INSPIRE
Infrastructure for Spatial Information in Europe

Draft Guidelines – INSPIRE metadata implementing rules based on ISO 19115 and ISO 19119

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Table of Contents

Introduction

According to Article 5(4) of Directive 2007/2/EC, the INSPIRE Implementing Rules shall take account of relevant, existing international standards and user requirements. In the context of metadata for spatial data and spatial data services, the standards ISO 19115 and ISO 19119 have been identified as important standards.

A proposed Regulation implementing Directive 2007/2/EC of the European Parliament and of the Council as regards metadata has been submitted to the Regulatory Committee that will meet on 2008-05-14 to express its opinion. Any reference in this document to "Implementing Rules for Metadata" refers to the Regulation as proposed to the Regulatory Committee.

The aim of this document is to define how these standards shall be used to implement the proposed Regulation and provide the metadata for INSPIRE. The following subsections describe for each element of the proposed Regulation its relation with the mentioned European standards.

This is an initial version of this document that will be developed further in collaboration with the stakeholder community and relevant standardization organizations.

Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 19115 designates these two normative references:
- EN ISO 19115*:2005, Geographic information - Metadata*[1]
- ISO 19115/Cor.1*:2006, Geographic information – Metadata, Technical Corrigendum 1*

ISO 19119 designates these two normative references:
- ISO 19119*:2005, Geographic information - Services*
- ISO 19119*:2005/FDAmd 1, Extensions of the service metadata model*

ISO 19108 designates:
- EN ISO 19108*:2005, Geographic information – Temporal Schema*[2]

ISO 639-2*, Codes for the representation of names of languages - Part 2: Alpha-3 code*

ISO 8601*, Data elements and interchange formats - Information interchange - Representation of dates and times*

ISO/TS 19139*:2007, Geographic information - Metadata – XML Schema Implementation*

CSW2 AP ISO, *OpenGIS Catalogue Services Specification 2.0.2 - ISO Metadata Application Profile*, Version 1.0.0, OGC 07-045, 2007

ISO 10646-1*, Information technology — Universal Multiple-Octet Coded Character Set (UCS) — Part 1: Architecture and Basic Multilingual Plane*

[1] EN ISO 19115:2005 is the adoption by CEN of ISO 19115:2003
[2] EN ISO 19108:2005 is the adoption by CEN of ISO 19108:2002

1 INSPIRE profile of ISO 19115 and ISO 19119

1.1 ISO Core Metadata Elements

1.1.1 Spatial dataset and spatial dataset series

The table below compares the core requirements of ISO 19115 (see Table 3 in 6.5 of ISO 19115:2003) to the requirements of INSPIRE for spatial dataset and spatial dataset series as defined in the Implementing Rules for metadata.

ISO 19115 Core	INSPIRE	Comments
Dataset title (M)	Part B 1.1 Resource Title	-
Dataset reference date (M)	Part B 5 Temporal Reference	ISO 19115 is more demanding. If the metadata set does not contain a date of publication (Part B 5.2), last revision (Part B 5.3) or creation (Part B 5.4) of the resource, it has to contain any other reference date.
Dataset responsible party (O)	Part B 9 Responsible organisation	-
Geographic location of the dataset (C)	Part B 4.1 Geographic Bounding Box	INSPIRE is more restrictive. A Geographic bounding box is mandated
Dataset language (M)	Part B 1.7 Resource Language	ISO 19115 is more demanding. It mandates the dataset language, even if the resource does not include any textual information. The ISO 19115 Dataset language is defaulted to the Metadata language.
Dataset character set (C)	-	ISO 19115 is more demanding. The dataset character set has to be documented in ISO 19115 when ISO 10646-1 is not used.
Dataset topic category (M)	Part B 2.1 Topic Category	-
Spatial resolution of the dataset (O)	Part B 6.2 Spatial Resolution	-
Abstract describing the dataset (M)	Part B 1.2 Resource abstract	-
Distribution format (O)	-	-
Additional extent information for the dataset (vertical and temporal) (O)	Part B 5.1 Temporal extent	INSPIRE is more demanding. A temporal reference is mandated, and can be expressed as a temporal extent.
Spatial representation type (O)	-	-
Reference system (O)	-	-
Lineage (O)	Part B 6.1 Lineage	INSPIRE is more demanding. A general lineage statement is mandated.
On-line resource (O)	Part B 1.4 Resource Locator	-
Metadata file identifier (O)	-	-
Metadata standard name (O)	-	-

ISO 19115 Core	INSPIRE	Comments
Metadata standard version (O)	-	-
Metadata language (C)	Part B 10.3 Metadata Language	INSPIRE is more demanding. The metadata language is mandated even if it is defined by the encoding.
Metadata character set (C)	-	ISO 19115 is more demanding. The metadata character set has to be documented in ISO 19115 when ISO 10646-1 is not used.
Metadata point of contact (M)	Part B 10.1 Metadata point of contact	-
Metadata date stamp (M)	Part B 10.2 Metadata Date	-
-	Part B 1.3 Resource Type	INSPIRE is more demanding
-	Part B 7 Conformity	INSPIRE is more demanding
-	Part B 8.1 Conditions for access and use	INSPIRE is more demanding
-	Part B 8.2 Limitations on public access	INSPIRE is more demanding

1.1.2 Services

The table below compares the core requirements of ISO 19115 (see Table 3 in 6.5 of ISO 19115:2003) to the requirements of INSPIRE for services as defined in the Implementing Rules for metadata. The greyed lines correspond to core metadata elements not applicable to services.

ISO 19115 Core	INSPIRE	Comments
Dataset title (M)	Part B 1.1 Resource Title	-
Dataset reference date (M)	Part B 5 Temporal Reference	ISO 19115 is more demanding. Despite its name, this ISO 19115 Core metadata element applies to services. A reference date of the service (date of publication, revision or creation …) is mandated.
Dataset responsible party (O)	Part B 9 Responsible organisation	-
Geographic location of the dataset (C)	-	See INSPIRE Geographic Bounding Box
-	Part B 4.1 Geographic Bounding Box	The Geographic Bounding Box is handled in ISO 19119 with a different metadata element from the one corresponding to “Geographic location of the dataset”
Dataset language (M)	-	Not applicable to services
Dataset character set (C)	-	Not applicable to services
Dataset topic category (M)	-	Not applicable to services
Spatial resolution of the dataset (O)	-	Not applicable to services

ISO 19115 Core	INSPIRE	Comments
Abstract describing the dataset (M)	Part B 1.2 Resource abstract	-
Distribution format (O)	-	-
Additional extent information for the dataset (O)	-	-
Spatial representation type (O)	-	-
Reference system (O)	-	-
Lineage (O)	-	-
On-line resource (O)	Part B 1.4 Resource Locator	-
Metadata file identifier (O)	-	-
Metadata standard name (O)	-	-
Metadata standard version (O)	-	-
Metadata language (C)	Part B 10.3 Metadata Language	INSPIRE is more demanding. The metadata language is mandated even if it is defined by the encoding.
Metadata character set (C)	-	ISO 19115 is more demanding. The metadata character set has to be documented in ISO 19115 when ISO 10646-1 is not used.
Metadata point of contact (M)	Part B 10.1 Metadata point of contact	-
Metadata date stamp (M)	Part B 10.2 Metadata Date	-
-	Part B 1.3 Resource Type	INSPIRE is more demanding
-	Part B 7 Conformity	INSPIRE is more demanding
-	Part B 8.1 Conditions for access and use	INSPIRE is more demanding
-	Part B 8.2 Limitations on public access	INSPIRE is more demanding
-	Part B 1.6 Coupled Resource	Optional in INSPIRE
-	Part B 2.2 Spatial Data Service Type	INSPIRE is more demanding

1.1.3 Conclusion

- The conformance of an ISO 19115 metadata set to the ISO 19115 Core does not guarantee the conformance to INSPIRE;
- The use of these guideline to create INSPIRE metadata ensures that the metadata is not in conflict with ISO 19115. However, full conformance to ISO 19115 implies the provision of additional metadata elements which are not required by INSPIRE.

1.2 INSPIRE specific constraints

Here is an initial list of INSPIRE constraints applicable to an ISO 19115/ISO 19119 metadata set (i.e. an instance of MD_Metadata) describing a resource:

SC1. MD_Metadata.language is mandatory;

SC2. MD_Metadata.hierarchyLevel is mandatory;

SC3. INSPIRE only considers the first instance of MD_Metadata.hierarchyLevel (i.e. MD_Metadata.hierarchyLevel[1]) when there are many;

SC4. If the value of MD_Metadata.hierarchyLevel[1] is not **service**, **dataset** or **series**, the metadata set is out of scope of the directive;

SC5. When there are many instances of MD_Metadata.identificationInfo, only the first one (i.e. MD_Metadata.identificationInfo[1]);concerns the current INSPIRE Resource.

SC6. INSPIRE only considers the instance of MD_Metadata.dataQualityInfo applicable to the whole resource;

SC7. There shall not be more than one instance of MD_Metadata.identificationInfo[1].MD_Identification.citation.CI_Citation.date declared as a creation date (i.e. CI_Date.dateType having the creation value);

SC8. MD_Metadata.identificationInfo[1].MD_DataIdentification.citation.CI_Citation.identifier is mandatory for metadata sets related to spatial dataset and spatial dataset series;

SC9. The data type of MD_Metadata.identificationInfo.MD_DataIdentification.language is the codelist LanguageCode from ISO/TS 19139;

SC10. There is at least one instance of MD_Metadata.identificationInfo[1].MD_DataIdentification.extent defining the geographic location of the resource as a geographic bounding box (i.e. an instance of EX_GeographicBoundingBox or one of its subclasses).

SC11. MD_Metadata.identificationInfo[1].SV_ServiceIdentification.operatesOn shall be instantiated by reference

SC12. There shall be at least one instance of MD_Metadata.identificationInfo[1].MD_Identification.resourceConstraints

SC13. The coordinates of the bounding boxes (instance of EX_GeographicBoundingBox) shall be expressed in any geographic coordinate reference system with the **Greenwich Prime Meridian**

1.3 Extensions

1.3.1 Spatial data service type

For spatial data service types, the Implementing Rules mandate the use of the value domain of Part D 3. This information will be handled using the serviceType attribute (See 2.3.2) of the class SV_ServiceIdentification (See ISO 19119).

The data type of this class is GenericName. Thus the value domain of Part D 3 cannot be implemented using a codelist because a codelist is not a valid subtype of GenericName. Furthermore, there is no a direct mapping between the INSPIRE spatial data service types and the values of the serviceType attribute of the class SV_ServiceIdentification used in practice. As a long term mechanism, a register will be put in place in order to provide an unambiguous list of the ISO 19119 values matching the different INSPIRE spatial data service types.

The table below defines an initial set of possible values of the serviceType property.

Id	MD IR Name	Examples of ISO 19119 values
1	Discovery Service	OGC:CSW
2	View Service	OGC:WMS
3	Download Service	OGC:WFS OGC:WCS
4	Transformation Service	OGC:WCTS
5	Invoke Spatial Data Service	OGC:WPS
6	Other Services	Any non registered value

1.3.2 Classification of spatial data services

For classification of spatial data services, the Implementing Rules mandate the use of the value domain of Part D 4. In order to ensure a language independent expression of the classification of spatial data services, the language neutral name will be used as the value of the ISO 19115 keywords (See 2.4).

2 Basic mapping

2.1 Introduction

The following tables describe the mapping between the metadata elements of INSPIRE, as defined in the INSPIRE implementing rules for metadata, and ISO 19115/ISO 19119. For each of the INSPIRE Metadata element, the mapping is composed of:

- The main characteristics of the metadata element as they are defined[3] in the INSPIRE implementing rules (**IR**) for metadata, i.e.:
    - The reference to the paragraph of the implementing rules describing the metadata element;
    - The name of the metadata element as used in the implementing rules;
    - The **obligation/condition** applicable to the metadata element.
    - The **multiplicity** of the metadata element.
- The main characteristics of the corresponding metadata element of **ISO 19115** or **ISO 19119**, i.e.:
    - The **number** that identifies the metadata element inside tables in ISO 19115 (or ISO 19119) published standard.
    - The **name** by which the metadata element is known in ISO 19115 (or ISO 19119) published standard;
    - The **definition**, which gives the current ISO 19115 or ISO 19119 terms for describing the metadata element (Annex B of ISO 19115 standard : Data Dictionary for geographic metadata or Annex C of ISO 19119 : Data dictionary for geographic service metadata);
    - An **XPath** expression indicating the metadata element within the ISO 19115 / ISO 19119 UML model (see 2.1.1).
    - An **example** that illustrates the description of the current metadata element by providing a concrete case.
- **Some Implementing instructions**, which give more warnings about the implementation in the particular context of the current metadata element.

The INSPIRE metadata elements related to a given resource have to be handled in a single ISO 19115/ISO 19119 metadata set. The overall structure of an ISO 19115/ISO 19119 metadata set supporting the requirements expressed in the INSPIRE Implementing rules for metadata is defined in Section 3 of this document.

2.1.1 Xpath expression

This compact notation allows many defaults and abbreviations for common cases. The simplest XPath takes a form such as `/A/B/C` which selects C elements that are children of B elements that are children of the A element that forms the outermost element of the model. More complex expressions can be constructed by specifying an axis other than the default 'child' axis, a node test other than a simple name, or predicates, which can be written in square brackets after any step. The main rules are the following ones:

- ***** selects all element children of the context node;
- **text()** selects all text node children of the context node;
- **@name** selects the name attribute of the context node;
- **@*** selects all the attributes of the context node;
- **.** selects the context node;
- **.//para** selects the para element descendants at any level of the context node;
- **..** selects the parent of the context node.

Hereafter, the root element of the XPath expression is an instance of MD_Metadata or one of its subclass. The possible subelements of a class are its properties. The possible subelement of a property is its data type or a subtype of its data type. In order to manage the

[3] In case of discrepancy, the INSPIRE Implementing rules take precedence

polymorphism, the XPath expression deals with the data type in a generic way (e.g., property_element_name/*/datatype_property_name).

2.2 Identification

2.2.1 Resource title

IR	Reference	Part B 1.1
	Element name	Resource title
	Obligation / condition	Mandatory
	Multiplicity	[1]
ISO 19115	Number	360
	Name	Title
	Definition	Name by which the cited resource is known.
	XPath	identificationInfo[1]/*/citation/*/title
	Data type	CharacterString
	Domain	Free text
	Example	Mastermap
Implementing instructions		None

2.2.2 Resource abstract

IR	Reference	Part B 1.2
	Element name	Resource abstract
	Obligation / condition	Mandatory
	Multiplicity	[1]
ISO 19115	Number	25
	Name	abstract
	Definition	Brief narrative summary of the content of the resource(s).
	XPath	identificationInfo[1]/*/abstract
	Data type	CharacterString
	Domain	Free text
	Example	**Dataset contains large scale (1:1.000) topography, which covers the whole country.**
Implementing instructions		None

2.2.3 Resource Type

IR	Reference	Part B 1.3
	Element name	Resource Type
	Obligation / condition	Mandatory
	Multiplicity	[1]
ISO 19115	Number	6
	Name	hierarchyLevel
	Definition	Scope to which metadata applies.
	XPath	hierarchyLevel
	Data type	MD_ScopeCode
	Domain	CodeList (See Annex B of ISO 19115)
	Example	dataset
Implementing instructions		The values of MD_ScopeCode in the scope of the directive (See SC4 in 1.2) are: • **dataset** for spatial datasets; • **series** for spatial dataset series; • **services** for spatial data services. The hierarchyLevel property is not mandated by ISO 19115, but is mandated for conformance to the INSPIRE Metadata Implementing rules (See SC2 in 1.2).

2.2.4 Resource locator

IR	Reference	Part B 1.4
	Element name	Resource locator
	Obligation / condition	• Conditional for spatial dataset and spatial dataset series: Mandatory if a URL is available to obtain more information on the resources and/or access related services. • Conditional for services: Mandatory if linkage to the service is available
	Multiplicity	[0..*]
ISO 19115	Number	397
	Name	linkage
	Definition	Location (address) for on-line access using a Uniform Resource Locator address or similar addressing scheme.
	XPath	distributionInfo/*/transferOptions/*/onLine/*/linkage
	Data type	URL
	Domain	URL (IETF RFC1738 and IETF RFC 2056)
	Example	http://www.geonorge.no
Implementing instructions		• Specify a valid URL to the resource. If no direct link to a resource is available, provide link to a contact point where more information about the resource is available. • For a service, the Resource Locator might be one of the following: - A link to the service capabilities document; - A link to the service WSDL document (SOAP Binding); - A link to a web page with further instructions - A link to a client application that directly accesses the service

2.2.5 Unique resource identifier

IR	Reference	Part B 1.5
	Element name	Unique resource identifier
	Obligation / condition	Mandatory for dataset and dataset series.
	Multiplicity	[1..*]
ISO 19115	Number	365
	Name	Identifier
	Definition	value uniquely identifying an object within a namespace.
	XPath	identificationInfo[1]/*/citation/*/identifier
	Data type	MD_Identifier
	Domain	See B.2.7.3 of ISO 19115. The code property is required at a minimum, and a codeSpace property may be provided.
	Examples	code: **http://www.ign.fr/9876543210#dataId**
		code: **9876543210** codeSpace: **http://www.ign.fr**
		code: **527c4cac-070c-4bca-9aaf-92bece7be902**
Implementing instructions		None

2.2.6 Coupled resource

IR	Reference	Part B 1.6
	Element name	Coupled resource
	Obligation / condition	• Not applicable to dataset and dataset series • Conditional to services: Mandatory if linkage to datasets on which the service operates are available.
	Multiplicity	[0..*]
ISO 19119	Number	9 of C.2.2
	Name	identificationInfo[1]/*/operatesOn
	Definition	Provides information about the datasets that the service operates on.
	XPath	identificationInfo[1]/*/operatesOn
	Data type	MD_DataIdentification
	Domain	A unique resource identifier or locator of the MD_DataIdentification object.
	Example	**http://www.ign.fr/9876543210#dataId**
Implementing instructions		- The property shall be implemented by reference (See SC11 in 1.2) and the MD_DataIdentification object reference value is the code of the Coupled resource metadata element. - For consistency, the code of the Couple resource metadata element should also be the code of one of the Unique resource identifiers of the corresponding coupled resource.

2.2.7 Resource language

IR	Reference	Part B 1.7
	Element name	Resource language
	Obligation / condition	• Conditional for spatial dataset and spatial dataset series: Mandatory if the resource includes textual information. • Not applicable to services.
	Multiplicity	[0..*]
ISO 19115	Number	39
	Name	language
	Definition	Language(s) used within the datasets
	XPath	identificationInfo[1]/*/language
	Data type	LanguageCode (ISO/TS 19139)
	Domain	Codelist (See ISO/TS 19139) based on alpha-3 codes of ISO 639-2. Use only three-letter codes from in ISO 639-2/B (bibliographic codes), as defined at http://www.loc.gov/standards/iso639-2/ The list of codes for the 23 official EU languages is: Bulgarian – **bul** Czech – **cze** Danish – **dan** Dutch – **dut** English – **eng** Estonian – **est** Finnish – **fin** French – **fre** German – **ger** Greek – **gre** Hungarian – **hun** Irish – **gle** Italian – **ita** Latvian – **lav** Lithuanian – **lit** Maltese – **mlt** Polish – **pol** Portuguese – **por** Romanian – **rum** Slovak – **slo** Slovenian – **slv** Spanish – **spa** Swedish – **swe**
	Example	**eng**
Implementing instructions		An instance of the language property is mandated by ISO 19115 ; it can be defaulted to the value of the Metadata Language when the dataset or the dataset series does not contain textual information.

2.3 Classification of spatial data and services

2.3.1 Topic category

IR	Reference	Part B 2.1
	Element name	Topic category
	Obligation / condition	• Mandatory for datasets and dataset series. • Not applicable to services.
	Multiplicity	[1..*]
ISO 19115	Number	41
	Name	topicCategory
	Definition	Main theme(s) of the dataset
	XPath	identificationInfo[1]/*/topicCategory
	Data type	MD_TopicCategory
	Domain	Enumeration (See B.5.27 of ISO 19115)
	Example	**boundaries**
Implementing instructions		The topic categories defined in Part D 2 of the INSPIRE Implementing rules for metadata are derived directly from the topic categories defined in B.5.27 of ISO 19115. INSPIRE Implementing rules for metadata define the INSPIRE data themes to which each topic category is applicable, i.e., Administrative units (I.4) and Statistical units (III.1) are INSPIRE themes for which the **boundaries** topic category is applicable. The value of the ISO 19115/ISO 19119 metadata element is the value appearing in the “name” column of the table in B.5.27 of ISO 19115.

2.3.2 Spatial data service type

IR	Reference	Part B 2.2
	Element name	Spatial data service type
	Obligation / condition	• Mandatory for services. • Not applicable to dataset and dataset series.
	Multiplicity	[1]
ISO 19119	Number	1 of C.2.2
	Name	identificationInfo[1]/*/serviceType
	Definition	A service type name from a registry of services.
	XPath	identificationInfo[1]/*/serviceType
	Data type	GenericName
	Domain	See 1.3.1
	Example	**OGC:CSW** (According to 1.3.1, the corresponding INSPIRE value is **Discovery Service**)
Implementing instructions		None

2.4 Keyword

An INSPIRE Keyword is defined by:

- a keyword value (see 2.4.1);
- and an optional originating controlled vocabulary (see 2.4.2).

There may be multiple keywords for a single resource, but the multiplicity of the keyword value and of the originating controlled vocabulary is expressed relative to a single keyword.

The INSPIRE Implementing rules for metadata mandate the presence of at least one keyword:

- for spatial dataset or spatial dataset series, it shall describe the relevant INSPIRE spatial data theme (as defined in Annex I, II and III of the Directive) originating from the general environmental multilingual thesaurus (GEMET) (http://www.eionet.europa.eu/gemet);
- for spatial data services, it shall at least define the category or subcategory of the service using its language neutral name as defined in Part D 4 of the Metadata Implementing Rules.

2.4.1 Keyword value

IR	Reference	Part B 3.1
	Element name	Keyword value
	Obligation / condition	Mandatory
	Multiplicity	[1] relative to a single keyword, but there may be many keywords, with each a different keyword value, originating from one or many different controlled vocabularies.
ISO 19115	Number	53
	Name	keyword
	Definition	Commonly used word(s) or formalised word(s) or phrase(s) used to describe the subject.
	XPath	identificationInfo[1]/*/descriptiveKeywords/*/keyword
	Data type	CharacterString
	Domain	Free text
	Example	**hydrography**, **river**
Implementing instructions		Each instance of ISO 19115 keyword may originate from a controlled vocabulary described through the thesaurusName property of the instance of descriptiveKeywords to which the keyword pertains.

2.4.2 Originating controlled vocabulary

IR	Reference	Part B 3.2
	Element name	Originating controlled vocabulary.
	Obligation / condition	Conditional: Mandatory if the keyword value originates from a controlled vocabulary.
	Multiplicity	[0..1] relative to a single Keyword, but there may be many keywords originating from different controlled vocabulary.
ISO 19115	Number	55
	Name	ThesaurusName
	Definition	Name of the formally registered thesaurus or a similar authoritative source of keywords.
	XPath	identificationInfo[1]/*/descriptiveKeywords/*/thesaurusName
	Data type	CI_Citation
	Domain	The following properties are expected: • title of type CharacterString (Free text) • reference date defined as: o a date type : creation, revision or publication o an effective date
	Example	• title: "**GEMET Thesaurus version 1.0**" • date: o dateType: **publication** o date: **2009-06-30**
Implementing instructions		In order to be consistent with ISO 19115, all the keyword values originating from a single version of a single controlled vocabulary shall be grouped in a single instance of the ISO 19115 descriptiveKeywords property.

2.5 Geographic location

2.5.1 Geographic bounding box

IR	Reference	Part B 4.1
	Element name	Geographic bounding box
	Obligation/ Condition	• Mandatory for spatial dataset and dataset series. • Conditional for spatial services: Mandatory for services with an explicit geographic extent.
	Multiplicity	[1..*] for spatial data sets and spatial dataset series [0..*] for spatial data services
ISO 19115	Number	344
	Name	westBoundLongitude
	Definition	Western-most coordinate of the limit of the dataset extent, expressed in longitude in decimal degrees (positive east).
	XPath	identificationInfo[1]/*/extent/*/geographicElement/*/westBoundLongitude
	Data type	Decimal
	Domain	-180.00 ≤ westBoundLongitude ≤ 180.00
	Example	**2.50**
ISO 19115	Number	345
	Name	eastBoundLongitude
	Definition	Eastern-most coordinate of the limit of the dataset extent, expressed in longitude in decimal degrees (positive east).
	XPath	identificationInfo[1]/*/extent/*/geographicElement/*/eastBoundLongitude
	Data type	Decimal
	Domain	-180 ≤ eastBoundLongitude ≤ 180.00
	Example	**5.80**
ISO 19115	Number	346
	Name	southBoundLatitude
	Definition	Southern-most coordinate of the limit of the dataset extent, expressed in latitude in decimal degrees (positive north).
	XPath	identificationInfo[1]/*/extent/*/geographicElement/*/southBoundLatitude
	Data type	Decimal
	Domain	-90.00 ≤ southBoundLatitude ≤ northBoundLatitude
	Example	**51.80**
ISO 19115	Number	347
	Name	northBoundLatitude
	Definition	Northern-most coordinate of the limit of the dataset extent, expressed in latitude in decimal degrees (positive north).
	XPath	identificationInfo[1]/*/extent/*/geographicElement/*/northBoundLatitude
	Data type	Decimal
	Domain	southBoundLatitude ≤ northBoundLatitude ≤ 90.00;
	Example	**54.60**
Implementing instructions		• There are as many bounding boxes defining the geographic location of the resource as instances of identificationInfo[1]/*/extent/*/geographicElement having the westBoundLongitude, eastBoundLongitude, southBoundLatitude and northBoundLatitude properties. The four coordinates of the bounding box originate from the same instance. • The bounding box shall be as small as possible. • If the bounding box crosses the 180 meridian, then the value of the westBoundLongitude will be greater than the eastBoundLongitude value. • The coordinates of the bounding box are expressed in any geographic coordinate reference system with a Greenwich Prime Meridian (See SC13 in 1.2).

2.6 Temporal reference

The INSPIRE Implementing Rules for metadata require at least one temporal reference of one of the following categories. In order to ensure the conformance to ISO 19115, it is required to provide at least a date of publication, the date of last revision or the date of creation.

2.6.1 Temporal extent

IR	Reference	Part B 5.1
	Element name	Temporal extent
	Obligation / condition	Conditional: At least one temporal reference is required.
	Multiplicity	[0..*] but at least one temporal reference is required.
ISO 19115	Number	351
	Name	Extent
	Definition	Time period covered by the content of the dataset.
	XPath	identificationInfo[1]/*/extent/*/temporalElement/*/extent
	Data type	TM_Primitive[4]
	Domain	As described in ISO 19108.
	Example	From **1977-03-10T11:45:30** to **2005-01-15T09:10:00**
Implementing instructions		Each instance of the temporal extent may be an interval of dates or an individual date. The overall time period covered by the content of the resource may be composed of one or many instances.

2.6.2 Date of publication

IR	Reference	Part B 5.2
	Element name	Date of publication
	Obligation / condition	Conditional: At least one temporal reference is required.
	Multiplicity	[0..*] but at least one temporal reference is required
ISO 19115	Number	394
	Name	date
	Definition	reference date for the cited resource – publication
	XPath	identificationInfo[1]/*/citation/*/date[./*/dateType/*/text()=' publication']/*/date
	Data type	CI_Date
	Domain	Described in ISO 19108 and ISO 8601
	Example	**2007-09-15** or **2007-11-15T11:15:00**
Implementing instructions		None

[4] ISO19108 describes other domains which might support the INSPIRE requirements for temporal metadata. There are no implementations currently known. ISO19108 allows ordinal temporal extents (TM_Position values of TM_OrdinalEras defined within a TM_OrdinalReferenceSystem) and an indeterminate value of “now” is valid under TM_Position. ISO 19108 TM_PeriodDuration also defines the distance in the temporal dimension

2.6.3 Date of last revision

IR	Reference	Part B 5.3
	Element name	Date of last revision
	Obligation / condition	Conditional: At least one temporal reference is required
	Multiplicity	[0..1] but at least one temporal reference is required.
ISO 19115	Number	394
	Name	Date
	Definition	reference date for the cited resource – revision
	XPath	identificationInfo[1]/*/citation/*/date[./*/dateType/*/text()='revision']/*/date
	Data type	Date
	Domain	Described in ISO 19108 and ISO 8601
	Example	**2007-09-15** or **2007-11-15T11:15:00**
Implementing instructions		There may be more than one revision date provided in an ISO 19115 metadata set, but the INSPIRE date of last revision is the more recent.

2.6.4 Date of creation

IR	Reference	Part B 5.4
	Element name	Date of creation
	Obligation / condition	Conditional: At least one temporal reference is required
	Multiplicity	[0..1] but at least one temporal reference is required
ISO 19115	Number	394
	Name	date
	Definition	reference date for the cited resource – creation
	XPath	identificationInfo[1]/*/citation/*/date[./*/dateType/*/text()='creation']/*/date
	Data type	Date
	Domain	Described in ISO 19108 and ISO 8601
	Example	**2007-09-15** or **2007-11-15T11:15:00**
Implementing instructions		If in practice an ISO 19115 metadata set may define more than one creation date, this has no sense. There shall be a single creation date for the resource (See SC7 in 1.2).

2.7 Quality and validity

2.7.1 Lineage

IR	Reference	Part B 6.1
	Element name	Lineage
	Obligation / Condition	• Mandatory for spatial dataset and spatial dataset series. • Not applicable to services.
	Multiplicity	[1]
ISO 19115	Number	83
	Name	Statement
	Definition	General explanation of the data producer's knowledge about the lineage of a dataset.
	XPath	dataQualityInfo/*/lineage/*/statement
	Data type	CharacterString
	Domain	Free text
	Example	**Dataset has been digitised from the standard 1:5.000 map**
Implementing instructions		• In addition to general explanation of the data producer's knowledge about the lineage of a dataset it is possible to put data quality statements here. • A single ISO 19115 metadata set may comprise more than one set of quality information, each of them having one or zero lineage statement. There shall be one and only one set of quality information scoped to the full resource and having a lineage statement (See SC6 in 1.2).

2.7.2 Spatial resolution

IR	Reference	Part B 6.2
	Element name	Spatial resolution
	Obligation / Condition	• Conditional: Mandatory if an equivalent scale or a resolution distance can be specified. • Conditional: Mandatory when there is a restriction on the spatial resolution for service
	Multiplicity	[0..*]
ISO 19115	Number	60
	Name	equivalentScale
	Definition	level of detail expressed as the scale denominator of a comparable hardcopy map or chart
	XPath	identificationInfo[1]/*/spatialResolution/*/equivalentScale/*/denominator
	Data type	Integer
	Domain	Positive integer
	Example	**50000** (e.g. 1:50000 scale map)
ISO 19115	Number	61
	Name	distance
	Definition	Ground sample distance
	XPath	identificationInfo[1]/*/spatialResolution/*/distance
	Data type	Distance
	Domain	A distance is a Number expressing the distance value and a unit of measure of the distance value.
	Example	**3 meters**
Implementing instructions		• Each spatial resolution is either an equivalent scale OR a ground sample distance. • When two equivalent scales or two ground sample distances are expressed, the spatial resolution is an interval bounded by these two values.

2.8 Conformity

In conformance to Directive 2007/2/EC, the metadata shall include information on the degree of conformity with the implementing rules provided in Art. 7-1. ISO 19115 provides a mechanism for reporting about the evaluation of the conformity of the resource against a given specification. This mechanism is used here to handle the conformity requirements of INSPIRE.

The Implementing Rules for metadata defines in Part D 5 three degrees of conformity: conformant, not conformant and not evaluated. In ISO 19115, it is possible to report about the conformity to a specification when it has been evaluated, but the only way to express the fact that the conformity with a given specification has not been evaluated is to not report anything in the metadata.

A precise list of specifications to which the different types of resource have to conform will be mandated later through INSPIRE Implementing Rules for the harmonisation of spatial data sets and services or a related instructions. These legal texts will define for each specification:

- the title of the specification;
- the date of publication of the specification;
- an identifier of the conformity statement used as the identifier of the quality measure for which the conformity is evaluated against the specification;
- the quality criteria concerned by the quality measure (i.e., the subtype of the ISO 19115 class DQ_Element to be instantiated). The default criteria is the logical consistency (i.e. DQ_DomainConsistency).

When the metadata does not contain any information about one of these specifications, the user applications exploiting the metadata shall report that the conformity to that specification has not been evaluated. So the general process for exploiting the metadata is for each INSPIRE conformity specification to:

- check using the identifier of the quality measure defined for the specification whether the conformance to the specification has been reported;
- report that the conformity to the specification has not been evaluated on this quality measure;
- exploit the metadata, i.e. the description of specification and the degree of conformity, as stated hereafter when the specification has been evaluated.

2.8.1 Degree

IR	Reference	Part B 7.2
	Element name	Degree
	Obligation/Condition	Mandatory
	Multiplicity	[1] understood in the context of a conformity statement when reported in the metadata – there may be more than one conformity statement.
ISO 19115	Number	132
	Name	Pass
	Definition	indication of the conformance result
	XPath	dataQualityInfo/*/report/*/result/*/pass
	Data type	Boolean[5]
	Domain	• **true** if conformant[5] • **false** if not conformant[5]
	Example	**true**
Implementing instructions		The first two degrees of conformity defined in Part D 5 of the INSPIRE Implementing rules for metadata map to two values of the Boolean domain of ISO 19115. The last value corresponds to the case where no conformance statement is expressed in the metadata for the related specification.

[5] ISO/TS 19103 defines Boolean as a value defining TRUE or FALSE (EXAMPLE: true or false), while ISO 19115:2003 clearly states that the domain of value of the Boolean properties is 0="no", 1="yes". In the meantime, ISO/TS 19139 implements the Boolean class using the XML build-in type xs:boolean (values are **true** or **false**).

2.8.2 Specification

IR	Reference	Part B 7.1
	Element name	Specification
	Obligation/Condition	Mandatory
	Multiplicity	[1] understood in the context of a conformity statement when reported in the metadata – there may be more than one conformity statement.
ISO 19115	Number	130
	Name	specification
	Definition	citation of the product specification or user requirement against which data is being evaluated.
	XPath	dataQualityInfo/*/report/*/result/*/specification
	Data type	CI_Citation
	Domain	The following properties are expected: • title of type CharacterString (Free text); • reference date defined as: o a date type : creation, revision or publication; o an effective date.
	Example	• title: "**INSPIRE Implementing rules laying down technical arrangements for the interoperability and harmonisation of administrative boundaries**". • date: o dateType: **publication** o date: **2009-05-15**
Implementing instructions		None

2.9 Constraints related to access and use

ISO 19115 provides a general mechanism for documenting different categories of constraints applicable to the resource (or its metadata). This mechanism is supported by the class MD_Constraints and its subclasses:

- MD_LegalConstraints for legal constraints;
- MD_SecurityConstraints for security constraints.

There are two major requirements expressed in Directive 20007/2/EC in terms of documentation of the constraints as part of the metadata:

- The conditions applying to access and use of the resource, and where applicable, the corresponding fees as required by Articles 5-2(b) and 11-2(f).
- The limitations on public access: the Member States may limit public access to spatial datasets and spatial data services in a set of cases defined in Article 13. These cases include public security or national defence, i.e. more generally the existence of a security constraint.

Each instance of MD_Constraints expresses:

- Zero or One condition applying to access and use (see 2.9.2);
- Zero or More limitations on public access (see 2.9.1);
- Or, both one or more limitations on public access and a condition applying to access and use.

There shall be at least one instance of MD_Constraints or one of its subclasses (See SC12 in 1.2) even if there is no limitation on public access or no specific condition applies to access and use of the resource.[6]

[6] If the Resource Type is 'service' there might be a conflict with the property 'restrictions' of class 'SV_ServiceIdentification'. This property is also of type MD_Constraints with a multiplicity of 0..1. Any constraint on a service described by this property is out of the scope of the Implementing rules. Instead, the constraints on services shall be defined as stated in clause 2.9.1 and 2.9.2 of this document.

2.9.1 Limitations on public access

IR	Reference	Part B 8.2
	Element name	Limitations on public access
	Obligation/Condition	Mandatory
	Multiplicity	[1..*] for the resource but there are zero or many limitations on public access per instance of MD_Constraints.
ISO 19115	Number	70
	Name	accessConstraints
	Definition	access constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the resource.
	XPath	identificationInfo[1]/*/resourceConstraints/*/accessConstraints
	Data type	MD_RestrictionCode
	Domain	Codelist (strictly limited to the value defined in B.5.24 of ISO 19115)
	Example	**intellectualPropertyRights** (rights to financial benefit from and control of distribution of non-tangible property that is a result of creativity).
ISO 19115	Number	72
	Name	otherConstraints
	Definition	other restrictions and legal prerequisites for accessing and using the resource or metadata.
	XPath	identificationInfo[1]/*/resourceConstraints/*/otherConstraints
	Data type	CharacterString
	Domain	Free text
	Example	
ISO 19115	Number	74
	Name	classification
	Definition	name of the handling restrictions on the resource.
	XPath	identificationInfo[1]/*/resourceConstraints/*/classification
	Data type	MD_ClassificationCode
	Domain	Codelist (See B.5.11 of ISO 19115)
	Example	**restricted** (not for general disclosure)

Implementing instructions		• Depending on the instance of MD_Constraints:
		  o There may be no limitation on public access;
		  o There may be only a classification property when expressing a security constraint (i.e., this is an instance of MD_SecurityConstraints or one of its subclasses);
		  o There may be one or more instances of the accessConstraints property, possibly associated with one or more instances of otherRestrictions property (i.e, this is an instance of MD_LegalConstraints);
		• The value of accessConstraints is otherRestrictions, if and only if they are instances of otherConstraints expressing limitations on public access. In such case, the instances of otherConstraints are reported as part of the INSPIRE limitations on public access, but the special value otherRestrictions of accessConstraints should not be reported.

2.9.2 Conditions applying to access and use

IR	Reference	Part B 8.1
	Element name	Condition applying to access and use
	Obligation/Condition	Mandatory
	Multiplicity	[1..*] for the resource but there is zero or one condition applying to access and use per instance of MD_Constraints.
ISO 19115	Number	68
	Name	useLimitation
	Definition	restrictions on the access and use of a resource or metadata
	XPath	identificationInfo[1]/*/resourceConstraints/*/useLimitation
	Data type	CharacterString
	Domain	Free text
	Example	**not to be used for navigation**
Implementing instructions		Where applicable, the corresponding fees shall be provided

2.10 Responsible organisation

A responsible organisation is defined by:

- a responsible party (see 2.10.1);
- and a responsible party role (see 2.10.2).

There are one to many responsible organisations for a single resource, but the multiplicity of the responsible and its role are expressed relative to a single responsible organisation.

2.10.1 Responsible party

IR	Reference	Part B 9.1
	Element name	Responsible party
	Obligation/Condition	Mandatory
	Multiplicity	[1] Relative to a responsible organisation, but there may be many responsible organisations for a single resource.
ISO 19115	Number	29
	Name	pointOfContact
	Definition	identification of, and means of communication with, person(s) and organization(s) associated with the resource(s)
	XPath	identificationInfo[1]/*/pointOfContact
	Data type	CI_ResponsibleParty
	Domain	The following properties are expected: • organisationName : CharacterString • contactInfo: o address: ▪ electronicMailAddress [1..*] : CharacterString
	Example	• organisationName: **Institut Géographique National** • contactInfo: o address: ▪ electronicMailAddress: **support@ign.fr**
Implementing instructions		None

2.10.2 Responsible party role

IR	Reference	Part B 9.2
	Element name	Responsible party role
	Obligation/Condition	Mandatory
	Multiplicity	[1] relative to a responsible organisation, but there may be many responsible organisations for a single resource.
ISO 19115	Number	379
	Name	role
	Definition	function performed by the responsible party
	XPath	identificationInfo[1]/*/pointOfContact/*/role
	Data type	CI_RoleCode
	Domain	Codelist (See B.5.5 of ISO 19115)
	Example	**resourceProvider** (Resource Provider)
Implementing instructions		There is a direct mapping between the responsible party roles defined in Part D 6 of the INSPIRE Implementing Rules for metadata and the values of the CI_RoleCode codelist of ISO 19115.

2.11 Metadata on metadata

2.11.1 Metadata point of contact

IR	Reference	Part B 10.1
	Element name	Metadata point of contact
	Obligation/Condition	Mandatory
	Multiplicity	[1..*]
ISO 19115	Number	8
	Name	contact
	Definition	party responsible for the metadata information.
	XPath	contact
	Data type	CI_ResponsibleParty
	Domain	The following properties are expected: • organisationName : CharacterString • contactInfo: o address: ▪ electronicMailAddress [1..*] : CharacterString • role : CI_RoleCode
	Example	• organisationName: **Institut Géographique National** • contactInfo: o address: ▪ electronicMailAddress: **support@ign.fr** • role: **pointOfContact**
Implementing instructions		The role of the responsible party serving as a metadata point of contact is out of scope of the INSPIRE Implementing Rules, but this property is mandated by ISO 19115. Its value can be defaulted to **pointOfContact**.

2.11.2 Metadata date

IR	Reference	Part B 10.2
	Element name	Metadata date
	Obligation/Condition	Mandatory
	Multiplicity	[1]
ISO 19115	Number	9
	Name	dateStamp
	Definition	Date that the metadata was created.
	XPath	dateStamp
	Data type	Date
	Domain	ISO 8601
	Example	**2005-03-27**
Implementing instructions		None

2.11.3 Metadata language

IR	Reference	Part B 10.3
	Element name	Metadata language
	Obligation/Condition	Mandatory
	Multiplicity	[1]
ISO 19115	Number	3
	Name	language
	Definition	Language used for documenting metadata.
	XPath	language
	Data type	LanguageCode (ISO/TS 19139)
	Domain	Codelist (See ISO/TS 19139) based on alpha-3 codes of ISO 639-2. Use only three-letter codes from in ISO 639-2/B (bibliographic codes), as defined at http://www.loc.gov/standards/iso639-2/ The list of codes for the 23 official EU languages is: Bulgarian – **bul** Czech – **cze** Danish – **dan** Dutch – **dut** English – **eng** Estonian – **est** Finnish – **fin** French – **fre** German – **ger** Greek – **gre** Hungarian – **hun** Irish – **gle** Italian – **ita** Latvian – **lav** Lithuanian – **lit** Maltese – **mlt** Polish – **pol** Portuguese – **por** Romanian – **rum** Slovak – **slo** Slovenian – **slv** Spanish – **spa** Swedish – **swe**
	Example	**eng**
Implementing instructions		The language property is not mandated by ISO 19115, but is mandated for conformance to the INSPIRE Metadata Implementing rules (See SC1 in 1.2).

3 Detailed mapping

3.1 Introduction

This structure is presented as a set of template instances of ISO 19115 and ISO 19119 classes. The template instance of a class is defined by a set of property instances. The description of each property instance is composed of:

- A + sign starting the description of the property instance;
- The property label as appearing in ISO 19115 and ISO 19119 UML Models;
- A presence requirement expressed with a cardinality statement between square brackets. This cardinality statement expresses the INSPIRE requirements which implies possible differences with the ISO 19115 cardinality;
- A colon;
- The property type name. The property type is implemented as a sub element of the property. This sub element can be an instance of the property type or an instance of one of its derived types. In the latter case, the derived type is either an ISO type or an extension type defined in a profile.
- A property instance statement which describes how the property type is implemented.

Additional information is provided in a Note section, at the bottom of each table.

This hierarchical set of labels acts as an instance Template. This template only shows the properties in the scope of the INSPIRE metadata elements, which encompass the mandatory properties of ISO 19115 and ISO 19119. The other optional properties of ISO 19115 are not described, but can be present in a real instance.
Additional properties defined in a profile of ISO 19115 or ISO 19119 compliant with the INSPIRE metadata elements can be expressed but are not documented here.

3.2 Resource MetadataSet

An INSPIRE Metadata Set is an instance of:

- the class MD_Metadata (from ISO 19115),
- the class MI_Metadata (from ISO 19115-2),
- or, an instance of any community specialisation of one of these two classes.

This instance is composed at least of the following property instances:

+ language [1] : LanguageCode ..... Metadata Language (See 2.11.3)
+ hierarchyLevel [1] : MD_ScopeCode ..... Resource Type (See 2.2.3 and note 2)
+ contact [1..*] : CI_ResponsibleParty ..... Metadata point of contact (See 2.11.1 and 3.5.2)
+ dateStamp [1] : Date ..... Metadata date (See 2.11.2)
+ identificationInfo [1] : MD_Identification ..... See 3.3 and note 3
+ distributionInfo [0..*] : MD_Distribution
  + transferOptions [0..*] : MD_Format
    + online [0..*] : CI_Onlineresource
      + linkage [1]: URL .....
      + Resource locator (See 2.2.4 and Note 1)
+ dataQualityInfo [0..*] : DQ_DataQuality ..... See 3.4

Notes :

1. The linkage property is not multiple, but there may be many instances of distributionInfo, and for each many instances of transferOptions and for each many instances of online, implying multiple INSPIRE Resource Locator.
2. There may be many instances of hierarchyLevel, but the value of the INSPIRE Resource Type corresponds to the first instance (See SC3 in 1.2). .
3. There may be many instances of identificationInfo, but only the first one will be considered (See SC5 in 1.2).

3.3 Identification Section

3.3.1 Sub-elements for spatial dataset and spatial dataset series

If the Resource Type (i.e., the value of metadata set hierarchyLevel) is dataset or series, the data type of identificationInfo instance will be MD_DataIdentification or a subclass of MD_DataIdentification. Its property instances are described hereafter.

+ citation [1] : CI_Citation
  + title [1] : CharacterString ..... Resource title (See 2.2.1)
  + date [0..*] : CI_Date ..... See note 1
    + date [1] : Date ..... Date of publication (See 2.6.2)
    + dateType [1] : CI_DateTypeCode ..... publication
  + date [0..1] : CI_Date ..... See notes 1 and 2
    + date [1] : Date ..... Date of last revision (See 2.6.3)
    + dateType [1] : CI_DateTypeCode ..... revision
  + date [0..1] : CI_Date ..... See Note 1 and 3
    + date [1] : Date ..... Date of creation (See 2.6.4)
    + dateType [1] : CI_DateTypeCode ..... creation
  + identifier [1..*] : MD_Identifier ..... Unique resource identifier(See 2.2.5 and SC8)
    + code [1] : CharacterString ..... This is the mandatory code of the identifier
    + codeSpace [0..1] : CharacterString ..... This is the optional namespace of the identifier
+ abstract [1] : CharacterString ..... Resource abstract (See 2.2.2)
+ pointOfContact [1..*] : CI_ResponsibleParty ..... See 3.5.1
+ descriptiveKeywords [1..*] : MD_Keywords
  + keyword [1..*] : CharacterString ..... Keyword value (See 2.4.1)
  + thesaurusName [0..1] : CI_Citation ..... Originating controlled vocabulary (See 2.4.2)
+ resourceConstraints [1..*] : MD_Constraints ..... See 3.6
+ spatialResolution [0..*] : MD_Resolution ..... Spatial resolution (2.7.2) – See Note 4
  + distance [0..1] : Distance ..... This is the ground distance
  + equivalentScale [0..1] : MD_RepresentativeFraction
    + denominator [1] : Integer ..... This is equivalent scale denominator
+ language [1..*] : LanguageCode ..... Resource language (See 2.2.7, SC9 in 1.2 and Note 5)
+ extent [1] : EX_Extent ..... See Note 6
  + geographicElement [1..*] : EX_GeographicBoundingBox ..... Geographic bounding box (See 2.5.1)
    + westBoundLongitude [1] : Decimal
    + eastBoundLongitude [1] : Decimal
    + southBoundLatitude [1] : Decimal
    + northBoundLatitude [1] : Decimal
  + temporalElement [0..*] : EX_TemporalExtent ..... See Note 7
    + extent [1] : TM_Primitive ..... Temporal extent (See 2.6.1)
+ topicCategory [1..*] : MD_TopicCategory ..... Topic category (2.3.1)

Notes:

1. There may be many instances of the date property with different date types including publication, revision or creation. The order of these instances is free. If no instance of this property has the publication, revision or creation date type, then the metadata set has to include the description of a temporal extent. For compliance with ISO 19115, there is necessarily one instance of the date property, whatever its date type, even if a temporal extent is provided in the metadata.
2. The only instance of date having the revision date type matching the INSPIRE last revision date is the one having the more recent date.
3. Even if ISO 19115 allows the presence of many dates having a creation date type, it is considered inconsistent to have more than one creation date (See SC7 in 1.2).
4. MD_Resolution is a union data type. Its content is either a distance property or an equivalent scale property. In case of an equivalent scale, the denominator of the equivalent scale is provided.
5. An instance of the language property is mandated by ISO 19115 ; it can be defaulted to the value of the Metadata Language when the dataset or the dataset series does not contain textual information.
6. There may be other instances, but at least one defining the bounding box is required (See SC10 in 1.2). This instance is not necessarily the first instance.
7. There may be different instances of temporalElement defining the temporal extent of the resource. These instances may be in different instances of extent, one of them possibly handling the geographic bounding box.

3.3.2 Sub-elements for service resources

If the Resource Type (i.e., the value of metadata set hierarchyLevel) is **service**, the data type of identificationInfo instance will be SV_ServiceIdentification or a subclass of SV_ServiceIdentification. Its property instances are described hereafter.

+ citation [1] : CI_Citation
  + title [1] : CharacterString ..... Resource title (See 2.2.1)
  + date [0..*] : CI_Date ..... See note 1
    + date [1] : Date ..... Date of publication (See 2.6.2)
    + dateType [1] : CI_DateTypeCode ..... publication
  + date [0..1] : CI_Date ..... See notes 1 and 2
    + date [1] : Date ..... Date of last revision (See 2.6.3)
    + dateType [1] : CI_DateTypeCode ..... revision
  + date [0..1] : CI_Date ..... See Note 1 and 3
    + date [1] : Date ..... Date of creation (See 2.6.4)
    + dateType [1] : CI_DateTypeCode ..... creation
+ abstract [1] : CharacterString ..... Resource abstract (See 2.2.2)
+ pointOfContact [1..*] : CI_ResponsibleParty ..... See 3.5.1
+ descriptiveKeywords [1..*] : MD_Keywords
  + keyword [1..*] : CharacterString ..... Keyword value (See 2.4.1)
  + thesaurusName [0..1] : CI_Citation ..... Originating controlled vocabulary (See 2.4.2)
+ resourceConstraints [1..*] : MD_Constraints ..... See 3.6
+ spatialResolution [0..*] : MD_Resolution ..... Spatial resolution (2.7.2) – See Note 4
  + distance [0..1] : Distance ..... This is the ground distance
  + equivalentScale [0..1] : MD_RepresentativeFraction
    + denominator [1] : Integer ..... This is equivalent scale denominator
+ serviceType [1] : GenericName ..... Spatial data service type(See 2.3.2)
+ couplingType [1] : SV_CouplingType ..... Mandated by ISO 19119. See Note 8
+ containsOperations [1..*] : SV_OperationMetadata ..... Mandated by ISO 19119
  + operationName [1] : CharacterString ..... Mandated by ISO 19119. Default value is unknown
  + DCP [1..*] : DCPList ..... Mandated by ISO 19119. Default value is WebServices
  + connectPoint [1..*] : CI_OnlineResource ..... Mandated by ISO 19119.
    + linkage [1] : URL ..... Mandated by ISO 19119. See Note 5
+ extent [1..*] : EX_Extent ..... See Note 4
  + geographicElement [1..*] : EX_GeographicBoundingBox ..... Geographic bounding box (See 2.5.1)
    + westBoundLongitude [1] : Decimal
    + eastBoundLongitude [1] : Decimal
    + southBoundLatitude [1] : Decimal
    + northBoundLatitude [1] : Decimal
  + temporalElement [0..*] : EX_TemporalExtent ..... See Note 6
    + extent [1] : TM_Primitive ..... Temporal extent (See 2.6.1)
+ operatesOn [0..*] : MD_DataIdentification ..... Coupled resource (See 2.2.6 and Note 7)

Notes:

1. There may be many instances of the date property with different date types including publication, revision or creation. The order of these instances is free. If no instance of this property has the publication, revision or creation date type, then the metadata set has to include the description of a temporal extent. For compliance with ISO 19115, there is necessarily one instance of the date property, whatever its date type, even if a temporal extent is provided in the metadata.
2. The only instance of date having the revision date type matching the INSPIRE last revision date is the one having the more recent date.
3. Even if ISO 19115 allows the presence of many dates having a creation date type, it is considered inconsistent to have more than one creation date (See SC7 in 1.2).
4. There may be other instances, but at least one defining the bounding box is required (See SC10 in 1.2). This instance is not necessarily the first instance.
5. One of the value of the INSPIRE Metadata Element “Resource Locator” (See 2.2.4) can be used as a default value
6. There may be different instances of temporalElement defining the temporal extent of the resource. These instances may be in different instances of extent, one of them possibly handling the geographic bounding box.
7. This property has to be implemented by reference (See 2.2.6 and SC11 in 1.2)
8. The value is:
   a. loose if there is no coupled Resource (the operatesOn property of SV_ServiceIdentification is not instantiated);
   b. tight if the service only operates on the Coupled Resources
   c. mixed if the service operates on the Coupled Resources and external dataset and dataset series.

3.4 Data Quality Section

3.4.1 Lineage

This part is applicable only to spatial dataset and spatial dataset series. As defined in 3.2, a metadata set may contain different sets of quality information (i.e. instances of DQ_DataQuality or a subclass of DQ_DataQuality). The reason for this multiplicity is that each set is scoped to the whole or a part of the resource. Each of these sets of quality information may contain a lineage statement. INSPIRE only considers one lineage statement concerning the whole resource, i.e. scoped to the dataset or series without any restrictions on the resource extent.

There shall be a single instance of DQ_DataQuality (or one of its subtypes) scoped to the whole spatial dataset or spatial dataset series. This instance may be one also handling conformity statements (as defined in 0), but this is not illustrated in its property instances described below.

+ scope [1] : DQ_Scope	
+ level [1] : MD_ScopeCode	series for a spatial dataset series or dataset for a spatial dataset
+ extentl [0] : EX_Extent	There shall not be any restriction on the resource extent
+ lineage [1] : LI_Lineage	
+ statement [1] : CharacterString	Lineage (See 2.7.1)

3.4.2 Conformity

The general mechanism to handle the INSPIRE requirements relative to conformity is described in 2.8. It is based on a precise list of specifications to which the different types of resource have to conform. This list will be mandated later through INSPIRE Implementing Rules or a related instruction. This legal text will define for each specification:

- the title of the specification;
- the date of publication of the specification
- an identifier the conformity statement used as the identifier of the quality measure for which the conformity is evaluated against the specification;
- the quality criteria concerned by the quality measure (i.e., the subtype of the ISO 19115 class DQ_Element to be instantiated). The default criterion is the logical consistency (i.e. DQ_DomainConsistency).

As defined in 3.2, a metadata set may contain different sets of quality information (i.e. instances of DQ_DataQuality or a subclass of DQ_DataQuality). Each set may contain conformity statements relative to one of the INSPIRE conformance specifications. The following property instances of the sets of quality information are involved, possibly with the property instance expressing a lineage statement as defined in 3.4.1.

+ report [0..*] : DQ_Element	See note 1 and 2
+ measureIdentification[1] : MD_Identifier	See note 3
+ result[1] : DQ_ConformanceResult	
+ specification [1] : CI_Citation	Specification (See 2.8.2)
+ explanation [1] : CharacterString	See Note 4
+ pass [1] : Boolean	Degree (See 2.8.1)

Notes:

1. ISO 19115 only reports the result of the conformance evaluation. There may be no information about the conformity to the INSPIRE Conformance specifications, if the conformance has not been evaluated.
2. DQ_Element is an abstract class. It has to be instantiated through one of its concrete subclasses. The appropriate subclass depends on the quality criteria concerned by the quality measure. DQ_DomainConsistency will be used when the conformance does not involve a more precise quality criterion.
3. This metadata element of ISO 19115 will contain the identifier of the conformity statement. This identifier will be used by the application to differentiate the conformance statement related to INSPIRE from others.
4. ISO 19115 mandates an explanation of the meaning of the conformance for this result. A default explanation such as "See the referenced specification" can be used.

3.5 Responsible Organisation

3.5.1 Resource responsible organisation

Each instance of CI_ResponsibleParty or one of its subclasses (see 3.3.2 for services and 3.3.1 for spatial datasets and spatial dataset series) describes a responsible organisation, i.e.:

- The name of the responsible party;
- A contact e-mail address of the responsible party;
- The responsible party role.

Here are the minimum property instances of CI_ResponsibleParty or one of its subclasses expected by INSPIRE:

```
+ organisationName[1] : CharacterString..... The name of the Responsible party (See 2.10.1)
+ contactInfo[1] : CI_Contact
  + address[1..*] : CI_Address..... There may be more than one address, so more than one e-mail
    + electronicEmailAddress [1..*] : CharacterString.... At least one e-mail addressof  the Responsible party (See 2.10.1)
+ role[1] : CI_RoleCode ..... Responsible party role (See 2.10.2)
```

3.5.2 Metadata point of contact

The metadata points of contact are also described by instances of MD_ResponsibleParty:

```
+  organisationName[1] : CharacterString.....The name of the Metadata point of contact (See 2.11.1)
+  contactInfo[1] : CI_Contact
  +  address[1..*] : CI_Address.....There may be more than one address, so more than one e-mail
    +  electronicEmailAddress [1..*] : CharacterString At least one e-mail address of the Metadata point of contact (See 2.11.1)
+  role[1] : CI_RoleCode .....See Note 1

Notes:
    1.  ISO 19115 mandates the definition of the role of the responsible party. The default role is pointOfContact, but a more
        appropriate choice is encouraged.
```

3.6 Constraint section

Depending on the effective instance of MD_Constraints[7], the following properties may have to be considered:

```
 +useLimitation [0..*] : CharacterString ..... Conditions applying to access and use (See 2.9.2)
 +accessConstraints [0..*] : MD_RestrictionCode..... Limitations on public access (See 2.9.1) –See Note 1
 +otherConstraints [0..*] : CharacterString..... Limitations on public access (See 2.9.1) –See Note 1
 +classification [0..1] : MD_ClassificationCode ..... Limitations on public access (See 2.9.1) –See Note 2

Notes:
1.  If the value of accessConstraints is otherRestrictions, then the instances of otherConstraints also describe Limitations on
    public access (See 2.9.1), but the special value otherConstraints has not to be reported as a Limitations on public
    access.
2.  If the value of classification is not unclassified, the classification has to be reported as a Limitation on Public Access.
```

[7] accessConstraints and otherConstraints are specific to instances of MD_LegalConstraints or one of its subclasses. classification is specific to instances of MD_SecurityConstraints and one of its subclasses.

Abbreviations

CEN	**C**omité **E**uropéen de **N**ormalisation
CSW	OGC **C**atalog **S**ervice **W**eb
EN	**E**uropean **N**orm by CEN
EU	**E**uropean **U**nion
GML	**G**eography **M**arkup **L**anguage
IRs	**I**mplementing **R**ules
ISO	**I**nternational **O**rganisation for **S**tandardization
ISO/TS	ISO Technical Specification
OGC	**O**pen **G**eospatial **C**onsortium
UML	**U**nified **M**odelling **L**anguage
URL	**U**niform **R**esource **L**ocator
XML	e**X**tensible **M**arkup **L**anguage

Annex A – ISO/TS 19139 encoding of the INSPIRE metadata elements

A.1 Introduction

This annex defines the XML ISO/TS 19139 encoding of the INSPIRE metadata elements. This XML encoding is based on XML Schemas derived from the UML models of ISO 19115 and ISO 19119 using the encoding rules defined in ISO/TS 19139 and:

- the XML Schema Implementation of ISO 19115 and the related standards defined in ISO/TS 19139;
- the XML Schema implementation of ISO 19119 defined in CSW2 AP ISO.

The XML encoding of the INSPIRE metadata elements shall follow the instance template defined in Section 3 and the instructions of Section 2 of this document with respect to the following instructions.

A.2 From the conceptual schema to XML File instances

The way in which the geographic metadata XML Schema is expected to be used makes it necessary to keep the organisation of the data, its associated metadata and the related information in very flexible files. Since the MD_Metadata XML element will rarely be the root element of an XML File, depending on the context, it may appear one or many times in a single XML File describing one or many different types of resources.

A.3 Polymorphism

It is possible to have an XML file containing a metadata set without containing a single MD_Metadata XML element. This is a consequence of polymorphism, which may imply that an XML element representing a subclass of MD_Metadata, potentially defined in a user community profile, occurs instead of the MD_Metadata XML element. This is true for MD_Metadata as well as for any of the concepts defined in the ISO 19100 series of International Standards.

A.4 Management of polymorphism

A.4.1 Management of community extensions

A.3 of ISO 19139 has a specific requirement to aid the understanding of user profiled metadata sets. The XML element of any new metadata element has to support a mandatory XML attribute called isoType that is expected to contain the name of the ISO class it derives from directly or indirectly.

```
<MY_Metadata gco:isotype="MD_Metadata">
  <!-- Standard properties not detailed here -->
  <myProperty>
    <gco:CharacterString>Whatever text</gco:CharacterString>
  </myProperty>
</MY_Metadata>
```

A.4.2 Parsing of metadata files

To accommodate polymorphism of the data types, parsing of metadata files has to be driven by the XML elements corresponding to the properties of the UML models (look rather for the metadata elements named identificationInfo, than the metadata elements named MD_DataIdentification or SV_ServiceIdentification). The elements corresponding to the data type can generally be skipped.

When it is necessary to evaluate the XML element representing data types (e.g., because the application needs to consider the data identification info, but not the service identification info), it is important to look for the XML element corresponding to the expected ISO data type (e.g., gco:MD_DataIdentification) or the XML element for which the value of gco:isotype is the expected data type (e.g. MD_DataIdentification). There is no namespace indication in the value of the isoType attribute.

A.5 Management of by reference containment

Any instance of a UML property can be implemented:

- by value, i.e. the instance of its datatype is a subelement of the property instance;

```
<gmx:MX_Aggregate>
   <gmd:composedOf>
      <gmx:MX_Dataset>
         …
      </gmx:MX_Dataset>
   </gmd:composedOf>
   <gmd:seriesMetadata> … </gmd:seriesMetadata>
</gmx:MX_Aggregate>
```

- by reference, i.e. the property instance handles a xlink:href attribute which value is a reference (typically URL) to the instance of its datatype. In this case, the instance of the datatype handles an id XML attribute serving as an identifier.

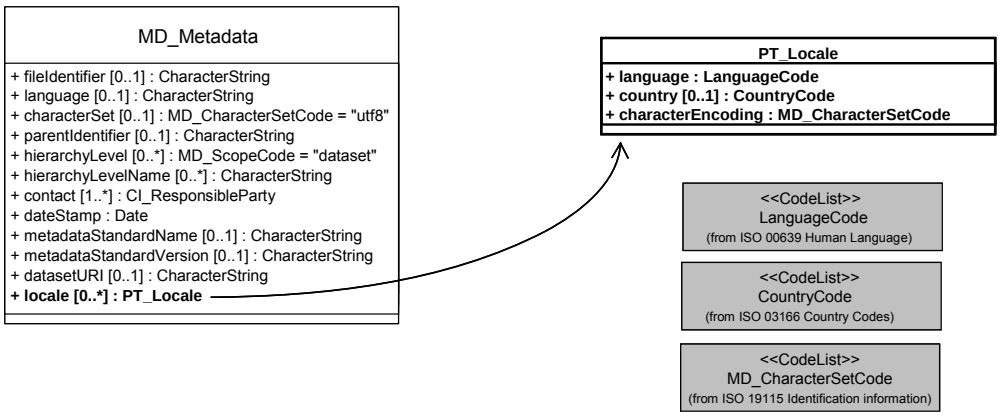
```
<gmx: MX_Aggregate>
   <gmd:composedOf xlink:href=”product1.xml”>
   <gmd:seriesMetadata> … </gmd:seriesMetadata>
</gmx:MX_Aggregate>
```

The use of by reference containment is of course a very good way to ensure the consistency of the XML data and to reduce the maintenance cost. However it complicates the parsing of the XML file. It is recommended that the parser use a generic mechanism to manage the by-reference containment.

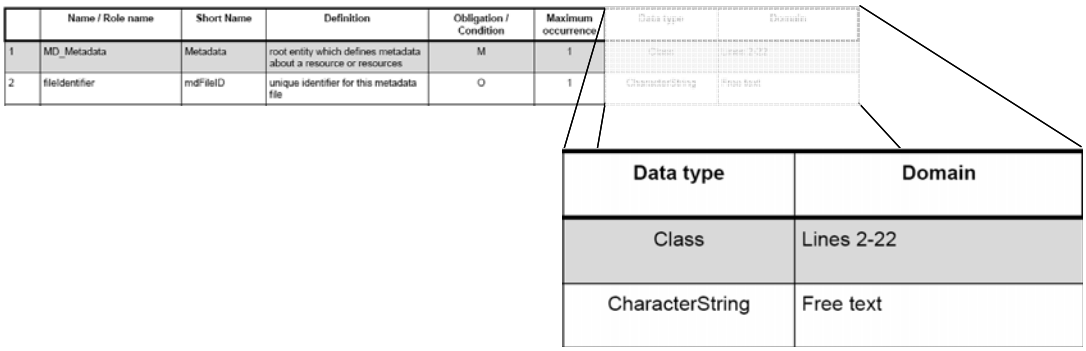
A.6 ISO 19139 and multilingual metadata

An optional but repeatable attribute “locale” has been added to the class MD_Metadata. Two cases are to be considered:

- When this attribute is not implemented, the metadata set is expected to be monolingual: the language of the metadata is defined by the language attribute of MD_Metadata.
- When this attribute is implemented, each instance represents a locale (language, country and character encoding) in which the metadata elements may be translated. The language attribute still defines the default language of the metadata, i.e. the language in which all the metadata elements are expressed. Then each metadata element can be translated in some of the locales define for the metadata set.



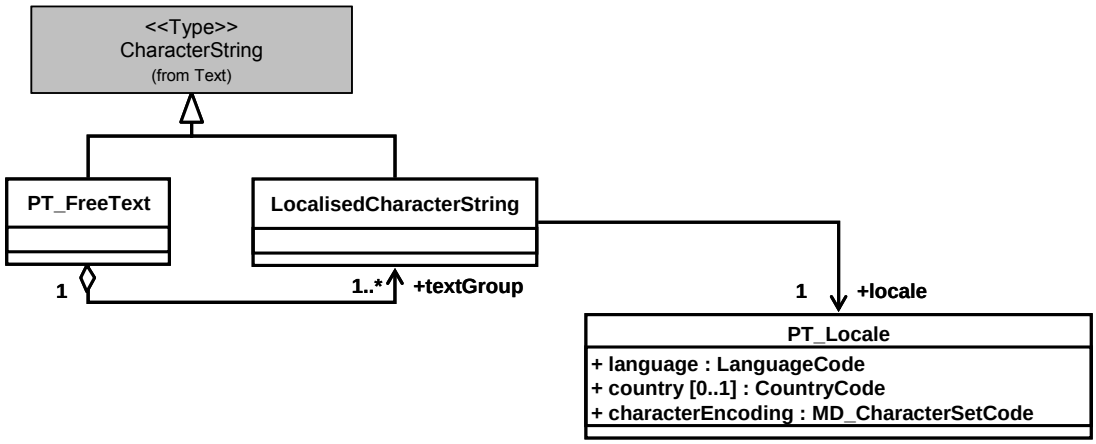
The metadata elements which may require translations are those of type CharacterString having a free text domain.



	Name / Role name	Short Name	Definition	Obligation / Condition	Maximum occurrence	Data type	Domain
1	MD_Metadata	Metadata	root entity which defines metadata about a resource or resources	M	1		
2	fileIdentifier	mdFileID	unique identifier for this metadata file	O	1		

Data type	Domain
Class	Lines 2-22
CharacterString	Free text

Support of free text is enabled via a subtype of CharacterString called PT_FreeText which aggregates a set of localised character strings through its textGroup property. Each localised character string provides a translation of the character string in the related locale.



The following clauses define the way multilingual metadata are implemented.

A.6.1 The default language

The default language of a metadata set is defined by the language property of MD_Metadata while the characterSet property defines the corresponding character encoding. Here is a sample instance of the class MD_Metadata illustrating the use of both properties.

```
<MD_Metadata>
  <!-- portions of metadata not shown -->
  <language>
```

```
    <LanguageCode
       codeList="resources/Codelist/gmxcodelists.xml#LanguageCode"
       codeListValue="eng"> English </LanguageCode>
  </language>
  <characterSet>
    <MD_CharacterSetCode

codeList="resources/Codelist/gmxcodelists.xml#MD_CharacterSetCode"
      codeListValue="utf8"> UTF-8 </MD_CharacterSetCode>
  </characterSet>
  <!-- portions of metadata not shown -->
</MD_Metadata>
```

A.6.2 Alternate languages

Each metadata alternate language of the metadata is defined through the locale property of MD_Metadata. In the following example, some of these metadata are translated into French:

```
<MD_Metadata>
  <!-- portions of metadata not shown, particularly the language and
       characterSet properties which are not detailed -->
  <locale>
    <PT_Locale id="locale-fr">
      <languageCode>
        <LanguageCode
           codeList="resources/Codelist/gmxcodelists.xml#
LanguageCode"
           codeListValue="fra"> French </LanguageCode>
      </languageCode>
      <characterEncoding>
        <MD_CharacterSetCode
         codeList="resources/Codelist/gmxcodelists.xml#
MD_CharacterSetCode"
         codeListValue="utf8">UTF 8</MD_CharacterSetCode>
      </characterEncoding>
   </PT_Locale>
  </locale>
  <!-- portions of metadata not shown -->
</MD_Metadata>
```

A.6.3 Embedded translations

Any metadata element having a free text domain (e.g. the abstract property of MD_DataIdentification) can then be instantiated like this:

```
<abstract xsi:type="PT_FreeText_PropertyType">
  <gco:CharacterString>Brief narrative summary of the content of the
resource</gco:CharacterString>
  <!--== Alternative value ==-->
  <PT_FreeText>
    <textGroup>
      <LocalisedCharacterString locale="#locale-fr">Résumé succinct
du contenu de la ressource</LocalisedCharacterString>
    </textGroup>
  </PT_FreeText>
</abstract>
```

The xsi:type attribute indicates that this instance of the abstract property is not instantiated through a simple CharacterString, but rather as a free text. As a consequence, the element

contains a complementary PT_FreeText subelement containing one or more textGroup elements (one per translation).

A.6.4 Use of translation files

In the preceding example, the definition of the locale property is provided by value which implies that the translations are embedded with default language metadata. It is also possible to store the translations corresponding to a given language into a translation file using the **PT_LocaleContainer** class. In such case, it is easier to define the locale within the translation file (e.g. `fr-fr.xml`) and to express the instance of the MD_Metadata locale property by reference.

```
<gmd:locale xlink:href="./fr-fr.xml#locale-fr"/>
```

The content of the `fr-fr.xml` file would look like this:

```
<PT_LocaleContainer>
  <!-- portions of metadata not shown -->
  <locale>
    <PT_Locale id="locale-fr">
      <languageCode>
        <LanguageCode
           codeList=”resources/Codelist/gmxcodelists.xml#
LanguageCode”
           codeListValue="fra"> French </LanguageCode>
      </languageCode>
      <characterEncoding>
        <MD_CharacterSetCode
           codeList="../Codelist/ML_gmxCodelists.xml#
MD_CharacterSetCode"
           codeListValue="utf8">UTF 8</MD_CharacterSetCode>
       </characterEncoding>
    </PT_Locale>
  </locale>
  <!-- portions of metadata not shown -->
  <localisedString>
      <LocalisedCharacterString locale="#locale-fr" id="#abstract-
fr"> Résumé succinct du contenu de la
ressource</LocalisedCharacterString>
  </localisedString>
  <!-- portions of metadata not shown -->
</PT_LocaleContainer>
```

The multilingual instance of the abstract property now implements the translation by reference to the translation file:

```
<abstract xsi:type="PT_FreeText_PropertyType">
  <gco:CharacterString>Brief narrative summary of the content of the
resource</gco:CharacterString>
  <!--== Alternative value ==-->
  <PT_FreeText>
    <textGroup xlink:href="fr-fr.xml#abstract-fr"/>
  </PT_FreeText>
</abstract>
```

A.7 Contexts of use

A.7.1 Use of ISO 19139 in the context of a Catalogue Service

When the data being passed through a cataloguing service is XML encoded, the catalogue service interface defines the different XML Schemas to be used as a response to the user queries. When the geographic metadata XML Schema is used, there should be one or many MD_Metadata instances in the returned XML File.

A.7.2 Use of ISO 19139 in the context of the standard interchange by transfer

The transfer aggregate and transfer dataset concepts are the two major components of an interchange by transfer. There may be one or many XML Files composing the interchange, but the root element of at least one of the files is an XML instance of MX_Dataset, MX_Aggregate or one of their extensions. From such an element, the parsing of the interchange is model driven and it follows the principles described in 7.4 of ISO 19139. See ISO 19139 for details about MX_Dataset and MX_Aggregate.

A.8 Character encoding

Character encoding is defined in MD_Metadata.characterEncoding and MD_Metadata.locale. Preferably this should be UTF-8 if the XML files contains multilingual metadata.

A.9 Temporal extent encoding

In ISO 19115, temporal extents are of type TM_Primitive (abstract type from ISO 19108). In ISO 19139, this type (and its sub-types) are mapped to ISO 19136 temporal types and W3C built-in types. In the INSPIRE Metadata Element Set for discovery, the concrete TM_Period subtype of TM_Primitive is used as type for the XML element temporalExtent. It is implemented as type TimePeriod from ISO 19136.

TimePeriod offers three options to express a time interval:

- Use two TimePosition elements for beginPosition and endPosition. Date and time information is contained in-line and cannot be referenced from another XML Element. Only the TimePeriod element can, through its gml:id.

```
<?xml version="1 0" encoding="UTF-8"?>
<gmd:MD_Metadata>
<!-- Portions of metadata not shown -->
<gmd:extent>
   <gmd:EX_Extent>
      <gmd:temporalElement>
         <gmd:EX_TemporalExtent>
            <gmd:extent>
               <gml:TimePeriod gml:id="extent">
                 <gml:beginPosition>1977-03-
10T11:45:30</gml:beginPosition>
                  <gml:endPosition>2005-01-
15T09:10:00</gml:endPosition>
               </gml:TimePeriod>
            </gmd:extent>
         </gmd:EX_TemporalExtent>
      </gmd:temporalElement>
   </gmd:EX_Extent>
  </gmd:extent>
<!-- Portions of metadata not shown -->
</gmd:MD_Metadata>
```

- Use two TimeInstant elements: Date and time information is here contained by reference and the TimeInstant elements can be re-used through a reference from another XML element in the XML file. The TimePeriod element can also be re-used.

```
<?xml version="1.0" encoding="UTF-8"?>
<gmd:MD_Metadata>
<!-- Portions of metadata not shown -->
<gmd:extent>
   <gmd:EX_Extent>
      <gmd:temporalElement>
.........<gmd:EX_TemporalExtent>
............<gmd:extent>
..............<gml:TimePeriod gml:id="extent">
….............<gml:begin>
....................<gml:TimeInstant gml:id="t11">
......................<gml:timePosition>1977-03-
10T11:45:30</gml:timePosition>
....................</gml:TimeInstant>
..................</gml:begin>
..................<gml:end>
....................<gml:TimeInstant gml:id="t12">
......................<gml:timePosition>2005-01-
15T09:10:00</gml:timePosition>
....................</gml:TimeInstant>
..................</gml:end>
..............</gml:TimePeriod>
............</gmd:extent>
.........</gmd:EX_TemporalExtent>
......</gmd:temporalElement>
...</gmd:EX_Extent>
</gmd:extent>
<!-- Portions of metadata not shown -->
</gmd:MD_Metadata>
```

- The two previous methods can be used in combination: one TimePeriod limit can be expressed as a TimePosition and the other as a TimeInstant:

```
<?xml version="1 0" encoding="UTF-8"?>
<gmd:MD_Metadata>
<!-- Portions of metadata not shown -->
<gmd:extent>
   <gmd:EX_Extent>
      <gmd:temporalElement>
         <gmd:EX_TemporalExtent>
            <gmd:extent>
               <gml:TimePeriod gml:id="extent">
              <gml:begin>
                     <gml:TimeInstant gml:id="t11">
                        <gml:timePosition>1977-03-
10T11:45:30</gml:timePosition>
                     </gml:TimeInstant>
                  </gml:begin>
                  <gml:endPosition>2005-01-
15T09:10:00</gml:endPosition>
               </gml:TimePeriod>
            </gmd:extent>
         </gmd:EX_TemporalExtent>
      </gmd:temporalElement>
   </gmd:EX_Extent>
</gmd:extent>
<!-- Portions of metadata not shown -->
</gmd:MD_Metadata>
```

A.10 Spatial resolution encoding

The spatial resolution of a dataset or dataset series can be expressed as an equivalent scale or as a resolution distance:

- Expression as an equivalent scale:

```
<?xml version="1.0" encoding="UTF-8"?>
<gmd:MD_Metadata>
<!-- Portions of metadata not shown -->
<gmd:identificationInfo>
<!-- Portions of metadata not shown -->
<gmd:spatialResolution>
   <gmd:MD_Resolution>
      <gmd:equivalentScale>
         <gmd:MD_RepresentativeFraction>
            <gmd:denominator>
               <gco:Integer>25000</gco:Integer>
            </gmd:denominator>
         </gmd:MD_RepresentativeFraction>
      </gmd:equivalentScale>
   </gmd:MD_Resolution>
</gmd:spatialResolution>
<!-- Portions of metadata not shown -->
</gmd:identificationInfo>
<!-- Portions of metadata not shown -->
</gmd:MD_Metadata>
```

In this case, the spatial resolution is expressed as the denominator of the scale of a comparable hardcopy map or chart.

- Expression as a resolution distance:

```
<?xml version="1.0" encoding="UTF-8"?>
<gmd:MD_Metadata>
<!-- Portions of metadata not shown -->
<gmd:identificationInfo>
<!-- Portions of metadata not shown -->
<gmd:spatialResolution>
   <gmd:MD_Resolution>
      <gmd:distance>
.........<gco:Distance uom="#cm">25</gco:Distance>
      </gmd:distance>
   </gmd:MD_Resolution>
</gmd:spatialResolution>
<!-- Portions of metadata not shown -->
</gmd:identificationInfo>
<!-- Portions of metadata not shown -->
</gmd:MD_Metadata>
```

In this case, the spatial resolution is expressed as the ground sample distance, implemented through the gco:Distance type. The unit of measure is either a conventional unit of measure symbol or a link to a definition. The latter case is illustrated above.

- If needed, the two options can be used in conjunction:

```
<?xml version="1 0" encoding="UTF-8"?>
<gmd:MD_Metadata>
<!-- Portions of metadata not shown -->
<gmd:identificationInfo>
<!-- Portions of metadata not shown -->
<gmd:spatialResolution>
   <gmd:MD_Resolution>
      <gmd:distance>
          <gco:Distance uom="#cm">25</gco:Distance>
      </gmd:distance>
   </gmd:MD_Resolution>
</gmd:spatialResolution>
<gmd:spatialResolution>
   <gmd:MD_Resolution>
      <gmd:equivalentScale>
         <gmd:MD_RepresentativeFraction>
            <gmd:denominator>
               <gco:Integer>25000</gco:Integer>
            </gmd:denominator>
         </gmd:MD_RepresentativeFraction>
      </gmd:equivalentScale>
   </gmd:MD_Resolution>
</gmd:spatialResolution>
<!-- Portions of metadata not shown -->
</gmd:identificationInfo>
<!-- Portions of metadata not shown -->
</gmd:MD_Metadata>
```

N.B. In this case, the property spatialResolution needs to be instantiated twice.

A.11 Example of ISO 19139 XML Metadata Sets

These examples consider a single specification of conformity. Its identifier is **Conformity_001** in the **INSPIRE** namespace. The reference specification is titled **Service Abstract Test Suite** and its date of publication is **2007-11-21**

A.11.1 Dataset

A.11.1.1 INSPIRE view

+ **Part B 1 Identification:**
  + **Part B 1.1 Resource Title:** Sample dataset
  + **Part B 1.2 Resource Abstract:** This dataset does not exist. This is an ISO 19119 sample metadata set encoded in XML using ISO 19139 encoding rules and XML Schema implementation of ISO 19115.
  + **Part B 1.3 Resource Type:** dataset
  + **Part B 1.4 Resource Locator:** http://anywhere.com/Sample_Access_Point
  + **Part B 1.4 Resource Locator:** http://anywhere.com/Sample_Access_Point2
  + **Part B 1.5 Resource Unique Identifier:**
    + **code:** FR.IGN.BDHYDRO.9876543210
    + **codeSpace:** INSPIRE
  + **Part B 1.5 Resource Unique Identifier:**
    + **code:** http://www.ign.fr/9876543210#dataId
  + **Part B 1.5 Resource Unique Identifier:**
    + **code:** 9876543210
    + **codeSpace:** http://www.ign.fr
  + **Part B 1.7 Resource language:** eng
+ **Part B 2 Classification of data and services:**
  + **Part B 2.1 Topic category:** inlandWaters
+ **Part B 3 Keyword:**
  + **Part B 3.1 Keyword value:** Hydrography
  + **Part B 3.2 Originating Controlled Vocabulary:**
    + **title:** GEMET Thesaurus version 1.0
    + **reference date:**
      + **date:** 2009-06-30
      + **date type:** publication
+ **Part B 4 Geographic Location:**
  + **Part B 4.1 Bounding Box:**
    + **West:** +3.12
    + **East:** +3.13
    + **North:** +42.26
    + **South:** +42.25
+ **Part B 5 Temporal Reference:**
  + **Part B 5.1 Temporal Extent:**
    + **time position:** after0085-03
    + **reference system URI:** http://my.big.org/TRS/calendars/japanese
    + **calendar era:** Meiji
  + **Part B 5.1 Temporal Extent:**
    + **begin:**
      + **time position:** 2001-01-01
      + **reference system URI:** #ISO-8601

+ **end:**
  + **time position:** 2001-03-31
  + **reference system URI:** #ISO-8601
+ **Part B 5.1 Temporal Extent:**
  + **begin:**
    + **time position:** 2000-07-01
    + **reference system URI:** #ISO-8601
  + **end:**
    + **time position:** 2000-09-30
    + **reference system URI:** #ISO-8601
+ **Part B 5.2 Date of publication:** 2005-12-14
+ **Part B 5.2 Date of publication:** 2006-01-10
+ **Part B 5.3 Date of last revision:** 2007-09-12
+ **Part B 5.4 Date of creation:** 2005-12-02

+ **Part B 6 Quality and validity:**
  + **Part B 6.1 Lineage:** Purely virtual dataset created from the spirit of the Author
  + **Part B 6.2 Spatial Resolution:** 2.0 to 3.0
  + **Part B 6.2 Spatial Resolution:** 1:50000 to 1:25000

+ **Part B 7 Conformity id="Conformity_001 (INSPIRE)" :**
  + **Part B 7.1 Specification:**
    + **title:** Service Abstract Test Suite
    + **publication date:** 2007-11-21
  + **Part B 7.2 Degree:** Not evaluated

+ **Part B 8 Constraints related to access and use:**
  + **Part B 8.2 Limitation on public access:** intellectualPropertyRights

+ **Part B 8 Constraints related to access and use:**
  + **Part B 8.1 Condition applying to access and use:** Not to be used for navigation

+ **Part B 8 Constraints related to access and use:**
  + **Part B 8.2 Limitation on public access:** unclassified

+ **Part B 9 Responsible Organisation:**
  + **Part B 9.1 Responsible party:**
    + **organisation:** Institut Géographique National (IGN)
    + **e-mail:** support@ign.fr
  + **Part B 9.2 Responsible party role:** author

+ **Part B 10 Metadata on metadata:**
  + **Part B 10.1 Metadata point of contact:**
    + **organisation:** Institut Géographique National (IGN)
    + **e-mail:** nicolas.lesage@ign.fr
  + **Part B 10.2 Metadata date:** 2007-12-03
  + **Part B 10.3 Metadata language:** eng

A.11.1.2 ISO/TS 19139 XML File

```
<?xml version="1.0" encoding="UTF-8"?>
<gmd:MD_Metadata xmlns:srv="http://www.isotc211.org/2005/srv" xmlns:gml="http://www.opengis.net/gml"
xmlns:gco="http://www.isotc211.org/2005/gco" xmlns:gmd="http://www.isotc211.org/2005/gmd"
xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.isotc211.org/2005/gmd ./xsd/gmd/gmd.xsd://www.isotc211.org/2005/srv
./xsd/srv/srv.xsd">
   <!-- Part B 10.3 Metadata Language -->
   <gmd:language>
      <gmd:LanguageCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/ML_gmx
Codelists.xml#LanguageCode" codeListValue="eng">eng</gmd:LanguageCode>
   </gmd:language>
   <!-- Part B 1.3 Resource type -->
   <gmd:hierarchyLevel>
      <gmd:MD_ScopeCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/ML_gmx
Codelists.xml#MD_ScopeCode" codeListValue="dataset">dataset</gmd:MD_ScopeCode>
   </gmd:hierarchyLevel>
   <!-- Part B 10.1 Metadata Contact -->
   <gmd:contact>
      <gmd:CI_ResponsibleParty>
         <gmd:individualName>
            <gco:CharacterString>Nicolas Lesage</gco:CharacterString>
         </gmd:individualName>
         <gmd:organisationName>
            <gco:CharacterString>Institut Géographique National (IGN)</gco:CharacterString>
         </gmd:organisationName>
         <gmd:contactInfo>
            <gmd:CI_Contact>
               <gmd:phone>
                  <gmd:CI_Telephone>
                     <gmd:voice>
                        <gco:CharacterString>+33.1.4398.8596</gco:CharacterString>
                     </gmd:voice>
                     <gmd:facsimile>
                        <gco:CharacterString>+33.1.4398.8171</gco:CharacterString>
                     </gmd:facsimile>
                  </gmd:CI_Telephone>
               </gmd:phone>
               <gmd:address>
                  <gmd:CI_Address>
                     <gmd:deliveryPoint>
                        <gco:CharacterString>2/4, avenue Pasteur</gco:CharacterString>
                     </gmd:deliveryPoint>
                     <gmd:city>
                        <gco:CharacterString>Saint-Mandé</gco:CharacterString>
                     </gmd:city>
                     <gmd:postalCode>
                        <gco:CharacterString>94160</gco:CharacterString>
                     </gmd:postalCode>
                     <gmd:country>
                        <gco:CharacterString>FRANCE</gco:CharacterString>
                     </gmd:country>
                     <gmd:electronicMailAddress>
                        <gco:CharacterString>nicolas.lesage@ign.fr</gco:CharacterString>
                     </gmd:electronicMailAddress>
                  </gmd:CI_Address>
               </gmd:address>
            </gmd:CI_Contact>
         </gmd:contactInfo>
         <gmd:role>
```

```
            <gmd:CI_RoleCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/ML_gmx
Codelists.xml#CI_RoleCode" codeListValue="author">author</gmd:CI_RoleCode>
         </gmd:role>
      </gmd:CI_ResponsibleParty>
   </gmd:contact>
   <!-- Part B 10.2 Metadata Date -->
   <gmd:dateStamp>
      <gco:Date>2007-12-03</gco:Date>
   </gmd:dateStamp>
   <gmd:identificationInfo>
      <gmd:MD_DataIdentification id="dataId">
         <gmd:citation>
            <gmd:CI_Citation>
               <!-- Part B 1.1 Resource title -->
               <gmd:title>
                  <gco:CharacterString> Sample dataset </gco:CharacterString>
               </gmd:title>
               <!-- Part B 5.4 Date of creation -->
               <gmd:date>
                  <gmd:CI_Date>
                     <gmd:date>
                        <gco:Date>2005-12-02</gco:Date>
                     </gmd:date>
                     <gmd:dateType>
                        <gmd:CI_DateTypeCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/ML_gmx
Codelists.xml#CI_DateTypeCode" codeListValue="creation">creation</gmd:CI_DateTypeCode>
                     </gmd:dateType>
                  </gmd:CI_Date>
               </gmd:date>
               <!-- Part B 5.2 Date of publication -->
               <gmd:date>
                  <gmd:CI_Date>
                     <gmd:date>
                        <gco:Date>2005-12-14</gco:Date>
                     </gmd:date>
                     <gmd:dateType>
                        <gmd:CI_DateTypeCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/ML_gmx
Codelists.xml#CI_DateTypeCode" codeListValue="publication">publication</gmd:CI_DateTypeCode>
                     </gmd:dateType>
                  </gmd:CI_Date>
               </gmd:date>
               <!-- Part B 5.3 Date of revision -->
               <gmd:date>
                  <gmd:CI_Date>
                     <gmd:date>
                        <gco:Date>2006-01-02</gco:Date>
                     </gmd:date>
                     <gmd:dateType>
                        <gmd:CI_DateTypeCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/ML_gmx
Codelists.xml#CI_DateTypeCode" codeListValue="revision">revision</gmd:CI_DateTypeCode>
                     </gmd:dateType>
                  </gmd:CI_Date>
               </gmd:date>
               <!-- Part B 5.2 Date of publication -->
               <gmd:date>
                  <gmd:CI_Date>
                     <gmd:date>
                        <gco:Date>2006-01-10</gco:Date>
                     </gmd:date>
                     <gmd:dateType>
```

```
                        <gmd:CI_DateTypeCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/ML_gmx
Codelists.xml#CI_DateTypeCode" codeListValue="publication">publication</gmd:CI_DateTypeCode>
                     </gmd:dateType>
                  </gmd:CI_Date>
               </gmd:date>
               <!-- Part B 5.3 Date of revision -->
               <gmd:date>
                  <gmd:CI_Date>
                     <gmd:date>
                        <gco:Date>2007-09-12</gco:Date>
                     </gmd:date>
                     <gmd:dateType>
                        <gmd:CI_DateTypeCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/ML_gmx
Codelists.xml#CI_DateTypeCode" codeListValue="revision">revision</gmd:CI_DateTypeCode>
                     </gmd:dateType>
                  </gmd:CI_Date>
               </gmd:date>
               <!-- Part B 5.3 Date of revision -->
               <gmd:date>
                  <gmd:CI_Date>
                     <gmd:date>
                        <gco:Date>2007-03-12</gco:Date>
                     </gmd:date>
                     <gmd:dateType>
                        <gmd:CI_DateTypeCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/ML_gmx
Codelists.xml#CI_DateTypeCode" codeListValue="revision">revision</gmd:CI_DateTypeCode>
                     </gmd:dateType>
                  </gmd:CI_Date>
               </gmd:date>
               <!-- Part B 1.5 Resource unique identifier -->
               <gmd:identifier>
                  <gmd:RS_Identifier>
                     <gmd:code>
                        <gco:CharacterString>FR.IGN.BDHYDRO.9876543210</gco:CharacterString>
                     </gmd:code>
                     <gmd:codeSpace>
                        <gco:CharacterString>INSPIRE</gco:CharacterString>
                     </gmd:codeSpace>
                  </gmd:RS_Identifier>
               </gmd:identifier>
               <!-- Part B 1.5 Resource unique identifier -->
               <gmd:identifier>
                  <gmd:RS_Identifier>
                     <gmd:code>
                        <gco:CharacterString>9876543210</gco:CharacterString>
                     </gmd:code>
                     <gmd:codeSpace>
                        <gco:CharacterString>http://www.ign.fr</gco:CharacterString>
                     </gmd:codeSpace>
                  </gmd:RS_Identifier>
               </gmd:identifier>
               <!-- Part B 1.5 Resource unique identifier -->
               <gmd:identifier>
                  <gmd:RS_Identifier>
                     <gmd:code>
                        <gco:CharacterString>http://www.ign.fr/9876543210#dataId</gco:CharacterString>
                     </gmd:code>
                  </gmd:RS_Identifier>
               </gmd:identifier>
            </gmd:CI_Citation>
         </gmd:citation>
```

```
        <!-- Part B 1.2 Resource Abstract -->
        <gmd:abstract>
          <gco:CharacterString>This dataset does not exist. This is an ISO 19119 sample metadata set encoded in XML using ISO 19139 encoding rules and XML Schema implementation of ISO 19115. </gco:CharacterString>
        </gmd:abstract>
        <!-- Part B 9 Organisation responsible for the establishment, management, maintenance and distribution  of spatial data sets and services -->
        <gmd:pointOfContact>
          <gmd:CI_ResponsibleParty>
            <!-- Part B 9.1 Name of the Responsible party -->
            <gmd:organisationName>
              <gco:CharacterString>Institut Géographique National (IGN)</gco:CharacterString>
            </gmd:organisationName>
            <gmd:contactInfo>
              <gmd:CI_Contact>
                <gmd:address>
                  <gmd:CI_Address>
                    <!-- Part B 9.1 E-mail address of the Responsible party -->
                    <gmd:electronicMailAddress>
                      <gco:CharacterString>support@ign.fr</gco:CharacterString>
                    </gmd:electronicMailAddress>
                  </gmd:CI_Address>
                </gmd:address>
              </gmd:CI_Contact>
            </gmd:contactInfo>
            <!-- Part B 9.2 Responsible party role -->
            <gmd:role>
              <gmd:CI_RoleCode codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/ML_gmxCodelists.xml#CI_RoleCode" codeListValue="author">author</gmd:CI_RoleCode>
            </gmd:role>
          </gmd:CI_ResponsibleParty>
        </gmd:pointOfContact>
        <!-- Part B 3 Keyword from the GEMET Controlled Vocabulary. Here the keyword value is a theme (Annex I.8) of INSPIRE-->
        <gmd:descriptiveKeywords>
          <gmd:MD_Keywords>
            <!-- Part B 3.1 Keyword Value -->
            <gmd:keyword>
              <gco:CharacterString>Hydrography</gco:CharacterString>
            </gmd:keyword>
            <!-- Part B 3.2 Originating Controlled Vocabulary -->
            <gmd:thesaurusName>
              <gmd:CI_Citation>
                <gmd:title>
                  <gco:CharacterString> GEMET Thesaurus version 1.0 </gco:CharacterString>
                </gmd:title>
                <gmd:date>
                  <gmd:CI_Date>
                    <gmd:date>
                      <gco:Date>2009-06-30</gco:Date>
                    </gmd:date>
                    <gmd:dateType>
                      <gmd:CI_DateTypeCode codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/ML_gmxCodelists.xml#CI_DateTypeCode" codeListValue="publication">publication</gmd:CI_DateTypeCode>
                    </gmd:dateType>
                  </gmd:CI_Date>
                </gmd:date>
              </gmd:CI_Citation>
            </gmd:thesaurusName>
          </gmd:MD_Keywords>
        </gmd:descriptiveKeywords>
        <!-- Part B 8 Constraints related to access and use -->
```

```
        <gmd:resourceConstraints>
          <gmd:MD_LegalConstraints>
            <!-- Part B 8.2  Limitations on public access -->
            <gmd:accessConstraints>
              <gmd:MD_RestrictionCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/ML_gmx
Codelists.xml#MD_RestrictionCode"
codeListValue="intellectualPropertyRights">intellectualPropertyRights</gmd:MD_RestrictionCode>
            </gmd:accessConstraints>
          </gmd:MD_LegalConstraints>
        </gmd:resourceConstraints>
        <!-- Part B 8 Constraints related to access and use -->
        <gmd:resourceConstraints>
          <gmd:MD_LegalConstraints>
            <!-- Part B 8.1 Conditions applying to access and use -->
            <gmd:useLimitation>
              <gco:CharacterString>Not to be used for navigation</gco:CharacterString>
            </gmd:useLimitation>
          </gmd:MD_LegalConstraints>
        </gmd:resourceConstraints>
        <!-- Part B 8 Constraints related to access and use -->
        <gmd:resourceConstraints>
          <gmd:MD_SecurityConstraints>
            <!-- Part B 8.2  Limitations on public access -->
            <gmd:classification>
              <gmd:MD_ClassificationCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/ML_gmx
Codelists.xml#MD_ClassificationCode" codeListValue="unclassified">unclassified</gmd:MD_ClassificationCode>
            </gmd:classification>
          </gmd:MD_SecurityConstraints>
        </gmd:resourceConstraints>
        <!-- Part B 6.2 Spatial Resolution -->
        <gmd:spatialResolution>
          <gmd:MD_Resolution>
            <gmd:equivalentScale>
              <gmd:MD_RepresentativeFraction>
                <gmd:denominator>
                  <gco:Integer>25000</gco:Integer>
                </gmd:denominator>
              </gmd:MD_RepresentativeFraction>
            </gmd:equivalentScale>
          </gmd:MD_Resolution>
        </gmd:spatialResolution>
        <gmd:spatialResolution>
          <gmd:MD_Resolution>
            <gmd:equivalentScale>
              <gmd:MD_RepresentativeFraction>
                <gmd:denominator>
                  <gco:Integer>50000</gco:Integer>
                </gmd:denominator>
              </gmd:MD_RepresentativeFraction>
            </gmd:equivalentScale>
          </gmd:MD_Resolution>
        </gmd:spatialResolution>
        <!-- Part B 6.2 Spatial Resolution -->
        <gmd:spatialResolution>
          <gmd:MD_Resolution>
            <gmd:distance><gco:Distance
uom="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/uom/gmxUom.xml#m"
>3.0</gco:Distance></gmd:distance>
          </gmd:MD_Resolution>
          </gmd:spatialResolution>
          <gmd:spatialResolution>
          <gmd:MD_Resolution>
```

```
                <gmd:distance><gco:Distance
uom="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/uom/gmxUom.xml#m"
>2.0</gco:Distance></gmd:distance>
            </gmd:MD_Resolution>
          </gmd:spatialResolution>
          <!-- Part B 1.7 Resource Language -->
          <gmd:language>
            <gmd:LanguageCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/ML_gmx
Codelists.xml#LanguageCode" codeListValue="eng">eng</gmd:LanguageCode>
          </gmd:language>
          <!-- Part B 2.1 Topic Category -->
          <gmd:topicCategory>
            <gmd:MD_TopicCategoryCode>inlandWaters</gmd:MD_TopicCategoryCode>
          </gmd:topicCategory>
          <!-- Part B 4.1 Geographic Bounding Box -->
          <gmd:extent>
            <gmd:EX_Extent>
              <gmd:geographicElement>
                <gmd:EX_GeographicBoundingBox>
                  <gmd:westBoundLongitude>
                    <gco:Decimal>+3.12</gco:Decimal>
                  </gmd:westBoundLongitude>
                  <gmd:eastBoundLongitude>
                    <gco:Decimal>+3.13</gco:Decimal>
                  </gmd:eastBoundLongitude>
                  <gmd:southBoundLatitude>
                    <gco:Decimal>+42.25</gco:Decimal>
                  </gmd:southBoundLatitude>
                  <gmd:northBoundLatitude>
                    <gco:Decimal>+42.26</gco:Decimal>
                  </gmd:northBoundLatitude>
                </gmd:EX_GeographicBoundingBox>
              </gmd:geographicElement>
              <gmd:temporalElement>
                <gmd:EX_TemporalExtent>
                  <gmd:extent>
                    <gml:TimeInstant gml:id="ti001">
                      <gml:timePosition frame='http://my.big.org/TRS/calendars/japanese'
calendarEraName="Meiji" indeterminatePosition="after">0085-03</gml:timePosition>
                    </gml:TimeInstant>
                  </gmd:extent>
                </gmd:EX_TemporalExtent>
              </gmd:temporalElement>
            </gmd:EX_Extent>
          </gmd:extent>
          <gmd:extent>
            <gmd:EX_Extent>
              <gmd:temporalElement>
                <gmd:EX_TemporalExtent>
                  <gmd:extent>
                    <gml:TimePeriod gml:id="tp001">
                      <gml:beginPosition>2001-01-01</gml:beginPosition>
                      <gml:endPosition>2001-03-31</gml:endPosition>
                    </gml:TimePeriod>
                  </gmd:extent>
                </gmd:EX_TemporalExtent>
              </gmd:temporalElement>
              <gmd:temporalElement>
                <gmd:EX_TemporalExtent>
                  <gmd:extent>
                    <gml:TimePeriod gml:id="tp002">
                      <gml:begin>
```

```
                        <gml:TimeInstant gml:id="ti002">
                            <gml:timePosition>2000-07-01</gml:timePosition>
                        </gml:TimeInstant>
                    </gml:begin>
                    <gml:end>
                        <gml:TimeInstant gml:id="ti003">
                            <gml:timePosition>2000-09-30</gml:timePosition>
                        </gml:TimeInstant>
                    </gml:end>
                </gml:TimePeriod>
            </gmd:extent>
        </gmd:EX_TemporalExtent>
    </gmd:temporalElement>
</gmd:EX_Extent>
</gmd:extent>
</gmd:MD_DataIdentification>
</gmd:identificationInfo>
<gmd:distributionInfo>
<gmd:MD_Distribution>
<gmd:transferOptions>
<gmd:MD_DigitalTransferOptions>
<gmd:onLine>
<gmd:CI_OnlineResource>
<!-- Part B 1.4 Resource locator -->
<gmd:linkage>
<gmd:URL>http://anywhere.com/Sample_Access_Point</gmd:URL>
</gmd:linkage>
</gmd:CI_OnlineResource>
</gmd:onLine>
<gmd:onLine>
<gmd:CI_OnlineResource>
<!-- Part B 1.4 Resource locator -->
<gmd:linkage>
<gmd:URL>http://anywhere.com/Sample_Access_Point2</gmd:URL>
</gmd:linkage>
</gmd:CI_OnlineResource>
</gmd:onLine>
</gmd:MD_DigitalTransferOptions>
</gmd:transferOptions>
</gmd:MD_Distribution>
</gmd:distributionInfo>
<gmd:dataQualityInfo>
<gmd:DQ_DataQuality>
<gmd:scope>
<gmd:DQ_Scope>
<gmd:level>
<gmd:MD_ScopeCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/ML_gmx
Codelists.xml#MD_ScopeCode" codeListValue="dataset">dataset</gmd:MD_ScopeCode>
</gmd:level>
</gmd:DQ_Scope>
</gmd:scope>
<gmd:lineage>
<gmd:LI_Lineage>
<gmd:statement>
<gco:CharacterString>Purely virtual dataset created from the spirit of the
Author</gco:CharacterString>
</gmd:statement>
</gmd:LI_Lineage>
</gmd:lineage>
</gmd:DQ_DataQuality>
</gmd:dataQualityInfo>
</gmd:MD_Metadata>
```

A.11.2 Dataset series

There is no significant difference between the metadata of a dataset and the metadata of a dataset series. See A.11.1.

A.11.3 Service

A.11.3.1 INSPIRE view

+ **Part B 1 Identification:**
  + **Part B 1.1 Resource Title:** Sample service
  + **Part B 1.2 Resource Abstract:** This service does not exist. This is an ISO 19119 sample metadata set encoded in XML using ISO 19139 encoding rules and XML Schema implementation of ISO 19115.
  + **Part B 1.3 Resource Type:** service
  + **Part B 1.4 Resource Locator:** http://anywhere.com/Sample_Access_Point
  + **Part B 1.4 Resource Locator:** http://anywhere.com/Sample_Access_Point2
  + **Part B 1.6 Coupled Resource:**
    + **ref:** http://www.ign.fr/9876543210#dataId
+ **Part B 2 Classification of data and services:**
  + **Part B 2.2 Spatial data service type:** View Service
+ **Part B 3 Keyword:**
  + **Part B 3.1 Keyword value:** infoMapAccessService
+ **Part B 3 Keyword:**
  + **Part B 3.1 Keyword value:** OPERATION
+ **Part B 3 Keyword:**
  + **Part B 3.1 Keyword value:** Hydrography
  + **Part B 3.2 Originating Controlled Vocabulary:**
    + **title:** GEMET Thesaurus version 1.0
    + **reference date:**
      + **date:** 2009-06-30
      + **date type:** publication
+ **Part B 4 Geographic Location:**
  + **Part B 4.1 Bounding Box:**
    + **West:** +3.12
    + **East:** +3.13
    + **North:** +42.26
    + **South:** +42.25
+ **Part B 5 Temporal Reference:**
  + **Part B 5.2 Date of publication:** 2005-12-14
+ **Part B 6 Quality and validity:**
+ **Part B 7 Conformity id="Conformity_001 (INSPIRE)" :**
  + **Part B 7.1 Specification:**
    + **title:** Service Abstract Test Suite
    + **publication date:** 2007-11-21
  + **Part B 7.2 Degree:** Conformant
+ **Part B 8 Constraint related to access and use:**
  + **Part B 8.1 Condition applying to access and use:** no condition apply
  + **Part B 8.2 Limitation on public access:** no limitation on public access

+ **Part B 9 Responsible Organisation:**
  + **Part B 9.1 Responsible party:**
    + **organisation:** Institut Géographique National (IGN)
    + **e-mail:** support@ign.fr
  + **Part B 9.2 Responsible party role:** author
+ **Part B 10 Metadata on metadata:**
  + **Part B 10.1 Metadata point of contact:**
    + **organisation:** Institut Géographique National (IGN)
    + **e-mail:** nicolas.lesage@ign.fr
  + **Part B 10.2 Metadata date:** 2005-12-14
  + **Part B 10.3 Metadata language:** eng

A.11.3.2 ISO/TS 19139 XML File

```
<?xml version="1.0" encoding="UTF-8"?>
<gmd:MD_Metadata xmlns:srv="http://www.isotc211.org/2005/srv" xmlns:gco="http://www.isotc211.org/2005/gco"
xmlns:gmd="http://www.isotc211.org/2005/gmd" xmlns:imd="http://www.isotc211.org/2005/inspire/imd"
xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation=" http://www.isotc211.org/2005/inspire/imd ./xsd/inspire/imd/imd.xsd
http://www.isotc211.org/2005/gmd ./xsd/gmd/gmd.xsd http://www.isotc211.org/2005/srv ./xsd/srv/srv.xsd">
   <!-- Part B 10.3 Metadata Language -->
   <gmd:language>
      <gmd:LanguageCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/ML_gmx
Codelists.xml#LanguageCode" codeListValue="eng">eng</gmd:LanguageCode>
   </gmd:language>
   <!-- Part B 1.3 Resource type -->
   <gmd:hierarchyLevel>
      <gmd:MD_ScopeCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/ML_gmx
Codelists.xml#MD_ScopeCode" codeListValue="service">service</gmd:MD_ScopeCode>
   </gmd:hierarchyLevel>
   <!-- Part B 10.1 Metadata Contact -->
   <gmd:contact>
      <gmd:CI_ResponsibleParty>
         <gmd:individualName>
            <gco:CharacterString>Nicolas Lesage</gco:CharacterString>
         </gmd:individualName>
         <gmd:organisationName>
            <gco:CharacterString>Institut Géographique National (IGN)</gco:CharacterString>
         </gmd:organisationName>
         <gmd:contactInfo>
            <gmd:CI_Contact>
               <gmd:phone>
                  <gmd:CI_Telephone>
                     <gmd:voice>
                        <gco:CharacterString>+33.1.4398.8596</gco:CharacterString>
                     </gmd:voice>
                     <gmd:facsimile>
                        <gco:CharacterString>+33.1.4398.8171</gco:CharacterString>
                     </gmd:facsimile>
                  </gmd:CI_Telephone>
               </gmd:phone>
               <gmd:address>
                  <gmd:CI_Address>
                     <gmd:deliveryPoint>
                        <gco:CharacterString>2/4, avenue Pasteur</gco:CharacterString>
                     </gmd:deliveryPoint>
                     <gmd:city>
                        <gco:CharacterString>Saint-Mandé</gco:CharacterString>
```

```
                    </gmd:city>
                    <gmd:postalCode>
                        <gco:CharacterString>94160</gco:CharacterString>
                    </gmd:postalCode>
                    <gmd:country>
                        <gco:CharacterString>FRANCE</gco:CharacterString>
                    </gmd:country>
                    <gmd:electronicMailAddress>
                        <gco:CharacterString>nicolas.lesage@ign.fr</gco:CharacterString>
                    </gmd:electronicMailAddress>
                </gmd:CI_Address>
            </gmd:address>
        </gmd:CI_Contact>
    </gmd:contactInfo>
    <gmd:role>
      <gmd:CI_RoleCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/ML_gmx
Codelists.xml#CI_RoleCode" codeListValue="author">author</gmd:CI_RoleCode>
    </gmd:role>
  </gmd:CI_ResponsibleParty>
</gmd:contact>
<!-- Part B 10.2 Metadata Date -->
<gmd:dateStamp>
  <gco:Date>2005-12-14</gco:Date>
</gmd:dateStamp>
<gmd:identificationInfo>
  <srv:SV_ServiceIdentification>
    <gmd:citation>
      <gmd:CI_Citation>
        <!-- Part B 1.1 Resource title -->
        <gmd:title>
            <gco:CharacterString> Sample service </gco:CharacterString>
        </gmd:title>
        <!-- Part B 5.2 Date of publication -->
        <gmd:date>
            <gmd:CI_Date>
              <gmd:date>
                <gco:Date>2005-12-14</gco:Date>
              </gmd:date>
              <gmd:dateType>
                <gmd:CI_DateTypeCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/ML_gmx
Codelists.xml#CI_DateTypeCode" codeListValue="publication">publication</gmd:CI_DateTypeCode>
              </gmd:dateType>
            </gmd:CI_Date>
        </gmd:date>
      </gmd:CI_Citation>
    </gmd:citation>
    <!-- Part B 1.2 Resource Abstract -->
    <gmd:abstract>
      <gco:CharacterString>This service does not exist. This is an ISO 19119 sample metadata set encoded in
XML using ISO 19139 encoding rules and XML Schema implementation of ISO 19115. </gco:CharacterString>
    </gmd:abstract>
    <!-- Part B 9 Organisation responsible for the establishment, management, maintenance and distribution  of
spatial data sets and services -->
    <gmd:pointOfContact>
      <gmd:CI_ResponsibleParty>
        <!-- Part B 9.1 Name of the Responsible party -->
        <gmd:organisationName>
            <gco:CharacterString>Institut Géographique National (IGN)</gco:CharacterString>
        </gmd:organisationName>
        <gmd:contactInfo>
            <gmd:CI_Contact>
              <gmd:address>
```

```
                        <gmd:CI_Address>
                            <!-- Part B 9.1 E-mail address of the Responsible party -->
                            <gmd:electronicMailAddress>
                                <gco:CharacterString>support@ign.fr</gco:CharacterString>
                            </gmd:electronicMailAddress>
                        </gmd:CI_Address>
                    </gmd:address>
                </gmd:CI_Contact>
            </gmd:contactInfo>
            <!-- Part B 9.2 Responsible party role -->
            <gmd:role>
                <gmd:CI_RoleCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/ML_gmx
Codelists.xml#CI_RoleCode" codeListValue="author">author</gmd:CI_RoleCode>
            </gmd:role>
          </gmd:CI_ResponsibleParty>
        </gmd:pointOfContact>
        <!-- Part B 3 Two keywords without Originating Controlled Vocabulary -->
        <gmd:descriptiveKeywords>
          <gmd:MD_Keywords>
            <!-- Part B 3.1 Keyword Value -->
            <gmd:keyword>
                <gco:CharacterString>infoMapAccessService</gco:CharacterString>
            </gmd:keyword>
            <!-- Part B 3.1 Keyword Value -->
            <gmd:keyword>
                <gco:CharacterString>OPERATION</gco:CharacterString>
            </gmd:keyword>
          </gmd:MD_Keywords>
        </gmd:descriptiveKeywords>
        <!-- Part B 3 Keyword from the GEMET Controlled Vocabulary. Here the keyword value is a theme (Annex I.8)
of INSPIRE-->
        <gmd:descriptiveKeywords>
          <gmd:MD_Keywords>
            <!-- Part B 3.1 Keyword Value -->
            <gmd:keyword>
                <gco:CharacterString>Hydrography</gco:CharacterString>
            </gmd:keyword>
            <!-- Part B 3.2 Originating Controlled Vocabulary -->
            <gmd:thesaurusName>
                <gmd:CI_Citation>
                    <gmd:title>
                        <gco:CharacterString> GEMET Thesaurus version 1.0 </gco:CharacterString>
                    </gmd:title>
                    <gmd:date>
                        <gmd:CI_Date>
                            <gmd:date>
                                <gco:Date>2009-06-30</gco:Date>
                            </gmd:date>
                            <gmd:dateType>
                                <gmd:CI_DateTypeCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/ML_gmx
Codelists.xml#CI_DateTypeCode" codeListValue="publication">publication</gmd:CI_DateTypeCode>
                            </gmd:dateType>
                        </gmd:CI_Date>
                    </gmd:date>
                </gmd:CI_Citation>
            </gmd:thesaurusName>
          </gmd:MD_Keywords>
        </gmd:descriptiveKeywords>
        <!-- Part B 8 Constraint related to access and use -->
        <gmd:resourceConstraints>
          <gmd:MD_LegalConstraints>
```

```
            <!-- Part B 8.1 Conditions applying to access and use -->
            <gmd:useLimitation>
                <gco:CharacterString>no condition apply</gco:CharacterString>
            </gmd:useLimitation>
            <gmd:accessConstraints>
                <gmd:MD_RestrictionCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/ML_gmx
Codelists.xml#MD_RestrictionCode"
codeListValue="otherRestrictions">otherRestrictions</gmd:MD_RestrictionCode>
            </gmd:accessConstraints>
            <!-- Part B 8.2 Limitations on public access -->
            <gmd:otherConstraints>
                <gco:CharacterString>no limitation on public access</gco:CharacterString>
            </gmd:otherConstraints>
          </gmd:MD_LegalConstraints>
        </gmd:resourceConstraints>
        <!-- Part B 2.2 Spatial data service type -->
        <srv:serviceType>
          <gco:LocalName>OGC:WMS</gco:LocalName>
        </srv:serviceType>
        <!-- Part B 4.1 Geographic Bounding Box -->
        <srv:extent>
          <gmd:EX_Extent>
            <gmd:geographicElement>
                <gmd:EX_GeographicBoundingBox>
                  <gmd:westBoundLongitude>
                    <gco:Decimal>+3.12</gco:Decimal>
                  </gmd:westBoundLongitude>
                  <gmd:eastBoundLongitude>
                    <gco:Decimal>+3.13</gco:Decimal>
                  </gmd:eastBoundLongitude>
                  <gmd:southBoundLatitude>
                    <gco:Decimal>+42.25</gco:Decimal>
                  </gmd:southBoundLatitude>
                  <gmd:northBoundLatitude>
                    <gco:Decimal>+42.26</gco:Decimal>
                  </gmd:northBoundLatitude>
                </gmd:EX_GeographicBoundingBox>
            </gmd:geographicElement>
          </gmd:EX_Extent>
        </srv:extent>
        <!-- Mandated by ISO 19119 -->
        <srv:couplingType>
          <srv:SV_CouplingType codeList="#SV_CouplingType" codeListValue="tight">tight</srv:SV_CouplingType>
        </srv:couplingType>
        <!-- Mandated by ISO 19119 -->
        <srv:containsOperations>
          <srv:SV_OperationMetadata>
            <srv:operationName>
                <gco:CharacterString>Operation 1</gco:CharacterString>
            </srv:operationName>
            <srv:DCP>
                <srv:DCPList codeList="#DCPList" codeListValue="WebService">WebService</srv:DCPList>
            </srv:DCP>
            <srv:connectPoint>
                <gmd:CI_OnlineResource>
                  <gmd:linkage>
                    <gmd:URL>http://anywhere.com/Sample_Access_Point</gmd:URL>
                  </gmd:linkage>
                </gmd:CI_OnlineResource>
            </srv:connectPoint>
          </srv:SV_OperationMetadata>
        </srv:containsOperations>
```

```
        <!-- Part B 1.6 Coupled Resource -->
        <srv:operatesOn xlink:href="http://www.ign.fr/9876543210#dataId"/>
      </srv:SV_ServiceIdentification>
    </gmd:identificationInfo>
    <gmd:distributionInfo>
      <gmd:MD_Distribution>
        <gmd:transferOptions>
          <gmd:MD_DigitalTransferOptions>
            <gmd:onLine>
              <gmd:CI_OnlineResource>
                <!-- Part B 1.4 Resource locator -->
                <gmd:linkage>
                  <gmd:URL>http://anywhere.com/Sample_Access_Point</gmd:URL>
                </gmd:linkage>
              </gmd:CI_OnlineResource>
            </gmd:onLine>
            <gmd:onLine>
              <gmd:CI_OnlineResource>
                <!-- Part B 1.4 Resource locator -->
                <gmd:linkage>
                  <gmd:URL>http://anywhere.com/Sample_Access_Point2</gmd:URL>
                </gmd:linkage>
              </gmd:CI_OnlineResource>
            </gmd:onLine>
          </gmd:MD_DigitalTransferOptions>
        </gmd:transferOptions>
      </gmd:MD_Distribution>
    </gmd:distributionInfo>
    <gmd:dataQualityInfo>
      <gmd:DQ_DataQuality>
        <gmd:scope>
          <gmd:DQ_Scope>
            <gmd:level>
              <gmd:MD_ScopeCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/ML_gmx
Codelists.xml#MD_ScopeCode" codeListValue="service">service</gmd:MD_ScopeCode>
            </gmd:level>
          </gmd:DQ_Scope>
        </gmd:scope>
        <!-- The conformity is reported only when it has been evaluated -->
        <!-- This an example of conformity statement -->
        <gmd:report>
          <gmd:DQ_DomainConsistency>
            <!-- This identifier is the only way to identiy which of the quality reports are conformity statement -->
            <gmd:measureIdentification>
              <gmd:RS_Identifier>
                <gmd:code>
                  <gco:CharacterString>Conformity_001</gco:CharacterString>
                </gmd:code>
                <gmd:codeSpace>
                  <gco:CharacterString>INSPIRE</gco:CharacterString>
                </gmd:codeSpace>
              </gmd:RS_Identifier>
            </gmd:measureIdentification>
            <gmd:result>
              <gmd:DQ_ConformanceResult>
                <!-- Part B 7.1 Specification -->
                <gmd:specification>
                  <gmd:CI_Citation>
                    <gmd:title>
                      <gco:CharacterString>Service Abstract Test Suite</gco:CharacterString>
                    </gmd:title>
                    <gmd:date>
```

```
                                <gmd:CI_Date>
                                    <gmd:date>
                                        <gco:Date>2007-11-21</gco:Date>
                                    </gmd:date>
                                    <gmd:dateType>
                                        <gmd:CI_DateTypeCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/ML_gmx
Codelists.xml#CI_DateTypeCode" codeListValue="publication">publication</gmd:CI_DateTypeCode>
                                    </gmd:dateType>
                                </gmd:CI_Date>
                            </gmd:date>
                        </gmd:CI_Citation>
                    </gmd:specification>
                    <!-- Mandated by ISO 19115 -->
                    <gmd:explanation>
                        <gco:CharacterString>See the referenced specification</gco:CharacterString>
                    </gmd:explanation>
                    <!-- Part B 7.2 Degree -->
                    <gmd:pass>
                        <gco:Boolean>true</gco:Boolean>
                    </gmd:pass>
                </gmd:DQ_ConformanceResult>
            </gmd:result>
        </gmd:DQ_DomainConsistency>
    </gmd:report>
</gmd:DQ_DataQuality>
</gmd:dataQualityInfo>
</gmd:MD_Metadata>
```