



Open  
Geospatial  
Consortium



# 3rd Open Standards and Open Software Code Sprint

Welcome Session  
#Kick-off



# WELCOME

## What is a Code Sprint?

A collaborative hybrid event, where developers from across the world come together to work on open geospatial standards and software that implements those standards.



Freedom day:

[https://en.wikipedia.org/wiki/Carnation\\_Revolution](https://en.wikipedia.org/wiki/Carnation_Revolution)

# Sprint Sponsor's Remarks

Gold-level  
Sponsor:



Checkout the #ordnance-survey discord channel, under the #Sponsor section

# ORDNANCE SURVEY

Great Britain's National Mapping Service

Sponsors of the open standards and open source software code sprint  
April 25 – 27<sup>th</sup> 2023

Allan Jamieson  
[Allan.jamieson@os.uk](mailto:Allan.jamieson@os.uk)

# Ordnance Survey

National Mapping Service of Great Britain.

We collect and curate accurate and detailed geospatial data, across England, Scotland and Wales.

We are a Government Company, owned 100% by the Department for Business, Energy and Industrial Strategy

We provide services to governments internationally, license data to a 'partner' network, and provide mapping products and experiences to a consumer market.

+ £82.3m<sup>\*</sup>  
Revenue  
**1,325\***

Data Transactions  
**103,544 kms\***  
Kms of Britain flown by the OS flying unit

Employees



\* OS Annual Report 2021-22 [Annual Reports | Governance](#)  
 [\(ordnancesurvey.co.uk\)](http://ordnancesurvey.co.uk)



# Geovation from Ordnance Survey

**Geovation** is the home of the geospatial start-up ecosystem.

**Community**

**3 accelerators**

**A London Hub**

**A Partner hub network**

**150+**

Companies actively supported

**2500+**

Jobs created

**\$160M+**

Raised



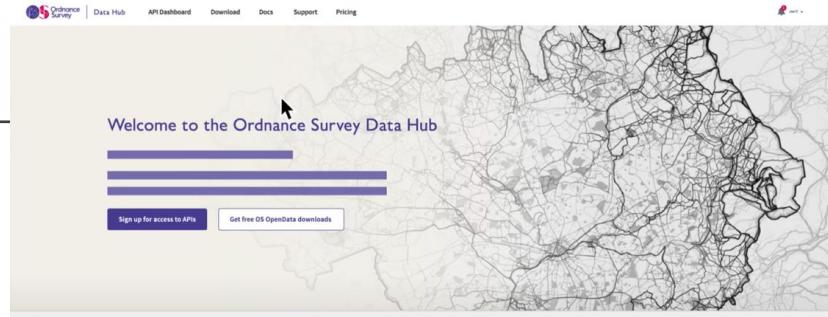
HM Land Registry



# Open Standards at Ordnance Survey

## 1/ OS Data Hub

- Development of OGC API's for access to our National Geographic Database
- OS Select and Build – OS NGD Features API



## 2/ MUDDI – Mapping Underground Utilities

- OS contribution in the development of the conceptual MUDDI standard

## 3/ Urban Digital Twins

- Identification of standards for Urban Digital Twins

## 4/ Climate Resilience

- Identification and development of open standards to improve the interoperability of the climate resilience data

## 5/ OS Innovation and Research

- AI / ML – Interest in training data for ML and interoperable/transferable ML Models for Earth Observation applications
- Geo AI developments, data extraction
- EO – Geo Data cubes, Analysis Ready Data and Reproducible Science
- GeoPose standard – terrestrial imagery orientation
- Moving features, real-time data, IoT particularly in transport

A screenshot of the "Add a data package" interface on the Ordnance Survey Data Hub. It shows a map of the Liverpool region with various data layers. On the left, there's a sidebar with a search bar ("Enter postcode or place"), a "Reset all options" button, and sections for "Choose your area" (radio buttons for "All of Great Britain or Predefined Area" and "Draw a polygon/upload a file/use an OS Polygon"), "File format" (dropdown menu), "Updates" (checkbox for "I want a one-off snapshot of the date in the past"), and a "Select updates" dropdown.

# Sprint Host's Remarks



Checkout the #camptocamp discord channel, under the #Sponsor section

# Camptocamp staff and locations

- Open Source, since 2001
- 160+ employees
- The leading European service provider contributing to geospatial open source software.

camptocamp  
Paris

camptocamp  
Munich

camptocamp  
Olten

camptocamp  
.Lausanne

camptocamp  
Chambéry

# Catering Sponsors

camp to camp



HAUTE ÉCOLE  
D'INGÉNIERIE ET DE GESTION  
DU CANTON DE VAUD  
[www.heig-vd.ch](http://www.heig-vd.ch)

HEIG-VD (School of Engineering and Management)



EPFL



UNIL | Université de Lausanne

University of Lausanne



State of Neuchâtel



State of Vaud

# Camptocamp staff and locations

- Open Source, since 2001
  - Service provider
  - Editor, contributor and integrator
- 160+ employees
  - Cross functional team: Plan - Build - Run
- 75+ geospatial & devops experts
  - Open Source contributors
  - Agile Software development
  - DevOps & Cloud expertise
- The leading European service provider contributing to geospatial open source software.

camptocamp  
Paris

camptocamp  
Munich

camptocamp  
Olten

camptocamp  
.Lausanne

camptocamp  
Chambéry

# Open Source Geospatial Software

## 20+ years contributions

camptocamp



# Open source and interoperability

camp to camp



# Logistics

- Multiple entries: A Stairs
- Free coffee, chocolate @ Camptocamp 3rd floor
  - Drinks (except water) only allowed in the cafeteria
- Code sprint rooms (A Stairs)
  - 1st floor
  - 3rd floor
- Open : 8am to 9pm
- Emmanuel phone: +41 79 936 46 62

# Catering

- Tuesday
  - Breakfast @camptocamp
  - Lunch: 1230-1330: @camptocamp sandwiches
  - Diner: 1700-1800: @stamm ceviche/chicken
- Wednesday
  - Lunch: 1230-1330: @camptocamp paëlla
  - Diner: 1700-1800: @stamm tapas
- Thursday
  - Lunch: 1230-1330 @camptocamp pokebowls

# Rooms

## 1st floor (Salon QG)

- 26 pax: general space
- 8 pax: solarium
- 4 pax: labo
- 5 pax: study room

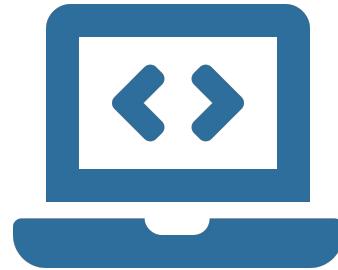
## 3rd floor (Camptocamp)

- entire Open Space
- 12 pax: room 4
- 7 pax: room 1
- 6 pax: room 5
- 6 pax: room 7
- 4 pax: room 3
- 4 pax: room 8

# What happens during the code sprint?



Discussions



Independent Work



Mentor Stream

# Sprint Structure (2x speeds)

The sprint will take place in person at CamptoCamp's offices (near Lausanne, Switzerland) and on the OGC Events Discord Server.



Main Track  
General  
channels



Mentor Stream  
Mentoring channels

# Main Track

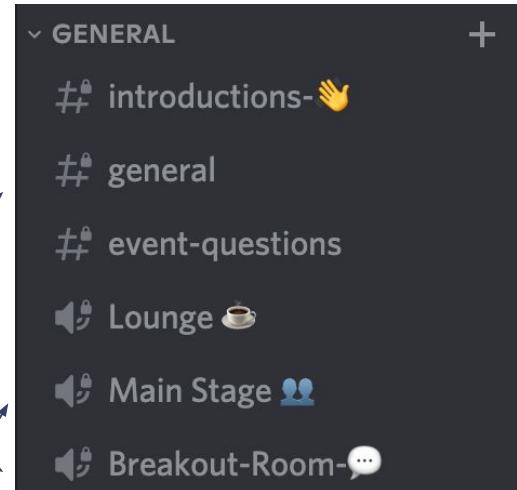


Developers will be working at their own pace:

- Developing standards implementations.
- Testing standards implementations.
- Providing feedback.

Discussion and  
knowledge sharing

Meet at given checkpoints



# Mentor Stream



Developers will have the opportunity to give their first steps, using the standards or implementations of the standards.

You can find  
mentoring here

Tutorials will take place here



# Sprint Agenda

## #MainTrack

Day 1 - April 25th

09:00 - 09:15	Welcome remarks from the Initiative Manager and Event Host	V:  #Main Stage
09:15 - 09:35	Overview and Sprint Goals for participating OGC standards working groups - Gobe Hobona	V:  #Main Stage
09:35 - 09:55	Overview and Sprint Goals for participating OSGeo projects - Tom Kralidis	V:  #Main Stage
09:55 - 10:15	Overview and Sprint Goals for Apache projects - Martin Desruisseaux	V:  #Main Stage
10:15 - 10:30	Q&A	V:  #Main Stage
10:30 - 11:30	5-minute introduction per project or working group - <a href="#">more info</a>	V:  #Main Stage
11:30 - 12:30	Practical Work	V:  #Breakout Room
11:30 - 12:30	Practical Work	V:  #OSGeo Room
12:30 - 13:30	Lunch	
13:30 - 17:00	Practical Work	V:  #Breakout Room
13:30 - 17:00	Practical Work	V:  #OSGeo Room
17:00 - 18:00	Early dinner	
18:00 - 20:00	Practical work	V:  #Breakout Room
18:00 - 20:00	Practical Work	V:  #OSGeo Room
20:00 - 21:00	Daily Brief Back	V:  #Main Stage

## Day 2 - April 26th

2023-04-26		Day #2	
	09:00 - 10:00	Practical work	V:  #Breakout Room
	09:00 - 10:00	Practical Work	V:  #OSGeo Room
	10:00 - 11:00	Stand-up & demos	V:  #Main Stage
	11:00 - 12:30	Practical work	V:  #Breakout Room
	10:30 - 12:30	Practical Work	V:  #OSGeo Room
	12:30 - 13:30	Lunch	
	13:30 - 17:00	Practical Work	V:  #Breakout Room
	13:30 - 17:00	Practical Work	V:  #OSGeo Room
	17:00 - 18:00	Early dinner	
	18:00 - 20:00	Practical work	V:  #Breakout Room
	18:00 - 20:00	Practical Work	V:  #OSGeo Room
	20:00 - 21:00	Daily Brief Back	V:  #Main Stage

## Day 3 - April 27th

2023-04-27		Day #3: Final Day	
	09:00 - 10:00	Practical work	V:  #Breakout Room
	09:00 - 10:00	Practical Work	V:  #OSGeo Room
	10:00 - 11:00	Stand-up & demos	V:  #Main Stage
	11:00 - 13:00	Practical work	V:  #Breakout Room
	11:00 - 13:00	Practical Work	V:  #OSGeo Room
	13:00 - 14:00	Lunch	
	14:00 - 15:00	Practical work	V:  #Breakout Room
	14:00 - 15:00	Practical Work	V:  #OSGeo Room
	15:00 - 17:00	Demos & Wrap-up	V:  GotoMeet

# Mentor Stream Onboarding Session

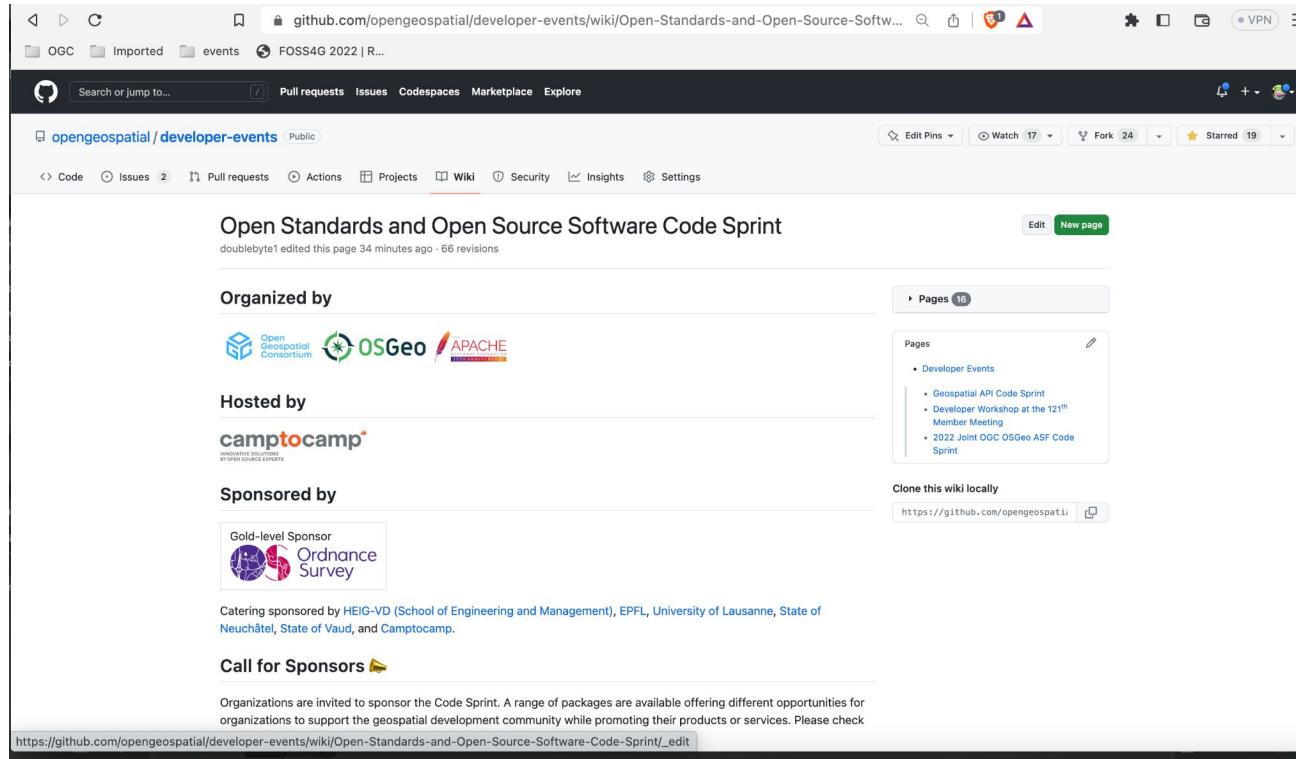


April, 25th, 12:00-12:30h CEST - #Mentor-Room

- Introduce mentor stream activities
- Introduce mentors



# Sprint Wiki on GitHub



A screenshot of a GitHub repository page for "opengeospatial / developer-events". The main title is "Open Standards and Open Source Software Code Sprint". Below it, there's a section titled "Organized by" featuring logos for Open Geospatial Consortium, OSGeo, and APACHE. Another section "Hosted by" shows the "campocamp" logo. A "Sponsored by" section includes the "Ordnance Survey" logo. To the right, there's a sidebar with a "Pages" section containing links to "Developer Events", "Geospatial API Code Sprint", "Developer Workshop at the 121<sup>th</sup> Member Meeting", and "2022 Joint OGC OSGeo ASF Code Sprint". At the bottom, there's a "Call for Sponsors" section and a link to the edit page.

https://github.com/opengeospatial/developer-events/wiki/Open-Standards-and-Open-Source-Software-Code-Sprint/\_edit

Hashtag on social media:  
**#CODESPRINT20**

<https://github.com/opengeospatial/developer-events/wiki/Open-Standards-and-Open-Source-Software-Code-Sprint>

# Which OGC Standards Working Groups do you regularly contribute to?

OGC API -  
Processes

GeoAPI

OGC API -  
Common

OGC API -  
Environmental  
Data Retrieval

OGC API -  
Discrete Global  
Grid Systems

OGC API -  
Features

OGC API -  
Tiles

OGC API -  
Records

OGC API -  
Routes

GeoTIFF

OGC API -  
Coverages

OGC API -  
Styles

EO Ex DWG

OGC API -  
Tiles

GeoPackage

OGC API -  
Maps

JSON-FG

MetOcean  
DWG

CITE SC

CRS

netCDF

Moving  
Features

IndoorGML

# What is OGC?

- **A Global consortium** of more than 500 businesses, government agencies, research organizations, and universities driven to make geospatial (location) information and services FAIR - Findable, Accessible, Interoperable, and Reusable.
- **A hub for thought leadership and innovation** for all things related to location
- **A neutral and trusted forum** for tackling interoperability issues within and across communities
- **A consensus-based open standards organization** for location information

# 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

# Sprint Goals for OGC SWGs

- Develop prototype implementations of OGC standards
  - including implementations of draft OGC APIs standards
- Test the prototype implementations
- Provide feedback to the Editor about what worked and what did not
- Provide feedback about the specification document

# Which OSGeo projects do you regularly contribute to?

QGIS

GeoNetwork

GeoNode

GeoServer

MapServer

GeoHealthCheck

deegree

GRASS GIS

PostGIS

OSGeoLive

OWSLib

GDAL

pgRouting

MobilityDB

Proj

pycsw

pygeoapi

MapBender

MapProxy

ZOO-Project

# What is OSGeo?

- OSGeo is a not-for-profit software foundation
  - Provides projects financial, organizational and legal support
- Outreach and advocacy
  - Promoting global adoption of open source geospatial technology
  - Partnerships on open approach to standards, data and education.
- OSGeo is volunteer driven
  - Passionate membership of individuals from around the world.



# Open Source Geospatial Foundation

- Working with our partners:
  - **Open Source:** a collaborative approach to software development.
  - **Open Data:** freely available information to use as you wish
  - **Open Standards:** avoid lock-in with interoperable software
  - **Open Education:** removing the barriers to learning and teaching
  - **Open Science:** share data and software for responsible research

# OSGeo Status Overview

Open, free membership:

---

**497** *31/Dec/2021* elected **charter members** (+15)

developers, activists, advocates, distribution by year, region and country [Welcome our new OSGeo Charter Members 2021](#)

**1704** *22/Jul/2022* **members on website** (+179 from August last year)

**36699** *01/Jul/2022* **OSGeo mailman server unique subscribers** (+470 from August last year)

Source: [M Neteler's monthly cronjob](#)



# OSGeo sponsors



WhereGroup



# OSGeo Projects

Projects: [osgeo.org/projects/](http://osgeo.org/projects/)

- OSGeo projects:
  - official projects passed graduation through incubation committee
  - 22 projects
- Community projects
  - the barrier for community projects is lower than for official ones, but they also need confirmation by incubation committee
  - 28 community projects

## OSGeo Projects

### Content Management Systems

GeoNode

### Desktop Applications

Marble  
gvSIG Desktop  
QGIS Desktop  
GRASS GIS

### Geospatial Libraries

PROJ  
GeoTools  
Orfeo ToolBox  
GDAL/OGR  
GEOS

### Metadata Catalogs

GeoNetwork  
pycsw

### Other

OSGeoLive

### Spatial Databases

PostGIS

### Web Mapping

pygeoapi  
MapServer  
deegree  
OpenLayers  
GeoMoose  
Mapbender  
PyWPS

# Community projects

## Desktop Applications

OSGeo4W  
Opticks

## Geospatial Libraries

PROJ-JNI  
GeoStyler  
Open Data Cube  
Mesh Data Abstraction Library (MDAL)  
actinia  
Pronto Raster  
OWSLib  
FDO  
OSSIM  
pgRouting

## Metadata Catalogs

**Other**  
GeoServer Client PHP  
Loader  
GeoHealthCheck  
Portable GIS  
TEAM Engine

## Spatial Databases

Giswater  
MobilityDB  
rasdaman

## Web Mapping

GeoExt  
GC2/Vidi  
GeoWebCache  
MapGuide Open Source  
mapfish  
Geomajas  
ZOO-Project  
istSOS

# Sprint Goals for OSGeo Projects

- Release new software versions
- Fix open issues
- Develop new features
- Improve documentation, translations
- Develop prototype implementations of OGC standards

# FOSS4G 2023 Global Conference

26 June - 1 July 2023

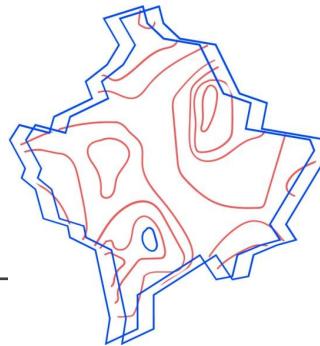
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Main Conference

Hands on Workshops

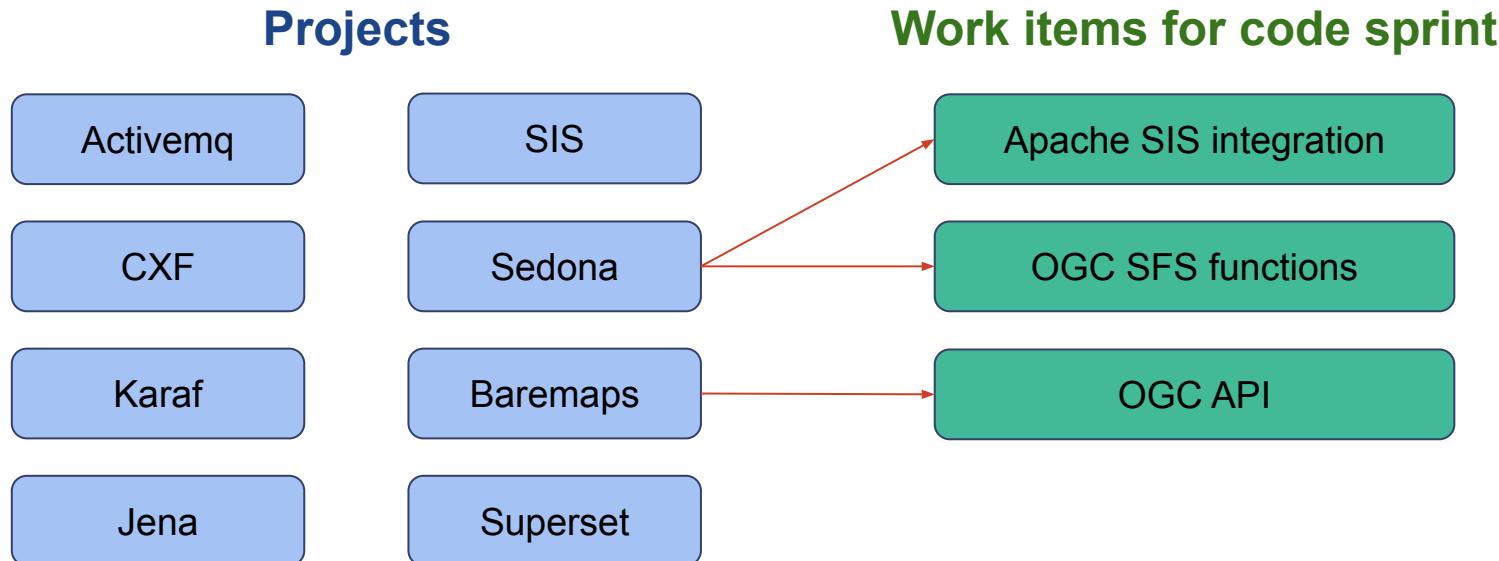
Join us!

[2023.foss4g.org](https://2023.foss4g.org)



**FOSS4G**  
Prizren, 2023

# Which Apache projects do you regularly contribute to?





# Established 1999

*Mission: to provide software for the public good*

## First Project

APACHE  
HTTP SERVER



**World's Most Popular Server**

2021: 26th Anniversary  
[22 years at the ASF]



## Today



**Develops, Stewards, Incubates**

350+ Projects and initiatives  
39 Incubating Podlings  
<https://projects.apache.org/>



# Global Impact: Apache Software

- **powering more than half the Internet**
- managing **zettabytes of data**
- executing **teraflops of operations**
- storing **billions of objects** in virtually every industry
- integral to **nearly every end-user computing device**
- **35M+ page views per week** across apache.org
- **9M+ source code downloads** annually from Apache mirrors
- Apache OpenOffice provides \$25M+ in value to users each day
- Web requests **from every Internet-connected country** on the planet
  
- **Valued conservatively at \$22B+ available to all at 100% no cost!**

# Level Playing Field

- Vendor-neutral, collaborative environment
- Projects are governed independently of commercial influence
- We do not take sides, or endorse or support any particular vendor
- We do not discourage the development of "competing" products
- Third parties can pursue for-profit and not-for-profit business models



# Apache Community

- All-Volunteer
- 21 original founding Members
- 815+ individual ASF Members
- 8,500+ Apache Committers
- Guardians of 227,000,000+ Lines of Code



# Apache Project Categories

Artificial Intelligence

Annotation

APIs

Application Performance

Big Data

Blockchain

Build Management

Clinical Data Management

Cloud Computing

Content Delivery

Data Management

Databases

Deep Learning

Email

ERP

Fintech

Graph Computing

Graphics

**Geospatial**

Hardware Optimization

HTTP

Identity Management

Integration

IoT

Java/JavaEE

Libraries

Mail

Machine Learning

Messaging

Mobile

Natural Language Processing

Network-Client

Network-Server

Observability

Operating Systems

OSGi

Productivity Suite

Programming Languages

Search/Search Learning

Security Frameworks

Service Mesh

Scheduling

SQL

Testing

Web Conferencing

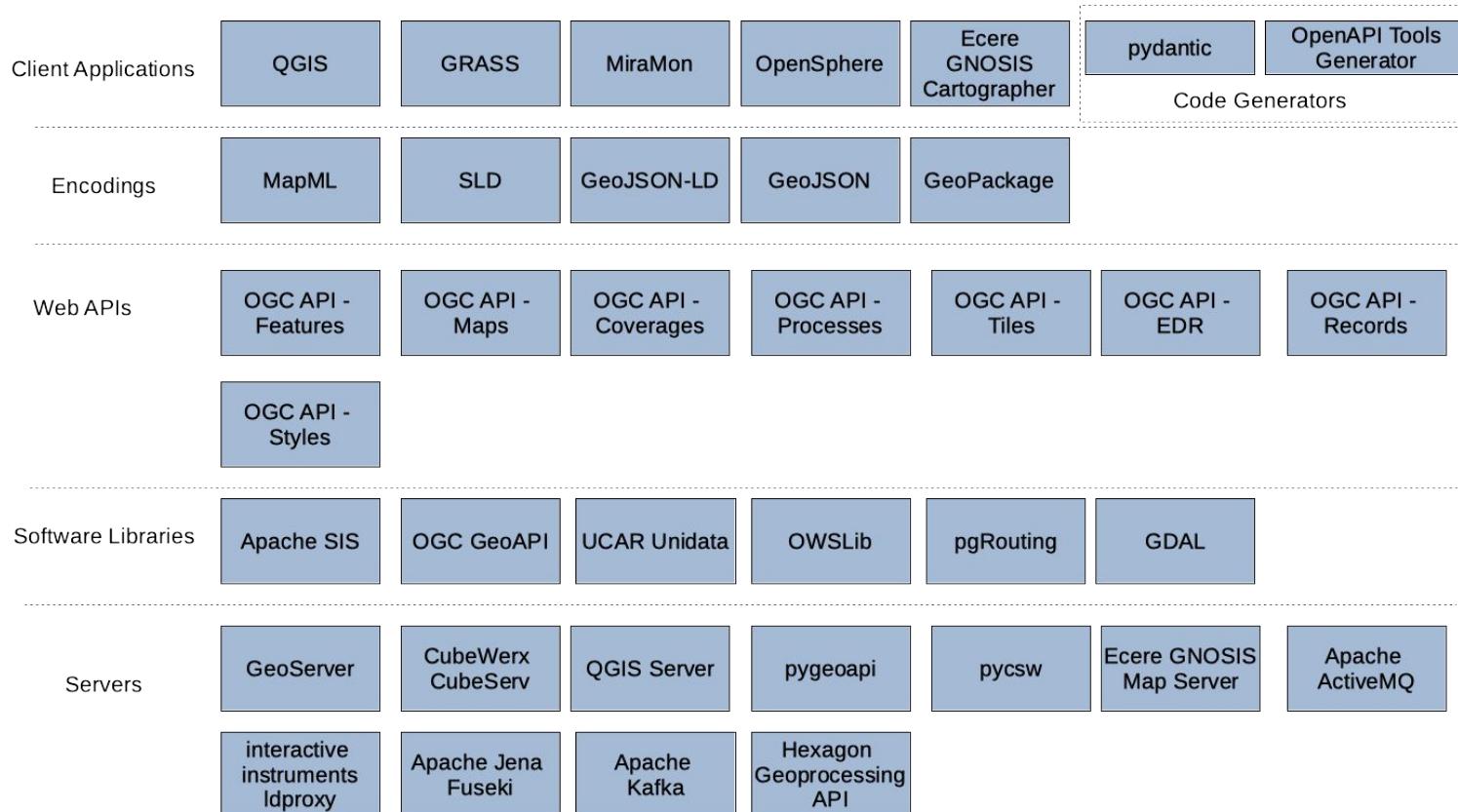
Web Frameworks

XML ...

# Sprint Goals for Apache Projects

- Improve support of OGC standards
  - OGC SFS in Sedona
  - OGC API in Baremaps
- Improve visualisation capabilities (map, ...)
- Improve documentation (web site, ...)
- Improve project-independant test coverage (GIGS + GeoAPI, ...)
- Improve interoperability with other libraries (GeoAPI + Panama, ...)
- Experiment new technologies (vectorization, Panama, ...)
- Integration (Sedona + SIS, ...)

# How everything fits together

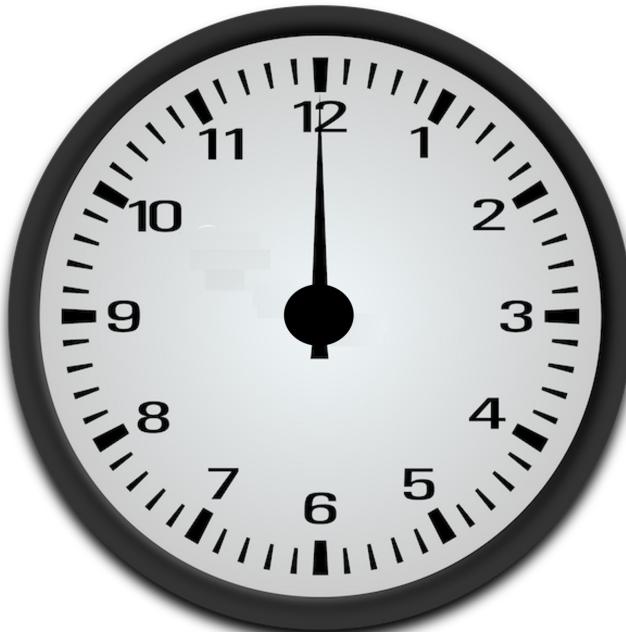


# Questions and Answers

?

# Thank You!

# 5-minute overview by each project or group



- OL-Cesium, Guillaume Beraudo
- OGC Indoor GML, Ki-Joune Li
- [OGC GeoAPI](#), Martin Desruisseaux
- [Apache SIS](#), Martin Desruisseaux
- OGC API - Processes, Peter Vretanos (Part 1-2) (and Jerome St-Louis - Part 3)
- OGC API - Maps, Jerome St-Louis
- OGC API - Coverages, Jerome St-Louis
- OGC Styles & Symbology, Jerome St-Louis
- OGC API - DGGS, Jerome St-Louis
- OGC API - Records, Tom Kralidis
- [GeoPython](#) (e.g.: pygeoapi, pycsw, OWSLib, pygeometa), Tom Kralidis
- Apache Baremaps, Bertil Chapuis
- OGC API - Features, Clemens Portele
- Geostyler

# OL-Cesium

A JS library for 2D/3D maps

# About me

- Guillaume Beraudo
- Architect at Campnocamp
- Maintainer of the OL-Cesium library

# OL-Cesium

- Part of the OpenLayers organization (OSGeo)
- Great for adding 3D to an OL application
- Result of a joint work between Andreas Hocevar, Khlokan and me
- <https://github.com/openlayers/ol-cesium>

# Open ideas

- Fix/close issues
- Modernize code base (typescript, build system, examples, tests...)
- Discuss community tools and interaction
- Implement an MVT renderer for CesiumJS
- Add experimental 3D support to GeoMapfish
- ...

# Is it for me?

- You are a developer;
- You know about javascript;
- You are interested in 2D and 3D;

-> no other requirement: just join

Open Standards and Open Source  
Software

*2023 Joint OGC-ASF-OSGeo Code Sprint*



IndoorGML

# OGC Sprint IndoorGML – 5 min pitch

April 25, 2023

Ki-Joune Li,  
Pusan National Univ.

<http://lik.pnu.edu>



# IndoorGML?

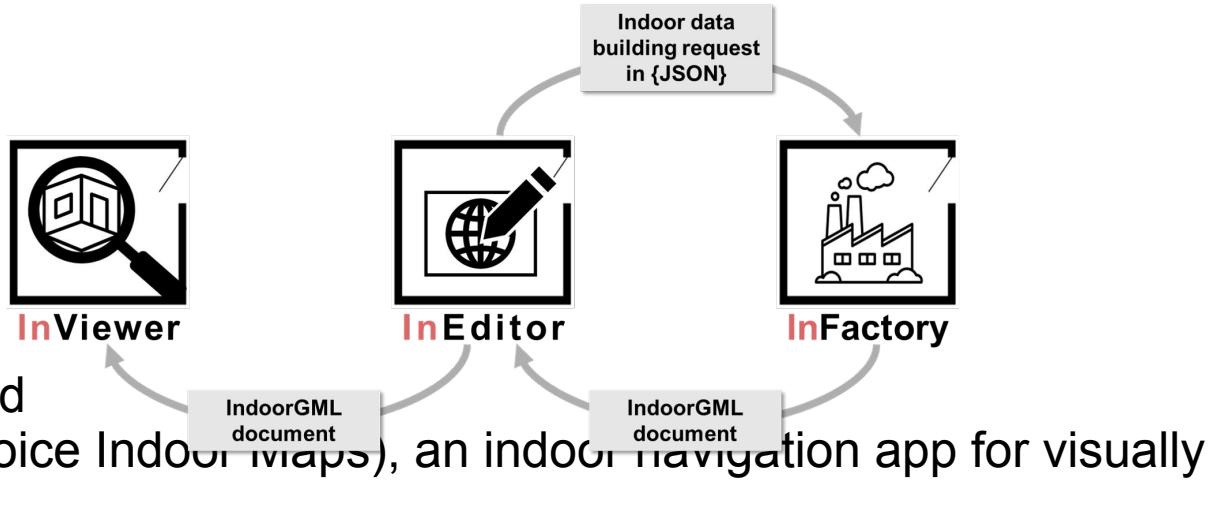
- IndoorGML is an OGC standard
  - of indoor spatial data model
  - and exchange data format in XML (GML)
  - for indoor maps
  - since 2015

## • Something

```
LX-IndoorGML.gml
1  <core:IndoorFeatures
2  xmlns:gml="http://www.opengis.net/gml/3.2"
3  xmlns:xlink="http://www.w3.org/1999/xlink"
4  xmlns:core="http://www.opengis.net/indoorgml/1.0/core"
5  xmlns:navi="http://www.opengis.net/indoorgml/1.0/navi"
6  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
7  gml:id="z3753b9e-80f4-9fdf-6c38-414c129695d4"
8  xsi:schemaLocation="http://www.opengis.net/indoorgml/1.0/core
9      http://schemas.opengis.net/indoorgml/1.0/indoorgmlcore.xsd
10     http://www.opengis.net/indoorgml/1.0/navigation
11     http://schemas.opengis.net/indoorgml/1.0/indoorgmlnavi.xsd">
12   <gml:boundedBy>
13     <gml:Envelope>
14       <gml:lowerCorner srsDimension="3">241.134 1882.31 9.39053e-010</gml:lowerCorner
15       <gml:upperCorner srsDimension="3">3898.17 3862.88 1062.99</gml:upperCorner
16     </gml:Envelope>
17   </gml:boundedBy>
18   <core:primalSpaceFeatures>
19     <core:PrimalSpaceFeatures gml:id="abc">
20       <core:cellSpaceMember>
21         <navi:GeneralSpace gml:id="cell-0">
22           <gml:description>storey="0":type="1"</gml:description>
23           <gml:name>M_lx20221221-3d_F0F0_BS_0</gml:name>
24           <gml:boundedBy xsi:nil="true"/>
25           <core:cellSpaceGeometry>
26             <core:Geometry3D>
27               <gml:Solid gml:id="Solid-0">
28                 <gml:exterior>
29                   <gml:Shell>
```

# During this OGC sprint

- We will talk about
  - what is IndoorGML,
  - open source tools supporting IndoorGML with demo



# This talk

- will be helpful for developers who plan to
  - make indoor map or spatial applications or
  - contribute open source tools and applications of IndoorGML such as VIM
- may require very basic knowledge on
  - spatial data modeling
- will start from
  - [25<sup>th</sup> of April, 14:45 - 15:45 CEST \(UTC+2\)](#)



Open  
Geospatial  
Consortium



# OGC – API Records

## 5 Minute Pitch

Tom Kralidis, Meteorological Service of Canada

Peter Vretanos, MariaDB

Angelos Tzotsos, OSGeo

25 April 2023



# Use Cases

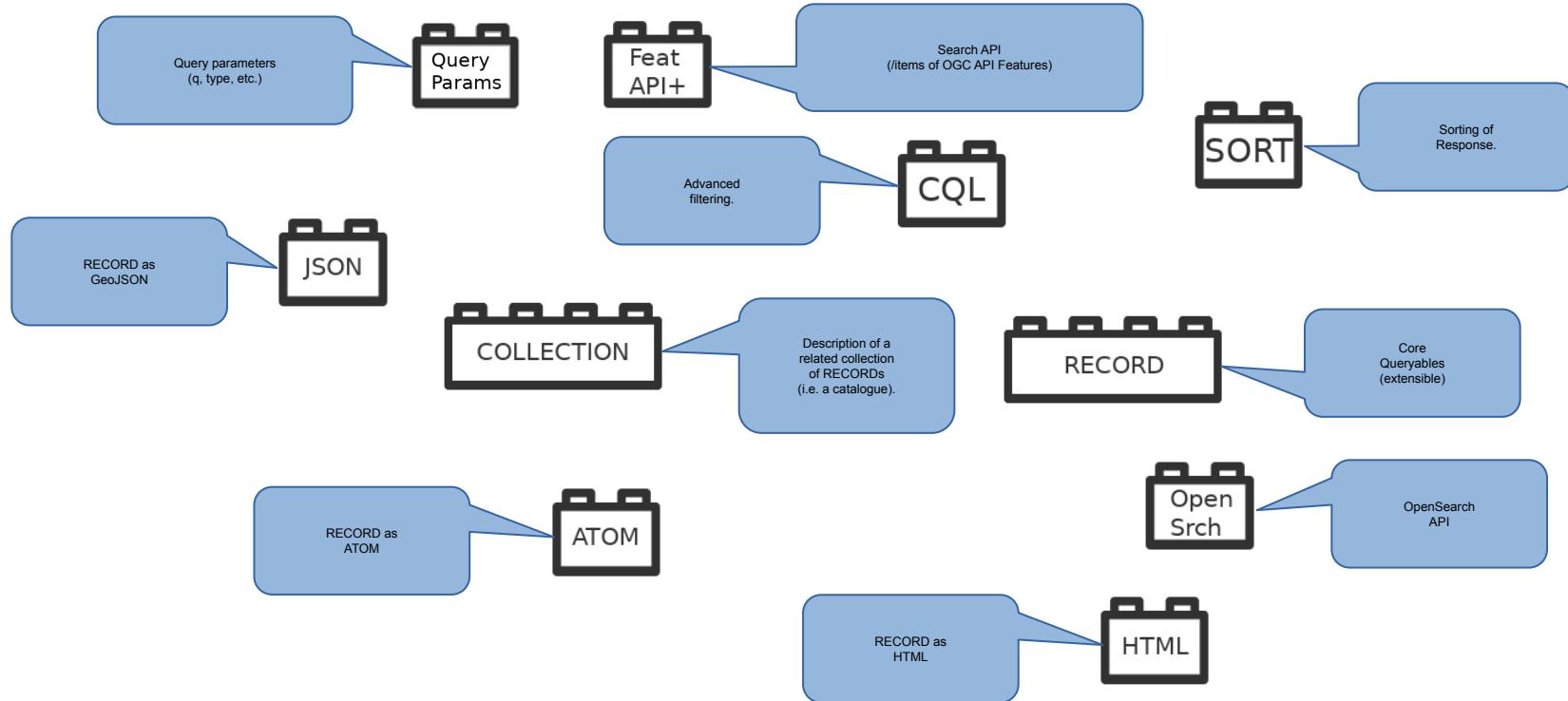
- Integrate existing legacy CSW servers into the OGC API framework
- General discovery portal
- Local resources discovery portal
- Catalogue as a repository/registry (e.g. code lists, ISO 19115 repository)
- Simple and fast navigation through hierarchically organized collections of records describing EO products or datasets
  - executable by humans (e.g. browser) and machine clients (e.g. crawlers)

# OGC API – Records

- OGC API effort/successor to OGC CSW specification
- Extends OGC API – Features
- Content model + access mechanisms
- OpenAPI/Swagger
- HTML, JSON
- Core record model (Dublin Core/DCAT/CSW 3)
- Numerous deployment patterns (static, dynamic)
- Supports transactional interfaces
- STAC relation: focus on EO, lower level metadata/granules
- Public RFC: Q3 2023



# Building Blocks



# Deployment patterns

- Crawlable catalogue
- Searchable catalogue
- Local Resources catalogue
- Other deployments are possible (customized building blocks)

# 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

# Query parameters (searchable catalogue)

Table 13. Table of Query Parameters

Parameter name	Description
bbox <sup>1</sup>	A bounding box. If the spatial extent of the record intersects the specified bounding box then the record shall be presented in the response document.
datetime <sup>1</sup>	A time instance or time period. If the temporal extent of the record intersects the specified data/time value then the record shall be presented in the response document.
limit <sup>1</sup>	The number of records to be presented in a response document.
q	A comma-separated list of search terms. If any server-chosen text field in the record contains 1 or more of the terms listed then this records shall appear in the response set.
type	An equality predicate consistent of a comma-separated list of resource types. Only records of the listed type shall appear in the resource set.
externalid	An equality predicate consistent of a comma-separated list of external resource identifiers. Only records with the specified external identifiers shall appear in the response set.
prop=value	Equality predicates with any queryable (see: /collections/{catalogueId}/queryables)
sortby <sup>2</sup>	Record sorting for response
filter/filter_lang/filter_crs <sup>3</sup>	Enhanced filtering parameters

NOTES: (1)Inherited from [OGC API - Features - Part 1: Core](#). (2) The server must implement the [Sorting](#) conformance class. (3) The server must implement the [Filtering using CQL](#) conformance class.

# Searchable Catalogue

Predicate	Example(s)
Spatial	<code>bbox=minx,miny,maxx,maxy</code>
Temporal	<ul style="list-style-type: none"><li><code>•datetime=t1</code></li><li><code>•datetime=t1/t2</code></li><li><code>•datetime=t1/..</code></li></ul>
Freetext	<code>q=air+temperature</code>
Attributes	<ul style="list-style-type: none"><li><code>•title=air+temperature</code></li><li><code>•nested.attribute=ozone</code></li><li><code>•wmo:topicHierarchy=wis2/can/eccc-msc/data/core/weather/analysis-prediction</code></li></ul>
Sorting/paging	<ul style="list-style-type: none"><li><code>•sortby=title&amp;limit=100&amp;startIndex=11</code></li><li><code>•prev / next link relations</code></li></ul>
Filter returnable properties	<ul style="list-style-type: none"><li><code>•properties=title,description</code></li></ul>

# Implementations



## EOEPCA Resource Catalogue

[Home](#) / [Collections](#) / [EOEPCA Resource Catalogue](#) / [Items](#)

[JSON](#) | [Contact](#)



[Prev](#) [Next](#)

Title	Type
<a href="#">LC08_L1TP_188026_20190504_02_T1</a>	dataset
<a href="#">LC08_L1TP_188030_20190504_02_T1</a>	dataset
<a href="#">LC08_L1TP_188029_20190504_02_T1</a>	dataset
<a href="#">LC08_L1TP_188028_20190504_02_T1</a>	dataset
<a href="#">LC08_L1TP_188025_20190504_02_T1</a>	dataset

[Prev](#) [Next](#)

Environment and Climate Change Canada Changement climatique Canada

[Home](#) > [Collections](#) > [WMO WIS2 discovery metadata \(experimental\)](#) > [Items](#) > [Item...](#)

Item urn:x-wmo:md:can:eccc-msc:1ee9e14d-0814-5201-a3be-705809d8ee0e



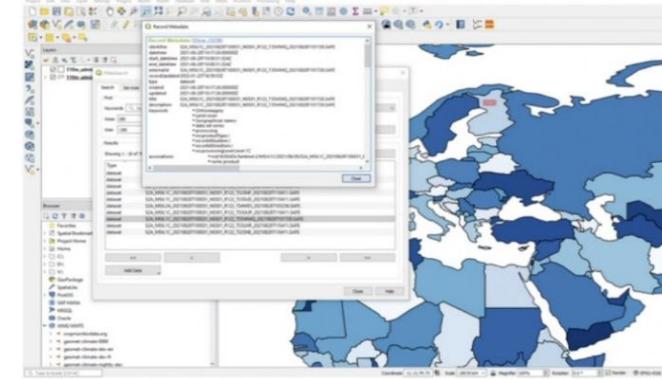
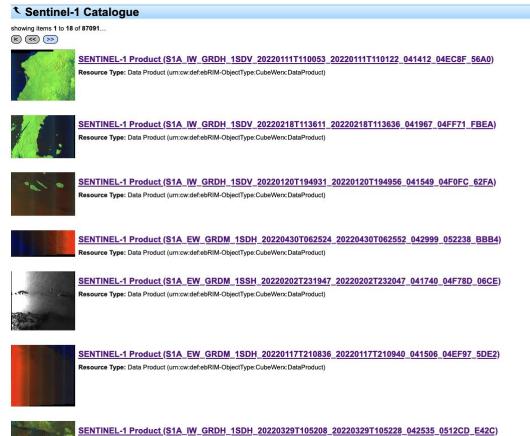
Property	Value
<b>id</b>	urn:x-wmo:md:can:eccc-msc:1ee9e14d-0814-5201-a3be-705809d8ee0e
<b>identifier</b>	urn:x-wmo:md:can:eccc-msc:1ee9e14d-0814-5201-a3be-705809d8ee0e
<b>title</b>	Historical Hydrometric Data

description

Historical hydrometric data are standardized water resource data and information. They are collected, interpreted and disseminated by the National Hydrological Services (NHS) in partnership with the provinces, territories and other agencies through the National Hydrometric Program. These data sets include daily mean, monthly mean, annual maximum and minimum daily mean and instantaneous peak water level and discharge information for over 2700 active and 5100 discontinued hydrometric monitoring stations across Canada.

themas

concept\_id:Historical



# Sprint Goals

- Core
  - <https://github.com/opengeospatial/ogcapi-records/projects/1>
- Abstract test suite
  - <https://github.com/opengeospatial/ogcapi-records/pull/207>
- STAC alignment
- Working session: Wednesday 26 April, 13h30 CEST

# Resources

GitHub	<a href="https://github.com/opengeospatial/ogcapi-records"><u>github.com/opengeospatial/ogcapi-records</u></a>
Implementations	<a href="https://github.com/opengeospatial/ogcapi-records/blob/master/implementations.md"><u>github.com/opengeospatial/ogcapi-records/blob/master/implementations. md</u></a>
Draft Specification (HTML)	<a href="https://docs.ogc.org/DRAFTS/20-004.html"><u>docs.ogc.org/DRAFTS/20-004.html</u></a>
Draft Specification (PDF)	<a href="https://docs.ogc.org/DRAFTS/20-004.pdf"><u>docs.ogc.org/DRAFTS/20-004.pdf</u></a>

# Thank you

- Panagiotis (Peter) A. Vretanos (MariaDB Corp.)
  - pvretano [at] cubewerx.com @pvretano
- Tom Kralidis (Meteorological Service of Canada)
  - tomkralidis [at] gmail.com @tomkralidis
- Angelos Tzotsos (President, OSGeo)
  - tzotsos [at] gmail.com @tzotsos



# Apache Baremaps (incubating)



## What is Apache Baremaps?

- An open-source, flexible, and extensible mapping framework
- Designed for creating, serving, and styling vector tiles
- Built on top of Apache software ecosystem

## What are some of our key features?

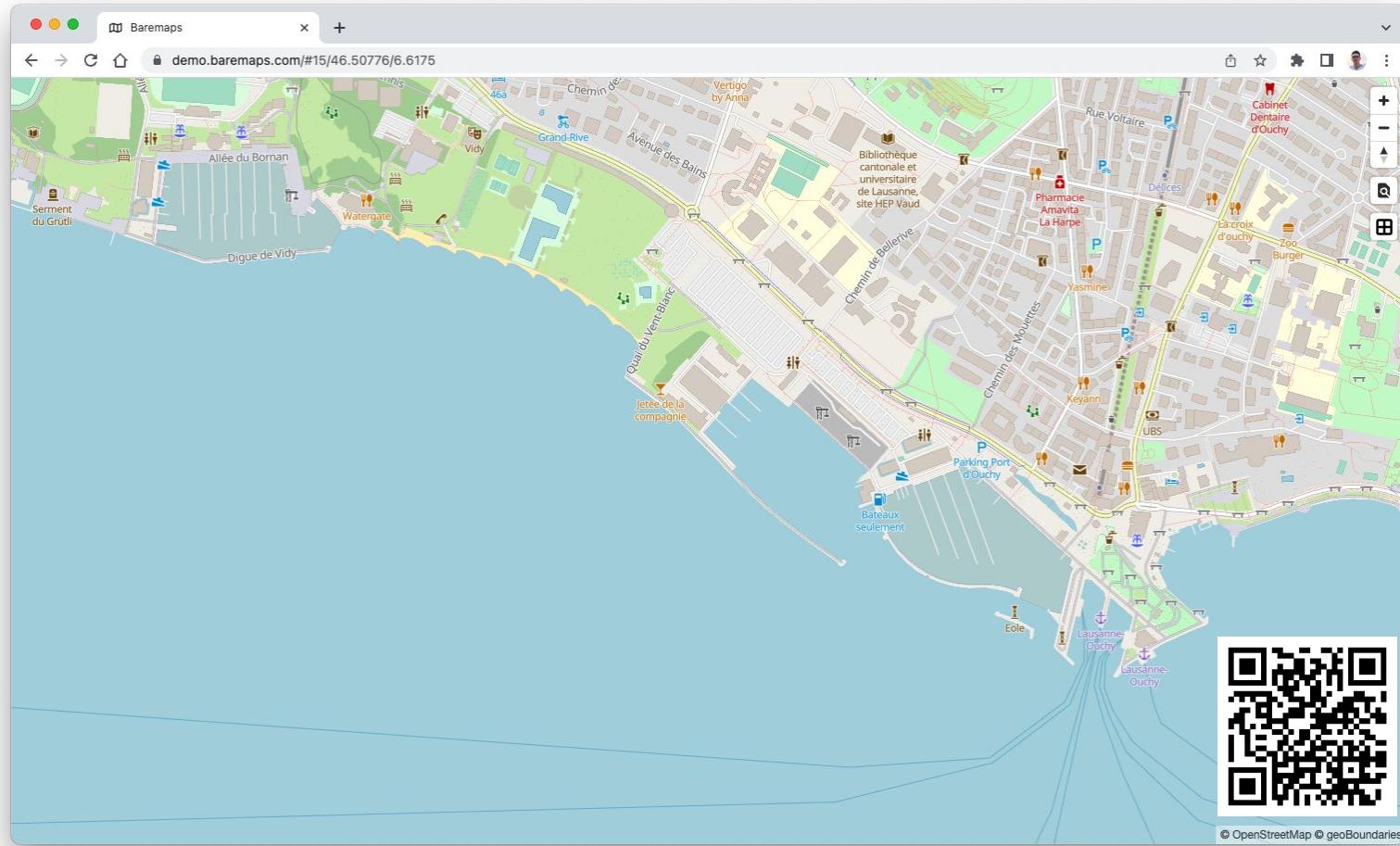
- Efficient end-to-end data pipeline
- Supports multiple data sources (OSM, OSC, Shapefile, GeoPackage, FlatGeobuf, etc.)
- High-performance vector tile serving
- Live reload capabilities (refreshed when the configuration changes)
- Open source schema and style
- And more (OGC-API, IP to location, Geocoder, etc.)



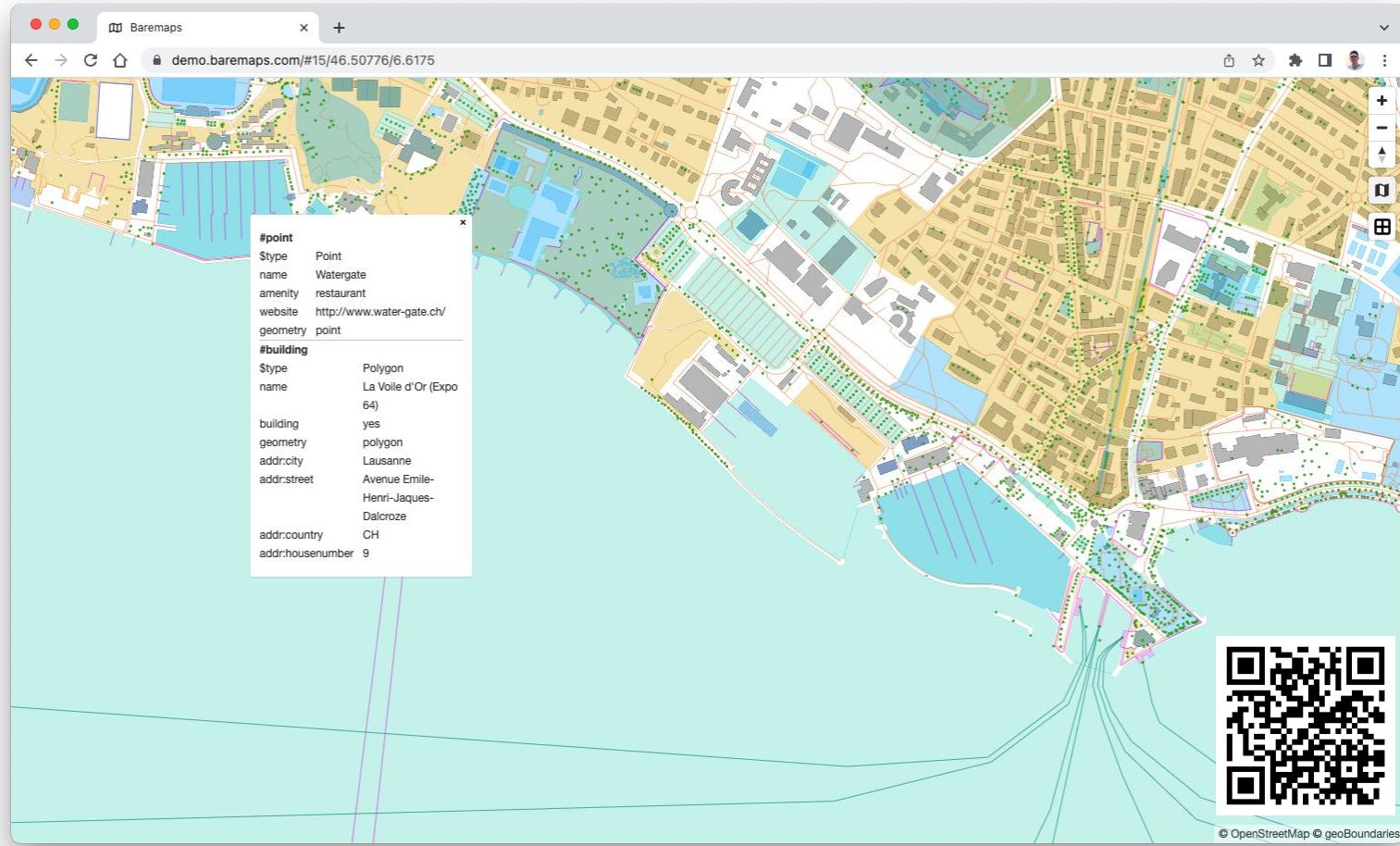
PostgreSQL



<https://github.com/apache/baremaps>



🔥 Live demo: <https://demo.baremaps.com/>



🔥 Live demo: <https://demo.baremaps.com/>

☰ Baremaps    ✎ Installing the CLI – Apache Bar... +

← → ⌂ 🔒 baremaps.apache.org/documentation/getting-started/installing-the-cli

Apache Baremaps (incubating)

Download Documentation Search documentation... ☰

Introduction Documentation > Getting started > Installing the CLI Question? Give us feedback →

Getting started ▾ Edit this page

Installing the CLI

Installing PostGIS

Examples >

Developer manual >

# Installing the CLI

In order to run Apache Baremaps, you first need to install Java 17 or a later version. [SDKMAN](#) provides a convenient Command Line Interface (CLI) to install and upgrade Java.

To install Apache Baremaps, download and decompress the latest [binary distribution](#). Then, add the `/bin` directory of the decompressed distribution to your `PATH` environment variable:

```
tar -xzf baremaps-<version>-incubating-bin.tar.gz  
export PATH=$PATH:`pwd`/baremaps/bin
```

Calling the `baremaps` command should now result in an output similar to the following:

```
Usage: baremaps [COMMAND]  
A toolkit for producing vector tiles.  
Commands:  
import Import OpenStreetMap data in the Postgresql database.  
update Update OpenStreetMap data in the Postgresql database.  
export Export vector tiles from the Postgresql database.  
serve Serve vector tiles from the Postgresql database.
```

From here, heads to [Installing PostGIS](#) if you plan to work with vector tiles.

If you want to work on [Geocoding](#) or [IP to location](#), head directly into the related examples.

Light



# Our goals for the Code Sprint

## Improving support for OGC-APIs

- Code generation with OpenAPI
- Conformance API
- Collections API
- Tilesets API
- Styles API
- Processes API

## Exchanging with others

- MapLibre, Apache SIS, Apache Sedona, Apache Calcite, etc.



# Apache Baremaps (incubating)



Development

<https://github.com/apache/baremaps>

Documentation

<https://baremaps.apache.org/>

Demonstration

<https://baremaps.apache.org/>



Community

We need you!



# OGC API Features

Code Sprint April 2023

Clemens Portele,  
interactive instruments  
25 April 2023



# Published Standards

- Part 1: Core
  - v1.0.0 October 2019
  - v1.0.1 April 2022
  - Minimal capabilities to share feature data via a Web API
  - Also published at ISO 19168-1, revision in progress to update to v1.0.1
- Part 2: Coordinate Reference Systems by Reference
  - v1.0.0 October 2020
  - v1.0.1 April 2022
  - Support beyond WGS84 for well-known CRS
  - Also published as ISO 19168-2
- CITE tests available
- INSPIRE Good Practice for Download Services
- Widely implemented using generic tools (“configure your API”, both open and closed source) as well as custom implementations
- Client support:
  - Part 1 is supported by various tools including QGIS, GDAL, ArcGIS Pro/JavaScript/Runtime, OWSLib, ...
  - Part 2 will be supported by QGIS 3.30.2 and GDAL 3.7

# Existing implementations

- Recently I was asked for examples of implementations of OGC API Features
- I sent APIs for selected datasets that are published and actively maintained
- ... and noticed that each of the deployments uses different software
  - Half of them use general purpose tools supporting OGC API Features / STAC API
  - The other half are custom implementations
- This is a non-representative sample

The image displays nine screenshots of different OGC API implementations, illustrating the variety in deployment:

- Top Row:**
  - APIs für Geodatensätze in NRW**: A screenshot of a web-based API documentation for NRW datasets.
  - OGC API - Features Hamburg**: A screenshot of the Hamburg Open Data portal showing the OGC API - Features interface.
  - MSC GeoMet - GeoMet-OGC-API**: A screenshot of the Canadian Meteorological Service's GeoMet-OGC-API interface.
- Middle Row:**
  - NLS Geographic Names API**: A screenshot of the National Land Survey of Norway's Geographic Names API.
  - Geographic names (OGC API Features)**: A screenshot of the Danish Meteorological Institute's OGC API Features interface.
  - Microsoft Planetary Computer STAC API (microsoft-pc)**: A screenshot of the Microsoft Planetary Computer's STAC API interface.
- Bottom Row:**
  - STAC API (stac-server)**: A screenshot of the STAC API interface for the STAC Server.
  - Public APIs**: A screenshot of the Microsoft Planetary Computer's Public APIs page.
  - Public Catalogs**: A screenshot of the Microsoft Planetary Computer's Public Catalogs page.

# Candidate Standards close to finalization

- Part 3: Filtering
  - Filter features using filter expressions
  - Queryable properties are published with their schema
- Common Query Language (CQL2)
  - Modular filter expression language, likely to evolve into a general expression language
  - Text and JSON encodings
- Well tested with multiple server implementations

# Candidate Standards

- Part 4: Create, Replace, Update and Delete
  - Update resources, one resource per request
  - Supports optimistic locking (conditional HTTP requests)
  - Features are just an example for a resource type, can be applied to other resources, too
  - Complete draft
  - Existing comments have mostly been resolved, update of the document in process
  - The next part the Working Group will focus on
  - Needs more implementations and feedback from them

# Additional Parts in Progress (1/3)

- Text Search
  - `q` parameter: keyword search on multiple properties
  - In Records, to be moved to Features
- Sorting
  - `sortby` parameter: sorting items in the responses based on property values
  - In Records, to be moved to Features

# Additional Parts in Progress (2/3)

- Property Selection
  - `properties` parameter: select the resource properties to include in the response
  - Proposal available
- Search
  - Queries on multiple collections, filters expressed using CQL2, supports sorting and property selection
  - (Parameterized) Stored Queries
  - Joins (?)
  - Proposal available, tested and updated in Testbed-18
- Geometry simplification
  - a query parameter to indicate the zoom level at which the features will be displayed

# Additional Parts in Progress (3/3)

- Schemas
  - Schema resources for the features in a feature collection; will consider multiple types of schemas
  - Proposal available
- OpenAPI 3.1
  - Support for OpenAPI 3.1
  - No activity so far, waiting for more OpenAPI 3.1 tool support



Open  
Geospatial  
Consortium



# 3rd Open Standards and Open Software Code Sprint

Demos & Wrap-up



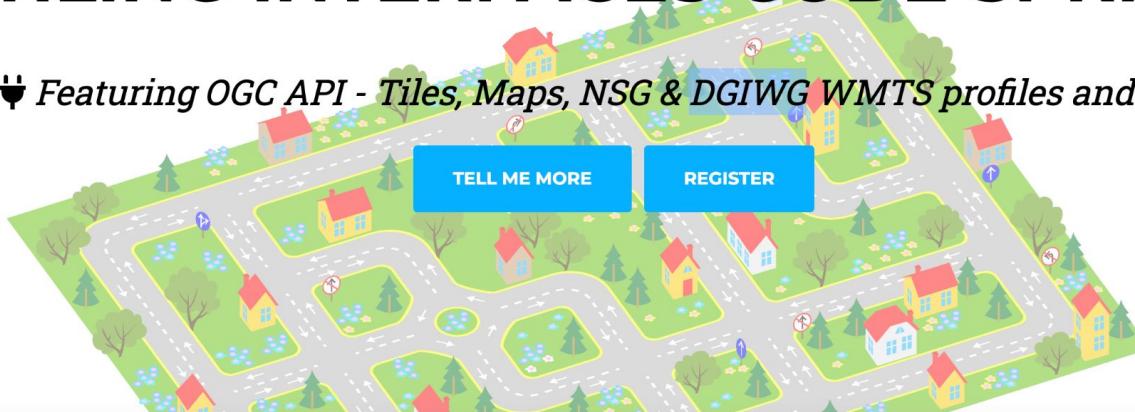
# Announcing the next event: June, 12-14



In-person registrations  
close on May, 10!

## TILING INTERFACES CODE SPRINT

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



Call for  
Sponsors

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

# Event Sponsor

Gold-level  
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# Thank You!



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