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Geographic information — Methodology for feature cataloguing

AMENDMENT 1

Information géographique — Méthodologie de catalogage des entités

AMENDEMENT 1

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

Amendment 1 to ISO 19110:2005 was prepared by Technical Committee ISO/TC 211, *Geographic information/Geomatics*.

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Introduction

This amendment is based on experience in implementing ISO 19110:2005, experience and lessons learned by the ISO 19126 project team, harmonization with other ISO/TC 211 standards, and in particular establishment of an eXtensible Mark-up Language (XML) schema encoding for feature catalogues. This amendment provides XML schemas that are meant to enhance interoperability by providing a common specification for describing, validating, and exchanging feature catalogue information.

The changes in this amendment aim to:

- facilitate the use of ISO 19110:2005 to create geographic feature catalogues;
- ensure a consistent description of the feature types of an application schema;
- enhance the compliance of ISO 19110:2005 with ISO 19109;
- enable an XML schema implementation, based on ISO/TS 19139 encoding rules, of ISO 19110:2005-compliant feature catalogues;
- enable the registration of feature catalogues and their feature types.

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Geographic information — Methodology for feature cataloguing

AMENDMENT 1

Page 1, Scope

Replace the entire clause with the following:

This International Standard defines the methodology for cataloguing feature types. This International Standard specifies how feature types can be organized into a feature catalogue and presented to the users of a set of geographic data. This International Standard is applicable to creating catalogues of feature types in previously uncatalogued domains and to revising existing feature catalogues to comply with standard practice. This International Standard applies to the cataloguing of feature types that are represented in digital form. Its principles can be extended to the cataloguing of other forms of geographic data. Feature catalogues are independent of feature concept dictionaries defined in ISO 19126 and can be specified without having to use or create a feature concept dictionary.

This International Standard is applicable to the definition of geographic features at the type level. This International Standard is not applicable to the representation of individual instances of each type. This International Standard excludes portrayal schemas as specified in ISO 19117.

This International Standard can be used as a basis for defining the universe of discourse being modelled in a particular application, or to standardize general aspects of real world features being modelled in more than one application.

Page 1, Conformance

Replace the entire clause with the following:

Because this International Standard specifies a number of options that are not required for all feature catalogues, this clause specifies five conformance classes. These classes are differentiated on the basis of the following criteria.

- a) Which elements of a feature type are required in a catalogue:
 - 1) feature attributes only?
 - 2) feature attributes and feature associations?
 - 3) feature attributes, feature associations, and feature operations?
- b) Is there a requirement for defining global feature attributes, feature associations, and feature operations which may be bound to multiple feature types?
- c) Is there a requirement to include inheritance relationships in the feature catalogue?

Annex A specifies a test module for each of the conformance classes, as shown in Table 1.

Table 1 — Conformance classes

Attributes only	Attributes and associations	Attributes, associations and operations	Global properties	Inheritance relationships included	Test module
×	—	—	—	—	A.17
—	×	—	—	—	A.18
—	—	×	—	—	A.19
—	—	—	×	—	A.22
×	—	—	—	×	A.23
—	×	—	—	×	A.24
—	—	×	—	×	A.25

NOTE The initial test module numbers are kept, even if some of the test modules are removed. The numbering can be subject to change on publication of any new edition of this International Standard.

Page 2, Normative references

Update the entries for ISO/TS 19103:— and ISO 19109:—, delete footnote 1), and add ISO 19135:2005 and ISO/TS 19139:2007:

ISO/TS 19103, *Geographic information — Conceptual schema language*

ISO 19109:2005, *Geographic information — Rules for application schema*

ISO 19135:2005, *Geographic information — Procedures for item registration*

ISO/TS 19139:2007, *Geographic information — Metadata — XML schema implementation*

Page 3, Terms and definitions

Replace entry 4.4 with the following:

feature catalogue

catalogue containing definitions and descriptions of the **feature** (4.1) types, **feature attributes** (4.3), and **feature relationships** (4.8) occurring in one or more sets of geographic data, together with any **feature operations** (4.5) that may be applied

[ISO 19101:2002, definition 4.13]

Add the following terms and definitions:

4.7

feature inheritance

mechanism by which more specific **features** (4.1) incorporate structure and behaviour of more general features related by behaviour

4.8

feature relationship

feature association (4.2) or **feature inheritance** (4.7)

Page 3, Abbreviations

Add the following heading under "5 Abbreviations"

5.1 Acronyms

Add the following after the new 5.1:

5.2 Namespace abbreviations

In the list below, the item on the left describes the common namespace prefix used to describe the elements in the namespace. The second item is an English description of the namespace prefix, and the item in parenthesis is the URI of the actual namespace. These URIs do not correspond necessarily to an effective location of the schemas.

This list corresponds to the namespaces used by this International Standard.

gco	Geographic Common extensible markup language	(http://www.isotc211.org/2005/gco)
gfc	Geographic Feature Cataloguing	(http://www.isotc211.org/2005/gfc .)
gmd	Geographic MetaData extensible markup language	(http://www.isotc211.org/2005/gmd)
gmx	Geographic Metadata XML Schema	(http://www.isotc211.org/2005/gmx)

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Page 4, 6.1

Replace the text in 6.1 with the following:

<https://standards.iteh.ai/catalog/standards/sist/95ac848d-2224-49c7-b7d7-4d5c6cc910d/iso-19110-2005-amd-1-2011>
A feature catalogue shall present the abstraction of reality represented in one or more sets of geographic data. The basic level of abstraction in a feature catalogue shall be the feature type. A feature catalogue shall be available in electronic form for any set of geographic data that contains features. A feature catalogue may also comply with the specifications of this International Standard independently of any existing set of geographic data.

Page 4, 6.2.1

Add the following text at the end of 6.2.1:

Annex E specifies XML encoding for feature catalogue, Annex F specifies concepts that permit the management of feature catalogue either in a multi-part register or in a hierarchical register containing multi-part subregisters, in accordance with ISO 19135. Annex G provides an example of XML implementation of this International Standard.

Page 4, 6.2.2

Replace the first sentence of 6.2.2 with the following:

A template for the representation of feature catalogues is specified in Annex B.

Page 4, 6.2.3.1

Replace the text in 6.2.3.1 with the following:

All feature types and feature properties (i.e. feature attributes, feature associations, association roles, and feature operations) included in a feature catalogue shall be identified by a name. The name of a feature type is unique within that feature catalogue. The name of a feature property (whether the feature property is a global property bound to the feature type or is local to the feature type) is unique within its feature type. The name of a global feature property is unique within that feature catalogue.

Page 6, A.1

In the 2nd and 3rd paragraph, replace “Tables B.1 through B.15” with “Tables B.1 through B.16”.

Page 7, A.3

Replace bullet 2) with the following:

- 2) that all feature types, all feature association and all global feature properties (feature role, feature attribute or feature operation not directly owned by a feature type) are identified by a name that is unique within the feature catalogue,

Add the following bullet point after 6):

- 7) that all carriers of characteristics of a feature type are identified by a name that is unique in the context of that feature type.

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Page 8, A.7

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Replace bullet b), with the following [deleting 1) and 2)]:

- b) test method: test each attribute and role listed in Table B.5 (and Table B.4) by verifying that for each the specified description, obligation/condition, maximum occurrence, type, and constraint are satisfied;

Page 9, A.10

Replace bullet b) with the following:

- b) test method: test each attribute and role listed in Table B.8 and Table B.4 by verifying that for each the specified description, obligation/condition, maximum occurrence, type, and constraint are satisfied;

Page 10, A.11

Delete bullet 2).

Page 12, A.19

Replace bullet b) with the following [deleting 1), 2) and 3)]:

- b) test method: perform test module A.18 and test case A.7 (feature operation);

Page 13, A.22

Replace the text in A.22 with the following:

Information for the test module is as follows:

- a) test purpose: verify that feature catalogue supports core representation functionality, comprised of feature types, and feature properties (i.e. feature attributes, association roles, and feature operations) either directly owned by a single feature type or globally defined in the feature catalogue;
- b) test method: perform test module A.8, A.16 and A.18;
- c) reference: A.8, A.16 and A.18;
- d) test type: capability.

Page 16, Annex B

In the first paragraph, replace “Tables B.1 through B.15” with “Tables B.1 through B.16”.

In the second paragraph, replace “Figure B.1” with “Figure B.1 a), b), and c)”.

In the last line, delete “ISO 19109:—1)” and insert “ISO 19109:2005”.

Page 17, Annex B

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Replace Table B.1 with the following:

Table B.1 — Feature catalogue

No.	Name/Role Name	Description	Obligation/Condition ^a	Maximum Occurrence ^b	Type	Constraint
1	Class FC_FeatureCatalogue	a feature catalogue contains the definition of some number of feature types with other information necessary for those definitions	—	—	—	—
	Subtype of CT_Catalogue	see ISO/TS 19139	—	—	—	—
1.1	Attribute producer	name, address, country, and telecommunications address of person or organization having primary responsibility for the intellectual content of this feature catalogue	M	1	ISO 19115 Metadata:: CI_ResponsibleParty	—
1.2	Attribute functionalLanguage	formal functional language in which the feature operation formal definition occurs in this feature catalogue	C/Mandatory if feature operation formal definition occurs in feature catalogue	1	CharacterString	—
1.3	Role featureType	role that links this feature catalogue to the feature types that it contains	M	N	FC_FeatureType	Aggregation
1.4	Role definitionSource	role that links this feature catalogue to the sources of definitions of feature types, property types, and listed values that it contains	O	N	FC_DefinitionSource	Aggregation
1.5	Role inheritanceRelation	role that links this feature catalogue to the inheritance relationships that it contains	O	N	FC_InheritanceRelation	Aggregation
1.6	Role globalProperty	role that links this feature catalogue to the global feature properties, i.e. the feature properties which may be bound to many feature types	O	N	FC_PropertyType	Composition
^a M = mandatory; O = optional; C = conditional. ^b N = repeating occurrences.						

Pages 18 and 19, Annex B

In Table B.2, replace rows 2, 2.9 and 2.11 with the following:

No.	Name/Role Name	Description	Obligation/Condition ^a	Maximum Occurrence ^b	Type	Constraint
2	Class FC_FeatureType	class of real world phenomena with common properties	—	—	—	typeName realizes GF_FeatureType ::typeName; isAbstract realizes GF_FeatureType ::isAbstract; constrainedBy realizes GF_FeatureType ::constrainedBy
2.9	Role carrierOfCharacteristics	role that links this feature type to the property types that it contains	O	N	FC_CarrierOfCharacteristics	Composition
2.11	Role definitionReference	role that links this feature type to the source of its definition	O	1	FC_DefinitionReference	Aggregation

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Page 19, Annex B

In Table B.3, replace row 3.1 with the following:

No.	Name/Role Name	Description	Obligation/Condition	Maximum Occurrence	Type	Constraint
3.1	Attribute name	text string that uniquely identifies this inheritance relation within the feature catalogue that contains this inheritance relation	O	1	CharacterString	—

Page 20, Annex B

Add the following Table B.4a before Table B.4.

Table B.4a — Carrier of characteristics

No.	Name/Role Name	Description	Obligation/Condition ^a	Maximum Occurrence ^b	Type	Constraint
4bis	Class FC_CarrierOfCharacteristics	abstract class for local feature properties and bound global properties of a feature type	—	—	—	—
4bis.1	Role featureType	role that links the local and bound properties with the feature type that contains them	C/Mandatory for local properties	1	FC_FeatureType	—
4bis.2	Role constrainedBy	role that links a carrier of characteristics to the constraints placed upon it	O	N	FC_Constraint	Aggregation

^a O = optional; C = conditional.

^b N = repeating occurrences.

Update and extend Table B.4 with the following:

Table B.4 — Property type

No.	Name/Role Name	Description	Obligation/Condition ^a	Maximum Occurrence	Type	Constraint
4	Class FC_PropertyType	abstract class for local and global feature properties	—	—	—	—
	Subtype of FC_CarrierOfCharacteristics	Table B.4a	—	—	—	—
4.1	Attribute memberName	member name that locates this member within a feature type for a local property or within the feature catalogue for a global property	M	1	LocalName	—
4.2	Attribute definition	definition of the member in a natural language: This attribute is required if the definition is not provided by FC_FeatureCatalogue::definitionSource. If not provided, the definitionReference should specify a citation where the definition may be found, and any additional information as to which definition is to be used	C/Mandatory if not provided by definition source	1	CharacterString	—
4.3	Attribute cardinality	cardinality of the member in the feature class. If this is an attribute or operation, the default cardinality is 1. If this is an association role, then the default cardinality is 0..*. For operations, this is the number of return values possible. This is an elaboration of the GFM to allow for complete specifications for various programming and data definition languages	M	1	Multiplicity	Initial value =1
4.6	Role definitionReference	role that links this instance to the source of its definition	O	1	FC_DefinitionReference	Aggregation
4.7	Role featureCatalogue	feature catalogue to which a global property pertains	C/Mandatory for a global property	1	FC_FeatureCatalogue	—

^a M = mandatory; O = optional; C = conditional.

Page 21, Annex B

In Table B.5, replace rows 5.3, 5.4 and 5.5 with the following:

No.	Name/Role Name	Description	Obligation/Condition ^a	Maximum Occurrence ^b	Type	Constraint
5.3	Role triggeredByValuesOf	specifies attribute which may trigger an operation	O	N	FC_CarrierOfCharacteristics	Shall be instantiated as FC_FeatureAttribute, FC_BoundFeatureAttribute or one of their derived classes.
5.4	Role observesValuesOf	specifies attribute that may be used as input to perform an operation	O	N	FC_CarrierOfCharacteristics	Shall be instantiated as FC_FeatureAttribute, FC_BoundFeatureAttribute or one of their derived classes.
5.5	Role affectsValuesOf	specifies attribute that will be affected by an operation	O	N	FC_CarrierOfCharacteristics	Shall be instantiated as FC_FeatureAttribute, FC_BoundFeatureAttribute or one of their derived classes.

Page 21, Annex B

Replace Table B.6 with the following:

No.	Name/Role Name	Description	Obligation/Condition ^a	Maximum Occurrence	Type	Constraint
6	Class FC_Binding	class that is used to describe the specifics of how a property type is bound to a particular feature type	—	—	—	—
	Subtype of FC_CarrierOfCharacteristics	Table B.4a	—	—	—	—
6.1	Attribute description	description of how a property type is bound to a particular feature type	O	1	CharacterString	—
6.2	Role globalProperty	role that links to the bound global property	M	1	FC_PropertyType	—

^a M = mandatory; O = optional.

Page 22, Annex B

In Table B.8, replace rows 8.3 and 8.4 with the following:

No.	Name/Role Name	Description	Obligation/Condition ^a	Maximum Occurrence ^b	Type	Constraint
8.3	Attribute listedValue	if present, it defines the permissible values of this feature attribute as a restriction of the attribute valueType. If not present, there is no restriction on the valueType.	O	1	FC_ListedValue	—
8.4	Attribute valueType	type of the value of this feature attribute; a name from some namespace	C/Mandatory for local feature attribute	1	TypeName	—