

CMR Metadata Best Practices: Landing Page

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Introduction

This wiki resource provides best practices documentation for all collection and granule metadata concepts supported by the [Common Metadata Repository \(CMR\)](#). It is intended to support metadata authors as well as provide general guidance to those seeking information about CMR supported metadata.

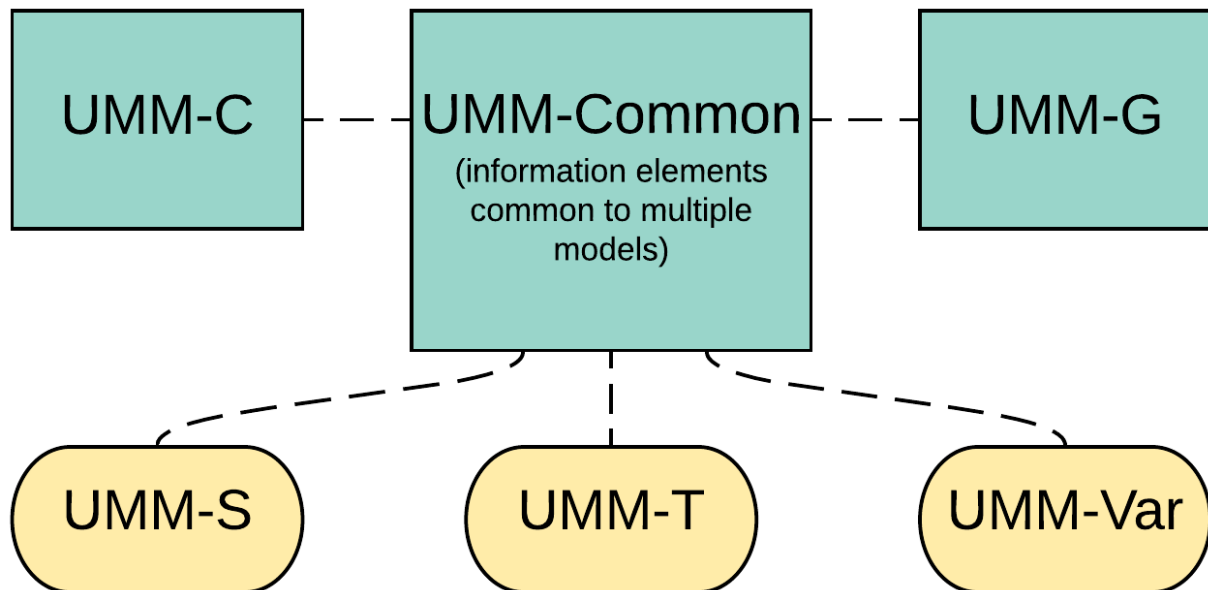
The wiki is organized by metadata concept as specified in the [Unified Metadata Model \(UMM\)](#) and includes information such as: required metadata fields, definitions for each metadata concept, best practices for populating each metadata field, guidance on how to use controlled vocabularies, and the revision history of the UMM metadata schema. Also included are a detailed mapping/crosswalk between each UMM metadata field and the corresponding field in each CMR supported metadata standard. Supported standards currently include [ECHO 10](#), [DIF 10](#), and [ISO 19115-2](#) (in NASA specific MENDS and SMAP "flavors"). [Click here to jump directly to the documentation.](#)

Unified Metadata Model (UMM)

The UMM is used as a bridge to map between each of the CMR-supported metadata standards. A number of different objects require descriptive metadata that is modeled using a corresponding UMM profile. For example, a collection (or dataset level) object is modeled using the [UMM-C \(Collection\)](#) profile, and granule (or file level) objects are modeled using the [UMM-G \(Granule\)](#) profile.

While UMM-C and UMM-G are separate entities, some elements are common to each profile and are therefore modeled using [UMM-Common](#).

Currently, this wiki resource provides documentation for elements found in the UMM-C, UMM-G and UMM-Common models.



Other UMM models not covered here include UMM-S (Services), UMM-T (Tools) and UMM-Var (Variables).

For information regarding UMM-S, please refer to the [CMR Documents](#) page and the [UMM-S Curator's Guide](#).

For information regarding UMM-T, please refer to the [CMR Documents](#) page. Information on how to generate UMM-T records can be found in the [MM T User's Guide](#).

For information regarding UMM-Var, please download the UMM-Var document from the [CMR Documents](#) page. Information on how to generate UMM-Var records can be found in the [MMT User's Guide](#) and the [UMM-Var Generator \(UVG\) User's Guide](#).

Wiki Page Structure

Each wiki page is structured as follows:

Element Description

- Provides a high-level definition of the metadata concept

Best Practices

- Provides best practices for the metadata concept as well as example values

Element Specification

- A table detailing each unique metadata element within the concept. For each metadata element, the table specifies:
 - The UMM model it is from (UMM-Common, C, or G)
 - The element name exactly as it appears in the UMM schema
 - The element type (string, decimal, enumeration, boolean, etc.)
 - Constraints (e.g. character length restrictions, controlled vocabularies, etc.)
 - The cardinality, which specifies how many times the element may be repeated
 - Notes: Any additional information which may be useful about the element

Metadata Validation and QA/QC

- There are various systems in place to ensure a certain standard of metadata quality is maintained in the CMR. The Metadata Validation and QA/QC section of the wiki page provides documentation regarding these efforts and systems:
 - **GCMD Metadata QA/QC:** The GCMD team is responsible for the stewardship of metadata records in the CMR provided by any of CMR's [International Directory Network \(IDN\)](#) partners. This section details both the automated and manual checks the GCMD team performs on the IDN records to help maintain a certain standard of quality.
 - **CMR Validation:** The CMR system itself has certain requirements. This section details any baseline CMR requirements for the metadata concept.
 - **ARC Metadata QA/QC:** The [ARC team](#) is responsible for performing quality assessments of NASA metadata records in the CMR. This section specifies what the ARC team looks for (both manually and in an automated fashion) to ensure NASA's metadata records in the CMR maintain a certain standard of quality.

Dialect Mappings

- The Dialect Mapping section provides detailed element-element mappings between the UMM and each CMR supported metadata standard. Current CMR supported metadata standards for collection-level metadata include:
 - UMM-JSON (UMM-C/Common)
 - DIF 10
 - ECHO 10
 - ISO 19115-2 MENDS
 - ISO 19115-2 SMAP
- CMR supported metadata standards for granule-level metadata include:
 - UMM-JSON (UMM-G)
 - ECHO 10
 - ISO 19115-2 MENDS
 - ISO 19115-2 SMAP
- Provided for each supported standard:
 - An element specification table that includes the direct crosswalk between the UMM element path and the corresponding element path in the supported standard. This table will also indicate if an element in a supported standard does not map to the UMM, or if there are any caveats in the manner that the information gets translated.
 - An enumeration mapping table (if applicable) - sometimes there are differences in enumeration values used in a supported standard versus the UMM. These differences are identified in the enumeration mapping table.
 - An example mapping showing how a snippet of metadata in the supported standard will appear in the UMM format. This may illustrate examples of how certain information can get dropped or only partially translated between the supported standard and the UMM.

UMM Migration

- If a metadata concept undergoes significant changes between UMM version updates, this section will illustrate how the information provided in the older UMM version gets translated to the newer version

History

- Provides a version history for the metadata element

Documentation Directory

There is a separate wiki page for each high-level metadata concept in the UMM. Click on the expandable tables below to view a listing of available metadata concepts and access the documentation for each concept:

Element	UMM Model	Definition	Required
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Abstract	UMM-C	This element provides a brief description of the dataset the metadata represents.	Yes
Access Constraints	UMM-C	This element describes any restrictions imposed on data access. Access Constraints can be described in a free text field with the option to provide an access control list (ACL) value.	No
Archive and Distribution Information	UMM-C	This element and all of its sub-elements allow a data provider to provide archive and distribution file information upfront to an end user to help them decide if they can use the product. The file information includes AverageFileSize - typically used for granules as well as file formats and other file information.	No
Direct Distribution Information	UMM-C	The direct distribution information main element allows data providers to provide users information on getting direct access to data products that are stored in the Amazon Web Service (AWS) S3 buckets when they are initially looking at a collection. The end users get information such as the S3 credentials end point, a credential documentation URL, as well as bucket prefix names, and an AWS region.	No
Collection Citation	UMM-C	This element provides the information required to properly cite the collection in professional scientific literature.	No
Collection Data Type	UMM-C	This element is used to identify the collection as a Science Quality Collection or as a non-science-quality collection such as a Near Real Time collection.	No
Collection Progress	UMM-C	This element describes the production status of the dataset.	Yes
Contact Group	UMM-Common	This element is used to provide contact information for a group associated with the dataset.	No
Contact Person	UMM-Common	This element is used to provide contact information for an individual associated with the dataset.	No
Data Center - Data Center - Contact Group - Data Center - Contact Person	UMM-Common	This element is used to identify and provide contact information for the organization responsible for originating, processing, archiving, and/or distributing the dataset being described in the metadata.	Yes
Data Dates	UMM-C	This element is used to identify dates when the <i>data</i> or <i>resource itself</i> changed in some way.	No
Data Language	UMM-C	This element describes the language used in the preparation, storage, and description of the collection. It is the language of the collection data itself. It does not refer to the language used in the metadata record (although this may be the same language)	No
DOI	UMM-C	This element stores the DOI (Digital Object Identifier) that identifies the dataset.	Yes, if applicable
Associated DOIs	UMM-C	This element stores the DOIs (Digital Object Identifier) for associated collections or other associated items.	No
Entry Title	UMM-C	This element describes the title of the dataset described by the metadata.	Yes
Maturity	UMM-C	This element describes the collection life cycle. There are four valid values: Beta refers to collections that intend to enable users to gain familiarity with the collections parameters and data formats. Provisional collections allow users to find the data and process studies where the product doesn't need rigorous validation or top quality. Validated products are high quality data that have been fully validated. Deprecated products have been retired but are still discoverable for historical purposes.	No
Metadata Association	UMM-C	This element is used to identify other metadata resources that are dependent on or related to the data described by the metadata.	No
Processing Level	UMM-C	This element describes an identifier indicating the level at which the data in the collection are processed, ranging from level 0 (raw instrument data at full resolution) to level 4 (model output or analysis results).	Yes
Publication Reference	UMM-C	This element describes key bibliographic citations pertaining to the collection.	No
Purpose	UMM-C	This element contains suggested usage for the data and/or a description of why the resource exists.	No
Quality	UMM-C	This element describes the quality of the dataset.	No
Short Name	UMM-C	This element describes the dataset short name.	Yes
Use Constraints	UMM-C	This element defines how data may or may not be used to assure the protection of privacy or intellectual property. This includes license information as well as any special restrictions, legal prerequisites, terms and conditions, and/or limitations on using the dataset.	No
Version	UMM-C	This element describes the dataset version.	Yes

Version Description	UMM-C	This element describes the version of the dataset.	No
Element	UMM Model	Definition	Required?
Paleo Temporal Coverage	UMM-C	This element defines the time period for geologic and/or paleoclimate data. The element is predominantly used for data samples that originated prior to 01-01-0001.	No
Temporal Extent	UMM-Common	This element describes when data were acquired or collected.	Yes
Temporal Keywords	UMM-C	This element specifies a word or phrase which serves to summarize the temporal characteristics of a dataset.	No
Element	UMM Model	Definition	Required?
Location Keywords	UMM-C	This element contains keywords that characterize the study area/region where data was collected.	No
Spatial Extent	UMM-Common	This element describes the geographic coverage of the data.	Yes
Spatial Information	UMM-C	This element stores information about the reference frame from which horizontal and vertical spatial domains are measured. The horizontal reference frame includes fields for Geodetic Model, Geographic Coordinates, and Local Coordinates. The Vertical reference frame includes fields for altitudes (elevations) and depths.	No
Tiling Identification System	UMM-Common	This element defines a named two-dimensional tiling system related to the collection.	No
Element	UMM Model	Definition	Required?
Platform	UMM-Common	This element describes the relevant platforms used to acquire the data.	Yes
Instrument	UMM-Common	This element is used to register the device that measured or recorded the data, including direct human observation.	No
Project	UMM-Common	This element describes the scientific endeavor(s) with which the collection is associated.	No
Element	UMM Model	Definition	Required?
Related URL • Related URLs (GET DATA) • Related URLs (USE SERVICE API)	UMM-Common	This element describes any resource-related URLs that include project home pages, resource information pages, services, related data, archives/servers, metadata extensions, direct links to online software packages, web mapping services, links to images, documents, or other data.	Yes
Online Resource		• no wiki page for this concept	
Element	UMM Model	Definition	Required?
Additional Attributes	UMM-C	This element stores the data's distinctive attributes (i.e. attributes used to describe the unique characteristics of the resource which extend beyond those defined in this mapping).	No
Ancillary Keywords	UMM-C	This element allows metadata authors to provide words or phrases beyond the controlled Science Keyword vocabulary to further describe the collection.	No
ISO Topic Category	UMM-C	This element identifies the topic category (or categories) from the EN ISO 19115 Topic Category Code List that pertain to a collection.	No
Science Keywords	UMM-C	This element enables the specification of Earth Science keywords.	Yes
Element	UMM Model	Definition	Required?
Directory Names	UMM-C	This element has been used historically by the GCMD internally to identify association, responsibility and/or ownership of the dataset, service, or supplemental information. Note: This field only occurs in the DIF. When a DIF record is retrieved in the ECHO10 or ISO 19115 formats, this element will not be translated.	No
Metadata Dates	UMM-C	This element is used to identify dates when the <i>metadata</i> changed in some way. This element is made of two sub-elements, Type and Date.	No
Metadata Language	UMM-C	This element specifies the language used in the metadata record (i.e. English, French, Chinese, etc.).	No

Element	UMM Model	Definition	Required?
Archive and Distribution Information for Granules	UMM-G	This element provides information about the files or file packages that make up the granule.	No
Cloud Cover	UMM-G	This element describes a percentage value indicating how much of the area of a granule (the EOSDIS data unit) has been obscured by clouds. It is worth noting that there are many different measures of cloud cover within the EOSDIS data holdings and that the cloud cover parameter that is represented in the archive is dataset-specific.	No
Collection Reference	UMM-G	This element describes the collection metadata record's short name and version or entry title to which this granule metadata record belongs.	Yes
Day Night Flag	UMM-G	This element identifies whether a granule was collected during the day, at night (any time between sunset and sunrise), or both.	No
GranuleUR	UMM-G	This element describes the Universal Reference ID of the granule referred by the data provider. This ID is unique per data provider.	Yes
Grid Mapping Names	UMM-G	Represents the native grid mapping of the granule if the granule is gridded.	No
Identifiers	UMM-G	This element holds various types of granule identifiers.	Yes
Input Granules	UMM-G	This element describes the identification of the input granule(s) for a specific granule.	No
Measured Parameters	UMM-G	This element describes the name of the geophysical parameter expressed in the data as well as associated quality flags and quality statistics. The quality statistics element contains measures of quality for the granule. The parameters used to set these measures are not preset and will be determined by the data producer. Each set of measures can occur many times either for the granule as a whole or for individual parameters. The quality flags contain the science, operational and automatic quality flags that indicate the overall quality assurance levels of specific parameter values within a granule.	No
Metadata Specification	UMM-G	Requires the user to add schema information into every granule record. It includes the schema's name, version, and URL location. The information is controlled through enumerations at the end of this schema.	Yes
Native Projection Names	UMM-G	Represents the native projection of the granule if the granule has a native projection.	No
PGE Version Class	UMM-G	This element describes basic descriptive characteristics related to the Product Generation Executable associated with a granule.	No
Production Date Time	UMM-G	This element provides the exact date and time a granule was produced using the following format: YYYYMMDDTHH:MM:SS (time is in UTC).	Yes
Provider Dates	UMM-G	This element describes the dates related to activities involving the granule and the data provider database with the exception of Delete. For Create, Update, and Insert, the date is the date that the granule file is created, updated, or inserted into the provider database by the provider. Delete is the date that the CMR should delete the granule metadata record from its repository.	Yes
Related URLs (Granules)	UMM-G	*Will probably combine with existing Related URLs UMM-Common page	Yes
Reprocessing Actual	UMM-G	This element provides what, if any, reprocessing has been performed on a granule.	No
Reprocessing Planned	UMM-G	This element provides what, if any, reprocessing may be performed on a granule.	No
Spatial Extent - Granule Localities - Track	UMM-G	This element contains attributes that describe the horizontal (geographical) and/or vertical region over which the data was acquired. Spatial Extent includes any or all of Granule Localities, Horizontal Spatial Domain, and Vertical Spatial Domain.	No

OR

[Click here](#) to see a list of all Collection level (UMM-C) metadata elements and corresponding documentation.

[Click here](#) to see list of all Granule level (UMM-G) metadata elements and corresponding documentation.

Additionally, there are some metadata concepts in CMR supported metadata standards that are not included in the UMM. Please [refer to this wiki page](#) for a list of ECHO 10 and DIF 10 metadata elements that do not translate to the UMM.

Additional Resources

Below are additional resources regarding the UMM and the CMR:

Unified Metadata Model:

- [Background and Introduction](#)
- [ESO UMM and CMR Information](#)
- [UMM/CMR Schema Documentation](#)

Miscellaneous CMR Resources:

- [CMR Introduction](#)
- [Data Product Development Guide for Data Producers](#)
- [Earthdata Search Portal](#)
- [Global Change Master Directory \(GCMD\)](#)
- [CMR API Search Introduction](#)
- [CMR API Documentation](#)
- [Analysis and Review of CMR \(ARC\) Introduction](#)