**Open Geospatial Consortium**

Submission Date:   <2018-03-23>

Approval Date:   <yyyy-dd-mm>

Publication Date:   <yyyy-dd-mm>

External identifier of this OGC® document: <[http://www.opengis.net/doc/[{doc-type/}]{standard}/{m.n}](http://www.opengis.net/def/%5b%7bdoc-type/%7d%5d%7bstandard%7d/%7bm.n%7d)>

Internal reference number of this OGC® document:    13-026r9

Version: 1.1.0

Category: OGC® Implementation Standard

Editor:   Uwe Voges, Pedro Gonçalves, Yves Coene

OGC® OpenSearch Extension for Earth Observation (OpenSearch-EO)

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Document type:    OGC® Interface Standard

Document subtype:    Encoding

Document stage:    Draft

Document language:  English

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Abstract

This document is the specification for the OpenSearch extension for Earth Observation collections and products search.

This standard is intended to provide a very simple way to make queries to a repository that contains Earth Observation information and to allow syndication of repositories.

Keywords

The following are keywords to be used by search engines and document catalogues.

ATOM, ogcdoc, OGC document, OpenSearch, Earth Observation Extension, OpenSearch Earth Observation Service, EO Collection, EO Product, ISO19115, INSPIRE, OGC O&M EOP

History

The first release of the document was the result of work undertaken within the GENESI-DR (Ground European Network for Earth Science Interoperations - Digital Repositories) project funded by the 7th Framework program of the European (EC Grant Agreement no. 212073), the follow-up project GENESI-DEC (Ground European Network for Earth Science Interoperations -Digital Earth Community) funded by the same program (Contract nº RI-261623). This document was initially produced during the ESA HMA (Heterogeneous Missions Accessibility) initiative [RD.25] and related projects.

Preface

The recent release of the document is the result of work sponsored by EUMETSAT and ESA in the context of the continuation of the ESA HMA (Heterogeneous Missions Accessibility) initiative [RD.25].

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Submitting organizations

The following organizations submitted this Document to the Open Geospatial Consortium (OGC):

* **EUMETSAT**
* **European Space Agency (ESA)**
* **con terra GmbH**
* **Spacebel s.a.**
* **Terradue SRL**

The editors would like to acknowledge that this work is the result of collaboration and review of many organisations and would like to thank for the comments and contributions from:

* CEOS/WGISS
* NASA
* AIRBUS
* CGI
* EOX GmbH
* Luciad
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Note: this does not imply a complete endorsement by these organisations.

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| Olivier Barois | ESA |
| Michael Schick | EUMETSAT |
| John Taylor | CGI |

Future Work

In a next release of OGC 10-032 that specification should include things which are specified for the time being within this document:

* Encoding of paging (using atom:link rel="prev", rel="next",…) and OS metadata (like os:totalResults)

# Scope

The OpenSearch specification originated in a community effort built around Amazon's A9.com. It was intended to allow syndication of search results that could then be aggregated by one large index. It provides a simple to use description of the search interface, which is called OpenSearch Description document (OSDD). A client (e.g. a browser) can use this description to check which response formats are supported and how a query/filter can be formulated.

The OpenSearch specification [RD.15] is made available under the Creative Commons Attribution-Sharealike 2.5 license (<http://www.opensearch.org/Specifications/License>).

Earth Observation (EO) products have specific characteristics that follow a specific logic inherent to the EO community of users of satellite datasets. Typically, an EO product contains information regarding:

* The platform or satellite from where it originates (e.g. SPOT, ENVISAT).
* The sensor used to acquire the data.
* The processing centre responsible for its elaboration, together with the date and software used for the processing.
* Specific satellite orbit information like the orbit number, wrsLatitudeGrid and direction.

The OSDD format permits the use of extensions that allow search engines to inform clients about specific and contextual query parameters and response formats. This OGC standard specifies an Earth Observation extension to OpenSearch that defines query parameters that permit the filtering of search results with those fields and a search response model supporting different search response encodings.

This document incorporates feedback from developers in the open source geospatial community and includes several annexes showing result sets in several possible formats and giving details that reflect a sample implementation.

Services that support the OpenSearch Specification and the Earth Observation extension defined in this document are called OpenSearch Earth Observation Services (OpenSearch-EO).

# Conformance

Conformance with this standard shall be checked using all the relevant tests specified in Annex A (normative) of this document. Annex C presents the RELAX-NG schemas for the OpenSearch Description and the Atom Response Documents. The framework, concepts, and methodology for testing, and the criteria to be achieved to claim conformance are specified in the OGC Compliance Testing Policies and Procedures and the OGC Compliance Testing web site[[1]](#footnote-1).

To conform to this OGC™interface standard, a software implementation shall implement the Core conformance class and may implement any other of the conformance classes specified in Table 1. The implementation can be validated with the conformance tests defined in Annex A (normative). An implementation candidate to conformance shall minimally pass all applicable tests specified in the Abstract Test Suite belonging to core conformance class (minimal support).

The mappings between the conformance classes and the requirement classes are shown in Table 1.

Note 1: If a requirement class *r11* depends on another requirement class *r1* then also *r1* must be implemented.

Note 2: Every requirement class (except the Core requirement class) depends on the Core requirement class.

All requirements-classes, conformance-classes and conformance tests described in this document are owned by the specification identified as <http://www.opengis.net/spec/opensearcheo/1.0>.

For each conformance class listed in Table 1 there is a corresponding requirement class with the same name. Table 2 lists each requirement classes and the set of requirements that correspond to each requirement class. Furthermore, each requirement in Table 2 is covered by a test in the conformance tests defined in Annex A: Abstract Test Suite (Normative).

Table 1: Conformance Classes

|  |  |  |
| --- | --- | --- |
| **Conformance Class Name** | **Conformance Class URI** | **Requirements Classes (URI´s)** |
| Core | /conf/Core | /req/Core |
| INSPIRE | /conf/INSPIRE | /req/INSPIRE |
| ParameterExtension | /conf/ParameterExtension | /req/ParameterExtension |
| CustomSearch | /conf/CustomSearch | /req/CustomSearch |
| SetsAndRanges | /conf/SetsAndRanges | /req/SetsAndRanges |
| LinkTypeAttribute | /conf/LinkTypeAttribute | /req/LinkTypeAttribute |
| OSGeoTempParameters | /conf/OSGeoTempParameters | /req/OSGeoTempParameters |
| OSGeoNameParamete | /conf/OSGeoNameParameter | /req/OSGeoNameParameter |
| GeometryTypes | /conf/GeometryTypes | /req/GeometryTypes |
| Paging | /conf/Paging | /req/Paging |
| SpecReference | /conf/SpecReference | req/SpecReference |
| Spatial Extent | /conf/SpatialExtent | /req/SpatialExtent |
| Data Access | /conf/DataAccess | /req/DataAccess |
| TwoStepSearch | /conf/TwoStepSearch | /req/TwoStepSearch |
| MetadataLink | /conf/MetadataLink | /req/MetadataLink |
| InlineMetadata | /conf/InlineMetadata | /req/InlineMetadata |
| ImagesByLink | /conf/ImagesByLink | /req/ImagesByLink |
| ImagesByMediaRSS | /conf/ImagesByMediaRSS | /req/ImagesByMediaRSS |
| EntrySummary | /conf/EntrySummary | /req/EntrySummary |
| Offerings | /conf/Offerings | /req/Offerings |
| Exception | /conf/Exceptions | /req/Exceptions |

The mappings between the requirements and the associated requirement class are shown in the table below.

Table 2: Requirements Classes

|  |  |  |
| --- | --- | --- |
| **Requirements Class Name / URI** | **Dependendcy** | **Requirements URIs** |
| Core  /req/Core | OpenSearch-Geo [RD.3] | /req/osdd  /req/osdd/namespaces  /req/osdd/atom  /req/request/parameters  /req/request/kvpget  /req/osdd/optionalTemplateParameters  /req/response/ATOM  /req/response/ATOM/model  /req/response/ATOM/feed  /req/response/ATOM/entry  /req/response/ATOM/entry/identifier /req/request/osParameters /req/request/multiWordsSearchTerms /req/request/stringParameters |
| ParameterExtension  /req/ParameterExtension | /req/Core | /req/osdd/parameterExtension |
| CustomSearch  /req/CustomSearch | /req/Core  /req/ParameterExtension | /req/osdd/customSearch |
| SetsAndRanges  /req/SetsAndRanges | /req/Core  /req/ParameterExtension | /req/osdd/setsAndRanges |
| LinkTypeAttribute  /req/LinkTypeAttribute | /req/Core | /req/response/ATOM/entry/linkTypeAttribute |
| OSGeoTempParameters  /req/osGeoTempParameters | /req/Core | /req/request/osGeoTempParameters |
| OSGeoNameParameter  /req/osGeoNameParameter | /req/Core | /req/request/osGeoNameParameter |
| GeometryTypes  /req/GeometryTypes | /req/Core  /req/ParameterExtension | /req/osdd/supportedGeometryTypes |
| Paging  /req/Paging | /req/Core | /req/response/ATOM/entry/resultSetNavigation  /req/response/ATOM/feed/useOfStartIndexOverStartPage |
| SpecReference  /req/SpecReference | /req/Core | req/response/ATOM/feed/specReference |
| Spatial Extent  /req/spatialExtent | /req/Core | /req/response/ATOM/feed/extent  /req/response/ATOM/entry/extent  req/response/ATOM/entry/GeoRSSMultiPolygonFootprint  /req/response/ATOM/entry/GeoRSSMultiPointFootprint  /req/response/ATOM/entry/GeoRSSMultiLineFootprint |
| Data Access  /req/DataAccess | /req/Core | /req/response/ATOM/entry/datalink /req/response/ATOM/entry/ordering /req/response/ATOM/entry/documentationLink |
| TwoStepSearch  /req/TwoStepSearch | /req/Core  /req/LinkTypeAttribute | /req/response/ATOM/entry/searchContextLink /req/response/ATOM/entry/parentIdentifier /req/osdd/relAttributeOfURL /req/osdd/queryElement |
| MetadataLink  /req/MetadataLink | /req/Core  /req/LinkTypeAttribute | /req/response/ATOM/entry/metadataLink |
| InlineMetadata  /req/InlineMetadata | /req/Core  /req/ParameterExtension | /req/response/ATOM/entry/inlineMetadata /req/osdd/inlineMetadataSchemas |
| ImagesByLink  /req/ImagesByLink | /req/Core  /req/LinkTypeAttribute | /req/response/ATOM/entry/imagesByLink |
| ImagesByMediaRSS  /req/ImagesByMediaRSS | /req/Core | /req/response/ATOM/entry/imagesByMediaRSS |
| EntrySummary  /req/EntrySummary | /req/Core | /req/response/ATOM/entry/atomSummary |
| Offerings /req/Offerings | /req/Core | /req/response/ATOM/entry/offerings |
| INSPIRE  /req/INSPIRE | /req/Core | /req/request/INSPIREParameters |
| Exceptions  /req/Exceptions | /req/Core | /req/exceptions |

# References

## Normative References

The following normative documents contain provisions that, through reference in this text, constitute provisions of this document. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. For undated references, the latest edition of the normative document referred to applies.

[RD.1] OGC 06-121r9 - OpenGIS® Implementation Standard: OGC Web Services Common Standard

[RD.2] OASIS OpenSearch - searchRetrieve: Part 4. APD Binding for OpenSearch Version 1.0, OASIS Standard, 30 January 2013, <http://docs.oasis-open.org/search-ws/searchRetrieve/v1.0/searchRetrieve-v1.0-part4-opensearch.html>

[RD.3] OGC 10-032r8 - OpenGIS® Implementation Standard: OpenSearch Geo and Time Extensions

[RD.4] OGC 10-157r3 – OpenGIS® Implementation Standard: Earth Observation Metadata profile of Observations & Measurements, V 1.0

[RD.5] OGC 10-157r4 – OpenGIS® Implementation Standard: Earth Observation Metadata profile of Observations & Measurements, V 1.1

[RD.6] *not more assigned.*

[RD.7] Linked Data Platform Paging 1.0, W3C Working Group Note, 30 June 2015,

<http://www.w3.org/TR/ldp-paging/>

[RD.8] *not more assigned.*

[RD.9] CEOS OpenSearch Best Practice, Issue 1.2, 13/06/2017.

[RD.10] The Library of Congress – **Information Resource Retrieval Protocols:** SRU/SRW (Search and Retrieve URL/Web Service) DC Schema for SRU (<http://www.loc.gov/standards/sru/recordSchemas/dc-schema.html>)

[RD.11] OGC 12-084r2 – OGC OWS Context Atom Encoding Standard, V 1.0, 2013-12-05

[RD.12] OGC 13-043 – OGC Download Service for Earth Observation Products, OGC Best Practice, V 1.0, 2014-01-31

[RD.13] OGC 06-141r6 - [Ordering Services Framework for Earth Observation Products Interface Standard](https://portal.opengeospatial.org/files/?artifact_id=43928" \t "_blank) (OSEO), V 1.0, 2012-01-09.

[RD.14] OGC 13-043 – OGC Download Service for Earth Observation Products Best Practice (ROSEO), V 1.0, 2014-01-31.

[RD.15] OpenSearch - <http://www.opensearch.org/Specifications/OpenSearch/1.1>

[RD.16] OGC GeoRSS Encoding Standard (Candidate), V 1.0, OGC 17-002r1, <http://www.opengeospatial.org/standards/georss>.

[RD.17] OpenSearch Parameter Extension - <http://www.opensearch.org/Specifications/OpenSearch/Extensions/Parameter/1.0/Draft_2>

[RD.18] OpenSearch SRU Extension - <http://www.opensearch.org/Community/Proposal/Specifications/OpenSearch/Extensions/SRU/1.0/Draft_1>

[RD.19] INSPIRE Metadata Implementing Rules: Technical Guidelines based on EN ISO 19115 and EN ISO 19119 (<http://inspire.ec.europa.eu/Technical-Guidelines2/Metadata/6541>)

[RD.20] Technical Guidance for the implementation of INSPIRE Discovery Services (<http://inspire.ec.europa.eu/documents/technical-guidance-implementation-inspire-discovery-services-0>)

[RD.21] Media RSS Specification, Version 1.5.1, <http://www.rssboard.org/media-rss>

[RD.22] Atom - The Atom Syndication Format (IETF RFC4287)

[RD.23] OGC 06-131r6 – OGC Implementation Standard: OGC Catalogue Services Standard 2.0 Extension Package for ebRIM Application Profile: Earth Observation Products”

[RD.24] OGC 13-084r2 – OGC Extension Package Standard: OGC I15 (ISO19115 Metadata) Extension Package of CS-W ebRIM Profile 1.0.

[RD.25] ESA HMA (Heterogeneous Missions Accessibility). <http://www.esa.int/About_Us/ESA_Publications/ESA_TM-21_Heterogeneous_Missions_Accessibility>

[RD.26] ISO 19115:2003, Geographic Information – Metadata

[RD.27] ISO/TS 19139:2007, Geographic information -- Metadata -- XML schema implementation

[RD.28] ISO19115-2:2009, Geographic information – Metadata – Part 2: Extensions for imagery and gridded data.

[RD.29] ISO/TS 19139-2:2012, Geographic information - Metadata - XML schema implementation - Part 2: Extensions for imagery and gridded data

[RD.30] ISO 19115-1:2014, Geographic information -- Metadata -- Part 1: Fundamentals

[RD.31] ISO/TS 19115-3, Geographic information -- Metadata -- Part 3: XML schema implementation for fundamental concepts

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HMA - Heterogeneous Missions Accessibility – Design Methodology, Architecture and Use of Geospatial Standards for the Ground Segment Support of Earth Observation missions ESA TM-21 http://www.esa.int/About\_Us/ESA\_Publications/ESA\_TM- 21\_Heterogeneous\_Missions\_Accessibility

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RDFS - http://schema.rdfs.org/

RFC 3339 - Date and Time on the Internet: Timestamps. Internet profile of the ISO 8601 standard for representation of dates and times using the Gregorian calendar. http://www.ietf.org/rfc/rfc3339.txt

RFC 5646 - Tags for Identifying Languages - http://tools.ietf.org/html/rfc5646

RFC 5988 - Web Linking - http://tools.ietf.org/html/rfc5988   
http://www.iana.org/assignments/link-relations/link-relations.xhtml

# Terms and Definitions

This document uses the terms defined in Sub-clause 5.3 of [RD.1], which is based on the ISO/IEC Directives, Part 2, Rules for the structure and drafting of International Standards. In particular, the word “shall” (not “must”) is the verb form used to indicate a requirement to be strictly followed to conform to this standard.

For the purposes of this document, the following additional terms and definitions apply.

1. Collection

A Collection or a Dataset Series (in short *Series*) defines a container for a list of Products (or datasets) that have common properties. Products inherit all the Collection properties that are not explicitly overridden.

1. Product

A Product or a Dataset corresponds to an identifiable collection of data under one single identifier. It is independent of a physical form or an encoding even if it is normally distributed in a single file.

1. OpenSearch

Draft specification for web search syndication, originating from Amazon's A9 project and given a corresponding interface binding by the OASIS Search Web Services working group.

1. OpenSearch Geospatial Service

Defines services that comply with the OpenSearch Specification and the Geo extension defined in OGC 10-032 [RD.3]

1. OpenSearch GeoTemporal Service

Defines services that comply with the OpenSearch Specification, the Geo and Time extensions defined in OGC 10-032 [RD.3]

1. OpenSearch Description Document (OSDD)

An XML document available at a consistent location describing metadata for the service and providing templates for queries.

1. OpenSearch Earth Observation Service

Defines services that comply with the OpenSearch Specification and the Earth Observation extension defined in this document

1. Search feed

The response document of search service request containing zero or several entries.

1. Entry

An element of the search response representing a catalogued resource.

# Conventions

## Abbreviated terms

Some of the abbreviated terms listed in Subclause 5.1 of the OWS Common Implementation Specification [RD.1] apply to this document, plus the following:

ATS Abstract Test Suite

CEOS Committee on Earth Observation Satellites

DM Download Manager

EC European Commission

EO Earth Observation

EOP Earth Observation Product

ESA European Space Agency

GML Geography Markup Language

HMA Heterogeneous Missions Accessibility

HTTP HyperText Transfer Protocol

IRI Internationalised Resource Identifier

ISO International Organisation for Standardisation

OASIS Advancing Open Standards for the Information Society

OGC Open Geospatial Consortium

OSDD OpenSearch Description Document

O&M Observations and Measurements

OWC OGC Web Services Context

RDF Resource Description Framework

RDFS RDF Schema

REST Representational State Transfer

SRU Search/Retrieval via URL

SWS Search Web Services

UML Unified Modelling Language

UMM Unified Metadata Model

URI Uniform Resource Identifier

URL Uniform Resource Locator

URN Uniform Resource Name

W3C World Wide Web Consortium

WGISS Working Group on Information Systems and Services

WKT Well-Known Text

WMC Web Map Context

WMS Web Map Service

XML eXtensible Markup Language

XSD XML Schema Definition Language

## Namespace prefix conventions

Table 3 lists the namespaces used in this document and the specifications in which they are defined. The prefixes are **not** normative and are merely chosen for convenience; they may appear in examples without being formally declared, and have no semantic significance. The namespaces to which the prefixes correspond are normative, however.

Table 3 – Namespace mappings

| **Prefix** | **Namespace URI** | **Specification** |
| --- | --- | --- |
| atom | http://www.w3.org/2005/Atom | The Atom Syndication Format [RD.22] |
| dc | http://purl.org/dc/elements/1.1/ | Namespace Policy for the DCMIa |
| dct | http://purl.org/dc/terms/ | Namespace Policy for the DCMIa |
| eo | http://a9.com/-/opensearch/extensions/eo/1.0/ | OpenSearch Extension for EO V 1.0 (this document) |
| eop | http://www.opengis.net/eop/2.0 or  http://www.opengis.net/eop/2.1 | EO product schema namespace defined in OGC 10-157r3 [RD.4] or  EO product schema namespace defined in OGC 10-157r4 [RD.5] |
| geo | http://a9.com/-/opensearch/extensions/geo/1.0/ | OpenSearch Geo Extension [RD.3] |
| georss | http://www.georss.org/georss | GeoRSS Specification b [RD.16] |
| gmd | http://www.isotc211.org/2005/gmd | ISO19115/ISO19139 [RD.26][RD.27] |
| gmi | http://www.isotc211.org/2005/gmi | ISO19115-2/ISO19139-2 [RD.28][RD.29] |
| lmb | http://www.opengis.net/lmb/2.1/ | [RD.5] |
| mdb | http://standards.iso.org/iso/19115/-3/mdb/1.0 | ISO19115-1/ISO19115-3 [RD.30][RD.31] |
| media | http://search.yahoo.com/mrss/ | Media RSS [RD.21] |
| os | http://a9.com/-/spec/opensearch/1.1/ | OpenSearch 1.1 Specification [RD.2] |
| owc | http://www.opengis.net/owc/1.0/ | OGC OWS Context Atom Encoding Standard [RD.11] |
| param | http://a9.com/-/opensearch/extensions/param/1.0/ | OpenSearch parameter extension [RD.17] |
| rdfs | http://www.w3.org/2000/01/rdf-schema# | RDF Schema c |
| sru | http://a9.com/-/opensearch/extensions/sru/2.0/ | OpenSearch SRU Extension [RD.18] |
| srw\_dc | info:srw/schema/1/dc-schema | Dublin Core Schema for SRU [RD.10] |
| time | http://a9.com/-/opensearch/extensions/time/1.0/ | OpenSearch Time Extension [RD.3] |
| a See <http://dublincore.org/documents/dcmi-namespace/>  b See <http://www.georss.org/>  c See <https://www.w3.org/TR/rdf-schema/> | | |

# OpenSearch-EO – Overview

As the OpenSearch specification [RD.15] is defined in the OASIS SWS bindings [RD.2], we confine ourselves here to the OpenSearch Earth Observation extension (OpenSearch-EO). This specification is complementary to the OpenSearch Geo and Time Extensions (OGC 10-032 [RD.3]) and recommends its use for spatial and temporal queries especially for EO collection and EO product metadata. Further it defines a default response encoding based on Atom 1.0/XML [RD.22].

OpenSearch-EO specifies a series of parameters that can be used to constrain search results. These are discussed in more detail in section 7.2. In short, provision is made to filter results by sensor information, acquisition, processing parameters and other information. The purpose of OpenSearch-EO is to make sure that OpenSearch parameters are aligned with OGC 10-157r4 [RD.5] that describes EO products metadata and with ISO19115(-1) [RD.26, RD.30]/ISO19115-2 [RD.28] that is used for describing EO collection metadata (see 6.1). An OpenSearch Earth Observation Service is not expected to support all the elements defined here but use them in accordance with a given use case and search service contents.

Further an important aspect is the definition of search responses supporting best practices which are relevant in the context hypermedia web guidelines such as HATEOAS (Hypermedia As The Engine Of Application State).

## Collections and Products

An EO Collection (i.e. dataset series) is defined as a set of EO Products (i.e. datasets), sharing a common specification or characteristics. Below are few examples on how to define an EO Collection:

* EO products of the same platform (e.g. Sentinel-1) and the same instrument (C-SAR sensor) acquired over a specific Area of Interest (AOI) and Time of Interest (TOI)
* EO products of several SAR instruments over AOI and TOI (e.g., Time series with ENVISAT ASAR, Sentinel-1A/b, TSX)
* EO products acquired from a combination of platforms/instrument (e.g., Sentinel-1/SAR, Sentinel-2/MSI and SMOS/MIRAS) over AOI and TOI to address specific purposes. Definition of a “*Thematic Collection”* would permit the users to get direct access to EO products, necessary for specific application domains (e.g. Forestry, land monitoring, Emergency, ice monitoring, etc…), instead of searching in all the collections for different satellite products.

Definition of flexible EO collections, that are as close as possible to users’ needs, requires the possibility to associate a specific EO product to more than one EO Collection.

## Two Step Search

In a typical search scenario, a client will first request for a catalogue´s OpenSearch Description Document - OSDD (see Figure 1), which will detail the catalogue’s support for searching for collections. Then, the client will submit a query searching for EO collections, according to allowed search parameters specified in this OSDD (See 7.2), and will receive the results in XML encoding (e.g., atom). In the search response, the user will find the details of the collections that match the search, these can be used to select a collection of interest and to identify how to request its specific search support (e.g. via the identifier or the hyperlink to the OSDD for the collection). This OSDD can then be retrieved and used to search for products of interest in this EO products collection.

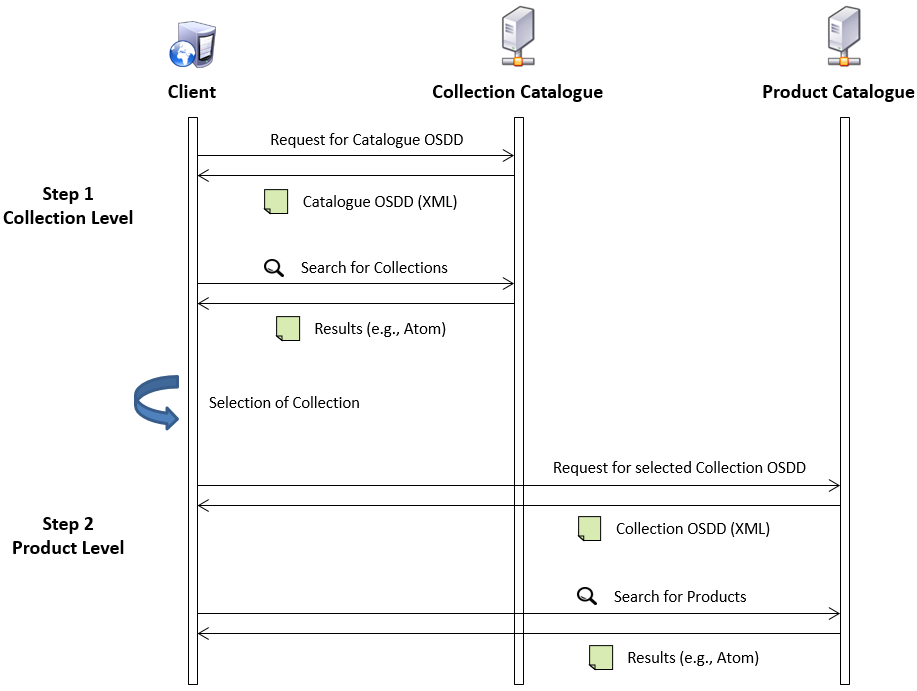


Figure 1 – Two Step Search

# OpenSearch-EO Search Service

## Search Service Description (Metadata)

The OpenSearch Description Document (OSDD) allows clients to retrieve service metadata from a server. The response to a request for a Description shall be an XML document in the form specified by the SWS OpenSearch bindings published by OASIS. A brief summary of the Description's requirements is provided in OGC 10-032 [RD.3].

The OpenSearch Earth Observation Extension is designed to provide a search facility of Earth Observation metadata to the OpenSearch protocol. One namespace is provided for use in URL templates that form part of the OSDD (see Example 1, below), published by the server in XML at a stable URL.

A server provides an OSDD that a client reads to determine the response formats available and how to formulate a search/retrieve request. The OSDD includes a mandatory URL element containing a mandatory request template. Where several request templates are provided, a client may choose the one offering the most useful format (specified by MIME-type defined in the *type* attribute of the element) as shown in Example 1 below.

|  |  |
| --- | --- |
| **Requirement** | **/req/osdd**  An OpenSearch Earth Observation Service **shall** return (upon request) a valid OpenSearch description document (OSDD). |
| Requirement Class | **/req/Core** |

|  |  |
| --- | --- |
| **Requirement** | **/req/osdd/namespaces**  The namespace below and a corresponding namespace prefix **shall** be included when parameters from the EO Extension are used in an OpenSearch Description document:  http://a9.com/-/opensearch/extensions/eo/1.0/ |
| Requirement Class | **/req/Core** |

|  |  |
| --- | --- |
| **Requirement** | **/req/osdd/atom**  Any server supporting the Earth Observation extension **shall** provide an access point returning documents complying with the rules specified in [RD.22] (Atom 1.0). |
| Requirement Class | **/req/Core** |

Example 1: The following XML document provides a sample response to a request for an OpenSearch Description Document from a repository supporting the Earth Observation Extension. Note that the response type is given in the type attribute and not implicitly on the URL path

<OpenSearchDescription xmlns="http://a9.com/-/spec/opensearch/1.1/" xmlns:eo="http://a9.com/-/opensearch/extensions/eo/1.0/">

<ShortName>Web Search</ShortName>

<Description>Use Example.com to search the Web.</Description>

<Contact>admin@example.com</Contact>

<Url type="application/atom+xml" template="http://example.com/myatom/?q= {searchTerms}&amp;pw={startPage?}&amp;platform={eo:platform?}"/>

<Url type="application/geo+json" template="http://example.com/geojson/?q= {searchTerms}&amp;pw={startPage?}&amp;platform={eo:platform?}"/>

<Url type="text/html" template="http://example.com/?q= {searchTerms}&amp;platform={eo:platform?}&amp;pw={startPage?}"/>

<LongName>Example.com Web Search</LongName>

<Query role="example" searchTerms="cat" eo:platform="ENVISAT"/>

<Attribution>Copyright 2005, Example.com, Inc.</Attribution>

<SyndicationRight>open</SyndicationRight>

</OpenSearchDescription>

|  |  |
| --- | --- |
| **Requirement** | **/req/osdd/relAttributeOfURL**  The rel attribute of the Url element **shall** be used in the following manner:   * rel=”collection” to advertise collection level search query URL * rel=”results” (default) to mean product (granule) level search query URL * If rel attribute is not specified, it assumes that its value is “results”. * Please note that it is strictly forbidden to provide more than one URL template for a given “rel” / “type” combination |
| Requirement Class | **/req/TwoStepSearch** |

|  |  |
| --- | --- |
| **Requirement** | **/req/osdd/queryElement**  For testability purposes, it is recommended that an OSDD at least contains one <Query role="example"/> element defining a search query with Atom response which does return representative results.[[2]](#footnote-2)   * In case the OSDD contains multiple <Url> templates or <Url> templates for both collection and granule level search, the Query element **shall** refer to a collection level search with Atom response. * In case the OSDD contains only <Url> templates for collection level search, the Query element **shall** refer to a collection level search with Atom response. * In case the OSDD contains only <Url> templates for granule level search, the Query element **shall** refer to a granule level search with Atom response. |
| Requirement Class | **/req/TwoStepSearch** |

## Search operation request

### Fundamental search request parameters to search by time and space

The time and geo extensions defined in OGC10-032 [RD.3] give a list of fundamental search parameters sufficient to constrain a search by time and space. This OpenSearch Extension for EO complements it with optional parameters specific to EO data.

|  |  |
| --- | --- |
| **Requirement** | **/req/request/osParameters**  From OpenSearch the implementation shall support the following minimum set of search parameters for both “collection” and “granule” levels:   * count * searchTerms (optional for “granule level” search) * startIndex or startPage |
| Requirement Class | **/req/Core** |

|  |  |
| --- | --- |
| **Requirement** | **/req/request/osGeoTempParameters**  From the time and geo extensions (OGC10-032 [RD.3]) an OpenSearch-EO implementation is recommended to support the following minimum set of search parameters for both “collection” and “granule” levels:   * geo:uid * geo:box * time:start * time:end |
| Requirement Class | **/req/OSGeoTempParameters** |

|  |  |
| --- | --- |
| **Requirement** | **/req/request/osGeoNameParameter**  It is **recommend** to support geo:name and optionally, geo:radius (see (OGC10-032 [RD.3])). If geo:name is supported but geo:radius is not, it is **recommended** that the search be interpreted as a point search[[3]](#footnote-3).  When a server supports geo:radius the default value **should** be specified in the OSDD within the “title” attribute of the corresponding Parameter element.  Example:  <param:Parameter name="radius" value="{geo:radius}" title="Expressed in meters. Default value is 10000"/> |
| Requirement Class | **/req/OSGeoNameParameter** |

### Concept of search request parameters for the Earth Observation Extension

This Earth Observation Extension defines in **Table 4**, **Table 5**, **Table 6** and **Table 7** an extensive list of OpenSearch parameters that **can (all parameters are optional)** be supported by a search engine when searching via EO-related attributes. **It is not expected or advisable for an OpenSearch Earth Observation Service to support all the parameters**. Their use is largely dependent on the search engine contents and capabilities.

If a search engine use case is for the discovery of **collections**, typically the parameters of tables 4-6 are relevant. Those tables include parameters like: *platform, orbitType*, *instrument*, *sensorType*, *spectralRange, processingLevel or compositeType.* **Table 6** includes the parameters which are aligned with the **INSPIRE** requirements like *title, topicCategory, organisationName, useLimitation or accessConstraint*.

Conversely, if the search engine use case is for the discovery of **products**[[4]](#footnote-4) (usually when a collection was already identified and afterwards a subset of interesting products of that collection shall be selected), it is recommended to select relevant parameters e.g. from: *orbitNumber*, *orbitDirection, wrsLatitudeGrid, archivingCenter, processingCenter, processingSoftware, processingDate, cloudCover, snowCover* as defined in **Table 7**.

In some situations, it may happen that for the selection of a subset of interesting products all parameters of tables 4-7 may become relevant. This is the case for example:

* when there is no strict separation between collections and products (e.g. because products are described and indexed by parameters which include those which are typically only used for collections).
* for “thematic collections” in cases where:
  + products in a collection are of various types/sensors/missions/... ("a logical collection could be defined as a group of products from a given number of collections…”)
  + the same product belongs to several collections

|  |  |
| --- | --- |
| **Requirement** | **/req/request/parameters**  An OpenSearch-EO implementation shall support the OpenSearch-EO Parameters (all optional) as specified in:  Table 4, Table 5, Table 6 and Table 7. |
| Requirement Class | **/req/Core** |

### Informing clients about constraints on search request parameters

To inform clients about permitted values (supported value list, range, ...) for a given parameter an OpenSearch Earth Observation Service should make use of the OpenSearch Parameter Extension [RD.17]. The Parameter Extension explicitly advertises the valid lists and ranges of search parameters. Thus, it allows reducing ambiguities and errors dramatically.

|  |  |
| --- | --- |
| **Requirement** | **/req/osdd/parameterExtension**  It is **recommended** to support the OpenSearch Parameter Extension with the following constraints:   1. the “value” attribute **should** always be set to facilitate the client task (i.e. avoid parsing the <Url> templates) 2. other attributes (i.e. “minimum”, “maximum”) and options (e.g. param:Option) **should** be provided only when it makes sense 3. pattern **should** be provided when options are not provided (or when options only provide a subset of the possible values).   In case of inconsistency1 between the Parameter extension annotations and the <Url> template in the OSDD, the <Url> template prevails.. |
| Requirement Class | **/req/parameterExtension** |
| 1Examples of "inconsistencies" are when the <Url> template includes a parameter for which no <param:Parameter> is specified or when a search parameter is mandatory or optional in the <Url> template, but the corresponding <param:Parameter> element does not have a corresponding "minimum" or "maximum" attribute or such attributes with contradicting values. | |

The following example provides a sample response to a request for an OpenSearch Description from a repository supporting the Earth Observation and Temporal Extensions. The OpenSearch Parameter extension elements are used to suggest to clients the possible values for temporal range and acquisition station names

Example 2: OpenSearch Desction Document supporting the OpenSearch Parameter extension

<?xml version="1.0" encoding="UTF-8"?>

<OpenSearchDescription xmlns="http://a9.com/-/spec/opensearch/1.1/"

xmlns:eo="http://a9.com/-/opensearch/extensions/eo/1.0/"

xmlns:param="http://a9.com/-/spec/opensearch/extensions/parameters/1.0/"

xmlns:time="http://a9.com/-/opensearch/extensions/time/1.0/">

<ShortName>Web Search</ShortName>

<LongName>Example.com Web Search</LongName>

<Description>Use Example.com to search the Web.</Description>

<Tags>example web</Tags>

<Contact>admin@example.com</Contact>

<Url type="application/atom+xml" template="http://example.com/myatom/? pw={startPage?}&acq={eo:acquisitionStation?}&start={time:start?}& end={time:end?}">

<param:Parameter name="start" value="{time:start}" minimum="0"

minInclusive="2011-01-01T00:00:00Z" maxExclusive="2012-01-01T00:00:00Z"/>

<param:Parameter name="end" value="{time:end}" minimum="0"

minInclusive="2011-01-01T00:00:00Z" maxExclusive="2012-01-01T00:00:00Z"/>

<param:Parameter name=”acq” value=”{eo:acquisitionStation}” minimum=”0”

title=”Acquisition Station”>

<param:Option value="PDHS-K" label=”Kiruna”/>

<param:Option value="PDHS-E" label=”ESRIN”/ >

</param:Parameter>

</Url>

<Attribution>Copyright 2005, Example.com, Inc.</Attribution>

<SyndicationRight>open</SyndicationRight>

</OpenSearchDescription>

For conveying the server’s search support condition on ranges and sets (used in request parameters to express that a set or a whole range of values are accepted) the Parameter Extension can be used as well.

|  |  |
| --- | --- |
| **Requirement** | **/req/osdd/setsAndRanges**  It is recommended that the server suggests the support for range and/or set notations in the OSDD using the Parameter Extension with the EO specific attributes eo:rangeAllowed and/or eo:setAllowed.  If "pattern attribute” is provided in the Parameter Extension, it shall describe the syntax of each one of the n\* values (i.e.: n1, n2, …) used in the range or set notation." |
| Requirement Class | **/req/SetsAndRanges** |

Example 3: Parameter definition for a Parameter supporting a set and a range

<param:Parameter name="pDate" value="{eo:processingDate}" pattern="[0-9]{4}-[0-9]{2}-[0-9]{2}T[0-9]{2}:[0-9]{2}:[0-9]{2}(\.[0-9]+)?)(Z|([\+\-][0-9]{2}:[0-9]{2}))" minimum="0" minInclusive="2011-01-01T00:00::00Z" maxExclusive="2013-01-01T00:00::00Z" eo:rangeAllowed="true" eo:setAllowed="true"/>

This tells a client that for the eo:processingDate a range (e.g. pDate=[2012-01-01T00:00:00Z, 2012-01-01T00:00:00Z]) or a set (e.g. {2012-01-01T00:00:00Z, 2012-01-02T00:00:00Z, 2012-01-03T00:00:00Z}) can be provided in a request.

### Conventions for search request parameters of type "string"

OpenSearch does not define or suggest any convention for searching on parameters of type "string". However, consistent rules for this are important from a client’s and a server´s perspective.

In general, the default behavior for search parameters of type string is an "**exact search**" where the comparison is based on equality.

For example, a search for "sensorType=RADAR" should return only those entries where the sensorType equals exactly to "RADAR".

Just for some parameters of type string in Table 6 (INSPIRE queryables) the default behavior is changed to "**substring search**" (the parameters are accordingly marked in Table 6). "substring search" means that the substring must occur (case-insensitive) somewhere in the corresponding metadata element.

For example, a search for "title=water" should return those entries where the word "water" (case-insensitive) is included as substring: e.g. "water", "…Waterworld…", "wasteWater…".

|  |  |
| --- | --- |
| **Requirement** | **/req/request/stringParameters**  For all search parameters of type string (except for os:searchTerms and some of those included in **Table 6** (marked accordingly)) an "exact search" is the default behavior. The comparison here is based on equality. |
| Requirement Class | **/req/Core** |

Note: "substring search" does not mean that an implementation is not allowed to provide possible values (options) via the parameter extension (s. 7.2.3).

As defined in 7.2.3 range and set notations should be the usual way to express a set of “OR-related” search terms (e.g. ["air", "temperature"] meaning "air OR temperature") or a whole range of values to search for on a search request parameter (this is possible regardless of whether the behavior of the parameter is "exact search" or "substring search").

Nevertheless, another convention must be made for the notation of the query parameters os:searchTerms and those included marked as of type "substring search" in Table 6 when the provided search term consists of multiple words. Consistent notation rules for expressing a phrase and logical operators are important from a user’s (i.e. client’s) and server´s perspective. For example, how has a phrasal search for "air temperature" to be interpreted? This might be interpreted as "air OR temperature" or "air AND temperature".

To clarify this the following interpretation is the default.

|  |  |
| --- | --- |
| **Requirement** | **/req/request/multiWordsSearchTerms**   * whitespace delimited words not enclosed in double quote “ “ represents logical AND   (e.g.) q=air temperature: air AND temperature   * whitespace delimited words enclosed in double quote “ “ represents phrasal search   (e.g.) q="air temperature": “air temperature” in one phrase  Note: the examples are not URL encoded. |
| Requirement Class | **/req/Core** |

The default behavior ("exact search" or "substring search", as defined above) can be modified for all parameters by the implementation. But this needs to be reported in the OSDD by a corresponding parameter extension as explained in the next section “Custom search behaviour”.

#### Custom Search Behavior

An OpenSearch server can advertise its support for custom search behaviour different from the above default behaviour by using an Atom link refering to a profile as explained in the current section.

|  |  |
| --- | --- |
| **Requirement** | **/req/osdd/****customSearch**  It is recommended that the server declares adherence to a specific, existing standard within the parameter definition using the Parameter Extension [RD.17] and an Atom link referring to a profile [RFC6906] (as shown in the examples below). |
| Requirement Class |  |

Two common examples, using search engine syntax or a searchRetrieve CQL syntax are given below, but implementers are free to use the proposed mechanism to advertise other search behavior.

**Search engine syntax**

An OpenSearch server can advertise its support for more intelligent "free text searches" (such as usually processed by search engines like Google or Lucene, including taking into account the wordstem, similarities etc.) for a search request parameter.

Example: title = waterga -> should return result entries where the whole word "waterga" is included but also those where just "Water" or "waterworld" or "Watergate" is included.

For conveying the server’s search support condition on free text/keywords (e.g. searchTerms, title) the Parameter Extension can be used as well.

Example 4: Parameter definition with a Lucene supported syntax

<param:Parameter name="q" value="{searchTerms}">

<atom:link rel="profile" href="http://lucene.apache.org/core/2\_9\_4/queryparsersyntax.html" title="This parameter follows the Lucene free text search implementations"/>

</param:Parameter>

This tells a client to refer to the href link for the definition of the expected syntax of the search term (here for the search parameter "searchTerms"). In this case, Apache Lucene is used.

**CQL wildcard syntax**

An OpenSearch server can advertise its support for wildcard searches (such as "\*" or "?") for a search request parameter. The OpenSearch specifications (in contrast to the more elaborate OASIS SearchRetrieve specifications), do not specify the expected behavior of a server in such cases.

Example 5: Parameter definition with CQL syntax (masked)

<param:Parameter name="platform" value=”{eo:platform}”>

<atom:link rel="profile" href=”info:srw/cql-context-set/1/cql-v2.0#masked” title="This parameter supports wild cards" />

</param:Parameter>

In this example, the server advertises its support for the "masked" modifier defined at the URL provided. This allows a client to pass eo:platform parameters with wild cards such as "Spot-[123]\*" and receive hits e.g. for Spot-4, Spot-5,…

CQL[[5]](#footnote-5) defines even more advanced syntaxes, allowing a client to use POSIX regular expressions. This can be advertised as follows, using the same general mechanism:

Example 6: Parameter definition with CQL syntax (regexp)

<param:Parameter name="platform" value=”{eo:platform}”>

<atom:link rel="profile" href=”info:srw/cql-context-set/1/cql-v2.0#regexp” title="This parameter supports regular expressions" />

</param:Parameter>

This allows a client for instance to express the eo:platform search parameter as follows: “(Spot|SPOT)[123]” matching “Spot-1”, “SPOT-1”, “Spot-2”, “SPOT-2”, “Spot-3”, “SPOT3”, “Spot-4”, “SPOT4”.

### Conventions for search request parameters of type "geometry"

For conveying the server’s support condition of a geometry (geo:geometry) parameter, the server should declare adherence to a specific, existing standard within the parameter definition using the Parameter Extension

|  |  |
| --- | --- |
| **Requirement** | **/req/osdd/supportedGeometryTypes**  An OpenSearch server with {geo:geometry} search capabilities **shall** advertise supported geometry types with the Parameter extension and via Atom links referring to geometry type profiles. |
| Requirement Class | **/req/GeometryTypes** |

Example 7: Parameter definition for a Parameter supporting geometrical search

<param:Parameter name="geometry" value="{geo:geometry}">

<atom:link rel="profile" href="http://www.opengis.net/wkt/LINESTRING" title="This service accepts WKT LineStrings"/>

<atom:link rel="profile" href="http://www.opengis.net/wkt/POINT" title="This service accepts WKT Point"/>

<atom:link rel="profile" href="http://www.opengis.net/wkt/POLYGON" title="This service accepts WKT Polygons"/>

<atom:link rel="profile" href="http://www.opengis.net/wkt/MULTILINESTRING" title="This service accepts WKT Multi-LineStrings"/>

<atom:link rel="profile" href="http://www.opengis.net/wkt/MULTIPOINT" title="This service accepts WKT Multi-Point"/>

<atom:link rel="profile" href="http://www.opengis.net/wkt/MULTIPOLYGON" title="This service accepts WKT Multi-Polygons"/>

</param:Parameter>

This explains that a server supports point, line and polygon among other geometry types, and the convention can be found in the value of href.

### The search parameters of the Earth Observation Extension

Table 4 – OpenSearch Parameters of general applicability

| **OpenSearch Parametera** | **Definition** | **Data Type** |
| --- | --- | --- |
| sru:sortKeys | Specifies how to sort the result set. For details see the OpenSearch SRU Extension [RD.18]. Support of the sortKeys parameter is optional. | String b,c |
| sru:recordSchema | Metadata model in which the full (source) metadata should be provided inline (in addition to the Atom response elements). Possible formats are shown in footnote d.For further details see 7.3.2.2.4 and [RD.18]. Support of the recordSchema parameter is optional (0..1). | String (URI) c,d |
| a The name capitalization rules are specified in Subclause 11.6.2 of [RD.1]. b OpenSearch Earth Observation Services are recommended to suggest the supported list of values on the OpenSearch Description document using the OpenSearch Parameter Extension [RD.17]. Here every allowed combination of sub-parameters should be provided as value of one param:Option element. c Default is defined by server  d OpenSearch Earth Observation Services are recommended to suggest the supported list of values on the OpenSearch Description document using the OpenSearch Parameter Extension [RD.17], standard values are the Schemas (URI´s) are shown in **Table 10** (not limited to). | | |

Table 5 – OpenSearch-EO Parameters for Collection Search

| **OpenSearch Parametera** | **Definition** | **Data Type** |
| --- | --- | --- |
| productType | A string identifying the entry type (e.g. ER02\_SAR\_IM\_\_0P, MER\_RR\_\_1P, SM\_SLC\_\_1S, GES\_DISC\_AIRH3STD\_V005) | String b,c |
| doi | Digital Object Identifier identifying the product (see http://www.doi.org) | String b |
| platform | A string with the platform short name (e.g. Sentinel-1) | String b,c |
| platformSerialIdentifier | A string with the Platform serial identifier | String b,c |
| instrument | A string identifying the instrument (e.g. MERIS, AATSR, ASAR, HRVIR. SAR). | String b,c |
| sensorType | A string identifying the sensor type. Suggested values are: OPTICAL, RADAR, ALTIMETRIC, ATMOSPHERIC, LIMB | String b,c |
| compositeType | Type of composite product expressed as time period that the composite product covers (in ISO 8601 format, e.g. P10D for a 10 day composite) | String b,c |
| processingLevel | A string identifying the processing level applied to the entry | String b,c |
| orbitType | A string identifying the platform orbit type (e.g. LEO, GEO) | String b,c |
| spectralRange | A string identifying the sensor spectral range (e.g. INFRARED, NEAR-INFRARED, UV, VISIBLE) | String b,c |
| wavelength | A number, set or interval filtering on the sensor´s wavelength in nanometers. | Integer b,d |
| hasSecurityConstraints | A string informing if the resource has any security constraints. Possible values: TRUE, FALSE | String c  (fixed list) |
| dissemination | A string identifying the dissemination method (e.g. EUMETCast, EUMETCast-Europe, DataCentre) | String b,c |
| a All in the eo: namespace. The name capitalization rules are specified in Subclause 11.6.2 of [RD.1]  b The default behavior which has to be supported is b1. In the parameter extension of the OSDD the (optional) additional support for b2 and b3 can be advertised (as defined in Requirement /req/osdd/setsAndRanges):  b1 *n1* equals to field = n1  b2 Mathematical notation for ranges to define the intervals with:   *[n1,n2]* equals to n1 <= field <= n2, *[n1,n2[* equals to n1 <= field < n2  *]n1,n2[* equals to n1 < field < n2 *]n1,n2]* equals to n1 < field <= n2.  *[n1* equals to n1<= field *]n1* equals to n1 < field  *n2]* equals to field <= n2 n2[ equals to field < n2.  b3 Mathematical notation for sets to define the values with:   *{n1,n2,…}* equals to field=n1 OR field=n2 OR … c OpenSearch Earth Observation Services are recommended to suggest the supported list of values on the OpenSearch Description document using the OpenSearch Parameter Extension [RD.17], standard values for lists are suggested in OGC 10-157r4 [RD.5] d OpenSearch Earth Observation Services are recommended to suggest the range of possible values of the element values on the OpenSearch Description document using the OpenSearch Parameter Extension. | | |

Table 6 – Additional INSPIRE obligated OpenSearch-EO Parameters for Collection Search

| **OpenSearch Parametera** | **Definition** | **Data Type** |
| --- | --- | --- |
| title | A name given to the resource i | String b,m |
| topicCategory | Main theme(s) of the dataset i | String b,c |
| keyword | Commonly used word(s) or formalised word(s) or phrase(s) used to describe the subject. h | String b,c |
| abstract | Abstract. i | String b,m |
| *resolution* | Using this (optional) parameter mandates the usage of one of the following 2 parameter groups within one search request:i. |  |
| **denominator**: Level of detail expressed as a scale factor or a ground distance. Here: the number below the line in a vulgar fraction.  Only used, if distanceValue and distanceUOM are not used.i | Integer b,d |
| **distanceValue**: Sample ground distance. Here: the distance as decimal value.  **distanceUOM**: Sample ground distance. Here: the name of the unit of measure. CodeList, one of: meter, km, …  Only used, if Denominator is not used. i | Double b,d  String b,c |
| organisationName | A string identifying the name of the organization responsible for the resource i | String b,c,m |
| organisationRole | The function performed by the responsible party i | String b,j,c |
| publicationDate | The date when the resource was issued. | Datetime b3,d, l |
| lineage | General explanation of the data producer’s knowledge about the lineage of a dataset. i | String b,c,m |
| useLimitation | A string identifying informing if the resource has usage limitations i | String b,c,m |
| accessConstraint | Applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the resource i | String b,e,c,m |
| otherConstraint | Other restrictions and legal prerequisites for accessing and using the resource or metadata. i | String b,c,m |
| classification | Name of the handling restrictions on the resource or metadata i | String b,f,c,m |
| language | Language of the intellectual content of the metadata record i | String b,g,c |
| *specification* | Using this (optional) parameter mandates the usage of the following 4 parameters within one search request:i.  **specificationTitle**: Title of the specification i.  **specificationDate**: Reference date of specification l.  **specificationdateType**: Type reference date of specification i  **degree**: This is the degree of conformity of the resource to the related specification. i Possible values: true (if conformant), false (if not conformant), null (if not evaluated) | String b,c  Datetime b,d, l  String b,k,c  String b,c |
|  |  |  |
| a All in the eo: namespace. The name capitalization rules are specified in Subclause 11.6.2 of [RD.1].  b The default behavior which has to be supported is b1. In the parameter extension of the OSDD the (optional) additional support for b2 and b3 can be advertised (as defined in Requirement /req/osdd/setsAndRanges):  b1 *n1* equals to field = n1  b2 Mathematical notation for ranges to define the intervals with:   *[n1,n2]* equals to n1 <= field <= n2, *[n1,n2[* equals to n1 <= field < n2  *]n1,n2[* equals to n1 < field < n2 *]n1,n2]* equals to n1 < field <= n2.  *[n1* equals to n1<= field *]n1* equals to n1 < field  *n2]* equals to field <= n2 n2[ equals to field < n2.  b3 Mathematical notation for sets to define the values with:   *{n1,n2,…}* equals to field=n1 OR field=n2 OR … c OpenSearch Earth Observation Services are recommended to suggest the supported list of values on the OpenSearch Description document using the OpenSearch Parameter Extension [RD.17], standard values for lists are suggested in OGC 10-157r4 [RD.5]. d OpenSearch Earth Observation Services are recommended to suggest the range of possible values of the element values on the OpenSearch Description document using the OpenSearch Parameter Extension [RD.17].  e Codelist (MD\_RestrictionCode), one of: copyright, patent, patentPending, trademark, license, intellectualPropertyRights, restricted, otherRestrictions  f Codelist (MD\_ClassificationCode), one of: unclassified, restricted, confidential, secret, topSecret  g ISO 639-2, other parts may be used  h Optional parameter, for INSPIRE mandatory: the use of one keyword expressing the INSPIRE Data theme is required. Relevant INSPIRE data themes concerning EO Product collections are “Land cover” and “Orthoimagery” (see [RD.19] Table 15 and Table 21)  i Optional parameter, mandatory for INSPIRE. For details see INSPIRE Metadata Implementing Rules: Technical Guidelines based on EN ISO 19115 and EN ISO 19119 and Technical Guidance for the implementation of INSPIRE Discovery Services [RD.19, RD.20]  j Codelist (CI\_RoleCode codelist), one of: resourceProvider, custodian, owner, user, distributor, originator, pointOfContact, principalInvestigator, processor, publisher, author  k Codelist (CI\_DateTypeCode), one of: creation, revision or publication  l A String matching RFC 3339 with the exception that dates (without explicitely defining time related data: meaning any time between 00:00:00.000Z - 23:59:59.999 (UTC) of that date) are supported as well. The formal pattern of the string is: "yyyy-mm-dd[Thh:mm:ss[.S](Z|+/-ZZ:zz)] " where yyyy = Four digit year, mm = Two digit month (01 = January), dd = Two digit day of month (01 = first day), hh = Hour of day (00 – 23), mm = Minute of hour (00 – 59), ss = Second of minute (00 – 59), S = Fraction of seconds with any precision, Z = UTC time zone, +/-ZZ:zz = The time zone offset from UTC time zone, where ZZ is the number of offset hours and zz is the number of minutes of the offset hour, all of which is preceded by a minus or plus sign to indicate the direction of the offset.  m For this parameter a "substring search" (instead of an "exact search") is the default behavior (s. 7.2.4). "subsring search" means that the substring must occur (case-insensite) somewhere in the corresponding metadata element. | | |

|  |  |
| --- | --- |
| **Requirement** | **/req/request/INSPIREParameters**  It is recommended to support the OpenSearch Parameters relevant for INSPIRE as specified in Table 6 (all optional[[6]](#footnote-6)). |
| Requirement Class | **/req/INSPIRE** |

Table 7 – OpenSearch-EO Parameters for Product Search (incl Acquistion Parameters)

|  |  |  |
| --- | --- | --- |
| **OpenSearch Parametera** | **Definition** | **Data Type** |
| parentIdentifier | A string identifying the parent of the entry in a hierarchy of resources (usually the collection identifier) | String b,c |
| productionStatus | A string identifying the status of the entry (e.g. ARCHIVED, ACQUIRED, CANCELLED) | String b,c |
| acquisitionType | Used to distinguish at a high level the appropriateness of the acquisition for "general" use, whether the product is a nominal acquisition, special calibration product or other. Values: NOMINAL, CALIBRATION, OTHER | String b,c  (fixed list) |
| orbitNumber | A number, set or interval requesting the acquisition orbit | Integer b |
| orbitDirection | A string identifying the acquisition orbit direction at the start of the acquisition/product.  Possible values are: ASCENDING, DESCENDING | String b (fixed list) |
| lastOrbitDirection | A string identifying the acquisition orbit direction at the end of the acquisition/product. It is assumed to be identical to orbitDirection if not present in the underlying metadata.  Possible values are: ASCENDING, DESCENDING | String b (fixed list) |
| relativeOrbitNumber | A number, set or interval requesting the relative orbit number.  The relative orbit number is a count of orbits from 1 to the number of orbits contained in a repeat cycle. The relative orbit number 1 corresponds to the orbit whose ascending node crossing is closest to the Greenwich Meridian (eastwards). | Integer b |
| timeliness | Timeliness of the product, such as "near real time", "rush". Possible values are mission specific and shall refer to mission/ground segment dedicated codeSpace.  Example of values could be "NRT", "NOMINAL", “NTC” or “STC” | String b,c  (fixed list) |
| tileId | While track/frame can be used to represent the first part of an MGRS coordinate (i.g. grid zone), the tileId identifies e.g. the second part of an MGRS coordinate (square identification), e.g. in case of Sentinel.  Used when the world reference system coordinates can not be expressed in X/Y (Track/Frame) terms, such has for UTM tiles. (used for Sentinel-2 L1C granules) | String b,c |
| *track (deprecated)* | *A string identifying the orbit track* | *String c* |
| *frame (deprecated)* | *A string identifying the orbit frame* | *String c* |
| wrsLongitudeGrid | A string providing the coordinate of the EO data on the across track (east/west) axis of the reference system in use for the given Platform. Equivalent to *track*, path. | String b,c |
| wrsLatitudeGrid | A string providing the coordinate of the EO data on the along track (north/south) axis of the reference system in use for the given Platform. Equivalent to *frame*, row | String b,c |
| swathIdentifier | Swath identifier (e.g. Envisat ASAR has 7 distinct swaths (I1,I2,I3...I7) that correspond to precise incidence angles for the sensor). Value list can be retrieved with codeSpace. | String b,c |
| cloudCover | A number, set or interval of the cloud cover % (0-100). | Integer b |
| snowCover | A number, set or interval of the snow cover % (0-100). | Integer b |
| lowestLocation | Lower bound of measurements in vertical dimension (in meter or bar). | Double b |
| highestLocation | Upper bound of measurements in vertical dimension (in meter or bar). | Double b |
| locationUnit | Unit of measure used to express lowestLocation and highestLocation: meter (m) or bar (bar). Default is meter (m). | String c |
| productVersion | A string identifying the version of the Product | String b,c |
| productQualityStatus | This optional field must be provided if the product passed a quality check. Possible values: NOMINAL and DEGRADED | String b (fixed list) |
| productQualityDegradationTag | Keywords giving information on the degradations affecting the product. Possible values are mission specific and can be freely define (e.g. "RADIOMETRY", "MISSING\_LINES") | String b,c |
| processorName | A string identifying the processor software name | String b,c |
| processingCenter | A string identifying the processing center (e.g. PDHS-E, PDHS-K, DPA, F-ACRI) | String b,c |
| creationDate | The date when the metadata item was ingested for the first time (i.e. inserted) in the catalogue. | Datetime b,d, e |
| modificationDate | The date when the metadata item was last modified (i.e. updated) in the catalogue. | Datetime b,d, e |
| processingDate | A date interval requesting entries processed within a given time interval. | Datetime b,d, e |
| sensorMode | A string identifying the sensor mode. | String b,c |
| archivingCenter | A string identifying the archiving center. | String b,c |
| processingMode | Processing mode. Often referred to as Real Time, Near Real Time etc. | String b,c |
| availabilityTime | The time when the result became available (e.g. if postprocessing or laboratory analysis is required, it might be different to the phenomenonTime). | DateTime b,d, e |
| acquisitionStation | A string identifying the station used for the acquisition | String b,c |
| acquisitionSub Type | Acquisition sub-type | String b,c |
| startTimeFromAscendingNode | Start time of acquisition in milliseconds from Ascending node date. | Integer b,d |
| completionTimeFromAscending Node | Completion time of acquisition in milliseconds from Ascending node date. | Integer b, d |
| illuminationAzimuthAngle | Mean illumination/solar azimuth angle given in degrees. (i.e. uom='deg') | Double b,d |
| illuminationZenithAngle | Mean illumination/solar zenith angle given in degrees. | Double b,d |
| illuminationElevationAngle | Mean illumination/solar elevation angle given in degrees. (i.e. uom='deg') | Double b,d |
| polarisationMode | Polarisation mode taken from codelist: S (for single), D (for dual), T (for twin), Q (for quad), UNDEFINED | String b,c |
| polarisationChannels | Polarisation channel transmit/receive configuration: horizontal, vertical.  Values:  - HH  - HV  - VH  - VV  - HH, VV  - HH, VH  - HH, HV  - VH, VV  - VH, HV  - VV, HV  - VV, VH  - HV, VH  - HH, HV, VH, VV  - UNDEFINED | String b,c |
| antennaLookDirection | LEFT or RIGHT | String b,c  (fixed list) |
| minimumIncidenceAngle | Minimum incidence angle given in degrees (i.e. uom='deg') | Double b,d |
| maximumIncidenceAngle | Maximum incidence angle given in degrees (i.e. uom='deg') | Double b,d |
| dopplerFrequency | Doppler Frequency of acquisition | Double b,d |
| incidenceAngleVariation | Incidence angle variation | Double b,d |
| accessedFrom | A string identifying the host from which the resource will be accessed. The catalogue shall return the location in the enclosure atom link according to the parameter value. The queryable deals with the possible multiple URI values of the relation enclosure referencing the location of the data resource described in the entry. | String b,c  (fixed list) |
| a All in the eo: namespace. The name capitalization rules are specified in Subclause 11.6.2 of [RD.1].  b The default behavior which has to be supported is b1 (except for cloudCover and snowCover). In the parameter extension of the OSDD the (optional) additional support for b2 and b3 can be advertised (as defined in Requirement /req/osdd/setsAndRanges)  b1 *n1* equals to field = n1  b2 Mathematical notation for ranges to define the intervals with:   *[n1,n2]* equals to n1 <= field <= n2, *[n1,n2[* equals to n1 <= field < n2  *]n1,n2[* equals to n1 < field < n2 *]n1,n2]* equals to n1 < field <= n2.  *[n1* equals to n1<= field *]n1* equals to n1 < field  *n2]* equals to field <= n2 n2[ equals to field < n2.  b3 Mathematical notation for sets to define the values with:   *{n1,n2,…}* equals to field=n1 OR field=n2 OR … c OpenSearch Earth Observation Services are recommended to suggest the supported list of values on the OpenSearch Description document using the OpenSearch Parameter Extension [RD.17], standard values for lists are suggested in OGC 10-157r4 [RD.5]. d A String matching RFC 3339 with the exception that dates (without explicitely defining time related data: meaning any time between 00:00:00.000Z - 23:59:59.999 (UTC) of that date) are supported as well. The formal pattern of the string is: "yyyy-mm-dd[Thh:mm:ss[.S](Z|+/-ZZ:zz)] " where yyyy = Four digit year, mm = Two digit month (01 = January), dd = Two digit day of month (01 = first day), hh = Hour of day (00 – 23), mm = Minute of hour (00 – 59), ss = Second of minute (00 – 59), S = Fraction of seconds with any precision, Z = UTC time zone, +/-ZZ:zz = The time zone offset from UTC time zone, where ZZ is the number of offset hours and zz is the number of minutes of the offset hour, all of which is preceded by a minus or plus sign to indicate the direction of the offset. | | |

All parameters of an OpenSearch-EO query **should** be mapped to the appropriate catalogue or metadata fields of the underlying metadata management system. This should make the semantic of the parameter more clear. Annex D (informative) shows suggested mappings for:

* Earth Observation Metadata profile of Observations & Measurements (OGC 10-157) [RD.5]
* ISO 19115 [RD.26] / ISO19115-2 [RD.28] Geographic information – Metadata
* OGC Catalogue Services Standard 2.0 Extension Package for ebRIM Application Profile Earth Observation Products [RD.23]
* OGC I15 (ISO19115 Metadata) Extension Package of CS-W ebRIM Profile [RD.24]

### Search request KVP encoding

|  |  |
| --- | --- |
| **Requirement** | **/req/request/kvpget**  An OpenSearch-EO server **shall** implement HTTP GET transfer of the Search operation request, using KVP encoding. |
| Requirement Class | **/req/Core** |

Note that for the given key-value pairs, the key can be an arbitrary string, specified by one given instance of an OpenSearch repository. For example, one description may provide a URL template asking for platform={eo:platform}, another specifying plat={eo:platform}. It is the responsibility of the client application to parse the URL template and create the appropriate keys for each key-value pair. These parameter sets are templates from which URLs can be constructed. The search client must replace every instance of a template parameter with a value before the search request is performed.

If a search engine wishes to indicate that a template parameter is optional then the "?" notation described in the section on optional template parameters should be used.

|  |  |
| --- | --- |
| **Requirement** | **/req/osdd/optionalTemplateParameters**  OpenSearch-EO servers **shall** treat the following as equivalent,   * Values of optional parameter that are empty (i.e. the key is present but the value is absent) * key/value pairs of optional parameters that are removed (i.e. both key and value are absent). |
| Requirement Class | **/req/Core** |

Example 8: A search operation URL template with the OpenSearch parameter as a query string parameter, and the corresponding request:

<Url template="http://foo.com/atom/?count={count?}&st={startIndex?}& platform={eo:platform}" type="application/atom+xml"/>

http://foo.com/atom/?count=&st=&platform=ENVISAT

Clients should take special consideration to the fact that according to the OpenSearch specification the OpenSearch parameters usage is not restricted to the URL query string and can be used as templates values in any of the URL components (e.g. path, host).

Example 9: A search operation URL template with one of the OpenSearch Parameters as the URL path, and corresponding request examples:

<Url template="http://foo.com/{eo:platform}/atom/?count={count?}&st={startIndex?}" type="application/atom+xml" />

<http://foo.com/ENVISAT/atom/?count=&st>=

http://foo.com/ENVISAT/atom/

## 

## Search operation response

### Search operation response model

The search response model of an OpenSearch request (see dark boxes in Figure 2) can be considered a container which contains resources (the search result entries). The container itself includes information about the search service or search engine and some general metadata of the current search (e.g. total number of results of a search). The resources can be of different types, e.g. EO Collection metadata or EO Product metadata. The model needs to be applicable to multiple types of resources with minimal changes. Therefore, it includes mainly elements which can easily be derived (mapped) from different metadata models. Metadata details can be acquired by following hyperlinks (see below) which lead to alternative representations. For the encoding of a search response different formats can be distinguished.

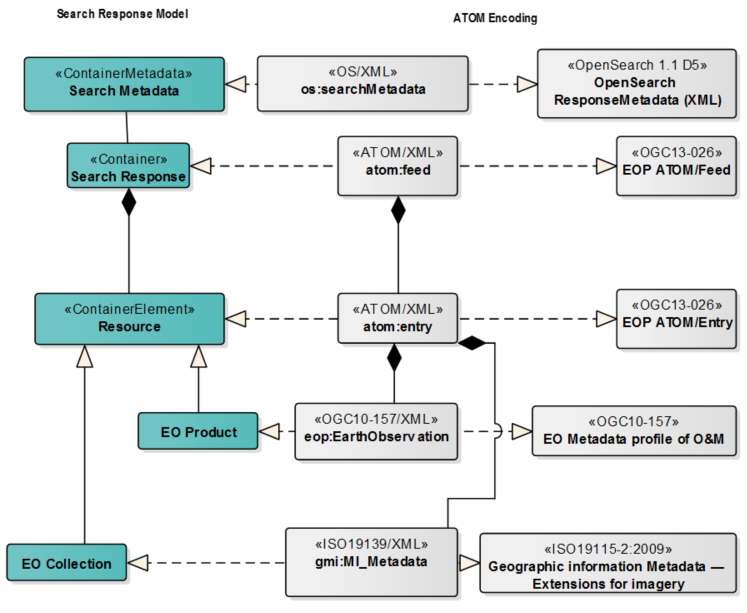


Figure 2 – Search operation response model

Important is the inclusion of hyperlinks in the response, e.g. for navigation, search (e.g. for the two-step-search, see 6.2), access to data, access to alternative representations etc. Those hyperlinks support the best practices for (Hypermedia) API´s such as HATEOAS.

The normal response to a valid search operation request **shall** be in one of several formats. The supported response formats are provided in the OpenSearch Description of a given instance. The mandatory response format is **Atom/XML**. Other formats may be supported by the server as well.

### Normative ATOM response encoding (Requirement)

|  |  |
| --- | --- |
| **Requirement** | **/req/response/ATOM**  The normative response encoding (format) for an OpenSearch service using the Earth Observation Extension **shall** be ATOM 1.0 [RD.22] (see light boxes in Figure 2). |
| Requirement Class | **/req/Core** |

The properties shown in the Atom and OpenSearch namespaces are those mandated by the OpenSearch core specification.

|  |  |
| --- | --- |
| **Requirement** | **/req/response/ATOM/model**  Following the search operation response model and the Atom format the response **shall be** made of an atom:feed element (representing the container) that shall contain 0 or more atom:entry elements (representing the resources). |
| Requirement Class | **/req/Core** |

#### 

#### atom:feed

This section defines in detail the recommended encoding of the OpenSearch response atom:feed element.

|  |  |
| --- | --- |
| **Requirement** | **/req/response/ATOM/feed**  An atom:feed response object (the container) **shall** implement the vocabulary items shown in Table 8, column “ATOM Element” (incl. values matching the types shown and with the multiplicity shown). |
| Requirement Class | **/req/Core** |

The atom:feed includes information facilitating the traversal of results (paging).

Table 8 — Search response collection encoding: *atom:feed*

| **Term** | **OGC core returnable** | **Atom Element** | **Description** | **Type / Multiplicity** |
| --- | --- | --- | --- | --- |
| Type | dc:type | atom:feed | Type of object | 1  mandatory |
| Title | dc:title | atom:feed/ atom:title | A title for the search feed. | String (not empty)  1  mandatory |
| specReference |  | atom:feed/atom:link[@rel=’profile’]/@href | Specification Reference usually identifying that this is an OpenSearch-EO- and an OWS Context-feed (see here for details: 7.3.2.1.2) | String (URI)  n  optional b |
| Creator | dc:creator | atom:feed/ atom:author | An entity primarily responsible for making the content of the search feed | String (not empty)  1  mandatory |
| Subject | dc:subject | atom:feed/ atom:category | A topic of the search feed. | String or skos:Concept (URI)  n  optional |
| Abstract | dct:abstract | atom:feed/ atom:subtitle | An account of the content of the search feed | String (not empty)  1  optional |
| Publisher | dc:publisher | atom:feed/ atom:generator | An entity or agent responsible for making the search feed. | String (not empty)  1  optional |
| Contributor | dc:contributor | atom:feed/ atom:contributor | An entity responsible for making contributions to the content of the search feed | String (not empty)  n  optional |
| Modified | dc:date | atom:feed/ atom:updated | A date of a creation or update of the search feed | RFC 3339 date  1 mandatory c |
| Identifier | dc:identifier | atom:feed/ atom:id | An IRI as a unique identifier of the feed (it excludes relative references). Not to be assumed dereferenceable. | String (URI)  1  mandatory |
| atom:feed/ dc:identifier | The local identifier of the feed. | String (URI)  1 optional |
| Source | dc:source | atom:feed/atom:link[@rel=’search’][@type=‘application/opensearchdescription+xml‘] | A reference to a resource from which the present feed is derived. This points to the OpenSearch document that describes the search engine | 1  mandatory |
| Language | dc:language | atom:feed/ @xml:lang | A language of feed’s content. | String (not empty) with an RFC 5646 code (if no language defined assume english (eng) as default)  1  optional b |
| Envelope | dct:spatial | atom:feed/  georss:\* | The maximal spatial extent of the search feed (GEORSS).  See here for further recommendations: 7.3.2.1.3 | GeoRSS Simple or  GeoRSS GML  n  optional a |
| Rights | dc:rights | atom:feed/ atom:rights | Information about rights held in and over the resource | String (not empty)  1  optional |
| Relation  (first,next, last page and previous pages) | dc:relation | atom:feed/atom:link[@rel= ‘first‘] | Reference to the first page of the search feed  For further details: see 7.3.2.1.1 | 1  optional |
| atom:feed/atom:link[@rel= ‘next‘] | Reference to the next page of the search feed  For further details: see 7.3.2.1.1 | 1  optional |
| atom:feed/atom:link[@rel= ‘last‘] | Reference to the next page of the search feed  For further details: see 7.3.2.1.1 | 1  optional |
| atom:feed/atom:link[@rel= ‘previous‘ or @rel=”prev”] | Reference to the previous page of the search feed  For further details: see 7.3.2.1.1 | 1  optional |
| atom:feed/atom:link[@rel=’up’] | Refers to a parent resource in a hierarchy of resources. | n  optional |
| atom:feed/atom:link[@rel= ‘self‘] | Preferred URI for retrieving Atom Feed Documents representing this Atom feed  For further details: see 7.3.2.1.1 | 1  optional |
| Query | - | atom:feed/os:Query | Defines the search request query (so that search clients can recreate the current search, role="request") | 1  optional |
| Extent  (total results, start index and items per page) | dct:extent | atom:feed/ os:totalResults | OpenSearch element with the total number of feed’s entries | Integer  1  mandatory |
| atom:feed/ os:startIndex | OpenSearch element with the index of the first feed’s entry.  For further details: see 7.3.2.1.1. | Integer  1  mandatory |
| atom:feed/ os:itemsPerPage | OpenSearch element with the number of entries returned per page. | Integer  1  mandatory |
| a Look at 10-[032](http://ogc.standardstracker.org/show_bug.cgi?id=448#c032) [RD.3] for details why this is of cardinality n.  b To be backwards compatible it remains optional (although mandatory in OWS Context)  c This diverges from 10-032r8 because of an error in 10-032r8 which has to be fixed there  Note: This table includes the same terms (in the same order) as provided in Table 6 of OGC 10-032 [RD.3] | | | | |

##### Result set navigation (Paging)

In this section, additional requirements can be found regarding the navigation of the result set.

|  |  |
| --- | --- |
| **Requirement** | **/req/response/ATOM/feed/resultSetNavigation**  OpenSearch implementations are **recommended** to provide navigation links for the first (rel="first"), previous (rel="prev" or "previous"), current (rel="self"), next (rel="next") and last pages (i.e. rel="last") of a result set (if applicable) using the rel attribute as defined in [OGC 10-032r8] and [RFC5988][[7]](#footnote-7) and shown below.  The table below indicates which navigation links **should** be included in a result set for a number of border cases: |
| Requirement Class | **/req/Paging** |

Example 10: ATOM encoding example for result set navigation (using startIndex)

<feed>

...

<os:totalResults>55</os:totalResults>

<os:itemsPerPage>10</os:itemsPerPage>

<os:startIndex>31</os:startIndex>

<link href="foo.gov/opensearch/datasets.atom?startIndex=1&amp;numberOfResults=10" rel="first" type="application/atom+xml"/>

<link href="foo.gov/opensearch/datasets.atom?startIndex=21&amp;numberOfResults=10" rel="prev" type="application/atom+xml"/>

<link href="foo.gov/opensearch/datasets.atom?startIndex=31&amp;numberOfResults=10" rel="self" type="application/atom+xml"/>

<link href="foo.gov/opensearch/datasets.atom?startIndex=41&amp;numberOfResults=10" rel="next" type="application/atom+xml"/>

<link href="foo.gov/opensearch/datasets.atom?startIndex=51&amp;numberOfResults=10" rel="last" type="application/atom+xml"/>

…

</feed>

The structure of the href attribute of the atom:link (see 7.3.2.3.1) is irrelevant to the client as long as the semantics (e.g. next set of results) are preserved by the link returned by the server. The client is not supposed to "parse" the URL returned by the server.

The example below using startPage is equivalent to the previous example using startIndex (although the usage of startIndex should be given the priority over startPage (see also requirement below the example)).

Example 11: ATOM encoding example for result set navigation (using startPage)

<feed>

...

<os:totalResults>55</os:totalResults>

<os:itemsPerPage>10</os:itemsPerPage>

<os:startIndex>31</os:startIndex>

<link href="foo.gov/opensearch/datasets.atom?startPage=1&amp;numberOfResults=10" rel="first" type="application/atom+xml"/>

<link href="foo.gov/opensearch/datasets.atom?startPage=3&amp;numberOfResults=10" rel="prev" type="application/atom+xml"/>

<link href="foo.gov/opensearch/datasets.atom?startPage=4&amp;numberOfResults=10" rel="self" type="application/atom+xml"/>

<link href="foo.gov/opensearch/datasets.atom?startPage=5&amp;numberOfResults=10" rel="next" type="application/atom+xml"/>

<link href="foo.gov/opensearch/datasets.atom?startPage=6&amp;numberOfResults=10" rel="last" type="application/atom+xml"/>

…

</feed>

|  |  |
| --- | --- |
| **Requirement** | **/****req/response/ATOM/feed/useOfStartIndexOverStartPage**  It is **recommended** to use ‘startIndex’ over ‘startPage’ because ‘startPage’ is not defined in the OpenSearch specification as a valid response element whereas ‘startIndex’ is. Although this is probably an oversight, adherence to specification is essential.  It is further **recommended** that in a search response ‘startIndex’ **should** be used in preference to startPage when both ‘startPage’ and ‘startIndex’ are supplied in a search request by a client. |
| Requirement Class | **/req/Paging** |

##### Specification reference

In this section, additional requirements can be found regarding the specification reference of the result set (feed).

|  |  |
| --- | --- |
| **Requirement** | **/****req/response/ATOM/feed/specReference**  In case the atom:feed is fully aligned with OpenSearch-EO profile it is recommended to provide a specReference as follows in the atom:feed:   * OpenSearch-EO by providing the URI of the OpenSearch-EO core requirements class (<http://www.opengis.net/spec/opensearcheo/1.0/req/core>)   In case the atom:feed is further fully aligned with the OWS Context profile it is recommended to provide a specReference as follows:   * OWS Context by providing the URI of the OWS Context core requirements class (<http://www.opengis.net/spec/owc-atom/1.0/req/core>)   Example: <link href="http://www.opengis.net/spec/opensearcheo/1.0/req/core" rel="profile" title=”This file is compliant with version 1.0 of OGC OpenSearch-EO”/> |
| Requirement Class | **/req/SpecReference** |

##### Representing the geographical extent of a feed

For representing the geographical extent of a feed minimally a “georss:box” element (a representation of “GeoRSS Simple”) (RD.16) **should** be provided.

|  |  |
| --- | --- |
| **Requirement** | **/req/response/ATOM/feed/extent**  For representing the geographical extent of a feed, it is recommended to provide a “georss:box” element (a representation of “GeoRSS Simple”) (RD.16). |
| Requirement Class | **/req/spatialExtent** |

#### atom:entry

This section defines in detail the encoding of the OpenSearch response´ atom:entry element. Additional requirements on specific elements of the response are given in the sub-sections.

|  |  |
| --- | --- |
| **Requirement** | **/req/response/ATOM/entry**  An ATOM Entry response object (contained in the Feed element) **shall** implement the vocabulary items shown in Table 9, column “ATOM Element” (incl. values matching the types shown and with the multiplicity shown). |
| Requirement Class | **/req/Core** |

The response for each item in the result set **should** provide a link to a “full” view of the result, where more detailed metadata is provided (see 7.3.2.2.4) and, when available, a direct link to the resource element (see 7.3.2.2.7).

Table 9 — Search response element encodings: *atom:entry*

| **Term** | **OGC core returnable** | **Atom Element** | **Description** | **Multiplicity (/ Type)** |
| --- | --- | --- | --- | --- |
| Type | dc:type | atom:entry (element) | Defines a Feature | 1  mandatory |
| atom:entry/ dc:type | Defines the type (genre) of the entry, mainly if it is a collection or a product. | 1  optional (recommended)  String (URI): one of those: <http://dublincore.org/documents/2002/07/13/dcmi-type-vocabulary/>  Example: <http://purl.org/dc/dcmitype/Dataset> |
| atom:entry/atom:link[@rel=’profile’]/@href | To state which recordSchemad is used for the encoding of inline metadata (if requested via the recordSchema parameter). | 1  optional  String (URI) d |
| Title | dc:title | atom:entry/ atom:title | A title given to the resource. | 1  mandatory  String |
| Creator | dc:creator | atom:entry/ atom:author | An entity primarily responsible for making the content of the resource | 1  optional  String |
| Subject | dc:subject | atom:entry/ atom:category | A topic of the content of the resource (a topic category or other taxonomy can be applied) | n  optional  String or skos:Concept (URI) |
| Abstract | dct:abstract | atom:entry/ atom:content | An account of the content of the resource.  The purpose is to provide a description of the content in a format understandable by mass-market generic Atom readers. | 1  optional (becomes mandatory when no atom:link with rel"alternate" for entry provided)  String (not empty)  The use of atom:content with @type equal to "html" is recommended. |
| atom:entry/ atom:summary | An account of the content of the resource | 1  optional  String (see 7.3.2.2.2) |
| Contributor | dc:contributor | atom:entry/ atom:contributor | An entity responsible for making contributions to the content of the resource | n  optional  String |
| Modified | dc:date | atom:entry/ atom:updated | A date of a creation or update of the metadata resource | 1 mandatory e  RFC 3339 date |
| Date | eop:EarthObservation /om:phenomenonTime/gml:TimePeriod  OR  gml:beginPosition and gml:endPosition of gmd:EX\_TemporalExtent | atom:entry/ dc:date | A date or range of dates relevant to the resource | 1  optional  RFC 3339 date a |
| Identifier | dc:identifier | atom:entry/ atom:id | A unique identifier of the entry. Its content MUST be an IRI (it excludes relative references). It should not be assumed that it can be dereferenced. | 1  mandatory  String (IRI) |
| atom:entry/ dc:identifier | The identifier of the resource within the search engine context (local reference).  For details on this see 7.3.2.2.1 | 1  mandatory  String (not empty) |
| Source | dc:source | atom:entry/ atom:link[@rel= ‘via’] | A reference to a document that is the source of the information provided in the entry (see also c). | n  optional  atom:link as defined in 7.3.2.2.4. |
| Language | dc:language | atom:entry/ @xml:lang | A language of the intellectual content of the resource as defined in RFC 5646 | 1  optional  String (see left) |
| Rights | dc:rights | atom:entry/ atom:rights | Information about rights held in and over the resource | 1  optional  String (not empty) |
| Envelope | eop:Footprint | atom:entry/  georss:\* | The spatial extent or scope of the content of the resource.  For further clarifications see 7.3.2.2.6 | GeoRSS Simple or  GeoRSS GML  1  optional f |
| Relation | dc:relation | atom:entry/ atom:link[@rel=’search’] | Reference to the OpenSearch description document when the resource is search service or a collection | 1  optional  atom:link as  defined in 7.3.2.2.3. |
| atom:entry/ atom:link[@rel=’enclosure’] | Reference to the location of the data resource described in the entry | n  optional  atom:link as defined in 7.3.2.2.7. |
| atom:entry/atom:link[@rel=’icon’]    **OR**  atom:entry/media:group | References to quicklooks, browse images etc representing the entry | n  optional  atom:link  **OR** media:group  as defined in 7.3.2.2.5 |
| atom:entry/ atom:link[@rel=’alternate’] | A reference to a document with the entry information in an alternative format (see also b,c)  For more details see 7.3.2.2.4 | n  optional  (becomes mandatory when no atom:content for entry provided)  atom:link as defined in 7.3.2.2.4. |
| atom:entry/ atom:link[@rel=’describedby’] | A reference to the documentation (a file with human-readable information about the resource). | n  optional  atom:link as defined in 7.3.2.2.7 |
| atom:entry/ owc:offering | Service or online content offering for the resource targeted at OGC compliant clients [see RD.11]. | n  optional  owc:Offering as defined in 7.3.2.2.8 |
| Format | dc:format | atom:entry/atom:link[@rel=’enclosure’]/@type | The MIME types of the data resources available | n  optional |
| ParentIdentifier | dc:relation | atom:entry/atom:link[@rel=’up’] | Refers to a parent resource in a hierarchy of resources | n  optional  atom:link as defined in 7.3.2.2.3 |
|  |  |  |  |  |
| Additional Metadata |  | For ATOM those types of additional metadata may be requested which are listed under c.  For details how to request etc see also 7.3.2.2.4 | Refers to additional “inline” metadata. The concrete type of this inline metadata has to be defined in the request via the sru:RecordSchema parameter (see 7.3.2.2.4) | 1  optional |
| a Can represent either:  • A single date  • A single date-time  • A date-time range: the element should contain two dates separated by a slash, like:  2004-02-19T03:03:23.736Z/2010-09-12T15:57:36.072Z  • An open-ended date-time range: element should contain a date ending with a slash, like:  2004-02-19T03:03:23.736Z/  • An open-beginning date-time range: element should contain a slash ending with a date, like:  /2004-02-19T03:03:23.736Z  b An atom:entry MUST NOT contain more than one atom:link element with a relation of "alternate" that has the same combination of type and hreflang attribute values  c For an ATOM response the types of metadata representations shown in **Table 10** (not limited to) may optionally be requestable via an atom:link element (relation "alternate" or "via" using the appropriate ***mime*T*ype).*** These are also the supported types which may be requested for inline inclusion via the sru:RecordSchema parameter by providing the corresponding URI (see also 7.3.2.2.4)).  d Supported Schema (URI´s) are shown in **Table 10** (not limited to).  e In r8 it was optional which was not aligned with ATOM (RFC 4287) where it is mandatory  f Conforms to OWS Context (12-084r2), but not to OpenSearch-Geo (10-032r8) defining “n optional”.  Note: Grey rows show differences with Table 7 of OGC 10-032 [RD.3] | | | | |

Table 10 —Metadata Representations

|  |  |  |  |
| --- | --- | --- | --- |
| **Metadata Format** | **Mime Type** | **Schema URI** | **Description** |
| OGC O&M EOP 2.1  (OGC 10-157r4) | application/gml+xml;profile=http://www.opengis.net/spec/EOMPOM/1.1 | http://www.opengis.net/eop/2.1 | OGC 10-157r4: root element will be “eop:EarthObservation” or one of the extensions (e.g. sar:EarthObservation) |
| OGC O&M EOP 2.0  (OGC 10-157r3) | application/gml+xml;profile=http://www.opengis.net/spec/EOMPOM/1.0 | http://www.opengis.net/eop/2.0 | OGC 10-157r3: root element “eop:EarthObservation” or one of the extensions (e.g. sar:EarthObservation) |
| ISO19115 (ISO19139) | application/vnd.iso.19139+xml | http://www.isotc211.org/2005/gmd | root element “gmd:MD\_Metadata” |
| ISO19115-2 (ISO19139-2) | application/vnd.iso.19139-2+xml | http://www.isotc211.org/2005/gmi | root element “gmi:MI\_Metadata” |
| ISO19115-1 (ISO19115-3)  [RD.30] | application/vnd.iso.19115-3+xml | http://standards.iso.org/iso/19115/-3/mdb/1.0 | root element “mdb:MD\_Metadata” |
| Dublin Core for SRU  [RD.10] | application/xml | info:srw/schema/1/dc-v1.1[[8]](#footnote-8) | [RD.10], root element “srw\_dc:dc” |
| Markdown | text/x-markdown | text/x-markdown |  |
| HTML | text/html | text/html |  |

##### dc:identifier

In this section, additional requirements can be found regarding the identifier of an entry.

|  |  |
| --- | --- |
| **Requirement** | **/req/response/ATOM/entry/identifier**  The dc:identifier element in the search result **shall** allow navigating from search results to a single entry inside these results using the OpenSearch parameter {geo:uid} as described in [RD.3]. |
| Requirement Class | /req/Core |

The latter makes the following use cases possible,

* Put a link on a Web site pointing to a single (OpenSearch) catalog item (using a URL) to illustrate a particular event (e.g. an earthquake in the Himalaya)
* The ability to bookmark and retrieve a single item

##### Abstract, Summary of an entry

In this section, additional requirements can be found for an entries “summary” element.

|  |  |
| --- | --- |
| **Requirement** | **/req/response/ATOM/entry/atomSummary**  The default type for atom:summary is “text” - i.e. if MIME type is not specified then the client **should** assume that it is of type “text”. Otherwise MIME type **should** be specified according to Table 10. Summaries of type ‘text/html”, **shall** be escaped as required per XML specification. It is **recommended** that OpenSearch implementations have “useful” information in the actual metadata and not only in atom:summary. The summary shall convey a short summary, abstract, or excerpt of an entry. The canonical source of information **should** be described in the metadata (atom:link or feed/entry) and not in the atom:summary. |
| Requirement Class | **/req/EntrySummary** |

##### 2-step-search

If the resource described in the response entry aggregates other resources (e.g. is a collection (see 2-step-search in 6.2)) or is a search service) it should possess an atom:link (7.3.2.3.1) with the *rel* attribute equal to “search” and the *type* (or *mediaType*) attribute equal to “application/opensearchdescription+xml” [RFC 5988]. This feature can be used to define “recursive” searches where the search context (e.g. queriables) is propagated to the search engine described by the OpenSearch description document referenced in the *href* attribute.

|  |  |
| --- | --- |
| **Requirement** | **/req/response/ATOM/entry/searchContextLink**  OpenSearch implementations are **recommended** to use an atom:link with the relation attribute value “search” when linking to an OpenSearch Description Document. |
| Requirement Class | **/req/TwoStepSearch** |

Example 12: Defining access to a search service of an atom:entry

<entry>

...

<title>Collection A</title>

<link rel="search" type="application/opensearchdescription+xml” href=”http://foo.ceos.org/search/osdd.xml?collectionId=collection\_a"/>

...

</entry>

<entry>

...

<title>Collection B</title>

<link rel="search" type="application/opensearchdescription+xml” href=”http://foo.ceos.org/search/osdd.xml?collectionId=collection\_b"/>

...

</entry>

If the resource described in the response is a member of an aggregate (e.g. is a product from a collection, see also 2-step-search in 6.2) it should possess an atom:link with the relation “up”. This means that the link can be used to request information about the aggregate (collection) and to optionally initiate alternative searches for products from the same collection using the requested information.

|  |  |
| --- | --- |
| **Requirement** | **/req/response/ATOM/entry/parentIdentifier**  OpenSearch implementations are **recommended** to use an atom:link with a relation attribute value “up” when linking to a parentIdentifier. |
| Requirement Class | **/req/TwoStepSearch** |

Example 13: Defining access to a parentIdentifier (e.g. the collection) of an atom:entry

<entry>

...

<title>Product X</title>

...

<link rel="up" type="application/atom+xml” href=”http://example.com/myatom/?id=collection\_b"/>

...

</entry>

##### Linking entries with source- or alternative-metadata

If possible, the access to the original authoritative metadata source of the entry should be given using an atom:link (see 7.3.2.3.1) element with the relation name equal to “via” [RFC5988] with the corresponding format announced in the type attribute.

If the information of this entry is available in other metadata encodings, then a server can include atom:link elements for each format using the “alternate” [RFC 5988] relation name and corresponding format in the type attribute.

|  |  |
| --- | --- |
| **Requirement** | **/req/response/ATOM/entry/metadataLink**  OpenSearch implementations are **recommended** to use an atom:link with the relation attributes “via” or “alternate” when describing links of an ATOM entry to associated metadata (files with (usually) structured information about corresponding data files).  The “via” relation **should** be preferred to convey the authoritative resource or the source of the information from where the atom:entry is made. |
| Requirement Class | **/req/MetadataLink** |

Example 14: Defining access to authoritative metadata and alternative metadata representations of an atom:entry

<atom:link rel="via" type="application/gml+xml" length="1845" title="Metadata (OGC CSW ebRIM EP EO)" href="http://rs211980.rs.hosteurope.de/eo-csw-umarf/servlet/csw?service=CSW-ebRIM&request=GetRepositoryItem&Id=urn:ogc:def:EOP:EUM:acronym:MSGCSKR:fileid:EO:EUM:DAT:MSG:CSR:20160804004500MSG3MSGCSKR02EF0OPE:EO"/>

<atom:link rel="alternate" type=" application/gml+xml;profile=http://www.opengis.net/spec/EOMPOM/1.1" title="EOP O&M Metadata" href="http://rs211980.rs.hosteurope.de/eo-csw-umarf/servlet/csw?service=CSW-ebRIM&amp;request=GetRepositoryItem&;Id=urn:ogc:def:EOP:EUM:acronym:MSGCSKR:fileid:EO:EUM:DAT:MSG:CSR:20160804004500MSG3MSGCSKR02EF0OPE:EO&omitWrapper=true"/>

A server can support requests to provide additional metadata inline in the response. For this the server must support the *sru:recordSchema* parameter and the client must use this parameter to identify the metadata model to be used to structure the metadata provided inline in the response. This metadata may be provided in addition to the metadata offered via a link.

Example 15: Request for inline metadata and corresponding response entry including an atom:entry with inline metadata

**Request:**

http://example.com/myatom/?q=water&recordSchema=http://www.opengis.net/eop/2.1&...

<atom:ntry>

...

<atom:title>Collection B</atom:title>

...

<eop:EarthObservation xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

xsi:schemaLocation=http://www.opengis.net/opt/2.1 ../xsd/opt.xsd

xmlns:eop=<http://www.opengis.net/eop/2.1> …

gml:id="eo\_ASA\_IM\_\_0CNPDE20100122\_014441\_000000162086\_00146\_41282\_7918.N1">

<om:phenomenonTime><gml:TimePeriod

gml:id="tp\_ASA\_IM\_\_0CNPDE20100122\_014441\_000000162086\_00146\_41282\_7918.N1">

<gml:beginPosition>2010-01-22T01:44:41.316Z</gml:beginPosition>

…

|  |  |
| --- | --- |
| **Requirement** | **/req/response/ATOM/entry/inlineMetadata**  OpenSearch implementations **can** provide additional “inline” metadata. The concrete type of this inline metadata **shall** be defined in the request via the sru:RecordSchema parameter |
| Requirement Class | **/req/InlineMetadata** |

|  |  |
| --- | --- |
| **Requirement** | **/req/OSDD/inlineMetadataSchemas**  When the server supports requests for inline metadata via the *sru:recordSchema* (see Table 5) it can advertise this (and the supported metadata schemas) in the OSDD by using the parameter extension [RD.17] |
| Requirement Class | **/req/InlineMetadata** |

An example of providing supported metadata schemas for inline metadata is shown in the example below.

Example 16: Use of parameter extension for sru:recordSchema

<param:Parameter name="rec" value="{sru:recordSchema}" minimum="0" title="Metadata model in which additional metadata should be provided inline">

<param:Option value=http://www.isotc211.org/2005/gmi label="ISO19115-2/ISO19139-2"/>

</param:Parameter>

Advertising *sru:recordSchema* means it can provide metadata inline. Not advertising it means it cannot do this but may provide additional metadata via alternative atom:links instead.

It is also possible that a server supports *sru:recordSchema* AND providing alternate links - support for both mechanisms simultaneously is valid.

##### Linking entries with thumbnail, quicklook, browse images or masks

References to thumbnails, quicklooks, browse images or masks (images representing the entry) can either be represented with an **atom:link**…

|  |  |
| --- | --- |
| **Requirement** | **/req/response/ATOM/entry/imagesByLink**  OpenSearch implementations are **recommended** to use an atom:link with the **relation attribute ’icon’** when linking an image of the data (typically used for making data request decisions). |
| Requirement Class | **/req/ImagesByLink** |

Example 17: Linking browse icon by atom:link

<link rel="icon" href="/favicon.ico" sizes="16x16 32x32" type="image/vnd.microsoft.icon">

…OR with a **media:group** element (see below)…

|  |  |
| --- | --- |
| **Requirement** | **/req/response/ATOM/entry/imagesByMediaRSS**  OpenSearch implementations are **recommended** to use the “Media RSS Specification” [RD.21]. Each of the images **shall** be included as a separate media:content (see 7.3.2.3.2) element. Multiple elements (e.g. Quicklook and cloud mask) for the same single entry **shall** be included in the same media:group element |
| Requirement Class | **/req/ImagesByMediaRSS** |

Example 18: Defining the reference to the thumbnail image of the atom:entry

<feed xmlns="http://www.w3.org/2005/Atom

xmlns:media="http://search.yahoo.com/mrss/">

…

<entry>

…

<media:group>

<media:content url="http://navigator.eumetsat.int/smartEditor/preview/msgcsr.jpg" type="image/jpeg" medium="image">

<media:category scheme="http://www.opengis.net/spec/EOMPOM/1.1">THUMBNAIL</media:category>

</media:content>

…

</media:group>

</entry>

##### Representing the geographical extent of an entry

|  |  |
| --- | --- |
| **Requirement** | **/req/response/ATOM/entry/extent**  For representing the geographical extent of an entry in GeoRSS the usage of “GeoRSS Simple” is **recommend** (when applicable) over “GeoRSS GML”.  Example: <georss:polygon>45.256 -110.45 46.46 -109.48 …</georss:polygon>  When not applicable (e.g. footprint made of multiple polygons), “GeoRSS GML” (i.e. <georss:where>) [RD.16] should be used. |
| Requirement Class | **/req/spatialExtent** |

|  |  |
| --- | --- |
| **Requirement** | **/req/response/ATOM/entry/GeoRSSMultiPolygonFootprint**  For representing geographical extent consisting of multiple polygons in GeoRSS in the search result, it is **recommended** to use “GeoRSS GML” [RD.16] with a <gml:MultiSurface> element containing multiple <gml:Polygon> elements[[9]](#footnote-9). |
| Requirement Class | **/req/spatialExtent** |

Example 19: GeoRSS GML with gml:MultiSurface element containing multiple gml:Polygon´s

<georss:where>

<gml:MultiSurface gml:id="MULSF01" srsName="EPSG:4326">

<gml:surfaceMembers>

<gml:Polygon xmlns:gml="http://www.opengis.net/gml" gml:id="POLN1004F1">

<gml:exterior>

<gml:LinearRing>

<gml:posList srsDimension="2">42.80386 7.22599 51.65319 4.44298 58.690876 1.600294 63.93042 -... 41.425982 -0.178961 42.80386 7.22599</gml:posList>

</gml:LinearRing>

</gml:exterior>

</gml:Polygon>

<gml:Polygon xmlns:gml="http://www.opengis.net/gml" gml:id="POLN1004F2">

<gml:exterior>

<gml:LinearRing>

<gml:posList srsDimension="2">5.86342 180 -13.180367 175.749402 -27.402929 172.044313 -37.983457 ... -39.323454 175.681849 -21.10288 180 5.86342 180</gml:posList>

</gml:LinearRing>

</gml:exterior>

</gml:Polygon>

</gml:surfaceMembers>

</gml:MultiSurface>

</georss:where>

|  |  |
| --- | --- |
| **Requirement** | **/req/response/ATOM/entry/GeoRSSMultiPointFootprint**  For representing geographical extent consisting of multiple points in GeoRSS in the search result, it is **recommended** to use “GeoRSS GML” with a <gml:MultiPoint> element containing multiple <gml:Point> elements. |
| Requirement Class | **/req/spatialExtent** |

Example 20: GeoRSS GML with gml:MultiPoint element containing multiple gml:Point

<georss:where>

<gml:MultiPoint gml:id="MULTIPOINTN10051">

<gml:pointMember xmlns:gml="http://www.opengis.net/gml">

<gml:Point gml:id="POINTN100511">

<gml:pos srsDimension="2">49.695066 -136.337212</gml:pos>

</gml:Point>

</gml:pointMember>

<gml:pointMember xmlns:gml="http://www.opengis.net/gml">

<gml:Point gml:id="POINTN100512">

<gml:pos srsDimension="2">49.699539 -136.322377</gml:pos>

</gml:Point>

</gml:pointMember>

</gml:MultiPoint>

</georss:where>

|  |  |
| --- | --- |
| **Requirement** | **/req/response/ATOM/entry/GeoRSSMultiLineFootprint**  For representing geographical extent consisting of multiple lines in GeoRSS in the search result, it is **recommended** to use “GeoRSS GML” with a <gml:MultiGeometry> element containing multiple <gml:LineString> elements. |
| Requirement Class | **/req/spatialExtent** |

Example 21: GeoRSS GML with gml:MultiGeometry element containing multiple gml:LineString

<georss:where>

<gml:MultiGeometry gml:id="MULGN10051">

<gml:geometryMembers>

<gml:LineString xmlns:gml="http://www.opengis.net/gml" gml:id="IDLSN100511">

<gml:posList srsDimension="2">-34.7796 102.055 -39.7836 100.515 ... 81.4918 -172.36 81.5337 -180</gml:posList>

</gml:LineString>

<gml:LineString xmlns:gml="http://www.opengis.net/gml/3.2" gml:id="IDLSN100512">

<gml:posList srsDimension="2">81.5337 180 81.4334 172.547 81.1894 ... -38.0684 76.0048 -42.0022 74.718</gml:posList>

</gml:LineString>

</gml:geometryMembers>

</gml:MultiGeometry>

</georss:where>

##### Representing data access capabilities of an entry

An atom:link (see 7.3.2.3.1) with the link type “enclosure” shall provide a reference to the location of the data resource described in the entry.

|  |  |
| --- | --- |
| **Requirement** | **/req/response/ATOM/entry/dataLink**  OpenSearch implementations are **recommended** to use an atom:link with the “enclosure” relation attribute value (and having a MIME type attribute type=” application/binary”) when describing the data (link representing a data file or other science data resource; may be large in size) associated with the resource.  Example: <link href="foo.hdf" rel="enclosure" type=”application/binary”/>  The above data access URL **should** also be applied in case multiple files are available for data access through a single .ZIP file or via a Metalink[[10]](#footnote-10) file. |
| Requirement Class | **/req/DataAccess** |

|  |  |
| --- | --- |
| **Requirement** | **/req/response/ATOM/entry/ordering**  OpenSearch implementations are **recommended** to use an atom:link with the “enclosure” relation attribute value (and having a MIME type attribute type=”text/html”) when describing ordering (link representing an ordering client) mechanism associated with the resource.  Example: <link href="http://.../OrderClient.html" rel="enclosure" type=”text/html”/> |
| Requirement Class | /req/DataAccess |

|  |  |
| --- | --- |
| **Requirement** | **/req/response/ATOM/entry/documentationLink**  OpenSearch implementations are **recommended** to use an atom:link with the “describedby” relation attribute value when describing a documentation (file with human-readable information about the resource) associated with a resource.  Example: <link href=" http://.../doc.pdf" rel="describedby" type=”application/pdf”/> |
| Requirement Class | **/req/DataAccess** |

##### Presenting available services with owc:Offering Type

An atom entry should include ways to automatically present available services, like OGC Services and Download Services, in a way that smart clients mayexploit.

|  |  |
| --- | --- |
| **Requirement** | **/req/response/ATOM/entry/offerings**  OpenSearch implementations are **recommended** to use the owc:OfferingType (s. OGC 12-084r2 [RD.11] for all details) when describing services or inline content offerings for the resource, targeted at OGC compliant clients.  An "Offering" object **shall** implement the properties defined in OGC 12-084r2, with the value matching the type shown, and with the obligations shown. |
| Requirement Class | **/req/Offerings** |

For further details about offerings (including examples) which maybe relevant s. also Annex B (8.2).

#### Types used in ATOM responses

##### atom:link Type

The atom:link type is used to express the properties of a hypermedia link to a resource identified by its URI.

Table 11 —Vocabulary items atom:link

|  |  |  |  |
| --- | --- | --- | --- |
| **Term** | **Atom Element** | **Description** | **Multiplicity(/Type)** |
| Type | rel (attribute)  atom:link/@rel | The class for an Atom Link. This property has the fixed value "atom:link". | 1 |
| URL | href (attribute)  atom:link/@href | URI representing the target of the link. | 1 mandatory  String (URI) |
| title | title (attribute)  atom:link/@title | Human readable information about the link. | 1 optional  String |
| media type | type (attribute)  atom:link/@type | Hint about the type of the representation that is expected to be returned when the value of href is dereferenced. | 1 optional\*  String (contains a media type) |
| length | length (attribute)  atom:link/@length | Hint about the content length (in bytes) of the representation that is expected to be returned when the value of href is dereferenced | 1 optional  Integer |
| \* see requirements below | | | |

|  |  |
| --- | --- |
| **Requirement** | **/req/response/ATOM/entry/linkTypeAttribute**  OpenSearch implementations shall specify the media (MIME) type of the artifact associated with a resource by specifying the "type" attribute of the Atom link element. |
| Requirement Class | **/req/LinkTypeAttribute** |

The former requirement allows a client to determine which resource type a HATEOAS Atom link refers to. Clients can make this distinction by checking the media type provided in the "type" attribute.

Example 22: Sample *link* providing the *next* set of search results in atom+xml format

<atom:link rel="next" href="http://eoportal.eumetsat.int/eopos?dtstart=2017-09-04T00:00:00Z&amp;pI=urn:ogc:def:EOP:EUM:acronym:OSICOGB:fileid:EO:EUM:DAT:DMSP:GBLSIC&amp;dtend=2017-09-06T15:00:00Z&amp;c=1&amp;si=2" type="application/atom+xml" title="next"/>

##### media:content Type

The media:content type is used to express the properties of a mediaRSS link to a resource identified by its URI.

Table 12 —Vocabulary items Media RSS Specification – media:content [RD.21]

|  |  |  |  |
| --- | --- | --- | --- |
| **Term** | **Atom Element** | **Description** | **Mult** |
| Type  (mediaContent) | media:content (element) | The class used for a Media Content, representing:   * "browse/ BrowseInformation" * "mask/ MaskInformation", * “product/ ProductInformation | 1 |
| mediaURL | url (attribute) | Character sequence used for representing:   * "browse/browseInformation/ filename" * "mask/MaskInformation/filename" * "product/ProductInformation/filename”. | 1  String (URL) |
| mediaType | type (attribute) | Character sequence representing media type, typically "image/jpeg" (not represented in EOP O&M metadata). | O  String (contains a media type). |
| mediaMedium | medium (attribute) | Character sequence representing media typically "image". | O  String |
| mediaExpression | expression (attribute) | Determines if the media:content object is a sample or the full version of the object. Use "full" for “product/ ProductInformation/”. Use "sample" for "browse/ BrowseInformation/" or "mask/ MaskInformation/". | O  String |
| fileSize | fileSize (attribute) | Character sequence representing "product/ProductInformation/size". | O  String |
| mediaCategory | media:category (element) | The object of the relationship is an object representing the media:category | 1  media:category (see Table 13) |
| conformsTo | dct:conformsTo (element) | The object of the relationship is an object representing:   * "browse/ BrowseInformation/ referenceSystemIdentifier" * "mask/MaskInformation/ referenceSystemIdentifier" * “product/ProductInformation/ referenceSystemIdentifier”.   Example: http://www.opengis.net/def/crs/EPSG/0/4326 | O |

Table 13 —Vocabulary items Media RSS Specification – media:category [RD.21]

|  |  |  |  |
| --- | --- | --- | --- |
| **Term** | **Atom Element** | **Description** | **Mult** |
| Type  (mediaCategory) | media:category (element) | The class for a Media Category. | 1 |
| mediaURI | The scheme parameter in the media:category element should reflect a thesaurus/codelist e.g. <http://www.opengis.net/spec/EOMPOM/1.0>.  The value is one of those (e.g. CLOUD) described in the “Description” column (without repeating the schema URL). | The object is representing "browse/BrowseInformation/type" (e.g. QUICKLOOK, THUMBNAIL, ALBUM) or "mask/MaskInformation/type" (e.g. SNOW, QUALITY, CLOUD) and categorisation schema used for "browse/ BrowseInformation/type" or "mask/MaskInformation/type". | 1 |

## Error handling

The Atom and the OpenSearch specifications do not directly specify how to deal with server and request errors. It is recommended that an OpenSearch Earth Observation Service use the HTTP error codes for client (4xx) and server (5xx) errors.

|  |  |
| --- | --- |
| **Requirement** | **/req/exceptions**  It is **recommended** that the following error codes are used:   * 400 Bad Request: The request has an invalid syntax (i.e. badly formatted geometry) * 413 Request Entity Too Large: The request originates too many returnable hits * 415 Unsupported media type: Media type in the request is not available or valid. * 500 Internal Server Error: Default code for the server side for an execution error. * 501 Not Implemented: When requesting an unimplemented feature  (e.g. relation operator not supported). * 503 Service Unavailable: When the search service is temporarily not available (due to overload or other reasons). * 504 Gateway Timeout: When the search engine is a broker or aggregator to other services that fail to produce an answer within a giving time frame. |
| Requirement Class | **/req/Exceptions** |

Example 23: Response example for a bad request (incorrect eo:orbitNumber format)

HTTP/1.1 400 Bad Request

Content-Type: text/plain

Date: Mon, 6 Feb 2012 14:27:37 GMT

Content-Length: 56

Bad Request - Wrong orbitNumber format (number or range)

To find relevant responses and alleviate some frustration for clients who may not always check the OSDD before formulating a query, a server or gateway shall ignore the unsupported request parameters and process the query as if they were not present. The server, to report about the considered search parameters, should return an <os:Query role="request" ../> element with only the parameters taken into account.

# Annex

## Annex A: Abstract Test Suite (Normative)

### Introduction

This annex defines the Abstract Test Suite (ATS) for the OGC OpenSearch Extension for Earth Observation (OpenSearch-EO) standard. It is organized by conformance test class.

An implementation can be validated with the conformance tests defined here. An implementation candidate to conformance shall minimally pass all applicable tests specified for the Core Conformance Test Class (minimal support). All other conformance test classes are optional.

Note: If a conformance test class depends on (one or more) other conformance test classes then also all applicable tests specified for these conformance test classes must be passed.

### Conformance Test Class: Core

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/Core** | |
| **Requirements Class** | /req/Core | |
| **Dependency** | OpenSearch-Geo [RD.3] | |
| **Test** | /req/Core/osdd | |
| **Requirements** | **req/osdd** |
| **Test purpose** | Verify that the server generates a valid OpenSearch description document |
| **Test method** | Execute an HTTP GET request to retrieve a server's description document. Verify that the response is correct XML and is valid according to the description in this standard |
| **Test type** | Capability |

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/Core** | |
| **Requirements Class** | /req/Core | |
| **Dependency** | OpenSearch-Geo [RD.3] | |
| **Test** | /req/Core/OSDDAtom | |
| **Requirements** | **req/osdd/atom** |
| **Test purpose** | Verify that the server defines an URL template for the Atom response |
| **Test method** | Execute an HTTP GET request to retrieve a server's description document. Verify that an URL element with the type equal to “application/atom+xml” exists |
| **Test type** | Capability |

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/Core** | |
| **Requirements Class** | /req/Core | |
| **Dependency** | OpenSearch-Geo [RD.3] | |
| **Test** | /req/Core/Namespaces | |
| **Requirements** | **/req/osdd/namespaces** |
| **Test purpose** | Verify that the server uses the EO extension namespaces |
| **Test method** | Execute an HTTP GET request to retrieve a server's description document. Verify that the EO extensions namespace is present |
| **Test type** | Capability |

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/Core** | |
| **Requirements Class** | /req/Core | |
| **Dependency** | OpenSearch-Geo [RD.3] | |
| **Test** | /req/Core/OptionalTemplateParameters | |
| **Requirements** | **/req/osdd/optionalTemplateParameters** |
| **Test purpose** | Verify that the server treats the following as equivalent,   * values of optional parameter that are empty (i.e. the key is present but the value is absent) * key/value pairs of optional parameters that are removed (i.e. both key and value are absent). |
| **Test method** | Execute two HTTP GET request which are equal except that one request has empty optional values (which are missing in the other request). Verify that the OpenSearch responses are equivalent. |
| **Test type** | Capability |

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/Core** | |
| **Requirements Class** | /req/Core | |
| **Dependency** | OpenSearch-Geo [RD.3] | |
| **Test** | /req/Core/KVPGet | |
| **Requirements** | **/req/request/kvpget** |
| **Test purpose** | Verify that the server accepts search parameters as KVP |
| **Test method** | Execute an HTTP GET request to retrieve a server's description document. Verify that the OpenSearch template accepts URL parameters |
| **Test type** | Capability |

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/Core** | |
| **Requirements Class** | /req/Core | |
| **Dependency** | OpenSearch-Geo [RD.3] | |
| **Test** | /req/Core/Parameters | |
| **Requirements** | **/req/request/parameters** |
| **Test purpose** | Verify that the server accepts search parameters from the EO extension. |
| **Test method** | Execute an HTTP GET request to retrieve a server's description document. Verify that the OpenSearch template accepts template parameters from the EO extension |
| **Test type** | Capability |

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/Core** | |
| **Requirements Class** | /req/Core | |
| **Dependency** | OpenSearch-Geo [RD.3] | |
| **Test** | /req/Core/OSParameters | |
| **Requirements** | **req/request/osParameters** |
| **Test purpose** | Verify that the server accepts search parameters count, searchTerms (optional for “granule level” search) and (startIndex or startPage). |
| **Test method** | Execute an HTTP GET request to retrieve a server's description document. Verify that the OpenSearch template accepts those template parameters. Then execute another HTTP GET request using the URL template having instantiated those template parameters and check if the response is valid. |
| **Test type** | Capability |

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/Core** | |
| **Requirements Class** | /req/Core | |
| **Dependency** | OpenSearch-Geo [RD.3] | |
| **Test** | /req/Core/ResponseAtom | |
| **Requirements** | **/req/response/atom,**  **/req/response/ATOM/model,**  **/req/response/ATOM/feed,**  **/req/response/ATOM/entry,**  **/req/response/ATOM/entry/identifier** |
| **Test purpose** | Verify that the server response is a valid Atom document, that the atom:feed element implements the mandatory vocabulary items shown in Table 8, column “ATOM Element” (incl. values matching the types shown and with the multiplicity shown) and that every Atom Entry (contained in the Feed element) implements the mandatory vocabulary items shown in Table 9, column “ATOM Element” (incl. values matching the types shown and with the multiplicity shown) and including the identifier. |
| **Test method** | Execute search request and validate using XPath or similar. |
| **Test type** | Capability |

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/Core** | |
| **Requirements Class** | /req/Core | |
| **Dependency** | OpenSearch-Geo [RD.3] | |
| **Test** | /req/Core/OSParameters | |
| **Requirements** | **/req/request/multiWordsSearchTerms** |
| **Test purpose** | Verify that without additional support for the freeTextSupport conformance class the server interprets the notation of multiple keywords used in searchTerms parameter as follows:   * whitespace delimited words not enclosed in double quote “ “ represents logical AND   (e.g.) q=air temperature : air AND temperature   * whitespace delimited words enclosed in double quote “ “ represents phrasal search   (e.g.) q="air temperature" : “air temperature” in one  phrase |
| **Test method** | Execute two HTTP GET requests (using the URL-template) by instantiating the searchTerm parameters with multiple keywords in the two different ways. Then compare the result sets in a manner that it can be verified that the SearchTerm is interpreted correctly. |
| **Test type** | Capability |

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/Core** | |
| **Requirements Class** | /req/Core | |
| **Dependency** | OpenSearch-Geo [RD.3] | |
| **Test** | /req/Core/OSParameters | |
| **Requirements** | **/req/request/stringParameters** |
| **Test purpose** | Verify that the server interprets searches on parameters of type string (except those marked in table 6 as of type “substring search”) based on equality . |
| **Test method** | Execute HTTP GET requests (using the URL-template) by instantiating appropriate search parameters of type string with a keyword. Then check the response that it just includes metadata entries where the value of the search parameter is equal to the value of the corresponding parameter in the metadata. |
| **Test type** | Capability |

### Conformance Test Class: ParameterExtension

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/ParameterExtension** | |
| **Requirements Class** | /req/ParameterExtension | |
| **Dependency** | /conf/Core | |
| **Test** | req/ParameterExtension | |
| **Requirements** | **req/osdd/parameterExtension** |
| **Test purpose** | Verify that the server generates a valid OpenSearch description document supporting the Parameter Extension in which the “value” attribute is always be set to facilitate the client task (i.e. avoid parsing the <Url> templates). |
| **Test method** | Execute an HTTP GET request to retrieve a server's description document and verify using XPath or similar. |
| **Test type** | Capability |

### Conformance Test Class: CustomSearch

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/CustomSearch** | |
| **Requirements Class** | /req/CustomSearch | |
| **Dependency** | /conf/Core  /conf/ParameterExtension | |
| **Test** | req/customSearch | |
| **Requirements** | **/req/osdd/customSearch** |
| **Test purpose** | Verify that the server provides a valid OpenSearch description document supporting the Parameter Extension [RD.17] and which defines for a URL-template a parameter providing an Atom link referring to a custom search profile [RFC6906].  Then test if it allows to provide a request including a value for the parameter that aligns to the profile´s specification. |
| **Test method** | Execute an HTTP GET request to retrieve a server's description document and verify using XPath or similar. Subsequently execute an HTTP GET request instantiating a URL template that includes a parameter supporting the custom search and assign a value having a corresponding value included and test if the request succeeds. |
| **Test type** | Capability |

### Conformance Test Class: SetsAndRanges

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/SetsAndRanges** | |
| **Requirements Class** | /req/SetsAndRanges | |
| **Dependency** | /conf/Core  /conf/ParameterExtension | |
| **Test** | req/SetsAndRanges | |
| **Requirements** | **/req/osdd/setsAndRanges** |
| **Test purpose** | Verify that the server provides a valid OpenSearch description document supporting the Parameter Extension [RD.17] and which defines for a URL-template a parameter the support for the range and/or set notations providing one or both of the EO specific attributes eo:rangeAllowed and/or eo:setAllowed. In a subsequent request aligning to this parameter definition test if the server supports requesting by a range and/or a set. |
| **Test method** | Execute an HTTP GET request to retrieve a server's description document and verify using XPath or similar. Subsequently execute an HTTP GET request instantiating a URL template that includes a parameter supporting eo:rangeAllowed and/or eo:setAllowed and formulate a request having a range and/or a set included and test if the request succeeds. |
| **Test type** | Capability |

### Conformance Test Class: LinkTypeAttribute

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/LinkTypeAttribute** | |
| **Requirements Class** | /req/LinkTypeAttribute | |
| **Dependency** | /conf/Core | |
| **Test** | req/LinkTypeAttribute | |
| **Requirements** | **/req/response/ATOM/entry/linkTypeAttribute** |
| **Test purpose** | Verify that the server provides search responses where all Atom link elements include a media (MIME) for the artifact associated. |
| **Test method** | Execute a search request n HTTP GET request and verify the Atom links using XPath or similar. |
| **Test type** | Capability |

### Conformance Test Class: OSGeoTempParameters

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/OSGeoTempParameters** | |
| **Requirements Class** | /req/OSGeoTempParameters | |
| **Dependency** | /conf/Core | |
| **Test** | req/OSGeoTempParameters | |
| **Requirements** | **/req/request/osGeoTempParameters** |
| **Test purpose** | Verify that the server provides a valid OpenSearch description document supporting the Parameter Extension [RD.17] and in which each of the URL-templates for “collection” (if available) and for “granule” (if available) cover the search parameters geo:uid, geo:box, time:start and time:end. |
| **Test method** | Execute an HTTP GET request to retrieve a server's description document and verify using XPath or similar. |
| **Test type** | Capability |

### Conformance Test Class: OSGeoNameParameter

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/OSGeoNameParameter** | |
| **Requirements Class** | /req/OSGeoNameParameter | |
| **Dependency** | /conf/Core | |
| **Test** | req/OSGeoNameParameter | |
| **Requirements** | **/req/request/osGeoNameParameter** |
| **Test purpose** | Verify that the server provides a valid OpenSearch description document supporting the Parameter Extension [RD.17] and in which each of the URL-templates for “collection” (if available) and for “granule” (if available) cover the search parameter geo:name. |
| **Test method** | Execute an HTTP GET request to retrieve a server's description document and verify using XPath or similar. |
| **Test type** | Capability |

### Conformance Test Class: GeometryTypes

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/GeometryTypes** | |
| **Requirements Class** | /req/GeometryTypes | |
| **Dependency** | /conf/Core  /conf/ParameterExtension | |
| **Test** | req/GeometryTypes | |
| **Requirements** | **/req/osdd/supportedGeometryTypes** |
| **Test purpose** | Verify that a server providing a {geo:geometry} search parameter (within a URL template of its OpenSearch description document) advertises the supported geometry types within the parameter extension via Atom links referring to geometry type profiles (<atom:link rel="profile"). |
| **Test method** | Execute an HTTP GET request to retrieve a server's description document and verify using XPath or similar. |
| **Test type** | Capability |

### Conformance Test Class: Paging

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/Paging** | |
| **Requirements Class** | /req/Paging | |
| **Dependency** | /conf/Core | |
| **Test** | req/Paging | |
| **Requirements** | **/req/response/ATOM/entry/resultSetNavigation**  **/req/response/ATOM/feed/useOfStartIndexOverStartPage** |
| **Test purpose** | Verify that a server is providing navigation links for the first (rel="first"), previous (rel="prev" or "previous"), current (rel="self"), next (rel="next") and last pages (i.e. rel="last") of a result set (if applicable) using the rel attribute as defined in [OGC 10-032r8] and [RFC5988][[11]](#footnote-11).  Further check if in these links the parameter ‘startIndex’ is used. |
| **Test method** | Execute an HTTP GET search request and verify using XPath or similar. |
| **Test type** | Capability |

### Conformance Test Class: SpecReference

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/SpecReference** | |
| **Requirements Class** | /req/SpecReference | |
| **Dependency** | /conf/Core | |
| **Test** | req/SpecReference | |
| **Requirements** | **/req/response/ATOM/feed/specReference** |
| **Test purpose** | Verify that a server is providing specReferences to OpenSearch-EO and OWS Context in case it is atom:feed in case the feed is fully aligned with these two profiles (by checking conformity of feed and entries). |
| **Test method** | Execute an HTTP GET search request and verify using XPath or similar. |
| **Test type** | Capability |

### Conformance Test Class: SpatialExtent

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/SpatialExtent** | |
| **Requirements Class** | /req/SpatialExtent | |
| **Dependency** | /conf/Core | |
| **Test** | req/SpatialExtentFeed | |
| **Requirements** | **/req/response/ATOM/feed/extent** |
| **Test purpose** | Verify that a server is providing a “georss:box” element (a representation of “GeoRSS Simple”) (RD.16) for a feed in case the feed includes an envelope. |
| **Test method** | Execute an HTTP GET search request and verify using XPath or similar. |
| **Test type** | Capability |

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/SpatialExtent** | |
| **Requirements Class** | /req/SpatialExtent | |
| **Dependency** | /conf/Core | |
| **Test** | req/SpatialExtentEntry | |
| **Requirements** | **/req/response/ATOM/entry/extent**  **/req/response/ATOM/entry/GeoRSSMultiPolygonFootprint**  **/req/response/ATOM/entry/GeoRSSMultiPointFootprint**  **/req/response/ATOM/entry/GeoRSSMultiLineFootprint** |
| **Test purpose** | Verify that a server is providing a “GeoRSS Simple” (when applicable) over “GeoRSS GML” for an entry in case the feed includes an envelope.  When not applicable (e.g. footprint made of multiple polygons), “GeoRSS GML” (i.e. <georss:where>) [RD.16] must be available in one of the following flavours:   * For representing geographical extent consisting of multiple polygons a <gml:MultiSurface> element containing multiple <gml:Polygon> elements has to be present. * For representing geographical extent consisting of multiple points a <gml:MultiPoint> element containing multiple <gml:Point> elements has to be present. * For representing geographical extent consisting of multiple lines a <gml:MultiGeometry> element containing multiple <gml:LineString> elements has to be present. |
| **Test method** | Execute an HTTP GET search request and verify using XPath or similar. |
| **Test type** | Capability |

### Conformance Test Class: Data Access

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/DataAccess** | |
| **Requirements Class** | /req/DataAccess | |
| **Dependency** | /conf/Core | |
| **Test** | req/DataAccessDataLink | |
| **Requirements** | **/req/response/ATOM/entry/datalink** |
| **Test purpose** | Verify that a server is providing an atom:link with the “enclosure” relation attribute value (and having a MIME type attribute type=” application/binary”) for an entry when the entry is providing a link describing the data (link representing a data file or other science data resource; may be large in size) associated with the resource. |
| **Test method** | Execute an HTTP GET search request and verify using XPath or similar. |
| **Test type** | Capability |

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/DataAccess** | |
| **Requirements Class** | /req/DataAccess | |
| **Dependency** | /conf/Core | |
| **Test** | req/DataAccessOrdering | |
| **Requirements** | **/req/response/ATOM/entry/ordering** |
| **Test purpose** | Verify that a server is providing an atom:link with the “enclosure” relation attribute value (and having a MIME type attribute type=”text/html”) when the entry is providing a link describing the ordering (link representing an ordering client) mechanism associated with the resource. |
| **Test method** | Execute an HTTP GET search request and verify using XPath or similar. |
| **Test type** | Capability |

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/DataAccess** | |
| **Requirements Class** | /req/DataAccess | |
| **Dependency** | /conf/Core | |
| **Test** | req/DataAccessDocumentation | |
| **Requirements** | **/req/response/ATOM/entry/documentationLink** |
| **Test purpose** | Verify that a server is providing an atom:link with the “describedby” relation attribute value when describing a documentation (file with human-readable information about the resource) associated with a resource. |
| **Test method** | Execute an HTTP GET search request and verify using XPath or similar. |
| **Test type** | Capability |

### Conformance Test Class: TwoStepSearch

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/TwoStepSearch** | |
| **Requirements Class** | /req/TwoStepSearch | |
| **Dependency** | /conf/Core  /conf/LinkTypeAttribute | |
| **Test** | req/TwoStepSearch | |
| **Requirements** | **req/response/ATOM/entry/searchContextLink**  **req/osdd/relAttributeOfURL**  **req/response/ATOM/entry/parentIdentifier** |
| **Test purpose** | Verify that upon searching for collection metadata the server is providing an atom:link within the feed having a relation attribute value “search” and a type value ‘application/opensearchdescription+xml‘ which is pointing to an OpenSearch Description Document (OSDD) and that in this OSDD document there exists a URL-template with a rel attribute of the Url element having the value ”collection”.  Further verify that a collection entry (having id <ID>) in the result list is providing an atom:link with the relation attribute value “search” which is pointing to an OpenSearch Description Document (OSDD) and that in this OSDD document there exists a URL-template with a rel attribute of the Url element having either the value ”results” or where the rel attribute is missing. Then do a subsequent search based on the latter URL-template and check if in the resul list the entries do have a parentIdentifier element pointing to id <ID>. |
| **Test method** | Execute a sequence of HTTP GET request and verify using XPath or similar. |
| **Test type** | Capability |

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/TwoStepSearch** | |
| **Requirements Class** | /req/TwoStepSearch | |
| **Dependency** | /conf/Core  /conf/LinkTypeAttribute | |
| **Test** | req/TwoStepSearchQueryElement | |
| **Requirements** | **req/osdd/queryElement** |
| **Test purpose** | Verify that upon searching for collection metadata the server is providing an atom:link within the feed having a relation attribute value “search” and a type value ‘application/opensearchdescription+xml‘ which is pointing to an OpenSearch Description Document (OSDD) and that in this OSDD document there exists a Query-element with a role attribute having the value ”example” pointing to a request.  Then execute the request and check if the entries are of type “collection”. |
| **Test method** | Execute two HTTP GET request and verify using XPath or similar. |
| **Test type** | Capability |

### Conformance Test Class: MetadataLink

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/MetadataLink** | |
| **Requirements Class** | /req/MetadataLink | |
| **Dependency** | /conf/Core  /conf/LinkTypeAttribute | |
| **Test** | req/MetadataLink | |
| **Requirements** | **/req/response/ATOM/entry/metadataLink** |
| **Test purpose** | Verify that upon searching for collection or products metadata the server is providing an atom:link within the entries having a relation attribute value “via” (or “alternate”) which point to an alternative metadata representation. |
| **Test method** | Execute a HTTP GET search request and verify using XPath or similar. |
| **Test type** | Capability |

### Conformance Test Class: Inline Metadata

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/InlineMetadata** | |
| **Requirements Class** | /req/InlineMetadata | |
| **Dependency** | /conf/Core  /conf/ParameterExtension | |
| **Test** | req/InlineMetadata | |
| **Requirements** | **/req/response/ATOM/entry/inlineMetadata /req/osdd/inlineMetadataSchemas** |
| **Test purpose** | Check in the OSDD if the server is providing inline metadata by identifying a URL-template supporting the parameter sru:recordSchema. Then create a search request with the sru:recordSchema parameter (having assigned one of the supported metadata schemas) and check if the response entries include inline metadata. |
| **Test method** | Execute a sequence of HTTP GET requests (for getting the OSDD and for doing a search) and verify / select using XPath or similar. |
| **Test type** | Capability |

### Conformance Test Class: ImagesByLink

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/ImagesByLink** | |
| **Requirements Class** | /req/ImagesByLink | |
| **Dependency** | /conf/Core  /conf/ParameterExtension | |
| **Test** | req/ImagesByLink | |
| **Requirements** | **req/response/ATOM/entry/imagesByLink** |
| **Test purpose** | Create a search request and check if the server is providing entries having an atom:link with a relation attribute value “icon” pointing to an image. |
| **Test method** | Execute a HTTP GET requests and verify / select using XPath or similar. |
| **Test type** | Capability |

### Conformance Test Class: ImagesByMediaRSS

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/ImagesByMediaRSS** | |
| **Requirements Class** | /req/ImagesByMediaRSS | |
| **Dependency** | /conf/Core  /conf/LinkTypeAttribute | |
| **Test** | req/ImagesByMediaRSS | |
| **Requirements** | **req/response/ATOM/entry/imagesByMediaRSS** |
| **Test purpose** | Create a search request and check if the server is providing entries having a media:group element following the “Media RSS Specification” [RD.21] where each of the images is included as a separate media:content element. |
| **Test method** | Execute a HTTP GET requests and verify / select using XPath or similar. |
| **Test type** | Capability |

### Conformance Test Class: EntrySummary

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/ImagesByMediaRSS** | |
| **Requirements Class** | /req/EntrySummary | |
| **Dependency** | /conf/Core | |
| **Test** | req/EntrySummary | |
| **Requirements** | **req/response/ATOM/entry/atomSummary** |
| **Test purpose** | Create a search request and check if the server is providing entries having an atom:summary. If yes, check – in case mimeType is missing or is of type “text” - if the content is structured appropriately. |
| **Test method** | Execute a HTTP GET requests and verify / select using XPath or similar. |
| **Test type** | Capability |

### Conformance Test Class: EntrySummary

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/ImagesByMediaRSS** | |
| **Requirements Class** | /req/EntrySummary | |
| **Dependency** | /conf/Core | |
| **Test** | req/EntrySummary | |
| **Requirements** | **req/response/ATOM/entry/atomSummary** |
| **Test purpose** | Create a search request and check if the server is providing entries having an atom:summary. If yes, check – in case mimeType is missing or is of type “text” - if the content is structured appropriately. |
| **Test method** | Execute a HTTP GET requests and verify / select using XPath or similar. |
| **Test type** | Capability |

### Conformance Test Class: Offerings

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/Offerings** | |
| **Requirements Class** | /req/Offerings | |
| **Dependency** | /conf/Core | |
| **Test** | req/Offerings | |
| **Requirements** | **/req/response/ATOM/entry/offerings** |
| **Test purpose** | Create a search request and check if the server is providing entries having owc:offerings and if these offerings are correctly structured (implementing the properties defined in OGC 12-084r2, with the value matching the type shown, and with the obligations shown) and linking to OGC service endpoints. |
| **Test method** | Execute a HTTP GET requests and verify / select using XPath or similar. |
| **Test type** | Capability |

### Conformance Test Class: INSPIREParameters

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/INSPIREParameters** | |
| **Requirements Class** | /req/INSPIREParameters | |
| **Dependency** | /conf/Core | |
| **Test** | req/INSPIREParameters | |
| **Requirements** | **req/request/INSPIREParameters** |
| **Test purpose** | Verify that the server supports the INSPIRE relevant (mandatory) OpenSearch parameters (queryables are: useLimitation, accessConstraint, otherConstraint, classification, organisationName, organisationRole, topicCategory, lineage, keyword, denominator, distanceValue, distanceUOM, language, title, abstract, start, end, box, specificationTitle, specificationDate, specificationdateType, Degree).  Verify that the OpenSearch Description Document includes a URL Search Template providing all INSPIRE relevant search parameters. |
| **Test method** | Execute a HTTP GET request for the OSDD and verify / select using XPath or similar. |
| **Test type** | Capability |

### Conformance Test Class: Exceptions

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **/conf/INSPIREParameters** | |
| **Requirements Class** | /req/Exceptions | |
| **Dependency** | /conf/Core | |
| **Test** | req/Exceptions | |
| **Requirements** | **req/exceptions** |
| **Test purpose** | Verify that the server supports the defined codes which coincides with the error situation. |
| **Test method** | Execute HTTP GET forcing one of the erros and verify / select using XPath or similar. |
| **Test type** | Capability |

|  |  |
| --- | --- |
|  |  |

## Annex B: Presenting OGC Services using owc:Offerings (Informative)

**Introduction**

OpenSearch-EO implementations are recommended to present within the entries of a search response service access metadata that smart clients may exploit to automatically access services (like OGC View- or Download-Services). The service metadata shall include minimally access to general capabilities and a most representative call.

The owc:Offering type is fully defined in OGC 12-084r2 [RD.11]. It describes a service offering (the service access metadata, see above) (or inline content) for the entry and is intended to be consumed by clients able to process access to OGC services. In the context of the current specification, An owc:offering can be used to describe:

* Feature services: allowing feature access via OGC WFS service interfaces
* View services: allowing visualisation via OGC WMS or WMTS service interfaces
* Coverage Services: providing direct data access via OGC WCS interface
* Processing Services: providing access to OGC WPS processing services
* Download Services: providing a download facility via OGC EO download services
* Ordering Services: providing a download facility via OGC EO Ordering

**OGC WFS Service Interface**

When a WFS is available, entries may contain an owc:offering with code <http://www.opengis.net/spec/owc-atom/1.0/req/wfs> and the following owc:operation sub-elements

* One GetCapabilities request to the service
* One or more sample requests (minimally one GetFeature request) limited to the selected entry. The client will be able to submit specific calls, to any of the available WFS operations, reusing the featureID value provided by the sample.

Example 24: WFS offering

<owc:offering code="http://www.opengis.net/spec/owc-atom/1.0/req/wfs">

<owc:operation method="GET" code="GetCapabilities" type="application/xml" href="http://services.interactive-instruments.de/xsprojects/ows9-tds/services/ltds/wfs?SERVICE=WFS&VERSION=1.0.0&REQUEST=GetCapabilities"/>

<owc:operation method="GET" code="GetFeature" type="text/xml" href="http://services.interactive-instruments.de/xsprojects/ows9-tds/services/ltds/wfs?SERVICE=WFS&VERSION=1.1.0&REQUEST=GetFeature&NAMESPACES=xmlns(tds,http:%2F%2Fmetadata.dod.mil%2Fmdr%2Fns%2FGSIP%2F3.0%2Ftds%2F3.0)&OUTPUTFORMAT=text/xml;subtype=gml/3.2.1&BBOX=-90,-180,90,180&TYPENAME=tds:AerodromeBoundaryGeocurve&**featureID=V\_feature**"/>

</owc:offering>

**OGC WMS Service Interface**

When a WMS is available, collection and product entries may also contain a owc:offering with code <http://www.opengis.net/spec/owc-atom/1.0/req/wms> and the following owc:operation sub-elements:

* One GetCapabilities request to the service
* One or more samples of GetMap limited to the selected entry. The client will be able to submit specific calls, to any of the WMS available operations, reusing the *layers* value provided by the sample.

Example 25: WMS offering

<owc:offering code="http://www.opengis.net/spec/owc-atom/1.0/req/wms">

<owc:operation code="GetCapabilities" method="GET" type="application/xml" href="http://eumetview.eumetsat.int/geoserv/wms?REQUEST=GetCapabilities&version=1.3.0&service=WMS"/>

<owc:operation code="GetMap" method="GET" type="image/jpeg" href=" http://eumetview.eumetsat.int/geoserv/wms?SERVICE=WMS&REQUEST=GetMap&TRANSPARENT=TRUE&EXCEPTIONS=INIMAGE&VERSION=1.3.0&LAYERS=meteosat%3Amsg\_ir108%2Coverlay%3Ane\_10m\_coastline%2Coverlay%3Ane\_10m\_admin\_0\_boundary\_lines\_land&STYLES=raster%2C%2C&SRS=EPSG%3A4326&WIDTH=1161&HEIGHT=693&BBOX=-107.41500082612,-180,107.41500082612,180&FORMAT=image%2Fjpeg&TIME=2017-02-21T12%3A00%3A00.000Z&"/>

</owc:offering>

**OGC WMTS Service Interface**

When a WMTS is available, collection and product entries may also contain a owc:offering with code <http://www.opengis.net/spec/owc-atom/1.0/req/wmts> and the following owc:operation sub-elements:

* One GetCapabilities request to the service
* One or more samples of GetTile limited to the selected entry. The client will be able to submit specific calls, to any of the WMTS available operations, reusing the *layer* value provided by the sample.

Example 26: WMTS offering

<owc:offering code="http://www.opengis.net/spec/owc-atom/1.0/req/wmts">

<owc:operation code="GetCapabilities" method="GET" type="application/xml" href="http://www.opengis.uab.es/cgi-bin/ICCTiled/MiraMon.cgi?REQUEST=GetCapabilities&SERVICE=WMTS"/>

<owc:operation code="ServiceMetadata" method="GET" type="application/xml" href=" http://www.opengis.uab.es/cgi-bin/ICCTiled/MiraMon.cgi?REQUEST=GetTile&SERVICE=WMTS&version=1.0.0&format=image/jpeg&layer=Topo250k\_Vers5\_ICC&TileMatrixSet=Cat\_topo250k\_v5\_EPSG23031&TileMatrix=200m&TileRow=1&TileCol=0"/>

<owc:operation code="GetTile" method="GET" type="image/jpeg" href=" http://www.opengis.uab.es/cgi-bin/ICCTiled/MiraMon.cgi?REQUEST=GetTile&SERVICE=WMTS&version=1.0.0&format=image/jpeg&layer=Topo250k\_Vers5\_ICC&TileMatrixSet=Cat\_topo250k\_v5\_EPSG23031&TileMatrix=200m&TileRow=1&TileCol=0"/>

<owc:operation code="Tile" method="GET" type="image/jpeg" href="http://www.opengis.uab.es/SITiled/ICC/Topo250k\_Vers5\_ICC/default/Cat\_topo250k\_v5\_EPSG23031/200m/1/0.jpg"/>

</owc:offering>

**OGC WCS Service Interface**

When a WCS is available, collection and product entries may also contain a owc:offering with code <http://www.opengis.net/spec/owc-atom/1.0/req/wcs> and the following owc:operation sub-elements:

* One GetCapabilities request to the service
* One or more samples of GetCoverage limited to the selected entry permitting access to the coverage. The client will be able to submit specific calls, to any of the WCS available operations, reusing the *coverageID* value provided by the sample.

Example 27: WCS offering

<owc:offering code=" http://www.opengis.net/spec/owc-atom/1.0/req/wcs">

<owc:operation code="GetCapabilities" method="GET" type="application/xml" href="http://fedeo.esa.int/geoserver/wcs?REQUEST=GetCapabilities&version=2.0.1&service=WC"/>

<owc:operation code="GetCoverage" method="GET" type="application/x-binary" href=" http://fedeo.esa.int/geoserver/wcs?service=wcs&amp;version=2.0.1&amp;request=getcoverage&amp;coverageid=ASA\_IMM\_1PNIPA20080308\_183226\_000001722066\_00371\_31487\_2902"/>

</owc:offering>

**OGC WPS Service Interface**

When a WPS is available, collection and product entries may also contain a owc:offering with code http://www.opengis.net/spec/owc-atom/1.0/req/wps and the following owc:operation sub-elements:

* One GetCapabilities request to the service
* One or more sample requests (e.g. for DescribeProcess) limited to the selected entry. The client will be able to submit specific calls, to any of the WPS available operations.

Example 28: WPS offering (snippet)

<owc:offering code="http://www.opengis.net/spec/owc-atom/1.0/req/wps">

<owc:operation method="GET" code="GetCapabilities" type="text/xml" href="http://tep.esa.int/wps/processing?REQUEST=GetCapabilities&SERVICE=WPS"/>

<owc:operation method="POST" code="DescribeProcess" type="application/xml" href="http://tep.esa.int/wps/processing">

<owc:request type="application/xml">

<wps:DescribeProcess xmlns:ows="http://www.opengis.net/ows/2.0" xmlns:wps="http://www.opengis.net/wps/2.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" service="WPS" version="2.0.0">

<ows:Identifier>LandCoverMapping</ows:Identifier>

</wps:DescribeProcess>

</owc:request>

<owc:result type="application/xml">

<wps:ProcessOfferings xmlns:wps="http://www.opengis.net/wps/2.0" xmlns:ows="http://www.opengis.net/ows/2.0" xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xs="http://www.w3.org/2001/XMLSchema">

<wps:ProcessOffering jobControlOptions="async-execute dismiss" outputTransmission="value reference">

<wps:Process>

<ows:Title>Land Cover Mapping</ows:Title>

<ows:Abstract>Land Cover Mapping is based on the Sentinel-2 processing workflow generated for the F-TEP platform.</ows:Abstract>

<ows:Identifier>LandCoverMapping</ows:Identifier>

<wps:Input>

<ows:Title>Sentinel-2 Image</ows:Title>

<ows:Abstract>URL of Sentinel-2 Level 1C image product in the format offered by AWS or IPT, with a size of up to multiple gigabytes.</ows:Abstract>

<ows:Identifier>Image</ows:Identifier>

<wps:LiteralData>

<wps:Format mimeType="text/xml" default="true"/>

<LiteralDataDomain default="true">

<ows:AnyValue/>

<ows:DataType ows:reference="xs:string">string</ows:DataType>

</LiteralDataDomain>

</wps:LiteralData>

</wps:Input>

<wps:Input>

<ows:Title>Reference Data</ows:Title>

<ows:Abstract>Representative training data set with land cover class attributes, in OGR vector format supported by GDAL, such as ESRI shapefile, in a flat zip structure containing .shp and the supporting files.</ows:Abstract>

<ows:Identifier>ReferenceData</ows:Identifier>

<wps:ComplexData>

<wps:Format mimeType="application/zip" encoding="base64" default="true"/>

</wps:ComplexData>

</wps:Input>

<wps:Output>

<ows:Title>GeoTIF Image</ows:Title>

<ows:Abstract>Labeled GeoTIFF file, containing for each pixel one of the class codes specified in the training reference data.</ows:Abstract>

<ows:Identifier>Image</ows:Identifier>

<wps:ComplexData>

<wps:Format mimeType="image/tiff" encoding="base64" default="true"/>

</wps:ComplexData>

</wps:Output>

</wps:Process>

</wps:ProcessOffering>

</wps:ProcessOfferings>

</owc:result>

</owc:operation>

…

</owc:offering>

**OGC Download Service Interface**

When a Download Service interface is available (e.g. OGC DSEO (13-043)), entries may also contain an owc:offering with code http://www.opengis.net/spec/owc-atom/1.0/req/dseo and the following owc:operation sub-elements:

* One GetCapabilities request to the service
* One or more sample requests (e.g. for GetProduct) limited to the selected entry. The client will be able to submit specific calls, to any of the DSEO available operations.

Example 29: DSEO offering

<owc:offering code="http://www.opengis.net/spec/owc-atom/1.0/req/dseo">

<owc:operation code="GetCapabilities" method="GET" type="application/xml" href="http://rs211980.rs.hosteurope.de/eo-download/servlet/download?service=DSEO&amp;version=1.0.0&amp;request=GetCapabilities"/>

<owc:operation code="GetProduct" method="GET" type="application/binary" href="http://rs211980.rs.hosteurope.de/eo-download/servlet/download?service=DSEO&amp;version=1.0.0&amp;request=GetProduct&amp;ProductURI=urn:ogc:def:EOP:EUM:acronym:MSGCSKR:fileid:EO:EUM:DAT:MSG:CSR:20160804004500MSG3MSGCSKR02EF0OPE:EO"/>

</owc:offering>

**OGC Ordering Service Interface**

When an Ordering Service interface is available (e.g., OGC ROSEO (13-042)), response entries may also contain an owc:offering with code http://www.opengis.net/spec/owc-atom/1.0/req/roseo and the following owc:operation sub-elements:

* One GetCapabilities request to the service
* One or more sample requests (e.g. for Order) limited to the selected entry. The client will be able to submit specific calls, to any of the ROSEO available operations

Example 30: ROSEO offering (snippet)

<owc:offering code="http://www.opengis.net/spec/owc-atom/1.0/req/roseo">

<owc:operation code="GetCapabilities" method="GET" type="application/xml" href="http://tep.esa.int/roseo/order?service=ROSEO&amp;version=1.0.0&amp;request=GetCapabilities"/>

<owc:operation method="POST" code="Order" type="application/xml" href="http://tep.esa.int/roseo/order">

<owc:request type="application/xml">

<roseo:Order xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://www.opengis.net/oseo/1.0" xmlns:roseo="http://www.opengis.net/roseo/1.0" xmlns:sps="http://www.opengis.net/sps/2.0" xmlns:swe="http://www.opengis.net/swe/2.0" xmlns:gml="http://www.opengis.net/gml" xsi:schemaLocation="http://www.opengis.net/roseo/1.0 ../roseo.xsd">

<orderReference>example\_0001</orderReference>

<orderRemark>example</orderRemark>

<option>

<ParameterData>

<encoding>XMLEncoding</encoding>

<values xmlns:ns="http://www.opengis.net/oseo/1.0/dataset">

<ns:ProcessingLevel>GRD</ns:ProcessingLevel>

<ns:Resolution>MR</ns:Resolution>

<ns:Swath>CROSS\_POL</ns:Swath>

<ns:Format>SAFE</ns:Format>

</values>

</ParameterData>

</option>

<deliveryOptions>

<onlineDataAccess>

<protocol>https</protocol>

</onlineDataAccess>

</deliveryOptions>

<orderType>PRODUCT\_ORDER</orderType>

<roseo:orderItem>

<itemId>item\_0001</itemId>

<productOrderOptionsId>S1\_SAR\_IW\_DUAL\_POL GRD</productOrderOptionsId>

<orderItemRemark>First product</orderItemRemark>

<payment>

<paymentMethod>quota</paymentMethod>

<orderAccount>project\_10000</orderAccount>

</payment>

<productId>

<identifier>http://www.opengis.net/def/EOP/ESA/0/ESA.EECF.S1-14121921114570-

3322.XI</identifier>

<collectionId>http://www.opengis.net/def/EOP/ESA/0/ESA.EECF.S1\_SAR\_IW\_DUAL\_POL</collectionId>

</productId>

</roseo:orderItem>

</roseo:Order>

</owc:request>

</owc:operation>

…

</owc:offering>

## Annex C: XML Schema Documents

**Atom Schema (schemas/atom/2005/rfc4287.rnc)[[12]](#footnote-12)**

# -\*- rnc -\*-

# RELAX NG Compact Syntax Grammar for the

# Atom Format Specification

# Taken from http://tools.ietf.org/html/rfc4287#page-35

# Defined a new constructor for Atom Feed and Entry

namespace atom = "http://www.w3.org/2005/Atom"

namespace xhtml = "http://www.w3.org/1999/xhtml"

namespace s = "http://purl.oclc.org/dsdl/schematron"

namespace local = ""

start = atomFeed | atomEntry

# Common attributes

atomCommonAttributes = attribute xml:base { atomUri }?,

attribute xml:lang { atomLanguageTag }?, undefinedAttribute\*

# Text Constructs

atomPlainTextConstruct = atomCommonAttributes,

attribute type { "text" | "html" }?, text

atomXHTMLTextConstruct = atomCommonAttributes, attribute type { "xhtml" }, xhtmlDiv

atomTextConstruct = atomPlainTextConstruct | atomXHTMLTextConstruct

# Person Construct

atomPersonConstruct = atomCommonAttributes,

(element atom:name { text } & element atom:uri { atomUri }?

& element atom:email { atomEmailAddress }? & extensionElement\*)

# Date Construct

atomDateConstruct = atomCommonAttributes, xsd:dateTime

# atom:feed

atomFeed = [

s:pattern [ name="check authors"

s:rule [ context = "atom:feed"

s:assert [test = "atom:author or not(atom:entry[not(atom:author)])"

"An atom:feed must have an atom:author unless all "

~ "of its atom:entry children have an atom:author."]]]]

element atom:feed { atomFeedConstruct }

atomFeedConstruct =

atomCommonAttributes, (atomAuthor\* & atomCategory\* & atomContributor\*

& atomGenerator? & atomIcon? & atomId & atomLink\* & atomLogo? & atomRights? &

atomSubtitle? & atomTitle & atomUpdated & extensionElement\*), atomEntry\*

# atom:entry

atomEntry = [

s:pattern [ name="check entry's alternate link"

s:rule [ context = "atom:entry" s:assert [

test = "atom:link[@rel='alternate'] "

~ "or atom:link[not(@rel)] or atom:content"

"An atom:entry must have at least one atom:link element "

~ "with a rel attribute of 'alternate' or an atom:content."

]]]

s:pattern [ name="check entry's author"

s:rule [ context = "atom:entry" s:assert [

test = "atom:author or ../atom:author or atom:source/atom:author"

"An atom:entry must have an atom:author if its feed does not."

]]]]

element atom:entry { atomEntryConstruct }

atomEntryConstruct =

atomCommonAttributes,

(atomAuthor\* & atomCategory\* & atomContent? & atomContributor\*

& atomId & atomLink\* & atomPublished? & atomRights? & atomSource?

& atomSummary? & atomTitle & atomUpdated & extensionElement\*)

# atom:content

atomInlineTextContent = element atom:content { atomCommonAttributes,

attribute type { "text" | "html" }?, (text)\* }

atomInlineXHTMLContent = element atom:content { atomCommonAttributes,

attribute type { "xhtml" }, xhtmlDiv }

atomInlineOtherContent = element atom:content { atomCommonAttributes,

attribute type { atomMediaType }?, (text|anyElement)\*}

atomOutOfLineContent = element atom:content { atomCommonAttributes,

attribute type { atomMediaType }?, attribute src { atomUri }, empty }

atomContent = atomInlineTextContent | atomInlineXHTMLContent

| atomInlineOtherContent | atomOutOfLineContent

atomAuthor = element atom:author { atomPersonConstruct }

atomCategory =

element atom:category { atomCommonAttributes, attribute term { text },

attribute scheme { atomUri }?, attribute label { text }?,

undefinedContent }

atomContributor = element atom:contributor { atomPersonConstruct }

atomGenerator = element atom:generator { atomCommonAttributes,

attribute uri { atomUri }?, attribute version { text }?, text }

atomIcon = element atom:icon { atomCommonAttributes, (atomUri) }

atomId = element atom:id { atomCommonAttributes, (atomUri) }

atomLogo = element atom:logo { atomCommonAttributes, (atomUri)}

atomLink =

element atom:link { atomCommonAttributes, attribute href { atomUri },

attribute rel { atomNCName | atomUri }?, attribute type { atomMediaType }?,

attribute hreflang { atomLanguageTag }?, attribute title { text }?,

attribute length { text }?, undefinedContent }

atomPublished = element atom:published { atomDateConstruct }

atomRights = element atom:rights { atomTextConstruct }

atomSource = element atom:source {

atomCommonAttributes, (atomAuthor\* & atomCategory\* & atomContributor\* &

atomGenerator? & atomIcon? & atomId? & atomLink\* & atomLogo? & atomRights?

& atomSubtitle? & atomTitle? & atomUpdated? & extensionElement\*)}

atomSubtitle = element atom:subtitle { atomTextConstruct }

atomSummary = element atom:summary { atomTextConstruct }

atomTitle = element atom:title { atomTextConstruct }

atomUpdated = element atom:updated { atomDateConstruct }

# Low-level simple types

atomNCName = xsd:string { minLength = "1" pattern = "[^:]\*" }

# Whatever a media type is, it contains at least one slash

atomMediaType = xsd:string { pattern = ".+/.+" }

# As defined in RFC 5646

atomLanguageTag = xsd:string { pattern = "[A-Za-z]{1,8}(-[A-Za-z0-9]{1,8})\*"}

# Unconstrained; it's not entirely clear how IRI fit into

# xsd:anyURI so let's not try to constrain it here

atomUri = text

# Whatever an email address is, it contains at least one @

atomEmailAddress = xsd:string { pattern = ".+@.+" }

# Simple Extension

simpleExtensionElement = element \* - atom:\* { text }

# Structured Extension

structuredExtensionElement = element \* - atom:\* {

(attribute \* { text }+, (text|anyElement)\*)

| (attribute \* { text }\*, (text?, anyElement+, (text|anyElement)\*))}

# Other Extensibility

extensionElement = simpleExtensionElement | structuredExtensionElement

undefinedAttribute = attribute \* - (xml:base | xml:lang | local:\*) { text }

undefinedContent = (text|anyForeignElement)\*

anyElement = element \* { (attribute \* { text } | text | anyElement)\* }

anyForeignElement = element \* - atom:\* { (attribute \* { text } | text | anyElement)\* }

# XHTML

anyXHTML = element xhtml:\* { (attribute \* { text } | text | anyXHTML)\* }

xhtmlDiv = element xhtml:div { (attribute \* { text } | text | anyXHTML)\* }

# EOF

**OpenSearch Atom Schema (schemas/opensearch/1.1/osatom.rnc)**

# -\*- rnc -\*-

# RELAX NG Compact Syntax Grammar for

# Atom encoding and foreign elements for OpenSearch

namespace s = "http://purl.oclc.org/dsdl/schematron"

namespace atom = "http://www.w3.org/2005/Atom"

namespace os = "http://a9.com/-/spec/opensearch/1.1/"

# Redefine atom:feed to include new OpenSearch elements

atomFeedConstruct &= osQuery ? & osTotalResults? &osStartIndex? &osItemsPerPage?

osQuery = element os:Query { undefinedAttribute\*, ( osQueryAttr ) }

osTotalResults = element os:totalResults { xsd:int }

osStartIndex = element os:startIndex { xsd:int }

osItemsPerPage = element os:itemsPerPage { xsd:int }

include "osquery.rnc"

# Replacing definitions on RFC4287

# relative path schemas/atom folder

include "../../atom/2005/rfc4287.rnc"{

# Redefine the Simple Extension to exclude os:\* elements

simpleExtensionElement = element \* - (atom:\* | os:\*) { text }

# Redefine the Structured Extension to exclude os:\* elements

structuredExtensionElement = element \* -

(atom:\* | os:\* ) { (attribute \* { text }+,(text|anyElement)\*)

| (attribute \* { text }\*, (text?, anyElement+, (text|anyElement)\*))}

# Redefine Atom rules

atomFeed = [

s:rule [ context = "atom:feed"

s:assert [ test = "atom:author or not(atom:entry[not(atom:author)])"

"An atom:feed must have an atom:author unless all "

~ "of its atom:entry children have an atom:author."]]

]

element atom:feed { atomFeedConstruct }

atomEntry =[

s:pattern [ name="check entry content"

s:rule [ context = "atom:entry"

s:assert [ test = "atom:content"

"An atom:entry must have one atom:content MUST have content "

~ "element in a format understandable by generic Atom readers"

~ " ( @type equal to 'html' is recommended)"]]]

]

element atom:entry { atomEntryConstruct }

}

# EOF

**OpenSearch Description Document Schema (schemas/opensearch/1.1/osdd.rnc)**

# -\*- rnc -\*-

# RELAX NG Compact Syntax Grammar for

# OpenSearch Description Document

namespace os = "http://a9.com/-/spec/opensearch/1.1/"

namespace s = "http://purl.oclc.org/dsdl/schematron"

namespace local = ""

start = osDocument

osDocument = element os:OpenSearchDescription { osDocumentConstruct }

osDocumentConstruct =

element os:ShortName { xsd:string { maxLength = "16" } }

& element os:Description { xsd:string { maxLength = "1024" } }

& element os:Url { osdUrlAttr } \*

& element os:Contact { xsd:string {pattern=".+@.+"}}?

& element os:Tags { text }? & element os:LongName { xsd:string {maxLength="48"}}?

& element os:Image { osdImage } \*

& element os:Query { undefinedAttribute\*, ( osQueryAttr ) }\*

& element os:Developer { xsd:string { maxLength = "64" } }?

& element os:Attribution { xsd:string { maxLength = "256" } }?

& element os:SyndicationRight { osdSyndicationRightValues } ?

& element os:AdultContent { "false" | "true" } ?

& element os:Language {xsd:string { pattern="[A-Za-z]{1,8}(-[A-Za-z0-9]{1,8})\*"}}?

& element os:InputEncoding { text } ? & element os:OutputEncoding { text } ?

& undefinedAttribute\*

& extensionElement\*

osdUrlAttr = attribute template { text }, attribute type { text },

attribute rel { osdRelationValues }?, attribute indexOffset { xsd:int }?,

attribute pageOffset { xsd:int }?, undefinedAttribute\*, extensionElement\*

osdImage = attribute height {xsd:int}, attribute width {xsd:int},

attribute type {xsd:string}, text

include "osquery.rnc"

osdRelationValues = "results" | "suggestions" | "self" | "collection"

osdSyndicationRightValues = "open" | "limited" | "private" | "closed"

# Simple Extension

simpleExtensionElement = element \* - os:\* { text }

# Structured Extension

structuredExtensionElement = element \* - os:\* {

(attribute \* { text }+, (text|anyElement)\*)

| (attribute \* { text }\*, (text?, anyElement+, (text|anyElement)\*))}

# Other Extensibility

extensionElement = simpleExtensionElement | structuredExtensionElement

undefinedAttribute = attribute \* - (local:\* ) { text }

undefinedContent = (text|anyForeignElement)\*

anyElement = element \* { (attribute \* { text } | text | anyElement)\* }

anyForeignElement = element \* - os:\* { (attribute \* { text } | text | anyElement)\* }

# EOF

**OpenSearch Query Element Schema (schemas/opensearch/1.1/osquery.rnc)**

# -\*- rnc -\*-

# RELAX NG Compact Syntax Grammar for

# OpenSearch Query element

namespace os = "http://a9.com/-/spec/opensearch/1.1/"

namespace s = "http://purl.oclc.org/dsdl/schematron"

namespace local = ""

osQueryAttr = attribute role { osQueryRoleValues },

attribute title { xsd:string { maxLength="256"}}?, attribute searchTerms { text }?,

attribute totalResults { xsd:int }?, attribute count { text }?,

attribute startIndex { text }?, attribute startPage { text }?,

attribute inputEncoding { text }?, attribute outputEncoding { text }?,

attribute language { text }?

osQueryRoleValues = "request" | "example" | "related" | "correction" | "subset" | "superset"

# EOF

**GeoRSS Schema (schemas/georss/1.1/georss.rnc)**

# -\*- rnc -\*-

# RELAX NG Compact Syntax Grammar for the GEORSS

# This defines the conformance to the rules of GEORSS

namespace georss="http://www.georss.org/georss"

namespace gml="http://www.opengis.net/gml"

namespace local = ""

georssElement = ( georssSimple | georssWhere)

georssWhere = element georss:where { gmlAttribute\*, gmlElement }

georssSimple = georssPoint | georssLine | georssPolygon | georssBox | georssCircle

| georssFeatureTypeTag | georssFeatureName | georssElev | georssFloor

georssPoint = element georss:point { list { xsd:decimal, xsd:decimal } }

georssLine = element georss:line { list { (xsd:decimal, xsd:decimal)+ } }

georssPolygon = element georss:polygon { list { (xsd:decimal, xsd:decimal)+ } }

georssBox = element georss:box {

list { (xsd:decimal, xsd:decimal, xsd:decimal, xsd:decimal) } }

georssCircle = element georss:circle {

list { (xsd:decimal, xsd:decimal, xsd:decimal) } }

georssFeatureTypeTag = element georss:featureTypeTag { text }

georssRelationshipTag = element georss:relationshipTag { text }

georssFeatureName = element georss:featureName { text }

georssElev = element georss:elev {xsd:decimal}

georssFloor = element georss:floor {xsd:decimal}

georssRadius = element georss:radius {xsd:decimal}

gmlAttribute = attribute (xml:base | xml:lang | local:\* | gml:\* ) { text }

gmlElement = (gmlPointElement | gmlLineStringElement |

gmlPolygonElement | gmlEnvelopeElement )

gmlPointElement =

element gml:Point { gmlAttribute\*,

element gml:pos { gmlAttribute\*, list { xsd:decimal, xsd:decimal }}}

gmlLineStringElement = element gml:LineString { gmlAttribute\*,

element gml:posList {gmlAttribute\*, list { (xsd:decimal, xsd:decimal)+ }}}

gmlPolygonElement = element gml:Polygon { gmlAttribute\*,

element gml:exterior { gmlAttribute\*,

element gml:LinearRing { gmlAttribute\*,

element gml:posList { gmlAttribute\*,

list { (xsd:decimal, xsd:decimal)+ }}}}}

gmlEnvelopeElement = element gml:Envelope { gmlAttribute\*,

( element gml:lowerCorner { gmlAttribute\*,

list { xsd:decimal, xsd:decimal } }

& element gml:upperCorner { gmlAttribute\*,

list { xsd:decimal, xsd:decimal } }) }

# EOF

**Earth Observation Extension Description Document Schema**

**(schemas/opensearch/extensions/eo/1.0/osddeo.rnc)**

# -\*- rnc -\*-

# RELAX NG Compact Syntax Grammar for OpenSearch Description Documents

# as defined in OGC 13-026

namespace s = "http://purl.oclc.org/dsdl/schematron"

namespace local = ""

namespace os = "http://a9.com/-/spec/opensearch/1.1/"

namespace time = "http://a9.com/-/opensearch/extensions/time/1.0/"

namespace geo = "http://a9.com/-/opensearch/extensions/geo/1.0/"

namespace eo = "http://a9.com/-/opensearch/extensions/eo/1.0/"

include "eo.rnc"

# Redefine the foreign attribute to exclude eo:\* elements

# relative path schemas/opensearch/1.1/ folder

include "../../../1.1/osdd.rnc"{

undefinedAttribute = attribute \* - (local:\* | eo:\* ) { text }

osDocument = [

s:pattern [ name="check Atom template"

s:rule [ context = "os:OpenSearchDescription"

s:assert [ test = "os:Url[@type='application/atom+xml']"

"An OpenSearch Description Document must have a Url template with "

~ " type of Atom document." ]]]]

element os:OpenSearchDescription { osDocumentConstruct }

}

#EOF

**Earth Observation Extension Query Element Schema (schemas/opensearch/extensions/eo/1.0/eo.rnc)**

# -\*- rnc -\*-

# RELAX NG Compact Syntax Grammar

# OpenSearch Query Element as defined in OGC 13-026 for the eo extension

namespace eo = "http://a9.com/-/opensearch/extensions/eo/1.0/"

# from Table 3

osQueryAttr &=

attribute eo:productType { text }?

& attribute eo:doi { text }?

& attribute eo:platform { text }?

& attribute eo:platformSerialIdentifier { text }?

& attribute eo:instrument { text }?

& attribute eo:sensorType { text }?

& attribute eo:compositeType { text }?

& attribute eo:processingLevel { text }?

& attribute eo:orbitType { text }?

& attribute eo:spectralRange { text }?

& attribute eo:wavelength {intValueOrSetOrRange }?

& attribute eo:hasSecurityConstraints { text }?

& attribute eo:dissemination { text }?

& attribute sru:recordSchema { text }?

# from Table 4

osQueryAttr &=

attribute eo:title { text }?

& attribute eo:topicCategory { text }?

& attribute eo:keyword { text }?

& attribute eo:abstract { text }?

& attribute eo:denominator { intValueOrSetOrRange }?

& attribute eo:distanceValue { floatValueOrSetOrRange }?

& attribute eo:distanceUOM { text }?

& attribute eo:organisationName { text }?

& attribute eo:organisationRole { text }?

& attribute eo:publicationDate { dateValueOrSetOrRange }?

& attribute eo:lineage { text }?

& attribute eo:useLimitation { text }?

& attribute eo:accessConstraint { text }?

& attribute eo:otherConstraint { text }?

& attribute eo:classification { text }?

& attribute eo:language { text }?

& attribute eo:specificationTitle { text }?

& attribute eo:specificationDate { dateValueOrSetOrRange }?

& attribute eo:specificationdateType { text }?

& attribute eo:degree { text }?

# from Table 5

osQueryAttr &=

attribute eo:parentIdentifier { text }?

& attribute eo:productionStatus { text }?

& attribute eo:acquisitionType { text }?

& attribute eo:orbitNumber { intValueOrSetOrRange }?

& attribute eo:orbitDirection { orbitDirection }?

*& attribute eo:track { text }?*

*& attribute eo:frame { text }?*

& attribute eo:wrsLongitudeGrid { text }?

& attribute eo:wrsLatitudeGrid { text }?

& attribute eo:swathIdentifier { text }?

& attribute eo:cloudCover { intValueOrSetOrRange }?

& attribute eo:snowCover { intValueOrSetOrRange }?

& attribute eo:lowestLocation { floatValueOrSetOrRange }?

& attribute eo:highestLocation { floatValueOrSetOrRange }?

& attribute eo:locationUnit { text }?

& attribute eo:productVersion { text }?

& attribute eo:productQualityStatus { text }?

& attribute eo:productQualityDegradationTag { text }?

& attribute eo:processorName { text }?

& attribute eo:processingCenter { text }?

& attribute eo:creationDate { dateValueOrSetOrRange }?

& attribute eo:modificationDate { dateValueOrSetOrRange }?

& attribute eo:processingDate { dateValueOrSetOrRange }?

& attribute eo:sensorMode { text }?

& attribute eo:archivingCenter { text }?

& attribute eo:processingMode { text }?

# from Table 6

osQueryAttr &=

attribute eo:availabilityTime

& attribute eo:acquisitionStation { text }?

& attribute eo:acquisitionSubType { text }?

& attribute eo:startTimeFromAscendingNode { intValueOrSetOrRange }?

& attribute eo:completionTimeFromAscendingNode { intValueOrSetOrRange }?

& attribute eo:illuminationAzimuthAngle { floatValueOrSetOrRange }?

& attribute eo:illuminationZenithAngle { floatValueOrSetOrRange }?

& attribute eo:illuminationElevationAngle { floatValueOrSetOrRange }?

& attribute eo:polarisationMode { polarisationMode }?

& attribute eo:polarisationChannels { text }?

& attribute eo:antennaLookDirection { antennaLookDirection }?

& attribute eo:minimumIncidenceAngle { floatValueOrSetOrRange }?

& attribute eo:maximumIncidenceAngle { floatValueOrSetOrRange }?

& attribute eo:dopplerFrequency { floatValueOrSetOrRange }?

& attribute eo:incidenceAngleVariation { floatValueOrSetOrRange }?

polarisationMode = "S" | "D" | "T" | "Q" | "UNDEFINED"

antennaLookDirection = "LEFT" | "RIGHT"

orbitDirection = "DESCENDING" | "ASCENDING"

# Ranges value|\{value(,value)\*\}|[\]\[\(\)]value,value[\]\[\(\)]

intValueOrSetOrRange = xsd:string { pattern ="[\+\-]?[\d]\*|\{[\+\-]?[\d]\*(,[\d]\*)\*\}|[\]\[\(\)]?[\+\-]?[\d]\*,[\+\-]?[\d]\*[\]\[\(\)]?" }

floatValueOrSetOrRange = xsd:string { pattern ="[\+\-]?[\d]\*(.[\d]+)?|\{[\+\-]?[\d]\*(.[\d]+)?(,[\+\-]?[\d]\*(.[\d]+)?)\*\}|[\]\[\(\)]?[\+\-]?[\d]\*(.[\d]+)?,[\+\-]?[\d]\*(.[\d]+)?[\]\[\(\)]?" }

dateValueOrSetOrRange = xsd:string { pattern="[0-9]{4}-[0-9]{2}-[0-9]{2}(T[0-9]{2}:[0-9]{2}:[0-9]{2}(\.[0-9]+)?(Z|[\+\-][0-9]{2}:[0-9]{2}))?|\{[0-9]{4}-[0-9]{2}-[0-9]{2}(T[0-9]{2}:[0-9]{2}:[0-9]{2}(\.[0-9]+)?(Z|[\+\-][0-9]{2}:[0-9]{2}))?(,[0-9]{4}-[0-9]{2}-[0-9]{2}(T[0-9]{2}:[0-9]{2}:[0-9]{2}(\.[0-9]+)?(Z|[\+\-][0-9]{2}:[0-9]{2}))?)\*\}|[\]\[\(\)][0-9]{4}-[0-9]{2}-[0-9]{2}(T[0-9]{2}:[0-9]{2}:[0-9]{2}(\.[0-9]+)?(Z|[\+\-][0-9]{2}:[0-9]{2}))?,[0-9]{4}-[0-9]{2}-[0-9]{2}(T[0-9]{2}:[0-9]{2}:[0-9]{2}(\.[0-9]+)?(Z|[\+\-][0-9]{2}:[0-9]{2}))?[\]\[\(\)]"}

**Earth Observation Extension Atom Response Schema (schemas/opensearch/extenstions/eo/1.0/atomeo.rnc)**

# -\*- rnc -\*-

# RELAX NG Compact Syntax Grammar for Atom encoding and foreign elements

# as defined in OGC 13-026 for the eo extension

namespace s = "http://purl.oclc.org/dsdl/schematron"

namespace atom = "http://www.w3.org/2005/Atom"

namespace os = "http://a9.com/-/spec/opensearch/1.1/"

namespace eo = "http://a9.com/-/opensearch/extensions/eo/1.0/"

namespace eop = "http://www.opengis.net/eop/2.1"

namespace opt = "http://www.opengis.net/opt/2.1"

namespace sar = "http://www.opengis.net/sar/2.1"

namespace atm = "http://www.opengis.net/atm/2.1"

namespace alt = "http://www.opengis.net/alt/2.1"

namespace lmb = "http://www.opengis.net/lmb/2.1"

namespace ssp = "http://www.opengis.net/ssp/2.1"

namespace local = ""

# Redefine atom:entry to include the EO elements defined in OGC 10-157r4

atomEntryConstruct &= eopElements ?

eopElements = eopElement | optElement | sarElement | atmElement | altElement

| lmgElement | sspElement

eopElement = element eop:EarthObservation { anyChildren }

optElement = element opt:EarthObservation { anyChildren }

sarElement = element sar:EarthObservation { anyChildren }

atmElement = element atm:EarthObservation { anyChildren }

altElement = element alt:EarthObservation { anyChildren }

lmgElement = element lmb:EarthObservation { anyChildren }

sspElement = element ssp:EarthObservation { anyChildren }

anyChildren = undefinedAttribute\*, extensionElement\*

include "eo.rnc"

# Replacing definitions on RFC4287 plus OpenSearch

# relative path schemas/opensearch/1.1/ folder

include "../../../1.1/osatom.rnc"{

undefinedAttribute = attribute \* - (xml:base | xml:lang | local:\* | eo:\* ) { text }

# Redefine the Simple Extension to exclude owc:\* elements

simpleExtensionElement = element \* -

(atom:\* | os:\* | eop:EarthObservation| opt:EarthObservation |

sar:EarthObservation | atm:EarthObservation | alt:EarthObservation |

lmb:EarthObservation | ssp:EarthObservation) { text }

# Redefine the Structured Extension to exclude owc:\* elements

structuredExtensionElement = element \* -

(atom:\* | eop:EarthObservation | opt:EarthObservation | sar:EarthObservation |

atm:EarthObservation | alt:EarthObservation | lmb:EarthObservation |

ssp:EarthObservation | os:\* ) {

(attribute \* { text }+,(text|anyElement)\*)

| (attribute \* { text }\*, (text?, anyElement+, (text|anyElement)\*))}

# Redefine Atom rules

atomFeed = element atom:feed { atomFeedConstruct }

atomEntry =element atom:entry { atomEntryConstruct }

}

# EOF

**Parameter Extension Query Element Schema (schemas/opensearch/extensions/parameter/1.0/parameter.rnc)**

# -\*- rnc -\*-

# RELAX NG Compact Syntax Grammar for

# OpenSearch Description Parameter Extension

namespace s = "http://purl.oclc.org/dsdl/schematron"

namespace local = ""

namespace os = "http://a9.com/-/spec/opensearch/1.1/"

namespace param = "http://a9.com/-/opensearch/extensions/param/1.0/"

parameterConstruct = attribute name { xsd:token }?,

attribute value { xsd:token }?,

attribute minimum { xsd:unsignedInt }?,

attribute maximum { xsd:unsignedInt }?,

attribute pattern { text }?,

attribute title { xsd:string { maxLength = "1024" } }?,

attribute minExclusive { xsd:decimal | xsd:dateTime }?,

attribute maxExclusive { xsd:decimal | xsd:dateTime }?,

attribute minInclusive { xsd:decimal | xsd:dateTime }?,

attribute maxInclusive { xsd:decimal | xsd:dateTime }?,

attribute step { xsd:decimal }?,

undefinedAttribute\*,

element param:Option { paramOption }\*

paramMethod = "OPTIONS" | "GET" | "HEAD" | "POST" | "PUT" | "DELETE" | "TRACE" | "CONNECT"

paramOption = attribute value { xsd:string },

attribute label { xsd:string }, undefinedAttribute\*

paramUrl = attribute param:method { paramMethod }?

& attribute param:enctype { xsd:string { pattern = ".+/.+" } }?

& element param:Parameter { parameterConstruct } \*

#extend the Url definition here

osdUrl &= paramUrl

# Redefine the foreign attribute to exclude param:\* elements

# relative path schemas/opensearch/1.1/ folder

include "../../../1.1/osdd.rnc"{

# Simple Extension

simpleExtensionElement = element \* - ( os:\* | param:\* ){ text }

# Structured Extension

structuredExtensionElement = element \* - ( os:\* | param:\* ) {

(attribute \* { text }+, (text|anyElement)\*)

| (attribute \* { text }\*, (text?, anyElement+, (text|anyElement)\*))}

# Other Extensibility

undefinedAttribute = attribute \* - ( local:\* | param:\* ) { text }

anyForeignElement = element \* - ( os:\* | param:\* ) { (attribute \* { text } | text | anyElement)\* }

osDocument = [ s:rule [ context = "os:OpenSearchDescription"

s:assert [ test = "os:Url/param:Parameter"

"This URL template does not contain a Parameter element." ]]]

element os:OpenSearchDescription { osDocumentConstruct }

}

# EOF

## Annex D (informative): Example XML Documents

**OpenSearch Description with Earth Observation Extension**

<?xml version="1.0" encoding="UTF-8"?>

<OpenSearchDescription xmlns="http://a9.com/-/spec/opensearch/1.1/" xmlns:geo="http://a9.com/-/opensearch/extensions/geo/1.0/" xmlns:time="http://a9.com/-/opensearch/extensions/time/1.0/" xmlns:eop="http://a9.com/-/opensearch/extensions/eo/1.0/" xmlns:param="http://a9.com/-/spec/opensearch/extensions/parameters/1.0/" xmlns:sru="http://a9.com/-/opensearch/extensions/sru/2.0/">

<ShortName>ProductNavigator</ShortName>

<Description>The EUMETSAT Product Navigator is the central data discovery service for all EUMETSAT data and products, including third-party products disseminated via EUMETCast.</Description>

<Url type="application/atom+xml" rel="collection" pageOffset="1" template="http://rs211980.rs.hosteurope.de/eo-pn-adapter/servlet/os?q={searchTerms}&amp;pw={startPage?}&amp;sI={startIndex?}&amp;c={count?}&amp;bbox={geo:box?}&amp;gname={geo:name?}&amp;dtstart={time:start?}&amp;dtend={time:end?}&amp;pp={eop:organisationName?}&amp;dis={eop:dissemination?}&amp;ins={eop:instrument?}&amp;sat={eop:platformShortName?}&amp;uL={eop:useLimitation?}&amp;mod={eop: modificationDate}&amp;rec={sru:recordSchema}&amp;id={geo:id?}&amp;format=atom">

<param:Parameter name="q" value="{searchTerms}">

<atom:link rel="profile" href="info:srw/cql-context-set/1/cql-v2.0#masked" title="This parameter supports wild cards"/>

</param:Parameter>

<param:Parameter name="dtstart" value="{time:start}" minimum="0" minInclusive="1970-01-01T00:00:00Z" maxExclusive="2030-01-01T00:00:00Z"/>

<param:Parameter name="dtend" value="{time:end}" minimum="0" minInclusive="1970-01-01T00:00:00Z" maxExclusive="2030-01-01T00:00:00Z"/>

<param:Parameter name="mod" value="{eop:modificationDate}" minimum="0" minInclusive="1970-01-01T00:00:00Z" maxExclusive="2030-01-01T00:00:00Z" pattern="[0-9]{4}-[0-9]{2}-[0-9]{2}T[0-9]{2}:[0-9]{2}:[0-9]{2}(\.[0-9]+)?)(Z|([\+\-][0-9]{2}:[0-9]{2}))" eop:rangeAllowed="false" eop:setAllowed="false"/>

<param:Parameter name="pp" value="{eop:organisationName}" minimum="0" title="Name of DataProvider (Organisation)">

<param:Option value="BDMS" label="BDMS"/>

<param:Option value="CIMSS" label="CIMSS"/>

<param:Option value="ESA" label="ESA"/>

<param:Option value="CNES" label="CNES"/>

<param:Option value="EUMETSAT" label="EUMETSAT"/>

<!--intentionally cutted off -->

</param:Parameter>

<param:Parameter name="rec" value="{sru:recordSchema}" minimum="0" title="Metadata model in which inline metadata should be provided">

<param:Option value="http://www.isotc211.org/2005/gmd" label="ISO19115 (ISO19139)"/>

<param:Option value="http://www.isotc211.org/2005/gmi" label="ISO19115-2 (ISO19139-2, EUMETSAT extended)"/>

</param:Parameter>

<param:Parameter name="dis" value="{eop:dissemination}" minimum="0" title="Dissemination Type">

<param:Option value="CMACast" label="CMACast"/>

<param:Option value="Direct Dissemination" label="Direct Dissemination"/>

<param:Option value="EUMETCast" label="EUMETCast"/>

<!--intentionally cutted off -->

</param:Parameter>

<param:Parameter name="sat" value="{eop:platformShortName}" minimum="0" title="Satellite">

<param:Option value="Aqua" label="Aqua"/>

<param:Option value="CBERS" label="CBERS"/>

<param:Option value="DMSP" label="DMSP"/>

<!--intentionally cutted off -->

</param:Parameter>

<param:Parameter name="ins" value="{eop:instrument}" minimum="0" title="Instrument">

<param:Option value="A-DCS" label="A-DCS"/>

<param:Option value="AMSU-A" label="AMSU-A"/>

<param:Option value="AMSU-B" label="AMSU-B"/>

<!--intentionally cutted off -->

</param:Parameter>

<param:Parameter name="cat" value="{eum:category}" minimum="0" title="Category">

<param:Option value="Aerosol" label="Aerosol"/>

<param:Option value="Analysis" label="Analysis"/>

<param:Option value="Atmosphere" label="Atmosphere"/>

<!--intentionally cutted off -->

</param:Parameter>

</Url>

<Url type="application/vnd.google-earth.kml+xml" rel="collection" pageOffset="1" template="http://rs211980.rs.hosteurope.de/eo-pn-adapter/servlet/os?q={searchTerms}&amp;pw={startPage?}&amp;c={count?}&amp;bbox={geo:box?}&amp;dtstart={time:start?}&amp;dtend={time:end?}&amp;pp={eop:organisationName?}&amp;dis={eop:dissemination?}&amp;ins={eop:instrument?}&amp;sat={eop:platformShortName?}&amp;uL={eop:useLimitation?}&amp;mod={eop: modificationDate}&amp;rec={sru:recordSchema}&amp;id={geo:id?}&amp;format=kml"/>

<!--Param definitions intentionally not repeated here -->

<Url type="application/rss+xml" rel="collection" pageOffset="1" template="http://rs211980.rs.hosteurope.de/eo-pn-adapter/servlet/os?q={searchTerms}&amp;pw={startPage?}&amp;c={count?}&amp;bbox={geo:box?}&amp;dtstart={time:start?}&amp;dtend={time:end?}&amp;pp={eop:organisationName?}&amp;dis={eop:dissemination?}&amp;ins={eop:instrument?}&amp;sat={eop:platformShortName?}&amp;uL={eop:useLimitation?}&amp;mod={eop: modificationDate}&amp;rec={sru:recordSchema}&amp;id={geo:id?}&amp;format=rss"/>

<!--Param definitions intentionally not repeated here -->

<Contact>u.einspanier@conterra.de</Contact>

<Tags>EUMETSAT meteorology satellite weather climate terraCatalog CSW catalogue service</Tags>

<LongName>EUMETSAT Product Navigator</LongName>

<Image height="75" width="155" type="image/png">terraCatalog\_feed.png</Image>

<Query role="example" searchTerms="water" startIndex="1" count="10"/>

<Developer>conterra SDI (EO) Development Team</Developer>

<SyndicationRight>open</SyndicationRight>

<AdultContent>false</AdultContent>

<Language>\*</Language>

<InputEncoding>UTF-8</InputEncoding>

<OutputEncoding>UTF-8</OutputEncoding>

</OpenSearchDescription>

**Atom Response for Collection Metadata**

<?xml version="1.0" encoding="UTF-8"?>

<feed xml:lang="en" xmlns="http://www.w3.org/2005/Atom" xmlns:georss="http://www.georss.org/georss" xmlns:gmi="http://www.isotc211.org/2005/gmi" xmlns:gml="http://www.opengis.net/gml" xmlns:dc="http://purl.org/dc/elements/1.1/" xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:media="http://search.yahoo.com/mrss/" xmlns:opensearch="http://a9.com/-/spec/opensearch/1.1/" xmlns:geo="http://a9.com/-/opensearch/extensions/geo/1.0/" xmlns:time="http://a9.com/-/opensearch/extensions/time/1.0/" xmlns:eop="http://a9.com/-/opensearch/extensions/eo/1.0/">

<title>EUMETSAT Product Navigator COLOS Adaptor results feed</title>

<subtitle type="html">Number of results: 213</subtitle>

<id>http://rs211980.rs.hosteurope.de/eo-pn-adapter/servlet/os/atom</id>

<generator uri="http://rs211980.rs.hosteurope.de/eo-pn-adapter/servlet/os" version="3.0">EUMETSAT Product Navigator</generator>

<author>

<name>EUMETSAT</name>

</author>

<category>climatologyMeteorologyAtmosphere</category>

<contributor>con terra GmbH</contributor>

<updated>2017-08-04T15:45:00Z</updated>

<link rel="profile" href="http://www.opengis.net/spec/opensearcheo/1.0/req/core" title="This file is compliant with version 1.0 of OGC OpenSearch-EO"/>

<link rel="profile" href="http://www.opengis.net/spec/owc-atom/1.0/req/core" title="This file is compliant with version 1.0 of OGC OWS context Atom 1.0"/>

<link rel="up" href="http://rs211980.rs.hosteurope.de/eo-pn-adapter/os-description.xml" type="application/opensearchdescription+xml" title="Product Navigator search"/>

<link rel="self" href="http://rs211980.rs.hosteurope.de/eo-pn-adapter/servlet/os?format=atom&amp;q=water&amp;c=1" type="application/atom+xml" title="self"/>

<link rel="next" href="http://rs211980.rs.hosteurope.de/eo-pn-adapter/servlet/os?format=atom&amp;q=water&amp;c=1&amp;sI=2" type="application/atom+xml" title="next"/>

<link rel="first" href="http://rs211980.rs.hosteurope.de/eo-pn-adapter/servlet/os?format=atom&amp;q=water&amp;c=1&amp;sI=1" type="application/atom+xml" title="first"/>

<link rel="last" href="http://rs211980.rs.hosteurope.de/eo-pn-adapter/servlet/os?format=atom&amp;q=water&amp;c=1&amp;sI=213" type="application/atom+xml" title="last"/>

<link rel="describedBy" href="http://navigator.eumetsat.int/" type="text/html" title="describedBy"/>

<link rel="search" href="http://rs211980.rs.hosteurope.de/eo-pn-adapter/os-description.xml" type="application/opensearchdescription+xml" title="Product Navigator search"/>

<georss:box>-90.0 -180.0 90.0 180.0</georss:box>

<rights>Copyright</rights>

<opensearch:Query role="request" searchTerms="water" count="1"/>

<opensearch:totalResults>213</opensearch:totalResults>

<opensearch:startIndex>1</opensearch:startIndex>

<opensearch:itemsPerPage>1</opensearch:itemsPerPage>

<icon>http://rs211980.rs.hosteurope.de/eo-pn-adapter/favicon\_speeddial-160.png</icon>

<logo>http://rs211980.rs.hosteurope.de/eo-pn-adapter/logo.png</logo>

<entry xml:lang="en">

<dc:type>http://purl.org/dc/dcmitype/Collection</dc:type>

<title>Global Low Resolution Sea Ice Drift - Multimission</title>

<author>

<name>OSI SAF</name>

<electronicMailAddress xmlns="http://www.isotc211.org/2005/gmd" xmlns:date="http://exslt.org/dates-and-times" xmlns:fn="http://www.w3.org/TR/xpath-functions" xmlns:gco="http://www.isotc211.org/2005/gco" xmlns:gmd="http://www.isotc211.org/2005/gmd" xmlns:str="http://exslt.org/strings" xmlns:xdt="http://www.w3.org/2005/02/xpath-datatypes" xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:csw="http://www.opengis.net/cat/csw/2.0.2" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

<email xmlns="http://www.w3.org/2005/Atom">osi-saf.manager@meteo.fr</email>

</electronicMailAddress>

</author>

<category term="climatologyMeteorologyAtmosphere"/>

<category term="Sea\_Ice"/>

<category term="Ocean"/>

<content type="html"><![CDATA[<a href="http://www.osi-saf.org">OSI SAF Archive and FTP (SAF Archive & FTP)</a>

<br/>

<a href="https://eoportal.eumetsat.int">EUMETCast Registration (EUMETCast-Africa,EUMETCast-Europe,EUMETCast-Satellite)</a>

<br/>

<a href="http://www.eumetsat.int/website/home/Data/DataDelivery/EUMETCast/index.html">EUMETCast Information (EUMETCast-Africa,EUMETCast-Europe,EUMETCast-Satellite)</a>

<br/>

<a href="http://www.eumetsat.int/website/home/Data/DataDelivery/EUMETCast/ReceptionStationSetup/index.html">Reception Station Set-up (EUMETCast-Africa,EUMETCast-Europe,EUMETCast-Satellite)</a>

<br/>

<a href="http://eoportal.eumetsat.int/userMgmt/protected/dataCentre.faces?acronym=OSIDRGB">Order this product (EUMETSAT Data Centre)</a>

<br/>

<a href="http://www.eumetsat.int/website/home/Data/DataDelivery/EUMETSATDataCentre/index.html">Data Centre Information (EUMETSAT Data Centre)</a>

<br/>

<a href="http://rs211980.rs.hosteurope.de/discovery/Start/DirectSearch/DetailResult.do?f(r0)=EO:EUM:DAT:MULT:GBL-LR-SIDR">Metadata (HTML)</a>

<br/>

<a href="http://rs211980.rs.hosteurope.de/elastic-csw/service?service=CSW&version=2.0.2&request=GetRecordById&outputSchema=http://www.isotc211.org/2005/gmi&Id=EO:EUM:DAT:MULT:GBL-LR-SIDR">Metadata (ISO19139 XML)</a>

<br/>

<a href="http://rs211980.rs.hosteurope.de/eo-pn-adapter/servlet/os?format=atom&id=EO:EUM:DAT:MULT:GBL-LR-SIDR">ATOM</a>

<br/>

<img src="http://navigator.eumetsat.int:80/smartEditor/preview/osi\_lr\_sid.jpg" border="0" alt="Overview" />

<br/>]]></content>

<summary>Low Resolution Sea Ice Drift product covers both Northern Hemisphere (NH) and Southern Hemisphere (SH), all year round. Ice motion vectors with a time span of 48 hours are estimated by an advanced cross-correlation method (the Continuous MCC, CMCC) from pairs of passive and active microwave satellite images. Several single-sensor products are available, as well as a merged (multi-sensor) product. Maps of uncertainties are embedded in the product files. Due to higher atmospheric wetness and sea ice surface melting, it is more challenging to track ice motion during summer. Accordingly, the NH product files distributed between 1 May and 30 September have larger uncertainties and more interpolated vectors. The same holds for the SH product files between 1 November and 30 March.</summary>

<updated>2016-08-04T15:45:00Z</updated>

<dc:date>2010-04-08T00:00:00Z</dc:date>

<id>urn:ogc:def:EOP:EUM:acronym:OSIDRGB:fileid:EO:EUM:DAT:MULT:GBL-LR-SIDR</id>

<dc:identifier>EO:EUM:DAT:MULT:GBL-LR-SIDR</dc:identifier>

<link rel="alternate" title="ISO 19139 Metadata" type="application/vnd.iso.19139-2+xml" href="http://rs211980.rs.hosteurope.de/eo-pn-adapter/servlet/rest/EO:EUM:DAT:MULT:GBL-LR-SIDR"/>

<link rel="via" title="ISO 19139 Metadata" type="application/xml" href="http://rs211980.rs.hosteurope.de/elastic-csw/service?service=CSW&amp;version=2.0.2&amp;request=GetRecordById&amp;outputSchema=http://www.isotc211.org/2005/gmi&amp;elementSetName=full&amp;Id=EO:EUM:DAT:MULT:GBL-LR-SIDR"/>

<link rel="alternate" type="text/html" title="Global Low Resolution Sea Ice Drift - Multimission" href="http://rs211980.rs.hosteurope.de/discovery/Start/DirectSearch/DetailResult.do?f(r0)=EO:EUM:DAT:MULT:GBL-LR-SIDR"/>

<link rel="search" href="http://eoportal.eumetsat.int/os-description" type="application/opensearchdescription+xml" title="EOP search"/>

<link rel="enclosure" type="text/html" title="OSI SAF Archive and FTP (SAF Archive &amp; FTP)" href="http://www.osi-saf.org"/>

<link rel="enclosure" type="text/html" title="EUMETCast Information (EUMETCast-Africa,EUMETCast-Europe,EUMETCast-Satellite)" href="http://www.eumetsat.int/website/home/Data/DataDelivery/EUMETCast/index.html"/>

<link rel="enclosure" type="text/html" title="Order this product (EUMETSAT Data Centre)" href="http://eoportal.eumetsat.int/userMgmt/protected/dataCentre.faces?acronym=OSIDRGB"/>

<rights>copyright</rights>

<georss:box>-90.0 -180.0 90.0 180.0</georss:box>

<media:group>

<media:content url="http://navigator.eumetsat.int:80/smartEditor/preview/osi\_lr\_sid.jpg" type="image/jpeg" medium="image">

<media:category scheme="http://www.opengis.net/spec/EOMPOM/1.0">QUICKLOOK</media:category>

</media:content>

</media:group>

</entry>

</feed>

**Atom Response for Earth Observation Metadata**

<?xml version="1.0" encoding="UTF-8"?>

<atom:feed xml:lang="en" xmlns:media="http://search.yahoo.com/mrss/" xmlns:time="http://a9.com/-/opensearch/extensions/time/1.0/" xmlns:geo="http://a9.com/-/opensearch/extensions/geo/1.0/" xmlns:eop="http://a9.com/-/opensearch/extensions/eo/1.0/" xmlns:eum="http://a9.com/-/opensearch/extensions/eumetsat/1.0/" xmlns:atom="http://www.w3.org/2005/Atom" xmlns:opensearch="http://a9.com/-/spec/opensearch/1.1/" xmlns:georss="http://www.georss.org/georss" xmlns:kml="http://earth.google.com/kml/2.2" xmlns:gml="http://www.opengis.net/gml" xmlns:dc="http://purl.org/dc/elements/1.1/">

<atom:title>EO Portal Clearinghouse EOPOS/CWIC Adapter results feed</atom:title>

<atom:subtitle type="html">Found 12 results.&lt;br/></atom:subtitle>

<atom:id>http://eoportal.eumetsat.int/eopos?</atom:id>

<atom:generator uri="http://eoportal.eumetsat.int" version="1.0">EUMETSAT Clearinghouse</atom:generator>

<atom:author>

<atom:name>EUMETSAT</atom:name>

</atom:author>

<atom:category>climatologyMeteorologyAtmosphere</atom:category>

<atom:contributor>con terra GmbH</atom:contributor>

<atom:rights>Copyright</atom:rights>

<atom:updated>2017-11-23T14:43:23</atom:updated>

<atom:link rel="profile" href="http://www.opengis.net/spec/opensearcheo/1.0/req/core" title="This file is compliant with version 1.0 of OGC OpenSearch-EO"/>

<atom:link rel="profile" href="http://www.opengis.net/spec/owc-atom/1.0/req/core" title="This file is compliant with version 1.0 of OGC OWS context Atom 1.0"/>

<atom:link rel="up" href="http://navigator.eumetsat.int/soapServices/os-description.xml" type="application/opensearchdescription+xml" title="Product Navigator search"/>

<atom:link rel="self" href="http://eoportal.eumetsat.int/eopos?dtstart=2017-09-04T00:00:00Z&amp;pI=urn:ogc:def:EOP:EUM:acronym:OSICOGB:fileid:EO:EUM:DAT:DMSP:GBLSIC&amp;dtend=2017-09-06T15:00:00Z&amp;c=1" type="application/atom+xml" title="self"/>

<atom:link rel="next" href="http://eoportal.eumetsat.int/eopos?dtstart=2017-09-04T00:00:00Z&amp;pI=urn:ogc:def:EOP:EUM:acronym:OSICOGB:fileid:EO:EUM:DAT:DMSP:GBLSIC&amp;dtend=2017-09-06T15:00:00Z&amp;c=1&amp;si=2" type="application/atom+xml" title="next"/>

<atom:link rel="first" href="http://eoportal.eumetsat.int/eopos?dtstart=2017-09-04T00:00:00Z&amp;pI=urn:ogc:def:EOP:EUM:acronym:OSICOGB:fileid:EO:EUM:DAT:DMSP:GBLSIC&amp;dtend=2017-09-06T15:00:00Z&amp;c=1&amp;pw=1" type="application/atom+xml" title="first"/>

<atom:link rel="last" type="application/atom+xml" title="last" href="http://eoportal.eumetsat.int/eopos?dtstart=2017-09-04T00:00:00Z&amp;pI=urn:ogc:def:EOP:EUM:acronym:OSICOGB:fileid:EO:EUM:DAT:DMSP:GBLSIC&amp;dtend=2017-09-06T15:00:00Z&amp;c=1&amp;pw=12"/>

<atom:link rel="search" href="http://eoportal.eumetsat.int/os-description" type="application/opensearchdescription+xml" title="EOPOS/CWIC search"/>

<atom:link rel="describedBy" href="http://archive.eumetsat.int/usc" type="text/html" title="User Services Client"/>

<atom:link rel="enclosure" type="text/html" title="order results with User Services Client" href="http://archive.eumetsat.int/usc/#sf:;plc=sf,sd,co;id=EO:EUM:DAT:DMSP:GBLSIC;ssbt=;ssst="/>

<georss:box>-90.0 -180.0 90.0 180.0</georss:box>

<opensearch:totalResults>12</opensearch:totalResults>

<opensearch:startIndex>1</opensearch:startIndex>

<opensearch:itemsPerPage>1</opensearch:itemsPerPage>

<opensearch:Query role="request" count="1" time:start="2017-09-04T00:00:00Z" time:end="2017-09-06T15:00:00Z"/>

<atom:entry>

<dc:type>http://purl.org/dc/dcmitype/Dataset</dc:type>

<atom:title>urn:ogc:def:EOP:EUM:acronym:OSICOGB:fileid:EO:EUM:DAT:DMSP:GBLSIC:20170904120000MMLOSICOGB449C1OPE</atom:title>

<atom:author>EUMETSAT Data Centre</atom:author>

<atom:category>climatologyMeteorologyAtmosphere</atom:category>

<atom:updated>2017-09-04T12:00:00Z</atom:updated>

<dc:date>2017-09-04T12:00:00Z</dc:date>

<atom:id>urn:ogc:def:EOP:EUM:acronym:OSICOGB:fileid:EO:EUM:DAT:DMSP:GBLSIC:20170904120000MMLOSICOGB449C1OPE</atom:id>

<dc:identifier>urn:ogc:def:EOP:EUM:acronym:OSICOGB:fileid:EO:EUM:DAT:DMSP:GBLSIC:20170904120000MMLOSICOGB449C1OPE</dc:identifier>

<atom:rights>Copyright</atom:rights>

<georss:box>-90.0 -180.0 90.0 180.0</georss:box>

<media:group>

<media:content url="http://archive.eumetsat.int/umarf-gwt/thu/MML/201709/OSICOGB3.05.0.1\_04120000\_843\_OPE-01.png" medium="image" type="image/png">

<media:category scheme="http://www.opengis.net/spec/EOMPOM/1.0">THUMBNAIL</media:category>

</media:content>

<media:content url="http://archive.eumetsat.int/umarf-gwt/brw/MML/201709/OSICOGB3.05.0.1\_04120000\_843\_OPE-01.png" medium="image" type="image/png">

<media:category scheme="http://www.opengis.net/spec/EOMPOM/1.0">QUICKLOOK</media:category>

</media:content>

</media:group>

<atom:link rel="icon" href="http://archive.eumetsat.int/umarf-gwt/thu/MML/201709/OSICOGB3.05.0.1\_04120000\_843\_OPE-01.png" type="image/png"/>

<atom:link rel="via" title="Metadata (OGC CSW ebRIM EP EO GetReposioryItem Response)" type="application/gml+xml" href="http://eoportal.eumetsat.int/cswHTTP/ProductDiscovery?service=CSW-ebRIM&amp;request=GetRepositoryItem&amp;Id=urn:ogc:def:EOP:EUM:acronym:OSICOGB:fileid:EO:EUM:DAT:DMSP:GBLSIC:20170904120000MMLOSICOGB449C1OPE:EO"/>

<atom:link rel="alternate" title="Metadata (OGC O&amp;M EOP Format)" type="application/gml+xml;profile=http://www.opengis.net/spec/EOMPOM/1.1" href="http://eoportal.eumetsat.int/cswHTTP/ProductDiscovery?service=CSW-ebRIM&amp;request=GetRepositoryItem&amp;Id=urn:ogc:def:EOP:EUM:acronym:OSICOGB:fileid:EO:EUM:DAT:DMSP:GBLSIC:20170904120000MMLOSICOGB449C1OPE:EO&amp;omitWrapper=true"/>

<atom:link rel="up" type="application/xml" title="Reference to dataset" href="http://navigator.eumetsat.int/soapServices/OpenSearch?format=atom&amp;id=EO:EUM:DAT:DMSP:GBLSIC"/>

<atom:link rel="enclosure" type="text/html" title="Order with User Services Client" href="http://archive.eumetsat.int/usc/#sf:;plc=sf,sd,co;id=EO:EUM:DAT:DMSP:GBLSIC;satellite=MML;ssbt=2017-09-04T00:00;ssst=2017-09-04T23:05"/>

<atom:link rel="enclosure" type="text/html" title="Download with EO Download Service" href="http://eoportal.eumetsat.int/eo-download?service=DSEO&amp;version=1.0.0&amp;request=GetProduct&amp;ProductURI=urn:ogc:def:EOP:EUM:acronym:OSICOGB:fileid:EO:EUM:DAT:DMSP:GBLSIC:20170904120000MMLOSICOGB449C1OPE"/>

<atom:content type="html"><![CDATA[<ul> <li> <b>Date</b>: 2017-09-04 <br/>

(2017-09-04T00:00:00Z / 2017-09-04T23:05:00Z)

</li><li> <b>Processing Center</b>: DataCentre </li><li> <b>

<a href="http://eoportal.eumetsat.int/cswHTTP/ProductDiscovery?service=CSW-ebRIM&request=GetRepositoryItem&Id=urn:ogc:def:EOP:EUM:acronym:OSICOGB:fileid:EO:EUM:DAT:DMSP:GBLSIC:20170904120000MMLOSICOGB449C1OPE:EO">

<img src="http://archive.eumetsat.int/umarf-gwt/thu/MML/201709/OSICOGB3.05.0.1\_04120000\_843\_OPE-01.png" border="0" alt="More Detailed Metadata..."></a><br/><a href="http://eoportal.eumetsat.int/userMgmt">EO Portal Registration</a>]]></atom:content>

</atom:entry>

</atom:feed>

## Annex E (informative): OpenSearch Parameter Metadata Mappings

This Annex defines mappings associating the OpenSearch parameters defined in Tables 5-7 for Collection and Product Searches with the corresponding metadata elements (names) used for them in each of the standards/formats listed.

**Mapping OpenSearch parameters to EO Metadata profile of O&M**

In the table below mappings of the OpenSearch parameters for the **Product Search** to “*Earth Observation Metadata profile of Observations & Measurements*” (OGC 10-157r4) are defined.

The table also includes the **mappings of the spatial and temporal** parameters defined in the OpenSearch Geo- and Time-Extension to the appropriate XPath in OGC 10-157r4.

| **OpenSearch Parameter** | **EOP (OGC 10-157r4) Metadata XPath** |
| --- | --- |
| geo:box | to be derived from: /eopr:EarthObservation/om:featureOfInterest/eop:Footprint |
| geo:name | N/A |
| geo:uid | /eop:EarthObservation/eop:metaDataProperty/eop:EarthObservationMetaData/eop:identifier |
| time:end | /eop:EarthObservation/om:phenomenonTime/gml:TimePeriod/gml:endPosition |
| time:start | /eop:EarthObservation/om:phenomenonTime/gml:TimePeriod/gml:beginPosition |
| os:searchTerms | N/A |
| acquisitionType | /eop:metaDataProperty/eop:EarthObservationMetaData/eop:acquisitionType |
| compositeType | /eop:metaDataProperty/eop:EarthObservationMetaData/eop:processing/eop:ProcessingInformation/eop:compositeType |
| creationDate | /eop:metaDataProperty/eop:EarthObservationMetaData/eop:creationDate |
| doi | /eop:EarthObservation/eop:metaDataProperty/eop:EarthObservationMetaData/eop:doi |
| dissemination | N/A |
| wrsLatitudeGrid */ frame (deprecated)* | */om:procedure/eop:EarthObservationEquipment/ eop:acquisitionParameters/eop:Acquisition/eop:wrsLatitudeGrid* |
| hasSecurityConstraints | N/A |
| instrument | /om:procedure/eop:EarthObservationEquipment/eop:instrument/eop:Instrument/eop:shortName |
| modificationDate | /eop:metaDataProperty/eop:EarthObservationMetaData/eop:modificationDate |
| orbitDirection | /om:procedure/eop:EarthObservationEquipment/eop:acquisitionParameters/eop:Acquisition/eop:orbitDirection |
| lastOrbitDirection | N/A in 10-157r4(just defined in 17-003) |
| orbitNumber | /om:procedure/eop:EarthObservationEquipment/eop:acquisitionParameters/eop:Acquisition/eop:orbitNumber |
| relativeOrbitNumber | /eop:vendorSpecific/eop:SpecificInformation/eop:localValue[../eop:localAttribute='relativeOrbitNumber'] |
| orbitType | /om:procedure/eop:EarthObservationEquipment/eop:platform/eop:Platform/eop:orbitType |
| organisationName | N/A |
| parentIdentifier | /eop:metaDataProperty/eop:EarthObservationMetaData/eop:parentIdentifier |
| platform | /om:procedure/eop:EarthObservationEquipment/eop:platform/eop:Platform/eop:shortName |
| platformSerialIdentifier | /om:procedure/eop:EarthObservationEquipment/eop:platform/eop:Platform/eop:serialIdentifier |
| processingLevel | /eop:metaDataProperty/eop:EarthObservationMetaData/eop:processing/eop:ProcessingInformation/eop:processingLevel |
| productType | /eop:metaDataProperty/eop:EarthObservationMetaData/eop:productType |
| productionStatus | /eop:metaDataProperty/eop:EarthObservationMetaData/eop:status |
| publicationDate | N/A |
| sensorType | /om:procedure/eop:EarthObservationEquipment/eop:sensor/eop:Sensor/eop:sensorType |
| resolution | /om:procedure/eop:EarthObservationEquipment/eop:sensor/eop:Sensor/eop:resolution |
| spectralRange | /om:procedure/eop:EarthObservationEquipment/eop:sensor/eop:Sensor/ eop:wavelengthInformation/eop:WavelengthInformation/eop:spectralRange |
| wrsLongitudeGrid */ track (deprecated)* | */om:procedure/eop:EarthObservationEquipment/ eop:acquisitionParameters/eop:Acquisition/eop:wrsLongitudeGrid* |
| useLimitation | N/A |
| wavelength | /om:procedure/eop:EarthObservationEquipment/eop:sensor/eop:Sensor/ eop:wavelengthInformation/eop:WavelengthInformation/eop:discreteWavelengths |
| swathIdentifier | /om:procedure/eop:EarthObservationEquipment/eop:sensor/eop:Sensor/eop:swathIdentifier |
| cloudCover | /om:result/opt:EarthObservationResult/opt:cloudCoverPercentage  or  /atm:EarthObservation/om:result/atm:EarthObservationResult/atm:cloudCoverPercentage |
| snowCover | /om:result/opt:EarthObservationResult/opt:snowCoverPercentage  or  /atm:EarthObservation/om:result/atm:EarthObservationResult/atm:snowCoverPercentage |
| locationUnit | lmb:Footprint/lmb:minimumAltitude  lmb:Footprint/lmb:maximumAltitude  (gml:MeasureType) |
| lowestLocation | /lmb:Footprint/lmb:minimumAltitude |
| highestLocation | /lmb:Footprint/lmb:maximumAltitude |
| productVersion | /eop:EarthObservation/om:result/eop:EarthObservationResult/eop:product/eop:ProductInformation/eop:version |
| timeliness | /eop:EarthObservation/om:result/eop:EarthObservationResult/eop:product/eop:ProductInformation/eop:timeliness |
| acquisitionStation | /eop:metaDataProperty/eop:EarthObservationMetaData/eop:downlinkedTo/eop:DownlinkInformation/eop:acquisitionStation |
| productQualityStatus | /eop:metaDataProperty/eop:EarthObservationMetaData/eop:productQualityDegradation |
| productQualityDegradationTag | /eop:metaDataProperty/eop:EarthObservationMetaData/eop:productQualityDegradationTag |
| processorName | /eop:metaDataProperty/eop:EarthObservationMetaData/eop:processing/eop:ProcessingInformation/eop:processorName |
| processingCenter | /eop:metaDataProperty/eop:EarthObservationMetadata/eop:processing/eop:ProcessingInformation/eop:processingCenter |
| processingDate | /eop:metaDataProperty/eop:EarthObservationMetadata/eop:processing/eop:ProcessingInformation/eop:processingDate |
| sensorMode | /om:procedure/eop:EarthObservationEquipment/eop:sensor/eop:Sensor/eop:operationalMode |
| archivingCenter | /eop:metaDataProperty/eop:EarthObservationMetaData/eop:archivedIn/eop:ArchivingInformation/eop:archivingCenter |
| processingMode | /eop:metaDataProperty/eop:EarthObservationMetaData/eop:processing/eop:ProcessingInformation/eop:ProcessingMode |
| availabilityTime | om:resultTime/gml:TimeInstant/gml:timePosition |
| acquisitionSubType | /eop:metaDataProperty/eop:EarthObservationMetaData/eop:acquisitionSubType |
| startTimeFromAscendingNode | /om:procedure/eop:EarthObservationEquipment/eop:acquisitionParameters/eop:Acquisition/eop:startTimeFromAscendingNode |
| completionTimeFromAscendingNode | /om:procedure/eop:EarthObservationEquipment/eop:acquisitionParameters/eop:Acquisition/eop:completionTimeFromAscendingNode |
| illuminationAzimuthAngle | /om:procedure/eop:EarthObservationEquipment/eop:acquisitionParameters/eop:Acquisition/eop:illuminationAzimuthAngle |
| illuminationZenithAngle | /om:procedure/eop:EarthObservationEquipment/eop:acquisitionParameters/eop:Acquisition/eop:illuminationZenithAngle |
| illuminationElevationAngle | /om:procedure/eop:EarthObservationEquipment/eop:acquisitionParameters/eop:Acquisition/eop:illuminationElevationAngle |
| polarisationMode | /om:procedure/eop:EarthObservationEquipment/eop:acquisitionParameters/sar:Acquisition/sar:polarisationMode |
| polarisationChannels | /om:procedure/eop:EarthObservationEquipment/eop:acquisitionParameters/sar:Acquisition/sar:polarisationChannels |
| antennaLookDirection | /om:procedure/eop:EarthObservationEquipment/eop:acquisitionParameters/sar:Acquisition/sar:antennaLookDirection |
| minimumIncidenceAngle | /om:procedure/eop:EarthObservationEquipment/eop:acquisitionParameters/sar:Acquisition/sar:minimumIncidenceAngle |
| maximumIncidenceAngle | /om:procedure/eop:EarthObservationEquipment/eop:acquisitionParameters/sar:Acquisition/sar:maximumIncidenceAngle |
| dopplerFrequency | /om:procedure/eop:EarthObservationEquipment/eop:acquisitionParameters/sar:Acquisition/sar:dopplerFrequency |
| incidenceAngleVariation | /om:procedure/eop:EarthObservationEquipment/eop:acquisitionParameters/sar:Acquisition/sar:incidenceAngleVariation |
| accessedFrom | N/A |

**Mapping OpenSearch parameters to ISO 19115 / ISO19115-2 Metadata**

In the table below mappings of the OpenSearch parameters for the Collection Search to ISO19115(-2) [RD.26] [RD.28] /ISO19139(-2) [RD.26] are defined.

The table includes the **mappings of the spatial and temporal** parameters of the OpenSearch Geo- and Time-Extension to the appropriate XPath in ISO 19115 / ISO 19115-2.

|  |  |
| --- | --- |
| **OpenSearch Parameter** | **ISO191(15|39) Metadata XPath[[13]](#footnote-13)** |
| geo:box | /gmi:MI\_Metadata/gmd:identificationInfo/\*/gmd:EX\_Extent/gmd:geographicElement/gmd:EX\_GeographicBoundingBox/gmd:westBoundLongitude  /gmi:MI\_Metadata/gmd:identificationInfo/\*/gmd:EX\_Extent/gmd:geographicElement/gmd:EX\_GeographicBoundingBox/gmd:eastBoundLongitude  /gmi:MI\_Metadata/gmd:identificationInfo/\*/gmd:EX\_Extent/gmd:geographicElement/gmd:EX\_GeographicBoundingBox/gmd:southBoundLatitude  /gmi:MI\_Metadata/gmd:identificationInfo/\*/gmd:EX\_Extent/gmd:geographicElement/gmd:EX\_GeographicBoundingBox/gmd:northBoundLatitude |
| geo:name | /gmi:MI\_Metadata/gmd:identificationInfo/\*/gmd:EX\_Extent/gmd:geographicElement/gmd:EX\_GeographicDescription/gmd:geographicIdentifier |
| time:start | /gmi:MI\_Metadata/identificationInfo/MD\_DataIdentification/extent/EX\_Extent/temporalElement/EX\_TemporalExtent/extent/gml:TimePeriod/beginPosition |
| time:end | /gmi:MI\_Metadata/identificationInfo/MD\_DataIdentification/extent/EX\_Extent/temporalElement/EX\_TemporalExtent/extent/gml:TimePeriod/endPosition |
| geo:uid | gmd:MD\_Metadata/gmd:fileIdentifier |
| os:searchTerms | Minimally this should be mapped to search on:  /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:abstract  /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:citation/gmd:CI\_Citation/gmd:title  /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:pointOfContact/gmd:CI\_ResponsibleParty/gmd:organisationName/gco:CharacterString  /gmi:MI\_Metadata/gmd:identificationInfo//gmd:descriptiveKeywords/gmd:MD\_Keywords [gmd:type/gmd:MD\_KeywordTypeCode/@codeListValue = 'theme'] |
| useLimitation | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_Data-Identification/gmd:resourceConstraints/gmd:MD\_LegalConstraints/gmd:useLimitation/gco:CharacterString |
| accessConstraint | /gmi:MI\_Metadata|gmd:MD\_Metadata)/identificationInfo/MD\_DataIdentification/resourceConstraints/MD\_LegalConstraints/accessConstraints/MD\_RestrictionCode/@codeListValue  Sample: license |
| otherConstraint | /gmi:MI\_Metadata/gmd:identificationInfo/…/gmd:resourceConstraints/gmd:MD\_LegalConstraints/gmd:otherConstraints |
| classification | /gmi:MI\_Metadata/gmd:identificationInfo/…/gmd:resourceConstraints/gmd:MD\_SecurityConstraints/gmd:classification  Sample: confidential |
| hasSecurityConstraints | /gmi:MI\_Metadata/identificationInfo/MD\_DataIdentification/resourceConstraints[2]/MD\_SecurityConstraints/  If an instance of the class MD\_SecurityConstraint exists for a resource, the “HasSecurityConstraints” is “true”, otherwise “false” |
| organisationName | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:pointOfContact/gmd:CI\_ResponsibleParty/gmd:organisationName/gco:CharacterString |
| organisationRole | //(gmi:MI\_Metadata|gmd:MD\_Metadata)/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:pointOfContact/\*/role |
| publicationDate | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:citation/gmd:CI\_Citation/gmd:date/gmd:CI\_Date/gmd:date/gco:Date[../../gmd:dateType/gmd:CI\_DateTypeCode/@codeListValue='publication']/text() |
| dissemination | /gmi:MI\_Metadata/gmd:distributionInfo/gmd:MD\_Distribution/gmd:transferOptions/gmd:MD\_DigitalTransferOptions/gmd:onLine/gmd:CI\_OnlineResource/gmd:name  or  /gmi:MI\_Metadata/gmd:distributionInfo/gmd:MD\_Distribution/gmd:distributor/gmd:MD\_Distributor/gmd:distributorTransferOptions/gmd:MD\_DigitalTransferOptions/gmd:onLine/gmd:CI\_OnlineResource/gmd:name |
| topicCategory | gmi:MI\_Metadata/identificationInfo/MD\_DataIdentification/topicCategory/gco:CharacterString |
| lineage | /gmi:MI\_Metadata/gmd:dataQualityInfo/gmd:DQ\_DataQuality/gmd:lineage/gmd:LI\_Lineage/gmd:statement/gco:CharacterString |
| keyword | /gmi:MI\_Metadata/gmd:identificationInfo//gmd:descriptiveKeywords/gmd:MD\_Keywords [gmd:type/gmd:MD\_KeywordTypeCode/@codeListValue = 'theme'] |
| doi | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:citation/gmd:CI\_Citation/gmd:identifier/gmd:RS\_Identifier/gmd:code/gco:CharacterString[../../codeSpace/gco:CharacterString='http://doi.org'] |
| denominator | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:spatialResolution/MD\_Resolution/gmd:equivalentScale/MD\_RepresentativeFraction/gmd:denominator/gco:Integer  Sample:  <gmd:MD\_Resolution>  <equivalentScale>  <MD\_RepresentativeFraction>  <denominator>  <gco:Integer>50000</gco:Integer>  </denominator>  </MD\_RepresentativeFraction>  </equivalentScale>  </gmd:MD\_Resolution> |
| distanceValue  distanceUOM | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:spatialResolution/MD\_Resolution/gmd:distance/gco:Distance  /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:spatialResolution/MD\_Resolution/gmd:distance/gco:Distance/@uom  Sample 1:  <gmd:MD\_Resolution>  <gmd:distance>  <gco:Distance uom="m">1000</gco:Distance>  </gmd:distance>  </gmd:MD\_Resolution> |
| language | /gmi:MI\_Metadata/gmd:language |
| modificationDate | /gmi:MI\_Metadata/gmd:dateStamp |
| title | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:citation/gmd:CI\_Citation/gmd:title |
| abstract | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:abstract |
| platform | /gmi:MI\_Metadata/gmi:acquisitionInformation/ gmi:MI\_AcquisitionInformation /gmi:platform/gmi:MI\_Platform/ gmi:description/gco:CharacterString  OR:  /gmi:MI\_Metadata/gmi:acquisitionInformation/ gmi:MI\_AcquisitionInformation/gmi:platform/ gmi:MI\_Platform/gmi:instrument/gmi:MI\_Instrument/ gmi:mountedOn/gmi:MI\_Platform/ gmi:description/gco:CharacterString  Sample: Meteosat8 |
| platformSerialIdentifier | /gmi:MI\_Metadata/gmi:acquisitionInformation/ gmi:MI\_AcquisitionInformation/gmi:platform/ gmi:MI\_Platform/gmi:identifier/gmd:MD\_Identifier/ gmd:code/gco:CharacterString  OR:  /gmi:MI\_Metadata/gmi:acquisitionInformation/ gmi:MI\_AcquisitionInformation/gmi:platform/ gmi:MI\_Platform/gmi:instrument/gmi:MI\_Instrument/ gmi:mountedOn/gmi:MI\_Platform/gmi:identifier/ MD\_Identifier/code/gco:CharacterString |
| instrument | /gmi:MI\_Metadata/gmi:acquisitionInformation/ gmi:MI\_AcquisitionInformation/ /gmi:instrument/gmi:MI\_Instrument/ gmi:citation/gmd:CI\_Citation/gmd:identifier /gmd:MD\_Identifier/gmd:code/gco:CharacterString  OR:  /gmi:MI\_Metadata/gmi:acquisitionInformation/ gmi:MI\_AcquisitionInformation/gmi:platform/ gmi:MI\_Platform/gmi:instrument/gmi:MI\_Instrument/ gmi:citation/gmd:CI\_Citation/gmd:identifier /gmd:MD\_Identifier/gmd:code/gco:CharacterString  ***…..OR…..***  /gmi:MI\_Metadata/gmi:acquisitionInformation/ gmi:MI\_AcquisitionInformation/ /gmi:instrument/gmi:MI\_Instrument/ gmi:description/gco:CharacterString  OR:  /gmi:MI\_Metadata/gmi:acquisitionInformation/ gmi:MI\_AcquisitionInformation/gmi:platform/ gmi:MI\_Platform/gmi:instrument/gmi:MI\_Instrument/ gmi:description/gco:CharacterString  Instrument name (sensor name). Used as ID for the instrument  Note: MI\_Instrument/identifier not existent within XML schema of ISO19115-2  Sample: SEVERI |
| sensorType | /gmi:MI\_Metadata/gmi:acquisitionInformation/ gmi:MI\_AcquisitionInformation/gmi:instrument/ gmi:MI\_Instrument/ gmi:type/gmi:MI\_SensorTypeCode/@id  OR: /gmi:MI\_Metadata/gmi:acquisitionInformation/ gmi:MI\_AcquisitionInformation/gmi:platform/ gmi:MI\_Platform/gmi:instrument/gmi:MI\_Instrument/ gmi:type/gmi:MI\_SensorTypeCode/@id |
| orbitType | N/A (not available in ISO19115(-2)) |
| spectralRange | /gmi:MI\_Metadata/gmd:contentInfo/gmi:MI\_CoverageDescription/gmd:dimension/gmi:MI\_Band |
| wavelength | /gmi:MI\_Metadata/gmd:contentInfo/gmi:MI\_CoverageDescription/gmd:dimension/gmi:MI\_Band/gmi:bandBoundaryDefinition |
| specificationTitle | //dataQualityInfo/\*/report/\*/result/\*/specification/\*/title |
| specificationDate | //dataQualityInfo/\*/report/\*/result/\*/specification/\*/date/\*/date |
| specificationdateType | //dataQualityInfo/\*/report/\*/result/\*/specification/\*/date/\*/dateType |
| degree | //dataQualityInfo/\*/report/\*/result/\*/pass |
| processingLevel | N/A |
| compositeType | N/A |
| productType | N/A |

**Mapping OpenSearch parameters to OGC CS Extension Package for ebRIM AP: EO Products**

In the table below mappings of the OpenSearch parameters for the Product Search to the “OGC Catalogue Services Standard 2.0 Extension Package for ebRIM Application Profile Earth Observation Products” [RD.23] are defined.

|  |  |
| --- | --- |
| **OpenSearch Parameter** | **EOProduct ExtrinsicObject Attribute** |
| productType | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC-CSW-ebRIM-EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::productType” ]/rim:ValueList/rim:Value[1] |
| doi | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC-CSW-ebRIM-EO::EOProduct” ]/rim:Slot[ @name= ”urn:ogc:def:slot:OGC-CSW-ebRIMEO::doi”]/rim:ValueList/rim:Value[1] |
| modificationDate | N/A |
| platform | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC- CSW-ebRIM- EO::EOAcquisitionPlatform” ]/rim:Name/rim:LocalizedString/@value |
| platformSerialIdentifier | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC- CSW-ebRIM- EO::EOAcquisitionPlatform” ]/rim:Slot[ @name = ”urn:ogc:def:slot:O GC-CSW-ebRIM- EO::platformSerialIdentifier” ]/rim:ValueList/rim:Value[1] |
| instrument | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC- CSW-ebRIM- EO::EOAcquisitionPlatform” ]/rim:Slot[ @name = ”urn:ogc:def:slot:O GC-CSW-ebRIM- EO::instrumentShortName” ]/rim:ValueList/rim:Value[1] |
| sensorType | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC- CSW-ebRIM- EO::EOAcquisitionPlatform” ]/rim:Slot[ @name = ”urn:ogc:def:slot:O GC-CSW-ebRIM-EO::sensorType” ]/rim:ValueList/rim:Value[1] |
| compositeType | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC-CSW-ebRIM-EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::compositeType” ]/rim:ValueList/rim:Value[\*] |
| processingLevel | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC-CSW-ebRIM-EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::processingLevel” ]/rim:ValueList/rim:Value[\*] |
| orbitType | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC- CSW-ebRIM- EO::EOAcquisitionPlatform” ]/rim:Slot[ @name = ”urn:ogc:def:slot:O GC-CSW-ebRIM- EO::platformOrbitType” ]/rim:ValueList/rim:Value[1] |
| resolution | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC- CSW-ebRIM- EO::EOAcquisitionPlatform” ]/rim:Slot[ @name = ”urn:ogc:def:slot:O GC-CSW-ebRIM- EO::sensorResolution” ]/rim:ValueList/rim:Value[1] |
| spectralRange | N/A |
| wavelength | N/A |
| geo:box | /rim:ExtrinsicObject[@objectType=”urn:ogc:def:objectType:OGC-CSW-bRIMEO::EOProduct”]/rim:Slot[@name=”urn:ogc:def:slot:OGC-CSW-ebRIMEO::multiExtentOf”]/wrs:ValueList/wrs:AnyValue[1] |
| geo:name | N/A |
| time:start | /rim:ExtrinsicObject[@objectType=”urn:ogc:def:objectType:OGC-CSW-bRIMEO::EOProduct”]/rim:Slot[@name=”urn:ogc:def:slot:OGC-CSW-ebRIMEO::beginPosition”]/rim:ValueList/rim:Value[1] |
| time:end | /rim:ExtrinsicObject[@objectType=”urn:ogc:def:objectType:OGC-CSW-ebRIMEO::EOProduct”]/rim:Slot[@name=”urn:ogc:def: |
| geo:uid | /rim:ExtrinsicObject[@objectType=”urn:ogc:def:objectType:OGC-CSW-ebRIMEO::EOProduct”]/@id  or  /rim:ExternalIdentifier/@value (linked to the EOProduct ExtrinsicObject by the ExternalIdentifier’s registryObject attribute) |
| useLimitation | N/A |
| hasSecurityConstraints | N/A |
| organisationName | N/A |
| publicationDate | N/A |
| dissemination | N/A |
| parentIdentifier | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC-CSW-ebRIM-EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::parentIdentifier” ]/rim:ValueList/rim:Value[1] |
| productionStatus | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC-CSW-ebRIM-EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::status” ]/rim:ValueList/rim:Value[1] |
| acquisitionType | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC-CSW-ebRIM-EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::acquisitionType” ]/rim:ValueList/rim:Value[1] |
| orbitNumber | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC-CSW-ebRIM-EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::orbitNumber” ]/rim:ValueList/rim:Value[1] |
| orbitDirection | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC-CSW-ebRIM-EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::orbitDirection” ]/rim:ValueList/rim:Value[1] |
| lastOorbitDirection | N/A |
| *track (deprecated)* | */rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC-CSW-ebRIM-EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::wrsLongitudeGrid” ]/rim:ValueList/rim:Value[1]* |
| *frame (deprecated)* | */rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC-CSW-ebRIM-EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::wrsLatitudeGrid” ]/rim:ValueList/rim:Value[1]* |
| wrsLongitudeGrid | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC-CSW-ebRIM-EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::wrsLongitudeGrid” ]/rim:ValueList/rim:Value[1] |
| wrsLatitudeGrid | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC-CSW-ebRIM-EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::wrsLatitudeGrid” ]/rim:ValueList/rim:Value[1] |
| swathIdentifier | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC- CSW-ebRIM-EO:: EOAcquisitionPlatform” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC- CSW-ebRIM-EO::swathIdentifier” ]/rim:ValueList/rim:Value[1] |
| cloudCover | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC- CSW-ebRIM- EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::cloudCoverPercentage” ]/rim:ValueList/rim:Value[1] |
| snowCover | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC- CSW-ebRIM- EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::snowCoverPercentage” ]/rim:ValueList/rim:Value[1] |
| lowestLocation | /rim:ExtrinsicObject[@objectType=”urn:ogc:def:objectType:OGCCSW-  ebRIM-EO::EODataLayer”]/rim:Slot[@name=”  urn:ogc:def:slot:OGC-CSW-ebRIMEO::lowestLocation”]/rim:ValueList/rim:Value[1] |
| highestLocation | /rim:ExtrinsicObject[@objectType=”urn:ogc:def:objectType:OGCCSW-  ebRIM-EO::EODataLayer”]/rim:Slot[@name=”  urn:ogc:def:slot:OGC-CSW-ebRIMEO::highestLocation”]/rim:ValueList/rim:Value[1] |
| locationUnit | N/A |
| productVersion | /rim:ExtrinsicObject[@objectType=”urn:ogc:def:objectType:OGCCSW-  ebRIMEO::EOProductInformation”]/rim:Slot[@name=”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::version”]/rim:ValueList/rim:Value[1] |
| timeliness | N/A |
| acquisitionStation | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC-CSW-ebRIM-EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::acquisitionStation” ]/rim:ValueList/rim:Value[1] |
| productQualityStatus | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC-CSW-ebRIM-EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::imageQualityDegradation” ]/rim:ValueList/rim:Value[1] |
| productQualityDegradationTag | N/A |
| processorName | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC-CSW-ebRIM-EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::processorName” ]/rim:ValueList/rim:Value[\*] |
| processingCenter | N/A |
| processingDate | N/A |
| sensorMode | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC- CSW-ebRIM- EO::EOAcquisitionPlatform” ]/rim:Slot[ @name = ”urn:ogc:def:slot:O GC-CSW-ebRIM- EO::sensorOperationalMode” ]/rim:ValueList/rim:Value[1] |
| archivingCenter | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC- CSW-ebRIM- EO::EOArchivingInformation” ]/rim:Name/rim:LocalizedString/@value |
| processingMode | N/A |
| availabilityTime | N/A |
| acquisitionSubType | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC-CSW-ebRIM-EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::acquisitionSubType” ]/rim:ValueList/rim:Value[1] |
| startTimeFromAscendingNode | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC-CSW-ebRIM-EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::startTimeFromAscendingNode” ]/rim:ValueList/rim:Value[1] |
| completionTimeFromAscendingNode | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC-CSW-ebRIM-EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::completionTimeFromAscendingNode” ]/rim:ValueList/rim:Value[1] |
| illuminationAzimuthAngle | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC- CSW-ebRIM- EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM- EO::illuminationAzimuthAngle” ]/rim:ValueList/rim:Value[1] |
| illuminationZenithAngle | N/A |
| illuminationElevationAngle | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC- CSW-ebRIM- EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM- EO::illuminationElevationAngle” ]/rim:ValueList/rim:Value[1] |
| polarisationMode | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC- CSW-ebRIM- EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::polarisationMode” ]/rim:ValueList/rim:Value[1] |
| polarisationChannels | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC- CSW-ebRIM- EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::polarisationChannels” ]/rim:ValueList/rim:Value[1] |
| antennaLookDirection | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC- CSW-ebRIM- EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::antennaLookDirection” ]/rim:ValueList/rim:Value[1] |
| minimumIncidenceAngle | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC- CSW-ebRIM- EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::minimumIncidenceAngle” ]/rim:ValueList/rim:Value[1] |
| maximumIncidenceAngle | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC- CSW-ebRIM- EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::maximumIncidenceAngle” ]/rim:ValueList/rim:Value[1] |
| dopplerFrequency | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC- CSW-ebRIM- EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::dopplerFrequency” ]/rim:ValueList/rim:Value[1] |
| incidenceAngleVariation | /rim:ExtrinsicObject[ @objectType = ”urn:ogc:def:objectType:OGC- CSW-ebRIM- EO::EOProduct” ]/rim:Slot[ @name = ”urn:ogc:def:slot:OGC-CSW-ebRIM-EO::incidenceAngleV ariation” ]/rim:ValueList/rim:Value[1] |
| accessedFrom | N/A |

**Mapping OpenSearch parameters to OGC CS Extension Package for ebRIM AP: I15**

In the table below the informative mappings of the queryables for the Collection Search to the CSW ebRIM I15 Extension Package [RD.24] are defined.

The table also includes the **mapping of the spatial and temporal** parameters of the OpenSearch Geo- and Time-Extension to the CSW ebRIM I15 Extension Package.

|  |  |
| --- | --- |
| **OpenSearch Parameter** | **I15 Extension Package Elements [RD.24]** |
| useLimitation | <<ExtrinsicObject>> LegalConstraints -> <<Description>> |
| accessConstraint | <<ExtrinsicObject>> LegalConstraints -> <<classification>> RestrictionCode (the classification is classified with RestrictionType “access”) |
| otherConstraint | <<ExtrinsicObject>> LegalConstraints -> <<slot>> Rights |
| classification | <<ExtrinsicObject>> SecurityConstraints -> <<classification>> ClassificationCode |
| hasSecurityConstraints | Map to a check for availability of any of the predefined constraints |
| organisationName | <<RegistryObject>> Organization -> Name |
| publicationDate | <<ExtrinsicObject>> ResourceMetadata -> <<slot>> Issued |
| dissemination | N/A |
| abstract | <<ExtrinsicObject>> *ResourceMetadata ->*<<Description>> |
| topicCategory | <<ExtrinsicObject>> *ResourceMetadata -> <<classification>* TopicCategory |
| lineage | <<ExtrinsicObject>> *ResourceMetadata ->* <<slot>> Lineage |
| parentIdentifier | <<association >> parentMetadata from <<ExtrinsicObject>> ResourceMetadata to MetadataInformation -> <<slot>> Identifier |
| keyword | Classification with KeywordSchemeUntyped or KeywordSchemeTheme |
| doi | N/A |
| distanceValue  distanceUOM | <<slot>> Resolution |
| denominator | <<slot>> ScaleDenominator |
| language | <<ExtrinsicObject>> MetadataInformation -> <<slot>> Language |
| modificationDate | <<ExtrinsicObject>> MetadataInformation -> <<slot>> Date |
| title | <<ExtrinsicObject>> ResourceMetadata -> Name |
| searchTerms | Minimally this should be mapped to the corresponding mappings of:   * abstract * title * organisationName * keyword |
| platform | <<ExtrinsicObject>> Platform -> Description |
| platformSerialIdentifier | <<ExtrinsicObject>> Platform -> <<slot>> Identifier |
| instrument | <<ExtrinsicObject>> Instrument -> <<slot>> Identifier  …..OR…..  <<ExtrinsicObject>> Instrument -> Description |
| sensorType | <<ExtrinsicObject>> Instrument -> Name |
| orbitType | N/A |
| spectralRange | N/A |
| wavelength | N/A |
| specificationTitle | <<ExtrinsicObject>> ReferenceSpecification -> <<Name>> |
| specificationDate  specificationdateType | <<ExtrinsicObject>> ReferenceSpecification ->  <<slot>> Created or  <<slot>> Modified or  <<slot>> Issued or |
| degree | <<ExtrinsicObject>> ReferenceSpecification -> <<slot>> Conformance |
| organisationRole | Handled through the CitedResponsibleParty classification on the CitedResponsibleParty association. |
| processingLevel | N/A |
| compositeType | N/A |
| productType | N/A |
| geo:box | <<slot>> Envelope (type gml:Envelope):  The WestBoundLongitude corresponds to the longitude of “lowerCorner” in gml:Envelope  The EastBoundLongitude corresponds to the longitude of “upperCorner” in gml:Envelope  The SouthBoundLatitude corresponds to the latitude of “lowerCorner” in gml:Envelope.  The NorthBoundLongitude corresponds to the latitude of “upperCorner” in gml:Envelope |
| geo:name | <<ExtrinsicObject>> ResourceMetadata -> <<slot>> Coverage |
| time:start | <<ExtrinsicObject>> ResourceMetadata -> <<slot>> TemporalBegin |
| time:end | <<ExtrinsicObject>> ResourceMetadata -> <<slot>> TemporalEnd |
| geo:uid | <<ExtrinsicObject>> MetadataInformation -> <<slot>> Identifier |

## Annex F (informative): OpenSearch Response Metadata Mappings

**Response Mapping: EOP O&M / EOP EP to ATOM**

Response mapping for Atom encoding to the EO Metadata profile of O&M (OGC 10-157r4).

| **Atom Element** | **Mapping to EO O&M** |
| --- | --- |
| atom:entry/ atom:title | eop:metaDataProperty/eop:EarthObservationMetaData/eop:identifier |
| atom:entry/ atom:author | N/A |
| atom:entry/ atom:category | N/A |
| atom:entry/ atom:summary | N/A |
| atom:entry/ atom:updated | om:resultTime |
| atom:entry/ dc:date | om:phenomenonTime |
| atom:entry/ atom:id | N/A |
| atom:entry/ dc:identifier | eop:metaDataProperty / eop:EarthObservationMetaData / eop:identifier |
| atom:entry/ @xml:lang | N/A |
| atom:entry/ atom:rights | N/A |
| atom:entry/ georss:\* | om: featureOfInterest |
| atom:entry/ atom:link[@rel=’search’] | N/A |
| atom:entry/ atom:link[@rel=’icon’] | om:result/eop:EarthObservationResult/eop:product/eop: BrowseInformation/eop:fileName |
| atom:entry/ atom:link[@rel=’alternate’] | N/A |
| atom:entry/ atom:link[@rel=’enclosure’] | om:result/eop:EarthObservationResult/eop:product/eop:ProductInformation/eop:fileName |

**Response Mapping: ISO191(15|39)[-2] / I15 EP to ATOM**

The following table defines the mappings from ISO191(15|39)[-2] and I15 EP [RD.24] to ATOM response elements.

| **Atom Element** | **Mapping from ISO19139-2** | **Mapping from I15** |
| --- | --- | --- |
| atom:entry/ atom:title | gmd:MD\_Metadata/gmd:identificationInfo/<gmd:MD\_DataIdentification |srv:SV\_ServiceIdentification>/gmd:citation/gmd:CI\_Citation/gmd:title | <<ExtrinsicObject>> ResourceMetadata -> Name |
| atom:entry/ atom:author | The organization name and email of the corresponding field in ISO19139-2: mapped from /gmd:MD\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:pointOfContact/-> /gmd:organisationName/ gco:CharacterString  and  /gmd:contactInfo/ gmd:CI\_Contact/gmd:address/ gmd:CI\_Address/ gmd:electronicMailAddress/ gco:CharacterString | <<RegistryObject>> Organization -> Name  And  <<RegistryObject>> Organization -> EmailAddress |
| atom:entry/ atom:category | Shall include: /gmd:MD\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:topicCategory  and  gmd:identificationInfo//gmd:descriptiveKeywords/gmd:MD\_Keywords [gmd:type/gmd:MD\_KeywordTypeCode/@codeListValue = 'theme']  and possibly entries from:  /gmi:MI\_Metadata/gmd:hierarchyLevelName/gco:CharacterString | <<ExtrinsicObject>> ResourceMetadata -> <<classification> TopicCategory  and  Classifications with KeywordSchemeUntyped or KeywordSchemeTheme  and possibly  <<ExtrinsicObject>> ResourceMetadata -> <<slot>> Type |
| atom:entry/ atom:summary | /gmd:MD\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:abstract | <<ExtrinsicObject>> ResourceMetadata -> <<Description>> |
| atom:entry/ atom:contributor | N/A |  |
| atom:entry/ atom:updated | gmd:MD\_Metadata/gmd:identificationInfo/<gmd:MD\_DataIdentification/gmd:citation/gmd:CI\_Citation/gmd:date (of dateType revision, if not available of dateType creation) | <<ExtrinsicObject>> ResourceMetadata -> <<slot>> Modified (or <<slot>> Created) |
| atom:entry/ dc:date | DateTime[[14]](#footnote-14) or DateTime Interval (aka: 2007-03-01T13:00:00Z/2008-05-11T15:30:00Z) -> to be mapped from /gmd:MD\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/extent/EX\_Extent/temporalElement/EX\_TemporalExtent/extent/gml:TimePeriod/gml:beginPosition / /gmd:MD\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/extent/EX\_Extent/temporalElement/EX\_TemporalExtent/extent/gml:TimePeriod/gml:endPosition | <<ExtrinsicObject>> ResourceMetadata -> <<slot>> TemporalBegin  <<ExtrinsicObject>> ResourceMetadata -> <<slot>> TemporalEnd |
| atom:entry/ atom:id | The identifier shall be created (as already done in the I15ToISO-Bridge) in a way that it can be used as parentIdentifier parameter for a subsequent EOP product search. Sample: urn:ogc:def:EOP:EUM:acronym:ASCxxx1A:satellite:M02:fileid:EO:EUM:DAT:METOP:ASCSZO1B | see notes column left |
| atom:entry/ dc:identifier | To be mapped from: /gmd:MD\_Metadata/gmd:fileIdentifier | <<ExtrinsicObject>> MetadataInformation -> <<slot>> Identifier |
| atom:entry/ @xml:lang | /gmd:MD\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:language | <<ExtrinsicObject>> ResourceMetadata -> <<slot>> Language |
| atom:entry/ atom:rights | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_Data-Identification/  gmd:resourceConstraints/gmd:MD\_LegalConstraints/gmd:useLimitation/gco:CharacterString[[15]](#footnote-15) | <<ExtrinsicObject>> Rights -> <<Description>> |
| atom:entry/ georss:\* | Polygon -> to be mapped from the /gmd:MD\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:extent//gmd:geographicElement/gmd:EX\_GeographicBoundingBox[[16]](#footnote-16) | <<ExtrinsicObject>> ResourceMetadata -> <<slot>> Envelope |
| atom:entry/ atom:link[@rel=’search’] | The atom/link[@rel='search'] element should provide a link to a search engine (OSDD document) to search for specific products of the collection described in the atom:entry. In this OSDD a link with @rel='results' should be found that provides gives the template for the product query (e.g. …&parentIdentifier=<atom:id of current collection>&…) | see notes column left |
| atom:entry/atom:link[@rel=’icon’] | The media:content@url (see 7.3.2.2.5) should be mapped from /gmd:MD\_BrowseGraphic/gmd:filename, the media:content@type from /gmd:MD\_BrowseGraphic/gmd:filetype. | <<ExtrinsicObject>> MD\_BrowseGraphic |
| atom:entry/atom:link[@rel=’via’][[17]](#footnote-17)  atom:entry/atom:link[@rel=’alternate’] | For the rel “via” a link to the original/native source (from which the other metadata types are derived by conversion or translation) shall be provided.  For the rel “alternate” links to alternative formats/representations of the original source shall be provided.  E.g. link to the GetRecordById operation: Reference (Link) to the data source (e.g. original ISO19139 collection metadata).  The “type” attribute set to “application/vnd.iso.19139+xml”.  Example:  <atom:link rel="via" type="application/vnd.iso.19139+xml" length="845" title="ISO 19139 Metadata" href=" http://46.51.189.235:80/soapServices/CSWStartup?service=CSW&version=2.0.2&request=GetRecordById&outputSchema=http://www.isotc211.org/2005/gmi&Id=EO:EUM:DAT:METOP:OAS025"/>  It may also make sense to include other links, e.g. a link (with rel=”alternate”) to the HTML-based metadata-representation – but now with the “type” attribute set to “text/html” and the "href" attribute set to the additional HTML representation of the metadata.  Example:  <link href="http://46.51.189.235:80/discovery/Start/DirectSearch/DetailResult.do?f(r0)=EO:EUM:DAT:METOP:OAS025" rel="alternate" title="ASCAT Winds and Soil Moisture at 25 km Swath Grid - Metop" type=" text/html "/> |  |
| atom:entry/ atom:link[@rel=’enclosure’] | Provide here the dissemination endpoints: atom:link elements reference every single dissemination endpoint of the data resource.  Proposal: Link element includes a "rel" attribute with value "enclosure", a "type" attribute with "text/html" and a "title" attribute with the name of the dissemination point. Example:  <link href="http://eoportal.eumetsat.int/userMgmt" rel="enclosure" title="EO Portal Registration" type="text/html"/>  The XPaths in ISO19139 are as follows:   * The link itself:   /gmd:MD\_Metadata/gmd:distributionInfo/gmd:MD\_Distribution/gmd:distributor[1]/gmd:MD\_Distributor/gmd:distributorTransferOptions/gmd:MD\_DigitalTransferOptions/gmd:onLine[2]/gmd:CI\_OnlineResource/gmd:linkage/gmd:URL   * The title:   /gmd:MD\_Metadata/gmd:distributionInfo/gmd:MD\_Distribution/gmd:distributor[1]/gmd:MD\_Distributor/gmd:distributorTransferOptions/gmd:MD\_DigitalTransferOptions/gmd:onLine[1]/gmd:CI\_OnlineResource/gmd:name/gco:CharacterString |  |
| atom:entry/atom:link[@rel=’up’] | N/A |  |
| atom:content[@type=’html’] | An atom:content element may be added to the atom:entry to allow to visualization links to the additional metadata presentations and the dissemination links. The content element of the **atom:entry** includes a “type” attribute with “html”. Example:  <content type="html">&lt;a href="http://46.51.189.235:80/discovery/Start/DirectSearch/DetailResult.do?f(r0)=EO:EUM:DAT:METOP:ASCAT25"&gt;Metadata (HTML)&lt;/a&gt; &lt;br/&gt;&lt;a href="http://46.51.189.235:80/soapServices/CSWStartup?service=CSW&amp;version=2.0.2&amp;request=GetRecordById&amp;outputSchema=http://www.isotc211.org/2005/gmi&amp;Id=EO:EUM:DAT:METOP:ASCAT25"&gt;Metadata (ISO19139 XML)&lt;/a&gt; &lt;br/&gt; &lt;a href="http://46.51.189.235:80/soapServices/OpenSearch?format=atom&amp;id=EO:EUM:DAT:METOP:ASCAT25"&gt;Metadata (ATOM)&lt;/a&gt; &lt;br/&gt; &lt;a href="http://eoportal.eumetsat.int/userMgmt/protected/dataCentre.faces?acronym=OASW025"&gt;EUMETSAT Data Centre (until 28/02/2011) &lt;/a&gt; &lt;br/&gt; &lt;a href="/discovery/Start/DirectSearch/Extended.do?freeTextValue(resourceidentifier)=EO:EUM:DAT:METOP:OAS025"&gt;Please order from ASCAT Winds and Soil Moisture for data from 28/02/11 onwards&lt;/a&gt; &lt;br/&gt; &lt;a href="http://www.osi-saf.org"&gt;OSI SAF Archive and FTP&lt;/a&gt; &lt;br/&gt;</content>  The content without URL-encoding looks as follows:  <a href="http://46.51.189.235:80/discovery/Start/DirectSearch/DetailResult.do?f(r0)=EO:EUM:DAT:METOP:ASCAT25">Metadata (HTML)</a> <br/><a href="http://46.51.189.235:80/soapServices/CSWStartup?service=CSW&version=2.0.2&request=GetRecordById&outputSchema=http://www.isotc211.org/2005/gmi&Id=EO:EUM:DAT:METOP:ASCAT25">Metadata (ISO19139 XML)</a> <br/> <a href="http://46.51.189.235:80/soapServices/OpenSearch?format=atom&id=EO:EUM:DAT:METOP:ASCAT25">Metadata (ATOM)</a> <br/> <a href="http://eoportal.eumetsat.int/userMgmt/protected/dataCentre.faces?acronym=OASW025">EUMETSAT Data Centre (until 28/02/2011) </a> <br/> <a href="/discovery/Start/DirectSearch/Extended.do?freeTextValue(resourceidentifier)=EO:EUM:DAT:METOP:OAS025">Please order from ASCAT Winds and Soil Moisture for data from 28/02/11 onwards</a> <br/> <a href="http://www.osi-saf.org">OSI SAF Archive and FTP</a> <br/></a> |  |

## Annex G: Alignment to CEOS Best Practices (Informative)

The document "CEOS OpenSearch Best Practice Document, Version 1.2" [RD.9] defines a list of server implementation Best Practices (BP) for EO OpenSearch search services that allow for standardized and harmonized access to metadata and data for CEOS agencies, including CWIC and FedEO.

The following table shows a mapping between those CEOS BP which are of common relevance for this specification and the Requirements defined in this document.

|  |  |
| --- | --- |
| **Requirement (URL)** | **CEOS-BP ID** |
| /req/response/ATOM/entry/searchContextLink | CEOS-BP-001 |
| /req/osdd/parameterExtension | CEOS-BP-002 |
| /req/osdd/customSearch | CEOS-BP-002B |
| /req/osdd/supportedGeometryTypes | CEOS-BP-002C |
| /req/osdd/relAttributeOfURL | CEOS-BP-003 |
| /req/osdd/queryElement | CEOS-BP-003B |
| /req/request/osParameters | CEOS-BP-005 |
| /req/request/osGeoTempParameters | CEOS-BP-005 |
| /req/osdd/optionalTemplateParameters | CEOS-BP-005F |
| /req/request/multiWordsSearchTerms | CEOS-BP-006 |
| /req/response/ATOM/feed/useOfStartIndexOverStartPage | CEOS-BP-007 |
| /req/request/osGeoNameParameter | CEOS-BP-008 |
| /req/response/ATOM | CEOS-BP-010 |
| /req/response/ATOM/entry/identifier | CEOS-BP-011 |
| /req/response/ATOM/feed/resultSetNavigation | CEOS-BP-011B |
| /req/response/ATOM/entry/metadataLink | CEOS-BP-012/-012D |
| /req/response/ATOM/entry/documentationLink | CEOS-BP-012C+D |
| /req/response/ATOM/entry/linkTypeAttribute | CEOS-BP-012E |
| /req/response/ATOM/entry/atomSummary | CEOS-BP-013 |
| /req/response/ATOM/entry/extent | CEOS-BP-014 |
| /req/response/ATOM/entry/GeoRSSMultiPolygonFootprint | CEOS-BP-014B |
| req/response/ATOM/entry/GeoRSSMultiPointFootprint | CEOS-BP-014C |
| /req/response/ATOM/entry/GeoRSSMultiLineFootprint | CEOS-BP-014D |
| /req/response/ATOM/entry/imagesByLink | CEOS-BP-015 |
| /req/response/ATOM/entry/dataLink | CEOS-BP-016 |
| req/response/ATOM/entry/ordering | CEOS-BP-016C |
| /req/exceptions | CEOS-BP-017 |

## Annex H: Revision history

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Date** | **Release** | **Author** | **Paragraph modified** | **Description** |
| 2013-03-15 | 0.0.1 | Pedro Gonçalves |  | Consolidation of Earth Observation Extension |
| 2013-08-12 | 0.0.2 | Pedro Goncalves | Annex B and C  All | Addition of Schemas and examples  Revision and typo correction |
| 2013-12-13 | 0.0.3 | Pedro Goncalves | Annexes | Reorganization of Annexes. Correction of example values on tables 3, 4 and 5. |
| 2014-06-02 | 0.0.4 | Uwe Voges | All | Included definitions of Collection, Product etc, included additional queryables for Collection Discovery, included informative mappings of all Collection queryables to ISO19115/1939 and to CSW ebRIM EP I15, included all informative response mappings from ISO19115/1939 and CSW ebRIM EP I15 to ATOM,…. |
| 2014-06-26 | 0.0.4 | Uwe Voges | All | Added an INSPIRE conformance class, updated rnc file regarding additional query parameters, resolved some comments, mainly in "Response Mapping: ISO191(15|39)[-2] / I15 EP to ATOM", renamed platformShortName now platform, uniquely named "productQualityStatus" and "productQualityDegradationTag" in the whole doc and added those to rnc schema definition, fixed the "resolution" for Collections as follows:  Splitted resolution into 2 (groups) of parameters (see my mapping in annex D2):  denominator AND  distanceValue + distanceUOM (for resolution an UOM is needed)  This is the only useful way it can be done (this was done in the same way in CSW AP ISO). |
| 2014-07-11 | 0.0.4 | Uwe Voges | All | Added reference to INSPIRE specifications. Added requirement for INSPIRE. |
| 2014-07-25 | 0.0.4 | Uwe Voges | All | Split parameters table for collections into 2 tables: one for INSPIRE conformance  In the INSPIRE table: degree now has possible values of "true", "false", "null" and I grouped queryables which make only sense if used together.  Extended the “Overview” section. Added 6.2 "Two step search" for a better understanding how search for collections and products may work.  Reorganized the requirements in the text and their mappings to conformance classes in table 1.  Reorganized and extended the ATS: organized the ATS so that tests are grouped related to conformance classes and assigned requirement(s) to the tests.  Corrected specification references, added SensorML EP Ref  Updated response mappings to ATOM  Added comments to: B.7. Earth Observation Extension Query Element Schema (schemas/opensearch/extensions/eo/1.0/eo.rnc) which must be solved by Pedro |
| 2014-07-28 | 0.0.4 | Pedro Gonçalves | Conformance Classes  Schemas | Content review of requirements and their mappings to conformance classes / test classes  Review of EO Schemas |
| 2014-10-27 | 0.0.5 | Yves Coene | All | Corrected eop entry in Table 2 and Annex B.8.  Updated requirement /req/entry-eop.  Added eo:creationDate and eo:modificationDate mapping in Table 5, Annex B.7 and Annex D.1.  Reworded Conformance Test Class A.2.1 to allow also derived types such as opt:EarthObservation or sar:EarthObservation etc.  Updated OGC 10-032r7 references to OGC 10-032r8 and updated its title. |
| 2016-05-25 | 0.0.7 (0.0.6 was only internal) | Uwe Voges | All | Included the changes solving all comments received on the OGC OpenSearch Extension for Earth Observation candidate standard during the TC voting period:  Comment 2.1:  Added new queryables highestLocation and lowestLocation to table 5, B7, mappings to D1 and D3 (not applicable to collections).  Extended mappings for cloudCover and snowCover in D1  Comment 2.2:  We now use (in all tables) "organisation" instead "organization" for:  organisationName  organisationRole  Comment 2.3:  Made the type of eo:frame and eo:track equal to "string" in Table 5, B7, .  Comment 2.5:  “doi” was added as queryable.  Added definition to table 3 and B7.  Added mappings for collection and products to D1, D2, D3, D4  Comment 2.6:  “publicationDate” was added as queryable.  The type of the queryable is now of type date.  Added definition to table 4.  Added definition to B7.  Added mappings for collection and products to D1, D2, D3, D4  Comment 2.7  Product Identifier is not defined as new queryable but is mapped to OGC 10-032 geo:uid  Added to table D1 and D3.  Comment 2.8:  “productVersion” was added as queryable.  The type of the queryable is now of type string.  Added definition to table 5 and B7.  Added mappings for products to D1, D3  Comment 2.9:  recordSchema was added as queryable.  The type of the queryable is now of type string.  Standard values are e.g. http://www.opengis.net/eop/2.1 (OGC O&M EOP), http://www.isotc211.org/2005/gmi (ISO19115-2), http://www.isotc211.org/2005/gmd (ISO19115)  Added definition to table 3  Added definition to B7.  Comment 2.10:  Modified not added as queryable: this is already covered by queryable modificationDate.  But mappings were added in D2, D3, D4.  Comment 2.11:  Mapping of the basic OGC 10-032 queryables geo:box, geo:name, geo:uid, time:start, time.end in D1 and D3  Editorial:  Added keywords  Hints on "alternative" representations in atom response entries  Editorial changes |
| 2016-05-30 | 0.0.7 (0.0.6 was only internal) | Uwe Voges | All | Table 2: added media namespace from example 7. Added param namespace used in Annex C.  Instead of adding recordSchema in the eo: namespace, we keep it in the sru: namespace and added a note in the same way as for the Parameter extension where also the param: namespace is kept instead of moving everything to the eo: namespace.  Table 7: added relation to first and last page in ATOM response |
| 2016-05-31 | 0.0.7 (0.0.6 was only internal) | Uwe Voges | All | Added links to first and last entry to atom feed.  atom:entry/dc:identifier now mandatory  Added root nodes to be provided for every recordSchema  Added hint to the official Atom.XSD file used by NASA CWICSmart conformance tests |
| 2016-06-01 | 0.0.7 (0.0.6 was only internal) | Uwe Voges | Table-2  Chapter 8.1, 8.2  all | Added namespaces for ISO19115(-2)  Added recordSchemas for Sensor ML 2.0 and Dublin Core  Editorial |
| 2016-07-06 | 0.0.8 | Uwe Voges, Yves Coene | Table-3  Chapter 8.2.2  Table 8  Chapter 8.2.4 | In summary the inclusion and linking to additional/alternative metadata in the ATOM response was clarified and updated. Metadata model references (namespaces, identifier, media types,..) were updated (ISO19115-1/ISO19115-3 was added), the list of reference documents was updated, document references were added in different positions and examples were updated and clarified  clarified sru:recordSchema  improved text on detailed metadata  Clarified atom:entry/atom:link[@rel= ’alternative’] and Additional Metadata.  Extended chapter 8.2.4 with additional explanations |
| 2016-09-06 | 1.0.0 | Uwe Voges | Requirements / Conformance Classes  Conformance Tests  Table 6 | Improved explanation for what kind of search which parameters should be used  Definitions of requirements / conformance classs aligned with usual OGC definitions  Updated references  Definition of availabilityTime improved |
| 2017-03-10 | 1.1.0 | Uwe Voges |  | Defined:   * a search response model * GeoJSON + JSON-LD encodings * JSON-LD Context * Mappings ATOM <-> GeoJSON/JSON-LD * atom:link type and owc:Offering type * added example   Added sorting capability. |
| 2017-05-30 | 1.1.0 | Uwe Voges |  | **Removed GeoJSON and JSON-LD related things (now in a separate document OGC 17-047),**  Chapter 6 (6. OpenSearch-EO - Overview incl Two Step Search) updated by AdV (editorial)  Chapter 8.1 (Search operation request) updated by AdV (editorial)  Merged chapter 7 (OpenSearch-EO Description (Requirement)) and 8 (OpenSearch-EO – Search Operation) into one chapter 7 (OpenSearch-EO Search Service) (editorial)  Improved a whole bunch of explanations including: search parameters, search parameter tables, atom:link vs mediaRSS, usage of link-types,... (editorial)  Improved the section on ATOM response (edititorial + requirements)  Removed the GeoJSON(-LD) parts -> now OGC 17-047  Added optional “alternate” full metadata formats  Added mathematical operations also to different search parameters of type "date"  Provided lots of CEOS requirements (e.g. added requirements on usage of wild cards from CEOS-BP-002B or CEOS-BP-002C (advertising supported geometry types)) in the document (either as „CEOSCore“ or „CEOSRecommend” Requirements -> some were overtaken directly into the “Core” or “Recommend” CCs).  Assigned the requirements to the CCs. The CEOS requirements are mostly clear and were inherently already included in the document -> just needed formal requirement definitions  Fixing comments (from AdV´s review) -> just those which are quite clear (no need for discussion -> ) |
| 2017-06-21 | 1.1.0 | Uwe Voges |  | Per ATOM “atom:feed elements MUST contain exactly one atom:updated element.” This was now updated. A CR for OGC 10-032 is created by Pedro.  s. <http://ogc.standardstracker.org/show_request.cgi?id=447>  The representation of a reference to a document with the response´ entry information in an alternative format is done in r8 based on an atom:link with [@rel=’alternative’]. This contradict 10-032 which says that [@rel=’alternate’] has to be used. We changed [@rel=’alternative’] to [@rel=’alternate’].  Offering was further specified and an annex included providing additional information and examples  Different other fixes |
| 2017-07-04 | 1.1.0 | Uwe Voges |  | Definition of envelope for atom:entry:  Fixed as follows:  Term: Envelope / eop:Footprint  ATOM Element: atom:entry/georss:\*  Description: The spatial extent or scope of the content of the resource. Usually it should be represented using “GeoRSS Simple”, e.g.: <georss:polygon>45.256 -110.45 46.46 -109.48 …</georss:polygon>. For further clarifications see 7.3.3.6  Multiplicity Type: 1 Optional. Types and further explanations see columns left (Description). In 7.3.3.6 the CEOS-BP-014(X) are provided and pooled in a Requirement-Class  \*\*  Added and clarified “Specification Reference” to Atom:feed.  It is now 0:n (for being backwards compatible) (the GeoJSON encoding will make it mandatory (1:n) In ows:Context it is mandatory (1) as well)  When OS-EO response atom:feed is correctly provided it minimally aligns to the 2 profiles:  - OWS Context: provided as URI of the OWS Context core requirements class  - OpenSearch-EO: provided as URI of the OpenSearch-EO core requirements class  A requirement class was created for this so that Best Practices or implementation guidlines may force the provision of the atom:feed "specification" element  \*\*  atom:feed / language:  Left the language as optional and make a default language: if there is no language defiend default is english (eng)  \*\*  atom:entry/atom:content  Added atom:content as optional (becomes mandatory when no atom:link with rel"alternate" for entry provided): this is an error correction.  The use of atom:content with @type equal to "html" is recommended.  \*\*  Added a clarification that it is strictly forbidden to provide more than one URL template for a given “rel” / “type” combination  \*\*  Added wrsLongitudeGrid and wrsLatitudeGrid as search parameter and left track and frame for backward compatibility with a note explaining they are deprecated in favour of the wrs\* ones. |
| 2017-07-26 | 1.1.0 | Uwe Voges |  | Removed Sensor ML related stuff  \*\*  Reorganized Appendixes  \*\*  Provided empty annex (F) to include OSDD fragments of parameter definitions expressing the predefined behaviour for each query parameter  \*\*  reviewed all query parameters and corrected if something was wrong  \*\*  adjusted some requirement classes / assignments of requirements to requirement classes, splitted off Conformance Classes / Requirement Classes, created new Requirement Classes: e.g. Rep.Class “TwoStepSearch”, “DataAccess”, “Paging”, ImagesByLink”, “ImagesByMediaRSS”, “MetadataLink”, “InlineMetadata”, “EntrySummary”, “Offerings”, “ExceptionHandling”, “LinkTypeAttribute”, “osGeoTempParameters”, “osGeoNameParameter”, “GeometryTypes”, “SpecReference”, “Spatial Extent”  \*\*  Restructured the section on the atom response model 7.3.2  \*\*  Finalized the definition of the envelope of an atom:feed  \*\*  Aligned responses with OWS Context and 10-032 (as long as those are aligned with ATOM -> if not, CRs for those specs were issued)  \*\*  Definition of relation “up”  \*\* |
| 2017-08-15 | 1.1.0 | John Taylor |  | QA, wording, clarity changes applied, and related comments raised in-line. |
| 2017-10-1 | 1.1.0 | Uwe Voges |  | Updated normative references, wording,…  \*\*  Added clarifications regarding conformance and requirement classes  \*\*  Using “polarisationChannels” everywhere, was a bug in 13-026r8 where sometimes “polarizationChannels” was used  \*\*  Using consistently “wavelength” instead of “wavelengths” (was a bug in 13-026r8)  \*\*  Propose to use ISO 8601 format as format for time periods for the query parameter compositeType  \*\*  Clarified that no query parameters are mandatory  \*\*  Assigned parameters with a fixed value-list the type info: “String (fixed list)”  \*\*  clarified startIndex vs startPage  \*\*  Clarified the specReference  \*\*  For “non-core” requirements always the wording “it is recommended…” is used..  \*\*  Redefined lowestLocation, highestLocation and added locationUnit  \*\*  Fixed CR 463: Resource Type (dataset, collection,..)  \*\*  Fixed CR 486: Declaration of operators ‘ranges’ and ‘sets’ in parameter extension  \*\*  Defined Conformance Classes, started working on ATS...  \*\* |
| 2017-11-10 | 1.1.0 | Uwe Voges |  | Finalized ATS.  \*\*  All schema URI´s now in Table 10  \*\*  Improved inline metadata example  \*\*  Full update of the owc:Offerings in Annex B  \*\*  Restructured a bit the Mapping Annexes (E+F) |
| 2017-12-06 | 1.1.0 | Uwe Voges |  | Updated the examples in Annex D  \*\*  Removed remaining GeoJSON references (all now covered by OGC 17-047)  \*\*  Adoption of CEOS Best Practices by 13-026r9:   * Create new Annex G for mapping CEOS-BP with Requirements   \*\*  Expanded possible values for polarisation channels (#526) |
| 2018-01-31 | 1.1.0 | Uwe Voges |  | \*\*  Added new search parameters for product searches (see table 7)  \*\*  Updated definitions for wrsLongitudeGrid and wrsLatitudeGrid  \*\*  Added footnote for current CR on support for multi-polygons in GeoRSS GML (OGC 17-002r1)  \*\*  Checked and updated OpenSearch parameter mappings  \*\*  Deleted search parameters lastOrbitNumber, startLat and endLat and ascendingCrossing, which were introduced recently  \*\*  Included parameter mappings for:   * relativeOrbitNumber * timeliness * lastOrbitDirection * tileId   \*\*  Editorial updates in section 1, 2, 6  \*\*  Clarified definition of values of parameters of type datetime  \*\* |
| 2018-03-23 | 1.1.0 | Uwe Voges |  | Changes to the definition of values of parameters of type datetime  \*\*  Updated /req/osdd/parameterExtension  \*\*  Updated pattern in parameter extension example  \*\*  Added accessedFrom as query parameter  \*\*  Re-structured the section Search operation request (7.2): Clarified searching with string parameters: default is “exact search” (for some parameters “substring search”) with optional support of range and set notations. Default behavior can be modified: e.g. wildcard searches, Lucene like full text searches…  \*\*  Updated the xml examples: OSDD, Collection response  \*\*  Search parameters of type datetime need to align with RFC 3339 with the exception that the time is optional  \*\* |

1. www.opengeospatial.org/cite [↑](#footnote-ref-1)
2. Implementers are recommended to include a search query example which will return a response with the largest possible set of features, e.g. quick look images, access to data etc. [↑](#footnote-ref-2)
3. The geo:name may be resolved by Gazetteer. A common one used is geonames.org (http://api.geonames.org/searchJSON). [↑](#footnote-ref-3)
4. Including products of logical collections (e.g. containing items of different types, sensor, sensor mode, platforms) [↑](#footnote-ref-4)
5. http://docs.oasis-open.org/search-ws/searchRetrieve/v1.0/os/part5-cql/searchRetrieve-v1.0-os-part5-cql.html [↑](#footnote-ref-5)
6. For INSPIRE alignment mostly mandatory. [↑](#footnote-ref-6)
7. [OGC 10-032r8] only mentions "self", "prev", "previous", "next". "last" and "first" are defined in RFC5988. [↑](#footnote-ref-7)
8. For the identifier see: <https://www.loc.gov/standards/sru/recordSchemas/index.html> [↑](#footnote-ref-8)
9. GeoRSS GML (OGC 17-002r1) [RD.16] does (at the time of writing) not allow representing a multi-polygon, just simple GML elements can appear under georss:where. CR (528) to support multi-polygons is already passed to the OGC and the specification will be adapted accordingly. [↑](#footnote-ref-9)
10. <https://tools.ietf.org/html/rfc5854> [↑](#footnote-ref-10)
11. [OGC 10-032r8] only mentions "self", "prev", "previous", "next". "last" and "first" are defined in RFC5988. [↑](#footnote-ref-11)
12. Note: the official Atom.XSD file used by NASA CWICSmart conformance tests is more strict than this RELAX NG which allows more flexibility. See <https://tools.oasis-open.org/version-control/browse/wsvn/cmis/trunk/SchemaProject/schema/ATOM.xsd> [↑](#footnote-ref-12)
13. Can be applied to gmd:MD\_Metadata (ISO19139 [RD.26]) and gmi:MI\_Metadata (ISO19139-2 [RD.29]) [↑](#footnote-ref-13)
14. A String matching the RFC 3339. "yyyy-mm-ddThh:mm:ss[.S](Z|+/-ZZ:zz)" where yyyy = Four digit year, mm = Two digit month (01 = January), dd = Two digit day of month (01 = first day), hh = Hour of day (00 – 23), mm = Minute of hour (00 – 59), ss = Second of minute (00 – 59), S = Fraction of seconds with any precision, Z = UTC time zone, +/-ZZ:zz = The time zone offset from UTC time zone, where ZZ is the number of offset hours and zz is the number of minutes of the offset hour, all of which is preceded by a minus or plus sign to indicate the direction of the offset. [↑](#footnote-ref-14)
15. the semantic of atom:rights is not 100%: therefore other mappings (accessConstraints, otherConstraints, useConstratints, classification) may make sense. [↑](#footnote-ref-15)
16. Note: it makes sense to provide a gml:Polygon/gml:exterior/gml:LinearRing/gml:posList entry as different clients are able to render this. [↑](#footnote-ref-16)
17. An alternative (or in addition to this) is to include gmd:MD\_Metadata into the ATOM response (see below). [↑](#footnote-ref-17)