HMA-S Final Presentation
Task 3: EO Product Metadata evolution

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Overview

• Summary of Work performed
• Overview of Change Requests
  • Philosophy
  • OGC13-085: Improved expression of EO Product Quality & status
  • OGC13-086: Addition of optional productGroupId property
  • OGC13-093: Better expression of timeliness
  • OGC13-087: Improved description of EO Product Masks
  • OGC13-088: Correct inconsistencies between UML and tables
  • OGC13-094: Add optional elements referring to products io images
  • OGC13-098: Replace example of EO Product Metadata extension
  • OGC14-031: Corrections related to the implementation of the eop:type attribute
  • OGC14-032: Addition of optional elements creationDate and modificationDate
• Collecting Requirements
  - Input received from ESA concerning Sentinel 2 & ngEO
  - Contacts with SAFE Community
  - Critical review existing spec
    - inconsistencies Model (UML, xsd) and tables
    - Inconsistencies ATS (part of document and ETS)
  - Feedback from HMA AWG (via forum and meetings)
  - Review by Spacebel and CGI

• Standardisation process
  - Contacts with OGC TC Chair
  - Compilation and submission of SWG Charter combined for EO Product Metadata and OpenSearch
  - Cochair of EOPMOS SWG.
  - Organisation of and participation to telco’s.
EO Metadata Evolution – Work performed

- Outcome update
  - Technical Note HMA-S-TN-001-GIM-V10 summarising the initial set of change requests (Internal HMA)
  - 10 change requests published via OGC application
  - OGC13-058r1: SWG charter
  - OGC10-157r4 (5 intermediate versions)
  - OGC14-064: revision notes document
  - Updated UML model (XMI export in data package)
  - Updated schemas
  - Update examples
  - Updated Schematrons (ETS) in 2 versions (normal and adapted version suitable for OGC team engine)
• OGC 10-157 is an official OGC Specification (Profile)
  - Revision process works with change requests that need to be submitted and individually approved
• Goal: maintain as much as possible backwards compatibility
  - Propose new optional elements
  - Exceptions are corrigenda – bug fixes that by definition cannot be backwards compatible
• Fully inline with ngEO and GSCDA proposed evolutions to OGC10-157
• OGC13-085: Improved expression of EO Product Quality and status
  – Current situation
    • Currently the EO Product Metadata Profile of O&M allows within the EOP::EarthObservationMetaData element to specify the imageQualityDegradation as a percentage.
    • In addition, there is a value “QUALITYDEGRADED” in the EarthObservationMetadata/status code list to signal quality degradation. However this is not at the correct place since QualityDegraded is not a status in the lifecycle of an EO Product like the other entries in this code list (Acquired, Archived, Cancelled, ...).
EO Metadata Evolution – OGC13-085

- OGC13-085 : Improved expression of EO Product Quality and status
  - Proposed evolution
    - Additional optional attribute `imageQualityStatus` that can take the values “DEGRADED” or “NOMINAL”
    - Additional optional `imageQualityDegradationTag` that can contain further textual information concerning the quality degradation. Mission specific Codelists. Shall be provided if `imageQualityStatus` is degraded.
    - Additional optional `imageQualityReportURL` property – reference to an external quality report
    - the `QUALITYDEGRADED` in the status code list is set to be deprecated.
    - Additional optional `statusSubType` element that refines the status of a product when the “status” is set to “ARCHIVE”. Possible values for this `statusSubType` element are “Online” and “Offline”.
**EO Metadata Evolution OGC13-085**

```
<complexType>
  <complexContent>
    <extension base="EarthObservationMetaData">
      <attribute name="imageQualityStatusValue" type="ImageQualityResponseStatusValue"/>
      <attribute name="statusSubType" type="StatusSubTypeValueEnumeration"/>
    </extension>
  </complexContent>
</complexType>
```
• OGC13-086: ADDITION OF OPTIONAL PRODUCTGROUPID PROPERTY
  - Addition within the EarthObservationMetaData element of an optional property \texttt{productGroupId} that holds the identifier of a particular group to which the product belongs to.
  - Group members represent then "granules" or "portions" of end-user products that are eligible for specific aggregations (e.g. all Sentinel-2 granules having the same productGroupId can be assembled together to form a Sentinel-2 end-user product)
• OGC13-093: Better expression of timeliness of EO product acquisition/processing
  
  - Addition within the EarthObservationResult/product/ProductInformation element of an optional property “timeliness”. It specifies the timeliness of the product, such as "near real time" or "rush". Possible values are mission specific and shall refer to mission/ground segment dedicated codeSpace. Example of values could be "NRT", "NOMINAL", “NTC” or “STC”
• OGC13-093: Better expression of timeliness of EO product acquisition/processing

  - The current ProcessingInformation/processingMode element is constrained to a fixed enumeration with values that are not generally applicable and through which the timeliness cannot be correctly expressed. It is proposed to change the type of this element to a mission/ground segment specific codelist. Examples of values are NRT, NOMINAL, BACKLOGGED, REPROCESSED, VALIDATE
OGC13-087: IMPROVED DESCRIPTION OF EO PRODUCT MASKS

- Addition of new optional property subType within the MaskInformation to further specify the type of Mask
- a new optional property multiExtentOf will be added to the MaskInformation element that allows inline encoding of mask polygon geometries using the gml:MultiSurface/gml:surfaceMembers/gml:Polygon construct. Either the fileName or the multiExtentOf shall be provided.
- fileName made optional
OGC13-087: IMPROVED DESCRIPTION OF EO PRODUCT MASKS

- When using the filename property to reference an external mask, neither the information model or encoding is specified.
- In order to further improve interoperability, a new Informative Annex F is added that gives the recommended GML 3.2.1 Application Schema that is preferred to be used when using an external mask file.
- The root element is Mask, a feature collection that contains a set of MaskFeatures as its members.
- Each MaskFeature characterised by standard gml:Feature properties as well as maskType (Codelist) and extentOf (Polygon geometries)
• OGC13-087: IMPROVED DESCRIPTION OF EO PRODUCT MASKS
OGC 13-088: CORRECT INCONSISTENCIES BETWEEN UML MODEL AND TABLES

- CloudCoverPercentageQuotationMode has wrong type in UML
EO Metadata Evolution – OGC 13-088

- OGC 13-088: CORRECT INCONSISTENCIES BETWEEN UML MODEL AND TABLES
  - CompositeTypeValue has become obsolete
  - Used to be a fixed enumeration in OGC06-080r4: DAILY, WEEKLY, MONTHLY
  - Changed in OGC10-157 into TM_PeriodDuration
  - Enumeration list to be removed from model
OGC 13-088 : CORRECT INCONSISTENCIES BETWEEN UML MODEL AND TABLES

In the Processing Information class diagram, the type of the processingDate property is TM_PeriodDuration. The table specifies that this should be a datetime. The model is wrong and the type of processingDate should be changed to DateTime.
• OGC 13-088 : CORRECT INCONSISTENCIES BETWEEN UML MODEL AND TABLES

  – Table 6 lists the possible values for the OrbitDirectionValue as Ascending and Descending. The UML model specifies ASCENDING and DESCENDING. The model is correct and table 6 should be amended.

  – Table 9 lists properties cloudCoverPercentageAssessmentPercentage and snowCoverPercentageAssessmentPercentage. The opt:EarthObservationResult class diagram has instead the properties cloudCoverPercentageAssessmentConfidence and snowCoverPercentageAssessmentConfidence. The UML is correct and Table 9 should be corrected.
OGC 13-088 : CORRECT INCONSISTENCIES BETWEEN UML MODEL AND TABLES

- The class diagram for Synthesis and Systematic Products metadata has a derivedFrom property of type CharacterString. The associated table 22 specifies that this property should be a link to the EO Products that were used in the generation of the ssp products. Like the similar eop:linkedWith and subsetOf properties, the type of the element should be EarthObservation encoded by reference.
EO Metadata Evolution – OGC 13-088

- OGC 13-088: CORRECT INCONSISTENCIES BETWEEN UML MODEL AND TABLES
  - The class diagram for altimetry products has the cardinality of the property `alt:auxiliaryInstrument/alt:instrumentType` as 1. The corresponding table 12 has 0..1 (within `alt:auxiliaryInstrument` with cardinality 0..n)
  - `atm:earthObservationResult` model contains `cloudCover` and `snowCover` related properties, table does not. Table needs to be updated. It was checked with results from HMA-FO questionnaire that there was a requirement for this.
• OGC 13-094: Add optional elements referring to products instead of images
  - A number of elements currently have image in their name which could give the false impression that the standard is only applicable to optical products.
  - Equivalent elements with element names referring to product are introduced as new optional elements with same type, cardinality and description as the original elements.
  - The existing elements with image in their name are declared as deprecated but not removed in order to preserve backwards compatibility.
OGC 13-094: Add optional elements referring to products instead of images

- The new elements are:
  - productQualityDegradation
  - productQualityDegradationQuotationMode
  - productQualityDegradationTag
  - productQualityReportURL
  - productQualityStatus

- In addition, the description of the filename elements for products, masks and browses in the EarthObservationResult class is changed to refer to products instead of images
OGC 14-031: Corrections related to the implementation of the eop:type attribute

- OGC06-080, the GML 3.1.1 Application Schema for EO products, which is the predecessor of OGC 10-157, contained a mechanism that facilitated the extension of the base eop and derived thematic schemas towards so-called mission specific schemas.

- This mechanism is based on the introduction of an eop:type attribute that should be used in the derived mission specific schemas to inform consumers of extended schemas/instance documents about the base elements from which these extended elements have been derived.

- This mechanism is described in the OGC 10-157 document text but has not been ported to the XML schemas even though the schematron that is part of the ETS relies on this attribute.

- In addition, the requirements for XML documents (section 7.5) and the Abstract Test Suite (Annex A) do not consistently take into account this extension mechanism.
• OGC 14-031 : Corrections related to the implementation of the eop:type attribute
• Changes:
  – OGC 10:157 document-section 7.5 - table 3 requirements for XML instances : refine requirements to make the distinction between thematic extensions defined in the document and mission specific extensions using the eop:type attribute
  – OGC 10:157 document-Annex A Abstract Test Suite table 23 : refine test descriptions to make the distinction between thematic extensions defined in the document and mission specific extensions using the eop:type attribute
  – XML Schema: eop.xsd reintroduction of the eop:type attribute
  – Schematron: update of the schematron taking the eop:type attribute correctly into account.
• OGC 14-032: addition of optional elements creationDate and modificationDate
  – The document OGC10-157r3 describes within the EarthObservationMetaData class an element creationDate with as description: metadata field for the creation/modification date of the catalogue entry. This element is however not present in the corresponding schema eop.xsd.
  – In addition it is often useful to make the distinction between the date of creation and the date of modification of a metadata record.
• OGC 14-032 : addition of optional elements creationDate and modificationDate

• Changes
  - In the OGC10-157 document text, revise the description of the creationDate element and add the modificationDate element with following descriptions:
    - creationDate : Creation date for the metadata item. When retrieved from a metadata catalogue, the creationDate is the date when the metadata item was ingested for the first time (i.e. inserted) in the catalogue.
    - modificationDate: Date of the last modification to the metadata item. When retrieved from a metadata catalogue, the modificationDate is the date when the metadata item was last modified (i.e. updated) in the catalogue.
  - The eop.xsd needs to be updated accordingly.

• Supersedes OGC13-095 which was Rejected
In addition a set of editorial changes has been performed:
- Correction of typos
- Class diagrams for better readability
- Correction in casing of elements
- Corrections in captions of tables
- ...

All changes documented in Revision Notes document:
- OGC 14-064 EO Metadata profile of O&M 1.1.0 revision notes
In addition to the ATS GIM also worked on the ETS – the schematrons
- Update in function of eop:type attribute
- Improve consistency between ATS and ETS
- Changes to make it compatible with the OGC Team Engine
EO Metadata Evolution – Status

- Change request approval status:
  - 9 change requests have been approved by electronic vote:
    - OGC 13-098
    - OGC 13-087
    - OGC 13-093
    - OGC 13-085
    - OGC 13-088
    - OGC 13-094
    - OGC 13-086
    - OGC 14-031
    - OGC 14-032
  - Change request OGC 13-095 Rejected (superseded by 14-032)
EO Metadata Evolution – Status

- OGC 14-064 EO Metadata profile of O&M 1.1.0 revision notes uploaded to the pending documents list
- OGC10-157r4 version 1.1.0 package consisting of
  - Updated document
  - Updated schemas and examples
  - Updated schematron
  - Ready for vote in SWG
• How is the final SWG vote for recommendation to the TC handled?
  – Once the SWG and the standard editor feel that the revision of the Implementation Standard is complete, the following steps happen:
    • The SWG Chair calls for an electronic vote of the SWG members for recommending to the TC that the document be considered for formal adoption and public release. This e-vote can be done by email. The Chair keeps the tally.
    • The revised document must be posted to the SWG Documents Archive and an informational announcement made to the members at least one week prior to the SWG vote.
How is the final SWG vote for recommendation to the TC handled?

- The SWG Chair initiates the vote.
- The vote is deemed complete when a quorum (simple majority) of the SWG members have voted and a simple majority vote YES for the recommendation.
- The results of the vote are announced to the TC.
- Assuming a positive SWG vote, the document is posted to Pending Documents and the TCC shall announce the 60 day IPR review and associated adoption vote.
EO Metadata Evolution – Status

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EO Metadata Evolution – Open issues

- Question ESA (June 2014)
- Referring to HMAFOT1-TN-0002-ERDAS-14 – analysis on how to deal with EO Product footprints crossing the dateline.
EO Metadata Evolution – Open issues
EO Metadata Evolution – Open issues

• Conclusion was that two conventions are required
  – Orientation of the EO footprint coordinates. Should be normally Counter Clock Wise according to OGC Simple Features – but not all catalogues implemented this like this. Solution was to implement an optional attribute to present the actual orientation
  – Minimal world distance criterium: take the smallest distance between two vertices to decide whether the polygon goes over the dateline. Not put in the document as
    • “Normal” EO product footprints not affected
    • Affects polygons wider than 180 degrees (e.g. world covering polygons)
    • Solution considered to be too client specific.