OGC Coverages

TITLE:	OGC Coverages Standards Working Group Charter
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CATEGORY:	SWG Charter

To: OGC members & interested parties

Recharting the Web Coverage Service (WCS) Standards Working Group (SWG).

The OGC members listed below have proposed that the Web Coverage Service SWG be rechartered as the "OGC Coverages SWG". The SWG proposal provided in this document meets the requirements of the OGC Technical Committee (TC) Policies and Procedures. The SWG name, statement of purpose, scope, list of deliverables, audience, and language specified in the proposal will constitute the SWG's official charter.

This SWG will operate under the OGC IPR Policy. The eligibility requirements for becoming a participant in the SWG meetings (see details below) are that:

- You must be an employee of an OGC member organization or an individual member of OGC;
- The OGC member must have signed the OGC Membership agreement;
- You must notify the SWG chair of your intent to participate to the meetings. Members may do so by logging onto the OGC Portal and navigating to the Observer page and clicking on the link for the SWG they wish to join and;

Participants may join the SWG at any time. The OGC and the SWG welcome all interested parties.

Non-OGC members who wish to participate may contact the OGC about joining. In addition, the public may access some of the resources maintained for each SWG: the SWG public description, the SWG Charter, Change Requests, and public comments, which will be linked from the SWG's page.

Please feel free to forward this announcement to any other appropriate lists. The OGC is an open standards organization; we encourage your feedback.

Purpose of the OGC Coverages Standards Working Group

The purpose of this Standards Working Group is to:

- Develop and maintain the OGC Web Coverage Service standards suite.
- Develop and maintain additions and extensions to the WCS standards suite.

- Develop and maintain the OGC API - Coverages standards suite
- Develop and maintain additions and extensions to the OGC API - Coverages standards suite.
- Develop and maintain standards for metadata exposed through Web Coverage Services or APIs.
- Develop and maintain the Coverage data model suite, including Coverage encodings.

Business Value Proposition

The quarterly Space Foundation 2019 first quarter Space Report states that 38 percent of the 465 spacecraft deployed in 2018 were deployed for Earth Observation or Remote Sensing missions. A majority of those spacecraft were deployed for commercial purposes. In a separate report by a consulting firm specializing in space markets report, the market for data and services derived from Earth observation (EO) satellites was forecasted to reach $8.5 billion by 2026.

Much of the coverage data produced by EO satellite programs is used by scientists to help understand environmental change and how communities can improve their management of natural resources. Other applications include, for example, competitor analysis in business and geospatial intelligence in defense and security.

In the European INSPIRE legal framework for a common Spatial Data Infrastructure coverages play a central role. In 9 of the 13 themes data appear modeled as coverages, such as Elevation, Land cover, Orthoimagery, Soil, Energy resources, Species distribution, Natural risk zones, and Geology.

With the volume of coverage data growing daily, there is an significant need to find ways to leverage recent advances in technology that can improve the ability of users to discover and access coverages. The goal of the OGC API - Coverages standards work is to leverage some of those technological advances, in particular Web APIs.

Scope of Work

- Coverages, as defined in Abstract Topic 6 and Coverage Implementation Schema (CIS), have proven valuable as a unified, comprehensive representation of spatio-temporal grids, point clouds, and meshes. In particular, coverages serve to model "datacubes".
- Web Coverage Service (WCS) with its easy to implement and use core and the manifold extensions has proven a powerful way to access, process, filter, analyse, and combine coverage data, being used on multi-Petabyte satellite image and atmospheric data, among others.
- OGC API - Coverages is a service model base on OpenAPI frameworks. These have helped make describing and sharing API definitions more suitable for interoperability standardization. The concept of a OGC API - Coverages was demonstrated in various OGC Innovation Program initiatives.

Regarding OGC API - Coverages, the OGC Coverages SWG will build on those preliminary efforts to more fully develop and document an OGC API - Coverages candidate standard that will provide a modernized, common, and consistent interface to services that aligns with the current architecture of the Web and the Spatial Data on the Web Best Practices (https://www.w3.org/TR/sdw-bp/).

Before finalizing parts of the future versions of the Coverage Standards, completion of goals should

be verified:

- Working implementations of all capabilities must be available and tested.
- Implementation feedback must be taken into account.

A consequence of this verification is that the period between the availability of what is considered a mature draft and the finalization of the candidate standard may be longer than in the past. The timing is dependent on the availability of evidence about the suitability of the candidate standard based on implementations. Developers should be encouraged as early as possible to implement the draft API specification and provide feedback. An aspect of this is public access to drafts from the beginning. To this end, the SWG intends to use a public GitHub repository in the development of this standard as this is the environment many developers are familiar with and use on a daily basis.

Statement of relationship of planned work to the current OGC standards baseline

The proposed OGC API - Coverages standard is intended to be a major component of the OGC API framework. It will take advantage of Web API patterns identified in OGC API standards (e.g., OGC API - Features) and other ongoing API efforts (e.g. OGC API - Common development in the OWS Common SWG) to better align with current and emerging IT practices. The work of the Coverages SWG will complement the previously developed Coverage Implementation Schema (CIS) and provide a means for sharing coverages developed under OGC and other coverage encodings.

What is Out of Scope?

Proposals for new parts of OGC Coverages or change requests to existing parts must identify the user group that will benefit from the proposal and for each proposed conformance class; otherwise the proposal will be considered out-of-scope.

OGC API - Coverages is envisioned to be a modular, multi-part standard. Extensions and profiles not identified as in scope in the previous section will require a revision to the SWG charter prior to commencement of work. If a community has a need to develop a profile, the profile should be specified and governed by that community.

The basic resource described in OGC Coverages are coverages. The Coverages SWG describes the interface and exchange of coverages. The definition of coverages is given by the Coverage Implementation Schema (CIS) standard and its encoding standards.

Specific Contribution of Existing Work as a Starting Point

The starting points for the initial deliverables are:

- OGC API - Coverages GitHub repository (https://github.com/opengeospatial/ogc_api_coverages)
- CoverageJSON GitHub repository (https://github.com/opengeospatial/CoverageJSON)

The work will also be informed by the following specifications and by recommendations found in:

- OGC API - Common

- OGC/W3C Spatial Data Working Group on the Web Best Practices (https://www.w3.org/TR/sdw-bp/);
- OGC Geospatial API White Paper [OGC 16-019r4];
- OGC API - Features - Part 1: Core standard, [OGC 17-069r3]; and
- Coverage Implementation Schema (CIS), [OGC 09-146r8].

Is this a persistent SWG?

- [x] Yes
- [ ] No

When can SWG be inactivated?

The OGC Coverages SWG is a standing one, maintaining the suite through corrigenda, feature extensions, new features, etc. as requested by the membership. Any newly adopted coverage standard will be added to the portfolio of standards maintained.

Description of Deliverables

Ongoing Tasks

The following set of deliverables will be provided by this SWG:

- A final version of the "OGC API - Coverages - Part 1: Core" document for submission to the TC.
- Identification of at least three prototype implementations of the core based on the standard - although more would be preferred.
- Zero or more additional parts as time and community interest permits.

Part 1 will cover basic capabilities to GET, PUT, PATCH, POST, and DELETE coverages and define coverage metadata. Capabilities for richer coverage interfaces or extension for unique geospatial resource considerations will be specified in additional parts.

Work on this deliverable has been proceeding under the WCS SWG. This work will transition to the OGC Coverages SWG once the charter is approved. Formal approval of the core OGC API - Coverages is envisaged to take place nearer December 2020.

The OGC Coverages SWG is developing Coverage encodings for:

- CoverageJSON

Additional SWG Tasks

The OGC Coverages SWG provides CIS and WCS maintenance:

- Corrigenda and new functionality as proposed via Change Requests

The OGC Coverages SWG work program also include development of extensions to the OGC API -

Coverages Core Standards mirroring the WCS capabilities:

- OGC API - Coverages - Part n: Subsetting
- OGC API - Coverages - Part n: Range-subsetting
- OGC API - Coverages - Part n: Processing
- OGC API - Coverages - Part n: CRS
- OGC API - Coverages - Part n: Transactional
- OGC API - Coverages - Part n: Scaling
- OGC API - Coverages - Part n: Interpolation

The part numbers will be determined later including combining extensions in one part as conformance classes.

The OGC Coverages SWG will explore and specify how the OGC API - Coverages can support the following coverage format standards:

- GeoTIFF
- JPEG 2000
- JPEG
- HDF5
- PNG
- NetCDF
- GMLJP2
- JPIP
- GRIB2
- Any other coverage relevant encoding

The OGC Coverages SWG will deliver updated standards in response to Change Requests.

Additional tasks for the SWG may be proposed and addressed in revisions to this charter. The process to be used is described in OGC 05-020r27 Technical Committee Policies and Procedures. The SWG may begin work on the new task once TC approval has been received, the charter updated, and the charter has been posted.

IPR Policy for this SWG

- ☑ RAND-Royalty Free
- ☐ RAND for fee

Anticipated Participants

- coverage resource providers.

- Developers implementing services.
- Producers of coverage data.
- Users of coverage resources.

Domain Working Group Endorsement

The Coverages DWG will review the proof-of-concept at https://github.com/opengeospatial/ogc_api_coverages and this SWG charter. A statement of endorsement will be requested at the September 2020 OGC Members' meeting.

Other Informative Remarks about this SWG

a. Similar or Applicable Standards Work (OGC and Elsewhere).

The following standards work may be applicable to the work of the proposed SWG:

- 19-072 OGC API - Common - Part 1: Core
- ISO 19123-1:(working draft) Coverage Fundamentals
- ISO 19123-2:2018 Coverage implementation schema
- OGC Web Coverage Service
- OGC Web Coverage Processing Service
- EO-GeoJSON
- GML in JPEG2000
- GeoTIFF
- HDF5
- LAS
- NetCDF

Additionally, the proposed SWG will monitor other related work ongoing in various Standards and Innovation Program activities.

b. Projected On-going Meeting Schedule

The work of this SWG will be carried out primarily on GitHub and via email, conference calls, with potential face-to-face meetings at OGC TC meetings as agreed to by the SWG members. The teleconference calls will be scheduled as needed and posted to the OGC portal. Voting on Coverages SWG SWG content will be limited to SWG members only.

c. Supporters of the Proposal (Charter Members)

The following people support this proposal and are committed to the Charter and projected meeting schedule. These members are known as SWG Founding or Charter members. The charter members agree to the SoW and IPR terms as defined in this charter. The charter members have voting rights beginning the day the SWG is officially renamed. Charter Members are shown on the

public SWG page.

Name	Organization
Stephan Meissl	EOX IT Services GmbH
Jerome Jacovella St Louis	Ecere
Tom Kralidis	Meteorological Service of Canada
Chuck Heazel	Heazel Tech
Chris Little	UK Met Office
Peter Baumann	Jacobs University, rasdaman GmbH
James Passmore	United Kingdom Research Institute (UKRI)
Panagiotis (Peter) A. Vretanos	CubeWerx Inc.

d. Convener(s)

Stephan Meissl, Chuck Heazel