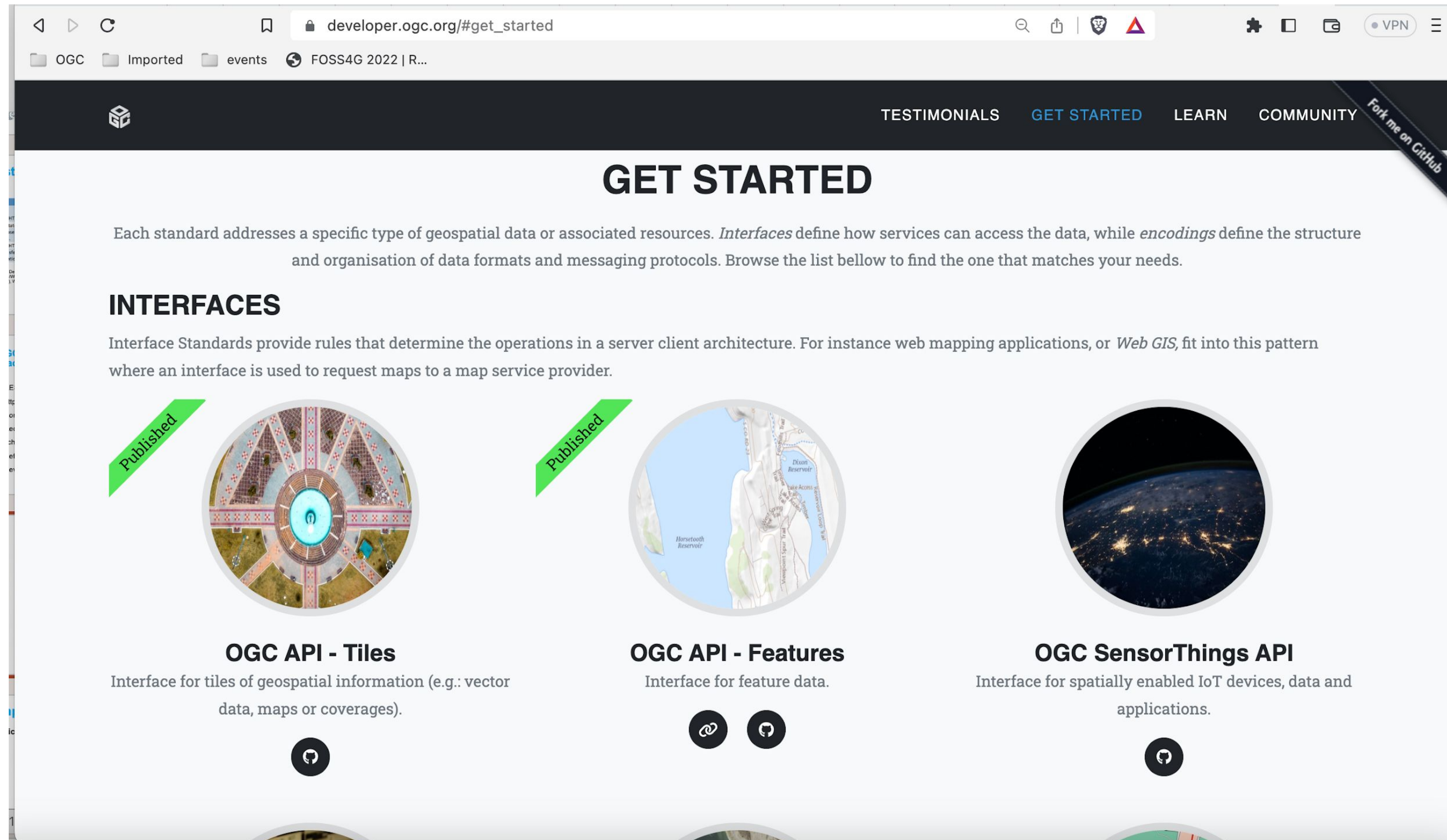


{ REST }





More info:  <https://developer.ogc.org/>



developer.ogc.org/#get\_started

OGC Imported events FOSS4G 2022 | R... VPN

TESTIMONIALS GET STARTED LEARN COMMUNITY Fork me on GitHub

## GET STARTED

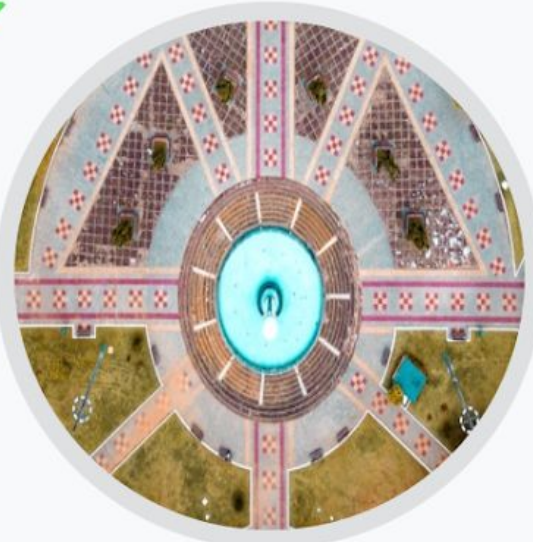
Each standard addresses a specific type of geospatial data or associated resources. *Interfaces* define how services can access the data, while *encodings* define the structure and organisation of data formats and messaging protocols. Browse the list below to find the one that matches your needs.

### INTERFACES

Interface Standards provide rules that determine the operations in a server client architecture. For instance web mapping applications, or *Web GIS*, fit into this pattern where an interface is used to request maps to a map service provider.

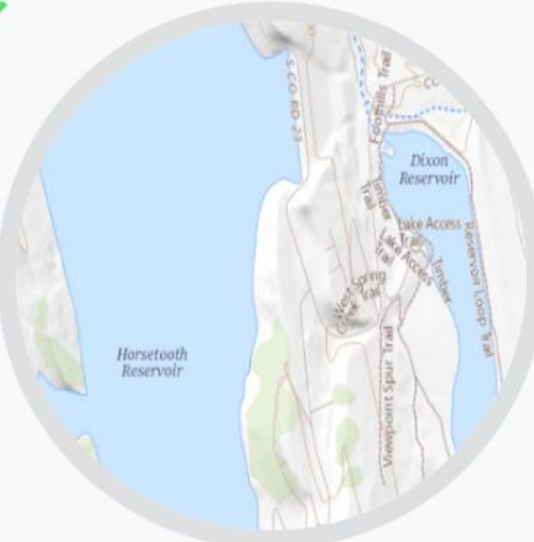
**OGC API - Tiles**  
Interface for tiles of geospatial information (e.g.: vector data, maps or coverages).

Published




**OGC API - Features**  
Interface for feature data.

Published



**OGC SensorThings API**  
Interface for spatially enabled IoT devices, data and applications.





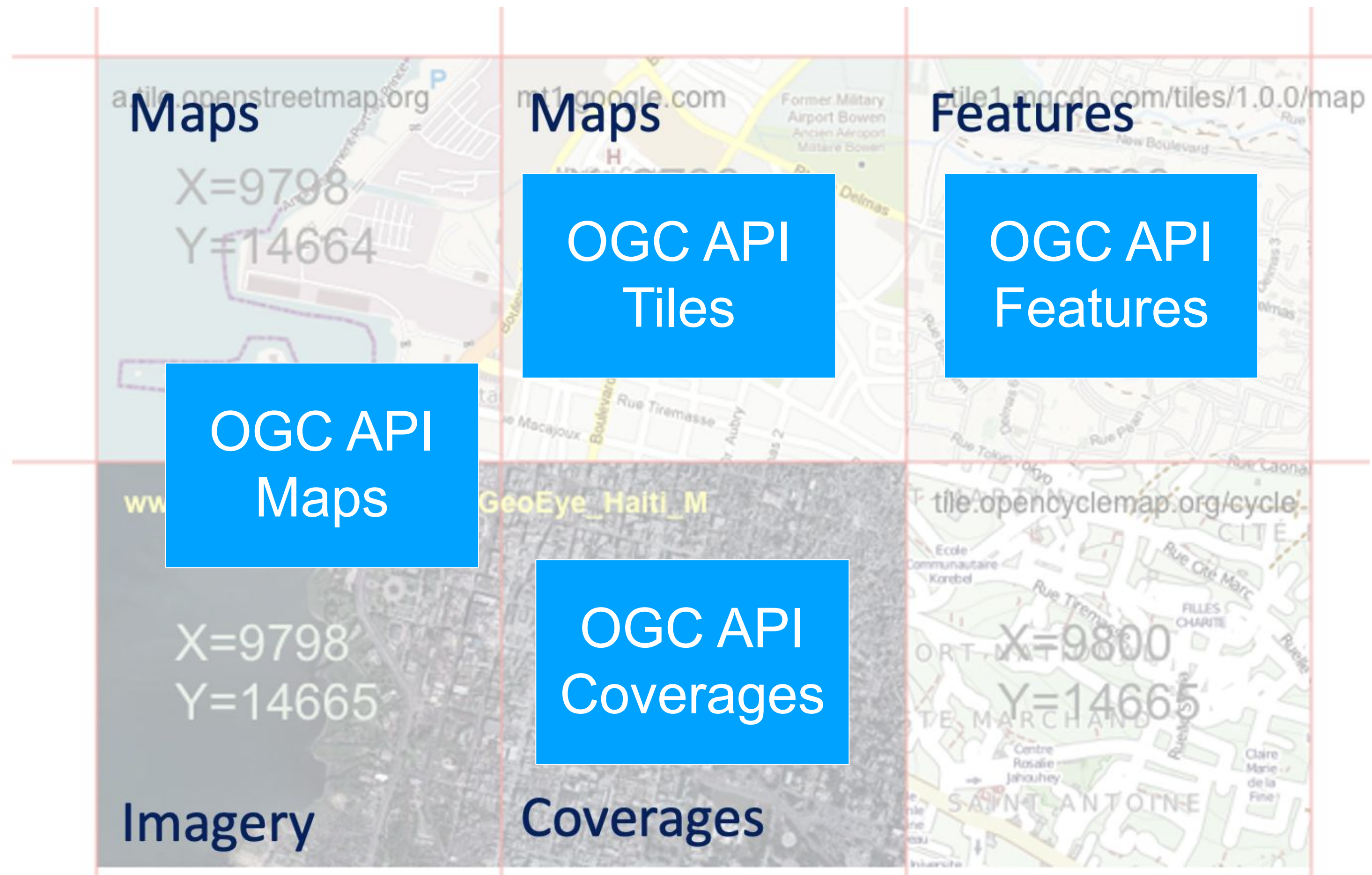
# Improved Developer Experience

**Quicker onboarding for non OGC/GIS experts**





# OWS -> OGC APIs




**Discover via**  
OGC API Records

Multiple Maps with common semantics - Interoperability (Source: Joan Maso)



# There are more OGC APIs than OWS

OGC API –  
Discrete Global Grid Systems



OGC API –  
Records



OGC API - Maps



OGC API - Styles




OGC API –  
Moving Features




OGC API - Tiles



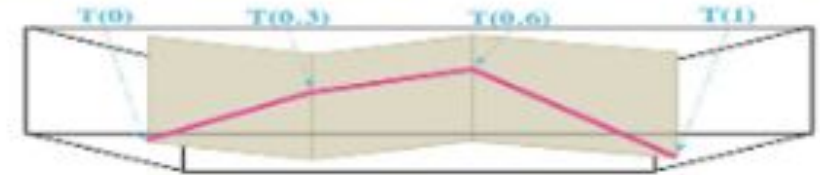
OGC API - Common




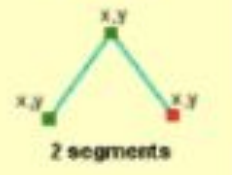
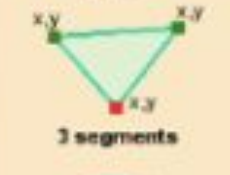
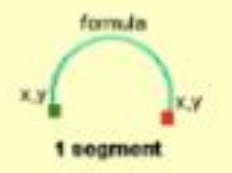

OGC API - Routes



OGC API –  
Environmental Data Retrieval



OGC API - Features

Points	Lines	Polygons
		
		


OGC API - Processes



OGC API – Coverages



OGC API –  
Joins



Green border means approved



# But maybe you need a more custom solution...

User: just want features in WGS 84, but want to query



Features: CQL

Features: CRS

Features: Core

User: need features supporting other CRSs



Features: Transactions

Records

User: I want to find it on my search engine



OGC API - Common

Tiles

User: tile it up and make it work on my phone



Maps

Coverages

User: I am a fire incident commander: give me everything

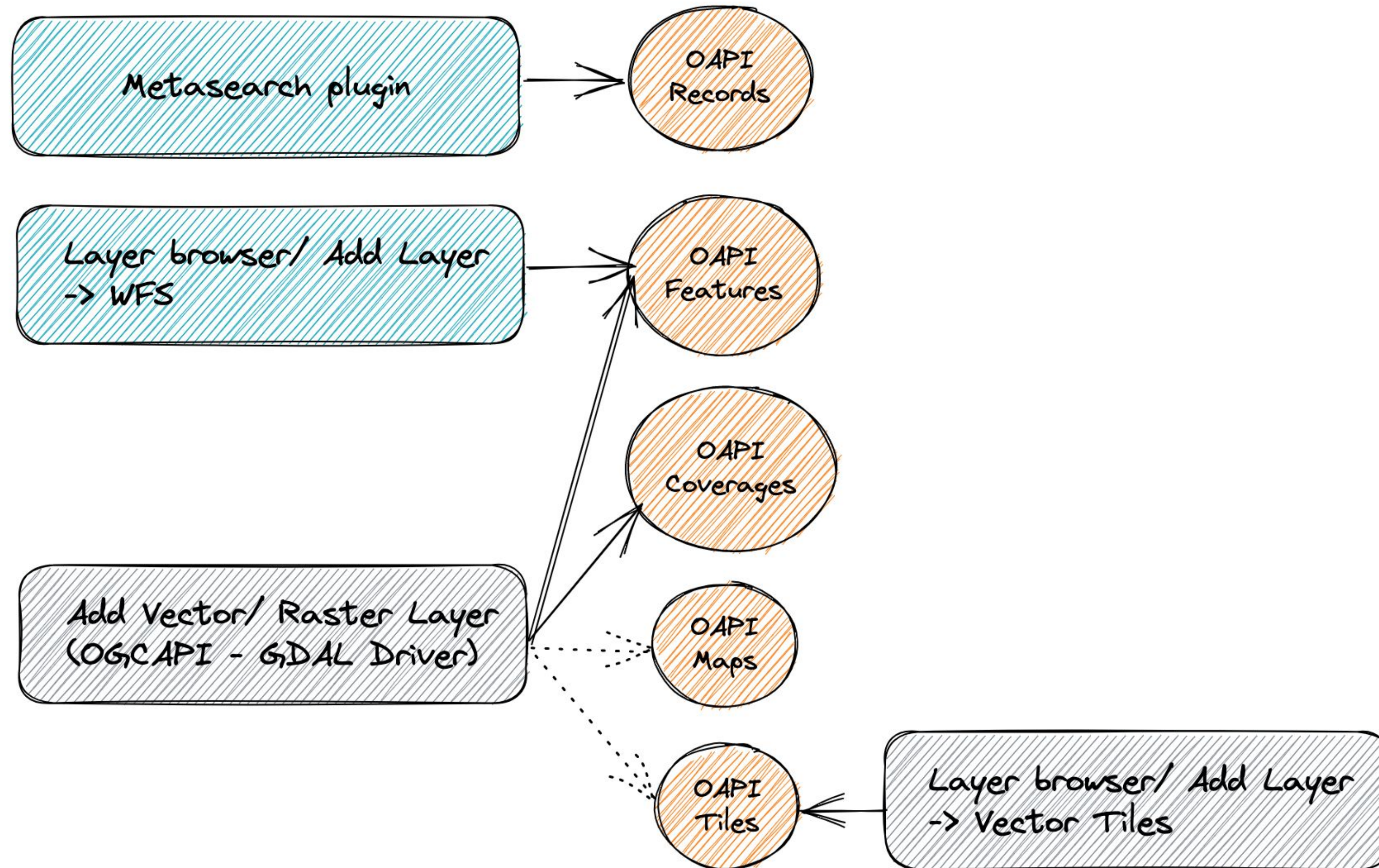


EDR

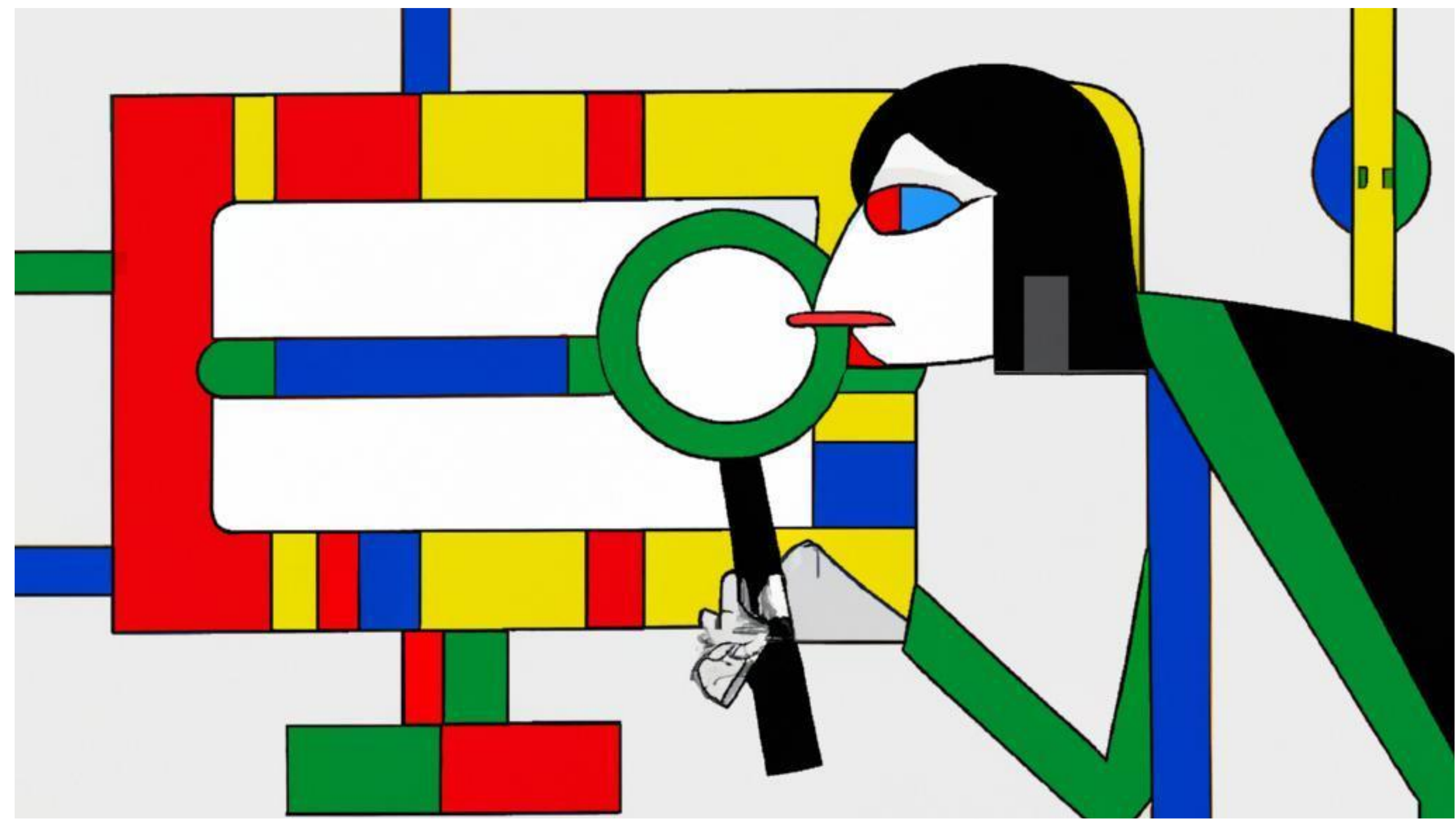
More Info at:  <https://blocks.ogc.org>



# OGC API Support in QGIS Desktop (core)

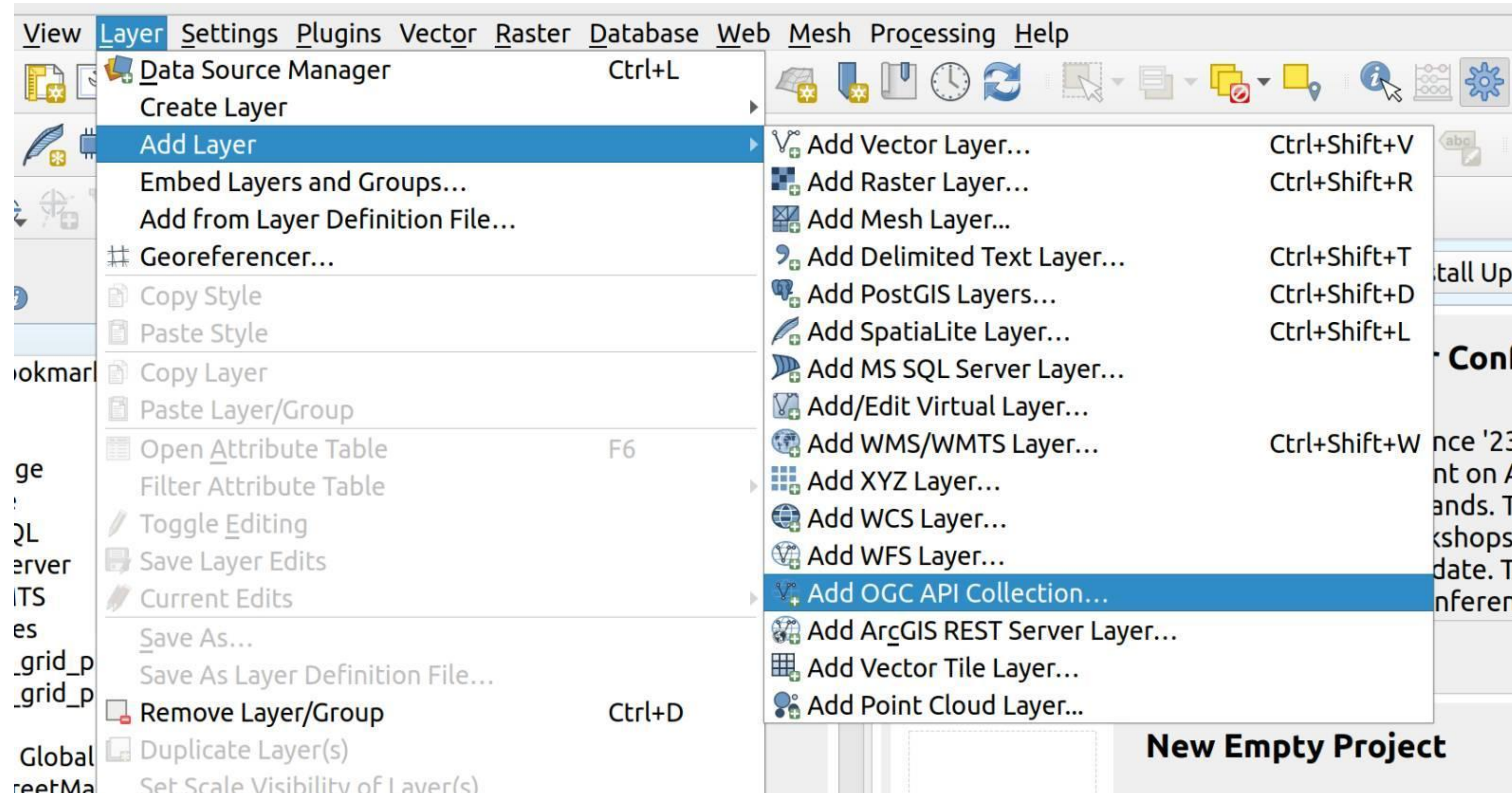






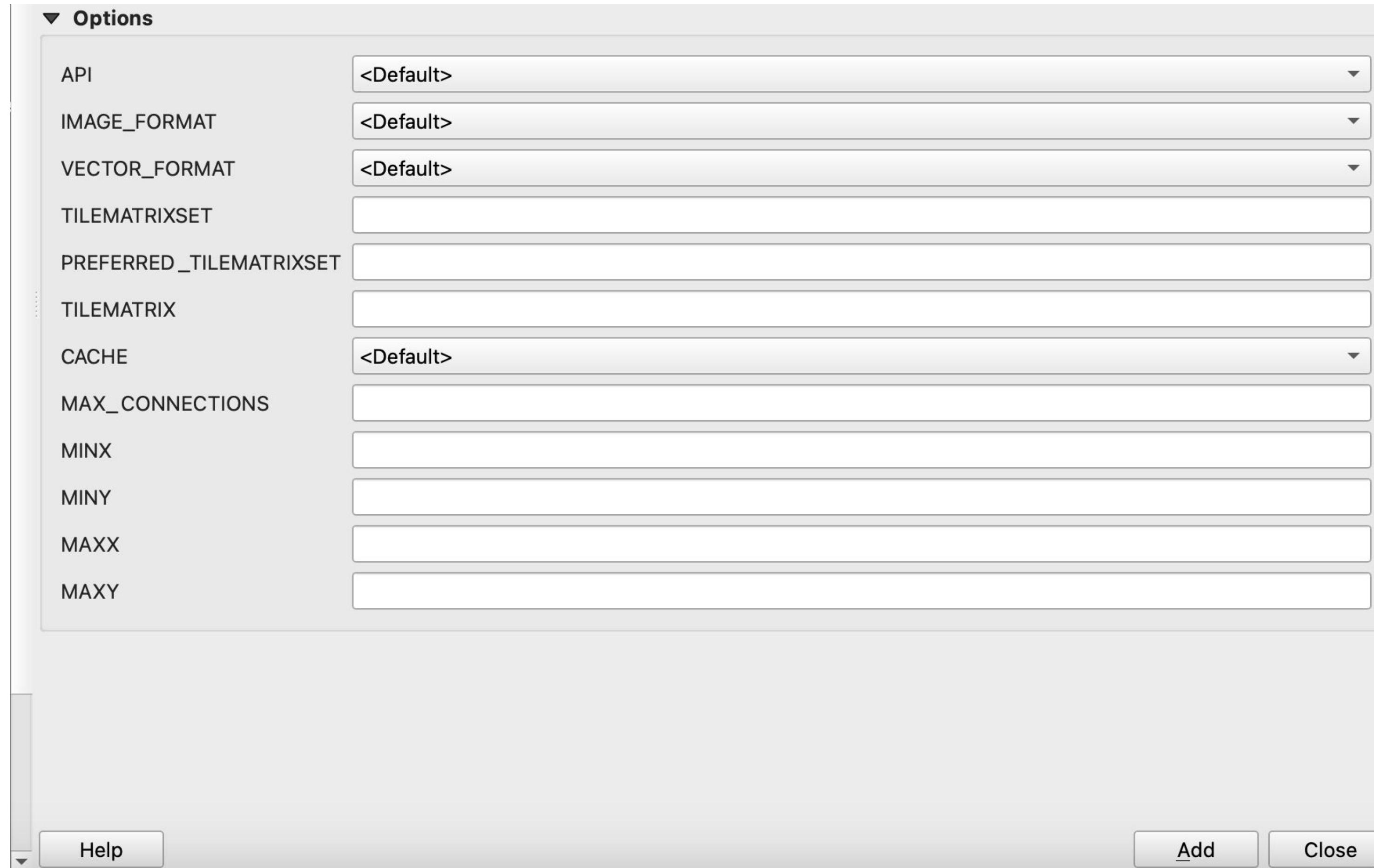


# Proposed Improvements (UI/Documentation):





# Proposed Improvements (UI/Documentation):



The image shows a screenshot of the 'Options' dialog box in QGIS. The dialog is titled 'Options' and has a dropdown arrow next to the title. It contains a list of settings on the left and their corresponding input fields on the right. The settings are:

Setting Name	Input Field
API	<Default> (dropdown)
IMAGE_FORMAT	<Default> (dropdown)
VECTOR_FORMAT	<Default> (dropdown)
TILEMATRIXSET	Text input field
PREFERRED_TILEMATRIXSET	Text input field
TILEMATRIX	Text input field
CACHE	<Default> (dropdown)
MAX_CONNECTIONS	Text input field
MINX	Text input field
MINY	Text input field
MAXX	Text input field
MAXY	Text input field

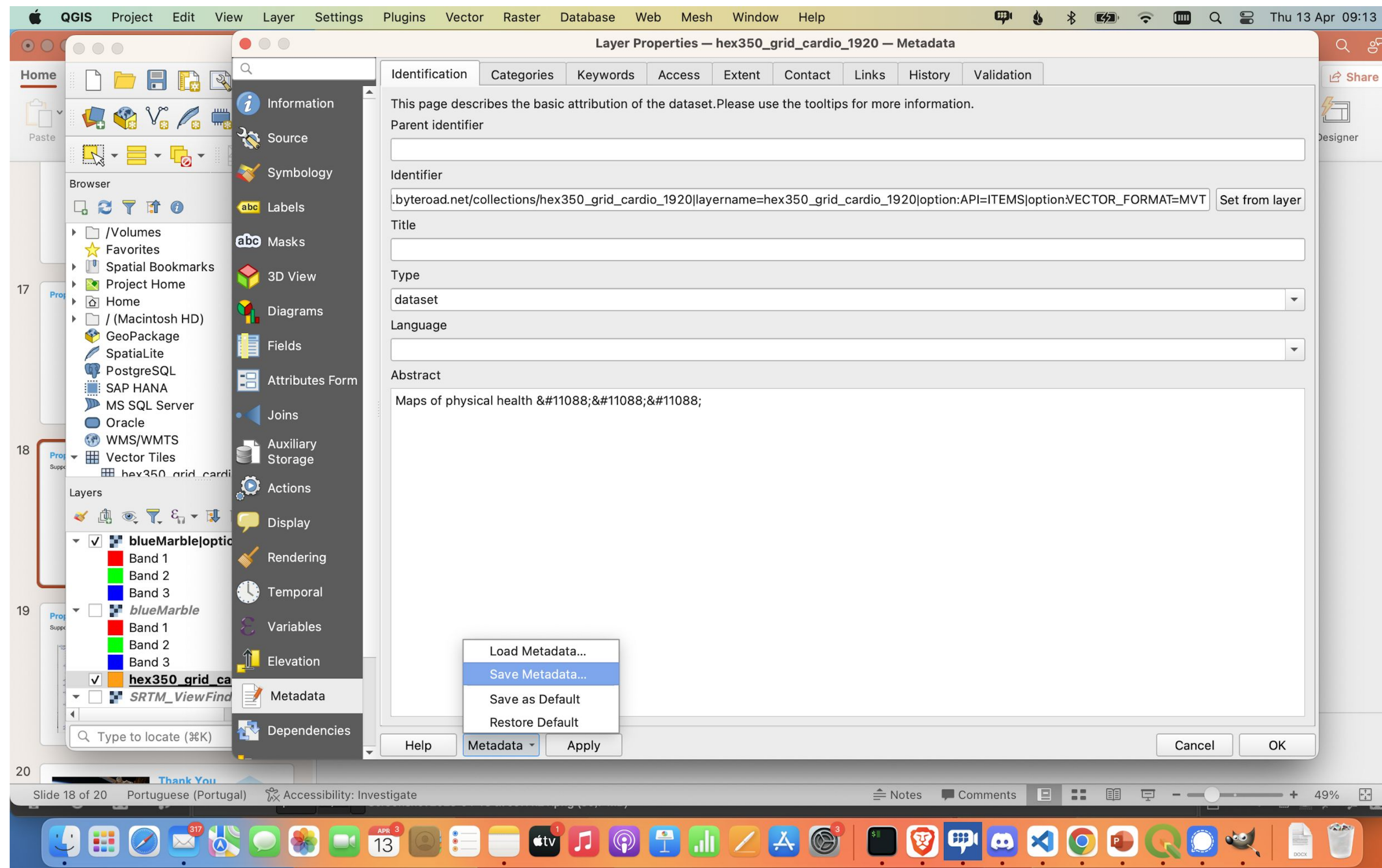
At the bottom of the dialog, there are three buttons: 'Help' on the left, and 'Add' and 'Close' on the right.

Related Issue  <https://github.com/qgis/QGIS/issues/52674>



# Proposed Improvement – metadata:

Support authoring OGC API Records metadata





# Proposed Improvement – metadata:

## QMD (Dublin Core)

```
JSON
├── ResourceMetadata
│   ├── identifier : 1234
│   ├── parentidentifier : "xyz"
│   ├── language : "en-CA"
│   ├── type : "dataset"
│   ├── title : "roads"
│   ├── abstract : "my roads"
│   ├── keywords
│   │   ├── 0
│   │   │   └── keyword : "natural"
│   │   ├── 1
│   │   │   └── keyword
│   │   └── fees : "None"
│   ├── constraints
│   │   └── rights : "Copyright foo 2017"
│   ├── license
│   │   ├── encoding : "utf-8"
│   │   └── crs : "EPSG:4326"
│   ├── extent
│   │   ├── spatial
│   │   │   ├── 0 : ""
│   │   │   └── 1 : ""
│   │   └── temporal
│   └── contact
│       ├── name : "John Smith"
│       ├── organization : "ACME"
│       ├── position : "staff"
│       ├── contactAddress
│       │   ├── voice : "xx.xxx.xxx.xxxx"
│       │   ├── fax : "xx.xxx.xxx.xxxx"
│       │   ├── email : "foo@example.org"
│       │   └── role : "pointOfContact"
│       └── links
│       └── history
```

## OGC API Records

```
JSON
├── recordUpdated : "2023-04-12T06:35:34.671858697Z"
├── recordCreated : "2023-04-12T06:35:34.671858697Z"
├── temporal
│   └── trs : "http://www.opengis.net/def/uom/ISO-8601/0/Gregorian"
├── properties
│   ├── language : "en"
│   ├── formats
│   ├── contactPoint
│   │   └── institution : " University of Cambridge"
│   ├── keywords
│   │   ├── 0 : "Urban Health"
│   │   ├── 1 : " Health Outcomes"
│   │   ├── 2 : "Physical Health"
│   │   ├── 3 : " Urban Health Mapping"
│   │   ├── 4 : " Inner London"
│   │   └── 5 : ""
│   ├── associations
│   │   ├── type : "Feature"
│   │   ├── description : "The mapping results of urban health outcomes (Prevalence rates of cardiovascular diseases) in 350m hexagonal grids of Inner London"
│   │   ├── created : "2023-04-12T06:35:34.671858697Z"
│   │   ├── title : "Prevalence rates of cardiovascular diseases in London"
│   │   ├── publisher : "eMOTIONAL Cities"
│   │   └── updated : "2023-04-12T06:35:34.671858697Z"
│   ├── themes
│   │   └── id : "382df6ef-a0c6-4794-8660-cfb1fddefd4f"
│   ├── extent
│   │   ├── spatial
│   │   │   └── bbox
│   │   │       └── crs : "http://www.opengis.net/def/crs/OGC/1.3/CRS84"
│   │   └── @version : "1"
│   └── @timestamp : "2023-04-12T06:35:34.671858697Z"
├── tags
├── geometry
│   └── id : "382df6ef-a0c6-4794-8660-cfb1fddefd4f"
└── links
```

Alternative approach:  <https://github.com/geopython/pygeometa/issues/150>



# Feedback

- Are these developments interesting?
- Does anyone want to join?
- Other ideas?





# OGC/OSGeo Collaboration

... provides OSGeo with an organizational membership in OGC  
... allows OSGeo participants to represent their priorities in the development of OGC Standards and supporting documents and services.



## Associate membership

- Charter Members
- No limit on number of participating members!
- Participation in SWGs, DWGs
- Participation in pilots, testbeds (funding)

OSGeo wiki:  [https://wiki.osgeo.org/wiki/Standards\\_Committee](https://wiki.osgeo.org/wiki/Standards_Committee)

Standards mailing list:  <https://lists.osgeo.org/mailman/listinfo/standards>



Organised by:



Open  
Geospatial  
Consortium



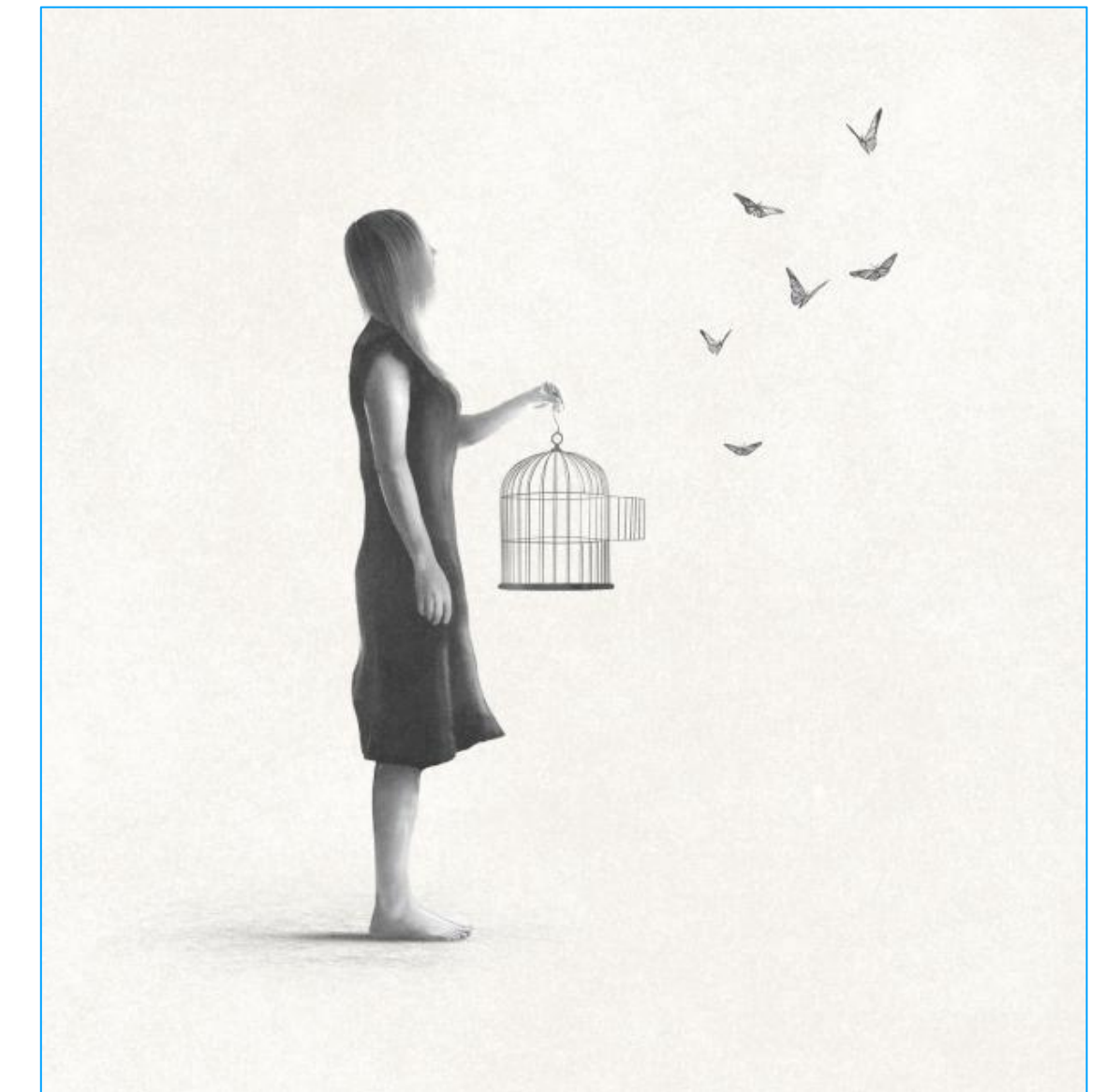
Hosted by:



Open Standards and Open Source Software

*2023 Joint OGC-ASF-OSGeo Code Sprint*

*April 25 to 27*



This code sprint will take place at Camptocamp's offices (near Lausanne, Switzerland) and on the OGC's Discord events server.

Register at <https://developer.ogc.org/sprints/20/>



# Announcing the next Code Sprint: June, 12-14

**JUNE, 12-14 2023** [ABOUT](#) [TRACKS](#) [SPEAKERS](#) [FAQ](#) Fork me on GitHub

## TILING INTERFACES CODE SPRINT

🔌 *Featuring OGC API - Tiles, Maps, NSG & DGIWG WMTS profiles and more*

[TELL ME MORE](#) [REGISTER](#)

Call for Sponsors

This code sprint will take place at the Moonshot Labs (St. Louis, MO, US) and on the OGC's Discord events server.

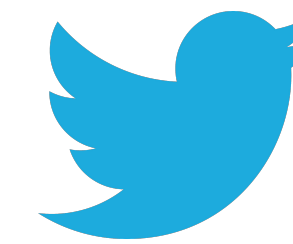
Register at <https://developer.ogc.org/sprints/21/>



# Thank You for Listening! ❤️



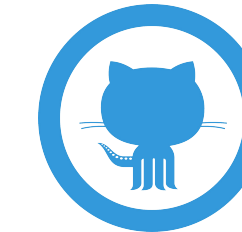
jsimoes@ogc.org



@doublebyte



joanasimoes



@doublebyte1



<https://dev.to/doublebyte>



<https://community.ops.io/doublebyte>