Open
Geospatial
Consortium

OGC GEOSPATIAL USER FEEDBACK STANDARD: XML ENCODING EXTENSION.

STANDARD
Implementation

APPROVED

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I ABSTRACT

The OGC Geospatial User Feedback Standard version 2 — XML Encoding Extension is based on the OGC Geospatial User Feedback conceptual model [2]. Geospatial User Feedback (GUF) is metadata that is produced primarily by the consumers of geospatial data products based on their use and experience with those products. The GUF Standards complement the existing metadata conventions whereby documents recording dataset characteristics and production workflows are generated by the creator, publisher or curator of a data product. As a part of metadata, the GUF data model internally reuses some elements of ISO 19115-1 (the updated version of the OGC Abstract Specification topic 11) but not the general structure. This selective use of ISO metadata elements prioritizes future interoperability with developing ISO metadata models.

This Standard can be used in combination with [2]. In the future, other encodings may be considered, an alternative could use the JSON-LD encoding based on parts of schema.org.

The OGC Geospatial User Feedback Standard version 2 — XML Encoding Extension is based on work done in two European Union 7th Framework program projects called GeoViQua (FP7 FP7/2007-2013 under grant agreement n°265178) and CHARMe (FP7/2007-2013 under grant agreement n°312641). GeoViQua considers user feedback as part of the metadata that enables users to assess the quality and fitness-for-use of geospatial datasets. The GeoViQua participants developed its quality model based on ISO 19115-1:2014 and drafts of ISO 19157:2013. The GeoViQua model is divided into the Producer Quality Model and the User Feedback Model. Both models are encoded in XML based on the ISO 19139 rules. The GeoViQua User Feedback Model[1] formed the initial basis of the XML Encoding Extension defined in this Standard. CHARMe also focused on developing means for users to annotate datasets. The approach used in that project was based on W3C annotations and developed annotation conventions in RDF. Parts of the CHARMe conceptual model are incorporated in the OGC GUF standards.

II KEYWORDS

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

ogcdoc, OGC document, API, openapi, html

III PREFACE

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IV   SECURITY CONSIDERATIONS

No security considerations have been made for this document.

V SUBMITTING ORGANIZATIONS

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

- UAB-CREAF

VI SUBMITTERS

All questions regarding this submission should be directed to the editor or the submitters:

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1

SCOPE

___

1 SCOPE

The OGC Geospatial User Feedback Standard: XML Encoding Extension version 2.0 (a.k.a. "this Standard") defines an XML encoding for encoding user feedback about geospatial datasets or metadata records describing datasets. This Standard reuses and extends the ISO 19115-1:2014 model [3] and follows the ISO 19139 [4] encoding rules. The XML encoding is based on the Geospatial User Feedback Conceptual Model Standard version 2.0 [2].

This Standard is applicable to metadata catalogue servers and clients that want to exchange geospatial user feedback information.

This Standard is defined to allow implementation of catalogue clients that are able to complement the discovery of geospatial datasets. Catalogue clients present query results, commonly based on summaries of detailed metadata records created and maintained by the producers. With the GUF Standard, the metadata responses can also provide user feedback summaries and detailed user feedback reports. Clients implementing the GUF Standard can provide a user interface to support provision of additional comments or inquiries about datasets or to complement the producer metadata by presenting additional user feedback information about the data.

Geospatial User Feedback as defined in this Standard encompasses:

- User comments

- Questions and answers

- User reports of dataset problems and proposed solutions to those problems

- Ratings

- Usage reports

- Citations of related datasets or publications describing usage

- Quality reports

- Relevant additional provenance information

- Significant events related to the use or interpretation of a dataset.

This standard does not define any query language to request or send user feedback to/from metadata catalogues.

2

CONFORMANCE

2 CONFORMANCE

The GUF XML Standard defines four requirements and four related conformance classes.

Requirements for some standardization targets types are considered.

- Requirements Class Quality-Common: [http://www.opengis.net/spec/geospatial-user-feedback-xml/1.0/req/quality-common] has a single conformance class, Quality Common: [http://www.opengis.net/spec/geospatial-user-feedback-xml/1.0/conf/quality-common]. This requirements class targets clients and services implementing quality or user feedback models.

- Requirements Class Feedback-Item: [http://www.opengis.net/spec/geospatial-user-feedback-xml/1.0/req/feedback-item] has a single pertaining conformance class, Feedback-item [http://www.opengis.net/spec/geospatial-user-feedback-xml/1.0/conf/feedback-item]. This requirements class targets clients and services implementing user feedback models.

- Requirements Class Feedback-Summary: [http://www.opengis.net/spec/geospatial-user-feedback-xml/1.0/req/feedback-summary] has a single conformance class, Feedback-summary: [http://www.opengis.net/spec/geospatial-user-feedback-xml/1.0/conf/feedback-summary]. This requirements class targets clients and services implementing user feedback models.

- Requirements Class Feedback-Collection: [http://www.opengis.net/spec/geospatial-user-feedback-xml/1.0/req/feedback-collection] has a single pertaining conformance class, Feedback-collection, [http://www.opengis.net/spec/geospatial-user-feedback-xml/1.0/conf/ feedback-collection]. This requirements class targets clients and services implementing user feedback models.

Conformance with this Standard shall be checked using all the relevant tests specified in Annex A, Abstract Test Suite (normative) of this document. 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[2].

All requirements-classes and conformance-classes described in this document are owned by the standard(s) identified.

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[2]www.opengeospatial.org/cite

3

NORMATIVE REFERENCES

3 NORMATIVE REFERENCES

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

OGC Geospatial User Feedback Standard: Conceptual Model v.2.0

ISO: ISO/TS 19139:2007, *Geographic information — Metadata — XML schema implementation*. International Organization for Standardization, Geneva (2007). https://www.iso.org/standard/32557.html.

ISO: ISO 19115-3:2023, *Geographic information — Metadata — Part 3: XML schema implementation for fundamental concepts.* International Organization for Standardization, Geneva (2023). https://www.iso.org/standard/80874.html.

ISO: ISO/TS 19157-2:2016, *Geographic information — Data quality — Part 2: XML schema implementation*. International Organization for Standardization, Geneva (2016). https://www.iso.org/standard/66197.html.

4

TERMS AND DEFINITIONS

4 TERMS AND DEFINITIONS

No terms and definitions are listed in this document.

This document uses the terms defined in Sub-clause 5.3 of [5], 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.

This document uses the Terms and Definition provided by the OGC 15-097 Geospatial UserFeedback Conceptual Model standard [2]. No additional terms and definitions apply.

5

CONVENTIONS

5 CONVENTIONS

5.1. Namespace prefix conventions

The following namespaces are used in this document. The prefix abbreviations used constitute conventions used here, but are not normative. The namespaces to which the prefixes refer to are normative.

Table 1 — Namespaces

Prefix	Namespace URI	Description
xsd	http://www.w3.org/2001/XMLSchema	XML Schema namespace
gco	http://standards.iso.org/iso/19115/-3/gco/1.0	ISO 19115 Common classes
mcc	http://standards.iso.org/iso/19115/-3/mcc/1.0	http://standards.iso.org/iso/19115/-3/mcc/1.0
mri	http://standards.iso.org/iso/19115/-3/mri/1.0	ISO 19115-1 Identification
mrl	http://standards.iso.org/iso/19115/-3/mrl/1.0	ISO 19115-1 Lineage
gex	http://standards.iso.org/iso/19115/-3/gex/1.0	ISO 19115-1 Extent
cit	http://standards.iso.org/iso/19115/-3/cit/1.0"/>	ISO 19115-1 Citation
mdq	http://standards.iso.org/iso/19157/-2/mdq/1.0	ISO 19157 Quality
lan	http://standards.iso.org/iso/19115/-3/lan/1.0	ISO 19115-3 Language
qcm	http://www.opengis.net/guf/2.0/common	Quality common
guf	http://www.opengis.net/guf/2.0/core	User feedback core
ufc	http://www.opengis.net/guf/2.0/collection	User feedback collection
ufs	http://www.opengis.net/guf/2.0/summary	User feedback summary

6

GEOSPATIAL USER FEEDBACK XML ENCODING

6 GEOSPATIAL USER FEEDBACK XML ENCODING

The XML schemas described here were developed using the encoding rules for creating an XML encoding from a UML model, as documented in ISO 19139 [4]. These encoding rules are coded in the ShapeChange [6] application. ShapeChange is a Java tool that takes application schemas constructed according to ISO 19109 from a UML model and derives implementation representations. ShapeChange was used to automatically transform the OGC 23-017 Geospatial User Feedback Conceptual Model [2] UML model into the XML schemas that are conformant with the encoding rules defined in this Standard. Since the conversion is automatic, this document does not provide tables describing the semantics of each element and the reader should refer to the conceptual model for details.

This encoding is intended for applications where the use of producer's metadata encoded according to ISO 19115-1:2014 [3] is common. In this way, there is a path for extending the current ISO 19115-1:2014 metadata editors and catalogues to support this model. This encoding also aims for an easy integration of the producer metadata and the user feedback in client applications.

7

GEOSPATIAL USER FEEDBACK MODEL. CORE

7 GEOSPATIAL USER FEEDBACK MODEL. CORE

This section describes two requirements classes that are fundamental for encoding Geospatial User Feedback items in XML: Quality Common and Feedback-Item.

7.1. Requirements Class Quality-Common

The Quality Common requirements class defines the XML encoding for data model classes that are common to, and useful for, both quality metadata generated by producers and user feedback metadata. For this reason, they are kept in a separate requirements class. In essence, this requirements class represents the foundations for building a user feedback model. This requirements class inherits all the necessary elements from the ISO 19115-1:2014 [3] and the ISO 19157:2013 [7] metadata models (such as CI_Citation, CI_Date etc) and adds two extra classes to the model for citing publications (QCM_Publications) and for reporting discovery issues (QCM_DiscoveredIssues).

REQUIREMENTS CLASS 1: REQUIREMENTS CLASS 'QUALITY-COMMON'	
IDENTIFIER	`https://www.opengis.net/spec/guf-schema/2.0/req/quality-common`
TARGET TYPE	Quality-Common
CONFORMANCE CLASS	Conformance class A.1: `https://www.opengis.net/spec/guf-schema/2.0/conf/quality-common`
PREREQUISITES	Requirement 1: `/req/quality-common/mime-type` Requirement 2: `/req/quality-common/file-extension` `/req/quality-common/xmlrules` Requirement 4: `/req/quality-common/iso-schema` Requirement 5: `/req/quality-common/qcm-schema`
NORMATIVE STATEMENT	Requirement 1-1: `ISO 19115-3, ISO 19157-2 and ISO 19139 schemas`

REQUIREMENT 1	
IDENTIFIER `/req/quality-common/mime-type`	
A	An XML encoding of a geospatial user feedback SHALL adopt the XML MIME type of application/xml

REQUIREMENT 2

IDENTIFIER	/req/quality-common/file-extension
A	An XML encoding of a geospatial user feedback SHALL use the file extension '.xml'

REQUIREMENT 3

IDENTIFIER	/req/quality-common/xml-rules
A	An XML encoding of a geospatial user feedback SHALL comply with the encoding rules specified in ISO-19139.

REQUIREMENT 4

IDENTIFIER	/req/quality-common/iso-schema
A	An XML encoding of a geospatial user feedback SHALL validate using the schemas ISO19115-3 and ISO19157-2 provided at: http://standards.iso.org/iso/19115/-3 and http://standards.iso.org/iso/19157/-2 respectively

REQUIREMENT 5

IDENTIFIER	/req/quality-common/qcm-schema
A	An XML encoding of a geospatial user feedback using QCM_Publication or QCM_DiscoveredIssue SHALL validate using the quality common schema qcm.xsd

The qcm.xsd schema is automatically derived from the OGC 23-017 UML model [2]. No tables describing the naming of the elements and sub-elements are reproduced here because to they will be the same specified in the conceptual model.

The following code shows a xml encoding example for QCM_Publication

```
<qcm:QCM_Publication
 xmlns:cit="http://standards.iso.org/iso/19115/-3/cit/2.0"
 xmlns:qcm="http://www.opengis.net/guf/2.0/common"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xmlns:gco="http://standards.iso.org/iso/19115/-3/gco/1.0"
 xmlns:mcc="http://standards.iso.org/iso/19115/-3/mcc/1.0"
 xmlns:mri="http://standards.iso.org/iso/19115/-3/mri/1.0"
 xsi:schemaLocation="http://www.opengis.net/guf/2.0/common https://schemas.
opengis.net/guf/2.0/qcm.xsd">
 <cit:title>
```

```xml
      <gco:CharacterString>Earth observations for sustainable development goals
monitoring based on essential variables and driver-pressure-state-impact-
response indicators</gco:CharacterString>
 </cit:title>
 <cit:date>
  <cit:CI_Date>
   <cit:date>
    <gco:DateTime>2020-01-01T00:00:00Z</gco:DateTime>
   </cit:date>
   <cit:dateType>
    <cit:CI_DateTypeCode codeList="http://wis.wmo.int/2008/catalogues/draft_
version_1-1/WMO_Codelists_ver1_1.xml#CI_DateTypeCode" codeListValue="creation"/
>
   </cit:dateType>
  </cit:CI_Date>
 </cit:date>
 <cit:identifier>
  <mcc:MD_Identifier>
   <mcc:code>
    <gco:CharacterString>10.1080/17538947.2019.1576787</gco:CharacterString>
   </mcc:code>
   <mcc:codeSpace>
    <gco:CharacterString>https://doi.org/</gco:CharacterString>
   </mcc:codeSpace>
  </mcc:MD_Identifier>
 </cit:identifier>
 <cit:citedResponsibleParty>
  <cit:CI_Responsibility>
   <cit:role>
    <cit:CI_RoleCode codeListValue="author" codeList="http://www.opengis.net/
guf/2.0/resources/codeList.xml#CI_RoleCode"/>
   </cit:role>
   <cit:party>
    <cit:CI_Individual>
     <cit:name>
      <gco:CharacterString>Joan Masó</gco:CharacterString>
     </cit:name>
     <cit:contactInfo>
      <cit:CI_Contact>
       <cit:address>
        <cit:CI_Address>
         <cit:electronicMailAddress>
          <gco:CharacterString>joan.maso@uab.cat</gco:CharacterString>
         </cit:electronicMailAddress>
        </cit:CI_Address>
       </cit:address>
      </cit:CI_Contact>
     </cit:contactInfo>
    </cit:CI_Individual>
   </cit:party>
  </cit:CI_Responsibility>
 </cit:citedResponsibleParty>
 <cit:citedResponsibleParty>
  <cit:CI_Responsibility>
   <cit:role>
    <cit:CI_RoleCode codeListValue="author" codeList="http://www.opengis.net/
guf/2.0/resources/codeList.xml#CI_RoleCode"/>
   </cit:role>
   <cit:party>
    <cit:CI_Individual>
     <cit:name>
      <gco:CharacterString>Ivette Serral</gco:CharacterString>
     </cit:name>
```

```xml
        </cit:CI_Individual>
       </cit:party>
      </cit:CI_Responsibility>
    </cit:citedResponsibleParty>
    <cit:citedResponsibleParty>
     <cit:CI_Responsibility>
      <cit:role>
       <cit:CI_RoleCode codeListValue="author" codeList="http://www.opengis.net/
guf/2.0/resources/codeList.xml#CI_RoleCode"/>
      </cit:role>
      <cit:party>
       <cit:CI_Individual>
        <cit:name>
         <gco:CharacterString>Cristina Domingo-Marimon</gco:CharacterString>
        </cit:name>
       </cit:CI_Individual>
      </cit:party>
     </cit:CI_Responsibility>
    </cit:citedResponsibleParty>
    <cit:citedResponsibleParty>
     <cit:CI_Responsibility>
      <cit:role>
       <cit:CI_RoleCode codeListValue="author" codeList="http://www.opengis.net/
guf/2.0/resources/codeList.xml#CI_RoleCode"/>
      </cit:role>
      <cit:party>
       <cit:CI_Individual>
        <cit:name>
         <gco:CharacterString>Alaitz Zabala</gco:CharacterString>
        </cit:name>
       </cit:CI_Individual>
      </cit:party>
     </cit:CI_Responsibility>
    </cit:citedResponsibleParty>
    <cit:presentationForm>
     <cit:CI_PresentationFormCode codeListValue="documentDigital" codeList="http:
//www.opengis.net/guf/2.0/resources/codeList.xml#CI_RoleCode"/>
    </cit:presentationForm>
    <cit:series>
     <cit:CI_Series>
      <cit:name>
       <gco:CharacterString>International Journal of Digital Earth </gco:
CharacterString>
      </cit:name>
      <cit:issueIdentification>
       <gco:CharacterString>Volume 13, number 2</gco:CharacterString>
      </cit:issueIdentification>
      <cit:page>
       <gco:CharacterString>217-235</gco:CharacterString>
      </cit:page>
     </cit:CI_Series>
    </cit:series>
    <cit:otherCitationDetails>
     <gco:CharacterString>2020, VOL. 13, NO. 2, 217–235</gco:CharacterString>
    </cit:otherCitationDetails>
    <cit:onlineResource>
     <cit:CI_OnlineResource>
      <cit:linkage>
       <gco:CharacterString>https://www.tandfonline.com/doi/epdf/10.1080/
17538947.2019.1576787</gco:CharacterString>
      </cit:linkage>
      <cit:description>
```

```xml
            <gco:CharacterString>Paper information (and possible download)</gco:
CharacterString>
        </cit:description>
        <cit:function>
            <cit:CI_OnLineFunctionCode codeListValue="information" codeList=
"http://www.isotc211.org/2005/resources/Codelist/ML_gmxCodelists.xml#CI_
OnLineFunctionCode">information
            </cit:CI_OnLineFunctionCode>
        </cit:function>
    </cit:CI_OnlineResource>
  </cit:onlineResource>
 <qcm:abstract>
  <gco:CharacterString>
    In recent years, researchers of different communities have increased their
efforts in formalizing a set of measurements regularly collected for analysing
changes in Drivers, States, Impacts and Responses of a given discipline. In
some cases, different actors have converged in a minimum set of Essential
Variables (EVs), such as for Climate, Biodiversity or Oceans. The definition
of such EVs is an ongoing evolution and in extension (e.g. EVs for water)
although some communities have not even started (e.g. agriculture and energy).
This paper characterizes the Earth Observation (EO) networks and creates a
graph representation of their relations. Secondly, this graph is enriched with
the EVs produced by each network creating a knowledge base. Finally, an effort
has been done to identify links between EVs and Sustainable Development Goals
(SDG) indicators in a way that they indirectly connect the EO. An analysis
to detect gaps in EO variables due to a lack of observational networks is
performed. Several suggestions for improving SDG indicators framework by
considering EVs are exposed, as well as proposing new necessary EVs and
suggesting new EO based indicators. The complete graph is available in the
ENEON website (http://www.eneon.net/graph-ev-sdg/).
    </gco:CharacterString>
 </qcm:abstract>
 <qcm:highlights>
  <gco:CharacterString>There is a need for a common and comprehensive list
of Essential Variables. Research infrastructures need to be characterized in
terms of the EV they are able to produce. Policy monitoring can benefit from
Earth observation.</gco:CharacterString>
 </qcm:highlights>
 <qcm:keywords>
  <mri:MD_Keywords>
    <mri:keyword>
     <gco:CharacterString>gap analysis</gco:CharacterString>
    </mri:keyword>
    <mri:keyword>
     <gco:CharacterString>policy monitoring</gco:CharacterString>
    </mri:keyword>
    <mri:keyword>
     <gco:CharacterString>essential variables</gco:CharacterString>
    </mri:keyword>
    <mri:keyword>
     <gco:CharacterString>earth observation</gco:CharacterString>
    </mri:keyword>
  </mri:MD_Keywords>
 </qcm:keywords>
 <qcm:category>
  <qcm:QCM_PublicationCategoryCode codeListValue="journalArticle"
codeList="http://www.opengis.net/guf/1.0/resources/codeList.xml#QCM_
PublicationCategoryCode"/>
 </qcm:category>
</qcm:QCM_Publication>
```

Listing 1

The following code shows a xml encoding example for QCM_DiscoveredIssue:

```xml
<qcm:QCM_DiscoveredIssue
 xmlns:qcm="http://www.opengis.net/guf/2.0/common"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xmlns:gco="http://standards.iso.org/iso/19115/-3/gco/1.0"
 xsi:schemaLocation="http://www.opengis.net/guf/2.0/common
 https://schemas.opengis.net/guf/2.0/qcm.xsd">
 <qcm:knownProblem>
  <gco:CharacterString>
    These maps cannot be used for land cover change detection since the error
in the original map is higher than the change detected (e.g. GLC-2000 versus
GlobCover). Due to the large disagreements between these land cover products,
we recommend that the user community does not, by default, use the latest
product with the highest resolution, but carefully examines the sensitivity of
these products within a specific application.
  </gco:CharacterString>
 </qcm:knownProblem>
 <qcm:workAround>
  <gco:CharacterString>
    In the situation where the maps are used for national and regional
applications, we would recommend examining the disagreement of the products
in the areas of interest and also to compare them with high resolution ground
data or aerial photography. One way to do this would be to use geo-wiki.org
(Fritz et al 2009), a global land cover validation tool, which can be used to
visualize the global land cover products and the disagreement directly on top
of Google Earth. By exploring the discrepancies at the level of an individual
country in combination with local knowledge, the user can gain insight into
which product is better in a specific region and which product is better suited
for a particular application. Crowd-sourced data in the form of geo-tagged
photos and information collected through Web 2.0 applications like geo-wiki
and smart phones could also be harnessed as a rich source of training and
calibration data fo global land cover algorithms.
  </gco:CharacterString>
 </qcm:workAround>
</qcm:QCM_DiscoveredIssue>
```

Listing 2

The following code shows a xml encoding example for QCM_ReproducibleUsage:

```xml
<qcm:QCM_ReproducibleUsage
 xmlns:mri="http://standards.iso.org/iso/19115/-3/mri/1.0"
 xmlns:qcm="http://www.opengis.net/guf/2.0/common"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xmlns:gco="http://standards.iso.org/iso/19115/-3/gco/1.0"
 xmlns:gml="http://www.opengis.net/gml/3.2"
 xmlns:gcx= "http://standards.iso.org/iso/19115/-3/gcx/1.0"
 xmlns:cit="http://standards.iso.org/iso/19115/-3/cit/2.0"
 xsi:schemaLocation="http://www.opengis.net/guf/2.0/common
 https://schemas.opengis.net/guf/2.0/qcm.xsd">
 <mri:specificUsage>
  <gco:CharacterString>Sharing style for an NDSI based snow coverage mask to
extract snow surfaces from Sentinel 2 L2A images</gco:CharacterString>
 </mri:specificUsage>
 <mri:usageDateTime>
  <gml:TimeInstant gml:id="usageDateTime_id">
   <gml:timePosition>2023-06-16T13:38:00Z</gml:timePosition>
  </gml:TimeInstant>
 </mri:usageDateTime>
 <mri:userDeterminedLimitations><gco:CharacterString>Water bodies
may be detected as snow covered surfaces</gco:CharacterString></mri:
userDeterminedLimitations>
```

```xml
        <mri:userContactInfo>
         <cit:CI_Responsibility>
          <cit:role>
           <cit:CI_RoleCode codeListValue="author" codeList="http://www.opengis.net/
guf/2.0/resources/codeList.xml#CI_RoleCode"/>
          </cit:role>
          <cit:party>
           <cit:CI_Individual>
            <cit:name>
             <gco:CharacterString>Olaf Banzai</gco:CharacterString>
            </cit:name>
            <cit:contactInfo>
             <cit:CI_Contact>
              <cit:address>
               <cit:CI_Address>
                <cit:electronicMailAddress>
                 <gco:CharacterString>olaf.banzai@mail.com</gco:CharacterString>
                </cit:electronicMailAddress>
               </cit:CI_Address>
              </cit:address>
             </cit:CI_Contact>
            </cit:contactInfo>
           </cit:CI_Individual>
          </cit:party>
         </cit:CI_Responsibility>
        </mri:userContactInfo>
        <qcm:codeSnippet>
         <gco:CharacterString>{"nom":null,"desc":"SnowMask","TipusObj":"P",
"component":[{"calcul":"(({\"i_capa\":235,\"i_valor\":2}-{\"i_capa\":235,
\"i_valor\":10})/({\"i_capa\":235,\"i_valor\":2}+{\"i_capa\":235,\"i_valor
\":10}))>0.4","estiramentPaleta":{"auto":false,"valorMaxim":1.60182954451864,
"valorMinim":-0.02371909222285906},"FormulaConsulta":"((v[2]-v[10])/
(v[2]+v[10]))>0.4","formulaInterna":"((v[2]-v[10])/(v[2]+v[10]))>0.4"}],
"metadades":null,"nItemLlegAuto":20,"ncol":4,"descColorMultiplesDe":0.01,
"origen":"usuari"}</gco:CharacterString>
        </qcm:codeSnippet>
        <qcm:codeMediaType>
         <gcx:MimeFileType type="application/json">application/json</gcx:MimeFileType>
        </qcm:codeMediaType>
        <qcm:platform>
         <gco:CharacterString>https://github.com/joanma747/MiraMonMapBrowser</gco:
CharacterString>
        </qcm:platform>
        <qcm:version>
         <gco:CharacterString>6.0</gco:CharacterString>
        </qcm:version>
        <qcm:schema>
         <gco:CharacterString>config-schema.json#/definitions/estil</gco:
CharacterString>
        </qcm:schema>
        <qcm:suggestedApplication>
         <gco:CharacterString>http://maps.ecopotential-project.eu/</gco:
CharacterString>
        </qcm:suggestedApplication>
       </qcm:QCM_ReproducibleUsage>
```

Listing 3

7.2. Requirements Class Feedback-Item

The Feedback-Item requirements class defines the data model classes that are involved in the definition of an individual user feedback item. A key design goal for the GUF to remain as simple as possible but comprehensive enough. This is, in order to allow for simple user interfaces that can cover different levels of expertise on geospatial data usage. The following are examples of what the GUF model allows:

- Commenting;

- Asking questions;

- Providing answers (the GUF_UserComment class);

- Rating data (GUF_Rating);

- Citing publications (QCM_Publication);

- Providing a quality measure (additionalQuality);

- Documenting additional lineage information (additional LineageSteps); or

- Emphasizing a significant event that conditions the interpretation of a dataset (GUF_SignificantEvent).

Each one of the previous examples is considered an "item" of feedback. Geospatial User Every item is set into a context by a combination of target, citations and scope. Feedback can be provided both about data or metadata.

REQUIREMENTS CLASS 2: REQUIREMENTS CLASS 'FEEDBACK-ITEM'	
IDENTIFIER	`https://www.opengis.net/spec/guf-schema/2.0/req/user-feedback-item`
TARGET TYPE	Feedback-Item
CONFORMANCE CLASS	Conformance class A.2: `https://www.opengis.net/spec/guf-schema/2.0/conf/user-feedback-item`
PREREQUISITE	Requirement 6: `/req/feedback-item/guf-schema`
NORMATIVE STATEMENT	Requirement 2-1: `/req/quality-common`

REQUIREMENT 6

IDENTIFIER	`/req/feedback-item/guf-schema`

A	An XML encoding of a geospatial user feedback item SHALL use GUF_FeedbackItem and SHALL validate using the geospatial user feedback item schema guf.xsd

The guf.xsd schema is automatically derived from the OGC 23-017 UML model [2]. No tables describing the naming of the elements and sub-elements are reproduced here due to they will be the same specified in the conceptual model.

The following code shows a xml encoding example for GUF_FeedbackItem

```xml
<guf:GUF_FeedbackItem
 xmlns:guf="http://www.opengis.net/guf/2.0/core"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xmlns:mcc="http://standards.iso.org/iso/19115/-3/mcc/1.0"
 xmlns:gco="http://standards.iso.org/iso/19115/-3/gco/1.0"
 xmlns:cit="http://standards.iso.org/iso/19115/-3/cit/2.0"
 xsi:schemaLocation="http://www.opengis.net/guf/2.0/core
 https://schemas.opengis.net/guf/2.0/guf.xsd">
 <guf:itemIdentifier>
  <mcc:MD_Identifier>
   <mcc:code>
    <gco:CharacterString>GCL2000_feedack_item_1</gco:CharacterString>
   </mcc:code>
  </mcc:MD_Identifier>
 </guf:itemIdentifier>
 <guf:abstract>
  <gco:CharacterString>Comparison with other land cover products is difficult
because legends are not compatible</gco:CharacterString>
 </guf:abstract>
 <guf:contactRole>
  <guf:GUF_UserRoleCode codeListValue="researchEndUser" codeList="http://www.
opengis.net/guf/2.0/resources/codeList.xml#CI_RoleCode#GUF_UserRoleCode"></guf:
GUF_UserRoleCode>
 </guf:contactRole>
 <guf:dateInfo>
  <cit:CI_Date>
   <cit:date>
    <gco:DateTime>2006-03-01T00:00:00Z</gco:DateTime>
   </cit:date>
   <cit:dateType>
    <cit:CI_DateTypeCode codeList="http://wis.wmo.int/2008/catalogues/draft_
version_1-1/WMO_Codelists_ver1_1.xml#CI_DateTypeCode" codeListValue="creation"/
>
   </cit:dateType>
  </cit:CI_Date>
 </guf:dateInfo>
 <guf:contact>
  <guf:GUF_UserInformation>
   <guf:userDetails>
    <cit:CI_Individual>
     <cit:name>
      <gco:CharacterString>Henrique M. Pereira</gco:CharacterString>
     </cit:name>
    </cit:CI_Individual>
   </guf:userDetails>
   <guf:applicationDomain>
```

```xml
    <guf:GUF_ApplicationDomain>
     <guf:domain>
      <cit:CI_RoleCode codeListValue="use" codeList="http://wis.wmo.int/2008/
catalogues/draft_version_1-1/WMO_Codelists_ver1_1.xml#CI_RoleCode"></cit:CI_
RoleCode>
     </guf:domain>
     <guf:expertiseLevel><guf:GUF_RatingCode codeListValue="5" codeList="http:
//www.opengis.net/guf/1.0/resources/codeList.xml#GUF_RatingCode"></guf:GUF_
RatingCode></guf:expertiseLevel>
    </guf:GUF_ApplicationDomain>
   </guf:applicationDomain>
  </guf:GUF_UserInformation>
 </guf:contact>
 <guf:userComment>
  <guf:GUF_UserComment>
   <guf:comment>
    <gco:CharacterString>Surprisingly, there are no directly comparable
sets of global land-cover data for two different dates. For instance, the
Global Land Cover for the year 2000 (GLC 2000) based on SPOT VEGETATION
(https://forobs.jrc.ec.europa.eu/products/glc2000) is not directly comparable
with the International Geosphere–Biosphere Programme (IGBP) Land Cover
(1992–1993, https://www.usgs.gov/centers/eros/science/usgs-eros-archive-
land-cover-products-global-land-cover-characterization-glcc) based on
the National Oceanic and Atmospheric Administration Advanced Very High
Resolution Radiometer (NOAA-AVHRR). The difficulties arise from the use
of different sensors, different land-cover classification  systems (including
different definitions of forest) and  different classification methods.</gco:
CharacterString>
   </guf:comment>
  </guf:GUF_UserComment>
 </guf:userComment>
 <guf:target>
  <guf:GUF_FeedbackTarget>
   <guf:resourceRef>
    <cit:CI_Citation>
     <cit:title><gco:CharacterString>Global Land Cover 2000</gco:
CharacterString></cit:title>
     <cit:onlineResource><cit:CI_OnlineResource>
      <cit:linkage><gco:CharacterString>https://forobs.jrc.ec.europa.eu/
products/glc2000/products.php</gco:CharacterString></cit:linkage>
     </cit:CI_OnlineResource></cit:onlineResource>
    </cit:CI_Citation>
   </guf:resourceRef>
   <guf:scope>
    <mcc:MD_Scope>
     <mcc:level>
      <mcc:MD_ScopeCode codeListValue="dataset" codeList="http://standards.
iso.org/iso/19115/resources/Codelist/cat/codeLists.xml#MD_ScopeCode"></mcc:MD_
ScopeCode>
     </mcc:level>
    </mcc:MD_Scope>
   </guf:scope>
   <guf:role>
    <guf:GUF_TargetRoleCode codeListValue="primary" codeList="http://www.
opengis.net/guf/1.0/resources/codeList.xml#GUF_TargetRoleCode"></guf:GUF_
TargetRoleCode>
   </guf:role>
  </guf:GUF_FeedbackTarget>
 </guf:target>
 <guf:target>
  <guf:GUF_FeedbackTarget>
   <guf:resourceRef>
    <cit:CI_Citation>
```

```
        <cit:title><gco:CharacterString>Global Land Cover Characterization</gco:
CharacterString></cit:title>
        <cit:onlineResource><cit:CI_OnlineResource>
         <cit:linkage><gco:CharacterString>https://www.usgs.gov/centers/
eros/science/usgs-eros-archive-land-cover-products-global-land-cover-
characterization-glcc</gco:CharacterString></cit:linkage>
        </cit:CI_OnlineResource></cit:onlineResource>
      </cit:CI_Citation>
    </guf:resourceRef>
    <guf:scope>
     <mcc:MD_Scope>
      <mcc:level>
       <mcc:MD_ScopeCode codeListValue="dataset" codeList="http://standards.
iso.org/iso/19115/resources/Codelist/cat/codeLists.xml#MD_ScopeCode"></mcc:MD_
ScopeCode>
      </mcc:level>
     </mcc:MD_Scope>
    </guf:scope>
    <guf:role>
     <guf:GUF_TargetRoleCode codeListValue="primary" codeList="http://www.
opengis.net/guf/1.0/resources/codeList.xml#GUF_TargetRoleCode"></guf:GUF_
TargetRoleCode>
    </guf:role>
   </guf:GUF_FeedbackTarget>
  </guf:target>
</guf:GUF_FeedbackItem>
```

Listing 4

8

GEOSPATIAL USER FEEDBACK MODEL. EXTENSIONS

8 GEOSPATIAL USER FEEDBACK MODEL. EXTENSIONS

This section describes two requirements classes that are considered extensions of the XML encoding core: Feedback-Summary and the Feedback-Collection.

8.1. Requirements Class Feedback-Summary

The Feedback-Summary requirements class defines the XML encoding classes that allow for encoding summary statistics of feedback items that share the same target.

REQUIREMENTS CLASS 3: REQUIREMENTS CLASS 'FEEDBACK-SUMMARY'	
IDENTIFIER	`https://www.opengis.net/spec/guf-schema/2.0/req/feedback-summary`
TARGET TYPE	Feedback-Summary
CONFORMANCE CLASS	Conformance class A.3: `https://www.opengis.net/spec/guf-schema/2.0/conf/feedback-summary`
PREREQUISITE	Requirement 7: `/req/feedback-summary/ufs-schema`
NORMATIVE STATEMENT	Requirement 3-1: `/req/feedback-item`

REQUIREMENT 7	
IDENTIFIER	`/req/feedback-summary/ufs-schema`
A	An XML Encoding of a geospatial user feedback summary SHALL use UFS_FeedbackSummary and SHALL validate using the geospatial user feedback summary schema ufs.xsd

The ufs.xsd schema is automatically derived from the OGC 15-097 UML model [8]. No tables describing the naming of the elements and sub-elements are reproduced here as they are specified in the conceptual model.

The following code shows a xml encoding example for UFS_FeedbackSummary

```
<UFS_FeedbackSummary
    xmlns:mcc="http://standards.iso.org/iso/19115/-3/mcc/1.0"
    xmlns:mri="http://standards.iso.org/iso/19115/-3/mri/1.0"
```

```
    xmlns:cit="http://standards.iso.org/iso/19115/-3/cit/1.0"
    xmlns:gco="http://standards.iso.org/iso/19115/-3/gco/1.0"
    xmlns:guf="http://www.opengis.net/guf/1.0/core"
    xmlns="http://www.opengis.net/guf/1.0/summary"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xlink="http://
www.w3.org/1999/xlink"
    xsi:schemaLocation="http://www.opengis.net/guf/1.0/summary ../ufs.xsd">
 <target>
  <cit:CI_Citation>
   <cit:title></cit:title>
   <cit:identifier>
    <mcc:MD_Identifier>
     <mcc:code>
      <gco:CharacterString>GLC2000</gco:CharacterString>
     </mcc:code>
     <mcc:codeSpace>
      <gco:CharacterString>jrc.ec.europa.eu</gco:CharacterString>
     </mcc:codeSpace>
    </mcc:MD_Identifier>
   </cit:identifier>
  </cit:CI_Citation>
 </target>
 <numberOfFeedbackItems><gco:Integer>4</gco:Integer></numberOfFeedbackItems>
 <minimumPossibleRating><gco:Real>1.0</gco:Real></minimumPossibleRating>
 <maximumPossibleRating><gco:Real>5.0</gco:Real></maximumPossibleRating>
 <averageRating><gco:Real>5.0</gco:Real></averageRating>
 <numberOfRatings><gco:Integer>0</gco:Integer></numberOfRatings>
 <numberOfUserComments><gco:Integer>3</gco:Integer></numberOfUserComments>
 <numberOfUsageReports><gco:Integer>2</gco:Integer></numberOfUsageReports>
 <numberOfCitations><gco:Integer>4</gco:Integer></numberOfCitations>
 <numberOfAdditionalQualities><gco:Integer>3</gco:Integer></
numberOfAdditionalQualities>
 <numberOfAdditionalLineages><gco:Integer>0</gco:Integer></
numberOfAdditionalLineages>
 <numberOfSignificantEvents><gco:Integer>0</gco:Integer></
numberOfSignificantEvents>
</UFS_FeedbackSummary>
```

Listing 5

8.2. Requirements Class Feedback-Collection

The Feedback-Collection requirements class defines the XML encoding classes that support for grouping of feedback items into a feedback response and feedback collection with summary statistics. A feedback collection is a collection of feedback items that share a common target and share the same rating code list.

REQUIREMENTS CLASS 4: REQUIREMENTS CLASS 'FEEDBACK-COLLECTION'	
IDENTIFIER	https://www.opengis.net/spec/guf-schema/2.0/req/feedback-collection
TARGET TYPE	Feedback-Collection

REQUIREMENTS CLASS 4: REQUIREMENTS CLASS 'FEEDBACK-COLLECTION'

CONFORMANCE CLASS	Conformance class A.4: `https://www.opengis.net/spec/guf-schema/2.0/conf/feedback-collection`
PREREQUISITE	/req/feedback-collection/ufc-schema
NORMATIVE STATEMENT	Requirement 4-1: `/req/feedback-collection`

REQUIREMENT 8

IDENTIFIER	`/req/feedback-item/ufc-schema`
A	An XML Encoding of a geospatial user feedback collection SHALL use UFC_FeedbackCollection and shall validate using the geospatial user feedback collection schema ufc.xsd

The ufc.xsd schema is automatically derived from the OGC 23-017 UML model [2]. No tables describing the naming of the elements and sub-elements are reproduced here as they are specified in the conceptual model.

The following code shows a xml encoding example for UFC_FeedbackCollection

```xml
<?xml version="1.0" encoding="UTF-8"?>
<ufc:UFC_FeedbackCollection
    xmlns:mcc="http://standards.iso.org/iso/19115/-3/mcc/1.0"
    xmlns:mdq="http://standards.iso.org/iso/19157/-2/mdq/1.0"
    xmlns:mri="http://standards.iso.org/iso/19115/-3/mri/1.0"
    xmlns:cit="http://standards.iso.org/iso/19115/-3/cit/1.0"
    xmlns:gco="http://standards.iso.org/iso/19115/-3/gco/1.0"
    xmlns:qcm="http://www.opengis.net/guf/1.0/common"
    xmlns:guf="http://www.opengis.net/guf/1.0/core"
    xmlns:ufc="http://www.opengis.net/guf/1.0/collection"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xlink="http://www.w3.org/1999/xlink"
    xsi:schemaLocation="http://www.opengis.net/guf/1.0/collection ../ufc.xsd">
 <ufc:item>
  <guf:GUF_FeedbackItem>
   <guf:itemIdentifier>
    <mcc:MD_Identifier>
     <mcc:code>
      <gco:CharacterString>GCL2000_feedack_item_2</gco:CharacterString>
     </mcc:code>
    </mcc:MD_Identifier>
   </guf:itemIdentifier>
   <guf:abstract>
    <gco:CharacterString>Comparing several global land cover products, i.e.
the Global Land Cover Characterization Database (GLCC), Global Land Cover 2000
(GLC2000), and the MODIS land cover product, reveil individual strengths and
weaknesses of mapping approaches.</gco:CharacterString>
   </guf:abstract>
   <guf:contactRole>
    <guf:GUF_UserRoleCode codeListValue="researchEndUser" codeList="">
researchEndUser</guf:GUF_UserRoleCode>
   </guf:contactRole>
```

```xml
<guf:dateInfo>
 <cit:CI_Date>
  <cit:date>
   <gco:DateTime>2006-01-01T00:00:00Z</gco:DateTime>
  </cit:date>
  <cit:dateType>
   <cit:CI_DateTypeCode codeList="http://wis.wmo.int/2008/catalogues/draft_
version_1-1/WMO_Codelists_ver1_1.xml#CI_DateTypeCode" codeListValue="creation"/
>
  </cit:dateType>
 </cit:CI_Date>
</guf:dateInfo>
<guf:citation>
 <cit:CI_Citation>
  <cit:title>
   <gco:CharacterString>Exploiting synergies of global land cover products
for carbon cycle modeling</gco:CharacterString>
  </cit:title>
  <cit:date>
   <cit:CI_Date>
    <cit:date>
     <gco:DateTime>2006-01-01T00:00:00Z</gco:DateTime>
    </cit:date>
    <cit:dateType>
     <cit:CI_DateTypeCode codeList="http://wis.wmo.int/2008/catalogues/
draft_version_1-1/WMO_Codelists_ver1_1.xml#CI_DateTypeCode" codeListValue=
"creation"/>
    </cit:dateType>
   </cit:CI_Date>
  </cit:date>
  <cit:series>
   <cit:CI_Series>
    <cit:name>
     <gco:CharacterString>Remote Sensing of Environment</gco:
CharacterString>
    </cit:name>
   </cit:CI_Series>
  </cit:series>
  <cit:otherCitationDetails>
   <gco:CharacterString>101 (2006) 534–553</gco:CharacterString>
  </cit:otherCitationDetails>
 </cit:CI_Citation>
</guf:citation>
<guf:additionalQuality>
 <mdq:DQ_DataQuality><mdq:scope><mcc:MD_Scope>
  <mcc:level><mcc:MD_ScopeCode codeList="http://standards.iso.org/iso/19115/
resources/Codelist/cat/codeLists.xml#MD_ScopeCode"  codeListValue="dataset"/></
mcc:level>
 </mcc:MD_Scope></mdq:scope>
 <mdq:report><mdq:DQ_DomainConsistency>
  <mdq:result>
   <mdq:DQ_DescriptiveResult>
    <mdq:statement><gco:CharacterString>14% of the area of the GLCC,
GLC2000, and MODIS land cover maps, reclassified to the SIMPLE legend disagree
in the all three land cover maps. Areas where all maps disagree or only
two maps agree seem to be associated with mainly transitional ecozones with
mixtures of the three main components trees, shrubs and grasses  such  as
tropical  savannas  including  the  Sahel, Mediterranean Europe, and tundra.</
gco:CharacterString></mdq:statement>
   </mdq:DQ_DescriptiveResult>
  </mdq:result>
 </mdq:DQ_DomainConsistency></mdq:report>
 </mdq:DQ_DataQuality>
```

```xml
          </guf:additionalQuality>
          <guf:usage>
           <guf:GUF_UsageReport>
            <guf:usageDescription>
             <mri:MD_Usage>
              <mri:specificUsage><gco:CharacterString>GLCC, GLC2000 and MODIS land
cover products comparison</gco:CharacterString></mri:specificUsage>
             </mri:MD_Usage>
            </guf:usageDescription>
            <guf:discoveredIssue>
             <qcm:QCM_DiscoveredIssue>
              <qcm:knownProblem>
               <gco:CharacterString>None of legends  of  all  three  global  land
cover  products  are  easily translated  into  the  land  cover  classes  of
 vegetation  models without introducing uncertainty due to poor definition of
mixed
classes or a lack of information about leaf type and phenology.</gco:
CharacterString>
              </qcm:knownProblem>
             </qcm:QCM_DiscoveredIssue>
            </guf:discoveredIssue>
           </guf:GUF_UsageReport>
          </guf:usage>
          <guf:contact>
           <guf:GUF_UserInformation>
            <guf:userDetails>
             <cit:CI_Responsibility>
              <cit:role>
               <cit:CI_RoleCode codeList="http://wis.wmo.int/2008/catalogues/draft_
version_1-1/WMO_Codelists_ver1_1.xml#CI_RoleCode" codeListValue="user"/>
              </cit:role>
              <cit:party>
               <cit:CI_Individual>
                <cit:name>
                 <gco:CharacterString>Martin Jung</gco:CharacterString>
                </cit:name>
               </cit:CI_Individual>
              </cit:party>
             </cit:CI_Responsibility>
            </guf:userDetails>
            <guf:expertiseLevel>
             <guf:GUF_RatingCode codeListValue="5" codeList="http://www.opengis.net/
guf/1.0/resources/codeList.xml#GUF_RatingCode"></guf:GUF_RatingCode>
            </guf:expertiseLevel>
           </guf:GUF_UserInformation>
          </guf:contact>
          <guf:userComment>
           <guf:GUF_UserComment>
            <guf:comment>
             <gco:CharacterString> GLCC is based on poorly or uncorrected raw data,
using only monthly NDVI composites that also have some geometric problems.
The VEGA data set of GLC2000 with daily composites of calibrated spectral
bands and NDVI offers  significantly  improved  data  and  more  flexibility
 for classification. A further advantage of the VEGA2000 is the effective
 geometric  correction  procedures  (Bartholomé  &amp; Belward, 2005). The
input data sets of the MODIS product supersede  GLCC  and  GLC2000  in  terms
 of  the  spectral properties of the MODIS instrument, specifically designed
for land surface mapping. Also, the MODIS data are based on higher  spatial
resolution  of  the  raw data  (250m/500m) and comprehensive  strategies  of
data  correction  and  calibration. Regarding  the  applied  classification
methods,  MLCCA (MODIS land cover classification algorithm) clearly seems the
most sophisticated algorithm. In contrast to GLCC and GLC2000, it is purely
objective, reproducible and operational for the whole globe, thus seems most
```

suitable for change detection. GLCC offers the most flexibility for users
in terms of available reclassifications including the Olsen classification
with 94 classes. MODIS is also available in different legends, which is
not the case for GLC2000. LCCS of GLC2000 is the most advanced and flexible
classification system with a clear rationale and standardized definition of
the classes. Although GLC2000 benefits strongly from the use of LCCS and its
regional bottom-up approach, its global map lacks some internal consistency
associated with the individual mapping initiatives by different project
participants.`</gco:CharacterString>`
      `</guf:comment>`
     `</guf:GUF_UserComment>`
    `</guf:userComment>`
    `<guf:target>`
     `<guf:GUF_FeedbackTarget>`
      `<guf:resourceRef` xlink:href=`"http://www-gvm.jrc.it/glc2000">`
       `<cit:CI_Citation>`
        `<cit:title></cit:title>`
        `<cit:identifier>`
         `<mcc:MD_Identifier>`
          `<mcc:code>`
           `<gco:CharacterString>`GLC2000`</gco:CharacterString>`
          `</mcc:code>`
          `<mcc:codeSpace>`
           `<gco:CharacterString>`jrc.ec.europa.eu`</gco:CharacterString>`
          `</mcc:codeSpace>`
         `</mcc:MD_Identifier>`
        `</cit:identifier>`
       `</cit:CI_Citation>`
      `</guf:resourceRef>`
      `<guf:scope>`
       `<mcc:MD_Scope>`
        `<mcc:level>`
         `<mcc:MD_ScopeCode` codeListValue=`"dataset"` codeList=`"http://standards.`
iso.org/iso/19115/resources/Codelist/cat/codeLists.xml#MD_ScopeCode`"/>`
        `</mcc:level>`
       `</mcc:MD_Scope>`
      `</guf:scope>`
      `<guf:role>`
       `<guf:GUF_TargetRoleCode` codeListValue=`"primary"` codeList=`"http://www.`
opengis.net/guf/1.0/resources/codeList.xml#GUF_TargetRoleCode`"></guf:GUF_`
TargetRoleCode`>`
      `</guf:role>`
     `</guf:GUF_FeedbackTarget>`
    `</guf:target>`
    `<guf:target>`
     `<guf:GUF_FeedbackTarget>`
      `<guf:resourceRef` xlink:href=`"http://edcdaac.usgs.gov/glcc/globdoc2_0.asp">`
       `<cit:CI_Citation>`
        `<cit:title></cit:title>`
        `<cit:identifier>`
         `<mcc:MD_Identifier>`
          `<mcc:code>`
           `<gco:CharacterString>`Global Land Cover Characterization DataBase
(GLCC)`</gco:CharacterString>`
          `</mcc:code>`
         `</mcc:MD_Identifier>`
        `</cit:identifier>`
       `</cit:CI_Citation>`
      `</guf:resourceRef>`
      `<guf:scope>`
       `<mcc:MD_Scope>`
        `<mcc:level>`

```xml
            <mcc:MD_ScopeCode codeListValue="dataset" codeList="http://standards.
iso.org/iso/19115/resources/Codelist/cat/codeLists.xml#MD_ScopeCode"/>
          </mcc:level>
         </mcc:MD_Scope>
        </guf:scope>
        <guf:role>
         <guf:GUF_TargetRoleCode codeListValue="primary" codeList="http://www.
opengis.net/guf/1.0/resources/codeList.xml#GUF_TargetRoleCode"></guf:GUF_
TargetRoleCode>
        </guf:role>
       </guf:GUF_FeedbackTarget>
      </guf:target>
      <guf:target>
       <guf:GUF_FeedbackTarget>
        <guf:resourceRef>
         <cit:CI_Citation>
          <cit:title></cit:title>
          <cit:identifier>
           <mcc:MD_Identifier>
            <mcc:code>
             <gco:CharacterString>The  MODIS  land  cover  product</gco:
CharacterString>
            </mcc:code>
           </mcc:MD_Identifier>
          </cit:identifier>
         </cit:CI_Citation>
        </guf:resourceRef>
        <guf:scope>
         <mcc:MD_Scope>
          <mcc:level>
           <mcc:MD_ScopeCode codeListValue="dataset" codeList="http://standards.
iso.org/iso/19115/resources/Codelist/cat/codeLists.xml#MD_ScopeCode"/>
          </mcc:level>
         </mcc:MD_Scope>
        </guf:scope>
        <guf:role>
         <guf:GUF_TargetRoleCode codeListValue="primary" codeList="http://www.
opengis.net/guf/1.0/resources/codeList.xml#GUF_TargetRoleCode"></guf:GUF_
TargetRoleCode>
        </guf:role>
       </guf:GUF_FeedbackTarget>
      </guf:target>
     </guf:GUF_FeedbackItem>
    </ufc:item>
    <ufc:pagination>
     <ufc:UFC_ResponsePagination>
      <ufc:numberOfFeedbackItems><gco:Integer>1</gco:Integer></ufc:
numberOfFeedbackItems>
      <ufc:count><gco:Integer>1</gco:Integer></ufc:count>
     </ufc:UFC_ResponsePagination>
    </ufc:pagination>
</ufc:UFC_FeedbackCollection>
```

Listing 6

A

ANNEX A (NORMATIVE) CONFORMANCE CLASS ABSTRACT TEST SUITE (NORMATIVE)

A ANNEX A (NORMATIVE) CONFORMANCE CLASS ABSTRACT TEST SUITE (NORMATIVE)

A.1. Introduction

A GUF XML implementation of this standard must satisfy the following system characteristics to be conformant with this specification.

A.2. Conformance class: Quality Common

CONFORMANCE CLASS A.1	
IDENTIFIER	`https://www.opengis.net/spec/guf-schema/2.0/conf/quality-common`
SUBJECT	Conformance Class "Quality Common"
REQUIREMENTS CLASS	Requirements class 1: `https://www.opengis.net/spec/guf-schema/2.0/req/quality-common`
CONFORMANCE TESTS	Abstract test A.2: `/conf/quality-common/file-extension` Abstract test A.4: `/conf/quality-common/iso-schema` Abstract test A.1: `/conf/quality-common/mime-type` Abstract test A.5: `/conf/quality-common/qcm-schema` Abstract test A.3: `/conf/quality-common/xml-rules`

A.2.1. MIME type

ABSTRACT TEST A.1

IDENTIFIER	`/conf/quality-common/mime-type`
REQUIREMENT	Requirement 1: `/req/quality-common/mime-type`
TEST PURPOSE	An XML encoding of a geospatial user feedback shall adopt the XML MIME type of application/xml
DESCRIPTION	Validate the MIME type
STEP	Test passes if the encoded instances have the associated MIME type application/xml.

A.2.2. File extension

ABSTRACT TEST A.2

IDENTIFIER	`/conf/quality-common/file-extension`
REQUIREMENT	Requirement 2: `/req/quality-common/file-extension`
TEST PURPOSE	An XML encoding of a geospatial user feedback shall use the file extension '.xml'
DESCRIPTION	Validate the file extension
STEP	Test passes if a file system is used and the encoded instances are files with '.xml' file extension

A.2.3. ISO XML rules

ABSTRACT TEST A.3

IDENTIFIER	`/conf/quality-common/xml-rules`
REQUIREMENT	Requirement 3: `/req/quality-common/xml-rules`
TEST PURPOSE	An XML encoding of a geospatial user feedback shall comply with the encoding rules specified in ISO-19139. Dependencies: ISO 19139
DESCRIPTION	Validate the encoding rules followed

ABSTRACT TEST A.3	
STEP	Test passes if the encoded instances follow ISO-19139 conformance classes.

A.2.4. ISO XML schema

ABSTRACT TEST A.4	
IDENTIFIER	`/conf/quality-common/iso-schema`
REQUIREMENT	Requirement 4: `/req/quality-common/iso-schema`
INDIRECT PREREQUISITE	ISO 19115-3 and ISO 19157-2
TEST PURPOSE	An XML encoding of a geospatial user feedback shall validate using the schemas ISO19115-3 and ISO19157-2 provided at: http://standards.iso.org/iso/19115/-3 and http://standards.iso.org/iso/19157/-2 respectively
DESCRIPTION	Validate the XML against the right XML schema
STEP	Test passes if encoded instances validates under the ISO XML schemas for ISO19115-1 and ISO19157-1 that are provided by ISO19115-3 and ISO19157-2 respectively.

A.2.5. Quality common XML schema

ABSTRACT TEST A.5	
IDENTIFIER	`/conf/quality-common/qcm-schema`
REQUIREMENT	Requirement 5: `/req/quality-common/qcm-schema`
INDIRECT PREREQUISITE	Requirements class 1: `https://www.opengis.net/spec/guf-schema/2.0/req/quality-common`
TEST PURPOSE	An XML encoding of a geospatial user feedback using QCM_Publication or QCM_Discovered Issue shall validate using the quality common schema qcm.xsd
DESCRIPTION	Validate the XML against the right XML schema
STEP	Test passes if XML elements of the data type QCM_Publication and QCM_DiscoveredIssue conform to the http://www.opengis.net/spec/geospatial-user-feedback/1.0/conf/quality-common and validate against the quality common schema with the XML namespace http://www.opengis.net/guf/1.0/common and encoded in the qcm.xsd

A.3. Conformance class: User Feedback-item

CONFORMANCE CLASS A.2	
IDENTIFIER	`https://www.opengis.net/spec/guf-schema/2.0/conf/user-feedback-item`
SUBJECT	Conformance Class "Feedback Item"
REQUIREMENTS CLASS	Requirements class 2: `https://www.opengis.net/spec/guf-schema/2.0/req/user-feedback-item`
CONFORMANCE TEST	Abstract test A.6: `/conf/feedback-item/guf-schema`

A.3.1. Feedback item XML schema

ABSTRACT TEST A.6	
IDENTIFIER	`/conf/feedback-item/guf-schema`
REQUIREMENT	Requirement 6: `/req/feedback-item/guf-schema`
INDIRECT PREREQUISITE	Requirements class 2: `https://www.opengis.net/spec/guf-schema/2.0/req/user-feedback-item`
TEST PURPOSE	An XML encoding of a geospatial user feedback item shall use GUF_FeedbackItem and shall validate using the geospatial user feedback item schema guf.xsd
DESCRIPTION	Validate the XML against the right XML schema
STEP	Test passes if XML elements of the data type GUF_FeedbackItem conform to the http://www.opengis.net/spec/geospatial-user-feedback/1.0/conf/feedback-item and validate against the quality common schema with the XML namespace http://www.opengis.net/guf/1.0/core and encoded in the guf.xsd

A.4. Conformance class: Feedback-summary

CONFORMANCE CLASS A.3	
IDENTIFIER	`https://www.opengis.net/spec/guf-schema/2.0/conf/feedback-summary`
SUBJECT	Conformance Class "Feedback Summary"
REQUIREMENTS CLASS	Requirements class 3: `https://www.opengis.net/spec/guf-schema/2.0/req/feedback-summary`
CONFORMANCE TEST	Abstract test A.7: `/conf/feedback-summary/ufs-schema`

A.4.1. Feedback summary XML schema

ABSTRACT TEST A.7	
IDENTIFIER	`/conf/feedback-summary/ufs-schema`
REQUIREMENT	Requirement 7: `/req/feedback-summary/ufs-schema`
INDIRECT PREREQUISITE	Requirements class 3: `https://www.opengis.net/spec/guf-schema/2.0/req/feedback-summary`
TEST PURPOSE	An XML Encoding of a geospatial user feedback summary shall use UFS_FeedbackSummary and shall validate using the geospatial user feedback summary schema ufs.xsd
DESCRIPTION	Validate the XML against the right XML schema
STEP	Test passes if XML elements of the data type UFS_FeedbackSummary conform to the http://www.opengis.net/spec/geospatial-user-feedback/1.0/conf/feedback-summary and validate against the quality common schema with the XML namespace http://www.opengis.net/guf/1.0/summary and encoded in the ufs.xsd.

A.5. Conformance class: Feedback-collection

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CONFORMANCE CLASS A.4	
IDENTIFIER	`https://www.opengis.net/spec/guf-schema/2.0/conf/feedback-collection`
SUBJECT	Conformance Class "Feedback Collection"

CONFORMANCE CLASS A.4	
REQUIREMENTS CLASS	Requirements class 4: `https://www.opengis.net/spec/guf-schema/2.0/req/feedback-collection`
CONFORMANCE TEST	Conformance test A.4-1: `/conf/feedback-collection/ufc-schema`

A.5.1. Feedback collection XML schema

ABSTRACT TEST A.8	
IDENTIFIER	`/conf/feedback-item/ufc-schema`
REQUIREMENT	Requirement 8: `/req/feedback-item/ufc-schema`
INDIRECT PREREQUISITE	Requirements class 4: `https://www.opengis.net/spec/guf-schema/2.0/req/feedback-collection`
TEST PURPOSE	An XML Encoding of a geospatial user feedback collection shall use UFC_FeedbackCollection and shall validate using the geospatial user feedback collection schema ufc.xsd
DESCRIPTION	Validate the XML against the right XML schema
STEP	Test passes if XML elements of the data type UFC_FeedbackCollection conform to the http://www.opengis.net/spec/geospatial-user-feedback/1.0/conf/feedback-collection and validate against the quality common schema with the XML namespace http://www.opengis.net/guf/1.0/collection and encoded in the ufc.xsd

B

ANNEX B (INFORMATIVE) XML SCHEMA DOCUMENTS

B

ANNEX B
(INFORMATIVE)
XML SCHEMA DOCUMENTS
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In addition to this document, this standard includes several XML Schema Documents. These XML Schema Documents are available at http://schemas.opengis.net/guf/2.0.

These XML Schema Documents and examples combine the XML schema fragments listed in various subclauses of this document, eliminating duplications. These XML Schema Documents match the GUF UML packages described in the OGC 15-097 Geospatial User Feedback Conceptual Model and were derived from them using ShapeChange application, and are named:

qcm.xsd
guf.xsd
ufs.xsd
ufc.xsd

These XML Schema Documents use and build on the ISO 19115-3 and ISO 19157-2 XML Schema Documents specified by ISO and that are available at http://standards.iso.org/iso, named:

19115/-3/mcc/1.0/mcc.xsd
19157/-2/mdq/1.0/mdq.xsd
19115/-3/gex/1.0/gex.xsd
19115/-3/mri/1.0/mri.xsd
19115/-3/cit/2.0/cit.xsd
19115/-3/gco/1.0/gco.xsd
19115/-3/mrl/1.0/mrl.xsd
19115/-3/lan/1.0/lan.xsd
19115/-3/mdb/1.0/mdb.xsd

All these XML Schema Documents contain documentation of the meaning of each element and attribute, and this documentation shall be considered normative as specified in Subclause 11.6.3 of [1].

C

ANNEX C (INFORMATIVE) REVISION HISTORY

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C ANNEX C (INFORMATIVE) REVISION HISTORY

Table C.1 — Revision History

DATE	RELEASE	EDITOR	PRIMARY CLAUSES MODIFIED	DESCRIPTION
2023-06-07	0.1	Alaitz Zabala	All	GUF XML implementation v.1.0 transcribed to metanorma
2023-11-24	0.2	Alaitz Zabala	All	First version of GUF XML implementation 2.0
2024-05-23	0.3	Alaitz Zabala & Oscar González	all	Reviewed version to present to OGC GUF SWG
2024-11-27	0.4	Carl Reed	All	text minor revisions

BIBLIOGRAPHY

BIBLIOGRAPHY

[1]   Arliss Whiteside, Jim Greenwood: OGC 06-121r9, *OGC Web Service Common Implementation Specification*. Open Geospatial Consortium (2010). https://portal.ogc.org/files/?artifact_id=38867.

[2]   Joan Masó, Lucy Bastin: OGC 15-097r1, *OGC® Geospatial User Feedback Standard: Conceptual Model*. Open Geospatial Consortium (2016). http://www.opengis.net/doc/IS/guf-conceptual/1.0.0.

[3]   ISO: ISO 19115-1:2014, *Geographic information — Metadata — Part 1: Fundamentals*. International Organization for Standardization, Geneva (2014). https://www.iso.org/standard/53798.html.

[4]   ISO: ISO 19139-1:2019, *Geographic information — XML Schema Implementation*. ISO (2019).

[5]   ISO: ISO 19157:2013, *Geographic information — Data quality*. International Organization for Standardization, Geneva (2013). https://www.iso.org/standard/32575.html.

[6]   _Processing application schemas for geographic information. Website: http://shapechange.net/_