



The OGC API: The future of sharing location information

The world's leading and comprehensive community of experts making location data more findable, accessible, interoperable and reusable

7 May 2020

OGC's Webinar Schedule



Webinar Name 	Date
<u>OGC and EUROGI: Beyond Spatial Data Infrastructures (webinar)</u>	May 13, 8am (EST)
<u>New Space Workshop by OGC (virtual event)</u>	May 13-14
<u>OGC India Forum (virtual event)</u>	May 14, 1pm
<u>OGC 2020 June Member Meeting (virtual event)</u>	June 15-23
<u>W3C/OGC Joint Workshop Series on Maps for the Web (virtual event)</u>	September 21, 9am

The OGC API: The future of sharing location information



Webinar Agenda

Welcome

APIs – what are they good for?

OGC API development

The Future of APIs – OGC Tech Trends

Q&A

Closing



**George
Percivall**
OGC CTO



**Scott
Simmons**
OGC Head of
Standards



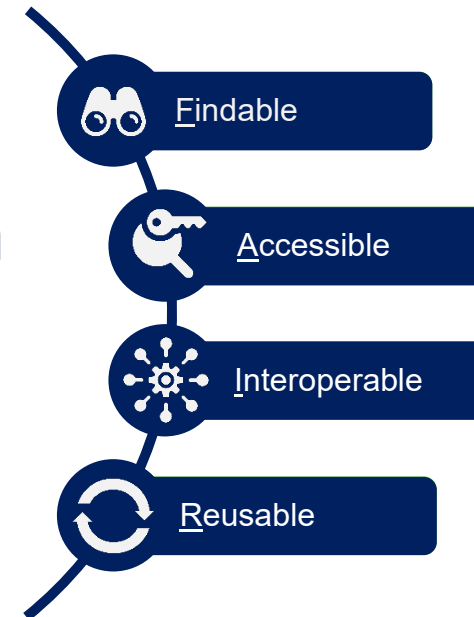
Global communities
Location expertise
Thought leadership
Trusted forum
Open standards

What is OGC?

Global consortium representing over 500 industry, government, research and academic member organizations. We are:

1. **A hub for thought leadership and innovation** for all things related to location
2. **A neutral and trusted forum for** tackling interoperability issues within and across communities
3. **A consensus-based open standards organization** for location information

Location





What do our Members Value ?

*The world's leading and comprehensive community of experts
making location data more findable, accessible, interoperable and reusable*

Commercial



Business Development
Competitive Technical
Advantage
Global; Brand Exposure
Funding for Innovation

Government



Innovation and Market
Support
Trusted Advice
International
Partnerships
Operational Policy
Support and
Certification

Research and Academia



Applied Research
Partners
Funding for Innovation
International
Collaboration
Citations

The OGC API: The future of sharing location information



Join OGC for an overview on how our new Web APIs help sharing of location information effectively for ready use across a wide variety of domains involving geospatial data. Learn how the APIs enable multiple location technologies to function seamlessly to reduce development time, accelerate integration of heterogeneous resources and improve cross-system or resource interoperability.

See how we're making location information more Findable, Accessible, Interoperable and Reusable (FAIR) for agency and industry benefits. Topics will include:

- Why use OGC APIs? Issues with open information sharing that led to OGC APIs
- How contributors are working across the globe to enable them
- Highlights from our recent API sprints, including Features and Tiles
- Getting active in the OGC APIs community

OGC APIs Webinar Speakers



George Percivall
OGC CTO

- Works with OGC members to ensure a strategic technology focus
- Authorizes technical staff to propose and implement technology approaches
- Chairs the OGC Architecture Board



Scott Simmons
OGC Head of
Standards

- Provides oversight and direction to the Consortium's technical and program operations
- Ensures that standards progress through the organization's consensus
- Chairs the OGC Technical Committee









Why did OGC start working on APIs

George Percivall
CTO, Chief Engineer
gpercivall@ogc.org

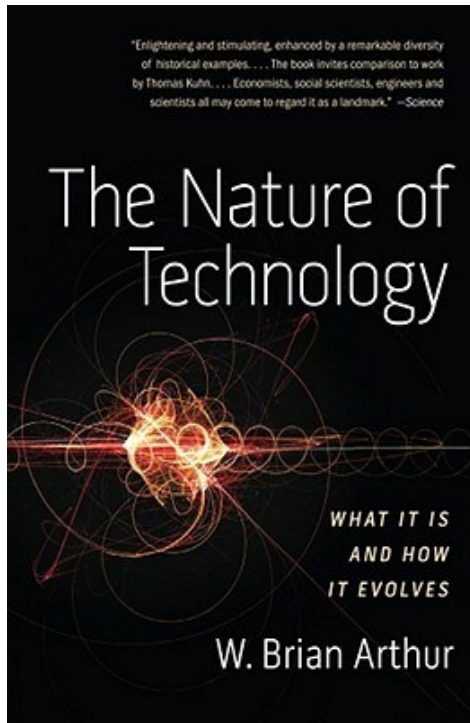
'Why' OGC APIs



-  APIs are popular, effective method for rapid software development
-  API variations degrade interoperability
-  Open Standards provide interoperability of independent implementations
-  OGC APIs will improve interoperability learning from OWS

**Start planning now for
transitioning operational systems to OGC APIs**

Evolution of Technology



“Every technology stands on a pyramid of others in a succession that goes back to the earliest phenomena that humans captured.

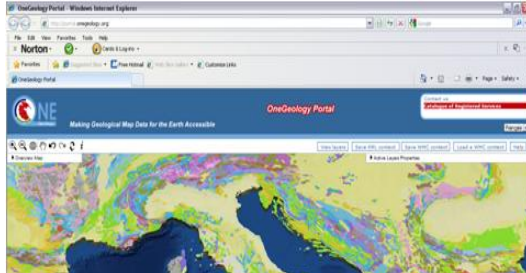
It tells us that all future technologies will derive from those that now exist.”



Millions of Geospatial Datasets on >200K Servers



OneGeology.Org

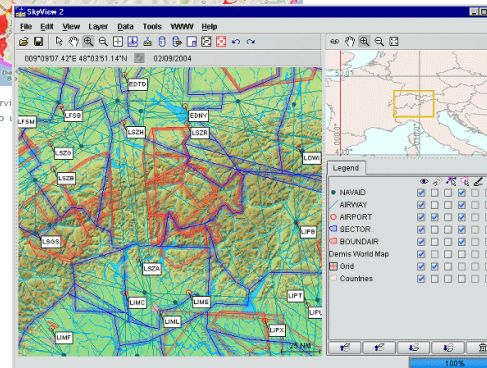
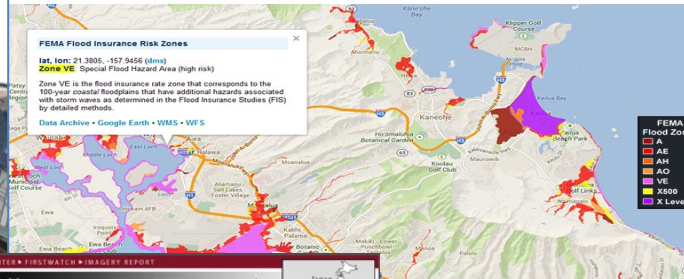


Emergency /
Disaster
Management



DigitalGlobe

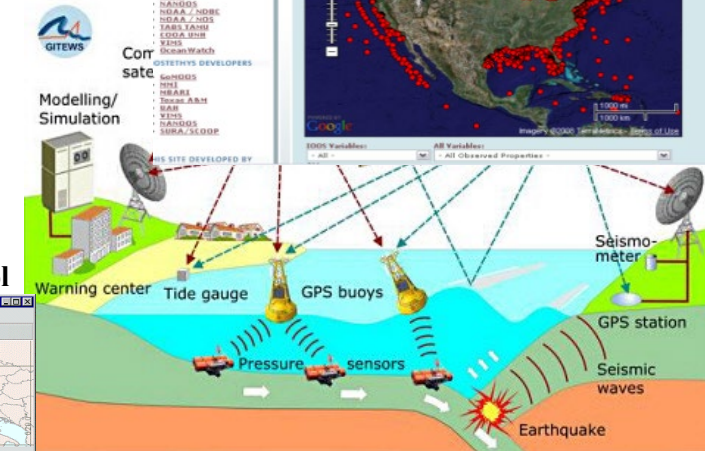
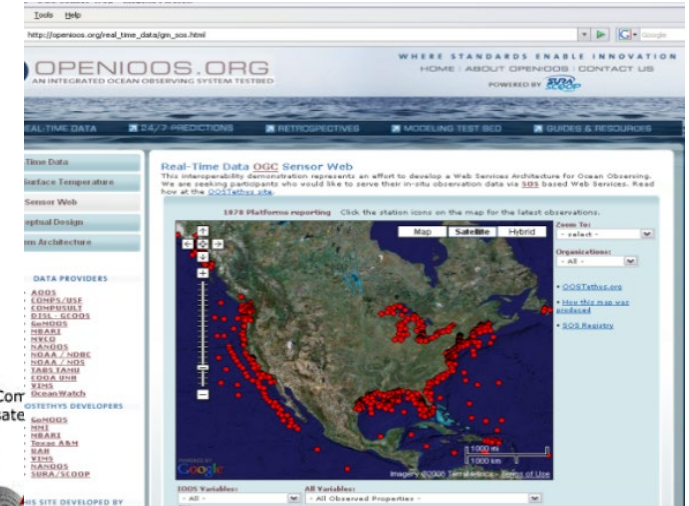
<http://oos.soest.hawaii.edu/pacios/voyager/news/2013/>



Eurocontrol

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

OpenIOOS.Org



Meteorology, Hydrology,
Ocean Monitoring

OGC®

Aviation Flight Information / Safety

Copyright © 2020 Open Geospatial Consortium

Source: GeoSeer spatial data search engine: <https://geoseer.net>

OGC APIs and OWS



- OGC is advancing new standards while simultaneously maintaining the current OGC Standards Baseline
- OGC API approach is based on technologies that did not exist during development of OGC Web Services (OWS)
- OGC will continue to maintain the approved OWS Standards, while developing and maintaining OGC APIs

OGC Open Geospatial APIs White Paper



OGC can play a leading role in the convergence of mapping APIs



Both simple and full richness of geospatial information

- Reusable API Building Blocks for core functions, avoid edge cases
- High-end functionality for critical functions
- Inform the marketplace on geospatial accuracy

White Paper Contributors: Chris Holmes – Planet Labs, Dave Wesloh – NGA, Chuck Heazel – WiSC Enterprises, Gary Gale – What 3 Words, Arnulf Christl – Metaspatial, Josh Lieberman – Tumbling Walls, Carl Reed - Carl Reed and Associates, John Herring – Oracle, Martin Desruisseaux - Geomatys, David Blodgett – USGS, Scott Simmons – OGC, Bart de Lathower – OGC, George Percivall – OGC

Proliferation of API Variations



APIs are often difficult to use and users repeatedly spend significant time learning new APIs

- For programmers at all levels
- From novices to experts



Thousands of APIs superficially similar but mutually incompatible

- Each has a slightly different view of basic real-world concepts like “person” and “event”
- Lack of agreement makes it impossible to create client-side software that can be reused between APIs
- You can find APIs that do the same thing, but have only have application/json media types in common



API variations degrade interoperability established by open standards

APIs with consistent elements provides Interoperability

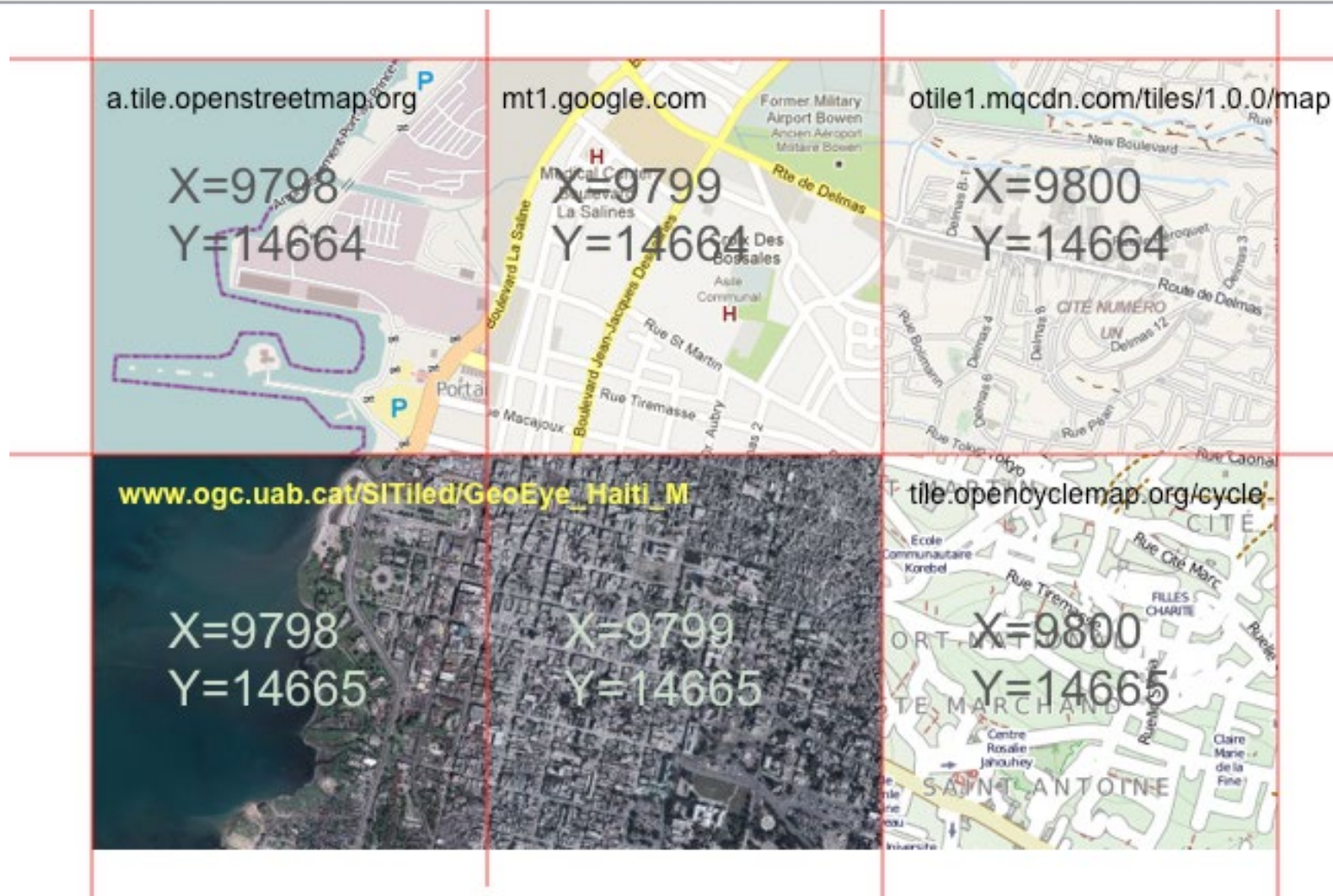


Figure 3. Multiple Maps with common semantics - Interoperability (Source: Joan Maso)

Open standards and APIs



Public vs. Open Standards defined:

- Public APIs are viewable and invocable, but the process to control the API may be proprietary, i.e., not open.  GraphQL

Open Standards Defined by OGC:

Freely and publicly available



Non-discriminatory process



No license fees



Vendor neutral



Data neutral



Defined, member driven consensus



Open Standards for Spatial Data on the Web



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/>

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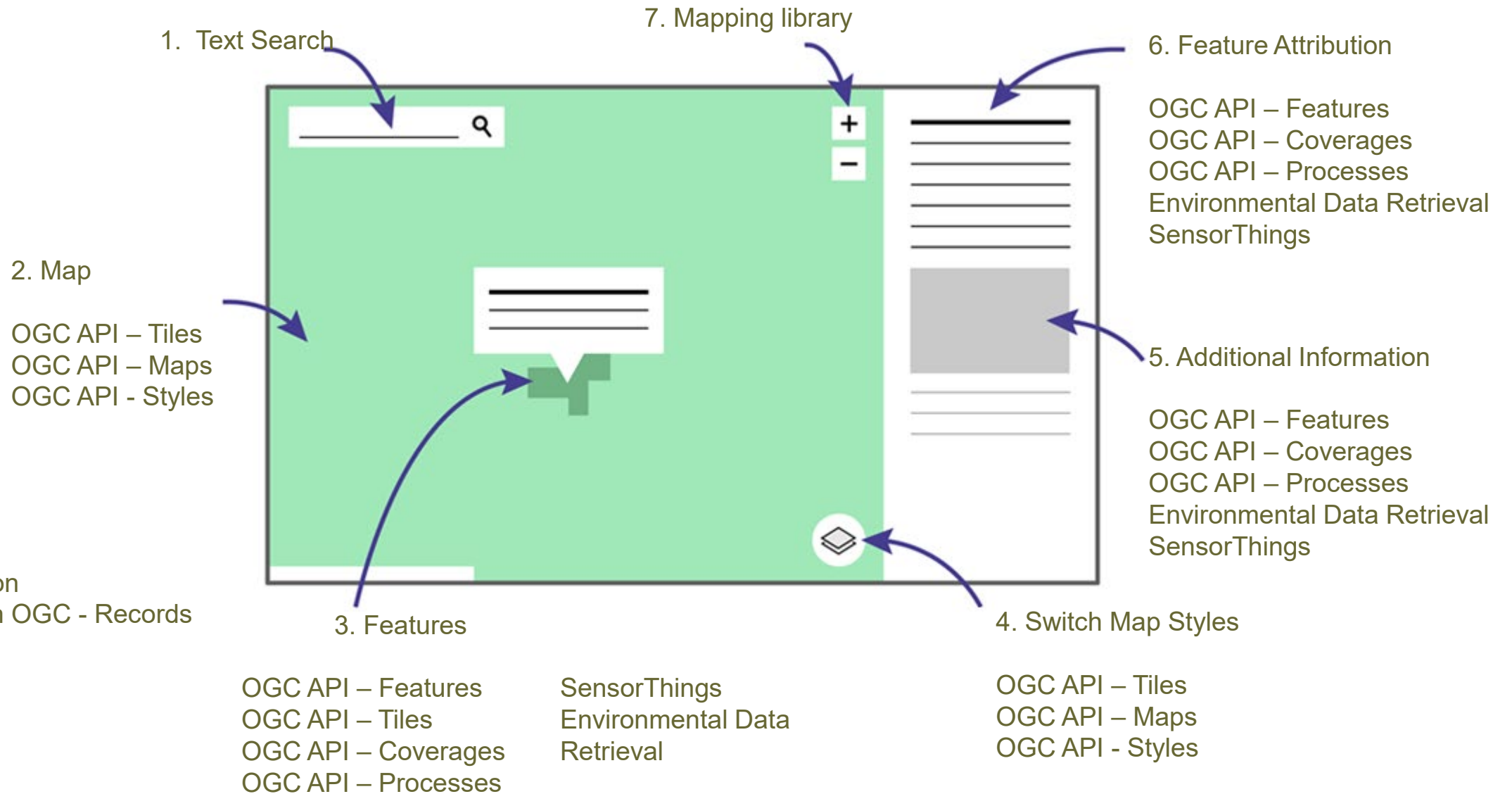
OGC API Development building on many sources



- W3C/OGC Spatial Data on the Web Best Practices
 - Best Practice 24: Use Web Standards as the Foundations of APIs
 - Best Practice 12: Expose spatial data through 'convenience APIs'
- SensorThings API
- OGC Architecture Board connection to OpenAPI
- FGDC API Concept Development Study
- Spatial Temporal Asset Catalogue (STAC)

Now is the time to plan deployment of OGC APIs

Now is the time to plan deployment of OGC APIs



All supported by
OGC API Common
and catalogued in OGC - Records



Modular API building blocks; spatially enable Web APIs in a consistent way

- Spatial Data on the Web Best Practices
- Leverage OpenAPI
- Focus on developer experience and usability
- Building blocks for spatial data that can be used in any API
- Open development:
Public GitHub, Early implementations, In-depth validation





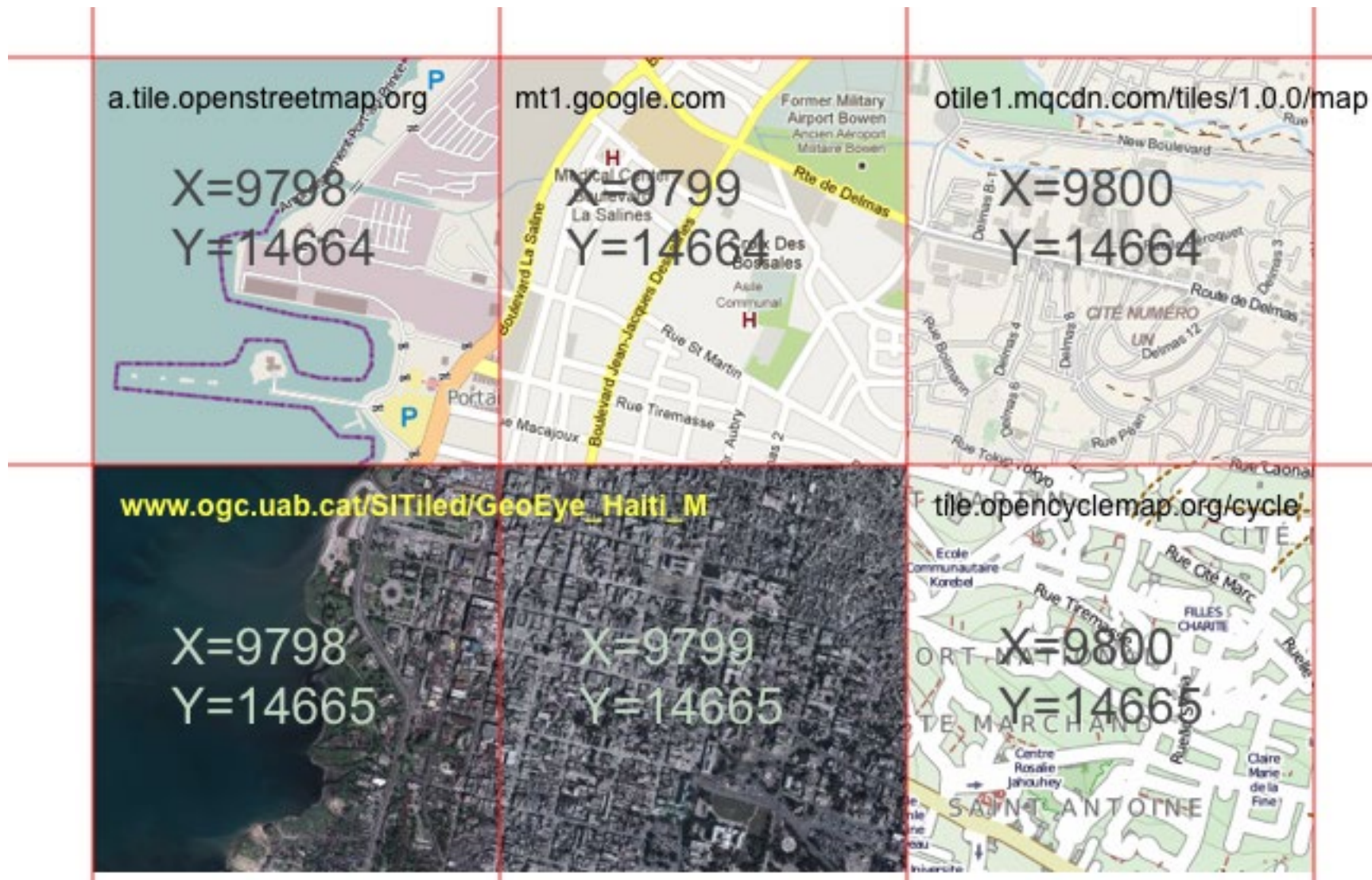
OGC APIs Community

Scott Simmons
Chief Operations Officer

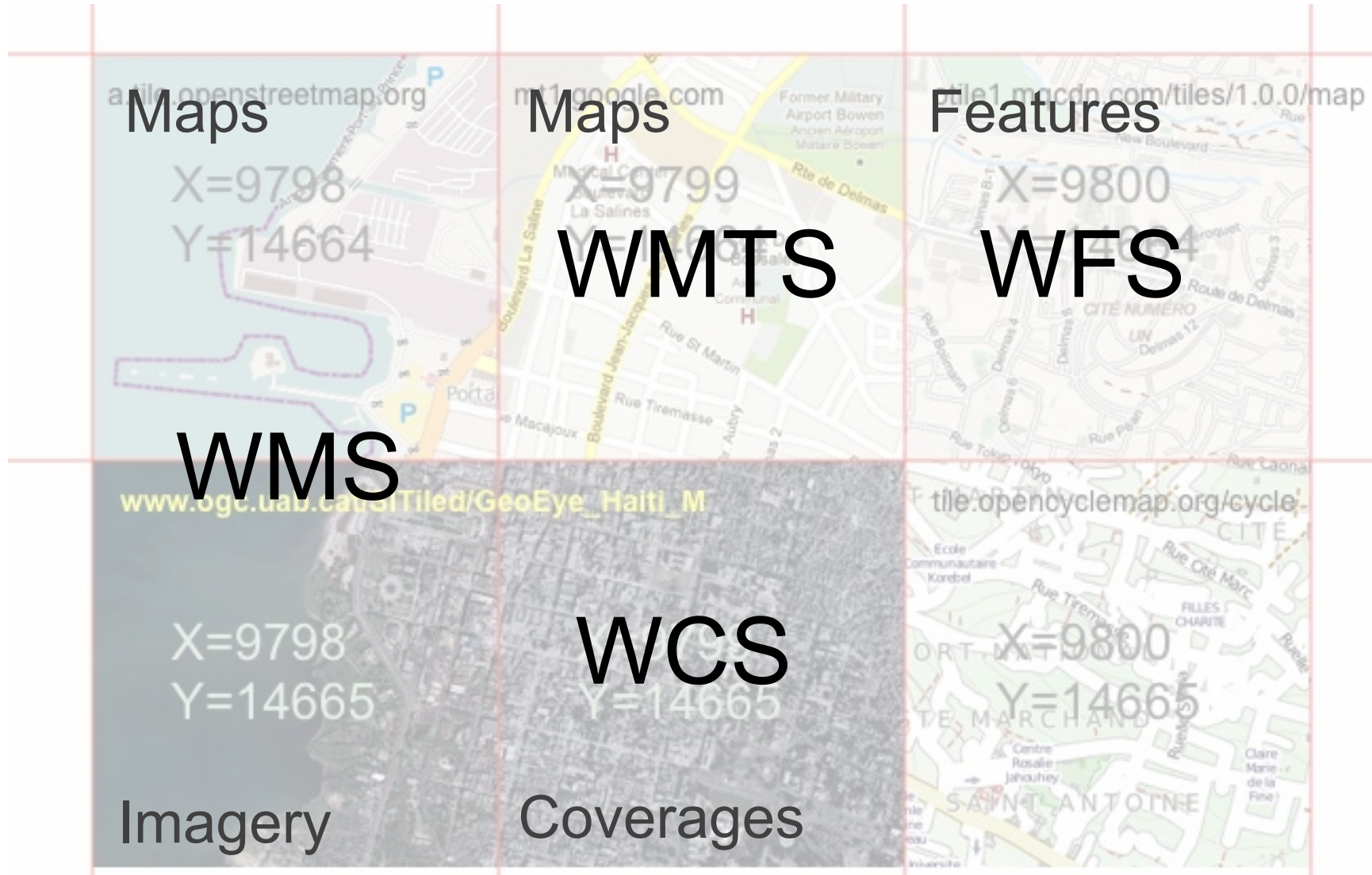


What is in work

APIs with consistent elements allow Interoperability



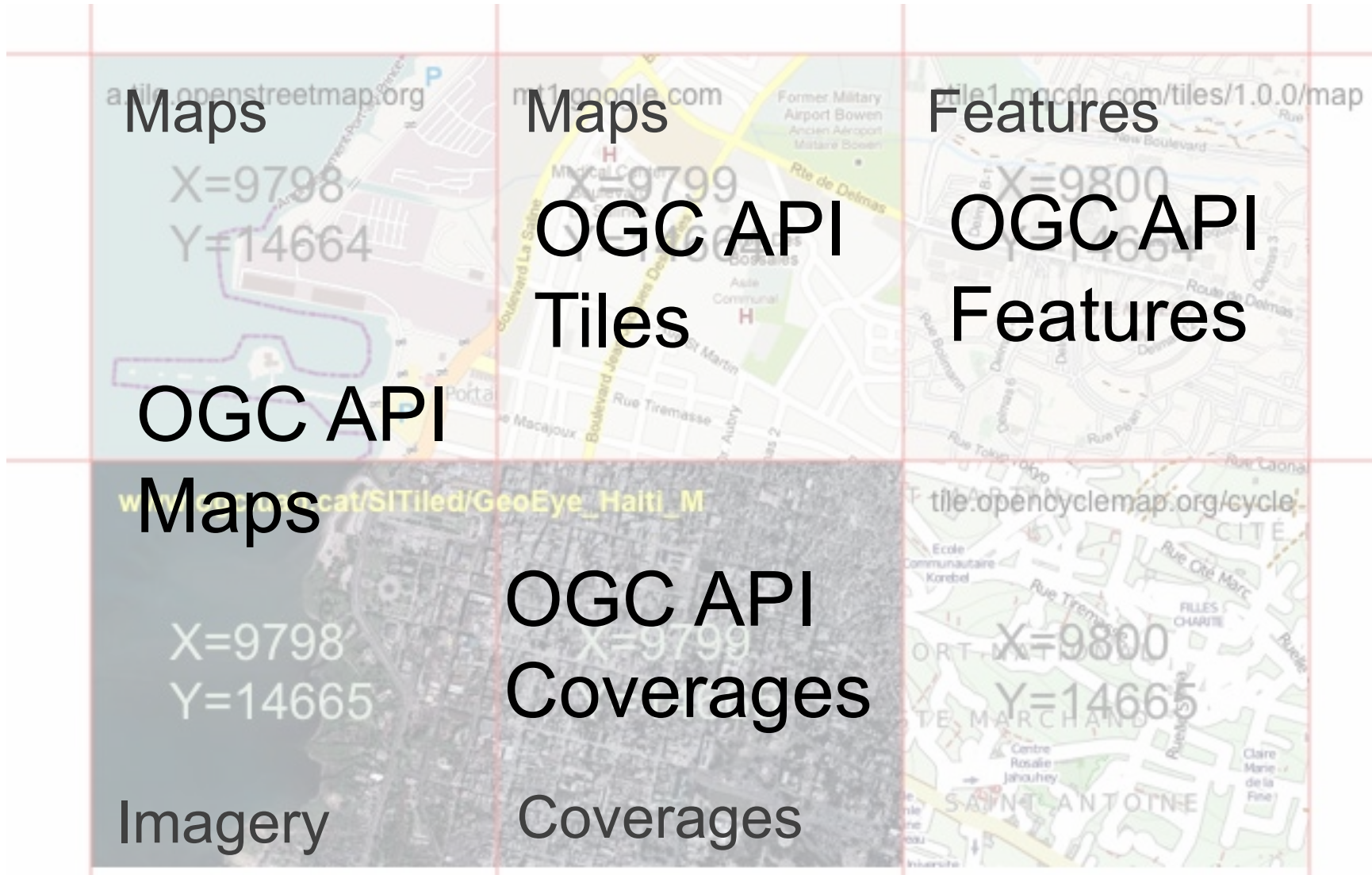
Legacy OGC Web Service Standards



W*S Architecture – so 1990s



OGC API Standards



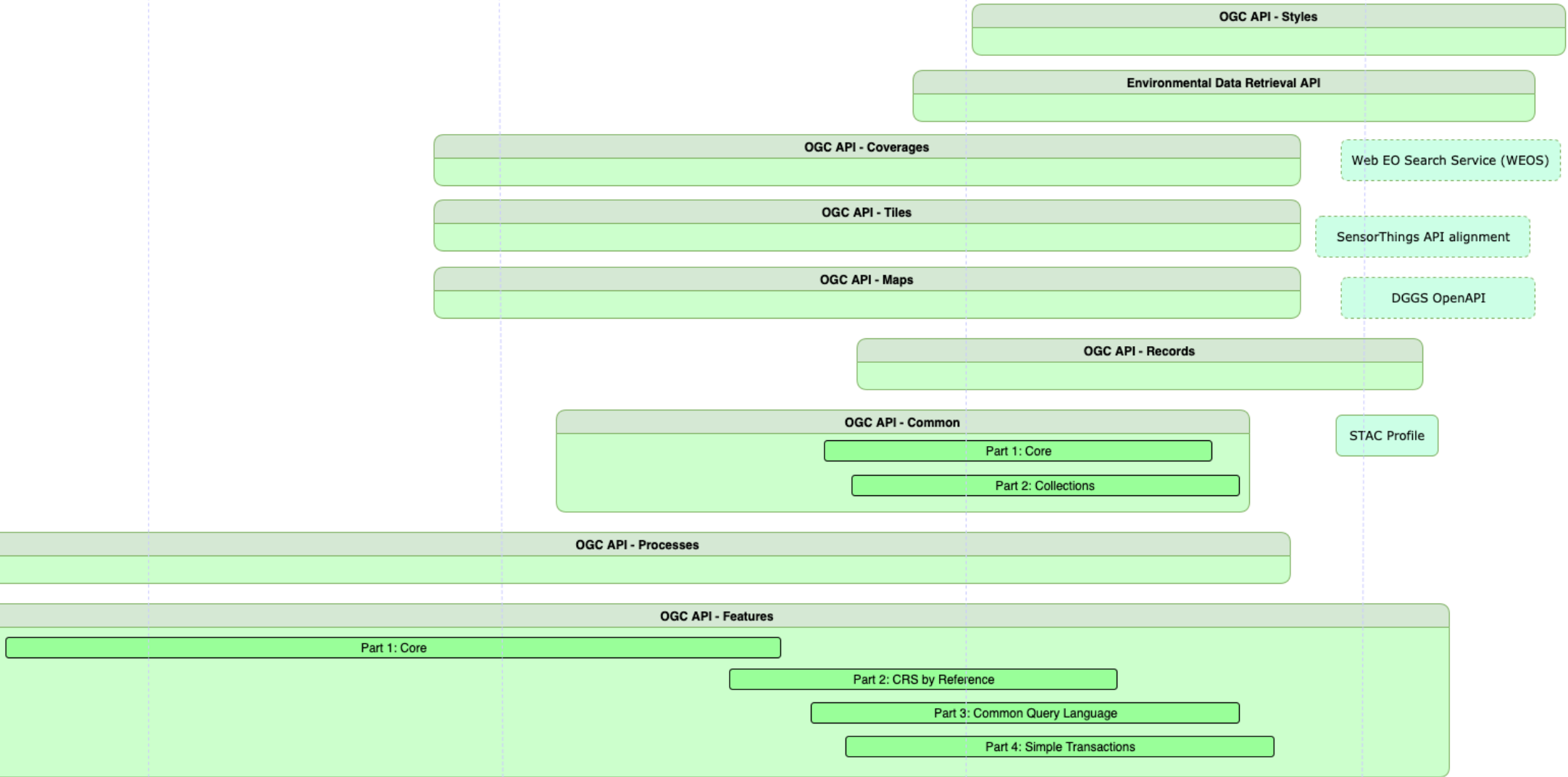
Discover via
OGC API - Records



OGC API Roadmap


Core Standards

Timeline



All defined in OpenAPI



 **Swagger Editor**
Supported by SMARTBEAR

File ▾ Edit ▾ Insert ▾ Generate Server ▾ Generate Client ▾

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

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.openegeospatial.org/legal/> .

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

[Contact Clemens Portele](#)

[OGC License](#)

No operations defined in spec!

Schemas ▾

collection > ↩

collections > ↩

OGC > ↩

OGC API-Common



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/{collectionid}	GET	The full description of a single collection.	
Collection	/collections/{collectionid}/items	GET	The collection itself.	the collection contents

API Features



Table 1. Overview of resources, applicable HTTP methods and links to the document sections

Resource	Path	HTTP method	Document reference
Landing page	/	GET	7.2 API landing page
API definition	/api	GET	7.3 API definition
Conformance classes	/conformance	GET	7.4 Declaration of conformance classes
Feature collections metadata	/collections	GET	7.11 Feature collections metadata
Feature collection metadata	/collections/{name}	GET	7.12 Feature collection metadata
Feature collection	/collections/{name}/items	GET	7.13 Feature collections
Feature	/collections/{name}/items/{fid}	GET	7.14 Feature

information about the API

a dataset with a sub-division into named collections of features

the features

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	



Recent successes and highlights

Standards



OGC API - Features:

Part 1 - Core

OGC

Public Comment Requested:
OGC API - Features Part 2:
Coordinate Reference Systems

OGC

Public Comment Requested:
OGC API - Common

The foundation upon which all OGC APIs will be built

OGC

Compliance testing
now available for
'OGC API - Features -
Part 1: Core' standard

Sprints, Hackathons, and Innovation



- **OGC API – Tiles Sprint:** April 2020
- **Environmental Data Retrieval API Sprint:** March 2020
- **ESIP and OGC Coverage Processing and Analysis Sprint:** January 2020
- **STAC and OGC API - Features and Catalogues Sprint:** December 2019
- **OGC API Hackathon:** June 2019
- **Routing Pilot**
- **Vector Tiles Pilot**
- **Testbed 15 Styles API**
- **Testbed 15 OGC API - Maps and Tiles**
- ... and many more





Upcoming releases and activities

Innovation

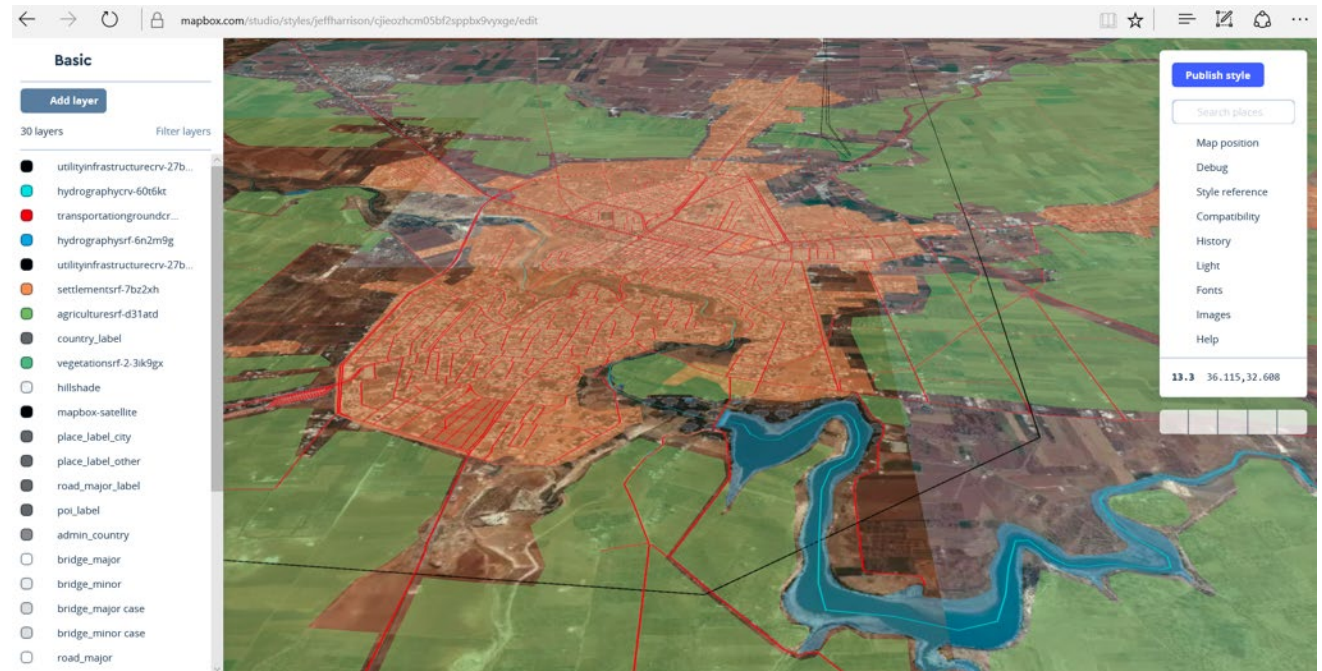


- Testbed 16
 - Data Access and Processing API
 - OGC API access to SWIM
 - DGGs API
 - OpenAPI Engineering
- 3D Data Container and Tiles Pilot
- OGC API Sprints
 - Topics under discussion
 - 3 or more forecast for remainder of 2020

Upcoming standards and standards parts



- OGC API – Features – Part 3: Common Query Language
- OGC API – Features – Part 4: Simple Transactions
- OGC API – Common – Part 1: Core
- OGC API – Common – Part 2: Collections
- OGC API – Environmental Data Retrieval
- OGC API – Tiles
- OGC API – Maps
- OGC API – Records
- OGC API – Coverages
- OGC API – Processes
- OGC API – Styles

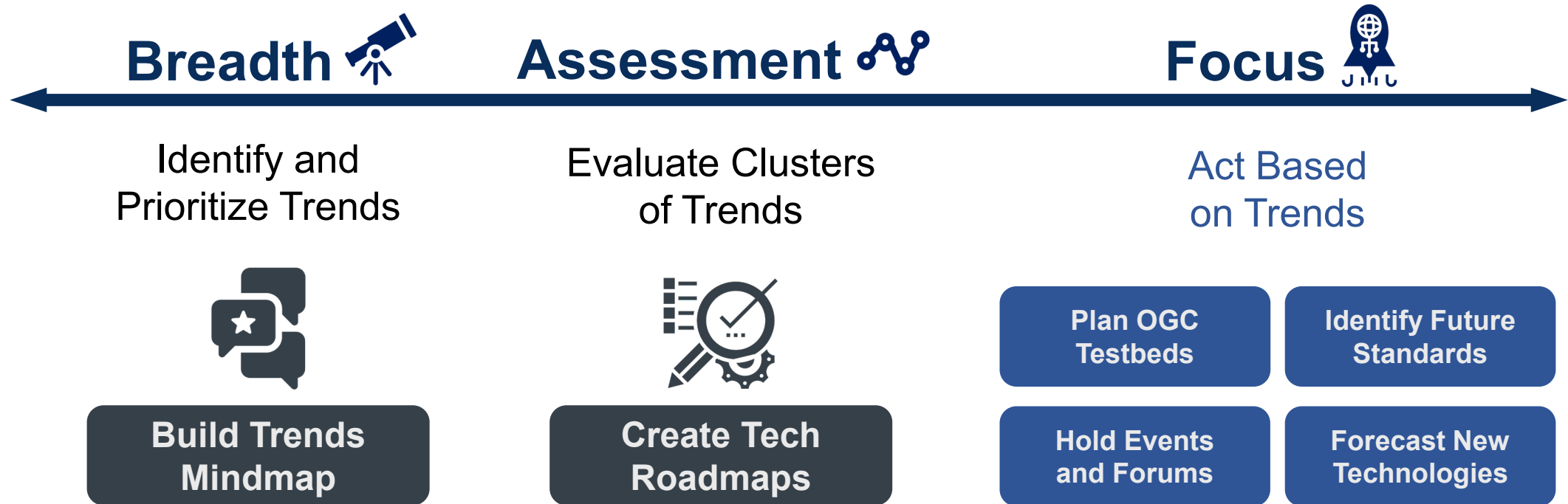




OGC Geospatial Tech Trends

George Percivall

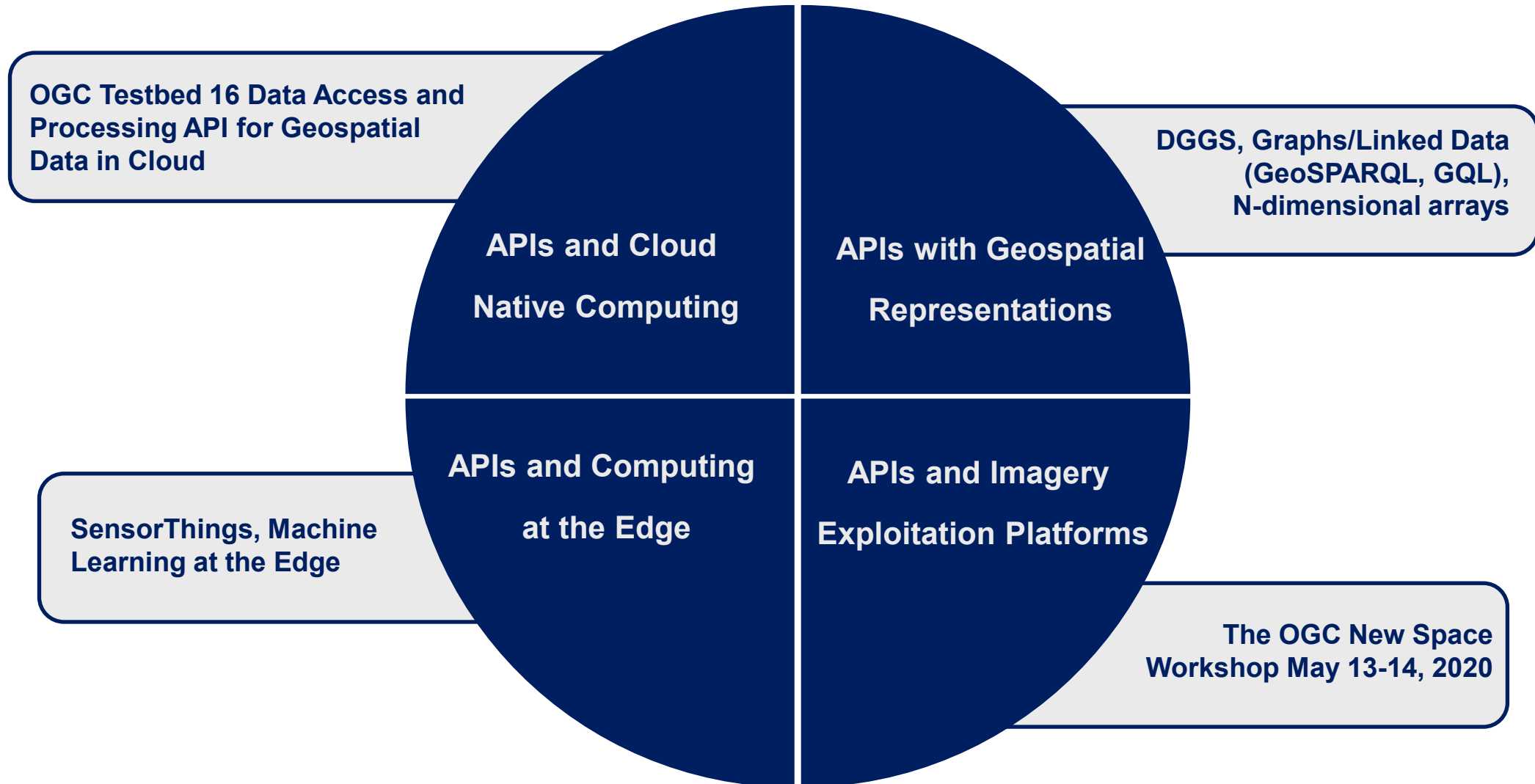
OGC Technology Forecasting



OGC Track ~60 trends in 8 categories



APIs and Geospatial Tech Trends





Thank You!

Making location count

Community

- 520+ International Members
- 110+ Member Meetings
- 60+ Alliance and Liaison partners
- 50+ Standards Working Groups
- 45+ Domain Standard 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

Contact info@ogc.org to schedule
a meeting for an in-depth discussion with OGC staff



A satellite with large gold-colored solar panels and a blue cylindrical body is shown in space. The Earth's blue and white surface is visible in the background.

The OGC New Space Workshop

May 13 - 14, 2020

ogc.org/webinars | [#ogcnewspace](https://twitter.com/ogcnewspace)