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**Appendix C. Metadata Requirements Base Reference Unified Metadata Model Granules (UMM-G)**

**Appendix C. Metadata Requirements Base Reference Unified Metadata Model Granules (UMM-G)**

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**online at: /** **https://ops1-cm.ems.eosdis.nasa.gov/cm2/**

Preface

This document is under ESDIS Project configuration control. Once this document is approved, ESDIS approved changes are handled in accordance with Class I and Class II change control requirements described in the ESDIS Configuration Management Procedures. Changes to this document shall be verified by a document change notice (DCN) and implemented by change bars or by complete revision.

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Abstract

This document describes the Unified Metadata Model for Granules (UMM-G) to be used by the NASA Earth Science community. This model takes into account standards and specifications (Earth Observing System (EOS) Clearing House (ECHO) 10, ISO 19115-2, and ISO 19115-1) used by this community. Implementers of Earth Science Data and Information System's (ESDIS) CMR, its clients, and data providers should reference this document and the Unified Metadata Model (UMM) as a guide while implementing the system, its clients, or generating metadata.

***Keywords:*** ***UMM-S, UMM-Common, UMM-C, UMM-G, UMM-Var, Granules, NASA Earthdata Search, Tools, EOSDIS, ESDIS, CMR***

Change History Log

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## Introduction

### Purpose

Earth Observing System Data and Information System (EOSDIS) generates, archives, and distributes enormous amounts of Earth Science data via its Distributed Active Archive Centers (DAACs). These data are accessed and employed by a broad user community. It is therefore imperative that reliable, consistent, and high-quality metadata be maintained in order to enable accurate cataloging, discovery, accessibility, and interpretation. To increase the level of quality and consistency among its metadata holdings, EOSDIS has developed a model for various metadata concepts that it archives and maintains. This model aims to document vital elements that may be represented across various metadata formats and standards and unify them through core fields useful for data discovery and service invocations. This unified model, aptly named the Unified Metadata Model (UMM), has been developed as part of the EOSDIS Metadata Architecture Studies (MAS I and II) conducted between 2012 and 2013.

The UMM will be used by the Common Metadata Repository (CMR) and will drive search and retrieval of metadata cataloged within that system.

This document is intended to serve as a reference profile – a part of the UMM model - for geospatial science metadata for individual granules that are part of a larger data collection. This reference profile is referred to as the UMM-G, where 'G' indicates that this is the granule profile. The UMM-G attempts to unify several metadata specifications (ECHO 10, International Organization for Standardization (ISO) 19115-2:2009, and ISO 19115-1:2014). The profile breaks down granules into elements or classes closely aligned to the ISO 19115-\* Geographic Information Metadata schemas. Links to more information about the standards and specifications used in this document can be found in Related Documents section.

For each element, this document provides: a description, analysis, and set of associated tags; specification of any conflicts that were identified by the unification process; and a discussion of applicable recommendations. The set of associated tags can be used to understand various aspects of the field. Some fields are identified as being part of a controlled vocabulary providing a uniform way of classifying and describing all EOSDIS metadata. A reconciliation process will be developed to handle any conflicts specified by the unification process and the details will be developed on a provider-by-provider basis.

This document provides information to the National Aeronautics and Space Administration (NASA) Earth Science community. Distribution is unlimited.

### Scope

This document describes the UMM Granule (UMM-G) model.

### Impact

This document outlines a profile intended to be backward compatible with existing NASA Earth Science metadata implementations. It will impact providers from NASA DAAC[s], CMR client developers, metadata catalog developers, and users.

### Copyright Notice

The contents of this document are not protected by copyright in the United States.

### Feedback

Questions, comments and recommendations on this model should be directed to [support@earthdata.nasa.gov](mailto:support@earthdata.nasa.gov)

### Document Conventions

Unified Modeling Language (UML) diagrams and element lists are provided for each subcomponent of the model. The [R] after a field name indicates that the field is required. Elements that have commonality across multiple models are fully documented in the UMM-Common model. These elements are documented here, with references to the UMM-Common model as appropriate. If the element is documented fully in the UMM-Common document, only Tags and Sample Mappings are included here.

Each section of this document describes an element of the model. Many elements in this model are used in other metadata models. For example, several metadata models contain the Science Keywords element. Elements that have commonality across multiple models are fully documented in the UMM-Common model. These elements are documented here, with references to the UMM-Common model as appropriate. If the element is documented fully in the UMM-Common document, only Tags and Sample Mappings are included here. Elements that are unique to the Collection model are documented in the following way:

* Element Specification: Identifies the individual fields for the element
* Description: Provides background information on the purpose of the element and how it should be used. Any notes about the current usage of this element are documented here as well as any recommendations for usage or unresolved issues.
* Cardinality: Indicates the expectation of counts for this element, summarized in the following table:
* Tags: Provides related keywords associated with this element. Tags have specific valid values, which are documented and described in Appendix B: Tags Glossary.
* Sample Mappings: Gives an XPath for this element in DIF 9, DIF 10.x, ECHO, EMS, ISO-1911-2 and ISO 19115-1 metadata XML representations. This can be seen as the "crosswalk" for this element. Note: Not all elements have mappings in all formats and sometimes elements may have multiple mappings.
* Examples: XML snippets from "crosswalked" data formats documenting sample values for the element. Whenever possible, a URL to the specific collection used for the metadata snippet is provided. ISO 19115-2 snippets were developed using the file ECHOtoISO.xsl. ISO 19115-1 snippets were developed using ECHOtoISO-1.xsl. Current versions of these transformations can be found at <https://cdn.earthdata.nasa.gov/iso/resources/transforms/>

Table C.1. Cardinality

|  |  |
| --- | --- |
| **Value** | Description |
| **1** | Exactly one of this element is required |
| **0..1** | Optionally, one of this element may be present |
| **0..\*** | Optionally, many of this element may be present |
| **1..\*** | At least one of this element is required, many may be present |

granule

The smallest aggregation of data independently described, inventoried, and managed. Granules can be managed as logical granules and/or physical granules.

These are metadata elements that describe a single instance of a data product. Values of granule metadata apply to all of the data in that one granule. Typical metadata in this category describe spatial and temporal extent of the data as well as the quality and lineage of the data.

Source: <http://edhs1.gsfc.nasa.gov/waisdata/docsw/pdf/tp1520303.pdf>

UML diagrams and element lists are provided for each subcomponent of the model. The [R] after an element name indicates that the element is required.

Some elements are marked via tags as 'Required (with Option)'. These elements are similar to the xml scheme <choice> element: one of the options is required, but there is a choice with regards to which option is utilized. For more information about the various tags used throughout this document, refer to Appendix B: Tags Glossary of this document.

### Related Documentation

There is a document that fully describes metadata elements that are used in multiple models. This document, the UMM-Common (https://wiki.earthdata.nasa.gov/display/CMR/CMR+Documents) is documented separately. The Granule model makes multiple references to the UMM-Common throughout.

The ISO 19115-2 and ISO 19115-1 mapping paths and extracts of XML encoding of this standard used in this document are derived from the NASA Best Practices ISO translation from ECHO to 19115-2 and a similar ECHO to ISO 19115-1 translation. The translation files can be found online at this site: https://cdn.earthdata.nasa.gov/iso/resources/transforms. These translations resulted from efforts of the group assembled for the Metadata Evolution for NASA Data Systems (MENDS). More information on the Base Metadata Requirements established by the MENDS group can be found online at: https://wiki.earthdata.nasa.gov/display/NASAISO/NASA+Base+Metadata+Requirements.

The latest versions of all documents below should be used. The latest ESDIS Project documents can be obtained from URL: <https://ops1-cm.ems.eosdis.nasa.gov>. ESDIS documents have a document number starting with either 423 or 505. Other documents are available for reference in the ESDIS project library website at: <http://esdisfmp01.gsfc.nasa.gov/esdis_lib/default.php> unless indicated otherwise.

#### Applicable Documents

The following documents are referenced within or are directly applicable, or contain policies or other directive matters that are binding upon the content of this document.

|  |  |
| --- | --- |
| 423-RQMT-003 | Metadata Requirements Base Reference Document |
| CMR Life Cycle | https://wiki.earthdata.nasa.gov/display/CMR/CMR+Documents |
| 423-RQMT-003-A  UMM-Common | Metadata Requirements Base Reference Appendix A UMM-Common  https://wiki.earthdata.nasa.gov/display/CMR/CMR+Documents |
| ECHO 10 | https://wiki.earthdata.nasa.gov/display/echo/Earth+Observing+System+Clearing+House+-+ECHO |
| ISO 19115-2 (MENDS) | ISO 19115-2 Geographic Information - Metadata. http://www.iso.org/iso/catalogue\_detail.htm?csnumber=39229  https://cdn.earthdata.nasa.gov/iso/ |
| ISO 19115-1 | ISO 19115-1 Geographic Information - Metadata  https://github.com/ISO-TC211/XML |

#### Reference Documents

The following documents are not binding on the content but referenced herein and, amplify or clarify the information presented in this document.

|  |  |
| --- | --- |
| Tags | http://en.wikipedia.org/wiki/Tag\_%28metadata%29 |
| Translators | Translators to ISO can be found at https://cdn.earthdata.nasa.gov/iso/resources/transforms/ |
| XPath | XPath is a language for addressing parts of an XML document, designed for use with XSLT. |
| XLinks | http://en.wikipedia.org/wiki/XLink |
| MENDS | More information on the Base Metadata Requirements established by the MENDS group: https://wiki.earthdata.nasa.gov/display/NASAISO/NASA+Base+Metadata+Requirements  http://www.w3schools.com/schema/el\_choice.asp |

## Granule Metadata Conceptual Model

As shown in Figure C.1, the model has been organized into seven subsections that group related model elements. Each of these subsections and its constituent elements is documented individually.

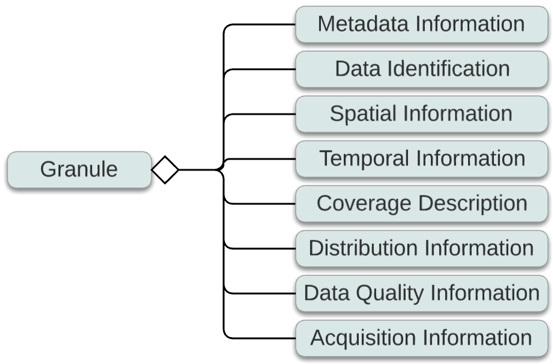


Figure C.1. Overall Granule Model

### Metadata Information

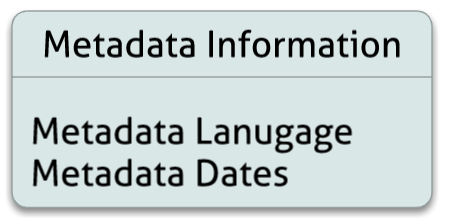


Figure C.2. Metadata Information

#### Metadata Language

This field is only part of ISO 19115. See UMM-Common Metadata Language element for full documentation and examples.

**Tags**

*Controlled Vocabulary, Faceted, Recommended*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata[gmd:characterSet/gmd:MD\_CharacterSetCode[*@codeList*='  <http://www.ngdc.noaa.gov/metadata/published/xsd/schema/resources/Codelist/>  gmxCodelists.xml#MD\_CharacterSetCode'][*@codeListValue*='utf8']]  /gmd:language/gco:CharacterString |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:defaultLocale/lan:PT\_Locale[lan:characterEncoding  /lan:MD\_CharacterSetCode[*@codeList*='codeListLocation#MD\_CharacterSetCode']  [*@codeListValue*='anyValidURI']]/lan:language/lan:LanguageCode |
| ECHO 10 Granule | N/A |

#### Metadata Dates

This includes any metadata related dates. All metadata dates will have a Lineage/Scope of 'metadata'. See UMM-Common Lineage and Metadata Dates element for full documentation and examples.

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:datestamp/gco:DateTime – metadata creation date |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:dateInfo/cit:CI\_Date[cit:dateType/cit:CI\_DateTypeCode[@codeList = 'codeListLocation#CI\_DateTypeCode'][@codeListValue = 'anyValidURI'][. = 'creation']]/cit:date/gco:DateTime |
| ECHO 10 Granule | /Granule/DataGranule/ProductionDateTime (cardinality [0..1]) |

### Data Identification

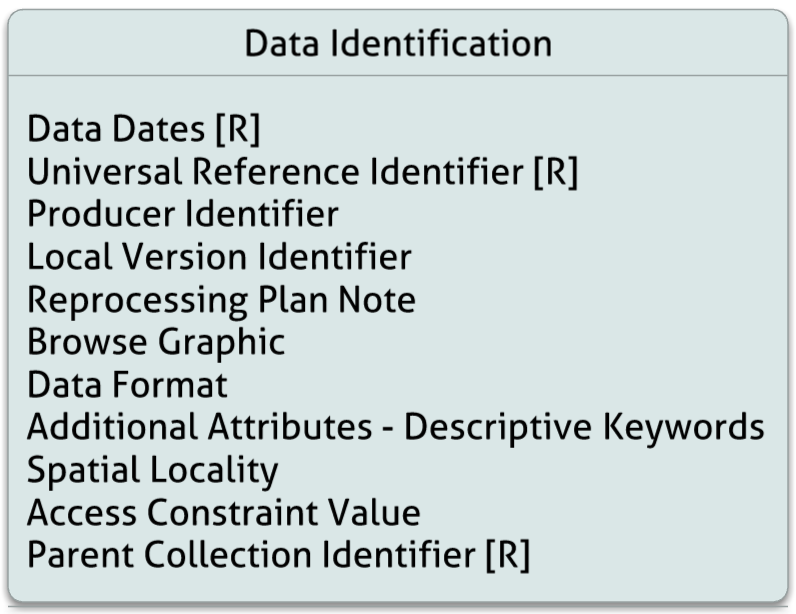


Figure C.3. Data Identification

#### Data Dates [R]

This includes any data related dates. All of these dates will have a Lineage/Scope of 'data'. See UMM-Common Lineage and Data Dates elements for full documentationand examples.

**Tags**

*Required (as specified in sample mappings)*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:citation  /gmd:CI\_Citation/gmd:date/gmd:CI\_Date[gmd:dateType/gmd:CI\_DateTypeCode  [*@codeList* = 'http://www.ngdc.noaa.gov/metadata/published/xsd/schema/resources/Codelist  /gmxCodelists.xml#CI\_DateTypeCode'][*@codeListValue*='creation']]/gmd:date/gco:DateTime  Note: *@codeListValue varies –* InsertTime -> 'creation', LastUpdate -> 'revision',  DeleteTime -> 'expiry' |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification  /mri:citation/cit:CI\_Citation/cit:date/cit:CI\_Date[cit:dateType/  cit:CI\_DateTypeCode[*@codeList* = 'codeListLocation#CI\_DateTypeCode']  [*@codeListValue* = 'anyValidURI'][. = 'creation']]/cit:date/gco:DateTime  Note: *@codeListValue varies –* InsertTime -> 'creation', LastUpdate -> 'revision', DeleteTime -> 'expiry' |
| ECHO 10 Granule | /Granule/InsertTime [R]  /Granule/LastUpdate [R]  /Granule/DeleteTime(cardinality [0..1]) |

#### Universal Reference Identifier [R]

**Element Specification**

GranuleUR

**Description**

The Universal Reference (UR) ID of the granule referred to by the data provider. This ID is unique per data provider.

**Cardinality**

1

**Tags**

*Required, Free Text Search, Parameter Search*

**Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | As data identifier: /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification  /gmd:citation  /gmd:CI\_Citation/gmd:identifier/gmd:MD\_Identifier/gmd:code/gco:CharacterString  As data title:  /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:citation  /gmd:CI\_Citation/gmd:title/gco:CharacterString |
| ISO 19115-1 | As data identifier: /mdb:MD\_Metadata/mdb:identificationInfo  /mri:MD\_DataIdentification/mri:citation  /cit:CI\_Citation/cit:identifier/mcc:MD\_Identifier[mcc:description/gco:CharacterString  [. = 'GranuleUR']]/mcc:code/gco:CharacterString  As data title:  /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification/mri:citation  /cit:CI\_Citation/cit:title/gco:CharacterString |
| ECHO 10 Granule | /Granule/GranuleUR [R] |

#### Producer Identifier

**Element Specification**

Lineage/Reprocessing/DataDates[Type = 'creation']/Date

**Description**

Unique identifier assigned to a granule by the data producer.

**Cardinality**

0..1

**Tags**

*Optional, Free Text Search, Parameter Search*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:citation  /gmd:CI\_Citation/gmd:identifier/gmd:MD\_Identifier/gmd:code/gco:CharacterString |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification/mri:citation  /cit:CI\_Citation/cit:identifier/mcc:MD\_Identifier/mcc:code/gco:CharacterString |
| ECHO 10 Granule | /Granule/DataGranule/ProducerGranuleId |

**Examples**

ECHO

|  |
| --- |
| <ProducerGranuleId>AIRS.2002.08.31.100.L1B.AIRS\_QaSub.v5.0.0.0.G07071151057.hdf  </ProducerGranuleId> |

ISO 19115-2

|  |
| --- |
| <gmd:identifier>  <gmd:MD\_Identifier>  <gmd:code>  <gco:CharacterString>AIRS.2002.08.31.100.L1B.AIRS\_QaSub.v5.0.0.0.G07071151057.hdf  </gco:CharacterString>  </gmd:code>  <gmd:description>  <gco:CharacterString>ProducerGranuleId</gco:CharacterString>  </gmd:description>  </gmd:MD\_Identifier>  </gmd:identifier> |

ISO 19115-1

|  |
| --- |
| <cit:identifier>  <mcc:MD\_Identifier>  <mcc:code>  <gco:CharacterString>MCD43C1.A2000057.005.2006264133654.hdf</gco:CharacterString>  </mcc:code>  <mcc:description>  <gco:CharacterString>ProducerGranuleId</gco:CharacterString>  </mcc:description>  </mcc:MD\_Identifier>  </cit:identifier> |

ECHO Granule Source:

<https://api.echo.nasa.gov:443/catalog-rest/echo_catalog/granules/G185415387-GSFCS4PA>

#### Local Version Identifier

**Element Specification**

Lineage/Reprocessing/EntryId/Version

**Description**

PGE-defined granule version as assigned by the data producer. See note for more information

*Note: This field is used inconsistently within ECHO. Some providers use this for more granule-specific lineage information. Usage needs to be normalized.*

**Cardinality**

0..1

**Tags**

*Optional, Deprecate, Normalize*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:citation  /gmd:CI\_Citation/gmd:identifier/gmd:MD\_Identifier[gmd:description  /gco:CharacterString[. = 'LocalVersionId']]/gmd:code/gco:CharacterString |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification/mri:citation  /cit:CI\_Citation/cit:identifier/mcc:MD\_Identifier[mcc:description/gco:CharacterString[. = 'LocalVersionId']]/mcc:code/gco:CharacterString |
| ECHO 10 Granule | /Granule/DataGranule/LocalVersionId |

**Examples**

ECHO

|  |
| --- |
| <LocalVersionId>1</LocalVersionId> |

ISO 19115-2

|  |
| --- |
| <gmd:identifier>  <gmd:MD\_Identifier>  <gmd:code>  <gco:CharacterString>1</gco:CharacterString>  </gmd:code>  <gmd:description>  <gco:CharacterString>LocalVersionId</gco:CharacterString>  </gmd:description>  </gmd:MD\_Identifier>  </gmd:identifier> |

ISO 19115-1

|  |
| --- |
| <cit:identifier>  <mcc:MD\_Identifier>  <mcc:code>  <gco:CharacterString>3.0.0</gco:CharacterString>  </mcc:code>  <mcc:description>  <gco:CharacterString>LocalVersionId</gco:CharacterString>  </mcc:description>  </mcc:MD\_Identifier>  </cit:identifier> |

ECHO Granule Source:

<https://api.echo.nasa.gov:443/catalog-rest/echo_catalog/granules/G202006-PODAAC>

#### Reprocessing Plan Note

**Description**

Note stating what reprocessing may be performed on this granule.

**Cardinality**

0..1

**Tags**

*Optional, Deprecate*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification  /gmd:resourceMaintenance/gmd:MD\_MaintenanceInformation/gmd:maintenanceNote  /gco:CharacterString |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification  /mri:resourceMaintenance/mmi:MD\_MaintenanceInformation/mmi:maintenanceNote  /gco:CharacterString |
| ECHO 10 Granule | /Granule/DataGranule/ReprocessingPlanned |

**Examples**

ECHO

|  |
| --- |
| <ReprocessingPlanned>further update is anticipated</ReprocessingPlanned> |

ISO 19115-2

|  |
| --- |
| <gmd:resourceMaintenance>  <gmd:MD\_MaintenanceInformation>  <gmd:maintenanceAndUpdateFrequency gco:nilReason="missing"/>  <gmd:maintenanceNote>  <gco:CharacterString>further update is anticipated</gco:CharacterString>  </gmd:maintenanceNote>  </gmd:MD\_MaintenanceInformation>  </gmd:resourceMaintenance> |

ISO 19115-1

|  |
| --- |
| <mri:resourceMaintenance>  <mmi:MD\_MaintenanceInformation>  <mmi:maintenanceAndUpdateFrequency gco:nilReason="missing"/>  <mmi:maintenanceNote>  <gco:CharacterString>further update is anticipated</gco:CharacterString>  </mmi:maintenanceNote>  </mmi:MD\_MaintenanceInformation>  </mri:resourceMaintenance> |

ECHO Granule Source:

<https://api.echo.nasa.gov:443/catalog-rest/echo_catalog/granules/G29633887-LPDAAC_ECS>

#### Browse Graphic

**Description**

The list of browse image urls and descriptions associated with this granule. In the future this may be deprecated in favor of visualization metadata linkage.   
  
In ISO 19115-2 the URL is included as an attribute and the description and file size are descriptive elements. The mime type for the browse graphic is included under a file type element.

*The Browse Graphic details can be found in Related URL element of the UMM Common document.*

**Cardinality**

0..\*

**Tags**

*Optional*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | URL -> /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification  /gmd:graphicOverview  /gmd:MD\_BrowseGraphic/gmd:fileName/gmx:FileName/@src  FileSize & Description -> /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification  /gmd:graphicOverview/gmd:MD\_BrowseGraphic/gmd:fileDescription  MimeType -> /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification  /gmd:graphicOverview/gmd:MD\_BrowseGraphic/gmd:fileType/gco:CharacterString |
| ISO 19115-1 | URL -> /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification  /mri:graphicOverview/mcc:MD\_BrowseGraphic/mcc:fileName/gcx:FileName/@src  FileSize & Description -> /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification  /mri:graphicOverview/mcc:MD\_BrowseGraphic/mcc:fileDescription/gco:CharacterString  MimeType -> /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification  /mri:graphicOverview/mcc:MD\_BrowseGraphic/mcc:fileType/gco:CharacterString |
| ECHO 10 Granule | /Granule/AssociatedBrowseImageUrls/ProviderBrowseUrl/URL  /Granule/AssociatedBrowseImageUrls/ProviderBrowseUrl/FileSize  /Granule/AssociatedBrowseImageUrls/ProviderBrowseUrl/Description  /Granule/AssociatedBrowseImageUrls/ProviderBrowseUrl/MimeType |

#### Data Format

**Description**

This attribute contains the file format of the raw data (such as HDF) for this granule

**Cardinality**

0..\*

**Tags**

*Optional, Controlled Vocabulary, Normalize, Multiple ISO Mappings*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification  /gmd:resourceFormat/gmd:MD\_Format/gmd:name/gco:CharacterString |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification  /mri:resourceFormat/mrd:MD\_Format/mrd:formatSpecificationCitation  /cit:CI\_Citation/cit:title/gco:CharacterString |
| ECHO 10 Granule | /Granule/DataFormat |

#### Additional Attributes - Descriptive Keywords

**Description**

This entity stores the product specific attributes that are descriptive in nature. For more information on how attributes are mapped, please refer **Appendix E: Additional Attributes Categorization**.

The Additional Attributes details can be found in the UMM Common document.

**Cardinality**

0..\*

**Relationships**

This field is validated against the parent collection field **ProductSpecificAttribute** of the UMM-C to ensure that it contains an attribute of the same name.

**Tags**

*Optional, Free Text Search, Parameter Search, Validated*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification  /gmd:descriptiveKeywords/gmd:MD\_Keywords/gmd:keyword/gco:CharacterString |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification  \/mri:descriptiveKeywords/mri:MD\_Keywords/mri:keyword/gco:CharacterString |
| ECHO 10 Granule | /Granule/AdditionalAttributes/AdditionalAttribute/Name: /Granule  /AdditionalAttributes/AdditionalAttribute/Values/Value |

#### Spatial Locality

**Description**

This field needs a re-evaluation and subsequent clarification of the usage criteria. Typical Values are  
'Global'  
'Limb'  
'Land'

**Cardinality**

0..\*

**Tags**

*Optional, Free Text Search, Deprecate, Normalize*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification  /gmd:descriptiveKeywords/gmd:MD\_Keywords[gmd:type  /gmd:MD\_KeywordTypeCode[*@codeList*='http://www.ngdc.noaa.gov  /metadata/published/xsd/schema/resources/Codelist/gmxCodelists.xm  l#MD\_KeywordTypeCode'][*@codeListValue*='place']]/gmd:keyword/gco:CharacterString |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification  /mri:descriptiveKeywords/mri:MD\_Keywords [mri:type/mri:MD\_KeywordTypeCode[*@codeList*=codeListLocation  #MD\_KeywordTypeCode'][*@codeListValue*='place']]/mri:keyword/gco:CharacterString |
| ECHO 10 Granule | /Granule/Spatial/GranuleLocality/LocalityValue |

**Examples**

ECHO

|  |
| --- |
| <LocalityValue>Limb</LocalityValue> |

ISO 19115-2

|  |
| --- |
| <gmd:descriptiveKeywords>  <gmd:MD\_Keywords>  <gmd:keyword>  <gco:CharacterString>Limb</gco:CharacterString>  </gmd:keyword>  <gmd:type>  <gmd:MD\_KeywordTypeCode codeList="http://www.ngdc.noaa.gov/metadata/published/xsd/schema/resources/Codelist  /gmxCodelists.xml#MD\_KeywordTypeCode"  codeListValue="place">place</gmd:MD\_KeywordTypeCode>  </gmd:type>  </gmd:MD\_Keywords>  </gmd:descriptiveKeywords> |

ISO 19115-1

|  |
| --- |
| <mri:descriptiveKeywords>  <mri:MD\_Keywords>  <mri:keyword>  <gco:CharacterString>Global</gco:CharacterString>  </mri:keyword>  <mri:type>  <mri:MD\_KeywordTypeCode codeList="codeListLocation#MD\_KeywordTypeCode"  codeListValue="place">place</mri:MD\_KeywordTypeCode>  </mri:type>  </mri:MD\_Keywords>  </mri:descriptiveKeywords> |

ECHO Granule Source:

<https://api.echo.nasa.gov:443/catalog-rest/echo_catalog/granules/G179134463-GSFCS4PA>

#### Access Constraint Value

**Description**

The numerical value indicates the type of data access restriction that applies on the granule.

The Access Constraints details can be found in the UMM Common document. UMM element specification AccessConstraints/Description[. = 'RestrictionComment Value']/Value[. = 'RestrictionFlag Value']

**Tags**

*Optional*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification  /gmd:resourceConstraints/gmd:MD\_LegalConstraints[gmd:otherConstraints  /gco:CharacterString[. =concat( 'Restriction Comment:',RestrictionComment) ]]  /gmd:otherConstraints/gco:CharacterString[. =concat( 'Restriction Flag:',RestrictionFlag) ] |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification  /mri:resourceConstraints/mco:MD\_LegalConstraints[mco:otherConstraints  /gco:CharacterString[. =concat( 'Restriction Comment:',RestrictionComment) ]]/mco:otherConstraints[2]/gco:CharacterString[. =concat( 'Restriction Flag:',RestrictionFlag) ] |
| ECHO 10 Granule | /Granule/RestrictionFlag |

#### Parent Collection Identifier [R]

**Description**

Each granule has an associated parent collection as shown in Figure C.4. The relationship between the granule and its parent can be specified in a number of ways. The following fields provide options for specifying the parent relationship.

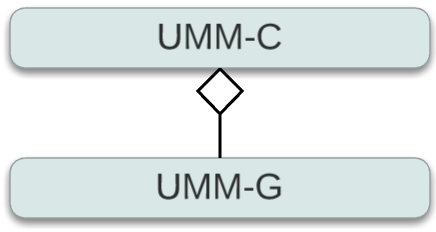


Figure C.4. Collection - Granule Relationship

#### Parent Collection Identifier Option 1 - Entry Id (Short Name + Version)

**Description**

This element defines the association of a granule with its parent collection. The collection short name and version can be used.

**Cardinality**

0..1

**Relationships**

This field is validated against the parent collection field **ShortName** and **Version** of the UMM-C to ensure that it contains an id of the same name.

**Tags**

*Required (with option), Free Text Search, Parameter Search, Addition, Validated*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification  /gmd:aggregationInfo/gmd:MD\_AggregateInformation/gmd:aggregateDataSetName  /gmd:CI\_Citation[gmd:edition/gco:CharacterString[. = 'VersionId']]/gmd:title  /gco:CharacterString[. = 'ShortName']  and  /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification  /gmd:aggregationInfo/gmd:MD\_AggregateInformation/gmd:aggregateDataSetName  /gmd:CI\_Citation/gmd:identifier/gmd:MD\_Identifier/gmd:code/gco:CharacterString  [. = concat(ShortName, VersionId)]  with  DS\_AssociationTypeCode[@codeListValue="LargerWorkCitation"] |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification  /mri:associatedResource/mri:MD\_AsociatedResource/mri:name  /cit:CI\_Citation[cit:edition/gco:CharacterString[. = 'VersionId']]/cit:title  /gco:CharacterString[. = 'ShortName']  and  /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification  /mri:associatedResource/mri:MD\_AsociatedResource/mri:name/cit:CI\_Citation  /cit:identifier/mcc:MD\_Identifier/mcc:code/gco:CharacterString[. = concat(ShortName, VersionId)]  with  DS\_AssociationTypeCode[@codeListValue="LargerWorkCitation"] |
| ECHO 10 Granule | /Granule/Collection/ShortName with /Granule/Collection/VersionId  or  /Granule/Collection/DataSetId (Proposed addition to ECHO Granule schema) |

**Examples**

ECHO

|  |
| --- |
| <Collection>  <ShortName>AIRS2CCF</ShortName>  <VersionId>005</VersionId>  </Collection> |

ISO 19115-2

|  |
| --- |
| <gmd:aggregationInfo>  <gmd:MD\_AggregateInformation>  <gmd:aggregateDataSetName>  <gmd:CI\_Citation>  <gmd:title>  <gco:CharacterString>AIRS2CCF</gco:CharacterString>  </gmd:title>  <gmd:date gco:nilReason="unknown"/>  <gmd:edition>  <gco:CharacterString>005</gco:CharacterString>  </gmd:edition>  </gmd:CI\_Citation>  </gmd:aggregateDataSetName>  <gmd:aggregateDataSetIdentifier>  <gmd:MD\_Identifier>  <gmd:code>  <gco:CharacterString>AIRS2CCF</gco:CharacterString>  </gmd:code>  </gmd:MD\_Identifier>  </gmd:aggregateDataSetIdentifier>  <gmd:associationType>  <gmd:DS\_AssociationTypeCode codeList="http://www.ngdc.noaa.gov/metadata/published/xsd/schema/resources  /Codelist/gmxCodelists.xml#DS\_AssociationTypeCode"  codeListValue="LargerWorkCitation">LargerWorkCitation  </gmd:DS\_AssociationTypeCode>  </gmd:associationType>  </gmd:MD\_AggregateInformation>  </gmd:aggregationInfo> |

ISO 19115-1

|  |
| --- |
| <mri:associatedResource>  <mri:MD\_AssociatedResource>  <mri:name>  <cit:CI\_Citation>  <cit:title>  <gco:CharacterString>AIRS2CCF</gco:CharacterString>  </cit:title>  <cit:date gco:nilReason="unknown"/>  <cit:edition>  <gco:CharacterString>005</gco:CharacterString>  </cit:edition>  </cit:CI\_Citation>  </mri:name>  <mri:associationType>  <mri:DS\_AssociationTypeCode codeList="codeListLocation#DS\_AssociationTypeCode"  codeListValue="LargerWorkCitation">LargerWorkCitation  </mri:DS\_AssociationTypeCode>  </mri:associationType>  </mri:MD\_AssociatedResource>  </mri:associatedResource> |

ECHO Granule Source:

<https://api.echo.nasa.gov:443/catalog-rest/echo_catalog/granules/G187566519-GSFCS4PA>

#### Parent Collection Identifier Option 2 - Entry Title (Dataset Id)

**Description**

This element defines the association of a granule with its parent collection. The collection entry title can be used.

*Note: Need Name Changes to align with UMM-C (Entry Title)*

**Cardinality**

0..1

**Relationships**

This field is validated against the parent collection field **Entry Title** of the UMM-C to ensure that it contains a title of the same name.

**Tags**

*Required (with option), Free Text Search, Parameter Search, Validated*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification  /gmd:aggregationInfo/gmd:MD\_AggregateInformation/gmd:aggregateDataSetName  /gmd:CI\_Citation/gmd:identifier/gmd:MD\_Identifier/gmd:code/gco:CharacterString  and  /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification  /gmd:aggregationInfo/gmd:MD\_AggregateInformation[gmd:associationType  /gmd:DS\_AssociationTypeCode[@codeList="http://www.ngdc.noaa.gov/metadata  /published/xsd/schema/resources/Codelist/gmxCodelists.xml#DS\_AssociationTypeCode"]  [@codeListValue="LargerWorkCitation"]][gmd:initiativeType/gmd:DS\_InitiativeTypeCode  [@codeList="http://www.ngdc.noaa.gov/metadata/published/xsd/schema/resources  /Codelist/gmxCodelists.xml#DS\_InitiativeTypeCode"][@codeListValue="collection"]]  /gmd:aggregateDataSetName/gmd:CI\_Citation/gmd:title/gco:CharacterString |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification  /mri:associatedResource/mri:MD\_AsociatedResource/mri:name/cit:CI\_Citation  /cit:identifier/mcc:MD\_Identifier/mcc:code/gco:CharacterString  and  /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification  /mri:associatedResource/mri:MD\_AsociatedResource[mri:associationType  /mri:DS\_AssociationTypeCode[@codeList="codeListLocation  #DS\_AssociationTypeCode"][@codeListValue="LargerWorkCitation"]]  [mri:initiativeType/mri:DS\_InitiativeTypeCode[@codeList=  "codeListLocation#DS\_InitiativeTypeCode"][@codeListValue="collection"]]  /mri:name/cit:CI\_Citation/cit:title/gco:CharacterString |
| ECHO 10 Granule | /Granule/Collection/DataSetId |

**Examples**

ECHO

|  |
| --- |
| <Collection>  <DataSetId>  AMSR-E/Aqua Daily L3 12.5 km Tb, Sea Ice Conc., &amp; Snow Depth Polar Grids V003  </DataSetId>  </Collection> |

ISO 19115-2

|  |
| --- |
| <gmd:aggregationInfo>  <gmd:MD\_AggregateInformation>  <gmd:aggregateDataSetName>  <gmd:CI\_Citation>  <gmd:title>  <gco:CharacterString>AMSR-E/Aqua Daily L3 12.5 km Tb, Sea Ice Conc., &amp;  Snow Depth Polar Grids V003</gco:CharacterString>  </gmd:title>  <gmd:date gco:nilReason="unknown"/>  </gmd:CI\_Citation>  </gmd:aggregateDataSetName>  <gmd:aggregateDataSetIdentifier>  <gmd:MD\_Identifier>  <gmd:code>  <gco:CharacterString>AMSR-E/Aqua Daily L3 12.5 km Tb, Sea Ice Conc., &amp; Snow  Depth Polar Grids V003</gco:CharacterString>  </gmd:code>  </gmd:MD\_Identifier>  </gmd:aggregateDataSetIdentifier>  <gmd:associationType>  <gmd:DS\_AssociationTypeCode codeList="http://www.ngdc.noaa.gov/metadata/published/xsd/schema/resources/Codelist  /gmxCodelists.xml#DS\_AssociationTypeCode"  codeListValue="LargerWorkCitation">LargerWorkCitation  </gmd:DS\_AssociationTypeCode>  </gmd:associationType>  </gmd:MD\_AggregateInformation>  </gmd:aggregationInfo> |

ISO 19115-1

|  |
| --- |
| <mri:associatedResource>  <mri:MD\_AssociatedResource>  <mri:name>  <cit:CI\_Citation>  <cit:title>  <gco:CharacterString>MODIS/Terra+Aqua BRDF/Albedo Parameters 16-Day L3  Global 0.05Deg CMG V005</gco:CharacterString>  </cit:title>  <cit:date gco:nilReason="unknown"/>  </cit:CI\_Citation>  </mri:name>  <mri:associationType>  <mri:DS\_AssociationTypeCode codeList="codeListLocation#DS\_AssociationTypeCode"  codeListValue="LargerWorkCitation">LargerWorkCitation  </mri:DS\_AssociationTypeCode>  </mri:associationType>  </mri:MD\_AssociatedResource>  </mri:associatedResource> |

ECHO Granule Source:

<https://api.echo.nasa.gov:443/catalog-rest/echo_catalog/granules/G1000849409-NSIDC_ECS>

### Spatial Information

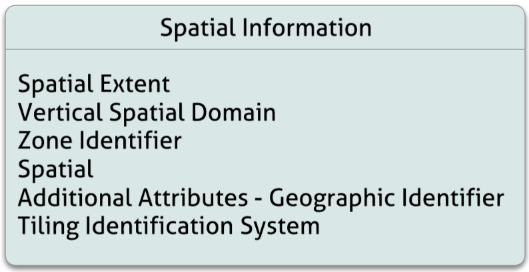


Figure C.5. Spatial Information

**Spatial Relationships**

This field is validated against the parent collection field **Spatial Extent** of the UMM-C to ensure that the parent collection allows for the extent described in the granule.

**NASA Best Practices ISO 19115 and Spatial Metadata**

The MENDS effort has produced extensive documentation related to the use of spatial extents in the ISO metadata.

More information can be found at the following link: <https://wiki.earthdata.nasa.gov/display/NASAISO/Extents>

#### Spatial Extent

See UMM-Common Spatial Extent element for full documentation and examples.

#### VerticalSpatialDomain

**Description**

This entity contains the domain value and type for the granule's vertical spatial domain - i.e., reference frame or system from which altitude or depths are measured. The term 'altitude' is used instead of the common term 'elevation' to conform to terminology in Federal Information Processing Standards 70-1 and 173. The information contains the datum name, distance units and encoding method, which provide the definition for the system.

*Note: This field will hold both the type and value fields of the existing ECHO 10 Granule schema.*

See UMM-Common VerticalSpatialDomain element for full documentation and examples.

**Tags**

*Optional, Controlled Vocabulary, Normalize*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:extent  /gmd:EX\_Extent/gmd:description/gco:CharacterString[. = 'VerticalSpatialDomainType  =Atmosphere Layer, VerticalSpatialDomainValue=Atmosphere Profile'] |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification/mri:extent  /gex:EX\_Extent/gex:description/gco:CharacterString[. = 'VerticalSpatialDomainType=Atmosphere Layer, VerticalSpatialDomainValue=Atmosphere Profile'] |
| ECHO 10 Granule | /Granule/Spatial/VerticalSpatialDomains/VerticalSpatialDomain/Type  /Granule/Spatial/VerticalSpatialDomains/VerticalSpatialDomain/Value |

**Examples**

ECHO

|  |
| --- |
| <VerticalSpatialDomains>  <VerticalSpatialDomain>  <Type>Atmosphere Layer</Type>  <Value>Atmosphere Profile</Value>  </VerticalSpatialDomain>  </VerticalSpatialDomains> |

ISO 19115-2

|  |
| --- |
| <gmd:extent>  <gmd:EX\_Extent id="boundingExtent">  <gmd:description>  <gco:CharacterString>VerticalSpatialDomainType=Atmosphere Layer, VerticalSpatialDomainValue=Atmosphere Profile</gco:CharacterString>  </gmd:description>  ...  </gmd:EX\_Extent>  </gmd:extent> |

ISO 19115-1

|  |
| --- |
| <mri:extent>  <gex:EX\_Extent>  <gex:description>  <gco:CharacterString>VerticalSpatialDomainType=Atmosphere Layer, VerticalSpatialDomainValue=Atmosphere Profile</gco:CharacterString>  </gex:description>  ...  </gex:EX\_Extent>  </mri:extent> |

#### ZoneIdentifier

**Description**

The appropriate numeric or alpha code used to identify the various zones in this grid coordinate system. See domain values of coordinate system for constraints on the zone numbers.

See UMM-Common ZoneIdentifier element for full documentation and examples.

**Tags**

*Optional, Controlled Vocabulary*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:extent  /gmd:EX\_Extent/gmd:geographicElement[2]/gmd:EX\_GeographicDescription  /gmd:geographicIdentifier/gmd:MD\_Identifier[gmd:description/gco:CharacterString  ='ZoneIdentifier']/gmd:code/gco:CharacterString |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification/mri:extent  /EX\_Extent[@id='boundingExtent']/gex:geographicElement  /gex:EX\_GeographicDescription/gex:geographicIdentifier/mcc:MD\_Identifier  [gex:description/gco:CharacterString='ZoneIdentifier']/gex:code/gco:CharacterString |
| ECHO 10 Granule | /Granule/Spatial/HorizontalSpatialDomain/ZoneIdentifier |

**Examples**

ECHO

|  |
| --- |
| <Spatial>  ...  <HorizontalSpatialDomain>  <ZoneIdentifier>Universal Transverse Mercator (UTM)</ZoneIdentifier>  </HorizontalSpatialDomain>  ...  </Spatial> |

ISO 19115-2

|  |
| --- |
| <gmd:geographicElement>  <gmd:EX\_GeographicDescription>  <gmd:geographicIdentifier>  <gmd:MD\_Identifier>  <gmd:code>  <gco:CharacterString>Universal Transverse Mercator (UTM)</gco:CharacterString>  </gmd:code>  <gmd:description>  <gco:CharacterString>ZoneIdentifier</gco:CharacterString>  </gmd:description>  </gmd:MD\_Identifier>  </gmd:geographicIdentifier>  </gmd:EX\_GeographicDescription>  </gmd:geographicElement> |

ISO 19115-1

|  |
| --- |
| <gex:geographicElement>  <gex:EX\_GeographicDescription>  <gex:geographicIdentifier>  <mcc:MD\_Identifier>  <gex:code>  <gco:CharacterString>Universal Transverse Mercator (UTM)</gco:CharacterString>  </gex:code>  <gex:description>  <gco:CharacterString>ZoneIdentifier</gco:CharacterString>  </gex:description>  </mcc:MD\_Identifier>  </gex:geographicIdentifier>  </gex:EX\_GeographicDescription>  </gex:geographicElement> |

#### Spatial Option 1- Point

**Description**

A point represents a single geodetic latitudinal, longitudinal value.

See UMM-Common for full documentation and examples.

**Tags**

*Optional, Parameter Search, Validated*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:extent  /gmd:EX\_Extent/gmd:geographicElement/gmd:EX\_GeographicBoundingBox  [gmd:westBoundLongitude/gco:Decimal ][gmd:eastBoundLongitude/gco:Decimal]  [gmd:southBoundLatitude/gco:Decimal][gmd:northBoundLatitude/gco:Decimal]  and  /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:extent  /gmd:EX\_Extent/gmd:geographicElement[2]/gmd:EX\_BoundingPolygon/gmd:polygon  /gml:Point/gml:pos[@srsName='http://www.opengis.net/def/crs/EPSG/4326']@  [srsDimension='2'] |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification/mri:extent  /gex:EX\_Extent/gex:geographicElement/gex:EX\_GeographicBoundingBox  [gex:westBoundLongitude/gco:Decimal ][gex:eastBoundLongitude/gco:Decimal]  [gex:southBoundLatitude/gco:Decimal][gex:northBoundLatitude/gco:Decimal]  and  /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification/mri:extent  /gex:EX\_Extent/gex:geographicElement[2]/gex:EX\_BoundingPolygon/gex:polygon  /gml:Point/gml:pos[@srsName='http://www.opengis.net/def/crs/EPSG/4326']  [@srsDimension='2'] |
| ECHO 10 Granule | /Granule/Spatial/HorizontalSpatialDomain/Geometry/Point/PointLongitude  /Granule/Spatial/HorizontalSpatialDomain/Geometry/Point/PointLatitude |

#### Spatial Option 2 - Line

**Description**

This entity contains the granule's spatial coverage information. The ISO mapping includes two elements for ease of use in a variety of tools

See UMM-Common for full documentation and examples.

**Tags**

*Optional, Parameter Search, Validated*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:extent  /gmd:EX\_Extent/gmd:geographicElement/gmd:EX\_GeographicBoundingBox  [gmd:westBoundLongitude/gco:Decimal ][gmd:eastBoundLongitude/gco:Decimal]  [gmd:southBoundLatitude/gco:Decimal][gmd:northBoundLatitude/gco:Decimal]  and  /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:extent  /gmd:EX\_Extent/gmd:geographicElement[2]/gmd:EX\_BoundingPolygon/gmd:polygon  /gml:LineString/gml:posList[@srsName='http://www.opengis.net/def/crs/EPSG/4326']  [@srsDimension='2'] |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification/mri:extent  /gex:EX\_Extent/gex:geographicElement/gex:EX\_GeographicBoundingBox  [gex:westBoundLongitude/gco:Decimal ][gex:eastBoundLongitude/gco:Decimal]  [gex:southBoundLatitude/gco:Decimal][gex:northBoundLatitude/gco:Decimal]  and  /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification/mri:extent  /gex:EX\_Extent/gex:geographicElement[2]/gex:EX\_BoundingPolygon/gex:polygon  /gml:LineString/gml:posList[@srsName='http://www.opengis.net/def/crs/EPSG/4326']  [@srsDimension='2'] |
| ECHO 10 Granule | /Granule/Spatial/HorizontalSpatialDomain/Geometry/Line/Point/PointLongitude  /Granule/Spatial/HorizontalSpatialDomain/Geometry/Line/Point/PointLatitude |

#### Spatial Option 3 - Polygon

**Description**

This entity contains the granule's spatial coverage information. Need a minimum of 3 points to define a polygon.

See UMM-Common for full documentation and examples.

**Tags**

*Optional, Parameter Search, Validated*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:extent  /gmd:EX\_Extent/gmd:geographicElement/gmd:EX\_BoundingPolygon/gmd:polygon  /gml:Polygon/gml:exterior/gml:LinearRing/gml:posList[@srsName="  http://www.opengis.net/def/crs/EPSG/4326"][@srsDimension="2"] |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification/mri:extent  /gex:EX\_Extent/gex:geographicElement[2]/gex:EX\_BoundingPolygon/gex:polygon  /gml:Polygon/gml:exterior/gml:LinearRing/gml:posList[@srsName=  "http://www.opengis.net/def/crs/EPSG/4326"][@srsDimension="2"] |
| ECHO 10 Granule | /Granule/Spatial/HorizontalSpatialDomain/Geometry/Gpolygon/Boundary/Point (min 3 points) |

#### Spatial Option 4 – Bounding Box

**Description**

This entity contains the granule's spatial coverage information.

See UMM-Common for full documentation and examples.

**Tags**

*Optional, Parameter Search, Validated*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:exten  t/gmd:EX\_Extent/gmd:geographicElement/gmd:EX\_GeographicBoundingBox  [gmd:westBoundLongitude/gco:Decimal ][gmd:eastBoundLongitude/gco:Decimal][gmd:southBoundLatitude/gco:Decimal]  [gmd:northBoundLatitude/gco:Decimal] |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification/mri:extent  /gex:EX\_Extent/gex:geographicElement/gex:EX\_GeographicBoundingBox  [gex:westBoundLongitude/gco:Decimal ][gex:eastBoundLongitude/gco:Decimal][gex:southBoundLatitude/gco:Decimal]  [gex:northBoundLatitude/gco:Decimal] |
| ECHO 10 Granule | /Granule/Spatial/HorizontalSpatialDomain/Geometry/BoundingRectangle  /WestBoundingCoordinate  /Granule/Spatial/HorizontalSpatialDomain/Geometry/BoundingRectangle  /NorthBoundingCoordinate  /Granule/Spatial/HorizontalSpatialDomain/Geometry/BoundingRectangle  /EastBoundingCoordinate  /Granule/Spatial/HorizontalSpatialDomain/Geometry/BoundingRectangle  /SouthBoundingCoordinate |

#### Spatial Option 5 – Bounding Box with Center Point

**Description**

This entity contains the granule's spatial coverage information and represents the center point of the bounding rectangle.

See UMM-Common for full documentation and examples.

**Tags**

*Optional, Parameter Search, Validated*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | TBD |
| ISO 19115-1 | TBD |
| ECHO 10 Granule | /Granule/Spatial/HorizontalSpatialDomain/Geometry/BoundingRectangle  /WestBoundingCoordinate  /Granule/Spatial/HorizontalSpatialDomain/Geometry/BoundingRectangle  /NorthBoundingCoordinate  /Granule/Spatial/HorizontalSpatialDomain/Geometry/BoundingRectangle  /EastBoundingCoordinate  /Granule/Spatial/HorizontalSpatialDomain/Geometry/BoundingRectangle  /SouthBoundingCoordinate  /Granule/Spatial/HorizontalSpatialDomain/Geometry/BoundingRectangle  /CenterPoint/PointLongitude  /Granule/Spatial/HorizontalSpatialDomain/Geometry/BoundingRectangle  /CenterPoint/PointLatitude |

#### Spatial Option 6 – Polygon with Center Point

**Description**

This entity contains the granule's spatial coverage information and represents the center point of the polygon.

See UMM-Common for full documentation and examples.

**Tags**

*Optional, Parameter Search, Validated*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | TBD |
| ISO 19115-1 | TBD |
| ECHO 10 Granule | /Granule/Spatial/HorizontalSpatialDomain/Geometry/Gpolygon/Boundary/Point (a minimum of 3 points)  /Granule/Spatial/HorizontalSpatialDomain/Geometry/Gpolygon/CenterPoint |

#### Spatial Option 7 – Polygon with Holes

**Description**

This entity contains the granule's spatial coverage information.

See UMM-Common for full documentation and examples.

**Tags**

*Optional, Parameter Search, Validated*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | Exterior ->  /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:extent  /gmd:EX\_Extent/gmd:geographicElement/gmd:EX\_BoundingPolygon/gmd:polygon  /gml:Polygon/gml:exterior/gml:LinearRing/gml:posList[@srsName="  http://www.opengis.net/def/crs/EPSG/4326"][@srsDimension="2"]  Interior ->  /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:extent  /gmd:EX\_Extent/gmd:geographicElement/gmd:EX\_BoundingPolygon/gmd:polygon  /gml:Polygon/gml:interior/gml:LinearRing/gml:posList[@srsName="  http://www.opengis.net/def/crs/EPSG/4326"][@srsDimension="2"] |
| ISO 19115-1 | Exterior ->  /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:extent  /gmd:EX\_Extent/gmd:geographicElement/gmd:EX\_BoundingPolygon/gmd:polygon/  gml:Polygon/gml:exterior/gml:LinearRing/gml:posList[@srsName="  http://www.opengis.net/def/crs/EPSG/4326"][@srsDimension="2"]  Interior ->  /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification/mri:extent  /gex:EX\_Extent/gex:geographicElement[2]/gex:EX\_BoundingPolygon/gex:polygon  /gml:Polygon/gml:interior/gml:LinearRing/gml:posList[@srsName="  http://www.opengis.net/def/crs/EPSG/4326"][@srsDimension="2"] |
| ECHO 10 Granule | /Granule/Spatial/HorizontalSpatialDomain/Geometry/Gpolygon/Boundary/Point (a minimum of 3 points)  /Granule/Spatial/HorizontalSpatialDomain/Geometry/Gpolygon/ExclusiveZone/Boundary  /Point (a minimum of 3 points) |

#### Spatial Option 8 – Platform Orbit Information

**Element Specification**

PlatformOrbitInfo/OrbitalModelName

PlatformOrbitInfo/OrbitNumber

PlatformOrbitInfo/StartOrbitNumber

PlatformOrbitInfo/StopOrbitNumber

PlatformOrbitInfo/EquatorCrossingLongitude

PlatformOrbitInfo/EquatorCrossingDateTime

**Description**

This entity is used to store the characteristics of the orbit calculated spatial domain, which includes: the model name, orbit number, start and stop orbit number, equator crossing date and time, and equator crossing longitude.

**Cardinality**

0..1

**Tags**

*Optional*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmi:acquisitionInformation/gmi:MI\_AcquisitionInformation  /gmi:platform/eos:EOS\_Platform/eos:otherProperty/gco:Record/eos:AdditionalAttributes  /eos:AdditionalAttribute[3][eos:reference/eos:EOS\_AdditionalAttributeDescription[eos:type  /eos:EOS\_AdditionalAttributeTypeCode[@codeList='http://earthdata.nasa.gov  /metadata/resources/Codelists.xml#EOS\_AdditionalAttributeTypeCode']  [@codeListValue='platformInformation'][. = 'platformInformation']]  [eos:name/gco:CharacterString[.='orbitSpecNameXXX']]]/eos:value/gco:CharacterString  with  orbitSpecNameXXX = OrbitalModelName | OrbitNumber | StartOrbitNumber | StopOrbitNumber | EquatorCrossingLongitude | EquatorCrossingDateTime |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:acquisitionInformation/mac:MI\_AcquisitionInformation  /mac:platform/eos:EOS\_Platform/eos:otherProperty/gco:Record  /eos:AdditionalAttributes/eos:AdditionalAttribute[eos:reference  /eos:EOS\_AdditionalAttributeDescription[eos:type  /eos:EOS\_AdditionalAttributeTypeCode[@codeList='http://earthdata.nasa.gov  /metadata/resources/Codelists.xml#EOS\_AdditionalAttributeTypeCode']  [@codeListValue='platformInformation'][. = 'platformInformation']][eos:name/gco:CharacterString[.='OrbitalModelName']]]  /eos:value/gco:CharacterString  with  orbitSpecNameXXX = OrbitalModelName | OrbitNumber | StartOrbitNumber | StopOrbitNumber | EquatorCrossingLongitude | EquatorCrossingDateTime |
| ECHO 10 Granule | /Granule/OrbitCalculatedSpatialDomains/OrbitCalculatedSpatialDomain/[OrbitalModelName | OrbitNumber | StartOrbitNumber | StopOrbitNumber | EquatorCrossingLongitude | EquatorCrossingDateTime] |

**Examples**

ECHO

|  |
| --- |
| <OrbitCalculatedSpatialDomains>  <OrbitCalculatedSpatialDomain>  <OrbitalModelName>WRS-2</OrbitalModelName>  <StartOrbitNumber>667</StartOrbitNumber>  <StopOrbitNumber>667</StopOrbitNumber>  <EquatorCrossingLongitude>9.54</EquatorCrossingLongitude>  <EquatorCrossingDateTime>2002-06-19T00:56:48.48Z</EquatorCrossingDateTime>  </OrbitCalculatedSpatialDomain>  </OrbitCalculatedSpatialDomains> |

ISO 19115-2

|  |
| --- |
| <gmi:acquisitionInformation>  <gmi:MI\_AcquisitionInformation>  <gmi:platform>  <eos:EOS\_Platform>  <gmi:identifier gco:nilReason="missing"/>  <gmi:description gco:nilReason="missing"/>  <gmi:instrument gco:nilReason="missing"/>  <eos:otherPropertyType>  <gco:RecordType xlink:href="http://earthdata.nasa.gov/metadata/schema/eos  /1.0/eos.xsd#xpointer(  //element[@name='AdditionalAttributes'])">Echo Additional Attributes</gco:RecordType>  </eos:otherPropertyType>  <eos:otherProperty>  <gco:Record>  <eos:AdditionalAttributes><!--OrbitCalculatedSpatialDomains-->  <eos:AdditionalAttribute>  <eos:reference>  <eos:EOS\_AdditionalAttributeDescription>  <eos:type>  <eos:EOS\_AdditionalAttributeTypeCode codeList=  "http://earthdata.nasa.gov/metadata/resources/Codelists.xml  #EOS\_AdditionalAttributeTypeCode"  codeListValue="platformInformation">platformInformation</eos:EOS\_AdditionalAttributeTypeCode>  </eos:type>  <eos:name>  <gco:CharacterString>OrbitalModelName</gco:CharacterString>  </eos:name>  </eos:EOS\_AdditionalAttributeDescription>  </eos:reference>  <eos:value>  <gco:CharacterString>WRS-2</gco:CharacterString>  </eos:value>  </eos:AdditionalAttribute>  <eos:AdditionalAttribute>  <eos:reference>  <eos:EOS\_AdditionalAttributeDescription>  <eos:type>  <eos:EOS\_AdditionalAttributeTypeCode codeList="http://earthdata.nasa.gov/metadata/resources/Codelists.xml  #EOS\_AdditionalAttributeTypeCode" codeListValue="platformInformation">platformInformation</eos:EOS\_AdditionalAttributeTypeCode>  </eos:type>  <eos:name>  <gco:CharacterString>StartOrbitNumber</gco:CharacterString>  </eos:name>  </eos:EOS\_AdditionalAttributeDescription>  </eos:reference>  <eos:value>  <gco:CharacterString>667</gco:CharacterString>  </eos:value>  </eos:AdditionalAttribute>  <eos:AdditionalAttribute>  <eos:reference>  <eos:EOS\_AdditionalAttributeDescription>  <eos:type>  <eos:EOS\_AdditionalAttributeTypeCode codeList="http://earthdata.nasa.gov/metadata/resources/Codelists.xml  #EOS\_AdditionalAttributeTypeCode" codeListValue="platformInformation">platformInformation</eos:EOS\_AdditionalAttributeTypeCode>  </eos:type>  <eos:name>  <gco:CharacterString>StopOrbitNumber</gco:CharacterString>  </eos:name>  </eos:EOS\_AdditionalAttributeDescription>  </eos:reference>  <eos:value>  <gco:CharacterString>667</gco:CharacterString>  </eos:value>  </eos:AdditionalAttribute>  <eos:AdditionalAttribute>  <eos:reference>  <eos:EOS\_AdditionalAttributeDescription>  <eos:type>  <eos:EOS\_AdditionalAttributeTypeCode codeList="http://earthdata.nasa.gov/metadata/resources/Codelists.xm  l#EOS\_AdditionalAttributeTypeCode" codeListValue="platformInformation">platformInformation</eos:EOS\_AdditionalAttributeTypeCode>  </eos:type>  <eos:name>  <gco:CharacterString>EquatorCrossingLongitude</gco:CharacterString>  </eos:name>  </eos:EOS\_AdditionalAttributeDescription>  </eos:reference>  <eos:value>  <gco:CharacterString>9.54</gco:CharacterString>  </eos:value>  </eos:AdditionalAttribute>  <eos:AdditionalAttribute>  <eos:reference>  <eos:EOS\_AdditionalAttributeDescription>  <eos:type>  <eos:EOS\_AdditionalAttributeTypeCode codeList="http://earthdata.nasa.gov/metadata/resources/Codelists.xml  #EOS\_AdditionalAttributeTypeCode" codeListValue="platformInformation">platformInformation</eos:EOS\_AdditionalAttributeTypeCode>  </eos:type>  <eos:name>  <gco:CharacterString>EquatorCrossingDateTime</gco:CharacterString>  </eos:name>  </eos:EOS\_AdditionalAttributeDescription>  </eos:reference>  <eos:value>  <gco:CharacterString>2002-06-19T00:56:48.48Z</gco:CharacterString>  </eos:value>  </eos:AdditionalAttribute>  <!--HorizontalSpatialDomain/Orbit-->  <eos:AdditionalAttribute>  <eos:reference>  <eos:EOS\_AdditionalAttributeDescription>  <eos:type>  <eos:EOS\_AdditionalAttributeTypeCode codeList="http://earthdata.nasa.gov/metadata/resources/Codelists.xml  #EOS\_AdditionalAttributeTypeCode" codeListValue="platformInformation">platformInformation</eos:EOS\_AdditionalAttributeTypeCode>  </eos:type>  <eos:name>  <gco:CharacterString>AscendingCrossing</gco:CharacterString>  </eos:name>  </eos:EOS\_AdditionalAttributeDescription>  </eos:reference>  <eos:value>  <gco:CharacterString>-158.10</gco:CharacterString>  </eos:value>  </eos:AdditionalAttribute>  <eos:AdditionalAttribute>  <eos:reference>  <eos:EOS\_AdditionalAttributeDescription>  <eos:type>  <eos:EOS\_AdditionalAttributeTypeCode codeList="http://earthdata.nasa.gov/metadata/resources/Codelists.xml  #EOS\_AdditionalAttributeTypeCode" codeListValue="platformInformation">platformInformation</eos:EOS\_AdditionalAttributeTypeCode>  </eos:type>  <eos:name>  <gco:CharacterString>StartLat</gco:CharacterString>  </eos:name>  </eos:EOS\_AdditionalAttributeDescription>  </eos:reference>  <eos:value>  <gco:CharacterString>81.8</gco:CharacterString>  </eos:value>  </eos:AdditionalAttribute>  <eos:AdditionalAttribute>  <eos:reference>  <eos:EOS\_AdditionalAttributeDescription>  <eos:type>  <eos:EOS\_AdditionalAttributeTypeCode codeList="http://earthdata.nasa.gov/metadata/resources/Codelists.xml  #EOS\_AdditionalAttributeTypeCode" codeListValue="platformInformation">platformInformation</eos:EOS\_AdditionalAttributeTypeCode>  </eos:type>  <eos:name>  <gco:CharacterString>StartDirection</gco:CharacterString>  </eos:name>  </eos:EOS\_AdditionalAttributeDescription>  </eos:reference>  <eos:value>  <gco:CharacterString>D</gco:CharacterString>  </eos:value>  </eos:AdditionalAttribute>  <eos:AdditionalAttribute>  <eos:reference>  <eos:EOS\_AdditionalAttributeDescription>  <eos:type>  <eos:EOS\_AdditionalAttributeTypeCode codeList="http://earthdata.nasa.gov/metadata/resources/Codelists.xml  #EOS\_AdditionalAttributeTypeCode" codeListValue="platformInformation">platformInformation</eos:EOS\_AdditionalAttributeTypeCode>  </eos:type>  <eos:name>  <gco:CharacterString>EndLat</gco:CharacterString>  </eos:name>  </eos:EOS\_AdditionalAttributeDescription>  </eos:reference>  <eos:value>  <gco:CharacterString>-81.8</gco:CharacterString>  </eos:value>  </eos:AdditionalAttribute>  <eos:AdditionalAttribute>  <eos:reference>  <eos:EOS\_AdditionalAttributeDescription>  <eos:type>  <eos:EOS\_AdditionalAttributeTypeCode codeList="http://earthdata.nasa.gov/metadata/resources/Codelists.xml  #EOS\_AdditionalAttributeTypeCode" codeListValue="platformInformation">platformInformation</eos:EOS\_AdditionalAttributeTypeCode>  </eos:type>  <eos:name>  <gco:CharacterString>EndDirection</gco:CharacterString>  </eos:name>  </eos:EOS\_AdditionalAttributeDescription>  </eos:reference>  <eos:value>  <gco:CharacterString>D</gco:CharacterString>  </eos:value>  </eos:AdditionalAttribute>  <eos:AdditionalAttribute>  <eos:reference>  <eos:EOS\_AdditionalAttributeDescription>  <eos:type>  <eos:EOS\_AdditionalAttributeTypeCode codeList="http://earthdata.nasa.gov/metadata/resources/Codelists.xml  #EOS\_AdditionalAttributeTypeCode" codeListValue="platformInformation">platformInformation</eos:EOS\_AdditionalAttributeTypeCode>  </eos:type>  <eos:name>  <gco:CharacterString>CenterPoint</gco:CharacterString>  </eos:name>  </eos:EOS\_AdditionalAttributeDescription>  </eos:reference>  <eos:value>  <gco:CharacterString>-80.118772.5477</gco:CharacterString>  </eos:value>  </eos:AdditionalAttribute>  </eos:AdditionalAttributes>  </gco:Record>  </eos:otherProperty>  </eos:EOS\_Platform>  </gmi:platform>  </gmi:MI\_AcquisitionInformation> |

ISO 19115-1

|  |
| --- |
| TBD |

#### Additional Attributes - Geographic Identifier

**Description**

This entity stores the product specific attributes that are geographic in nature. For more information on how attributes are mapped, please refer Appendix E: Additional Attributes Categorization.

See UMM-Common for full documentation and examples.

**Relationships**

This field is validated against the parent collection field **ProductSpecificAttribute** of the UMM-C to ensure that it contains an attribute of the same name.

**Tags**

*Optional, Free Text Search, Parameter Search, Validated*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | map AdditionalAttribute/Name -> /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification  /gmd:extent/gmd:EX\_Extent/gmd:geographicElement[5]  /gmd:EX\_GeographicDescription/gmd:geographicIdentifier  /gmd:MD\_Identifier/gmd:description/gco:CharacterString    map AdditionalAttribute/Value -> /gmi:MI\_Metadata/gmd:identificationInfo  /gmd:MD\_DataIdentification  /gmd:extent/gmd:EX\_Extent/gmd:geographicElement[5]  /gmd:EX\_GeographicDescription/gmd:geographicIdentifier  /gmd:MD\_Identifier[gmd:codeSpace/gco:CharacterString[. = 'gov.nasa.echo']]  /gmd:code/gco:CharacterString |
| ISO 19115-1 | map AdditionalAttribute/Name -> /mdb:MD\_Metadata/mdb:identificationInfo  /mri:MD\_DataIdentification/mri:extent  /gex:EX\_Extent/gex:geographicElement[5]/gex:EX\_GeographicDescription  /gex:geographicIdentifier/mcc:MD\_Identifier/mcc:description/gco:CharacterString    map AdditionalAttribute/Value -> /mdb:MD\_Metadata/mdb:identificationInfo  /mri:MD\_DataIdentification  /mri:extent/gex:EX\_Extent/gex:geographicElement[5]/gex:EX\_GeographicDescription  /gex:geographicIdentifier/mcc:MD\_Identifier[mcc:codeSpace/gco:CharacterString[. = 'gov.nasa.echo']]/mcc:code/gco:CharacterString |
| ECHO 10 Granule | /Granule/AdditionalAttributes/AdditionalAttribute/Name  /Granule/AdditionalAttributes/AdditionalAttribute/Values/Value |

#### Tiling Identification System

**Description**

This entity stores the two-dimensional coordinate system information for the granule, which is an alternative way to express granule's spatial coverage based on a tiling system defined by the providers.  
  
The following discussion on Landsat's PATH/ROW is an example of grid information. The Path is the longitudinal center-line of a Landsat scene corresponding to the center of an orbital track that is represented by grid Y lines.

The Row is the Latitudinal center line of a Landsat scene corresponding to grid X lines. The indication of the two dimensional coordinate system type is "WRS-2". The two-dimensional coordinate system information can be used to designate a geographic search for a nominal scene center.

More information related to this topic exists as part of the MENDS documentation and can be found at the following URL (URS login required) <https://wiki.earthdata.nasa.gov/display/MEN/Two+Dimensional+Coordinate+Systems>

*Note: See the Tiling Identification System Appendix for more information about specific coordinate system translations. Formerly Two Dimensional Coordinate System.*

**Cardinality**

0..1

**Tags**

*Optional, Controlled Vocabulary, Parameter Search, Normalize, Validated*

**Sample Mappings**

|  |  |
| --- | --- |
| ECHO 10 Granule | /Granule/TwoDCoordinateSystem/StartCoordinate1  /Granule/TwoDCoordinateSystem/EndCoordinate1 /Granule/TwoDCoordinateSystem/StartCoordinate2  /Granule/TwoDCoordinateSystem/EndCoordinate2  /Granule/TwoDCoordinateSystem/TwoDCoordinateSystemName |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification  /gmd:extent/gmd:EX\_Extent/gmd:geographicElement[6]/gmd:EX\_GeographicDescription  /gmd:geographicIdentifier/gmd:MD\_Identifier[gmd:description  /gco:CharacterString[. = 'TwoDCoordinateSystemName']]  /gmd:code/gco:CharacterString[. = 'h19-29v11-21'] |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification/mri:extent  /gex:EX\_Extent/gex:geographicElement[6]/gex:EX\_GeographicDescription  /gex:geographicIdentifier/mcc:MD\_Identifier[mcc:description/gco:CharacterString[. = 'TwoDCoordinateSystemName']]/mcc:code/gco:CharacterString[. = 'h19-29v11-21'] |

### Temporal Information

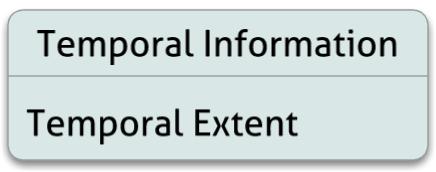


Figure C.6. Temporal Information

#### Temporal Extent

**Description**

This field is validated against the parent collection field **Temporal Extent** of the UMM-C to ensure that the parent collection allows for the extent described in the granule.

See UMM-Common Temporal Extent element for full documentation and examples.

**Tags**

*Required (with option), Parameter Search, Validated*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | 1. /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:extent 2. /gmd:EX\_Extent/gmd:temporalElement/gmd:EX\_TemporalExtent/gmd:extent 3. /gml:TimePeriod/gml:beginPosition   /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:extent  /gmd:EX\_Extent/gmd:temporalElement/gmd:EX\_TemporalExtent/gmd:extent  /gml:TimePeriod/gml:endPosition    2/gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification/gmd:extent  /gmd:EX\_Extent/gmd:temporalElement/gmd:EX\_TemporalExtent/gmd:extent  /gml:TimeInstant/gml:timePosition |
| ISO 19115-1 | 1)/mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification/mri:extent  /gex:EX\_Extent/gex:temporalElement/gex:EX\_TemporalExtent/gex:extent/gml:TimePeriod  /gml:beginPosition  /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification/mri:extent  /gex:EX\_Extent/gex:temporalElement/gex:EX\_TemporalExtent/gex:extent/gml:TimePeriod  /gml:endPosition    2)/mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification/mri:extent  /gex:EX\_Extent/gex:temporalElement/gex:EX\_TemporalExtent/gex:extent  /gml:TimeInstant/gml:timePosition |
| ECHO 10 Granule | {Choice of one}  1)/Granule/Temporal/RangeDateTime/BeginningDateTime  /Granule/Temporal/RangeDateTime/EndingDateTime  2)/Granule/Temporal/SingleDateTime |

### Coverage Description

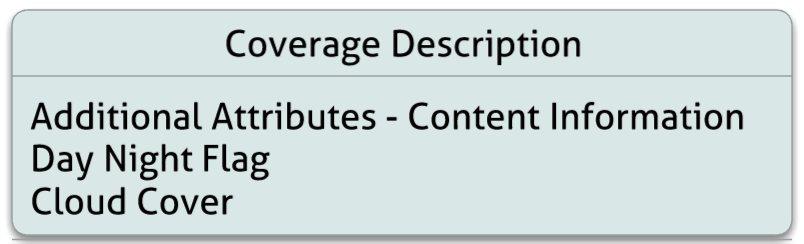


Figure C.7. Coverage Description

#### Additional Attributes - Content Information

**Description**

This entity stores the product specific attributes that are related to granule content. For more information on how attributes are mapped, please refer Appendix E: Additional Attributes Categorization.

See UMM-Common Additional Attribute elements for full documentation and examples.

**Tags**

*Optional, Free Text Search, Parameter Search, Validated*

#### Day Night Flag

**Element Specification**

DayNightFlag (0..1)

**Description**

Possible values for the day night flag. If no day night flag information is available, the unspecified value should be used.

**Cardinality**

0..1

**Tags**

*Optional, Controlled Vocabulary, Parameter Search*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:contentInfo/gmd:MD\_CoverageDescription/gmd:dimension  /gmd:MD\_Band/gmd:otherProperty/gco:Record/eos:AdditionalAttributes  /eos:AdditionalAttribute[eos:reference/eos:EOS\_AdditionalAttributeDescription  [eos:type/eos:EOS\_AdditionalAttributeTypeCode[@codeListValue = 'contentInformation']]  [eos:name/gco:CharacterString[. = 'DayNightFlag']]]/eos:value/gco:CharacterString |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:contentInfo/mrc:MD\_CoverageDescription/mrc:attributeGroup  /mrc:MD\_AttributeGroup/mrc:attribute/mrc:MD\_SampleDimension/mrc:otherProperty  /gco:Record/\*[namespace-uri()='http://www.echo.nasa.gov/ingest/schemas/operations'  and local-name()='AdditionalAttributes']/eos:AdditionalAttribute[eos:reference  /eos:EOS\_AdditionalAttributeDescription[eos:type/eos:EOS\_AdditionalAttributeTypeCode  [@codeListValue = 'contentInformation']][eos:name/gco:CharacterString[. = 'DayNightFlag']]]/eos:value/gco:CharacterString |
| ECHO 10 Granule | /Granule/DataGranule/DayNightFlag |

**Examples**

ECHO

|  |
| --- |
| <DayNightFlag>DAY</DayNightFlag> |

ISO 19115-2

|  |
| --- |
| <eos:AdditionalAttributes>  <eos:AdditionalAttribute>  <eos:reference>  <eos:EOS\_AdditionalAttributeDescription>  <eos:type>  <eos:EOS\_AdditionalAttributeTypeCode codeList="http://earthdata.nasa.gov/metadata/resources/Codelists.xml  #EOS\_AdditionalAttributeTypeCode" codeListValue="contentInformation">contentInformation</eos:EOS\_AdditionalAttributeTypeCode>  </eos:type>  <eos:name>  <gco:CharacterString>DayNightFlag</gco:CharacterString>  </eos:name>  </eos:EOS\_AdditionalAttributeDescription>  </eos:reference>  <eos:value>  <gco:CharacterString>DAY</gco:CharacterString>  </eos:value>  </eos:AdditionalAttribute>  </eos:AdditionalAttributes> |

ISO 19115-1

|  |
| --- |
| <mrc:AdditionalAttribute>  <mrc:reference>  <mrc:EOS\_AdditionalAttributeDescription>  <mrc:type>  <mrc:EOS\_AdditionalAttributeTypeCode  codeList="http://earthdata.nasa.gov/metadata/resources/Codelists.xm  l#EOS\_AdditionalAttributeTypeCode"  codeListValue="contentInformation">  contentInformation  </mrc:EOS\_AdditionalAttributeTypeCode>  </mrc:type>  <mrc:name>  <gco:CharacterString>DayNightFlag</gco:CharacterString>  </mrc:name>  </mrc:EOS\_AdditionalAttributeDescription>  </mrc:reference>  <mrc:value>  <gco:CharacterString>DAY</gco:CharacterString>  </mrc:value>  </mrc:AdditionalAttribute> |

ECHO Granule Source:

<https://api.echo.nasa.gov:443/catalog-rest/echo_catalog/granules/G7052933-LARC_ASDC>

#### Cloud Cover

**Element Specification**

CloudCover (0..1)

**Description**

This element is a percentage value indicating how much of the area of a granule has been obscured by clouds. It is worth noting that there are many different measures of cloud cover across data holdings and that the cloud cover parameter that is represented is specific to the entire granule.

**Cardinality**

0..1

**Tags**

*Optional, Parameter Search*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:contentInfo/gmd:MD\_ImageDescription  /gmd:cloudCoverPercentage/gco:Real |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:contentInfo/mdb:MD\_ImageDescription  /mdb:cloudCoverPercentage/gco:Real |
| ECHO 10 Granule | /Granule/CloudCover |

**Examples**

ECHO

|  |
| --- |
| <CloudCover>3</CloudCover> |

ISO 19115-2

|  |
| --- |
| <gmd:contentInfo>  <gmd:MD\_ImageDescription>  <gmd:attributeDescription/>  <gmd:contentType/>  <gmd:cloudCoverPercentage>  <gco:Real>3</gco:Real>  </gmd:cloudCoverPercentage>  </gmd:MD\_ImageDescription>  </gmd:contentInfo> |

ISO 19115-1

|  |
| --- |
| <mdb:contentInfo>  <mdb:MD\_ImageDescription>  <mdb:attributeDescription/>  <mdb:contentType/>  <mdb:cloudCoverPercentage>  <gco:Real>3</gco:Real>  </mdb:cloudCoverPercentage>  </mdb:MD\_ImageDescription>  </mdb:contentInfo> |

ECHO Granule Source:

<https://api.echo.nasa.gov:443/catalog-rest/echo_catalog/granules/G133543732-NSIDC_ECS>

### Distribution Information

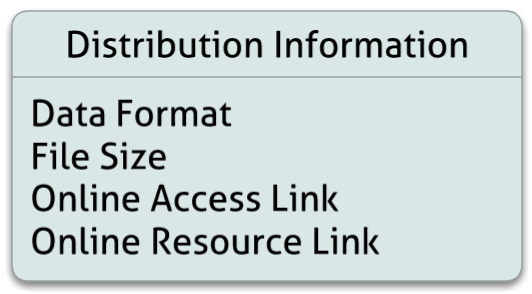


Figure C.8. Distribution Information

#### Distribution

The Distribution details can be found in the UMM Common document.

#### Data Format

**Element Specification**

Distribution/Format (0..1)

**Description**

This attribute contains the file format of the raw data (such as HDF) for a granule.

This attribute is tracked by Distribution/Format element of UMM Common.

**Cardinality**

0..\*

**Tags**

*Optional, Controlled Vocabulary, Normalize, Multiple ISO Mappings*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:distributionInfo/gmd:MD\_Distribution/gmd:distributor  \/gmd:MD\_Distributor/gmd:distributorFormat/gmd:MD\_Format/gmd:name  /gco:CharacterString |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:distributionInfo/mrd:MD\_Distribution/mrd:distributor  /mrd:MD\_Distributor/mrd:distributorFormat/mrd:MD\_Format  /mrd:formatSpecificationCitation/cit:CI\_Citation/cit:title/gco:CharacterString |
| ECHO 10 Granule | /Granule/DataFormat |

#### File Size

**Element Specification**

Distribution/Size (0..1)

**Description**

The size attribute will indicate the volume of data, in megabytes, contained in a granule.

This attribute is tracked by Distribution/Size element of UMM Common.

*Note: The ISO Snippet for this field includes online access information for a granule in addition to the file size information to provide context*

**Cardinality**

0..1

**Tags**

*Optional*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:distributionInfo/gmd:MD\_Distribution/gmd:distributor  /gmd:MD\_Distributor/gmd:distributorTransferOptions/gmd:MD\_DigitalTransferOptions  /gmd:transferSize/gco:Real |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:distributionInfo/mrd:MD\_Distribution/mrd:distributor  /mrd:MD\_Distributor/mrd:distributorTransferOptions/mrd:MD\_DigitalTransferOptions  /mrd:transferSize/gco:Real |
| ECHO 10 Granule | /Granule/SizeMBDataGranule |

#### Related URL

**Description**

This field specifies links to Internet sites that contain information related to the data, as well as related Internet sites such as project home pages, related data archives/servers, metadata extensions, online software packages, web mapping services, and calibration/validation data. Two fields from ECHO's granule schema have been consolidated into a single field. This field is related to the UMM-C field RelatedURL element.

The Related URL details can be found in the UMM Common document.

**Cardinality**

0..\*

**Tags**

*Optional*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | URL -> /gmi:MI\_Metadata/gmd:distributionInfo/gmd:MD\_Distribution/gmd:distributor  /gmd:MD\_Distributor/gmd:distributorTransferOptions/gmd:MD\_DigitalTransferOptions  /gmd:onLine/gmd:CI\_OnlineResource[gmd:function/gmd:CI\_OnLineFunctionCode  [@codeList = 'http://www.ngdc.noaa.gov/metadata/published/xsd/schema/resources  /Codelist/gmxCodelists.xml#CI\_OnLineFunctionCode'][@codeListValue = 'download']]  /gmd:linkage/gmd:URL    Description -> /gmi:MI\_Metadata/gmd:distributionInfo/gmd:MD\_Distribution/gmd:distributor  /gmd:MD\_Distributor/gmd:distributorTransferOptions/gmd:MD\_DigitalTransferOptions  /gmd:onLine/gmd:CI\_OnlineResource/gmd:description/gco:CharacterString    MimeType -> /gmi:MI\_Metadata/gmd:distributionInfo/gmd:MD\_Distribution/gmd:distributor  /gmd:MD\_Distributor/gmd:distributorTransferOptions/gmd:MD\_DigitalTransferOptions  /gmd:onLine/gmd:CI\_OnlineResource/gmd:applicationProfile/gco:CharacterString |
| ISO 19115-1 | URL -> /mdb:MD\_Metadata/mdb:distributionInfo/mrd:MD\_Distribution  /mrd:distributor/mrd:MD\_Distributor/mrd:distributorTransferOptions  /mrd:MD\_DigitalTransferOptions/mrd:onLine/cit:CI\_OnlineResource  /cit:linkage/gco:CharacterString  Description -> /mdb:MD\_Metadata/mdb:distributionInfo/mrd:MD\_Distribution  /mrd:distributor/mrd:MD\_Distributor/mrd:distributorTransferOptions  /mrd:MD\_DigitalTransferOptions/mrd:onLine/cit:CI\_OnlineResource  /cit:description/gco:CharacterString  MimeType -> /mdb:MD\_Metadata/mdb:distributionInfo/mrd:MD\_Distribution  /mrd:distributor/mrd:MD\_Distributor/mrd:distributorTransferOption  s/mrd:MD\_DigitalTransferOptions/mrd:onLine/cit:CI\_OnlineResource  /cit:applicationProfile/gco:CharacterString |
| ECHO 10 Granule | /Granule/OnlineAccessURLs/OnlineAccessURL/URL  or  /Granule/OnlineResources/OnlineResource/URL |

### Data Quality Information

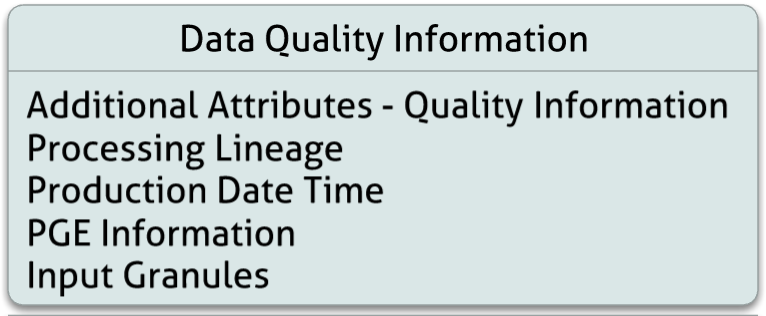


Figure C.9. Data Quality Information

#### Additional Attributes - Quality Information

**Description**

This entity stores the product specific attributes that are related to data quality. For more information on how attributes are mapped, please refer Appendix E: Additional Attributes Categorization.

See UMM-Common Additional Attributes section for full documentation and examples.

**Cardinality**

0..\*

**Relationships**

This field is validated against the parent collection field **ProductSpecificAttribute** of the UMM-C to ensure that it contains an attribute of the same name.

**Tags**

*Optional, Free Text Search, Parameter Search, Validated*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:dataQualityInfo/gmd:DQ\_DataQuality/gmd:report  /gmd:DQ\_QuantitativeAttributeAccuracy/gmd:result/gmd:DQ\_QuantitativeResult  /gmd:value/gco:Record/eos:AdditionalAttributes/eos:AdditionalAttribute/eos:reference  /eos:EOS\_AdditionalAttributeDescription/eos:name/gco:CharacterString |
| ISO 19115-1 | BASE\_XPATH=/mdb:MD\_Metadata/mdb:contentInfo/mrc:MD\_CoverageDescription  /mrc:attributeGroup/mrc:MD\_AttributeGroup/mrc:attribute/mrc:MD\_SampleDimension  /mrc:otherProperty/gco:Record/mrc:AdditionalAttributes/mrc:AdditionalAttribute    /BASE\_XPATH/mrc:reference/mrc:EOS\_AdditionalAttributeDescription/mrc:name  /gco:CharacterString  and  /BASE\_XPATH/mrc:value/gco:CharacterString |
| ECHO 10 Granule | /Granule/AdditionalAttributes/AdditionalAttribute |

**Examples**

ECHO

|  |
| --- |
| <AdditionalAttribute>  <Name>OrbitQuality</Name>  <Values>  <Value>6</Value>  </Values>  </AdditionalAttribute> |

ISO 19115-2

|  |
| --- |
| <eos:AdditionalAttribute>  <eos:reference>  <eos:EOS\_AdditionalAttributeDescription>  <eos:type>  <eos:EOS\_AdditionalAttributeTypeCode  codeList="http://earthdata.nasa.gov/metadata/resources/Codelists.xml  #EOS\_AdditionalAttributeTypeCode"  codeListValue="qualityInformation"  >qualityInformation</eos:EOS\_AdditionalAttributeTypeCode>  </eos:type>  <eos:name>  <gco:CharacterString>OrbitQuality</gco:CharacterString>  </eos:name>  </eos:EOS\_AdditionalAttributeDescription>  </eos:reference>  <eos:value>  <gco:CharacterString>6</gco:CharacterString>  </eos:value>  </eos:AdditionalAttribute> |

ISO 19115-1

|  |
| --- |
| <mrc:AdditionalAttribute>  <mrc:reference>  <mrc:EOS\_AdditionalAttributeDescription>  <mrc:type>  <mrc:EOS\_AdditionalAttributeTypeCode  codeList="http://earthdata.nasa.gov/metadata/resources/Codelists.xml  #EOS\_AdditionalAttributeTypeCode"  codeListValue="contentInformation">  contentInformation  </mrc:EOS\_AdditionalAttributeTypeCode>  </mrc:type>  <mrc:name>  <gco:CharacterString>OrbitQuality</gco:CharacterString>  </mrc:name>  </mrc:EOS\_AdditionalAttributeDescription>  </mrc:reference>  <mrc:value>  <gco:CharacterString>6</gco:CharacterString>  </mrc:value>  </mrc:AdditionalAttribute> |

ECHO Granule Source:

<https://api.echo.nasa.gov:443/catalog-rest/echo_catalog/granules/G190034442-NSIDC_ECS>

#### Reprocessing Lineage

**Element Specification**

Lineage/Reprocessing/Description

**Description**

Granule level, stating what reprocessing has been performed on this granule.

*Note: The ISO Snippet for this field includes PGE version information and production date time for the granule in addition to the reprocessing information to provide context*

**Cardinality**

0..\*

**Tags**

*Optional*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:dataQualityInfo/gmd:DQ\_DataQuality/gmd:lineage  /gmd:LI\_Lineage/gmd:processStep/gmi:LE\_ProcessStep/gmd:description  /gco:CharacterString |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:resourceLineage/mrl:LI\_Lineage/mrl:processStep  /mrl:LE\_ProcessStep/mrl:description/gco:CharacterString |
| ECHO 10 Granule | /Granule/DataGranule/ReprocessingActual |

**Examples**

ECHO

|  |
| --- |
| <ReprocessingActual>reprocessed once</ReprocessingActual> |

ISO 19115-2

|  |
| --- |
| <gmi:LE\_ProcessStep>  <gmd:description>  <gco:CharacterString>reprocessed once</gco:CharacterString>  </gmd:description>  </gmi:LE\_ProcessStep> |

ISO 19115-1

|  |
| --- |
| <mrl:LE\_ProcessStep>  <mrl:description>  <gco:CharacterString>reprocessed once</gco:CharacterString>  </mrl:description>  </mrl:LE\_ProcessStep> |

ECHO Granule Source:

<https://api.echo.nasa.gov:443/catalog-rest/echo_catalog/granules/G186406262-NSIDC_ECS>

#### Production Date Time

**Element Specification**

Lineage/Reprocessing/DataDates[Type = 'creation']/Date

**Description**

The date and time a specific granule was produced by a Product Generation Executive (PGE).

**Cardinality**

0..\*

**Tags**

*Optional*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:dataQualityInfo/gmd:DQ\_DataQuality/gmd:lineage  /gmd:LI\_Lineage/gmd:processStep/gmi:LE\_ProcessStep/gmd:dateTime/gco:DateTime |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:resourceLineage/mrl:LI\_Lineage/mrl:processStep  /mrl:LE\_ProcessStep/mrl:stepDateTime/gml:TimeInstant/gml:timePosition |
| ECHO 10 Granule | /Granule/DataGranule/ProductionDateTime |

**Examples**

ECHO

|  |
| --- |
| <ProductionDateTime>2007-03-12T20:17:30.000Z</ProductionDateTime> |

ISO 19115-2

|  |
| --- |
| <gmd:lineage>  <gmd:LI\_Lineage>  <gmd:processStep>  <gmi:LE\_ProcessStep>  <gmd:description gco:nilReason="unknown"/>  <gmd:dateTime>  <gco:DateTime>2007-03-12T20:17:30.000Z</gco:DateTime>  </gmd:dateTime>  </gmi:LE\_ProcessStep>  </gmd:processStep>  </gmd:LI\_Lineage>  </gmd:lineage> |

ISO 19115-1

|  |
| --- |
| <mrl:processStep>  <mrl:LE\_ProcessStep>  <mrl:stepDateTime>  <gml:TimeInstant gml:id="d1e1116">  <gml:timePosition>2007-03-12T20:17:30.000Z</gml:timePosition>  </gml:TimeInstant>  </mrl:stepDateTime>  </mrl:LE\_ProcessStep>  </mrl:processStep> |

ECHO Granule Source:

<https://api.echo.nasa.gov:443/catalog-rest/echo_catalog/granules/G185415463-GSFCS4PA>

#### Product Generation Executive (PGE) Information

**Element Specification**

Lineage/Reprocessing/Source/EntryId/Id

Lineage/Reprocessing/Source/EntryId/Version

**Description**

Name of the product generation executive as well as the version of the PGE that applied when producing a granule.

**Cardinality**

0..\*

**Tags**

*Optional*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:dataQualityInfo/gmd:DQ\_DataQuality/gmd:lineage  /gmd:LI\_Lineage/gmd:processStep/gmi:LE\_ProcessStep/gmi:processingInformation  /eos:EOS\_Processing/gmi:identifier/gmd:MD\_Identifier[gmd:description  /gco:CharacterString[. = 'PGENameXXX']/gmd:code/gco:CharacterString |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:resourceLineage/mrl:LI\_Lineage/mrl:processStep  /mrl:LE\_ProcessStep/mrl:processingInformation/mrl:EOS\_Processing  /mrl:identifier/mcc:MD\_Identifier[mcc:description[1]/gco:CharacterString[. = 'PGENameXXX']/mcc:code/gco:CharacterString |
| ECHO 10 Granule | /Granule/PGEVersionClass/PGEName  /Granule/PGEVersionClass/PGEVersion |

**Examples**

ECHO

|  |
| --- |
| <PGEVersionClass>  <PGEName>Compute Surface and Atmospheric Fluxes at Synoptic Time 6</PGEName>  <PGEVersion>7.2.1P3</PGEVersion>  </PGEVersionClass> |

ISO 19115-2

|  |
| --- |
| <gmi:processingInformation>  <eos:EOS\_Processing>  <gmi:identifier>  <gmd:MD\_Identifier>  <gmd:code>  <gco:CharacterString>7.2.1P3</gco:CharacterString>  </gmd:code>  <gmd:description>  <gco:CharacterString> Compute Surface and Atmospheric Fluxes at Synoptic Time 6</gco:CharacterString>  </gmd:description>  </gmd:MD\_Identifier>  </gmi:identifier>  <gmi:softwareReference>  <gmd:CI\_Citation>  <gmd:title>  <gco:CharacterString>Compute Surface and Atmospheric Fluxes at Synoptic Time 6</gco:CharacterString>  </gmd:title>  <gmd:date gco:nilReason="unknown"/>  <gmd:edition>  <gco:CharacterString>7.2.1P3</gco:CharacterString>  </gmd:edition>  </gmd:CI\_Citation>  </gmi:softwareReference>  </eos:EOS\_Processing>  </gmi:processingInformation> |

ISO 19115-1

|  |
| --- |
| <mrl:processingInformation>  <mrl:EOS\_Processing>  <mrl:identifier>  <mcc:MD\_Identifier>  <mcc:code>  <gco:CharacterString>7.2.1P3</gco:CharacterString>  </mcc:code>  <mcc:description>  <gco:CharacterString> Compute Surface and Atmospheric Fluxes at Synoptic Time 6</gco:CharacterString>  </mcc:description>  </mcc:MD\_Identifier>  </mrl:identifier>  <mrl:softwareReference>  <cit:CI\_Citation>  <cit:title>  <gco:CharacterString> Compute Surface and Atmospheric Fluxes at Synoptic Time 6</gco:CharacterString>  </cit:title>  <cit:date gco:nilReason="unknown"/>  <cit:edition>  <gco:CharacterString>7.2.1P3</gco:CharacterString>  </cit:edition>  </cit:CI\_Citation>  </mrl:softwareReference>  </mrl:EOS\_Processing>  </mrl:processingInformation> |

#### Input Granules

**Element Specification**

Lineage/Source/EntryId/Id

**Description**

This entity contains the identification of the input granule(s) for a specific granule.

*Note: Lineage Metadata will most likely become its own metadata model in the future.*

**Cardinality**

0..\*

**Tags**

*Optional*

**Sample Mappings**

|  |  |
| --- | --- |
| ISO 19115-2 | /gmi:MI\_Metadata/gmd:dataQualityInfo/gmd:DQ\_DataQuality/gmd:lineage  /gmd:LI\_Lineage/gmd:source/gmi:LE\_Source/gmd:sourceCitation/gmd:CI\_Citation  /gmd:title/gmx:FileName/@src |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:resourceLineage/mrl:LI\_Lineage/mrl:source/mil:LE\_Source  /mrl:sourceCitation/cit:CI\_Citation/cit:title/gcx:FileName/@src |
| ECHO | /Granule/InputGranules |

**Examples**

ECHO

|  |
| --- |
| <InputGranules>  <InputGranule>CTL00\_000\_20130110\_2259791\_01\_gla07\_h5\_convert.ctl</InputGranule>  <InputGranule>tai-utc.dat</InputGranule>  <InputGranule>GLA07\_633\_1102\_001\_0111\_0\_01\_0001.DAT</InputGranule>  <InputGranule>DsESDTGlGLAH07.033.desc</InputGranule>  </InputGranules> |

ISO 19115-2

|  |
| --- |
| <gmd:source>  <gmi:LE\_Source id="d2e496">  <gmd:sourceCitation>  <gmd:CI\_Citation>  <gmd:title>  <gmx:FileName src="CTL00\_000\_20130110\_2259791\_01\_gla07\_h5\_convert.ctl"/>  </gmd:title>  <gmd:date gco:nilReason="unknown"/>  </gmd:CI\_Citation>  </gmd:sourceCitation>  </gmi:LE\_Source>  </gmd:source> |

ISO 19115-1

|  |
| --- |
| <mrl:source>  <mrl:LE\_Source id="d1e432">  <mrl:sourceCitation>  <cit:CI\_Citation>  <cit:title>  <gcx:FileName src="CTL00\_000\_20130110\_2259791\_01\_gla07\_h5\_convert.ctl"/>  </cit:title>  <cit:date gco:nilReason="unknown"/>  </cit:CI\_Citation>  </mrl:sourceCitation>  </mrl:LE\_Source>  </mrl:source> |

ECHO Granule Source:

<https://api.echo.nasa.gov:443/catalog-rest/echo_catalog/granules/G190434172-NSIDC_ECS>

### Acquisition Information

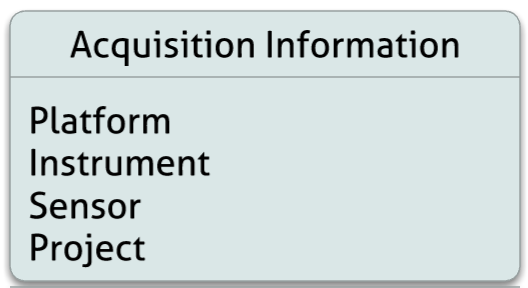


Figure C.10. Acquisition Information

#### Platform

See UMM-Common Platform element for full documentation and examples.

**Tags**

*Required, Free Text Search, Parameter Search, Controlled Vocabulary, Faceted, Validated Relationship*

**Sample Mappings**

|  |  |
| --- | --- |
| ECHO 10 Granule | /Granule/Platforms/Platform/ShortName |
| ISO 19115-2 | /gmi:MI\_Metadata/gmi:acquisitionInformation/gmi:MI\_AcquisitionInformation  /gmi:platform/eos:EOS\_Platform[gmi:instrument[@xlink:href='#d7e54']]/gmi:identifier  /gmd:MD\_Identifier/gmd:code/gco:CharacterString  and  /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification  /gmd:descriptiveKeywords/gmd:MD\_Keywords[gmd:type  /gmd:MD\_KeywordTypeCode[@codeList = 'http://www.ngdc.noaa.gov  /metadata/published/xsd/schema/resources/Codelist/gmxCodelists.xm  l#MD\_KeywordTypeCode'][@codeListValue = 'platform'][. = 'platform']]  /gmd:keyword/gco:CharacterString |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:acquisitionInformation/mac:MI\_AcquisitionInformation  /mac:platform/eos:EOS\_Platform[mac:instrument[@xlink:href="#d22e142"]]  /mac:identifier/mcc:MD\_Identifier/mcc:code/gco:CharacterString  and  /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification  /mri:descriptiveKeywords/mri:MD\_Keywords[mri:type/mri:MD\_KeywordTypeCode  [@codeList="codeListLocation#MD\_KeywordTypeCode"][@codeListValue="platform"]]  /mri:keyword/gco:CharacterString |

#### Instrument

See UMM-Common Instrument element for full documentation and examples.

**Tags**

*Required, Free Text Search, Parameter Search, Controlled Vocabulary, Faceted, Validated Relationship*

**Sample Mappings**

|  |  |
| --- | --- |
| ECHO 10 Granule | /Granule/Platforms/Platform/Instruments/Instrument/ShortName |
| ISO 19115-2 | /gmi:MI\_Metadata/gmi:acquisitionInformation/gmi:MI\_AcquisitionInformation/  gmi:instrument/eos:EOS\_Instrument[@id='d7e54'][gmi:citation/gmd:CI\_Citation  /gmd:title/gco:CharacterString[.='ACRIM']]/gmi:identifier/gmd:MD\_Identifier  /gmd:code/gco:CharacterString  and  /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification  /gmd:descriptiveKeywords[2]/gmd:MD\_Keywords[gmd:type  /gmd:MD\_KeywordTypeCode[@codeList = 'http://www.ngdc.noaa.gov  /metadata/published/xsd/schema/resources/Codelist/gmxCodelists.xml  #MD\_KeywordTypeCode'][@codeListValue = 'instrument'][. = 'instrument']]  /gmd:keyword/gco:CharacterString |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:acquisitionInformation/mac:MI\_AcquisitionInformation  /mac:instrument/eos:EOS\_Instrument/mac:identifier/mcc:MD\_Identifier/mcc:code  /gco:CharacterString  and  /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification  /mri:descriptiveKeywords/mri:MD\_Keywords[mri:type/mri:MD\_KeywordTypeCode  [@codeList="codeListLocation#MD\_KeywordTypeCode"][@codeListValue="'instrument"]]  /mri:keyword/gco:CharacterString |

#### Sensor

See UMM-Common Sensor element for full documentation and examples.

**Tags**

*Free Text Search, Parameter Search, Controlled Vocabulary, Faceted, Validated Relationship*

**Sample Mappings**

|  |  |
| --- | --- |
| ECHO 10 Granule | /Granule/Platforms/Platform/Instruments/Instrument/Sensors/Sensor/ShortName |
| ISO 19115-2 | /gmi:MI\_Metadata/gmi:acquisitionInformation/gmi:MI\_AcquisitionInformation  /gmi:instrument/eos:EOS\_Instrument/eos:sensor/eos:EOS\_Sensor[eos:citation  /gmd:CI\_Citation/gmd:title/gco:CharacterString[ . = 'ACR&gt;']]/eos:identifier  /gmd:MD\_Identifier/gmd:code/gco:CharacterString |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:acquisitionInformation/mac:MI\_AcquisitionInformation  /mac:instrument/eos:EOS\_Instrument/eos:sensor/eos:EOS\_Sensor/eos:identifier/  mcc:MD\_Identifier/mcc:code/gco:CharacterString |

#### Project

See UMM-Common Project element for full documentation and examples.

**Tags**

*Required, Free Text Search, Parameter Search, Controlled Vocabulary, Faceted, Validated Relationship*

**Sample Mappings**

|  |  |
| --- | --- |
| ECHO 10 Granule | /Granule/Campaigns/Campaign/ShortName |
| ISO 19115-2 | /gmi:MI\_Metadata/gmi:acquisitionInformation/gmi:MI\_AcquisitionInformation  /gmi:operation/gmi:MI\_Operation[gmi:description/gco:CharacterString  [. = 'Campaign/ShortName' ]]/gmi:identifier/gmd:MD\_Identifier/gmd:code/gco:CharacterString  and  /gmi:MI\_Metadata/gmd:identificationInfo/gmd:MD\_DataIdentification  /gmd:descriptiveKeywords/gmd:MD\_Keywords[gmd:type  /gmd:MD\_KeywordTypeCode[@codeListValue="project"]  [@codeList="http://www.ngdc.noaa.gov/metadata/published/xsd/schema/resources/  Codelist/gmxCodelists.xml#MD\_KeywordTypeCode"]]/gmd:keyword/gco:CharacterString |
| ISO 19115-1 | /mdb:MD\_Metadata/mdb:acquisitionInformation/mac:MI\_AcquisitionInformation  /mac:operation/mac:MI\_Operation[mac:description/gco:CharacterString  [. = 'Campaign/ShortName' ]]/mac:identifier/mcc:MD\_Identifier/mcc:code/gco:CharacterString  and  /mdb:MD\_Metadata/mdb:identificationInfo/mri:MD\_DataIdentification  /mri:descriptiveKeywords/mri:MD\_Keywords[mri:type/  mri:MD\_KeywordTypeCode[@codeListValue="project"]  [@codeList="codeListLocation#MD\_KeywordTypeCode"]]/mri:keyword/gco:CharacterString |

**APPENDIX C-1 Deprecated Fields**

**C-1.1 Measured Parameters**

The ECHO granule metadata in its current iteration contains the concept of a "Measured Parameter" or Variable. The Measured Parameter is used to expose variable level quality information about the granule.

**Example**

|  |
| --- |
| <MeasuredParameter>  <ParameterName>Water Vapor Mass Mixing Ratio</ParameterName>  <QAStats/>  <QAFlags>  <AutomaticQualityFlag>Passed</AutomaticQualityFlag>  <AutomaticQualityFlagExplanation>  Based on percentage of product that is good.  Suspect used where true quality is not known.  </AutomaticQualityFlagExplanation>  </QAFlags>  </MeasuredParameter> |

ECHO Granule Source: <https://api.echo.nasa.gov:443/catalog-rest/echo_catalog/granules/G203262173-GSFCS4PA>

Corresponds to roughly to variable 'H20\_MMR' from the HDF file.

This field will not be included in the unified granule model. Variable level metadata will be promoted to its own concept within the CMR via the unified metadata model for Variables (UMM-Var). This will allow the CMR to create parameter linkages at both the collection and granule level and expose a variable data catalog that can be exploited by service implementers. More details related to this concept is described in a separate document.

**C-1.2 Price**

This field is not currently in use (all collected sample data contained values of '0' or '0.0') and is not indexed for search via Free Text Search or parameter search.

**C-1.3 Orderable**

The Orderable field was originally introduced to identify granules as orderable via a provider-implemented ordering service. Determining whether a granule is orderable is now managed via external management applications. Thus, the Orderable field is no longer relevant in granule metadata.

**C-1.4 Visible**

The Visible field was originally introduced to identify granules as public/private. Determining whether a granule is visible to a particular user is now managed via external management applications and access control levels (ACLs). Thus, the Visible field is no longer relevant in granule metadata.

**APPENDIX C-2 Tags Glossary**

The following table lists all tags used in this model and provides a description of the tags' usage.

|  |  |
| --- | --- |
| Tag Name | Description |
| Optional | This field is not required. |
| Required | This field is required. |
| Controlled Vocabulary | This field will be populated with a vocabulary that will be used to validate the value. This task will most likely be performed via a vocabulary management service. |
| Free Text Search | This field will be indexed by the CMR as part of the free text search. |
| Parameter Search | This field will be indexed by the CMR and will be exposed via the CMR API and a specific parameter. For example, the CMR will expose a "platform" search parameter, so the "Platform" field will have this tag. |
| Deprecate | This field should be deprecated in a future revision of the UMM-G |
| Validated | This field is validated against the parent collection |
| Addition | This field is recommended for addition to the ECHO Granule schema |
| Faceted | This field should be exposed by the CMR catalog via a faceted search response. |
| Markdown Support | This class supports markdown-formatted text. Additional information on markdown can be found at <http://en.wikipedia.org/wiki/Markdown> |
| Validated Relationship | Any associated granules use this field for validation against the collection, or associated collections are check for validity |

**APPENDIX C-3 Tag Index**

**C-3.1 Required**

These fields are required.

|  |
| --- |
| Granule Universal Identifier |
| Insert Time |
| Last Update |
| Parent Collection Identifier (with Options) |
| Universal Reference Identifier |

**C-3.2 Optional**

These fields are not required.

|  |
| --- |
| Access Constraint Description |
| Access Constraint Value |
| Additional Attributes - Content Information |
| Additional Attributes - Descriptive Keywords |
| Additional Attributes - Geographic Identifier |
| Additional Attributes - Instrument Information |
| Additional Attributes - Platform Information |
| Additional Attributes - Quality Information |
| Additional Platform Orbit Information |
| Browse Graphic |
| Project/Campaign |
| Cloud Cover |
| Data Format |
| Day Night Flag |
| File Size |
| Input Granules |
| Instrument |
| Instrument Characteristics |
| Instrument Operation Modes |
| Local Version Identifier |
| Related URL |
| Platform |
| Platform Orbit Information |

|  |
| --- |
| Spatial Extent (with Options) |
| Temporal Extent (with Options) |

**C-3.3 Controlled Vocabulary**

These fields will have a vocabulary that will be used to validate the value. This will most likely be done via a vocabulary management service.

|  |
| --- |
| Project/Campaign |
| Data Format |
| Day Night Flag |
| Instrument |
| Platform |
| Two Dimensional Coordinate System |
| Vertical Spatial Domain |

**C-3.4 Free Text Search**

These fields will be indexed by the CMR as part of the free text keyword search. This is similar to data returned using 'csw:anyText' query parameter on a CSW implementation.

|  |
| --- |
| Additional Attributes - Content Information |
| Additional Attributes - Descriptive Keywords |
| Additional Attributes - Geographic Identifier |
| Additional Attributes - Instrument Information |
| Additional Attributes - Platform Information |
| Additional Attributes - Quality Information |
| Project/Campaign |
| Granule Universal Identifier |
| Instrument |
| Parent Collection Identifier Option 1 - Entry Id (Short Name + Version) |
| Parent Collection Identifier Option 2 - Entry Title (Dataset Id) |
| Platform |
| Producer Identifier |
| Spatial Locality |
| Universal Reference Identifier |

**C-3.5 Parameter Search**

These fields will be indexed by the CMR to facilitate specific parameter search via the CMR API. For example, the CMR will allow a "platform" search parameter, so the "Platform" field will have this tag.

|  |
| --- |
| Additional Attributes - Content Information |
| Additional Attributes - Descriptive Keywords |
| Additional Attributes - Geographic Identifier |
| Additional Attributes - Instrument Information |
| Additional Attributes - Platform Information |
| Additional Attributes - Quality Information |
| Project/Campaign |
| Cloud Cover |
| Day Night Flag |
| Insert Time |
| Instrument |
| Last Update |
| Parent Collection Identifier Option 1 - Entry Id (Short Name + Version) |
| Parent Collection Identifier Option 2 - Entry Title (Dataset Id) |
| Platform |
| Producer Identifier |
| Spatial Extent |
| Temporal Extent |

**C-3.6 Deprecate**

These fields should be deprecated in a future revision of the UMM-G

|  |
| --- |
| Instrument Characteristics |
| Instrument Operation Modes |
| Local Version Identifier |
| Reprocessing Plan Note |
| Sensor Characteristics |
| Spatial Locality |

**C-3.7 Validated with Parent**

These fields are validated against the parent collection

|  |  |
| --- | --- |
| UMM-G Field | Related UMM-C Validated Field |
| Additional Attributes - Content Information | ProductSpecificAttribute |
| Additional Attributes - Descriptive Keywords | ProductSpecificAttribute |
| Additional Attributes - Geographic Identifier | ProductSpecificAttribute |
| Additional Attributes - Instrument Information | ProductSpecificAttribute |
| Additional Attributes - Quality Information | ProductSpecificAttribute |
| Additional Attributes - Platform Information | ProductSpecificAttribute |
| Additional Platform Orbit Information | SpatialCoverage/HorizontalSpatialDomain/Orbit |
| Project/Campaign | Project/Campaign |
| Instrument | Platform/Instrument |
| Instrument Operation Modes | Platform/Instrument/Instrument Operation Mode |
| Parent Collection Identifier Option 1 - Entry Id (Short Name + Version) | Entry Id |
| Parent Collection Identifier Option 2 - Entry Title (Dataset Id) | Entry Title |
| Platform | Platform |
| Sensor | Platform/Instrument/Sensor |
| Spatial Extent | Spatial Extent |
| Temporal Extent | Temporal Extent |

**C-3.8 Addition**

This field is recommended for addition to the ECHO Granule schema

|  |
| --- |
| Parent Collection Identifier Option 1 - Entry Id (Short Name + Version) |

**APPENDIX C-4 Tiling Identification Systems**

*The following table outlines all tiling systems (formerly 2D coordinate systems) used in CMR and their corresponding format in the ISO translation. This table also includes information on a generic translation used if none of the known tiling systems is applicable.*

|  |  |
| --- | --- |
| **Tiling System** | Sample ISO Translated Format |
| **CALIPSO** | o29309,29310p171,171 |
| **MISR** | p232b1-180 |
| **MODIS Tile EASE** | h12v14 |
| **MODIS Tile SIN** | h0v9 |
| **WRS-2** | p158r4 |
| **WRS-1** | p24-24r28-28 |
| **WELD Alaska tile** | uses generic translation |
| **WELD CONUS tile** | uses generic translation |
| **generic ISO to ECHO translation** | x2-12y3-18 |

*More information may be found at the following link related to the MENDS Working Group documentation (URS Login Required):* [*https://wiki.earthdata.nasa.gov/display/NASAISO/Two-Dimensional+Coordinate+Systems*](https://wiki.earthdata.nasa.gov/display/NASAISO/Two-Dimensional+Coordinate+Systems)

**APPENDIX C-5 Additional Attributes Categorization**

For the latest mapping of additional attributes and their various categorizations, see the following link:

<https://cdn.earthdata.nasa.gov/iso/resources/transforms/additionalAttributeType.xml>

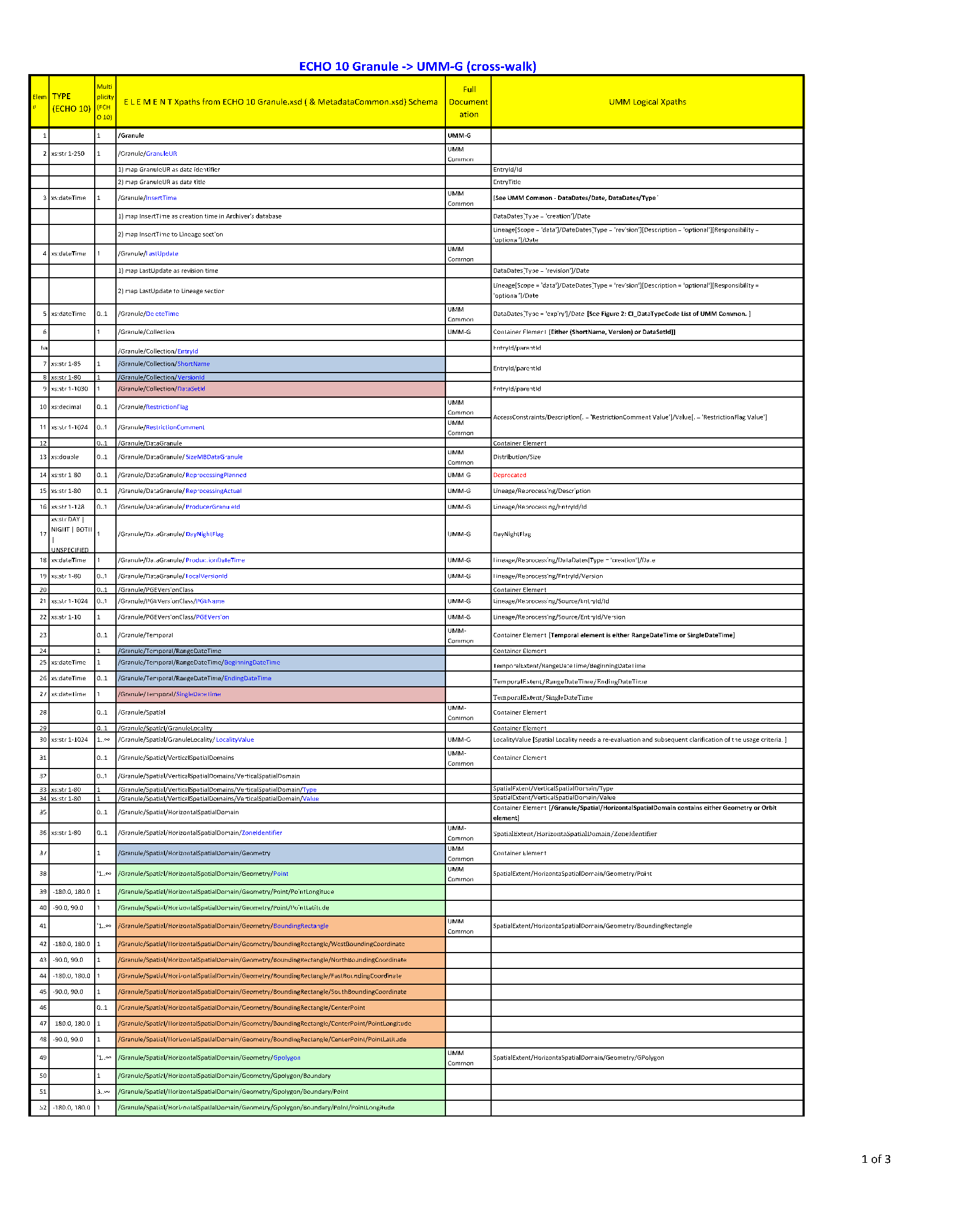
**APPENDIX C-6 Field Summary**

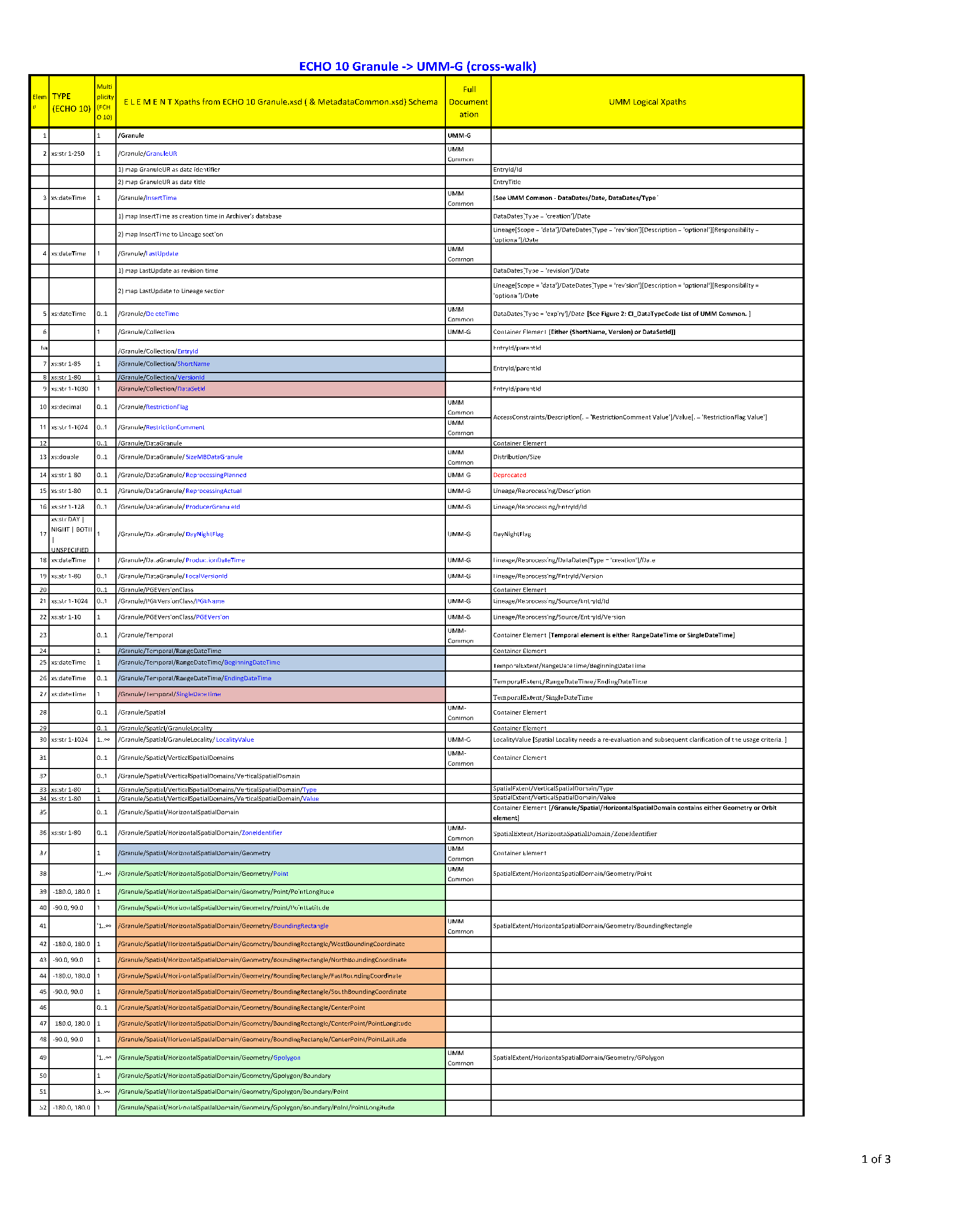
*The following table shows how various metadata formats accommodate the UMM-G fields.*

*(Latest updates are available at: https://wiki.earthdata.nasa.gov/display/CMR/UMM-G%3A+Granule+Metadata+Mapping+Summaries)*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **UMM-G Field** | **Required?** | **Full Documentation** | **ECHO 10** | **ISO 19115-2** | **ISO 19115-1** |
|  | **METADATA INFORMATION** |  |  |  |  |  |
| 1 | Metadata Language |  | UMM Common | N | Y | Y |
| 2 | Metadata Standard |  | UMM Common | Y | Y | Y |
| 3 | Metadata Dates |  | UMM Common | Y | Y | Y |
|  | **DATA IDENTIFICATION** |  |  |  |  |  |
| 4 | Universal Reference Identifier | YES | UMM Common |  |  |  |
| 5 | Data Language |  | UMM Common | N | Y | Y |
| 6 | Data Dates | YES | UMM Common | Y | Y | Y |
| 7 | Producer Identifier |  | UMM-G | Y | Y | Y |
| 8 | Local Version Identifier |  | UMM-G | Y | Y | Y |
| 9 | Browse Graphic |  | UMM Common | Y | Y | Y |
| 10 | Data Format |  | UMM -G | Y | Y | Y |
| 11 | Access Constraint Value |  | UMM Common | Y | Y | Y |
| 12 | Parent Collection Identifier | YES | UMM-G | Y | Y | Y |
|  | **DESCRIPTIVE KEYWORDS** |  |  |  |  |  |
| 13 | Spatial Locality |  | UMM-G | Y | Y | Y |
|  | **SPATIAL INFORMATION** |  |  |  |  |  |
| 14 | Spatial Extent |  | UMM Common | Y | Y | Y |
| 15 | Tiling Identification System (Formerly TwoDCoordinateSystem) |  | UMM Common | Y | Y | Y |
|  | **TEMPORAL INFORMATION** |  |  |  |  |  |
| 16 | Temporal Extent |  | UMM Common | Y | Y | Y |
|  | **COVERAGE INFORMATION** |  |  |  |  |  |
| 17 | Additional Attributes - Content Information |  | UMM Common | Y | Y | Y |
| 18 | Day Night Flag |  | UMM-G | Y | Y | Y |
| 19 | Cloud Cover |  | UMM-G | Y | Y | Y |
|  | **DISTRIBUTION INFORMATION** |  |  |  |  |  |
| 20 | Related URL |  | UMM Common | Y | Y | Y |
| 21 | Distribution |  | UMM Common | Y | Y | Y |
|  | **ACQUISITION INFORMATION** |  |  |  |  |  |
| 22 | Platform |  | UMM Common | Y | Y | Y |
| 23 | Instrument |  | UMM Common | Y | Y | Y |
| 24 | Sensor |  | UMM Common | Y | Y | Y |
| 25 | Project |  | UMM Common | Y | Y | Y |
| 26 | Platform Orbit Information |  | UMM Common | Y | Y | Y |
| 27 | Additional Attributes - Platform Information |  | UMM Common | Y | Y | Y |
|  | **DATA QUALITY INFORMATION** |  |  |  |  |  |
| 28 | Additional Attributes - Quality Information |  | UMM Common | Y | Y | Y |
| 29 | Reprocessing Lineage |  | UMM-G | Y | Y | Y |
| 30 | Production Date Time |  | UMM-G | Y | Y | Y |
| 31 | Product Generation Executive (PGE) Information |  | UMM-G | Y | Y | Y |
| 32 | Input Granules |  | UMM-G | Y | Y | Y |
|  |  |  |  |  |  |  |
|  | Format has a mapping for this field documented in the UMM-C |  |  |  |  |  |
|  | The exact mapping for this field is still under discussion. |  |  |  |  |  |
|  | Format does have a mapping for this field |  |  |  |  |  |

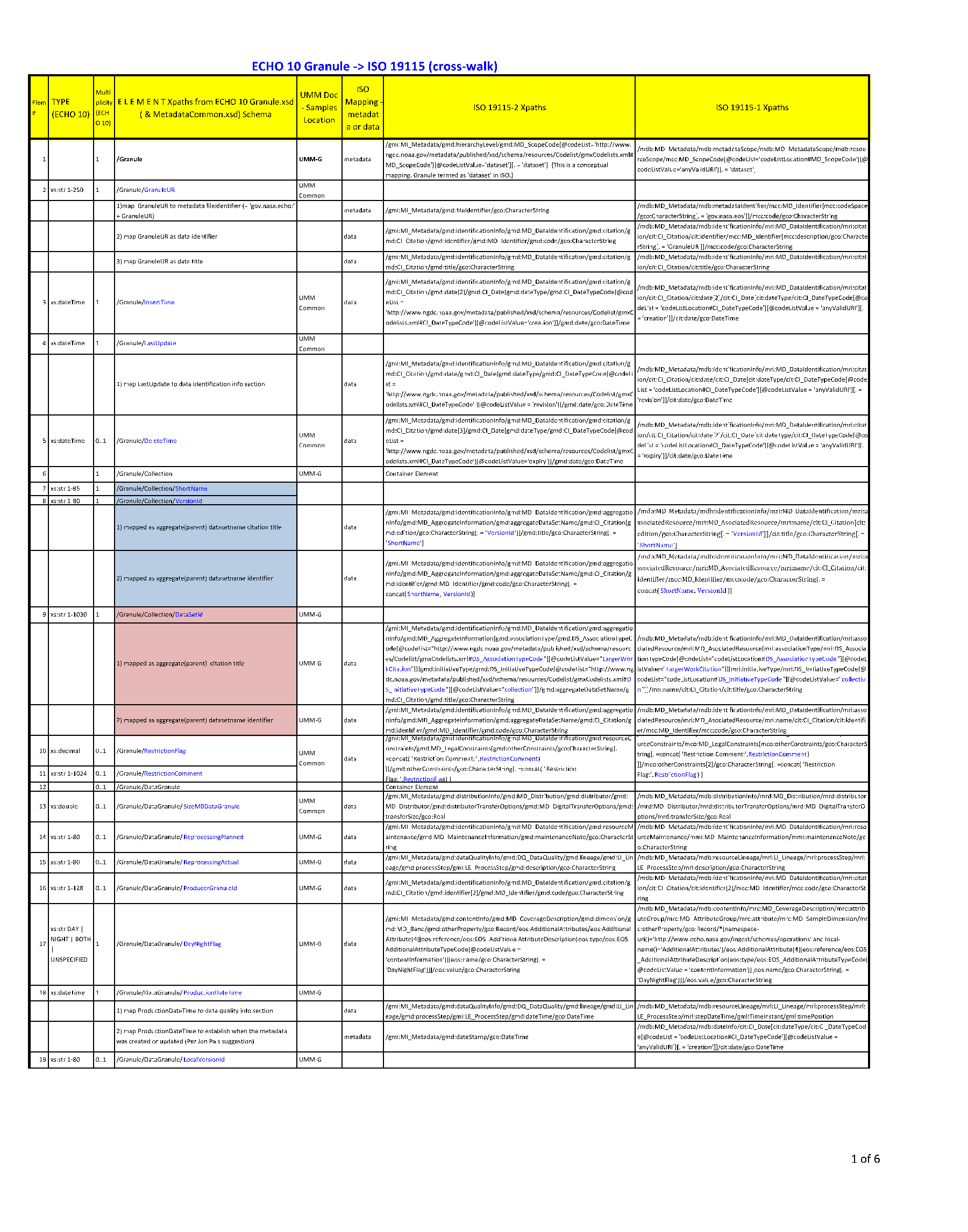
**APPENDIX C-7 NASA ESDIS Echo 10 Granule elements to UMM Mapping (Cross-walk)**

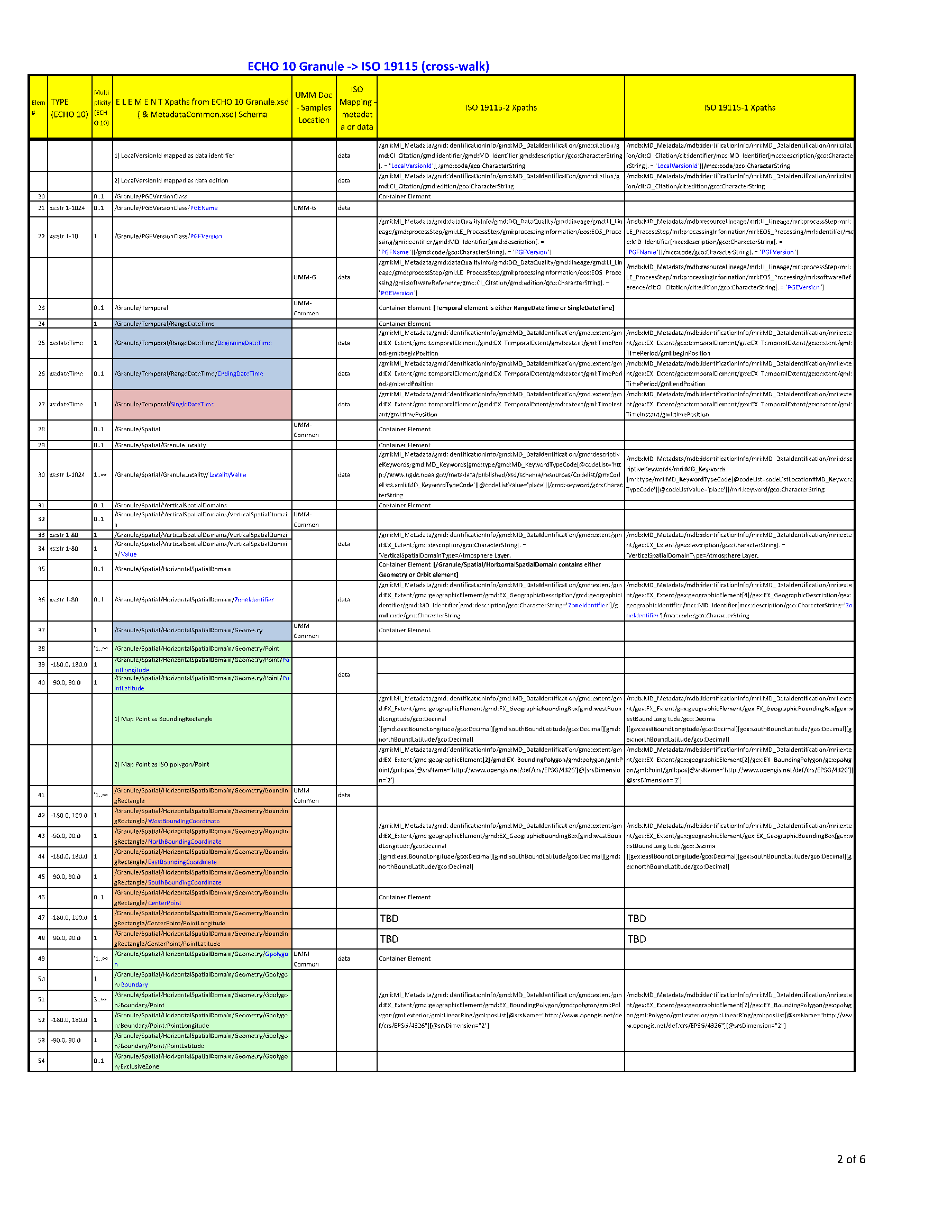
Table below presents a cross-walk of ECHO 10 Granule elements to corresponding UMM-G elements. 

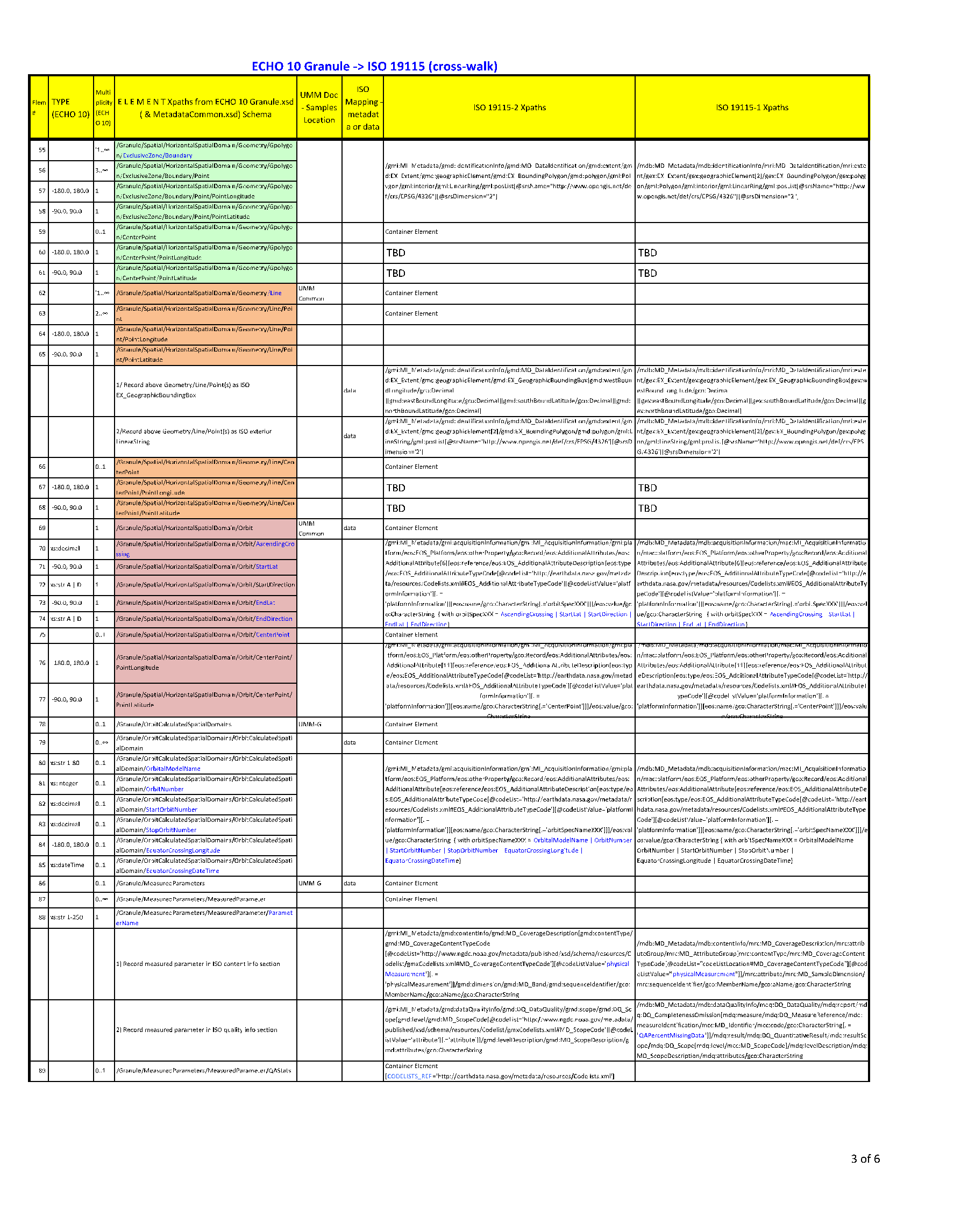




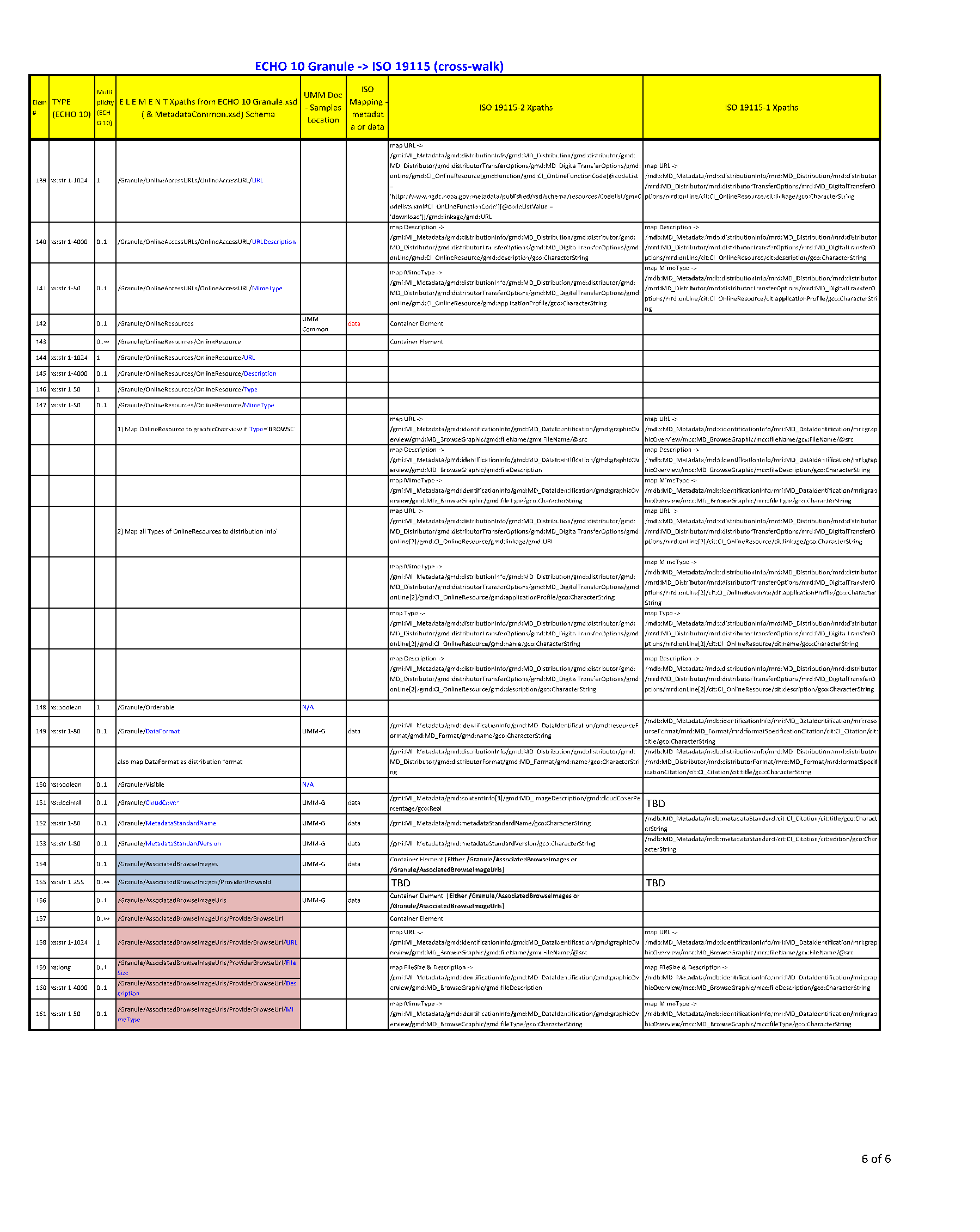
**APPENDIX C-8 NASA ESDIS Granule profile of ISO 19115 Compatible with ECHO 10 Granule Information Content (Cross-walk)**

Table below presents a cross-walk of ECHO 10 Granule elements to corresponding ISO 19115 elements. 









**APPENDIX C-9 Abbreviations and Acronyms**

|  |  |
| --- | --- |
| ACL | Access Control List |
| CMR | Common Metadata Repository |
| DAAC | Distributed Active Archive Center |
| DOI | Digital Object Identifier |
| ECHO | Earth Observing System (EOS) Clearing House |
| EOS | Earth Observing System |
| EOSDIS | Earth Observing System Data and Information System |
| ESDIS | Earth Science Data and Information System |
| ISO | International Organization for Standardization |
| KMS | Keyword Management System |
| MAS | Metadata Architecture Studies |
| MENDS | Metadata Evolution for NASA Data Systems |
| NASA | National Aeronautics and Space Administration |
| NOAA | National Oceanic and Atmospheric Administration |
| UML | Unified Modeling Language |
| UMM | Unified Metadata Model |
| UMM–C | Unified Metadata Model – Collections |
| UMM–G | Unified Metadata Model – Granules |
| UMM–M | Unified Metadata Model – Metadata |
| UMM–S | Unified Metadata Model – Services |
| UMM–V | Unified Metadata Model – Visualization |
| UMM–Var | Unified Metadata Model – Variables |
| UMM–Vis | Unified Metadata Model – Visualization |
| URI | Uniform Resource Identifier |
| URL | Uniform Resource Locator |
| URS | User Registration System |
| XML | Extensible Markup Language |
| XPath | XML Path Language |