

**North American Profile of  
ISO19115:2003 - Geographic information - Metadata**

(NAP – Metadata, version 1.0.1)

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## 1. Introduction

Geographic information has been captured and used for more than three decades in different disciplines: natural resources, transportation, disaster, security, economy, land management, etc. Many organizations have contributed to this immense collection of geographic information that is more and more available on the Internet through Web services. Geographic metadata provides a mechanism for organizations producing geographic information to describe datasets in detail. Users at different levels can now have access to this geographic metadata, to help better understand the assumptions and limitations of geographic information and to facilitate the search for proper information to fit their needs.

Standards for geographic metadata provide a common framework for the documentation of geographic information in terms of terminology, definition, and structure. In 1995, the Canadian General Standard Board has published the *Directory Information Describing Geo-referenced Datasets* which introduced a form standardizing the metadata content for the description of geographic datasets. In 1998, the Federal Geospatial Data Committee introduced the *Content Standards for Digital Geospatial Metadata* which specifies a set of metadata element and its structure for the representation of geographic datasets. More recently, *ISO19115:2003 Geographic information – Metadata*, an international standard that sets the basis for the description of geographic data, has been released. This international standard provides a common framework for producing and exchanging geographic metadata between nations.

In this context, the United States of America and Canada have agreed to revise their respective metadata standards and develop a common profile of *ISO19115:2003 Geographic information – Metadata* which will enhance interoperability of geographic information metadata in North America.

Major uses of geographic metadata are:

- to maintain an organization's internal inventory of geographic information;
- to help the organisation and management of geographic information metadata;
- to provide information about an organization's geographic data holdings to geographic data catalogues, clearinghouses, and brokerages, geographic information discovery portal; and
- to provide information needed to process and interpret data to be received through a transfer from an external source.

The information included in the standard support the following use:

- discovery – data needed to identify and locate the sets of geographic data that exist for a geographic location;
- access – data needed to acquire an identified set of geographic data;
- fitness for use – data needed to determine if a set of geographic data meets the user's need and to support the user in applying the geographic information appropriately; and
- transfer – data needed to get a copy of a set of geographic data.

The North American Profile of *ISO19115:2003 Geographic information – Metadata* is organized as follow:

- a) statement of the scope (clause 2);
- b) identification of normative references (clause 3);
- c) terms and definitions (clause 4);
- d) symbols and abbreviated terms (clause 5);
- e) content of the profile (clause 6);
- f) cultural and linguistic adaptability (clause 7);
- g) code lists and metadata register (clause 8 and 9).

## 2. Scope

This profile is based on *ISO19115:2003 Geographic information – Metadata* and *ISO19106:2004 Geographic information – Profiles*. It also includes service metadata from *ISO19119:2005 Geographic information – Services* and *ISO19119:2005/PDAM 1 Geographic information – Services* and implementation perspectives from *ISO/TS19139:2007 Geographic information – Metadata – XML schema implementation*. It is intended to identify the geospatial metadata that are needed for North America to describe of geospatial data, including dataset and dataset series, and related Web services. It satisfies conformance class 1 since it defines a pure subset of *ISO19115:2003 Geographic information – Metadata*. It supports interoperability of geospatial information as it provides a common framework for the description and representation of metadata. In addition, this profile provides a mechanism to support cultural and linguistic adaptability by enabling representation of free text in multiple languages and by introducing a metadata register describing metadata in multiple languages (i.e. English and French) compliant to *ISO19135:2005 Geographic information – Procedures for item registration*.

Note: Parts of *ISO19110:2005 Geographic information – Methodology for feature cataloguing* and *ISO/DIS19111 rev. Geographic information – Spatial referencing by coordinates* are covered as needed.

### **3. Normative References**

- ISO639-2, Codes for the representation of names of languages - Part 2: alpha-3 code
- ISO3166-1, Codes for the representation of names of countries and their subdivisions - Part 1: Country codes
- ISO/TS19103:2005, Geographic information - Conceptual schema language
- ISO19106:2004, Geographic Information – Profiles
- ISO/DIS19111 rev., Geographic information – Spatial referencing by coordinates
- ISO19115:2003, Geographic information – Metadata
- ISO19115:2003, Geographic information – Metadata, Technical corrigendum 1
- ISO19118:2005, Geographic information – Encoding
- ISO19119:2005, Geographic information – Services
- ISO19119:2005 PDAM 1, Geographic information – Services
- ISO/TS19127:2005 Geographic information – Geodetic codes and parameters
- ISO19135:2005, Geographic information – Procedures for item registration
- ISO/DIS19136, Geographic information – Geography markup language
- ISO/TS19139:2007, Geographic information – Metadata - XML schema implementation
- OGC 05-008, OpenGIS® Web Services Common Specification

## **4. Terms and Definitions**

For the purposes of this document, the following terms and definitions apply.

### **4.1. application profile**

identification of clauses, classes, subsets, options and parameters from base standards that are necessary for accomplishing a particular function

### **4.2. client**

software component that can invoke an operation from a server

### **4.3. dataset**

identifiable collection of data [ISO19115]

### **4.4. dataset series**

collection of datasets sharing the same product specification [ISO19115]

### **4.5. geographic dataset**

dataset with features depicted geometrically

### **4.6. geographic information**

information concerning phenomena implicitly or explicitly associated with a location relative to the Earth [ISO19101]

### **4.7. identifier**

linguistically independent sequence of characters capable of uniquely and permanently identifying that with which it is associated [ISO19135]

### **4.8. metadata entity**

set of metadata elements describing the same aspect of data [ISO19115]

### **4.9. metadata schema**

conceptual schema describing metadata [ISO19101]

### **4.10. metadata section**

subset of metadata that defines a collection of related **metadata entities** and elements [ISO19115]

#### **4.11. operation**

specification of a transformation or query that an object may be called to execute [ISO19119]

#### **4.12. parameter**

variable use to express a value in an operation **request** or **response**

#### **4.13. request**

invocation of an operation by a **client** [ISO19128]

#### **4.14. response**

result of an operation returned from a server to a **client** [ISO19132]

#### **4.15. schema**

formal description of a model [ISO19101]

#### **4.16. server**

a particular instance of a **service** [ISO19128]

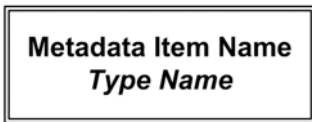
#### **4.17. service**

distinct part of the functionality that is provided by an entity through **interfaces** [ISO19119]

## 5. Notation, Symbols and Abbreviated Terms

### 5.1. Notation

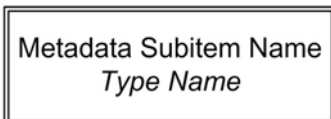
The following notation is used in the diagrams of this profile:



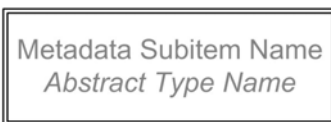
An instantiable metadata item class and its type.



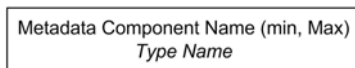
A non-instantiable metadata item class and its abstract type.



An instantiable metadata sub item class and its type. A metadata sub item class is a specialization of its parent metadata item class.



A non-instantiable metadata sub item class and its abstract type. A metadata sub item class is a specialization of its parent metadata item class.

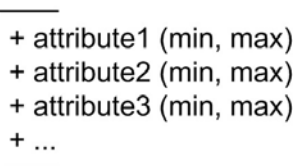


An instantiable metadata component class, its multiplicity, and its type. A metadata component class is a component of a metadata item or sub item class. It can specialize a non-instantiable metadata component class.

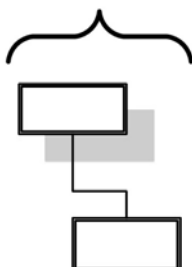


A non-instantiable metadata component class, its multiplicity, and its type. A metadata component class is a component of a metadata item or sub item class. It is usually specialized by an instantiable metadata component class.

**ATTRIBUTES**



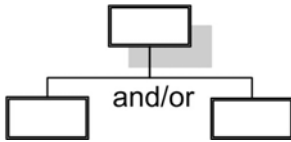
List of attributes of a metadata item class, metadata sub item class, or metadata component class. It includes the multiplicity of each attribute.



Inclusion of metadata components.

A metadata item class and metadata sub item class inheritance relationship.





An **and/or** operator specifying that either one or a combination of sub elements can be used.

Multiplicity of a metadata component class or attribute. It specifies the minimum and maximum number of occurrences that can be used:

(min, max)

- (O) Optional, maximum 1
- (M) Mandatory, maximum 1
- (C) Conditional, maximum 1
- (O, \*) Optional, Repeatable
- (M, \*) Mandatory, Repeatable
- (C, \*) Conditional, Repeatable

## 5.2. Symbols and Abbreviated Terms

BP	Best Practise
DC	Dublin Core
DCMI	Dublin Core Metadata Initiative
FGDC	Federal Geographic Data Committee
GML	Geospatial Markup Language
HTTP	HyperText Transport Protocol
ISO	International Organization for Standardization
NAP – Metadata	North American Profile of ISO19115:2003 Geographic information – Metadata
OGC	OpenGIS Consortium
UML	Unified Modeling Language
UTF-8	Unicode Transformation Format-8
XML	Extensible Markup Language
XSD	XML Schema Definition
XSL	Extensible Style Language
XSLT	XSL Transformation

## **6. Metadata Content**

### **6.1. Introduction**

This clause presents the content of NAP – Metadata. It begins with the description of the metadata entity set information, which is the root of metadata description, and is followed by the various components (or classes) that are included in it.

All metadata items that are listed in this clause are also specified in the NAP – Metadata register introduced in clause 9, in the various languages supported by the register. Code lists and their values that are referred in this clause are not detailed in this document but are also included and defined in the NAP – Metadata register.

## 6.2. Metadata Entity Set Information

### 6.2.1. Introduction

The following attributes and components provide information about metadata entity set information.

Type: MD\_Metadata

Description: Attributes which describe the metadata and the components to describe the resource.

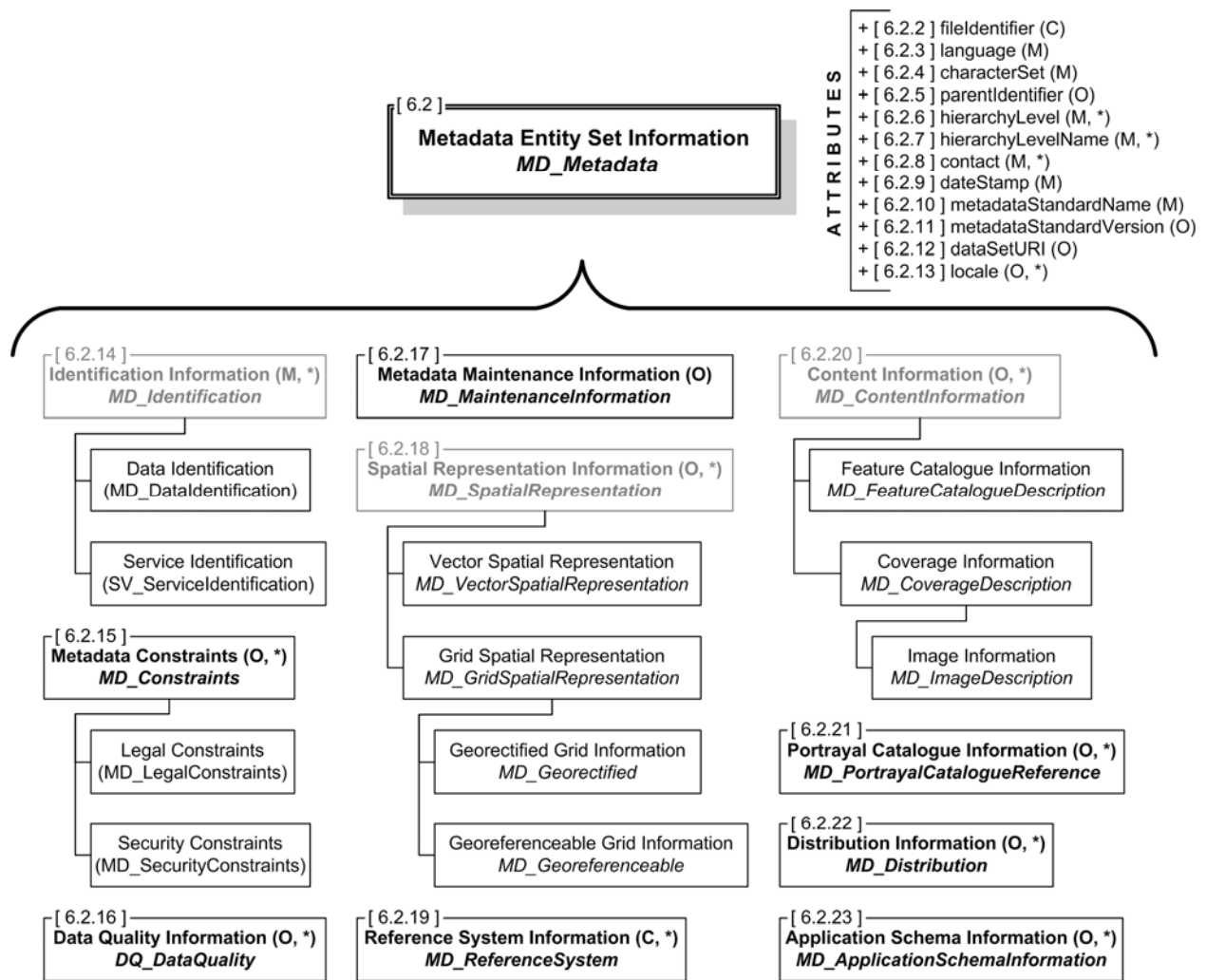


Figure 1: Metadata entity set information

### 6.2.2. fileIdentifier (C)

Type: free text

Description: A unique phrase or string which uniquely identifies the metadata file.

BP: Each metadata file should have a unique fileIdentifier. If the metadata filename is not the fileIdentifier then fileIdentifier is mandatory. If the metadata is generated from a database application then the fileIdentifier is mandatory to link the metadata to the database.

### 6.2.3. language (M)

Type: CodeList napMD\_LanguageCountryCode

Description: Language of the metadata composed of an ISO639-2/T three letter language code and an ISO3166-1 three letter country code.

BP: The language code and country code are documented in the following manner:

<ISO639-2/T three letter language code><;><blank space><ISO3166-1 three letter country code>

e.g. FRA; CAN

This attribute constitutes the primary language of free text attributes. When more than one language is used in the metadata, then the attribute *locale* (see 6.2.13) is mandatory.

Select *language* from napMD\_LanguageCountryCode.

### 6.2.4. characterSet (M)

Type: Default value “UTF8”

Description: Character coding standard in the metadata.

### 6.2.5. parentIdentifier (O)

Type: free text

Description: The unique name of the file related in higher hierarchy to the file.

### 6.2.6. heirarchyLevel (M,Repeatable)

Type: CodeList napMD\_ScopeCode

Description: Dataset level to which the metadata applies.

BP: Default repeatability is 1. If hierarchy is unknown then default value is “dataset.”

Select *heirarchyLevel* from napMD\_ScopeCode.

**6.2.7. heirarchyLevelName (M)**

Type: free text

Description: Name of the heirarchy levels for which the metadata is provided.

**6.2.8. contact (M,Repeatable)**

Type: CI\_ ResponsibleParty (see 6.15)

Description: The responsible party for the metadata content.

BP: The organization directly responsible for metadata maintenance. Contact information (see 6.15.5 contactInfo) shall be provided.

**6.2.9. dateStamp (M)**

Type: Date (see Annex A – A.4)

Description: Metadata creation date.

BP: Date of metadata creation or the last metadata update.

**6.2.10. metadataStandardName (M)**

Type: free text

Description: Name of the metadata standard/profile used.

BP: Default value to “NAP – Metadata.”

**6.2.11. metadataStandardVersion (M)**

Type: free text

Description: Version of the metadata standard/profile used.

BP: Default value NAP – Metadata version used.

**6.2.12. dataSetURI (O)**

Type: free text

Description: Uniform Resource Identifier for the dataset.

### **6.2.13. locale (C,Repeatable)**

Type: PT\_Locale (see 7.2)

Description: Other languages used in metadata free text description.

BP: Mandatory when more than one language is used in free text descriptions. See CodeList napMD\_LanguageCountryCode included in the NAP – Metadata register for a short list of language and country codes. The character encoding shall be set to the default value “UTF8.”

Note: The above items 6.2.2 – 6.2.13 constitute the content used to describe the metadata. The following content describe the resource. Items 6.2.14 – 6.2.1.23 are presented here briefly and later fully described beginning in 6.3.

### **6.2.14. Identification Information (M,Repeatable)**

Type: MD\_DataIdentification (see 6.3.2) and/or SV\_ServiceIdentification (see 6.3.3)

Description: Basic information about the dataset.

BP: MD\_Identification is an abstract class; identification information can only be instantiated via MD\_DataIdentification and/or SV\_ServiceIdentification.

### **6.2.15. Metadata Constraint Information (O,Repeatable)**

Type: MD\_Constraints (see 6.4.2) and/or MD\_LegalConstraints (see 6.4.4) and/or MD\_SecurityConstraints (see 6.4.4).

Description: Describes the use, legal, and security constraints on the use of the dataset.

### **6.2.16. Data Quality Information (O,Repeatable)**

Type: DQ\_DataQuality (see 6.5)

Description: Data quality information for the resource.

### **6.2.17. Metadata Maintenance Information (O)**

Type: MD\_MaintenanceInformation (see 6.6)

Description: Information about dataset update.

### **6.2.18. Spatial Representation Information (O,Repeatable)**

Type: MD\_GridSpatialRepresentation (see 6.7.2) and/or MD\_VectorSpatialRepresentation (see 6.7.3) and/or MD\_Georectified (see 6.7.4) and/or MD\_Georeferenceable (see 6.7.5)

Description: Representation of digital vector and/or grid objects in the dataset.

BP: MD\_SpatialRepresentation is an abstract class; spatial representation information can be instantiated only via MD\_VectorSpatialRepresentation and/or MD\_GridSpatialRepresentation and/or MD\_Georectified and/or MD\_Georeferenceable

### **6.2.19. Reference System Information (C,Repeatable)**

Type: MD\_ReferenceSystem (see 6.8)

Description: Description of the spatial and/or temporal reference systems used in the dataset.

BP: Conditional, if *spatialRepresentationType* in MD\_DataIdentification is “vector”, “raster” or “tin.”

### **6.2.20. Content Information (O,Repeatable)**

Type: MD\_FeatureCatalogueDescription (see 6.9.2) and/or {MD\_CoverageDescription (see 6.9.3) or MD\_ImageDescription (see 6.9.4)}

Description: The information about the feature catalogue and describes the coverage and image data characteristics.

BP: MD\_ContentInformation is an abstract class; content information can only be instantiated via MD\_FeatureCatalogueDescription and/or MD\_CoverageDescription or MD\_ImageDescription.

### **6.2.21. Portrayal Catalogue Information (O,Repeatable)**

Type: MD\_PortrayalCatalogueReference (see 6.10)

Description: Information about acquiring the dataset.

### **6.2.22. Distribution Information (O,Repeatable)**

Type: MD\_Distribution (see 6.11)

Description: Information about acquiring the dataset.

### **6.2.23. Application Schema Information (O,Repeatable)**

Type: MD\_ApplicationSchemaInformation (see 6.12)

Description: Information about the conceptual schema of the dataset.

### 6.3. Identification Information

#### 6.3.1. Introduction

Identification information is reported through data identification and/or service identification. As such, geographic information could be identified either via data identification, service identification, or both depending on the method to make the resource available.

#### 6.3.2. Data Identification

Type: MD\_DataIdentification

Description: Information which describes a dataset.

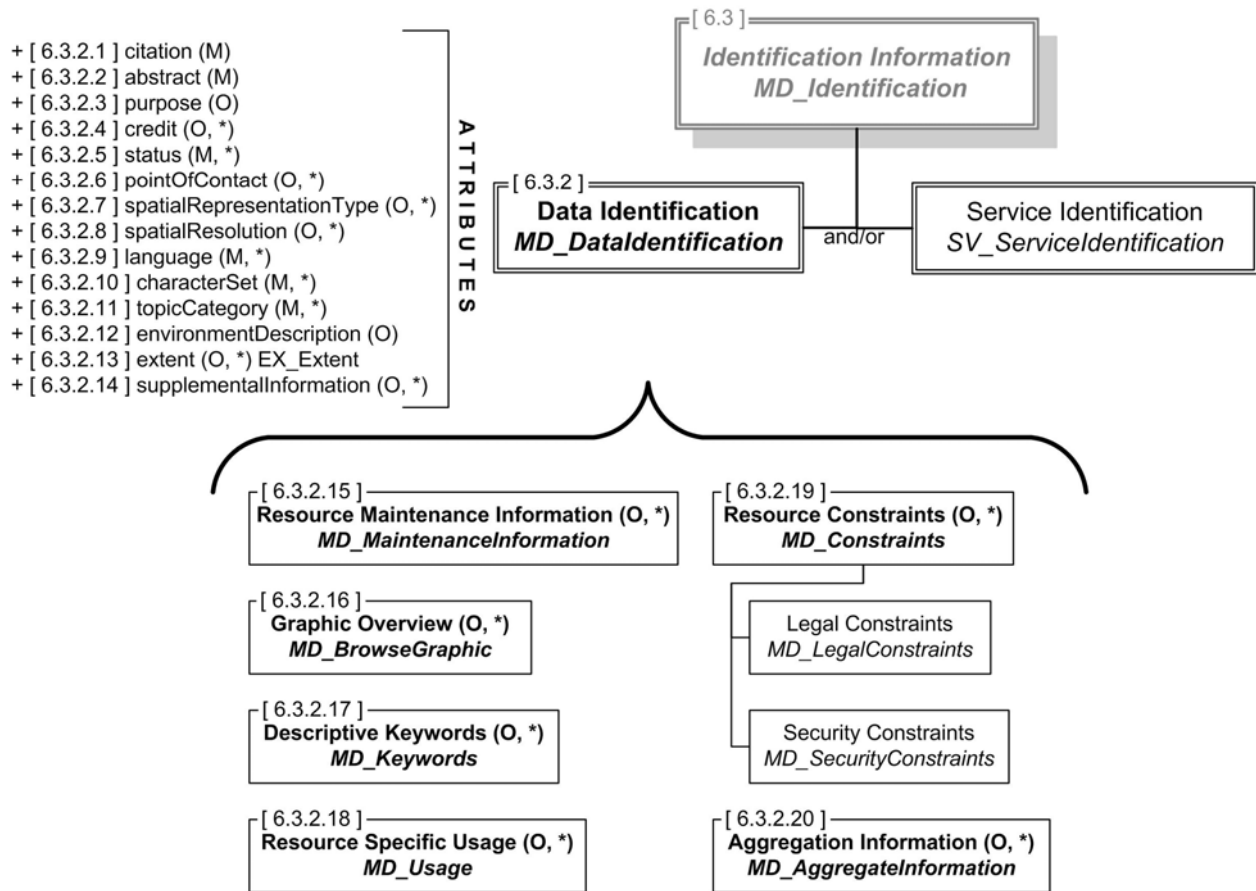


Figure 2: Data identification



#### **6.3.2.1. citation (M)**

Type: CI\_Citation (see 6.14)

Description: Citation for the dataset.

BP: The attribute *citedResponsibleParty* in CI\_Citation shall be reported at least once.

Contact information (see 6.15.5 contactInfo) for the cited responsible party shall also be provided.

The date of the resource reported in the citation (i.e. citation date, see 6.14.4) corresponds to the resource's last update version according to its update frequency (see 6.6.2) and the date of next update (see 6.6.3) of its previous version.

#### **6.3.2.2. abstract (M)**

Type: free text

Description: Brief narrative summary of the dataset's contents.

BP: Abstract narrative should include information on general content and features; dataset application: GIS, CAD, image, Dbase; geographic coverage: county/city name; time period of content: begin and end date or single date; and special data characteristics or limitations.

#### **6.3.2.3. purpose (O)**

Type: free text

Description: Summary of the intensions for which the dataset was developed.

BP: Purpose includes objectives for creating the dataset and what the dataset is to support.

#### **6.3.2.4. credit (O,Repeatable)**

Type: free text

Description: Recognition of those who contributed to the dataset.

#### **6.3.2.5. status (M,Repeatable)**

Type: CodeList napMD\_ProgressCode

Description: The development phase of the dataset.

BP: Select *status* from napMD\_ProgressCode.

#### **6.3.2.6. pointOfContact (O,Repeatable)**

Type: CI\_ResponsibleParty (see 6.15)

Description: Identification and means to contact people/organizations associated with the dataset.

BP: Contacts other than those cited under *citation* (6.3.2.1). Contact information (see 6.15.5 contactInfo) shall be provided.

**6.3.2.7. spatialRepresentationType (O,Repeatable)**

Type: CodeList napMD\_SpatialRepresentationTypeCode

Description: Object(s) used to represent the geographic information.

BP: Select *spatialRepresentationType* from napMD\_SpatialRepresentationTypeCode.

**6.3.2.8. spatialResolution (O,Repeatable)**

Type: MD\_Resolution (see 6.3.4)

Description: Data density in the dataset.

**6.3.2.9. language (M,Repeatable)**

Type: CodeList napMD\_LanguageCountryCode

Description: Languages of the dataset using standard ISO three letter codes.

BP: Three letter language code followed by an optional three letter country code:

<ISO639-2/T three letter language code> {<;><blank space><ISO3166-1 three letter country code>}

e.g.ENG

FRA; CAN

This attribute constitutes the default languages of the dataset.

Select *language* from napMD\_LanguageCountryCode.

**6.3.2.10. characterSet (M,Repeatable)**

Type: Default value “UTF8”

Description: Character coding standard in the dataset.

**6.3.2.11. topicCategory (M,Repeatable)**

Type: CodeList napMD\_TopicCategoryCode

Description: The main theme(s) of the dataset.

BP: Select *topicCategory* from napMD\_TopicCategoryCode.

**6.3.2.12. environmentDescription (O)**

Type: free text

Description: Describes the dataset’s processing environment. Includes information such as software, computer operating system, filename, and dataset size.

**6.3.2.13. extent (O,Repeatable)**

Type: EX\_Extent (see 6.13)

Description: Describes the spatial, horizontal and/or vertical, and the temporal coverage in the resource.

**6.3.2.14. supplementalInformation (O)**

Type: free text

Description: Other descriptive information about the dataset.

**6.3.2.15. Resource Maintenance Information (O,Repeatable)**

Type: MD\_MaintanceInformation (see 6.6)

Description: Describes the frequency, scope, and responsible party for updating the dataset.

**6.3.2.16. Graphic Overview**

Type: MD\_BrowseGraphic (see 6.3.6)

Description: The name of, description of, and file type of an illustration of the dataset.

**6.3.2.17. Descriptive Keywords (O,Repeatable)**

Type: MD\_Keywords (see 6.3.7)

Description: Commonly used words or phrases which describe the dataset. Optionally, the keyword type and a citation for the authoritative or registered resource of the keywords are also provided.

**6.3.2.18. Resource Specific Usage (O,Repeatable)**

Type: MD\_Usage (see 6.3.8)

Description: Brief description of the current use of the dataset.

BP: MD\_Usage describes a unique usage only. For the description of multiple usages, use as much instances as needed. This metadata component describes the first time use of the dataset only.

**6.3.2.19. Resource Constraints (O,Repeatable)**

Type: MD\_Constraints (see 6.4.2) and/or MD\_LegalConstraints (see 6.4.3) and/or MD\_SecurityConstraints (see 6.4.4)

Description: The limitations or constrains on the use of or access to the resource.

**6.3.2.20. Aggregation Information (O,Repeatable)**

Type: MD\_AggregateInformation (see 6.3.9)

Description: The citation for the aggregate dataset or the name of the aggregate dataset, the type of aggregate dataset, and optionally the activity which produced the dataset.

BP: Either the attribute *aggregateDataSetName* or *aggregateDataSetName* shall be reported.

### 6.3.3. Service Identification

Type: SV\_ServiceIdentification

Description: Service metadata describes the operation and address of an electronic geographic information delivery system.

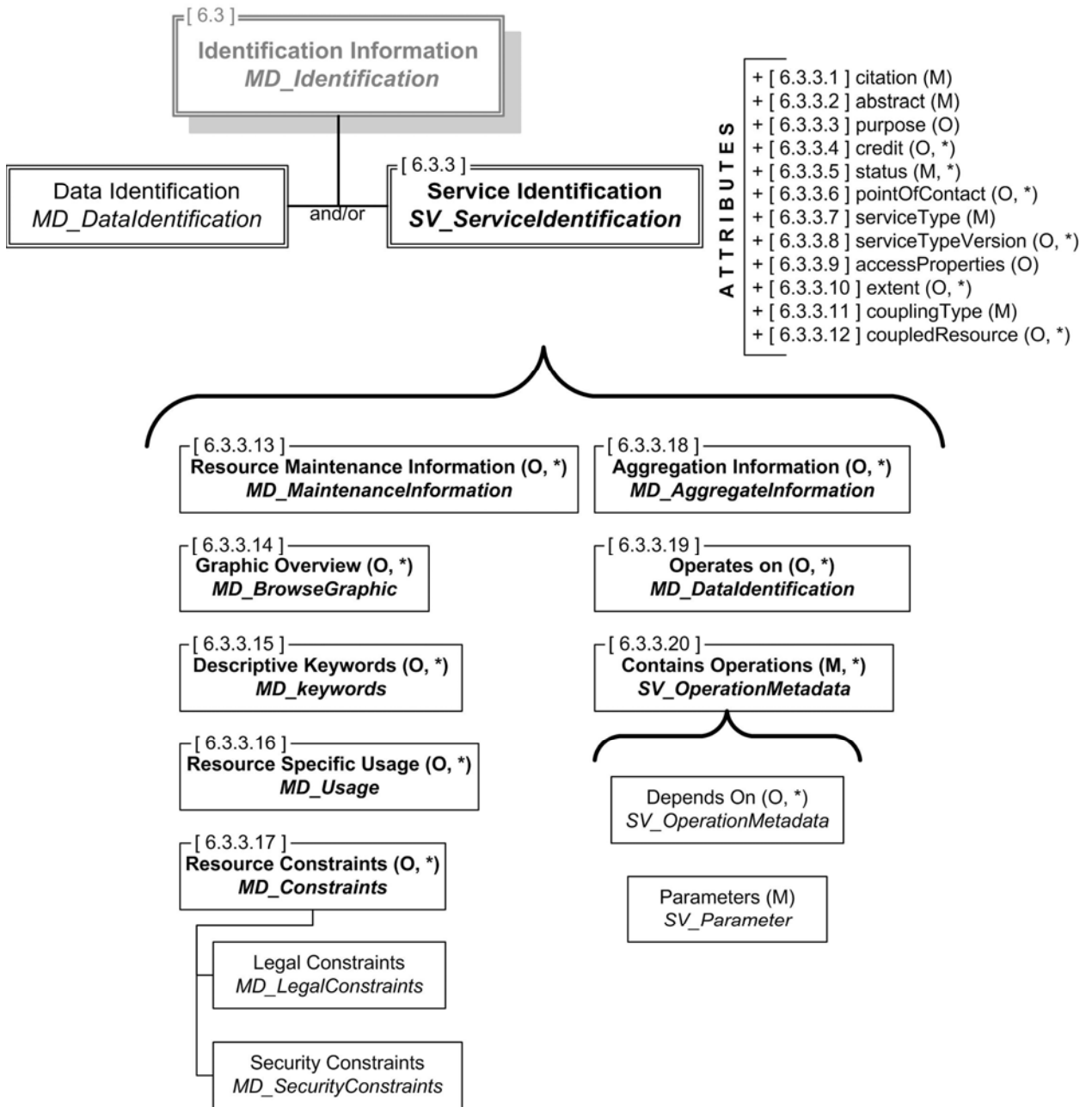


Figure 3: Service identification

#### **6.3.3.1. citation (M)**

Type: CI\_Citation (see 6.14)

Description: Citation for the service.

BP: The attribute *citedResponsibleParty* in CI\_Citation shall be reported at least once. Contact information (see 6.15.5 contactInfo) of the cited responsible party shall be provided.

#### **6.3.3.2. abstract (M)**

Type: free text

Description: Brief narrative summary of the service contents.

BP: Abstract narrative should include information on general content and features; dataset application: GIS, CAD, image, Dbase; geographic coverage: county/city name; time period of content: begin and end date or single date; and special data characteristics or limitations.

#### **6.3.3.3. purpose (O)**

Type: free text

Description: Summary of the intensions for which the service was developed.

BP: Purpose includes objectives for creating the service and what the service supports.

#### **6.3.3.4. credit (O,Repeatable)**

Type: free text

Description: Recognition of those who contributed to the service.

#### **6.3.3.5. status (M,Repeatable)**

Type: CodeList napMD\_ProgressCode

Description: The development phase of the service.

BP: Select *status* from napMD\_ProgressCode.

#### **6.3.3.6. pointOfContact (O,Repeatable)**

Type: CI\_ResponsibleParty (see 6.15)

Description: Identification and means to contact people/organizations associated with the service.

BP: Contacts other than those cited under *citation* (6.3.3.1). Contact information (see 6.15.5 contactInfo) shall be provided.

#### **6.3.3.7. serviceType (M)**

Type: GenericName (see Annex A – A.8)

Description: The service type name from a services registry.

BP: The registry namespace may be “OGC” and the service type name may be “Catalogue”.

#### **6.3.3.8. serviceTypeVersion (O,Repeatable)**

Type: free text

Description: The version of the service type.

BP: If the registry namespace is “OGC” and the service type name is “Catalogue” (as provided in 6.3.3.7), then the version can be “1.1”.

#### **6.3.3.9. accessProperties (O)**

Type: MD\_StandardOrderProcess (see 6.11.6)

Description: Information on the availability of the service which includes attributes from Standard Order Process including: fees, available date and time, ordering instructions, turnaround.

#### **6.3.3.10. extent (O,Repeatable)**

Type: EX\_Extent (see 6.13)

Description: Describes the spatial, horizontal and/or vertical coverage and the temporal coverage in the service.

#### **6.3.3.11. couplingType (O)**

Type: CodeList napSV\_CouplingType

Description: Qualitative information on the tightness that the service and the associated data are coupled.

BP: Select *couplingType* from napSV\_CouplingType.

#### **6.3.3.12. coupledResource (O,Repeatable)**

Type: SV\_CoupledResource (see 6.3.10)

Description: Further description of the coupling between the service and the data when they are tightly coupled.

#### **6.3.3.13. Resource Maintenance Information (O,Repeatable)**

Type: MD\_MaintanceInformation (see 6.6)

Description: Describes the frequency, scope, and responsible party for updating the service.

#### **6.3.3.14. Graphic Overview**

Type: MD\_BrowseGraphic (see 6.3.6)

Description: The name of, description of, and file type of an illustration of the service.

#### **6.3.3.15. Descriptive Keywords (O,Repeatable)**

Type: MD\_Keywords (see 6.3.7)

Description: Commonly used words or phrases which describe the service. Optionally, the keyword type and a citation for the authoritative or registered resource of the keywords are also provided.

### 6.3.3.16. Resource Specific Usage (O,Repeatable)

Type: MD\_Usage (see 6.3.8)

Description: Brief description of the current use of the service.

BP: MD\_Usage describes a unique usage only. For the description of multiple usages, use as much instances as needed.

### 6.3.3.17. Resource Constraints (O,Repeatable)

Type: MD\_Constraints (see 6.4.2) and/or MD\_LegalConstraints (see 6.4.3) and/or MD\_SecurityConstraints (see 6.4.4)

Description: The limitations or constraints on the use of or access to the service.

### 6.3.3.18. Aggregation Information (O,Repeatable)

Type: MD\_AggregateInformation (see 6.3.9)

Description: The citation for the aggregate service or the name of the aggregate service, the type of aggregate service, and optionally the activity which produced the service.

### 6.3.3.19. Operates On (O,Repeatable)

Type: MD\_DataIdentification (see 6.3.2)

Description: Information that describes the datasets the service operates on.

### 6.3.3.20. Contains Operations (M,Repeatable)

Type: SV\_OperationMetadata (see 6.3.11)

Description: Operations contained in the service.

Note: The following class description refers to Data Identification and Service Identification items.

## 6.3.4. Spatial Resolution

Type: MD\_Resolution

Description: The level of detail in a dataset expressed as equivalent scale or ground distance.

BP: Either *equivalentScale* or *distance* is provided.

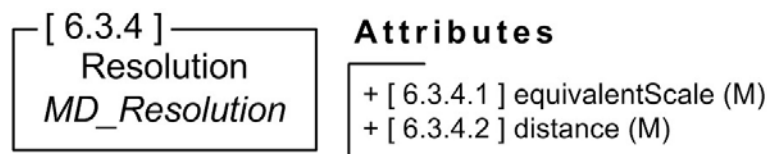


Figure 4: Resolution

**6.3.4.1. equivalentScale (M)**

Type: MD\_RepresentativeFraction (see 6.3.5)

Description: Detail expressed as the scale of a comparable hardcopy map or chart.

**6.3.4.2. distance (M)**

Type: Distance (see Annex A – A.7)

Description: Ground sample distance.

**6.3.5. Fraction**

Type: MD\_RepresentativeFraction

Description: Distance on a map which represents the distance measured on the ground.

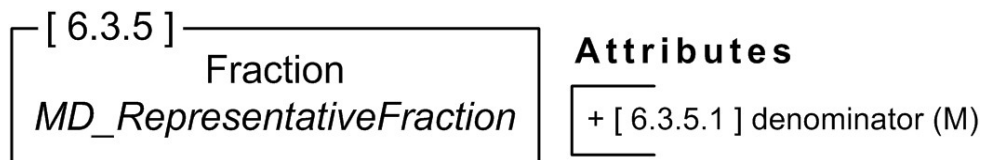


Figure 5: Fraction

**6.3.5.1. denominator (M)**

Type: Integer (see Annex A – A.13)

Description: The number below the line in a vulgar fraction.

BP: Value is greater than 0.

**6.3.6. Browse Graphic**

Type: MD\_BrowseGraphic

Description: The name, description, and file type of an illustration of the resource.

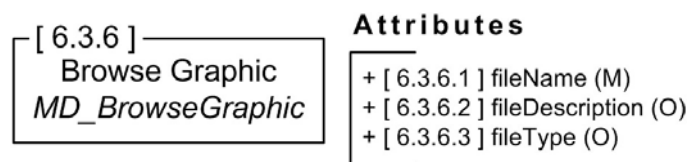


Figure 6: Browse graphic



### 6.3.6.1. filename (M)

Type: free text

Description: Name of the graphic file provided to illustrate the resource.

BP: The attribute *filename* shall include the file type extension, e.g. “metadata.pdf.” If the file type is not well known then it shall be described within the attribute *fileType*.

### 6.3.6.2. fileDescription (O)

Type: free text

Description: Text description of the graphic file.

### 6.3.6.3. fileType (O)

Type: free text

Description: Graphic file format description. It is mandatory when the file type included as the extension of the file name is not well known, especially if the file type extension is not included in CodeList napMD\_FileFormatCode.

## 6.3.7. Keywords

Type: MD\_Keywords

Description: Commonly used words or phrases which describe the resource. Optionally, the keyword type and a citation for the authoritative or registered resource of the keywords are also provided.

BP: The use of keywords from authoritative source instead of using user defined keywords is highly recommended or communities should develop specific thesaurus of keywords and make them available on the Web for its use with this profile.

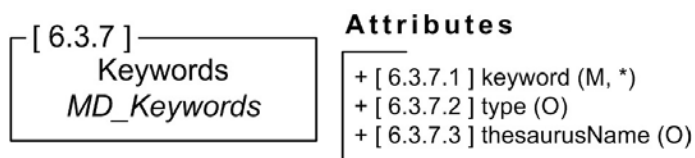


Figure 7: Keywords

### 6.3.7.1. keyword (M,Repeatable)

Type: free text

Description: Commonly used words or phrases which describe the resource.

### 6.3.7.2. type (O)

Type: CodeList napMD\_KeywordTypeCode

Description: Terms or type used to group keywords: discipline, place, stratum, temporal, or theme.

BP: Select *type* from napMD\_KeywordTypeCode.

### 6.3.7.3. thesaurusName (O)

Type: CI\_Citation (see 6.14)

Description: The name of a registered authoritative keyword resource.

BP: Strongly recommend to provide contact information (see 6.15.5 contactInfo).

## 6.3.8. Usage

Type: MD\_Usage

Description: Describes the date and time or range of dates of first resource use, the limitations or unsuitable uses of the resource, and identification and contact information for the users of the resource.

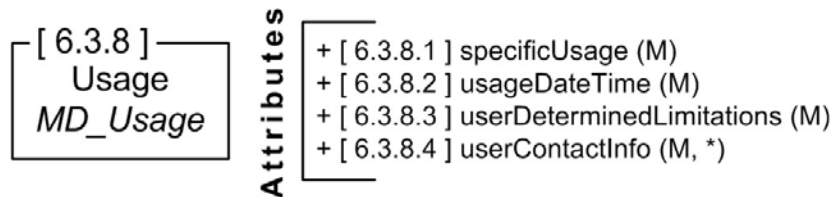


Figure 8: Usage

### 6.3.8.1. specificUsage (M)

Type: free text

Description: Description of the resource use.

### 6.3.8.2. usageDateTime (M)

Type: DateTime (see Annex A – A.5)

Description: Date and time of the first use of the resource.

### 6.3.8.3. userDeterminedLimitations (M)

Type: free text

Description: User described inappropriate uses of the resource.

#### 6.3.8.4. userContactInfo (M,Repeatable)

Type: CI\_ResponsibleParty (see 6.15)

Description: Identification and means to communicate with the person/organization using the resource.

BP: Contact information (see 6.15.5 contactInfo) shall be provided.

#### 6.3.9. Aggregation Information

Type: MD\_AggregateInformation

Description: The citation for or name of an aggregate dataset, the type of aggregate dataset, and optionally the activity which produced the dataset.

BP: Either the attribute *aggregateDataSetName* or *aggregateDataSetIdentifier* shall be reported.

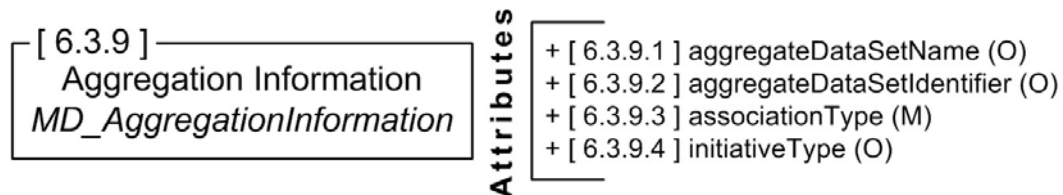


Figure 9: Aggregation information

##### 6.3.9.1. aggregateDataSetName (O)

Type: CI\_Citation (see 6.14)

Description: Citation information for the aggregate dataset.

BP: Strongly recommend to provide contact information (see 6.14.4 contactInfo).

##### 6.3.9.2. aggregateDataSetIdentifier (O)

Type: MD\_Identifier (see 6.22)

Description: Identification of the aggregate dataset.

##### 6.3.9.3. associationType (M)

Type: CodeList napDS\_AssociationTypeCode

Description: Association type of the aggregate dataset.

BP: Select *associationType* from napDS\_AssociationTypeCode.

In order to allow navigation from aggregate datasets to datasets whose compose them, the association type code *isComposedOf* has been introduced. However, this approach is not encouraged since every time a dataset is derived from the aggregate dataset, it implies an update of the aggregate dataset metadata mentioning that the aggregate dataset is composed of this new derived dataset.

#### 6.3.9.4. initiativeType (O)

Type: CodeList napDS\_InitiativeTypeCode

Description: Type of initiative for which the dataset was developed.

BP: Select *initiativeType* from napDS\_InitiativeTypeCode.

#### 6.3.10. Coupled Resource

Type: SV\_CoupledResource

Description: information describing the linkage between a service operation and a tightly coupled dataset.

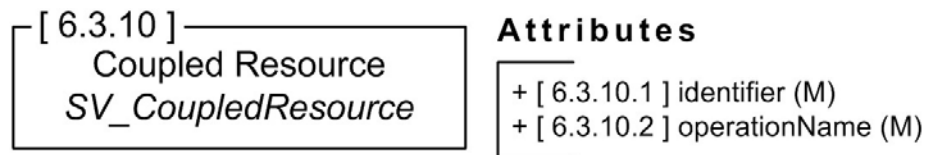


Figure 10: Coupled resource

##### 6.3.10.1. identifier (M)

Type: free text

Description: The dataset name or identifier of the associated dataset.

##### 6.3.10.2. operationName (M)

Type: free text

Description: The service operation name.

#### 6.3.11. Operation Metadata

Type: SV\_OperationMetadata

Description: Description of one service’s operation. Together, attributes and components provide the signature of the operation (i.e. the method).

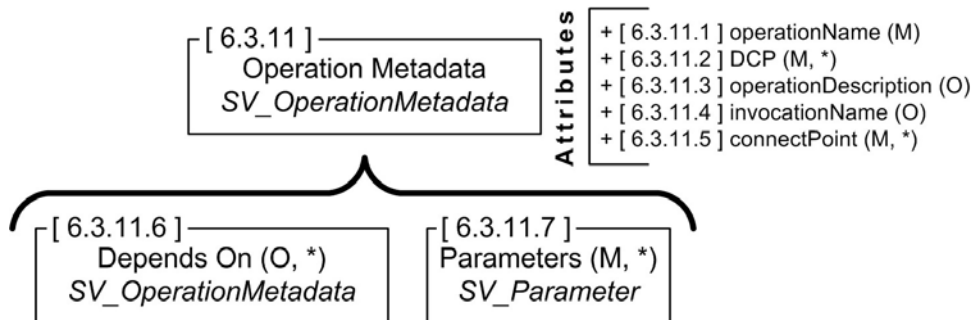


Figure 11: Operation metadata

**6.3.11.1. operationName (M)**

Type: free text

Description: A name that uniquely identifies the interface.

**6.3.11.2. DCP (M,Repeatable)**

Type: Codelist nap\_DCPList

Description: Distributed Computing Platforms that has been used to implement the operation such as XML, CORBA, JAVA, COM, SQL, or WebServices.

BP: Select *DCP* from nap\_DCPList.

**6.3.11.3. operationDescription (O)**

Type: free text

Description: Description of the purpose of the operation and results obtained from the operation.

**6.3.11.4. invocationName (O)**

Type: free text

Description: The name used to invoke the operation on all DCPs.

**6.3.11.5. connectPoint (M,Repeatable)**

Type: CI\_OnlineResource (see 6.19)

Description: Reference to access the service interface.

**6.3.11.6. Depends On (O,Repeatable)**

Type: SV\_OperationMetadata (see 6.3.11)

Description: The list of operations required prior to invoking the service, structured as a list for capturing alternate or parallel predecessor paths.

**6.3.11.7. Parameters (M)**

Type: Sequence<SV\_Parameter> (see 6.3.12)

Description: Values required for the interface invocation.

## 6.3.12. Parameter

Type: SV\_Parameter

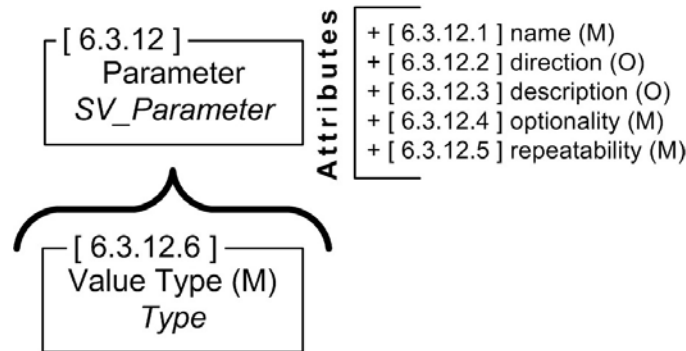


Figure 12: Parameter

### 6.3.12.1. name (M)

Type: MemberName (see Annex A – A.15)

Description: The name that the service uses for the parameter.

### 6.3.12.2. direction (O)

Type: Enumeration SV\_ParameterDirection

Description: Indication if the parameter serves as input, output, or both.

### 6.3.12.3. description (O)

Type: free text

Description: Explanation of the purpose and function of the parameter.

### 6.3.12.4. optionality (M)

Type: free text (default value is “Mandatory”)

Description: Indicates the necessity of the parameter.

### 6.3.12.5. repeatability (M)

Type: Boolean (see annex A - A.2)

Description: Indication if one or more value for the parameter may be provided.

### 6.3.12.6. Value Type (M)

Type: Type (see annex A - A.22)

Description: The base class for value type.

## 6.4. Constraint

### 6.4.1. Introduction

Constraints are reported through metadata constraint information and/or legal constraints and/or security constraints.

### 6.4.2. Constraint information

Type: MD\_Constraints

Description: The limitations, restrictions or statement on the resource fitness for use.

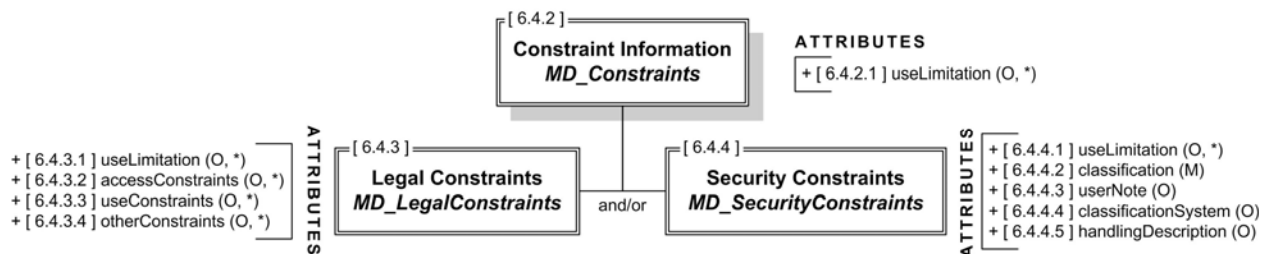


Figure 13: Constraint information

#### 6.4.2.1. useLimitation (O,Repeatable)

Type: free text

Description: Statement on the fitness of use or limitations on the use of the resource or metadata.

BP: Use limitation is mandatory unless MD\_LegalConstraints or MD\_SecurityConstraints is used.

### 6.4.3. Legal constraints

Type: MD\_LegalConstraints

Description: The legal restrictions or prerequisites to using the resource or accessing the metadata.

#### 6.4.3.1. useLimitation (O,Repeatable)

Type: free text

Description: Statement on the fitness of use or limitations on the use of the resource or metadata.

#### 6.4.3.2. accessConstraints (O,Repeatable)

Type: CodeList napMD\_RestrictionCode

Description: Limitations to access the resource or metadata to protect privacy, intellectual property, or any special limitations.

BP: Select *accessConstraints* from napMD\_RestrictionCode.

#### **6.4.3.3. useConstraints (O,Repeatable)**

Type: CodeList napMD\_RestrictionCode

Description: Restrictions or limitations or warnings to protect privacy, intellectual property, or other special restrictions on the resource or the metadata.

BP: Select *useConstraints* from napMD\_RestrictionCode.

#### **6.4.3.4. otherConstraints (O,Repeatable)**

Type: free text

Description: Other restrictions or legal prerequisites for accessing the resource or metadata.

BP: Shall be provided if *accessConstraints* or *useConstraints* is set to “otherRestrictions.” Include statement such as: “Data only to be used for the purposes for which they were collected.”

### **6.4.4. Security constraints**

Type: MD\_SecurityConstraints

Description: Restrictions applied to the resource or metadata to protect security concerns.

#### **6.4.4.1. useLimitation (O,Repeatable)**

Type: free text

Description: Statement on the fitness of use or limitations on the use of the resource or metadata.

#### **6.4.4.2. classification (M)**

Type: CodeList napMD\_classificationCode

Description: Name of the handling restrictions on the resource or the metadata.

BP: Select *classification* from napMD\_classificationCode.

#### **6.4.4.3. userNote (O)**

Type: free text

Description: An explanation of the application of the classification level to the resource or metadata.

#### **6.4.4.4. classificationSystem (O)**

Type: free text

Description: Name of the security classification system.



**6.4.4.5. handlingDescription (O)**

Type: free text

Description: Additional information regarding the restrictions on the resource or metadata.

## 6.5. Data quality information

### 6.5.1. Introduction

This section describes attributes and components that provide information about data quality.

Type: DQ\_DataQuality

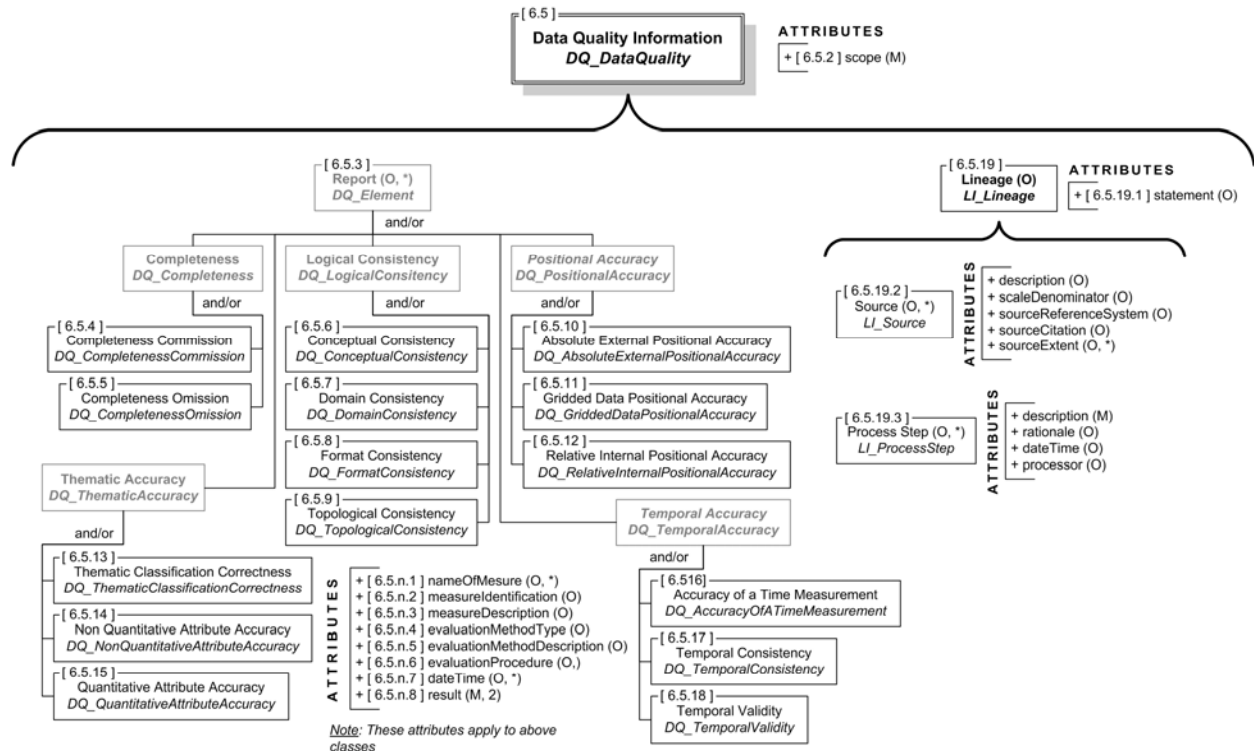


Figure 14: Data quality information

### 6.5.2. scope (M)

Type: DQ\_Scope

Description: The extent of characteristics for which data quality information is reported.

BP: report (6.4.3) or lineage (6.4.4) is mandatory when the attribute level is set to “dataset.” However, both of them can be reported.

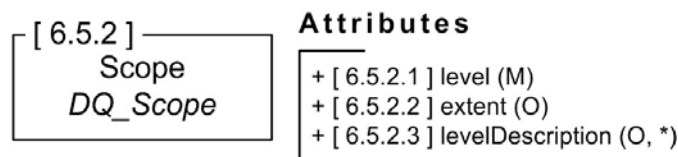


Figure 15: Scope

#### **6.5.2.1. level (M)**

Type: CodeList napMD\_ScopeCode

Description: The data or application level for which data quality is described.

BP: Select *level* from napMD\_ScopeCode.

#### **6.5.2.2. extent (O)**

Type: EX\_Extent (see 6.13)

Description: The spatial, horizontal and/or vertical, and the temporal coverage in the resource.

#### **6.5.2.3. levelDescription (O,Repeatable)**

Type: MD\_ScopeDescription (see 6.5.20)

Description: Description of the level of the dataset.

BP: Mandatory when level is not “dataset” or “series.”

### **6.5.3. Report (O,Repeatable)**

Type: DQ\_CompletenessCommission (see 6.5.4) and/or DQ\_CompletenessOmission (see 6.5.5) and/or DQ\_ConceptualConsistency (see 6.5.6) and/or DQ\_DomainConsistency (see 6.5.7) and/or DQ\_FormatConsistency (see 6.5.8) and/or DQ\_TopologicalConsistency (see 6.5.9) and/or DQ\_AbsoluteExternalPositionalAccuracy (see 6.5.10) and/or DQ\_GridDEDDataPositionalAccuracy (see 6.5.11) and/or DQ\_RelativeInternalPositionalAccuracy (see 6.5.12) and/or DQ\_ThematicClassificationCorrecness (see 6.5.13) and/or DQ\_NonQuantitativeAttributeAccuracy (see 6.5.14) and/or DQ\_QuantitativeAttributeAccuracy (see 6.5.15) and/or DQ\_AccuracyOfATimeMeasurement (see 6.5.16) and/or DQ\_TemporalConsistency (see 6.5.17) and/or DQ\_TemporalValidity (see 6.5.18)

BP: *Report* shall be provided when *Lineage* is not reported.

### **6.5.4. Completeness Commission**

Type: DQ\_CompletenessCommission

Description: Notification of excess data present in the dataset beyond the extent defined in Scope.

#### **6.5.4.1. nameOfMeasure (O,Repeatable)**

Type: free text

Description: Name of the test applied to the data to assure data quality.

**6.5.4.2. measureIdentification (O)**

Type: MD\_Identifier (see 6.22)

Description: Code which identifies a registered standard data quality procedure.

**6.5.4.3. measureDescription (O)**

Type: free text

Description: Description of the measure applied to the dataset to assure quality.

**6.5.4.4. evaluationMethodType (O)**

Type: CodeList napDQ\_EvaluationMethodTypeCode

Description: Method type used to evaluate data quality in the dataset.

BP: Select *evaluationMethodType* from napDQ\_EvaluationMethodTypeCode.

**6.5.4.5. evaluationMethodDescription (O)**

Type: free text

Description: Description of the evaluation method applied to the dataset.

**6.5.4.6. evaluationProcedure (O)**

Type: CI\_Citation (see 6.15)

Description: Citation for the evaluation procedure.

BP: Strongly recommend to provide contact information (see 6.15.5 contactInfo).

**6.5.4.7. dateTime (O,Repeatable)**

Type: DateTime (see Annex A – A.5)

Description: Date and time at which the test was completed.

BP: DateTime cannot support the description of duration, only single time is allowed.

**6.5.4.8. result (M,2)**

Type: DQ\_QuantitativeResult (see 6.5.21) and/or DQ\_ConformanceResult (see 6.5.22)

Description: Value(s) obtained from data quality test or outcome from applying data quality measure against a specified/acceptable quality conformance level.

**6.5.5. Completeness Omission**

Type: DQ\_CompletenessOmission

Description: Notification of data absent from the dataset as defined by Scope.

**6.5.5.1. nameOfMeasure (O,Repeatable)**

Type: free text

Description: Name of the test applied to the data to assure data quality.

**6.5.5.2. measureIdentification (O)**

Type: MD\_Identifier (see 6.22)

Description: Code which identifies a registered standard data quality procedure.

**6.5.5.3. measureDescription (O)**

Type: free text

Description: Description of the measure applied to the dataset to assure quality.

**6.5.5.4. evaluationMethodType (O)**

Type: CodeList napDQ\_EvaluationMethodTypeCode

Description: Method type used to evaluate data quality in the dataset.

BP: Select *evaluationMethodType* from napDQ\_EvaluationMethodTypeCode.

**6.5.5.5. evaluationMethodDescription (O)**

Type: free text

Description: Description of the evaluation method applied to the dataset.

**6.5.5.6. evaluationProcedure (O)**

Type: CI\_Citation (see 6.14)

Description: Citation for the evaluation procedure.

BP: Strongly recommend to provide contact information (see 6.15.5 contactInfo).

**6.5.5.7. dateTime (O,Repeatable)**

Type: DateTime (see Annex A – A.5)

Description: Date and time at which the test was completed.

BP: DateTime cannot support the description of duration, only single time is allowed.

**6.5.5.8. result (M,2)**

Type: DQ\_QuantitativeResult (see 6.5.21) and/or DQ\_ConformanceResult (see 6.5.22)

Description: Value(s) obtained from data quality test or outcome from applying data quality measure against a specified/acceptable quality conformance level.

**6.5.6. Conceptual Consistency**

Type: DQ\_ConceptualConsistency

Description: The level of which the dataset adheres to the conceptual schema.

**6.5.6.1. nameOfMeasure (O,Repeatable)**

Type: free text

Description: Name of the test applied to the data to assure data quality.

**6.5.6.2. measureIdentification (O)**

Type: MD\_Identifier (see 6.22)

Description: Code which identifies a registered standard data quality procedure.

**6.5.6.3. measureDescription (O)**

Type: free text

Description: Description of the measure applied to the dataset to assure quality.

**6.5.6.4. evaluationMethodType (O)**

Type: CodeList napDQ\_EvaluationMethodTypeCode

Description: Method type used to evaluate data quality in the dataset.

BP: Select *evaluationMethodType* from napDQ\_EvaluationMethodTypeCode.

**6.5.6.5. evaluationMethodDescription (O)**

Type: free text

Description: Description of the evaluation method applied to the dataset.

**6.5.6.6. evaluationProcedure (O)**

Type: CI\_Citation (see 6.14)

Description: Citation for the evaluation procedure.

BP: Strongly recommend to provide contact information (see 6.15.5 contactInfo).

**6.5.6.7. dateTime (O,Repeatable)**

Type: DateTime (see Annex A – A.5)

Description: Date and time at which the test was completed.

BP: DateTime cannot support the description of duration, only single time is allowed.

**6.5.6.8. result (M,2)**

Type: DQ\_QuantitativeResult (see 6.5.21) and/or DQ\_ConformanceResult (see 6.5.22)

Description: Value(s) obtained from data quality test or outcome from applying data quality measure against a specified/acceptable quality conformance level.

**6.5.7. Domain Consistency**

Type: DQ\_DomainConsistency

Description: The adherence to the logical rules of data structure, attributing, and data structure whether conceptual, logical, or physical.

**6.5.7.1. nameOfMeasure (O,Repeatable)**

Type: free text

Description: Name of the test applied to the data to assure data quality.

**6.5.7.2. measureIdentification (O)**

Type: MD\_Identifier (see 6.22)

Description: Code which identifies a registered standard data quality procedure.

**6.5.7.3. measureDescription (O)**

Type: free text

Description: Description of the measure applied to the dataset to assure quality.

**6.5.7.4. evaluationMethodType (O)**

Type: CodeList napDQ\_EvaluationMethodTypeCode

Description: Method type used to evaluate data quality in the dataset.

BP: Select *evaluationMethodType* from napDQ\_EvaluationMethodTypeCode.

**6.5.7.5. evaluationMethodDescription (O)**

Type: free text

Description: Description of the evaluation method applied to the dataset.

**6.5.7.6. evaluationProcedure (O)**

Type: CI\_Citation (see 6.14)

Description: Citation for the evaluation procedure.

BP: Strongly recommend to provide contact information (see 6.15.5 contactInfo).

**6.5.7.7. dateTime (O,Repeatable)**

Type: DateTime (see Annex A – A.5)

Description: Date and time at which the test was completed.

BP: DateTime cannot support the description of duration, only single time is allowed.

**6.5.7.8. result (M,2)**

Type: DQ\_QuantitativeResult (see 6.5.21) and/or DQ\_ConformanceResult (see 6.5.22)

Description: Value(s) obtained from data quality test or outcome from applying data quality measure against a specified/acceptable quality conformance level.

### **6.5.8. Format Consistency**

Type: DQ\_FormatConsistency

Description: The level of data storage which is in agreement with the dataset physical structure as described by Scope.

#### **6.5.8.1. nameOfMeasure (O,Repeatable)**

Type: free text

Description: Name of the test applied to the data to assure data quality.

#### **6.5.8.2. measureIdentification (O)**

Type: MD\_Identifier (see 6.22)

Description: Code which identifies a registered standard data quality procedure.

#### **6.5.8.3. measureDescription (O)**

Type: free text

Description: Description of the measure applied to the dataset to assure quality.

#### **6.5.8.4. evaluationMethodType (O)**

Type: CodeList napDQ\_EvaluationMethodTypeCode

Description: Method type used to evaluate data quality in the dataset.

BP: Select *evaluationMethodType* from napDQ\_EvaluationMethodTypeCode.

#### **6.5.8.5. evaluationMethodDescription (O)**

Type: free text

Description: Description of the evaluation method applied to the dataset.

#### **6.5.8.6. evaluationProcedure (O)**

Type: CI\_Citation (see 6.14)

Description: Citation for the evaluation procedure.

BP: Strongly recommend to provide contact information (see 6.15.5 contactInfo).

#### **6.5.8.7. dateTime (O,Repeatable)**

Type: DateTime (see Annex A – A.5)

Description: Date and time at which the test was completed.

BP: DateTime cannot support the description of duration, only single time is allowed.



#### **6.5.8.8. result (M,2)**

Type: DQ\_QuantitativeResult (see 6.5.21) and/or DQ\_ConformanceResult (see 6.5.22)

Description: Value(s) obtained from data quality test or outcome from applying data quality measure against a specified/acceptable quality conformance level.

### **6.5.9. Topological Consistency**

Type: DQ\_TopologicalConsistency

Description: The testing for topological correctness of encoded characteristics in the dataset as delimited by Scope.

#### **6.5.9.1. nameOfMeasure (O,Repeatable)**

Type: free text

Description: Name of the test applied to the data to assure data quality.

#### **6.5.9.2. measureIdentification (O)**

Type: MD\_Identifier (see 6.22)

Description: Code which identifies a registered standard data quality procedure.

#### **6.5.9.3. measureDescription (O)**

Type: free text

Description: Description of the measure applied to the dataset to assure quality.

#### **6.5.9.4. evaluationMethodType (O)**

Type: CodeList napDQ\_EvaluationMethodTypeCode

Description: Method type used to evaluate data quality in the dataset.

BP: Select *evaluationMethodType* from napDQ\_EvaluationMethodTypeCode.

#### **6.5.9.5. evaluationMethodDescription (O)**

Type: free text

Description: Description of the evaluation method applied to the dataset.

#### **6.5.9.6. evaluationProcedure (O)**

Type: CI\_Citation (see 6.14)

Description: Citation for the evaluation procedure.

BP: Strongly recommend to provide contact information (see 6.15.5 contactInfo).

**6.5.9.7. dateTime (O,Repeatable)**

Type: DateTime (see Annex A – A.5)

Description: Date and time at which the test was completed.

BP: DateTime cannot support the description of duration, only single time is allowed.

**6.5.9.8. result (M,2)**

Type: DQ\_QuantitativeResult (see 6.5.21) and/or DQ\_ConformanceResult (see 6.5.22)

Description: Value(s) obtained from data quality test or outcome from applying data quality measure against a specified/acceptable quality conformance level.

**6.5.10. Absolute External Positional Accuracy**

Type: DQ\_AbsoluteExternalPositionalAccuracy

Description: Description of the methods, procedures, date stamp, conformance results or quantitative results, and date stamp of the positional measurement in the dataset.

**6.5.10.1. nameOfMeasure (O,Repeatable)**

Type: free text

Description: Name of the test applied to the data to assure data quality.

**6.5.10.2. measureIdentification (O)**

Type: MD\_Identifier (see 6.22)

Description: Code which identifies a registered standard data quality procedure.

**6.5.10.3. measureDescription (O)**

Type: free text

Description: Description of the measure applied to the dataset to assure quality.

**6.5.10.4. evaluationMethodType (O)**

Type: CodeList napDQ\_EvaluationMethodTypeCode

Description: Method type used to evaluate data quality in the dataset.

BP: Select *evaluationMethodType* from napDQ\_EvaluationMethodTypeCode.

**6.5.10.5. evaluationMethodDescription (O)**

Type: free text

Description: Description of the evaluation method applied to the dataset.

**6.5.10.6. evaluationProcedure (O)**

Type: CI\_Citation (see 6.14)

Description: Citation for the evaluation procedure.

BP: Strongly recommend to provide contact information (see 6.15.5 contactInfo).

**6.5.10.7. dateTime (O,Repeatable)**

Type: DateTime (see Annex A – A.5)

Description: Date and time at which the test was completed.

BP: DateTime cannot support the description of duration, only single time is allowed.

**6.5.10.8. result (M,2)**

Type: DQ\_QuantitativeResult (see 6.5.21) and/or DQ\_ConformanceResult (see 6.5.22)

Description: Value(s) obtained from data quality test or outcome from applying data quality measure against a specified/acceptable quality conformance level.

**6.5.11. Gridded Data Positional Accuracy**

Type: DQ\_GriddedDataPositionalAccuracy

Description: The fidelity of gridded data positions.

**6.5.11.1. nameOfMeasure (O,Repeatable)**

Type: free text

Description: Name of the test applied to the data to assure data quality.

**6.5.11.2. measureIdentification (O)**

Type: MD\_Identifier (see 6.22)

Description: Code which identifies a registered standard data quality procedure.

**6.5.11.3. measureDescription (O)**

Type: free text

Description: Description of the measure applied to the dataset to assure quality.

**6.5.11.4. evaluationMethodType (O)**

Type: CodeList napDQ\_EvaluationMethodTypeCode

Description: Method type used to evaluate data quality in the dataset.

BP: Select *evaluationMethodType* from napDQ\_EvaluationMethodTypeCode.

**6.5.11.5. evaluationMethodDescription (O)**

Type: free text

Description: The evaluation method applied to the dataset.

**6.5.11.6. evaluationProcedure (O)**

Type: CI\_Citation (see 6.14)

Description: Citation for the evaluation procedure.

BP: Strongly recommend to provide contact information (see 6.15.5 contactInfo).

**6.5.11.7. dateTime (O,Repeatable)**

Type: DateTime (see Annex A – A.5)

Description: Date and time at which the test was completed.

BP: DateTime cannot support the description of duration, only single time is allowed.

**6.5.11.8. result (M,2)**

Type: DQ\_QuantitativeResult (see 6.5.21) and/or DQ\_ConformanceResult (see 6.5.22)

Description: Value(s) obtained from data quality test or outcome from applying data quality measure against a specified/acceptable quality conformance level.

**6.5.12. Relative Internal Positional Accuracy**

Type: DQ\_RelativeInternalPositionalAccuracy

Description: The fidelity of features relative positions in the dataset.

**6.5.12.1. nameOfMeasure (O,Repeatable)**

Type: free text

Description: Name of the test applied to the data to assure data quality.

**6.5.12.2. measureIdentification (O)**

Type: MD\_Identifier (see 6.22)

Description: Code which identifies a registered standard data quality procedure.

**6.5.12.3. measureDescription (O)**

Type: free text

Description: Description of the measure applied to the dataset to assure quality.

**6.5.12.4. evaluationMethodType (O)**

Type: CodeList napDQ\_EvaluationMethodTypeCode

Description: Method type used to evaluate data quality in the dataset.

BP: Select *evaluationMethodType* from napDQ\_EvaluationMethodTypeCode.

**6.5.12.5. evaluationMethodDescription (O)**

Type: free text

Description: Description of the evaluation method applied to the dataset.

#### **6.5.12.6. evaluationProcedure (O)**

Type: CI\_Citation (see 6.14)

Description: Citation for the evaluation procedure.

BP: Strongly recommend to provide contact information (see 6.15.5 contactInfo).

#### **6.5.12.7. dateTime (O,Repeatable)**

Type: DateTime (see Annex A – A.5)

Description: Date and time at which the test was completed.

BP: DateTime cannot support the description of duration, only single time is allowed.

#### **6.5.12.8. result (M,2)**

Type: DQ\_QuantitativeResult (see 6.5.21) and/or DQ\_ConformanceResult (see 6.5.22)

Description: Value(s) obtained from data quality test or outcome from applying data quality measure against a specified/acceptable quality conformance level.

### **6.5.13. Thematic Classification Correctness**

Type: DQ\_ThematicClassificationCorrectness

Description: Comparison of classes or attributes assigned to features or feature attributes respectively with respect to a recognized repository of features that hold in a particular context.

#### **6.5.13.1. nameOfMeasure (O,Repeatable)**

Type: free text

Description: Name of the test applied to the data to assure data quality.

#### **6.5.13.2. measureIdentification (O)**

Type: MD\_Identifier (see 6.22)

Description: Code which identifies a registered standard data quality procedure.

#### **6.5.13.3. measureDescription (O)**

Type: free text

Description: Description of the measure applied to the dataset to assure quality.

#### **6.5.13.4. evaluationMethodType (O)**

Type: CodeList napDQ\_EvaluationMethodTypeCode

Description: Method type used to evaluate data quality in the dataset.

BP: Select *evaluationMethodType* from napDQ\_EvaluationMethodTypeCode.

**6.5.13.5. evaluationMethodDescription (O)**

Type: free text

Description: Description of the evaluation method applied to the dataset.

**6.5.13.6. evaluationProcedure (O)**

Type: CI\_Citation (see 6.14)

Description: Citation for the evaluation procedure.

BP: Strongly recommend to provide contact information (see 6.15.5 contactInfo).

**6.5.13.7. dateTime (O,Repeatable)**

Type: DateTime (see Annex A – A.5)

Description: Date and time at which the test was completed.

BP: DateTime cannot support the description of duration, only single time is allowed.

**6.5.13.8. result (M,2)**

Type: DQ\_QuantitativeResult (see 6.5.21) and/or DQ\_ConformanceResult (see 6.5.21)

Description: Value(s) obtained from data quality test or outcome from applying data quality measure against a specified/acceptable quality conformance level.

**6.5.14. Non Quantitative Attribute Qccuracy**

Type: DQ\_NonQuantitativeAttributeAccuracy

Description: Fidelity of assigning non-qualitative attributes.

**6.5.14.1. nameOfMeasure (O,Repeatable)**

Type: free text

Description: Name of the test applied to the data to assure data quality.

**6.5.14.2. measureIdentification (O)**

Type: MD\_Identifier (see 6.22)

Description: Code which identifies a registered standard data quality procedure.

**6.5.14.3. measureDescription (O)**

Type: free text

Description: Description of the measure applied to the dataset to assure quality.

**6.5.14.4. evaluationMethodType (O)**

Type: CodeList napDQ\_EvaluationMethodTypeCode

Description: Method type used to evaluate data quality in the dataset.

BP: Select *evaluationMethodType* from napDQ\_EvaluationMethodTypeCode.

**6.5.14.5. evaluationMethodDescription (O)**

Type: free text

Description: Description of the evaluation method applied to the dataset.

**6.5.14.6. evaluationProcedure (O)**

Type: CI\_Citation (see 6.14)

Description: Citation for the evaluation procedure.

BP: Strongly recommend to provide contact information (see 6.15.5 contactInfo).

**6.5.14.7. dateTime (O,Repeatable)**

Type: DateTime (see Annex A – A.5)

Description: Date and time at which the test was completed.

BP: DateTime cannot support the description of duration, only single time is allowed.

**6.5.14.8. result (M,2)**

Type: DQ\_QuantitativeResult (see 6.5.21) and/or DQ\_ConformanceResult (see 6.5.21)

Description: Value(s) obtained from data quality test or outcome from applying data quality measure against a specified/acceptable quality conformance level.

**6.5.15. Quantitative Attribute Accuracy**

Type: DQ\_QuantitativeAttributeAccuracy

Description: Fidelity of quantitative attributing.

**6.5.15.1. nameOfMeasure (O,Repeatable)**

Type: free text

Description: Name of the test applied to the data to assure data quality.

**6.5.15.2. measureIdentification (O)**

Type: MD\_Identifier (see 6.22)

Description: Code which identifies a registered standard data quality procedure.

**6.5.15.3. measureDescription (O)**

Type: free text

Description: Description of the measure applied to the dataset to assure quality.

**6.5.15.4. evaluationMethodType (O)**

Type: CodeList napDQ\_EvaluationMethodTypeCode

Description: Method type used to evaluate data quality in the dataset.

BP: Select *evaluationMethodType* from napDQ\_EvaluationMethodTypeCode.

**6.5.15.5. evaluationMethodDescription (O)**

Type: free text

Description: Description of the evaluation method applied to the dataset.

**6.5.15.6. evaluationProcedure (O)**

Type: CI\_Citation (see 6.14)

Description: Citation for the evaluation procedure.

BP: Strongly recommend to provide contact information (see 6.15.5 contactInfo).

**6.5.15.7. dateTime (O,Repeatable)**

Type: DateTime (see Annex A – A.5)

Description: Date and time at which the test was completed.

BP: DateTime cannot support the description of duration, only single time is allowed.

**6.5.15.8. result (M,2)**

Type: DQ\_QuantitativeResult (see 6.5.21) and/or DQ\_ConformanceResult (see 6.5.21)

Description: Value(s) obtained from data quality test or outcome from applying data quality measure against a specified/acceptable quality conformance level.

**6.5.16. Accuracy of a Time Measurement**

Type: DQ\_AccuracyOfATimeMeasurement

Description: Report the accuracy or error in time measurement.

**6.5.16.1. nameOfMeasure (O,Repeatable)**

Type: free text

Description: Name of the test applied to the data to assure data quality.

**6.5.16.2. measureIdentification (O)**

Type: MD\_Identifier (see 6.22)

Description: Code which identifies a registered standard data quality procedure.

**6.5.16.3. measureDescription (O)**

Type: free text

Description: Description of the measure applied to the dataset to assure quality.

**6.5.16.4. evaluationMethodType (O)**

Type: CodeList napDQ\_EvaluationMethodTypeCode

Description: Method type used to evaluate data quality in the dataset.

BP: Select *evaluationMethodType* from napDQ\_EvaluationMethodTypeCode.



**6.5.16.5. evaluationMethodDescription (O)**

Type: free text

Description: Description of the evaluation method applied to the dataset.

**6.5.16.6. evaluationProcedure (O)**

Type: CI\_Citation (see 6.14)

Description: Citation for the evaluation procedure.

BP: Strongly recommend to provide contact information (see 6.15.5 contactInfo).

**6.5.16.7. dateTime (O,Repeatable)**

Type: DateTime (see Annex A – A.5)

Description: Date and time at which the test was completed.

BP: DateTime cannot support the description of duration, only single time is allowed.

**6.5.16.8. result (M,2)**

Type: DQ\_QuantitativeResult (see 6.5.21) and/or DQ\_ConformanceResult (see 6.5.22)

Description: Value(s) obtained from data quality test or outcome from applying data quality measure against a specified/acceptable quality conformance level.

**6.5.17. Temporal Consistency**

Type: DQ\_TemporalConsistency

Description: The correctness of reported ordered events or sequences.

**6.5.17.1. nameOfMeasure (O,Repeatable)**

Type: free text

Description: Name of the test applied to the data to assure data quality.

**6.5.17.2. measureIdentification (O)**

Type: MD\_Identifier (see 6.22)

Description: Code which identifies a registered standard data quality procedure.

**6.5.17.3. measureDescription (O)**

Type: free text

Description: Description of the measure applied to the dataset to assure quality.

**6.5.17.4. evaluationMethodType (O)**

Type: CodeList napDQ\_EvaluationMethodTypeCode

Description: Method type used to evaluate data quality in the dataset.

BP: Select *evaluationMethodType* from napDQ\_EvaluationMethodTypeCode.

#### **6.5.17.5. evaluationMethodDescription (O)**

Type: free text

Description: Description of the evaluation method applied to the dataset.

#### **6.5.17.6. evaluationProcedure (O)**

Type: CI\_Citation (see 6.14)

Description: Citation for the evaluation procedure.

BP: Strongly recommend to provide contact information (see 6.14.4 contactInfo).

#### **6.5.17.7. dateTime (O,Repeatable)**

Type: DateTime (see Annex A – A.5)

Description: Date and time at which the test was completed.

BP: DateTime cannot support the description of duration, only single time is allowed.

#### **6.5.17.8. result (M,2)**

Type: DQ\_QuantitativeResult (see 6.5.21) and/or DQ\_ConformanceResult (see 6.5.22)

Description: Value(s) obtained from data quality test or outcome from applying data quality measure against a specified/acceptable quality conformance level.

### **6.5.18. Temporal Validity**

Type: DQ\_TemporalValidity

Description: Temporal validity of the data within the identified Scope.

#### **6.5.18.1. nameOfMeasure (O,Repeatable)**

Type: free text

Description: Name of the test applied to the data to assure data quality.

#### **6.5.18.2. measureIdentification (O)**

Type: MD\_Identifier (see 6.22)

Description: Code which identifies a registered standard data quality procedure.

#### **6.5.18.3. measureDescription (O)**

Type: free text

Description: Description of the measure applied to the dataset to assure quality.

#### **6.5.18.4. evaluationMethodType (O)**

Type: CodeList napDQ\_EvaluationMethodTypeCode

Description: Method type used to evaluate data quality in the dataset.

BP: Select *evaluationMethodType* from napDQ\_EvaluationMethodTypeCode.

#### **6.5.18.5. evaluationMethodDescription (O)**

Type: free text

Description: Description of the evaluation method applied to the dataset.

#### **6.5.18.6. evaluationProcedure (O)**

Type: CI\_Citation (see 6.14)

Description: Citation for the evaluation procedure.

BP: Strongly recommend to provide contact information (see 6.15.5 contactInfo).

#### **6.5.18.7. dateTime (O,Repeatable)**

Type: DateTime (see Annex A – A.5)

Description: Date and time at which the test was completed.

BP: DateTime cannot support the description of duration, only single time is allowed.

#### **6.5.18.8. result (M,2)**

Type: DQ\_QuantitativeResult (see 6.5.21) and/or DQ\_ConformanceResult (see 6.5.22)

Description: Value(s) obtained from data quality test or outcome from applying data quality measure against a specified/acceptable quality conformance level.

### **6.5.19. Lineage (O)**

Type: LI\_Lineage

Description: Information or lack of information on the events and source data used to construct the dataset within the specified Scope.

BP: *Lineage* shall be provided when *Report* is not reported. One of the attributes: *statement*, *source*, or *processStep* shall be provided. The attribute *statement* shall be provided when (1) the attributes *source* and *processStep* are not provided and (2) the attribute *level* of the scope of DQ\_Quality is set to “dataset” or “series.”

#### **6.5.19.1. statement (O)**

Type: free text

Description: General explanation of the data producer’s knowledge of the dataset lineage.

#### **6.5.19.2. source (O,Repeatable)**

Type: LI\_Source (see 6.5.23)

Description: Information on the sources used in the development of the dataset.

BP: Source is provided when *statement* or *processStep* is not reported.

**6.5.19.3. processStep (O,Repeatable)**

Type: LI\_ProcessStep (see 6.5.24)

Description: The events in the development of the dataset.

**6.5.20. Scope Description**

Type: MD\_ScopeDescription

Description: Description of the class of information covered by the information.

BP: One and only one of the following must be entered: attributes, features, featureInstances, attributeInstances, dataset, or other as appropriate.

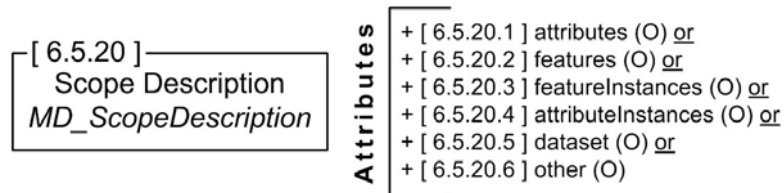


Figure 16: Scope description

The following attributes provide information about scope description.

**6.5.20.1. attributes (O)**

Type: Set<GF\_AttributeType> (see Annex A – A.9)

Description: Allows defining attribute valueType, such as: Integer, CharacterString, or GM\_Object; describing the domain of values; and identifying the number of times a value may be assigned to a feature type (cardinality).

BP: Mandatory if *features*, *featureInstances*, *attributeInstances*, *dataset*, or *other* are not documented.

**6.5.20.2. features (O)**

Type: Set<GF\_FeatureType> (see Annex A – A.10)

BP: Mandatory if *attributes*, *featureInstances*, *attributeInstances*, *dataset*, or *other* are not documented.

**6.5.20.3. featureInstances (O)**

Type: Set<GF\_FeatureType> (see Annex A – A.10)

BP: Mandatory if *attributes*, *features*, *attributeInstances*, *dataset*, or *other* are not documented.

*featureInstances* should refer to a set of occurrences of feature types.

**6.5.20.4. attributeInstances (O)**

Type: Set<GF\_AttributeType> (see Annex A – A.9)

BP: Mandatory if *attributes*, *features*, *featureInstances*, *dataset*, or *other* are documented. *attributeInstances* should refer to a set of occurrences of attribute types.

**6.5.20.5. dataset (O)**

Type: free text

BP: Mandatory if *attributes*, *features*, *featureInstances*, *attributeInstances*, or *other* are not documented.

**6.5.20.6. other (O)**

Type: free text

BP: Mandatory if *attributes*, *features*, *featureInstances*, *attributeInstances*, or *dataset* are not documented.

**6.5.21. Quantitative Result**

Type: DQ\_QuantitativeResult

Description: Information on the value(s) resulting from applying a data quality measure.

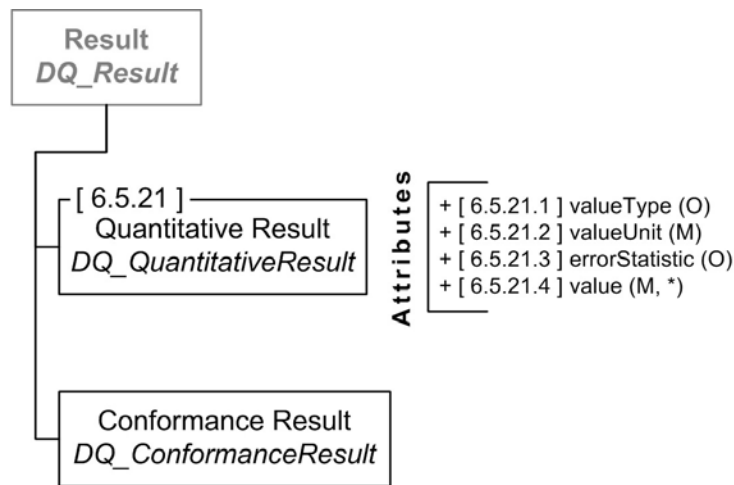


Figure 17: Quantitative result

**6.5.21.1. valueType (O)**

Type: RecordType (see Annex A – A.18)

Description: The base class or classes used for the value type(s).

**6.5.21.2. valueUnit (M)**

Type: UnitOfMeasure (see annex A - A.23)

Description: Any system devised to quantify a value such as length, time, angle, area, volume, velocity, or scale.

**6.5.21.3. errorStatistic (O)**

Type: free text

Description: The statistical method used to estimate error in the value.

**6.5.21.4. value (M,Repeatable)**

Type: Record (see Annex A – A.17)

Description: The quantitative value(s) for the object measured.

BP: If the attribute *valueType* is not used then this attribute will consist of a single (or list of) values(s). If this attribute is a matrix, as in a covariance matrix, the structure must be described in *valueType* (6.5.21.1) with the type: RecordType.

**6.5.22. Conformance Result**

Type: DQ\_ConformanceResult

Description: Information which describes the outcome from evaluating the value(s) against a set acceptable quality level.

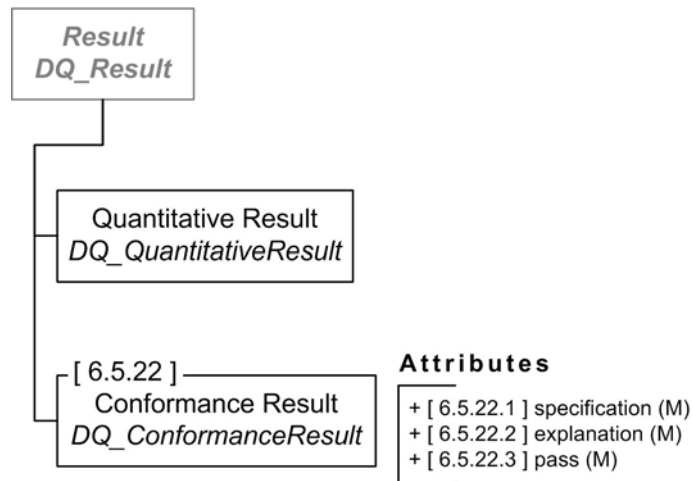


Figure 18: Conformance result

**6.5.22.1. specification (M)**

Type: CI\_Citation (see 6.14)

Description: Citation for the specification or user requirement used to evaluate the data.

### 6.5.22.2. explanation (M)

Type: free text

Description: An explanation of the conformance result.

### 6.5.22.3. pass (M)

Type: Boolean (see annex A - A.2)

Description: Notification of whether the data passes or failed the conformance test.

## 6.5.23. Source

Type: LI\_Source

Description: Information about the source data used in creating the data within the specified Scope.

BP: At least the attribute *description* or the attribute pair *sourceCitation* and *sourceExtent* shall be provided.

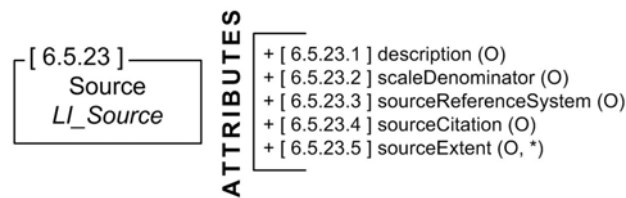


Figure 19: Source

### 6.5.23.1. description (O)

Type: free text

Description: The attribute *description* shall provide the source medium name code (CodeList napMD\_MediumNameCode) followed by a free text description, e.g. “dvd; source satellite image.”

### 6.5.23.2. scaleDenominator (O)

Type: MD\_RepresentativeFraction (see 6.3.5)

Description: The number below the line in a vulgar fraction.

### 6.5.23.3. sourceReferenceSystem (O)

Type: MD\_ReferenceSystem (see 6.8)

Description: Information about the reference system.

#### 6.5.23.4. sourceCitation (O)

Type: CI\_Citation (see 6.14)

Description: Citation for the sources for the dataset.

BP: One of the attributes *description*, *sourceCitation* or *sourceExtent* shall be provided.

Strongly recommend to provide contact information (see 6.14.4 contactInfo).

#### 6.5.23.5. sourceExtent (O,Repeatable)

Type: EX\_Extent (see 6.13)

Description: Describes the spatial, horizontal and/or vertical, and the temporal coverage in the dataset.

BP: One of the attributes *description*, *sourceCitation* or *sourceExtent* shall be provided.

### 6.5.24. Process Step

Type: LI\_ProcessStep

Description: The events in the development of the dataset.

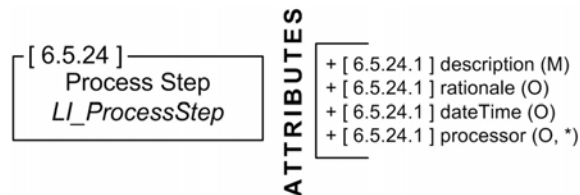


Figure 20: Process step

#### 6.5.24.1. description (M)

Type: free text

Description: Description of the processes performed on the data.

#### 6.5.24.2. rationale (O)

Type: free text

Description: Purpose for performing the process on the data.



**6.5.24.3. dateTime<sup>1</sup> (O)**

Type: DateTime (see Annex A – A.5)

Description: The date and time when the process was completed.

BP: Only single time is allowed.

**6.5.24.4. processor (O,Repeatable)**

Type: CI\_ResponsibleParty (see 6.16)

Description: Identification and means to contact the person or party that performed the process.

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<sup>1</sup> dateTime cannot support the description of duration.

## 6.6. Maintenance Information

### 6.6.1. Introduction

This section describes attributes that provide information about maintenance information.

Type: MD\_MaintenanceInformation

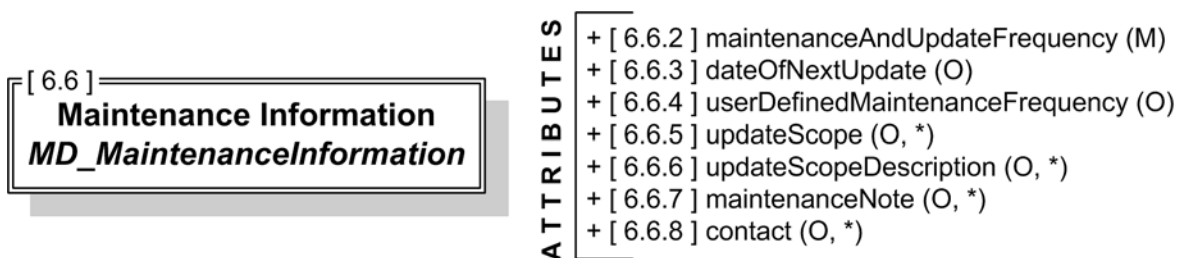


Figure 21: Maintenance information

### 6.6.2. maintenanceAndUpdateFrequency (M)

Type: CodeList napMD\_MaintenanceFrequencyCode

Description: Frequency of changes and additions made to the resource after the initial completion.

BP: This could be used to calculate automatically the attribute *dateOfNextUpdate* (see 6.6.3) using the date of the resource (see 6.3.2.1) and the metadata date stamp (see 6.2.8) of the metadata entity set information (see 6.2).

Select *maintenanceAndUpdateFrequency* from napMD\_MaintenanceFrequencyCode.

### 6.6.3. dateOfNextUpdate (O)

Type: Date (see Annex A – A.4)

Description: The scheduled revision date for the resource.

BP: This could be calculated based on the resource reference date (see 6.3.2.1) and the maintenance and update frequency code (see 6.6.2). Typically, this date should become the date of the next resource version, which will be reported in the citation of the resource (see 6.3.2.1), and possibly the next date stamp (see 6.2.8) of its metadata

### 6.6.4. userDefinedMaintenanceFrequency (O)

Type: TM\_PeriodDuration (see Annex A – A.20)

Description: The maintenance period other than those defined.

**6.6.5. updateScope (O,Repeatable)**

Type: CodeList napMD\_ScopeCode

Description: Scope of data to which maintenance is applied.

BP: Select *updateCode* from napMD\_ScopeCode.

**6.6.6. updateScopeDescription (O,Repeatable)**

Type: MD\_ScopeDescription (see 6.5.20)

Description: Additional information about the range or extent of the resource.

**6.6.7. maintenanceNote (O,Repeatable)**

Type: free text

Description: Information regarding specific requirements for maintaining the resource.

**6.6.8. contact (O,Repeatable)**

Type: CI\_ResponsibleParty (see 6.15)

Description: Identification of, and means of communicating with, person(s) and organization(s) with responsibility for maintaining the resource.

BP: Contact information (see 6.15.5 contactInfo) shall be provided.

## 6.7. Spatial representation information

### 6.7.1. Introduction

This section describes attributes and components that provide information about spatial representation information.

Type: MD\_GridSpatialRepresentation (see 6.7.1) and/or MD\_VectorSpatialRepresentation (see 6.7.3) and/or MD\_Georectified (see 6.7.4) and/or MD\_Georeferenceable (see 6.7.5)

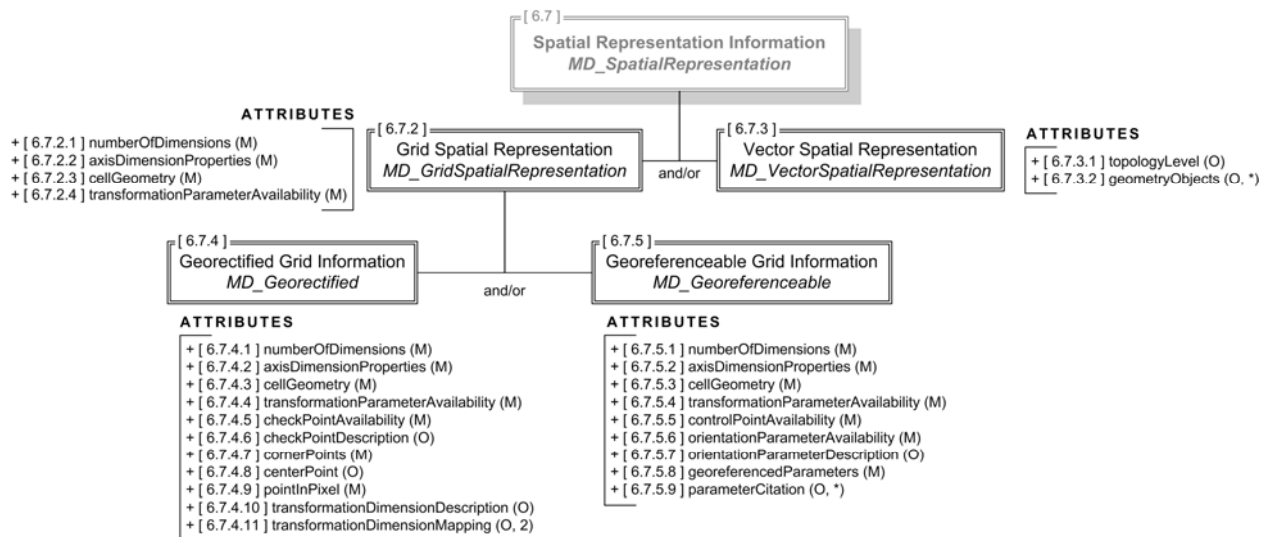


Figure 22: Spatial representation information

The following attributes provide information about grid spatial reference and/or vector spatial representation.

### 6.7.2. Grid Spatial Representation

Type: MD\_GridSpatialRepresentation

Description: Information on the grid system used in the dataset.

BP: Required if dataset objects are gridded.

#### 6.7.2.1. numberOfDimensions (M)

Type: Integer (see Annex A – A.13)

Description: The number of independent spatial-temporal axes.

#### 6.7.2.2. axisDimensionProperties (M)

Type: Sequence<MD\_Dimension> (see 6.7.6)

Description: Number of independent spatial-temporal axes.

#### **6.7.2.3. cellGeometry (M)**

Type: CodeList napMD\_CellGeometryCode

Description: Identification of grid data as point or cell.

BP: Select *cellGeometry* from napMD\_CellGeometryCode.

#### **6.7.2.4. transformationParameterAvailability (M)**

Type: Boolean (see annex A - A.2)

Description: Indication of image coordinates and geographic or map coordinates are available.

### **6.7.3. Vector Spatial Representation**

Type: MD\_VectorSpatialRepresentation

Description: Information about the vector objects in the dataset.

BP: Vector spatial reference is required if point or vector objects exist in the dataset. Either *topologyLevel* or *geometricObjects* shall be provided, or both.

#### **6.7.3.1. topologyLevel (O)**

Type: CodeList napMD\_TopologyLevelCode

Description: Code to identify topology level in the dataset.

BP: Select *topologyLevel* from napMD\_TopologyLevelCode.

#### **6.7.3.2. geometricObjects (O,Repeatable)**

Type: MD\_GeometricObjects (see 6.7.7)

Description: Identification of the objects used to represent features in the dataset.

### **6.7.4. Georectified Grid Information**

Type: MD\_Georectified

Description: Information on the grid used to georectify the data.

#### **6.7.4.1. numberOfDimensions (M)**

Type: Integer (see Annex A – A.13)

Description: Number of independent spatial-temporal axes.

#### **6.7.4.2. axisDimensionProperties (M)**

Type: Sequence<MD\_Dimension> (see 6.7.6)

Description: Number of independent spatial-temporal axes.

**6.7.4.3. cellGeometry (M)**

Type: CodeList napMD\_CellGeometryCode

Description: Identification of grid data as point or cell.

BP: Select *cellGeometry* from napMD\_CellGeometryCode.

**6.7.4.4. transformationParameterAvailability (M)**

Type: Boolean (see annex A - A.2)

Description: Indication of image coordinates and geographic or map coordinates availability.

**6.7.4.5. checkPointAvailability (M)**

Type: Boolean (see annex A - A.2)

Description: Indication of geographic position points availability to test the accuracy of the georeferenced grid data.

**6.7.4.6. checkPointDescription (O)**

Type: free text

Description: Description of geographic position points used to test the accuracy of the georeferenced grid data.

BP: Mandatory if checkPointAvailability = 1 (yes).

**6.7.4.7. cornerPoints (M)**

Type: Sequence<GM\_Point> (see Annex A – A.12)

Description: Location in coordinate system defined by Spatial Reference System and grid coordinates of the cells at opposite ends of the grid coverage along two diagonals in the grid spatial dimension.

BP: At a minimum, two corner points shall be provided along a diagonal. When providing more than two corner points, they shall be in the clockwise order.

**6.7.4.8. centerPoint (O)**

Type: GM\_Point (see Annex A – A.12)

Description: Earth location, represented as a point, in the coordinate system defined by the Spatial Reference System and the grid coordinate of the cell halfway between opposite ends of the grid.

**6.7.4.9. pointInPixel (M)**

Type: CodeList napMD\_PixelOrientationCode

Description: Point in a pixel corresponding to the Earth location of the pixel.

BP: Select *pointInPixel* from napMD\_PixelOrientationCode.

**6.7.4.10. transformationDimensionDescription (O)**

Type: free text

Description: General description of the transformation.

**6.7.4.11. transformationDimensionMapping (O,2)**

Type: free text

Description: Information about which grid axes are spatial axes.

**6.7.5. Georeferenceable Grid Information**

Type: MD\_Georeferenceable

Description: Information on georeferencing the dataset.

**6.7.5.1. numberOfDimensions (M)**

Type: Integer (see Annex A – A.13)

Description: Number of independent spatial-temporal axes.

**6.7.5.2. axisDimensionProperties (M)**

Type: Sequence<MD\_Dimension> (see 6.7.6)

Description: Number of independent spatial-temporal axes.

**6.7.5.3. cellGeometry (M)**

Type: CodeList napMD\_CellGeometryCode

Description: Identification of grid data as point or cell.

BP: Select *cellGeometry* from napMD\_CellGeometryCode.

**6.7.5.4. transformationParameterAvailability (M)**

Type: Boolean (see annex A - A.2)

Description: Indication of image coordinates and geographic or map coordinates are available.

**6.7.5.5. controlPointAvailability (M)**

Type: Boolean (see annex A - A.2)

Description: Indication of control point existence.

**6.7.5.6. orientationParameterAvailability (M)**

Type: Boolean (see annex A - A.2)

Description: Indication of orientation parameters availability.

**6.7.5.7. orientationParameterDescription (O)**

Type: free text

Description: Description of parameters used to describe sensor orientation.

**6.7.5.8. georeferencedParameters (M)**

Type: Record (see Annex A – A.17)

Description: Terms which support grid data georeferencing

**6.7.5.9. parameterCitation (O,Repeatable)**

Type: CI\_Citation (see 6.14)

Description: Citation for the parameter reference.

BP: Strongly recommend to provide contact information (see 6.15.5 contactInfo).

**6.7.6. Dimension**

Type: MD\_Dimension

Description: Information on the dimension name, size, and resolution used.

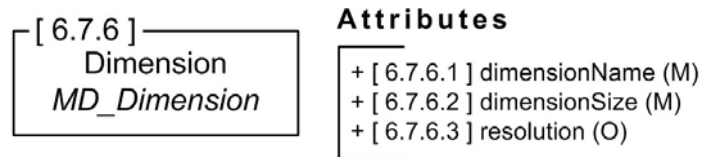


Figure 23: Dimension

**6.7.6.1. dimensionName (M)**

Type: CodeList napMD\_DimensionNameTypeCode

Description: Axis name.

BP: Select *dimensionName* from napMD\_DimensionNameTypeCode.

**6.7.6.2. dimensionSize (M)**

Type: Integer (see Annex A – A.13)

Description: Number of elements along the axes.

**6.7.6.3. resolution (O)**

Type: Measure (see Annex A – A.14)

Description: Degree of detail in the grid dataset.



### 6.7.7. Geometric Objects

Type: MD\_GeometricObjects

Description: Identification of the object type and number of objects in the dataset.

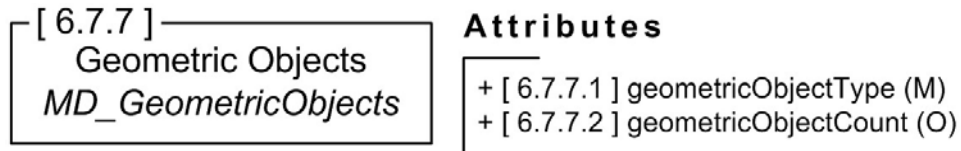


Figure 24: Geometric objects

#### 6.7.7.1. geometricObjectType (M)

Type: CodeList napMD\_GeometricObjectTypeCode

Description: Name of point or vector objects to locate zero, one, two or three dimensional locations in the dataset.

BP: Select *geometricObjectType* from napMD\_GeometricObjectTypeCode.

#### 6.7.7.2. geometricObjectCount (O)

Type: Integer (see Annex A – A.13)

Description: Total number of point or vector objects type in the dataset.

BP: Value greater than 0.

## 6.8. Reference system Information

### 6.8.1. Introduction

This section describes attributes that provide information about reference system information.

Type: MD\_ReferenceSystem

Description: Identification of the spatial and temporal reference systems used.

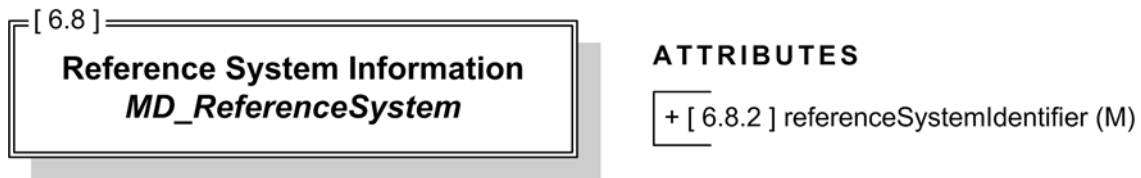


Figure 25: Reference System Information

The following attributes provide information about reference system.

### 6.8.2. referenceSystemIdentifier (M)

Type: RS\_Identifier

Description: Identifier of the Reference System.

BP: If a coordinate reference system (CRS) is not describe in a register and as such as no identifier, then that CRS shall be described according to ISO19111 and ISO/TS19127. A code with an authority is then defined and used here as reference. A dataset that has both a horizontal and a vertical CRS shall use a compound reference system with the horizontal CRS documented first and the vertical CRS documented second.

Note: A CRS identifier should be taken from a register such as EPSG ([www.epsg.org](http://www.epsg.org)).

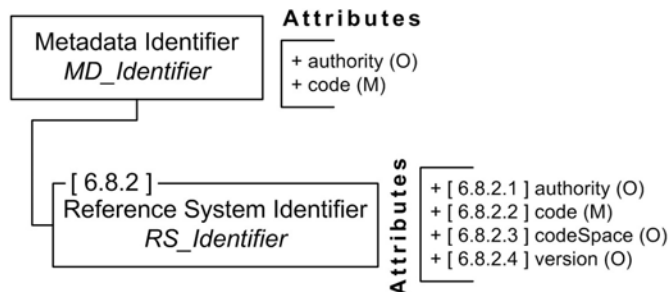


Figure 26: reference system identifier

**6.8.2.1. authority (O)**

Type: CI\_Citation (see 6.14)

Description: The party responsible for maintenance of the reference system resource.

BP: Strongly recommend to provide contact information (see 6.15.5 contactInfo).

**6.8.2.2. code (M)**

Type: free text

Description: The alphanumeric value identifying the source reference system.

**6.8.2.3. codeSpace (O)**

Type: free text

Description: The name organization or party responsible for the reference system resource.

**6.8.2.4. version (O)**

Type: free text

Description: The cited reference system version.

## 6.9. Content information

### 6.9.1. Introduction

This section describes attributes and components that provide information about content information.

Type: MD\_FeatureCatalogueDescription and/or (MD\_CoverageDescription or MD\_Image)

Description: Describes the dataset content.

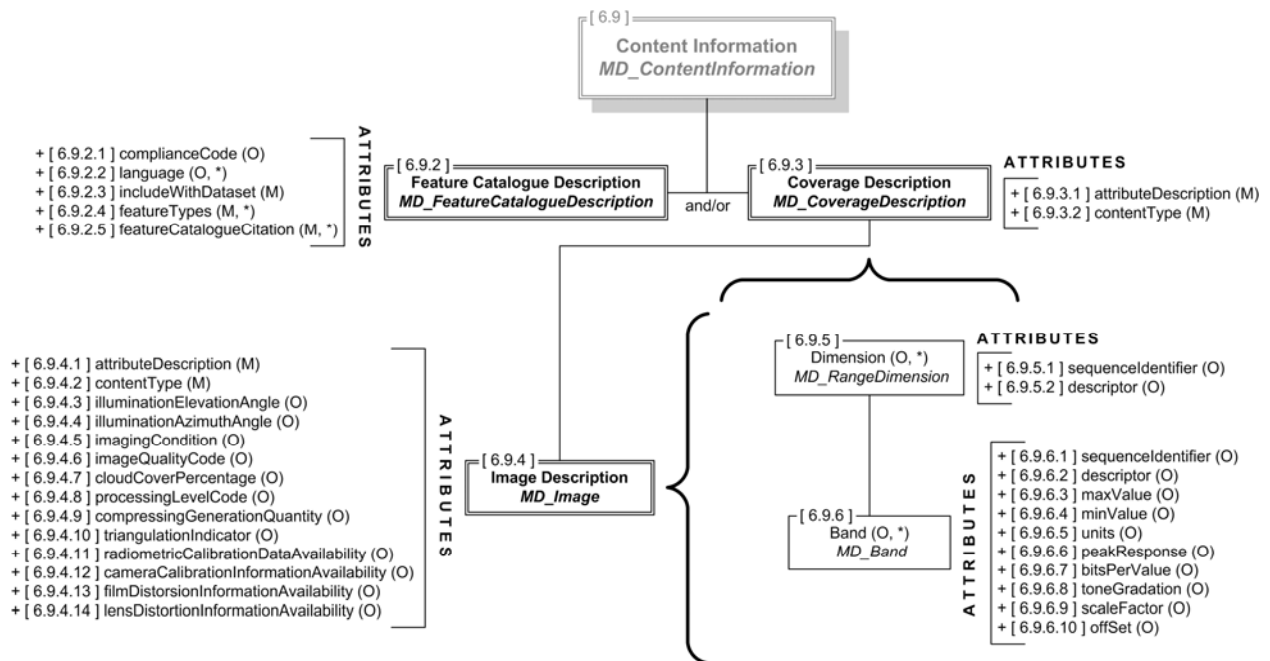


Figure 27: Content information

The following sub items with their attributes and components provide information about content.

### 6.9.2. Feature Catalogue Description

Type: MD\_FeatureCatalogueDescription

Description: Identification of the feature catalogue or the conceptual schema.

#### 6.9.2.1. complianceCode (O)

Type: Boolean (see annex A - A.2)

Description: Indication of whether the cited feature catalogue complies with ISO19110.

BP: 0 = not compliant, 1 = compliant.

#### **6.9.2.2. language (O,Repeatable)**

Type: free text

Description: Language and character coding standards of the feature catalogue.

BP: Three letter language code, a three letter country code, and character coding code:

<ISO639-2/T three letter language code><;><blank space><ISO3166-1 three letter country code><;><blank space><CodeList napMD\_CharacterSetCode>

e.g. FRA; CAN; UTF8

#### **6.9.2.3. includedWithDataset (M)**

Type: Boolean (see annex A - A.2)

Description: Is the feature catalogue included with the dataset?

#### **6.9.2.4. featureTypes (M,Repeatable)**

Type: GenericName (see Annex A – A.8)

Description: Is the feature catalogue included with the dataset?

#### **6.9.2.5. featureCatalogueCitation (M,Repeatable)**

Type: CI\_Citation (see 6.14)

Description: Citation to reference the feature catalogue.

BP: Strongly recommend to provide contact information (see 6.15.5 contactInfo) as part of the citation.

### **6.9.3. Coverage Description**

Type: MD\_CoverageDescription

Description: Information about grid data cell.

#### **6.9.3.1. attributeDescription (M)**

Type: RecordType (see Annex A – A.18)

Description: Description of the cell measurement.

#### **6.9.3.2. contentType (M)**

Type: CodeList napMD\_CoverageContentTypeCode

Description: Information represented by the cell.

BP: Select *contentType* from napMD\_CoverageContentTypeCode.

#### **6.9.3.3. Dimension (O,Repeatable)**

Type: MD\_RangeDimension (see 6.9.5) and/or MD\_Band (see 6.9.6)

Description: Information on the dimensions of the cell measurement value.

## **6.9.4. Image Description**

Type: MD\_Image

Description: Information about an image's suitability for use.

### **6.9.4.1. attributeDescription (M)**

Type: RecordType (see Annex A – A.18)

Description: Description of the cell measurement.

### **6.9.4.2. contentType (M)**

Type: CodeList napMD\_CoverageContentTypeCode

Description: Information represented by the cell.

BP: Select *contentType* from napMD\_CoverageContentTypeCode.

### **6.9.4.3. illuminationElevationAngle (O)**

Type: Real (see Annex A – A.16)

Description: Illumination elevation measured in degrees clockwise for the target plane at intersection of the optical line of sight with the Earth's surface.

BP: Value domain is [-90, 90]. For scanned images, refer to the center pixel of the image.

### **6.9.4.4. illuminationAzimuthAngle (O)**

Type: Real (see Annex A – A.16)

Description: Illumination azimuth measured in degrees clockwise from true north at the time the image is taken.

BP: Value domain is [-0, 360]. Reference the center pixel of the image for scanned images,

### **6.9.4.5. imagingCondition (O)**

Type: CodeList napMD\_ImagingConditionCode

Description: Conditions affecting the image.

BP: Select *imagingCondition* from napMD\_ImagingConditionCode.

### **6.9.4.6. imagingQualityCode (O)**

Type: MD\_Identifier (see 6.22)

Description: Specifies the image quality.

### **6.9.4.7. cloudCoverPercentage (O)**

Type: Real (see Annex A – A.16)

Description: Percentage of dataset area obscured by clouds.

BP: Value domain is [-0.0, 100.0].

**6.9.4.8. processingLevelCode (O)**

Type: MD\_Identifier (see 6.23)

Description: Identification of the image processing level.

**6.9.4.9. compressionGenerationQuantity (O)**

Type: Integer (see Annex A – A.13)

Description: The number of compression cycles performed on the image.

**6.9.4.10. triangulationIndicator (O)**

Type: Boolean (see annex A - A.2)

Description: Indication if triangulation was performed on the image.

BP: 0 = no, 1 = yes

**6.9.4.11. radiometricCalibrationDataAvailability (O)**

Type: Boolean (see annex A - A.2)

Description: Indication if radiometric calibration information to generate radiometrically calibrated standard data product is available.

BP: 0 = no, 1 = yes

**6.9.4.12. cameraCalibrationInformationAvailability (O)**

Type: Boolean (see annex A - A.2)

Description: Indication of camera calibration constants availability.

BP: 0 = no, 1 = yes

**6.9.4.13. filmDistortionInformationAvailability (O)**

Type: Boolean (see annex A - A.2)

Description: Indication of camera calibration information availability.

BP: 0 = no, 1 = yes

**6.9.4.14. lensDistortionInformationAvailability (O)**

Type: Boolean (see annex A - A.2)

Description: Availability of lens aberration correction information.

BP: 0 = no, 1 = yes

**6.9.4.15. Dimension (O,Repeatable)**

Type: MD\_RangeDimension (see 6.9.5) and/or MD\_Band (see 6.9.6)

Description: Information on the dimensions of the cell measurement value.

### **6.9.5. Dimension**

Type: MD\_RangeDescription

Description: Information on the dimensions of the cell measurement value.

BP: Either *sequenceIdentifier* or *descriptor* shall be provided, or both.

#### **6.9.5.1. sequenceIdentifier (O)**

Type: MemberName (see Annex A – A.15)

Description: Sensor band wavelengths.

#### **6.9.5.2. descriptor (O)**

Type: free text

Description: Description of cell value range.

### **6.9.6. Band**

Type: MD\_Band

Description: Range of wavelengths in the electromagnetic spectrum.

BP: Either *sequenceIdentifier* or *descriptor* shall be provided, or both.

#### **6.9.6.1. sequenceIdentifier (O)**

Type: MemberName (see Annex A – A.15)

Description: Sensor band wavelengths.

#### **6.9.6.2. descriptor (O)**

Type: free text

Description: Description of cell value range.

#### **6.9.6.3. maxValue (O)**

Type: Real (see Annex A – A.16)

Description: Longest wavelength the sensor is capable of collecting within the designated band.

#### **6.9.6.4. minValue (O)**

Type: Real (see Annex A – A.16)

Description: Shortest wavelength the sensor is capable of collecting within the designated band.



**6.9.6.5. units (O)**

Type: UomLength (see annex A - A.24)

Description: Sensor wavelength units.

BP: Mandatory if *maxValue* or *minValue* is reported.

**6.9.6.6. peakResponse (O)**

Type: Real (see Annex A – A.16)

Description: Highest wavelength response.

**6.9.6.7. bitsPerValue (O)**

Type: Integer (see Annex A – A.13)

Description: Maximum number of significant bits in the uncompressed representation for the value in each band of each pixel.

**6.9.6.8. toneGradation (O)**

Type: Integer (see Annex A – A.13)

Description: Number of discrete numerical values in the grid data.

**6.9.6.9. scaleFactor (O)**

Type: Real (see Annex A – A.16)

Description: Scale factor applied to each cell value.

**6.9.6.10. offset (O)**

Type: Real (see Annex A – A.16)

Description: The physical value corresponding to a cell value of zero.

## 6.10. Portrayal Catalogue Information

### 6.10.1. Introduction

This section describes attributes that provide information about portrayal catalogue information.

Type: MD\_PortrayalCatalogueReference

Description: Information used to identify and locate the portrayal catalogue.

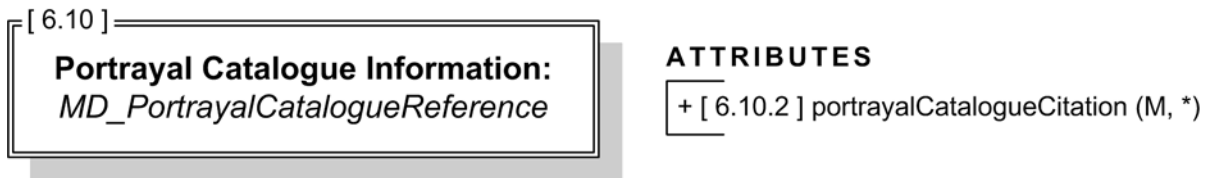


Figure 28: Portrayal catalogue information

The following attribute provides information about portrayal catalogue.

### 6.10.2. portrayalCatalogueCitation

Type: CI\_Citation (see 6.14)

Description: Bibliographic citation for the portrayal catalogue.

BP: Strongly recommend to provide contact information (see 6.15.5 contactInfo).

## 6.11. Distribution Information

### 6.11.1. Introduction

This section describes attributes and components that provide information about distribution information.

Type: MD\_Distribution

Description: Information about the dataset distributor and options to obtain the dataset.

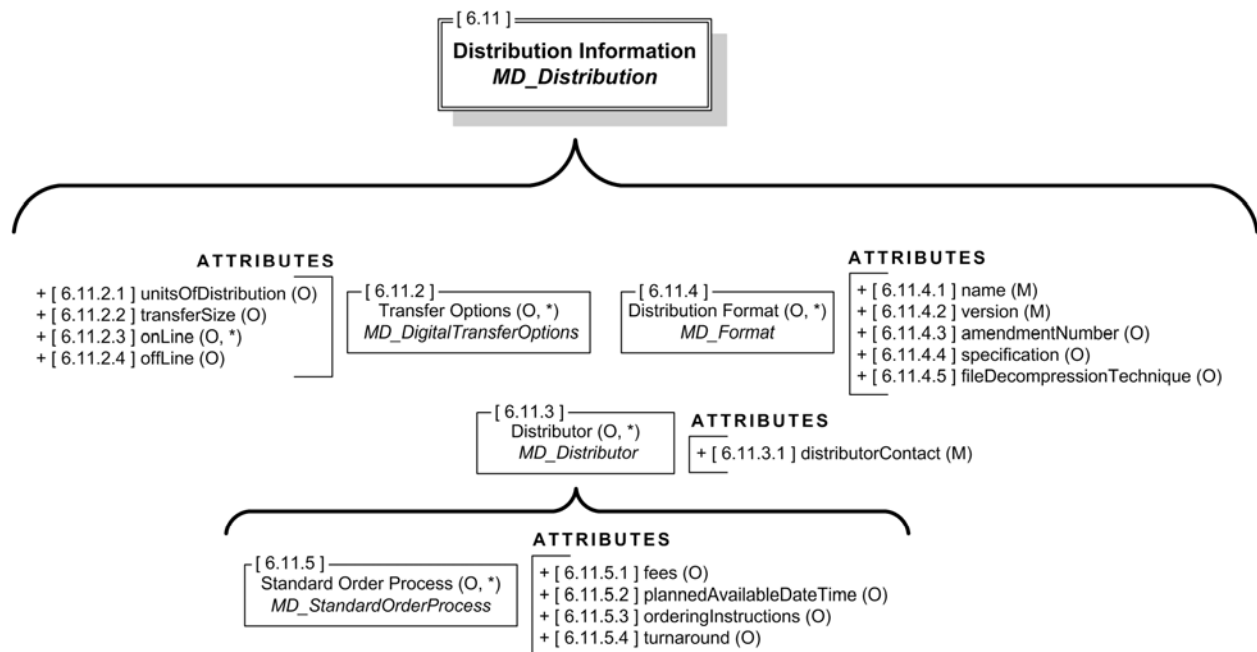


Figure 29: Distribution Information

The following components with their attributes provide information about dataset distribution.

### 6.11.2. Transfer Options (O,Repeatable)

Type: MD\_DigitalTransferOptions

Description: The means and media by which the data/dataset is obtained from the distributor.

BP: At least one of *unitsOfDistribution*, *transferSize*, *onLine*, or *offLine* shall be provided.

#### 6.11.2.1. unitsOfDistribution (O)

Type: free text

Description: Tiles, layers, geographic areas, etc. in which the data is available.

#### **6.11.2.2. transferSize (O)**

Type: Real (see Annex A – A.16)

Description: Estimated size of the transfer unit in the specified format, expressed in megabytes.

BP: Value greater than 0.0

#### **6.11.2.3. onLine (O,Repeatable)**

Type: CI\_OnlineResource (see 6.19)

Description: Information about the online sources where the data/dataset may be obtained.

#### **6.11.2.4. offLine (O)**

Type: MD\_Medium (see 6.11.6)

Description: Information about the offline distribution media.

### **6.11.3. Distributor**

Type: MD\_Distributor

Description: Information about the data distributor.

BP: Mandatory if distribution format information is not provided.

#### **6.11.3.1. distributorContact (M)**

Type: CI\_ResponsibleParty (see 6.15)

Description: Information on party responsible for dataset distribution.

BP: If the distributor name or position name not known then organization name is required. Contact information (see 6.15.5 contactInfo) shall be provided.

#### **6.11.3.2. Standard Order Process (O,Repeatable)**

Type: MD\_StandardOrderProcess (see 6.11.5)

Description: The process to follow when obtaining the dataset.

### **6.11.4. Distribution Format**

Type: MD\_Format

Description: Description of distribution format.

BP: Mandatory if distributor information is not provided.

#### **6.11.4.1. name (M)**

Type: free text

Description: Name of the data transfer format.

**6.11.4.2. version (M)**

Type: free text

Description: Version of the format (date, number, etc).

**6.11.4.3. amendmentNumber (O)**

Type: free text

Description: Format version amendment number.

**6.11.4.4. specification (O)**

Type: free text

Description: The subset name, profile, or product specification of the format.

**6.11.4.5. fileDecompressionTechnique (O)**

Type: free text

Description: Description of recommended processes or algorithms to apply to the compressed resource.

**6.11.5. Standard Order Process**

Type: MD\_StandardOrderProcess

Description: The process in which the resource is obtained or received and other related instructions or fee information.

BP: At least one of *fees*, *plannedAvailableDateTime*, *orderingInstructions* or *turnaround* shall be provided.

**6.11.5.1. fees (O)**

Type: free text

Description: Fees and terms for obtaining the data/dataset.

**6.11.5.2. plannedAvailableDateTime (O)**

Type: DateTime (see Annex A – A.5)

Description: Date and time the resource will be available.

**6.11.5.3. orderingInstructions (O)**

Type: free text

Description: General instructions, terms, and services provided by the data distributor.

**6.11.5.4. turnaround (O)**

Type: free text

Description: Typical time required for filling a data request.

### 6.11.6. Medium

Type: MD\_Medium

Description: Information on the name, density, density units, volumes, transfer method, and media limitations used to transfer the data to a medium.

BP: At least one of *name*, *density*, *volumes*, *mediumFormat* or *mediumNote* shall be provided. *DensityUnits* is mandatory if *density* is provided.

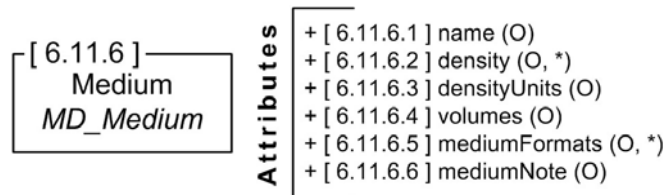


Figure 30: Medium

#### 6.11.6.1. name (O)

Type: CodeList napMD\_MediumNameCode

Description: Medium name code.

BP: Select medium *name* from napMD\_MediumNameCode.

#### 6.11.6.2. density (O,Repeatable)

Type: Real (see Annex A – A.16)

Description: The recording density on the specified media.

BP: Value greater than 0.0.

#### 6.11.6.3. densityUnits (O)

Type: free text

Description: The recording density units.

#### 6.11.6.4. volumes (O)

Type: Integer (see Annex A – A.13)

Description: Identification of the number of recorded items on the media.

BP: Value greater than 0.

#### 6.11.6.5. mediumFormat (O,Repeatable)

Type: CodeList napMD\_MediumFormatCode

Description: Method used to write to the medium.

BP: Select *mediumFormat* from napMD\_MediumFormatCode.

**6.11.6.6. mediumNote (O)**

Type: free text

Description: Description of limitations or requirements for using the medium.

## 6.12. Application Schema Information

### 6.12.1. Introduction

This section describes attributes that provide information about application schema information.

Type: MD\_ApplicationSchemaInformation

Description: Information about the application schema used to develop the dataset.

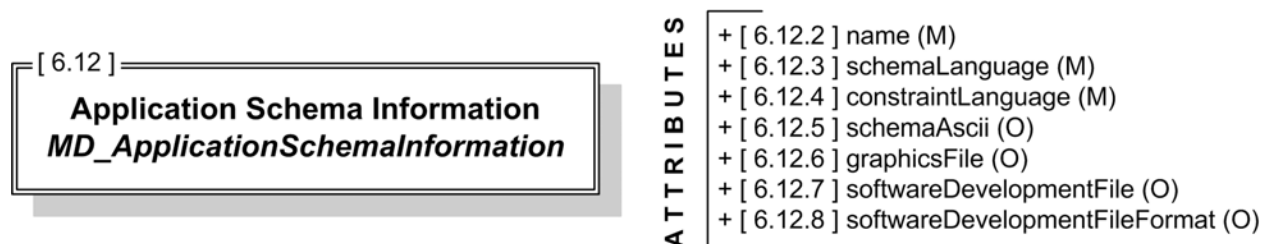


Figure 31: Application schema information

The following attributes provide information about the application schema.

### 6.12.2. name (M)

Type: CI\_Citation (see 6.14)

Description: Citation for the application schema.

BP: Strongly recommend to provide contact information (see 6.15.5 contactInfo).

### 6.12.3. schemaLanguage (M)

Type: free text

Description: identification of the schema language.

### 6.12.4. constraintLanguage (M)

Type: free text

Description: Identification of the formal language used to describe constraints in the application schema.

### 6.12.5. schemaAscii (O)

Type: free text

Description: Full application schema given as an ASCII file.



**6.12.6. graphicsFile (O)**

Type: Binary (see annex A - A.1)

Description: Full application schema given as a graphics file.

**6.12.7. softwareDevelopmentFile (O)**

Type: Binary (see annex A - A.1)

Description: Full application schema given as a software development file.

**6.12.8. softwareDevelopmentFileFormat (O)**

Type: free text

Description: Software dependent format used for the application schema software dependent file.

## 6.13. Extent Information

### 6.13.1. Introduction

This section describes attributes and components that provide information about extent.

Type: EX\_Extent

Description: Describes the spatial, horizontal and/or vertical, and the temporal coverage in the dataset.

BP: At least, one of *description*, *geographic element*, *temporal element* or *vertical element* shall be reported.

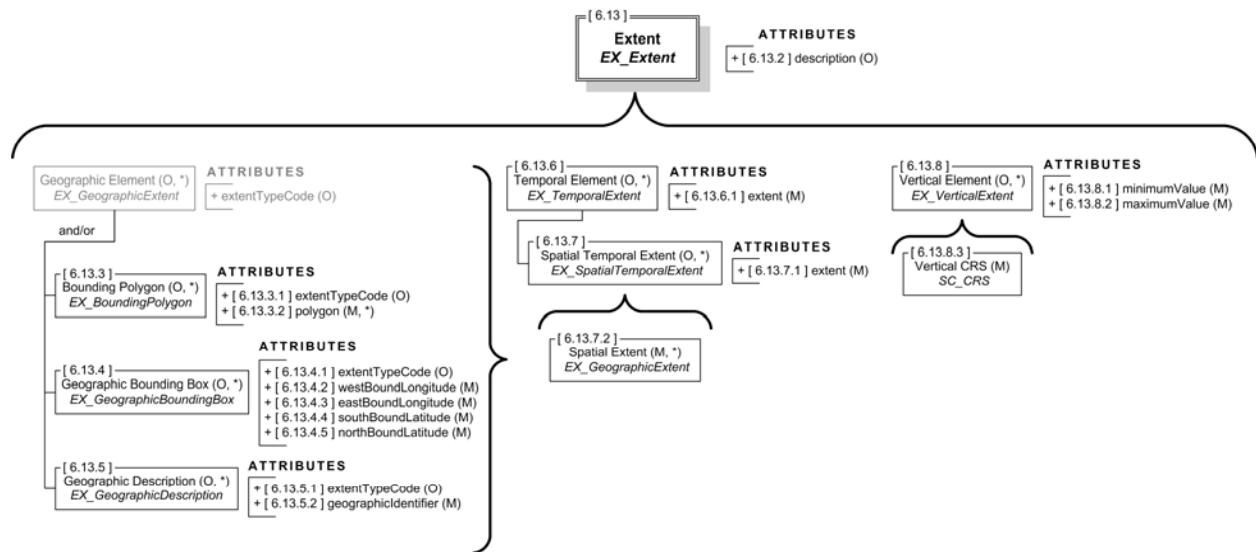


Figure 32: Extent information

### 6.13.2. description (O)

Type: free text

Description: Text which describes the spatial and temporal extent of the dataset.

BP: *Description* is entered if *bounding polygon*, *geographic bounding box*, *geographic description*, *temporal element*, *spatial-temporal extent*, or *vertical element* is not recorded.

### **6.13.3. Bounding Polygon (O,Repeatable)**

Type: EX\_BoundingPolygon

Description: An element which describes inclusions or exclusions in a resource. The enclosed boundary of the dataset expressed in x-y coordinates.

BP: *Bounding polygon* is entered if *description*, *geographic bounding box*, *geographic description*, *temporal element*, *spatial temporal extent*, or *vertical element* is not recorded.

#### **6.13.3.1. extentTypeCode (O)**

Type: Boolean (see annex A - A.2)

Description: Indication of the bounding polygon including or excluding areas or when the dataset includes areas where data does not exist.

BP: 0 = exclusion, 1= inclusion

#### **6.13.3.2. polygon (M,Repeatable)**

Type: GM\_Object (see Annex A – A.11)

Description: Bounding polygon represented by coordinate pairs.

BP: latitude domain [-90, 90], longitude domain [-180, 180].

### **6.13.4. Geographic Bounding Box (O,Repeatable)**

Type: EX\_GeographicBoundingBox

Description: An element which describes inclusions or exclusions in a resource. It consists of an approximation on the horizontal extent of the data represented by a rectangle-like shape.

BP: This is only an approximation and specifying the coordinate reference systems is not needed. *Geographic bounding box* is entered if *description*, *bounding polygon*, *geographic description*, *temporal element*, *spatial temporal extent*, or *vertical element* is not recorded.

#### **6.13.4.1. extentTypeCode (O)**

Type: Boolean (see annex A - A.2)

Description: Indication of the bounding box including or excluding areas or when the dataset includes areas where data does not exist.

BP: 0 = exclusion, 1= inclusion

#### **6.13.4.2. westBoundLongitude (M)**

Type: Decimal (see Annex A – A.6)

Description: Western most coordinate of the dataset extent

**6.13.4.3. eastBoundLongitude (M)**

Type: Decimal (see Annex A – A.6)

Description: Eastern most coordinate of the dataset extent.

**6.13.4.4. southBoundLatitude (M)**

Type: Decimal (see Annex A – A.6)

Description: Southern most coordinate of the dataset extent.

**6.13.4.5. northBoundLatitude (M)**

Type: Decimal (see Annex A – A.6)

Description: Northern most coordinate of the dataset extent.

**6.13.5. Geographic Description (O,Repeatable)**

Type: EX\_GeographicDescription

Description: An element which describes inclusions or exclusions in a resource. The description of the geographic extent is described by an identifier.

BP: *Geographic description* is entered if *description*, *bounding polygon*, *geographic bounding box*, *temporal element*, *spatial temporal extent*, or *vertical element* is not recorded.

**6.13.5.1. extentTypeCode (O)**

Type: Boolean (see annex A - A.2)

Description: Indication of the bounding box including or excluding areas or when the dataset includes areas where data does not exist.

BP: 0 = exclusion, 1= inclusion

**6.13.5.2. geographicIdentifier (M)**

Type: MD\_Identifier (see 6.22)

Description: Information which identifies the geographic area through the use of a unique name established and maintained by and authority.

**6.13.6. Temporal Element (O,Repeatable)**

Type: EX\_TemporalExtent

Description: The time period related to the dataset content.

BP: A temporal element could be used to describe either the time period covered by the content of the dataset (e.g. during the Jurassic) or the date and time when the data has been collected (e.g. the date on which the geological study was completed). If both are needed, then two temporal extents shall be provided. The use of multiple temporal extents shall be explained in the attribute *description* of the extent (see 6.13.2).

*Temporal element* is entered if *description, bounding polygon, geographic bounding box, geographic description, spatial temporal extent, or vertical element* is not recorded.

#### **6.13.6.1. extent (M)**

Type: TM\_Primitive (see Annex A – A.21)

Description: The date and time of the dataset content.

BP: Even if TM\_Primitive allows the description of an instant, a time period is expected here.

#### **6.13.7. Spatial Temporal Element (O,Repeatable)**

Type: EX\_TemporalExtent

Description: Dataset extent in respect to date and or time and spatial boundaries.

BP: A spatial temporal element can be used as a substitute to temporal element.

*Spatial temporal element* is entered if *description, bounding polygon, geographic bounding box, geographic description, temporal extent, or vertical element* is not recorded.

#### **6.13.7.1. extent (M)**

Type: TM\_Primitive (see Annex A – A.21)

Description: The date and time of the dataset.

#### **6.13.7.2. spatialExtent (M,Repeatable)**

Type: EX\_BoundingPolygon (see 6.13.3) and/or EX\_GeographicBoundingBox (see 6.13.4) and/or EX\_GeographicDescription (see 6.13.5)

Description: The description of dataset spatial extent in respect to temporal extent.

#### **6.13.8. Vertical Element (O,Repeatable)**

Type: EX\_VerticalExtent

Description: The elements which express the minimum and maximum of the vertical extent of the dataset.

BP: *Vertical element* is entered if *description, bounding polygon, geographic bounding box, geographic description, temporal extent, or spatial temporal element* is not recorded.

#### **6.13.8.1. minimumValue (M)**

Type: Real (see Annex A – A.16)

Description: Lowest vertical extent in the dataset

#### **6.13.8.2. maximumValue (M)**

Type: Real (see Annex A – A.16)

Description: Highest vertical extent in the dataset.

### **6.13.8.3. Vertical CRS (M)**

Type: SC\_CRS (see Annex A – A.19)

Description: Information about the coordinate system used as the reference system for measuring vertical extent.

## 6.14. Citation

### 6.14.1. Introduction

This section describes attributes that provide information about citation.

Type: CI\_Citation

Description: Bibliographic information to reference the resource.

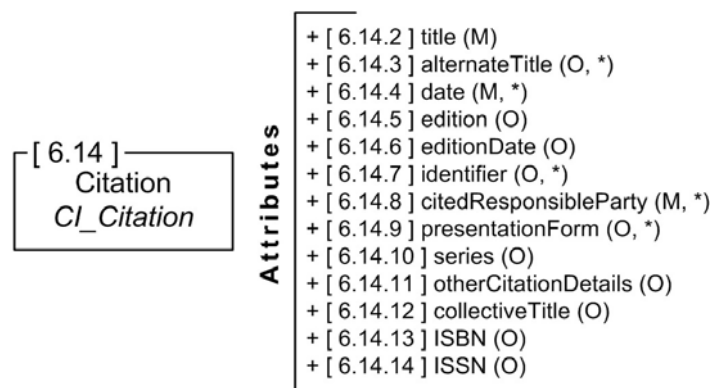


Figure 33: Citation

### 6.14.2. title (M)

Type: free text

Description: Name by which the cited resource is known.

### 6.14.3. alternateTitle (O,Repeatable)

Type: free text

Description: Short name or other language name by which the cited information is known, e.g. "DCW" as an alternative title for "Digital Chart of the World."

### 6.14.4. date (M,Repeatable)

Type: CI\_Date (see 6.18)

Description: Reference date for the cited resource; reference date and event used to describe it.

### 6.14.5. edition (O)

Type: free text

Description: Version of the cited resource.

#### **6.14.6. editionDate (O)**

Type: Date (see Annex A – A.4)

Description: Reference date for the cited resource.

#### **6.14.7. identifier (O,Repeatable)**

Type: MD\_Identifier (see 6.22)

Description: A unique value that identifies an object in a given namespace.

BP: In MD\_Identifier, the namespace is stored in the attribute *authority* and the ID is stored in the attribute *code*. For example, the 1:50 000 map sheet of Sherbrooke in Canada is identified by the code “21E05” under the authority of “National Topographic System.”

#### **6.14.8. citedResponsibleParty (M,Repeatable)**

Type: CI\_ResponsibleParty (see 6.15)

Description: Identification of the contact for the resource.

#### **6.14.9. presentationForm (O,Repeatable)**

Type: CodeList napCI\_PresentationFormCode

Description: The form in which the resource is available.

BP: Select *presentationForm* from napCI\_PresentationFormCode.

#### **6.14.10. series (O)**

Type: CI\_Series (see 6.20)

Description: Information about the series or collection which the resource is a part.

#### **6.14.11. otherCitationDetails (O)**

Type: free text

Description: Other information to complete a citation.

#### **6.14.12. collectiveTitle (O)**

Type: free text

Description: Information about the combined resource which the dataset is a part. The description may include information on other volumes which are also available.



#### **6.14.13. ISBN (O)**

Type: free text

Description: The international standard book number (ISBN) assigned by an ISBN authority to a publication such as a book, a pamphlet, a educational kit, a microform, a CD-ROM or another digital or electronic publication.

#### **6.14.14. ISSN (O)**

Type: free text

Description: The international standard serial number (ISSN) assigned by an ISSN authority to a serial publication, such as a periodical, a newspaper, an annual, a journal or a monographic series.

## 6.15. Responsible party

### 6.15.1. Introduction

This section describes attributes that provide information about responsible party.

Type: CI\_ResponsibleParty

Description: The identification of those responsible for the resource and the party's role in the resource.

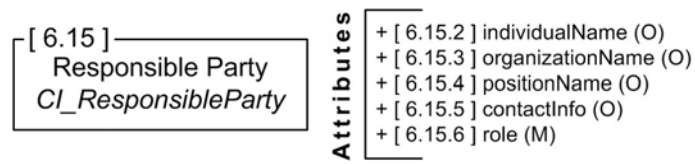


Figure 34: Responsible party

### 6.15.2. individualName (O)

Type: free text

Description: The name of the individual responsible for a reported action in the resource.

BP: *individualName* shall be provided if *organizationName* and/or *positionName* are not provided.

### 6.15.3. organizationName (O)

Type: free text

Description: Name of the responsible organization.

BP: *organizationName* shall be provided if *individualName* and/or *positionName* are not provided. *organizationName* is preferred.

### 6.15.4. positionName (O)

Type: free text

Description: Position of the responsible person.

BP: *positionName* shall be provided if *individualName* and/or *organizationName* are not provided.

**6.15.5. contactInfo (O)**

Type: CI\_Contact (see 6.17)

Description: Information required enabling contact with the responsible person and/or organization.

**6.15.6. role (M)**

Type: CodeList napCI\_RoleCode

Description: Function performed by the responsible party.

BP: Select *role* from napCI\_RoleCode.

## 6.16. Address

### 6.16.1. Introduction

This section describes attributes that provide information about address.

Type: CI\_Address

Description: Physical and email address at which the organization or individual may be contacted.

BP: At least one of the attributes below shall be provided.

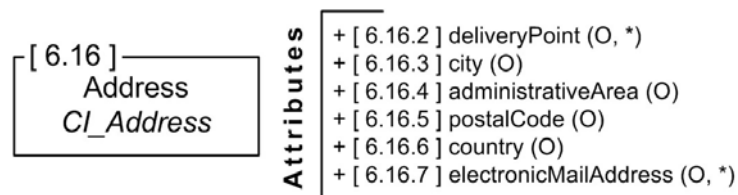


Figure 35: Address

### 6.16.2. deliveryPoint (O)

Type: free text

Description: Address line for the location.

BP: The delivery point is described according to one of the following:

- a) addressType; street number; street name; floor ID; room/suite ID
- b) addressType; street number; street name; floor ID; room/suite ID
- c) addressType; box number; post office name

The addressType is either “postal” or “physical.” For the case c), it shall be “postal.”

Information not available or not applicable is left blank.

Example: “physical; 2144; King West; ; 010” consists in a physical address of 2144 King West street with no floor information, and a room/suite ID of 010.

### 6.16.3. city (O)

Type: free text

Description: City of the address.

### 6.16.4. administrativeArea (O)

Type: free text

Description: State or province of the address.

**6.16.5. postalCode (O)**

Type: free text

Description: administrative spatial code which assists mail and parcel delivery.

**6.16.6. country (O)**

Type: free text

Description: Country of the physical address.

**6.16.7. electronicMailAddress (O,Repeatable)**

Type: free text

Description: The electronic mailbox address of the responsible organization or individual.

## 6.17. Contact

### 6.17.1. Introduction

This section describes attributes that provide information about contact.

Type: CI\_Contact

Description: Information which assists one to contact an individual or organization.

BP: One of *phone*, *address* or *onlineResource* shall be provided.

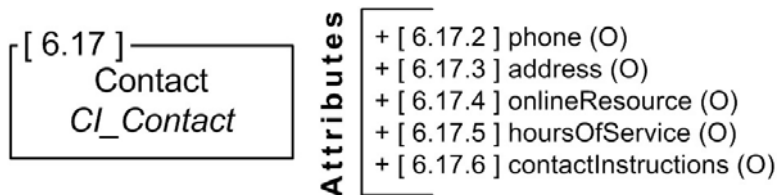


Figure 36: Contact

### 6.17.2. phone (O)

Type: CI\_Telephone (see 6.21)

Description: Telephone numbers to contact the organization or individual.

### 6.17.3. address (O)

Type: CI\_Address (see 6.16)

Description: Physical and email address to contact the organization or individual.

### 6.17.4. onlineResource (O)

Type: CI\_OnlineResource (see 6.19)

Description: Information about Internet hosted resources: availability; URL; protocol used; resource name; resource description, and resource function.

### 6.17.5. hoursOfService (O)

Type: free text

Description: Time period (including time zone) when individuals can contact the organization or individual.

**6.17.6. contactInstructions (O)**

Type: free text

Description: Supplemental instructions on how or when to contact the individual or organization.

## 6.18. Date

### 6.18.1. Introduction

This section describes attributes that provide information about citation.

Type: CI\_Date

Description: The date in which the event or action occurred.

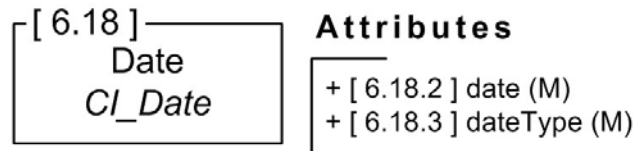


Figure 37: Date

### 6.18.2. date (M)

Type: Date (see Annex A – A.4)

Description: The date in which the event or action occurred.

BP: Date is represented minimally as a four digit representation for year-YYYY.

### 6.18.3. dateType (M)

Type: CodeList napCI\_DateTypeCode

Description: Identification of the event used for the temporal aspects in the resource.

BP: Select *dateType* from napCI\_DateTypeCode.



## 6.19. Online resource

### 6.19.1. Introduction

This section describes attributes that provide information about online resource.

Type: CI\_OnlineResource

Description: Information on the Internet available resource.

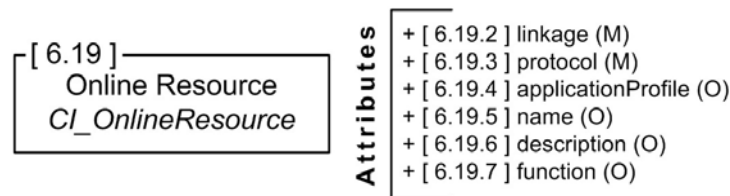


Figure 38: Online resource

### 6.19.2. linkage (M)

Type: URL (see Annex A – A.25)

Description: Internet location (address) for on-line access which uses a Uniform Resource Locator address or similar addressing scheme such as [www.isotc211.org](http://www.isotc211.org) or [ftp.isotc211.org](ftp://ftp.isotc211.org).

### 6.19.3. protocol (M)

Type: free text

Description: The connection protocol to be used such as http, ftp, etc.

### 6.19.4. applicationProfile (O)

Type: free text

Description: Name of an application profile that can be used with the online resource.

### 6.19.5. name (O)

Type: free text

Description: Name of the online resource.

### 6.19.6. description (O)

Type: free text

Description: A detailed text description of the online resource

**6.19.7. function (O)**

Type: CodeList napCI\_OnlineFunctionCode

Description: Code for function performed by the online resource.

BP: Select *function* from napCI\_OnlineFunctionCode.

## 6.20. Series

### 6.20.1. Introduction

This section describes attributes that provide information about series.

Type: CI\_Series

Description: Information about a serial publication.

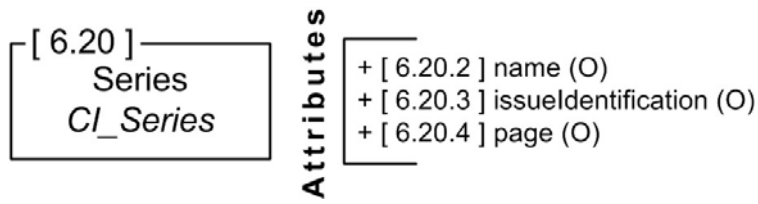


Figure 39: Series

### 6.20.2. name (O)

Type: URL (see Annex A – A.25)

Description: Name of the publication series or aggregate dataset which the referenced dataset is a part.

BP: *name* shall be provided if *issueIdentification* is not provided.

### 6.20.3. issueIdentification (O)

Type: free text

Description: Identification of the series' issue information.

BP: *issueIdentification* shall be provided if *name* is not provided.

### 6.20.4. page (O)

Type: free text

Description: Identification of the articles' page number(s).

## 6.21. Telephone

### 6.21.1. Introduction

This section describes attributes that provide information about telephone.

Type: CI\_Telephone

Description: Information on the telephone numbers used to contact the responsible individual or organization.

BP: Voice or Facsimile is required.

### 6.21.2. voice (O)

Type: free text

Description: Telephone number of an organization or individual.

BP: The structure of the phone number is:

“phoneType: countryCode (areaCode) localNumber”

The *phoneType* values are either “voice” or “TDD/TTY.”

e.g. {voice:1 (819) 5645600}

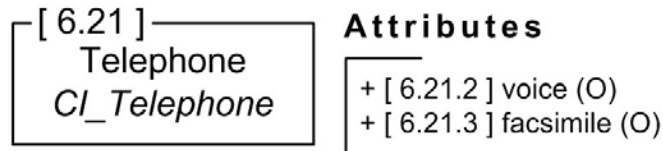


Figure 40: Telephone

### 6.21.3. facsimile (O)

Type: free text

Description: Facsimile telephone number of an organization or individual.

BP: the structure of the facsimile number is:

“countryCode (areaCode) localNumber”

e.g. {1 (819) 5645698}

## 6.22. Identifier

### 6.22.1. Introduction

This section describes attributes that provide information about identification.

Type: MD\_Identifier

Description: Information about the unique identification of an object.

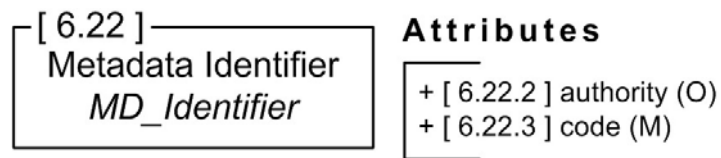


Figure 41: Metadata identifier

### 6.22.2. authority (O)

Type: CI\_Citation (see 6.14)

Description: Recognized responsible party or organization for a reference.

### 6.22.3. code (M)

Type: free text

Description: The alphanumeric value that identifies a resource.

## 7. Cultural and Linguistic Adaptability

NAP – Metadata supports cultural and linguistic adaptability. It means that metadata is reported according to identified languages to serve cultures, application areas, professions, etc. Accordingly, three mechanisms are recognized in this profile:

1. Metadata language and CharacterSet;
2. Locale and free text attributes; and
3. Metadata element and code list register.

### 7.1. Metadata language and CharacterSet

Metadata elements are primarily reported in a specific language and an encoding character set. That language and character set shall be identified in the attributes *language* and *CharacterSet* respectively, both at the metadata root level – i.e. Metadata Entity Set Information (MD\_Metadata). In this profile, the language identification is composed of a language identifier agreeing with ISO639-2/T three letter terminology code and a country identifier agreeing with ISO3166-1 three letter code separated by “:” and blank space character (e.g. “fra: can”). Therefore, any character string metadata element reported in that language only can use a CharacterString data type as defined in ISO/TS19103:2005.

### 7.2. Locale and free text attributes

Metadata may need to be reported in multiple languages. This is the case in Canada, which has two official languages. For this purpose, this profile allows the representation of free text metadata using the characterString type described in ISO19139:2006. Accordingly, the primary language used for metadata description shall be identified with the attributes *language* and *characterSet* respectively of the Metadata Entity Set Information (see 6.2.2 and 6.2.3). Any additional languages shall be identified in the attribute *locale* of the Metadata Entity Set Information. The attribute *locale* is documented in conformity with the PT\_Locale type as defined in ISO19139:2006 and depicted in Figure 42.

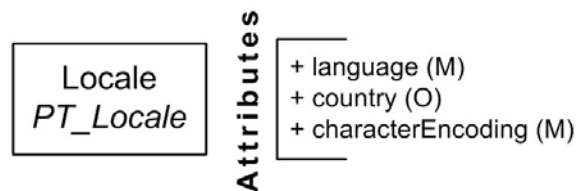


Figure 42: Locale

Consequently, free text metadata can then be reported within any declared languages by the way of a localized character string type. A localized character string is a string of characters that comes along with its locale identification (Figure 43).

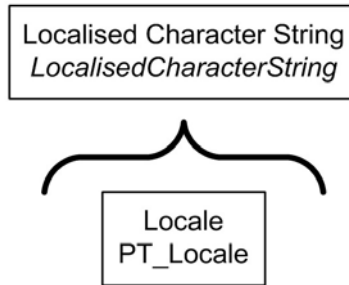


Figure 43: LocalisedCharacterString

ISO19139:2006 defines LocalizedCharacterString and PT\_FreeText as subtypes of CharacterString (Figure 44). LocalizedCharacterString is a single instance of localized character string whereas PT\_FreeText is an aggregate of at least one LocalizedCharacterString instance. Therefore, CharacterString, LocalizedCharacterString, or PT\_FreeText can be used to report free text metadata attributes.

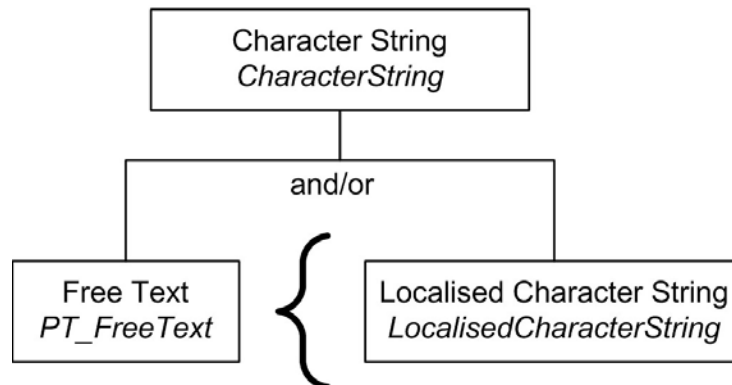


Figure 44: Character String, Localised Character String, and Free Text

Consequently, the following rules apply when using CharacterString, LocalisedCharacterString, and PT\_FreeText:

1. CharacterString shall be used when
  - a free text metadata attribute is reported in the primary metadata language and character set (attribute *language* and *characterSet* of MD\_Metadata); or
  - a free text metadata attribute is reported without reference to any language but according to the primary character set (attribute *characterSet* of MD\_Metadata) Typically, this is the case for proper nouns, which are essentially identifiers for people, things, events, etc.;
2. LocalisedCharacterString shall be used when a free text metadata attribute is reported in one and only one of the additional metadata languages and character sets (attribute *locale* of MD\_Metadata);
3. PT\_FreeText shall be used when a free text metadata element is reported in more than one language and character set identified as primary and additional languages.

### **7.3. Metadata register**

NAP – Metadata also supports cultural and linguistic adaptability through the implementation of a metadata register. The metadata register identifies and provides definition of all metadata items, sub items, components, attributes, code lists, and coded values of that are part of NAP – Metadata in both English and French. Clause 9 provides the details of the register.



## 8. Code Lists

In order to standardize allowable textual values for metadata elements, NAP – Metadata makes use of code lists. A code list is an open enumeration of values. It is a flexible mechanism permitting to extend code lists as needed. NAP – Metadata code lists are based on ISO19115:2003 code lists. Essentially, NAP – Metadata uses some of the ISO19115:2003 code lists as is and extends others. Additionally, it develops new code lists for the purpose of this profile. NAP – Metadata code lists reuse ISO19115:2003 code lists that are prefixed “CI\_”, “DQ\_”, “DS\_”, and “MD\_” and also define new ones. NAP – Metadata code lists are prefixed “napDQ\_”, “napDS\_”, and “napMD\_”. In Figure 45 examples, the napCI\_DateCodeType code list reuses the ISO19115:2003 CI\_DateTypeCode and adds five new values (shown in bold face) for the NAP – Metadata purpose, and napMD\_FileFormatCode is a new one added to the profile.

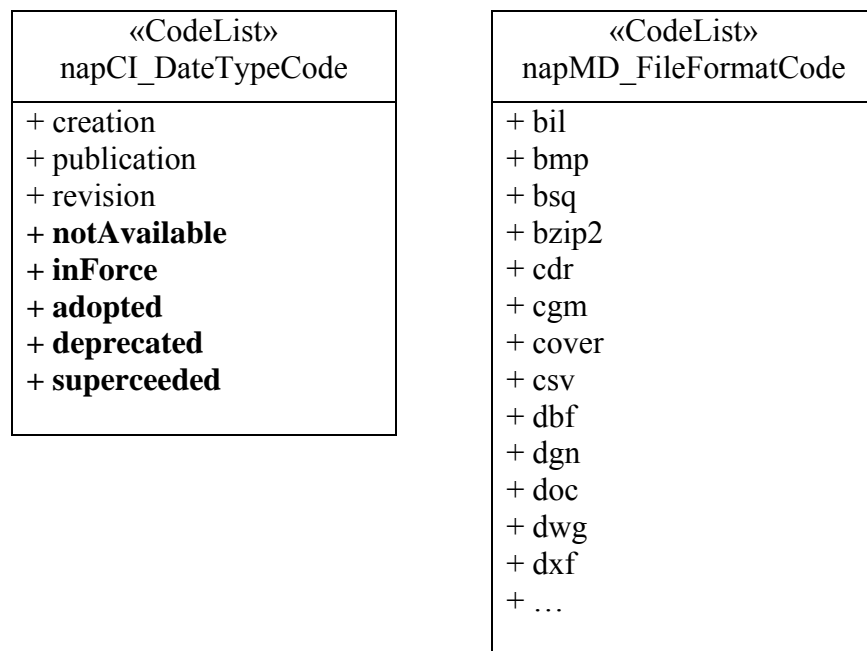


Figure 45: Examples of NAP – Metadata code list

NAP –Metadata code lists shall be used to claim compliance this profile.

It is not the intention of this document to list all code lists and coded values that are needed for NAP – Metadata. The code lists and coded values are managed as part of and made available from the NAP-Metadata Register that is introduced in Clause 9. As such, code lists and coded values are available in the various languages handled by the register.

## 9. NAP – Metadata Register

Among other challenges, NAP – Metadata provides a solution to cultural and linguistic adaptability by introducing a multilingual register, i.e. *NAP – Metadata Register*. The NAP – Metadata Register manages the meaning of metadata items, code lists, and coded values that are needed for this profile in the languages that are required for North America. As such, code lists and coded values may evolve as needed without affecting this profile. The NAP – Metadata Register is ISO19135:2005 compliant.

The following apply to the NAP – Metadata register:

- name: North American Profile of ISO19115:2003 Metadata Register
- Uniform resource identifier (URI): <http://napmetadata.org>  
Note: The URI must be confirmed.
- Operating language: English

## 10. Extending the Profile

Although NAP – Metadata do not provide explicit instructions for its extension process, it is still possible to expand this profile. To that end, the *Metadata extension methodology* from Annex F of *ISO19115:2003, Geographic information – Metadata* along with *ISO19106:2004, Geographic Information – Profiles* must be followed.

However before developing NAP – Metadata extensions, the following notices are given:

- Before developing any extension to this profile, it is important to recognize that these extensions will not be interoperable outside of the specific community for which they will be developed;
- Therefore before initiating any extension development, a complete and careful study of the “Metadata Content” section of this profile along with the NAP-Metadata Register shall be conducted in order to identify appropriate ways and coded values to document metadata. Extensions might not be required if existing metadata items and coded values meet the requirements;
- The review of any available formal NAP – Metadata extensions must also be considered before developing others as they might fulfill the needs and be reused.

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## **Annex A**

### **Data Types**

(normative)

#### **A.1 Binary**

Any binary data (e.g. image, sound) encoded as a sequence of bits.

(see *ISO/TS19133:2005, Geographic information – Location based services – Tracking and navigation*, clause 10.2.3).

#### **A.2 Boolean**

Truth value representing true or false. True can be represented by {true, 1} and false by {false, 0}

(see *ISO/TS19103:2005, Geographic information - Conceptual schema language*, clause 6.5.2.11).

#### **A.3 CharacterString**

An arbitrary-length sequence of characters, including accents and special characters from the identified character set.

#### **A.4 Date**

Date gives values for the representation of:

1. year, e.g. 2006
2. year and month, e.g. 2006-10;
3. year, month, and day, e.g. 2006-10-01-05:00;
4. year, month, day, and time, e.g. 2006-10-01T12:00:00-05:00 (see A.5 DateTime).

Case 3 and 4 include optionally a time zone representation showing the time shift related to Coordinated Universal Time (UTC) origin.

(see *ISO/TS19103:2005, Geographic information - Conceptual schema language*, clause 6.5.2.8, and *ISO/TS19139:2007, Geographic information – Metadata – XML schema implementation*, clause 8.5.8.4.7)

#### **A.5 DateTime**

Date gives values for the representation of year, month, day, and time of the day in terms of hours, minutes, and second, with an optional time zone. Example 2006-10-01T12:00:00-05:00 corresponds to noon on October 1st, 2002, Eastern Standard Time in the U.S.

(see *ISO/TS19103:2005, Geographic information - Conceptual schema language*, clause 6.5.2.8, and *ISO/TS19139:2007, Geographic information – Metadata – XML schema implementation*, clause 8.5.8.4.7)

## **A.6 Decimal**

A number that represents an exact value, e.g. 2.5, 5.25, 12.125

(see *ISO/TS19103:2005, Geographic information - Conceptual schema language*, clause 6.5.2.4).

## **A.7 Distance**

Measure of length between two points.

(see *ISO/TS19103:2005, Geographic information - Conceptual schema language*, clause 6.5.7.7).

## **A.8 GenericName**

Abstract class for the representation of a name in a namespace. A `GenericName` can be either a `LocalName` of a `ScopedName`. A `LocalName` is either a `MemberName` (see A.15) or a `TypeName`. A `TypeName` is a name that references either a `RecordType` or an object in a schema.

(see *ISO/TS19103:2005, Geographic information - Conceptual schema language*, clause 6.5.6.3).

## **A.9 GF\_AttributeType**

*ISO19109:2005, Geographic information – Rules for application schema metaclass* used for the representation of an attribute of a class of features, e.g. “numberOfLane”, and “buildingUsage.”

(see *ISO19109:2005, Geographic information – Rules for application schema*, clause 7.3.6).

## **A.10 GF\_FeatureType**

*ISO19109:2005, Geographic information – Rules for application schema metaclass* used for the representation of a class of features, e.g. “road”, “river”, and “building.”

(see *ISO19109:2005, Geographic information – Rules for application schema*, clause 7.3.4).

## **A.11 GM\_Object**

*ISO19107:2003, Geographic information – Spatial schema* abstract classes standing for any geometric objects (e.g. `GM_Point`, `GM_Curve`, `GM_Surface`) for the representation of the geometry of objects.

(see *ISO19107:2003, Geographic information – Spatial schema*, clause 6.2.2).

### **A.12 GM\_Point**

*ISO19107:2003, Geographic information – Spatial schema* data type for the representation of a single point.

(see *ISO19107:2003, Geographic information – Spatial schema*, clause 6.3.11).

### **A.13 Integer**

A signed number with no fractional part, e.g. -12, 125, 12000963.

(see *ISO/TS19103:2005, Geographic information - Conceptual schema language*, clause 6.5.2.3).

### **A.14 Measure**

A value resulting from the process to evaluate an amount or a quantity expressed in a unit of measure.

(see *ISO/TS19103:2005, Geographic information - Conceptual schema language*, clause 6.5.7.2).

### **A.15 MemberName**

Name that references an attribute in a record, a RecordType, an attribute, an operation, or an association role.

(see *ISO/TS19103:2005, Geographic information - Conceptual schema language*, clause 6.5.6.7).

### **A.16 Real**

A signed floating point number composed of a mantissa and an optional exponent, e.g. -2E5, 364.236E8, 15.32e-3, 24, -0, 0.

(see *ISO/TS19103:2005, Geographic information - Conceptual schema language*, clause 6.5.2.5).

### **A.17 Record**

A structure of logically related elements.

(see *ISO/TS19103:2005, Geographic information - Conceptual schema language*, clause 6.5.5).

### **A.18 RecordType**

Specification of the content and structure of a Record.

(see *ISO/TS19103:2005, Geographic information - Conceptual schema language*, clause 6.5.5).

### **A.19 SC\_CRS**

Coordinate reference system documented according to *ISO/TS19111:2003, Geographic information – Spatial referencing by coordinates*.

### **A.20 TM\_PeriodDuration**

Time span of an object or an event. A TM\_PeriodDuration of 5 year, 1 months, 6 days, 12 hours, and 35 minutes is represented by P5Y1M6DT10H35M. Any subset of this representation is allowed as long as one unit is represented, e.g. a period duration of minus 80 days is represented as -P80D.

(see *ISO19108:2003, Geographic information – Temporal schema*, clause 5.2.3.7).

### **A.21 TM\_Primitive**

TM\_Primitive is an abstract data type for temporal geometric primitives (TM\_Instant and TM\_Period) and temporal topological primitives (TM\_Node and TM\_Edge).

(see *ISO19108:2003, Geographic information – Temporal schema*, clause 5.2.2).

### **A.22 Type**

Any acceptable data type.

### **A.23 UnitOfMeasure**

A quantity adopted as a standard unit of measure, e.g. metre, degree, kilogram.

(see *ISO/TS19103:2005, Geographic information - Conceptual schema language*, clause 6.5.7.3).

### **A.24 UomLength**

Reference quantities to express the value of a length, e.g. metre

(see *ISO/TS19103:2005, Geographic information - Conceptual schema language*, clause 6.5.7.8).

### **A.25 URL**

A uniform resource locator, e.g. <http://napmetadata.org>



## **Annex B**

### **Metadata Schemas**

(normative)

#### **B.1 NAP – Metadata UML diagram differences**

Metadata for describing geographic data is defined using an abstract object model in the Unified Modelling Language (UML). The diagrams in the following sub clauses provide “views,” which are portions of the total abstract model for metadata. Each diagram defines a metadata section (UML package) of related entities, elements, data types, and code lists. Related entities, which are defined in another diagram, are shown with elements suppressed and the defining package specified under the entity name in parenthesis. Throughout the following models, entities may have mandatory and/or optional elements and associations. In some cases, optional entities may have mandatory elements; those elements become mandatory only if the optional element is used.

In the UML diagrams shown in this annex, classes and relationships in light grey are not used in NAP – Metadata and notes in light grey entitled “NAP – Metadata” highlight changes from *ISO19115:2003 Geographic information – Metadata* to NAP-Metadata



## B.2.2 Identification information

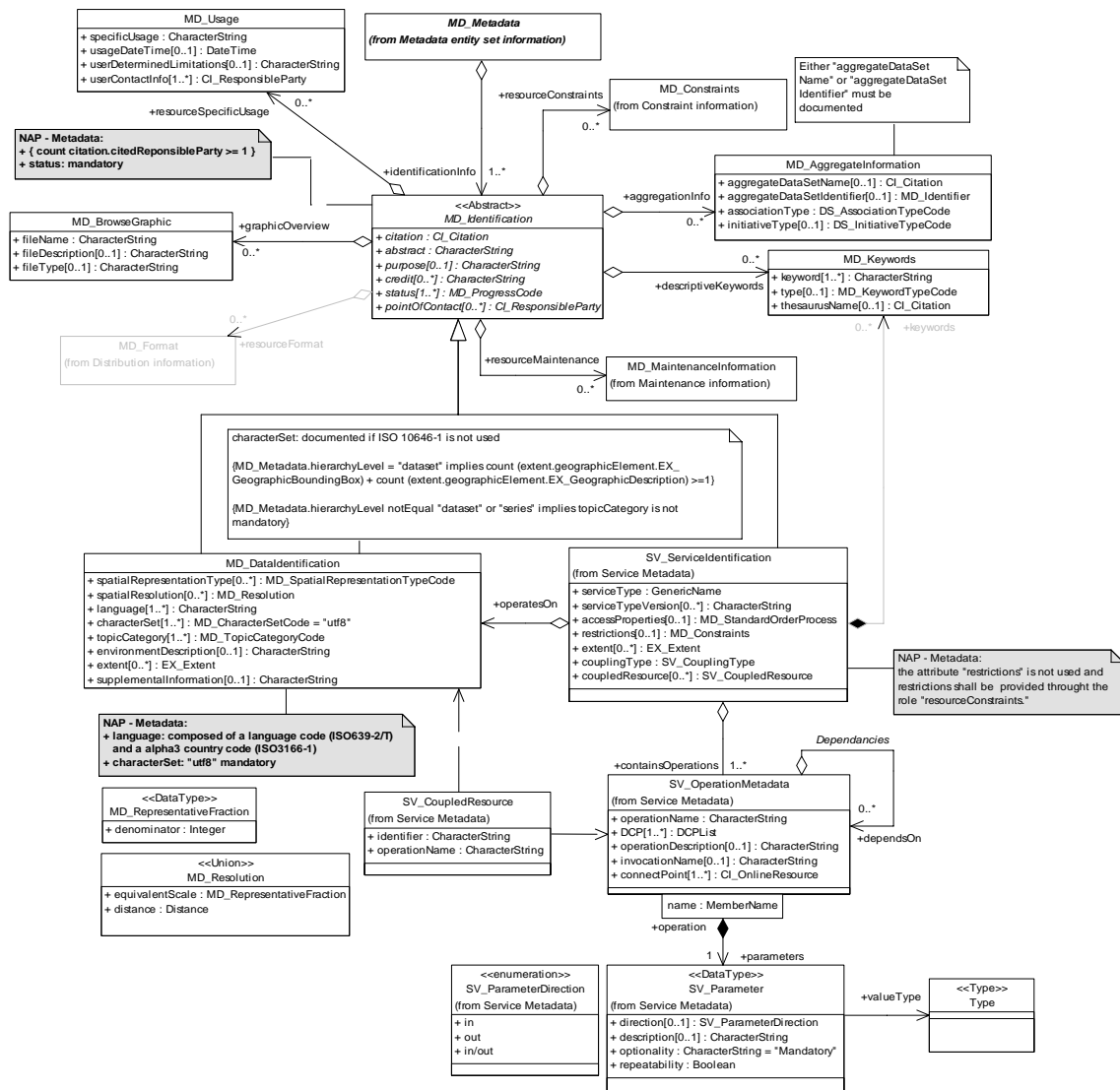


Figure 47: Identification information

### B.2.3 Data identification information

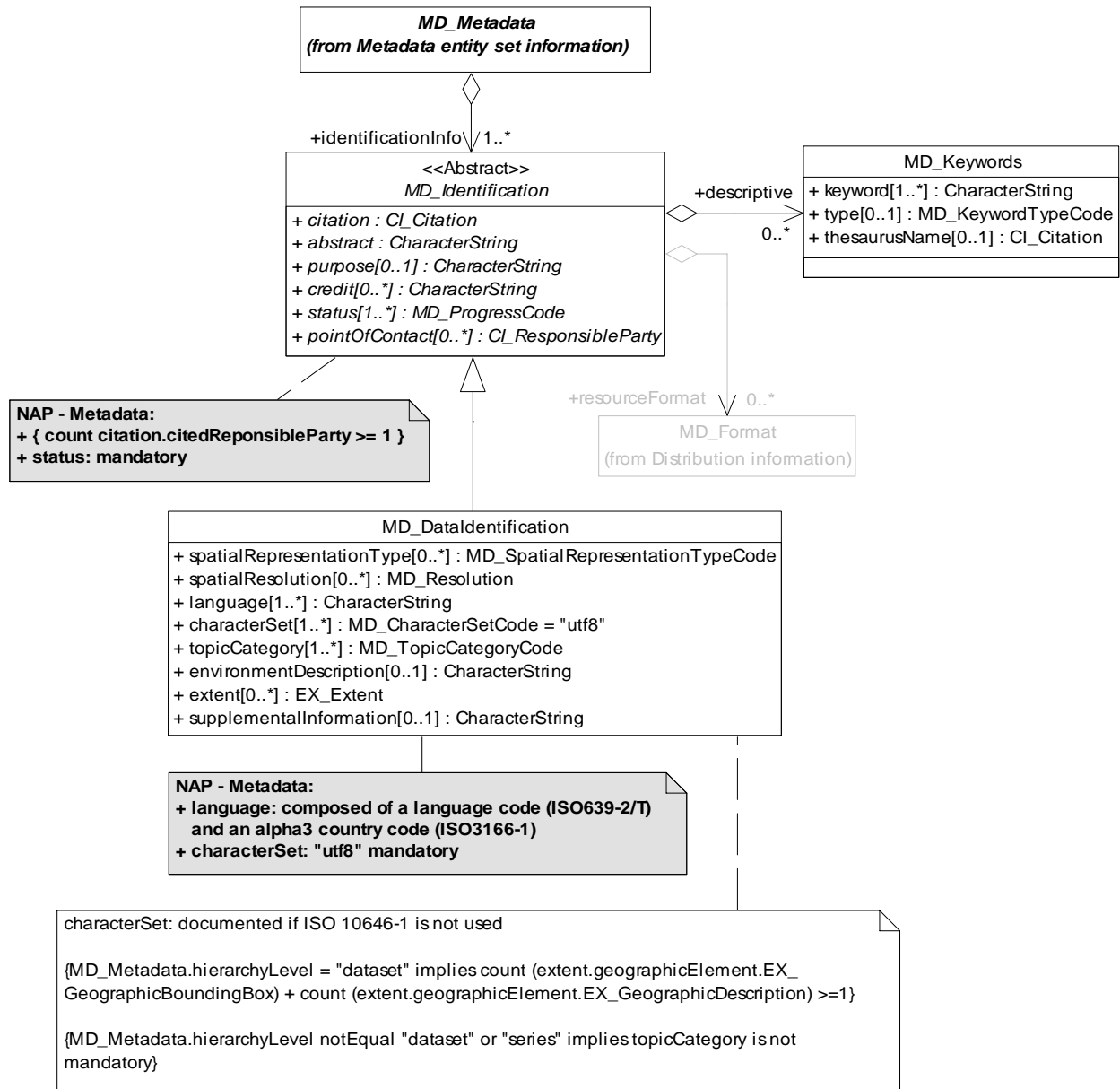


Figure 48: Data identification information

### B.2.4 Service identification information

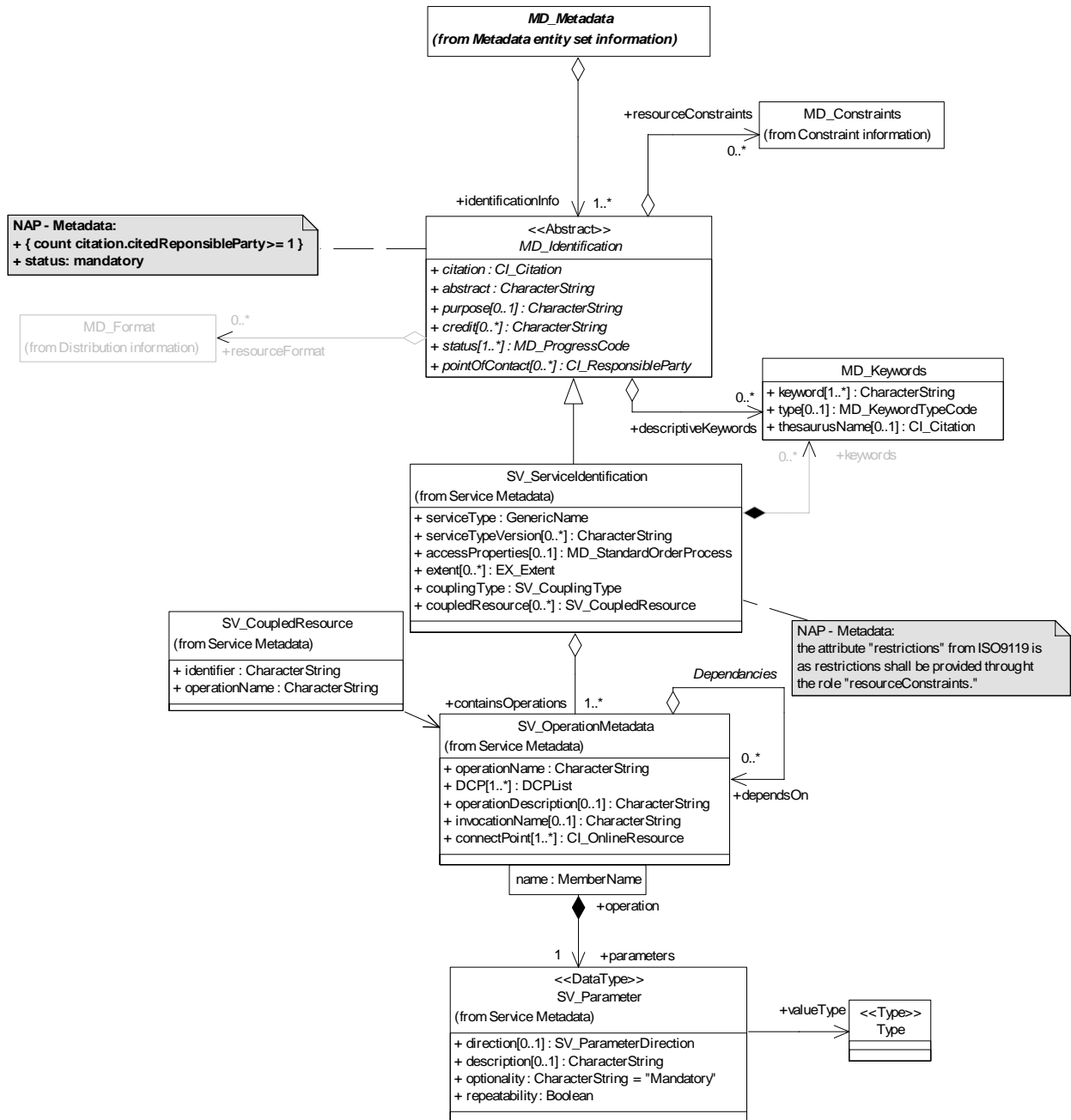


Figure 49: Service identification information

### B.2.5 Constraint information

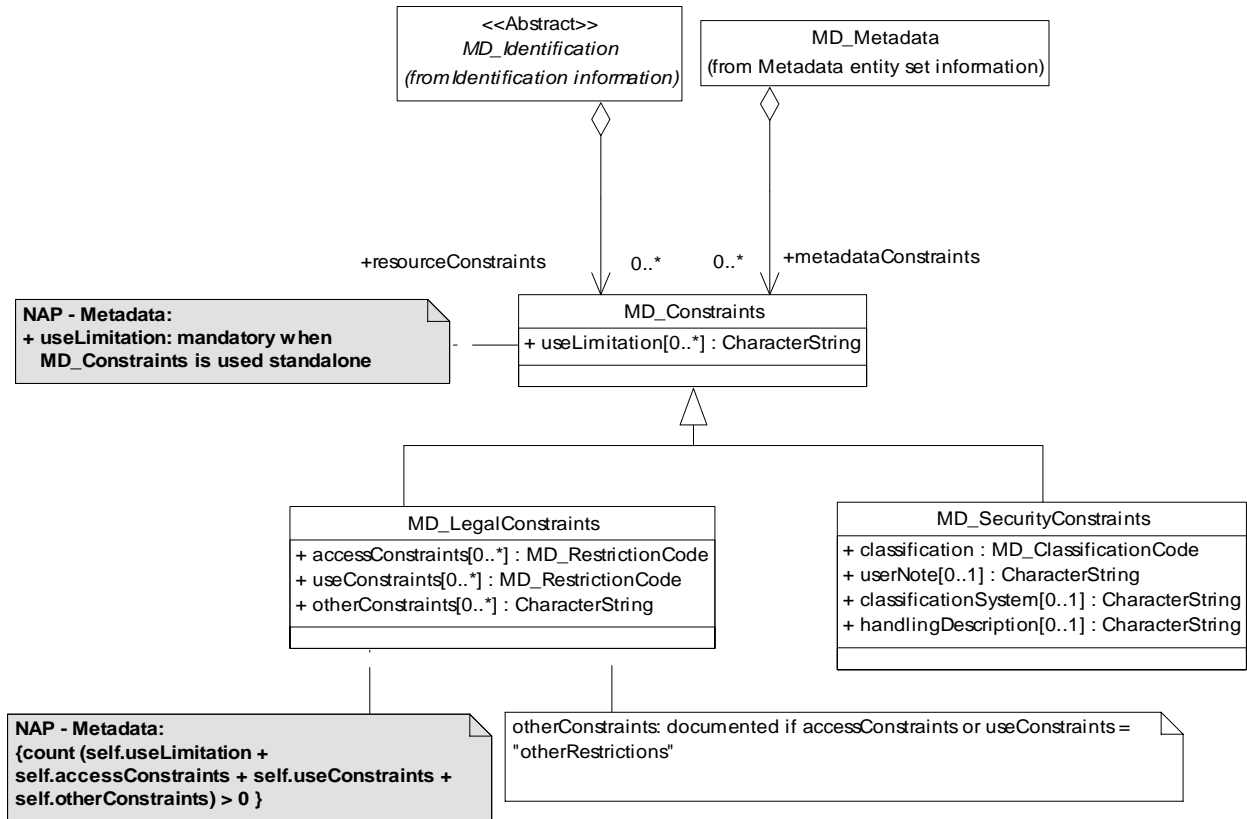


Figure 50: Constraint information

### B.2.6 Legal constraint information

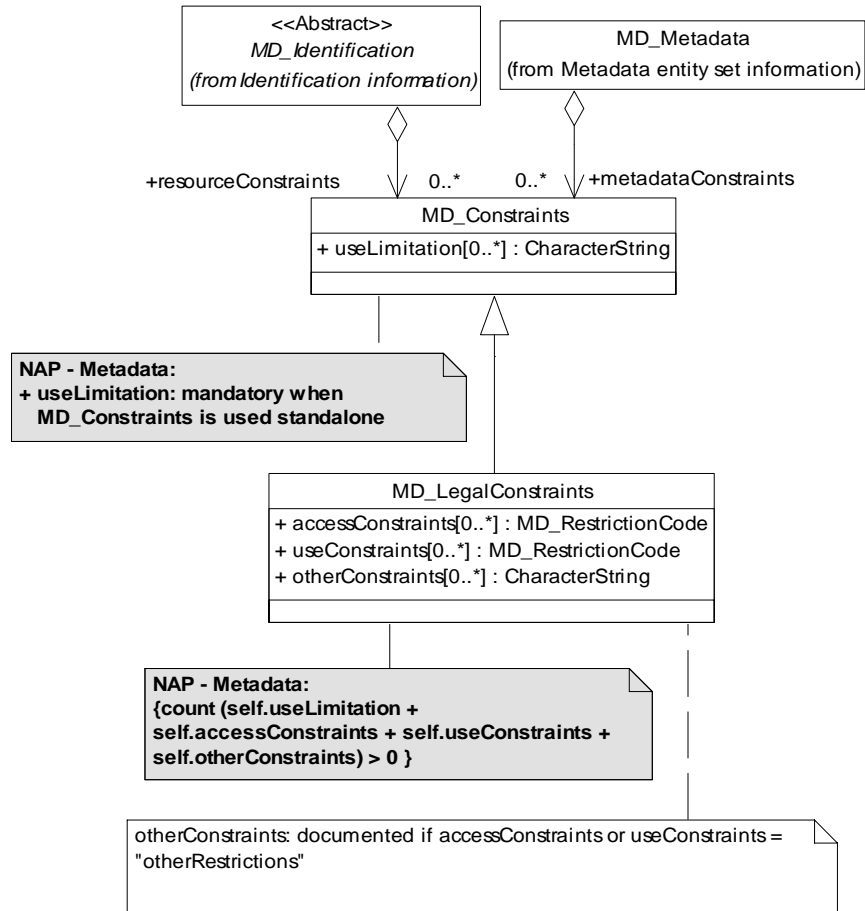


Figure 51: Legal constraint information

### B.2.7 Data quality information

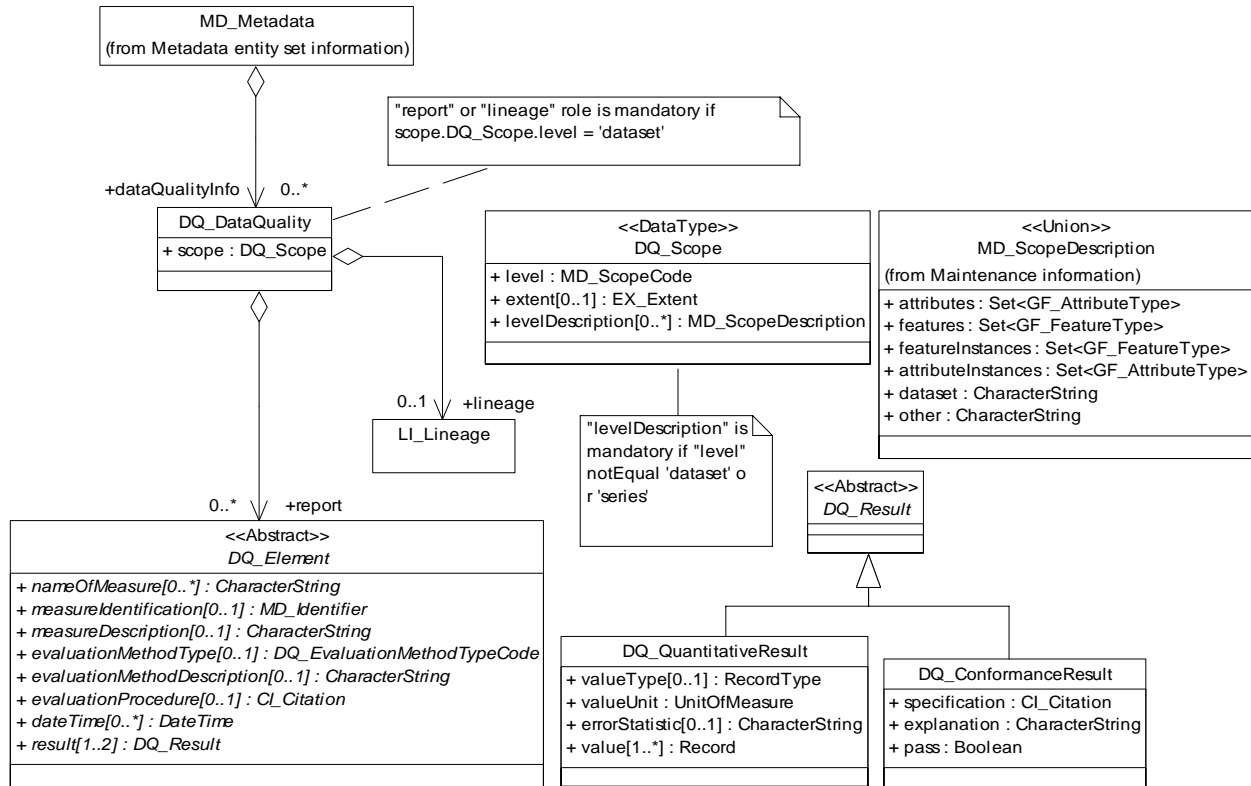


Figure 52: Data quality information



### B.2.8 Lineage information

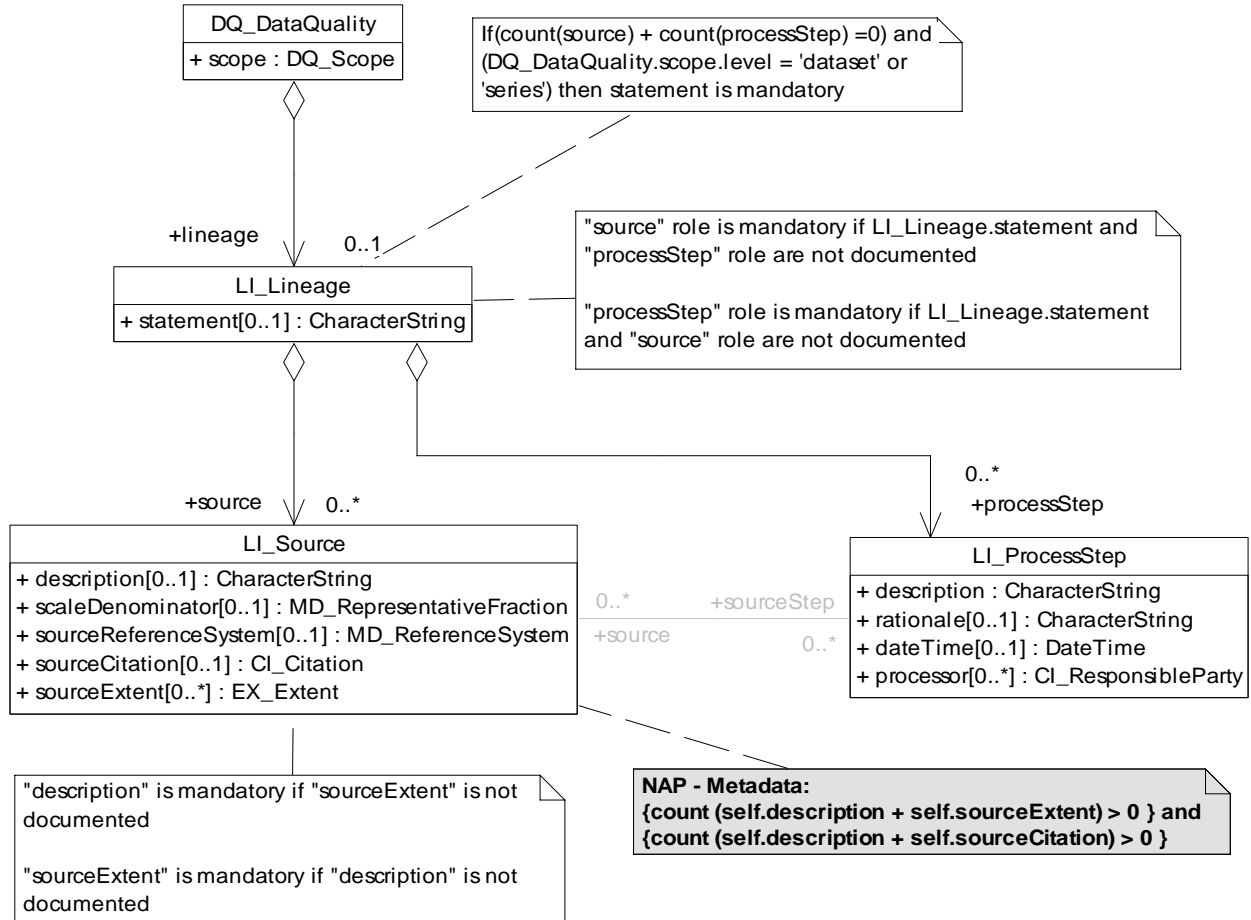


Figure 53: Lineage information

### B.2.9 Data quality classes and subclasses

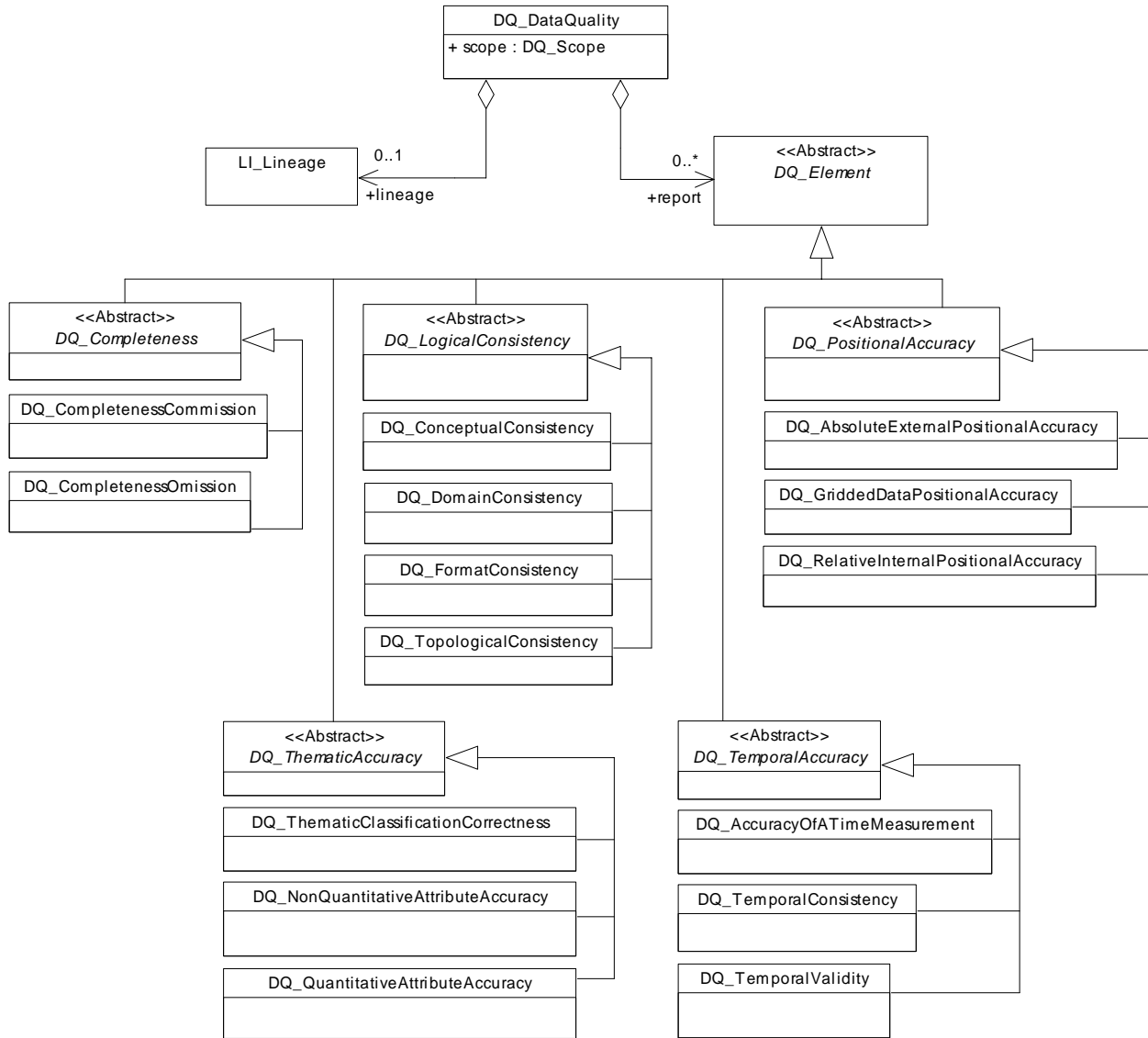


Figure 54: Data quality classes and subclasses

### B.2.10 Maintenance information

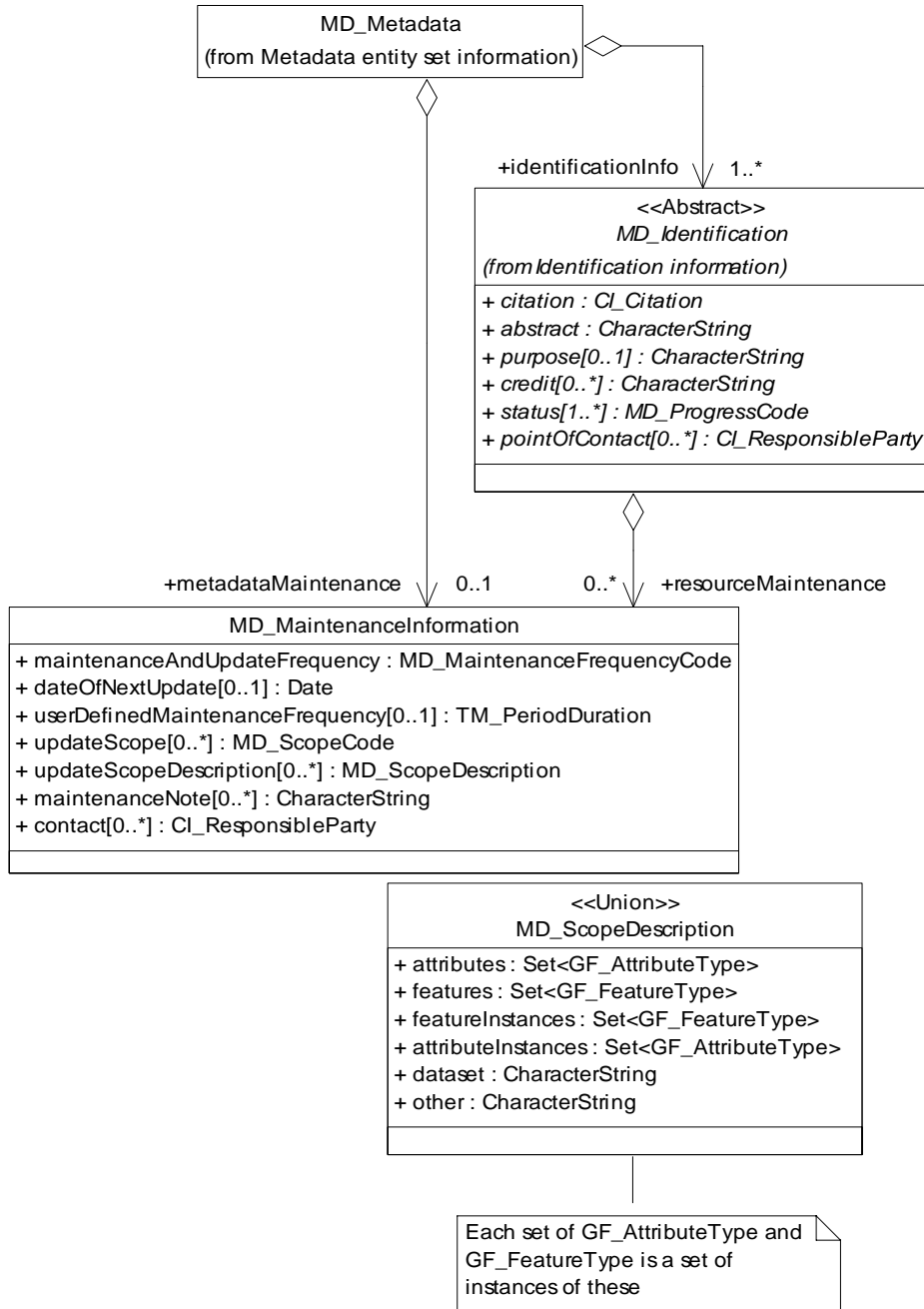


Figure 55: Maintenance information

## B.2.11 Spatial representation information

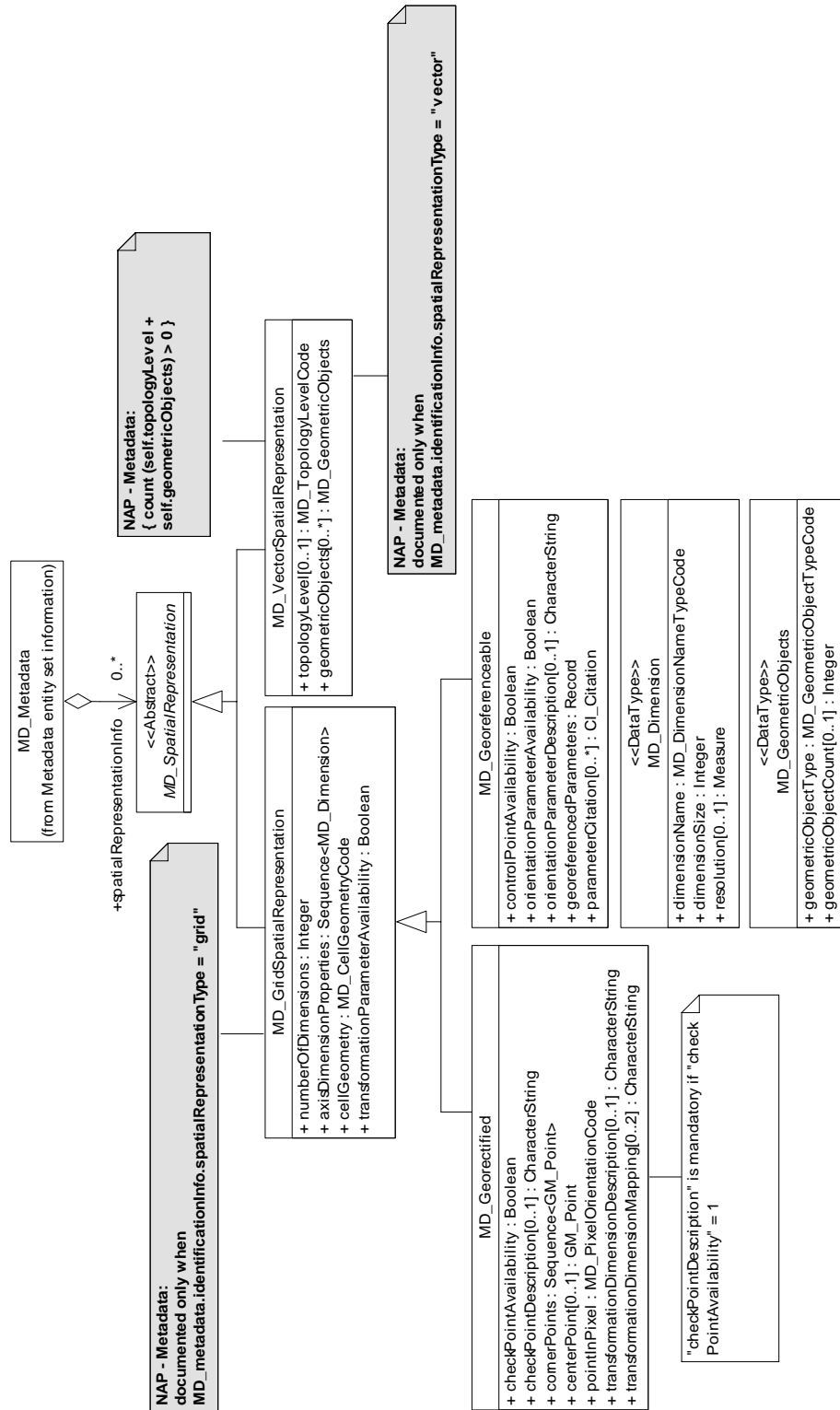


Figure 56: Spatial representation information

### B.2.12 Reference system information

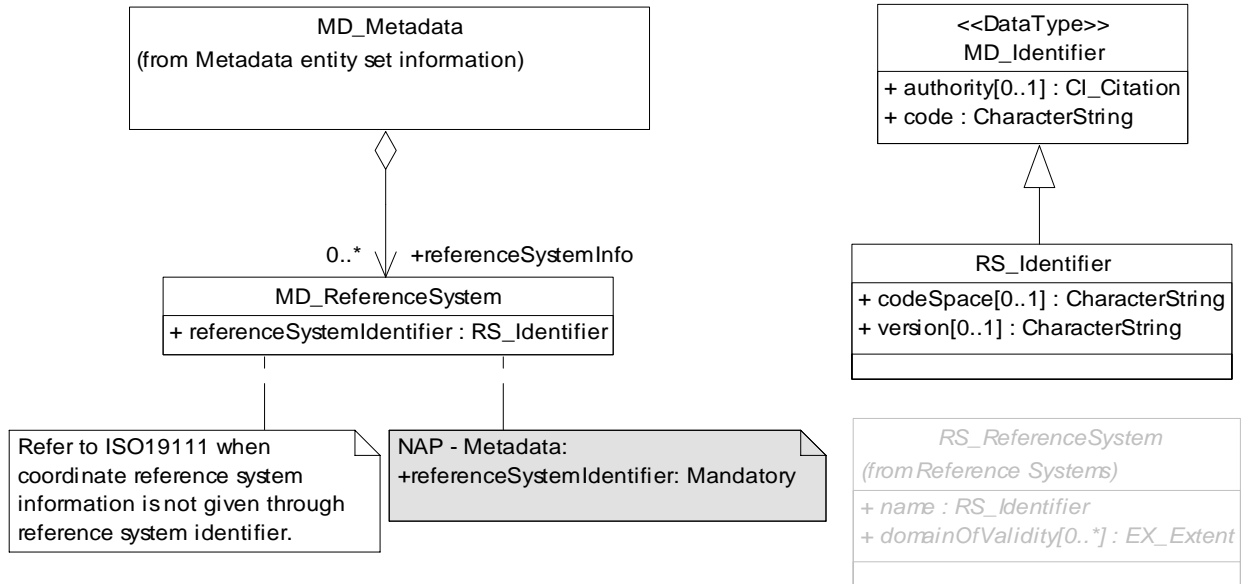


Figure 57: Reference system information

### B.2.13 Content information

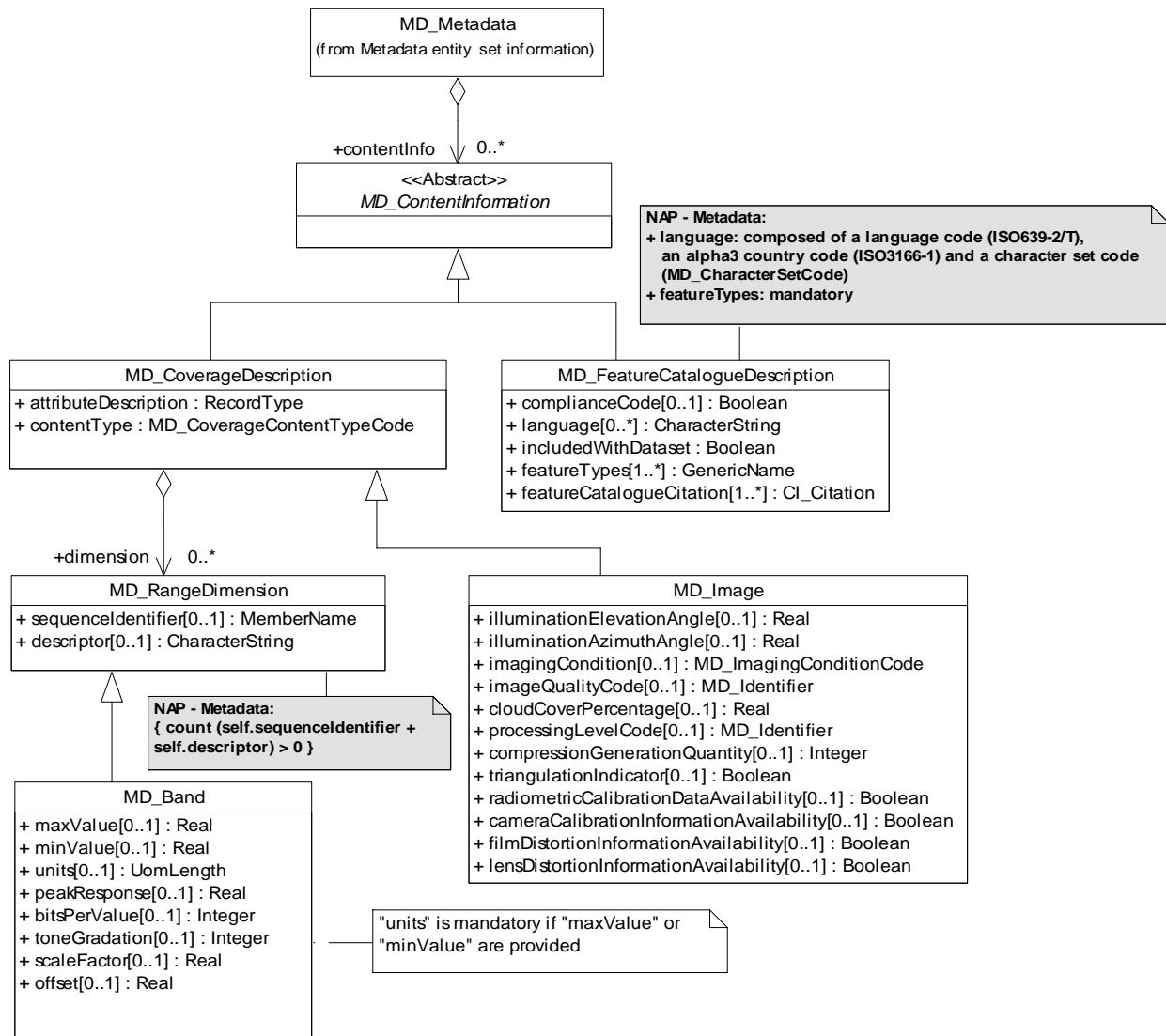


Figure 58: Content information

## B.2.14 Portrayal catalogue information

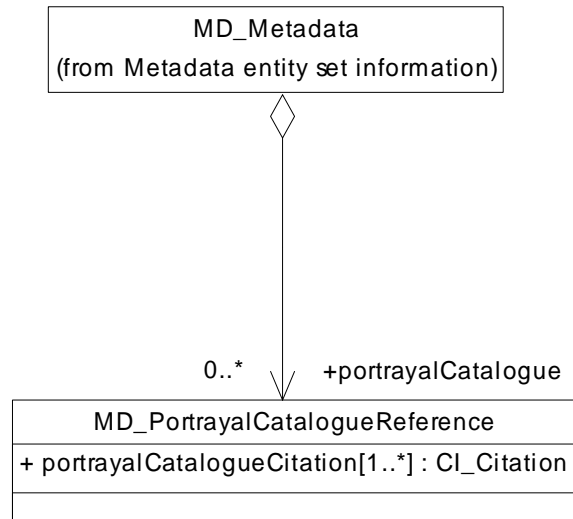


Figure 59: Portrayal catalogue information





## B.2.16 Metadata extension information

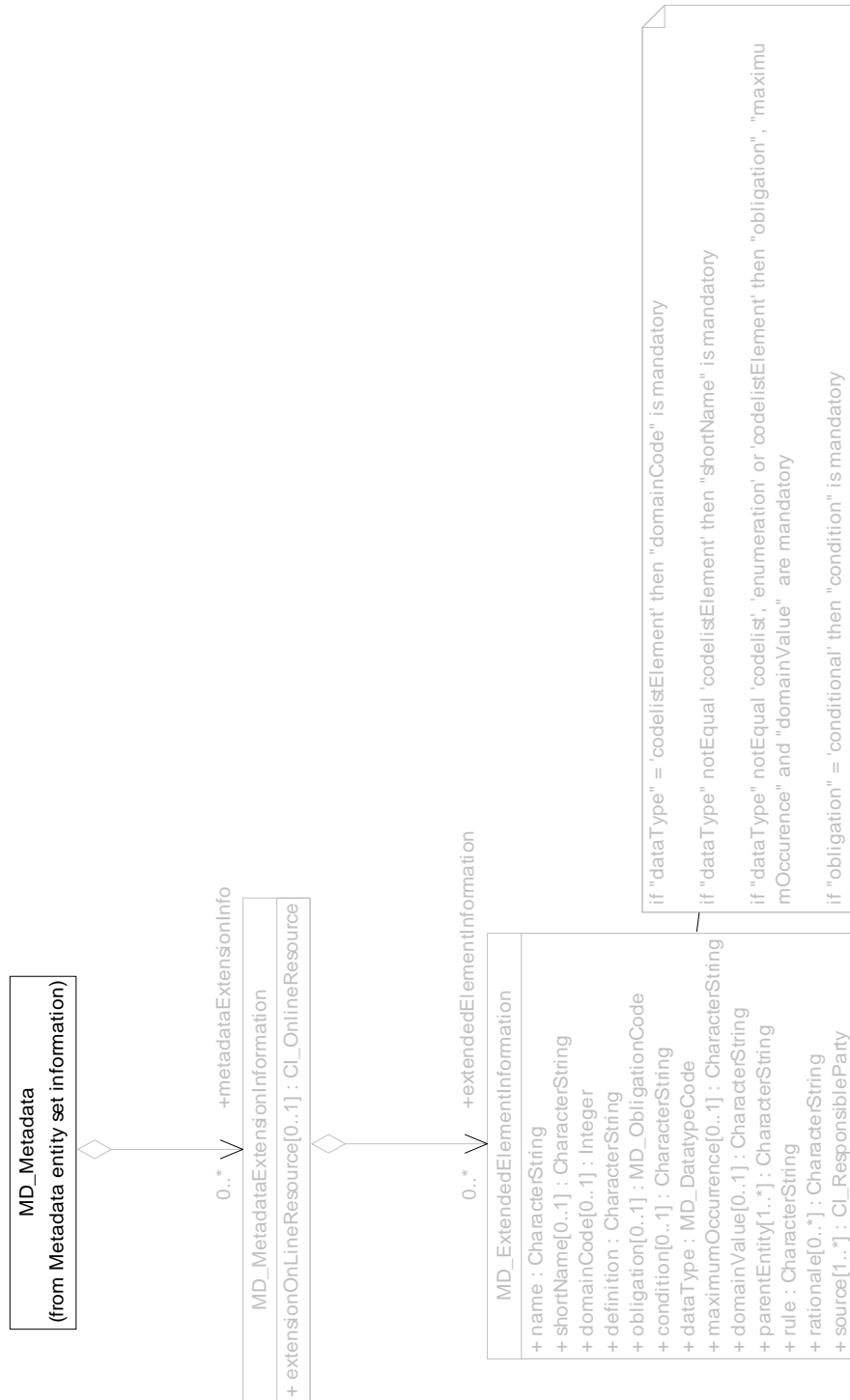


Figure 61: Metadata extension information

### B.2.17 Application schema information

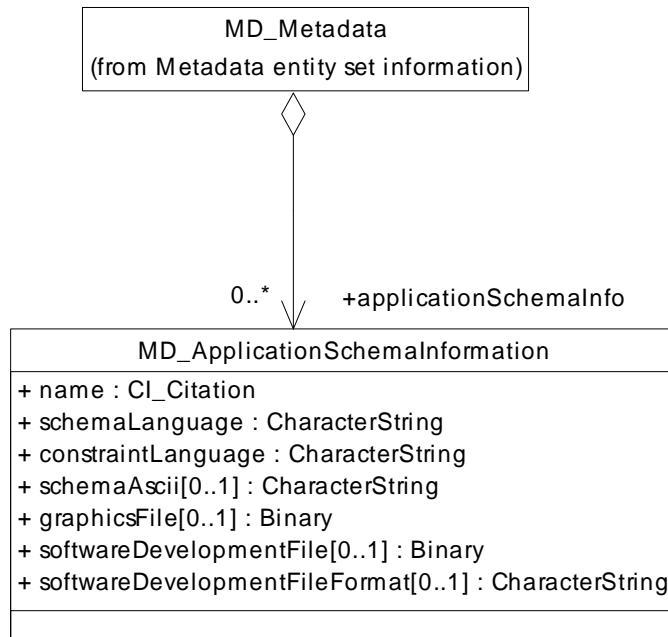


Figure 62: Application schema information

### B.2.18 Extent information

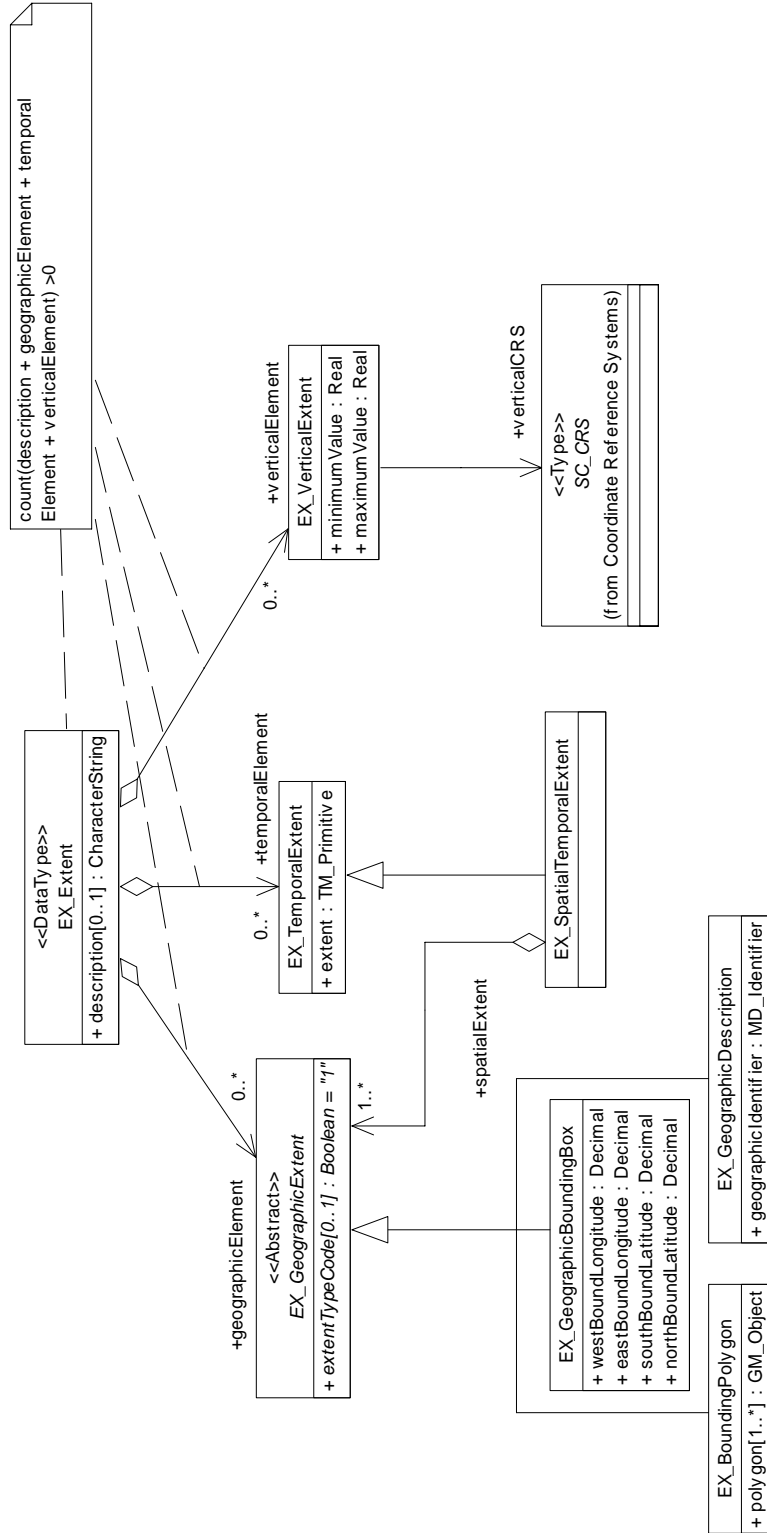


Figure 63: Extent information

## B.2.19 Citation and responsible party information

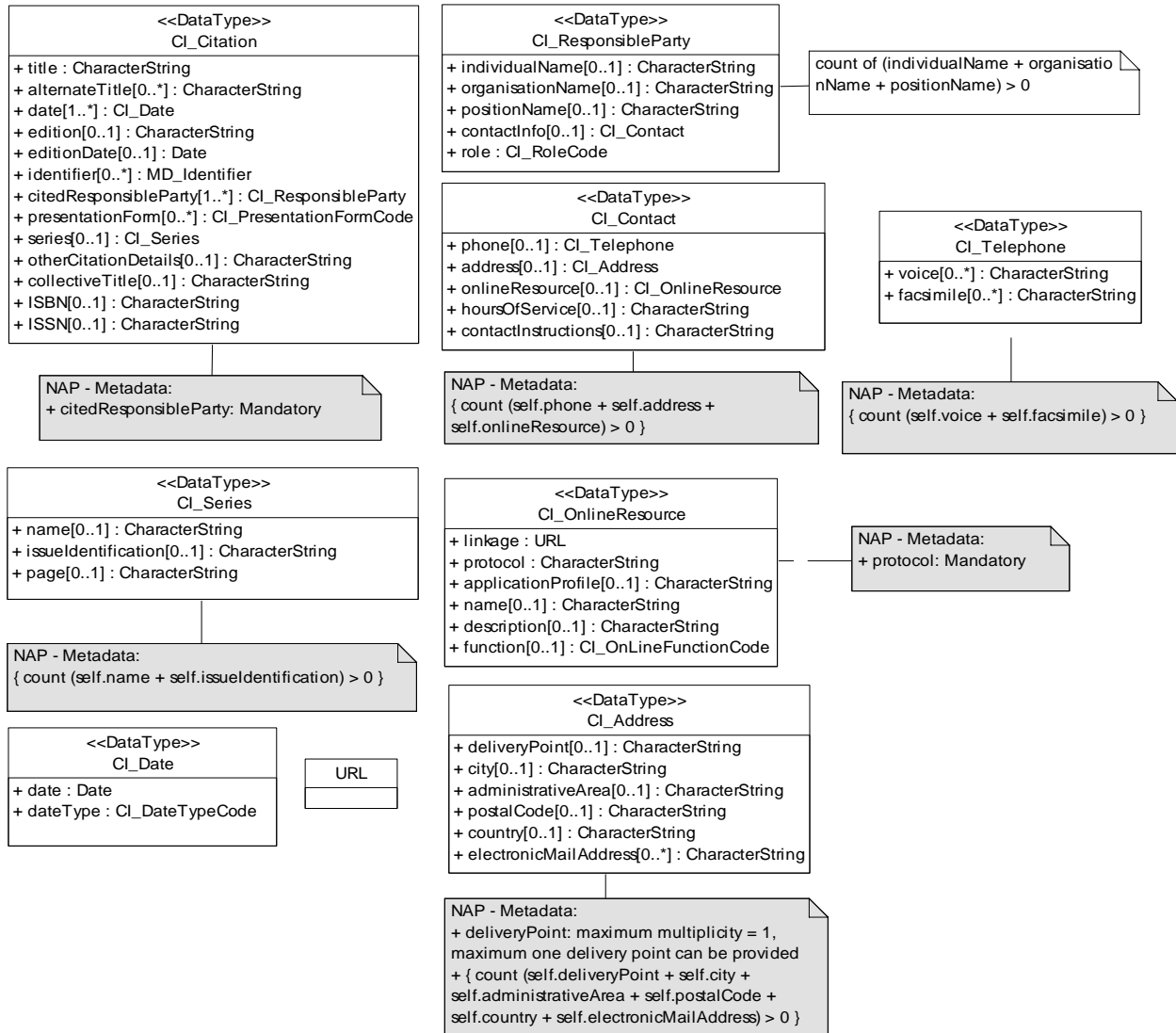


Figure 64: Citation and responsible party information

## **Annex C**

### **Conformance Clauses**

(normative)

#### **C.1 Conformance Requirements**

Metadata instance documents implementing this standard shall be considered in conformance as a result of following the rules as stated in Clauses 6 and 7 and Annex A and B and meet the following tests:

##### **C.1.1 Completeness**

All metadata instance documents must contain all mandatory and conditional (if conditions apply) metadata elements defined in this document.

##### **C.1.2 Semantics**

All metadata instance documents implementing this standard must use the metadata elements provided in this standard for the purposes for which they were defined

##### **C.1.3 Schema**

All metadata instance documents implementing this standard must contain metadata organized as specified in this standard.

##### **C.1.4 Maximum Occurrences**

All metadata instance documents implementing this standard must contain not more than the specified number of occurrences of metadata component classes or attributes

##### **C.1.5 Data Types**

All metadata instance documents implementing this standard must use data types as specified in this standard and in the manner specified.

##### **C.1.6 Codelists**

All metadata instance documents implementing this standard must use codelists as defined in this standard, or extensions of these codelists, which are listed and documented within the NAP – Metadata Register.

#### **C.2 User Defined Extension Metadata Conformance**

##### **C.2.1 Exclusiveness**

User defined metadata elements must not duplicate elements defined in this standard.

##### **C.2.2 Structure**

User defined metadata elements must be integrated correctly and must not disrupt the schema defined in this standard.

##### **C.2.3 Extended Codelists**

User extended codelists must include the original codes in the same order with the new codes appended to the end of the list.

## Annex D

### Metadata Implementation

(informative)

#### D.1. Background

Scope and Objectives:

This North American Standard outlines the format to be used for definitions, data types, and relationships among geographic metadata elements. In order to use these elements to create, modify, discover, evaluate, present, and/or access the metadata records of which they form a part, and the related spatial data they describe, it is necessary to manage the elements in software implementations and to provide for the exchange of metadata between such data management systems. This, in turn, requires that the metadata elements be encoded in a clear and consistent manner.

This Annex provides an overview, and some examples, of how to encode the metadata elements listed in this Standard. It specifically covers the creation of Metadata records for single Datasets, Services, and Aggregations of Information Objects, as well as the assignment of Constraints or Usage to Metadata records. The examples provided are in Canadian English. However, users may also create records in American English or Canadian French when implementing this North American Standard. The resource described by the Metadata record may be available in any language.

#### D.2. Metadata Records for Single Datasets

Datasets are the most common type of Resource for which Metadata Records are created. The following example is for a dataset titled “Nesting Site – North Bay District”. The same dataset also is used as an example for the creation of metadata records for an aggregation. In this case, the Ontario Ministry of Natural Resources (OMNR) has a data class entitled “Nesting Site” for all of Ontario that is maintained by 26 different, geographically discrete, district offices. Since the period of maintenance, the contact and the geographic coverage is unique, a discrete metadata record has been created for each District in addition to the Series-level metadata record for the entire Province.

The record is provided in a tabbed-outline format with element values in bold and role names denoted with a “+”. This example illustrates the hierarchical structure of ISO 19115-NAP metadata and is based on an implementation schema that governs the ordering of the elements.

+Metadata Entity Set Information:

fileIdentifier: **771**

(**[http://lioapp.lrc.gov.on.ca/edwin/EDWINCGI.exe?IHID=771&AgencyID=1&Theme=All\\_Themes](http://lioapp.lrc.gov.on.ca/edwin/EDWINCGI.exe?IHID=771&AgencyID=1&Theme=All_Themes)**)

language: **ENG; CAN**

characterSet: **004 (utf8)**

parentIdentifier:

fileIdentifier: **260**  
([http://lioapp.lrc.gov.on.ca/edwin/EDWINCGI.exe?IHID=260&AgencyID=1&Theme=All\\_Themes](http://lioapp.lrc.gov.on.ca/edwin/EDWINCGI.exe?IHID=260&AgencyID=1&Theme=All_Themes))  
citation  
title: **Ontario Nesting Sites**  
series:  
name: **Ontario Nesting Sites**  
authority  
organizationName: **Ontario Ministry of Natural Resources**  
role: **001 (resourceProvider)**  
hierarchyLevel: **005 (dataset)**  
hierarchyLevelName: **Dataset**  
contact:  
organizationName: **Ontario Ministry of Natural Resources**  
positionName: **North Bay District GSO**  
contactInfo:  
phone:  
voice: **voice: 1 (705) 4755550**  
facsimile: **1 (705) 4755550**  
address:  
deliveryPoint: **physical; 3301; Trout Lake Road; ;**  
city: **North Bay**  
administrativeArea: **Ontario**  
postalCode: **P1A 4L7**  
country: **Canada**  
electronicMailAddress: **info-access@webmail.mnr.gov.on.ca**  
role: **007 (pointOfContact)**  
dateStamp: **20060426 (April 26, 2006)**  
metadataStandardName: **NAP - Metadata**  
metadataStandardVersion: **1.0**  
dataSetURI: **[http://lioapp.lrc.gov.on.ca/edwin/EDWINCGI.exe?IHID=2606&AgencyID=1&Theme=All\\_Themes](http://lioapp.lrc.gov.on.ca/edwin/EDWINCGI.exe?IHID=2606&AgencyID=1&Theme=All_Themes)**  
locale:  
language: **ENG**  
country: **CAN**  
characterSet: **004 (utf8)**

+identificationInfo:

citation:  
title: **Nesting Site - North Bay District**  
date:  
dateType: **001 (Creation)**  
date: **20000125 (January 25, 2000)**  
date:  
dateType: **003 (Revision)**  
date: **20060216 (February 16, 2006)**

abstract: **A Nesting Site is a point feature that identifies the location of one or more nests that belong to a particular species.**

purpose: **To identify the location and types of Nesting Sites which are commonly found on maps for wildlife management purposes.**

credit: **Ontario Ministry of Natural Resources North Bay District Biologist**

credit: **Bowater Forest Industry Ltd – Forestry Division**

credit: **North Bay Conservation Authority Biologist**

status: **004 (onGoing)**

pointOfContact:

organisationName: **Ministry of Natural Resources**

positionName: **Land Information Ontario Support**

contactInfo:

phone:

voice: **voice: 1 (705) 7551878**

facsimile: **1 (705) 7551677**

address:

deliveryPoint: **physical; 300; Water Street; ;**

city: **Peterborough**

administrativeArea: **Ontario**

postalCode: **K7J 8M5**

country: **Canada**

electronicMailAddress: **info-access@webmail.mnr.gov.on.ca**

role: **007 (pointOfContact)**

pointOfContact:

organizationName: **Ontario Ministry of Natural Resources**

positionName: **North Bay District Biologist**

contactInfo:

phone:

voice: **1 (705) 4755550**

facsimile: **1 (705) 4755550**

address:

deliveryPoint: **physical; 3301; Trout Lake Road; ;**

city: **North Bay**

administrativeArea: **Ontario**

postalCode: **P1A 4L7**

country: **Canada**

electronicMailAddress: **info-access@webmail.mnr.gov.on.ca**

role: **002 (Custodian)**

pointOfContact:

organisationName: **Ministry of Natural Resources**

positionName: **Land Information Ontario Support**

contactInfo:

phone:

voice: **voice: 1 (705) 7551878**

facsimile: **1 (705) 7551677**

address:



deliveryPoint: **physical; 300; Water Street; ;**  
city: **Peterborough**  
administrativeArea: **Ontario**  
postalCode: **K7J 8M5**  
country: **Canada**  
electronicMailAddress: **info-access@webmail.mnr.gov.on.ca**  
role: **005 (Distributor)**  
onlineResource:  
linkage: **www.lio.mnr.gov.on.ca/en/OGDELogin.htm**  
protocol: **http**  
applicationProfile:  
name: **Land Information Data Subscription Service (LIDS)**  
description: **Secure Web-based application by which registered individuals affiliated with organizations that are members of a Data Exchange administered by Land Information Ontario can order data sets to which they have appropriate access permission. Upon ordering the data sets are either prepared for download, and notice sent to requestor, or packaged and distributed offline.**  
function: **004 (Order)**  
hoursOfService: **24/7**  
contactInstructions: **If you are not a member of a Data Exchange, please contact Land Information Ontario Information Access unit by email at info-access@webmail.mnr.gov.on.ca or by telephone at 705-755-1878.**  
spatialRepresentationType: **001 (Vector)**  
spatialResolution:  
equivalentScale:  
denominator: **20000**  
distance:  
value: **10**  
uom:  
uomName: **meter**  
uomSymbol: **m**  
measureType: **length**  
language: **ENG; CAN**  
language: **FRA; CAN**  
language: **CRE**  
characterSet: **004 (utf8)**  
topicCategory: **002 (biota)**  
environmentDescription: **Spatial locations and attributes are maintained by the OMNR's Natural Resources Values Information System (NRVIS), a custom instance of ESRI ArcGIS 9.x supported by Oracle DBMS**  
extent:  
description:  
geographicElement:  
extentTypeCode: **1 (inclusion)**  
polygon: **northbaydistrict.shp**  
GM\_Object: **<Refer to ISO 19107 for documentation>**

geographicElement:  
extentTypeCode: **1 (inclusion)**  
westBoundLongitude: **-80.5**  
eastBoundLongitude: **-78.2**  
southBoundLatitude: **45.5**  
northBoundLatitude: **47.3**

geographicElement:  
extentTypeCode: **1 (inclusion)**  
geographicIdentifier:  
authority: **Ontario Ministry of Natural Resources**  
code: **14 (North Bay OMNR District)**

resourceMaintenance:  
maintenanceAndUpdateFrequency: **010 (irregular)**  
dateOfNextUpdate: **200701/200703 (sometime between January 2007 and March 2007)**

userDefinedMaintenanceFrequency:

TM\_PeriodDuration: **P5Y (maximum 5 years)**

updateScope: **001 (Attribute)**

updateScopeDescription: **Update activity determines whether existing nests are still in good repair, are in use, are occupied by the same species, are occupied by the same birds. Update activity also establishes values for attributes of new features.**

maintenanceNote: **Nests unoccupied for 5 years or more leads to Feature instance being “frozen” (not included for analysis or display).**

contact:

organizationName: **Ontario Ministry of Natural Resources**

positionName: **North Bay District Biologist**

contactInfo:

phone:

voice: **voice: 1 (705) 4755550**

facsimile: **1 (705) 4755550**

address:

deliveryPoint: **physical; 3301; Trout Lake Road; ;**

city: **North Bay**

administrativeArea: **Ontario**

postalCode: **P1A 4L7**

country: **Canada**

electronicMailAddress: **info-access@webmail.mnr.gov.on.ca**

role: **002 (Custodian)**

resourceMaintenance:

maintenanceAndUpdateFrequency: **010 (irregular)**

dateOfNextUpdate: **200701/200703 (sometime between January 2007 and March 2007)**

userDefinedMaintenanceFrequency:

TM\_PeriodDuration: **P5Y (maximum 5 years)**

updateScope: **009 (Feature)**

updateScopeDescription: **Update activity locates and identifies new nests.**

**maintenanceNote: Nests unoccupied for 5 years or more leads to Feature instance being “frozen” (not included for analysis or display, status Not Active).**

contact:

organizationName: **Ontario Ministry of Natural Resources**

positionName: **North Bay District Biologist**

contactInfo:

phone:

voice: **voice: 1 (705) 4755550**

facsimile: **1 (705) 4755550**

address:

deliveryPoint: **physical; 3301; Trout Lake Road; ;**

city: **North Bay**

administrativeArea: **Ontario**

postalCode: **P1A 4L7**

country: **Canada**

electronicMailAddress: **info-access@webmail.mnr.gov.on.ca**

role: **002 (Custodian)**

graphicOverview:

fileName: **[http://publicdocs.mnr.gov.on.ca/View.asp?Document\\_ID=9632&Attachment\\_ID=18204](http://publicdocs.mnr.gov.on.ca/View.asp?Document_ID=9632&Attachment_ID=18204)**

fileDescription: **Display created in ArcIMS using OMNR Base Data classes (eg roads, water features, utility corridors, treed areas, etc) as context for this point data set.**

fileType: **jpg**

descriptiveKeywords:

keyword: **BIRD POPULATIONS**

type: **005 (Theme)**

thesaurusName:

title: **Ontario Ministry of Natural Resources (OMNR) Thesaurus**

date:

dateType: **001 (Creation)**

date: **19720622 (June 22, 1972)**

date:

dateType: **003 (Revision)**

date: **20060716 (July 16, 2006)**

purpose: **Originally created to catalogue documents stored in the OMNR library and since modified**

descriptiveKeywords:

keyword: **BIRDS**

type: **005 (Theme)**

thesaurusName: **Ontario Ministry of Natural Resources (OMNR) Thesaurus**

+descriptive Keywords:

keyword: **COLONIES**

type: **005 (Theme)**

thesaurusName: **Ontario Ministry of Natural Resources (OMNR) Thesaurus**

descriptiveKeywords:

keyword: **NESTING**

type: **005 (Theme)**  
thesaurusName: **Ontario Ministry of Natural Resources (OMNR) Thesaurus**  
descriptiveKeywords:  
keyword: **NESTS**  
type: **005 (Theme)**  
thesaurusName: **Ontario Ministry of Natural Resources (OMNR) Thesaurus**  
descriptiveKeywords:  
keyword: **FOREST MANAGEMENT**  
type: **001 (Discipline)**  
thesaurusName: **Ontario Ministry of Natural Resources (OMNR) Thesaurus**  
descriptiveKeywords:  
keyword: **FORESTRY**  
type: **001 (Discipline)**  
thesaurusName: **Ontario Ministry of Natural Resources (OMNR) Thesaurus**  
descriptiveKeywords:  
keyword: **LAND USE PLANNING**  
type: **001 (Discipline)**  
thesaurusName: **Ontario Ministry of Natural Resources (OMNR) Thesaurus**  
descriptiveKeywords:  
keyword: **MUNICIPAL PLANNING**  
type: **001 (Discipline)**  
thesaurusName: **Ontario Ministry of Natural Resources (OMNR) Thesaurus**  
descriptiveKeywords:  
keyword: **WILDLIFE**  
type: **001 (Discipline)**  
thesaurusName: **Ontario Ministry of Natural Resources (OMNR) Thesaurus**  
descriptiveKeywords:  
keyword: **NORTH BAY OMNR DISTRICT**  
type: **002 (Place)**  
thesaurusName: **Ontario Ministry of Natural Resources (OMNR) Thesaurus**

+identificationInfo:

citation:

title: **Land Information Ontario Web Mapping Service (WMS) Data Set**

date: **20050101**

responsibleParty:

organizationName: **Ministry of Natural Resources**

contactInfo:

phone:

voice: **voice: 1(705) 7551878**

address:

deliveryPoint: **physical; 300; Water Street; 3<sup>rd</sup> Floor South Tower;**

city: **Peterborough**

administrativeArea: **Ontario**

postalcode: **K7J 8M5**

country: **Canada**

emailAddress: **lio@ontario.ca**  
onlineResource: **http://www.lio.gov.on.ca**  
role: **001 (resourceProvider)**  
abstract: **A subset of Geospatial data available for use with OGC-compliant Web Map Service (WMS) about Ontario. For use in Geospatial analysis requiring a level of horizontal accuracy no greater than 3m.**  
status: **004 (onGoing)**  
serviceType: **WMS**  
couplingType: **loose**  
containsOperations  
operationsName: **webServices**  
DCP: **WebServices**  
connectPoint:  
linkage: **limbs.mnr.gov.on.ca/LioOgcWms21/liogcwmserver/base?version=1.1.1&service=WMS&request=getcapabilities**  
protocol: **http**  
parameters:  
name: **paramName**  
optionality: **Mandatory**  
repeatability: **false**  
valueType: **CharacterString**

resourceSpecificUsage:  
specificUsage: **Identifying the location and types of nesting Sites which are commonly found on maps for forest resource and wildlife management planning purposes.**  
usageDateTime: **20000325 (March 25, 2000)**  
userDeterminedLimitations: **Not intended for display at greater than 1:5000 or analysis requiring geographic accuracy of better than 10 m. Intended for display in conjunction with Ontario Ministry of Natural Resources (OMNR) Base Data Series of data sets and may not align with other data sets.**  
userContactInfo:  
organisationName: **Ministry of Natural Resources**  
positionName: **Land Information Ontario Support**  
contactInfo:  
phone:  
voice: **voice: 1(705) 7551878**  
facsimile: **1 (705) 7551677**  
address:  
deliveryPoint: **physical; 300; Water Street; ;**  
city: **Peterborough**  
administrativeArea: **Ontario**  
postalCode: **K7J 8M5**  
country: **Canada**  
electronicMailAddress: **info-access@webmail.mnr.gov.on.ca**  
role: **007 (pointOfContact)**

resource Constraints:

useLimitation: **This information holding is not to be used for Legal Purposes.**

resource Constraints:

useLimitation: **Statutory: This Information holding is to be used only for the purposes for which it was collected. Use must be in accordance with the terms of the licence issued by the Ontario Ministry of Natural Resources.**

useLimitation: **Sensitivity: Although generally available to the public, some of the information in this information holding may be considered sensitive and, as such, access to the holding may, in whole or in part, be restricted to authorized individuals and/or organizations in accordance with the Ontario Rare and Endangered Species Act 2003. For more information, see Selected Wildlife and Habitat Features: Inventory Manual, W. B. Ranta, Kenora District, Section 2.2d. A list of authorized users are available from the Ontario Ministry of Natural Resources (OMNR) Information Access unit.**

useLimitation: **Privacy: There are no known privacy concerns in this information holding.**

useConstraints: **005 (Licence)**

resource Constraints:

useLimitation: **N/A**

classification: **002 (Unclassified)**

aggregationInfo

aggregateDataSetName:

title: **Ontario Nesting Sites**

presentationForm: **005 (Digital Map)**

series:

name: **[http://lioapp.lrc.gov.on.ca/edwin/EDWINCGI.exe?IHID=771&AgencyID=1&Theme=All\\_Themes](http://lioapp.lrc.gov.on.ca/edwin/EDWINCGI.exe?IHID=771&AgencyID=1&Theme=All_Themes)**

authority

organizationName: **Ontario Ministry of Natural Resources**

role: **001 (resourceProvider)**

code: **x**

aggregateDataSetIdentifier: **771**

associationType: **003 (PartOfSeamlessDatabase)**

initiativeType: **002 (Collection)**

+dataQualityInfo:

scope:

level: **dataset**

lineage:

statement: **Data is collected and maintained by Ontario Ministry of Natural Resources (OMNR) Districts using the Natural Resources Values Information System (NRVIS).**

source:

description: **The Nesting Site data was compiled from various sources including direct collection by Ontario Ministry of Natural Resources (OMNR) biologists via GPS and in some cases sketches based on observations. Some of the data may have been**

**taken from vintage Ontario Base Maps (circa 1972-1985). The Nesting Site data class is a point class and should be used with one or more OMNR Base Data classes in order to provide an appropriate relative geographic reference.**

processStep:

description: **Investigation by OMNR staff biologists via GPS and remote GIS devices both on the ground and by helicopter.**

rationale: **Periodic update**

dateTime: **20060415 (April 15, 2006)**

+metadataMaintenanceInfo:

maintenanceAndUpdateFrequency: **008 (annually)**

dateOfNextUpdate: **20070415 (April 15, 2007)**

updateScope: **005 (Dataset)**

updateScopeDescription: **Update activity checks for changes to any aspect of the dataset and modifies the Metadata record accordingly.**

contact:

organizationName: **Ontario Ministry of Natural Resources**

positionName: **North Bay District Biologist**

contactInfo:

phone:

voice: **voice: 1 (705) 4755550**

facsimile: **1 (705) 4755550**

address:

deliveryPoint: **physical; 3301; Trout Lake Road; ;**

city: **North Bay**

administrativeArea: **Ontario**

postalCode: **P1A 4L7**

country: **Canada**

electronicMailAddress: **info-access@webmail.mnr.gov.on.ca**

role: **002 (Custodian)**

+spatialRepresentationInfo:

topologyLevel: **001 (geometryOnly)**

geometricObjects:

geometricObjectType: **004 (point)**

geometricObjectCount: **6308**

+spatialRepresentationInfo:

numberOfDimensions: **2**

axisDimensionProperties:

cellGeometry:

transformationParameterAvailability: **True**

controlPointAvailability: **False**

orientationParameterAvailability: **False**

orientationParameterDescription:

georeferencedParameters:

parameterCitation:

title:

date:

dateType:

date:

purpose:

+referenceSystemInfo:

referenceSystemIdentifier:

authority:

title: **North American Datum 1983**

alternateTitle: **NAD83**

code: **NAD83**

+contentInfo:

complianceCode: **0 (not compliant)**

language: **ENG; CAN; UTF8**

includedWithDataset: **false**

featureTypes: **1015 Bald Eagle Nesting Site**

featureTypes: **1037 Caspian Tern Nesting Site**

featureTypes: **1042 Common Barn Owl Nesting Site**

featureTypes: **1049 Cooper's Hawk Nesting Site**

featureTypes: **1069 Eastern Bluebird Nesting Site**

featureTypes: **1130 Loggerhead Shrike Nesting Site**

featureTypes: **1097 Golden Eagle Nesting Site**

featureTypes: **1185 Peregrine Falcon Nesting Site**

featureTypes: **1345 Unidentified Hawk/Owl Nesting Site**

featureTypes: **1344 Unidentified Heron Nesting Site**

featureTypes: **1314 Cormorant Nesting Site/Colony**

featureTypes: **1296 Turtle Nesting Site**

featureTypes: **1280 White Pelican Nesting Site/Colony**

featureTypes: **1211 Red-Shouldered Hawk Nesting Site**

featureTypes: **1190 Piping Plover Nesting Site**

featureTypes: **1189 Pileated Woodpecker Nesting Site**

featureTypes: **1180 Osprey Nesting Site**

featureTypes: **1700 Northern Goshawk Nesting Site**

featureTypes: **1500 Sandhill Crane Nesting Site**

featureTypes: **1450 Tundra Swan Nesting Site**

featureTypes: **1449 Trumpeter Swan Nesting Site**

featureTypes: **1448 Snow Goose Nesting Site/Colony**

featureTypes: **1432 Common Tern Nesting Site/Colony**

featureTypes: **1349 Arctic Tern Nesting Site/Colony**

featureTypes: **1348 Unidentified Duck Nesting Site**

featureTypes: **1347 Unidentified Goose Nesting Site**

featureTypes: **1346 Unidentified Eagle/Osprey Nesting Site**

featureTypes: **1100 Great Blue Heron Nesting Site/Colony**



featureTypes: **1101 Great Gray Owl Nesting Site**  
featureTypes: **1121 Kirtland's Warbler Nesting Site (expired)**  
featureTypes: **1128 Least Bittern Nesting Site (expired)**  
featureTypes: **1133 Louisiana Tern Nesting Site (expired)**  
featureTypes: **1196 Prairie Warbler Nesting Site (expired)**  
featureTypes: **1134 Louisiana Waterthrush Nesting Site (expired)**

featureCatalogueCitation:

title: **Standard NRVIS Interchange Format (SNIF) Report – ‘Nesting Site’**

alternateTitle: **SNIF Report – ‘Nesting Site’**

date:

dateType: **003 (Revision)**

date: **20060620 (June 20, 2006)**

edition: **SNIF Version 2.0**

editionDate: **20030522 (May 22, 2003)**

citedResponsibleParty:

organisationName: **Ministry of Natural Resources**

positionName: **Land Information Ontario Support**

contactInfo:

phone:

voice: **voice: 1 (705) 7551878**

facsimile: **1 (705) 7551677**

address:

deliveryPoint: **physical; 300; Water Street; ;**

city: **Peterborough**

administrativeArea: **Ontario**

postalCode: **K7J 8M5**

country: **Canada**

electronicMailAddress: **info-access@webmail.mnr.gov.on.ca**

onlineResource:

linkage: **[http://publicdocs.mnr.gov.on.ca/View.asp?Document\\_ID=8874&](http://publicdocs.mnr.gov.on.ca/View.asp?Document_ID=8874&Attachment_ID=16787)**

**Attachment\_ID=16787**

role: **007 (Point of Contact)**

purpose: **Detailed description of data dictionary and data model.**

+distributionInfo:

distributor:

contactInfo:

phone:

voice: **voice: 1 (705) 7551878**

facsimile: **1 (705) 7551677**

address:

deliveryPoint: **physical; 300; Water Street; ;**

city: **Peterborough**

administrativeArea: **Ontario**

postalCode: **K7J 8M5**

country: **Canada**  
electronicMailAddress: **info-access@webmail.mnr.gov.on.ca**  
role: **005 (distributor)**  
distributionFormat:  
name: **ESRI ARC/INFO Coverage**  
version: **ArcGIS 8.3**  
distributionFormat:  
name: **ESRI ARC/INFO Export (.e00)**  
version: **ArcGIS 8.3**  
distributionFormat:  
name: **ESRI Shapefile**  
version: **ArcGIS 8.3**  
distributionFormat :  
name: **MNR NRVIS-Lite**  
version: **2.1**  
transferOptions:  
name: **001(cdRom)**  
transferOptions:  
offLine:  
name: **003(dvdRom)**

### **D.3. Metadata Records for Services**

The example provided is a Web Map Service (WMS) of the same dataset described above, Great Gray Owl Nest – North Bay OMNR District.

[This Section is Under Construction.]

### **D.4. Information Object Aggregations**

The basic principle behind distinguishing among Levels of Metadata is that a lower level, sometimes referred to as the Child, inherits the characteristics of an upper level, often referred to as the Parent. A Child Metadata Record can have many Parents. In order to avoid repeating the same description for all levels, only those characteristics that are different are added to the Child records. For example, if the distributor of the data remains the same, this need not be carried down the structure. In order to clarify this concept, the following example follows the life cycle of an example set of geographic data.

There is a potential hierarchy of re-usable metadata that can be employed in implementing a metadata collection. By creating several levels of abstraction, a linked hierarchy can assist in filtering or targeting user queries to the requested level of detail. The hierarchy should not necessarily be interpreted to require multiple copies of metadata being managed on-line. Conversely, the definition of general metadata can be supplemented by spatially specific metadata that, when queried, either inherits or overrides the general case. Through use of pointers this method can reduce the redundancy of metadata managed at a site and provide for different views of the holdings by users.

This hierarchy of metadata can be graphically represented as shown in Figure 65.

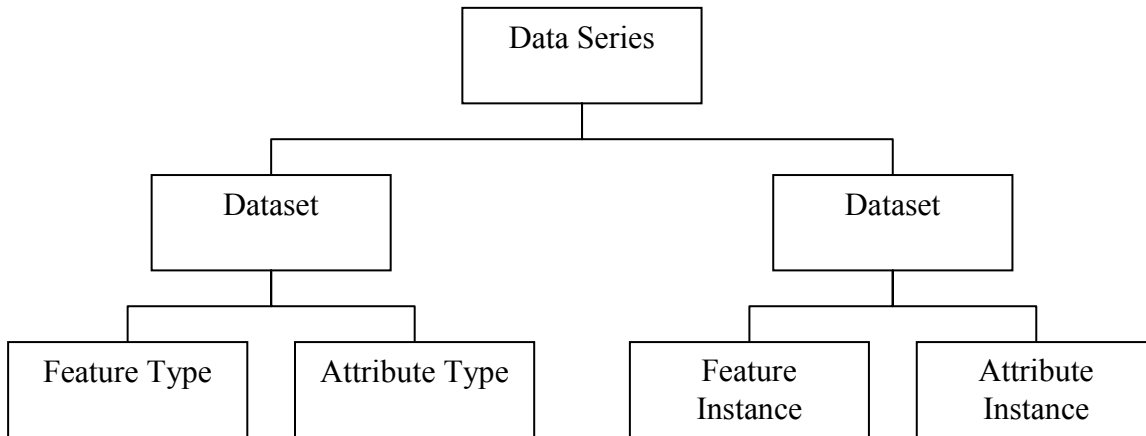


Figure 65: Metadata Hierarchy

### Dataset series metadata (optional)

A dataset series is a collection of spatial data that shares similar characteristics such as theme, source date, resolution, methodology, or distributor. The exact definition of what constitutes a series entry will be determined by the data provider. Examples of dataset series metadata entries may include:

- A collection of aerial photographs captured during a single flight with one camera and film type.
- A collection of vector datasets depicting the same features for multiple administrative areas.
- A collection of the same thematic dataset(s) in the same geographic area for multiple years.
- A collection of raster map data captured from the same paper map source.

A Series can, itself, be part of another Series. For example, a Series of Series might include:

- A series of collections of aerial photographs captured at regular intervals (eg annually).
- A series of collections of single-feature vector datasets for multiple areas in the same jurisdiction.
- A series of collections of thematic groupings (eg transportation) of datasets in the same area.

The creation of a “dataset series” metadata level is an optional feature that allows users to consult higher-level characteristics for data search. The definition of this type of metadata may be adequate for the initial characterization of available spatial data, but may not be adequate for detailed assessment of data quality of specific datasets.

### Dataset metadata

For the purposes of this North American Standard, a dataset should be a consistent spatial data product instance that can be generated or made available by a spatial data distributor. A dataset may be a member of a data series, as defined in the previous sub clause. A dataset may be

composed of a set of identified feature types and instances, and attribute types and instances as described in the following four sub clauses. On a demand basis, metadata from series and dataset information will be merged to present the user with a view of the metadata at the dataset level of abstraction. Metadata for which no hierarchy is listed are interpreted to be “dataset” metadata, by default.

### **Feature type metadata (optional)**

Constructs known as features are grouped with common characteristics. Spatial data services may elect to support feature type-level metadata where it is available and make such metadata available for query or retrieval. Feature Type-level metadata, together with feature instance attribute type and attribute instance level metadata, will be grouped into datasets, as defined in the previous sub clause. Examples of feature type metadata entries may include:

*All Great Grey Owl Nests within a dataset of Nesting Sites.*

### **Feature instance metadata (optional)**

Feature instances are spatial constructs (features) that have a direct correspondence with a real world object. Spatial data services may elect to support feature instance-level metadata where it is available and make such metadata available for query or retrieval. Feature Instance-level metadata, together with feature type, attribute type, and attribute instance-level metadata, will be grouped into datasets. Examples of feature instance metadata entries may include:

*A specific Great Grey Owl Nest site.*

### **Attribute type metadata (optional)**

Attribute types are the digital parameters that describe a common aspect of grouped spatial primitives (0-, 1-, 2-, and 3-dimensional geometric objects). Spatial data services may elect to support attribute type-level metadata where it is available and make such metadata available for query or retrieval. Attribute type-level metadata, together with feature type-, feature instance-, and attribute instance-level metadata, will be grouped into datasets. Examples of attribute type metadata entries may include:

*Height above ground (of a Great Grey Owl Nest).*

### **Attribute instance metadata (optional)**

Attribute instances are the digital parameters that describe an aspect of a feature instance. Spatial data services may elect to support attribute instance-level metadata where it is available and make such metadata available for query or retrieval. Attribute instance-level metadata, together with feature type-, feature instance-, and attribute type-level metadata, will be grouped into datasets, as defined in G.2.2. Examples of attribute instance metadata entries may include:

*Height above ground of a specific Great Grey Owl Nest.*

### **Example**

1) Consider a geographic data provider generating vector mapping data for the Province of Ontario of Bird Nests for Ontario. Initially the vector mapping was generated using a common series of paper maps, which were processed in the same way into a vector format. The bulk of the metadata for this initial data could be carried at a single level (Dataset series). This metadata

would describe the quality, citation, source, processing, of the data for all of 26 administrative areas.

So, the metadata could be carried exclusively at Dataset Series level.

**Dataset series – Nesting Site (Province of Ontario)**

Metadata entity set

Identification

Citation and responsible party

Extent

Constraints

Data quality

Maintenance

Spatial representation

Reference system

Content

Portrayal catalogue

Distribution

2) Each of the 26 individual Ontario Ministry of Natural Resources (OMNR) Districts begin validating and updating the vector mapping at their own pace and with their own biologists. The metadata would then be extended for each District to describe the new elements and modify the values for existing elements. These values would supersede those given for the Dataset series, but only for each District. In this case, each local data custodian is contributing changes to a single dataset that covers the entire province of Ontario. All local data conforms to the same spatial representation and reference system, all local data sets each contain the same content, and all districts make data available through the same distributor.

So, 26 new dataset-level records are created with some additional metadata added at the Dataset level to describe the new, district-level data. The initial dataset-level metadata record becomes a Series-level record. Some metadata elements are removed from the Series level. The minimum level of metadata required to reflect this change would be:

**Dataset series – Nesting Site (Province of Ontario)**

Metadata entity set

Series Identification

Citation and responsible party (Distributor)

Extent

Constraints

Spatial representation

Reference system

Portrayal catalogue

Distribution

**Dataset – Nesting Site - North Bay District**

Dataset Identification

Citation and Responsible Party (Custodian)

Extent

Content

Attributes

Data quality  
Maintenance

3) For research and application purposes the data custodian decides to distinguish Feature types within the dataset of Nesting Sites (e.g. Great Grey Owl nesting sites) for each Ontario Ministry of natural Resources (OMNR) District (e.g. North Bay District). Individual metadata records are created for each Feature Type for each OMNR District. Where there is no occurrence of the particular Feature in a given District, no record is created.

So, up to 34 new individual metadata records are created for each OMNR District at Feature type level (eg North Bay District Great Grey Owl Nesting Site). The minimum level of metadata required to reflect this change would be:

**Dataset series – Nesting Site (Province of Ontario)**

Metadata entity set  
Identification  
Citation and responsible party  
Extent  
Constraints  
Spatial representation  
Reference system  
Content  
Portrayal catalogue  
Distribution

**Dataset – Nesting Site – North Bay District**

Dataset Identification  
Citation and Responsible Party  
Extent  
Data quality  
Maintenance

**Feature Type - Great Grey Owl Nesting Site - North Bay District**

Dataset Identification  
Attributes  
Citation and Responsible Party

4) Since the data is being collected primarily for the purposes of creating forest management plans that will protect the Great Grey Owl, among other species, it is deemed important to know the height of each Great Gray Owl Nest as different methods of protection apply to low and high nests. All the Great Gray Owl Nests North Bay District are re-surveyed to add “Nest Height” to the nearest decimetre an attribute formerly left blank or of doubtful quality. This re-survey implies new metadata for the affected attribute type ‘Nest Height’. All other metadata for the North Bay District remains unaffected. This ‘Nest Height’ metadata is recorded at Attribute Type level.

So, metadata records are created for each instance of each Feature listing each of the Attributes of interest. Generally these records are available as part of the dataset itself. In this case, a Feature Catalogue is created that is available independent of the dataset, as a data dictionary for data within its transfer medium to allow dataset recipients to unbundle the data into their local

environment. The only Attribute value populated is the North Bay District Great Grey Owl Nesting Site ‘Nest Height’. The minimum level of metadata required reflecting this change would be:

**Dataset series – Nesting Site (Province of Ontario)**

Metadata entity set  
Identification  
Citation and responsible party  
Extent  
Constraints  
Spatial representation  
Reference system  
Content  
Portrayal catalogue  
Distribution

**Dataset - Nesting Site – North Bay District**

Dataset Identification  
Citation and Responsible Party  
Extent  
Data quality  
Maintenance

**Feature type - Great Grey Owl Nesting Site - North Bay District**

Dataset Identification  
Citation and Responsible Party

**Attribute type – Great Grey Owl Nesting Site - North Bay District – Nest Height**

Dataset Identification  
Citation and Responsible Party  
Attributes  
Data quality

5) One Great Gray Owl nest is located close to a hiking Trail in North Bay District and, as such is deemed to be sensitive and its existence to be revealed only to named users. This new data is reflected in the geographic data for North Bay District, and new metadata is required to record this new feature. All other metadata for North Bay District remains unaffected. This new feature metadata is recorded at Feature instance level.

So, additional metadata is required at Feature instance level to describe the new nest. The minimum level of metadata required reflecting this change would be:

**Dataset series – Nesting Site (Province of Ontario)**

Metadata entity set  
Identification  
Citation and responsible party  
Extent  
Constraints  
Spatial representation  
Reference system

Content  
Portrayal catalogue  
Distribution

**Dataset – Nesting Site – North Bay District**

Dataset Identification  
Citation and Responsible Party  
Extent  
Data quality  
Maintenance

**Feature type - Great Grey Owl Nesting Site - North Bay District**

Dataset Identification  
Citation and Responsible Party

**Attribute type - North Bay District – Nest Height**

Dataset Identification  
Citation and Responsible Party  
Data Quality

**Feature instance – North Bay District – New Great Grey Owl Nest**

Dataset Identification  
Citation and Responsible Party  
Extent

6) The availability of named users is considered to be a breach of Privacy and security protection must be added to this attribute to prevent disclosure. Again this new attribute requires new metadata to describe the modification. All other metadata for North Bay District remains unaffected. This new attribute metadata is recorded at Attribute instance level. However, since at least one feature in the dataset is classified as requiring access restrictions the Feature-level, Dataset-level, and possibly Series-level, access restrictions may have to be modified.

So, additional metadata is required at Attribute Instance level to describe the new Nest Height. The minimum level of metadata required reflecting this change would be:

**Dataset series – Nesting Site (Province of Ontario)**

Metadata entity set  
Identification  
Citation and responsible party  
Extent  
Constraints  
Data quality  
Maintenance  
Spatial representation  
Reference system  
Content  
Portrayal catalogue  
Distribution



**Feature type – Great Grey Owl Nesting Site - North Bay District**

Dataset Identification

Citation and Responsible Party

Extent

**Attribute type - North Bay District – Nest Height**

Dataset Identification

Citation and Responsible Party

Data Quality

**Feature instance - – North Bay District – Sensitive Great Gray Owl Nest**

Dataset Identification

Citation and Responsible Party

Extent

**Attribute instance - – North Bay District – Sensitive Great Gray Owl Nest – Privacy Protection**

Dataset Identification

Citation and Responsible Party

Data Quality

## **Annex E**

### **FGDC to NAP – Metadata**

(informative)

The issue of transformation of “Content Standard for Digital Geospatial Metadata (revised June 1998)” compliant metadata to NAP – Metadata compliant metadata is highly recognised. However, it is not in the scope of this profile to describe the metadata transformation from one to the other and conversely. But, tools such as crosswalk and XSLT between the two metadata standards and more are made available on the NAP – Metadata web page.