Closing Plenary

The 132nd OGC Member Meeting,

Mérida, Mexico

Scott Simmons | OGC

12 June 2025

CentroGeo

19°17'30"N 99°13'17"O 2489m

INEGI

Thank you

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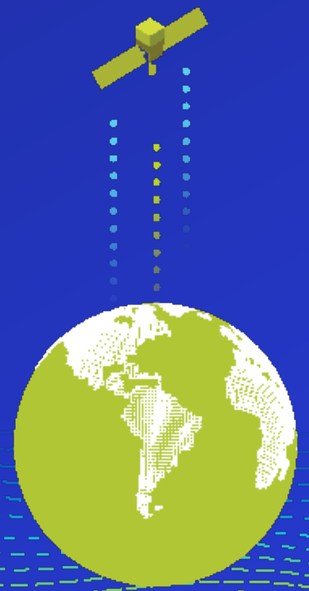
Session Agenda

- Thank you!
- Quorum confirmation
- TC Presentations and Motions
  - WCS Interpolation Extension: Peter Baumann
  - Bathymetric Attribute Grid: Steve Olson
  - Features and Geometries JSON: Clemens Portele
  - Geospatial User Feedback 2.0: Scott Simmons for Joan Maso
  - GONAR SWG: Scott Simmons for Joan Maso
  - STAC: Scott Simmons for Pete Gadomski
  - openEO: Matthias Mohr
  - Innovation Summit recap: Cassie Lee
  - Project Govern: Stefaan Verhulst
- TC Chair announcements and motions
- Periodic review of Standards
- Working Groups to inactivate
- Working Group reports with motions: 3 to Z

TC presentations and motions



WCS Interpolation Extension

The 132nd OGC Member Meeting, Mérida, Mexico

Peter Baumann, Constructor U

2025-06-10

Meeting Sponsors -

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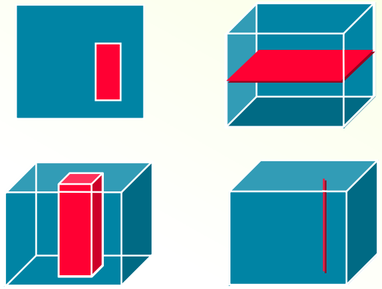
How to Hit a Datacube Slice?

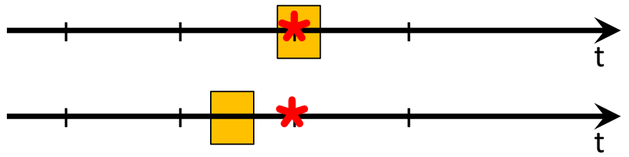
- WCS-Core: subsetting is trimming or slicing



- Trimming with arbitrary interval [a,b]:

- success

- Slicing with arbitrary slice point s:
  - Case 1: s matches direct position
  - Case 2: s not an exact direct position

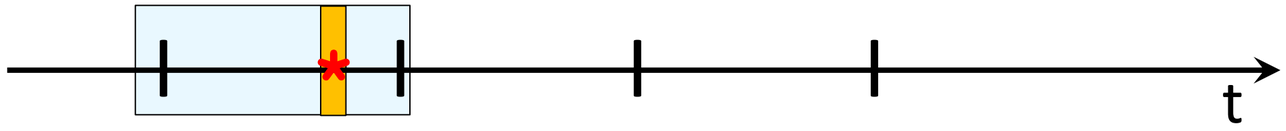


- success
- error

- When is position exact?
  - Reduced accuracy in request, such as 2024-06-17 ?
    - WMS time coordinates allow milliseconds: 2024-06-17T14:00:00.001
  - Rounding errors?

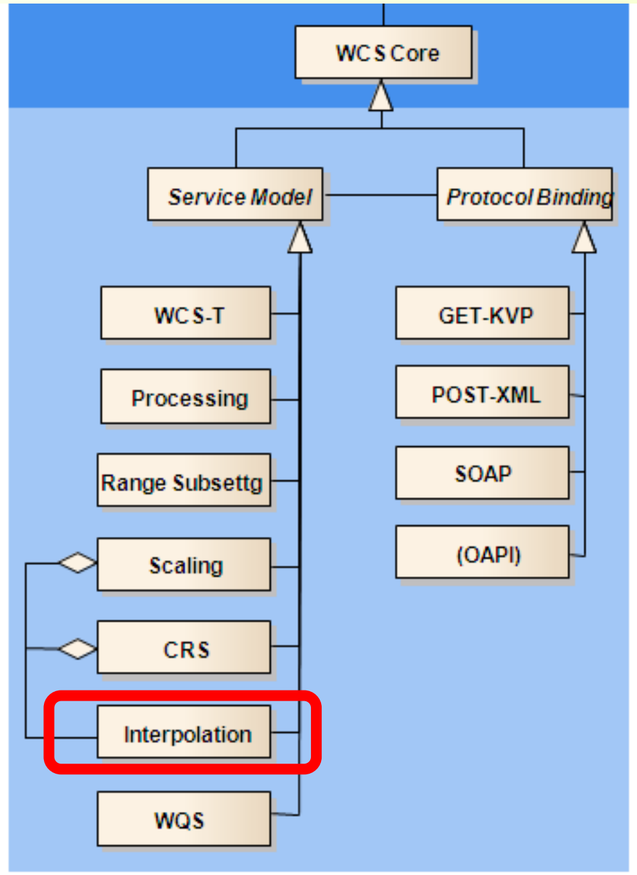
Extension of Slicing Semantics

- allow interpolation in slicing
  - slicing beyond direct positions if interpolation is defined
  - Compute slice via interpolation along axis



- Ex:
  - Nearest neighbor: pick closest direct position
  - Linear: weighted means between direct positions
- No contradiction to existing service definition in WCS Core
  - Only when interpolation is possible → WCS Interpolation

- OGC 24-018r1 on pending for WCS-Interpolation 1.1
- Status: SWG ok, OAB ok, public comments period ok



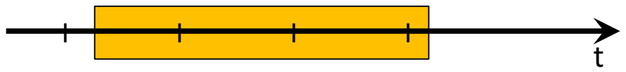
A Smooth Enhancement

OGC 24-018r1 WCS-Interpolation 1.1:

- Addition of interpolated slicing at non-direct positions
- Minimal impact:
  - No change in WCS-Core subsetting
  - No change of WCS-Interpolation behavior defined already
    - scaling, interpolation

…And Why Not Trimming?

- WCS-Core: subsetting is trimming or slicing
- Recall: Trimming with arbitrary interval [a,b]:



- With interpolation, infinite number of slices would be generated, for all (!) possible coordinates within trim interval
- Not expected behavior

BAG

Bathymetric Attributed Grid for Open Data Exchange

132nd OGC member meeting
Merida, June 2025

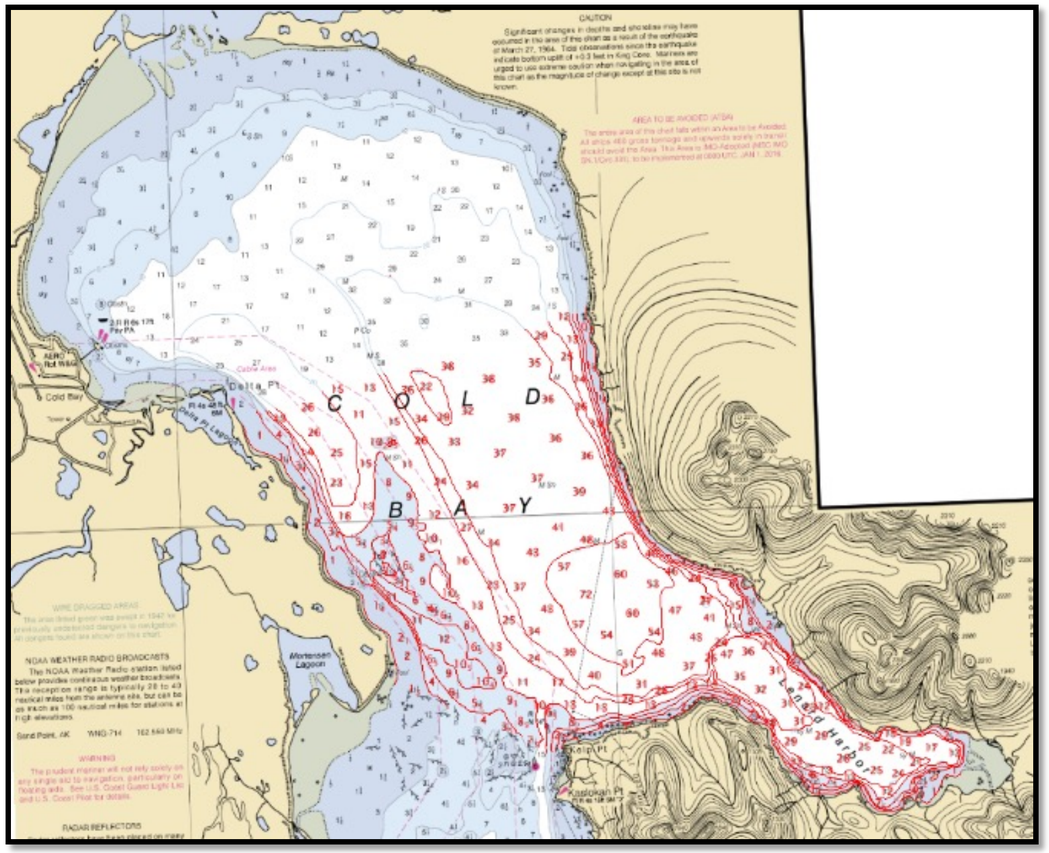
Glen Rice

www.opennavsurf.org

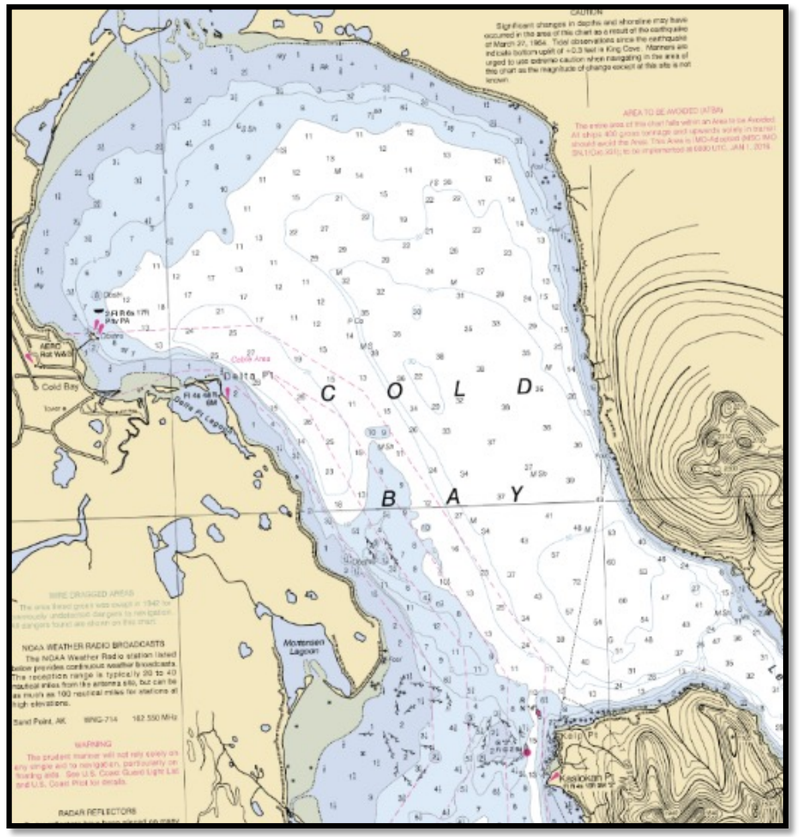

Why BAG?

Before BAG (2004)…

Hydrographic Survey (Red)

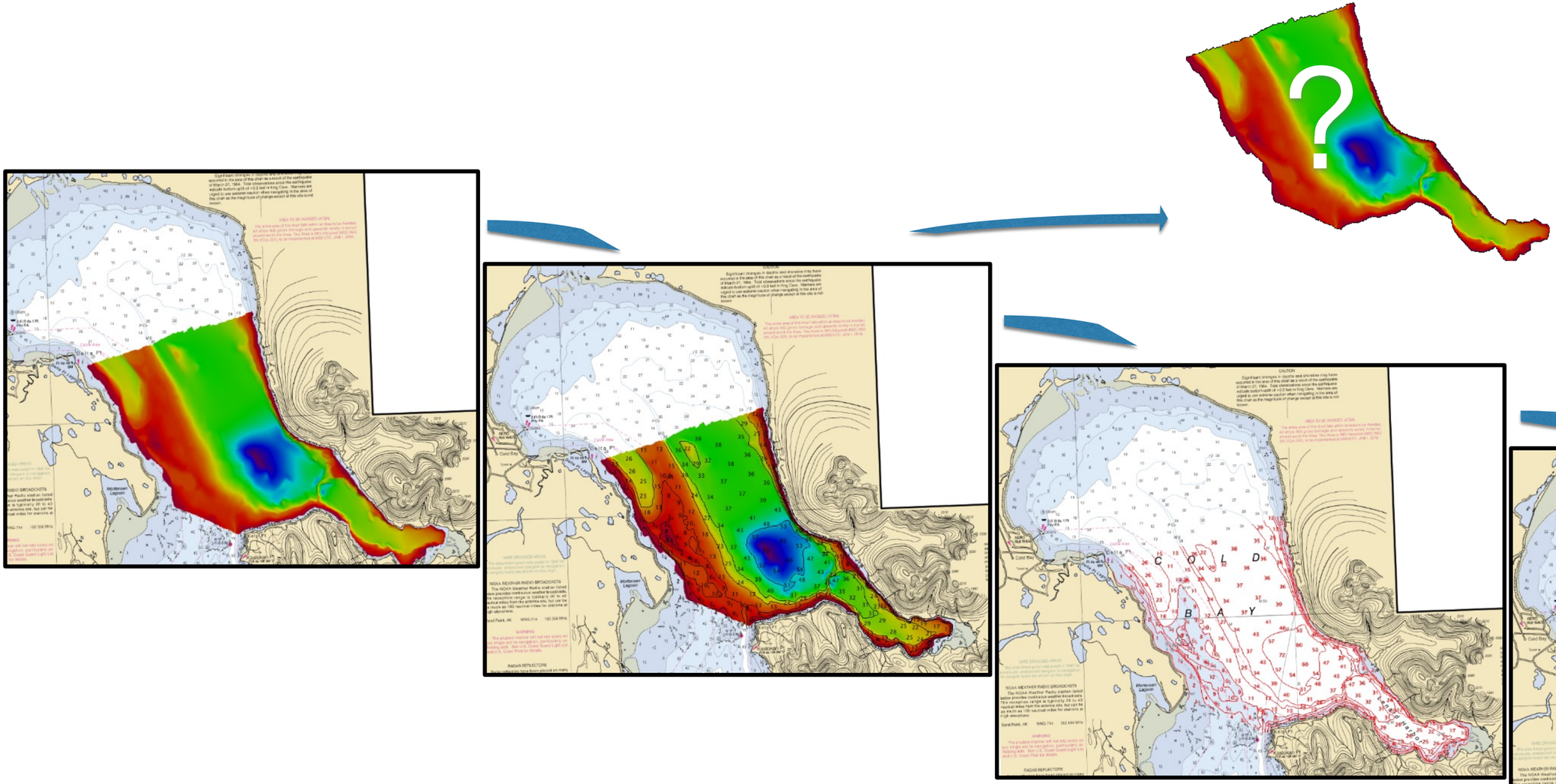


Updated Chart



Sparse soundings (lead line <=1940s; single-beam echo sounders 1950s-1990s)

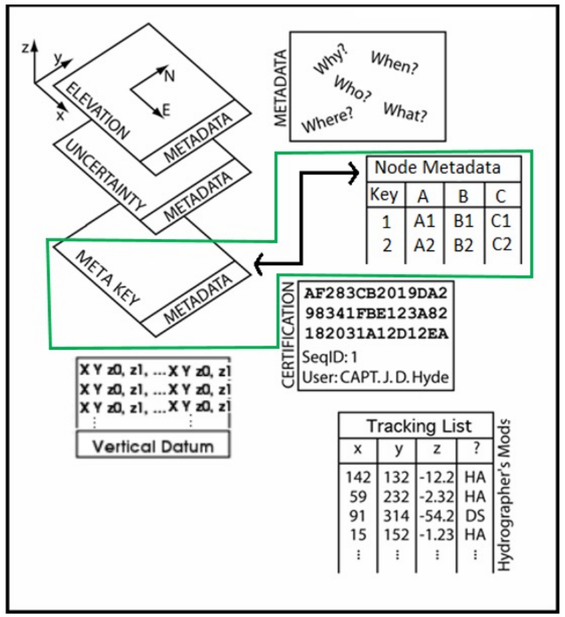
New Survey Techniques ➡ New Data Format?



Dense soundings (multi-beam echo sounders, lidar bathymetry, etc.)

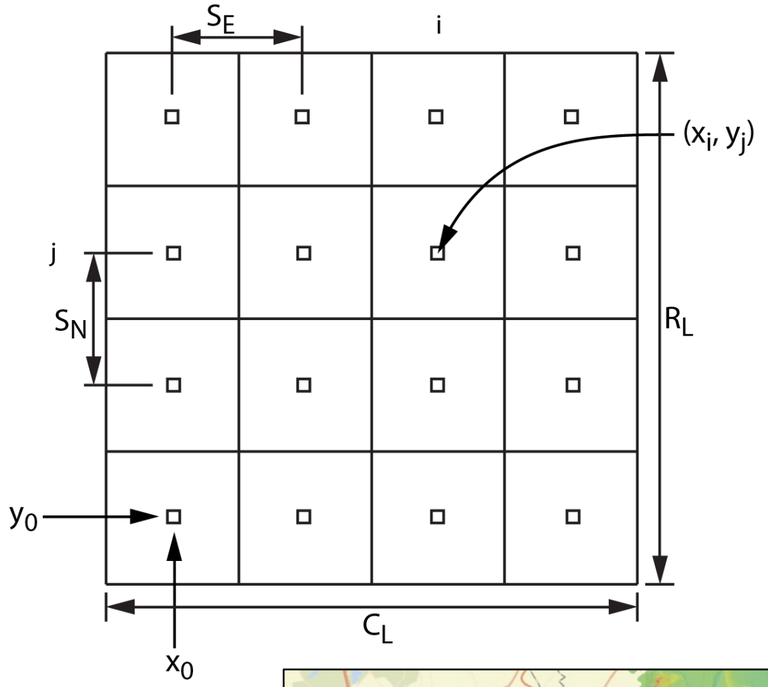
The Solution

- Open Navigation Surface Working Group
  - Formed as a partnership between Academia, Business, and Government in 2004
  - Created the Bathymetric Attributed Grid standard to facilitate data exchange between various software and support custom hydrographic constructs.
  - Meets at Hydrographic Conferences in the United States and Canada with remote attendance.
- BAG
  - Built on HDF5
  - Store raster elevation, uncertainty, metadata.
  - Extended to support additional layers

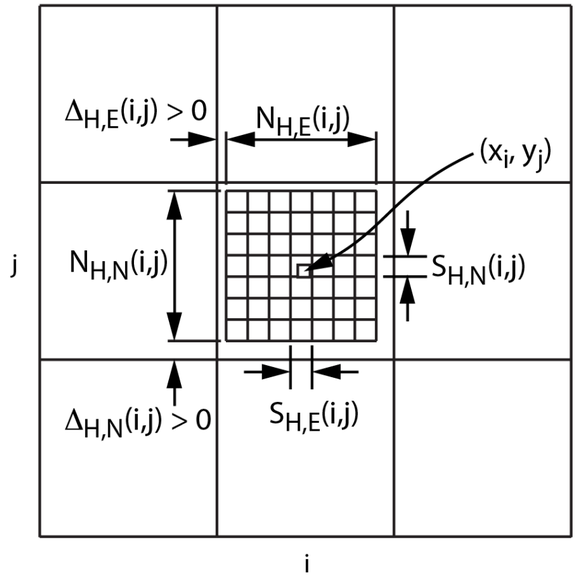


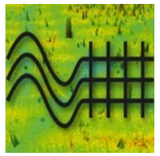
Extensions

- Variable Resolution

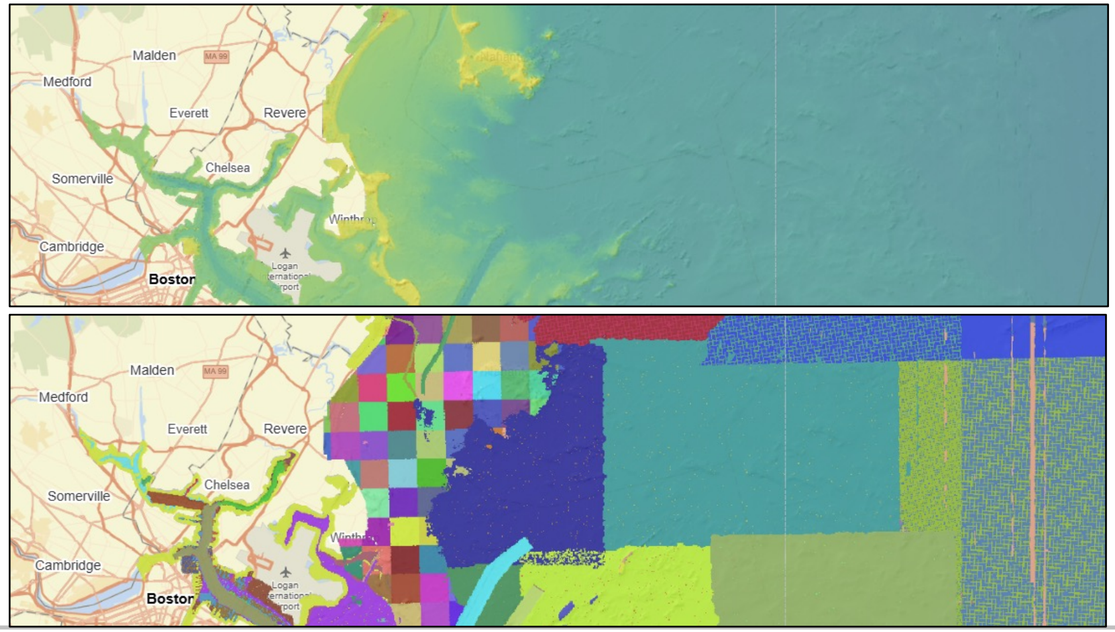


$$\Delta_{H,E}(i,j) + (N_{H,E}(i,j)\text{-}1)S_{H,E}(i,j) \le S_E$$
$$\Delta_{H,N}(i,j) + (N_{H,N}(i,j)\text{-}1)S_{H,N}(i,j) \le S_N$$

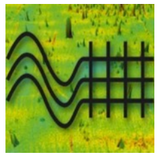




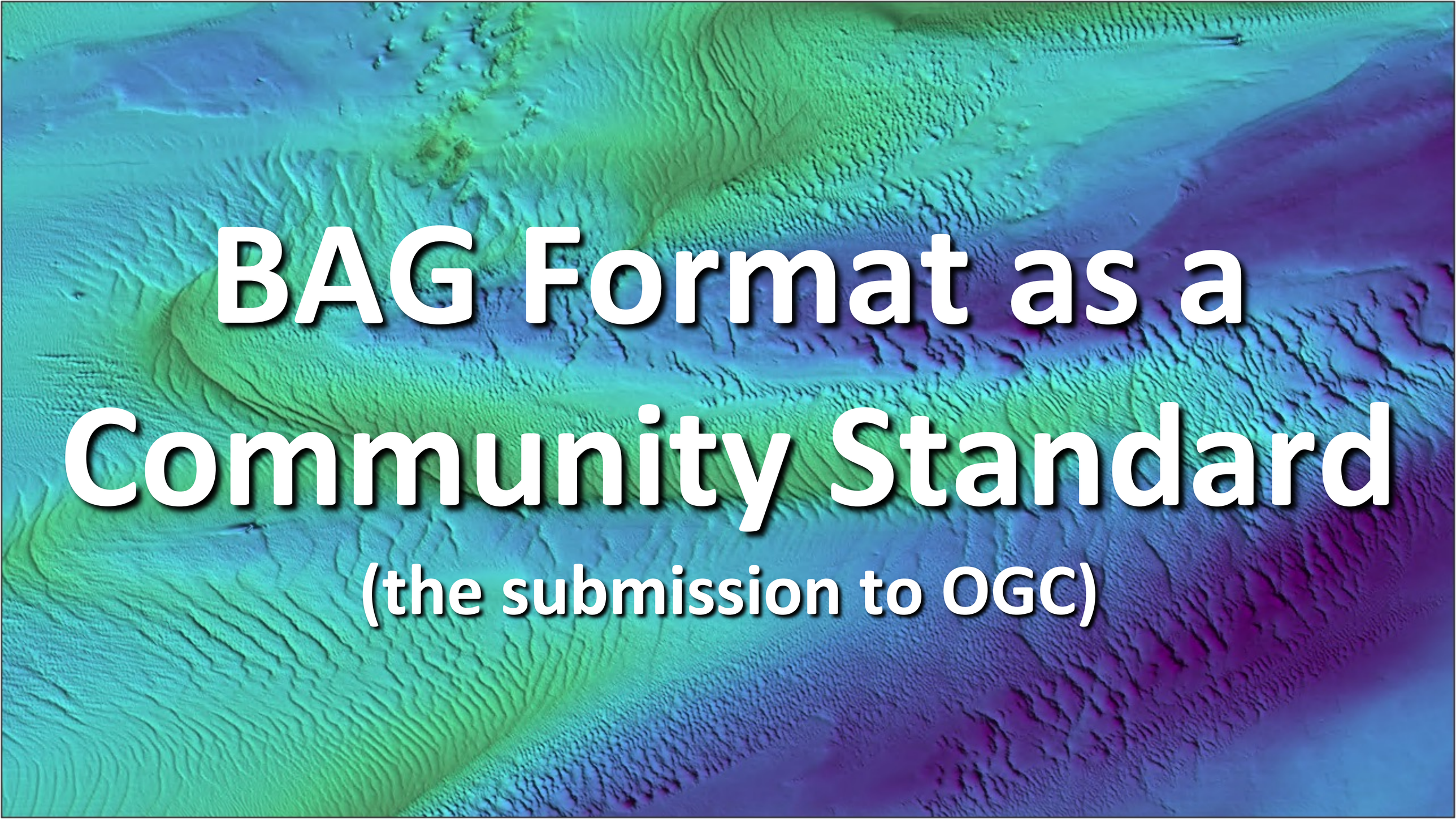
- Raster Attribute Table



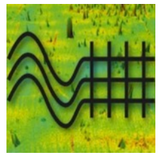
Why BAG as Community Standard?



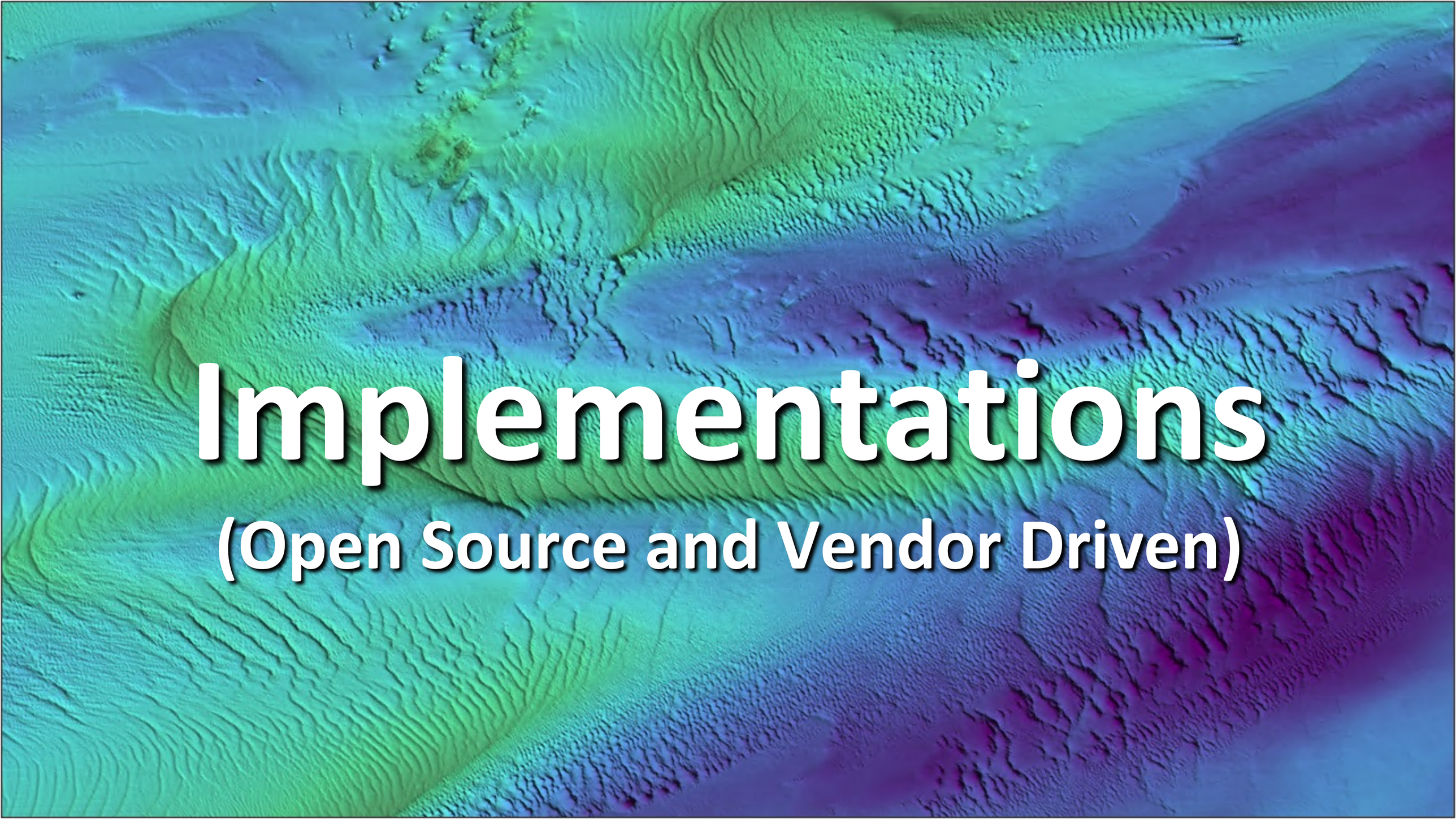
- There are substantial bathymetry data holdings in BAG
  - https://www.ncei.noaa.gov/maps/bathymetry/
- Adding BAG as a community standard reenforces FAIR (Findable, Accessible, Interoperable, Reuseable) principles for public access to these data, which aligns with the goals of the OGC.


BAG Format as a
Community Standard
(the submission to OGC)

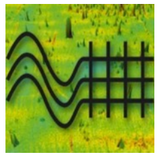
The BAG Standard



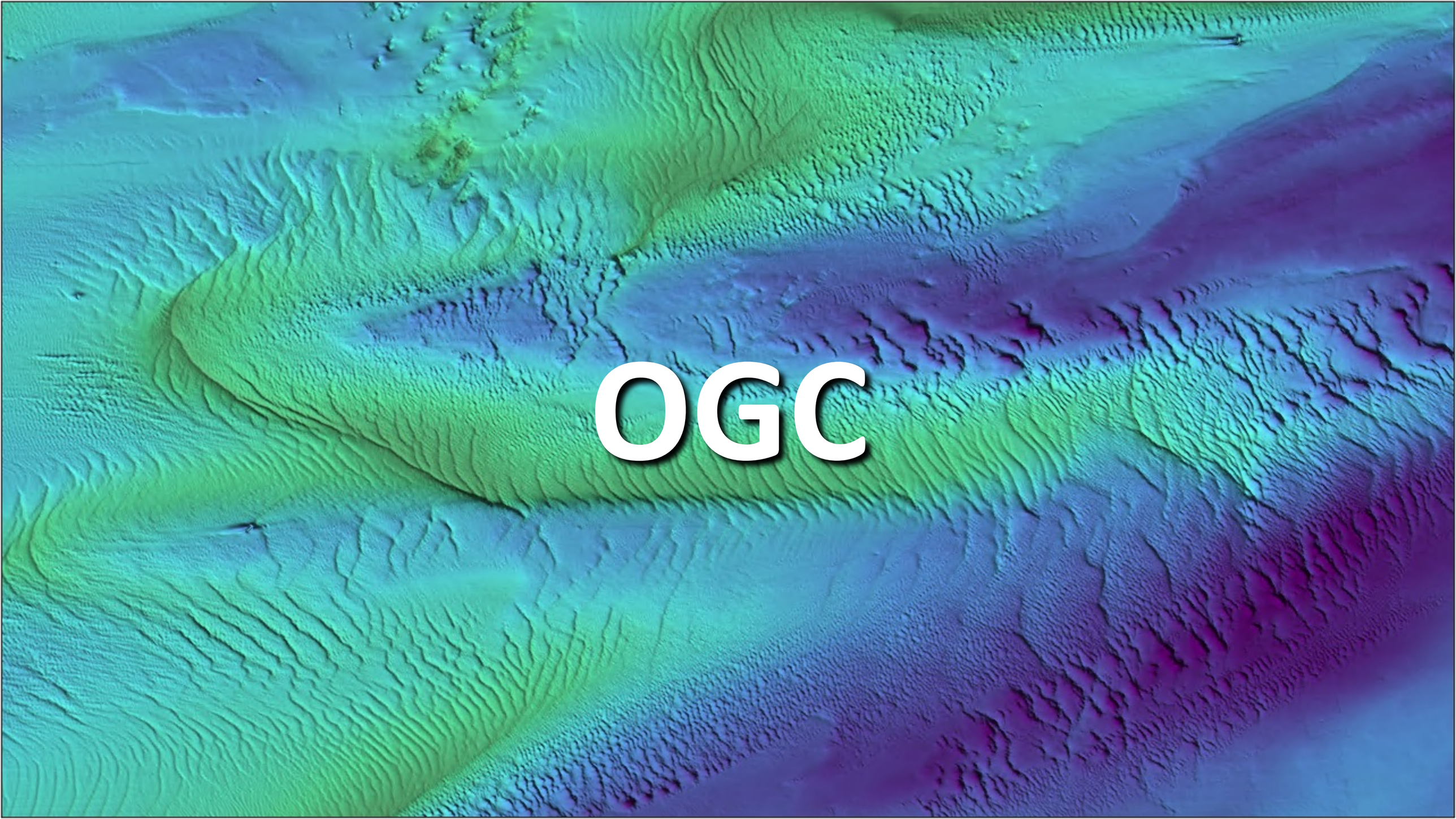
- Read the Docs
  - https://bag.readthedocs.io/en/master/


Implementations
(Open Source and Vendor Driven)

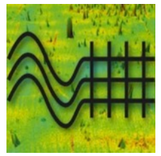
BAG Implementations



- Reference Library
  - https://github.com/OpenNavigationSurface/BAG/
  - Functionality supporting reading and writing of various data stored in the format.
  - C++ with python bindings
- Other ways to access BAG (with differing levels of support) include:
  - GDAL
  - QGIS
  - CARIS
  - SABER
  - ESRI


OGC

Relation to OGC standards



- BAG is built on HDF5, similar to netCDF.

OGC Features and Geometries JSON (JSON-FG)

The 132nd OGC Member Meeting,

Mérida, Mexico

Clemens Portele | interactive instruments

12 June 2025

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The most important thing for this Working Group is...

- Finalizing JSON-FG v1.0

About JSON-FG

- Intentional limitations exist in GeoJSON
  - Restricted to WGS 84 (longitude/latitude) as Coordinate Reference System
  - Points, line strings and polygons – no support for 3D, non-linear interpolation or measures
  - Supports spatial, but not time
  - No feature type concept, no information about the schema

- JSON-FG specifies GeoJSON extensions to address these constraints
  - Avoid edge cases, focus on capabilities that are useful for many spatial experts
  - Specify as a superset of GeoJSON: Valid JSON-FG is also valid GeoJSON
  - Extensions:
    - Additional JSON members in feature collections, features and geometries
    - Additional geometry types
  - JSON Schema is used to formally specify the JSON-FG syntax

Requirements class overview

- Mandatory extensions (Core):
  - Coordinate Reference Systems other than WGS 84
  - The ability to encode temporal characteristics of a feature
  - A statement to which JSON-FG conformance classes a JSON-FG feature collection, feature, or geometry conforms to

- Optional extensions specified in additional requirements classes:
  - Support for polyhedra as geometry types
  - Support for prisms (extruded geometries) as geometry types
  - Support for circular arcs, compound curves, and curve polygons as geometry types
  - Support for measure values in coordinates
  - The ability to declare the type and the schema of a feature

An example - three airports in the UK

- “conformsTo”:
  - declaration of the supported conformance classes
- “place”:
  - a primary feature geometry that is not a Simple Feature geometry or not in WGS 84 longitude/latitude
- “coordRefSys”:
  - Coordinate reference system of the geometry in “place”
- “geometry” (from GeoJSON):
  - a primary feature geometry that is a Simple Feature geometry and in WGS 84 longitude/latitude (optional, if “place” is provided)
- “geometryDimension”:
  - hint about the geometry types used (0 = points)
- “featureType”, “featureSchema”:
  - Information about the type of a feature and the logical schema of the features of that type


```
{
  "type": "FeatureCollection",
  "conformsTo": [
    "http://www.opengis.net/spec/json-fg-1/0.3/conf/core"          ,
    "http://www.opengis.net/spec/json-fg-1/0.3/conf/types-schemas"
  ],
  "coordRefSys": "http://www.opengis.net/def/crs/EPSG/0/27700",
  "featureType": "Airport",
  "featureSchema": "https://demo.ldproxy.net/zoomstack/collections/airports/schema",
  "geometryDimension": 0,
  "features": [
    {
      "type": "Feature",
      "id": 1,
      "geometry": { "type": "Point", "coordinates": [-1.6930015, 60.3216821] },
      "properties": {"name": "Papa Stour Airstrip"},
      "place": { "type": "Point", "coordinates": [417057.93, 1159772.2] }
    },
    {
      "type": "Feature",
      "id": 2,
      "geometry": { "type": "Point", "coordinates": [-1.2922268, 59.8782666] },
      "properties": {"name": "Sumburgh Airport"},
      "place": { "type": "Point", "coordinates": [439723.69, 1110559.95] }
    },
    {
      "type": "Feature",
      "id": 46,
      "geometry": { "type": "Point", "coordinates": [0.9384272, 50.9556174] },
      "properties": {"name": "Lydd Airport"},
      "place": { "type": "Point", "coordinates": [606468.75, 121465.11] }
    }
  ]
}
```

Another example – a road accident in Germany

- “time”:
  - a primary temporal information


```
{
  "type": "Feature",
  "coordRefSys": "http://www.opengis.net/def/crs/EPSG/0/25832",
  "conformsTo": [
    "http://www.opengis.net/spec/json-fg-1/0.2/conf/core"
  ],
  "id": 1,
  "geometry": null,
  "place": {
    "type": "Point",
    "coordinates": [
      378660.21,
      5626466.55
    ]
  },
  "time": {
    "instant": "2019-02-05T07:00:00Z"
  },
  "properties": {
    "unfzeit": "2019-02-05T07:00:00Z",
    "hauptunft": "Einbiege-/Kreuzungs-Unfall",
    "unfart": "Zusammenstoß mit Fahrzeug, das einbiegt oder kreuzt",
    "unfkat.bez": "Unfall mit Leichtverletzten",
    "unfkat.knz": "3",
    "strzust1": "Nass/Feucht",
    "abs": "5209062A52090470",
    "stat": 851,
    "fahrtri": "Fahrtrichtung in absteigender Stationierungsrichtung",
    "netzstand": "2022-10-21T18:00:00Z"
  }
}
```

Technical changes since the Public Comment Period

- Improvements
  - Use “application/geo+json” as the media type, do not register a JSON-FG media type
    - Supports GeoJSON clients that access JSON-FG documents over HTTP
    - Specification of three GeoJSON profiles
  - Geometries are also first class JSON-FG objects, not just features and feature collections
    - Allows, for example, reuse of the geometries in future versions of CQL2-JSON
  - Updated JSON Schemas to test more requirements through JSON Schema validation
- New capabilities
  - Added support for circular arcs – plus curves and surfaces with arcs
  - Added support for measure (M) coordinates
- Removed from scope
  - The permission to use non-Euclidean metrics, in particular ellipsoidal metrics
    - This would break GeoJSON, which requires Euclidean metrics for GeoJSON geometry types
    - GeodesicString has been added as an example of a geometry extension
  - Support for CURIEs
    - CURIEs add overhead to parsers, but are not an advantage to writers

Circular arcs

- New geometry types CircularString, CompoundCurve, CurvePolygon, MultiCurve, MultiSurface
- JSON representation based on WKT of the geometry types with the same name from SQL/MM
  - Following the same conventions as GeoJSON – the use of “coordinate” arrays, a “type” member and a “geometries” array for collections of geometries
- Widely implemented in spatial databases
- Multiple requests for support


```
{
  "conformsTo": [
    "http://www.opengis.net/spec/json-fg-1/0.3/conf/core",
    "http://www.opengis.net/spec/json-fg-1/0.3/conf/circular-arcs"
  ],
  "coordRefSys": "http://www.opengis.net/def/crs/OGC/0/CRS84",
  "type": "CompoundCurve",
  "geometries": [
    {
      "type": "LineString",
      "coordinates": [
        [4.5362932, 51.5906989],
        [4.5362737, 51.5906938]
      ]
    },
    {
      "type": "CircularString",
      "coordinates": [
        [4.5362737, 51.5906938],
        [4.5362567, 51.5906829],
        [4.5362591, 51.5906678]
      ]
    },
    {
      "type": "LineString",
      "coordinates": [
        [4.5362591, 51.5906678],
        [4.5363324, 51.5906866]
      ]
    },
    {
      "type": "CircularString",
      "coordinates": [
        [4.5363324, 51.5906866],
        [4.5363173, 51.5906983],
        [4.5363037, 51.5906992]
      ]
    }
  ]
}
```

Measure (M) coordinates

- GeoJSON supports more than three coordinates in a position, but discourages non-spatial coordinates
- Multiple requests for support
- M coordinates are supported in WKT and widely supported in spatial databases
- “measures”
  - Used to declare the use of M coordinates in geometries
  - The meaning of the X/Y or X/Y/Z coordinates is declared through the “coordRefSys” member
  - “unit” and “description” provide metadata (optional)
- Only in “place”, not in “geometry”


```
{
  "type": "Feature",
  "id": "371304103613255A",
  "conformsTo": [
    "http://www.opengis.net/spec/json-fg-1/0.3/conf/core"    ,
    "http://www.opengis.net/spec/json-fg-1/0.3/conf/measures"
  ],
  "coordRefSys": "http://www.opengis.net/def/crs/OGC/0/CRS84",
  "measures": {
    "enabled": true,
    "unit": "km",
    "description": "Kilometers along the road based on the kilometer
    markers. Positions between two physical markers are interpolated."
  },
  "geometry": null,
  "place": {
    "type": "LineString",
    "coordinates": [
      [7.9379077, 52.2841795, 227.396],
      [7.9386618, 52.2856218, 227.227],

      [7.9438507, 52.3024014, 225.325],
      [7.9443588, 52.3034069, 225.208]
    ]
  },
  "time": {"instant": "2022-10-21T18:00:00Z"},
  "properties": {
    "road": "A1",
    "num": "8",
    "type": "Abschnitt",
    "length_m": 2188
  }
}
```

GeoJSON profiles

- A GeoJSON document should use the “application/geo+json” media type
- A profile specifies “additional semantics (constraints, conventions, extensions) that are associated with a resource representation, in addition to those defined by the media type” [RFC 6906]
- JSON-FG specifies three profiles for use in Web APIs such as those implementing OGC API Features
  - RFC 7946 ("rfc7946"): GeoJSON as specified in RFC 7946
  - JSON-FG ("jsonfg"): JSON-FG as specified in this Standard
  - JSON-FG with improved support for GeoJSON readers ("jsonfg-plus"): JSON-FG with a geometry in the "geometry" member
- Profiles are requested via a ”profile” query parameter (one or more profiles)
  - Example: `...&profile=jsonfg-plus,rel-as-uri`

HTTP-Response with Profile “rfc7946”

Example 16. HTTP response with a feature in the profile "RFC 7946".

```
HTTP/2 200
Content-Crs: <http://www.opengis.net/def/crs/EPSG/0/27700>
Content-Language: en
Content-Type: application/geo+json
Date: Sun, 27 Apr 2025 13:19:31 GMT
Link: <http://www.opengis.net/def/profile/OGC/0/rfc7946>; rel="profile"
Vary: Accept,Accept-Language,Accept-Encoding
Content-Length: 160

{
    "type": "Feature",
    "id": 13,
    "geometry": { "type": "Point", "coordinates": [132440.63, 651435.92] },
    "properties": {"name": "Islay Airport"}
}
```

HTTP-Response with Profile ”jsonfg-plus”

Example 18. HTTP response with a feature in the profile "JSON-FG with improved support for GeoJSON readers".

```
HTTP/2 200
Content-Crs: <http://www.opengis.net/def/crs/EPSG/0/27700>
Content-Language: en
Content-Type: application/geo+json
Date: Sun, 27 Apr 2025 13:19:31 GMT
Link: <http://www.opengis.net/def/profile/OGC/0/jsonfg-plus>; rel="profile"
Vary: Accept,Accept-Language,Accept-Encoding
Content-Length: 556

{
    "type": "Feature",
    "featureType": "Airport",
    "featureSchema": "https://demo.ldproxy.net/zoomstack/collections/airports/schema",
    "coordRefSys": "http://www.opengis.net/def/crs/EPSG/0/27700",
    "conformsTo": ["http://www.opengis.net/spec/json-fg-
1/0.3/conf/core","http://www.opengis.net/spec/json-fg-1/0.3/conf/types-schemas"],
    "id": 13,
    "geometry": { "type": "Point", "coordinates": [-6.2580609, 55.6824121] },
    "properties": {"name": "Islay Airport"},
    "place": { "type": "Point", "coordinates": [132440.63, 651435.92] }
}
```

Implementations

- Multiple implementations of the previous draft (v0.2)
  - Servers/APIs
  - Map clients
  - Converters (including GDAL)
  - Validators (including the OGC Checker by Geonovum)
- Tested and used in multiple code sprints
- Changes since v0.2 that may affect current implementations (ignoring new capabilities):
  - Use of “application/geo+json” as the media type, use of GeoJSON profiles
  - Removal of CURIEs
  - New version → new Conformance Class URIs
- At least two implementations will be upgraded, including support for the new capabilities, in parallel to the approval process

Dependency on OGC API – Features – Part 5: Schemas

- Schemas referenced by a “featureSchema” member are logical schemas that conform to OGC API – Features – Part 5: Schemas
- Part 5 is currently still a draft
- Close to finalization, should be submitted to the TC in a few weeks
- Delay JSON-FG publication until the vote of Part 5 has passed?

Geospatial User Feedback v2.0

The 132nd OGC Member Meeting,

Mérida, Mexico

Joan Maso | UAB-CREAF

12 June 2025

CentroGeo

19°17'30"N 99°13'17"O 2489m

INEGI

What's GUF?

Geospatial User Feedback (**GUF**): OGC 15-097 Standard

- **Metadata produced by the consumers** of geospatial data products as they use and gain experience with those products.

- The standard **allows** for documenting feedback items such as **ratings, comments, quality reports, citations, significant events, etc**. about the usage of the data.

- **Complements existing metadata** whereby documents recording dataset characteristics and production workflows are generated by the creator,
publisher, or curator of a data product.

Why a revision was needed

- By re-implementing it we found some small mistakes that we wanted to be corrected
- We discover that contributions from the users can go beyond feedback.

  They can produce content, results, code... about the geospatial data that are worth to share.

  The same "platform" can help to do so if the GUF model was extended a bit.
- Needed to change the conceptual model and the XML encoding.

Micropublishing

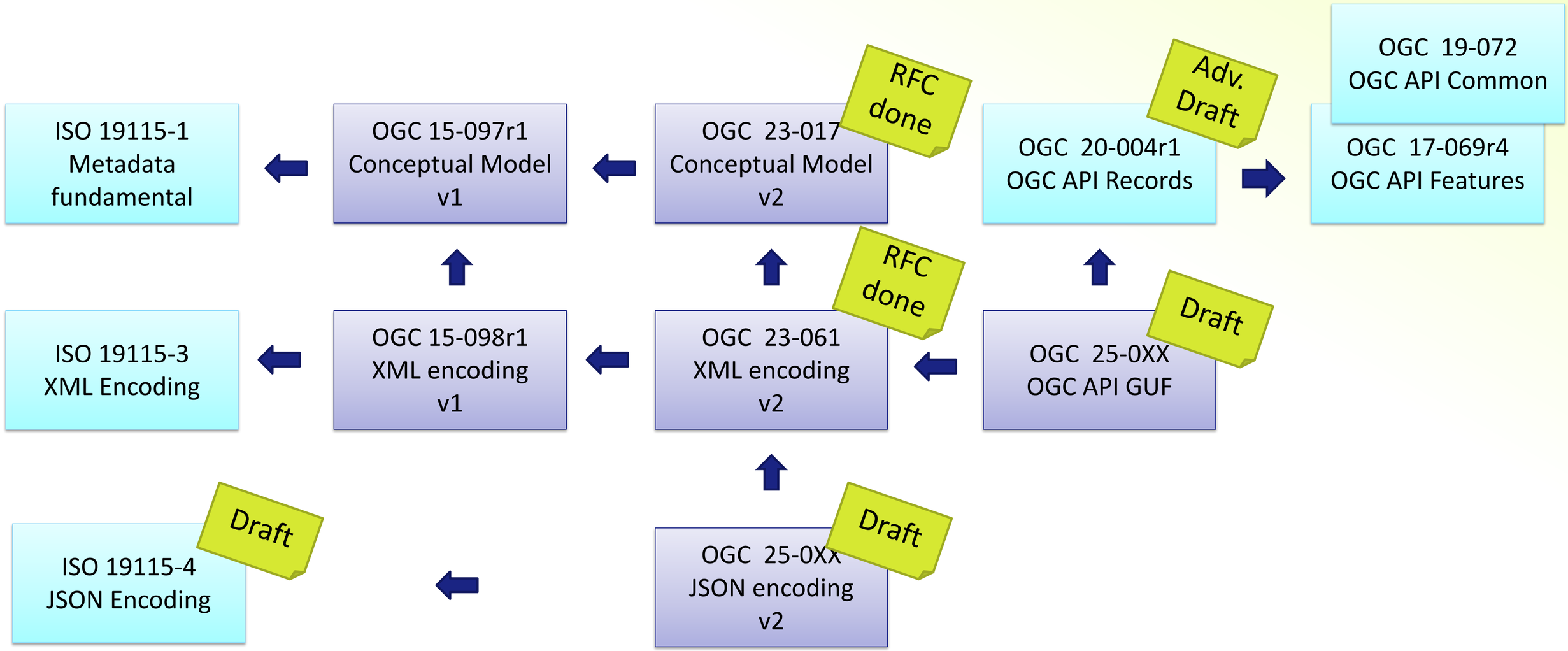
The Turing Way Community

What is Micropublishing?

A micropublication can be thought of as a mini research article - they are a small, simple articles describing a single result or claim without a broader narrative. They are also referred to as a brief or short report.

The idea behind micropublishing is to get more research published and out in the open so it can be used by other researchers. For example during a research lifecycle, you may get small results from pilot experiments that won't fit the narrative of your final traditional research article, therefore micropublishing allows you to get this kind of thing published.

Where is the GUF evolving?

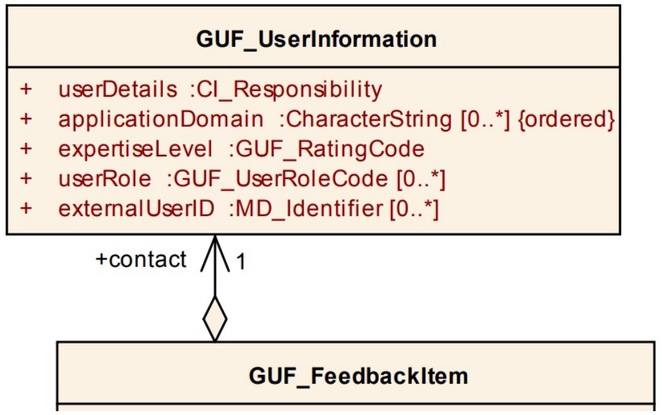


Open Geospatial Consortium

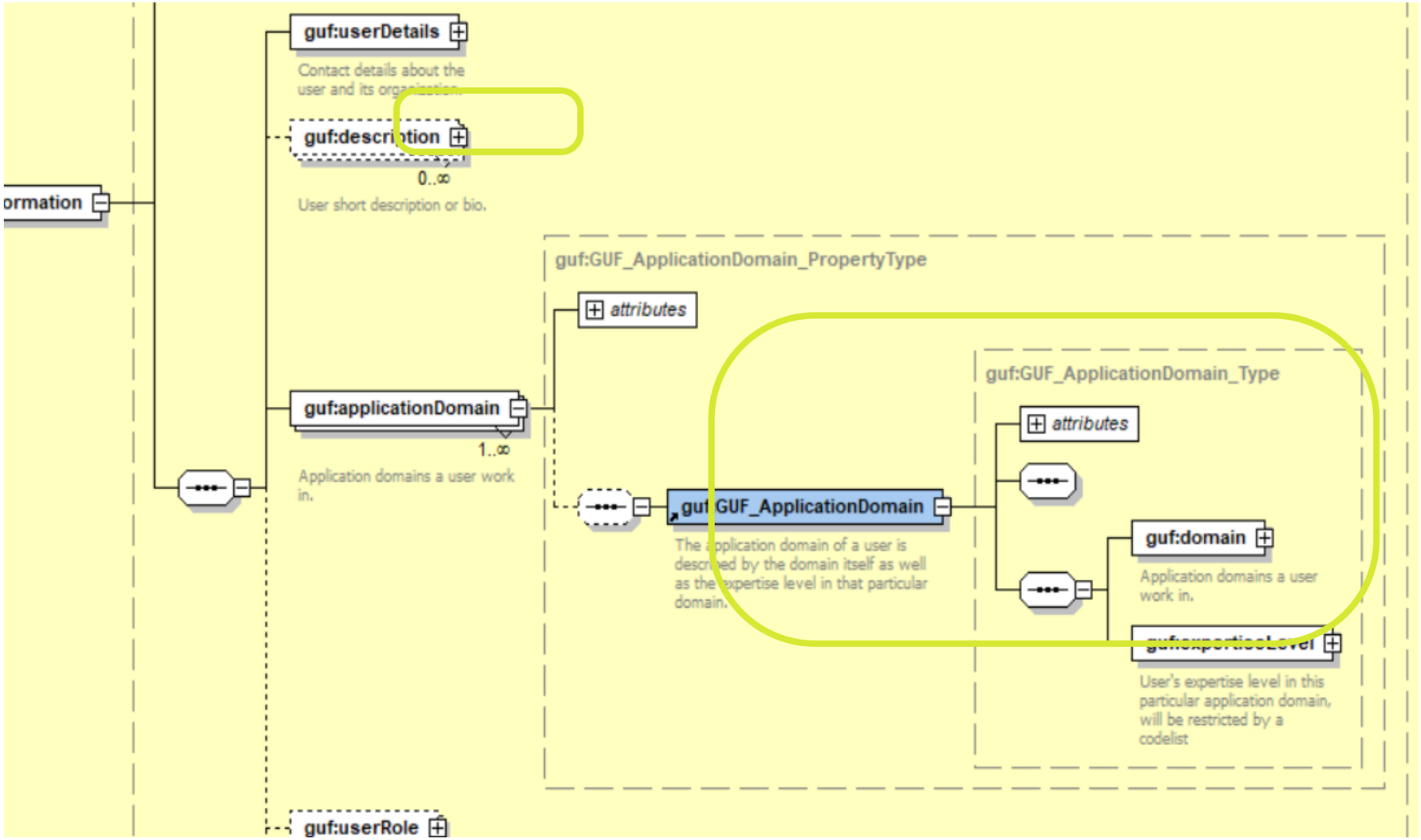
A bit of UML on what is new

GUF_UserInformation

PREVIOUS

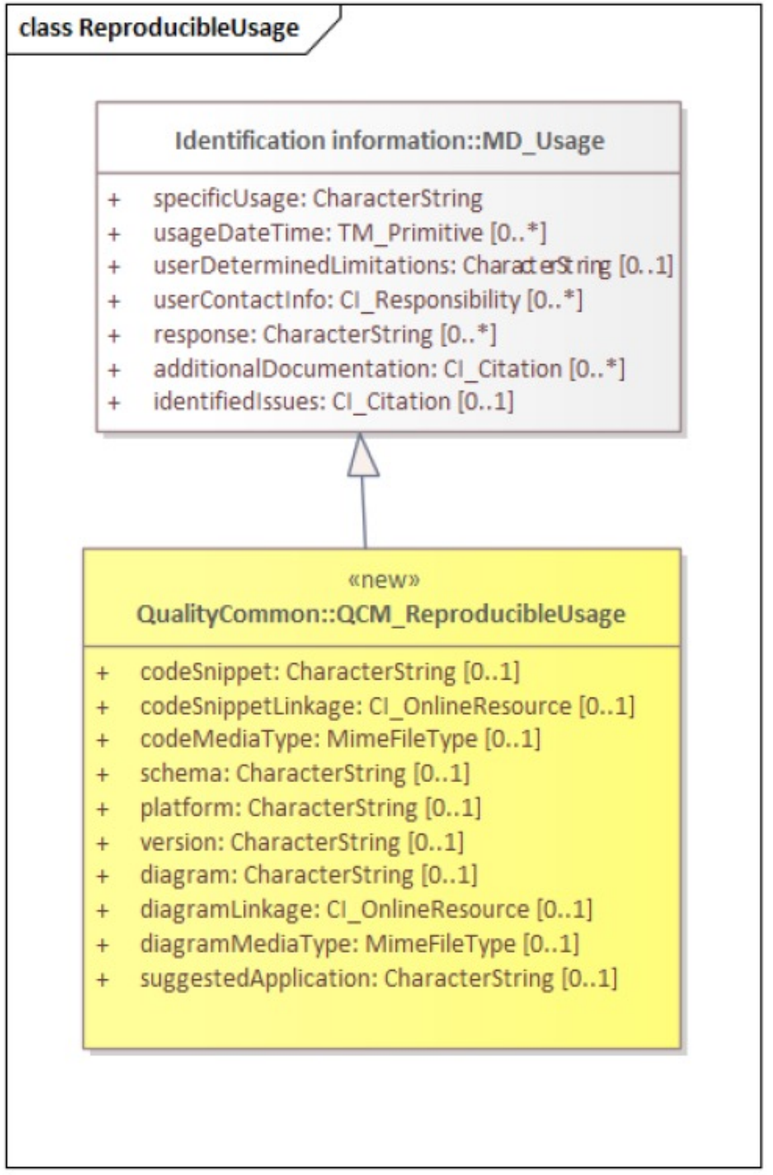


PROPOSAL



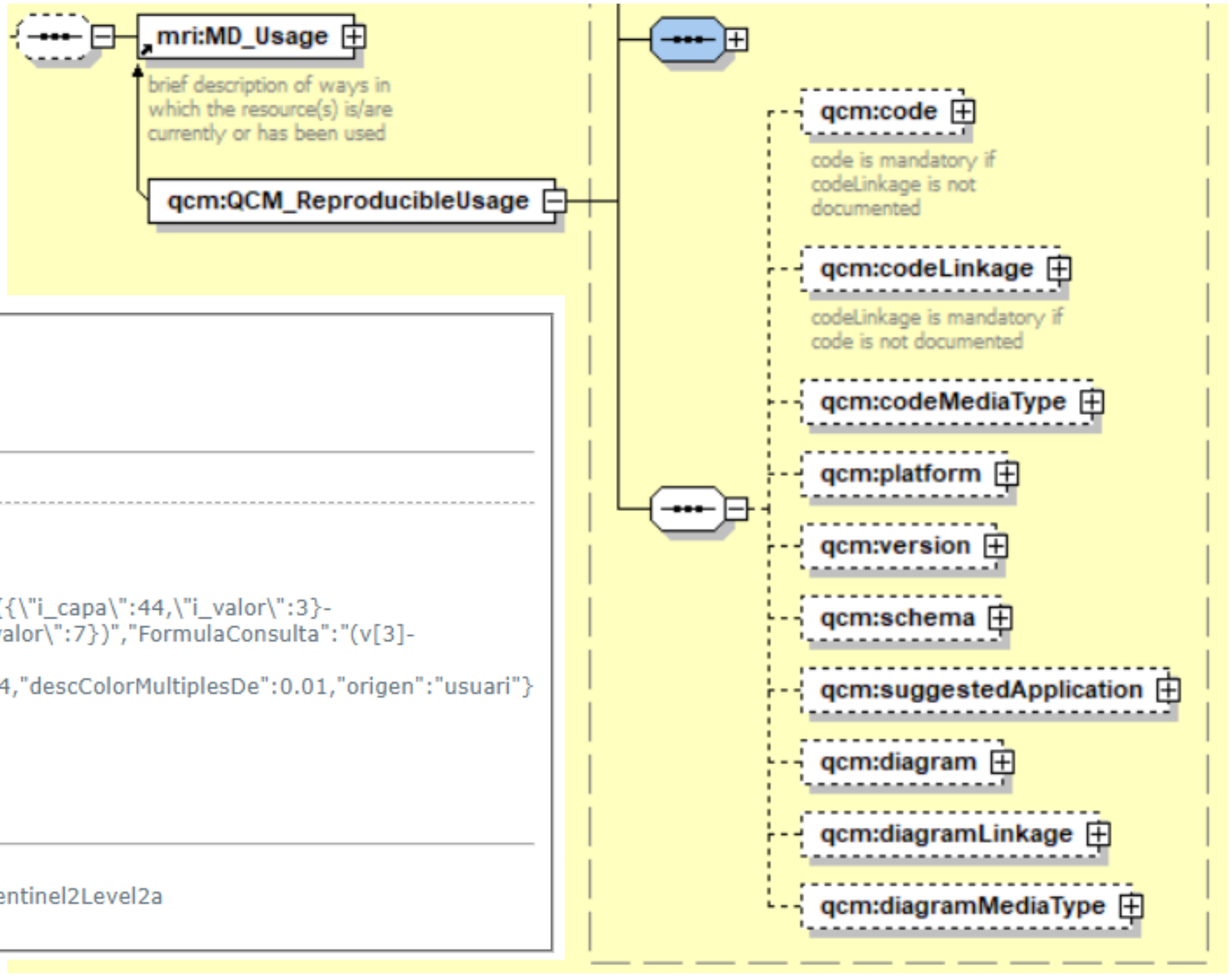
New applicability to share gained kwowledge on the data.

- The existing usage element was designed for descriptive text
- We can extend to code that can be used to reproduce some "analytics" done in the data.
  - E.g. I did a new RS band combination and I would like to share this.
  - E.g. I better characterized the meaning of the columns in a table and I would like to share it.



New QCM_ReproducibleUsage

PROPOSAL



Example

JoanMaso, 2022-07-05 15:56:40

NiMMbus Id.: ZLG28NJV7U5085741S99NP1218V5YOEN38V6DRQN02Y393N
Abstract: NDVI2
User role: General public
Date (creation): 2022-07-05

Aspect reported: Usage

Specific usage description: Share style
Usage date and time: 2022-07-05T15:56:00Z
Reproducible usage:
Code (text): {"nom":null,"desc":"NDVI2","TipusObj":"P","component":[{"calcul":"({\"i_capa\":44,\"i_valor\":3}-{\"i_capa\":44,\"i_valor\":7})/({\"i_capa\":44,\"i_valor\":3}+{\"i_capa\":44,\"i_valor\":7})","FormulaConsulta":"(v[3]-v[7])/(v[3]+v[7])","estiramentPaleta":{"valorMinim":-1,"valorMaxim":1}}],"metadades":null,"nItemLlegAuto":20,"ncol":4,"descColorMultiplesDe":0.01,"origen":"usuari"}
Code format: JSON (application/json)
Platform: https://github.com/joanma747/MiraMonMapBrowser
Version: 6.0
Schema: config-schema.json#/definitions/estil
Suggested application: http://maps.ecopotential-project.eu/

Target resource (Primary): Sentinel 2 L2A
Identifier: http://www.datacube.cat/cgi-bin/ecopotential/miramon.cgi/CamargueSentinel2Level2a
NiMMbus Id.: CR751283YK2T625RX715446P727SHF3K752B71WP614J955

WG action motion in Montreal 2024

- The GUF.SWG agrees that 23-017 "OGC Geospatial User Feedback Standard: Conceptual Model v.2.0" and 23-061 "OGC Geospatjal User Feedback Standard: XML Encoding v.2.0" are send to the OAB for approval of a public review (as part of the process to approve them as OGC standards)
  - Pending any final edits and review by OGC staff
  - Motion: Marie Lambois (IGN-F)
  - Second: Alaitz Zabala (UAB-CREAF)
  - Discussion:
  - There was no objection to unanimous consent

We went to the OAB and applied requested changes.

Joan Maso <joan.maso@ieee.org> Mon, Feb 3, 11:15 AM

to Scott, Alaitz, Oscar

This is to inform you that we have acted on the suggestion from the OAB to the Conceptual Framework release notes and there is a "r1" of the document available on the portal.

So I believe we are ready for the e-vote on the 2 documents:
https://portal.ogc.org/files/?artifact_id=108150&version=1
https://portal.ogc.org/files/?artifact_id=108149&version=1

with their respective release notes
https://portal.ogc.org/files/?artifact_id=110348&version=1
https://portal.ogc.org/files/?artifact_id=108147&version=1

If you require anything else from us, let me know.

Thanks,

Joan Masó
joan.maso@ieee.org
CREAF

- The documents went to RFC. RFC period is closed and no comments were received.

Geospatial Observation Needs And Requirements (GONAR) SWG

The 132nd OGC Member Meeting,

Mérida, Mexico

Joan Maso & Alba Brobia | CREAF

10 June 2025

CentroGeo

19°17'30"N 99°13'17"O 2489m

INEGI

Why standardization of “data requirements” (for in-situ observations)

- *Data requirements* are the specifications describing potential datasets that a project needs to collect, store, analyze, and present to achieve the project objectives

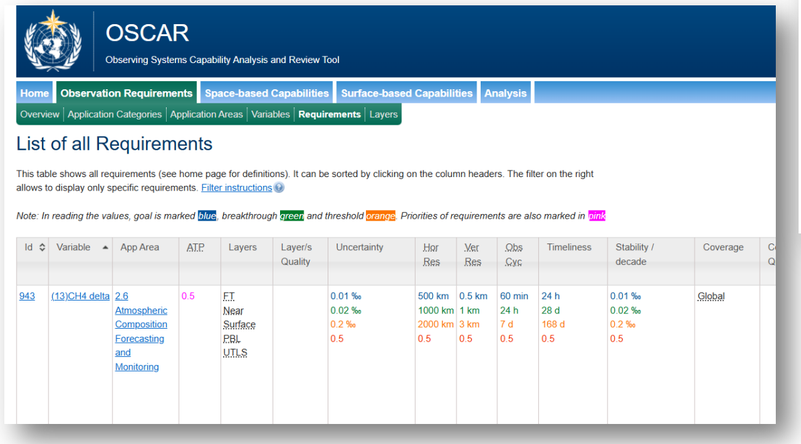
- During the study on previous existing models for describing geospatial data requirements, we were not able to identify any specific standard (in the OGC or in any other standardization body) with focus on requirements for observations *from the user point of view*

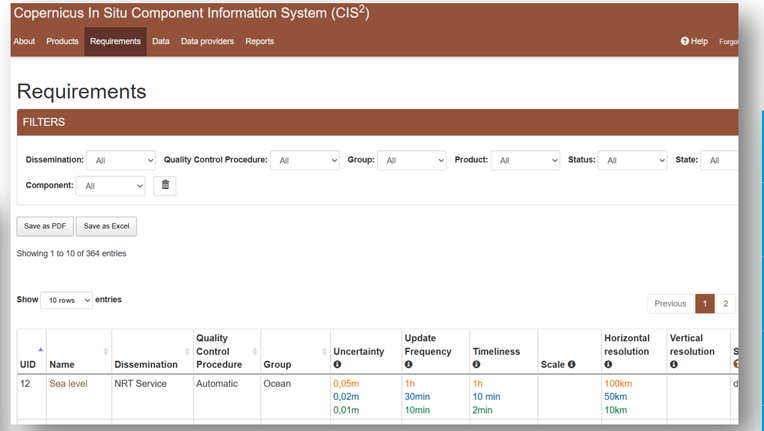
- The lack of data requirements description *from the user point of view* with focus on observations is identified as a **gap** and represents an opportunity for standardization.

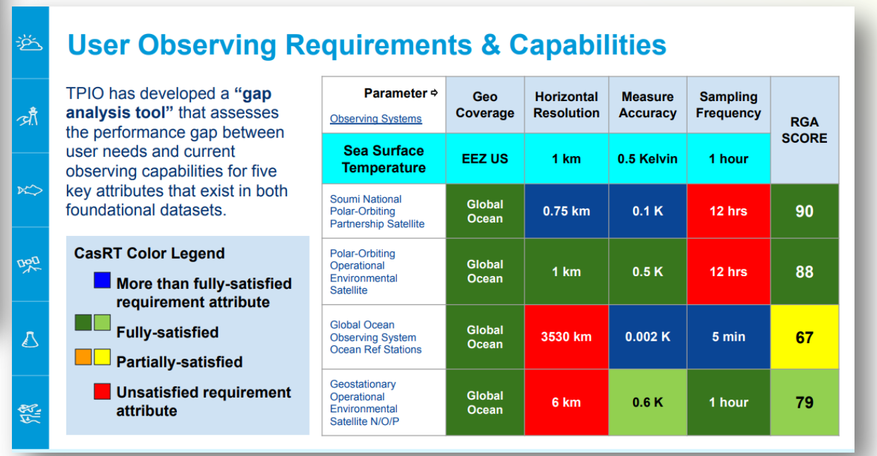
Institutions that are working on “requirements” in a similar way

- National Oceanic and Atmospheric Administration (NOAA) - User Observation Requirements Information
- CIS2 – Copernicus In Situ Component Information System (managed by the EEA)
- WMO OSCAR requirements (https://space.oscar.wmo.int/requirements)
- USGS Requirements Capabilities & Analysis for Earth Observations (RCA-EO)
- G-REQS: Geospatial requirements database for GEO (owned by the EEA)

Actually, these projects inspired each other but they cannot exchange information because the data model is not fully harmonized







Which standards already exist for the purpose

- ISO 19131 Geographic information — Data product specifications
  - Defines data product specifications from the point of view and level of detail of the producer

- OGC Analysis Ready Data (ARD) SWG
  - Deals with product specifications (producer point of view) for a selected group of harmonized remote sensing products

- Other ISO 191** metadata family standards, such as 19115 (OGC abstract Topic 11 - Metadata)
- STAC, DCAT, and DCAT-AP
- OGC abstract Topic 20 - Observations, Measurements, and Samples
- OGC API – Records
- OGC Geospatial User Feedback

Next: OGC GONAR SWG

- We had 3 GONAR ad-hoc’s in Delft, Montreal and Rome
- GONAR ad-hoc approved the charter in Montreal MM.
- Charter can be found in *Pending documents* in the portal as OGC 24-011r2
  - https://portal.ogc.org/files/?artifact_id=109077&version=2
- GONAR ad-hoc requests a vote and officially start activities SWG
- If approved, GONAR is eager to meet for the first time in Boulder
  - from Merida to Boulder we will prepare materials to discuss
  - and request for a GitHub, email list etc.

Charter

Scope:

- Identification of core needs for Geospatial Observation Needs And Requirements;
- Standardization of a data model to describe data and observational user need and requirements.
- Standardization of an OGC API to create, modify, retrieve, and delete descriptions of data needs and requirements.
- Promotion of the use of standardized requirements
- Collaborate with other OGC Working Groups

Study the possibility to use it as an interface to request the automatic creation of data from a GIS platform (idea emerging in Rome from Hexagon)

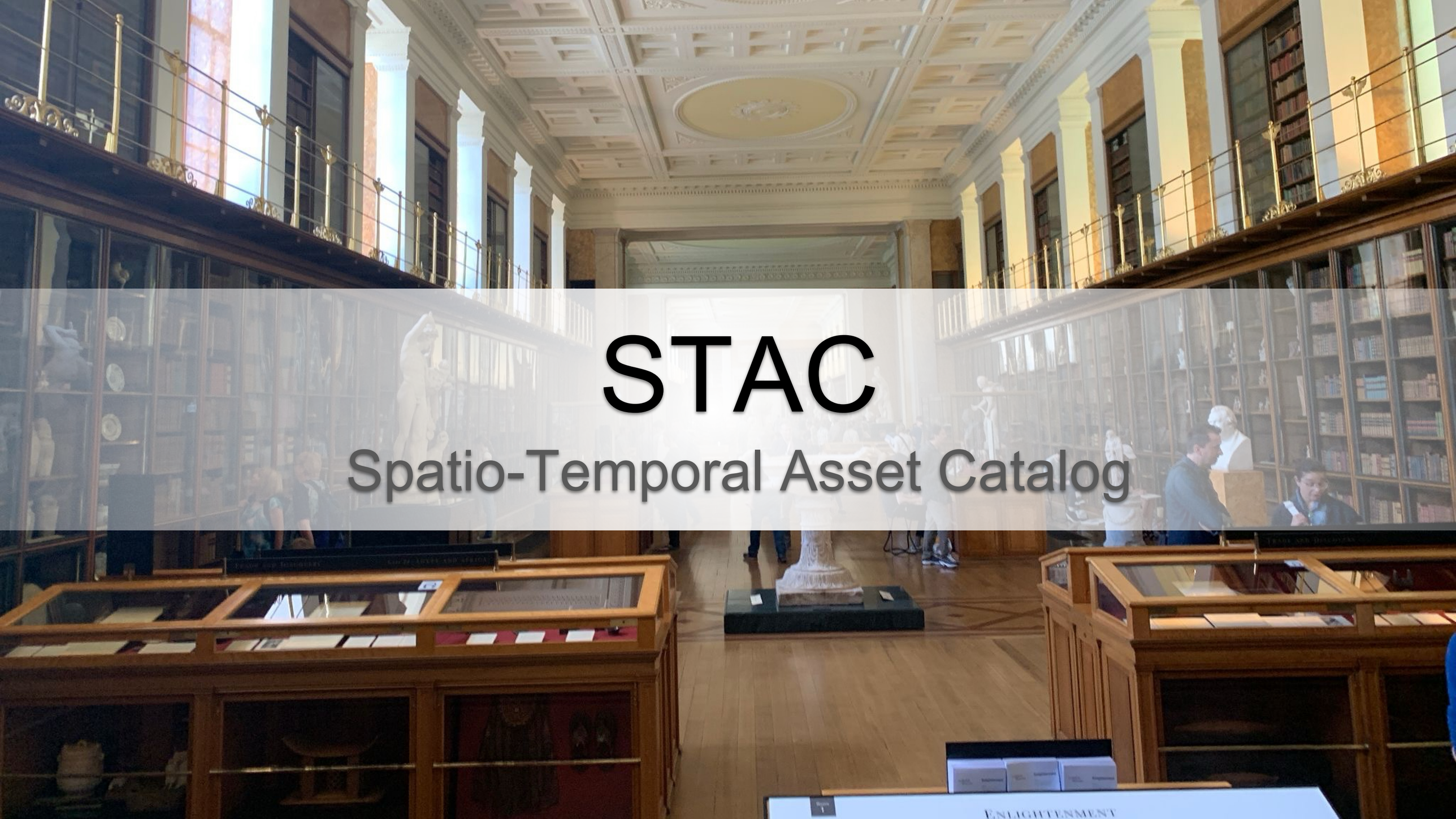
Out of scope:

- Define software or interfaces user requirements and its corresponding technical requirements;
- Define product specifications at the producer level;
- Define a list of domain specific geospatial data products; and
- Define another metadata standard to describe existing datasets.

In principle, the scope is restricted to in-situ observations. It could be possible to encompass remote sensing space based observations in the future.

Deliverables:

- Provision of common standard needs and requirements model for Geospatial Observation Needs And Requirements; and
- Make the Geospatial Observation Needs And Requirements FAIR by means of the new OGC APIs.



STAC

Spatio-Temporal Asset Catalog

What is STAC and the STAC API?

The **Spatio-Temporal Asset Catalog** specification

- Spatio-temporal (time and space are fundamental)
- Asset (URL paths to files/objects)
- Catalog (An index of things)
- In short, it's a **schema for a GeoJSON document**

The **STAC API** specification is:

- A representational state transfer (REST) API
- An implementation of the OGC API for Features
- Provides access to STAC Collections, Items and a search interface for both

Both were submitted to OGC as community standards

History

- In 2015, Planet and AWS collaborated on Landsat on AWS
  - This included an early implementation of Cloud Optimised GeoTIFFs with STAC metadata
- First sprint was October 2017 in Boulder, CO, USA
- The Sentinel-2 COGs archive was released in 2020 on AWS
  - Included a STAC 1.0.0 beta version
- STAC v1.0.0 released May 25, 2021
  - v1.1.0 released September 11, 2024
- USGS released the Landsat Collection 2 archive on AWS in 2021
  - Included STAC 1.0.0 metadata and the STAC API at launch
- STAC API v1.0.0 released April 25, 2023

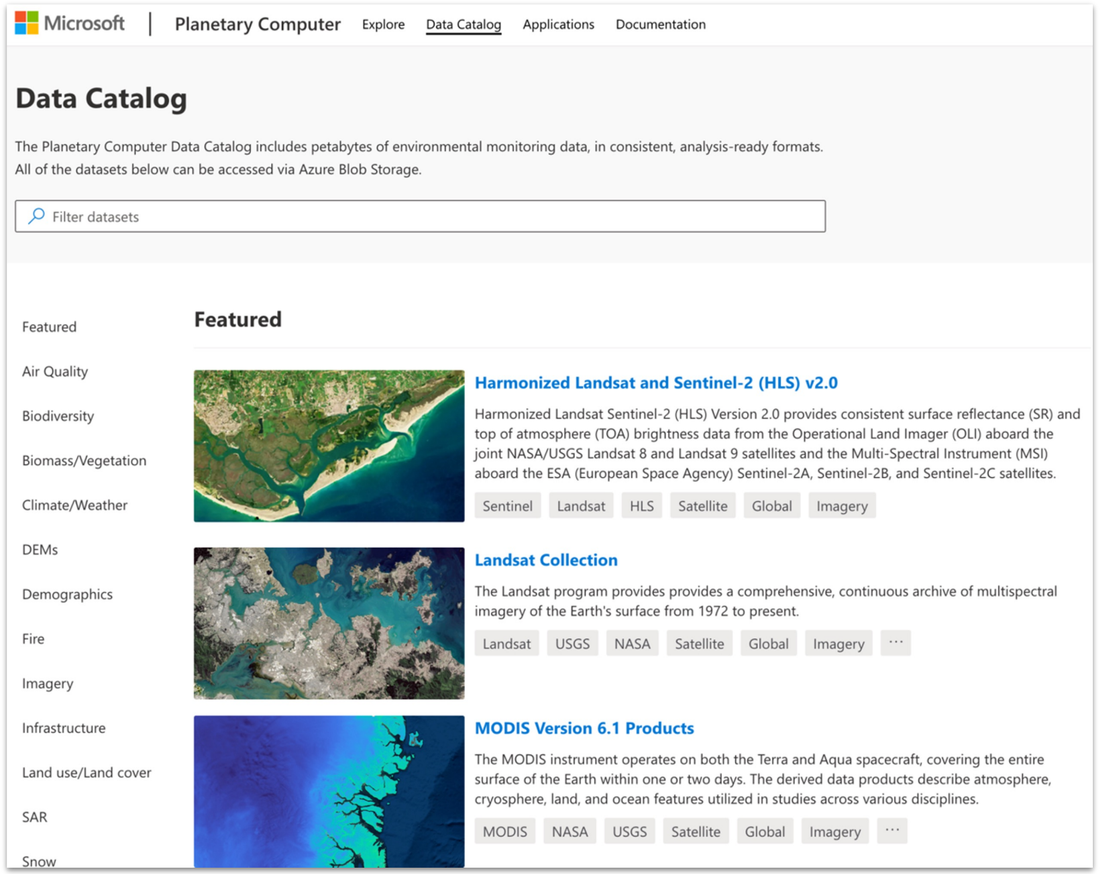
STAC Fundamentals

- STAC Catalog
  - A grouping of one or more more Catalogs and/or Collections
- STAC Collection
  - A grouping of consistent Items, for example, Landsat, or Sentinel-2
- STAC Item
  - A single spatio-temporal instance inside a Collection
- Assets
  - Assets can be attached to Collections or Items, usually Items
  - An Asset will have a href/url to an actual file or similar, often on an object store
- STAC API
  - REST interface including catalog, collection, item and search endpoints

STAC is as an index to Assets (data files) via URLs. In this way, it’s a machine-readable metadata specification that enables access to data in an interoperable way.

STAC providers

- Government
  - Copernicus Data Space Ecosystem (CDSE)
  - USGS Landsat
  - NASA CMR STAC, VEDA
- Commercial
  - Microsoft Planetary Computer
  - AWS Earth Search
  - Planet Open Data
  - Maxar Open Data
  - Umbra Open SAR Data
- Non-profit
  - Earth Genome STAC
  - HOT OpenAerialMap



Examples of STAC usage

- Notebooks
  - Coupled with tools like PySTAC Client, for search, and ODC-STAC for loading, notebooks can work with STAC APIs to provide a seamless interface into an Xarray-based data science workflow
- Visualizations
  - Large scale data collections can be visualised using tools like Titiler, which is used by the Microsoft Planetary Computer to visualised dozens of Petabytes of data
- Large-scale analytic processing
  - Global analyses can be powered by STAC-based workflows, undertaking analyses using data from multiple locations leveraging the interoperability enabled by STAC’s common API and metadata schema
- Desktop GIS
  - Both ArcMap and QGIS have methods of finding and accessing raster data using STAC, enabling desktop GIS workflows to access data from huge collections more easily

openEO

Interoperable geoprocessing in the cloud

132nd OGC member meeting, Mérida
June 12, 2025

Matthias Mohr
openEO PSC chair

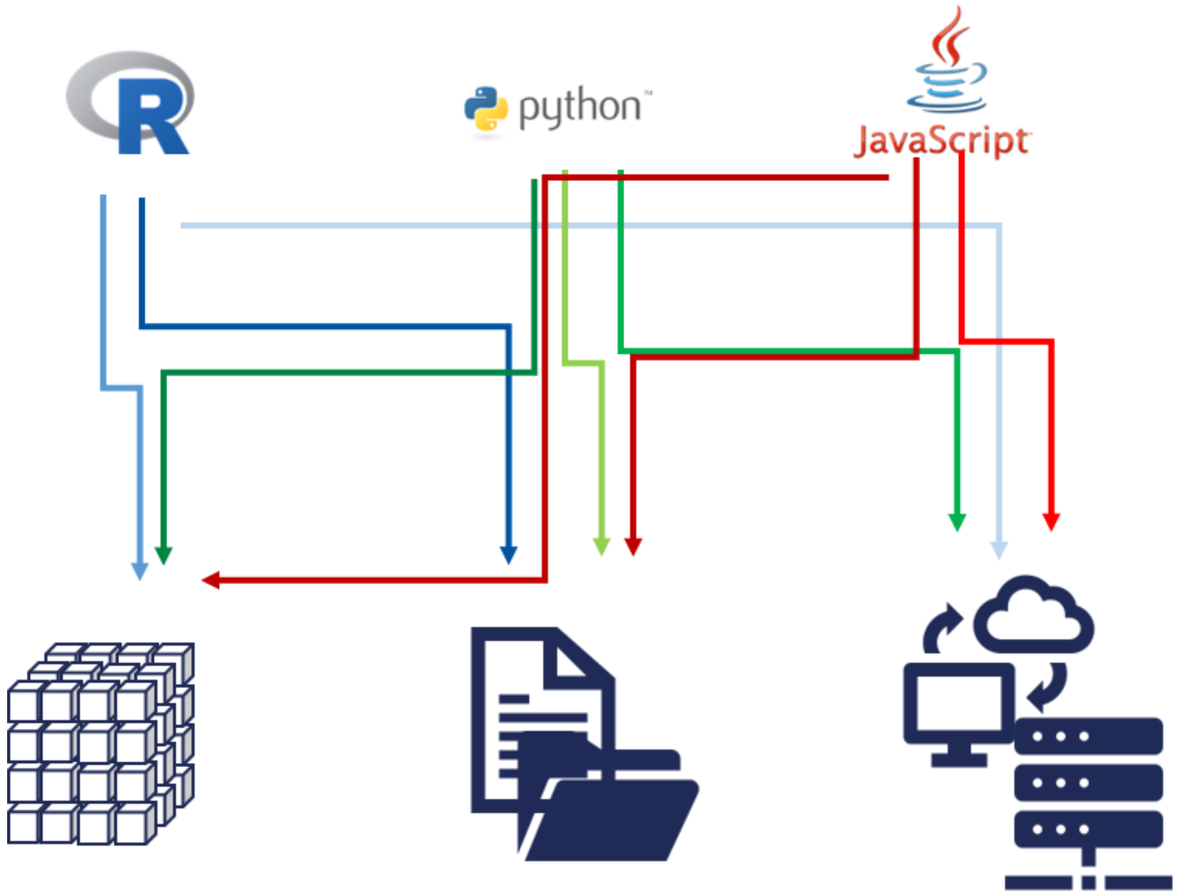
openeo.org

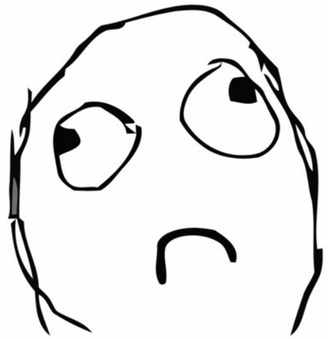

Why openEO?

What is openEO?

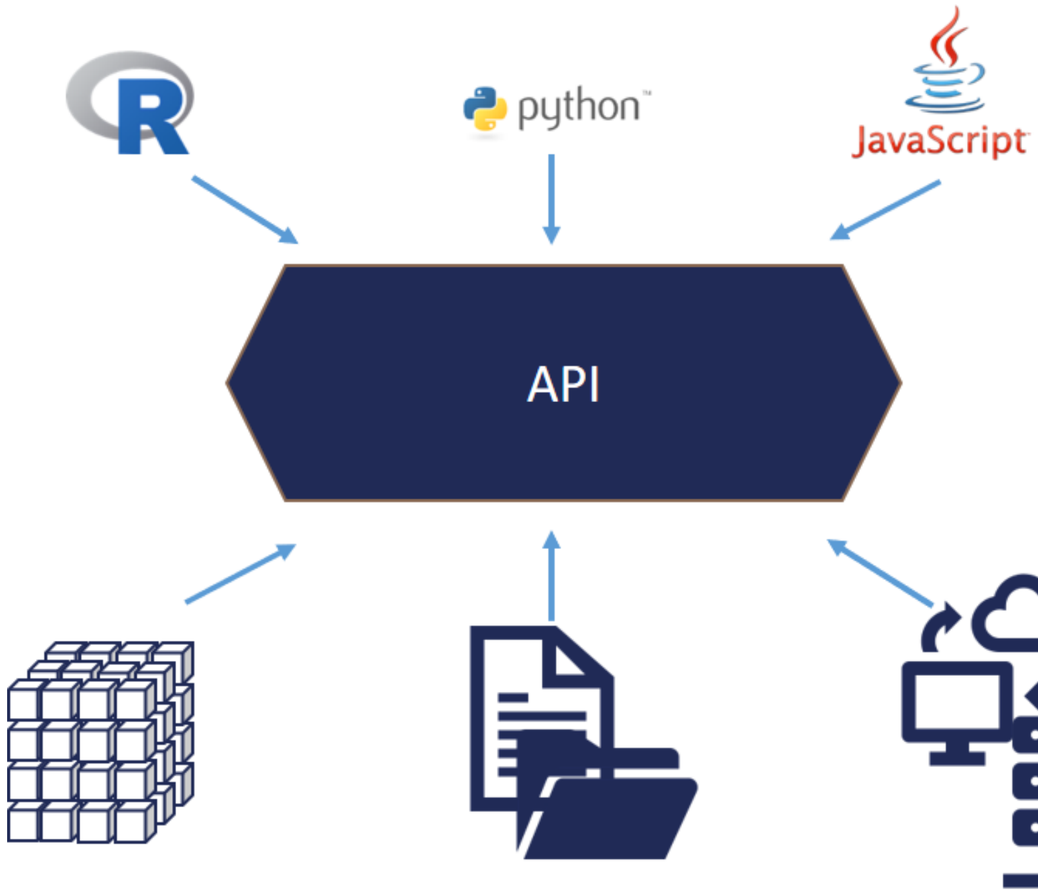
- Language for geospatial processing
  - API + Processes
- Data Cubes
- Cloud-native
- Open specification (managed via GitHub)
- Community-driven project
  - governed by the openEO PSC
  - monthly calls

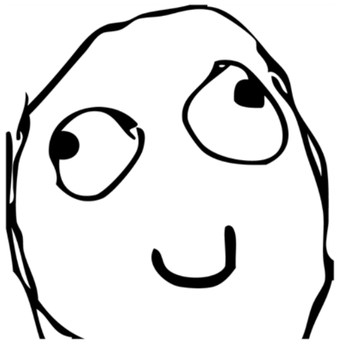
Why openEO?





Why openEO?





Relation to OGC standards

- Alignment whenever possible
  - API Basics -> OGC API Common ✓
  - Data Discovery -> STAC (✓)
  - Processing / Workflows -> openEO ✗
  - Visualization / Web Services -> e.g. W*S, OGC APIs, … ✓
  - Result Access -> STAC (✓)
  - Non-OGC
    - Auth -> OpenID Connect, HTTP Basic
    - Files -> openEO, S3 soon


API and Processes
(the submission to OGC)

API

- Defined in OpenAPI
  - api.openeo.org
- HTTPS & JSON
- Functionality
  - Capabilities (OGC API – Common)
  - Data Discovery (STAC)
  - Authentication (openID Connect, HTTP Basic)
  - File management
  - Data Processing / Workflow management
  - Data Export / Web Services (STAC, OGC W*S, OGC APIs, …)
  - Extensions

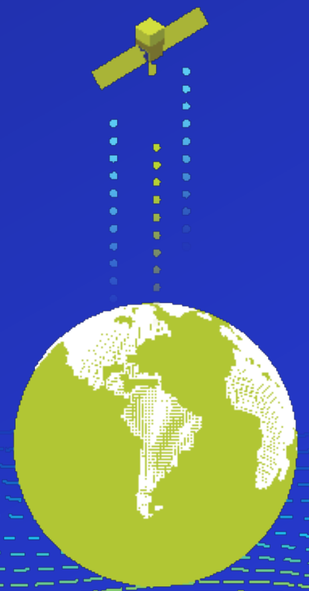
Processes

- Pre-defined processes
  - processes.openeo.org (150+)
  - Can be customized (e.g. remove a parameter)
  - Data cubes
- User-defined processes (UDP)
  - Combine processes to a new process (like functions in programming) with parameters, metadata, …
- User-defined functions (UDF)


Q & A

Innovation Summit recap

Cassie Lee



THEGOVLAB

Future-Proofing OGC Governance

Stefaan Verhulst

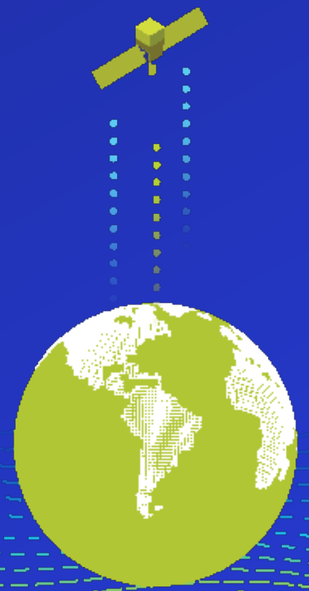
June 12, 2025

SCOPE OF WORK

Focus

"To strengthen the governance structures and processes of the Open Geospatial Consortium by reviewing and updating its foundational policies, procedures, and bylaws."

TC Chair announcements and motions



WGs inactivated

- Approved in March 2025
  - 3D Portrayal SWG
  - Aviation DWG
  - CRS WKT SWG
  - EO Product Metadata and OpenSearch SWG
  - GML SWG
  - GMLJP2 SWG
  - HDF SWG
  - LandInfra SWG
  - Mobile Location Services DWG
  - Perspective Imagery DWG
  - OWS Context SWG
  - PipelineML SWG

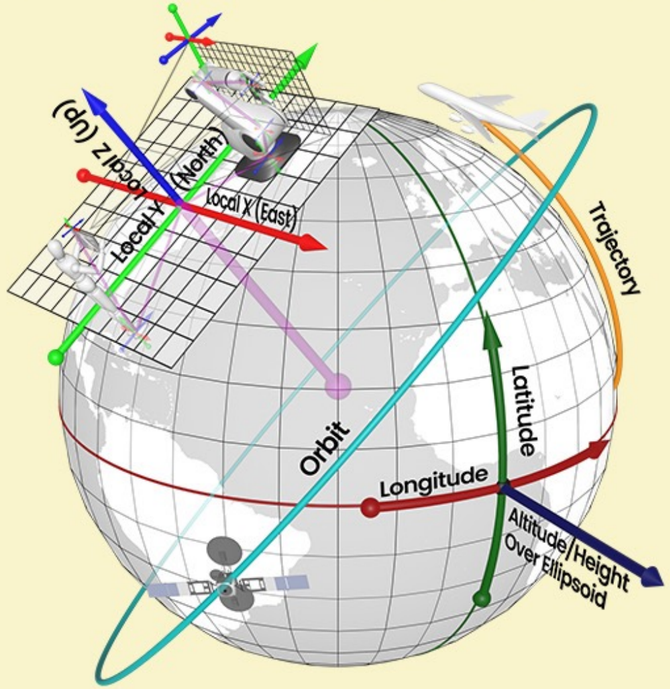
Upcoming OGC Events

Date	Location	Host/Sponsor
28-31 October 2025 Member Meeting	Boulder, CO USA	UCAR
9-12 December 2025 Innovation Days	Frankfurt, Germany	
March 2026 Member Meeting	Philadelphia, PA USA	Bentley
June 2026 Member Meeting	Info very soon	
October 2026 Member Meeting	Info very soon	

Expanding OGC GeoPose Support for Visual Positioning

Open Geospatial Consortium

GeoPose

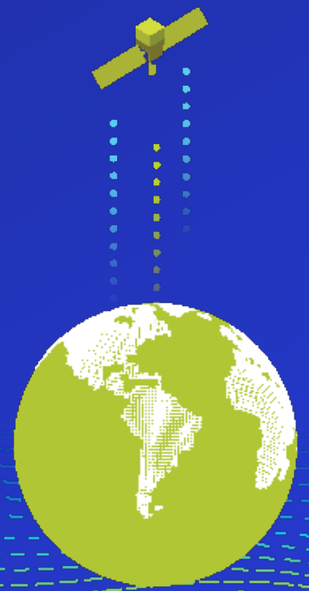


Metaverse STANDARDS FORUM™

June 27, 2025

- More information https://metaverse-standards.org/event/expanding-ogc-geopose-support-for-visual-positioning/
- Register: https://metaverse-standards-org.zoom.us/meeting/register/NmhhdLpRQqiWsbBJPNiqbw#/registration

Working Group reports not to be briefed

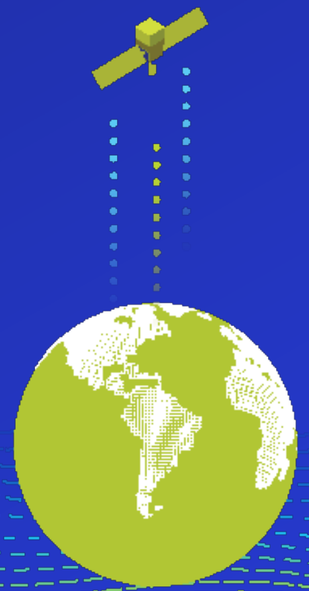


Not being briefed today, saving you 121 slides

- Agriculture DWG
- Architecture DWG
- Coordinate Reference System DWG
- DGGS DWG
- DGGS SWG
- EmissionML SWG
- EDR API SWG
- Features API SWG
- GeoDataCubes SWG
- Geosemantics DWG
- Joint Urban Digital Twins / Geo for Metaverse DWGs
- Met Ocean DWG
- MUDDI SWG
- OGC API – Processes SWG
- PubSub SWG
- Security DWG
- Training Data ML SWG

WG reports with TC motions

3 to Z



3DIM Closing Plenary Report

The 132nd OGC Member Meeting, Mérida, Mexico

Carsten Rönsdorf | Ordnance Survey

12 June 2025

CentroGeo
19°17'30"N 99°13'17"O 2489m

INEGI

The most important thing for this Working Group is…

- We cover anything 3D

What we talked about this week

- Use cases that call for a granular representation of materials, current approaches and overlap with AECO industry
- CityGML Best Practices discussion paper in development
- Consolidation of Level of Detail model and use of the building block concepts for data specifications:
    - MUDDI use case to represent complex 3D alongside simplified 2D
    - Should future OGC data specifications be more like building blocks that allow you to pick and mix rather than being a defined model that can be profiled/extended?

Where we are headed in the coming year

- An uncertain future in an uncertain world (though we are sure it will be 3D).

Session Agenda

- Update on CityGML Profile/Best Practices, by Tam Belayneh [Esri]
- Towards Material Metadata Standardization, by Diego Diaz [Bentley Systems] & Andy Grigg [Ansys]
- MUDDI and representation of higher LoD underground data, by Carsten Rönsdorf [Ordnance Survey]
- Building blocks for data specs + discussion, by Rob Atkinson [OGC], Carsten

Template for TC Document Approval Motion

- The 3DIM DWG recommends that the OGC Technical Committee approve release of [OGC 25-006r1] “Towards Material Metadata Standardization” as an OGC Discussion Paper.
  - Pending any final edits and review by OGC staff
  - Discussion about positioning of material representation between AECO and geospatial domains. OGC ontology representations, methods and tools are available to be utilised.
- There was no objection to unanimous consent
- This discussion paper aimed at highlighting the increasing need for richer material data that machines can understand, both in terms of semantical classification as well as attribution. This paper focused on the AECO industries, as these needs have risen as they have adopted state of the art advancements in information technologies, especially Digital Twin (DT) applications and processes.Four different example to represent materials are discussed. It is suggested that existing OGC standards, such as CityGML or 3D Tiles may benefit from the representation of materials and their semantics.

Climate Resilience DWG Closing Plenary Report

The 132nd OGC Member Meeting,

Mérida, Mexico

Allan Jamieson | UK Ordnance Survey

Dean Hintz | Safe Software

Ryan Ahola | Natural Resources Canada

12 June 2025

CentroGeo

19°17'30"N 99°13'17"O 2489m

INEGI

The most important thing for this Working Group is...

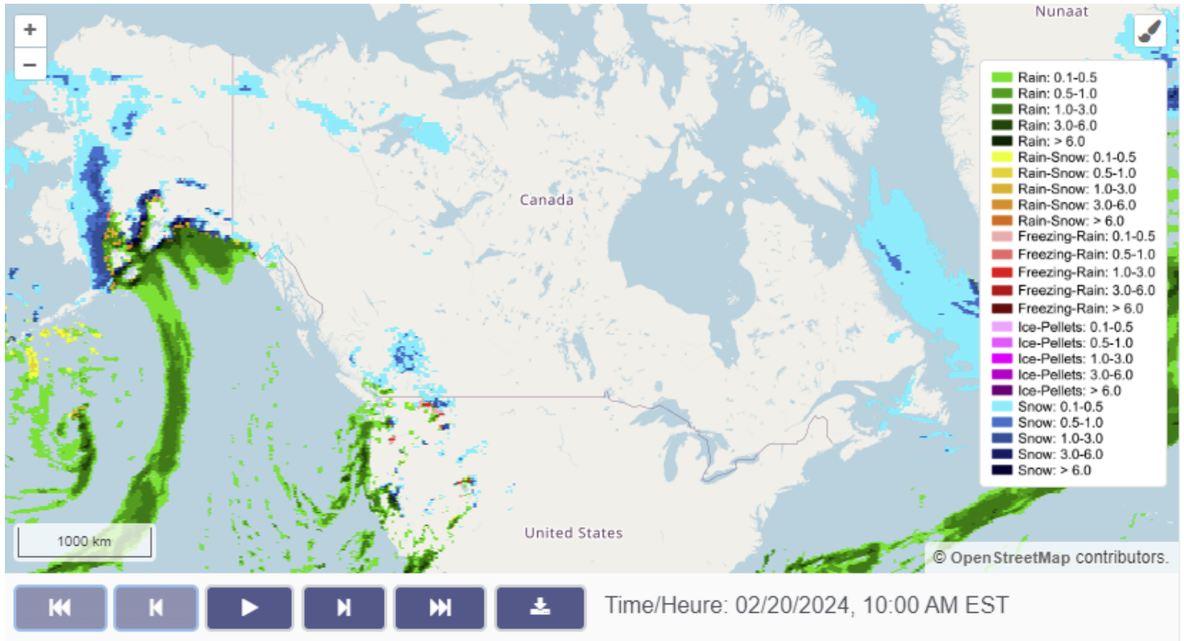
- Motions for recently completed climate resilience OGC engineering reports. Progress on past and future climate resilience-focused activities.

What we talked about this week

- Upcoming DGGS pilot and climate resilience components.
- Improvements to a heat health risk index.
- Motions for recently completed engineering reports (Climate and Disaster Resilience Pilot 2024 report, Generative AI for Wildfires report).

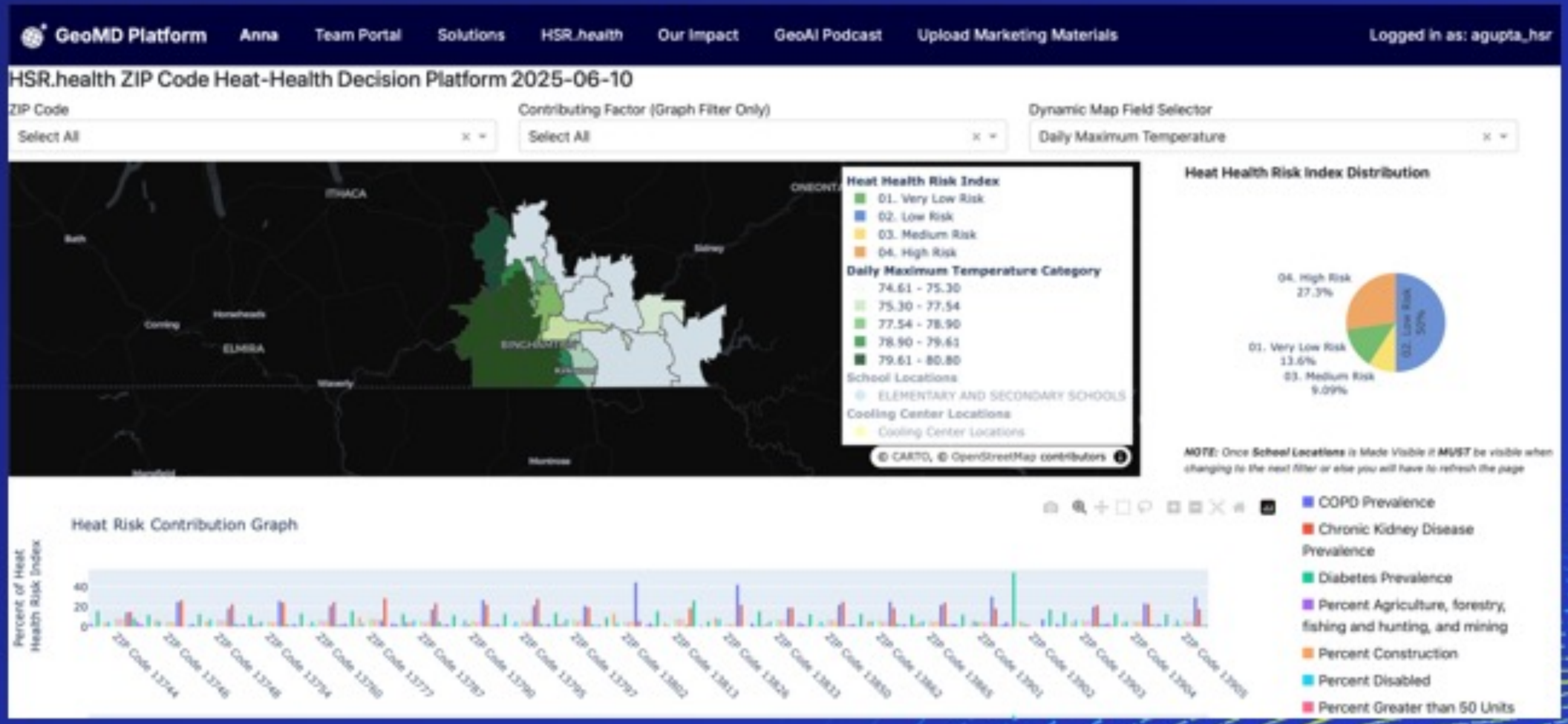
Technical Focus: Integration of Environment Data

- Environment & Climate Change Canada uses grids for weather forecasting and climate modelling applications
- Evaluating ability of DGGS to support these grid applications. Does the draft OGC standard support use and interoperability of this information?
- Interest in better connecting users to climate modelling indicators. Potential for DGGS to enable creation and use of indicators at multiple levels of geography
- Link to disaster management: weather data for immediate decision needs. Climate indicators to inform understanding and preparation for future disasters
- Weather prediction and climate modelling data is openly available for use during the project



Example of Global Deterministic Prediction System (GDPS) data.
Image courtesy of ECCC

Community Heat-Health Decision Platform



HSR.health+

Input: GenAI Roadmap Recommendations for in Wildfire Insurance

Below is a four-phase roadmap outlining the key activities and deliverables necessary to effectively integrate Generative AI (GenAI) into wildfire insurance workflows.

Phase	Deliverables
Phase 1: Foundation Building	
Stakeholder Identification	Stakeholder map, engagement framework, and collaboration plan.
Data Inventory & Gaps Analysis	Dataset inventory, gap analysis report, and prioritization matrix for data sources.
Governance Framework Development	Governance framework document aligned with legal and ethical considerations.
Phase 2: Use Case Development	
Use Case Prioritization	Use case catalog ranked by impact, feasibility, and ROI.
Technology Assessment	GenAI solution matrix with technology alignment to specific use cases.
Proof-of-Concept (PoC) Design	PoC proposals with resource, timeline, and evaluation metrics.

Phase	Deliverables
Phase 3: Pilot Implementation	
Prototype Development	Functional prototypes demonstrating AI capabilities in real-world scenarios.
Dataset Integration	Integrated data platform enabling GenAI model deployment.
Pilot Testing & Iteration	Pilot results, stakeholder feedback reports, and iterative model improvements.
Phase 4: Scaling & Optimization	
Operationalization	Full-scale implementation plans and training modules for end-users.
Continuous Improvement	Performance dashboards, compliance checks, and periodic technology updates.
Ecosystem Expansion	Partnership agreements and expanded stakeholder networks for broader adoption.

2 CHALLENGES IN EXPLOITING GENAI WITHIN THE CLIMATE RESILIENCE DOMAIN

Generative AI has immense potential for transforming geospatial applications, particularly in areas like climate resilience and disaster management. However, leveraging this potential comes with unique challenges, as GenAI systems often struggle to handle the complexities of geospatial data and domain-specific requirements. The following sections explore critical issues such as geospatial awareness, hallucinations, climate-specific contexts, and integration with geospatial standards and APIs.

2.1. Geospatial Awareness in Generative AI Systems

Generative AI systems face inherent challenges in understanding and referencing geographic locations. Unlike humans, who perceive locations through lived experiences, context, and intuitive spatial reasoning, GenAI's grasp of geospatial information is limited to the data it is trained on or linked to. This limitation raises several issues critical to the effective application of GenAI in domains requiring geospatial awareness, such as climate resilience or disaster management.

Where we are headed in the coming year

- Continuing to support discussions for OGC Climate Resilience activities.
- Supporting publication and communication of recently completed OGC climate resilience work.

Next quarter WG communications plan

- Communication of recently completed engineering reports.
- Communication of DGGS pilot activities and participation opportunities.

Session Agenda

- Ryan Ahola (Natural Resources Canada) - Overview of upcoming Discrete Global Grid Systems project and links to climate resilience
- Ajay Gupta (HSR.Health) - Enhancements to the Heat-Health Risk Index
- Motions:
  - Matt Tricomi (xentity corporation) - Approving Generative AI for Wildfire State-of-the-Art Engineering Report
  - Stelios Contarinis (HARTIS Integrated Nautical Services) – Approving Climate and Disaster Resilience Pilot 2024 Engineering Report
- Group Discussion – Next steps for DWG

Document Approval Motion

- The Climate Resilience DWG recommends that the OGC Technical Committee approve release of 25-012 “D030 - Generative AI for Wildfire State-of-the-Art Engineering Report” as an OGC Public Engineering Report.
  - Pending any final edits and review by OGC staff
  - Paper has been reviewed by sponsor and accepted since February 17, 2025 [No changes made since then except DOI added]
  - There was no objection to unanimous consent.
- Short summary: As part of OGC Disasters and Climate Resilience Pilot IV Phase 2, this D-030 Generative AI for WildFire State-of-the-Art Engineering report delivers a comprehensive Generative AI for Wildfire which assessed Generative AI technology on workflows for wildfire risk, hazard, and impact workflows typical in the insurance sector. This deliverable builds on Xentity’s expertise and contributions to Phase 1 (D-123) for advancing the integration of Generative AI (GenAI) technologies into wildfire risk, hazard, and insurance workflows. Phase 1 (D-123) provided a U.S. data focus across all wildfire use cases and went deeper into broader GenAI governance, capabilities and technology approaches in LLM, RAG, NLP integration, GANs, and AI Agent integration.
- This report outlines key GenAI-driven use cases relevant to wildfire resilience, response, and risk assessment. This report centers on leveraging Generative AI (GenAI) to strengthen wildfire insurance and preparedness efforts in Canada, addressing social impact, operational efficiency, and business resilience. Specifically, the use case focus, and needed data focuses on Helping People and Business Management as it relates to Wildland Fire Insurance Stakeholders. Phase 2 includes an inventory of over 200 Canadian wildfire-related data sources categorized in data subject areas of Wildland Fire National Strategy & Management, National Base Data Layer Information, and Risk Indicators, Analysis, and Assessment which would be needed for GenAI Training data.

Document Approval Motion – CDRP 2024.2 D001

The Climate Resilience DWG recommends that the OGC Technical Committee approve release of 25-010 "D001 - OGC Climate and Disaster Resilience Pilot 2024.2 Engineering Report" as an OGC Public Engineering Report, pending any final edits by OGC staff.

- There was no objection to unanimous consent

Short summary: The OGC Climate and Disaster Resilience Pilot 2024.2 explores how Generative AI (GenAI) can enhance climate resilience and disaster management through integration with geospatial data systems. The pilot focused on developing AI-powered virtual assistants, evaluating data maturity, and creating demonstrators in areas such as flood risk, wildfires, coastal vulnerability, and public health. Techniques like Retrieval-Augmented Generation (RAG) and Chain-of-Thought (CoT) reasoning were used to improve the quality and contextual relevance of AI responses.

Key findings highlight both the opportunities and challenges of using GenAI in geospatial applications. While GenAI shows promise in translating complex data into actionable insights, it also suffers from issues like hallucinations and limited spatial reasoning. The report recommends enhancing metadata standards, aligning AI tools with OGC-compliant APIs, and strengthening interdisciplinary collaboration to ensure trustworthy and interoperable AI integration.

D&I DWG Closing Plenary Report

The 132nd OGC Member Meeting,

Mérida, Mexico

Lucio Colaiacomo | 4113 Engineering

12 June 2025

CentroGeo

19°17'30"N 99°13'17"O 2489m

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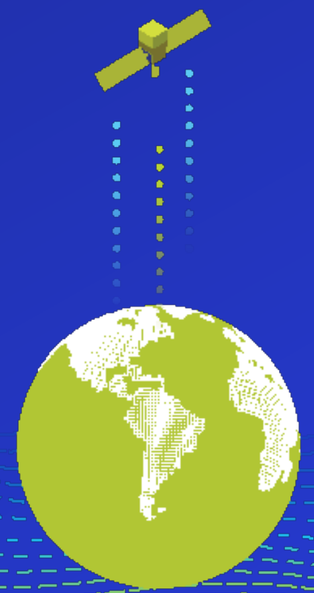
The most important thing for this Working Group is...

- Interesting discussion about evolution of GIMI format.
- Cube4EnvSec presentation showing important results in the integration using rasdaman ecosystem.

Agenda

- Cube4EnvSec: Interoperable AI-Cube Federations with Cloud/Edge Integration **by Peter Baumann** [Constructor University] (30 min)
- OGC Testbed 20: GIMI Lessons Learned and Best Practices Report **by Núria Julià** [UAB CREAF] (30 min)
- OGC 24-042r1: OGC Testbed-20 GIMI Open Source Report by **Sina Taghavikish** [OGC] (30 min)

Motions



Document Approval Motion

- The Defense & Intelligence recommends that the OGC Technical Committee approve release of 24-042r1 “GIMI Open-Source Report” as an OGC Public Engineering Report.
  - Pending any final edits and review by OGC staff
  - <Any Discussion Points that the TC needs to be aware of> None
  - There was no objection to unanimous consent
- This GIMI Open-Source Report documents the results of the OGC Testbed-20 work performed to evaluate and enhance open source libraries and tools in support of the GEOINT Imagery Media for ISR (GIMI) format.The GIMI format has the potential to grow and gain popularity by building upon existing open-source software. Recent integration work, particularly with libheif, aims to align with the GIMI profile and enhance architectural robustness. The libheif library provides the capability to decode and generate all conformant still-image HEIF/AVIF files, including HDR, and uses the color transformation matrices specified in the color profile. The High-Efficiency Image File Format (HEIF) is a digital container format for storing individual digital images and image sequences. The work performed in the OGC Testbed-20 GIMI initiative has significantly enhanced libheif’s functionalities, further supporting the GIMI profile and its architecture, thus benefiting the broader HEIF user community. This effort included improvements for HEIF file support in prominent projects such as GDAL and the Apache Spatial Information System (SIS). Two modules were developed within Apache SIS for handling a subset of the HEIF file format: A pure-Java GeoHEIF reader, currently in the incubator stage, and a native C/C++ GDAL binding, set to be included in the upcoming Apache SIS 1.5 release. Both modules enable tiling capabilities. Key features emphasized include multi-resolution pyramids, tool extensions, network streaming, and the introduction of new data types. A novel tiling strategy, along with detailed API specifications for tiled images, has emerged from the Testbed-20 GIMI work.

Document Approval Motion

- The Defense and Intelligence DWG recommends that the OGC Technical Committee approve release of [24-040r1] “GIMI Lessons Learned and Best Practices Report as an OGC Engineering Report.

Pending any final edits and review by OGC staff.

No discussion

There was no objection to unanimous consent

- Documents and summarizes the **discussions and lessons learned** of the GEOINT Imagery Media for ISR (intelligence, surveillance and reconnaissance) (GIMI) Task
  - To develop, implement, and validate content that will form the basis of a future **GIMI Standard**, addressing specific standardization issues within the context of payload optimization and metadata management.
  - To evaluate the **performance** and quality impacts of various design choices to determine the most **efficient design** options for the **GIMI implementation**.
- Presents a **set of recommendations** for the HEIF format as well as some of the experimentation performed during OGC Testbed 20.

- The **objectives** of this Report are to:
  - Identify best practices on how to combine HEIF boxes and propose a new box for **tiles**.
  - Provide best practices on the use of the **affine transformations** as a georeference mechanism and to use **NaN** as nodata value.
  - Describe some **implementations** to read, write, and present **GeoHEIF** files.
  - Identify **ISR use cases** which can benefit from GEOINT analysis of **geotagged video synchronized** and aggregated with data from other sources.
  - Provide considerations on how to storage the information in `mdat` box for image sequence (frames and metadata).

EDM DWG Closing Plenary Report v1

The 132nd OGC Member Meeting,

Mérida, Mexico

Don Sullivan| NASA Airborne Science

12 June 2025

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Agenda

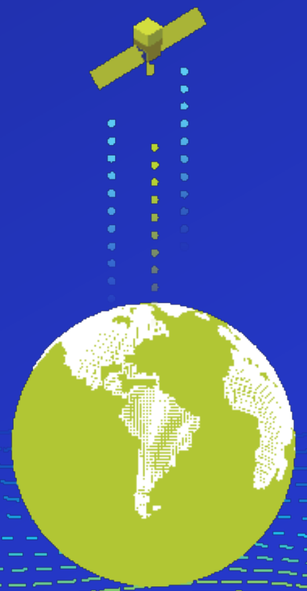
- A report on recent CEOS ARD achievements and future direction:
  - Dave Borges, NASA, CEOS ARD Lead

- Review report and vote on a motion, Information Interoperability Report:
  - https://portal.ogc.org/files/?artifact_id=111145&version=1
  - Sina Taghavikish, Project Manager for International R&D Projects, OGC

About this Working Group

- The Emergency and Disaster Domain Working Group works on well, Emergency and Disaster related issues …

Section Two - Votes.



INFORMATION INTEROPERABILITY REPORT

- The EDM DWG request the Technical Committee to approves [OGC 25-011] INFORMATION INTEROPERABILITY REPORT as a public Report
- NOTUC motion passes
- Semi-short abstract:

Mapping the OGC Environmental Data Retrieval API (EDR-API) to the Common Core Ontologies (CCO) a suite of eleven mid-level ontologies built upon the ISO-standard Basic Formal Ontology (BFO) is essential for advancing semantic interoperability in the context of emergency response and disaster management. While the OGC community has developed the EDR-API standard to support data discoverability, querying, and transfer in accordance with FAIR principles, the DoD/IC utilizes the CCO and its relevant domain extensions (such as the Atmospheric Feature Ontology, Hydrographic Feature Ontology, and Sensor Ontology) to structure information and enable effective content discovery. Aligning the OGC EDR-API with the CCO suite ensures that environmental and geospatial data can be semantically integrated and interpreted across systems, thereby improving coordination, situational awareness, and timely decision-making during emergencies.

GeoTIFF SWG Closing Plenary Report

The 132nd OGC Member Meeting,

Mérida, Mexico

Joan Maso & Núria Julià | UAB-CREAF

12 June 2025

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Document Approval Motion

- The GeoTIFF.SWG recommends that the OGC Technical Committee approve release of OGC 24-041 “OGC Testbed-20 GIMI Benchmarking Report” as an OGC Engineering Report.
  - Pending any final edits and review by OGC staff
  - Track work in W3C was discussed which is covered in other GIMI Testbed-20 reports
  - There was no objection to unanimous consent

- The OGC GIMI Benchmarking Report documents the evaluation of implementations of the OGC Geographic Tagged Image File Format (GeoTIFF) Standard and Cloud Optimized GeoTIFFs (COGs) to see how they perform compared to the new “GEOINT Imagery Media for ISR” (GIMI) standard. The focus was on understanding the costs and efficiency of these different formats, particularly in terms of how data is managed across programming languages.

THANK YOU

www.ogc.org

MetaCat DWG Closing Plenary Report

The 132nd OGC Member Meeting,

Mérida, Mexico

Naomi Thiru | KU Leuven

12 June 2025

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The most important thing for this Working Group is…

- The code sprint report was summarized, and a motion passed to present it a discussion paper.

- For more, read the report

https://ogcincubator.github.io/metadata-codesprint2024/document.html

What we talked about this week

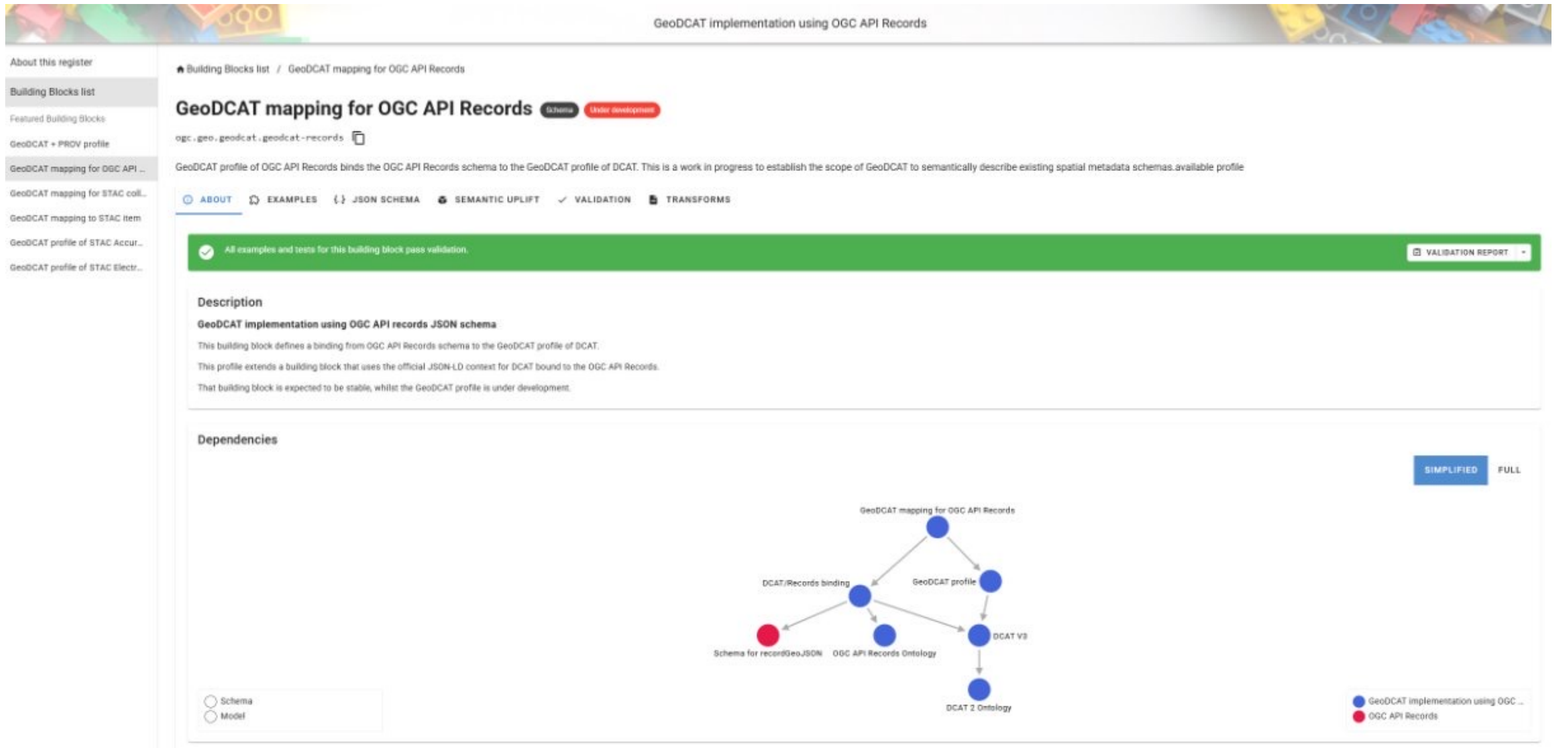
-

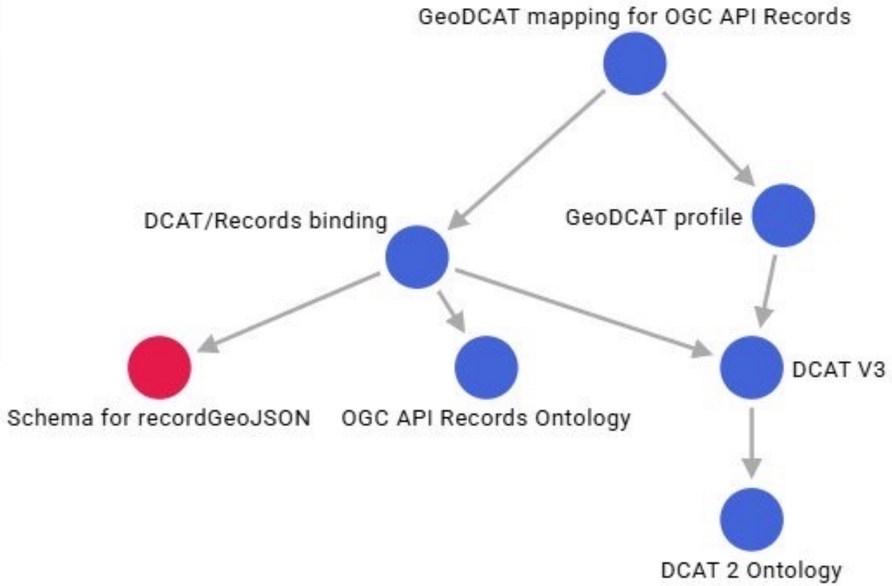
- ISO 19115-1:2014 Geographic information – Metadata – Fundamentals *revision project update and* ISO/TS 19115-5 Geographic information — Metadata Part 5: DCAT mapping *project*

- Work on ISO 19115 is aligned with the work of the GeoDCAT SWG (and vice versa). Several members of the OGC DWG and SWG are also active in WG7 of ISO TC211

What we talked about this week

- Practical example of using the building blocks tested





https://ogcincubator.github.io/geodcat-ogcapi-records/bblock/ogc.geo.geodcat.geodcat-records

Where we are headed in the coming year

- Bi-weekly meetings to regular monthly meetings.
- Discussion paper will be presented to the consortium
- Call for contributions from members working on implementations of metadata standards, mapping of standards, own ‘profiles’, etc.

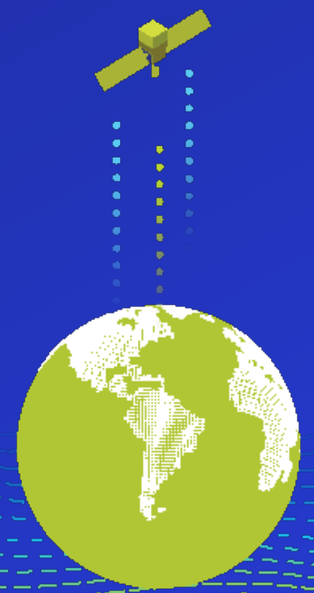
Next quarter WG communications plan

- GeoDCAT meetings shifted from bi-weekly to monthly
- More practical focus with things ‘to-do’ between two meetings

Session Agenda

- Overview of ongoing metadata work
- Publication of the GeoDCAT code sprint report
- What happens with geospatial metadata in data space federated catalogues
- How to train your Application Profiles - OGC Building Blocks and DCAT
- ISO 19115 developments: revision of ISO19115-1 and new ISO19115-5

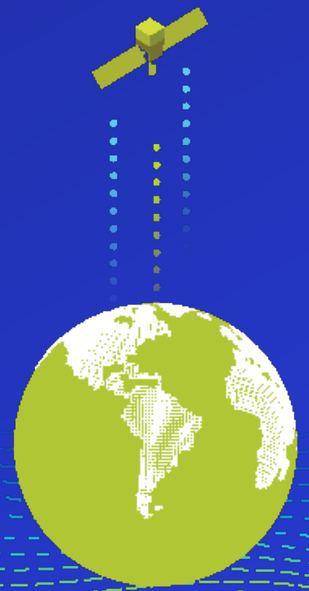
motions



Document approval motion

- The MetaCat DWG recommends that the OGC Technical Committee approve release of [OGC 24-063] “November 2024 Metadata Code Sprint Summary Report” as an OGC Discussion Paper pending any final edits and review by OGC staff
- There was no objection to unanimous consent
- The document discusses activities and findings from the Nov 2024 metadata codesprint. It includes analysis of common patterns and challenges from ISO and OGC metadata standardization activities.

Come back to Mérida



Conference on Geoinformation 2025

November 24th to 28th, 2025, Mérida, Yucatán, Mexico.
This meeting will host 3 conferences:

- **16th Geoinformation for Disaster Management (Gi4DM),**
- **XXVI National Congress SELPER Mexico**
- **XI SELPER Educational Workshops of Central America and the Caribbean.**

With your registration for the Conference on Geoinformation you will have access to the 3 conferences.

Conference website

https://www.selper.org.mx/conference-on-geoinformation-2025

Closing Plenary Reports without motions

The 132nd OGC Member Meeting,

Mérida, Mexico

WG Chairs

12 June 2025

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Agriculture DWG Closing Plenary Report

The 132nd OGC Member Meeting,

Mérida, Mexico

Karel Charvat, Plan4all

12 June 2025

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The most important thing for this Working Group is…

- Publish an AI-ready Agriculture Information Model (AIM) core specification together with a harmonised metadata profile to enable standards-based Retrieval-Augmented Generation and other LLM workflows across OGC spatial data services.

What we talked about this week

- AIM core spec: layered ontology, JSON-LD, SHACL; draft timeline agreed.
- AI-native metadata profile bridging ISO 19115 / DCAT / STAC.
- Grid geoinformation as compact LLM context.
- Roadmap for joint AIM × SensorThings × Metadata × GeoAI standardisation.
- RAG prototype using real-time SensorThings IoT streams.

Agriculture Information Model – AIM - recap

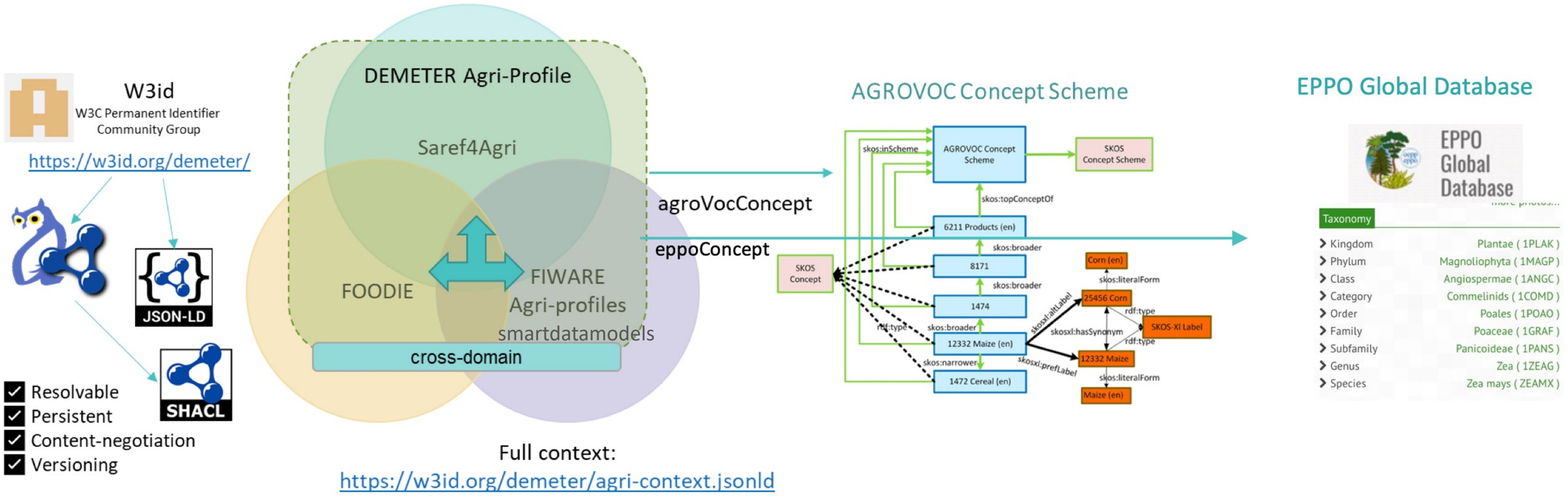
AIM aims to establish the basis of a common agricultural data space, enable the interoperation of different systems, and the analysis of data produced by those systems in an integrated manner

AIM follows a modular approach in a layered architecture:

- realized as a *suite of* ***ontologies*** and associated ***JSON-LD contexts*** enabling both the specification of formal semantics, and a simple adoption and implementation by tech providers, plus a set of ***SHACL shapes*** enabling validation of data at the semantic level.
- implemented in line with best practices, ***reusing*** existing ***standards*** and well-scoped ***models***
- establishes ***alignments*** between base models to enable their ***interoperability*** and the ***integration*** of existing data
- published with resolvable **PIDs (w3id.org)** to ensure a **long-lasting reference**

AIM domain layer

- Defines agri-specific concepts and properties covering different aspects of interest of agri related applications and data sources
- Aligns relevant vocabularies in the sector allowing interoperability and integration of existing data sources



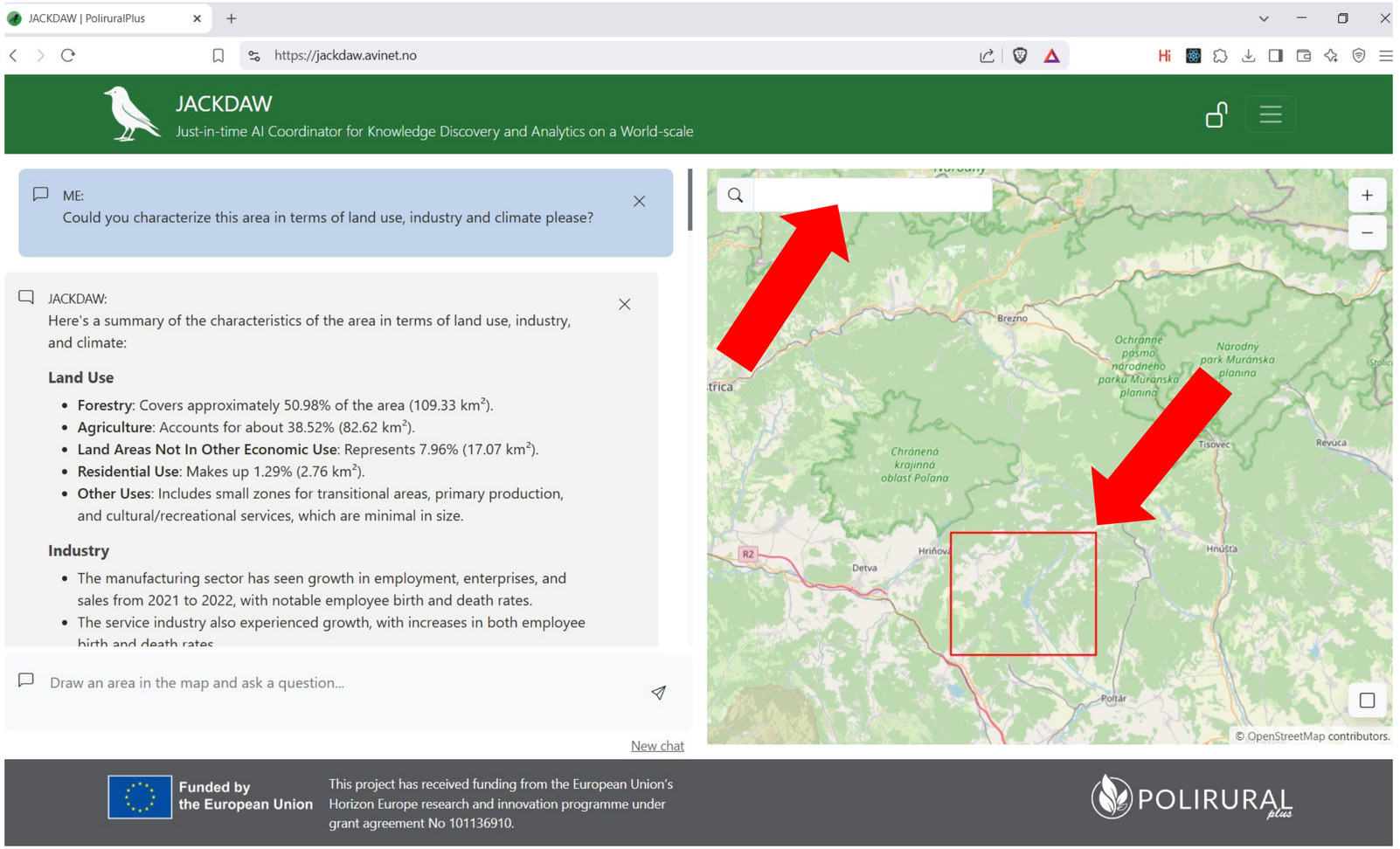
Full context:
https://w3id.org/demeter/agri-context.jsonld

Having decided for context enrichment, how to find the area of interest?

- We could geocode questions – but the richness and multitude of names available means that there are no geocoders capable of supplying the required detail and to resolve them unambiguously

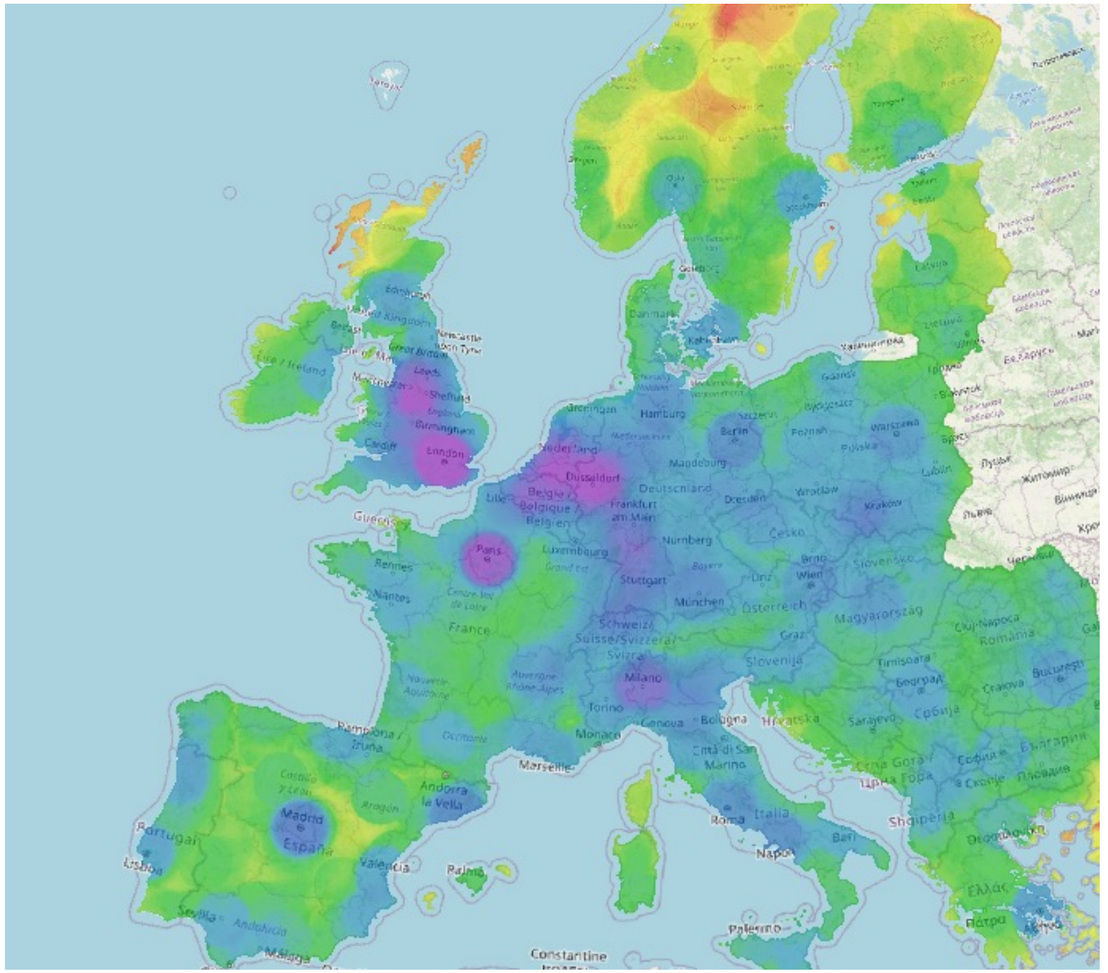
or…

- We could simply search for or draw the area of interest in a map and pass it along with the users question?

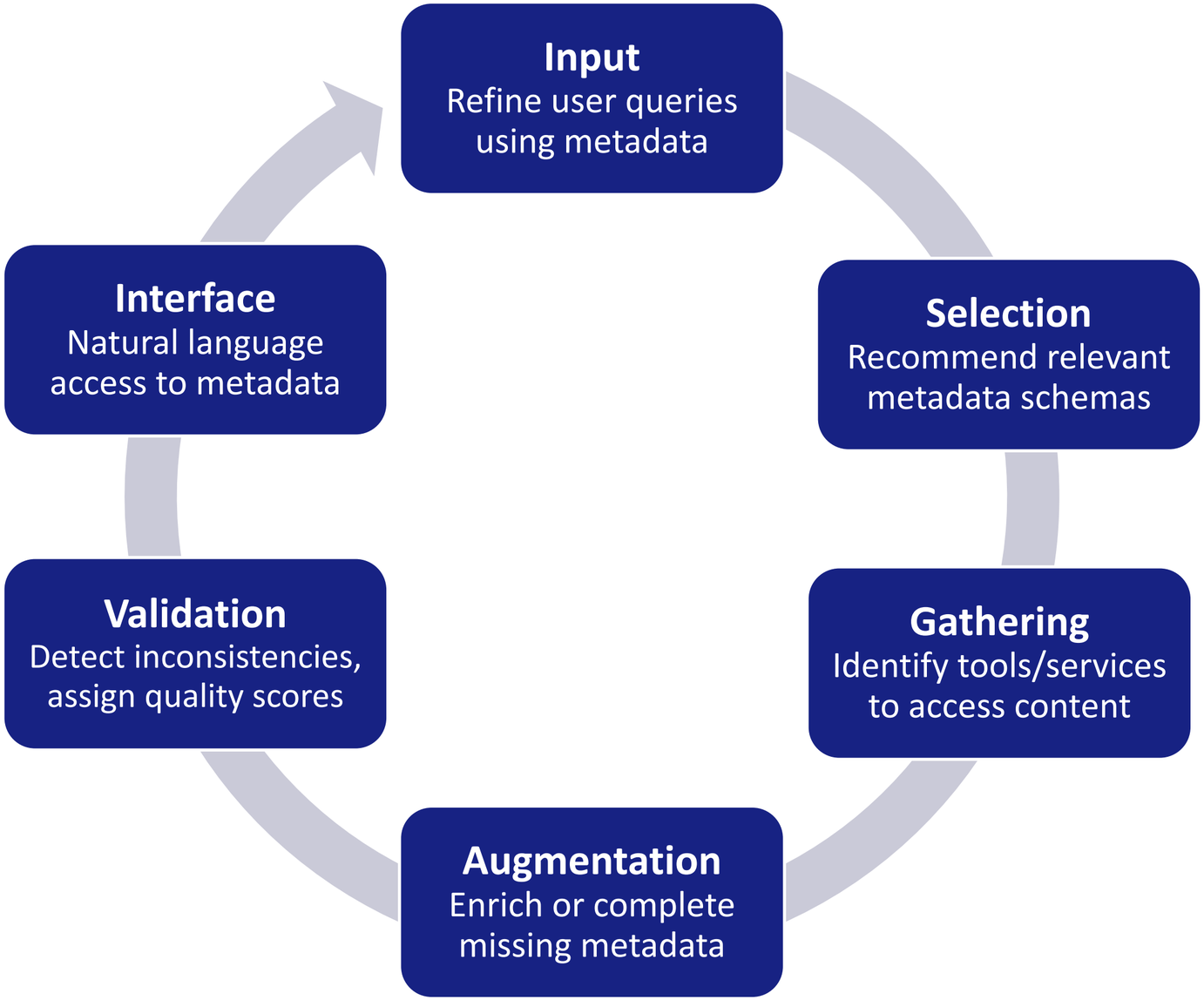


What can we do when we have a pile of grid data?

- We can easily lookup values to add to the context of LLMs as codeblocks inside Markdown
- We can correlate information across multiple dimensions deemed relevant and determine if there is e.g. over-supply or under-supply for a given type of activity in an area.
- By comparing e.g. demography with number of pubs we can determine the median and mean population size served by each pub – and then identify areas where there are less pubs than the population might indicate



Role of LLMs in the metadata lifecycle



Metadata Intelligence HUB: Solution Concept

Metadata Catalog Layer

Core infrastructure for schema management and publication

- **Schema Library**
  - Supports ISO 19115, DCAT, STAC, custom schemas
  - Versioning, validation, and documentation of metadata models
- **Ontology Mapping & AI Support**
  - Schema alignment via mapping standards (e.g., SSSOM, SHACL)
  - LLM-assisted field mapping and label translation
  - Experimental layer for dynamic, AI-generated mappings
- **Publication Pipeline**
  - Output in native schemas and transformed (interoperable) profiles
  - Full audit trail and optional governance workflows

Interplay Between Layers

Toolbox interacts with catalog as both a **metadata consumer and producer**

Enables:

- Context-aware querying
- Result interpretation
- Feedback loops for metadata enrichment

Toolbox Layer

User and AI-facing services for metadata-driven interaction

- **Natural Language Query Interface**
  - Translates human queries into structured metadata actions
- **Schema Selection Service**
  - Identifies the most relevant metadata models for the query
- **Query & Synthesis Engine**
  - Executes cross-schema and cascading queries
  - Synthesizes responses from distributed metadata
- **Response Contextualizer**
  - Adds explanation, provenance, and links to source data

Optional Extensions

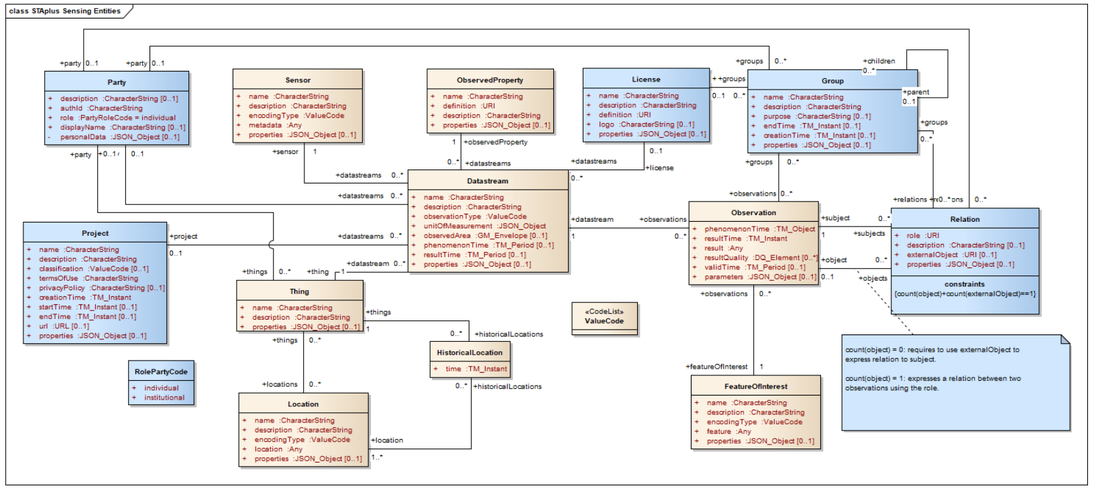
Domain-specific LLM fine-tuning
(e.g., agri-environmental)

Usage-driven adaptation
Learning from user interactions

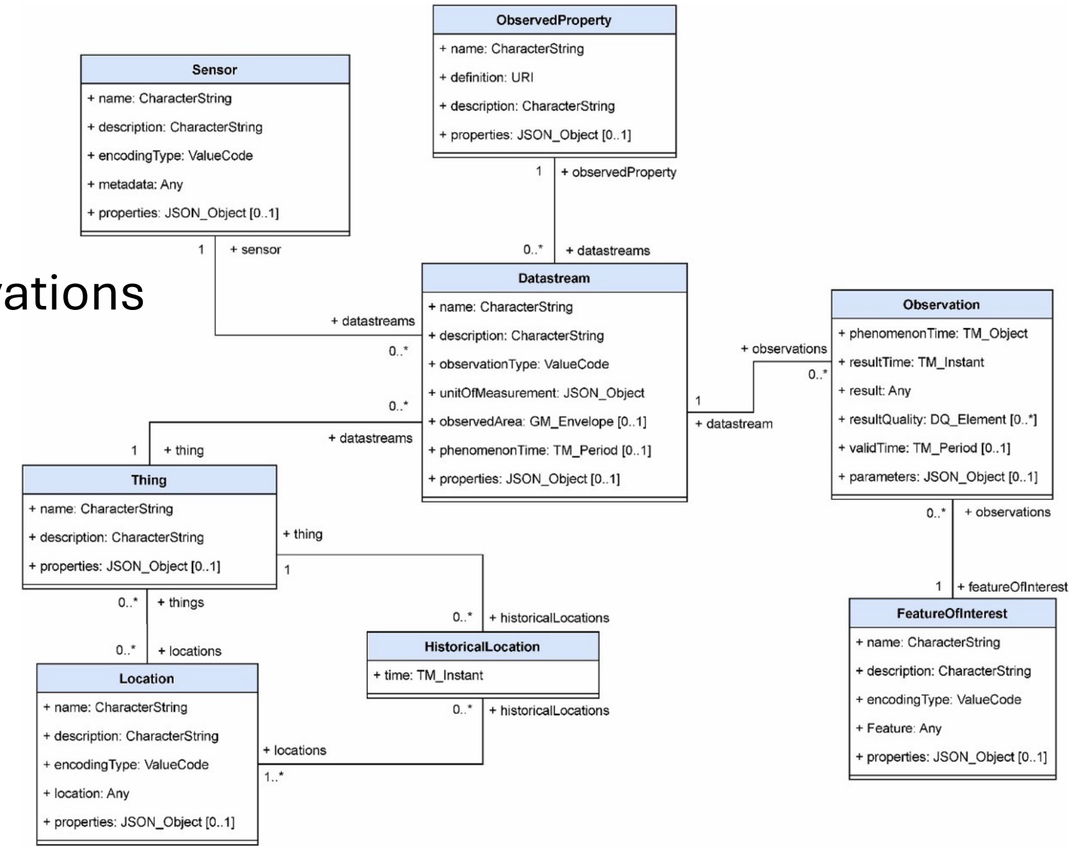
Metadata governance panel
Review & approval workflows

Civil IoT & SensorThings API

- One-stop IoT data service: air, water, disaster, etc.
- Based on OGC SensorThings API
- Key entities: Things, Locations, Datastreams, Observations
- Enables accurate, standards-based data access



STAplus Data Model (future proposed version)



The UML Data Model of the OGC SensorThings API

System Integration

- Combines real-time classification + targeted RAG
- Enables intelligent, reliable response to Civil IoT queries
- Modular, scalable to other public datasets

Integrated Application of Real-Time Query Response

Where we are headed in the coming year

- **Where we are headed in 2026**
- **Adopt AIM core standard + AI-metadata profile** — target OGC approval Q3 2026.
- **Issue RAG/LLM best-practice guide for OGC APIs** — publish Technical Report Q2 2026.
- **Complete cross-WG pilot (AIM × SensorThings × Metadata × GeoAI)** — deliver validated reference corpus and final report Q4 2026

- **This week's contribution**
- Scope and timeline confirmed; working-draft updates authorised; pilot architecture approved.

Next quarter WG communications plan

- Conference paper – “Gridification of agricultural geodata for Digital-Twin workflows” (methodology and early results); submission planned next quarter. Request OGC news item and social-media promotion upon acceptance.
- Project blog series – One short technical post each from PoliRuralPlus, FOCAL, and FAIR2Adapt describing AI-ready data/metadata practices and interim findings.
- Technical explainer – Brief OGC blog article outlining the forthcoming AI-native metadata profile and its relevance to Retrieval-Augmented Generation.
- External coverage – No recent publications referencing the WG; continue monitoring and report any new mentions immediately.

Session Agenda

- **Karel Charvat** Why we need new data and metadata models in the new World of AI and LLM
- **Raul Palma** Current status of AIM and future development
- **Runar Bergheim** Geoinformation in AI - a new spring for grid data
- **Tony Kubicek** New vision of Metadata in the time of Digital Twins and LLM
- **Will** Integrative Application of the Generative AI Dialogue Engine TAIDE Based on Advanced RAG: A Case Study of The Civil IoT Taiwan Data Service Platform

Architecture DWG Closing Plenary Report

The 132nd OGC Member Meeting,

Mérida, Mexico

Núria Julià | UAB-CREAF
Joan Maso | UAB-CREAF
Gobe Hobona | OGC

12 June 2025

CentroGeo
19°17'30"N 99°13'17"O 2489m

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The most important thing for this Working Group is…

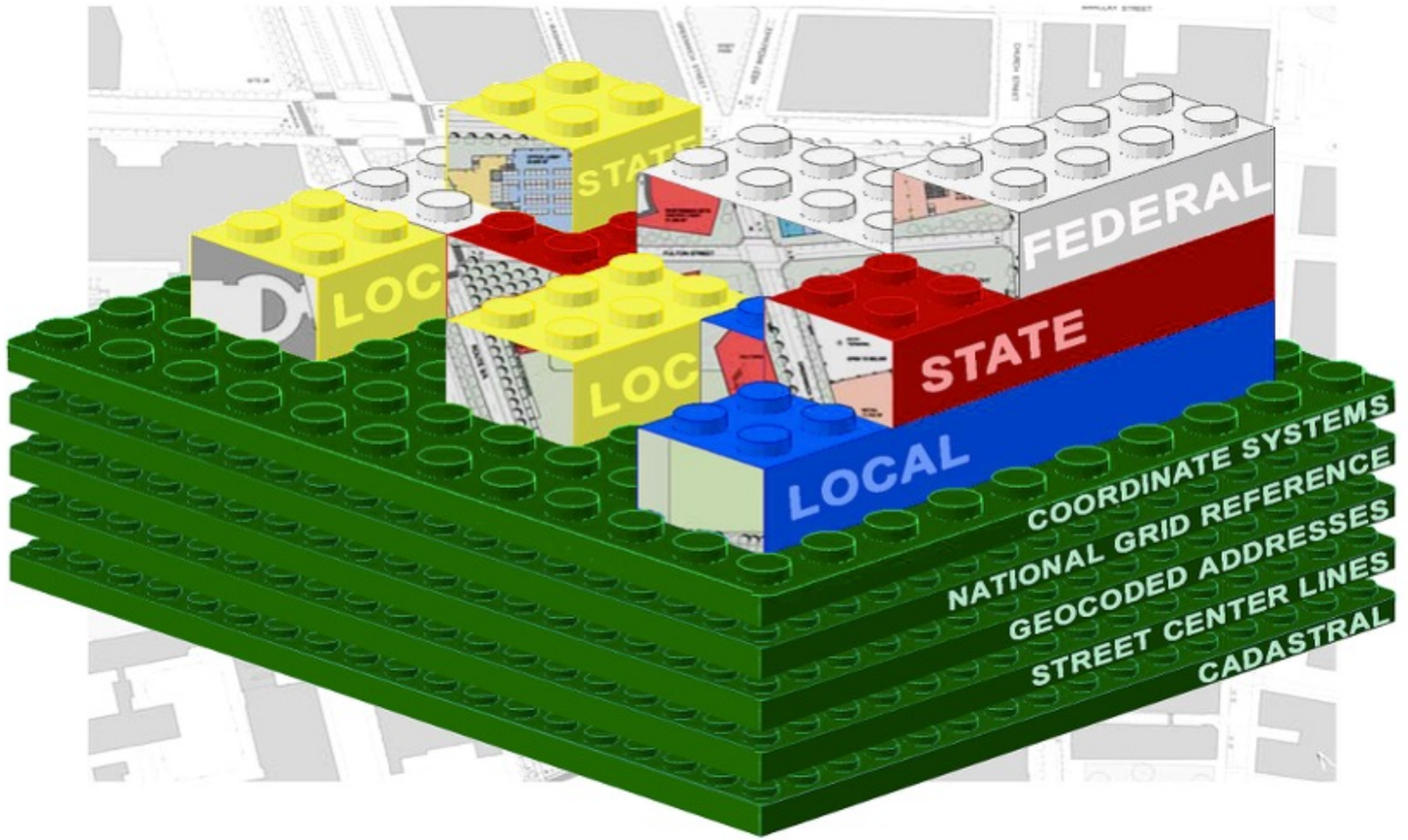
- The increasing requirements for Integrity, Provenance and Trust (IPT) are leading to a growing need for a Provenance Domain Working Group (DWG)

Session Agenda

- Josh Lieberman, Alan Leidner - Towards A Wireframe and Surface Fabric Approach to NSDI (20 min)
- Linda van den Brink (Geonovum) - An update on the Geonovum OGC Checker and Linter (20 min)
- Rajat Shinde (NASA IMPACT at University of Alabama in Huntsville) - Introducing GeoCroissant: A Format for Machine Learning Datasets (20 min)
- Lucio Colaiacomo - Towards Establishing a Provenance DWG (30 min)

What we talked about this week

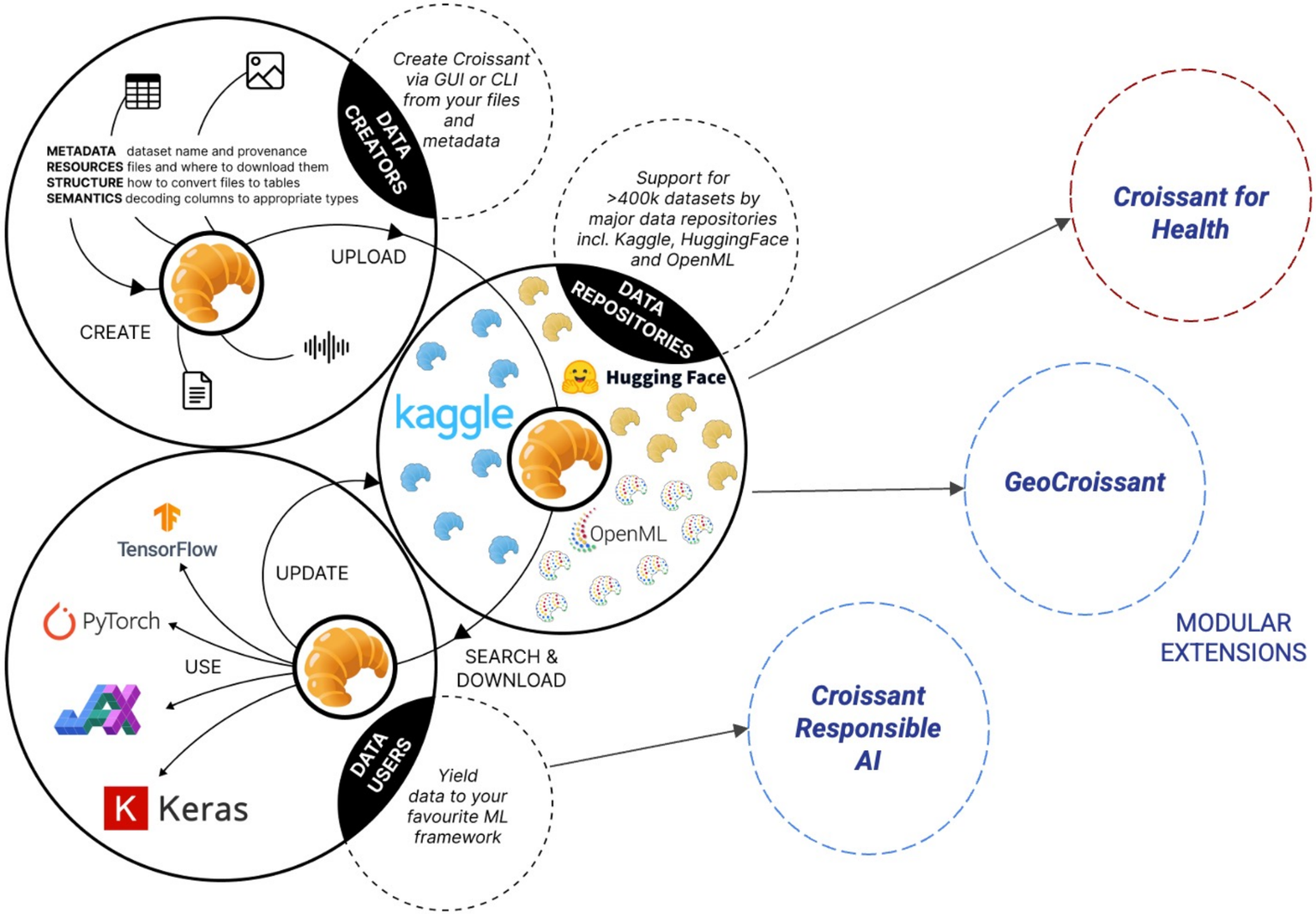
- Vision For Integrated Federal, State and Local Data – based on a surface fabric approach for NSDI



One Map To Bind Them All

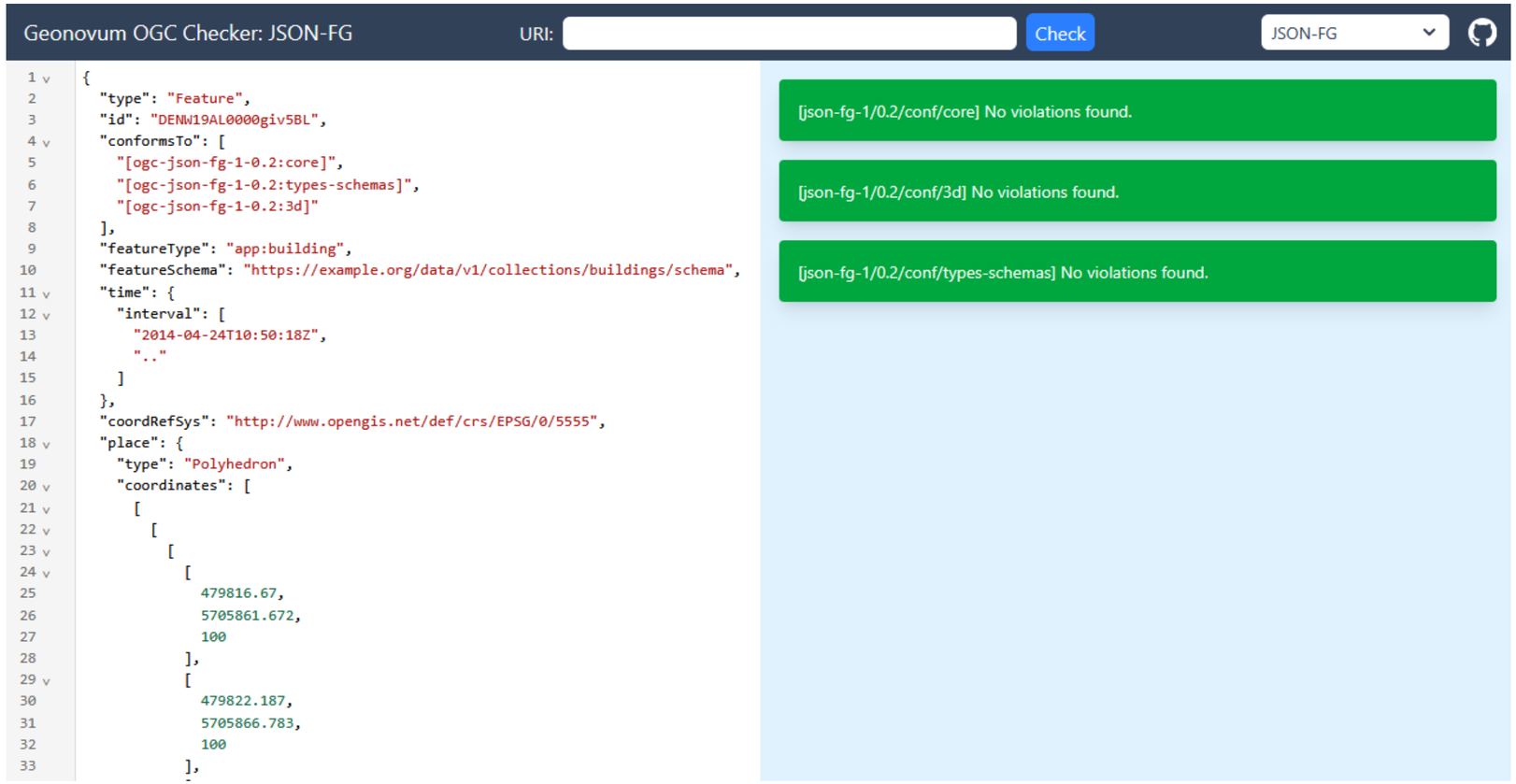
What we talked about this week

- GeoCroissant as a metadata format for Machine Learning models
- Potential synergies with Training Data Markup Language for AI



The Geonovum OGC checker

- Open source: https://github.com/Geonovum-labs/ogc-checker
- Runs as online validator at https://geonovum-labs.github.io/ogc-checker/
- As of now, supports validation of JSON-FG, OGC API Features part 1+2, OGC API Records (new)



Where we are headed in the coming year

- Development of a Charter for the **Provenance DWG**
- Purpose of the DWG: The mission and purpose of the proposed Provenance DWG is to investigate requirements for an open international standard data model and encoding(s) that will benefit the many disciplines and market domains that work with Provenance data and services.
- Expressions of Interest: Please contact Lucio Colaiacomo (luciocol@mac.com)

CRS DWG Closing Plenary Report

The 132nd OGC Member Meeting,

Mérida, Mexico

Keith Ryden, Esri

12 June 2025

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Session Agenda

- Compound CRS Definitions for DGIWG GeoPackage profile – James Ressler

This was a short-format DWG meeting (30 minutes) where issues being encountered with compound CRS and GeoPackage were presented. There will need to be follow-up communication to bring this to final resolution. The goal is to ensure the CRS is completely defined in the CRS WKT and working properly in software, and that the GeoPackage properly validates with DGIWG specific CRS ID values and URIs in the GeoPackage spatial reference table fields.

Discrete Global Grid Systems Domain Working Group Closing Plenary Report

The 132nd OGC Member Meeting, Mérida, Mexico

Dr Matthew B.J. Purss |

Pangaea Innovations Pty Ltd

12 June 2025

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The most important thing for this Working Group is…

- One Very Important thing to this WG is the outreach and promotion of the DGGS suite of standards.

What we talked about this week

- A key point of Discussion during this session was focused on the upcoming OGC AI-DGGS Pilot. Ryan Ahola provided a briefing to the DWG on the currently active Request for Participants and the desired outcomes from this pilot.
- We also had presentations from group members who are implementing OGC DGGS Standards.
  - Erin Li (University of Calgary) presented on how the rHealPix DGGS is being used to progress research activities into improved statistics related to Atmospheric Methane Inventories.
  - Jerome St-Louis (Ecere Corp.) presented on new approaches to DGGS projections, including more appropriate treatment of latitudes when defining the geometries of DGGS Zones.
  - Matthew Purss (Pangaea Innovations Pty Ltd) presented on work being done to develop and implement 4D DGGS - including a discussion of the different data management requirements posed by the different geometry structures of DGGS Zones across the dimensions (2D, 3D and 4D).

Where we are headed in the coming year

- There are numerous outreach and technical implementation activities scheduled for this year that will provide opportunities for the DGGS community to further the testing and implementation of DGGS technologies. These include:
  - The OGC AI-DGGS Pilot
  - TestBed 21
  - The OGC Space Pilot
  - Multiple OGC API Code Sprints
  - The Living Planet Simposium

Next quarter WG communications plan

- Promotion of DGGS at the Living Planet Symposium - a dedicated DGGS stream will be held as part of the conference.
- The OGC AI-DGGS Pilot will produce early/interim reports on the application of DGGS to AI-enabled Disaster Management scenarios.

Session Agenda

- Intro and Logistics
  - 5 Minutes **DGGS DWG Chair(s)**
- Project Briefing: OGC DGGS Pilot
  - 25 Minutes **(Ryan Ahola *[Natural Resources Canada]*)**
- Beyond the Graticule: Spatially Explicit Methane Inventories Using Discrete Global Grids
  - 15 Minutes **(Erin Li *[University of Calgary]*)**
- Update on Icosahedral Equal Area Projections and DGGRS support in DGGAL
  - 15 Minutes **(Jerome St-Louis *[Ecere Corporation]*)**
- 4D DGGS Research and Applications
  - 15 Minutes **(Matthew Purss *[Pangaea Innovations Pty Ltd]*)**

Discrete Global Grid Systems Standards Working Group Closing Plenary Report

The 132nd OGC Member Meeting, Mérida, Mexico

Dr Matthew B.J. Purss |

Pangaea Innovations Pty Ltd

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EmissionML SWG Closing Plenary Report

The 132nd OGC Member Meeting,

Mérida, Mexico

Steve Liang| UCalgary / SensorUp

12 June 2025

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EDR-API SWG Closing Plenary Report

The 132nd OGC Member Meeting,

Mérida, Mexico

Chris Little | UK Met Office
Dave Bldogett | USGS
Peng Yue | Wuhan University

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Features API SWG Closing Plenary Report

The 132nd OGC Member Meeting,

Mérida, Mexico

Clemens Portele | interactive instruments

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GeoDataCube SWG Closing Plenary Report

The 132nd OGC Member Meeting,

Mérida, Mexico

Alexander Jacob | Eurac Research
Miruna Stoicescu | EUMETSAT
Ryan Ahola | Natural Resources Canada

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GeoSemantics DWG Closing Plenary Report

The 132nd OGC Member Meeting,

Mérida, Mexico

Linda van den Brink | Geonovum

12 June 2025

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The most important thing for this Working Group is…

- Nothing major at the moment. The DWG would like input on what its major focus should be.

What we talked about this week

- Should OGC work on a standard for vocabulary services?
- Gathering use cases & requirements for the new version of GeoSPARQL, adding support for 3D geometry & topology
- How spatial knowledge graphs can help improve LLMs

Where we are headed in the coming year

- What are the longer-term goals for the Working Group
- Did this week contribute to those goals?
- Are any documents or other deliverables in work?

Next quarter WG communications plan

- Once we finish the 3D GeoSPARQL whitepaper, that would merit some communication by OGC to bring it to the attention of a wider audience

- There is a call for participation for a **Vocabulary Service Standard** https://www.ogc.org/requests/vocabulary-service-standard/

Session Agenda

- Metadata Needed to Bring Provenance to GeoAI Using Spatial Knowledge Graphs – Nathan McEachen
- A standard for vocabulary services - Ingo Simonis
- Update on the GeoSPARQL 3D whitepaper – Linda van den Brink

Joint Urban Digital Twins and Geo for Metaverse Closing Plenary Report

The 132nd OGC Member Meeting, Mérida, Mexico

Carsten Rönsdorf | Ordnance Survey

12 June 2025

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The most important thing for this Working Group is…

- Explore the overlap between the Urban Digital Twins and Geo for Metaverse DWGs

What we talked about this week

- Exiting new visualisation approaches, such as Gaussian Splats that promise a 10-100x increase in fidelity and removal of unwanted artefacts without changes in photogrammetric source data acquisition
- The usefulness of the inclusion of the word ‘urban’ in UDT
- Relevance of ISO/TC211 NWIP on metadata for UDTs, resulting from initial discussion at Rome Member meeting earlier this year.
- Alignment between the UDT and Geo4MV DWGs

Where we are headed in the coming year

- More joint discussions/meetings between UDT and Geo4MV

Session Agenda

- Geospatial **Gaussian Splat** Layer, Part 2 of Previous Geo for Metaverse, by Amanda Morgan [Cesium/Bentley], Tam Belayneh [Esri], & Konrad Wenze [ESRI]
- Draft ISO/NP TR Extended **Metadata Standards** for Urban Digital Twins, by Kyoung-Sook Kim [National Institute of Advanced Industrial Science and Technology] & Carsten
- Current state of Affairs - **Geo for Metaverse** DWG, by Tam Belayneh [Esri]
- Current state of Affairs - **UDT** DWG, by Carsten Rönsdorf [Ordnance Survey]
- Discussion about **alignment** and **strengths** of both DWGs [all]

UDT Current state of affairs

- Discussion paper: Urban Digital Twins: Integrating Infrastructure, natural environment and people
- January 2025 Panel discussion
- Breadth of Urban Digital Twin work and focus areas
- Use cases?
- What should we focus on?

Met Ocean DWG Closing Plenary Report

The 132nd OGC Member Meeting,

Mérida, Mexico

Chris Little | UK Met Office
Steve Olson | USA NWS
12 June 2025

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The most important thing for the Met Ocean Domain Working Group is…

(Getting ZoHo to work reliably and consistently on a variety of platforms)

- Approval and publication of OGC API-EDR Part 3: Service Profile Support
  - This is actually a profile of ModSpec, so potentially useful for other APIs

What the Met Ocean DWG talked about this week

Projects/standards/WGs of interest:

1. API EDR Part 1, Part 2, Part 3: Profiles, etc
2. CoverageJSON Community Standard V1.0.1, V1.1
3. Abstract Conceptual Model for Time
4. TSML TimeSeriesML V2.0 and CoverageJSON
5. BAG
6. Metadata consistency and tools across domain specific, geo-specific, generic formats E.g. Zarr, GeoZarr, VirtualiZarr, etcm including controlled vocabualries, taxonomies, ontologies

Other topics:

- Put OMS namespace in API-EDR and CoverageJSON
- Multilingual support in EDR – implies preferably all APIs – therefore API-Common Part 1: Core V1.1
- CoverageJSON time only domain for TSML
- CoverageJSON Parameter groups for TSML

Where the Met Ocean DWG is heading in the coming year

- Publish OGC API-EDR Part 1: Core, V1.2
- Enhance OGC CoverageJSON Community Standard to support multiple, custom axes
- Publish OGC API-EDR Part 3: Service Profile Support and begin adoption process at Boulder MM
- Start work on OGC API-EDR Part 4: Aggregations and Statistics

Next quarter Met Ocean DWG communications plan

- Weekly online meetings

Met Ocean DWG Agenda

- Welcome, introduction and technology struggles (5 mins)
- Brief current status of Met Ocean projects, Chris Little (15 mins)
- BAG update, Steve Olson (5 mins)
- Status of API-EDR Part 3: restrictive Service Profile Support, Chuck Heazel (10 mins)
- Use of OGC API-EDR and CoverageJSON at ECMWF, Adam Warde (15 mins)
- RODEO EDR Implementation, Mikko Rauhala, Mikko Visa, Håvard Futsæter (10 mins)
- TSML update, Paul Hershberg (10 mins)
- Questions and discussion, All (20 mins)
- Any Other Business (5 mins)

MUDDI SWG Closing Plenary Report

The 132nd OGC Member Meeting, Mérida, Mexico

Carsten Rönsdorf | Ordnance Survey

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The 132nd OGC Member Meeting, Mérida, Mexico

OGC API – Processes SWG Closing Plenary Report

Benjamin Pross | 52°North

12 June 2025

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PubSub SWG Closing Plenary Report

The 132nd OGC Member Meeting,

Mérida, Mexico

Tom Kralidis
Meteorologial Service of Canada
12 June 2025

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Security DWG Closing Plenary Report

The 132nd OGC Member Meeting,

Mérida, Mexico

Author name | Affiliation

12 June 2025

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The most important thing for this Working Group is...

- The security working group spun of a SWG a while back for the development of a standard to advertise security controls both in Human and Machine readable formats.
- The group should consider following the results and drafting some Best Practices for implementing security controls with an API service.

What we talked about this week

- There was an interesting presentation on Integrity, Provenance and Trust presented by Joan Maso. If you missed the presentation please check out the slide deck at https://portal.ogc.org/files/?artifact_id=111241.
- The OGC API Common - Security SWG provided an overview and a demo on the work they are doing.
  - The main take away from the presentation is that there is no one standard for advertising security controls currently that will cover every case.
    - Open API documentation can cover some controls and associate them with an endpoint.
    - OGC Conformance could be used to document the existence of a control but doesn't associate it with an endpoint.
      - OGC Conformance may not have an OGC conformance class the covers a control.
      - Other Standards Agencies may have conformance classes that do cover the control.
    - .Well-Known IETF standards many have a way to advertise some controls with relation links.
  - .Well-Know.api-catalog provides a way to advertise multiple APIs as well as document API endpoints with relation links for each API in the form of a linkset expressed in JSON.

Where we are headed in the coming year

- The OGC API Common - Security SWG should finish the standard for advertising security controls.
- The Security DWG will look in to drafting some Best Practice Guides for Developers interested in adding security to their APIs.

Next quarter WG communications plan

- The OGC API Common - Security SWG announces meetings on the portal every two weeks. Please feel free to sign the Observer Agreement and attend those meetings.
- The Security DWG and the OGC API Common - Security SWG will be presenting update on ongoing security efforts and the progress on the Standard at the next Member Meeting.

Session Agenda

- Agenda item
- IPT in the EU Project AD4GD- By Joan Maso and Andreas Matheus
- OGC API Common - Security SWG Overview and Demo

TrainingDML-AI SWG Closing Plenary Report

The 132nd OGC Member Meeting,

Mérida, Mexico

Peng Yue | Wuhan University

12 June 2025

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