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OGC OpenSearch Extension for Earth Observation

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Abstract

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

This candidate 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.

ogcdoc, OGC document, <tags separated by commas>

Preface

This document is 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). The document was initially produced during the ESA HMA (Heterogeneous Missions Accessibility) initiative [OR1] and related projects.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. The Open Geospatial Consortium shall not be held responsible for identifying any or all such patent rights.

*Recipients of this document are requested to submit, with their comments, notification of any relevant patent claims or other intellectual property rights of which they may be aware that might be infringed by any implementation of the standard set forth in this document, and to provide supporting documentation.*

Submitting organizations

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

Terradue SRL

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European Space Agency (ESA)

EADS Astrium

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# 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. The OpenSearch specification is made available under the Creative Commons Attribution-Sharealike 2.5 license.

Earth Observation (EO) products have specific characteristics like the orbit number, processing centre and acquisition station that follow a specific logic inherent to the EO community of users of satellite datasets. Typically an EO product contains information regarding the:

1. Platform or satellite from where it originates (e.g. SPOT, ENVISAT)
2. The sensor used to acquire the data
3. The processing centre responsible for its elaboration together with the date and software used for the processing
4. Specific satellite orbit information like the number, track, frame and direction.

The OpenSearch Description document format allows the use of extensions that allow search engines to inform clients about specific and contextual query parameters. This OGC candidate standard specifies an Earth Observation extension to OpenSearch that defines query parameters that allow the filtering of search results with those fields.

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.

# Conformance

Conformance with this standard shall be checked using all the relevant tests specified in Annex A (normative) of this document. Annex B presents the different 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).

In order to conform to this OGC™interface standard, a software implementation shall choose to implement any one of the conformance classes specified in Table 1. The implementation can be validated with the conformance test 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 requirements belonging to a requirements class and the associated conformance class are shown in the table below.

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.

Table 1 – Conformance Classes

|  |  |  |
| --- | --- | --- |
| **Conformance Class** | **Requirements Class** | **Requirements** |
| /conf/Core | /req/Core | /req/osd  /req/atom  /req/namespaces  /req/response/atom  /req/request/ kvpget  /req/request/parameters |
| /conf/Earth ObservationForeignElement | /req/Earth ObservationForeignElement | /req/entry-eop |
| /conf/Suggestions | /req/Suggestions | /req/suggestions  /req/suggestions-range |
| /conf/INSPIRE | /req/INSPIRE | /req/request/INSPIRE |

# 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.

Atom - The Atom Syndication Format (IETF RFC4287)

Media RSS - http://www.rssboard.org/media-rss

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/os/part4-opensearch/searchRetrieve-v1.0-os-part4-opensearch.html

OGC 06-121r9 - *OWS Common Implementation Specification*

OGC 06-103r4 - *OpenGIS® Implementation Standard for Geographic information - Simple feature access - Part 1: Common architecture*

OGC 10-032r8 - *OpenSearch Geo and Time Extensions*

OGC 10-157r4 – *Earth Observation Metadata profile of Observations & Measurements*

OGC 11-035r1, EO Collection and Service Discovery using the ebRIM Application Profile of CSW 2.0

OGC 06-131r6 – OGC Catalogue Services Standard 2.0 Extension Package for ebRIM Application Profile Earth Observation Products”

OGC 13-084r2 - OGC I15 (ISO19115 Metadata) Extension Package of CS-W ebRIM Profile 1.0.

OGC 09-163r2 – OGC Catalogue Services Specification 2.0 Extension Package for ebRIM Application Profile: SensorML

INSPIRE Metadata Implementing Rules: Technical Guidelines based on EN ISO 19115 and EN ISO 19119 (<http://inspire.ec.europa.eu/index.cfm/pageid/101>)

Technical Guidance for the implementation of INSPIRE Discovery Services (<http://inspire.ec.europa.eu/index.cfm/pageid/5>)

ISO 19115:2003, Geographic Information – Metadata

ISO 19115:2003/Cor 1 2006, Geographic information – Metadata - Corrigendum 1

ISO/TS 19139:2007, Geographic information -- Metadata -- XML schema implementation

ISO19115-2, Geographic information – Metadata – Part 2: Extensions for imagery and gridded data, 2007 ISO19139-2 encoding (http://eden.ign.fr).

OpenSearch Parameter Extension - http://www.opensearch.org/Specifications/ OpenSearch/Extensions/Parameter/1.0/Draft\_2

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

## Other References

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.

# Terms and Definitions

This document uses the terms defined in Sub-clause 5.3 of [OGC 06-121r8], 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.

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.

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.

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.

OpenSearch Geospatial Service

Defines services that comply with the OpenSearch Specification and the Geo extension defined in OGC 10-032

OpenSearch GeoTemporal Service

Defines services that comply with the OpenSearch Specification, the Geo and Time extensions defined in OGC 10-032

OpenSearch Description Document

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

OpenSearch Earth Observation Service

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

Search feed

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

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 [OGC 06-121] apply to this document, plus the following:

EC European Commission

EO Earth Observation

EOP Earth Observation Product

ESA European Space Agency

OASIS Advancing Open Standards for the Information Society

O&M Observations and Measurements

SWS Search Web Services

## Namespace prefix conventions

Table 2 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 2 — Namespace mappings

| **Prefix** | **Namespace URI** | **Specification** |
| --- | --- | --- |
| os | http://a9.com/-/spec/opensearch/1.1/" | OpenSearch 1.1 Specification |
| geo | http://a9.com/-/opensearch/extensions/geo/1.0/ | OpenSearch Geo Extension |
| time | http://a9.com/-/opensearch/extensions/time/1.0/ | OpenSearch Time Extension |
| atom | http://www.w3.org/2005/Atom | The Atom Syndication Format Common 1.0 – RFC-4287 |
| georss | http://www.georss.org/georss | GeoRSS Specification |
| dc | http://purl.org/dc/elements/1.1/ | Namespace Policy for the DCMIa |
| eop | http://www.opengis.net/eop/2.1 | EO product schema namespace defined in OGC 10-157r4 |
| eo | http://a9.com/-/opensearch/extensions/eo/1.0/ | OpenSearch Extension for EO |
| a See <http://dublincore.org/documents/dcmi-namespace/>. | | |

# Overview

As the OpenSearch specification is defined in the OASIS SWS bindings [OASIS OpenSearch], we confine ourselves here to the OpenSearch Earth Observation extension. This specification is complementary to the OpenSearch Geo and Time Extensions (OGC 10-032) and recommends its use for spatial and temporal queries.

The Earth Observation Extension specifies a series of parameters that can be used to constrain search results. These are discussed in more detail in Section 3.1. In short, provision is made to filter results by sensor information, acquisition, processing parameters and other information. The purpose of the OpenSearch Extension for Earth Observation is to make sure that OpenSearch parameters are aligned with OGC 10-157r4 that describes EO products metadata and with ISO19115/ISO19115-2 that is used for describing EO collection metadata. 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.

## Collections and Products

The parameters defined in this extension can be used both to search resources identifying EO Collections (i.e. dataset series) or EO Products (i.e. datasets) although different parameters are more suitable for one of the two (see 3.1).

An EO Collection is defined as a set of EO Products sharing a common specification or characteristics. For example, an EO Collection can be defined as series of EO products of the same satellite (e.g. MSG) and the same sensor (detector, e.g. SEVIRI/optical) acquired at different times.

Within ESA´s Heterogeneous Missions Access (HMA) project [HMA] the EO Collection Metadata (describing an EO Collection) is differentiated from the EO Product Metadata (describing an EO Product) (see Figure 1). EO Collections are described by metadata that are focused on the general application area (usage scenarios), the dissemination channels, access and use constraints and on the producer of the data etc. Nevertheless, it also includes metadata that is equally applicable to EO Products like information on the acquisition type (e.g. satellite and instrument) or on spatial and temporal extents describing the covered area. This metadata shall be interpreted as common to all EO Products of the same collection so that it must not be repeated within the metadata of every single EO Product.



Figure 1 – General UML model of EO Collection and EO Product Metadata

In contrast to EO Collection metadata, EO Product metadata is more geared to concrete technical details of the acquisition, quality, processing, archiving of the concrete EO Product.

## Two Step Search

In a typical search scenario a client will first search for the appropriate EO Collection with the parameters appropriate to EO Collections (see 3.1). In the search response he will find the details (e.g. the identifier or the link to the OpenSearch description document) to search for EO Products of that EO Collection that he identifies as most appropriate.

## Search Optimization

In the case of a two-step search a possible search optimization is to follow an inheritance model as defined in ISO19115 where the product implicitly inherits the properties of the associated collection. Any discovery performed on the products will first validate the corresponding collection. Conversely, product inherits the metadata fields that are common to an entire collection (e.g. data access policies). For example a collection may be defined to a specific geographical area or temporal range that aggregates all the associated products. This federated approach allows a strong optimization of the metadata storage and discovery mechanisms by distributing the server load in several logical or physical data servers.

## Logical Collections

A given number of products from different collections can also be aggregated in special groups for specific applications. Using annotation or any other registry mechanism the *logical collection* will group products that have a special relation or domain specific usage. For example, a *logical collection* could be defined as a group of products from a given number of collections that cover a given spatial-temporal range by special annotation during product ingestion or my administrator configuration. This feature will also allow the definition of application-oriented collections that group the products of interest for that domain. For example, in a emergency situation instead of searching in all the collections for different satellite products, an operator will certainly value the existence of a dedicated feed that groups all past and currently available products of interest to the problem in hand. The logical collection is in its essence a server side classification or arrangement of entries and is seen by the client any other collection.

# OpenSearch Description (Requirement)

The OpenSearch Description Document 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.

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 OpenSearch Description Document (see Example 1), published by the server in XML at a stable URL.

A server provides an OpenSearch description document that a client reads to determine the response formats available and how to formulate a search/retrieve request. The OpenSearch Description Document 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.

An OpenSearch Earth Observation Service shall return a valid OpenSearch description document using the parameters from the EO Extension namespace is an Atom access point.

EXAMPLE 1 The following XML document provides a sample response to a request for an OpenSearch Description 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.

<?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/">

<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/geojson" 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/osd** |
| The server generates a valid OpenSearch description document |

|  |
| --- |
| **Requirement** |
| **/req/namespaces** |
| This namespaces and a corresponding namespace prefix **shall** be included when the extension is used in an OpenSearch Description document or any other XML document:   * http://a9.com/-/opensearch/extensions/eo/1.0/ |

|  |
| --- |
| **Requirement** |
| **/req/atom** |
| Any server supporting the Earth Observation extension **shall** provide an access point returning documents complying with the rules specified in IETF [RFC-4287] (Atom 1.0) |

# OpenSearch Earth Observation operation

## Search operation request

### Search request parameters

An OpenSearch Earth Observation Service should use the time and geo extensions defined in OGC10-032 when supporting the search respectively by acquisition times and acquisition footprint. This Earth Observation Extension defines in Table 3, Table 4, Table 5 and Table 6 an extensive list of OpenSearch parameters that can be supported by a search engine.

It is not expected or advisable for an OpenSearch Earth Observation Service to support all the elements defined in this specification. The elements defined should be used to constrain search results and their use is largely dependent on the search engine contents and capabilities (see also 1).

If a search engine use case is for the discovery of **collections**, it is recommended to use the elements of Table 3 and Table 4 that include parameters like: *platform, orbitType*, *instrument*, *sensorType*, *spectralRange, processingLevel, compositeType, organisationName, useLimitation or accessConstraint.* If the search engine is obliged to be aligned with **INSPIRE** requirements it SHALL support the elements of Table 4.

Conversely, if the search engine use case is for the discovery of **products[[2]](#footnote-2)** associated to a single collection, it is recommended to select additional relevant parameters e.g. from: *orbitNumber*, *orbitDirection*, *track*, *frame*, *archivingCenter*, *processingCenter*, *processingSoftware*, *processingDate*, *cloudCover* and *snowCover* as shown in Table 5. The specific parameters related to the acquisition of Earth Observation products are shown on Table 6.

|  |
| --- |
| **Requirement** |
| **/req/request/parameters** |
| The eo OpenSearch Parameters shall be used as specified in Table 3, Table 5 and Table 6 |

Table 3 - OpenSearch Parameters for Collection Search

| **OpenSearch Parameter a** | **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 c |
| platform | A string with the platform short name (e.g. Sentinel-1) | String c |
| platformSerialIdentifier | A string with the Platform serial identifier | String c |
| instrument | A string identifying the instrument (e.g. MERIS, AATSR, ASAR, HRVIR. SAR). | String c |
| sensorType | A string identifying the sensor type. Suggested values are: OPTICAL, RADAR, ALTIMETRIC, ATMOSPHERIC, LIMB | String c |
| compositeType | Type of composite product expressed as time period that the composite product covers (e.g. P10D for a 10 day composite) | String c |
| processingLevel | A string identifying the processing level applied to the entry | String c |
| orbitType | A string identifying the platform orbit type (e.g. LEO, GEO) | String c |
| spectralRange | A string identifying the sensor spectral range (e.g. INFRARED, NEAR-INFRARED, UV, VISIBLE) | String c |
| wavelength | A number, set or interval requesting the sensor wavelengths in nanometers. | Integer b d |
| hasSecurityConstraints | A string informing if the resource has any security constraints. Possible values: TRUE, FALSE | String c |
| dissemination | A string identifying the dissemination method (e.g. EUMETCast, EUMETCast-Europe, DataCentre) | String c |
| a The name capitalization rules are specified in Subclause 11.6.2 of [OGC 06-121]. b It uses mathematical notation for ranges and sets to define the intervals with:   *n1* equal to field = n1, *{n1,n2,…}* equals to field=n1 OR field=n2 OR …  *[n1,n2]* equal to n1 <= field <= n2, *[n1,n2[* equals to n1 <= field < n2  *]n1,n2[* equals to n1 < field < n2 *]n1,n2]* equal to n1 < field <= n2.  *[n1* equals to n1<= field *]n1* equals to n1 < field  *n2]* equals to field <= n2 n2[ equals to field < n2. c OpenSearch Earth Observation Services are recommended to suggest the supported list of values on the OpenSearch Description document using the OpenSearch Parameter Extension , standard values for lists are suggested in OGC 10-157r4.  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 4 – Additional INSPIRE obligated OpenSearch Parameters for Collection Search

| **OpenSearch Parameter a** | **Definition** | **Data Type** |
| --- | --- | --- |
| title | A name given to the resource i | String |
| topicCategory | Main theme(s) of the dataset i | String c |
| keyword | Commonly used word(s) or formalised word(s) or phrase(s) used to describe the subject. h | String c |
| abstract | Abstract. i | String |
| *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 c |
| organizationName | A string identifying the name of the organization responsible for the resource i | String c |
| organizationRole | The function performed by the responsible party i | String j,c |
| lineage | General explanation of the data producer’s knowledge about the lineage of a dataset. i | String c |
| useLimitation | A string identifying informing if the resource has usage limitations i | String c |
| accessConstraint | Applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the resource i | String e,c |
| otherConstraint | Other restrictions and legal prerequisites for accessing and using the resource or metadata. i | String c |
| classification | Name of the handling restrictions on the resource or metadata i | String f,c |
| language | Language of the intellectual content of the metadata record i | String 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. If using this he parameters  **specificationDate**: Reference date of specification i  **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 c  Date timed  String k,c  String c |
| a The name capitalization rules are specified in Subclause 11.6.2 of [OGC 06-121]. b It uses mathematical notation for ranges and sets to define the intervals with:   *n1* equal to field = n1, *{n1,n2,…}* equals to field=n1 OR field=n2 OR …  *[n1,n2]* equal to n1 <= field <= n2, *[n1,n2[* equals to n1 <= field < n2  *]n1,n2[* equals to n1 < field < n2 *]n1,n2]* equal to n1 < field <= n2.  *[n1* equals to n1<= field *]n1* equals to n1 < field  *n2]* equals to field <= n2 n2[ equals to field < n2. c OpenSearch Earth Observation Services are recommended to suggest the supported list of values on the OpenSearch Description document using the OpenSearch Parameter Extension , standard values for lists are suggested in OGC 10-157r4.  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.  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 [RD12] 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  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 | | |

|  |
| --- |
| **Requirement** |
| **/req/request/INSPIRE** |
| The OpenSearch Parameters relevant for INSPIRE shall be supported as specified in Table 4. |

Table 5 - OpenSearch Parameters for Product Search

|  |  |  |
| --- | --- | --- |
| **OpenSearch Parameter a** | **Definition** | **Data Type** |
| parentIdentifier | A string identifying the parent of the entry in a hierarchy of resources | String c |
| productionStatus | A string identifying the status of the entry (e.g. ARCHIVED, ACQUIRED, CANCELLED) | String 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 c |
| orbitNumber | A number, set or interval requesting the acquisition orbit | Integer b |
| orbitDirection | A string identifying the acquisition orbit direction. Possible values are: ASCENDING, DESCENDING | String |
| track | A number, set or interval requesting the range of orbit tracks | Integer b |
| frame | A number, set or interval requesting the range of orbit frames | Integer b |
| 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 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 |
| productQualityStatus | This optional field must be provided if the product passed a quality check. Possible values: NOMINAL and DEGRADED | String c |
| productQuality DegradationTag | 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 c |
| processorName | A string identifying the processor software name | String c |
| processingCenter | A string identifying the processing center (e.g. PDHS-E, PDHS-K, DPA, F-ACRI) | String c |
| creationDate | The date when the metadata item was ingested for the first time (i.e. inserted) in the catalogue | Date timed |
| modificationDate | The date when the metadata item was last modified (i.e. updated) in the catalogue. | Date timed |
| processingDate | A date interval requesting entries processed within a given time interval | Date timed |
| sensorMode | A string identifying the sensor mode. | String c |
| archivingCenter | A string identifying the archiving center. | String c |
| processingMode | Processing mode. Often referred to as Real Time, Near Real Time etc. | String c |
| a The name capitalization rules are specified in Subclause 11.6.2 of [OGC 06-121]. b It uses mathematical notation for ranges and sets to define the intervals with:   *n1* equal to field = n1, *{n1,n2,…}* equals to field=n1 OR field=n2 OR …  *[n1,n2]* equal to n1 <= field <= n2, *[n1,n2[* equals to n1 <= field < n2  *]n1,n2[* equals to n1 < field < n2 *]n1,n2]* equal to n1 < field <= n2.  *[n1* equals to n1<= field *]n1* equals to n1 < field  *n2]* equals to field <= n2 n2[ equals to field < n2 c OpenSearch Earth Observation Services are recommended to suggest the supported list of values on the OpenSearch Description document using the OpenSearch Parameter Extension, standard values for lists are suggested in OGC 10-157r4. 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 - OpenSearch Parameters for Acquistion Parameters Search

|  |  |  |
| --- | --- | --- |
| **OpenSearch Parameter a** | **Definition** | **Data Type** |
| availabilityTime | The time when the result becomes available dateTime in ISO 8601 format (CCYY-MM- DDThh:mm[:ss[.cc]]Z) | Date Time b d |
| acquisitionStation | A string identifying the station used for the acquisition | String c |
| acquisitionSub Type | Acquisition sub-type | String c |
| startTimeFrom AscendingNode | Start time of acquisition in milliseconds from Ascending node date. | Integer b d |
| completionTime FromAscending Node | Completion time of acquisition in milliseconds from Ascending node date. | Integer b d |
| illumination AzimuthAngle | Mean illumination/solar azimuth angle given in degrees. (i.e. uom='deg') | Double b d |
| illumination ZenithAngle | Mean illumination/solar zenith angle given in degrees. | Double b d |
| illumination ElevationAngle | 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 c |
| polarization Channels | Polarisation channel transmit/receive configuration: horizontal, vertical. | String c |
| antennaLook Direction | LEFT or RIGHT | String c |
| minimum IncidenceAngle | Minimum incidence angle given in degrees (i.e. uom='deg') | Double b d |
| maximum IncidenceAngle | Maximum incidence angle given in degrees (i.e. uom='deg') | Double b d |
| dopplerFrequency | Doppler Frequency of acquisition | Double b d |
| incidenceAngle Variation | Incidence angle variation | Double b d |
| a The name capitalization rules are specified in Subclause 11.6.2 of [OGC 06-121]. b It uses mathematical notation for ranges and sets to define the intervals with:   *n1* equal to field = n1, *{n1,n2, …}* equals to field=n1 OR field = n2 OR ..  *[n1,n2]* equal to n1 <= field <= n2, *[n1,n2[* equals to n1 <= field < n2  *]n1,n2[* equals to n1 < field < n2 *]n1,n2]* equal to n1 < field <= n2.  *[n1* equals to n1<= field *]n1* equals to n1 < field  *n2]* equals to field <= n2 n2[ equals to field < n2 c OpenSearch Earth Observation Services are recommended to suggest the supported list of values on the OpenSearch Description document using the OpenSearch Parameter Extension, standard values for lists are suggested in OGC 10-157r4 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 | | |

To suggest clients of the possible values of a given parameter an OpenSearch Earth Observation Service should make use of the OpenSearch Parameter Extension.

EXAMPLE 2 The following XML document 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 clients the possible values for temporal range and acquisition station names:

<?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>

|  |
| --- |
| **Requirement** |
| **/req/suggestions** |
| The server implements a list of suggestions for string parameters for the Earth Observation extension elements on the OpenSearch Description document. |

|  |
| --- |
| **Requirement** |
| **/req/suggestions-range** |
| The server implements a suggestion of parameters range for the Earth Observation extension elements on the OpenSearch Description document. |

All parameters of the OpenSearch query **should** be mapped to the appropriate catalogue or metadata fields of the underlying metadata management system. Annex D shows the suggested mappings for

* Earth Observation Metadata profile of Observations & Measurements
* ISO 19115 / ISO19115-2 Geographic information – Metadata
* OGC Catalogue Services Standard 2.0 Extension Package for ebRIM Application Profile Earth Observation Products
* OGC I15 (ISO19115 Metadata) Extension Package of CS-W ebRIM Profile
* OGC Catalogue Services Specification 2.0 Extension Package for ebRIM Application Profile : SensorML

### Search request KVP encoding (mandatory)

|  |
| --- |
| **Requirement** |
| **/req/request/kvpget** |
| Servers shall implement HTTP GET transfer of the Search operation request, using KVP encoding. |

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 and can be replaced with the empty string, then the "?" notation described in the section on optional template parameters should be used. 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 URL components (e.g. path, host).

EXAMPLE 3 A search operation URL template with the OpenSearch Parameter as a Querystring 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

EXAMPLE 4 A search operation URL template with one of OpenSearch Parameter as the URL path and the corresponding request:

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

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

## Search operation response

### Normal response parameters

The normal response to a valid Search operation request **shall** be in one of several formats that are specified in the OpenSearch Description for a given instance. The mandatory response format is Atom but the server may support other formats.

### Normal response XML encoding

The normative response format for an OpenSearch service using Earth Observation Extension **shall** be ATOM 1.0. The properties shown in the Atom and OpenSearch namespaces are those mandated by the core specification.

Following the Atom format the response is made of a *atom:feed* element that may contain several *atom:entry* elements. While the latter describe the returned resources that respect the query performed the first describes the discovery service or search engine.

|  |
| --- |
| **Requirement** |
| **/req/response/atom** |
| The server response in Atom encoding shall be in accordance with the rules defined in Table 7 and Table 8. |

In the *atom:feed* element the response **should** include the elements listed in Table 7 and the atom:entry elements **should** include the elements listed in Table 8. The metadata for each item in the result set **should** provide a link to a “full” view of the result, where more detailed metadata according to OGC 10-157r4 can be provided and, when available, a direct link to the resource using the *atom:link* element.

|  |
| --- |
| **Requirement** |
| **/req/entry-eop** |
| The response includes an eop:EarthObservation element or a more specialized element such as opt:EarthObservation, sar:EarthObservation or other allowed by OGC 10-157r4 for each entry. |

Table 7 —Elements of Search operation response in the *atom:feed* element

| **Term** | **OGC core returnable** | **Atom Element** | **Description** | **Mult.** |
| --- | --- | --- | --- | --- |
| Title | dc:title | atom:feed/ atom:title | A title for the search feed. | 1  mandatory |
| Creator | dc:creator | atom:feed/ atom:author | An entity primarily responsible for making the content of the search feed | 1  mandatory |
| Subject | dc:subject | atom:feed/ atom:category | A topic of the search feed. | n  optional |
| Abstract | dct:abstract | atom:feed/ atom:subtitle | An account of the content of the search feed | 1  optional |
| Publisher | dc:publisher | atom:feed/ atom:generator | An entity or agent responsible for making the search feed. | 1  optional |
| Contributor | dc:contributor | atom:feed/ atom:contributor | An entity responsible for making contributions to the content of the search feed | n  optional |
| Modified | dc:date | atom:feed/ atom:updated | A date of a creation or update of the search feed (RFC 3339) | 1 optional |
| 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. | 1  mandatory |
| atom:feed/ dc:identifier | The local identifier of the feed. | 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 (RFC 5646) | 1  optional |
| Envelope | dct:spatial | atom:feed/  georss:\* | The maximal spatial extent of the search feed (GEORSS). | n  optional |
| Rights | dc:rights | atom:feed/ atom:rights | Information about rights held in and over the resource | 1  optional |
| Relation  (next page and previous pages) | dc:relation | atom:feed/atom:link[@rel= ‘next‘] | Reference to the next page of the search feed | 1  optional |
| atom:feed/atom:link[@rel= ‘previous‘ or @rel=”prev”] | Reference to the previous page of the search feed | 1  optional |
| atom:feed/atom:link[@rel=’up’] | Refers to a parent resource in a hierarchy of resources. | n  optional |
| Query | - | atom:feed/os:Query | Defines the search request query. | 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 | 1  mandatory |
| atom:feed/ os:startIndex | OpenSearch element with the index of the first feed’s entry. | 1  mandatory |
| atom:feed/ os:itemsPerPage | OpenSearch element with the number of entries returned per page. | 1  mandatory |
| Note: This table is equal Table 6 of OGC 10-032r8 | | | | |

Table 8 —Elements of Search operation response in the *atom:entry* elements describing each search result

| **Term** | **OGC returnable** | **Atom Element** | **Description** | **Mult.** |
| --- | --- | --- | --- | --- |
| Title | dc:title | atom:entry/ atom:title | A title given to the resource. | 1  mandatory |
| Creator | dc:creator | atom:entry/ atom:author | An entity primarily responsible for making the content of the resource | 1  optional |
| 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 |
| Abstract | dct:abstract | atom:entry/ atom:summary | An account of the content of the resource | 1  optional |
| Contributor | dc:contributor | atom:entry/ atom:contributor | An entity responsible for making contributions to the content of the resource | n  optional |
| Modified | dc:date | atom:entry/ atom:updated | A date of a creation or update of the metadata resource (RFC-3339) a | 1  optional |
| Date | eop:EarthObservation /om:phenomenonTime/gml:TimePeriod | atom:entry/ dc:date | A date or range of dates relevant to the resource (RFC-3339) a. | 1  optional |
| 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 |
| atom:entry/ dc:identifier | The identifier of the resource within the search engine context (local reference). | 1  optional |
| 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. | n  optional |
| Language | dc:language | atom:entry/ @xml:lang | A language of the intellectual content of the resource as defined in RFC 5646 | 1  optional |
| Rights | dc:rights | atom:entry/ atom:rights | Information about rights held in and over the resource | 1  optional |
| Envelope | eop:Footprint | atom:entry/  georss:\* | The spatial extent or scope of the content of the resource defined with an GEORSS element | 1  optional |
| 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:entry/ atom:link[@rel=’enclosure’] | Reference to the location of the data resource described in the entry | n  optional |
| atom:entry/atom:link[@rel=’icon’] | Reference to a quicklook or browse image representing the entry b | n  optional |
| atom:entry/ atom:link[@rel=’alternative’] | A reference to a document with the entry information in an alternative format c | n  optional |
| atom:entry/atom:link[@rel=’up’] | Refers to a parent resource in a hierarchy of resources | n  optional |
| Format | dc:format | atom:entry/atom:link[@rel=’enclosure’]/@type | The MIME types of the data resources available | n  optional |
| Additional Metadata |  |  | O&M metadata (eop:Earth Observation) or ISO (gmi:MI\_Metadata) | 1  optional |
| a When specifying a temporal range the element should contain two dates separated by a slash, like: <dc:date>2004-02-19T03:03:23.736Z/2010-09-12T15:57:36.072Z</dc:date>  b The different images are differentiated by type and size.  c An atom:entry MUST NOT contain more than one atom:link element with a rel attribute value of "alternate" that has the same combination of type and hreflang attribute values  Note: Grey rows show differences with Table 7 of OGC 10-032r8 | | | | |

### Search context propagation to external end points

If the resource described in the response entry aggregates other resources (e.g. is a collection or a search service) it should possess an atom:link with the relation “search” [RFC 5988]. This feature can be used to define recursive searches where the search context (e.g. queriables) is propagated to an internal or external service (see e.g. 1.2). It can also allow the aggregation of entries into collections or groups.

EXAMPLE 5 Defining access to the product file of the atom:entry

<atom:link rel="search" type="application/opensearchdescription+xml" href="http://search.acme.com/osd.xml" title="Search this resource" />

When an entry contains a link with the *rel* attribute equal to “search” and the *type* attribute equal to “application/opensearchdescription+xml” clients are recommended to propagate the query parameters to the search engine described by the OpenSearch description document located on the *href* attribute value using the original query parameters.

### Linking entry with metadata

If possible, the access to the original authoritative metadata source of the entry should be given using one atom:link element with the atom:rel equal to “via” [RFC5988] with the corresponding format announced in the type attribute. If the information of this entry is available in other formats then it is advised to include atom:link elements for each format using the “alternate” [RFC 5988] relation name and corresponding format in the type attribute.

EXAMPLE 6 Defining the access to authoritative source and alternative representations of the atom:entry

<atom:link rel="alternate" type="application/vnd.google-earth.kml+xml" title="KML file" href="http://site.com/eo/asarimageEOOM.kml" length="54321"/>

<atom:link rel="alternate" type="application/gml+xml" title="EO O&M Metadata" href="http://site.com/eo/asarimageEOOM.xml" length="1245"/>

<atom:link rel="via" type="application/vnd.iso.19139+xml" length="845" title="ISO 19139 Metadata" href="http://site.com/eo/asarimageISO.xml"/>

### Linking an entry with its thumbnail, quicklook or masks

To define the reference to a resource representing a quicklook, browse image or cloud mask that represents the entry, the “Media RSS Specification” **should** be used [Media RSS]. Each of the images should be included as a separate *media:content* element. Multiple elements (e.g. Quicklook and cloud mask) for the same entry single entry **should** be included in the same media:*group* element.

The scheme parameter in the media:category element should reflect a thesaurus/codelist covering the various possibilities, e.g. the values allowed in the OGC 10-157r4 codelist for browse/BrowseInformation/type (THUMBNAIL, QUICKLOOK, ALBUM) and mask/MaskInformation/type (SNOW, CLOUD, QUALITY).

EXAMPLE 7 Defining the reference to the quicklook 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://mda.com/browse/RADARSAT-2/2012/08/01/PASS\_RS2\_210671\_3\_32488\_1.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>

### 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. In particular, it is recommended to use the following error codes in the particular situations of client error:

* *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

For server side errors the following error codes are recommended:

* *500 Internal Server Error*: Default code for the server side for an execution error.
* *501 Not Implemented*: When requesting an unimplemented feature.
* *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 a answer within a giving time frame.

EXAMPLE 13 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)

Annex A: Conformance Class Abstract Test Suite (Normative)

* 1. Conformance Test Class Core (/conf/Core)
     1. OpenSearch description document

|  |  |
| --- | --- |
| Requirements: | /req/osd |
| 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. |
| References: | Section 8 |
| Test type: | Capability |

* + 1. Atom Response Type

|  |  |
| --- | --- |
| Requirements: | /req/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. |
| References: | Section 9.1 |
| Test type: | Capability |

* + 1. Namespaces

|  |  |
| --- | --- |
| Requirements: | /req/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 |
| References: | Section 9.1 |
| Test type: | Capability |

* + 1. ATOM response

|  |  |
| --- | --- |
| Requirements: | /req/response/atom |
| Test Purpose: | Verify that the server response is a valid ATOM document |
| Test Method: | Execute search request and validate the ATOM document |
| References: | Section 9.1 |
| Test type: | Capability |

* + 1. KVP GET

|  |  |
| --- | --- |
| 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 |
| References: | Section 9.1 |
| Test type: | Capability |

* + 1. 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 |
| References: | Section 9.1 |
| Test type: | Capability |

* 1. Conformance Test Class EarthObservationForeignElement (/conf/EarthObservationForeignElement)
     1. EarthObservationForeignElement

|  |  |
| --- | --- |
| Requirements: | /req/entry-eop |
| Test Purpose: | Verify that the server response includes a eop:EarthObservation (or derived) element for each entry. |
| Test Method: | Submit a series of requests to the server and verify that the server responds as include an eop:EarthObservation (or derived) element for each entry. |
| References: | Section 9.2.1 Table 5 Note d |
| Test type: | Capability |

* 1. Conformance Test Class Suggestions (/conf/Suggestions)
     1. Suggestions

|  |  |
| --- | --- |
| Requirements: | /req/suggestions |
| Test Purpose: | Verify that the server implements a list of suggestions for string parameters for the Earth Observation extension elements on the OpenSearch Description document. |
| Test Method: | Execute an HTTP GET request to retrieve a server's description document. Verify that the URL template includes parameters of the character string type (Table 5, note c). Verify that the document includes a parameter element with the attribute pattern or with child Option elements with suggested values. |
| References: | Section 9.1 |
| Test type: | Capability |

* + 1. Suggestions-Range

|  |  |
| --- | --- |
| Requirements: | /req/suggestions-range |
| Test Purpose: | Verify that the server implements a suggestion of parameters range for the Earth Observation extension elements on the OpenSearch Description document. |
| Test Method: | Execute an HTTP GET request to retrieve a server's description document. Verify that the URL template includes parameters of the numeric type (Table 5, note d). Verify that the document includes a parameter element with the attribute suggesting the value range. |
| References: | Section 9.2.1 Table 5 Note c |
| Test type: | Capability |

* 1. Conformance Test Class INSPIRE (/conf/INSPIRE)
     1. INSPIRE

|  |  |
| --- | --- |
| Requirements: | /req/request/INSPIRE |
| Test Purpose: | Verify that the server supports the INSPIRE relevant (mandatory) OpenSearch parameters (queryables are: useLimitation, accessConstraint, otherConstraint, classification, organisationName, organizationRole, topicCategory, lineage, keyword, denominator, distanceValue, distanceUOM, language, title, abstract, start, end, box, specificationTitle, specificationDate, specificationdateType, Degree). |
| Test Method: | Verify that the OpenSearch Description Document includes a URL Search Template providing all INSPIRE relevant search parameters. |
| References: | Section 8.1.1 |
| Test type: | Capability |

Annex B: XML Schema Documents

* 1. Atom Schema (schemas/atom/2005/rfc4287.rnc)

# -\*- 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

* 1. 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

* 1. 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

* 1. 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

* 1. 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

* 1. 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

* 1. 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: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 }?

# 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:organizationName { text }?

& attribute eo:organizationRole { text }?

& 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 { intValueOrSetOrRange }?

& attribute eo:frame { intValueOrSetOrRange }?

& attribute eo:swathIdentifier { text }?

& attribute eo:cloudCover { intValueOrSetOrRange }?

& attribute eo:snowCover { intValueOrSetOrRange }?

& 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:polarizationChannels { 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}))?[\]\[\(\)]"}

* 1. 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

* 1. 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 C (informative): Example XML Documents

C.1 OpenSearch Description with Earth Observation 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/-/opensearch/extensions/param/1.0/"

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

xmlns:geo="http://a9.com/-/opensearch/extensions/geo/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?}&amp;acq={eo:acquisitionStation?}&amp;bbox={geo:box?}&amp;start={time:start?}&amp;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="Acquisiton 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>

C.2 Atom Output of Earth Observation Metadata

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

<feed xml:lang="en" xmlns="http://www.w3.org/2005/Atom" xmlns:time="http://a9.com/-/opensearch/extensions/time/1.0/"

xmlns:os="http://a9.com/-/spec/opensearch/1.1/" xmlns:dc="http://purl.org/dc/elements/1.1/"

xmlns:georss="http://www.georss.org/georss" xmlns:gml="http://www.opengis.net/gml"

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

<title>Catalogue Search Feed for ASAR Image Mode source packets Level 0 (ASA\_IM\_\_0P)</title>

<subtitle type="html">The ASAR Image Mode source packets Level 0 data product offers Level 0 data for possible images processing on an other processing site. It includes some mandatory information for SAR processing. The Image Mode Level 0 product consists of time-ordered Annotated Instrument Source Packets (AISPs) collected while the instrument is in Image Mode. The echo samples contained in the AISPs are compressed to 4 bits/sample using Flexible Block Adaptive Quantisation (FBAQ). This is a high-rate, narrow swath mode so data is only acquired for partial orbit segments and may be from one of seven possible image swaths. The Level 0 product is produced systematically for all data acquired within this mode. This product provides a continuation of the ERS-SAR\_RAW product.</subtitle>

<generator uri="http://www.terradue.com" version="1.4.0">Terradue CAS</generator>

<updated>2013-03-24T17:54:40Z</updated>

<id>http://eo-virtual-archive4.esa.int/search/ASA\_IM\_\_0P/atom/</id>

<link rel="self" type="application/atom+xml" href="http://eo-virtual-archive4.esa.int/search/ASA\_IM\_\_0P/atom//?startIndex=0&amp;start=2010-01-01&amp;stop=2010-01-31&amp;bbox=125,39.9,132.7,43.5"/>

<link rel="search" type="application/opensearchdescription+xml" href="http://eo-virtual-archive4.esa.int/search/ASA\_IM\_\_0P/description"/>

<os:totalResults>1</os:totalResults>

<os:startIndex>0</os:startIndex>

<os:itemsPerPage>20</os:itemsPerPage>

<os:Query role="request" startIndex="0" time:start="2010-01-01" time:end="2010-01-31" geo:box="125,39.9,132.7,43.5"/>

<georss:where><gml:Polygon><gml:exterior><gml:LinearRing>

<gml:posList>39.9 125 43.5 125 43.5 132.7 39.9 132.7 39.9 132.7</gml:posList>

</gml:LinearRing></gml:exterior></gml:Polygon></georss:where>

<author><name>GEOSS Supersites</name></author>

<entry>

<id>http://eo-virtual-archive4.esa.int/search/ASA\_IM\_\_0P/ASA\_IM\_\_0CNPDE20100122\_014441\_000000162086\_00146\_41282\_7918.N1/atom</id>

<title>ASA\_IM\_\_0CNPDE20100122\_014441\_000000162086\_00146\_41282\_7918.N1</title>

<dc:identifier>ASA\_IM\_\_0CNPDE20100122\_014441\_000000162086\_00146\_41282\_7918.N1</dc:identifier>

<published>2012-03-06T00:10:33.000Z</published>

<updated>2013-05-16T22:25:57.124Z</updated>

<dc:date>2010-01-22T01:44:41.316Z/2010-01-22T01:44:57.596Z</dc:date>

<georss:where><gml:Polygon><gml:exterior><gml:LinearRing><gml:posList srsDimension="2">42.2879 128.7535 42.4897 127.4932 41.4254 127.1936 41.2326 128.3991 42.2879 128.7535

</gml:posList></gml:LinearRing></gml:exterior></gml:Polygon></georss:where>

<link rel="alternate" type="application/vnd.google-earth.kml+xml" title="KML file" href="http://eo-virtual-archive4.esa.int/search/ASA\_IM\_\_0P/ASA\_IM\_\_0CNPDE20100122\_014441\_000000162086\_00146\_41282\_7918.N1/kml"/>

<link rel="alternate" type="text/html" title="HTML page" href="http://eo-virtual-archive4.esa.int/search/ASA\_IM\_\_0P/ASA\_IM\_\_0CNPDE20100122\_014441\_ 000000162086\_00146\_41282\_7918.N1/html"/>

<link rel="via" type="application/rdf+xml" title="RDF metadata entry" href="http://eo-virtual-archive4.esa.int/search/ASA\_IM\_\_0P/ASA\_IM\_\_ 0CNPDE20100122\_014441\_000000162086\_00146\_41282\_7918.N1/rdf"/>

<link rel="enclosure" type="application/binary" length="157076059" title=" File ASA\_IM\_\_0CNPDE20100122\_014441\_000000162086\_00146\_41282\_7918.N1 in the N1 (ENVISAT) format" href="https://eo-virtual-archive4.esa.int/supersites/ASA\_IM\_\_ 0CNPDE20100122\_014441\_000000162086\_00146\_41282\_7918.N1"/>

<content type="html">

&lt;ul&gt; &lt;li&gt; &lt;b&gt;Date&lt;/b&gt;: 2010-01-22 &lt;br/&gt;

(2010-01-22T01:44:41.316Z / 2010-01-22T01:44:57.596Z) &lt;/li&gt;

&lt;li&gt; &lt;b&gt;Orbit Number&lt;/b&gt;: 41282 &lt;/li&gt;

&lt;li&gt; &lt;b&gt;Processing Center&lt;/b&gt;: PDHS-E &lt;/li&gt;

&lt;li&gt; &lt;b&gt;Processing Date&lt;/b&gt;: 2010-01-22 &lt;/li&gt;

&lt;br/&gt;

&lt;a href="https://eo-virtual-archive4.esa.int/supersites/ASA\_IM\_\_0CNPDE20100122\_014441\_000000162086\_00146\_41282\_7918.N1"&gt;Product Download &lt;/a&gt;

&lt;/ul&gt;

</content>

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

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

xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:gml="http://www.opengis.net/gml/3.2" xmlns:eop="http://www.opengis.net/eop/2.1" xmlns:swe="http://www.opengis.net/swe/1.0" xmlns:om="http://www.opengis.net/om/2.0"

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>

<gml:endPosition>2010-01-22T01:44:57.596Z</gml:endPosition>

</gml:TimePeriod></om:phenomenonTime><om:resultTime>

<gml:TimeInstant

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

<gml:timePosition>2010-01-22T02:35:06.000Z</gml:timePosition>

</gml:TimeInstant></om:resultTime>

<om:procedure>

<eop:EarthObservationEquipment

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

<eop:platform><eop:Platform><eop:shortName>ENVISAT</eop:shortName>

</eop:Platform></eop:platform>

<eop:instrument><eop:Instrument><eop:shortName>ASAR</eop:shortName>

</eop:Instrument>

</eop:instrument>

<eop:sensor><eop:Sensor><eop:sensorType>RADAR</eop:sensorType>

</eop:Sensor></eop:sensor>

</eop:EarthObservationEquipment>

</om:procedure>

<om:observedProperty xlink:href="#params1"/>

<om:featureOfInterest>

<eop:Footprint gml:id="fp\_ASA\_IM\_\_0CNPDE20100122\_014441\_000000162086\_00146\_41282\_7918.N1">

<eop:multiExtentOf><gml:MultiSurface gml:id="ms\_ASA\_IM\_\_0CNPDE20100122\_014441\_000000162086\_00146\_41282\_7918.N1" srsName="EPSG:4326"><gml:surfaceMember><gml:Polygon gml:id="p\_ASA\_IM\_\_0CNPDE20100122\_014441\_000000162086\_00146\_41282\_7918.N1">

<gml:exterior><gml:LinearRing>

<gml:posList>42.2879 128.7535 42.4897 127.4932 41.4254 127.1936 41.2326 128.3991 42.2879 128.7535</gml:posList>

</gml:LinearRing></gml:exterior></gml:Polygon>

</gml:surfaceMember></gml:MultiSurface></eop:multiExtentOf>

</eop:Footprint>

</om:featureOfInterest>

<om:result></om:result>

<eop:metaDataProperty>

<eop:EarthObservationMetaData>

<eop:identifier> ASA\_IM\_\_0CNPDE20100122\_014441\_000000162086\_00146\_41282\_7918.N1 </eop:identifier>

<eop:acquisitionType>NOMINAL</eop:acquisitionType>

<eop:productType>ASA\_IM\_\_0P</eop:productType>

<eop:status>ARCHIVED</eop:status>

<eop:downlinkedTo><eop:DownlinkInformation>

<eop:acquisitionStation>PDHS-E</eop:acquisitionStation>

</eop:DownlinkInformation></eop:downlinkedTo>

<eop:processing><eop:ProcessingInformation>

<eop:processingCenter>PDHS-E</eop:processingCenter>

</eop:ProcessingInformation></eop:processing>

</eop:EarthObservationMetaData>

</eop:metaDataProperty>

</eop:EarthObservation>

</entry>

</feed>

C.3 Atom Output of Earth Observation Collection Metadata

<atom:feed xml:lang="en" xmlns:atom="http://www.w3.org/2005/Atom" xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:gml="http://www.opengis.net/gml" xmlns:georss="http://www.georss.org/georss" xmlns:eop="http://a9.com/-/opensearch/extensions/eo/1.0/" xmlns:eum="http://a9.com/-/opensearch/extensions/eumetsat/1.0/" xmlns:time="http://a9.com/-/opensearch/extensions/time/1.0/" xmlns:geo="http://a9.com/-/opensearch/extensions/geo/1.0/" xmlns:opensearch="http://a9.com/-/spec/opensearch/1.1/" xmlns:kml="http://earth.google.com/kml/2.2">

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

<atom:subtitle type="html">Number of results: 58</atom:subtitle>

<atom:id>http://46.51.189.235:80/atom</atom:id>

<atom:generator version="2.1" uri="http://46.51.189.235:80">EUMETSAT Product Navigator</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>2014-03-14T11:23:28Z</atom:updated>

<atom:icon>http://46.51.189.235:80/soapServices/feed-icon-14x14.png</atom:icon>

<atom:logo>http://46.51.189.235:80/soapServices/terraCatalog\_feed.png</atom:logo>

<opensearch:totalResults>58</opensearch:totalResults>

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

<opensearch:itemsPerPage>10</opensearch:itemsPerPage>

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

<atom:link title="Product Navigator search" type="application/opensearchdescription+xml" href="http://46.51.189.235:80/soapServices/os-description.xml" rel="search"/>

<atom:link title="Product Navigator search" type="application/opensearchdescription+xml" href="http://46.51.189.235:80/soapServices/os-description.xml" rel="up"/>

<atom:link title="self" type="application/atom+xml" href="http://46.51.189.235:80/soapServices/OpenSearch?format=atom&amp;sI=1&amp;c=1&amp;q=wind" rel="self"/>

<atom:link title="next" type="application/atom+xml" href="http://46.51.189.235:80/soapServices/OpenSearch?format=atom&amp;sI=1&amp;c=1&amp;q=wind&amp;pw=2" rel="next"/>

<entry xml:lang="en" xmlns="http://www.w3.org/2005/Atom" xmlns:dc="http://purl.org/dc/elements/1.1/" xmlns:eum="http://www.eumetsat.int/2008/gmi" xmlns:gmi="http://www.isotc211.org/2005/gmi">

<title>ASCAT AHRPT - Metop</title>

<category term="climatologyMeteorologyAtmosphere"/>

<category term="Observation"/>

<category term="Marine"/>

<category term="Satellite\_Data"/>

<category term="Sea\_Ice"/>

<id>EO:EUM:DAT:METOP:ASCATAHRPT</id>

<dc:identifier>EO:EUM:DAT:METOP:ASCATAHRPT</dc:identifier>

<link 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:ASCATAHRPT" rel="alternate" type="application/vnd.iso.19139+xml"/>

<link href="http://46.51.189.235:80/discovery/Start/DirectSearch/DetailResult.do?f(r0)=EO:EUM:DAT:METOP:ASCATAHRPT" rel="alternate" title="ASCAT AHRPT - Metop" type="text/html"/>

<generator uri="http://navigator.eumatsat.int" version="2.1">EUMETSAT Product Navigator</generator>

<author>

<name>EUMETSAT</name>

<email>ops@eumetsat.int</email>

</author>

<updated>2010-09-21</updated>

<summary>The prime objective of the Advanced SCATterometer (ASCAT) is to measure wind speed and direction over the oceans, and the main operational application is the assimilation of ocean winds in NWP models. Other operational applications, based on the use of measurements of the backscattering coefficient, are sea ice edge detection and monitoring, monitoring sea ice, snow cover, soil moisture and land surface parameters.</summary>

<georss:where>

<gml:Polygon srsName="urn:x-ogc:def:crs:EPSG:6.7:4326">

<gml:exterior>

<gml:LinearRing>

<gml:posList srsDimension="2">90.0 -180.0 -90.0 -180.0 -90.0 180.0 90.0 180.0 90.0 -180.0</gml:posList>

</gml:LinearRing>

</gml:exterior>

</gml:Polygon>

</georss:where>

<rights>-</rights>

<link href="http://www.eumetsat.int/Home/Main/Satellites/Metop/Services/SP\_2010034162824650?l=en" rel="enclosure" title="Metop Direct Readout Service" type="text/html"/>

<content type="html"><![CDATA[<a href="http://www.eumetsat.int/Home/Main/Satellites/Metop/Services/SP\_2010034162824650?l=en">Metop Direct Readout Service</a>

<br/>

<a href="http://46.51.189.235:80/discovery/Start/DirectSearch/DetailResult.do?f(r0)=EO:EUM:DAT:METOP:ASCATAHRPT">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:ASCATAHRPT">Metadata (ISO19139 XML)</a>

<br/>

<a href="http://46.51.189.235:80/soapServices/OpenSearch?format=atom&id=EO:EUM:DAT:METOP:ASCATAHRPT">ATOM</a>

<br/>]]></content>

</entry>

</atom:feed>

Annex D (informative): Metadata Mappings

D.1 Mapping for EO Metadata profile of Observations & Measurements

In the table below the informative mappings of the queryables for the Product Search to “*Earth Observation Metadata profile of Observations & Measurements*” (OGC 10-157r4) are defined.

| **OpenSearch Parameter** | **GML Metadata XPath** |
| --- | --- |
| productType | /eop:metaDataProperty/eop:EarthObservationMetaData/eop:productType |
| creationDate | /eop:metaDataProperty/eop:EarthObservationMetaData/eop:creationDate |
| modificationDate | /eop:metaDataProperty/eop:EarthObservationMetaData/eop:modificationDate |
| platform | /om:procedure/eop:EarthObservationEquipment/eop:platform/eop:Platform/eop:shortName |
| platformSerialIdentifier | /om:procedure/eop:EarthObservationEquipment/eop:platform/eop:Platform/eop:serialIdentifier |
| instrument | /om:procedure/eop:EarthObservationEquipment/eop:instrument/eop:Instrument/eop:shortName |
| sensorType | /om:procedure/eop:EarthObservationEquipment/eop:sensor/eop:Sensor/eop:sensorType |
| compositeType | /eop:metaDataProperty/eop:EarthObservationMetaData/eop:processing/eop:ProcessingInformation/eop:compositeType |
| processingLevel | /eop:metaDataProperty/eop:EarthObservationMetaData/eop:processing/eop:ProcessingInformation/eop:processingLevel |
| orbitType | /om:procedure/eop:EarthObservationEquipment/eop:platform/eop:Platform/eop:orbitType |
| 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 |
| wavelengths | /om:procedure/eop:EarthObservationEquipment/eop:sensor/eop:Sensor/ eop:wavelengthInformation/eop:WavelengthInformation/eop:discreteWavelengths |
| useLimitation | N/A |
| hasSecurityConstraints | N/A |
| organisationName | N/A |
| dissemination | N/A |
| parentIdentifier | /eop:metaDataProperty/eop:EarthObservationMetaData/eop:parentIdentifier |
| productionStatus | /eop:metaDataProperty/eop:EarthObservationMetaData/eop:status |
| acquisitionType | /eop:metaDataProperty/eop:EarthObservationMetaData/eop:acquisitionType |
| orbitNumber | /om:procedure/eop:EarthObservationEquipment/eop:acquisitionParameters/eop:Acquisition/eop:orbitNumber |
| orbitDirection | /om:procedure/eop:EarthObservationEquipment/eop:acquisitionParameters/eop:Acquisition/eop:orbitDirection |
| track | /om:procedure/eop:EarthObservationEquipment/ eop:acquisitionParameters/eop:Acquisition/eop:wrsLongitudeGrid |
| frame | /om:procedure/eop:EarthObservationEquipment/ eop:acquisitionParameters/eop:Acquisition/eop:wrsLatitudeGrid |
| swathIdentifier | /om:procedure/eop:EarthObservationEquipment/eop:sensor/eop:Sensor/eop:swathIdentifier |
| cloudCover | /om:result/opt:EarthObservationResult/opt:cloudCoverPercentage |
| snowCover | /om:result/opt:EarthObservationResult/opt:snowCoverPercentage |
| 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 |

D.2 ISO 19115 / ISO19115-2 Geographic information – Metadata

In the table below the informative mappings of the queryables for the Collection Search to ISO19115(-2)/ISO19139(-2) are defined.

The table also includes the **mappings of the spatial and temporal** parameters of the OpenSearch Geo- and Time-Extension to the appropriate XPath in ISO 19115 [RD1] / ISO 19115-2 [RD4].

|  |  |
| --- | --- |
| **OpenSearch Parameter** | **ISO191(15|39) Metadata XPath[[3]](#footnote-3)** |
| 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 |
| organizationRole | //(gmi:MI\_Metadata|gmd:MD\_Metadata)/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:pointOfContact/\*/role |
| 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'] |
| 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 |
| 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 |
| 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'] |
| 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 |
| wavelengths | /gmi:MI\_Metadata/gmd:contentInfo/gmi:MI\_CoverageDescription/gmd:dimension/gmi:MI\_Band/gmi:bandBoundaryDefinition |
| 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 |
| name | /gmi:MI\_Metadata/gmd:identificationInfo/\*/gmd:EX\_Extent/gmd:geographicElement/gmd:EX\_GeographicDescription/gmd:geographicIdentifier |
| start | /gmi:MI\_Metadata/identificationInfo/MD\_DataIdentification/extent/ EX\_Extent/temporalElement/EX\_TemporalExtent/extent/gml:TimePeriod/beginPosition |
| end | /gmi:MI\_Metadata/identificationInfo/MD\_DataIdentification/extent/ EX\_Extent/temporalElement/EX\_TemporalExtent/extent/gml:TimePeriod/endPosition |
| 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 |

D.3 Mapping for OGC CS Extension Package for ebRIM AP: EO Products

This mapping is based on information from “*OGC Catalogue Services Standard 2.0 Extension Package for ebRIM Application Profile Earth Observation Products*”

|  |  |
| --- | --- |
| **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] |
| 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 |
| wavelengths | N/A |
| useLimitation | N/A |
| hasSecurityConstraints | N/A |
| organisationName | 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] |
| track | /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 | /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] |
| 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] |

D.4 Mapping for 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 [RD8] 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 [RD8].

|  |  |
| --- | --- |
| **OpenSearch Parameter** | **I15 Extension Package Elements (OGC 13-084)** |
| 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 |
| 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 |
| distanceValue  distanceUOM | <<slot>> Resolution |
| denominator | <<slot>> ScaleDenominator |
| language | <<ExtrinsicObject>> MetadataInformation -> <<slot>> Language |
| 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 |
| wavelengths | N/A |
| specificationTitle | <<ExtrinsicObject>> ReferenceSpecification -> <<Name>> |
| specificationDate  specificationdateType | <<ExtrinsicObject>> ReferenceSpecification ->  <<slot>> Created or  <<slot>> Modified or  <<slot>> Issued or |
| degree | <<ExtrinsicObject>> ReferenceSpecification -> <<slot>> Conformance |
| organizationRole | Handled through the CitedResponsibleParty classification on the CitedResponsibleParty association. |
| processingLevel | N/A |
| compositeType | N/A |
| productType | N/A |
| 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 |
| name | <<ExtrinsicObject>> ResourceMetadata -> <<slot>> Coverage |
| start | <<ExtrinsicObject>> ResourceMetadata -> <<slot>> TemporalBegin |
| end | <<ExtrinsicObject>> ResourceMetadata -> <<slot>> TemporalEnd |

D.5 Mapping for OGC CS Extension Package for ebRIM AP: SensorML

In the table below the informative mappings of the queryables to “*OGC Catalogue Services Specification 2.0 Extension Package for ebRIM Application Profile: SensorML*” is defined.

|  |  |  |
| --- | --- | --- |
| **OpenSearch Parameter** | **ExtrinsicObject Attribute** | **Section in OGC 09-163r2** |
| platform | wrs:ExtrinsicObject[@objectType=”urn:ogc:def:objectType:OGC-CSW-ebRIM-Sensor::System”]/rim:Slot  /rim:ValueList/rim:Value[1] | 13.1 |
| instrument | wrs:ExtrinsicObject[@objectType=”urn:ogc:def:objectType:OGC-CSW-ebRIM-Sensor::System”]/rim:Slot  /rim:ValueList/rim:Value[1] | 13.1 |
| orbitType | Use Classification to the Corresponding ClassificationNode of the “  urn:ogc:def: classificationScheme:OGC-CSW-ebRIM-Sensor::OrbitTypes  ” ClassificationScheme | B.6.1 |
| sensorType | Use Classification to the Corresponding ClassificationNode of the “urn:ogc:def:classificationScheme:OGC-CSW-ebRIM-Sensor::SystemTypes:SensorType:EOInstrumentType” ClassificationScheme | B.6.2 |
| pointingAcrossTrackAngle | rim:ExtrinsicObject[@objectType=”urn:ogc:def:objectType:OGC-CSW-ebRIM-Sensor::System”]/rim:Slot[@name=” urn:ogc:def:slot:OGC-CSW-ebRIM-Sensor:: AcrossTrackPointingLowerBound”]/rim:ValueList/rim:Value[1]  rim:ExtrinsicObject[@objectType=”urn:ogc:def:objectType:OGC-CSW-ebRIM-Sensor::System”]/rim:Slot[@name=” urn:ogc:def:slot:OGC-CSW-ebRIM-Sensor:: AcrossTrackPointingUpperBound”]/rim:ValueList/rim:Value[1] | B.6.2 |
| pointingAlongTrackAngle | /rim:ExtrinsicObject[@objectType=”urn:ogc:def:objectType:OGC-CSW-ebRIM-Sensor::System”]/rim:Slot[@name=” urn:ogc:def:slot:OGC-CSW-ebRIM-Sensor:: AlongTrackPointingLowerBound”]/rim:ValueList/rim:Value[1]  /rim:ExtrinsicObject[@objectType=”urn:ogc:def:objectType:OGC-CSW-ebRIM-Sensor::System”]/rim:Slot[@name=” urn:ogc:def:slot:OGC-CSW-ebRIM-Sensor:: AlongTrackPointingUpperBound”]/rim:ValueList/rim:Value[1] | B.6.2 |
| resolution | /rim:ExtrinsicObject[@objectType=”urn:ogc:def:objectType:OGC-CSW-ebRIM-Sensor::System”]/rim:Slot[@name=” urn:ogc:def:slot:OGC-CSW-ebRIM-Sensor:: AlongTrackGroundResolution”]/rim:ValueList/rim:Value[1] | B.6.4 |
| spectralRange | /rim:ExtrinsicObject[@objectType=”urn:ogc:def:objectType:OGC-CSW-ebRIM-Sensor::System”]/rim:Slot[@name=” urn:ogc:def:slot:OGC-CSW-ebRIM-Sensor::SpectralRange”]/rim:ValueList/rim:Value[1] | B.6.4 |

D.6 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 |

D.7 Response Mapping: ISO191(15|39)[-2] / I15 EP to ATOM

The following table defines the mappings from ISO191(15|39)[-2] and I15 EP 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 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 maopped 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[[4]](#footnote-4) | <<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[[5]](#footnote-5) | <<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’] | Per 8.2.5 the media:content@url 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’][[6]](#footnote-6)  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 a second 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 E: 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. |

1. www.opengeospatial.org/cite [↑](#footnote-ref-1)
2. Including products of logical collections (e.g. containing items of different types, sensor, sensor mode, platforms) [↑](#footnote-ref-2)
3. Can be applied to gmd:MD\_Metadata (ISO19139) and gmi:MI\_Metadata (ISO19139-2) [↑](#footnote-ref-3)
4. the semantic of atom:rights is not 100%: therefore other mappings (accessConstraints, otherConstraints, useConstratints, classification) may make sense. [↑](#footnote-ref-4)
5. 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-5)
6. An alternative (or in addition to this) is to include gmd:MD\_Metadata into the ATOM response (see below). [↑](#footnote-ref-6)