OGC Update on Activities for IHO HSSC

Scott Simmons, CSO

6 May 2021

The world's leading and comprehensive community of experts making location information:

- **F**indable
- **A**ccessible
- **I**nteroperable
- **R**eusable

Agenda

- OGC Introduction
- 2020 recap
- Standards Roadmap
- OGC APIs
- Emerging work
- Upcoming Member Meetings

What is OGC?

A Hub for thought leadership, innovation, and standards for all things related to location

Our Vision

Building the future of location with community and technology for the good of society

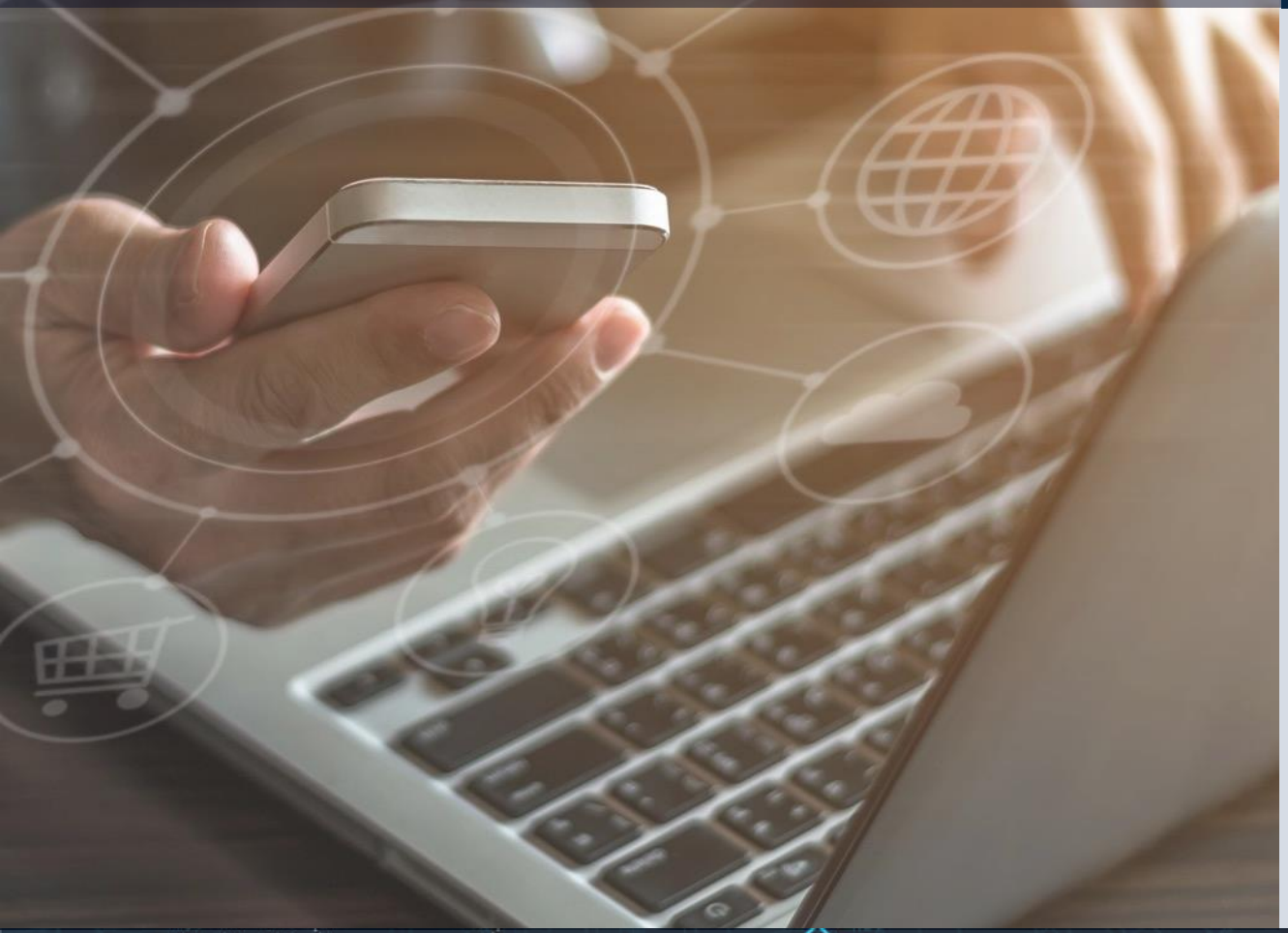
Our Mission

Make location information Findable, Accessible, Interoperable, and Reusable (FAIR)

Our Approach:

A proven collaborative and agile process combining consensus-based standards, innovation projects, and partnership building

Who are our members?



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

OGC

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 & Academia

- Applied Research Partners
- Funding for Innovation
- International Collaboration
- Citations

2020 recap

2020 in one slide

- 11 Standards approved
- 5 Best and Community Practices approved
- 48 Engineering Reports approved
- 10 Discussion or White Papers approved
- 1 new Standards Working Groups (SWGs)
- 12 Innovation Program initiatives completed

Standards

- OGC 04-084r4: OGC Abstract Specification Topic 0 – Overview
- OGC 17-014r7: Indexed 3D Scene Layer (I3S) v.1.1 Community standard
- **OGC 19-045r3: OGC Moving Features Encoding Extension – JSON**
- OGC 19-065: OpenFlight Community standard
- OGC 19-011r3: OGC IndoorGML 1.1
- **OGC 18-067r2 : OGC Symbology Conceptual Model: Core part (SymCore)**
- Many volumes: OGC CDB 1.2
- **OGC 19-014r3: Core Tiling Conceptual and Logical Models for 2D Euclidean Space - Abstract Specification Topic 22**
- **OGC 18-058: OGC API - Features - Part 2: Coordinate Reference Systems by Reference**
- **OGC 12-128r17: OGC GeoPackage Encoding Standard v1.3.0**
- **OGC 18-088: OGC SensorThings API Part 1: Sensing Version 1.1**

OGC Standards Roadmap

https://www.ogc.org/roadmap

OGC

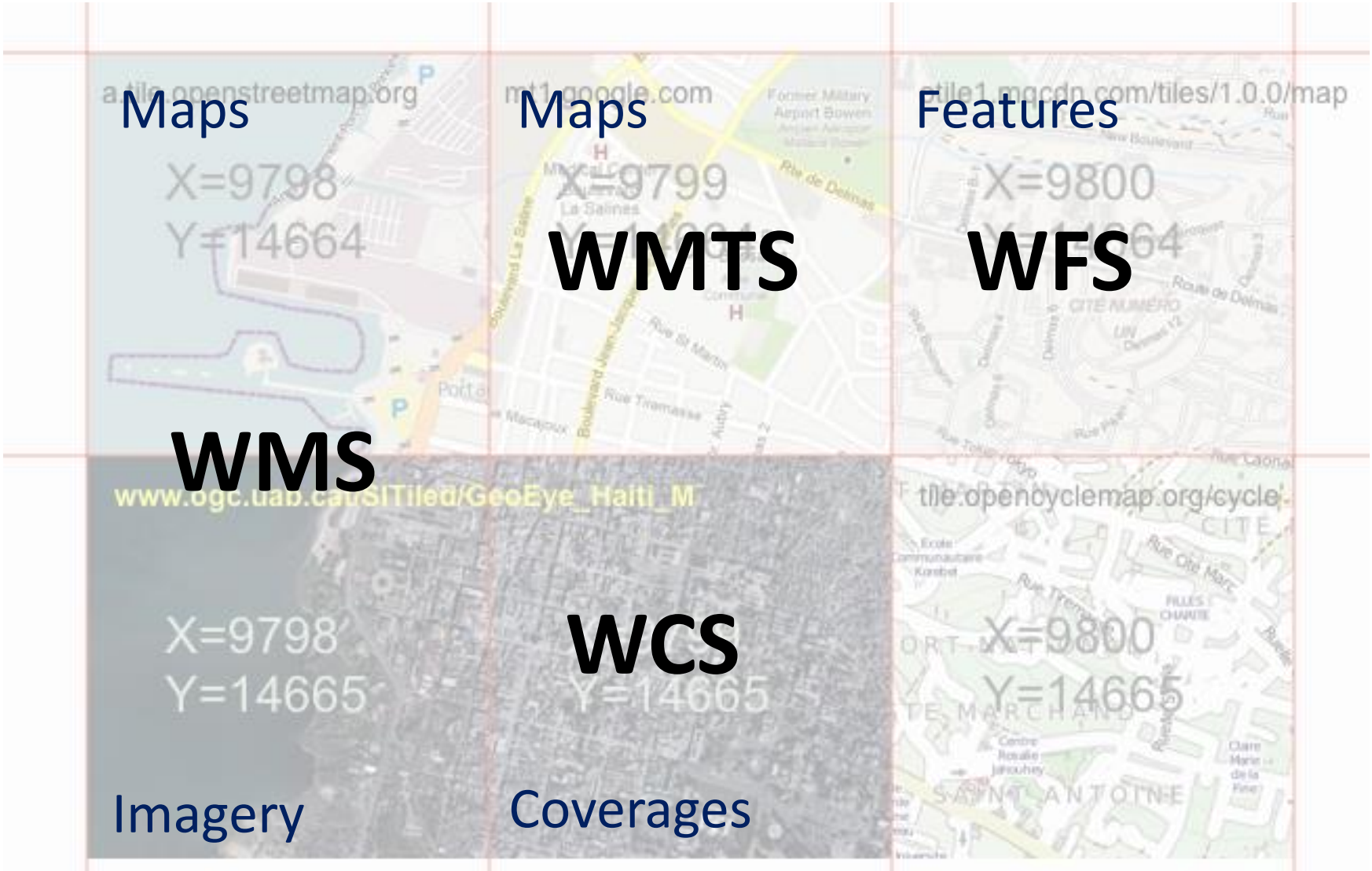
Progress of Official OGC Standards OGC & Community Standards Community 2020-11-23

Proposed Standards	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 Abstract Spec Topic 0 04-084	✓163d	✓64d	✓	✓135d	✓154d	✓	✓56d	✓15d	✓209d
OGC Abstract Spec Topic 2 - Referencing by Coordinates 18-005	✓533d	✓18d	✓	✓63d	✓115d	✓	✓64d	✓15d	✓77d
OGC Abstract Spec Topic 21 - DGGS v. 2.0 3 new 20-040	✓161d	✓15d	146d	✓66d	80d				
OGC Abstract Spec Topic 22 - Tiling 19-014	✓194d	✓195d	✓14d	✓51d	✓123d	✓	✓54d	✓34d	✓34d
OGC Abstract Spec Topic 6 - Schema for coverage geometry and functions	150d								
OGC CDB 1.2	✓287d	✓21d	✓97d	✓100d	✓32d	✓	✓48d	✓15d	91d
OGC CDB 2.0	774d								
OGC CityGML 3.0 2 new	✓768d	✓7d	13d	13d					
Community CityJSON	✓5d	✓36d	✓43d	76d					
OGC Common Object Model Container SWG	770d								
OGC Coverage Implementation Schema - ReferenceableGridCoverage Extension 1.1 3 new 16-083r6	✓94d	✓39d	55d	55d					
OGC EO Extension for OpenSearch 13-026r9	✓156d	✓190d	✓	✓73d	✓270d	✓14d	✓46d	✓	✓149d
OGC EO Product Metadata GeoJSON/JSON-LD Encoding 17-003	✓771d	✓425d	✓	✓73d	✓270d	✓14d	✓46d	✓	✓230d
OGC GeoAPI 09-083r4	370d								
OGC GeoPackage 1.3 1 new 12-128r16	✓300d	✓21d	✓36d	✓65d	✓106d	✓	✓50d	16d	
OGC GeoTIFF 19-008	✓7d	✓14d	✓	✓51d	✓14d	✓	✓60d	✓14d	✓5d
OGC GroundwaterML2 v2.3 19-013	✓93d	✓71d	✓	✓7d	✓127d	✓	✓80d	✓	435d
OGC HDF5 Core 18-043	✓336d	✓218d	✓218d	✓123d	✓47d	✓47d	✓24d	✓16d	✓155d
Community IMDF 1 new 19-089	✓56d	✓53d	✓36d	✓65d	5d				
OGC IndoorGML 1.1 19-011	✓101d	✓53d	✓48d	✓39d	✓97d	✓	✓51d	✓16d	✓178d
OGC MetOcean Profile and Extensions to WCS 2.1 15-045, 15	✓1383d	✓1086d	✓	✓227d	✓104d	✓	✓63d	✓15d	437d
OGC Moving Features Encoding Extension - JSON 19-045	✓17d	✓25d	✓13d	✓59d	✓	✓	✓45d	✓15d	✓101d

OGC Observations and Measurements v 3.0 1 new 20-082	✔48d	18d							
OGC OGC API - Common 19-072	✔3d	✔32d	✔112d	✔74d	240d				
OGC OGC API - Coverages	200d								
OGC OGC API - Environmental Data Retrieval 1 new 19-086	✔226d	✔245d	✔113d	✔60d	58d				
OGC OGC API - Features - Part 1: Core 17-069	✔285d	✔273d	✔	✔50d	✔128d	✔	✔59d	✔15d	✔28d
OGC OGC API - Features - Part 2: CRS by Reference 18-058	✔17d	✔46d	✔	✔105d	✔98d	✔23d	✔45d	✔16d	✔6d
OGC OGC API - Features - Part 3: Common Query Language 19-079	137d								
OGC OGC API - Features - Part 4: Simple Transactions 20-002	137d								
OGC OGC API - Features - Part 5: OpenAPI 3.1	137d								
OGC OGC API - Maps	200d								
OGC OGC API - Processes	✔25d	✔14d	161d	✔124d	35d				
OGC OGC API - Records	200d								
OGC OGC API - Styles	200d								
OGC OGC API - Tiles	200d								
OGC OGC Coverage Implementation Schema - ReferenceableGridCoverage Extension 16-083r6	✔20d	17d							
Community OpenFlight 16.0	200d								
OGC OpenSearch GeoJSON/JSON-LD Response Encoding 17-047	✔156d	✔190d	✔	✔73d	✔270d	✔14d	✔46d	✔	✔303d
OGC PipelineML 18-073	✔326d	✔85d	✔	✔53d	✔54d	✔	✔102d	✔45d	✔14d
OGC Semantic Sensor Network Ontology 16-079	✔691d	✔168d	✔168d	✔103d	✔40d	✔40d	✔17d	✔17d	✔58d
OGC SensorML 2.1 12-000r1	✔7d	✔34d	✔22d	✔81d	✔89d	✔	✔50d	✔15d	✔268d
OGC SensorThings API 1.1 - Part 1 1 new 18-088	✔	✔	✔28d	✔67d	✔76d	✔	✔51d	15d	
OGC Symbology Conceptual Model: Core 18-067	✔223d	✔21d	✔	✔127d	✔283d	✔	✔47d	✔16d	✔52d
OGC Time Ontology in OWL 16-071	✔671d	✔168d	✔168d	✔103d	✔40d	✔40d	✔13d	✔16d	✔63d
OGC TimeseriesML 1.3 1 new 15-042r6	✔27d	✔28d	✔13d	✔80d	✔231d	✔14d	8d		
OGC Two Dimensional Tile Matrix Set 17-083	✔289d	✔464d	✔464d	✔259d	✔42d	✔42d	✔28d	✔15d	✔135d
OGC Well Known Text Representation of Coordinate Reference Systems 18-010	✔315d	✔210d	✔210d	✔164d	✔47d	✔47d	✔32d	✔16d	✔71d

OGC APIs

Legacy OGC Web Service Standards



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

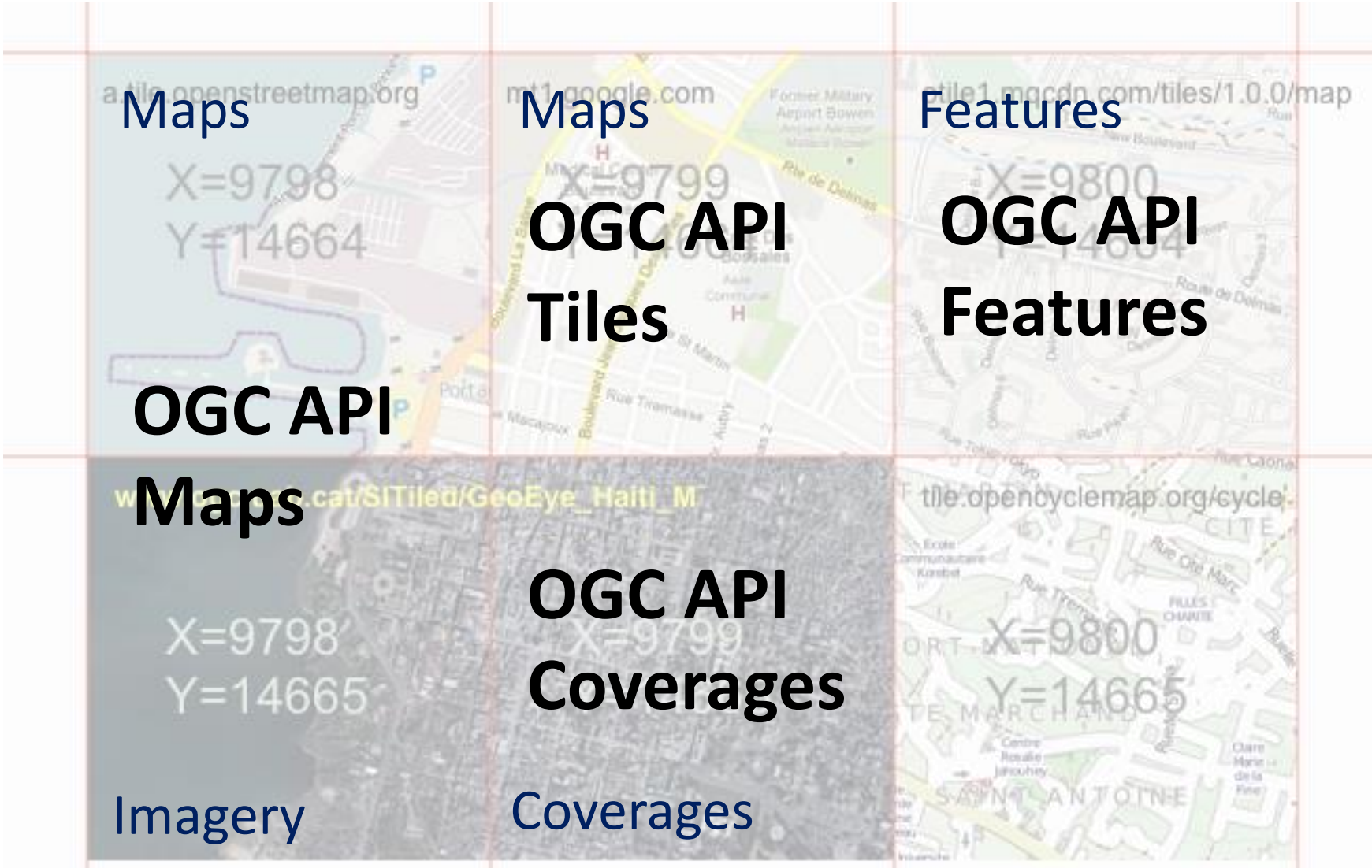
The 23 Design Principles for OGC Web APIs

#	Principle
1	Don't reinvent
2	Keep it simple and intuitive
3	Use well-known resource types
4	Construct consistent URIs
5	Use HTTP methods consistent with RFC 7231
6	Put selection criteria behind the '?'
7	Error handling and use of HTTP status codes
8	Use explicit list of HTTP status codes
9	Use of HTTP header
10	Allow flexible content negotiation
11	Pagination
12	Processing resources
13	Support metadata
14	Consider your security needs
15	API description
16	Use well-known identifiers
17	Use explicit relations
18	Support W3C cross-origin resource sharing
19	Resource encodings
20	Good APIs are testable from the beginning
21	Specify whether operations are safe and/or idempotent
22	Make resources discoverable
23	Make default behavior explicit

All principles are equally important and the order of the principles does not reflect their relative importance.

OGC API Standards

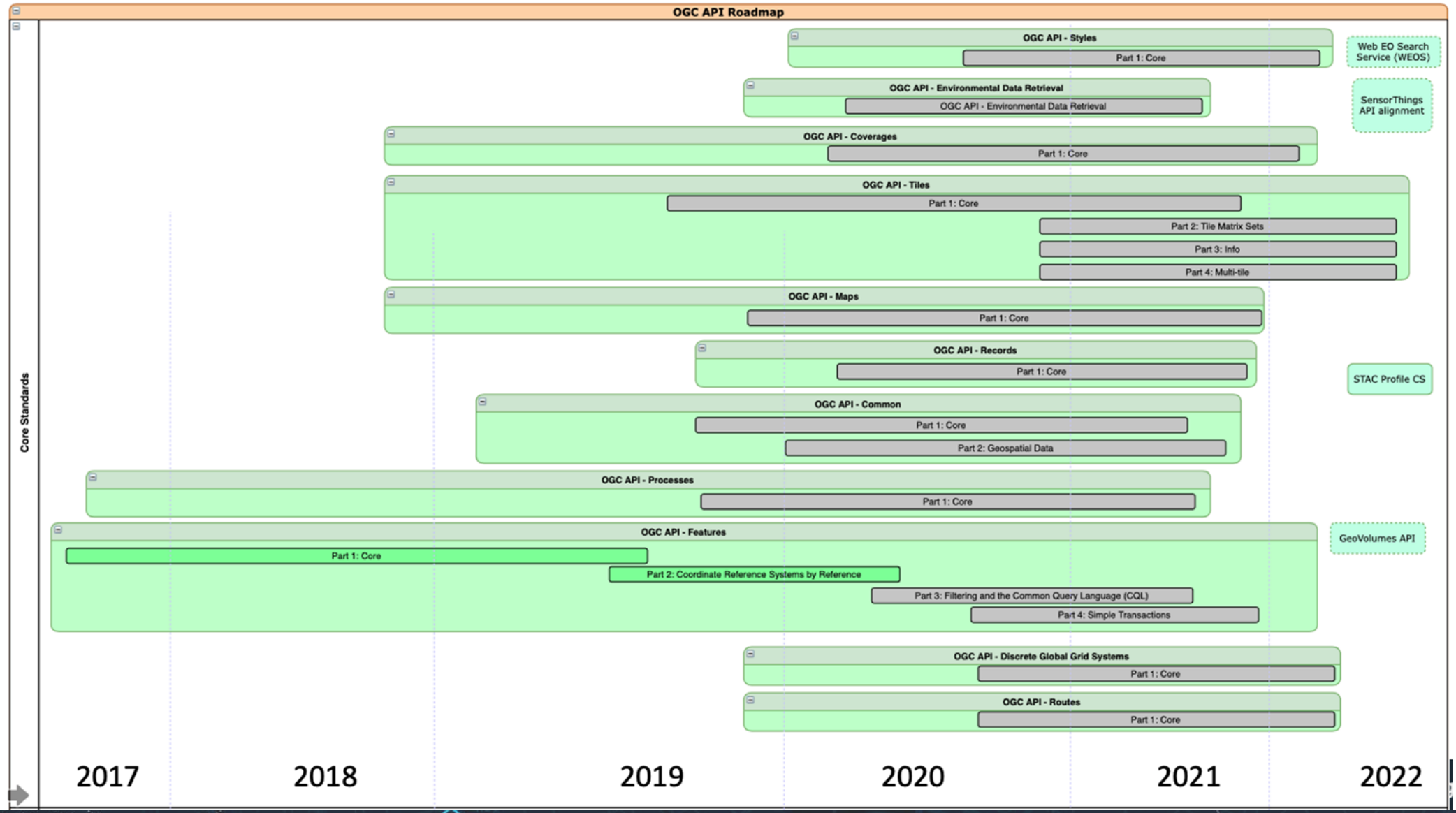
OGC



Discover via
OGC API - Records

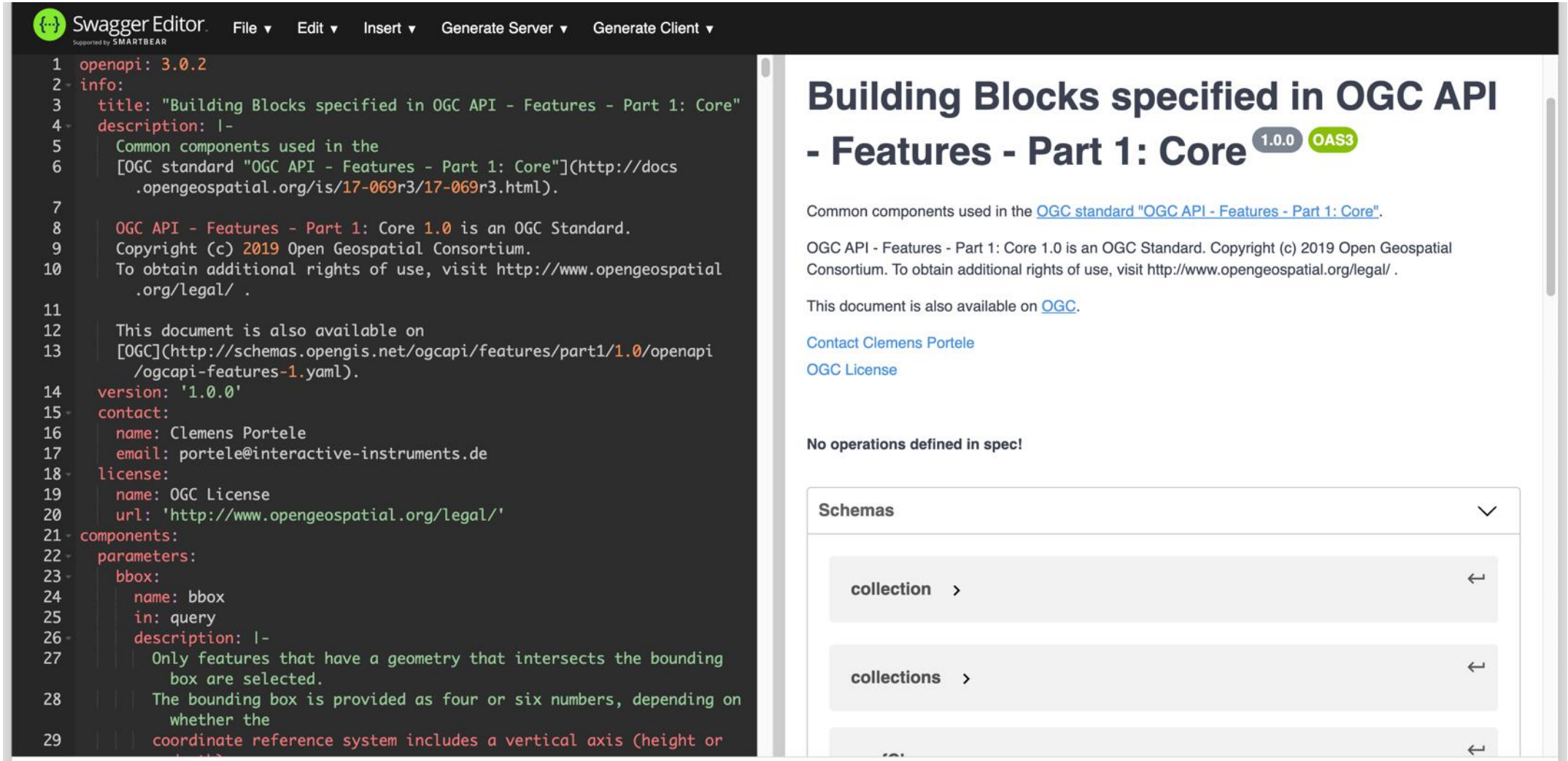
Multiple Maps with common semantics - Interoperability (Source: Joan Maso)

OGC API Roadmap



All defined in OpenAPI

OGC



Deployment model example – building blocks

OGC

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

Features: CQL

Features: CRS

Features: Core

Data

OGC API - Common

Tiles

Maps

Coverages

EDR

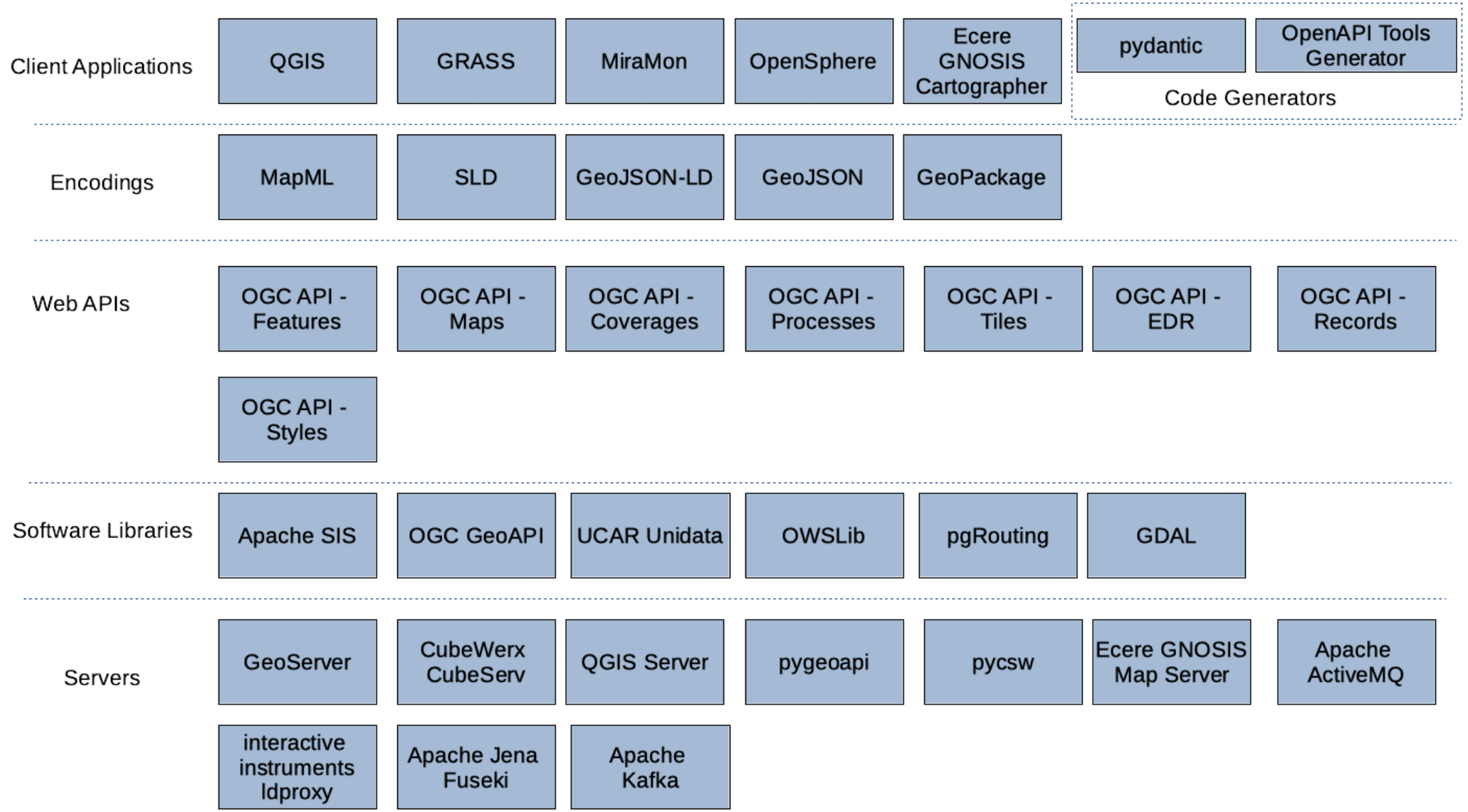
Features: Transactions

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

User: need features supporting GDA2020 and other CRSs

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

Architecture of the 2021 Joint OGC OSGeo ASF Code Sprint



Emerging work

Features and Geometries JSON - Motivation

- Developers today prefer JSON over XML
- GeoJSON popular and widely supported
- OGC API Features implementations typically support GeoJSON
- But (intentional) limitations exist in GeoJSON that are an issue for some use cases:
  - Restricted to WGS 84 as Coordinate Reference System
  - Ellipsoidal metrics not supported
  - No support for solids
  - No guidance for the encoding of feature properties

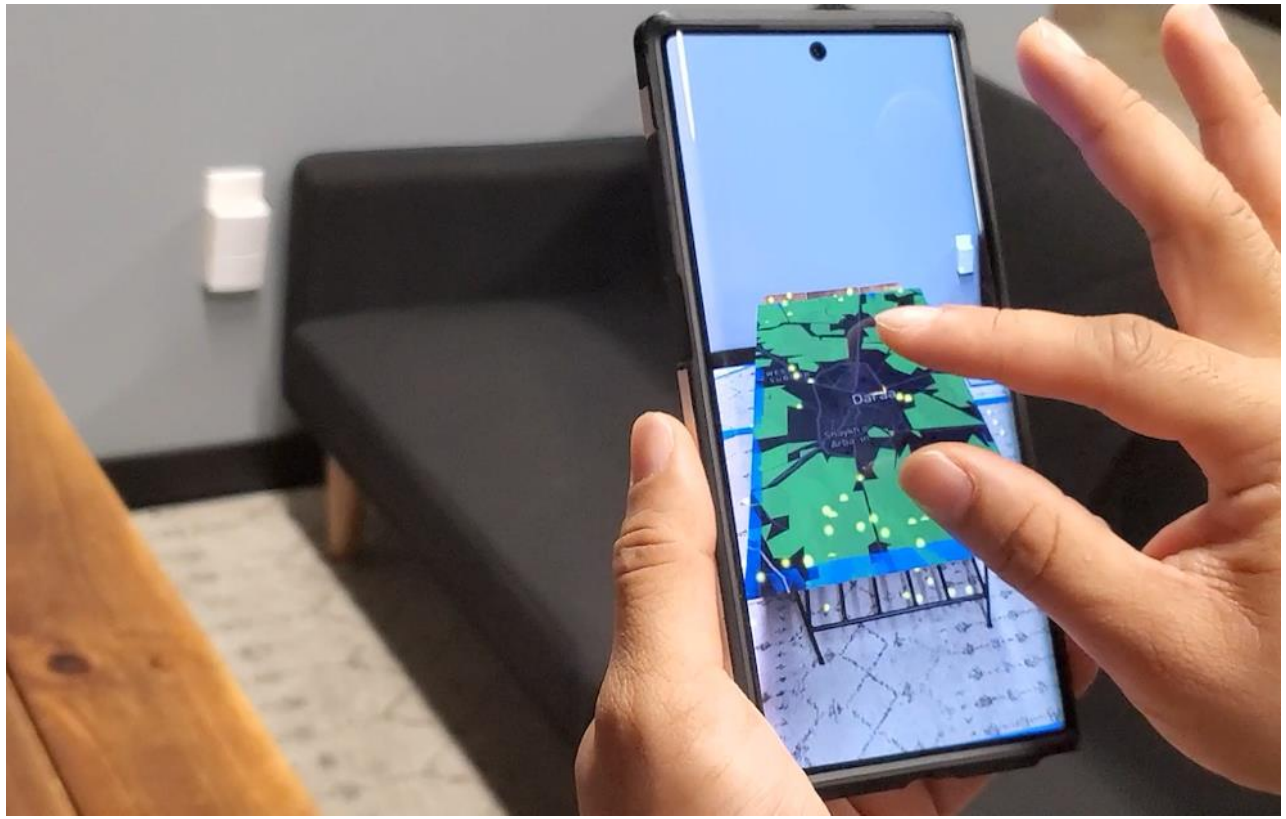
Features and Geometries JSON - Proposal

- Develop OGC Features and Geometries JSON addressing the identified limitations
  - Additional capabilities could be added in the future, if there is broad support for the initial OGC Features and Geometries JSON in implementations
- Specify as a superset of GeoJSON
  - i.e., valid GeoJSON is also valid OGC Features and Geometries JSON
- It is not the idea to develop a GML-equivalent for JSON!

- Target an initial release of a candidate standard: end of 2021

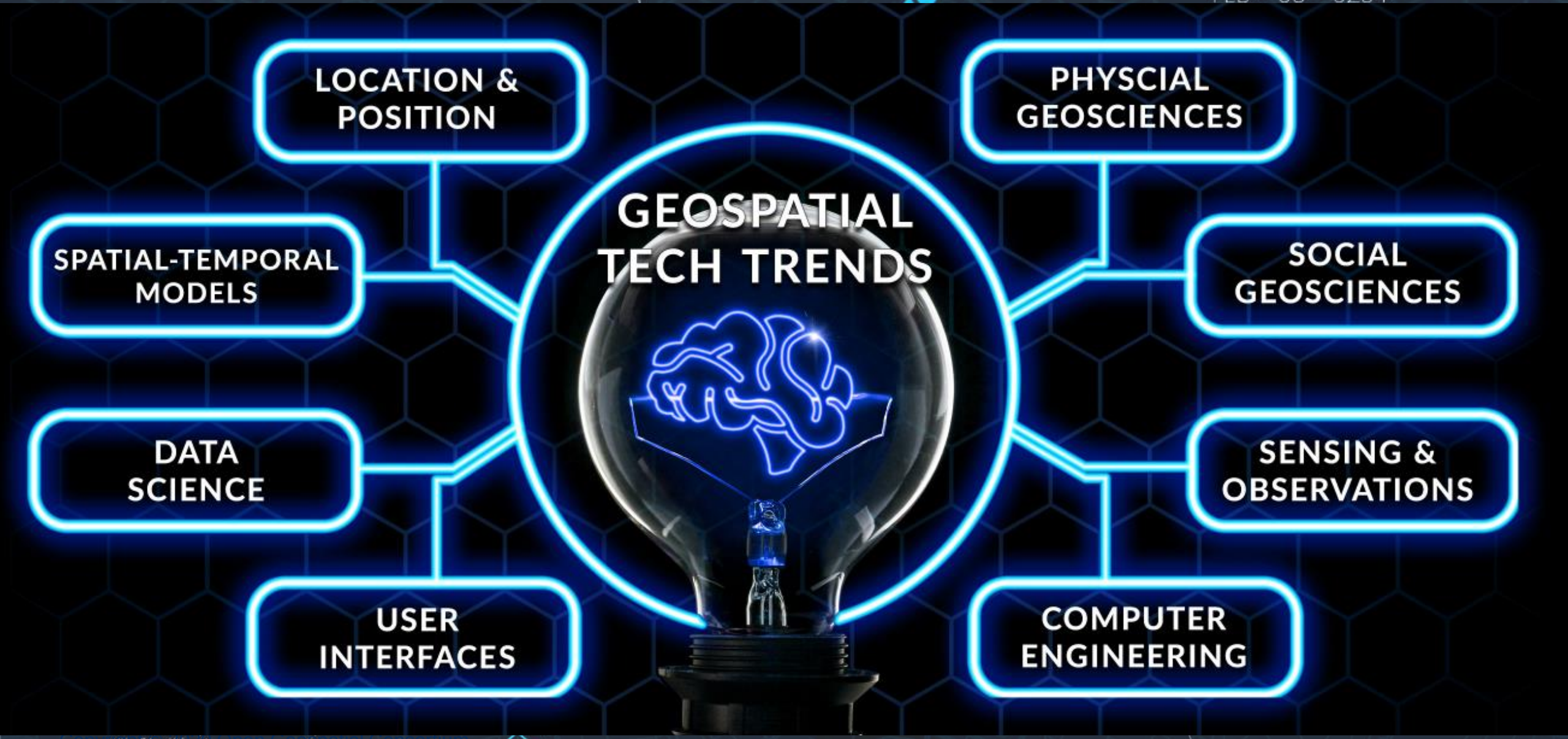
GeoPackage split

- GeoPackage is a portable, self-describing container for feature, raster, elevation, and bathymetric data
- New work to split the Conceptual Model from the Encoding
  - Removes dependency on SQLite
  - Implementable across other databases or data management schemes



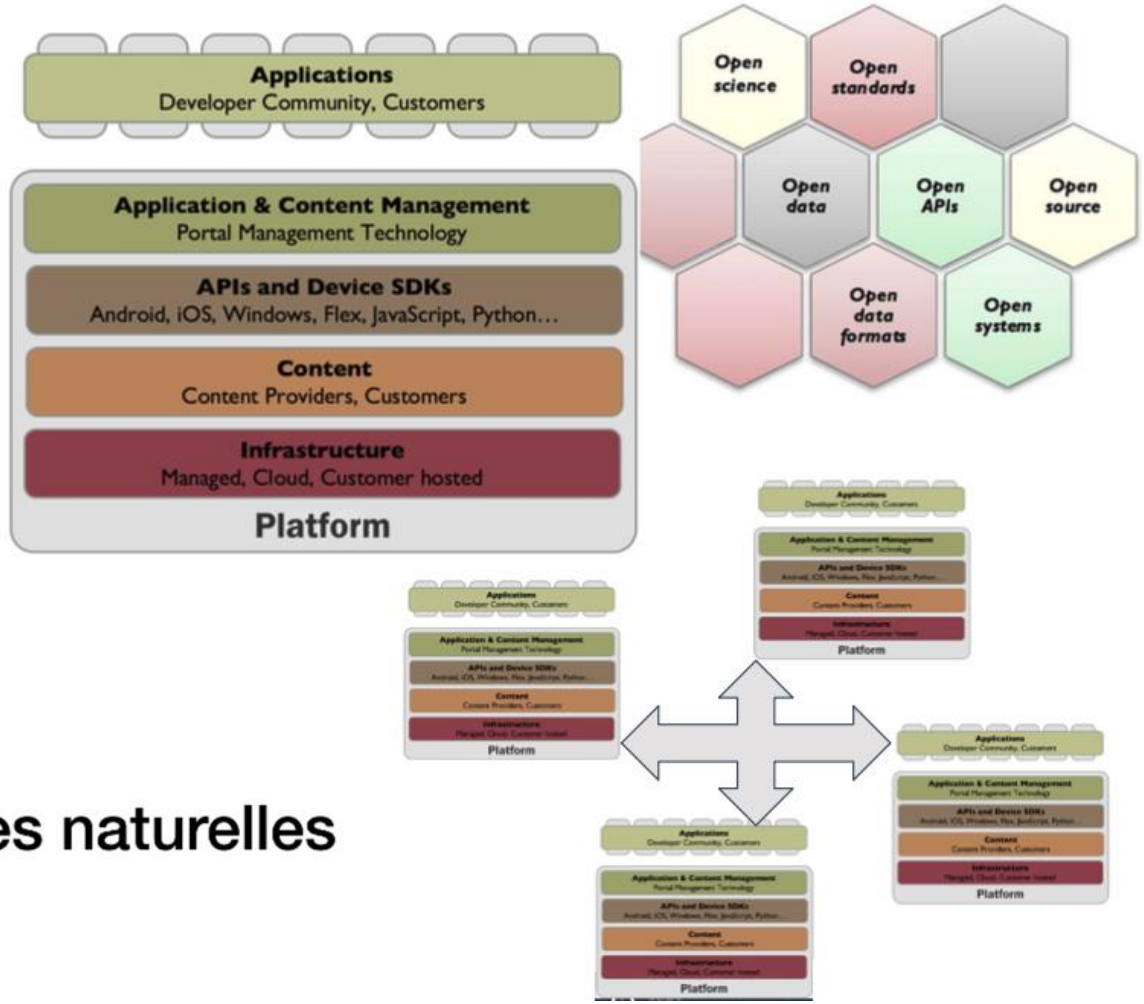
Skymantics Augmented Reality map browser

OGC Tech Trends - breadth



Modernizing SDI Concept Development Study

- Data Integration Challenges
- Stakeholder Needs
- Reference Architecture
- System Requirements



- Sponsored by:

Natural Resources Canada

Ressources naturelles Canada

Federated Marine SDI (FMSDI) Pilot

- **Build** on successful multi- stakeholder IHO-OGC MSDI Concept Development study
- **Demonstrate** a multi-nation, federated Marine Spatial Data Infrastructure (SDI) under land/sea interface use-cases.
  - Unlock valuable data and information for more than the traditional providers and consumers of hydrographic data.
  - Includes one or more land/sea interface scenarios in order to demonstrate how federated Marine SDI can provide simple, secure access across Nations and domains
  - Potential areas of interest include regions in the Arctic, European Coastal Waters, and South East Asia (dependent on sponsor requirements)

OGC- IHO collaborative Pilots work extremely well – Example : IHO-OGC Maritime Limits and Boundaries Pilot

Call for Sponsors now out!
https://www.ogc.org/projects/initiatives/fmsdi

Future OGC Member Meetings

Date	Location	Host/Sponsor
22-26 March 2021	Virtual	
14-18 June 2021	Virtual	
13-17 September 2021	Singapore (TBC)	Singapore Land Authority
6-10 December 2021	California USA (TBC)	

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

Contact info@ogc.org to schedule a meeting for an in-depth discussion with OGC staff and join our community today!