News from the OGC

Tech Trends & Developments

FOSS4G NL

Delft, Netherland – 20. June 2019

OSGeo·NL

Athina Trakas
Open Geospatial Consortium (OGC)
Regional Services Director
Europe, Central Asia & Africa

Who am I?

http://www.opengeospatial.org/ogc/organization/staff/atrakas

- work in the field of GIS since 1998
- Finished university with a diploma in Geography.
- Worked for 10 year in the private industry
- Since 2009 I am OGC's Director for Regional Services for Europe, Central Asia & Africa
- I am the contact person for OGC in these regions, responsible for the Consortiums activities and networking, like planning and managing of OGC recruitment, connecting with relevant stakeholder organisations and members.
- Since 2008 I am charter member of OSGeo.

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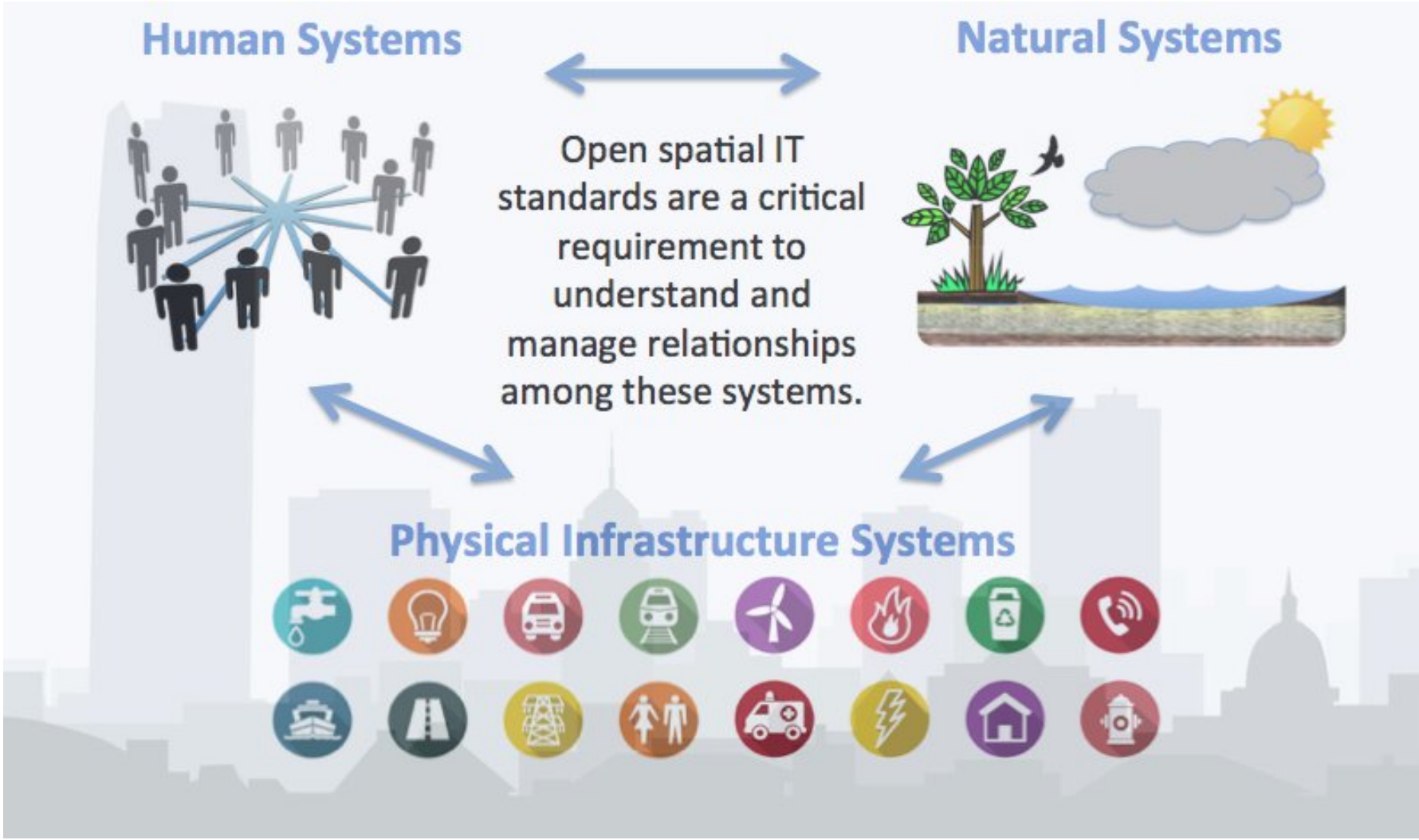
Introduction



Our story

- Location Data Expertise
- Open Collaborative Culture
- Results driven process

Dutch OGC members

- CycloMedia Technology B.V.
- Delft University of Technology
- Deltares
- Gemeente Rotterdam
- GeoCat bv
- Geodan Holding BV
- Geonovum
- HERE Global BV
- ISRIC - World Soil Information
- ITC, University of Twente
- Kadaster International
- Ministry of Infrastructure and the Environment
- OpenMI Association
- UNIGIS International Association (UIA)

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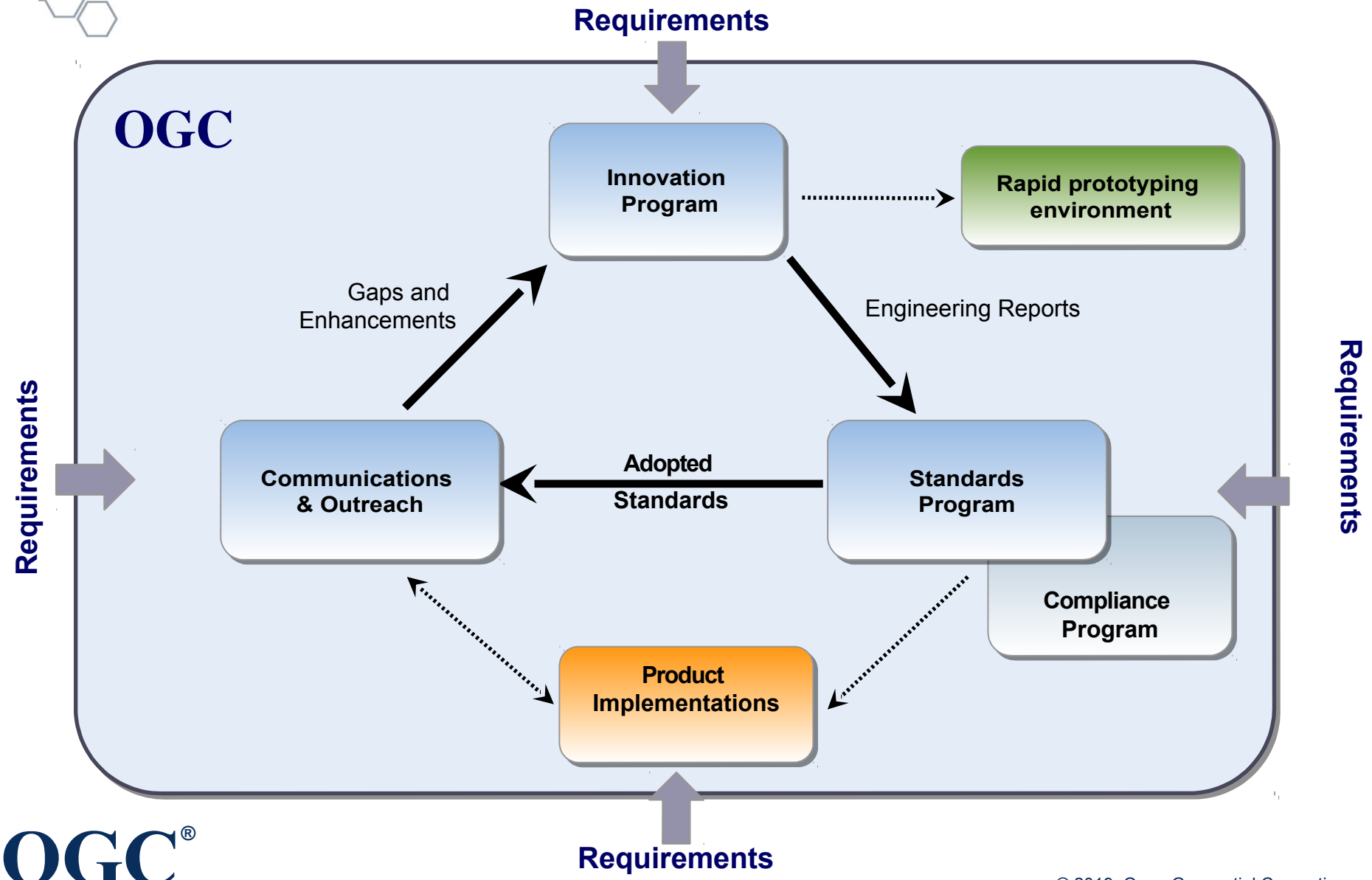
OGC Programs interaction



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2019 first half in one slide

- Busy year so far!
  - New leadership at OGC
  - 9 Standards approved
  - 30 Engineering Reports approved
  - 2 Discussion or White Papers approved
  - 5 new Domain Working Groups (DWG)

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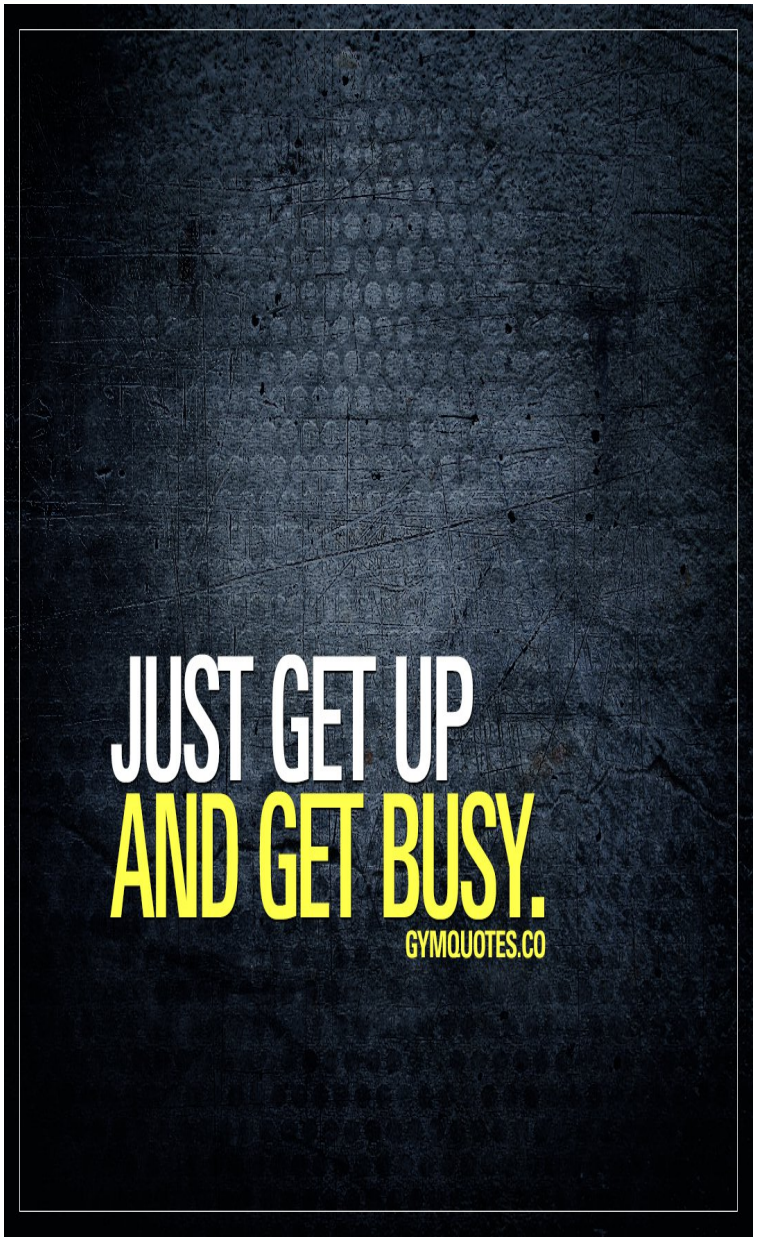
… and some more activities

- OGC baseline / open API
  - standards roadmap, e-learning, hackathons
- Tech Trends Watch
  - update
- OGC Technical Committee meetings
  - upcoming



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New OGC Leadership Team

- Nadine Alameh returns to OGC as our new CEO
- Bart DeLathouwer is now President
- Scott Simmons is now Chief Operations Officer (COO)
- George Percivall (CTO) and Jeff Burnett (CFO) retain their current roles
- Mark Reichardt is now the Executive Director of Strategic Opportunities

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Standards Approved

- OGC 18-053r1: 3D Tiles 1.0 (OGC Community standard)
- OGC 18-005r3: OGC Abstract Specification Topic 2 - Referencing by Coordinates
- OGC 18-000: OGC GeoPackage Related Tables Extension
- OGC 17-087r13: Features and Geometries - Part 1 - Feature Models
- OGC 16-071r2: Time Ontology in OWL
- OGC 16-079: Semantic Sensor Network Ontology
- OGC 17-083r1: OGC Two Dimensional Tile Matrix Set
- OGC 18-043r3: HDF5 Core 1.0
- OGC 18-010r6: Well Known Text Representation of Coordinate Reference Systems

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Active votes

- OGC PipelineML as a new standard
- OGC OpenSearch Extension for Earth Observation (OpenSearch-EO) as a new standard
- OGC EO Dataset Metadata GeoJSON(-LD) Encoding as a new standard
- OGC OpenSearch-EO GeoJSON(-LD) Response Encoding as a new standard

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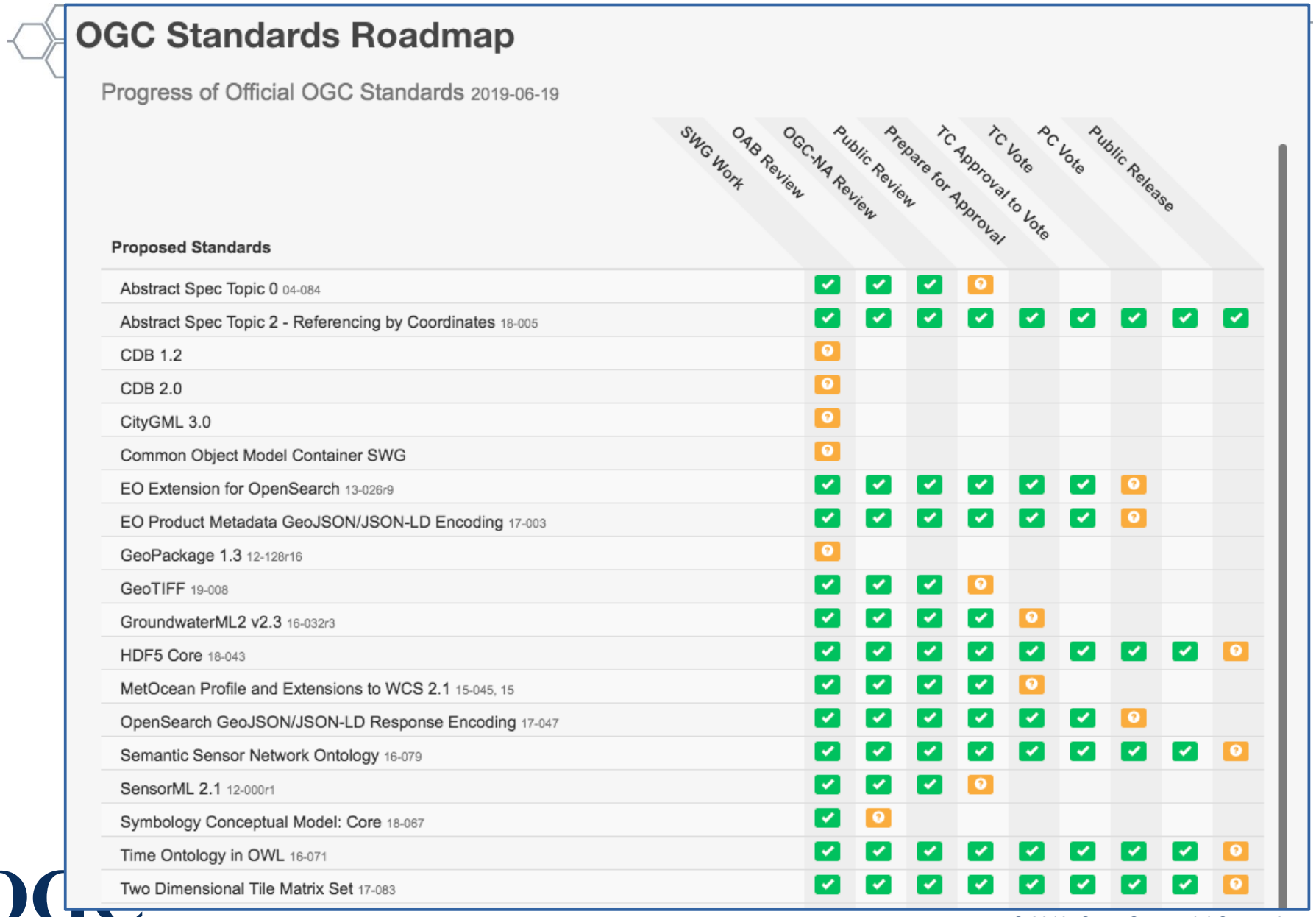
Standards Roadmap



Engineering Reports Approved (1)

- OGC 18-074: GeoPackage Vector Tiles Extensions
- OGC 18-028r2: OGC Testbed-14 WMS QoSE
- OGC 18-085: OGC Testbed-14: BPMN Workflow
- OGC 18-049r1: OGC Testbed-14: Application Package
- OGC 18-050r1: OGC Testbed-14: ADES & EMS Results and Best Practices
- OGC 18-036: OGC Testbed-14: WPS-T
- OGC 18-083: WMTS Vector Tiles Extension
- OGC 18-045: OGC Testbed-14: Next Generation Web APIs - WFS 3.0
- OGC 18-021: OGC Testbed-14: Next Generation APIs - Complex Feature Handling
- OGC 18-078: OGC Vector Tiles Pilot: WFS 3.0 Vector Tiles Extension
- OGC 18-047r2: OGC Testbed 14 Swath Coverage
- OGC 18-026r1: OGC Testbed-14 Security
- OGC 18-057: OGC Testbed-14 Authorization Authentication and Billing
- OGC 18-090r1: OGC Testbed-14 Federated Clouds
- OGC 18-097: OGC Environmental Linked Features Interoperability Experiment
- OGC 18-032: OGC Testbed-14: Application Schema-based Ontology Development

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- OGC 18-097: OGC Environmental Linked Features Interoperability Experiment
- OGC 18-032: OGC Testbed-14: Application Schema-based Ontology Development

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Engineering Reports Approved (2)

- OGC 18-091: OGC Testbed-14: Application Schemas and JSON Technologies
- OGC 18-022r1: OGC Testbed-14: SWIM Information Registry
- OGC 18-035: OGC Testbed-14: Semantically Enabled Aviation Data Models
- OGC 18-094r1: OGC Testbed-14: Characterization of RDF Application Profiles for Simple Linked Data Application and Complex Analytical Applications
- OGC 18-029: OGC Testbed-14: Symbology
- OGC 18-076: Tiled Vector Data Conceptual Model
- OGC 18-086r1: OGC Vector Tiles Pilot: Summary
- OGC 18-038r2: OGC Testbed-14: Machine Learning
- OGC 18-030: Secure Client Test
- OGC 18-034: OGC Testbed-14 Compliance
- OGC 18-023r1: OGC Testbed-14: MapML
- OGC 18-025: OGC Testbed-14 - CityGML and AR
- OGC 18-101: Vector Tiles Pilot Extension
- OGC 18-048r1: Point Cloud Data Handling

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Recently initiated Domain WG

- EO Exploitation Platform Domain Working Group (DWG)
- Statistical DWG
- Artificial Intelligence in Geoinformatics (GeoAI DWG)
- Blockchain and Distributed Ledger Technologies (BDLT DWG)
- Portrayal DWG

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Save the dates, …

- **SAVE THE DATE** - Next OGC Technical Committee meetings:
  - Leuven, Belgium 24.-28. June 2019
    → http://www.ogcmeet.org

Date	Location	Host/Sponsor
9-13 September 2019	Banff, Canada	University of Calgary, NRCan
18-22 Nov 2019	Toulouse, France (TBC)	Airbus
March 2020	Hong Kong (TBC)	
June 2020	Montreal, Canada	CAE
14-18 Sept 2020	Munich, Germany	TUM
30 Nov – 4 Dec 2020	Palo Alto, CA USA	EPRI

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… stay tuned and get engaged!

- Blogs about use of OGC standards (e.g. open APIs, Discovery of Data, Services and Applications etc)
  → http://www.opengeospatial.org/blog

- Other initiatives of interest
  → http://www.opengeospatial.org/projects/initiatives/active
  - Maritime Limits and Boundaries Pilot
  - Routing Pilot
  - SCIRA – Smart City Interoperability Reference Architecture

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OGC Web API standards

Why should we care?

What is in for us?

OGC Board of Directors guidance

- Get to 90% of a standard really fast…
- Then take time to finish the last 10%
- Make the 90% product available to stakeholders and implementers to test
- Develop a repository of example implementations
- Be more public for the 90%
- Control the 10% in the OGC process to ensure the final product is truly an “international consensus standard”

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OGC Web API family of standards

- Modernization of web service standards (W*S) started with Web Feature Service v. 3 (ISO 19168 / OGC WFS3)
- Additional standards following same pattern (none currently offered in parallel in ISO):
  - Processing
  - Map Tiles
  - Coverages
- Hackathon to define common core for OGC API to be held 20-21 June 2019 at the Geovation Hub in London, UK
  - http://www.opengeospatial.org/OGCAPI_Hack2019
- Old W*S standards don't go away, but will have minimal future revision

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OGC API Hackathon expectations

- Can we converge on a common core?

- All OGC Web API efforts are equal stakeholders
- Some borrowing or convergence is already happening
- Hack away and find those “building blocks” that are universal to all candidate standards
- Validate or improve what has already been done
- Improve guidance on use of Web APIs

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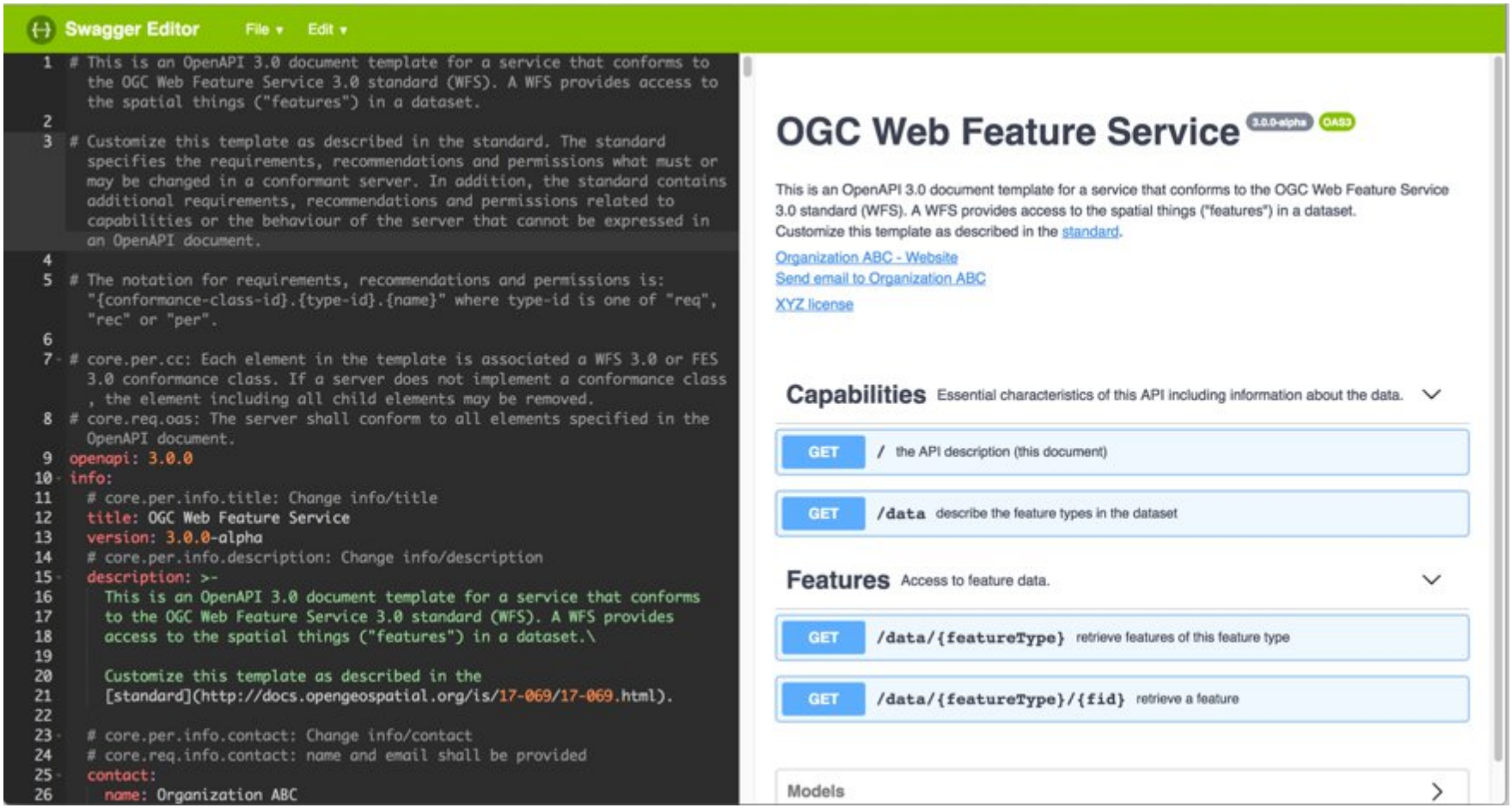
OGC API - Features OpenAPI document



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OGC API Map Tiles OpenAPI document

https://github.com/opengeospatial/e-learning/tree/master/source/wmts/text

Swagger Editor File ▾ Edit ▾ Switch back to previous editor

```yaml
openapi: 3.0.0
info:
  version: 1.0.0-alpha
  title: Draft WMTS API for Discussion Purposes Only
  description: >
    Draft (unofficial for discussion purposes only) WMTS API for retrieval
      of
    OGC WMTS resources. The design of this API roughly corresponds to the
    "resource-oriented style" described in version 1.0.0 of the OGC 07
      -057r7
    OpenGIS Web Map Tile Service Implementation Standard at
    www.opengeospatial.org/standards/wmts.
  termsOfService: 'http://cite.deegree.org/deegree-webservices-3.4-RC3/'
  contact:
    name: OGC Tech Desk
    email: techdesk@opengeospatial.org
  license:
    name: CC-BY 4.0 license
    url: 'https://creativecommons.org/licenses/by/4.0/'
servers:
  - url: 'http://cite.deegree.org/{basePath}'
    description: Server on which the API is implemented
    variables:
      basePath:
        default: 1.0.0
paths:
  '/{serviceMetadataDocumentName}':
    get:
      summary: Retrieve WMTS ServiceMetadata.
      description: This endpoint returns a WMTS ServiceMetadata resource.
      parameters:
        - $ref: '#/components/parameters/serviceMetadataDocumentNameParam'
      responses:
        '200':
          description: ServiceMetadata resource available
```

Draft WMTS API for Discussion Purposes Only

1.0.0-alpha OAS3

Draft (unofficial for discussion purposes only) WMTS API for retrieval of OGC WMTS resources. The design of this API roughly corresponds to the "resource-oriented style" described in version 1.0.0 of the OGC 07-057r7 OpenGIS Web Map Tile Service Implementation Standard at www.opengeospatial.org/standards/wmts.

Terms of service

Contact OGC Tech Desk

CC-BY 4.0 license

Authorize

Servers http://cite.deegree.org/{basePath}

Server variables

Computed URL: *http://cite.deegree.org/1.0.0*

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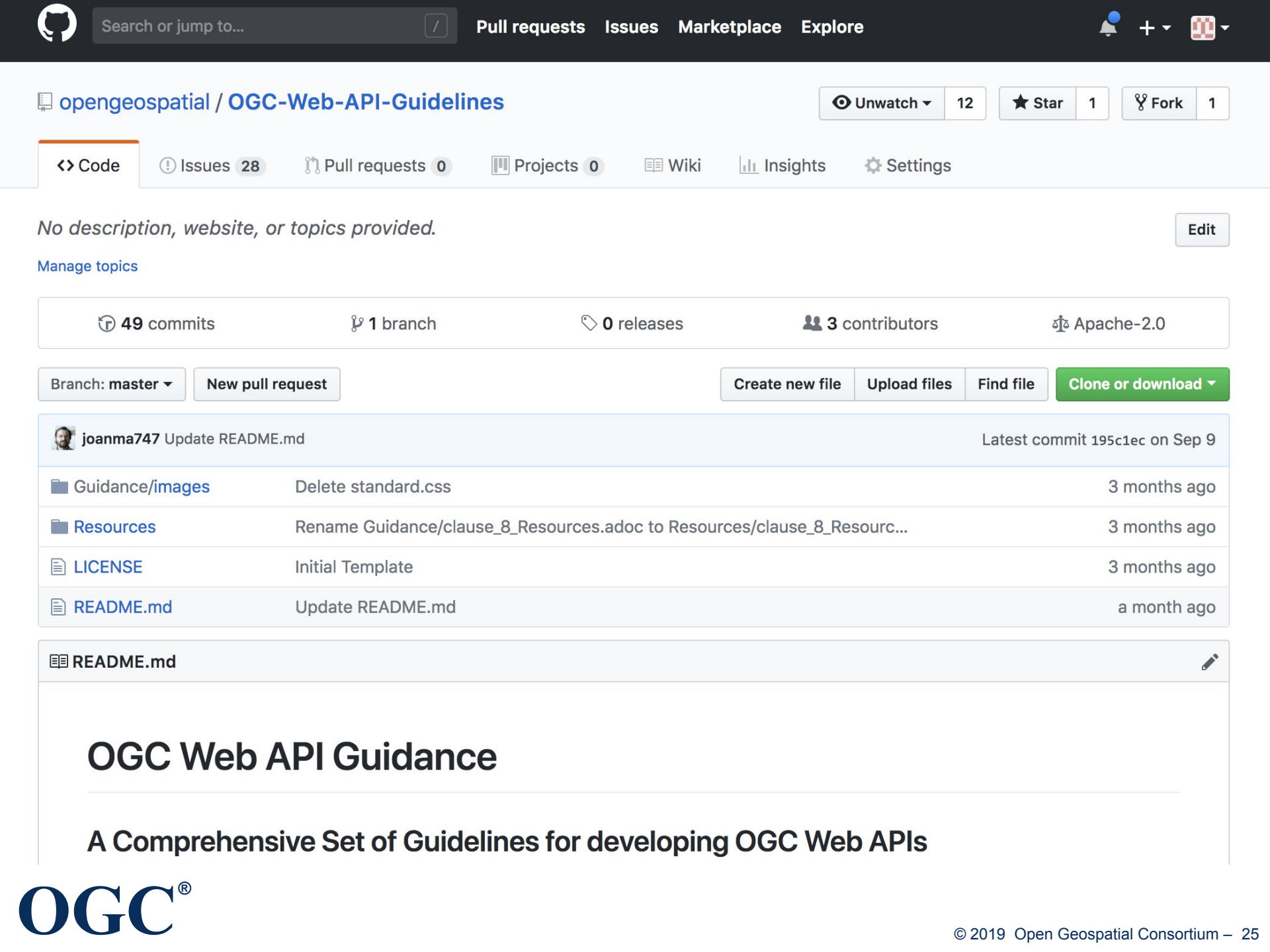
Search or jump to...
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Issues
Marketplace
Explore
opengeospatial / OGC-Web-API-Guidelines
Unwatch 12
Star 1
Fork 1
Code
Issues 28
Pull requests 0
Projects 0
Wiki
Insights
Settings
No description, website, or topics provided.
Edit
Manage topics
49 commits
1 branch
0 releases
3 contributors
Apache-2.0
Branch: master
New pull request
Create new file
Upload files
Find file
Clone or download
joanma747 Update README.md
Latest commit 195c1ec on Sep 9
Guidance/images
Delete standard.css
3 months ago
Resources
Rename Guidance/clause_8_Resources.adoc to Resources/clause_8_Resourc...
3 months ago
LICENSE
Initial Template
3 months ago
README.md
Update README.md
a month ago
README.md
OGC Web API Guidance
A Comprehensive Set of Guidelines for developing OGC Web APIs

OGC Web standards evolution

- Features (WFS SWG)
  - Public comment period complete
  - Coordination with ISO
- Processes (WPS SWG)
  - API in public GitHub with implementations
  - Public comment coming soon
- Map Tiles (WMS SWG)
  - Vector Tiles Pilot results
  - Draft OpenAPI definition
  - WMTS direct link to OWS Common work
- Catalogue (upcoming CAT4 SWG)
  - STAC using WFS3, coordinating loosely with OGC
  - CSW4 (SWG charter in process)
- Coverages (WCS SWG)
  - 2018: Testbed 14 & Met/Ocean Hack
  - 2019: Hackathon supported by several members
- Common (will be OWS Common SWG)
  - API Common Guidelines
  - API Common Spec with requirements

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What's next?

- 20 – 21 June 2019: OGC API Hackathon, Geovation Hub, London
  - http://www.opengeospatial.org/OGCAPI_Hack2019
- June 2019: OGC API Features should begin approval process in both OGC and ISO / TC 211
- August 2019: OGC API Features approved as OGC standard
- September 2019: OGC API Common, OGC API Processing, OGC API Map Tiles likely to be ready for TC approval

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OGC API – [resource]

=

Geospatial API for [resource]

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Technology Trends

More input and details on Github
https://github.com/opengeospatial/OGC-Technology-Trends

Why does OGC Track Geo Technology?

- OGC's position on Innovation (2014):
  - "develop standards to support evolving and potentially disruptive technologies, community needs and market trends."
- Formal Technology Strategy
  - OGC CTO leads a Technology Strategy process to track and promote technology evolution
- Overwhelming member interest to understand and address implications

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"Drone on campus" by Gabriel Garcia Marengo is licensed under CC BY 2.0

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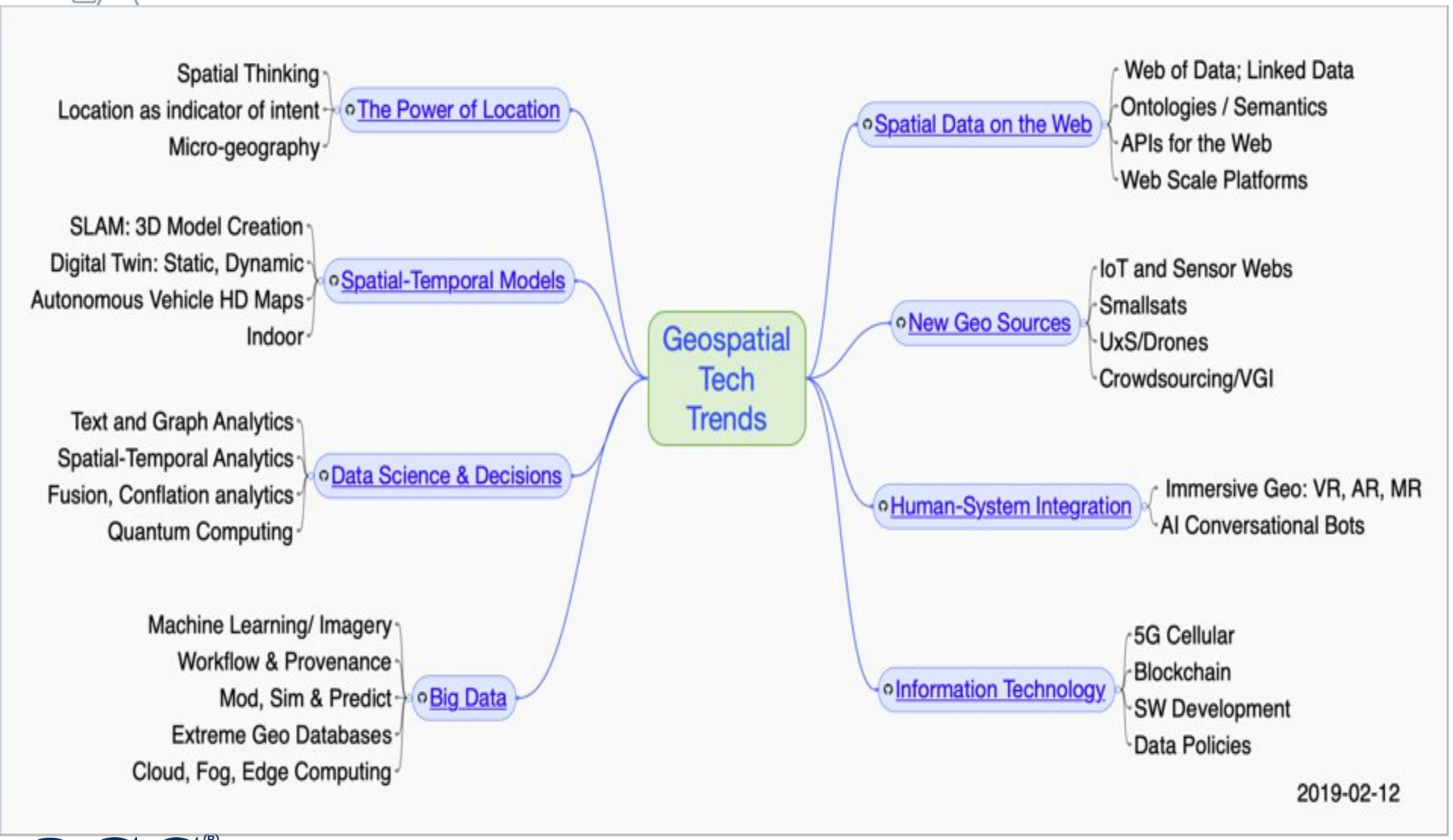
OGC Tech Trends – 2019



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Highlighted Topics – near term actions

- Power of Location
  - People who communicate digitally tend to meet in person
- Spatial/Temporal Models
  - 3D Geo Model creation
  - Indoor positioning
- Big Data and Data Science
  - Machine Learning
  - Modeling, Simulation and Prediction
  - Uncertainty and Veracity
- Spatial Data on the Web
  - APIs for the Web
  - Linked data
- New Geo Sources
  - IoT and Sensor Webs
  - Remote sensing on demand
    - UAVs and drones
    - Smallsats
- User platforms & Networks
  - Immersive Geo
  - Ambient Services
- Software development
  - Federation, Pub-Sub

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Characterization: Machine Learning

Trend

Meta Trend

Description
from Wikipedia

What is new or emerging?

Why might it matter?

SW TRL

Interop Readiness

References

Tipping Point

OGC SP

OGC IP

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Characterization: Machine Learning

Trend	Machine Learning
Meta Trend	Data Science and Analytics
Description from Wikipedia	Subfield of computer science that gives computers the ability to learn without being explicitly programmed. Deep learning - a sub type of machine learning - consists of multiple hidden layers in an artificial neural network.
What is new or emerging?	• 3rd generation of Machine Learning providing revolutionary big data capabilities • Need for robust training sets and methods to efficiently develop them
Why might it matter?	• Significantly improved ability to identify features in geospatial datasets, e.g., patterns in linked data, objects in features.
SW TRL	Level 7 – Demo in Operational Environment
Interop Readiness	Level 5 – Incorporation of novel service into apps with minimal custom code – Associational Standards
References	• Location Powers: Big Data • OGC Big Geo Data White Paper
Tipping Point	Past: ImageNet2012. Future: (break through in efficient, robust training set dev.)
OGC SP	Big Data DWG
OGC IP	OGC Testbeds - Testbed-14: Machine Learning Engineering Report

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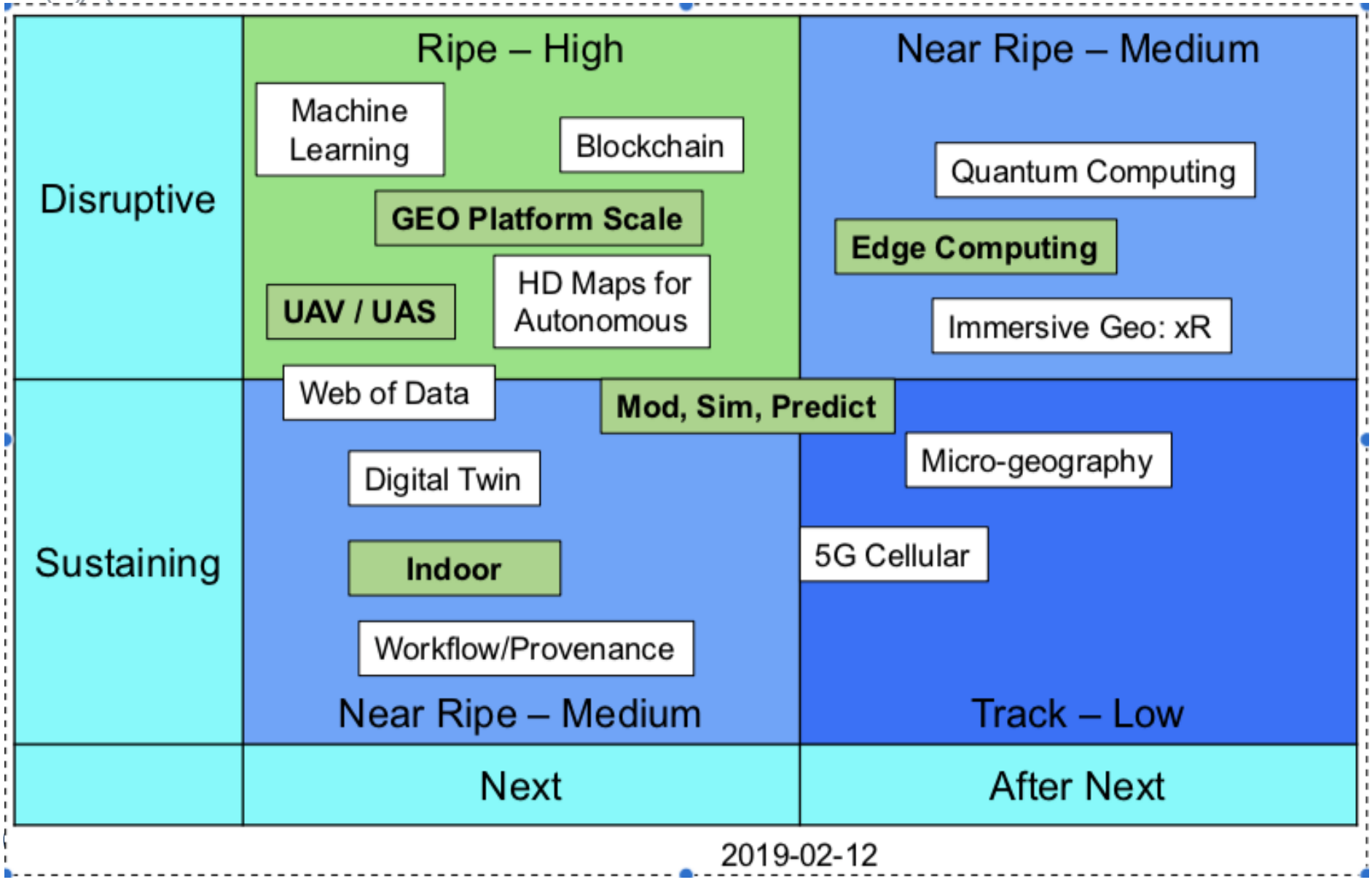
OGC Geospatial Tech Trends Priorities

Publicly Available at: https://github.com/opengeospatial/OGC-Technology-Trends



Stay curious and participate!

- → avoid re-inventing the wheel, duplication of work and efforts
- → interoperability & open standards help to sustain investments
- → key to success: contribution & cooperation on intern'l level

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With input from I. Simonis, G. Percivall, S. Simmons – thxs!