Closing Plenary
The 125th OGC Member Meeting

Meeting sponsor

Scott Simmons + WG Chairs
23 February 2023

Thanks for the support to Ukraine

Assigned OGC Membership

Natural Resources Canada / Ressources naturelles Canada

Canada

Delegate travel support

UK Hydrographic Office

Ordnance Survey

Agenda

- Thank you!
- Quorum confirmation
- TC Presentations and Motions
  - ESA – Günther Landgraf
  - WMO – Tom Kralidis
  - GeoDatacube SWG charter – Alex Jacob
  - ARD SWG charter – Liping Di
  - TrainingDataML for AI – Peng Yue
  - CityJSON 1.1 – Balázs Dukai
  - Corrigenda to Abstract Spec Topic 2 and CRS WKT – Roger Lott
  - Agriculture Information Model SWG - Karel Charvat
  - GeoDCAT SWG charter– Linda van den Brink
  - COG – Joan Masó
  - CityGML – Carl Smyth
- TC Chair announcements and motions
  - Upcoming Member Meeting in Huntsville – Stan Tillman
  - Building Blocks website launch – Joana Simoes
  - New TC PnP
  - OAB Confirmation
  - Abstract Spec Topics proposed for retirement
- Working Group reports with motions: Z to 3

TC Presentations and Motions

- Introduction/video
- Architecture and Global Services
- OGC Standards Implementation
- Next steps

WMO OMM

WORLD METEOROLOGICAL ORGANIZATION

Our mandate

As weather, climate and the water cycle know no national boundaries, international cooperation at a global scale is essential to implement an Earth system approach for the development of meteorology, climatology, operational hydrology and related environmental services as well as to reap the benefits from their application. WMO provides the framework for such international cooperation.

Weather **Climate** **Water** **Environment**

WMO OMM

WMO OMM

Evolution of WMO data exchange
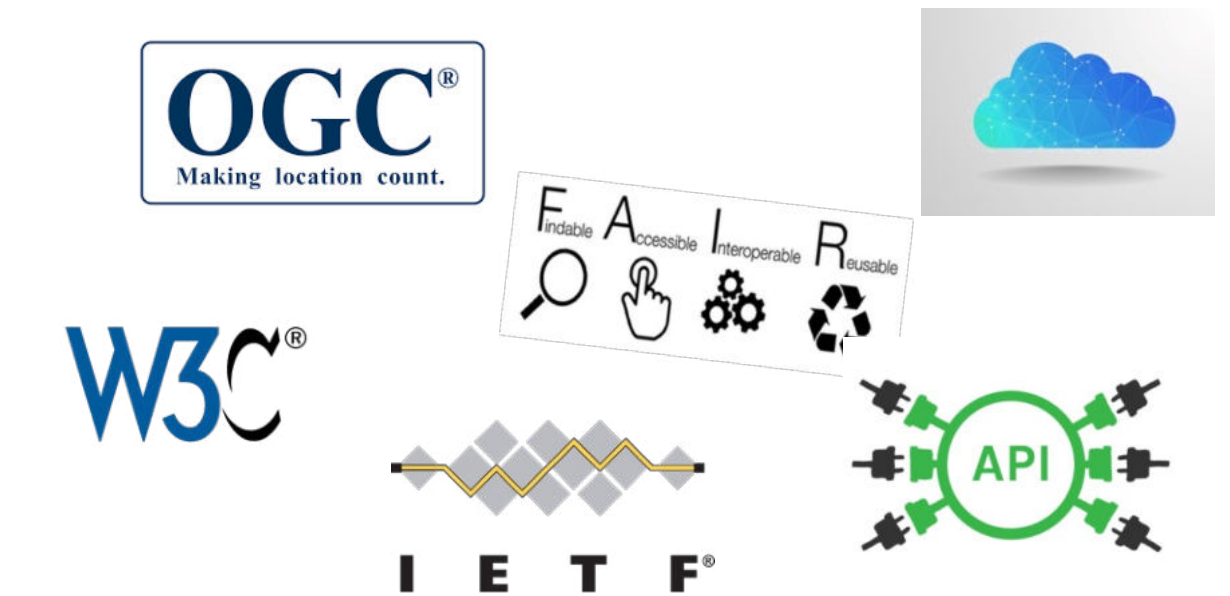
1963 World Weather Watch

  1970s Global Telecommunication System (GTS)

    2007 WMO Information System (WIS)

      2019 WMO Reform (Earth System Approach)

        2021 WMO Unified Data Policy (Core, Recommended)

WIS 2.0

… collaborative system of systems using Web-architecture and open standards to provide simple, timely and seamless sharing of trusted data and information …

- Open Standards (OGC, W3C, IETF, …)
- Free and Open Source tooling
- Data sharing through Web and real-time notifications with publication/subscription (pub/sub) protocols
- Cloud ready (turn-key solutions)
- Web APIs (Application Programming Interface)

WMO OMM

- Introduction/video
- **Architecture and Global Services**
- OGC Standards Implementation
- Next steps

WMO OMM

- Every data provider operates a WIS2 Node
- Low barrier to participation – minimum requirement:
  - publish files (**community-recognized format**) via Web server (**HTTP/S**)
  - publish data availability notifications (**GeoJSON**, w/ links) via message broker (**MQTT/S**)
  - publish discovery metadata (**WCMP2 / OGC-API Record**) via Web server (**HTTP/S**)
- Optional provisions:
  - access control
  - interactive Web API for data access – must be self-describing (**OpenAPI** and **OGC API** recommended)
  - interactive search (**OGC API - Records**)

notification of new data

notification of new data

download

Data Consumer

Message Broker

Core Data

Recommended

metadata

{ … }

WIS2 Node

13
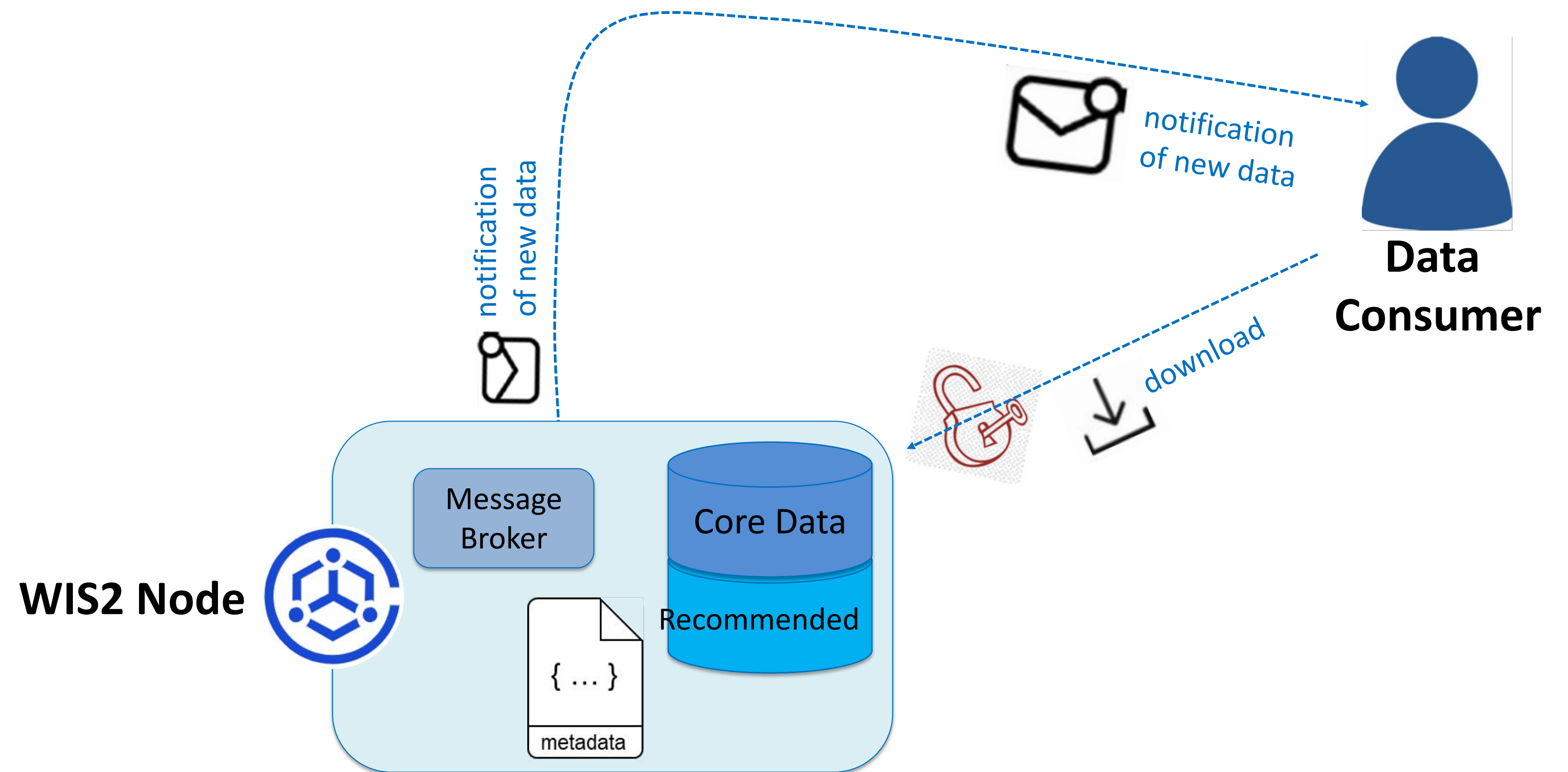
- Any metadata (datasets, services, processes, etc.)
- WMO Core Metadata Profile 2 (**WCMP2**; a profile of **OGC API - Records**)
- Core properties
  - Identification (Title, Abstract, Keywords, Topic Hierarchy, ...)
  - Extents (Spatial/Temporal)
  - Data Policy
  - Distribution (Actionable links)
- Extensible (additional properties)

WMO OMM

| Level	Name	Notes
1	channel	Location of where the data originates from (data providers [`origin`] or global services [`cache`])
2	version	Alphabetical version of the topic hierarchy
3	system	Fixed value of `wis2` for WIS2
4	country	Lower case representation of ISO3166 3-letter code. Includes extensions for partner organizations
5	centre-id	Acronym as specified by member and endorsed by the PR of the country and by WMO
6	resource-type	WIS2 resources types (`data` , `metadata` , `reports` [from monitoring activities])
7	data-policy	Data policy as defined by the WMO Unified Data Policy. `core` data are available from the Global Caches with open access on a free and unrestricted basis. Notifications for `core` and `recommended` data are available by subscription to Global Brokers. `recommended` data are downloaded from the original NC/DCPC and may require authentication/authorisation
8	earth-system-discipline	As per Annex 1 of resolution 1 Cg-Ext-2021
9	earth-system-discipline-subcategory	As proposed by domain experts and further approved by INFCOM

WMO OMM

15

- Global Broker: provides notifications of all data available in WIS2

- Subscribes to notifications from WIS2 nodes (and other Global Service instances) and republishes

- Highly-available, high-performance; multiple instances to serve global community

- Event driven discovery/access
  - Push notifications
  - Protocol: **MQTT/S**
  - Encoding: **GeoJSON**
  - Standard topic hierarchy

- Data consumers subscribe to topics of interest at the Global Broker; server-side filtering via topic, client-side filtering via message content


16
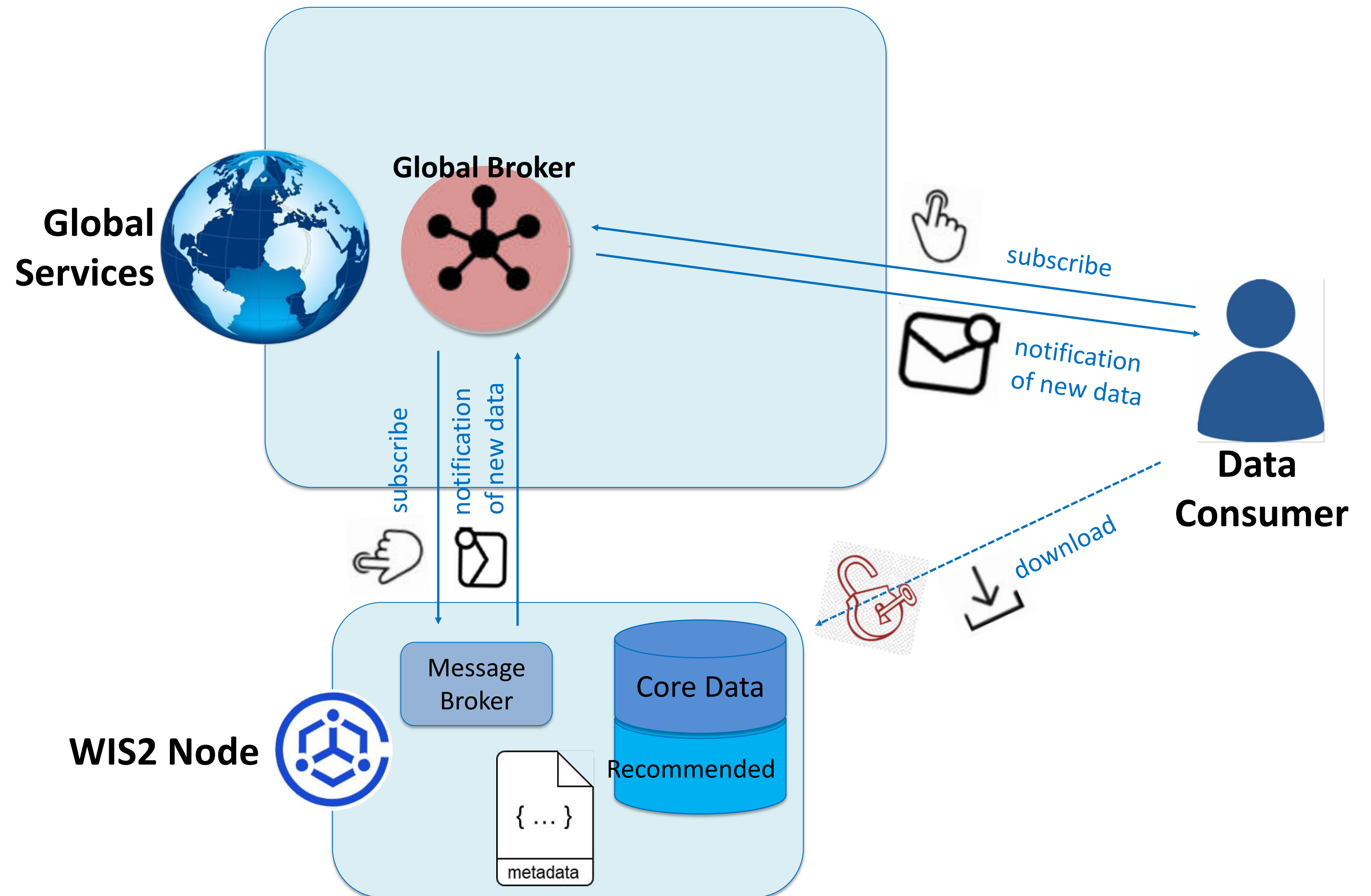
Global Services: scaling for high-availability

- Stores and provides a copy of *real-time* and *near-real-time* Core data from WIS2 nodes

- Data consumers *should* access data via Global Cache

- Raw data access server – deliberately simple, file-based data-server (**HTTP/S**)

- Push notifications via Global Broker (**MQTT/S**)

- Encodings: agnostic/programme specific to support target communities (e.g., GRIB2, BUFR4, WaterML2, CF/NetCDF, FM301/CfRadial2, GeoJSON)
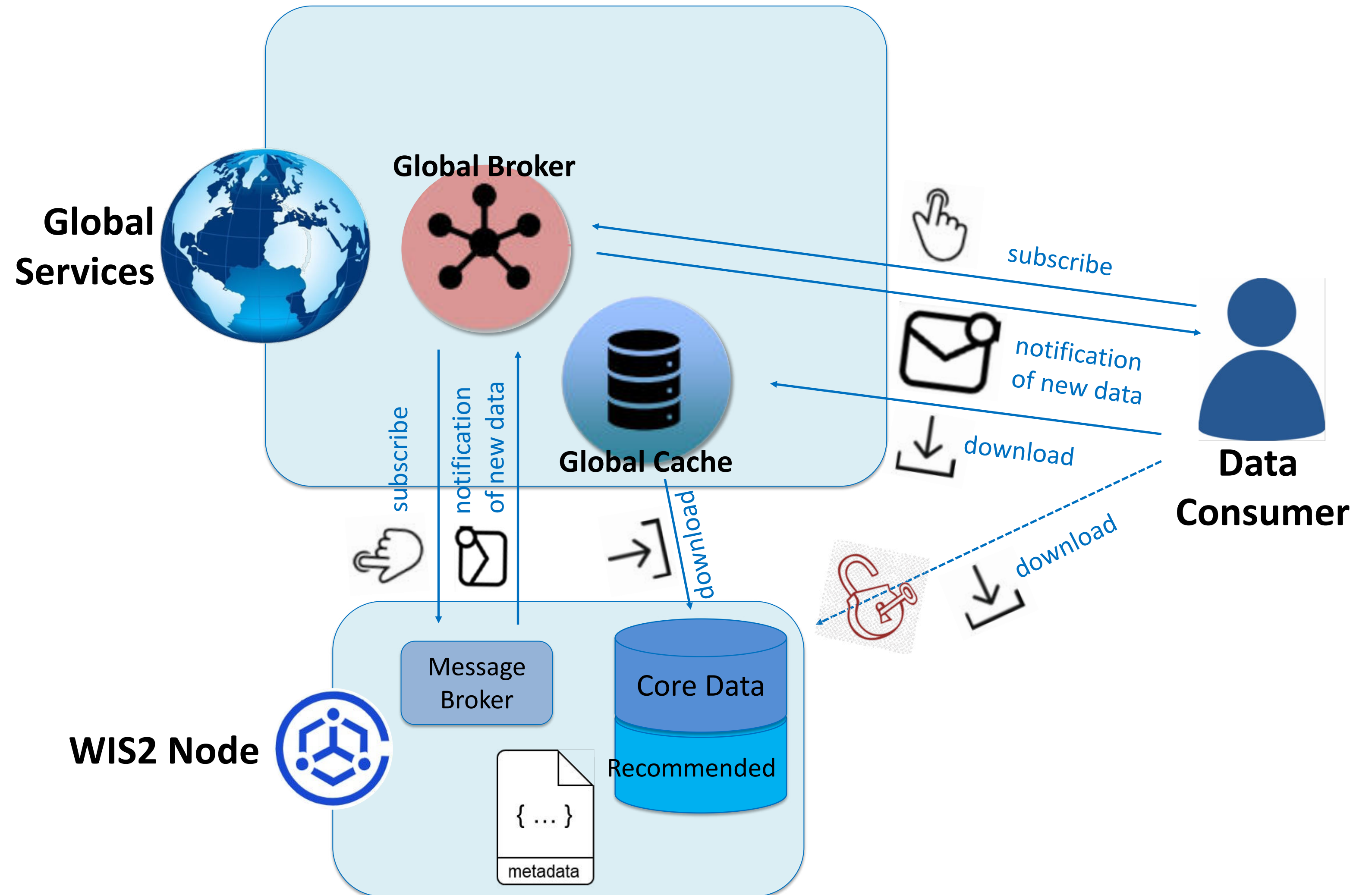
Global Services: finding what you need (discovery)

- Global Discovery Catalogue provides a cataloguing and discovery capability of WMO dataset collections

- Web-based API facilitating search/browse data published via WIS (**OGC API - Records**)

- Harvests WIS2 discovery metadata from WIS2 Nodes (**WCMP2 / OGC API - Records**)

- Yellow pages (discovery metadata) gateway into WIS data and services

- Provides indexing capability to mass market search engines

- Provides quality assessment services of discovery metadata in support of continuous improvement in alignment with WIS2 metadata KPIs
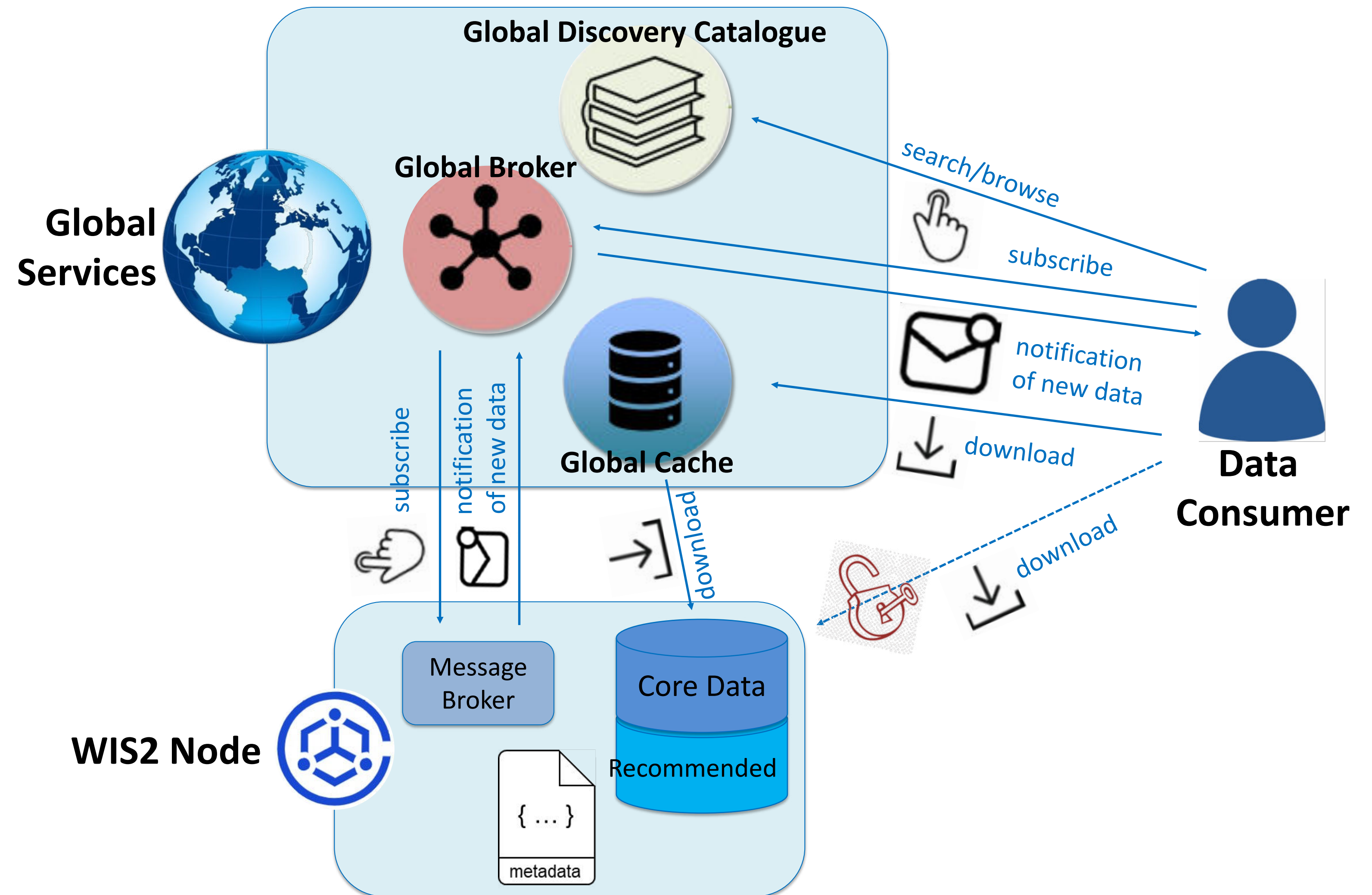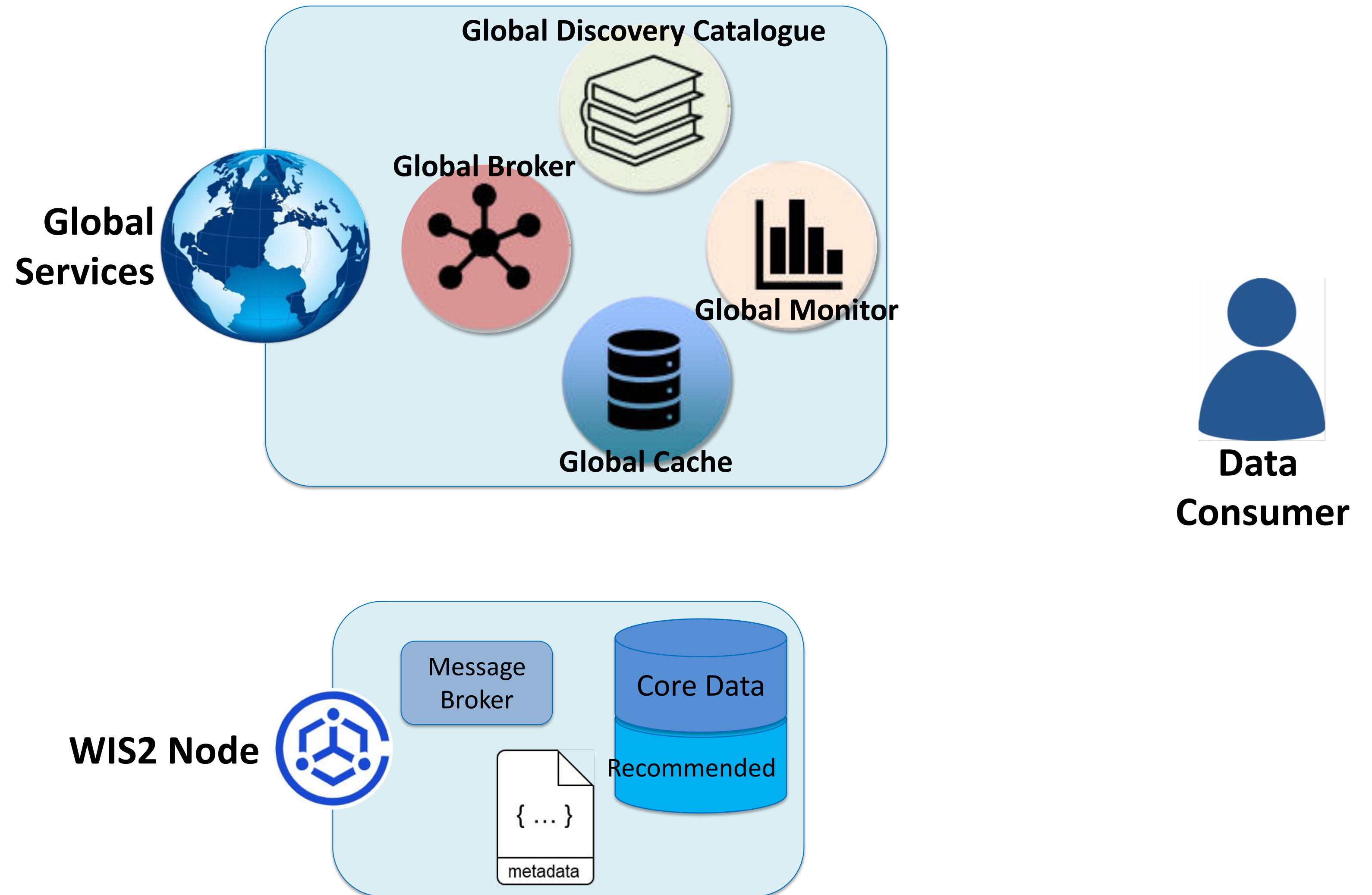
- Better metadata results in better findability/use

- The WIS2 Global Discovery Catalogue will work with multiple applications and environments (mobile, web application, workstation, GIS, etc.)

- Example: using the Free and Open Source QGIS Desktop GIS software, users will be able to search the GDC, view results and choose to subscribe and/or download data of interest

WMO OMM
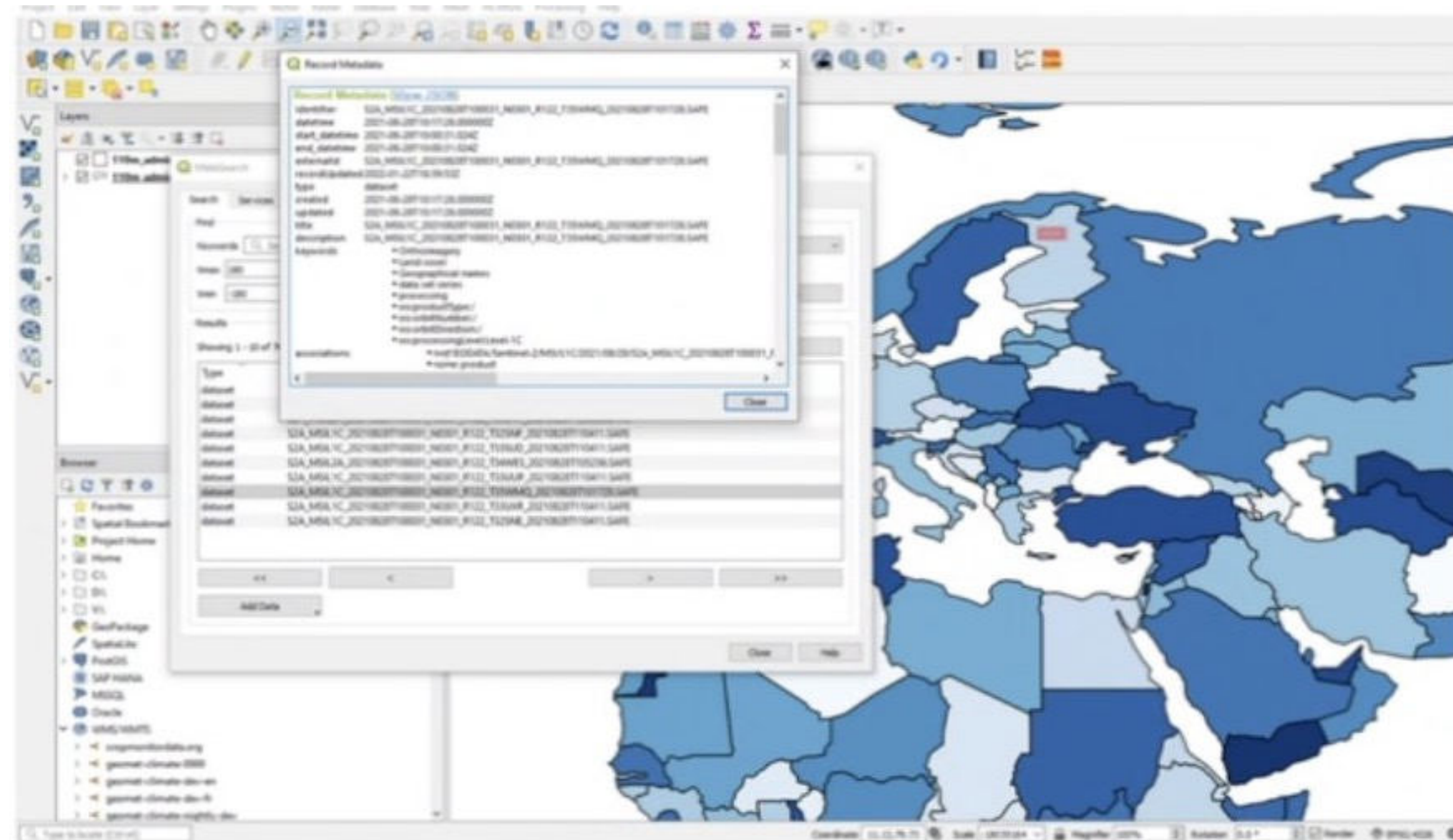
- Global Monitor service captures information on data availability and whether that data can effectively be accessed by Data consumers

- Also monitors performance of WIS2 components

- Provides a 'dashboard' that will support tracking of compliance against data policy regulation and management of operational system

- Based on **OpenMetrics**

Global Services

Global Discovery Catalogue

Global Broker

Global Monitor

Global Cache

Data Consumer

WIS2 Node

Message Broker

Core Data

Recommended

{ ... }

metadata

- Introduction/video
- Architecture and Global Services
- OGC Standards Implementation
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WMO OMM

WIS2 Components and Standards

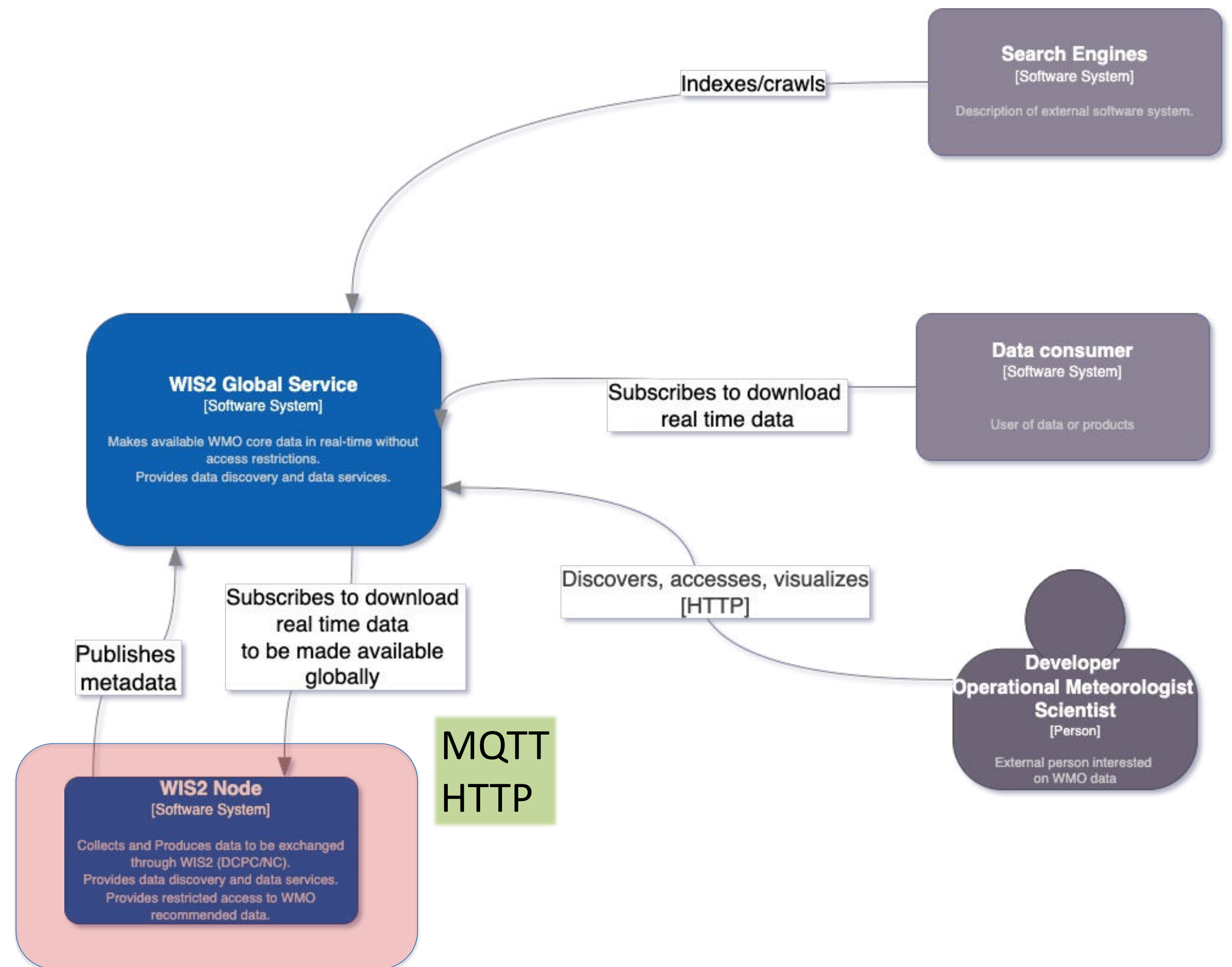| Component	Protocol/Interface/API	Content/Encoding(s)
Global Discovery Catalogue	HTTP/S OpenAPI OGC API – Records – Part 1: Core	-WCMP2 / OGC-API Rec -Topic hierarchy
Message Replay API	OGC API – Features	- Notification message (GeoJSON)
Global Broker	MQTT/S	- Notification message (GeoJSON)

- Discovery Metadata encoding
  - OGC API – Records – Core (Record)
  - GeoJSON
- Notification Metadata encoding
  - GeoJSON
- Global Discovery Catalogue API
  - OGC API - Records - Core
- Replay API
  - OGC API – Features – Core
- Data Access
  - OGC API - EDR, Features, etc. (recommended)
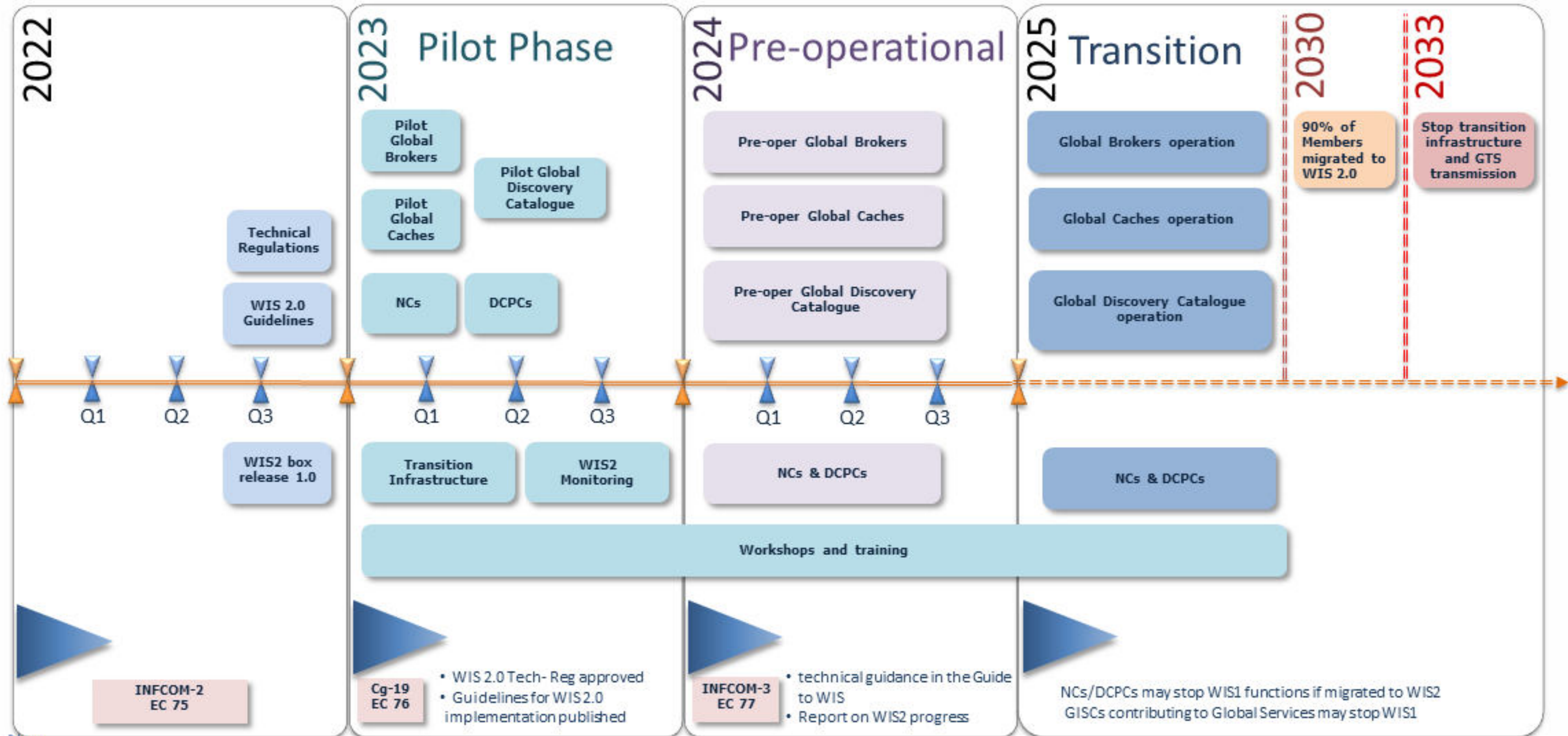- *Pub/Sub (pending)*
  - OGC API – Pub/Sub

WMO OMM

- **WIS2 in a box is a reference implementation of a WIS2 Node**
  - **MQTT**
  - **HTTP**
- **Free and Open Source**
- **Publishing facility/capability** compliant to WIS 2.0 Architecture
  - Provides data transformation
  - Can **integrate** with existing data management systems
  - OGC APIs out of the box
- docs.wis2box.wis.wmo.int

WMO OMM

- Introduction/video
- Architecture and Global Services
- OGC Standards Implementation
- Next steps

WMO OMM

2022

2023 Pilot Phase

Pilot Global Brokers

Pilot Global Discovery Catalogue

Pilot Global Caches

Technical Regulations

WIS 2.0 Guidelines

NCs

DCPCs

2024 Pre-operational

Pre-oper Global Brokers

Pre-oper Global Caches

Pre-oper Global Discovery Catalogue

2025 Transition

Global Brokers operation

Global Caches operation

Global Discovery Catalogue operation

2030

90% of Members migrated to WIS 2.0

2033

Stop transition infrastructure and GTS transmission

Q1 Q2 Q3 | Q1 Q2 Q3 | Q1 Q2 Q3

WIS2 box release 1.0

Transition Infrastructure

WIS2 Monitoring

NCs & DCPCs

NCs & DCPCs

Workshops and training

INFCOM-2 EC 75

Cg-19 EC 76
- WIS 2.0 Tech- Reg approved
- Guidelines for WIS 2.0 implementation published

INFCOM-3 EC 77
- technical guidance in the Guide to WIS
- Report on WIS2 progress

NCs/DCPCs may stop WIS1 functions if migrated to WIS2
GISCs contributing to Global Services may stop WIS1

WMO OMM

- Interoperability doesn't happen by accident (Kottman)
- Positive impact of OGC standards to the MetOcean / WMO domain
- Lowering the barrier to weather/climate/water data with Open Standards
- Profiles, extensions, build by exception

WMO OMM

- WIS2 architecture, standards, software implementations, and more:
  - [Draft Manual on WIS Vol. 2](#)
  - [Draft Guidance on technical specifications to WIS2](#)
  - [Resources (specifications, software, services)](#)

WMO OMM

The most important thing for this WG is…

- A good selection of relevant use cases
    - Organised as a start in testbed-19
- Good links with the other SWGs especially OGC API, but also many more.
- Including OGC external developments such as STAC and openEO
- To actually get approved, so that we can start with the work :p

What we talked about this week

- Identification of real-life use cases with industrial relevance

- Analysis of the usability of existing standards

- Definition of the GDC API (which may be a profile of (an) existing OGC API(s) or a new development)

- Definition of exchange format recommendations, profiles, or new developments

- Definition of the GDC metadata model (in particular information about how the GDC was built; similar to ARD concepts and vision around data provenance and lineage)

- The GDC API shall support accessing and processing at minimum

Session Agenda

- Introduction to the GeoDataCube SWG (20 min)

  - Speaker: Alexander Jacob (Eurac)

- CCMEO Data Cube (20 min)

  - Speaker: Ryan Ahola (NRCan)

- EUMETSAT's Proposal for OGC Testbed-19: A Destination Earth-Inspired GeoDataCube Use Case (20 min)

  - Speaker: Miruna Stoicescu (EUMETSAT)

- ECMWF Meteorological Datacube Use Case (20 min)

  - Speaker: James Hawkes (ECMWF)
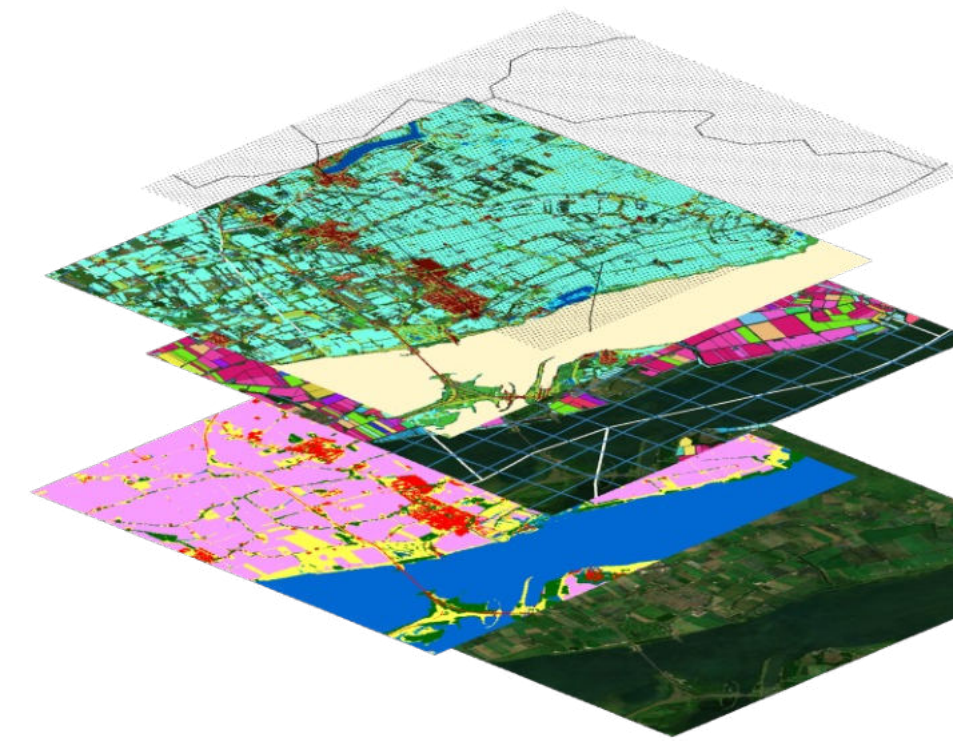
Examples of possible use cases
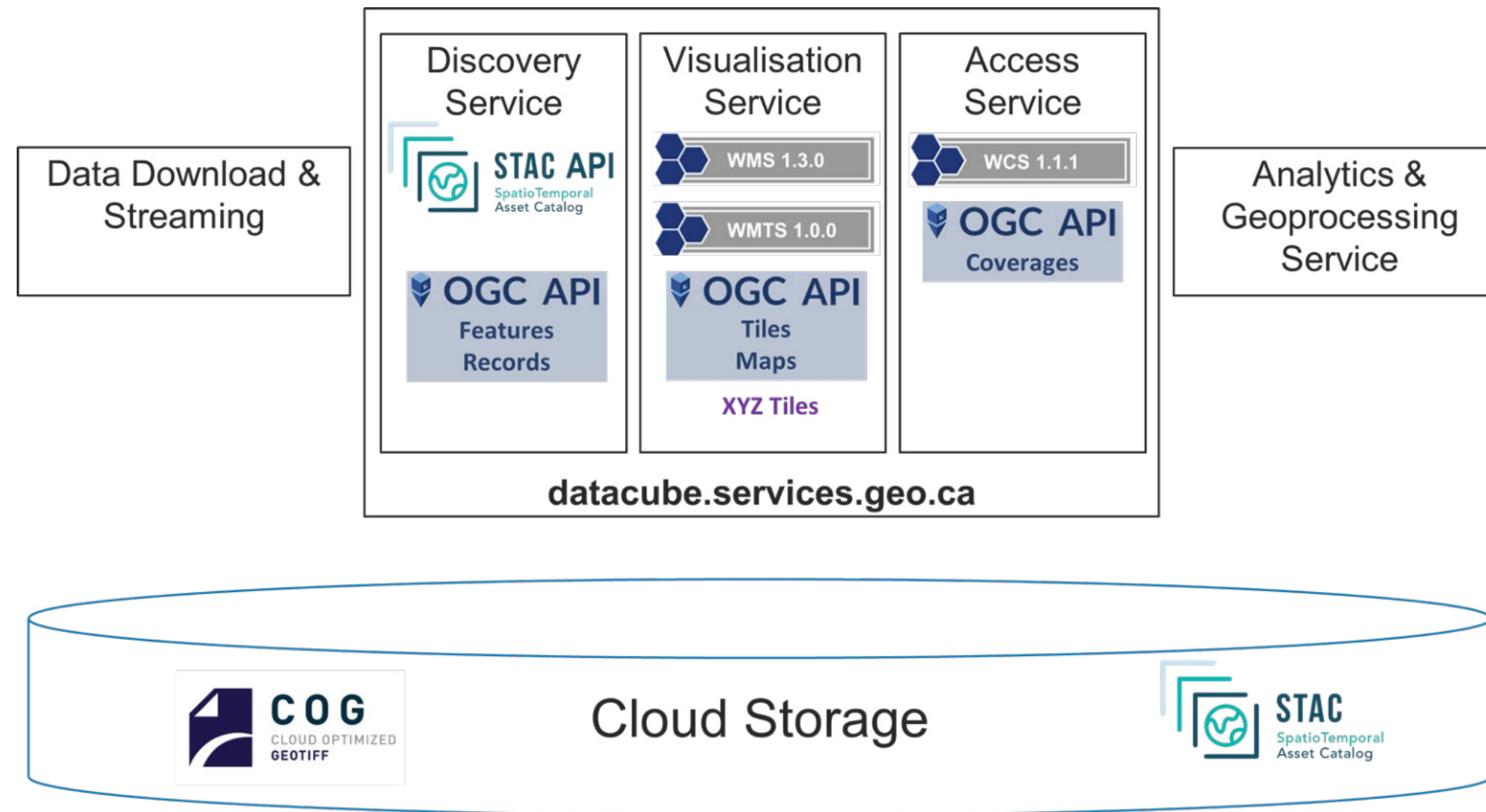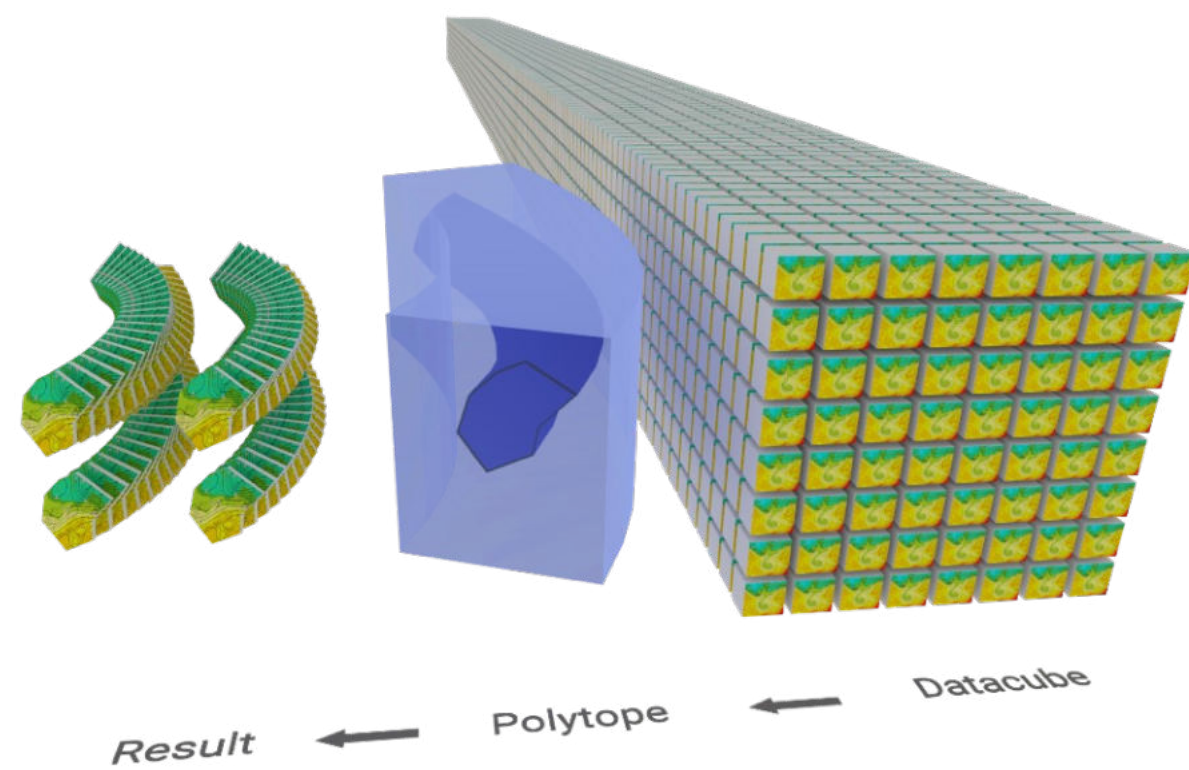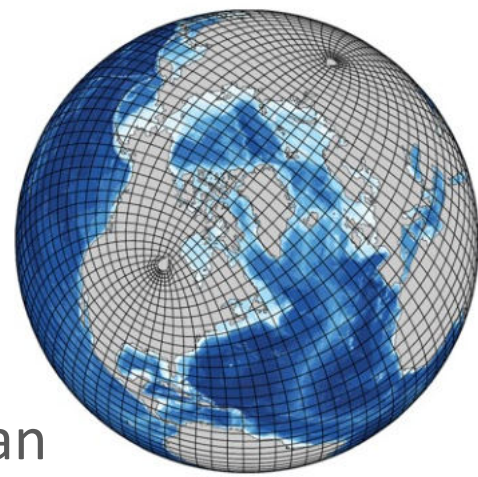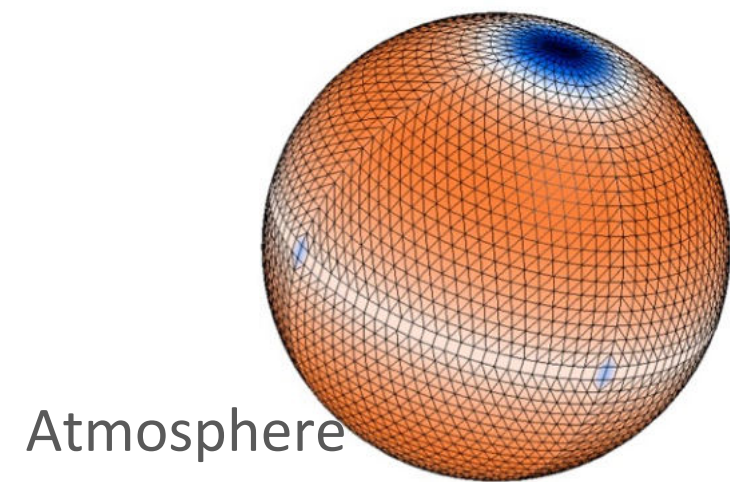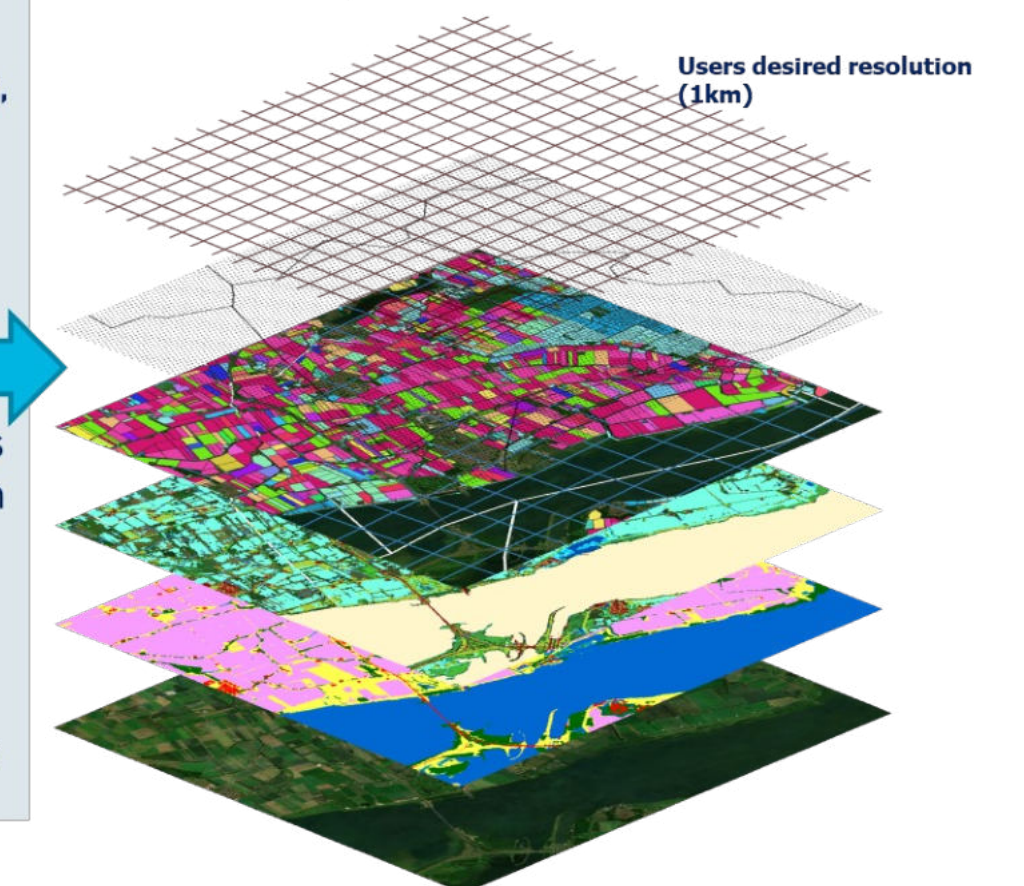
Where we are headed in the coming year

- Charter has been defined and was open for public commenting
- State of the art analysis with the existing material in terms of standards and relevant software tools
- First test with use cases from testbed-19, find possible more relevant use cases and mechanisms of setting them up
  - Guiding selection and refinement of the use cases
  - Monitoring the development of the prototype
  - Responsible of the results evaluation
  - Defining requirements for following pilots/testbeds

Next Quarter WG Communications Plan

- IGARSS 2023, Pasadena, California, USA, **16 - 21 July, 2023**
  - two session organized
    - CCS.137: Community-Contributed Sessions - Towards standards for data products: Analysis Ready Data, Decision Ready Information, and Geodata Cubes
    - CCS.30: Advances in Spatio-Temporal Datacube Management, Visualization, Analytics and AI (IEEE ESI Committee session)

Request of an electronic vote

- The Geodatacube Ad-hoc Group recommends that the OGC Technical Committee approve an electronic vote to approve the Geodatacube SWG as a new Standards Working Group per the charter [OGC 22-052].

  - There was no objection to unanimous consent

Propose to Set Up OGC ARD SWG

Dr. Liping Di

Dr. Liying Guo

Center for Spatial Information Science and Systems (CSISS)
George Mason University
ldi@gmu.edu

Dr. Joshua Lieberman
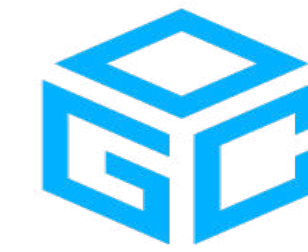Open Geospatial Consortium (OGC)

- Committee on Earth Observation Satellites (CEOS)
  - An international inter-space-agency committee responsible for coordinating civilian satellite Earth observations
  - Over 50 space agencies as its members
  - Many of its members are OGC strategic partners
- The concept of Earth observation Analysis-Ready Data (ARD) was developed by CEOS

- Definition of CEOS ARD
  - CEOS Analysis Ready Data (CEOS ARD) are satellite data that have been processed to a minimum set of requirements and organized into a form that allows immediate analysis with a minimum of additional user effort and interoperability both through time and with other datasets

- ARD is a CEOS-wide initiative
  - CEOS has developed a number of ARD product family specifications (PFS)
  - Space agencies are producing CEOS ARD PFS compliant data products
  - CEOS ARD Oversight Group manages the CEOS ARD activities, including compliance certification

- CEOS is not a recognized standardization organization
  - CEOS specifications are not considered as international standards
  - Difficult to incorporate the requirements on ARD compliance into government and organization procurement process

- The needs to expand the ARD to cover other geospatial data
  - Maximization of the interoperability between EO and non-EO data
  - CEOS lacks expertise in non-EO area

- CEOS ARD specifications needs a broader community consensus
  - Expand the adaptation by non-CEOS members and private sectors
  - Maximize the interoperability of satellite remote sensing data from different sectors
  - Maximize the interoperability between EO and non-EO data

- With CEOS support, OGC Disaster Pilot 2021 included an action item to develop a recommendation for ARD standardization
- Initial recommendations:
  - Use CEOS ARD specs as the base
  - Build on existing OGC and ISO standards
  - Be a joint ISO&OGC standard development effort
  - Go through formal standard development process
  - Publish as ISO and OGC standards
- CEOS ARD Oversight Group, CEOS WGISS, OGC, and ISO TC 211 have been briefed on the plan
  - Supported by all of them

A Proposal to set Up OGC ARD SWG

- To undertake the ARD standardization at OGC side
- ARD SWG Charter
  - Drafted in May 2022
  - Extensively reviewed by the CEOS ARD Oversight Group and OGC members
  - Draft charter presented at the 124th OGC member meeting in 10/2022
  - The revised charter was posted on OGC website for soliciting public comments in November 2022
    - No comments were received
- The first ARD SWG meeting (Ad Hoc) was held on Feb. 21, 2023 at the 125th OGC member meeting in Frascati, Italy

- The ARD SWG will develop multi-part geospatial ARD Standards by working jointly with the ISO/TC 211 ARD Standard project team. It is envisioned that the majority of members of the OGC ARD SWG will be the members of the corresponding ISO/TC 211 ARD project team. Through the formal standard development processes of both ISO and OGC, this SWG will develop geospatial ARD standards by using CEOS-ARD Specifications as the basis and will build on existing OGC and ISO standards where applicable. The standards developed by the ARD SWG will be published as both OGC and ISO standards.

Name	Organization
Liping Di	George Mason University
Steven T Labahn	U.S. Geological Survey
Ferran Gascon	European Space Agency
David J. Meyer	NASA
David E. Borges	NASA
Tyler Christensen	NOAA Federal
Rich Frazier	Federal Geographic Data Committee
Liying Guo	George Mason University
Yuqi Bai	Tsinghua University
Joshua Lieberman	Open Geospatial Consortium
Matthew Steventon	For GA, ESA, and USGS
Peter Strobl	EC-JRC
Sumit Sen	IIT Bombay
ADRIAN GUZMAN	Mexican Space Agency
Anna Wendleder	German Aerospace Center, DLR
HariPriya S	NRSC, ISRO
Radhika T	NRSC, ISRO
Christopher Barnes	KBR contractor to the U.S. Geological Survey
Andreia Siqueira	Geoscience Australia
David Moffat	Plymouth Marine Laboratory, UK
Peter Baumann	rasdaman GmbH Bremen
Eugene Yu	GMU and NASA
Zhe Fang	Wuhan University

- Envisioning that ARD standard will be a multi-part ISO & OGC standard
  - Part 1 -- ARD framework and fundamentals
  - Part 2 – EO ARD for Land
  - Part 3 – EO ARD for Ocean
  - Part 4 – EO ARD for Atmosphere
  - Part 5 – Earth System Model ARD
  - Part 6 – Thematic Geospatial Data
  - Part 6 – Geospatial ARD service
  - More parts….
- ISO/OGC project team will decide the division of each part

Teams to work on ARD standards

- OGC ARD SWG and ISO TC 211 ARD project team will work together to develop ARD standards
  - Expect large overlaps between the ISO and OGC teams
  - OGC ARD SWG chair will also be ISO ARD project chair
  - Close collaboration with relevant CEOS committees
- An ISO TC 211 ARD project team is being set up through the New Work Item Proposal (NWIP) process
- The two teams will work together initially on Part 1 of the ARD standard.

- A new work item proposal (NWIP) for setting up a new ISO project was prepared
    - Proposed to start the development of part 1 of ISO Standard on ARD
    - The name of the standard: Geographic information —Analysis Ready Data — Part 1: Framework and Fundamentals
    - The NWIP was intensively reviewed by CEOS ARD experts
- The NWIP was submitted by OGC to ISO TC 211 in December 2022
    - ISO TC 211 distributed the NWIP to its member counties and liaison organization for 1-month comment period in January
    - 8 comments received during the comment period

- ISO 191XX-1:YYYY Geographic information — Analysis Ready Data — Part 1: Framework and Fundamentals
- Defining overall structure of ARD series, the common structure and metadata, common preprocess/format/etc requirements
  - Allows other parts to plug in
- Using CEOS Analysis Ready Data Governance Framework as the basis
- Two-year development period
  - Expected to be published as an ISO and OGC standard in June 2025
  - Part 2 work will start when part 1 working draft is ready for review (expected one year after part-1 project starts-2024)
  - Other parts of the standards can start simultaneously if resources allow.

Request of an electronic vote

- The Analysis Ready Data (ARD) ad hoc recommends that the OGC Technical Committee approve an electronic vote to charter the ARD SWG per [22-046r1] "Analysis Ready Data SWG Charter."

  - There was no objection to unanimous consent

Content

1. History

2. Key issues discussed so far

3. Standard document development

4. Standard document review

1.1 Milestones

- Charter Proposal, 2021.01.30

- SWG established, 2022.01.14

- Use case scenarios collected, 2022.03

- Best practices & demos, 2022.06

- Draft standard document completed and internal review started, 2022.08.02

- Internal review done, 2023.01.29

1.2 History

- **Stage 1 (Proposal):**

  - 01/30/2021 OGC 21-003 submitted to portal

  - Hydrology and Geociences DWG mailing lists discussion on names

- **Stage 2 (Ad hoc session):**

  - 02/27/2021 OGC 21-003r1 submitted to portal

  - 03/22 SampleML ad hoc session at 118TH OGC MEMBER MEETING, discussion on Name Abbreviation and O&M harmonization

- **Stage 3 (Seeking Public comment):**

  - 04/09/2021 OGC 21-003r2 submitted to portal

  - Seeking public comment for SampleML Charter: 04/15/2021-05/05/2021

- **Stage 4 （TC Vote）**

  - 05/26/2021 OGC 21-003r3 submitted to portal after addressing public comments

  - Reporting to 119TH OGC MEMBER MEETING and starting TC vote to approve charter

- **Stage 5:**

  - 08/09/2021 The TC vote was passed

  - Based on the comments on the votes, the full name of SWG/standard has been changed from "Sample Markup Language for Artificial Intelligence Machine Learning (SampleML-AI/ML)" to "Training Data Markup Language for Artificial Intelligence". The abbreviation has been updated to "TrainingDML-AI". The data quality in TrainingDML has been aligned with ISO 19157

  - 09/22/2021 The SWG was approved by the OGC Planning Committee (PC)

- **Stage 6:**

  - 01/14/2022 SWG established

  - 02/28/2022 Use case scenarios collected

  - 06/15/2022 Best practices & demos

  - 07/29/2022 Draft standard document completed

  - Internal review of the draft standard document, 08/02/2022-01/29/2023

  - 12/16/2022 Review of Testbed18 ML Training Datasets ER

  - 01/27/2021 OGC 23-008 submitted to portal

2.1 Key issues

- Data model issues

  https://gitlab.ogc.org/ogc/TrainingDML-AI/-/wikis/Meetings/2022-02-11

  https://gitlab.ogc.org/ogc/TrainingDML-AI/-/issues/10

  https://gitlab.ogc.org/ogc/TrainingDML-AI/-/wikis/Meetings/2022-12-16

- Data privacy issues

  https://gitlab.ogc.org/ogc/TrainingDML-AI/-/wikis/Meetings/2022-04-08

- Data service issues

  http://dx.doi.org/10.1080/13658816.2022.2087223

- Related efforts Issues

  https://gitlab.ogc.org/ogc/TrainingDML-AI/-/issues/7

2.2 Use cases and scenarios

About 100 training datasets are collected, including scene classification, object detection, LC/LU classification, and change detection

Table 1. Typical training datasets for scene classification

Name	Created Time	Number of Samples	Number of Classes	Image Size	Reso-lution	Image Source	Dataset URL
Remote Sensing Dataset 46 categories-Wuhan University (RSD46-WHU)	2017	116912	46	256×256	0.5-2m	Google Earth, Tianditu	https://github.com/RSIA-LIESMARS-WHU/RSD46-WHU
Remote Sensing Image-Classification Benchmark 128×128 size (RSI-CB128)	2017	36707	45	128×128	0.3-3m	Google Earth	https://github.com/lehaifeng/RSI-CB
Remote Sensing Image-Classification Benchmark 256×256 size (RSI-CB256)	2017	24747	35	256×256	0.3-3m	Google Earth, Bing Map	https://github.com/lehaifeng/RSI-CB
Wuhan University-Remote Sensing 19 Categories (WHU-RS19)	2010	1005	19	600×600	0.5m	Google Earth	http://www.captain-whu.com/repository.html
Aerial Image Dataset (AID)	2017	10000	30	600×600	0.5-8m	Google Earth	http://www.captain-whu.com/project/AID
Scene Image dataset designed by RS_IDEA group-Wuhan University (SIRI-WHU)	2016	2400	12	200×200	2m	Google Earth	http://www.lmars.whu.edu.cn/prof_web/zhongyanfei/e-code.html

Table 2. Typical training datasets for object detection

Name	Crea-ted Time	Number of Samples	Number of Classes	Image Size	Reso-lution	Number of Instances	Annotation Way	Image Source	Dataset URL
Vehicle Detection in Aerial Imagery (VEDAI)	2015	4984	9	1024×1024	0.125m	15028	Oriented BBox	Utah 2012 HRO 6 inch orthophotography data	https://downloads.greyc.fr/vedai
Dataset for Object deTection in Aerial images-version 2.0 (DOTA-v2.0)	2021	2423	18	800×800 to 2000×2000	0.1m-4.5m/ 1m/0.1m	349675	Oriented BBox	Google Earth, GaoFen-2, Jilin-1, CycloMedia	https://captain-whu.github.io/DOTA/index.html
Object Detection in Remote Sensing images (RSOD)	2017	936	4	1044×915 to 1288×992	0.5-2m	7400	Horizontal BBox	GoogleEarth, Tianditu	https://github.com/RSIA-LIESMARS-WHU/RSOD-Dataset-
Bridge Dataset	2019	500	1	4800×2843	0.5m	501	Horizontal BBox	Google Earth	http://www.patreo.dcc.ufmg.br/2019/07/10/bridge-dataset
SAR Ship Detection Dataset (SSDD)	2017	1160	1	500×500	1-15m	2540	Horizontal BBox, Oriented BBox	RadarSat-2, TerraSAR-X, Sentinel-1	https://zhuanlan.zhihu.com/p/143794468
The DLR 3K Munich Vehicle Aerial Image Dataset	2015	10	7	5616×3744	0.13m	3505	Oriented BBox	Canon Eos 1Ds Mark III camera	https://www.dlr.de/eoc/en/desktopdefault.aspx/tabid-12760/22294_read-527

Table 3. Typical training datasets for LC/LU classification
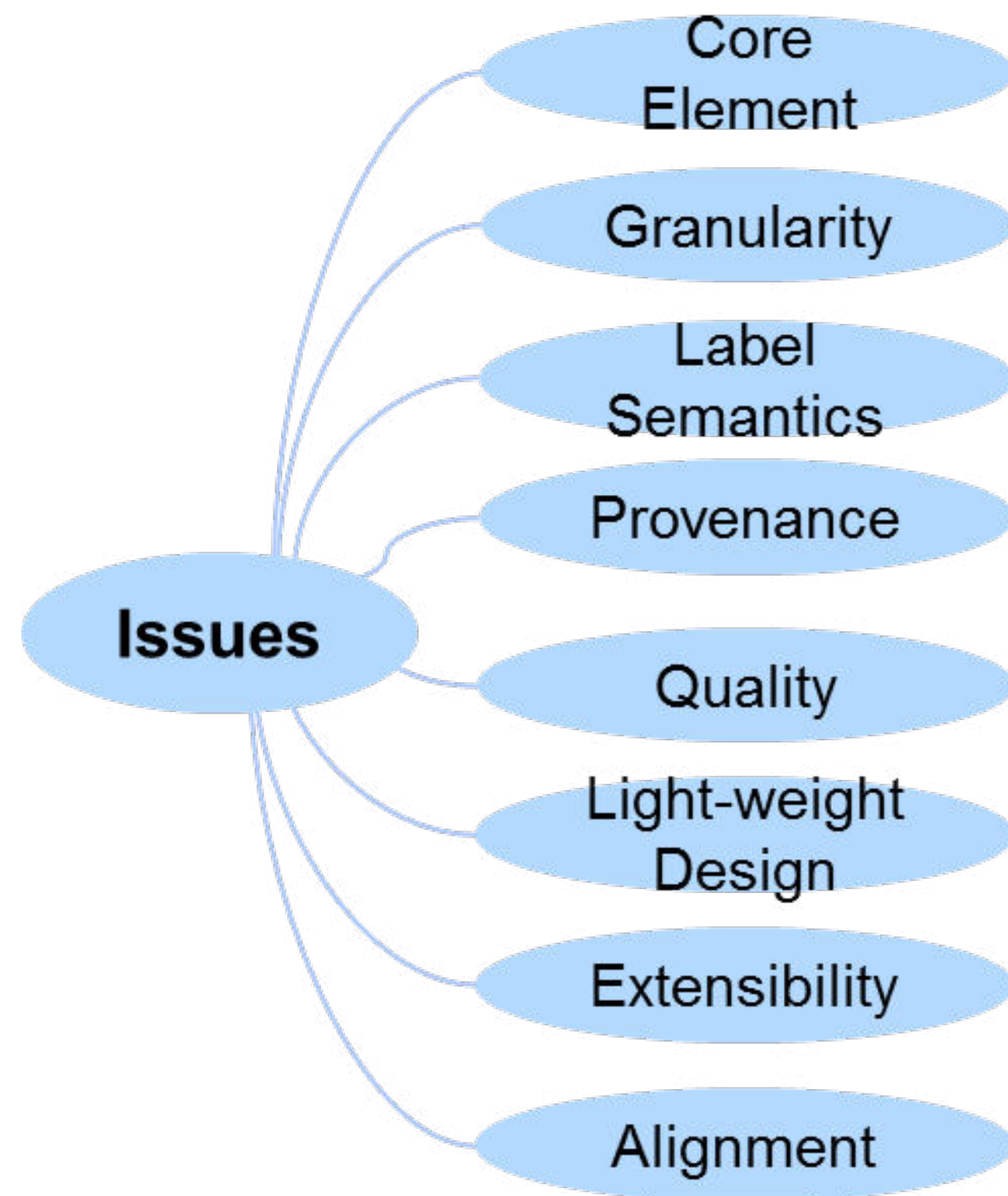
Name	Created Time	Number of Samples	Number of Classes	Image Size	Resolution	Image Source	Dataset URL
Wuhan University (WHU) Building Dataset-Aerial Imagery Dataset	2019	8188	1	512×512	0.3m	New Zealand Land Information Services website	https://study.rsgis.whu.edu.cn/pages/download/building_dataset.html
Wuhan University (WHU) Building Dataset-Satellite Dataset I (Global Cities)	2019	204	1	512×512	0.3-2.5m	QuickBird, Worldview series, IKONOS, ZiYuan-3	https://study.rsgis.whu.edu.cn/pages/download/building_dataset.html
Wuhan University (WHU) Building Dataset-Satellite Dataset II (East Asia)	2019	17388	1	512×512	0.45 m	QuickBird, Worldview series, IKONOS, ZiYuan-3	https://study.rsgis.whu.edu.cn/pages/download/building_dataset.html
GaoFen Image Dataset (GID)- Land-cover Classification	2018	150 images and 30,000 patches	5/15	56×56, 112×112, 224×224, 7200×6800	2m	GaoFen-2	https://x-ytong.github.io/project/GID.html
Massachusetts Roads Dataset (MRD)	2013	1171	1	1500×1500	1m	MassGIS	https://www.cs.toronto.edu/~vmnih/data
Massachusetts Buildings Dataset(MBD)	2013	151	1	1500×1500	1m	MassGIS	https://www.cs.toronto.edu/~vmnih/data
Inria Aerial Image Labeling Dataset (INRIA)	2017	180	1	1500×1500	0.3 m	USGS National Map service, WMS services provided by GIS department of Tyrol and Vienna	https://project.inria.fr/aerialimagelabeling/
Aerial Image Segmentation Dataset (AISD)	2017	1671	2	2500×2500 to 3328×3328	About 0.1m	Google Maps, ISPRS Potsdam data set	https://zenodo.org/record/1154821#.YQugx737RjV

Table 4. Typical training datasets for change detection

Name	Created Time	Number of Samples	Number of Classes	Image Size	Resolution	Image Source	Dataset URL
Wuhan University (WHU) Building Dataset -Building Change Detection Dataset	2011	1	1	32507×15354	0.2m	Land Information New Zealand Data Service	http://study.rsgis.whu.edu.cn/pages/download/building_dataset.html
Onera Satellite Change Detection (OSCD)	2018	23	1	600×600	10m, 20m, 60m	Sentinel-2	https://rcdaudt.github.io/oscd
High Resolution Semantic Change Dataset (HRSCD)	2019	291	6	10000×10000	0.5m	BASES DE DONNÉES ORTHO-IMAGES database	https://rcdaudt.github.io/hrscd
LEarning, VIsion and Remote sensing laboratory-Change Detection (LEVIR-CD)	2020	637	1	1024×1024	0.5m	Google Earth	https://justchenhao.github.io/LEVIR
Change Detection Dataset for High Resolution Satellite Image	2020	20	1	1006×1168 to 4936×5224	0.55m	Google Earth	https://github.com/daifeng2016/Change-Detection-Dataset-for-High-Resolution-Satellite-Imagery

Online available: https://docs.qq.com/doc/DS0VtZXZSYWFwbnJo (Tencent Doc)
https://docs.google.com/document/d/1bK6WDF0VpeVcvjevV9yzz80qqWvnQiuUG8C--RAjdNE/ (Google Doc)

2.3 Data model issues

- The following issues are highlighted when designing TrainingDML-AI data model

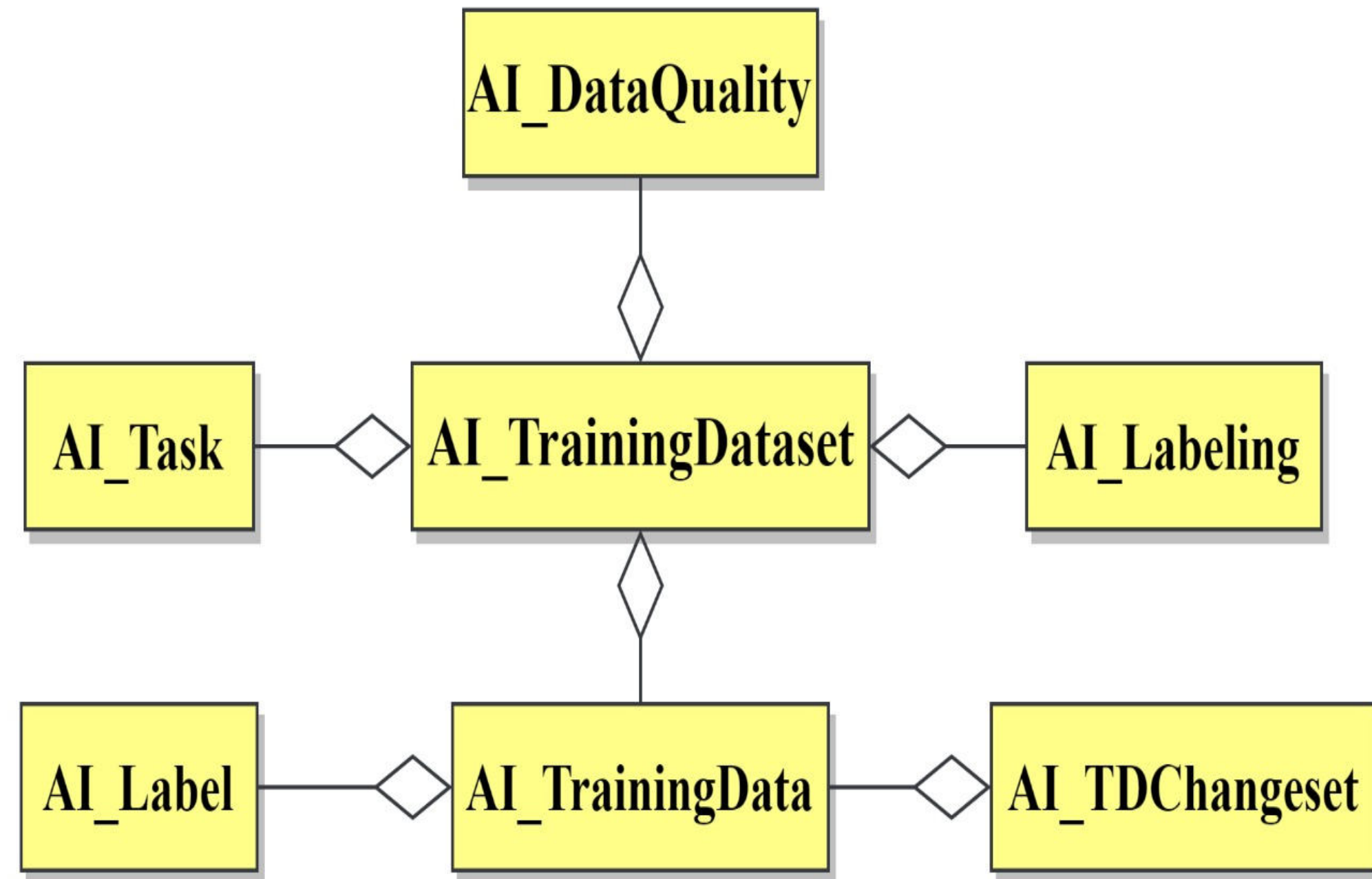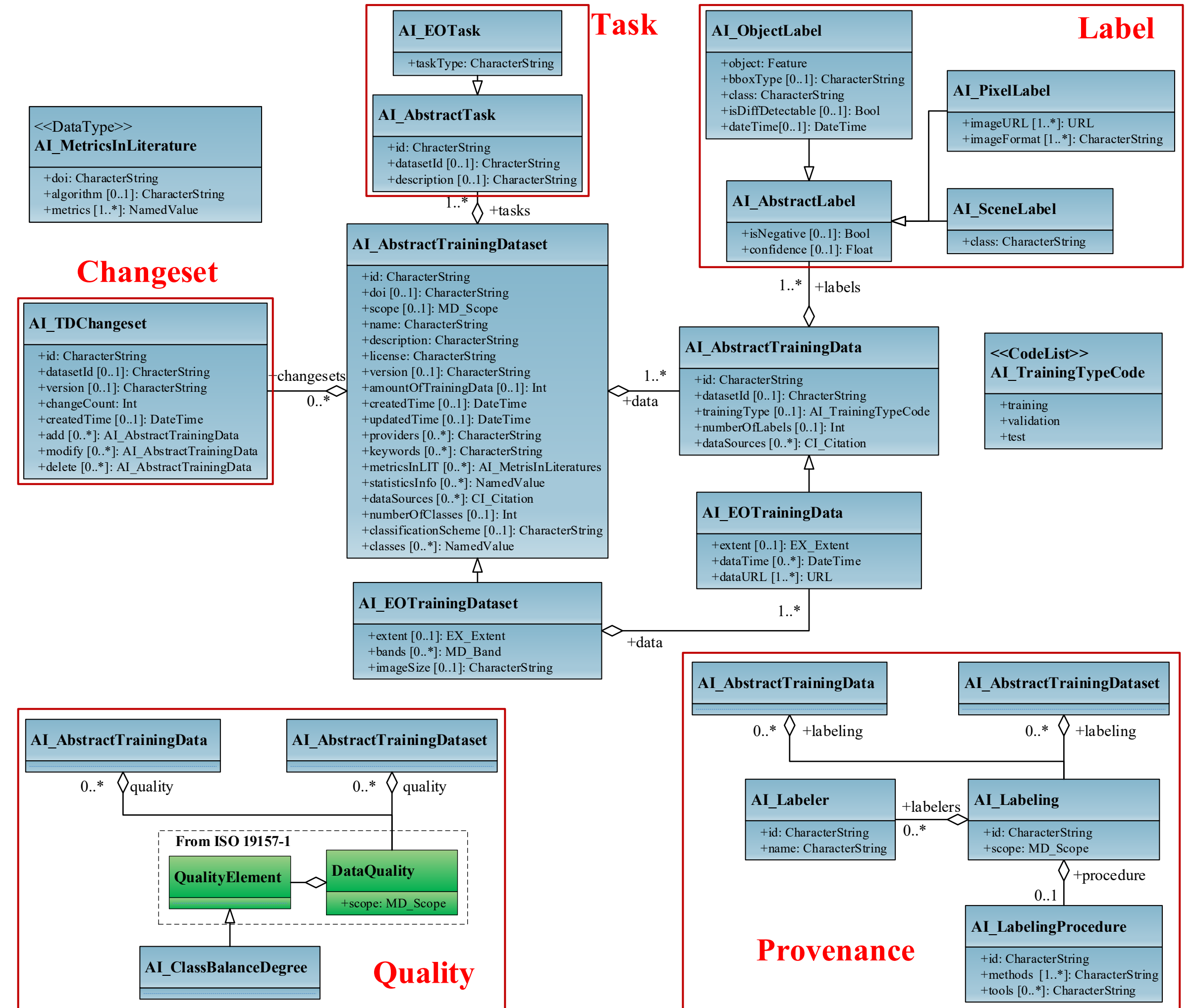Towards a training data model for artificial intelligence in earth observation
(IJGIS, DOI:10.1080/13658816.2022.2087223)
http://dx.doi.org/10.1080/13658816.2022.2087223

- Bias issue is discussed on the github

https://gitlab.ogc.org/ogc/TrainingDML-AI/-/issues/5

Core concepts and overview of the UML model

Core concepts

UML model

➢ **Granularity**

Collection level: AI_TrainingDataset

Individual level: AI_TrainingData

➢ **Provenance**

Find correspondence in W3C PROV on entities (AI_TrainingDataset), activities (AI_LabelingProcedure), and agents (AI_Labeler).
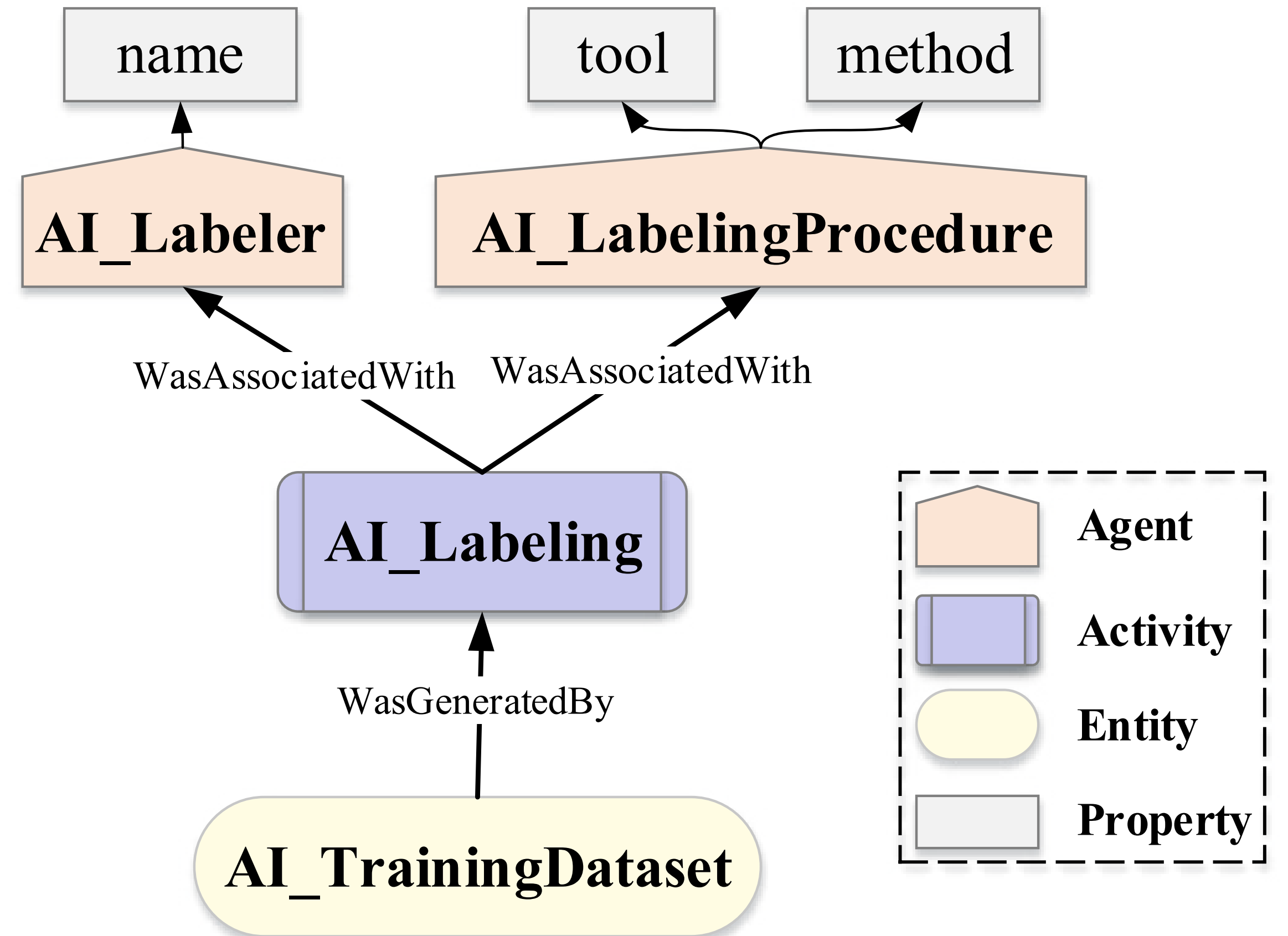
➤ **Quality**

The TD model will set up quality indicators specific to EO TD in ISO 19157

- 2021/06/15 Presentation on "Quality Considerations for Training DML-AI" in Data Quality Workshop/DWG at the TC Meeting

- 2021/06/17 Presentation on the TrainingDML-AI in GeoAI DWG session at the TC Meeting

- 2021/09/27 Presentation on "Quality Considerations for AI Training Data in Remote Sensing" in GeoKG&GeoAI workshop at GIScience 2021

Yue, P., Shangguan, B., Hu, L., Zhang, C., Jiang, L., Fang, Z., 2021. Quality considerations for AI training data in remote sensing. In: Proceedings of the 1st International Workshop on Methods, Models, and Resources for Geospatial Knowledge Graphs and GeoAI, co-located with GIScience 2021, 27 September, 2021. Poznań, Poland.

- 2021/10/19 Presentation on "Quality Considerations for TrainingDML-AI" at the SciDataCon 2021 - Session on Data and Information Quality

- 2021/12/09 Presentation on "Quality measures for RS training data in TrainingDML-AI" in Data Quality DWG at the TC Meeting

➢ **Quality**

- AI_TDQuality class issue is discussed on the github

- In 7.9 AI_DataQuality, Figure 13, the UML model has been updated to enable Dataquality to be evaluated in terms of either collection or individual levels of the TD.
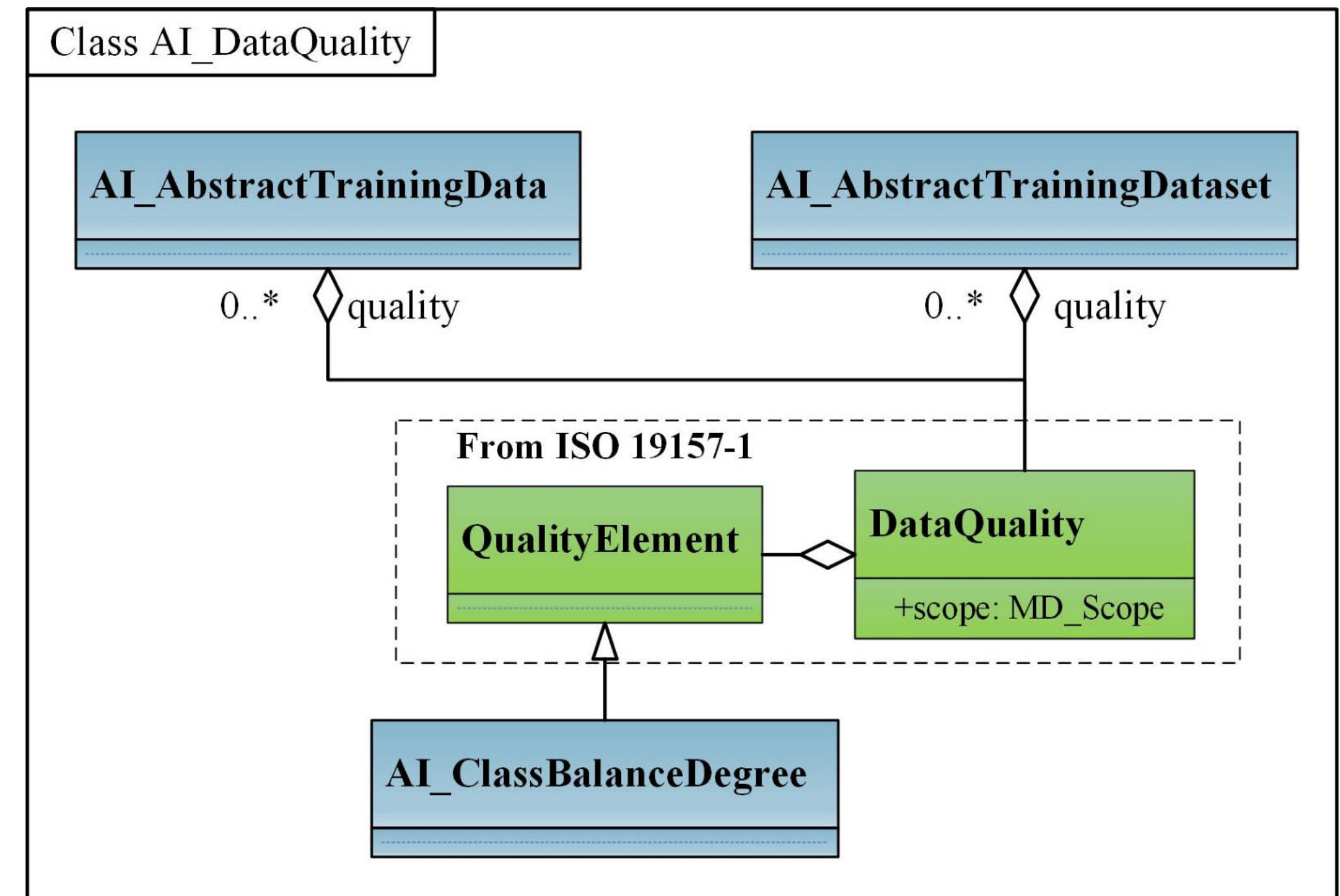
➤ **Light-weight design**

- The TD model will contain a minimum set of metadata elements, provenance, or quality at the collection level instead of the individual level

- light-weight protocols and exchange format such as REST and JSON will be adopted

➤ **Extensibility**

- AI_TrainingDataset -> AI_EOTrainingDataset

- AI_Label -> AI_SceneLabel, AI_ObjectLabel, AI_PixelLabel

➢ **Alignment**

- Feature model in ISO 19109

- Metadata model in ISO 19115-1

- Quality model in ISO 19157

- GML

- STAC

  https://gitlab.ogc.org/ogc/TrainingDML-AI/-/issues/4

  https://gitlab.ogc.org/ogc/TrainingDML-AI/-/wikis/Meetings/2022-02-11

➢ **Update**

- A provenance-aware method for updating Earth Observation training data

- In 6.2 Modularization, Figure 2, use Changeset which follows the style in the crowdsourcing map project like OSM, where the change set is used.
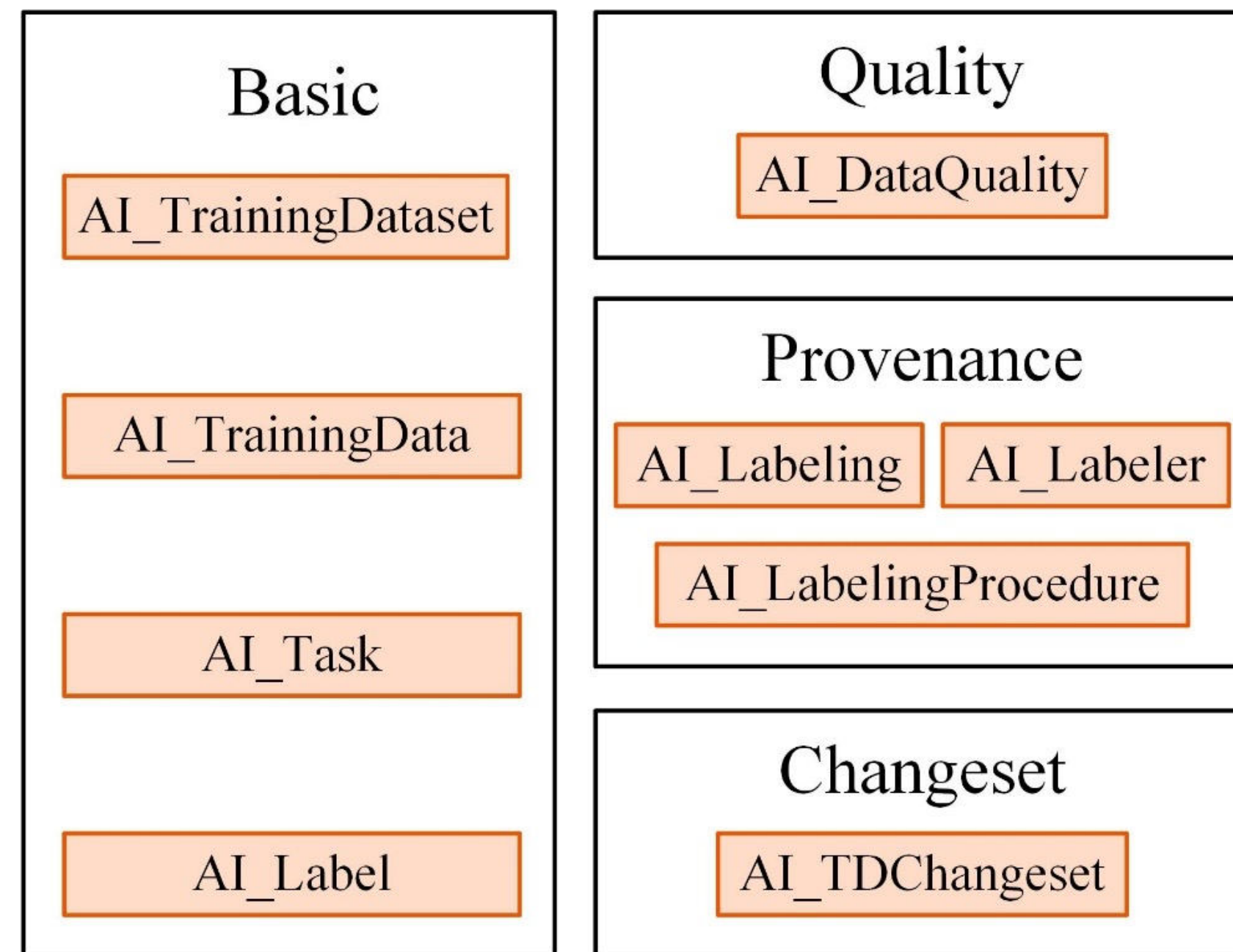
2.4 Data privacy/ethical issues

4 main principles to use ethical framework in TD:

- The dataset must serve a just purpose and fulfill a clear need.

- Primary stakeholders must be actively engaged throughout the lifespan of the dataset.

- The quality and inclusivity (lack of bias) of the dataset must be sufficient for its purpose.

- The dataset must be open and transparent.

https://gitlab.ogc.org/ogc/TrainingDML-AI/-/issues/5

https://gitlab.ogc.org/ogc/TrainingDML-AI/-/wikis/Meetings/2022-02-11

2.5 Data service issues

AI Ready SDI:
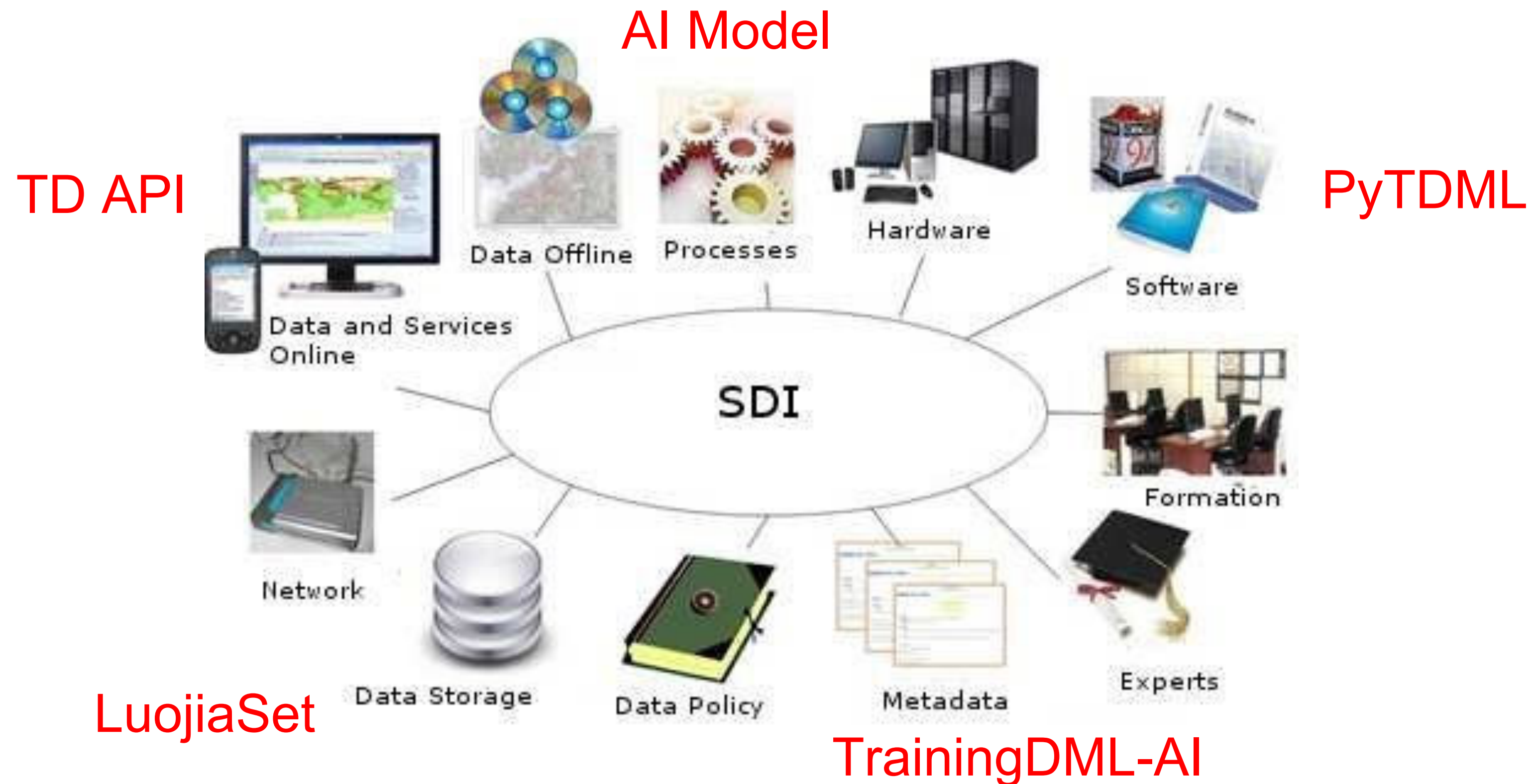
Towards a training data model for artificial intelligence in earth observation
(IJGIS,   DOI:10.1080/13658816.2022.2087223)
http://dx.doi.org/10.1080/13658816.2022.2087223

2.5 Data service issues

PyTDML: A Python package allowing documentation, storage, and sharing of geospatial training datasets in a unified data model (TDML).
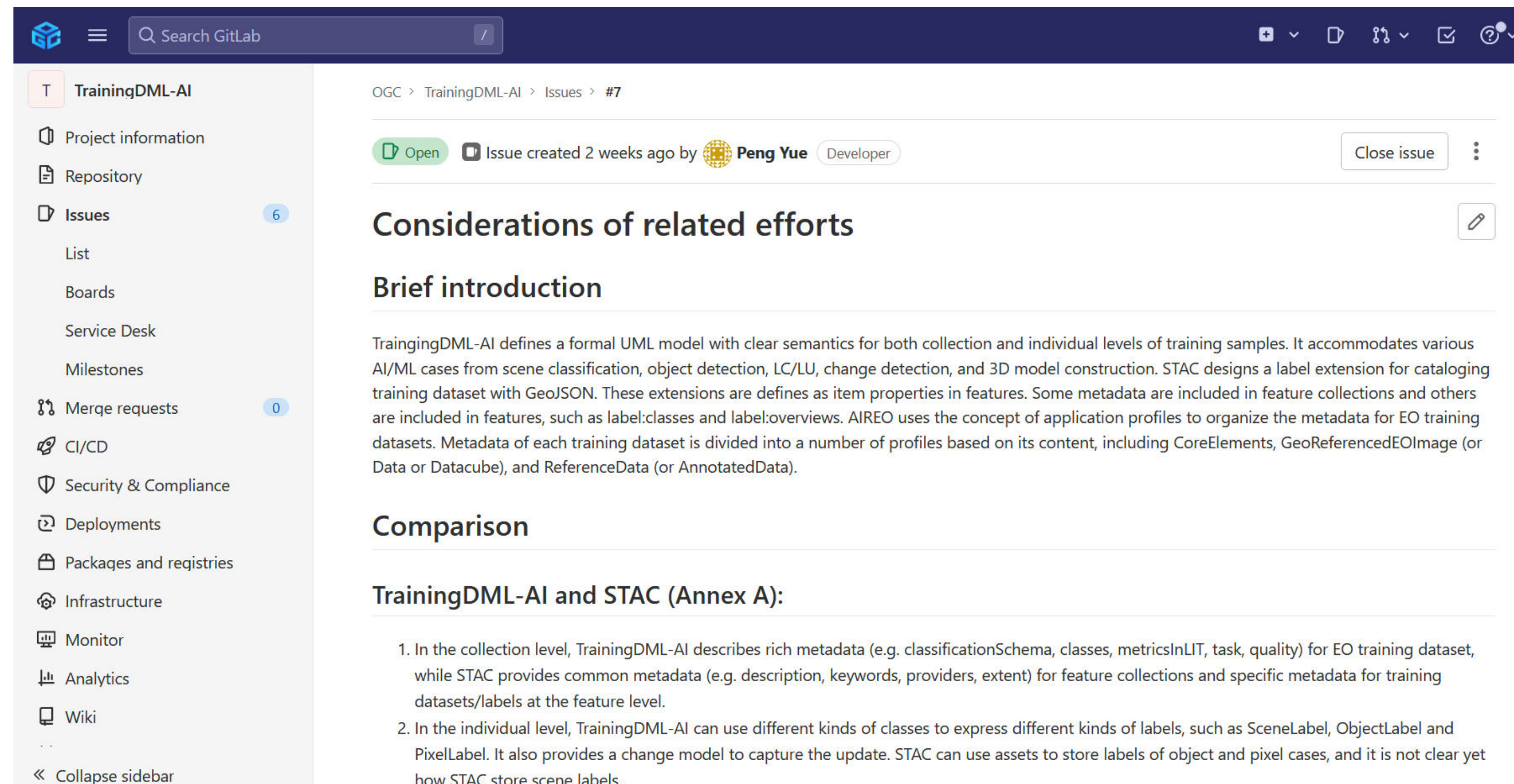

Github: https://github.com/TrainingDML/pytdml   PyPi: https://pypi.org/project/pytdml/
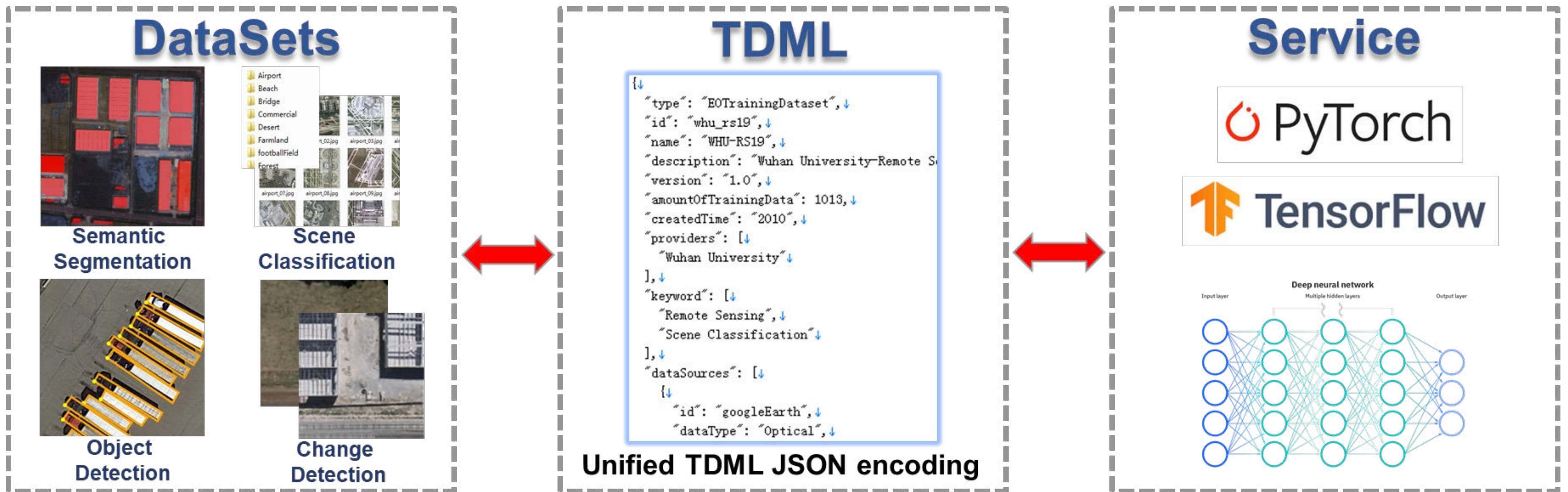
2.6 Related efforts issues

- TrainingDML-AI and STAC (Annex A)

- TrainingDML-AI and AIREO

- Mapping between TrainingDML-AI and STAC

https://gitlab.ogc.org/ogc/TrainingDML-AI/-/issues/7

2.7 Coordinate issues

- SWG coordinate with the Testbed-18 Machine Learning Training Data Engineering Report
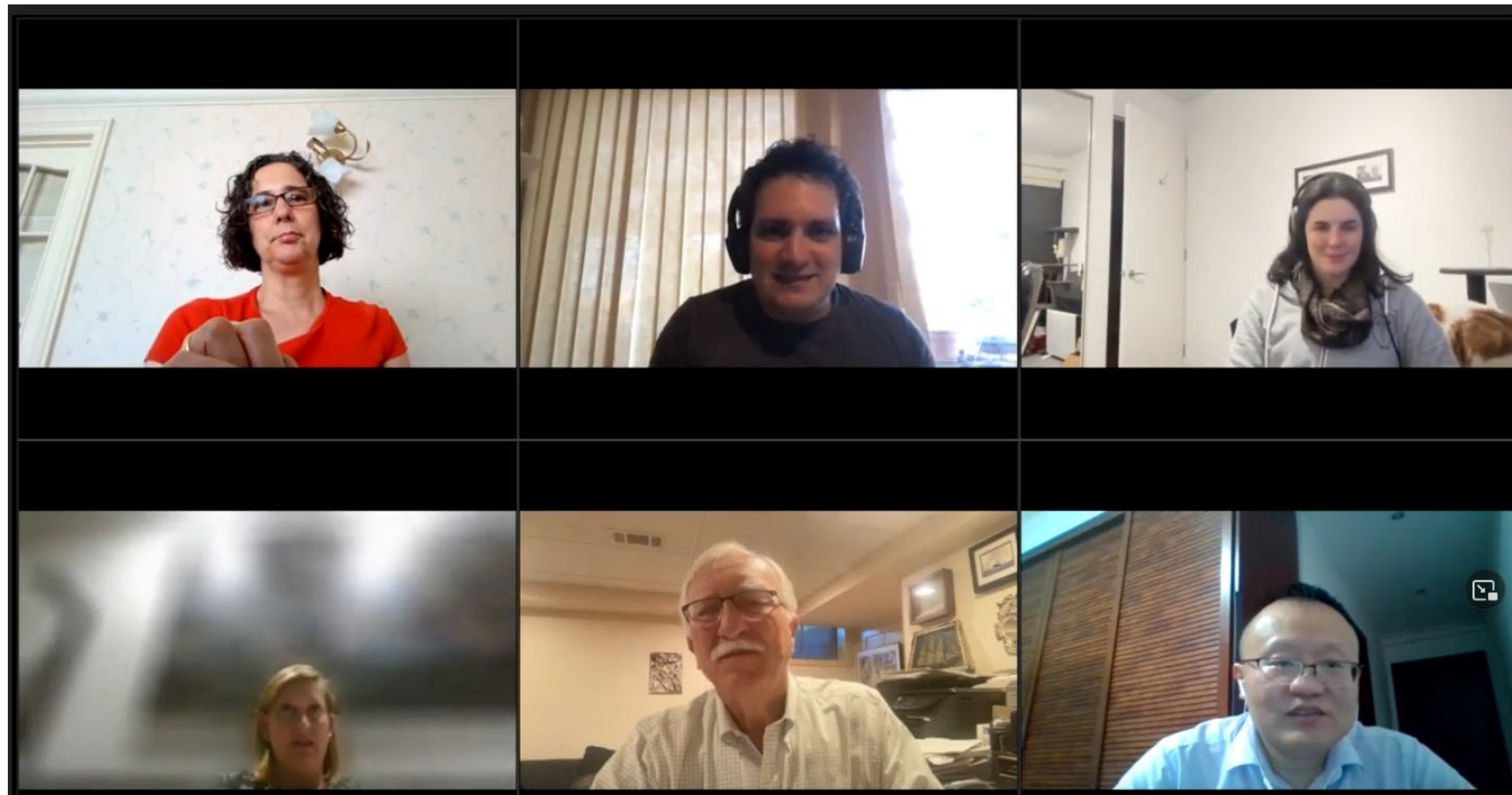
3. Standard document development

➢ TrainingDML-AI Part 1: Conceptual Model draft standard

- HTML format:

https://gitlab.ogc.org/ogc/TrainingDML-AI/-/raw/master/standard/part%201/standard_document.html

- PDF format:

https://gitlab.ogc.org/ogc/TrainingDML-AI/-/raw/master/standard/part%201/standard_document.pdf

- Microsoft Word format:

https://gitlab.ogc.org/ogc/TrainingDML-AI/-/raw/master/standard/part%201/standard_document.docx

annex-ats.adoc	version 0.2	2 weeks ago
annex-bibliography.adoc	version 0.2	2 weeks ago
annex-example.adoc	version 0.2	2 weeks ago
annex-history.adoc	version 0.2	2 weeks ago
clause_0_front_material.adoc	version 0.2	2 weeks ago
clause_1_scope.adoc	version 0.2	2 weeks ago
clause_2_conformance.adoc	version 0.2	2 weeks ago
clause_3_references.adoc	version 0.2	2 weeks ago
clause_4_terms_and_definitions.adoc	version 0.2	2 weeks ago
clause_5_conventions.adoc	version 0.2	2 weeks ago
clause_6_overview.adoc	version 0.2	2 weeks ago
clause_7_uml_model.adoc	version 0.2	2 weeks ago
clause_8_data_dictionary.adoc	version 0.2	2 weeks ago
standard.css	version 0.2	2 weeks ago
standard_document.adoc	version 0.2	2 weeks ago
standard_document.docx	version 0.2	2 weeks ago
standard_document.html	version 0.2	2 weeks ago
standard_document.pdf	version 0.2	2 weeks ago

➢ TrainingDML-AI Part 2: JSON Encoding draft standard

- TrainingDML-AI JSON Schema:

  https://gitlab.ogc.org/ogc/TrainingDML-AI/-/blob/master/use-cases/examples/TrainingDML-AI_Schema.json

```json
{
  "$schema": "http://json-schema.org/draft-07/schema#",
  "$id": "TrainingDML-AI.json",
  "title": "TrainingDML-AI JSON schema",
  "oneOf": [
    {
      "$ref": "#/definitions/eoTrainingDataset"
    },
    {
      "$ref": "#/definitions/eoTrainingData"
    }
  ],
  "definitions": {
    "trainingDataset": {
      "title": "TrainingDataset",
      "type": "object",
      "required": [
        "id",
        "name",
        "description",
        "version",
        "amountOfTrainingData",
        "createdTime",
        "numberOfClasses",
        "classes",
        "task"
      ],
      "properties": {
        "id": {
          "type": "string"
        },
        "name": {
          "type": "string"
        },
        "description": {
          "type": "string"
        },
```

```json
      "version": {
        "type": "string"
      },
      "amountOfTrainingData": {
        "type": "integer"
      },
      "createdTime": {
        "oneOf": [
          {
            "type": "string",
            "format": "date-time"
          },
          {
            "type": "string",
            "format": "date"
          }
        ]
      },
      "updatedTime": {
        "type": "string",
        "format": "date-time"
      },
      "license": {
        "type": "string"
      },
      "providers": {
        "type": "array",
        "items": {
          "type": "string"
        }
      },
      "keywords": {
        "type": "array",
        "items": {
          "type": "string"
        }
      },
      "metricsInLIT": {
        "type": "array",
        "items": {
          "$ref": "#/definitions/metricsInLiterature"
        }
      }
    }
```

4. Standard document review

➢Comments and edits from Dr. Samantha Lavender

Open ☐ Issue created 2 weeks ago by 🧑 **Samantha Lavender** Developer   Close issue   ⋮

Review of the standards   ✏️

I've reviewed the two standard documents, and my suggestions are in a branch called pixalytics-suggestions.

Part 1 - I've primarily edited the AsciiDoc files, with the edits mostly being grammatical suggestions and adjustments to the USA spelling, as this is required for OGC documents. In addition, I have the following points:

- Clause 6.3.1: The bullet point on "Quality, bias and ethical issues". I've rewritten this bullet as I struggled to follow it - so, see if the text still reflects your original aim.

- Clause 7.8: ThematiclAccuracy - I was going to correct the spelling to ThematicAccuracy, but then noticed this isn't listed in Table 10, so thought maybe the name had changed.

- In the main part of the document, I found "super class", while in the Abstract Test Suite, I found "superclasses". To have consistency, I've changed "superclasses" to "super classes" in the Abstract Test Suite.

Part 2 - I have edited the Word document with Track Changes on, as there are no AsciiDoc files.

➢Comments and edits from Community

Notes on OGC Training Data Markup Language – AI (TDML)
Week 1: Background and AI_TrainingDataSet (p17-21 Concept Model, p15-21 JSON)

This is the first in a series of short notes on TDML clarifications, questions, and issues as we prepare it for possible Public Review and transition to an OGC Standard.

4. Standard document review

➢ Comments and edits from Dr. Carl Reed

发件人:"Carl Reed" <carl.n.reed@gmail.com>
发送时间:2023-01-28 06:22:04 (星期六)
收件人: "Scott Simmons" <ssimmons@ogc.org>, "Greg Buehler" <gbuehler@ogc.org>, "Yue, Peng (乐鹏)" <pyue@whu.edu.cn>, shangguanboyi@southgis.com
抄送:
主题: RE: Reed review round 2 for TrainingDML-AI Part 1

All –

Please find attached my latest review of TrainingDML-AI Part 1 – Conceptual Model. Mostly minor edits and comments. However, there is one error that does need to be addressed in Annex A. There is a comment in that Annes pointing out the error.

Peng and Boyi – Nicely done!! Thanks for the effort.

Regards

Carl

➢ Comments and edits from Testbed-18 ML Training Datasets ER

Open Geospatial Consortium

Actions to T18 MLTD ER

The 25th TrainingDML-AI SWG Meeting

Peng Yue, Boyi Shangguan, Danielle Ziebelin, Chairs
13 January 2022

OGC®

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
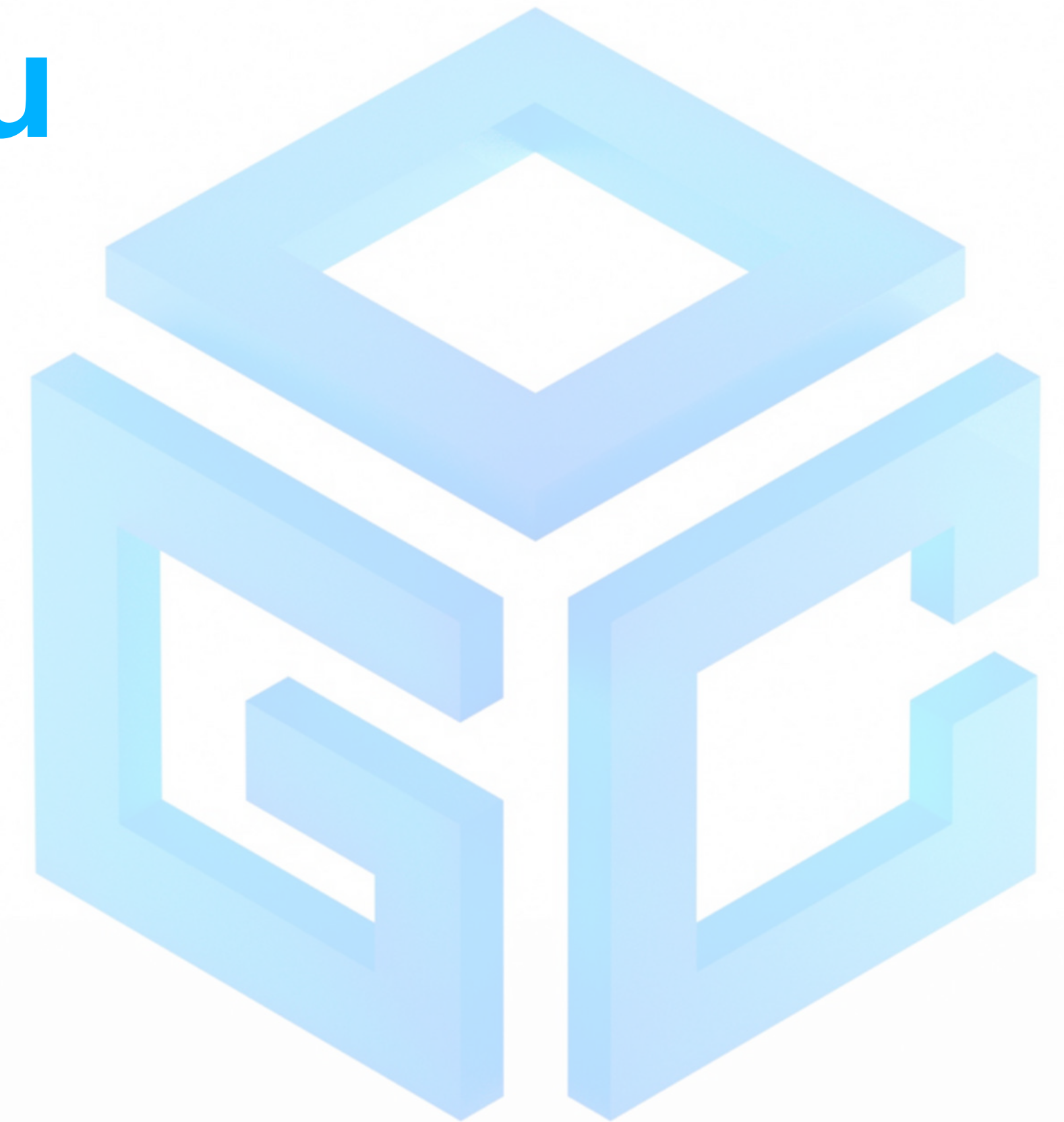
CityJSON revision v1.1

Community Standard Justification: 22-009r1
23-02-2023
Balázs Dukai, Linda van den Brink, Hugo Ledoux

Overview

CityObject types

1st-level city objects

- Bridge
- Building
- CityFurniture
- CityObjectGroup
- LandUse
- OtherConstruction
- PlantCover
- SolitaryVegetationObject
- TINRelief
- TransportationSquare
- Railway
- Road
- Tunnel
- WaterBody
- Waterway
- +Extension

2nd-level city objects

BridgePart
BridgeInstallation
BridgeConstructiveElement
BridgeRoom
BridgeFurniture

BuildingPart
BuildingInstallation
BuildingConstructiveElement
BuildingFurniture
BuildingStorey
BuildingRoom
BuildingUnit

TunnelPart
TunnelInstallation
TunnelConstructiveElement
TunnelHollowSpace
TunnelFurniture

OGC Community Standard, v1.0

Open Geospatial Consortium

Submission Date: 2020-08-03

Approval Date: 2021-05-31

Publication Date: 2021-08-13

External identifier of this OGC® document: http://www.opengis.net/doc/CS/CityJSON/1.0

Internal reference number of this OGC® document: 20-072r2

Version: 1.0

Category: OGC® Community Standard

Editor: Hugo Ledoux

CityJSON Community Standard 1.0

Changes v1.0 → v1.1

CityJSONFeature (text sequences)

```
{
  "type": "CityJSONFeature",
  "id": "myid",
  "CityObjects": {},
  "vertices": [],
  "appearance": {}
}
```

- enables streaming
- separate the CityObjects (incl. children)
- JSON Lines format

```
{"type": "CityJSON","version": "1.1","transform":{...},"metadata":{...},
"vertices":[], "CityObjects":{...}}
{"type": "CityJSONFeature", "id": "a", "CityObjects":{...},"vertices":[...]}
{"type": "CityJSONFeature", "id": "b", "CityObjects":{...},"vertices":[...]}
{"type": "CityJSONFeature", "id": "c", "CityObjects":{...},"vertices":[...]}
```

82

"transform" is mandatory

```
"transform": {
    "scale": [0.001, 0.001, 0.001],
    "translate": [442464.879, 5482614.692, 310.19]
}
```

- reduced file size
- coordinates stored as integers in **"vertices"**
  - geometry templates and textures are not transformed

CRS is URL

```
"metadata": {
  "referenceSystem": "urn:ogc:def:crs:EPSG::7415"
}
```

⬇
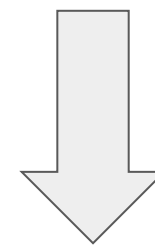
```
"metadata": {
  "referenceSystem": "https://www.opengis.net/def/crs/EPSG/0/7415"
}
```

- CRS is provided as URL, per OGC Name Type Specification
- CRS should be 3D

Limited metadata in core specs

Metadata in the core specifications is limited to:

- geographicalExtent (bbox)
- identifier
- pointOfContact
- referenceDate
- referenceSystem (CRS)
- title

Additional metadata is possible with the MetadataExtended Extension

https://github.com/cityjson/metadata-extended

GenericCityObject moved to Extension

```
"CityObjects":
{
    "id-1": {
        "type":    "+GenericCityObject"
    }
},
"extensions":
{
  "Generic":
  {
    "url": "https://www.cityjson.org/extensions/download/generic.ext.json",
    "version": "1.0"
  }
}
```

- GenericCityObject → +GenericCityObject

CityObject without geometry

```
{
    "type": "Building",
    "geometry": []
}
```

⟹
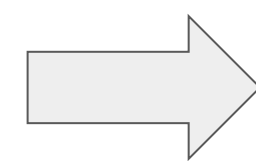
```
{
    "type": "Building"
}
```

A minimal, valid CityObject

"lod" is a string
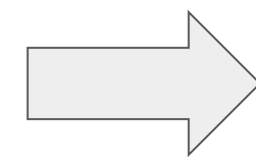
"lod" : 2.2 ⟹ "lod" : "2.2"

CityObjectGroup: "members" → "children"

```
"CityObjects": {
  "my-neighbourhood": {
    "type": "CityObjectGroup",
    "members": ["building1", "building2"],
    ...
  }
}
```
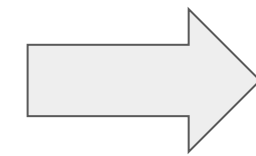
```
"CityObjects": {
  "my-neighbourhood": {
    "type": "CityObjectGroup",
    "children": ["building1", "building2"],
  },
  "building1": {
    "type": "Building",
    "parents": ["my-neighbourhood"],
  }
}
```

Harmonise CityObjectGroup with the rest of the CityObjects

CityGML v3.0 conformance

CityGML modules

CityGML module	compliant?	extra info
Core	⚠️	all geometries can be represented, Implicit Geometries are supported (called Geometry Templates). Only the `ExternalReferences` are not supported.
Appearance	⚠️	the CityGML class `TexCoordGen` is not supported, ie one must specify the UV coordinates in the texture files.
Bridge	✅	
Building	✅	
CityFurniture	✅	
CityObjectGroup	⚠️	groups of City Objects are supported, but not groups of parts of objects (eg it is not possible to group some walls of a building together)
Construction	✅	
Dynamizer	❌	

CityGML modules

CityGML module	compliant?	extra info
Generics	✅	everything supported, but implemention differs, see details below
LandUse	✅	
PointCloud	❌	this Extension can be used
Relief	⚠️	only the `TINRelief/TriangulatedSurface` is supported. `Tin` (where only elevation points and break lines are stored) is not supported since it would require viewer/applications to have a *constrained Delaunay triangulator*, which is problematic (especially for web-based tools). Also, it is not possible to store areas over a terrain that would support different resolutions. `RasterRelief` is also not supported.
Transportation	✅	
Tunnel	✅	
Vegetation	✅	
Versioning	❌	instead, CityJSON aims at offering a Git-based alternative, see our work-in-progress
WaterBody	✅	

CityGML v3.0 features not supported

No changes since CityJSON v1.0 – CityGML v2

1. Several CRSs in the same datasets
2. Identifiers for low-level geometries
    a.   e.g. no **gml:id** on surfaces
3. topological relationships (relativeToTerrain, relativeToWater)
4. Terrain Intersection Curve (TIC)
5. Complex attributes have been simplified
    a.   e.g. no derived attributes from **gml:Measure** (**bldg:measuredHeight**)
    b.   no generic attributes

Evidence of implementation

Software implementing CityJSON v1.1

- citygml4j, citygml-tools   – Java API and CLI tool
- 3dcitydb   – database solution
- WFS by VCS   – web service and viewer
- ldproxy   – streaming with CityJSONFeatures
- RESTful access demo   – streaming with CityJSONFeatures (test impl.)
- cjio   – CLI tool
- cjval (validator.cityjson.org/)   – validator
- NINJa (viewer.cityjson.org)   – online viewer
- QGIS plugin   – viewer in QGIS
- FME is on the way for v1.1

https://www.cityjson.org/software/

Thank you

Request of an electronic vote

- The CityJSON 1.1 submitters recommend that the OGC Technical Committee approve an electronic vote to approve release of [OGC 20-057r3] "CityJSON 1.1" as an OGC Community Standard.

  - Discussion:

    - would like to see the evidence of conformance with the applicable parts of the CityGML 3.0 – Part 1 Abstract Test Suite

    - provide evidence that CityJSON 1.1 is backward compatible; if not, should renumber to 2.0. OAB will take on this investigation

  - There was no objection to unanimous consent

The most important thing for this WG is…

We need standardized information in Agriculture

The way is to develop **Agriculture Information Model (AIM)**

Session Agenda

- Motivation behind the creation of AIM in DEMETER with selected pilots perspective Ioanna Roussaki

- Technical details and elaborate on the usage of AIM in DEMETER pilots Raul Palma

- Consideration for publishing semantic model based on the OGC standards Rob Atkinson

- Connection to other OGC/external activities all

- AIM Charter key elements Rob Atkinson

- Discussion Karel Charvat

Charter purpose

- The purpose of this SWG is to develop, publish and maintain an **Agriculture Information Model (AIM)** to support interoperability of information in the Agriculture Domain ("agri"), with emphasis on the re-use of generic OGC standards as appropriate.

- AIM will be a multi-tier and modular domain model aligning, profiling and/or extending well known **agriculture related and generic ontologies**, including existing ontologies published by the OGC. Recognising that this is an innovative approach to publish such a domain model as a modular ontology the SWG will address both **identification of best practices** for this specialisation approach and the **development of a series of complementary models.**

Charter purpose

The SWG will develop implementations of the AIM model compatible with OGC APIs, including:

- JSON schemas supported by OGC APIS

- JSON-LD contexts allowing identification and validation of AIM-compliant data.

- SHACL shapes enabling the validation of data against AIM semantics

Charter purpose

In addition other forms may be derived or supplied to support reusability of the AIM model, according to requirements identified by the SWG:

- UML representation of AIM conceptual model

- UML representation of one or more logical models for AIM implementation

- Formal profiles for implementation of AIM using GeoJSON, FG-JSON, CoverageJSON and other relevant generic schemas

Value to the OGC

- Reference data models that are defined based on the OGC ontologies and standards support their uptake and popularization. This leverages OGC's position as the reference for the spatio-temporal aspects of data exchange to provide the basis for common approaches in an otherwise fragmented domain.

Value to the OGC Membership

- Standardization of the AIM in a form that can be embedded in application-specific profiles of the OGC suite of data model and API standards shall facilitate the uptake of OGC standards and interoperability principles in the agriculture sector.

Value to the wider IT community

- The AIM standardization methodology will demonstrate the potential of industry-wide standards from OGC and other bodies to support the FAIR principles in large scale, highly heterogeneous domains.

Scope of Work

The SWG will undertake:

- a review of available standards relevant to the Agriculture Domain

- Comparison of these with the scope of the existing AIM candidate model

- Establish agreements and prioritizing scope for standardization of modules

- develop implementations of modules that can be realized using the concepts OGC API Building Blocks.

- Provide feedback to the OGC TC on best practices for domain model definition and its use in the APIs

Specific Existing Work Used as Starting Point

- NGSI-LD meta-model for AIM core layer

- W3C Time ontology for concepts of temporal properties and time values

- OGC GeoSPARQL and associated definitions for geographical and geometrical properties

- W3C/OGC recommendation SOSA/SSN regarding sensor and actuator data, including observations, observation collections, observed properties, systems and platforms

- QUDT regarding units of measurement, and concepts to represent quantities and quantity kinds

- RDF data cube vocabulary to represent statistical data, including datasets, data structures, slices, measure properties, dimension properties, etc.

- Basic terms from standard or widely used vocabularies like skos, foaf, schema.org.

- ISO geographic technology standards, including features (domain and sampling feature), and observations

Deliverables

- A final version of the "OGC Agriculture Information Model" document for submission to the TC;

- Identification of at least two prototype implementations of the core based on the standard — although more would be preferred; and

Value to the geospatial community

- The wider geospatial community will benefit from the emergence of harmonized approaches to reuse of generic spatio-temporal patterns with domain specific models. These approaches , tested in agriculture applications, will provide a template for other domains of application.

Motion to start electronic vote for Agriculture Information Model SWG

- The Agriculture DWG recommends that the OGC Technical Committee approve the start of an electronic vote for the Agriculture Information Model SWG as described in OGC the charter [OGC 23-009r2].

  - Result: There was no objection to unanimous consent

- Abstract: The purpose of this SWG is to develop, publish and maintain an Agriculture Information Model (AIM) to support interoperability of information in the Agriculture Domain, with emphasis on the re-use of generic OGC standards as appropriate. AIM will be a multi-tier and modular domain model aligning, profiling, and/or extending well known agriculture related and generic ontologies, including existing ontologies published by the OGC.

The most important thing for this WG is…

Updating several existing standards: GeoSPARQL, GeoDCAT, SOSA/SSN - how to get the work done and work with W3C where needed

Agenda

- Nick Car - GeoSPARQL 1.2 scope discussion
  - what should the focus of this new version be? Full 3D support is among the options discussed.

- Byron Cochrane - GeoDCAT SWG formation

- Rob Atkinson - Possible update of SOSA/SSN

What we talked about this week

- Scope of next update(s) of GeoSPARQL: 3D, CRS ontology, …
- Voting to get GeoDCAT SWG started
- SOSA/SSN update based on OMS

GeoDCAT Objectives
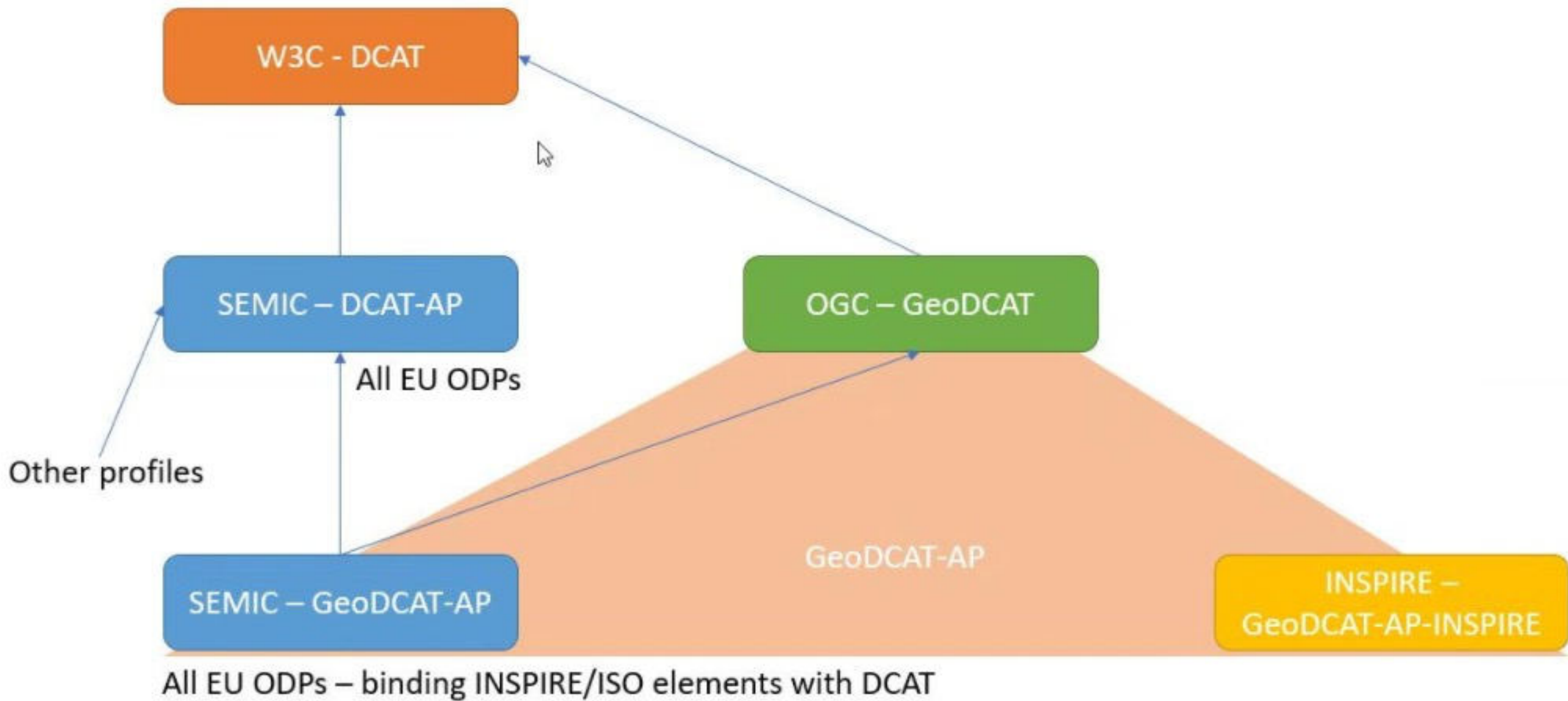
GeoDCAT Charter Scope

- Describe emergent best practices and examples, since OGC 18-001r1;

- Assess the need for a geospatial extension of DCAT;

- Separate DCAT-AP from GeoDCAT;

- Update GeoDCAT to meet the DCAT v3 recommendation status;

- Update as required to use current GeoSPARQL Standard version;

- Formalize machine readable versions of GeoDCAT profile;

- Prepare and validate illustrative examples with crosswalks;

- Define a mechanism for describing specialized profiles of GeoDCAT;

- Publish using current OGC Standard document methodology.

TC document approval motion

- The Geosemantic DWG recommends that the OGC Technical Committee charter the GeoDCAT Standards Working Group per [OGC 23-006] "*OGC GeoDCAT SWG Charter.*"

  - NOTUC

- Charter for the GeoDCAT Standards Working Group which will report to both the Geosemantics and MetaCat DWGs

TC Chair Announcements and Motions

Upcoming OGC Member Meetings

Date	Location	Host/Sponsor
20 – 24 February 2023	Frascati	European Space Agency
5 – 9 June 2023	Huntsville, AL USA	GeoHuntsville and more
25 – 29 September 2023	Singapore	Singapore Land Authority
February/March 2024	Europe	
June 2024	Montreal, Canada (TBC)	
September/October 2024	Asia	

We are looking for sponsors for future meetings

Why Huntsville?

- A very technical city

  - Highest concentration of high-level degrees in the country

  - Defense, Health, Space, Security, and more

- A very fun city

  - Lots of hiking trails

  - Lots of micro breweries

- Close to other attractions

- https://youtu.be/qboggCNtBYc

About GeoHuntsville

- **GEOHuntsville is a non-profit organization operating as an initiative from the Mayor of Huntsville**

- **It is a collaborative effort among businesses, academia and government entities to support workforce growth and economic development in our region and establish Huntsville as a major corridor for geospatial excellence.**

- **Geospatial Advantage Conference co-hosted with NGA**
  https://youtu.be/2Sl2ovjm2qQ

Meeting Location

- Huntsville Botanical Garden
  - [Voted 4th Best Botanical Garden in North America by USA Today](#)

Meeting Location

Meeting Facilities

- Nice large meeting rooms

- Several locations for breakout sessions as needed

- Access to the Gardens during the week

- Lunches provided daily

- Special snacks in the morning and afternoon

- Café on premise

- Gift shop on premise

Wednesday Dinner

- In the USSRC Saturn V Hall of the Davidson Center for Space Exploration, experience the mesmerizing opportunity to dine under an authentic Saturn V Apollo moon rocket – a National Historic Landmark!

- Surrounded by historic artifacts and interactive exhibits from space exploration, you will enjoy the breathtaking ambiance and dine beneath one of mankind's greatest scientific achievements.

Special Events

- Monday Evening Networking

  - Overlooking the Gardens

- Special Sessions

  - Emergency Response

  - Space and/or Defense

  - UxS

  - Point Clouds / Digital Reality

Additional Links

- [Huntsville Information](#)

- [Huntsville Facts and Video](#)

- [Huntsville Workforce](#)

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
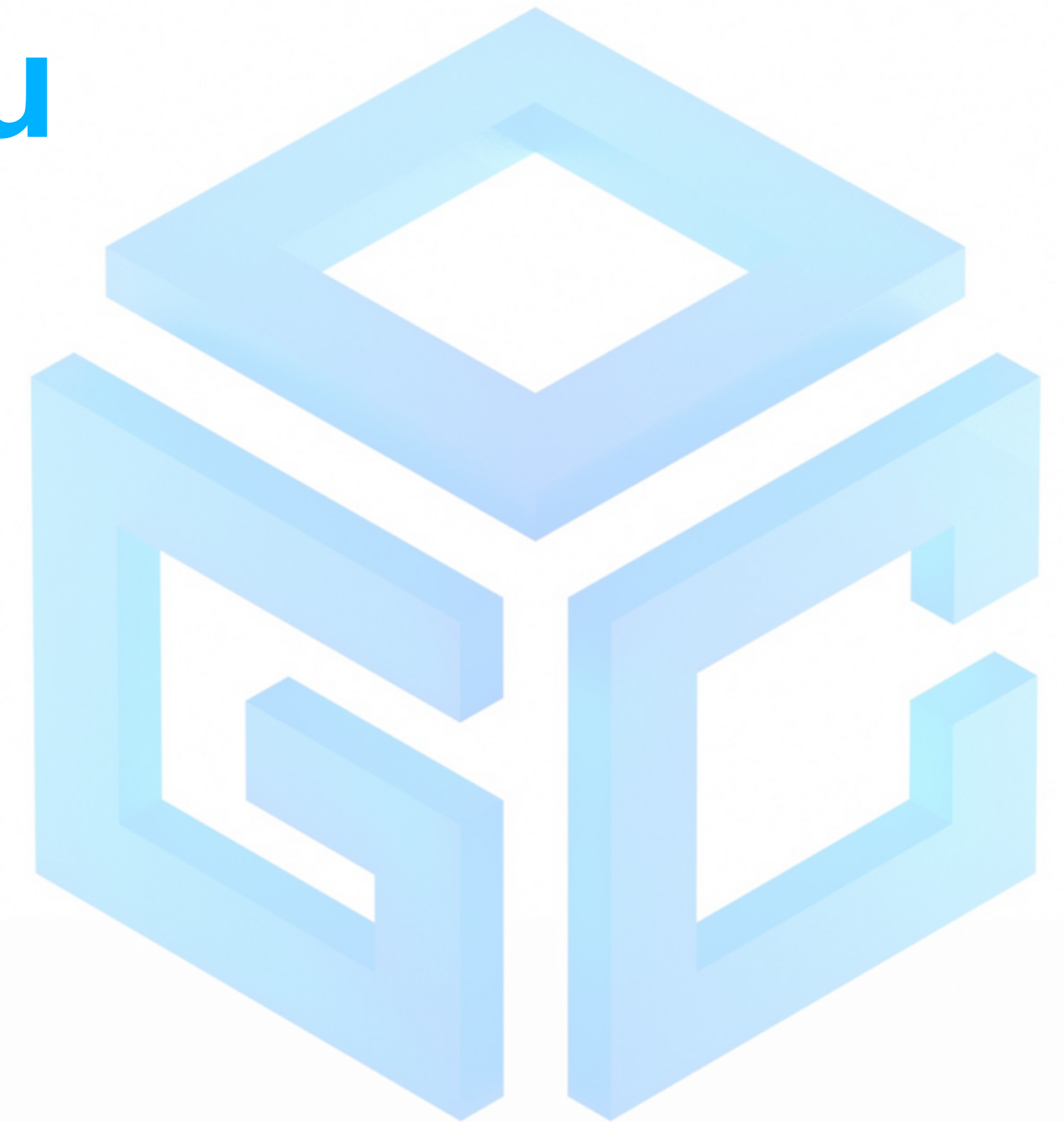
OGC Location Building Blocks

Geo-enable web applications.
Promote the adoption of modular, standalone, reusable, components.

Location-ready APIs✓
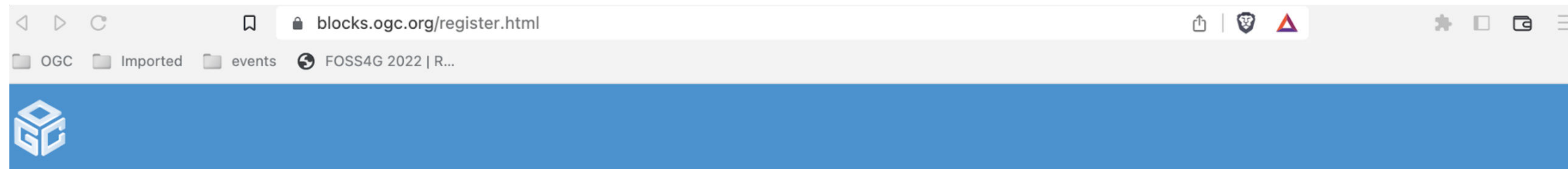
- One or multiple OGC API parts

Granular Resources✓

- Data types
- Parameters
- Headers

👉🏽 https://blocks.ogc.org/

Open Geospatial Consortium

Building Block Register

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

- Filter by maturity, type and source.
- Features building blocks originated by OGC API-Features and OGC API - EDR.

Register Schema

Example

```json
{
  "itemIdentifier": "r1.geo.common.parameters.bbox",
  "name": "bbox",
  "abstract": "The bbox query parameter provides a simple mechanism for filtering resources based on their location. It selects all resources that intersect a
  "status": "Valid",
  "dateTimeAddition": "2022-05-24T13:51:38+00:00",
  "itemClass": "ogc-building-block",
  "register": "ogc-building-block-register",
  "version": "0.1",
  "dateOfLastChange": "2022-05-24",
  "link": "https://doublebyte1.github.io/slate/",
  "sources": ["ogc-api-features"],
  "maturity": "Mature",
  "type": "geo"
},
```

How to contribute

👉 https://github.com/opengeospatial/bblocks/

- Block registration (following register schema), as JSON element.

- Block description as AsciiDoc.

Building Block Pipeline
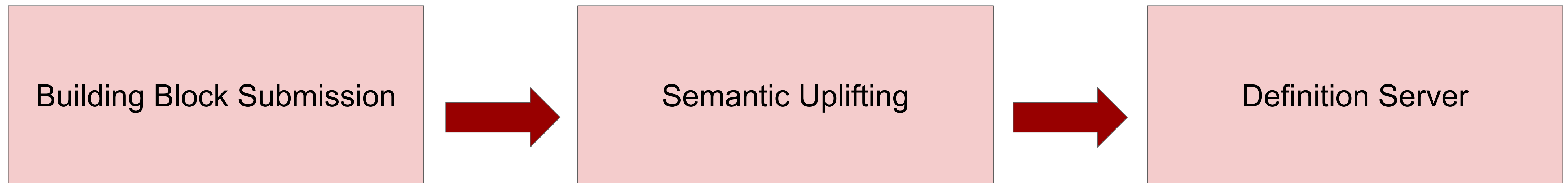
Discussion

👉 https://github.com/opengeospatial/bblocks/issues

Thank You

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Using OGC Standards

devrel@ogc.org

It's here

- A major revision of the TC Policies and Procedures is ready for vote
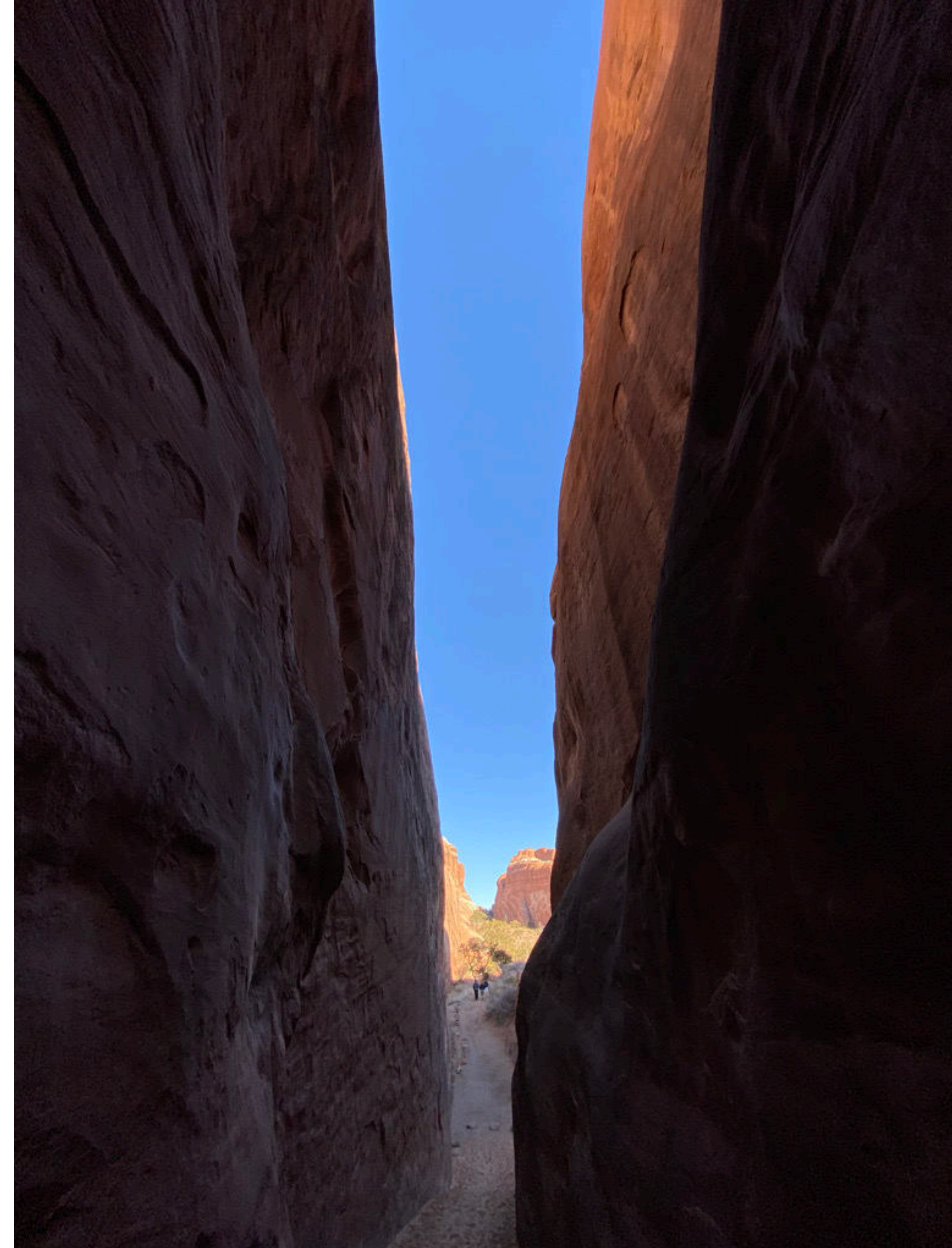
What's better?

- Reorganized, simplified, made more linear

- 20% shorter

- includes new polices:

  - reaffirmation of chairs

  - Innovation Program activities as seed for SWGs & Standards

  - building block management and lifecycle

  - API element revision

  - lifecycle management

  - Legacy standards

Request of an electronic vote

- The TC Chair recommends that the OGC Technical Committee approve an electronic vote to approve release of [OGC 05-020r29] "Technical Committee Policies and Procedures" as an OGC Policy.

  - There was no objection to unanimous consent

Abstract Specification Topics
for retirement

The following topics are proposed for retirement

- No action required today

- The list will be published for 60 days, then an electronic vote will be requested

- Provide any comments to the TC Chair (Scott Simmons) and the OAB Chair (Greg Buehler)

Topic 3 - Locational Geometry Structures (1999)

Summary

"*This Topic Volume 3, Locational Geometry, provides essential and abstract models for technology that is used widely across the GIS landscape. Its first heavy use is in support of Simple Feature geometry specification and their Spatial Reference Systems. Additional use is expected to occur in support of Coverage specifications (see Topic 6, The Coverage Type).*"

- Status: document is incomplete and seems to be covered by other Topics and ISO Standards.

- 8 pages long, most of which is white space

Open Geospatial Consortium

Topic 4 - Stored Functions and Interpolation (1999)

Summary

"*This Topic Volume, Stored Functions, provides essential and abstract models for technology that is used widely across the GIS landscape. Its first heavy use is expected to occur in support of Coverage specifications (see Topic 6, The Coverage Type).*"

- Status: Abstract model is TBD. Not referenced by current Coverage Standards.

Topic 14 - Semantics and Information Communities (1999)

Summary

"The OpenGIS™ notion of Information Communities was devised to enable groups such as ecologists and civil engineers to efficiently manage the semantics (or feature schema mismatches) of their own geodata collections and get maximum benefit from each other's geodata collections, despite semantic differences.

An Information Community is a collection of people (a government agency or group of agencies, a profession, a group of researchers in the same discipline, corporate partners cooperating on a project, etc.) who, at least part of the time, share a common digital geographic information language and share common spatial feature definitions. This implies a common world view as well as common abstractions, feature representations, and metadata. The feature collections that conform to the Information Community's standard language, definitions and representations belong to that Information Community.

- Status: no evidence that this has been used in OGC Standards; terms "subworlds" and "isomorphic project worlds" seem quite… well… uh…

Topic 17 - Location Based Mobile Services (2000)

Summary

"*This topic volume is the portion of the OpenGIS™ Abstract Specification that covers location based/mobile services. That is, this part of the abstract specification describes services that take advantage of mobility and the position or relative position of devices and points, lines, or polygons of service. Important concepts are location, route, and types of service.*"

- Status: clear and concise (if not a little incomplete), but not even referenced in OpenLS or Moving Features

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Topic Domain 1 - Telecommunications Domain (2001)

Summary

"*The Special Interest Group (SIG) for the Telecommunications Domain of OGC proposes this document to enumerate the requirements of telcos. Telcos, in this paper are defined as Communications Service Providers. These may be Incumbent or Competitive local exchange carriers (ILEC or CLEC), Long distance providers, or Wireless providers. The basic definition of objects, relationships, and actors are defined in Section 2.*"

- Status: would have been suitable for publication as a Technical Paper, but does not fit in the Abstract Spec

Open Geospatial Consortium

WG Reports not to be briefed

150

Not being briefed today, saving you 174 slides

- 3DIM DWG
- CDB SWG
- Climate Resilience DWG
- Data Quality DWG
- Defense & Intelligence DWG
- DGGS DWG
- DGGS SWG
- EOXP DWG
- Energy & Utilities DWG
- Features & Geometries JSON SWG
- Features API SWG
- GeoAI DWG
- GeoAPI SWG
- GeoPose SWG
- GeoXACML SWG
- Hydrology DWG
- IndoorGML SWG
- ISG DWG

- Met Ocean DWG
- MUDDI SWG
- OGC API – Maps SWG
- OGC API – Processes SWG
- OGC API – Tiles SWG
- OGC-NA
- OMS SWG
- Point Cloud DWG
- Routing SWG + UxS DWG joint session
- Security DWG
- SensorThings API SWG
- TrainingDLM-AI SWG
- Urban Digital Twins ad hoc

WG Reports with TC Motions

Z to 3

Session Agenda

- The OGC Marine community is meeting to highlight past, present and future work related to the global marine domain and the multi-year IHO-OGC Federated Marine SDI Initiative.

- Part I of the session focuses on both the work of the OGC Marine Domain working group and progress to data on past work on FMSDI and planned future work.

- Part II will be the demonstrations of results from The Federated MSDI Pilot (FMSDI) - Phase III (Arctic) under a Scenario of a vessel in distress in Western Alaska, just south of the Arctic Circle and a review if the Engineering report for approval Join us to learn more about the impact of the OGC community in the Marine Domain.

Approval Motion

- The OGC Marine DWG recommends that the OGC Technical Committee approve the release of Document Number 23-010r1 - Towards a Federated Marine SDI: Connecting Land and Sea to Protect the Arctic as an OGC Engineering Report.

  - There was no objection to unanimous consent

- Overarching goal was to learn more about current capabilities and possible shortcomings of marine data services offered by all Marine Spatial Data Infrastructures,

The most important thing for this WG is…

One new Executable Test Suite

Upcoming Electronic Vote on CITE Policy Changes

Session Agenda

- Proposal to deprecate Executable Test Suite of SPS 1.0 (10 min)

  Gobe Hobona (OGC)

- Compliance Policy update (10 min)

  Gobe Hobona (OGC)

- OGC API - Processes - Part 1: Core 1.0 Executable Test Suite (10 min)

  Gobe Hobona (OGC), Benjamin Pross (52°North)

- A Review of GeoPackage Support across Multiple Products, and lessons for Compliance Testing (20 min)

  Chad Wettlaufer (Canadian Department of National Defence)

Motion to recommend deprecation of the Executable Test Suite of v1.0 of the Sensor Planning Service Standard

The CITE SC recommends that the Technical Committee approves the deprecation of the Executable Test Suite of v1.0 of the Sensor Planning Service Standard.

- Result: NOTUC

SPS 1.0 is already a deprecated Standard. However, the ETS has been maintained over recent years to allow the market time to transition to the relatively newer SPS 2.0 and SensorThings API Standards. As there are now no remaining products certified compliant to SPS 1.0, deprecation of the ETS can proceed with minimal disruption.

A deprecated ETS is no longer supported (no longer receives updates and OGC may not provide technical support on the ETS). The ETS is removed from the OGC Validator Tools and the repository of the source code of the ETS is archived.

Motion to request electronic vote on OGC 08-134r12 "Compliance Testing Program Policies Procedures"

The CITE SC recommends that the OGC Technical Committee approve an electronic vote to approve release of OGC 08-134r12 "Compliance Testing Program Policies Procedures" as an OGC Policy.

- Result: NOTUC

The policy revision makes the following changes: Changes PC acronym to EPC. Expands CTC and CTP acronyms. Adds section on Compliance Test Package Deprecation. Adds note about government organizations using TGAR of $0M-<$5M. Updated to use new Membership Level names (Community, Voting).

Motion to approve the OGC API - Processes v1.0 Executable Test Suite as Official

- The CITE SubCommittee recommends that the Technical Committee approves the Executable Test Suite (ETS) of version 1.0 of the OGC API - Processes Standard as an official OGC Compliance Test Package.

- Subject to ongoing discussions in the OGC API – Processes SWG, this ETS may be modified to make asynchronous execution optional.

- At the time of this motion, there is 1 Early Implementor that has been certified compliant and the ETS has been on the Beta validator for more than 6 months. The Early Implementer supports both synchronous and asynchronous execution of processes.

- Result: NOTUC

Thank You

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Using OGC Standards

The most important thing for this WG is…

How do we coordinate better to avoid duplicated roles between different Sensor-related OGC Standards?

What we talked about this week

- How might we summarize lots of geospatial data in a standards-based way?

- How might we implement a Publish/Subscribe mechanism in OGC API Standards?

- How do we support Interpolation approaches in a standards-based way across various OGC API Standards?

Where we are headed in the coming year

- Discussion Paper on PubSub, led by the MetOcean DWG and the EDR API SWG – All OGC working groups are invited to contribute

- Code Sprint – See Next Slide

Next Code Sprint

Organised by:

Hosted by:

Open Standards and Open Source Software

2023 Joint OGC-ASF-OSGeo Code Sprint

April 25 to 27, 2023

The code sprint will take place at Camptocamp's offices (near Lausanne, Switzerland) and on the OGC's Discord events server.

Register at https://developer.ogc.org/sprints/20/

Session Agenda

- Web Mapping Code Sprint Summary Engineering Report – Gobe Hobona (OGC)

- The New ISO 19123-* Coverage Suite - Peter Baumann (rasdaman GmbH)

- Best Practice for UML to JSON Encoding Rules – Clemens Portele (interactive instruments) and Paul Janssen (Geonovum), Linda van den Brink (Geonovum)

- Cos4Cloud project for integrating citizen science based services in the EOSC - Kaori Otsu (CREAF) and Joan Masó (CREAF)

- STAplus - Andreas Matheus (Secure Dimensions), Hylke van der Schaaf (Fraunhofer-Gesellschaft), Joan Maso (UAB-CREAF)

- Towards a PubSub Discussion Paper - Chris Little (Met Office), Steve Olson (NOAA)

What we talked about this week

- 3D in planetary and inter-planetary spaces
- Link between COSI project work and TC
- Practical use of voxel models and their integration into 3D environments

Session Agenda

- Testbed 18 D026 - 3D+Data Streaming Engineering Report, Jerome St Louis (Ecere)

- 3D information for Digital Building Permits, Francesca Noardo (OGC)

- Visualizing multidimensional spatial and temporal information using Voxel Scene Layer, Tamrat Belayneh (ESRI)

Climate Resilience DWG Closing Plenary Report

The 125th OGC Member Meeting

Ryan Ahola, Natural Resources Canada

Angel Lopez Alos, European Centre for Medium-Range Weather Forecasts

Allan Jamieson, United Kingdom Ordnance Survey

23 February 2023

With the support of

The most important thing for this WG is…

First formal DWG meeting! Main goals of: 1) Being the OGC forum for climate change interoperability discussions, and 2) Delivering foundational OGC approaches to support climate change decision making.

What we talked about this week

- Introduction to the DWG; introduction of chairs.

- United Framework Convention on Climate Change (UNFCCC) requirements for interoperability. Contexts of mitigation and adaptation. Many datasets needed to support different national applications.

- Land Degradation Neutrality: concept of reaching a state where the quantity and quality of land needed to support ecosystem functions is maintained or increased. Highlighted interoperability requirements for developing and using indicators to monitor the degradation of land.

- Discussed the need for essential biodiversity variables to monitor the state of biodiversity globally. Highlighted interoperability needs and goals.

Where we are headed in the coming year

- Longer Term Goals:
    - **Discovery**: Climate ecosystem is complex. Map and registry of climate data, platforms, applications, tools to help with discovering what is available.

    - **COP28**: Participating in side event to highlight OGC member's climate change activities and the value of standards.

    - **UN Policy**: Linking OGC to UN climate change policy frames. How can we support / influence international climate policy decisions?

- Presentations and discussions highlighted the value of these goals and a desire to begin executing them.

- An initial document of desired characteristics of climate data, platforms, applications, and tools to be developed for the map and registry work.

Next Quarter WG Communications Plan

- Plan for an ad-hoc meeting to discuss next steps for the climate data/tools/application map/registry task.

- Aiming for a full-day session at the June Member Meeting to discuss outcomes from the Climate Resilience Pilot; plans for a Phase 2 of the Climate Resilience Pilot, and a DWG meeting.

Session Agenda

- **UNFCCC - Location Information for Climate Actions** - Joanna Post - United Nations Framework Convention on Climate Change

- **Location Information for Land Degradation Neutrality** - Brian O'Connor, Bernd Eversmann - United Nations Convention to Combat Desertification, Group on Earth Observations Land Degradation Neutrality Initiative

- **CBD - Essential Biodiversity Variables** - Miguel Fernandez, Europa Biodiversity Observation Network, German Centre for Integrative Biodiversity Research

- **Discussion**

The most important thing for this WG is…

Current focus of DQ DWG is in contributing to the improvement of ISO/TC211 standards for Data Quality (ISO 19157-1 and ISO 19157-3) and to the guidelines and best practice in managing quality of geodata.

What we talked about this week

- A new Geospatial User Feedback OGC API based on OGC API records and other updates from the SWG

- Challenges and Opportunities in deploying Data Spaces: Assessing the impact on data quality

- Reproducible Querying in evolving, schema changing databases to enhance FAIRness of research data

Where we are headed in the coming year

- Continue improving data quality standards and standard quality measures register

- Continue collecting FAIR quality information use-cases

Next Quarter WG Communications Plan

- 3rd Data Quality Workshop at Oct'23 OGC Member Meeting

Session Agenda

- Joan Masó (CREAF): A new Geospatial User Feedback OGC API based on OGC API records and other updates from the SWG

- Julien Adelberger & Anil Turkmayali (IDSA): Challenges and Opportunities in deploying Data Spaces: Assessing the impact on data quality

- Moritz Staudinger & Tomasz Miksa (TU Wien): Reproducible Querying in evolving, schema changing databases to enhance FAIRness of research data

- Discussion

The most important thing for this WG is…

Referencing the previous D&I DWG meeting march/june 2022 about OGC API for Defence and Intelligence community , the Agile Reference Architecture to enable a modular and dynamic environment and that should include data centric security in this meeting has been discussed data security by design and data, services and process to be easy discovered.

What we talked about this week

Chris Budas presented the DSTL slides. The following questions/discussion was the outcome:

- What's the definition of "secure"? It's hard to talk about something being secure if we don't agree on a common definition
- Security and discoverability are on opposite ends of the spectrum. We must hold these things in tension and find the right balance.
- For instance, metadata can be discoverable vs system level data secure – Maxar
- What should be discoverable?
- NATO DCS DGIWG is dealing with these things – IGN-FR
- We don't have an answer yet for security in aggregation of data (mosaic data). How do you build a system to account for that?
- Maxar is building a policy based system that could be applied.
- Aggregation is also an issue when you have the following instance: one person looking at one point is no big deal; many people looking at the same point is a concern
- Need a globally unique identifiers with integrity and protection. A.Matheus
- This would allow the capability to access control to a specific identifier

Christopher Tucker presented on OGC Connected Systems API
- Chris asked for any possible use cases for this API to come to him and Alex Robin to discuss what should be discoverable..and please keep in the loop D&I DWG

Where we are headed in the coming year

- Agile reference architecture should enable data centric security based and enable discoverable of data services and processes

- Indeed the discussion held during the meeting helped clarifying step forwards

- Connected system API with specific use cases can support defining the new architecture..

Session Agenda

- Future Information and Data Services , Chris Budas, UK DSTL

- OGC API - Connected systems, Christopher Tucker , OGC

Closing Plenary Report DGGS Domain Working Group

The 125th OGC Member Meeting

With the support of

Dr. Matthew B.J. Purss
Pangaea Innovations Pty. Ltd.
23 February 2023

The most important thing for this WG is…

One thing that is most important for this WG is to raise wider awareness of DGGS and OGC APIs for DGGS throughout the wider geospatial community.

What we talked about this week

- We had a number of presentations focusing on the application of DGGS as part of applied research projects. These included:
  - A Report on DGGS components of the OGC Federated Marine SDI Project; and,
  - A Report from a study comparing and assessing the application of different open source DGGS libraries to the data indexing and management of Sentinel-2 data.
- Also presented was some fundamental research into new methods of constructing DGGSs using rhombic triacontahedrons.

Where we are headed in the coming year

- The DGGS DWG will continue to provide a venue for discussing DGGS technologies, their application and issues related to the standardisation of DGGS infrastructures.

- This week contributed to this effort through:
  - The presentation of new DGGS zone aggregation techniques using rhombus' to provide a topological bridge between hexagonal Inverse Schneider Equal Area (ISEA) DGGSs and OGC API Tiles.
  - The presentation of a study into the application of different types of DGGS to index and manage Sentinel-2 data; and,
  - The presentation of new research into the structure of DGGSs using Rhombic Triacontahedrons instead of platonic solids to construct an equal area DGGS.

Next Quarter WG Communications Plan

The DGGS DWG will meet during the next OGC Members Meeting to continue its role as a forum for the DGGS community to present and discuss DGGS technologies and their application.

Session Agenda

- Intro & Logistics (Chair) – 5 min
- Report on DGGS components of the Federated Marine SDI (Jerome St Lious) – 20 min
- Construction of rhombic triacontahedron DGGSs (Jin Ben) – 15 min
- Sentinel-2 DGGS study (Enrico Cadeau) – 15 min
- Other Business (Chair)

The most important thing for this WG is…

Building towards executing the persistent demonstrator concept this year. Key for the DWG to begin experimenting with concepts it is developing.

What we talked about this week

- Upcoming Destination Earth platform concept.

- Findings of work exploring data management with SpatioTemporal Asset Catalogue (lessons learned will be valuable for STAC).

- Canadian EO derived products work with upcoming platform linkages

- Testbed-18 Reproducible Open Science Best Practice - potential test case for persistent demonstrator concept. How to further advance the reproducible open science concept and what we mean by "reproducible".

- Canadian EO data dissemination activities - current for the Meteorological Service of Canada and emerging platform concept (Digital Earth Canada) for entire federal government.

Where we are headed in the coming year

- Starting the Persistent Demonstrator concept.

- Beginning to experiment with persistent demonstrator. Reproducible Open Science as a potential test case.

- Furthering the Reproducible Open Science use case. Pedro Goncalves to lead. Likely dedicated DWG sessions upcoming to advance.

- Testbed-18 Reproducible Open Science Best Practice to be published.

Next Quarter WG Communications Plan

- Reproducible Open Science Best Practice efforts to be communicated and further advanced within the DWG.

- DWG session at next Member meeting.

Session Agenda

- Ines Sanz Morere, Claudia Vitolo - DESP: DestineE Core Service Platform - European Space Agency

- John Pelle, Naman Jain - Standardized Data Management with STAC - UP42

- Ryan Ahola and Simon Riopel - Earth Observation Derived Products for Climate Change Monitoring - Natural Resources Canada

- Pedro Goncalves - Best Practice for Reproducible Open Science - Terradue

- Tom Kralidis - Canadian Activities on Data Management, Dissemination and Perspectives on Exploitation - Environment and Climate Change Canada

The most important thing for this WG is…

Reviewing Testbed-18 Building Spatial Data Interoperability initiative outcomes and planning next steps.

What we talked about this week

- Testbed-18 results:

  - Initial implementations of OGC standards for building energy applications. OGC APIs found to perform well.

  - Challenges with interoperability of measured and modelled government datasets. Difficulties with scalability.

  - The potential of Augmented Reality as a way to better visualize building energy information. Remaining challenges with better connecting geospatial and augmented reality communities.

Where we are headed in the coming year

- Publishing Testbed-18 Building Energy engineering report.

- Planning next steps for better moving ahead with building energy interoperability. Many challenges remain, what is the next best thing to do?

Next Quarter WG Communications Plan

- Communications about results of the Testbed-18 engineering report.

- Session at the next member meeting. Focusing on discussing Testbed-18 work and planning next steps.

Session Agenda

- **Testbed-18 Building Energy Task Overview** – Ryan Ahola and Jessica Webster – Natural Resources Canada

- **Testbed-18: Web API providing 3D Building Models and On-Demand Energy Calculation workflow leveraging SimStadt API** – Jérôme St-Louis - Ecere

- **3D/AR Visualization of Building Energy Data using Unity®** – Tony Hodgson - Ethar

- **Development of SimStadt API for Montreal's Building Stock Energy Simulation using OGC CityGML -** Rushi Padsala and Santhanavanich (Joe) Thunyathep

- **Testbed-18 Building Energy Engineering Report** – Leigh St. Hilaire – Volta Research

The most important thing for this WG is…

GeoAI Roundtable Event

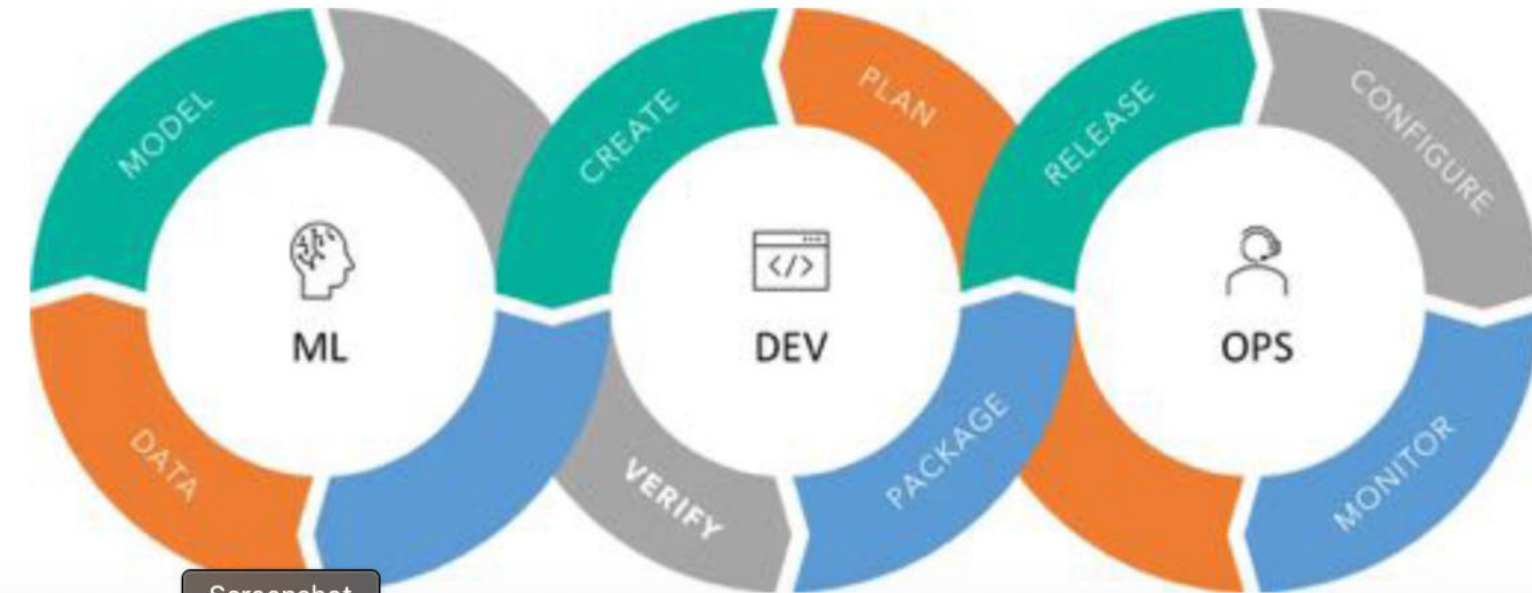Date: Tuesday, March 21st, 2023. 10 am EST

Location: Virtual

Duration: 3 hours

What we talked about this week

MLOps - Machine Learning Cycle

- Incorporation of DevOps practices into machine learning workflows
- Streamlining the process of taking machine learning models to production
- Automation and monitoring at all steps of ML system construction, including integration, testing, releasing, deployment and infrastructure management

Geospatial Discovery Network – Phase 2
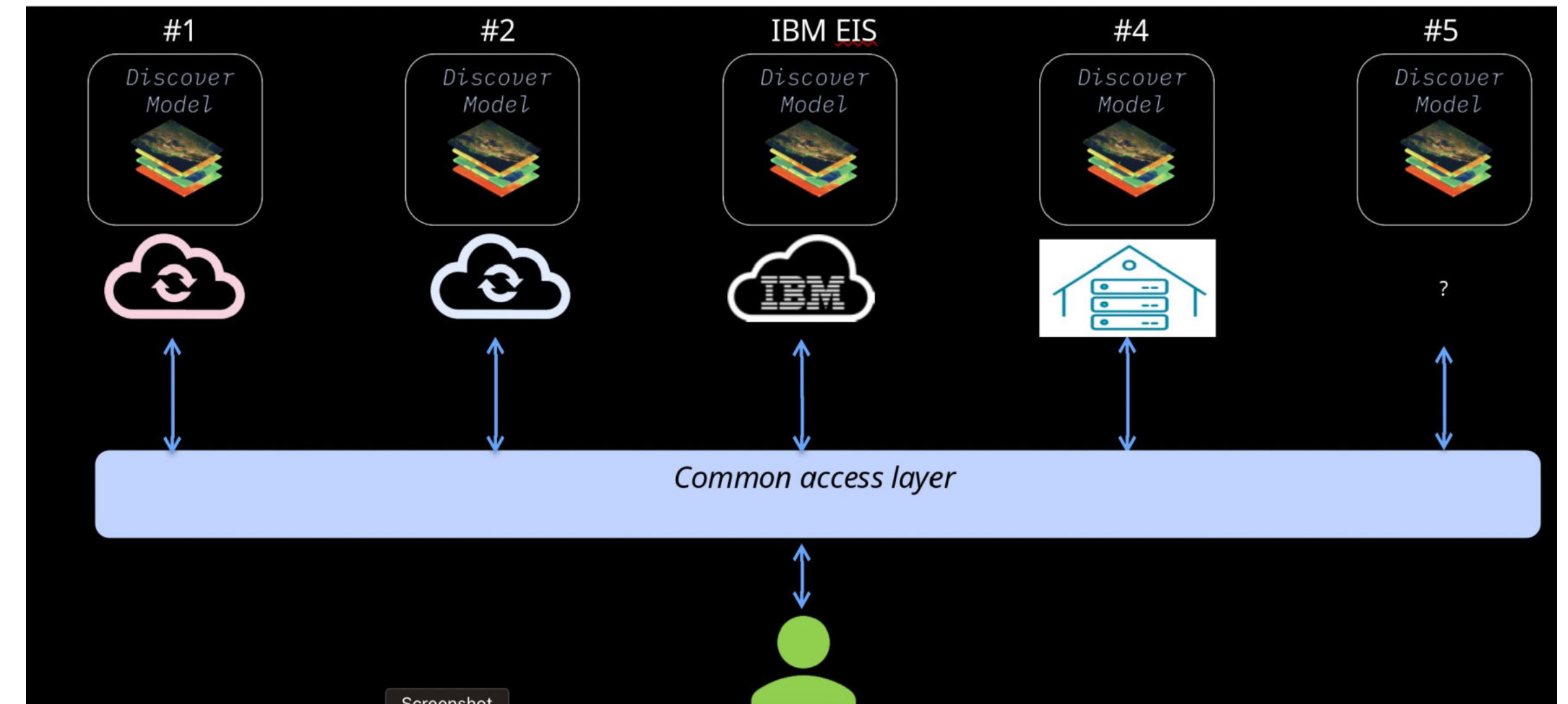
1. Challenges

Challenges faced with dataset creation and standardisation -

1. Preprocessing steps can be varied even when dealing with the same sensor
2. Different data ranges for satellite sensors
3. Minute differences in sensors capturing the same bands.
4. Data quality checks vary with sensors.

Where we are headed in the coming year

- What are the longer-term goals for the Working Group
  - New requirements for GeoAI standardization.

- Discussion paper
  - The results of the time series flood area image recognition by FCU/GIS
  - Welcome to joining the work

Next Quarter WG Communications Plan

- OGC invites location, AI, special interest, and the broader technology communities that foresee potential use of geospatial data in their work to attend our GeoAI Working Group's Roundtable event.

  - Training data sourcing/availability

  - Model & data drift

  - Interoperability challenges

Session Agenda

Wed, Feb 22nd 10:20am - 11:30am (Cook)

10:20am - 10:25am	Introduction, Kyoung-Sook Kim
10:23am - 10:35am	OGC Earth Observation Application Package support to MLOps : From training to model deployment, Pedro Pereira Goncalves (terradue)
10:36am - 10:51am	Federating queries and modeling across instances – beyond monolithic geodata platforms, Romeo Kienzler (IBM Research Europe)
11:51am - 11:13am	LIVING IN AN UNPREDICTABLE WORLD: Leveraging AI in large-scale 3D Digital Twins and challenges, Sacha Leprêtre (Presagis)
11:13am - 11:28am	Creating standards for EO training datasets for deep learning for better reproducibility and benchmarkable research, Jyotsna Budideti (Spacesense)
11:25am - 11:30am	Announcement of GeoAI Roundtable event, Lokendra Chauhan

The most important thing for this WG is…

We have all the ingredients to build the metaverse

What we talked about this week

- The potential for a Digital Twin Encapsulation Format
- Feel free to insert a slide or two from presentations made in the session

I3S : An OGC 3D Streaming Standard for

... 3D Objects, Meshes, Point Cloud, and now BIM data as Building Scene Layer

Evolution of a Standard

- Apr. 2015: I3S was released as an open format by Esri under Apache License

- Sep. 2016: Esri submitted I3S for OGC standardization

- Aug. 2017: OGC I3S 1.0 released supporting Integrated Mesh, 3D Object and Point Scene Layers as the first OGC 3D streaming format

- Jan. 2020: OGC I3S 1.1 released supporting Point Cloud Scene Layer

- Nov. 2021: OGC I3S 1.2 released supporting enhanced spatial indexing and PBR materials

- Dec. 2022: OGC I3S 1.3 released supporting Building Scene Layer
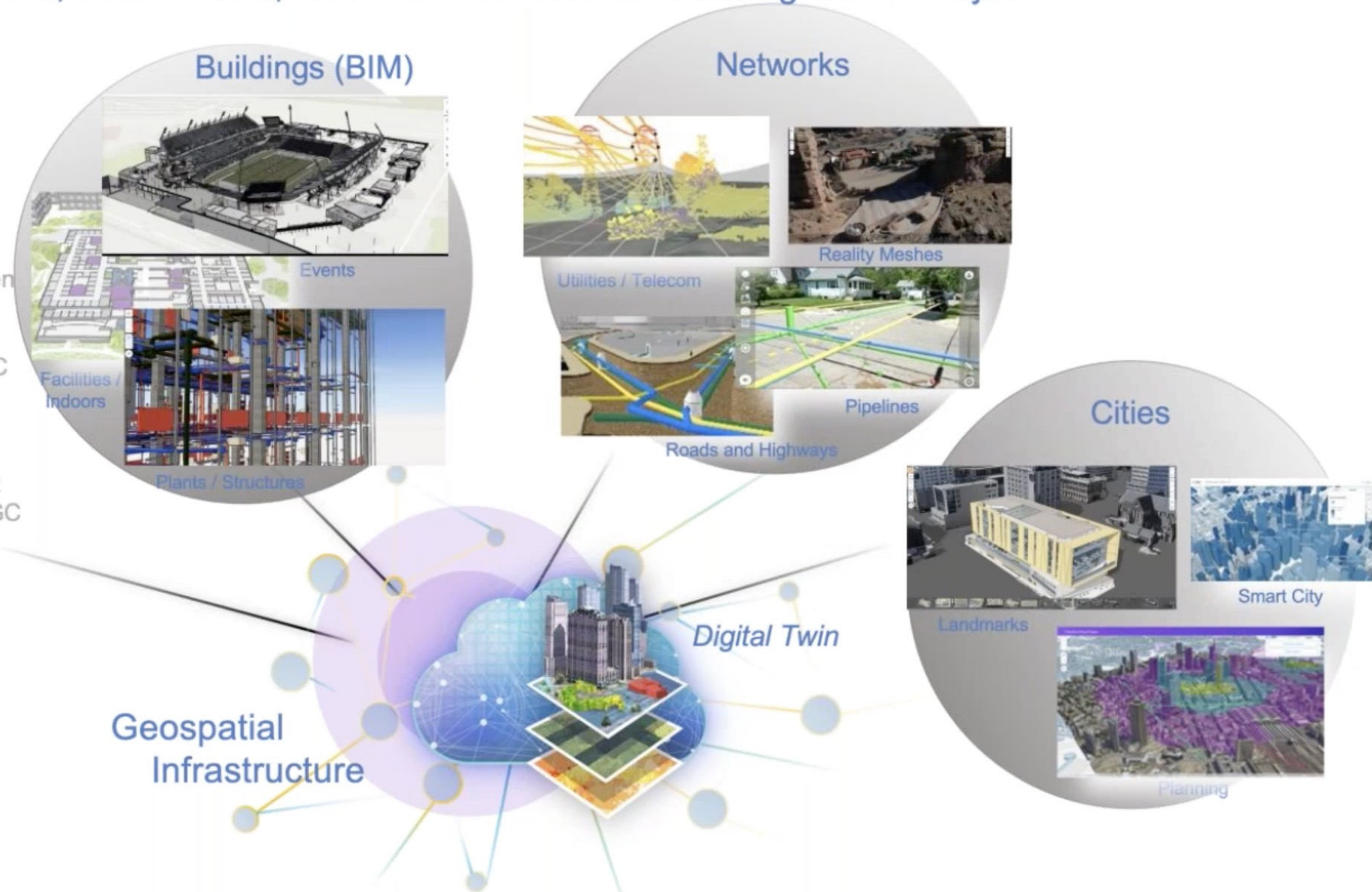
Why are we proposing a new digital twin standard for the metaverse?

1. Need for unified, reusable and modular digital twin building blocks

2. Flexibility in building diverse scenarios

3. Capacity to handle the complexity and scale of the metaverse

4. Option to expand across specific operating domains and application areas

5. Collaboration and cohesion between producers and consumers of digital twins

6. Ability to handle variation and changes across the product lifecycle

DU

Session Agenda

- Election of chairs
- Tam Belayneh, Esri: Geospatial in the Metaverse
- Roberto De Ioris, Duality Robotics: Digital Twin Encapsulation Format

Agenda

- Connected Systems API for Hydrology Applications - Alex Robin

- Water Quality IE Update – Sylvain Grellet

The most important thing for this WG is…

Broadening the scope of our Co-Chairs: Looking for diversity in at least two co-chairs:

Geographic diversity to complement existing North America Chair

Domain_background_network diversity to complement existing simulation industry background

What we talked about this week

- Excellent presentation by John Cormier from Epistemix, with great suggestions for standardization opportunities in Population Modeling

- The continuing, long-term, very solid use case for defense and industrial metaverse.

- Run this presentation in slide mode and click through the animations on the next two slides for a great two-slide description of metaverse!

The "Ownship" Paradigm...

some awareness

limited interactions

unalterable culture

unalterable models

unalterable terrain

Ownship simulation

Clouds
Atmosphere
Weather

uncorrelated/ad-hoc effects

"entity" simulations

Where we are headed in the coming year

- ISG DWG Session during the members meeting in Huntsville, AL in June

- New Co-chairs with added geographic and domain diversity

- ISG DWG sponsored Summit during the members meeting in Singapore in September

Next Quarter WG Communications Plan

- We will want to very actively promote the ISG DWG Sponsored Summit in Singapore in September. Requires early collaboration with OGC Staff for coordination of the Summit "Headline" and branding!

Session Agenda

- Introduction; search for Co-Chairs; likely Co-Chair vote in June in Huntsville

- Suggestions for Standardization of Population Modeling
	Epistemix; John Cordier

- The solid defense/industrial metaverse use case for mission rehearsal
	David Graham

The most important thing for this WG is…

- EDR API Pub/Sub Discussion Paper and upcoming plans to add a pub/sub framework into EDR API version 1.2

What we talked about this week

- Project updates on the EDR API Specification and CoverageJSON community standard

- Demonstrations on the versatility of EDR API, custom queries, and how the use of Kerchunk can aid in connecting data access APIs with Cloud datasets

- Presentations were give on WIS2 Updates, FMI discussed how EDR API will be used, and Improving access to marine data using an API standard

- EDR API Pub/Sub Discussion Paper

Where we are headed in the coming year

- Publication of EDR API version 1.1
- Code sprints, testing of EDR API version 1.2 additional functionality
- Explore what comes after 1.2 (interpolation and resampling)
- Did this week contribute to those goals? Yes
- Are any documents or other deliverables in work? Yes

Next Quarter WG Communications Plan

- Dedicated WMO WIS2 Pilot OGC API Sprint
- Dedicated pub/sub Sprint
- Advertise progress in the WMO and OGC communities
- Advertise the notion of OGC API community interpolation and resampling functionality

Session Agenda

- Introductions – Chris Little (UKMO) / Steve Olson (NWS)

- Project Updates

  - EDR API – Chris Little

  - CoverageJSON – Chris/Jon Blower

- Demonstrations

  - Versatility of EDR API (Mark Burgoyne - UKMO)

  - Updates on Items/Ensembles/Use of Kerchunk (Shane Mill - NWS)

- WIS2 Update presentation (Tom Kralidis - MSC)

- FMI EDR API presentation (Mikko Visa - FMI)

- Improving access to marine data using an API standard (Edd Lewis)

- EDR API Pub/Sub Discussion Paper (Tom, Chris, Mark, Steve, Shane)

- Closing Discussion and Any Other Business (Chris and Steve)

The most important thing for this WG is…

What's new in Version 6.0 of the Cadastre and Land Administration Thesaurus (CaLAThe)?

What we talked about this week

- Machine Readable Building Blocks

- The completed upgrade from CaLAThe 4. to 5.0

Where we are headed in the coming year

- Support the implementation of the Building Blocks Registry

- Representation of OGC Building Blocks in machine readable formats

- The planned upgrade of CaLAThe to v6.0

Session Agenda

- An update on the Definitions Server - Rob Atkinson (OGC) [10 mins]

- Machine Readable Building Blocks - Rob Atkinson (OGC), Alejandro Villar Fernandez (OGC) [10 mins]

- Discussion about requirements for the Definitions Server (All) [30 mins]

- Discussion towards CaLAThe v6 - Erik Stubkjær, Gobe Hobona (AAU, OGC) [15 mins]

- GeoXACML 3.0 – Andreas Matheus (Secure Dimensions) [15 mins]

What's new in CaLAThe v6

- Version 6 presents new and revised definitions for CaLAThe concepts.

- The intensional definition method, also known as the genus-differentia definition, recommended by ISO 704:2009 'Terminology work - Principles and methods', is applied as far as possible.

- Improves the multilingualism of CaLAThe by adding Malay terms provided by colleagues from the Centre for Real Estate Studies at Universiti Teknologi Malaysia.

- For v6 we would like to set up a fully automated transformation pipeline as a GitHub Action, a contribution towards [Land Administration DWG](#) Activities

Looking for volunteers to process Version 6

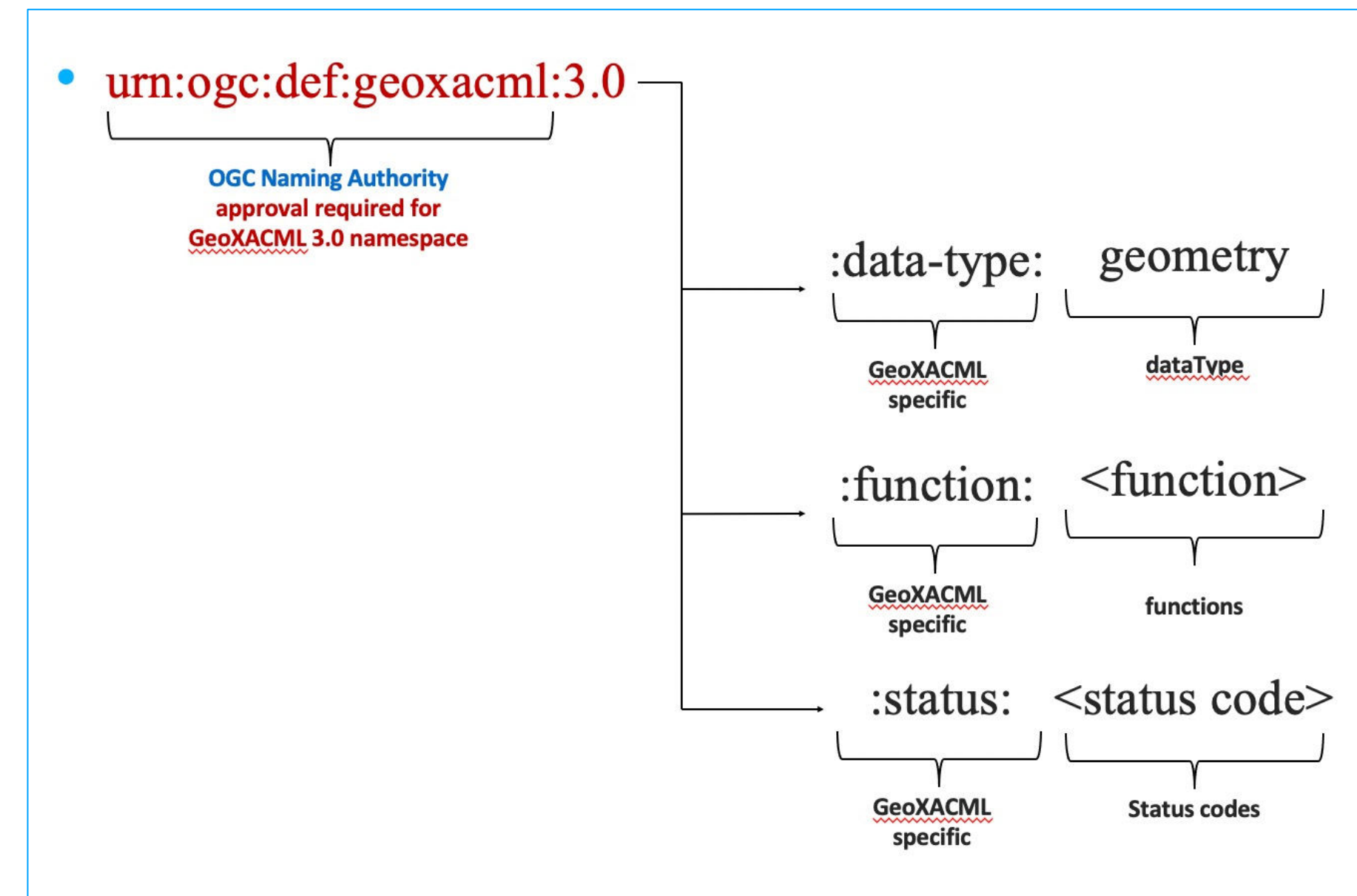For v6 we would like to set up a fully automated transformation pipeline as a GitHub Action.

Essential

- Familiarity with RDF/XML and Turtle
- Python expertise

Desirable

- GitHub Actions

OGC-NA SC Motion to approve the URN Structure of GeoXACML 3.0

- The OGC Naming Authority SubCommittee approves a URN Structure for GeoXACML 3.0 that follows the scheme: **urn:ogc:def:geoxacml:3.0**

  - Motion: Andreas Matheus

  - Second: Iikka Rinne

  - Discussion:

  - There was no objection to unanimous consent

- The GeoXACML 3.0 candidate Standard is in development. This motion addresses the URN scheme to be used in the specification.

- urn:ogc:def:geoxacml:3.0

  OGC Naming Authority approval required for GeoXACML 3.0 namespace

  :data-type: — geometry
  GeoXACML specific — dataType

  :function: — <function>
  GeoXACML specific — functions

  :status: — <status code>
  GeoXACML specific — Status codes

The most important thing for this WG is…

Not to be included on the important things voting:

We are still talking about what parts of the point cloud domain should be addressed as a standard. Looking at standardizing both data transfer and classifications.

What we talked about this week

- Discussion around where there are standards (if any) on Indoors Point Cloud Standard Classification

- Detecting changes in point clouds over time.

Where we are headed in the coming year

- Would like to examine whether the new 3D GeoVolumes standard would serve as a Point Cloud data transfer standard as well.

Next Quarter WG Communications Plan

- < Are there any upcoming events (e.g., conference papers) related to your WG that you would like OGC to promote? N/A

- <Is there a new project or outcome that you think is worthy of an article or blog post? Please add a short description.> N/A

- <Have there been any articles published online/in magazines that reference the work your WG is doing?> N/A

Session Agenda

- Thoughts on Indoors Point Cloud Standard Classification Development

  - Kathleen Ski, Iron EagleX

- Change detection in temporal point clouds

  - Vitali Diaz Mercado, TU Delft

What we talked about this week

- Reviewed the roadmap for Routing API release
  - On track, most of the items are either closed or deferred for V2
- Work will continue on routing API with more use cases for UxS
- EU regulations have to be considered by implementors
- Connected Systems, Routing, and UxS have overlaps and is recommended to align them

Session Agenda

- Clemens Portele/Jeff Harrison (interactive instruments GmbH/US Army Geospatial Center)

  - OGC Routing - Ballot Readiness

- Alex Robin/Teodor Hanchevici (SensiaSoft/Kongsberg Geospatial)

  - Overlap with Autonomy, Sensors, Things, Robots and Observations DWG

- Teodor Hanchevici (Kongsberg Geospatial)

  - EU Regulation 2021/664 and GOF2.0

- Don Sullivan (NASA)

  - UxV Usage in Volcanology

Security DWG

The 125th OGC Member Meeting

Meeting sponsor

Andreas Matheus, Secure Dimensions
23 February 2023

The most important thing for this WG is…

Data integrity and confidentiality in SensorThings API

What we talked about this week

- Different levels of access in APIs

Where we are headed in the coming year

- Data integrity and confidentiality in SensorThings and STAplus

Next Quarter WG Communications Plan

- Meet at next OGC Meeting in Huntsville

The most important thing for this WG is…

Re-charter is on the way and a small group of co-chair candidates has come forward.

What we talked about this week

- Creating Digital Twins and using them for simulation
- Scope of Digital Twins (why is there such a narrow urban focus in this group)

Where we are headed in the coming year

- Complete re-charter
- Create work programme
- Articulate OGC's position on Urban Digital Twins

Session Agenda

- Considerations for the use of AI in Urban Digital Twins, Sacha Leprêtre (Presagis)

- Objectives of group and charter (group discussion)

  - Any further comments on re-charter the Smart Cities DWG to become the Urban Digital Twins DWG?

  - Vote

  - Call for chairs

vote

- The Smart Cities DWG acknowledges the draft charter document (see meeting folder) and expresses the intention to re-charter as the Urban Digital Twins DWG.

  - Draft charter to be uploaded to pending documents and TC chair to issue electronic vote in due course.

  - There was no objection to unanimous consent