

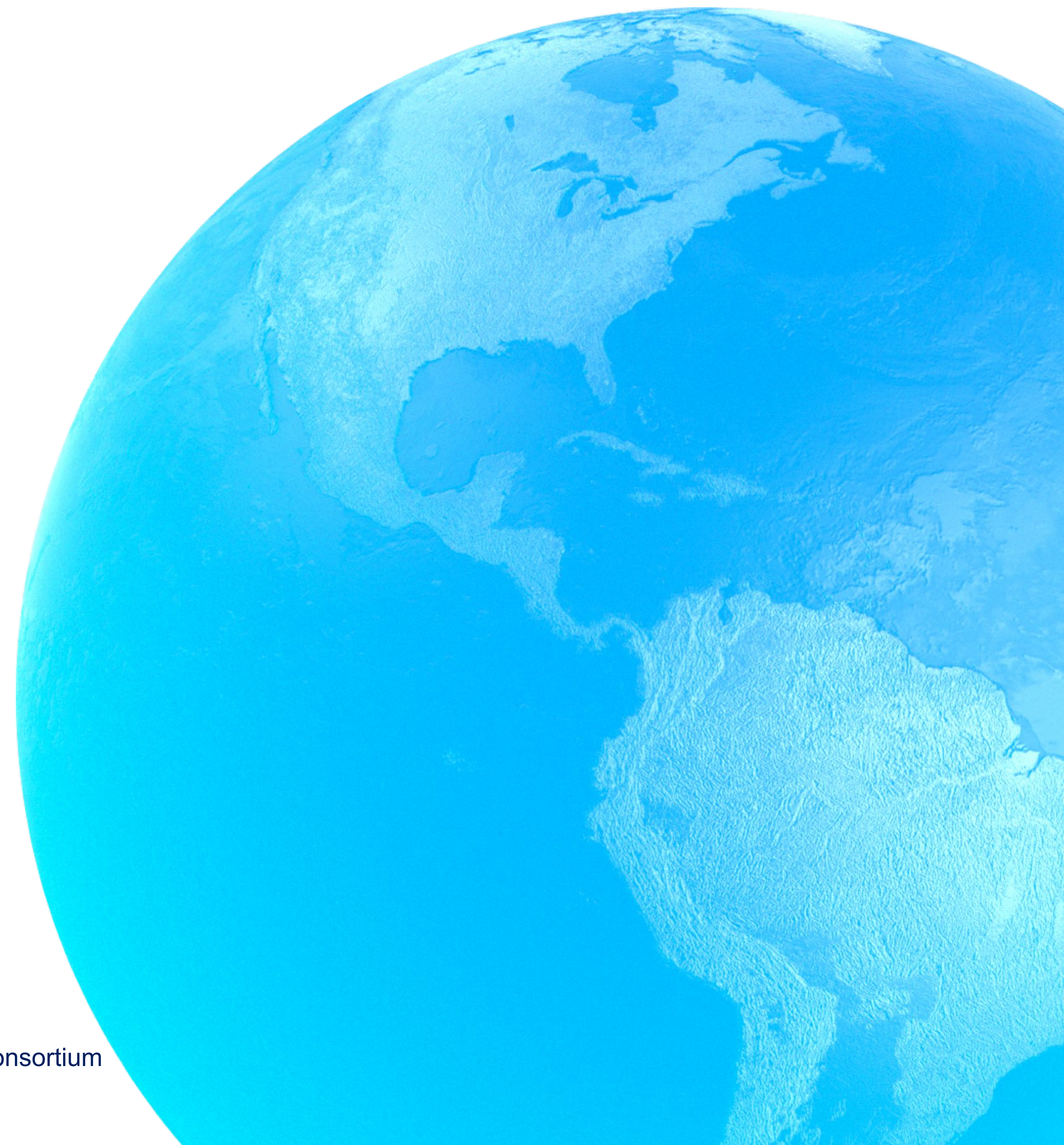


Open
Geospatial
Consortium

OGC API

Past, Present, and Towards an
Exciting Future 🚀

2022-12-28



Workshop Overview

1. Introduction & Background
2. Overview of OGC APIs
3. Related concepts
4. Continuing the journey

About Me



Dr. Joana Simoes
Developer Relations (OGC)

- Data Engineer & Data Scientist.
- PhD in GIS, University College of London.
- +15 years experience in SMEs, academia, a start-up and an international organization (FAO).
- Contributor to FOSS projects.
- OSGeo charter member.



Open
Geospatial
Consortium



OSGeo

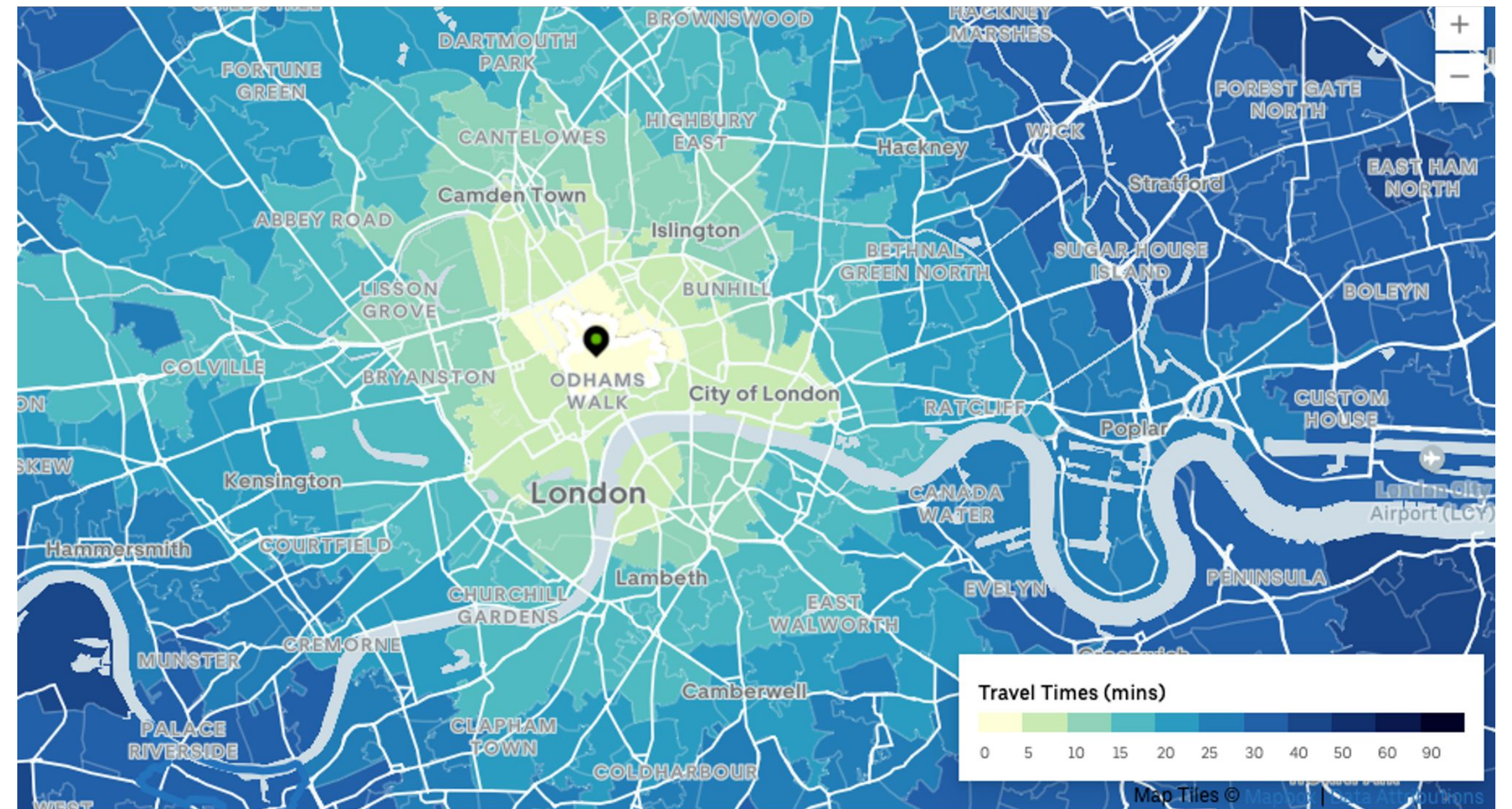
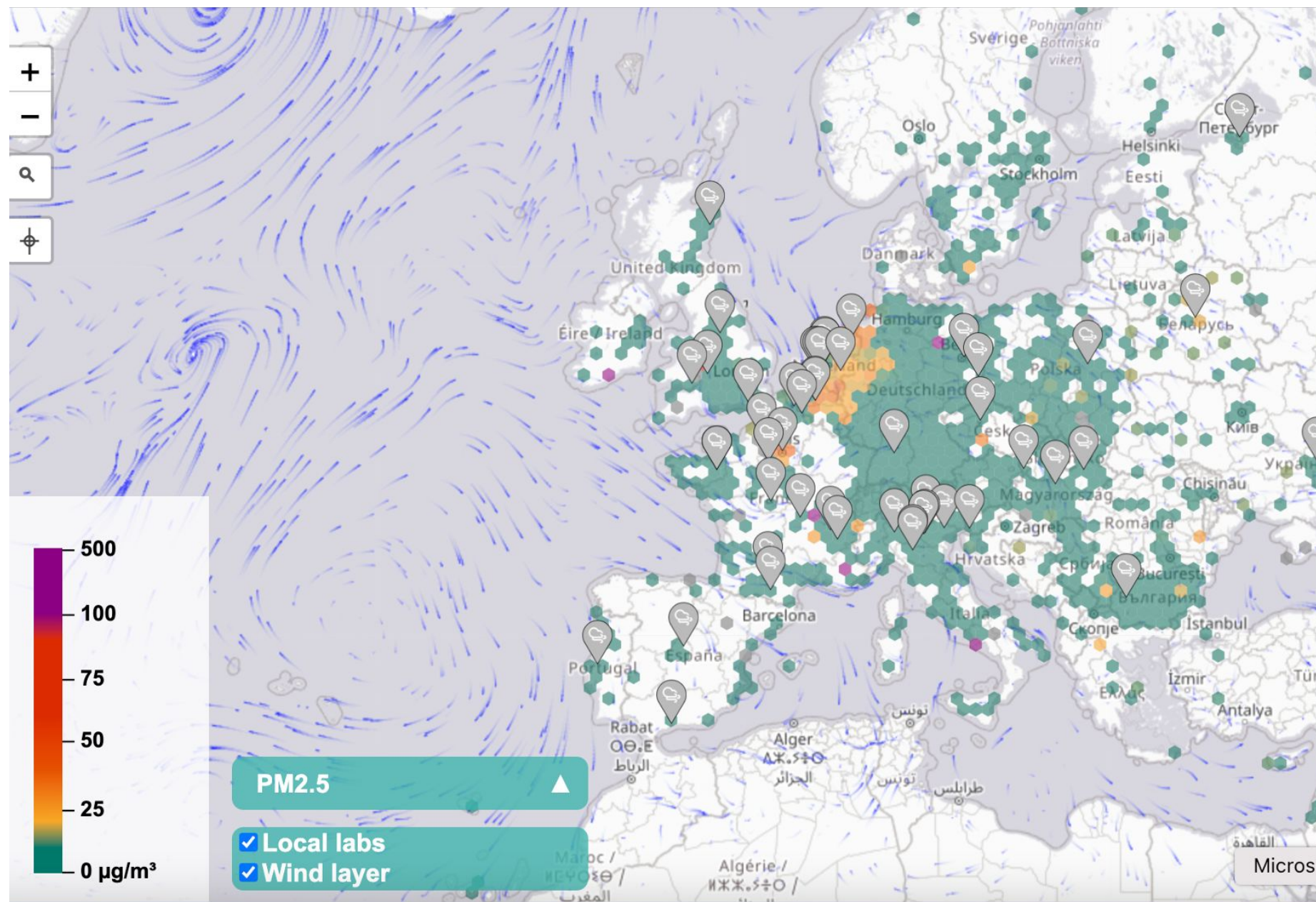


pygeoapi

QGIS



Motivation



Current values of sensors measuring air quality. Source: <https://maps.sensor.community/#2/0.0/0.0>

Travel times across London. Source: <https://movement.uber.com/>

Why using standards for sharing geospatial information?

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

FAIR DATA PRINCIPLES



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

Some advantages of adopting OGC Standards

- 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).
- More data access, less coding.



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

What is an OGC Standard?

- A document, established by consensus and approved by the OGC Membership, that provides rules and guidelines, aimed at the optimum degree of interoperability in a given context.

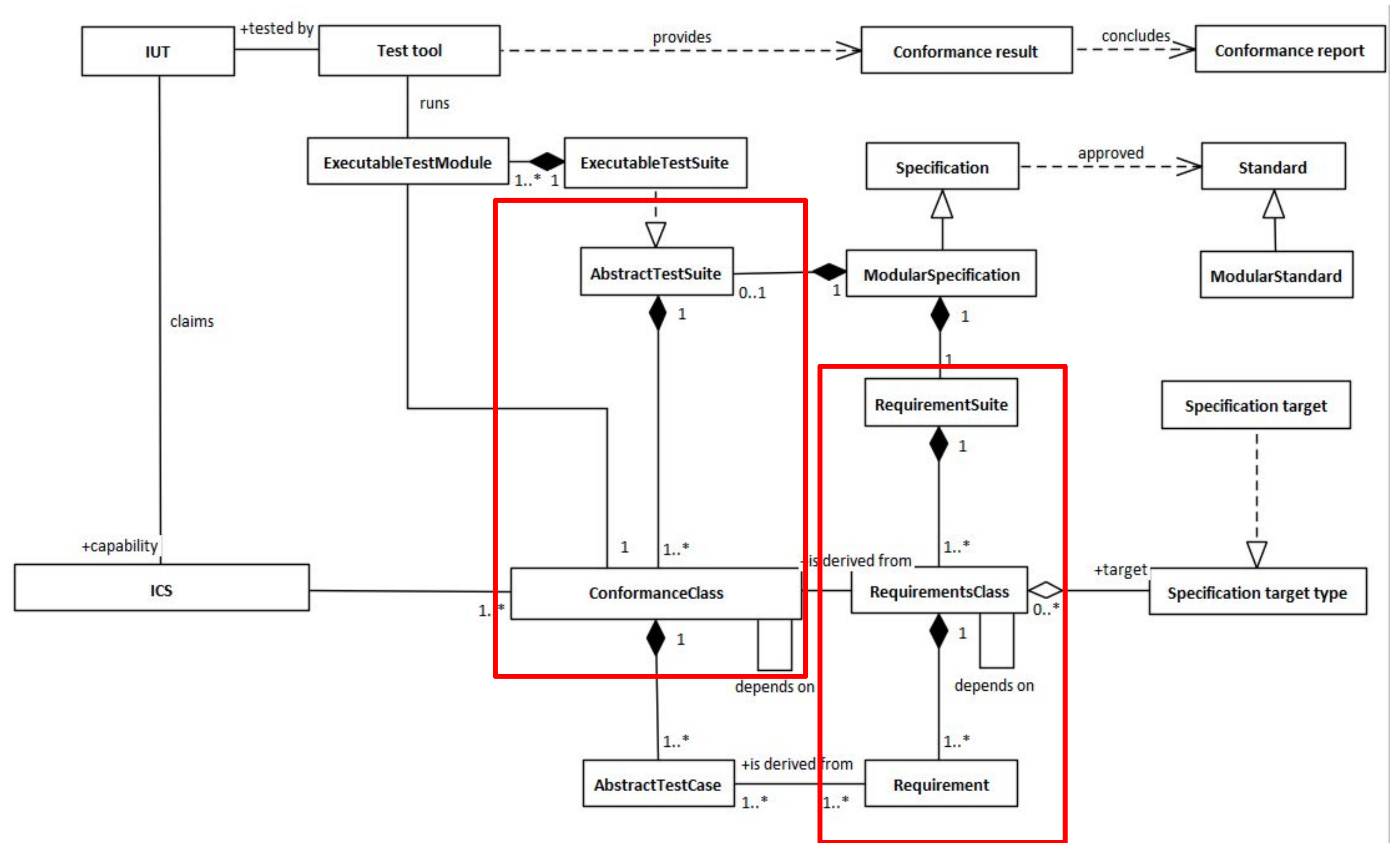


Photo taken March 2018

What's in an OGC Standard?

Specification Elements

- Requirements Classes
- Requirements
- Conformance Classes
- Conformance Tests



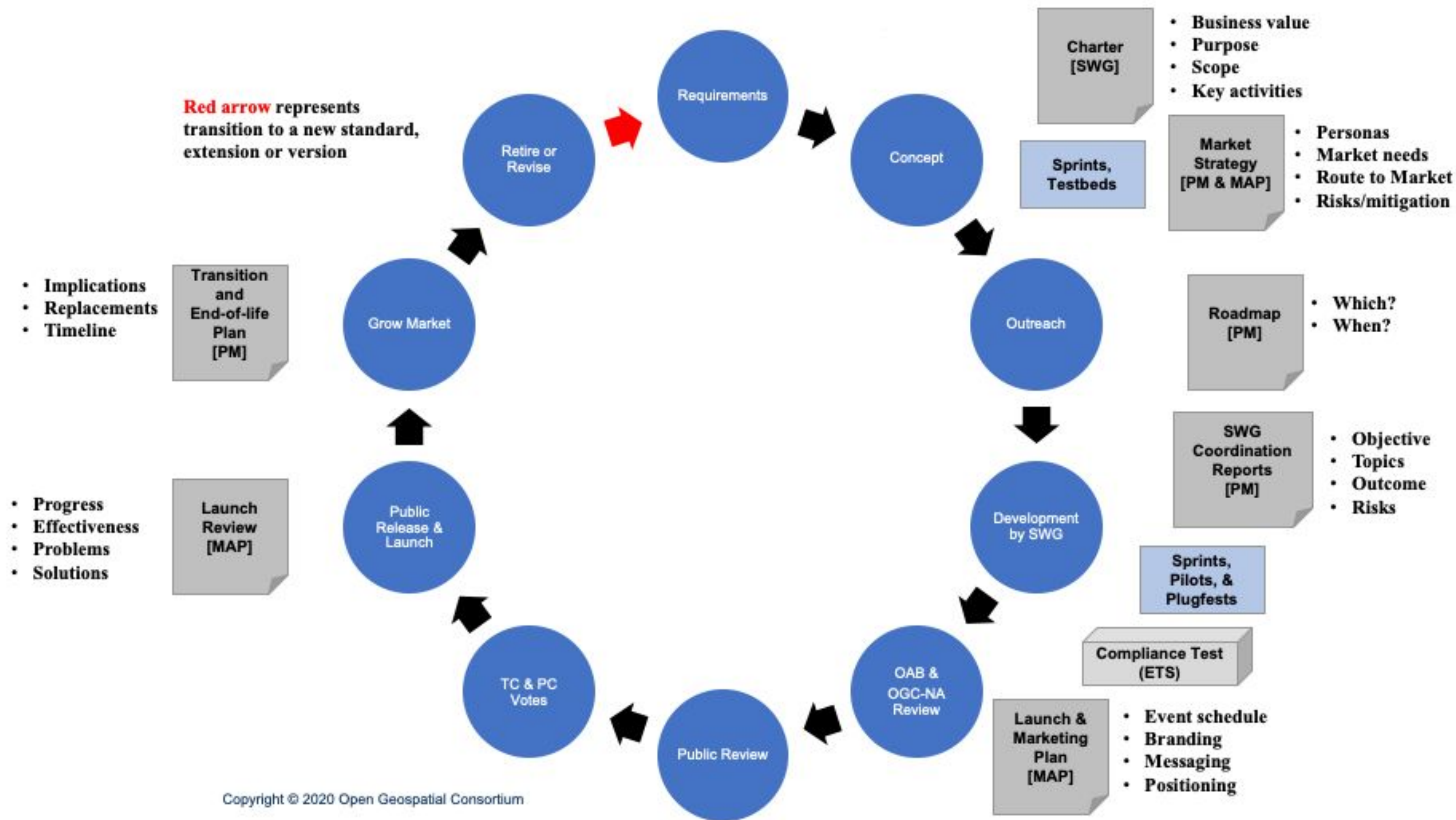
Example Specification Elements

Taken from OGC API – Features – Part 1: Core

Requirement 10	/req/core/crs84
A	Unless the client explicitly requests a different coordinate reference system, all spatial geometries SHALL be in the coordinate reference system http://www.opengis.net/def/crs/OGC/1.3/CRS84 (WGS 84 longitude/latitude) for geometries without height information and http://www.opengis.net/def/crs/OGC/0/CRS84h (WGS 84 longitude/latitude plus ellipsoidal height) for geometries with height information.

Abstract Test 2	/ats/core/crs84
Test Purpose	Validate that all spatial geometries provided through the API are in the CRS84 spatial reference system unless otherwise requested by the client.
Requirement	/req/core/crs84
Test Method	<ol style="list-style-type: none">1. Do not specify a coordinate reference system in any request. All spatial data should be in the CRS84 reference system.2. Validate retrieved spatial data using the CRS84 reference system.

OGC Product Lifecycle



Stage in the Lifecycle

The image displays a software interface for managing the lifecycle of OGC API specifications, organized into four columns representing different stages. A central vertical bar indicates the current stage is 'OPL: OAB & OGC-NA Review'.

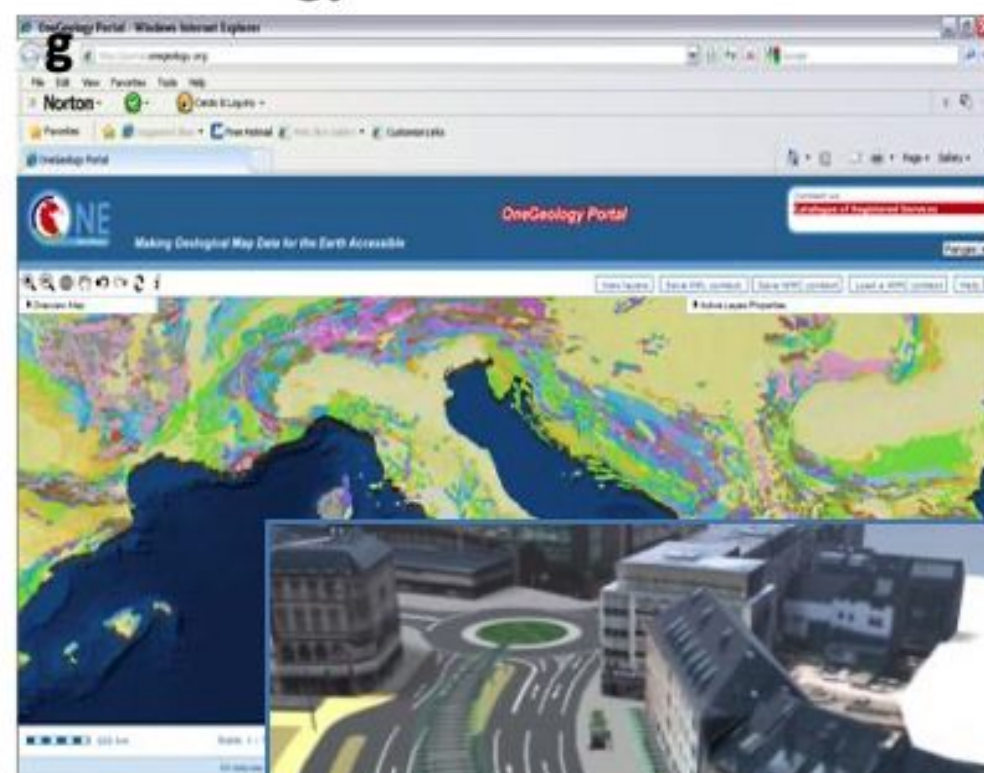
- OPL: Development by SWG (7 items):**
 - OGC API - Coverages - Part 1: Core (#46)
 - OGC API - Maps - Part 1: Core (#47)
 - OGC API - Records - Part 1: Core (#50)
 - OGC API - Features - Part 4: Create, Replace, Update and Delete (#58)
 - OGC API - Styles - Part 1: Core (#49)
 - OGC API - Discrete Global Grid Systems (#118)
 - OGC API - Moving Features (#132)
- OPL: Public Review (4 items):**
 - OGC API - Features - Part 3: Filtering (#57)
 - OGC API - Common - Part 2: GeoData (#52)
 - OGC API - Tiles - Part 1: Core (#48)
 - OGC API - Routes - Part 1: Core (#92)
- OPL: TC & PC Votes (1 item):**
 - OGC API - Common - Part 1: Core (#51)
- Public Release & Launch (4 items):**
 - OGC API - Features - Part 1: Core (#45)
 - OGC API - Features - Part 2: CRS by Reference (#42)
 - OGC API - Environmental Data Retrieval (#43)
 - OGC API - Processes - Part 1: Core (#44)

Millions of Geospatial Datasets on >200K Servers

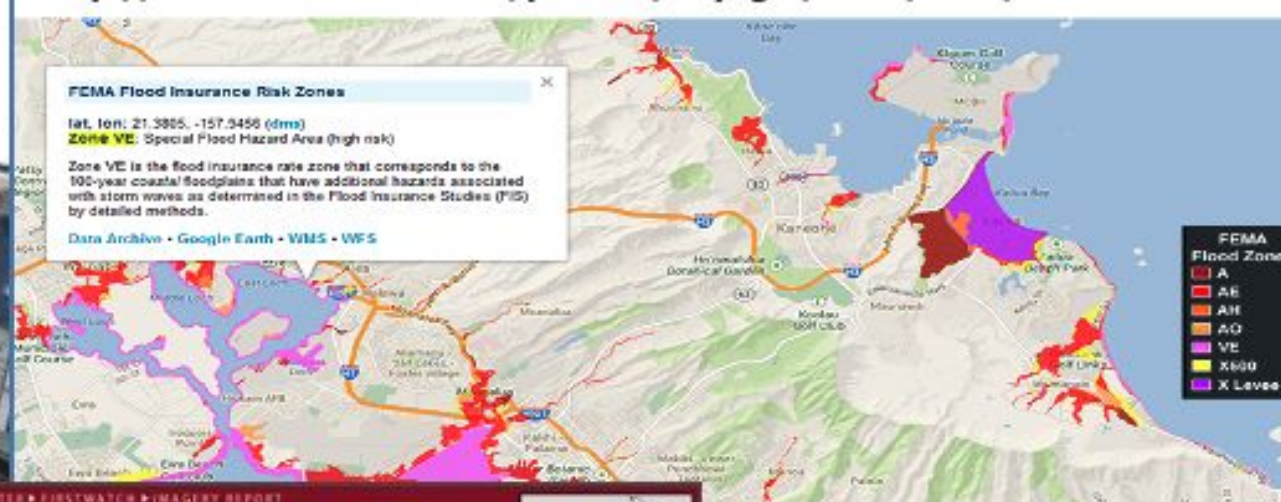
OGC Web Services (OWS)
Web Map Service (WMS)
Web Map Tile Service (WMTS)
Web Feature Service (WFS)
Web Coverage Service (WCS)

OpenI0OS.Org

OneGeology.Or



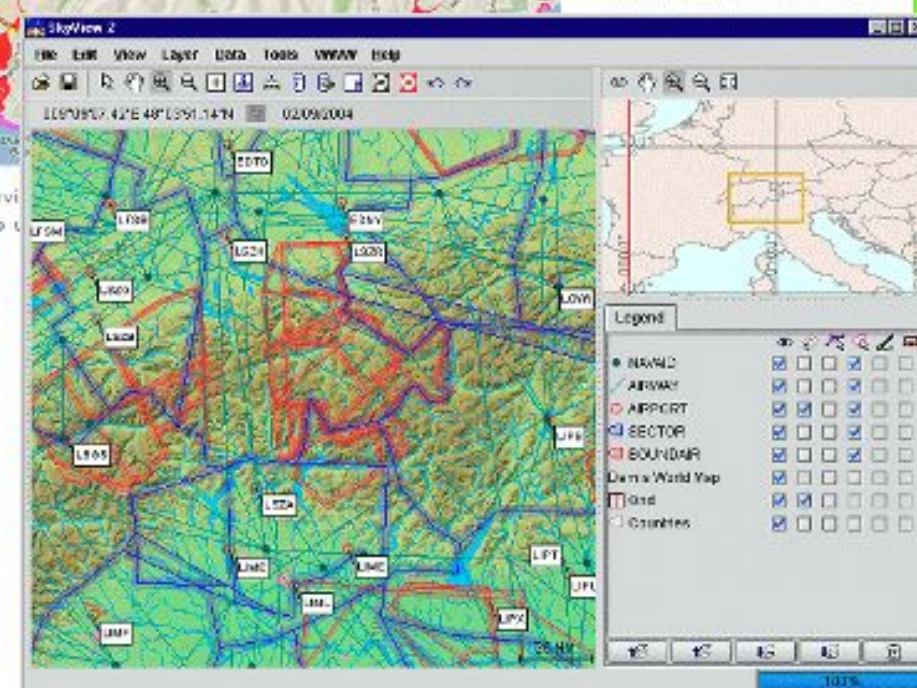
<http://oos.soest.hawaii.edu/pacioos/voyager/news/2013/>



**Emergency /
Disaster
Management**

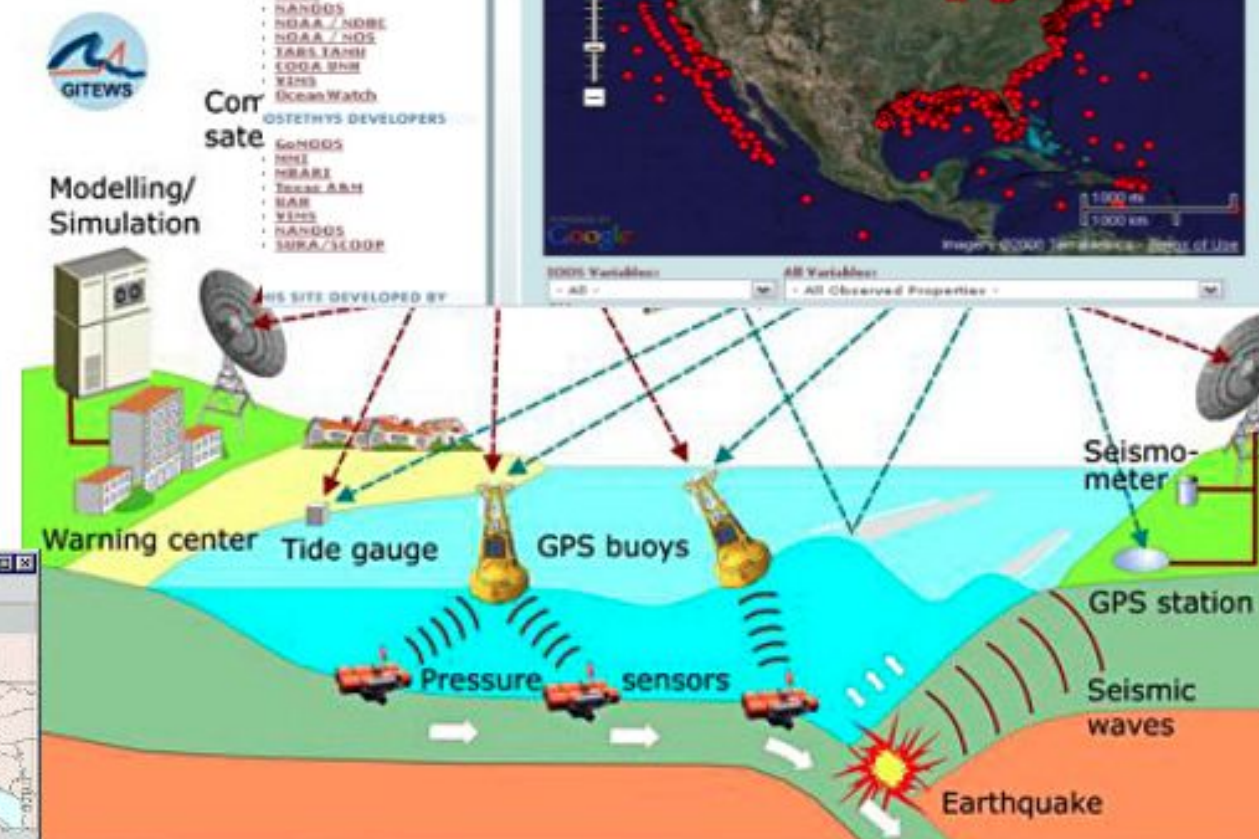


DigitalGlobe

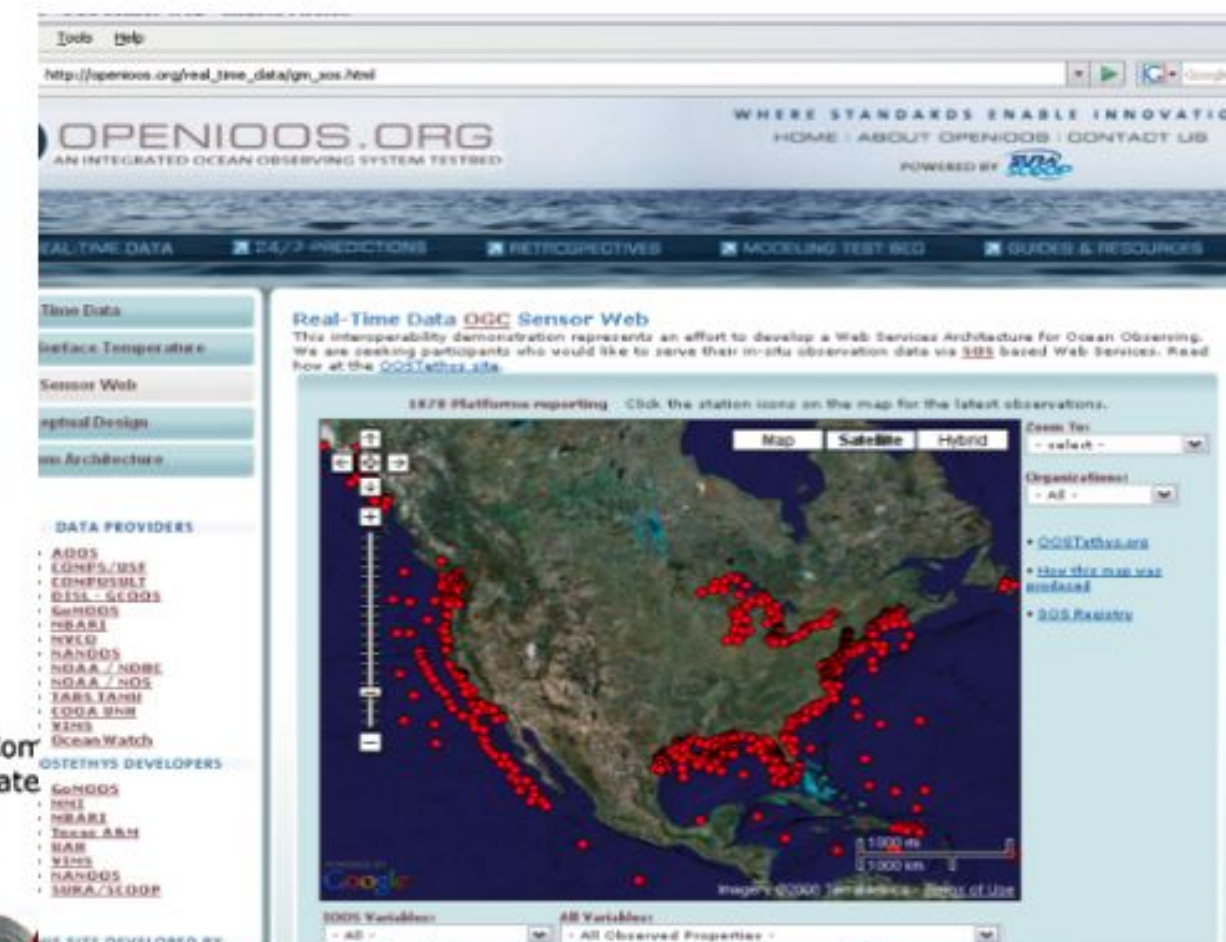


Aviation Flight Information / Safety

Eurocontrol



Meteorology, Hydrology, Ocean Monitoring

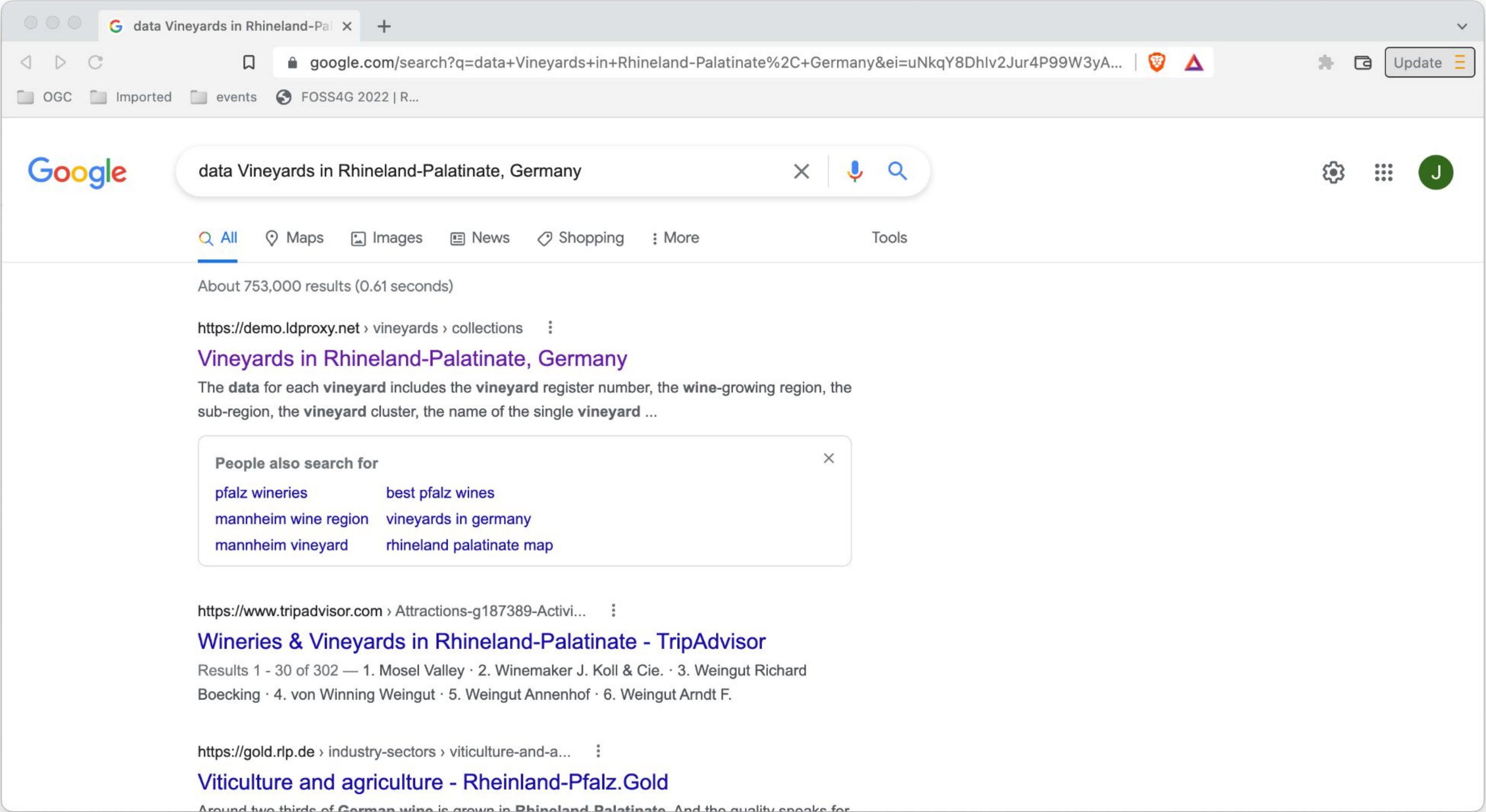


Background: Legacy OGC Web Services (OWS)

	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

Source: OGC 15-052r1r1

What do users expect now?



What do users expect now?

1. Enter search criteria for the data using a browser and search engine
2. Browse through the first results and check, if one of them seems to provide the desired data or refers to it
3. Browse through the data to determine, if it really has the information you are looking for, is available in a format that you can handle and that is has a license that suits your needs
4. Download the dataset or study the online API documentation and examples for accessing the data
5. Use the data/API in your application

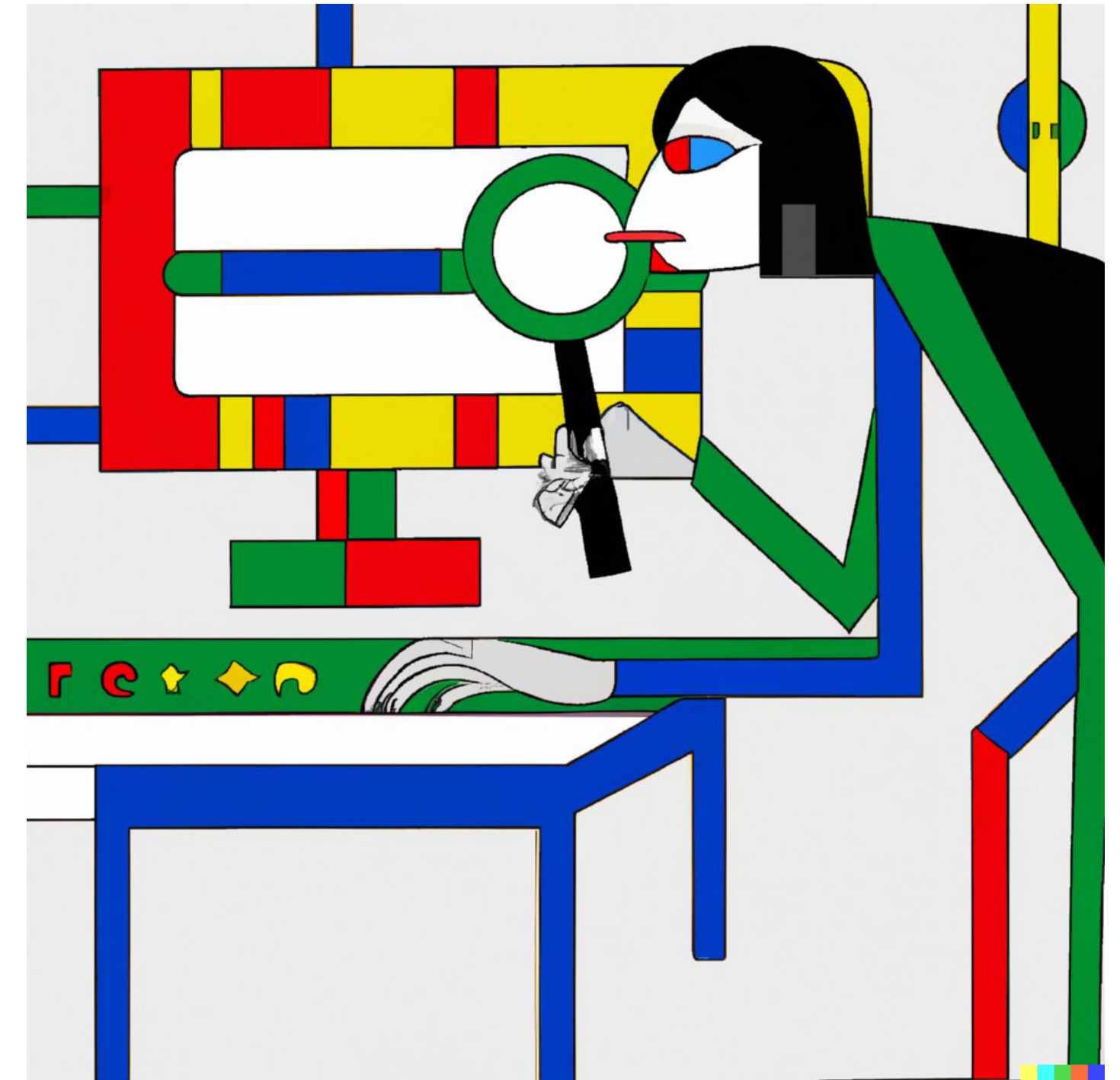


Image generated with DALL.E 2 :<https://openai.com/dall-e-2/>

Follow the rules of the Web architecture

- Web browsers
- HTTP / HTTPS
- Web linking
- Delegation to applications via media types
- Search engines
- Schema.org, OpenAPI and other generally understood metadata



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

Modern Web APIs

APIs are a popular, effective method for rapid software development.

There is an increasing need for interoperability between Web APIs.



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

ogcapi.org

The screenshot shows the website's header with the Open Geospatial Consortium logo and a navigation menu containing: CONTEXT, APIS, SPRINTS, VIDEOS, BLOGS, DOCUMENTS, and GET IN TOUCH. The main banner features the text "OGC APIs | Building Blocks for Location" and a "Watch the Overview Video" button. Below the banner, the word "CONTEXT" is displayed in large, bold letters, followed by a paragraph of introductory text.

OGC APIs | Building Blocks for Location

[Watch the Overview Video](#)

CONTEXT

The OGC API family of standards are being developed to make it easy for anyone to provide geospatial data to the web. These standards build upon the legacy of the OGC Web Service standards (WMS, WFS, WCS, WPS, etc.), but define resource-centric APIs that take advantage of modern web

OGC APIs

Built on modern web development practices

- Resource oriented architecture.
- http methods, status codes, errors.
- Content negotiation.
- Recommended encodings: JSON, HTML.
- schema.org annotations.



Open
Geospatial
Consortium

Improved Developer Experience

Quicker onboarding for non OGC/GIS experts.



W3C/OGC Spatial Data on the Web Best Practices

W3C Working Group Note

TABLE OF CONTENTS

- 1. **Introduction**
- 2. **Audience**
- 3. **Scope**
 - 3.1 Spatial data
 - 3.2 Data publication
 - 3.3 Best practice criteria
 - 3.4 Privacy considerations
- 4. **Best Practices Summary**
- 5. **Namespaces**
 - 5.1 General remarks
 - 5.2 RDF Namespaces
 - 5.3 XML Namespaces
- 6. **Spatial Things, Features and Geometry**
- 7. **Coverages: describing properties that vary with location (and time)**
- 8. **Spatial relations**
- 9. **Coordinate Reference Systems (CRS)**
- 10. **Linked Data**
- 11. **Why are traditional Spatial Data Infrastructures not enough?**
- 12. **The Best Practices**
 - 12.1 Web principles for spatial data
 - 12.1.1 Spatial data identifiers
 - 12.1.2 Indexable data
 - 12.1.3 Linking data
 - 12.2 Spatial data
 - 12.2.1 Spatial data encoding
 - 12.2.2 Geometries and coordinate reference systems
 - 12.2.3 Relative positioning
 - 12.2.4 Spatial links
 - 12.2.5 Spatial data versioning
 - 12.3 Spatial data access
 - 12.4 Spatial metadata

Spatial Data on the Web Best Practices

W3C Working Group Note 28 September 2017



This version:
<https://www.w3.org/TR/2017/NOTE-sdw-bp-20170928/>

Latest published version:
<https://www.w3.org/TR/sdw-bp/>

Latest editor's draft:
<https://w3c.github.io/sdw/bp/>

Previous version:
<https://www.w3.org/TR/2017/NOTE-sdw-bp-20170511/>

Editors:
Jeremy Tandy, [Met Office](#)
Linda van den Brink, [Geonovum](#)
Payam Barnaghi, [University of Surrey](#)

Contributors:
Phil Archer
Jon Blower
Newton Calegari
Byron Cochrane
Simon Cox
François Daoust
Andreas Harth
Bart van Leeuwen
Josh Lieberman
Chris Little
Andy Mabbett
Peter Parslow
Ed Parsons
Andrea Perego
Clemens Portele
Bill Roberts
Lars G. Svensson
Kerry Taylor
Erik Wilde
Rob Atkinson

OGC Document Number:
OGC 15-107

Copyright © 2017 OGC & W3C® (MIT, ERCIM, Keio, Beihang), W3C liability, trademark and document use rules apply.

W3C Data on the Web Best Practices

W3C Recommendation

TABLE OF CONTENTS

- 1. Introduction
- 2. Audience
- 3. Scope
- 4. Context
- 5. Namespaces
- 6. Best Practices Template
- 7. Best Practices Summary
- 8. The Best Practices
 - 8.1 Running Example
 - 8.2 Metadata
 - 8.3 Data Licenses
 - 8.4 Data Provenance
 - 8.5 Data Quality
 - 8.6 Data Versioning
 - 8.7 Data Identifiers
 - 8.8 Data Formats
 - 8.9 Data Vocabularies
 - 8.10 Data Access
 - 8.10.1 Data Access APIs
 - 8.11 Data Preservation
 - 8.12 Feedback
 - 8.13 Data Enrichment
 - 8.14 Republication
- 9. Glossary
- 10. Data on the Web Challenges
- 11. Best Practices Benefits
- 12. Use Cases Requirements x Best Practices

Data on the Web Best Practices

W3C Recommendation 31 January 2017



This version:

<https://www.w3.org/TR/2017/REC-dwbp-20170131/>

Latest published version:

<https://www.w3.org/TR/dwbp/>

Latest editor's draft:

<http://w3c.github.io/dwbp/bp.html>

Implementation report:

<http://w3c.github.io/dwbp/dwbp-implementation-report.html>

Previous version:

<https://www.w3.org/TR/2016/PR-dwbp-20161215/>

Editors:

- [Bernadette Farias Lóscio, CIn - UFPE, Brazil](#)
- [Caroline Burle, NIC.br, Brazil](#)
- [Newton Calegari, NIC.br, Brazil](#)

Contributors:

- Annette Greiner
- Antoine Isaac
- Carlos Iglesias
- Carlos Laufer
- Christophe Guéret
- Deirdre Lee
- Doug Schepers
- Eric G. Stephan
- Eric Kauz
- Ghislain A. Ateazing
- Hadley Beeman
- Ig Ibert Bittencourt
- João Paulo Almeida
- Makx Dekkers
- Peter Winstanley
- Phil Archer
- Riccardo Albertoni
- Sumit Purohit
- Yasodara Córdova

OGC White Paper on Open Geospatial APIs

Open Geospatial Consortium

OGC Document 16-019r4

External identifier of this OGC® document: <http://www.opengis.net/doc/WP/api-whitepaper>

URL for this OGC® document: <http://docs.opengeospatial.org/wp/16-019r4/16-019r4.html>

Internal reference number of this OGC® document: OGC 16-019r4

Category: OGC® White Paper

Editor: George Percivall

Previous Version: https://portal.opengeospatial.org/files/?artifact_id=71743

Publication Date: 2017-02-23

Approval Date: 2017-02-13

Submission Date: 2016-11-16

OGC® Open Geospatial APIs - White Paper

Copyright notice

Copyright © 2016-2017 Open Geospatial Consortium.

To obtain additional rights of use, visit <http://www.opengeospatial.org/legal/>

Warning

This document is not an OGC Standard. This document is an OGC White Paper and is therefore not an official position of the OGC membership. It is distributed for review and comment. It is subject to change without notice and may not be referred to as an OGC Standard. Further, an OGC White Paper should not be referenced as required or mandatory technology in procurements

Document type: OGC® White Paper
Document stage: Approved for Public Release
Document language: English

Preface

OGC defines interfaces that enable interoperability of geospatial applications. APIs are a popular method to implement interfaces for accessing spatial data. This White Paper provides a discussion of Application Programming Interfaces (APIs) to support discussion of possible actions in the Open Geospatial Consortium (OGC).

- [Chapter 1 – What is an API?](#)
- [Chapter 2 - Need for Interoperability across APIs](#)
- [Chapter 3 – API Design using Open Standards](#)
- [Chapter 4 – OGC API Essentials](#)
- [Chapter 5 – Open Standards and APIs](#)

Annexes are provided on these topics:

- [A. Examples of Web Mapping APIs](#)
- [B. Web APIs for Environmental Data - CSIRO Report](#)
- [C. The Open API Initiative and Specification](#)
- [D. APIs and implementation independence](#)
- [E. Open APIs and Licensing](#)

The main themes of paper are:

- **APIs are popular** because they are an effective method for rapid software development in particular for distributed systems. Examples of successful geospatial mapping APIs are listed in Annex A: Google Maps, OpenLayers, MapQuest API for OpenStreetMap, Leaflet, Esri ArcGIS REST and Mapbox
- The proliferation of **API variations degrade interoperability** defined by web protocols. The examples in Annex A show such variations in several parameters including "Zoom" level. A summary of the differences of Zoom is provided in Chapter 2, Table 1 - Comparison of Map-related attributes from several APIs.
- **Protocols provide interoperability** when implemented consistently across APIs. The OGC WMTS protocol when implemented across multiple APIs enables interoperability as demonstrated in the Figure at the end of Chapter 2. By using consistently using the WMTS TileMatrixSet, graphics returned from several APIs can provide a consistent, composite map. Similarly **consistent use of OGC Essentials** will improve interoperability (See Chapter 4).
- API implementation experience should be used to **improve the OGC Web Service Protocols**. Several RESTful approaches for defining OWS protocols based on resource types are being considered in OGC. Further, this white paper recommends that OGC consider activities that provide for consistent implementation of OWS protocols across multiple APIs (See in particular Chapters 3 and 4).

OpenAPI (f.k.a. Swagger)

TABLE OF CONTENTS	
1.	OpenAPI Specification
1.1	Version 3.0.3
2.	Introduction
3.	Definitions
3.1	OpenAPI Document
3.2	Path Templating
3.3	Media Types
3.4	HTTP Status Codes
4.	Specification
4.1	Versions
4.2	Format
4.3	Document Structure
4.4	Data Types
4.5	Rich Text Formatting
4.6	Relative References in URLs
4.7	Schema
4.7.1	OpenAPI Object
4.7.1.1	Fixed Fields
4.7.2	Info Object
4.7.2.1	Fixed Fields
4.7.2.2	Info Object Example
4.7.3	Contact Object
4.7.3.1	Fixed Fields
4.7.3.2	Contact Object Example
4.7.4	License Object
4.7.4.1	Fixed Fields
4.7.4.2	License Object Example
4.7.5	Server Object
4.7.5.1	Fixed Fields
4.7.5.2	Server Object Example
4.7.6	Server Variable Object
4.7.6.1	Fixed Fields
4.7.7	Components Object
4.7.7.1	Fixed Fields
4.7.7.2	Components Object Example
4.7.8	Paths Object
4.7.8.1	Patterned Fields
4.7.8.2	Path Templating Matching
4.7.8.3	Paths Object Example

OpenAPI Specification

Version 3.0.3



Published 20 February 2020

Latest editor's draft:

<https://github.com/OAI/OpenAPI-Specification/>

Editors:

Darrel Miller
Jeremy Whitlock
Marsh Gardiner
Mike Ralphson
Ron Ratovsky
Uri Sarid

Former editors:

Jason Harmon
Tony Tam

Participate:

[GitHub OAI/OpenAPI-Specification](#)
[File a bug](#)
[Commit history](#)
[Pull requests](#)

Copyright © 2020 the Linux Foundation

Abstract

The OpenAPI Specification (OAS) defines a standard, programming language-agnostic interface description for REST APIs, which allows both humans and computers to discover and understand the capabilities of a service without requiring access to source code, additional documentation, or inspection of network traffic. When properly defined via OpenAPI, a consumer can understand and interact with the remote service with a minimal amount of implementation logic. Similar to what interface descriptions have done for lower-level programming, the OpenAPI Specification removes guesswork in calling a service.

Status of This Document

The source-of-truth for the specification is the GitHub markdown file referenced above.

All defined in OpenAPI

The image shows a side-by-side comparison of an OpenAPI specification. On the left, the Swagger Editor interface displays the raw OpenAPI 3.0.2 code in a dark-themed editor. On the right, the rendered API page shows the same information in a clean, light-themed layout.

```
1 openapi: 3.0.2
2 info:
3   title: "Building Blocks specified in OGC API - Features - Part 1: Core"
4   description: |-
5     Common components used in the
6     [OGC standard "OGC API - Features - Part 1: Core"](http://docs
7       .opengeospatial.org/is/17-069r3/17-069r3.html).
8   OGC API - Features - Part 1: Core 1.0 is an OGC Standard.
9   Copyright (c) 2019 Open Geospatial Consortium.
10  To obtain additional rights of use, visit http://www.opengeospatial
11    .org/legal/ .
12  This document is also available on
13  [OGC](http://schemas.opengis.net/ogcapi/features/part1/1.0/openapi
14    /ogcapi-features-1.yaml).
15  version: '1.0.0'
16  contact:
17    name: Clemens Portele
18    email: portele@interactive-instruments.de
19  license:
20    name: OGC License
21    url: 'http://www.opengeospatial.org/legal/'
22  components:
23    parameters:
24      bbox:
25        name: bbox
26        in: query
27        description: |-
28          Only features that have a geometry that intersects the bounding
29          box are selected.
30          The bounding box is provided as four or six numbers, depending on
31          whether the
32          coordinate reference system includes a vertical axis (height or
```

Building Blocks specified in OGC API - Features - Part 1: Core 1.0.0 OAS3

Common components used in the [OGC standard "OGC API - Features - Part 1: Core"](#).

OGC API - Features - Part 1: Core 1.0 is an OGC Standard. Copyright (c) 2019 Open Geospatial Consortium. To obtain additional rights of use, visit <http://www.opengeospatial.org/legal/> .

This document is also available on [OGC](#).

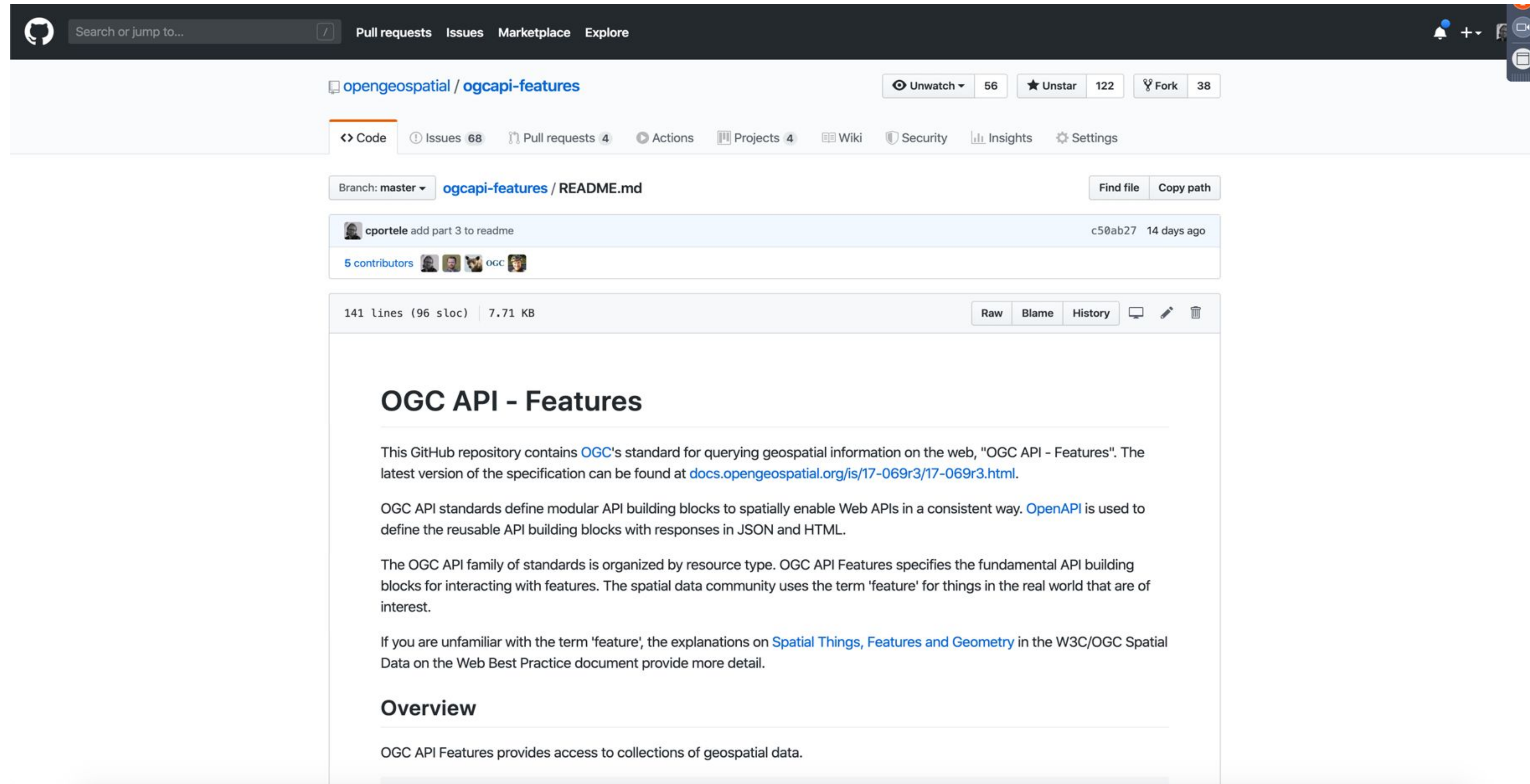
[Contact Clemens Portele](#)
[OGC License](#)

No operations defined in spec!

Schemas

- collection >
- collections >

Everything is on GitHub, including the discussions



The screenshot shows the GitHub interface for the repository 'opengeospatial / ogcapi-features'. The repository has 56 Unwatch, 122 Unstar, and 38 Forks. The current view is the 'ogcapi-features / README.md' file on the 'master' branch. The commit was made by 'cportele' 14 days ago. The file is 7.71 KB and contains 141 lines of code. The README content is as follows:

OGC API - Features

This GitHub repository contains [OGC's](#) standard for querying geospatial information on the web, "OGC API - Features". The latest version of the specification can be found at docs.opengeospatial.org/is/17-069r3/17-069r3.html.

OGC API standards define modular API building blocks to spatially enable Web APIs in a consistent way. [OpenAPI](#) is used to define the reusable API building blocks with responses in JSON and HTML.

The OGC API family of standards is organized by resource type. OGC API Features specifies the fundamental API building blocks for interacting with features. The spatial data community uses the term 'feature' for things in the real world that are of interest.

If you are unfamiliar with the term 'feature', the explanations on [Spatial Things, Features and Geometry](#) in the W3C/OGC Spatial Data on the Web Best Practice document provide more detail.

Overview

OGC API Features provides access to collections of geospatial data.

Approved and Candidate OGC API Standards

OGC API –
Discrete Global Grid Systems



OGC API –
Records



OGC API - Maps



OGC API - Styles



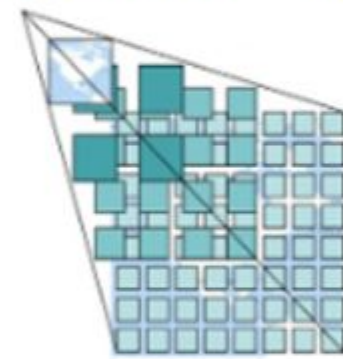
Sensor Things API



OGC API –
Moving Features



OGC API - Tiles



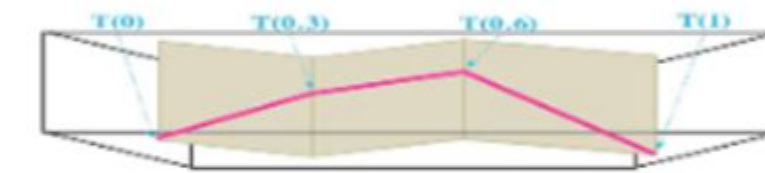
OGC API - Common



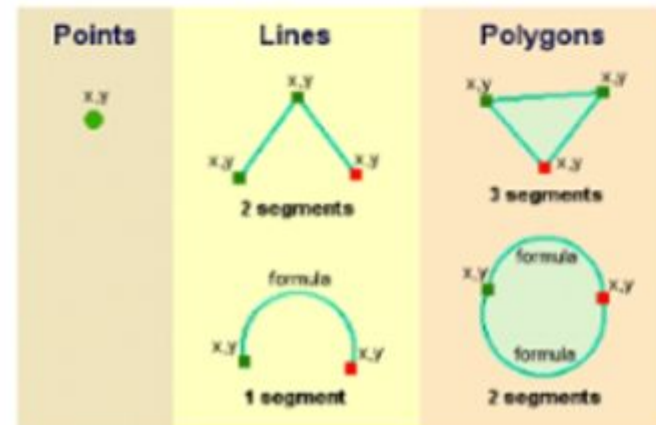
OGC API - Routes



OGC API –
Environmental Data Retrieval



OGC API - Features



OGC API - Processes



OGC API – Coverages

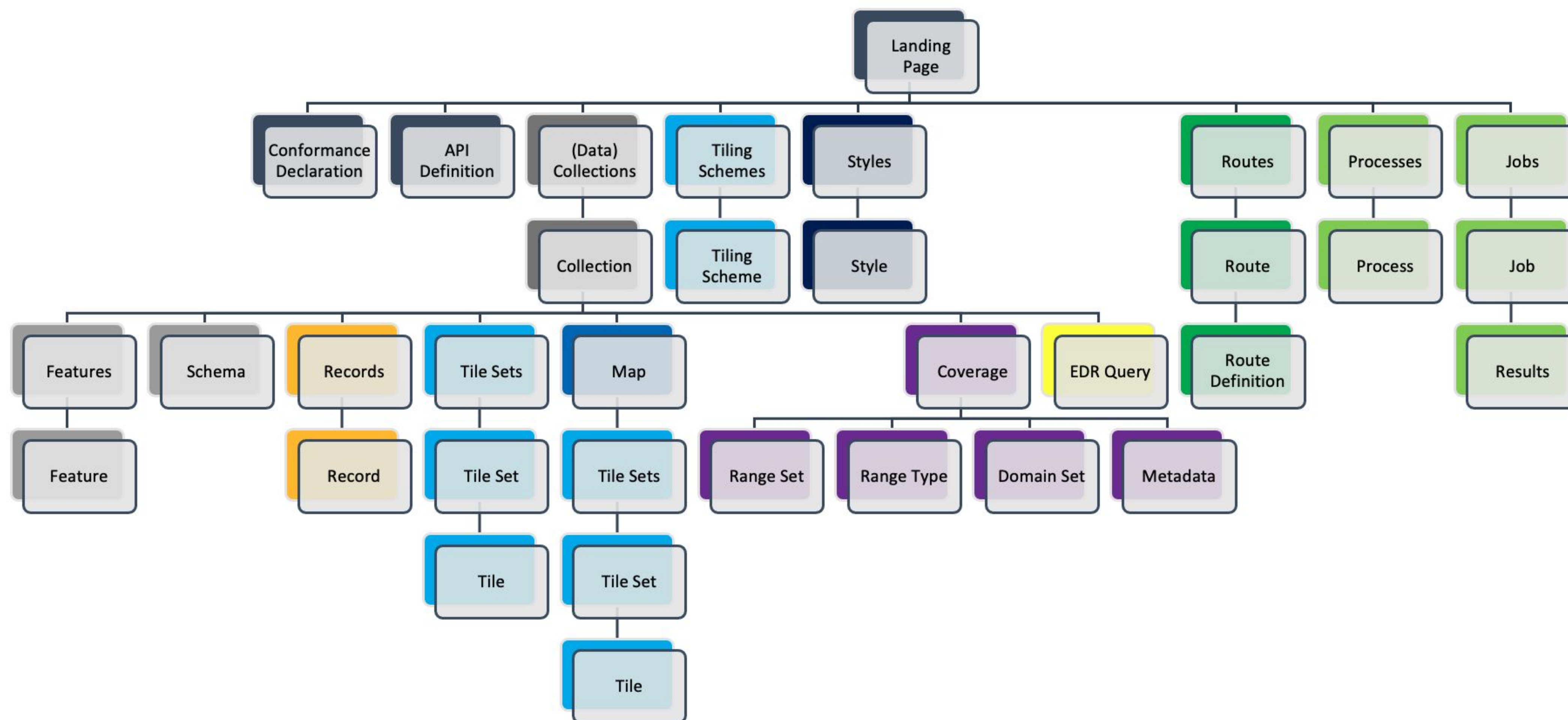


OGC API –
Joins



Green
border
means
approved

Resources in OGC API Standards



OGC API Overview

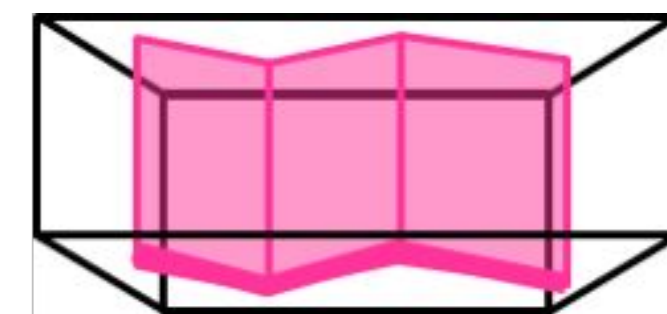
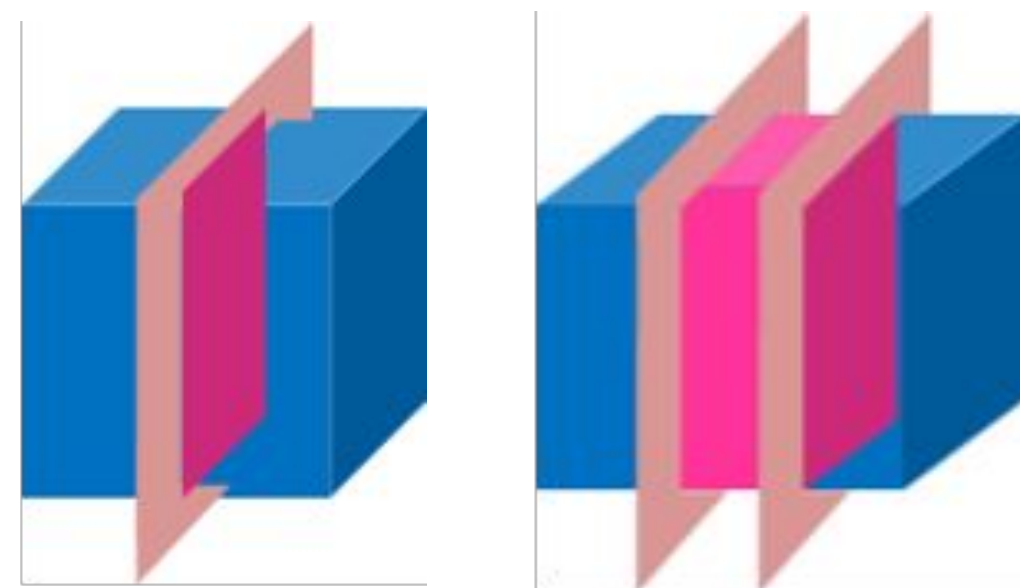
-
- OGC API - EDR
- OGC API - Processes
- OGC API - Coverages
- OGC API - Joins
- OGC API - Records

○

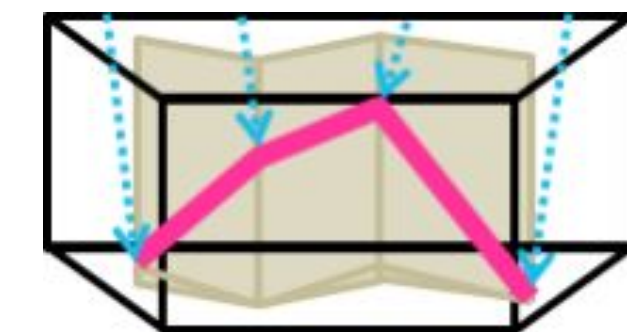
OGC API - EDR

APPROVED

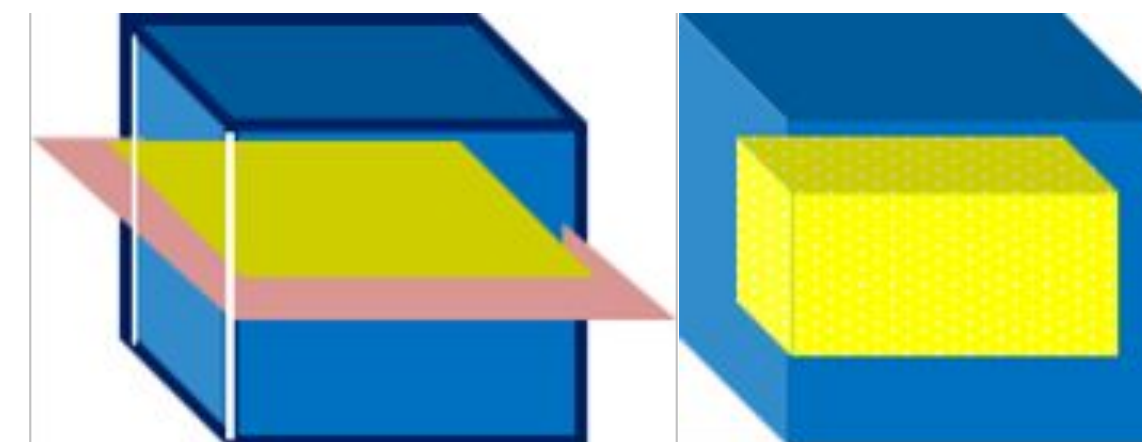
- Provides interfaces to access environmental data resources.
- An EDR collection can contain virtually any data about the natural or built environment that needs to be sampled using a spatio-temporal query pattern.



Information from a hydrologic sensor might be found spatially or accessed by ID.



Geospatial gridded data such as a digital elevation model might be accessed along a transect.



Weather information from meteorological stations might be queried within a specified polygon.

A climate model or weather reanalysis might be accessed at a point or within a bounding rectangle

Overview of OGC API - EDR

Resource	Path	HTTP method
Landing page	/	GET
Conformance declaration	/conformance	GET
Description of the collections of spatio-temporal data available from this API.	/collections	GET
Identifies a collection of spatio-temporal data with the unique identifier {collectionId}	/collections/{collectionId}	GET
Identifies an Information Resource of type {queryType} associated with the {collectionId} collection.	/collections/{collectionId}/{queryType}	GET

Example Case Study: OGC API – EDR

UK Met Office demo client

The screenshot displays the UK Met Office demo client interface. The main area shows a map of the United Kingdom with a blue-shaded region representing a data query. A tooltip on the map indicates the pressure at a specified height level above ground, showing values of 100034.58 Pa and 98199.38 Pa. The configuration panel on the right includes the following settings:

- Collection: gfs-pressure_at_height
- Query: area
- coordinates: POLYGON((-2.311355 50.755254,-2.527879 52.341453,1.848796 52.595294,2.134004 50.800543,-2.311355 50.755254))
- Pressure height_above_ground:
- Start time: 2022-01-10T00:00Z
- End time: 2022-01-10T09:00Z
- outputCRS: CRS84
- Select levels min/max range:
- 80.0
- outputformat: Coverage.JSON
- Get Data button

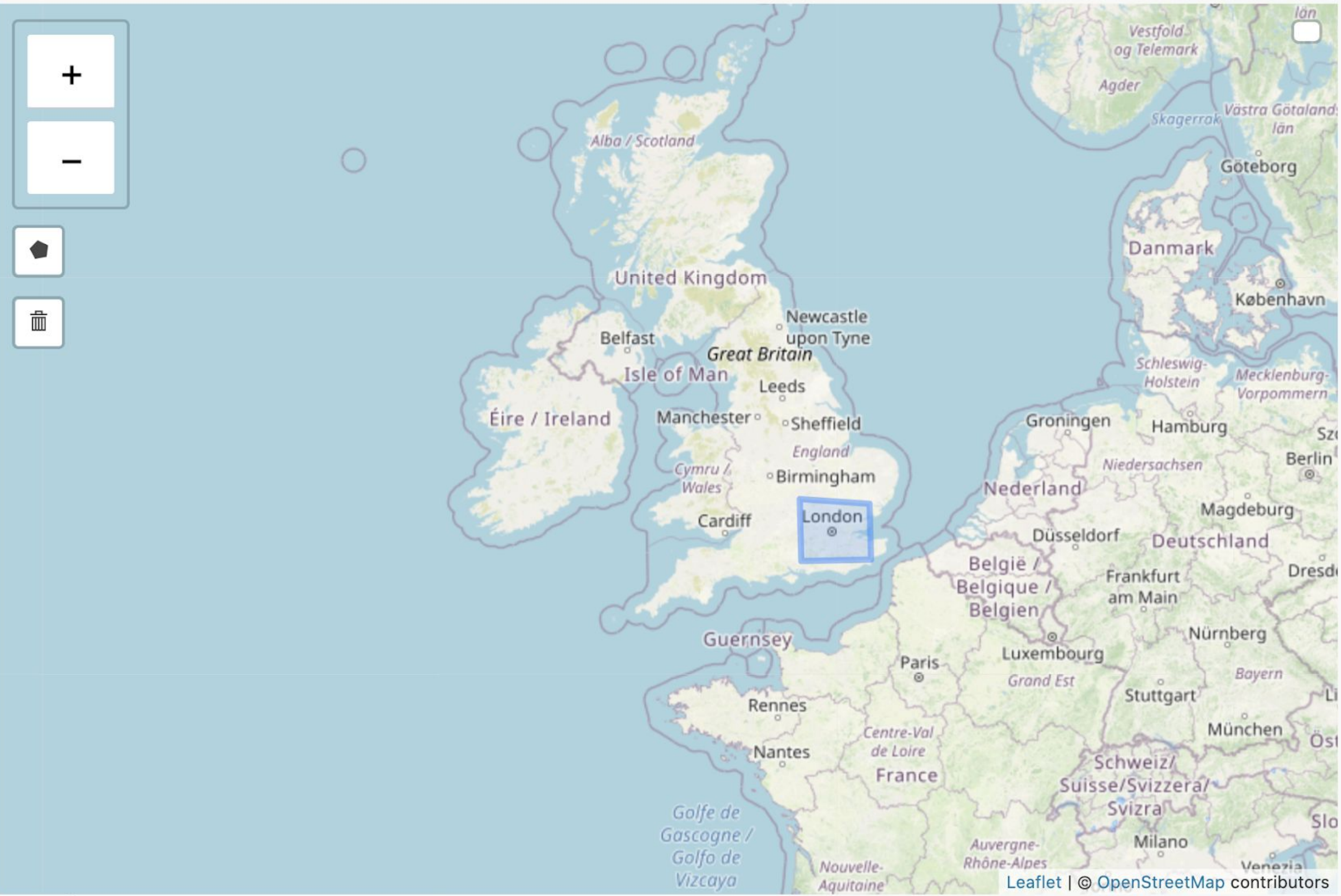
The URL bar shows the current page: <http://labs.metoffice.gov.uk/edr/collections?f=application/json>. The address bar at the bottom of the browser shows the full query URL: [http://labs.metoffice.gov.uk/edr/collections/gfs-pressure_at_height/area?coords=POLYGON\(\(-2.311355 50.755254,-2.527879 52.341453,1.848796 52.595294,2.134004 50.800543,-2.311355 50.755254\)\)¶meter-name=](http://labs.metoffice.gov.uk/edr/collections/gfs-pressure_at_height/area?coords=POLYGON((-2.311355 50.755254,-2.527879 52.341453,1.848796 52.595294,2.134004 50.800543,-2.311355 50.755254))¶meter-name=)

<http://labs.metoffice.gov.uk/edr/static/html/query.html>

http://labs.metoffice.gov.uk/edr/collections?f=application/json

Retrieve collections

Map Data



Collections (demo not for operational use)

Collection: gfs-wind_at_height_above_ground

Query: area

Coordinates POLYGON((-1.018 50.990,-1.068 52.0

u-component of wind_height_above_ground

v-component of wind_height_above_ground

Start time 2022-05-16T18:00Z

End time 2022-05-17T00:00Z

outputCRS EPSG:4326

Select levels min/max range

10.0

20.0

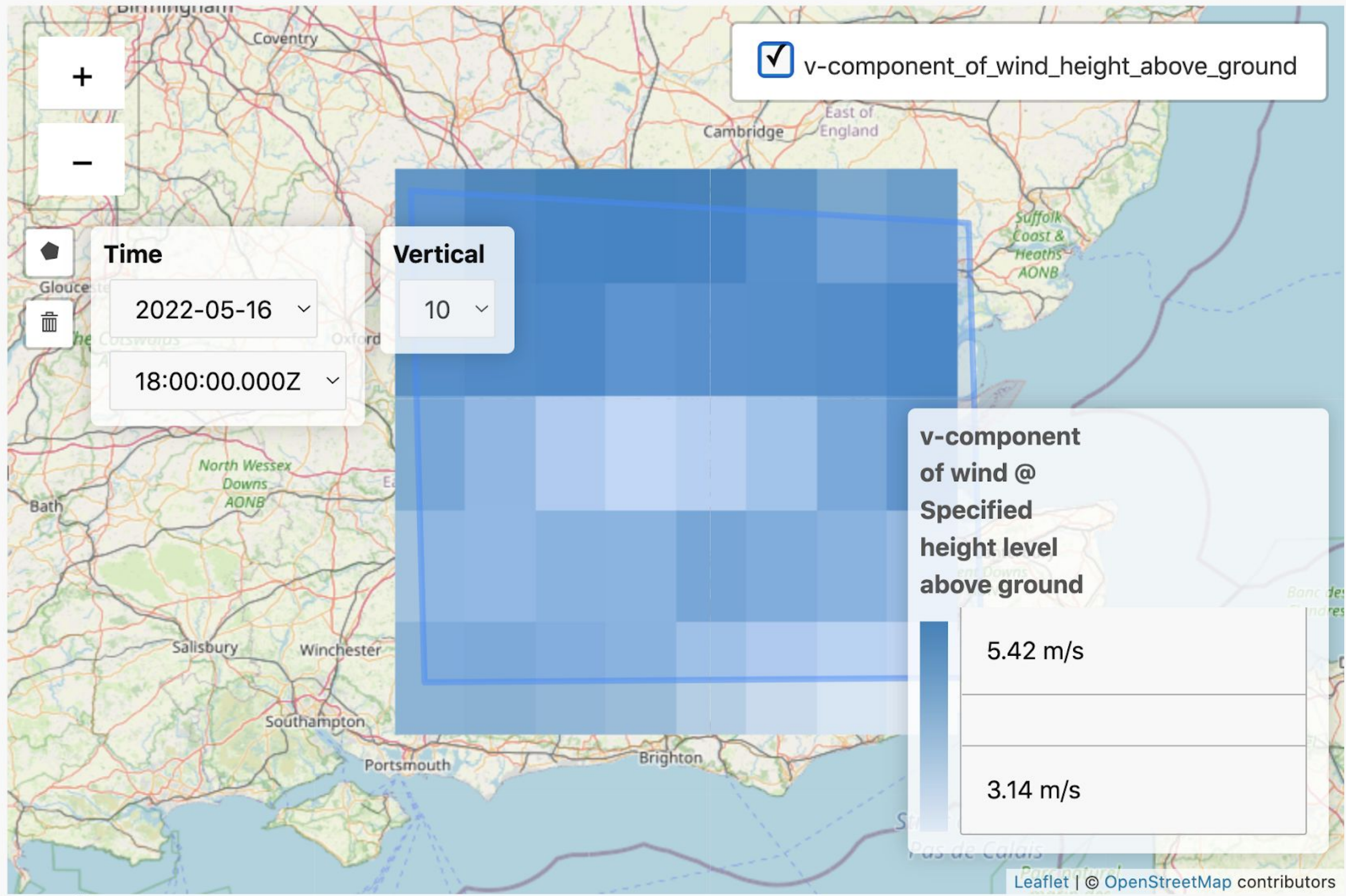
GetData



http://labs.metoffice.gov.uk/edr/collections/copernicus_dem/area?coords=POLYGON((-7.112 49.941

http://labs.metoffice.gov.uk/edr/collections?f=application/json Retrieve collections

Map Data



Collections (demo not for operational use)

Collection: gfs-wind_at_height_above_ground

Query: area

Coordinates: POLYGON((-1.018 50.990,-1.068 52.0

u-component of_wind_height_above_ground

v-component of_wind_height_above_ground

Start time	End time
2022-05-16T18:00Z	2022-05-17T00:00Z

outputCRS: EPSG:4326

Select levels min/max range

10.0

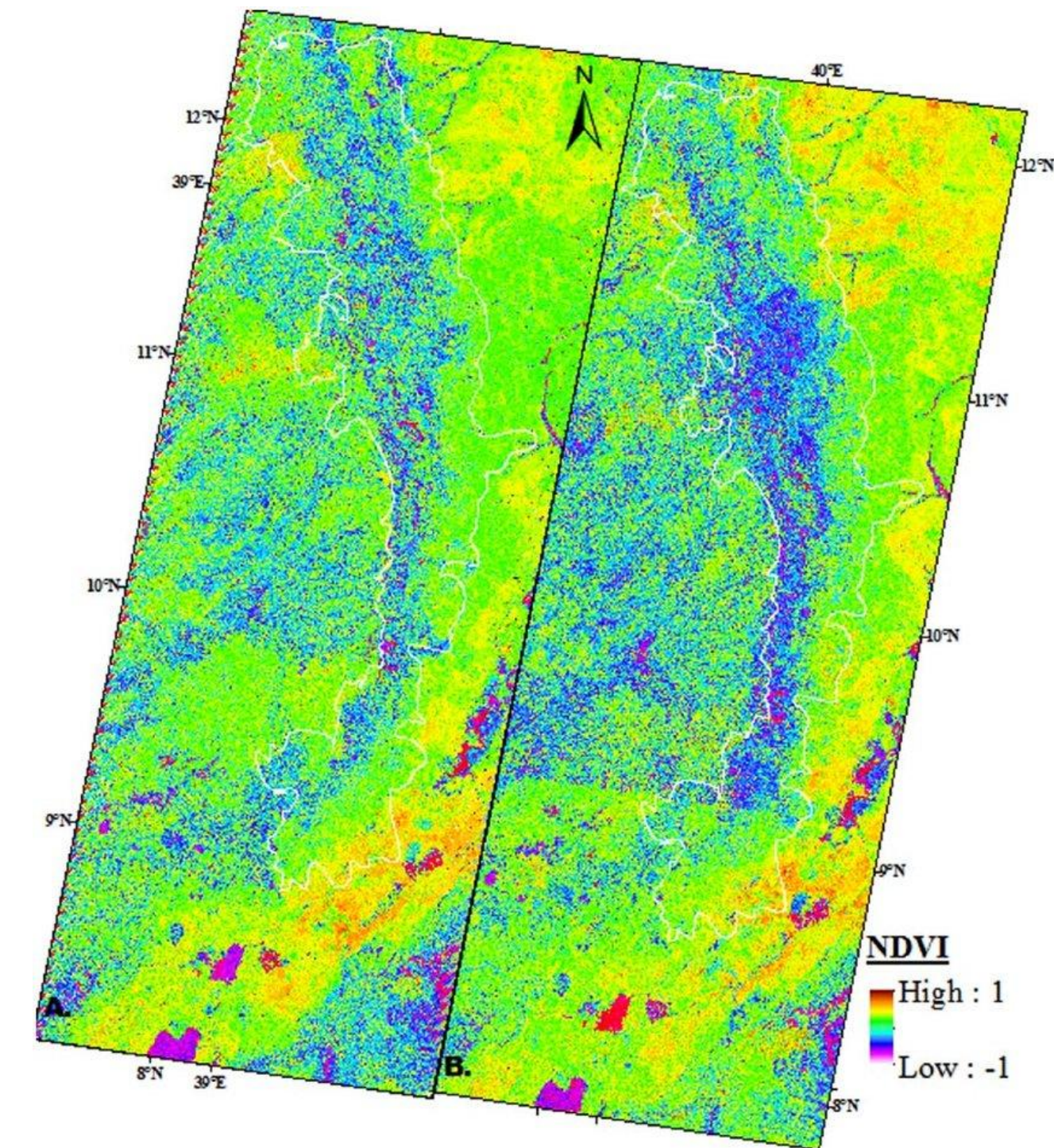
20.0

GetData

OGC API - Processes

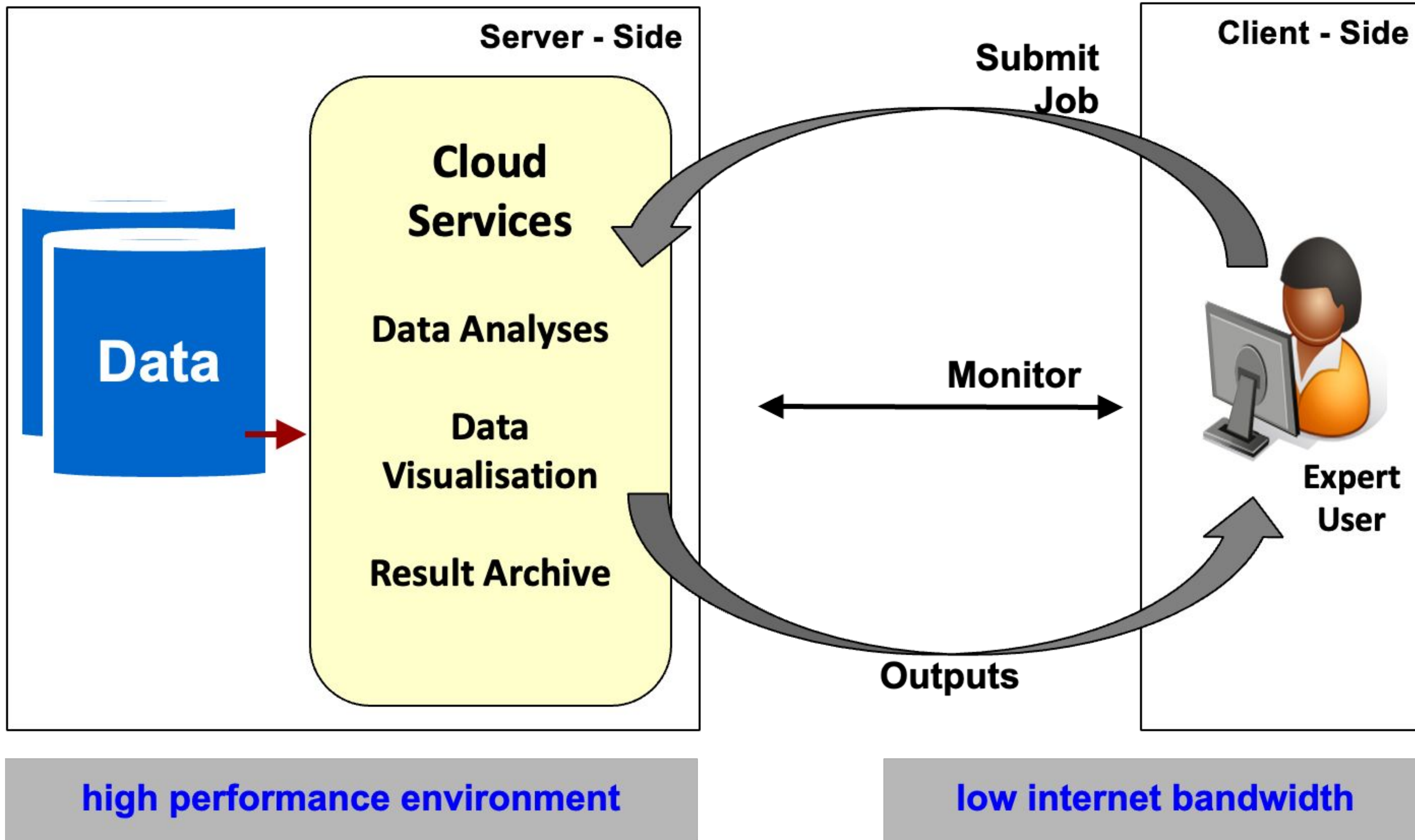
APPROVED

- Supports the wrapping of computational tasks into executable processes.
- Processes can be offered by a server through a Web API and be invoked by a client application.
- Processes include well-defined algorithms that ingest vector and/or coverage data to produce new datasets.



Ayele, Gebiaw & Tebeje, Aschalew Kassie & Demissie, Solomon & Belete, Mulugeta & Jemberie, Mengistu & Teshome, Wondie & Mengistu, Dereje & Teshale, Engidasew. (2018). Time Series Land Cover Mapping and Change Detection Analysis Using Geographic Information System and Remote Sensing, Northern Ethiopia. Air, Soil and Water Research. 11. 117862211775160. 10.1177/1178622117751603.

OGC API - Processes Workflow



Overview of OGC API - Processes

Resource	Path	HTTP method
Landing page	/	GET
Conformance declaration	/conformance	GET
Process list	/processes	GET
Process description	/processes/{processID}	GET
Process execution	/processes/{processID}/execution	POST
Job status info	/jobs/{jobID}	GET
Job results	/jobs/{jobID}/results	GET
Job list	/jobs	GET
Job status info	/jobs/{jobID}	DELETE

Example Case Study: OGC API - Processes

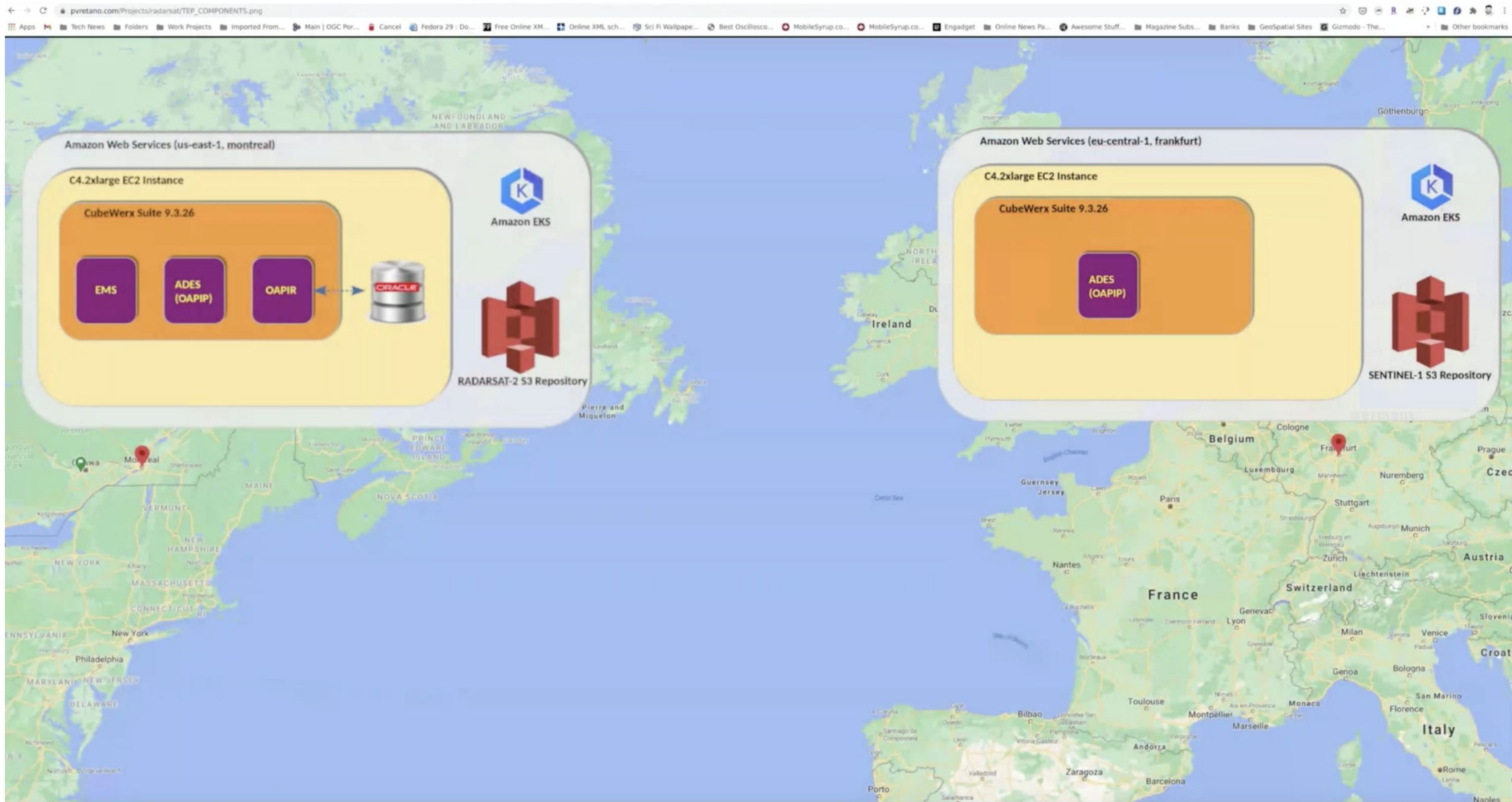
Analytical processing of RADARSAT satellite imagery

The screenshot displays the CubeWerx RADARSAT / SENTINEL Thematic Exploitation Platform. The interface is divided into several sections:

- Left Panel:** A search bar and a list of 60 results, each with a thumbnail and metadata.
- Center Panel:** A map of North America showing a satellite image of the St. Lawrence River area. A popup window titled "DSI Ship Detection Process" is overlaid on the map, displaying the following metadata:

```
RADARSAT 2 Product ID: RS2_0K84976_04547608_P0000195055_05VN_20170324_220556_VH_VH_SCF
Acquired Fri Mar 24 2017 18:05:55 GMT-0400 (Eastern Daylight Time)
Ship detected at Lat: 39.220961 Lon: -61.375514
Date: 2017-03-24T22:06:41
SourceFrame: VH
IncAngle: 41.97
Ship_ACS: 2088.9
```
- Right Panel:** A "Processing in Montreal" panel showing a list of active and completed ship detection processes. Each process entry includes a status indicator (e.g., "Successful"), a "Download Results" button, a "Show on map" button, a "Run log" button, and a "Delete Job" button.

<https://www.cubewerx.com/analytics>



RADARSAT / SENTINEL

THEMATIC EXPLOITATION PLATFORM

Search Results

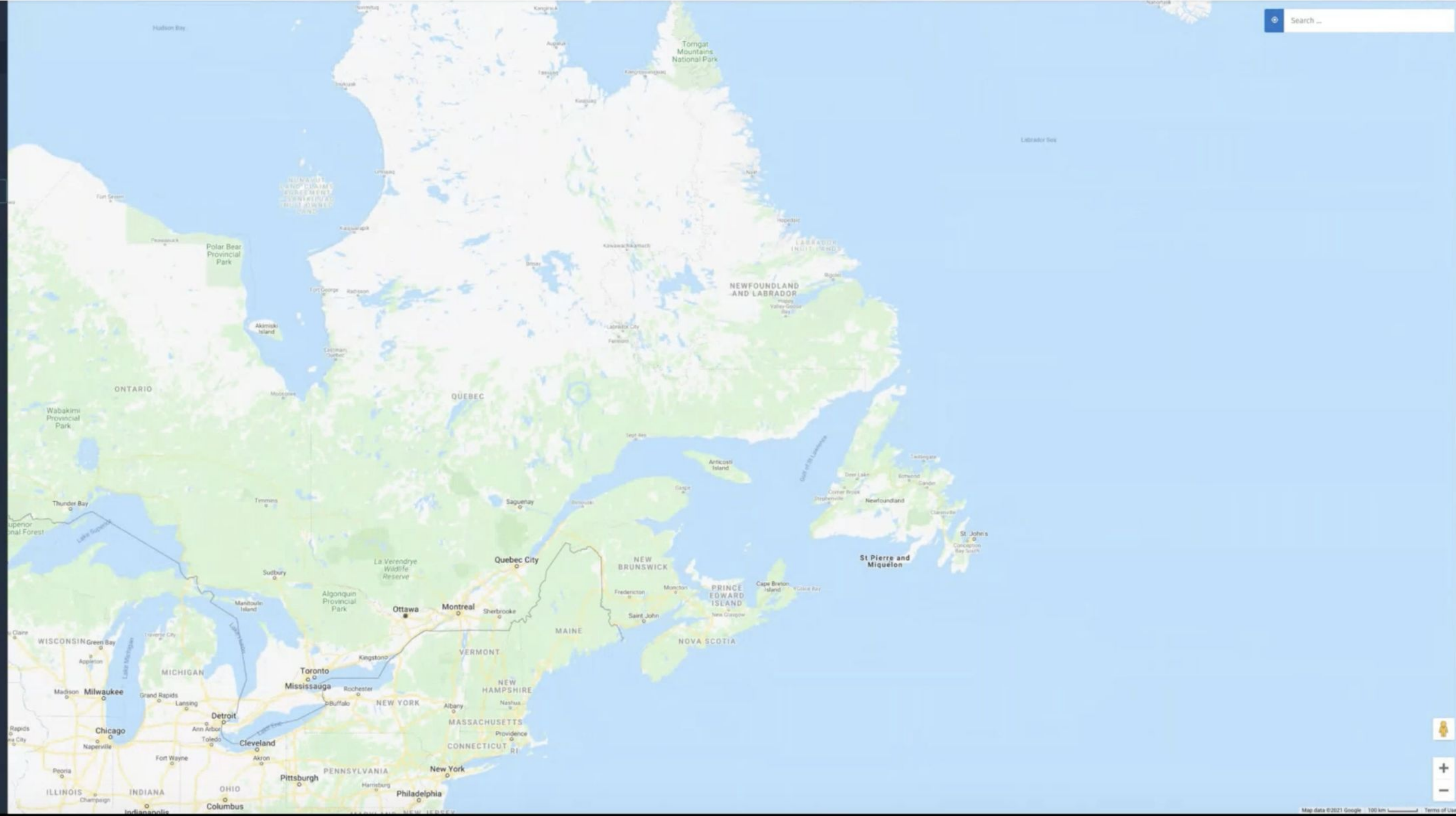
FIND SAR DATA

TIME RANGE 03/01/2017 to 03/31/2017

RADARSAT 2 ADVANCED SEARCH OFF ON SENTINEL 1

SEARCH

Search ...

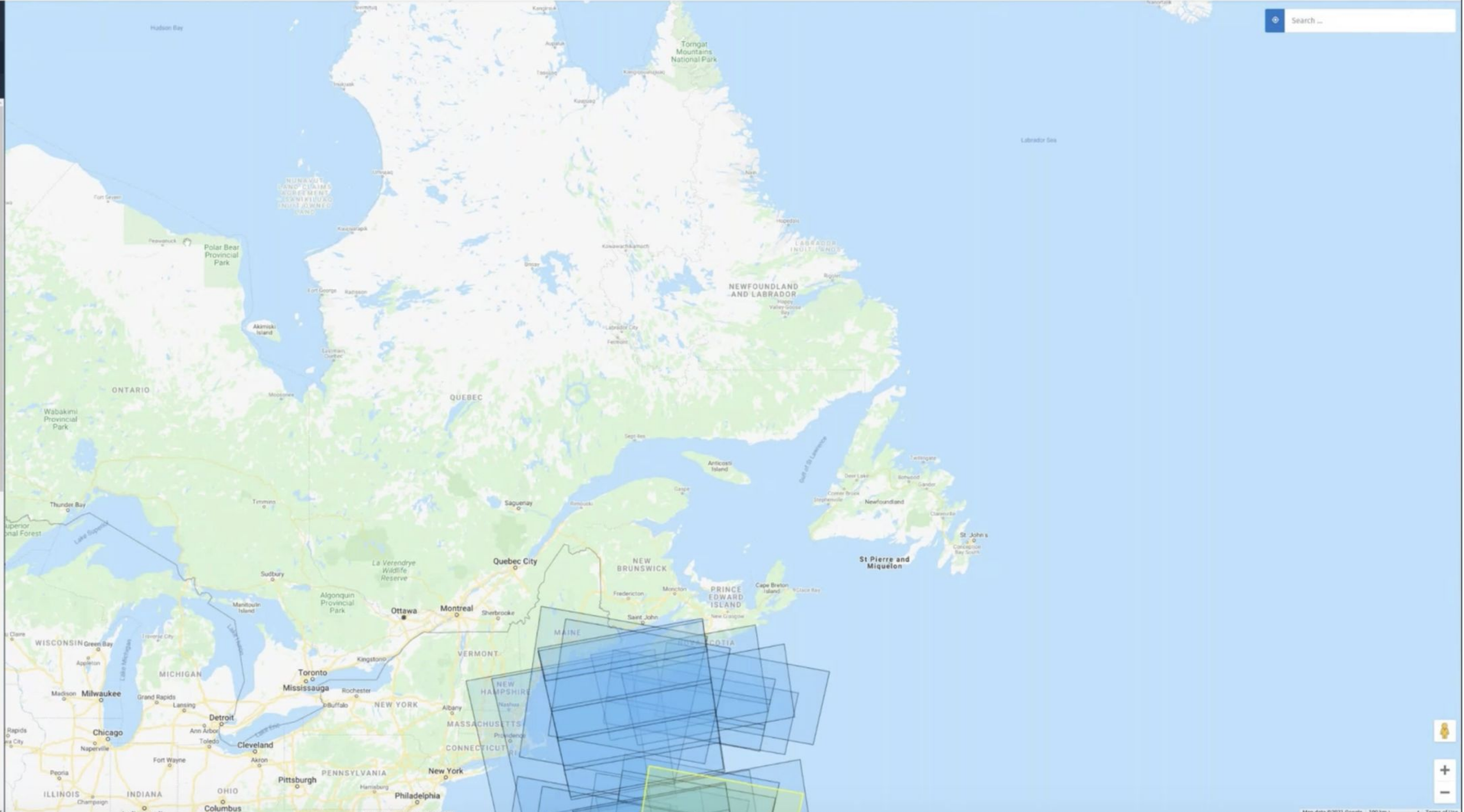


RADARSAT / SENTINEL

THEMATIC EXPLOITATION PLATFORM

Showing 60 results Select All None Clear

- Wed, 01 Mar 2017 10:31:31 GMT
Polarization: HH
- Mon, 06 Mar 2017 22:43:04 GMT
Polarization: HH
- Wed, 08 Mar 2017 10:33:33 GMT
Polarization: VV
- Fri, 10 Mar 2017 22:24:39 GMT
Polarization: VV
- Wed, 08 Mar 2017 10:25:31 GMT
Polarization: HH
- Mon, 13 Mar 2017 22:36:35 GMT
Polarization: VV
- Mon, 13 Mar 2017 22:36:10 GMT
Polarization: VV
- Sat, 18 Mar 2017 10:39:05 GMT
Polarization: VV
- Sat, 18 Mar 2017 10:25:18 GMT
Polarization: HH
- Sat, 18 Mar 2017 10:25:59 GMT
Polarization: HH
- Sat, 18 Mar 2017 10:26:12 GMT
Polarization: HH
- Fri, 17 Mar 2017 22:21:02 GMT
Polarization: HH
- Mon, 20 Mar 2017 22:36:13 GMT
Polarization: VV
- Tue, 21 Mar 2017 10:49:08 GMT
Polarization: VV
- Fri, 24 Mar 2017 22:16:17 GMT
Polarization: VV
- Sat, 25 Mar 2017 10:36:29 GMT
Polarization: VV



tep.cubewerx.com/cubewerx/tep/

Apps Tech News Folders Work Projects Imported From... Main | OGC Por... Cancel Fedora 29 : Do... Free Online XM... Online XML sch... Sci Fi Wallpape... Best Oscillosco... MobileSyrup.co... MobileSyrup.co... Engadget Online News Pa... Awesome Stuff... Magazine Subs... Banks GeoSpatial Sites Gizmodo - The... Other bookmarks

CubeWerx support@cubewerx.com

RADARSAT / SENTINEL

THEMATIC EXPLOITATION PLATFORM

Search Results

Showing 60 results Select All None Clear

- Wed, 01 Mar 2017 10:31:31 GMT
POLARIZATION: HH
- Mon, 06 Mar 2017 22:43:04 GMT
POLARIZATION: HH
- Wed, 08 Mar 2017 10:33:33 GMT
POLARIZATION: VV
- Fri, 10 Mar 2017 22:24:39 GMT
POLARIZATION: VV
- Wed, 08 Mar 2017 10:25:31 GMT
POLARIZATION: HH
- Mon, 13 Mar 2017 22:36:35 GMT
POLARIZATION: VV
- Mon, 13 Mar 2017 22:36:10 GMT
POLARIZATION: VV
- Sat, 18 Mar 2017 10:39:05 GMT
POLARIZATION: VV
- Sat, 18 Mar 2017 10:25:18 GMT
POLARIZATION: HH
- Sat, 18 Mar 2017 10:25:59 GMT
POLARIZATION: HH
- Sat, 18 Mar 2017 10:26:12 GMT
POLARIZATION: HH
- Fri, 17 Mar 2017 22:21:02 GMT
POLARIZATION: HH
- Mon, 20 Mar 2017 22:26:13 GMT
POLARIZATION: VV
- Tue, 21 Mar 2017 10:49:08 GMT
POLARIZATION: VV
- Fri, 24 Mar 2017 22:16:17 GMT
POLARIZATION: VV

Map data ©2021 Google 100 km Terms of Use

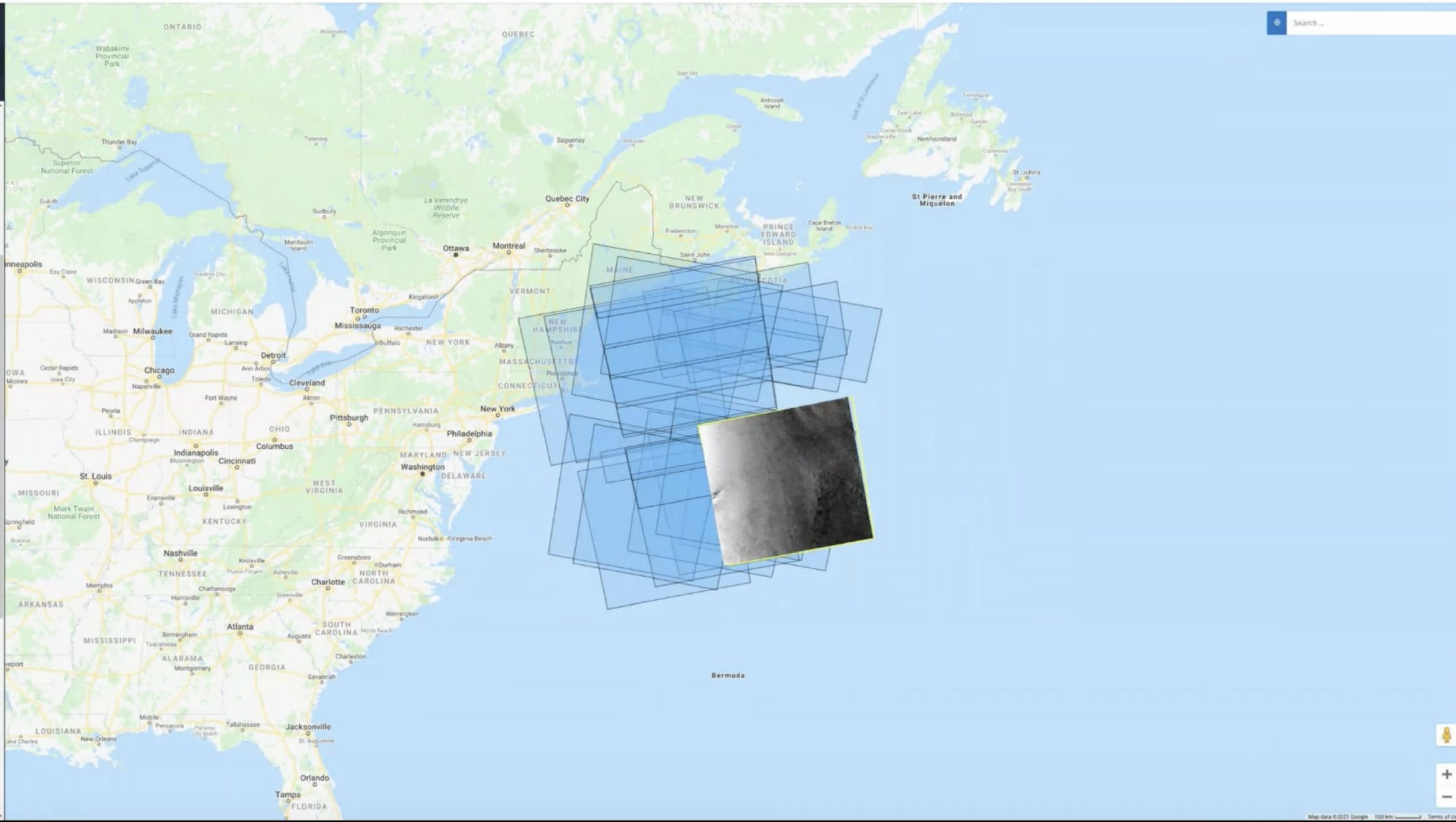
RADARSAT / SENTINEL
THEMATIC EXPLOITATION PLATFORM

Search Results

Showing 60 results Select All None Clear

- Mon, 13 Mar 2017 22:36:10 GMT
POLARIZATION: VV
 - Sat, 18 Mar 2017 10:39:05 GMT
POLARIZATION: VV
 - Sat, 18 Mar 2017 10:25:18 GMT
POLARIZATION: HH
 - Sat, 18 Mar 2017 10:25:59 GMT
POLARIZATION: HH
 - Sat, 18 Mar 2017 10:26:12 GMT
POLARIZATION: HH
 - Fri, 17 Mar 2017 22:21:02 GMT
POLARIZATION: HH
 - Mon, 20 Mar 2017 22:26:13 GMT
POLARIZATION: VV
- IMAGE DETAILS**

Software Version: CAPPS SAR 1.3
 Product Type: SCY
 Processing Time: Fri, 24 Mar 2017 22:16:17 GMT
 Beam Mode: CSYS
 Polarization: VV
 Pass Direction: Ascending
 Near Incidence Angle: 1.98232204+01
 Far Incidence Angle: 4.99533026+01
- Sat, 25 Mar 2017 10:36:29 GMT
POLARIZATION: VV
 - Tue, 21 Mar 2017 11:04:01 GMT
POLARIZATION: HH
 - Fri, 24 Mar 2017 22:15:45 GMT
POLARIZATION: HH
 - Mon, 27 Mar 2017 22:51:45 GMT
POLARIZATION: HH
 - Mon, 27 Mar 2017 22:31:00 GMT
POLARIZATION: VV
 - Tue, 28 Mar 2017 10:49:36 GMT
POLARIZATION: VV

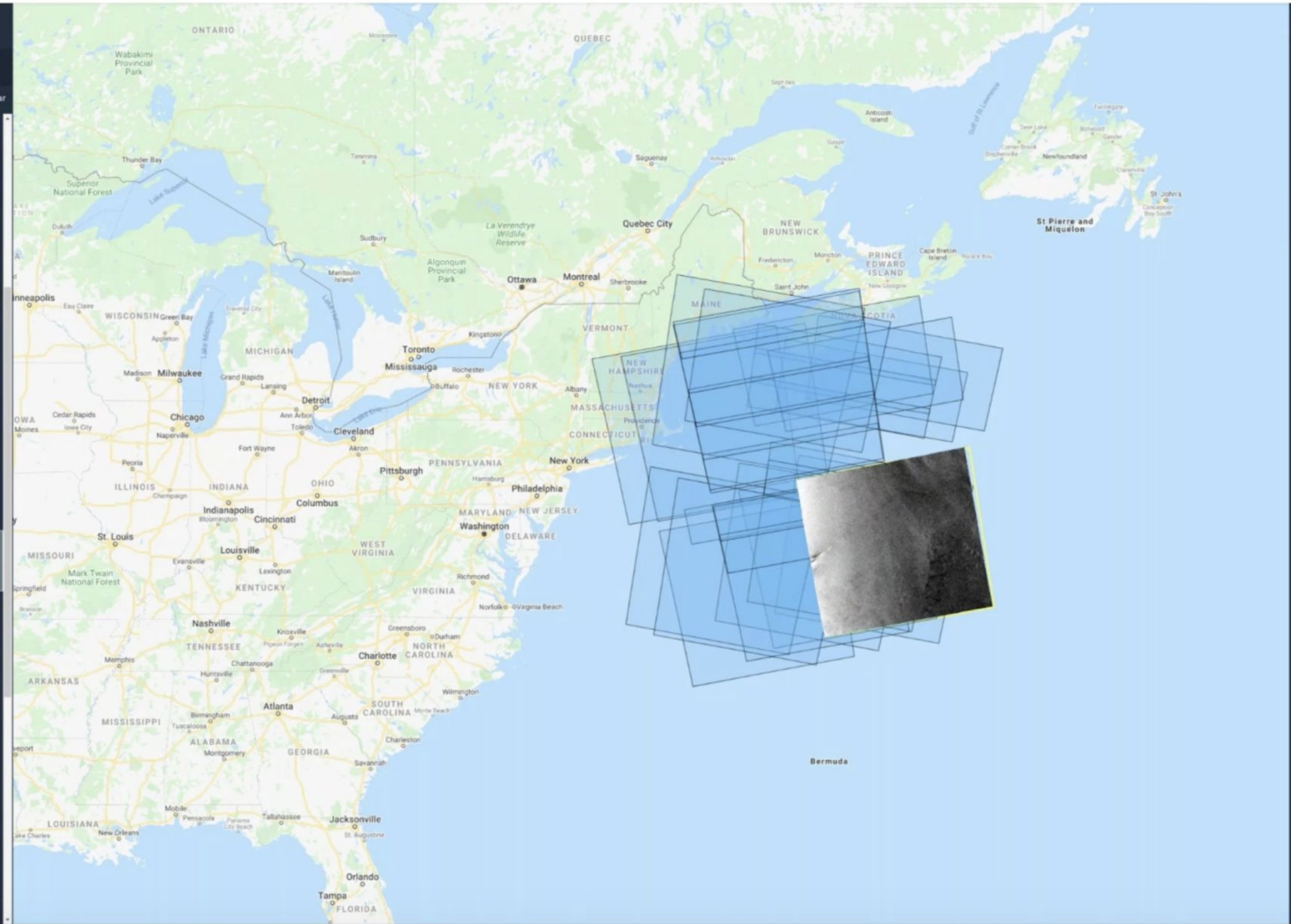


RADARSAT / SENTINEL THEMATIC EXPLOITATION PLATFORM

Search Results

Showing 60 results Select All None Clear

- Mon, 13 Mar 2017 22:36:10 GMT
POL_SENTINEL_SENTINEL_POLARIZATION_VV
Polarization: VV
- Sat, 18 Mar 2017 10:39:05 GMT
POL_SENTINEL_SENTINEL_POLARIZATION_VV
Polarization: VV
- Sat, 18 Mar 2017 10:25:18 GMT
POL_SENTINEL_SENTINEL_POLARIZATION_HH
Polarization: HH
- Sat, 18 Mar 2017 10:25:59 GMT
POL_SENTINEL_SENTINEL_POLARIZATION_HH
Polarization: HH
- Sat, 18 Mar 2017 10:26:12 GMT
POL_SENTINEL_SENTINEL_POLARIZATION_HH
Polarization: HH
- Fri, 17 Mar 2017 22:21:02 GMT
POL_SENTINEL_SENTINEL_POLARIZATION_HH
Polarization: HH
- Mon, 20 Mar 2017 22:26:13 GMT
POL_SENTINEL_SENTINEL_POLARIZATION_VV
Polarization: VV
- Tue, 21 Mar 2017 10:49:08 GMT
POL_SENTINEL_SENTINEL_POLARIZATION_VV
Polarization: VV
- Fri, 24 Mar 2017 22:16:17 GMT
POL_SENTINEL_SENTINEL_POLARIZATION_VV
Polarization: VV
- Sat, 25 Mar 2017 10:36:29 GMT
POL_SENTINEL_SENTINEL_POLARIZATION_VV
Polarization: VV
- Tue, 21 Mar 2017 11:04:01 GMT
POL_SENTINEL_SENTINEL_POLARIZATION_HV
Polarization: HV
- Fri, 24 Mar 2017 22:15:45 GMT
POL_SENTINEL_SENTINEL_POLARIZATION_HH
Polarization: HH
- Mon, 27 Mar 2017 22:51:45 GMT
POL_SENTINEL_SENTINEL_POLARIZATION_HH
Polarization: HH
- Mon, 27 Mar 2017 22:31:00 GMT
POL_SENTINEL_SENTINEL_POLARIZATION_VV
Polarization: VV
- Tue, 28 Mar 2017 10:48:36 GMT
POL_SENTINEL_SENTINEL_POLARIZATION_VV
Polarization: VV



Processing in Montreal

APPLICATIONS

Search...

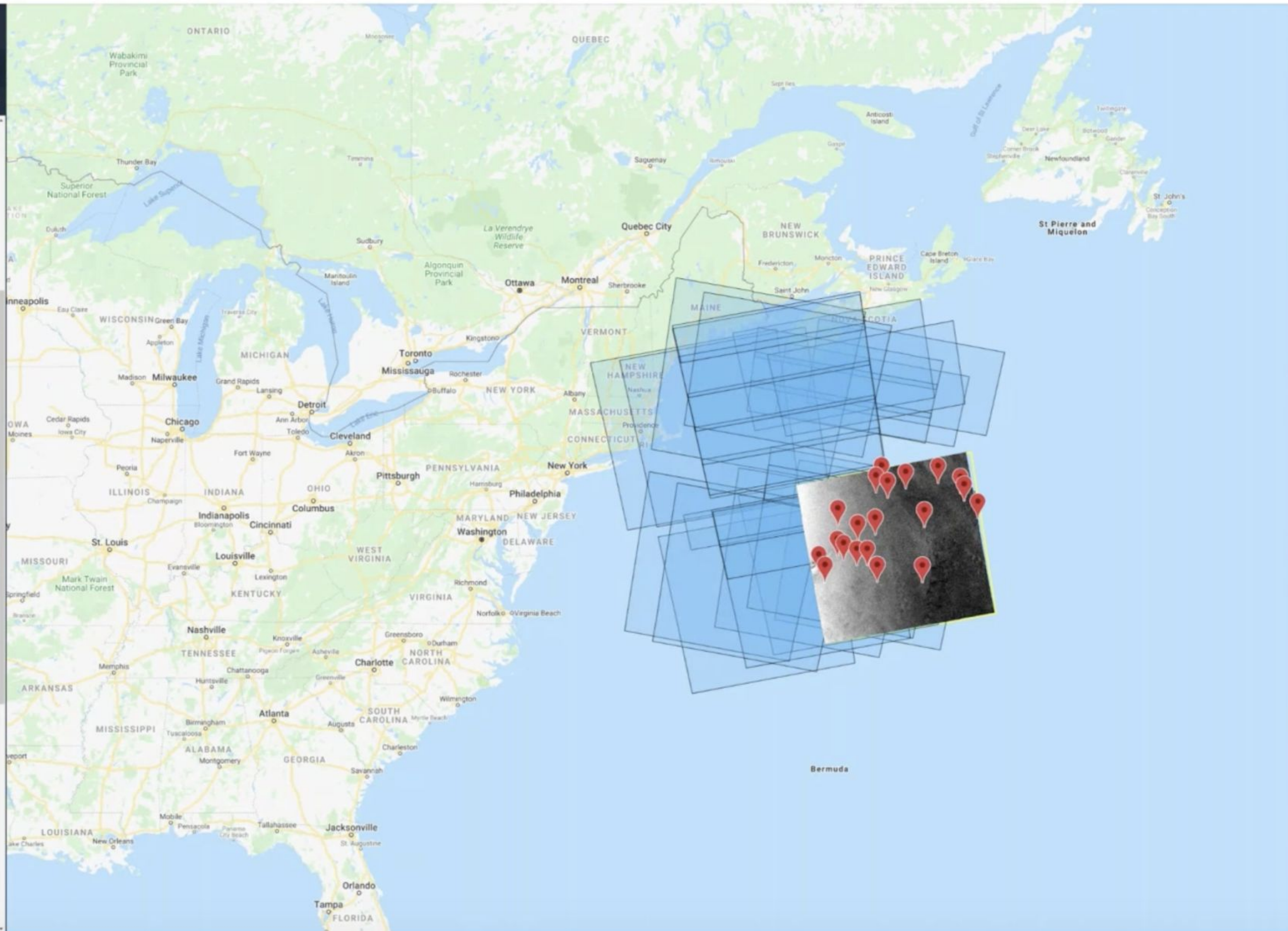
- SOFDT R&D**
In R&D mode, all parameters are available for modification. Wind direction should still be left at 2 (ASCII) and the wind direction file name left as is in most cases though, since that
- SOFDT Operational**
In operational mode, the SOFDT app requires no user-set parameters aside from the input frames. Wind direction is set to 2 (ASCII) with the wind direction data taken from
- Ship Detection Process**
A Process that detects ships in SAR images and outputs the detections into various output file formats including GeoJSON. SAR images from RS2, RCM and Sentinel-1 are supported.

RADARSAT / SENTINEL

THEMATIC EXPLOITATION PLATFORM

Showing 60 results

- Mon, 13 Mar 2017 22:36:10 GMT
Polarization: VV
- Sat, 18 Mar 2017 10:39:05 GMT
Polarization: VV
- Sat, 18 Mar 2017 10:25:16 GMT
Polarization: HH
- Sat, 18 Mar 2017 10:25:59 GMT
Polarization: HH
- Sat, 18 Mar 2017 10:29:12 GMT
Polarization: HH
- Fri, 17 Mar 2017 22:21:02 GMT
Polarization: HH
- Mon, 20 Mar 2017 22:26:13 GMT
Polarization: VV
- Tue, 21 Mar 2017 10:49:08 GMT
Polarization: VV
- Fri, 24 Mar 2017 22:16:17 GMT
Polarization: VV
- Sat, 25 Mar 2017 10:36:29 GMT
Polarization: VV
- Tue, 21 Mar 2017 11:04:01 GMT
Polarization: HV
- Fri, 24 Mar 2017 22:15:45 GMT
Polarization: HH
- Mon, 27 Mar 2017 22:51:45 GMT
Polarization: HH
- Mon, 27 Mar 2017 22:31:08 GMT
Polarization: VV
- Tue, 28 Mar 2017 10:49:36 GMT
Polarization: VV



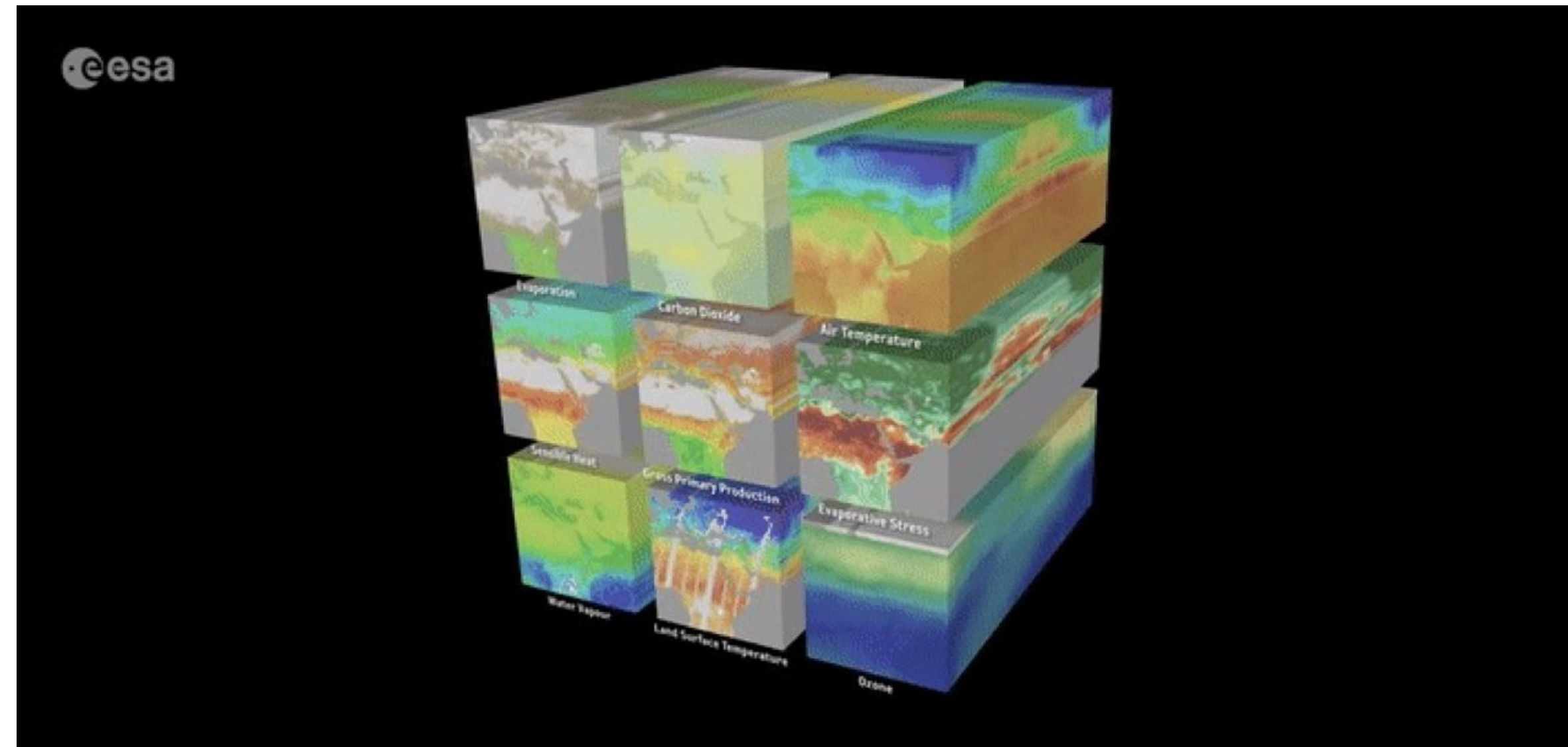
Processing in Montreal

- ACTIVE**
 - PENDING**
 - COMPLETED**
- Ship Detection Process
Submitted: 3/24/2017, 6:34:19 PM
Download Results | Hide | Run log | Delete Job
 - Ship Detection Process
Submitted: 3/24/2017, 9:05:54 AM
Download Results | Show on map | Run log | Delete Job
 - Ship Detection Process
Submitted: 2/7/2017, 4:50:02 PM
Download Results | Show on map | Run log | Delete Job
 - Ship Detection Process
Submitted: 2/7/2017, 9:49:06 AM
Download Results | Show on map | Run log | Delete Job
 - Ship Detection Process
Submitted: 2/7/2017, 9:24:44 AM
Download Results | Show on map | Run log | Delete Job
 - Ship Detection Process
Submitted: 11/24/2016, 2:52:28 PM
Download Results | Show on map | Run log | Delete Job
 - Ship Detection Process
Submitted: 11/24/2016, 2:52:06 PM
Download Results | Show on map | Run log | Delete Job
 - Ship Detection Process
Submitted: 11/24/2016, 2:07:40 PM
Download Results | Show on map | Run log | Delete Job
 - Ship Detection Process
Submitted: 11/24/2016, 10:43:59 AM
Download Results | Show on map | Run log | Delete Job
 - Ship Detection Process
Submitted: 11/23/2016, 4:44:29 PM
Download Results | Show on map | Run log | Delete Job

OGC API - Coverages

IN WORK

- Gives access to homogeneous collections of values located in space/time (e.g.: coverages).
-
- Satellite imagery is typically modeled as a gridded coverage.
-
- Responses in CoverageJSON, netCDF, GeoTIFF, PNG, HTML and other formats.
-



Overview of OGC API - Coverages

Resource	Path	HTTP Method	Resource Description	
Landing Page	/	GET	Basic information about this API and the starting point for hypermedia navigation	information about the API
API Definition	/api	GET	An OpenAPI document for this API	
Conformance Classes	/conformance	GET	A list of URLs, one for each implemented Conformance Class	
Collections Metadata	/collections	GET	Information about the collections on this API. Includes partial description of each collection.	named collections
Collection Information	/collections/{coverageid}	GET	The full description of a single collection (coverage).	
Coverage	/collections/{coverageid}/coverage	GET	The coverage offering (metadata)	the Coverage (CIS)
Coverage Description	/collections/{coverageid}/coverage/description	GET	The Domain Set, Range Type, and Metadata	
Domain Set	/collections/{coverageid}/coverage/domainset	GET	Describes axis and extent.	
Range Type	/collections/{coverageid}/coverage/rangetype	GET	Describes the measures (pixels)	
Range Set	/collections/{coverageid}/coverage/rangeset	GET	The measured values in native format.	
Metadata	/collections/{coverageid}/coverage/metadata	GET	General metadata	
All	/collections/{coverageid}/coverage/all	GET	The Domain Set, Range Type, Range Set, and Metadata	

OGC API - Joins

IN WORK

- Provides an interface to join data from input files either with feature collections that are available on the server or directly with other input files
- Discovery operations, data joining operations and file joining operations

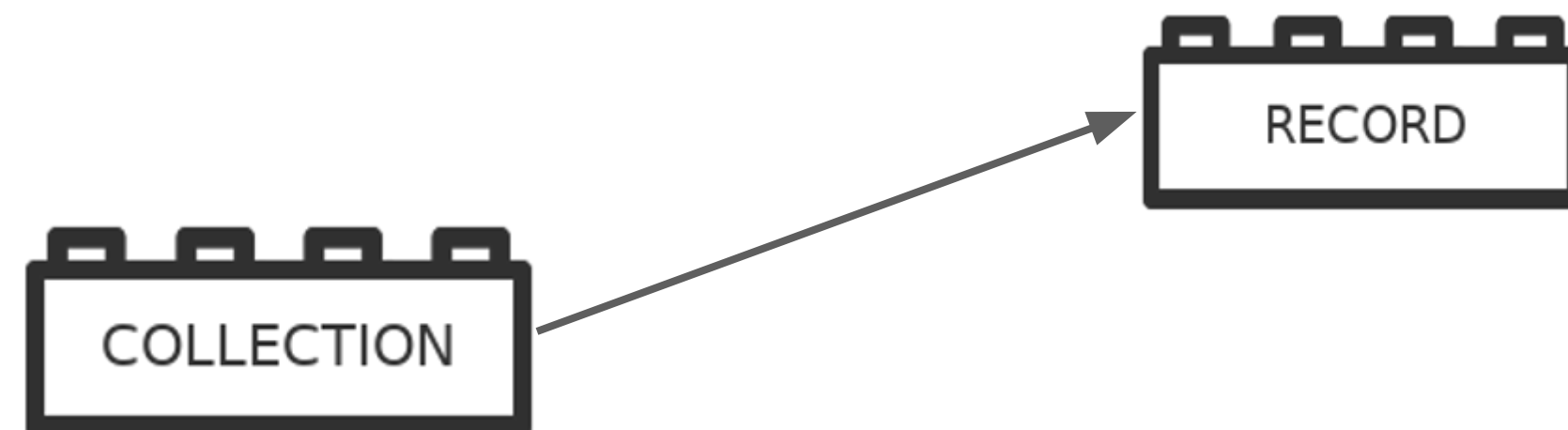
Overview of OGC API - Joins

Resource	Path	HTTP method
Landing page	/	GET
Conformance declaration	/conformance	GET
API definition		GET
Feature collections	/collections	GET
Feature collection	/collections/{collectionId}	GET
Key fields of a specific collection	/collections/{collectionId}/keys	GET
Key values of a specific key field of a specific collection	/collections/{collectionId}/keys/{keyFieldId}	GET
Returns a list of the joins available on the server/ Creates a new join	/joins	GET/ POST
Returns metadata on a specific join/ Deletes a specific join	/joins/{joinId}	GET/DELETE
Joins data between two input files	/filejoin	POST

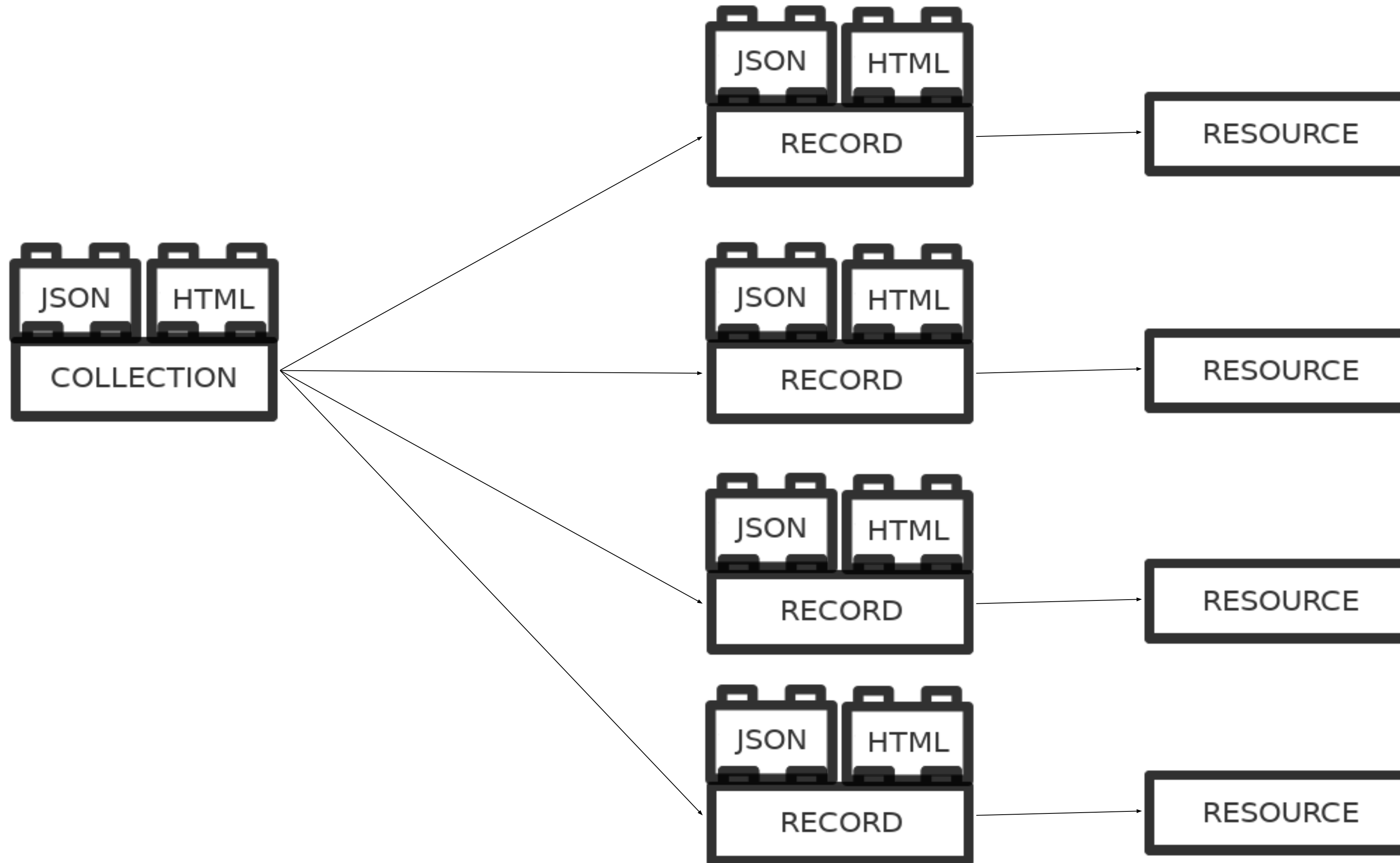
OGC API - Records

IN WORK

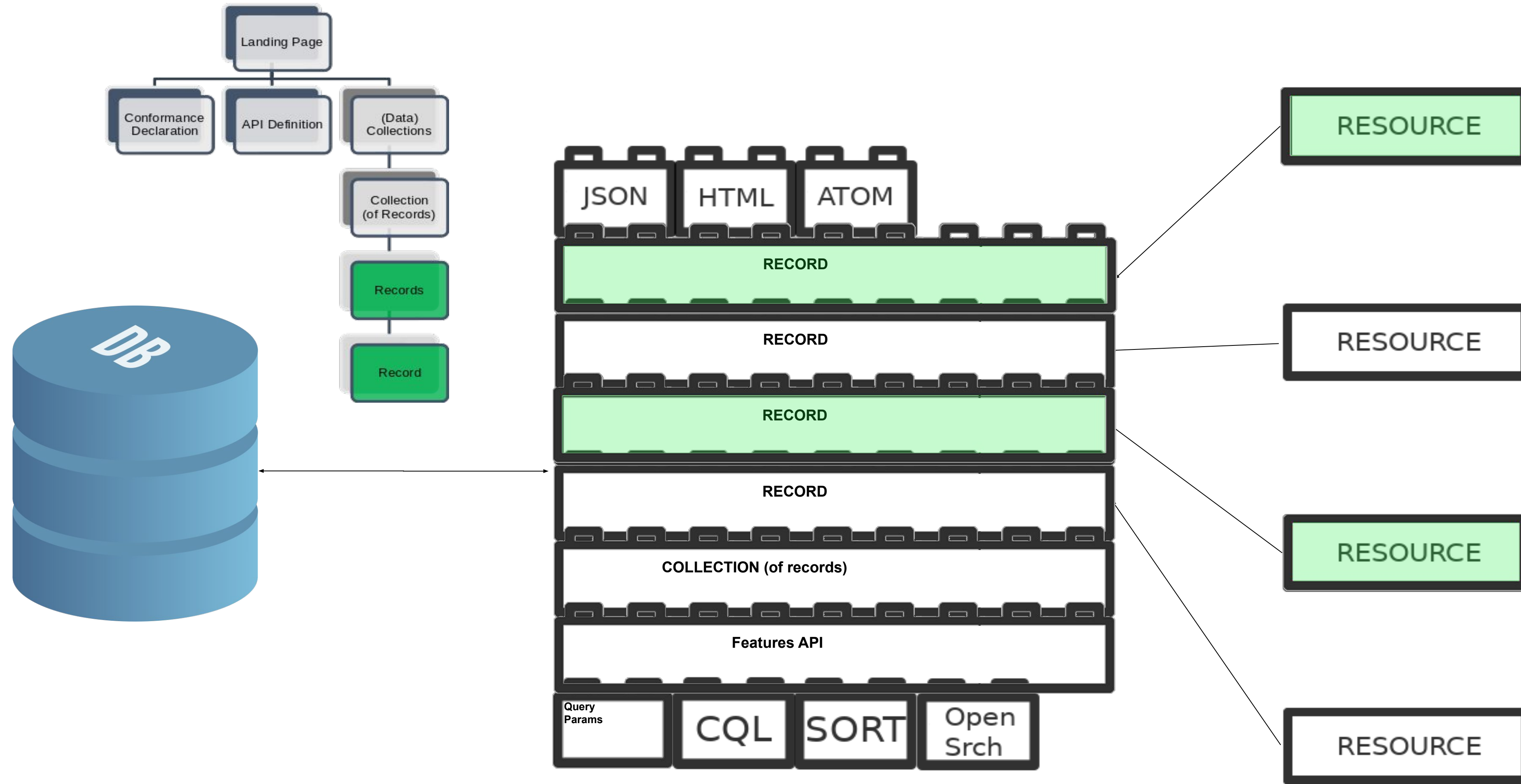
- Provides discovery and access to metadata about geospatial resources.
- Provides a series of building blocks.
- The Record is the atomic unit of information in a catalogue.
- Deployment patterns based on the building blocks.
- P1 is expected to be aligned with the STAC.



Crawlable Catalogue



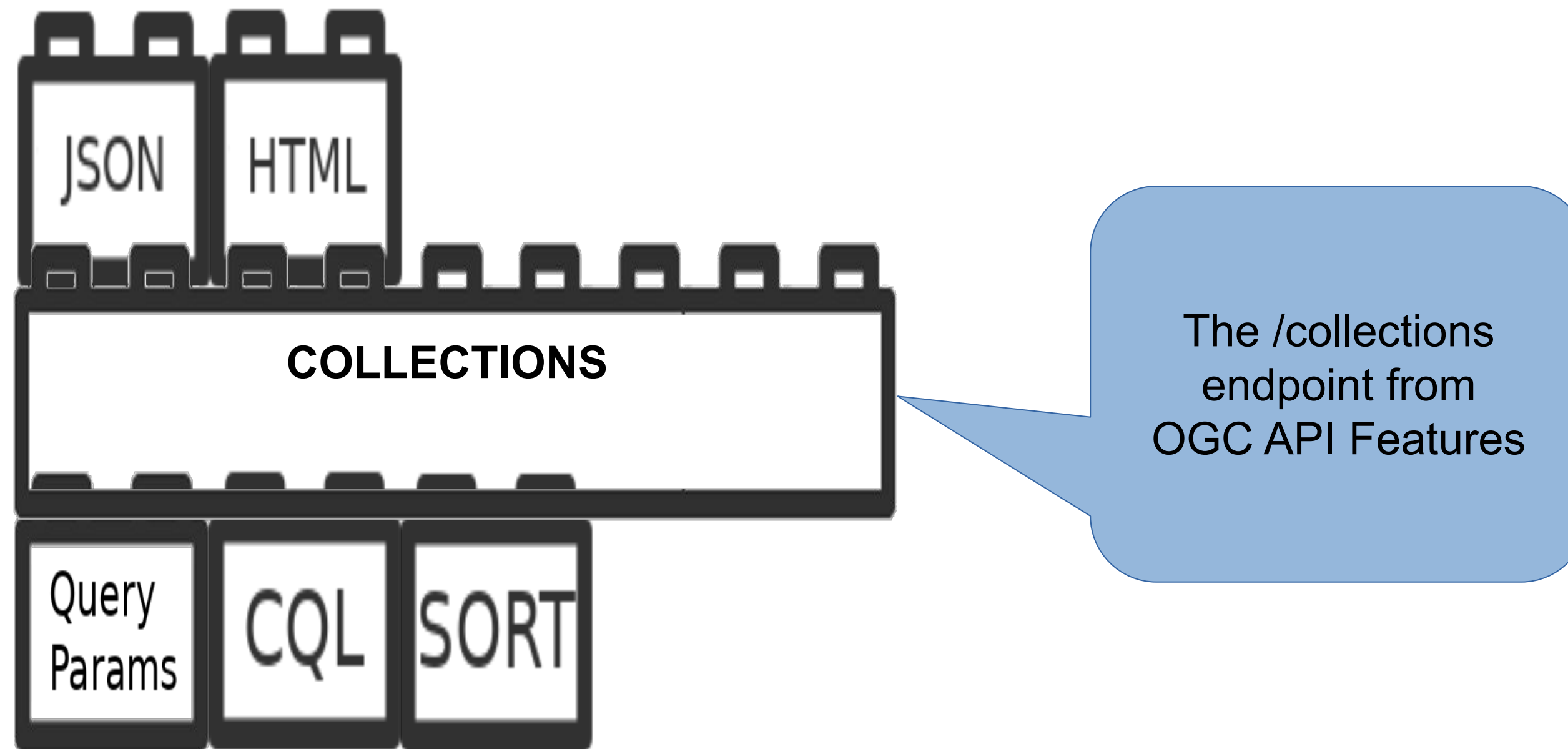
Searchable Catalogue



GET

[/collections/MyCat/items?bbox=-69.64,37.76,-56.12,46.63&datetime=2020-01-11T00:00:00/2020-01-12T00:00:00](#)

Local Resources Catalogue (/collections example)



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

API endpoints (searchable catalogue)

ACCESS PATH	DESCRIPTION
/	GET: Landing page
/api	GET: Service or API description document (OpenAPI)
/conformance	GET: conformance statement
/collections	GET: list of catalogue identifiers with hypermedia controls to each catalogue
/collections/{catalogueId}	GET: Metadata about the specific catalogue including hypermedia controls to other resources POST: create a new catalogue
/collections/{catalogueId}/item	GET: query the catalogue (simple) POST: create a new record
/collections/{catalogueId}/items/{recordId}	GET: get the record PUT: update the record DELETE: remove the record
/collections/{catalogueId}/queryables	GET: list of queryables that can be used in a filter

Example Case Study: OGC API - Records

👉 <https://emotional.byteroad.net/>

pygeoapi eMOTIONAL Cities ins x +

emotional.byteroad.net/collections/masked_rec

OGC Imported events FOSS4G 2022 | R...

pygeoapi Contact

Example metadata

Tech demo metadata from eMOTIONAL Cities. One metadata record for each feature.

Measurements Environmental Lisbon eMOTIONAL Cities Neuroscience Urban Planning H2020

👉 <https://luoghi-indomiti.github.io/a-gis-full-of-records/>

The screenshot shows a web browser window with the following elements:

- Browser Tabs:** "pygeoapi eMOTIONAL Cities instanc...", "ByteRoad - Check this OGC API x", and a plus sign for more tabs.
- Address Bar:** "luoghi-indomiti.github.io/a-gis-full-of-records/https%3A%2F%2Femotional.byteroad.net%2F/collection/activit..."
- Page Header:** A bookmark icon followed by the text "Check this OGC API".
- Map Interface:**
 - A "Back to items" button with a left arrow icon in the top-left corner.
 - A zoom control panel with a plus sign (+) and a minus sign (-) on the left side.
 - A map showing a region with several place names: "Staines", "Sunbury", "Esher", "Cobham", "Biggin Hill", and "West Wickham".
 - A large, irregular area in the center of the map is highlighted in light blue with a darker blue border.
 - A "Back to items" button with a left arrow icon in the bottom-left corner.
 - Map data attribution at the bottom right: "Leaflet | © Map tiles by Stamen Design, CC BY 3.0 - Map data © OpenStreetMap contributors, Preview".



Tomorrow, 29/12/22: “API enablement using pygeoapi”



Krishna Lodha



Special guest

Deployment as Building Blocks

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



Features: CQL

Features: CRS

Features: Core

Data
OGC API - Common

Tiles

Maps

Coverages

Features: Transactions

EDR

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



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



User: need features supporting GDA2020 and other CRSs



A sample API implementing Common, Features, Tiles, Styles

Home / Daraa JSON


Daraa

This is a test dataset for the Open Portrayal Framework thread in the OGC Testbed-15 as well as for the OGC Vector Tiles Pilot Phase 2. The data is OpenStreetMap data from the region of Daraa, Syria, converted to the Topographic Data Store schema of NGA.

Links to the main resources

- [Access the data](#)
- [Access a web map with the data](#)
- [Access the data as vector tiles](#)
- [Styles to render the data in maps](#)

API information

API description	Definition of the API in OpenAPI 3.0 Documentation of the API
API provider	Clemens Portele, interactive instruments GmbH portele@interactive-instruments.de
Data license	The dataset was provided by the US National Geospatial Intelligence Agency (NGA) for development and testing. For any reuse of the data outside this API, please contact NGA.
Spatial Extent	

Common Part 2, Features Parts 1 to 3

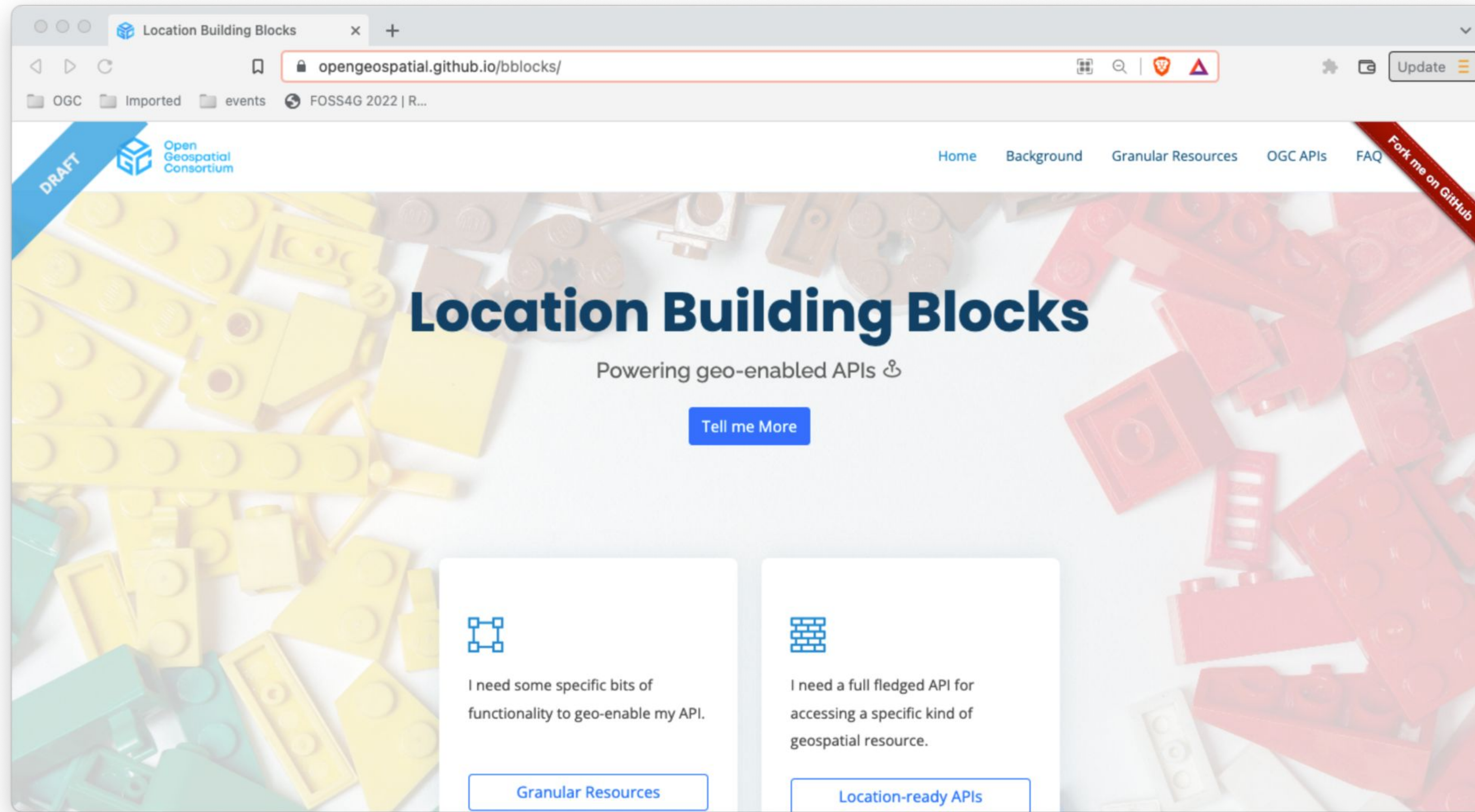
Tiles, Parts 1 and 2

Styles

Common Part 1

More info:

<https://blocks.ogc.org/>



https://blocks.ogc.org/register.html

Location Building Blocks - Regi x +

opengeospatial.github.io/bblocks/register.html

OGC Imported events

Open Geospatial Consortium

SEARCH THE REGISTER

This page presents the register of Building Blocks.

Search

OGC Collections

The distribution of a geospatial dataset in an API is organized into one or more collections of data. How the data is split into collections in a distribution depends on the intended use of the data. Two common approaches for organizing the data are: by semantic type and by spatial clustering. The OGC Collections JSON resource provides information about and access to the data in each collection of the distribution.

valid mature

More

OGC Collection

An OGC Collection resource is a JSON object that provides information about and access to a set of geospatial resources, through links to API endpoints and/or files online. It is most commonly used to describe geospatial datasets, but can be used for collections of anything geospatial.

valid mature

More

Data Encodings

- There are no mandatory encodings.
- API definition/ content negotiation.
- Recommendations: HTML, GeoJSON.



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

Use cases NOT supported in GeoJSON

- Geometries in a Coordinate Reference System (e.g.: CRS) other than WGS84.
- Solid geometries.
- Non-Euclidean metrics (e.g.: ellipsoidal metrics).
- Temporal properties.



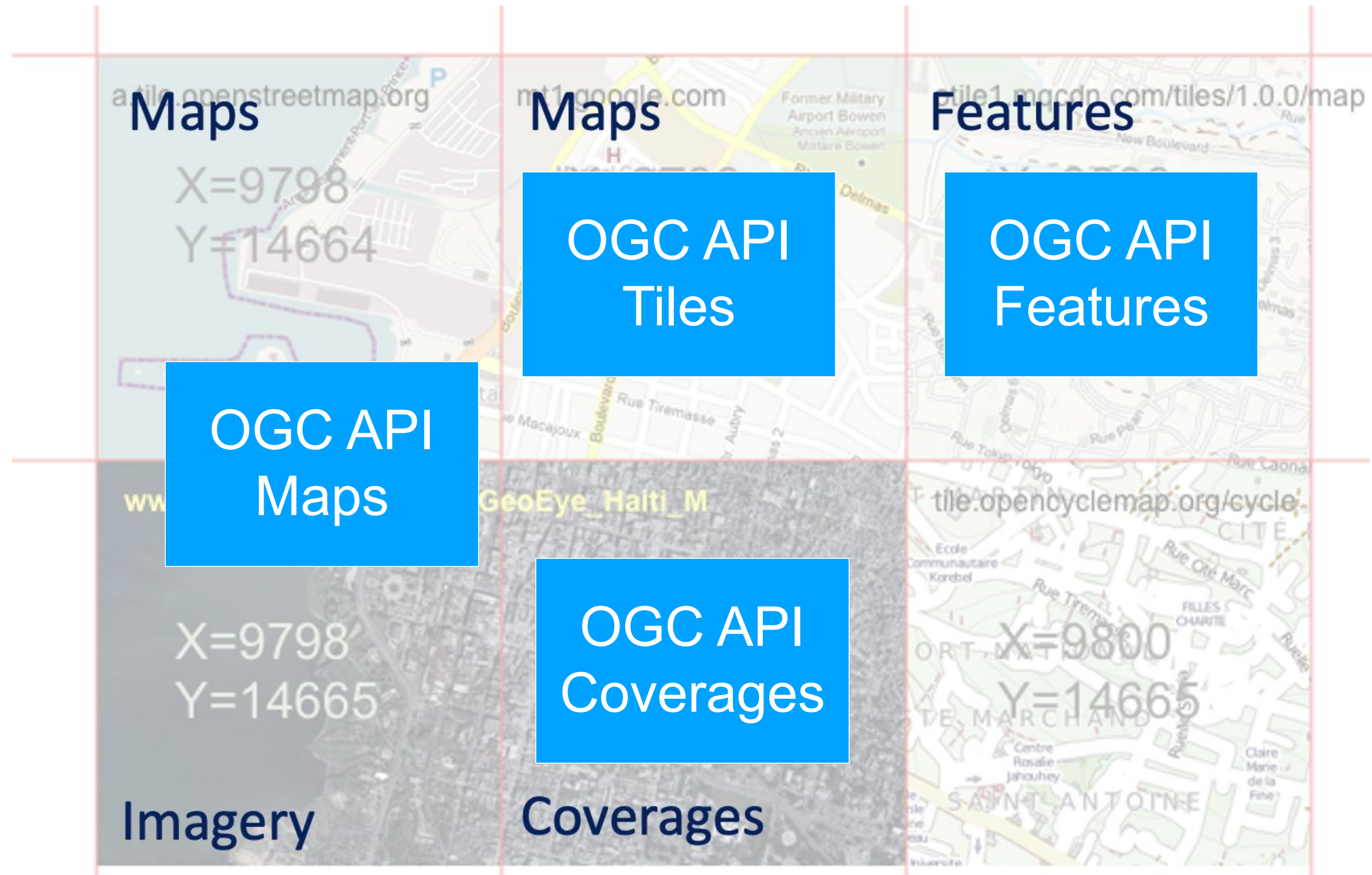
Features and Geometries JSON (JSON-FG)

- JSON encoding for feature data.
- Superset of GeoJSON, overcoming some of its limitations.
- It is not meant as a translation of GML to JSON.



👉 <https://github.com/opengeospatial/ogc-feat-geo-json>

Migration OWS -> OGC APIs



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

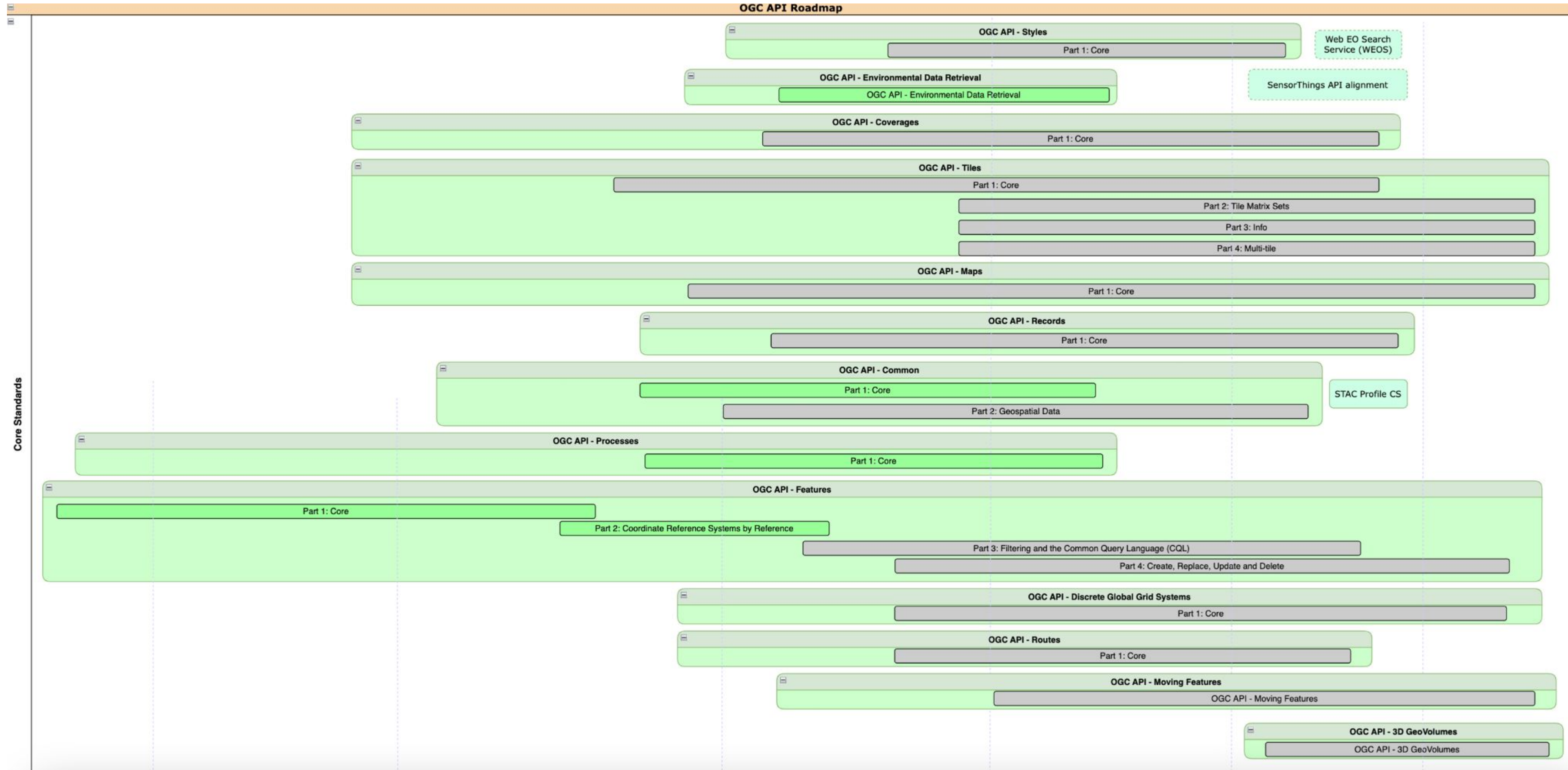
Depreciation of OWS



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

OGC API Roadmap

<https://ogcapi.org/apiroadmap.html>



2017

2018

2019

Copyright © 2022 Open Geospatial Consortium

2022

2023

Work in Progress

<https://www.ogc.org/roadmap>

	SWG Work / Work Item	OAB Review	OGC-NA Review	Public Review	Prepare for Approval	TC Approval to Vote	TC Vote	PC Vote	Public Release
OGC OGC API - Common - Part 1: Core 19-072	✓	✓	✓	✓	✓	✓	✓	✓	✓
OGC OGC API - Common - Part 2: Geospatial Data 20-024	✓	✓	✓	✓	✓	⊘			
OGC OGC API - Coverages	⊘								
OGC OGC API - Features - Part 3: Filtering and the Common Query Language (CQL) 19-079	✓	✓	⊘	✓	⊘				
OGC OGC API - Features - Part 4: Create, Replace, Update and Delete 20-002	⊘								
OGC OGC API - Features - Part 5: OpenAPI 3.1	⊘								
OGC OGC API - Maps	⊘								
OGC OGC API - Records	⊘								
OGC OGC API - Routes - Part 1: Core 21-000	✓	✓	✓	✓	✓	⊘			
OGC OGC API - Styles	⊘								

How to get involved with the OGC APIs?



Participate as a member ✓

- Join and participate in the relevant Domain & Standard Working Groups.

Follow the GitHub repos ✓

- Create issues.
- Contribute with PRs.

Join the code sprints ✓

- Build/ update implementations.
- Provide feedback.
- Sponsoring.

Test/certify implementations ✓

- Increase interoperability.
- Engage with the compliance program.

OGC Working Groups

- **Standard Working Groups (SWGs):** groups that work in new standards or standards revisions, through the OGC RFC process. Examples:
 - Features API SWG, OGC API - Tiles SWG, Coverages SWG, Routing SWG, Geocoding API SWG, Features and Geometries JSON SWG, OGC Geopackage SWG.
- **Domain Working Groups (DWGs):** groups that address interoperability requirements and issues of specific domains.

3DIM DWG ✓

- Interface and encoding standards for 3-dimensional content

Data Quality DWG ✓

- Interoperable framework or model for OGC quality measures and services

Smart Cities DWG ✓

- Mobile and static networks to support the data, application and monitoring requirements of the Smart Cities

Metaverse DWG ✓

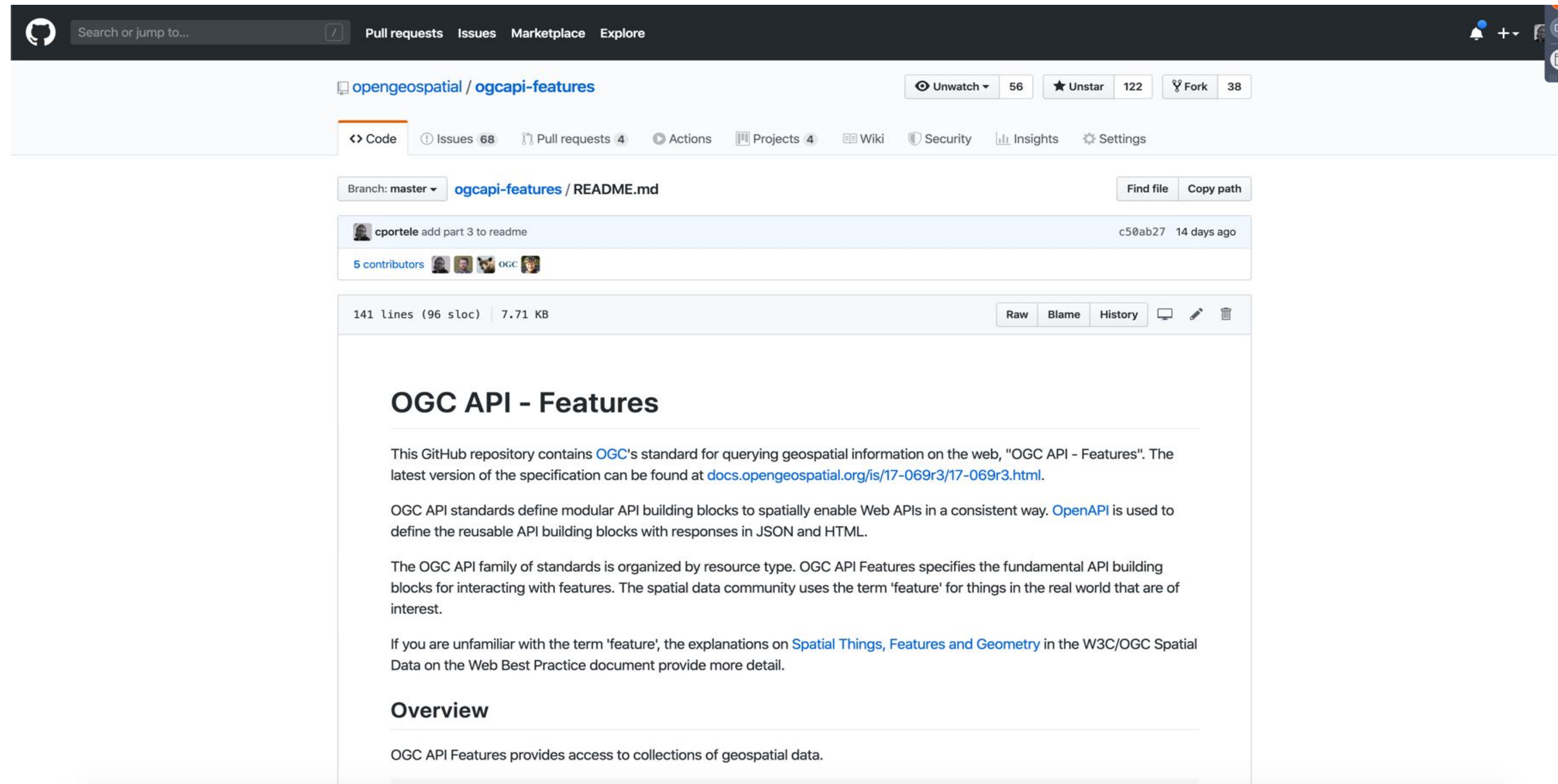
- Will work on pieces of the Metaverse that pertain to geospatial applications and Standards

Starting

OGC API GitHub Repos

- Join the discussions.
- File issues.
- Submit PR.


 <https://github.com/opengeospatial/>

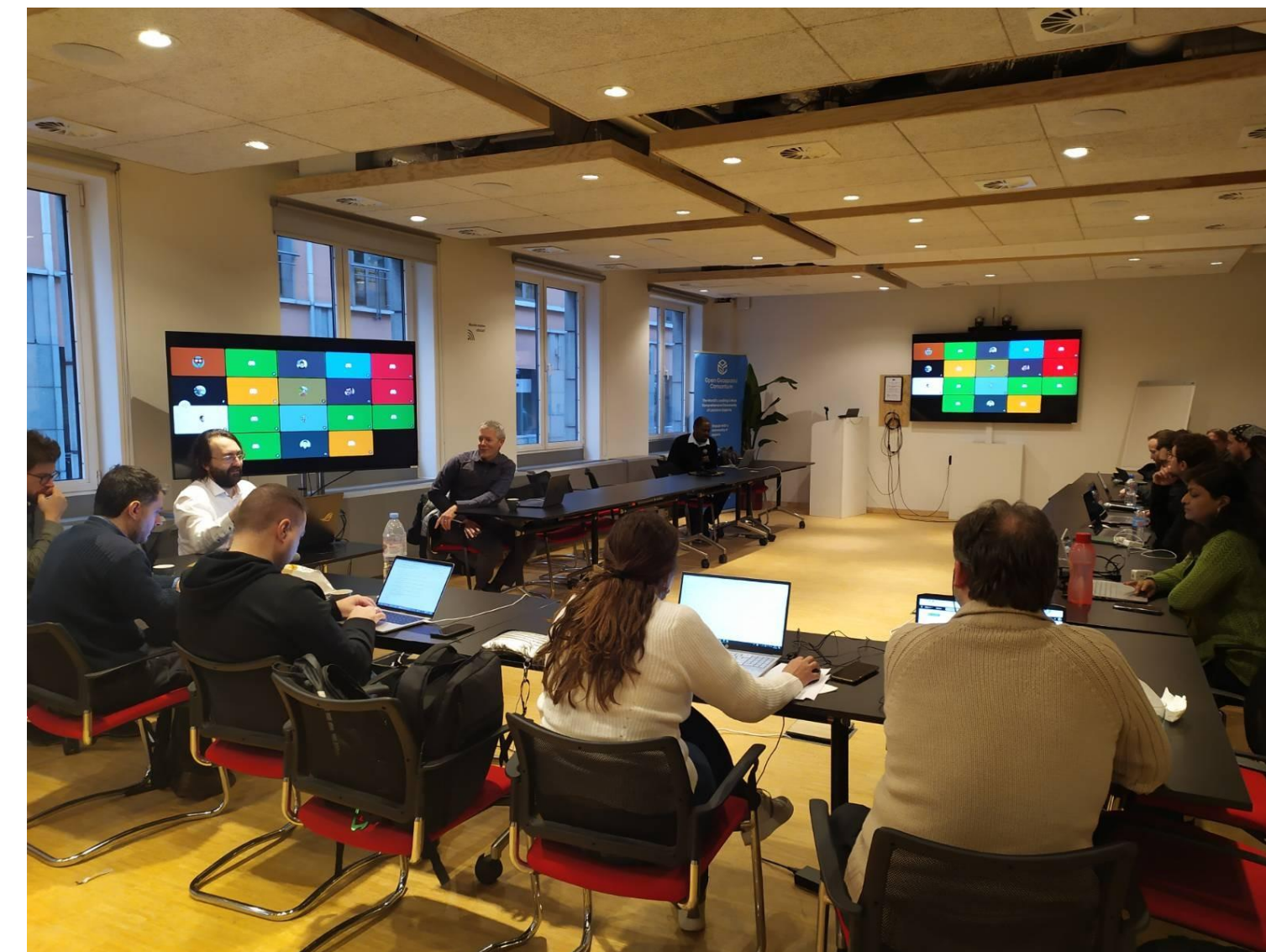
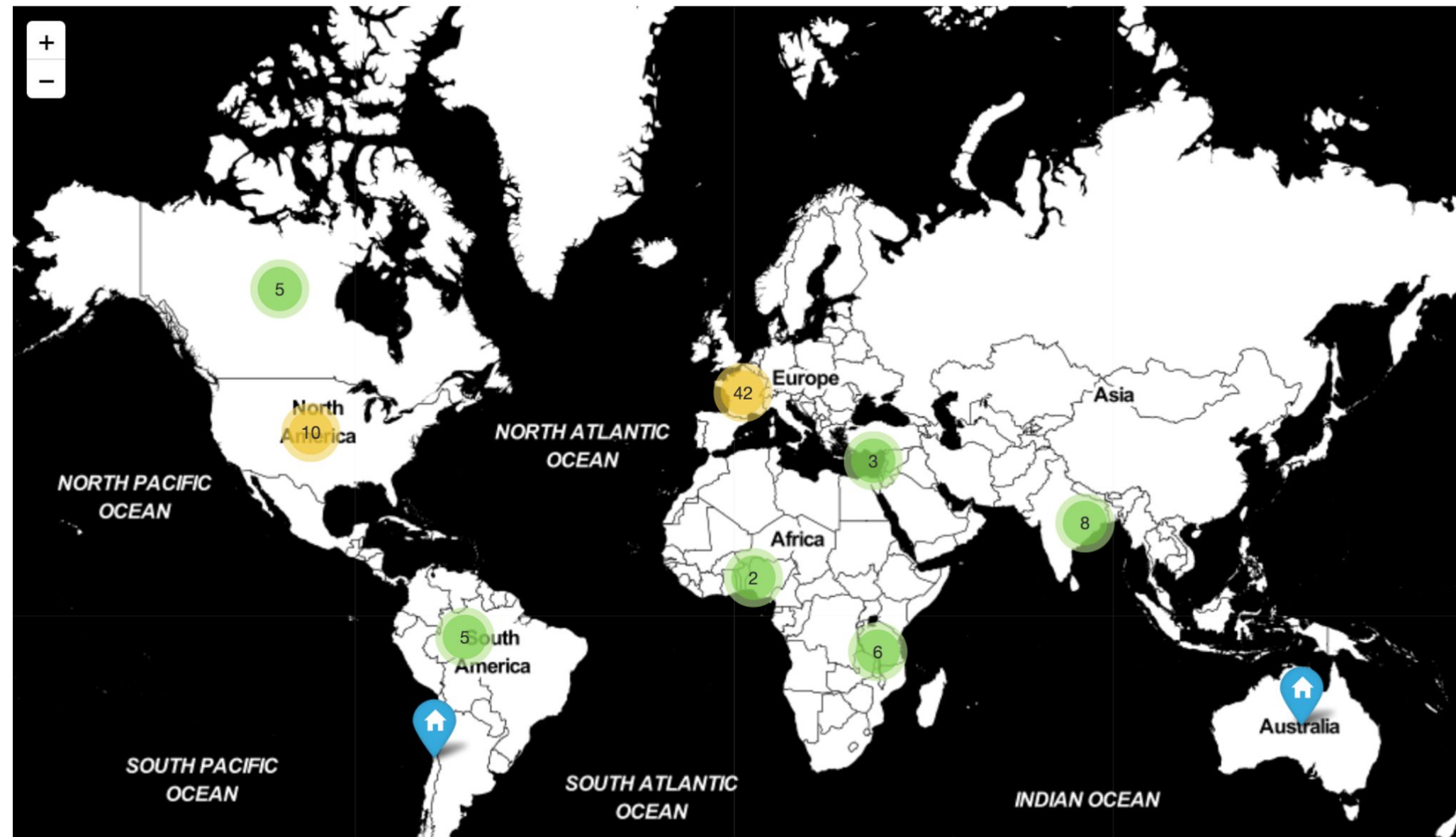


The screenshot shows the GitHub repository page for `opengeospatial/ogcapi-features`. The repository has 56 Unwatch, 122 Unstar, and 38 Forks. The current view is the `ogcapi-features / README.md` file on the `master` branch. The commit history shows a recent commit by `cportele` titled "add part 3 to readme" with commit hash `c50ab27` from 14 days ago, contributed by 5 contributors. The file size is 7.71 KB (141 lines, 96 sloc). The README content includes the title "OGC API - Features" and a description: "This GitHub repository contains OGC's standard for querying geospatial information on the web, 'OGC API - Features'. The latest version of the specification can be found at docs.opengeospatial.org/is/17-069r3/17-069r3.html. OGC API standards define modular API building blocks to spatially enable Web APIs in a consistent way. OpenAPI is used to define the reusable API building blocks with responses in JSON and HTML. The OGC API family of standards is organized by resource type. OGC API Features specifies the fundamental API building blocks for interacting with features. The spatial data community uses the term 'feature' for things in the real world that are of interest. If you are unfamiliar with the term 'feature', the explanations on [Spatial Things, Features and Geometry](#) in the W3C/OGC Spatial Data on the Web Best Practice document provide more detail." The "Overview" section states: "OGC API Features provides access to collections of geospatial data."

OGC Code Sprints

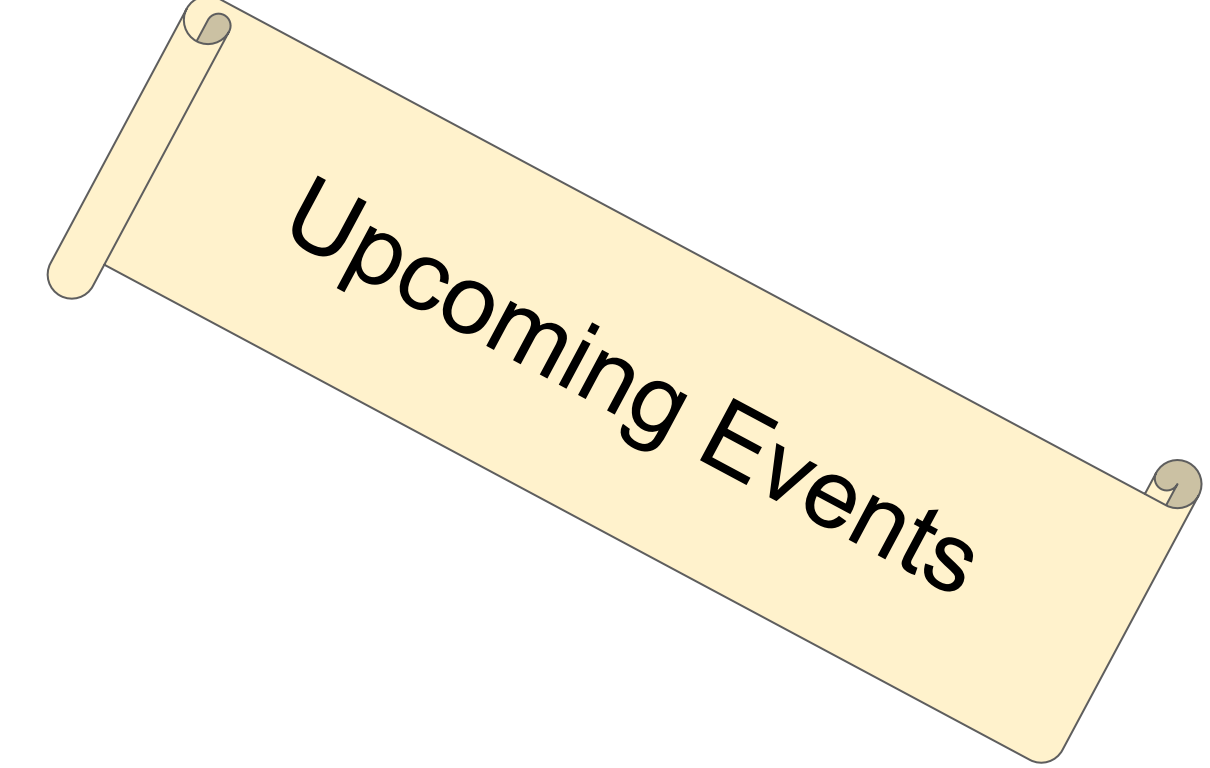
- Three-day collaborative, hybrid, events
- Held regularly
- Open to all OGC API standards
- Feature a mentor stream, to onboard newcomers
- Feature developers from across the globe

Join the OGC Events Discord Channel 



Source: Web Mapping Code Sprint - November 2022

Code Sprints in 2023



- Q1 - March/April - Europe (Switzerland)
- Q2 - June - NA (US)
- Q3 - September - Europe



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

👉 <https://github.com/opengeospatial/developer-events/wiki>

Test/certify Implementations

- The OGC Compliance Program provides the resources, procedures, and policies to certify products for compliance with one or more OGC standards.
- The primary purpose of the program is to increase systems interoperability while reducing technology risks by providing a process whereby compliance with OGC standards can be tested.




OGC Compliance Badge

👉 <https://www.ogc.org/compliance>

GEOE3 Academy

<https://geoe3.org>



Home

Geospatially Enabled Ecosystem for Europe

GEOE3 Academy

What is this Academy about?

This GEOE3 -e-learning program includes 10 separate modules, focused on the fundamentals of availability, interoperability, and integration of geospatial data services. You can select one or several modules and study at your own pace. The course material does not contain returnable study assignments.

After completing the free online course, you will have a better understanding of:

- how to improve access and interoperability of geospatial and other data
- how dynamic harmonisation of geospatial data works
- how to develop your services based on the national data and platforms, and integrate it to European framework

This course material is produced by GeoE3-project. The project provides a vital connection between existing and emerging National, Regional and Cross-Border digital services. It is co-financed by the Connecting Europe Facility of the European Union.

If you have any questions about the material, send us an email info@geoe3.eu

Summary

- OGC API Standards are becoming a key requirement for Web APIs offering location-referenced information
- Early impact has already been seen across government, private and academic sectors
- Organizations should spatially enable their Web APIs through OGC API Standards to ensure their data is Findable, Accessible, Interoperable, and Reusable (FAIR)

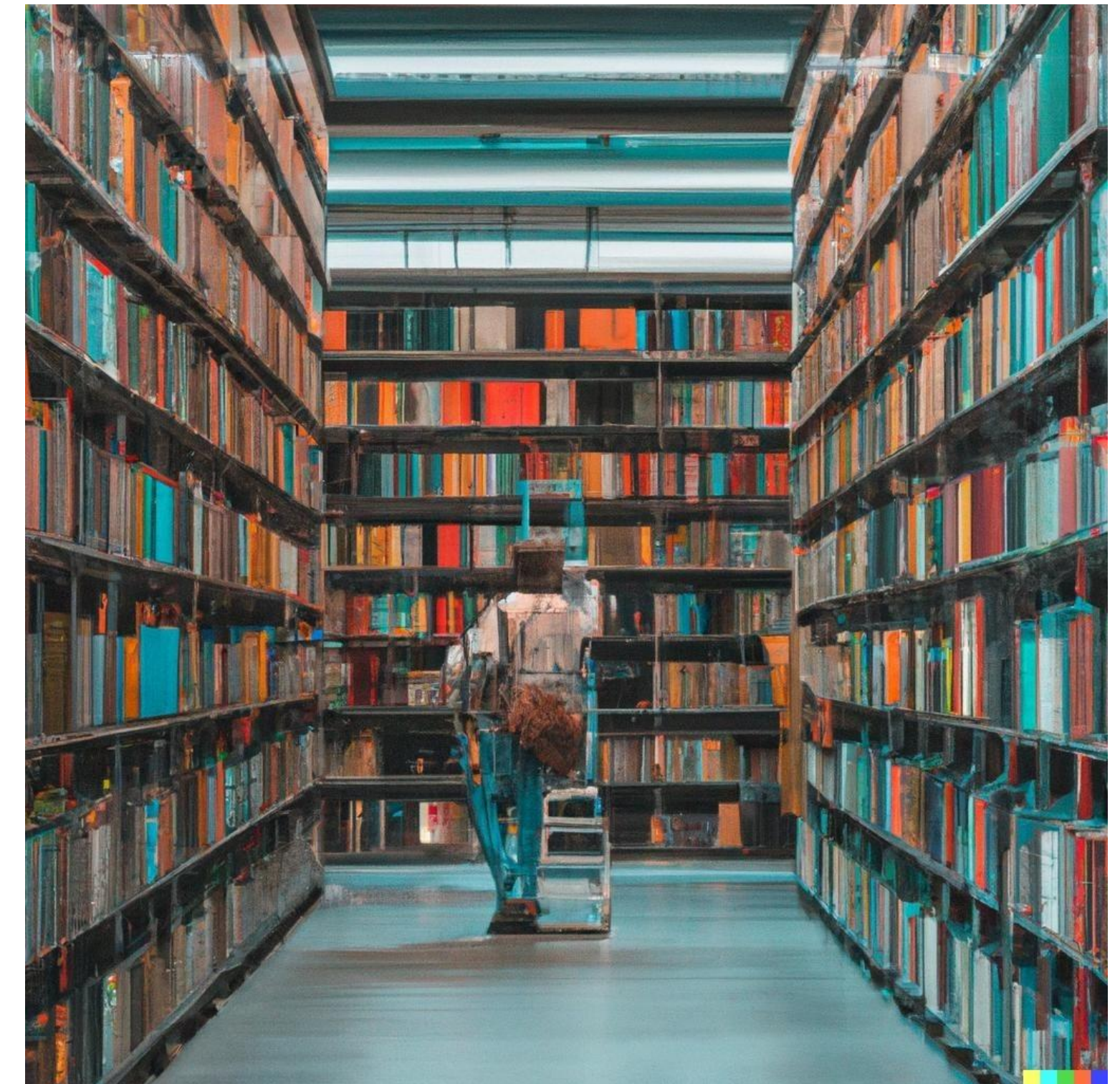


Image generated with DALL.E 2 :<https://openai.com/dall-e-2/>

#OGCAPI

Thank You

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
Quarterly Tech Trends monitoring

Standards

65+ Adopted Standards
300+ products with 1000+ certified implementations
1,700,000+ Operational Data Sets
Using OGC Standards



devrel@ogc.org



joanasimoes



@doublebyte@noc.social



@doublebyte1



Questions?

