

Using the latest ISO Standard for Geographic Information (ISO19115-1) for an INSPIRE Discovery Service

Use case in Wallonia Region
Implementation in GeoNetwork3



Wallonie

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INTERNATIONAL
STANDARD

ISO
19115-1

First edition
2014-04-01

**Geographic information —
Metadata —**

**Part 1:
Fundamentals**

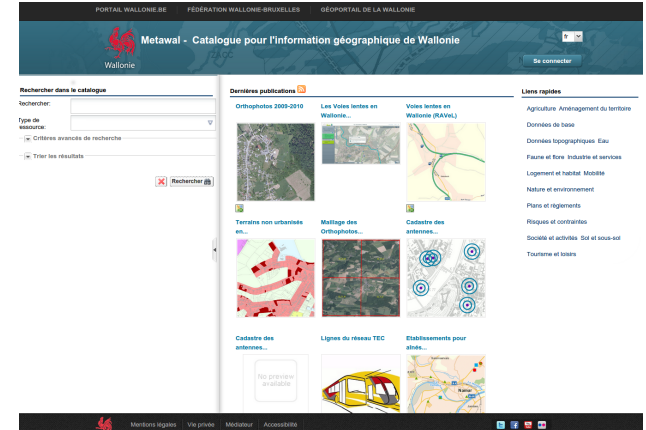
*Information géographique — Métadonnées —
Partie 1: Principes de base*

Metawal



In 2013, discussion about improving description of spatial resources

- 1) Create/Improve ISO19139 profile
- 2) Move to ISO19115-1



ISO 19115-1
published in
April 2014

INTERNATIONAL
STANDARD

ISO
19115-1

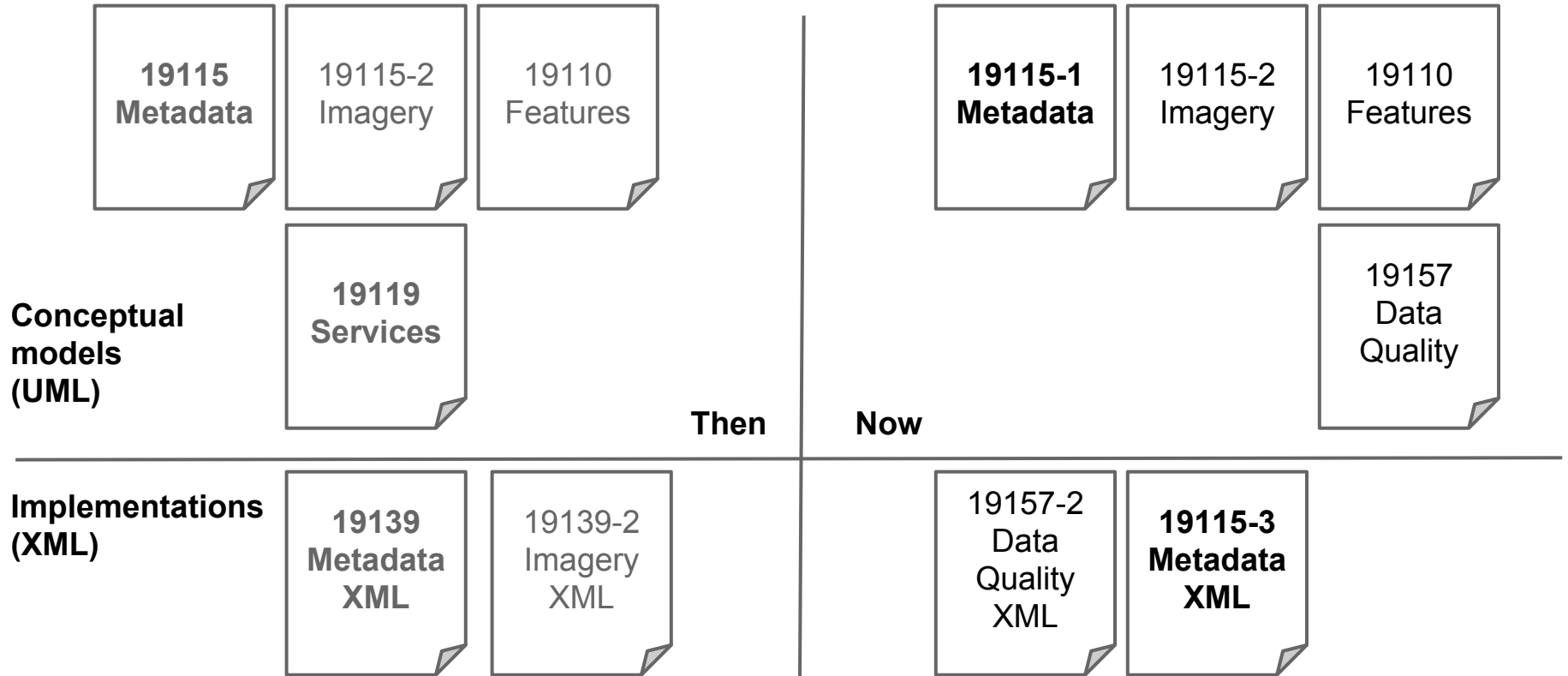
First edition
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**Geographic information —
Metadata —**

**Part 1:
Fundamentals**

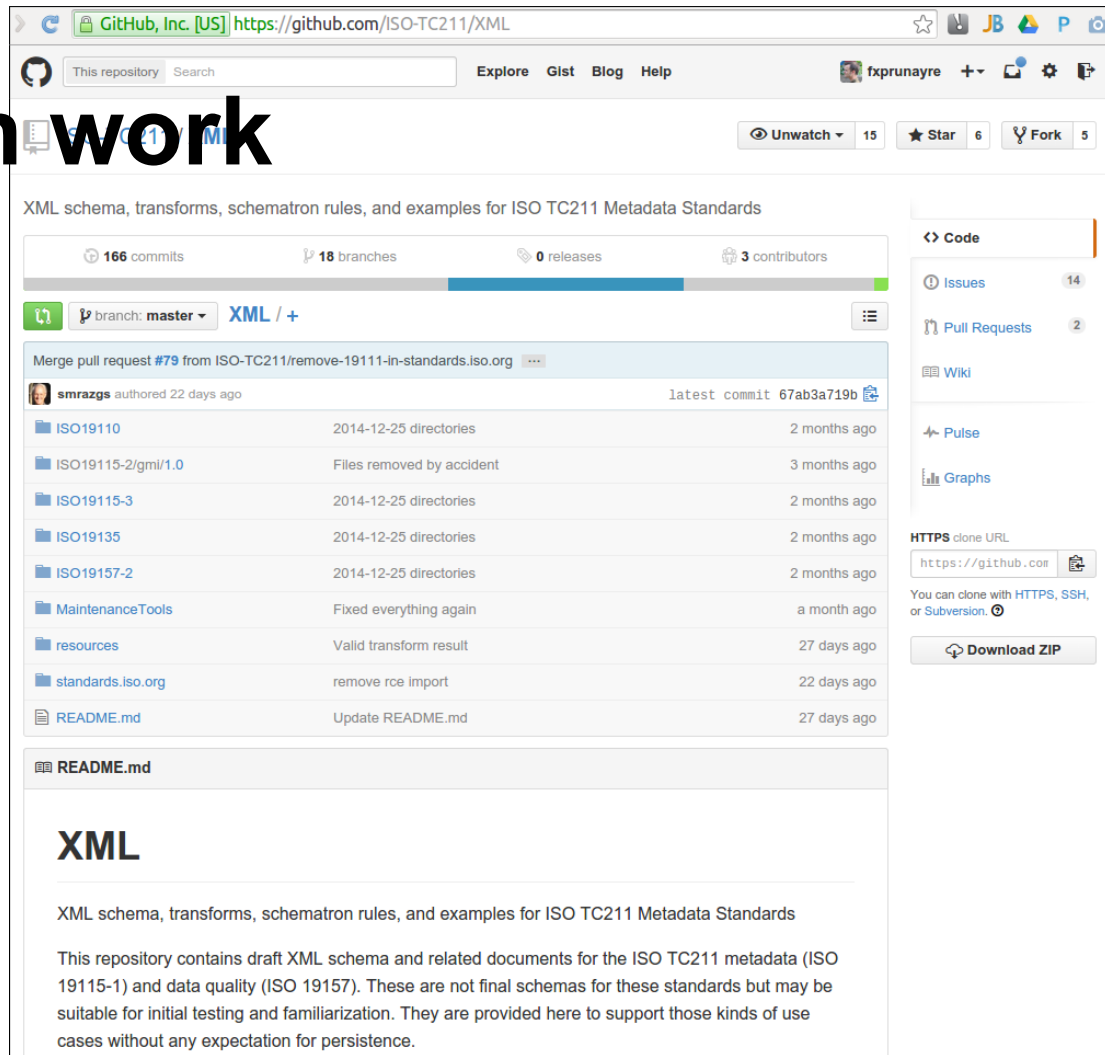
*Information géographique — Métadonnées —
Partie 1: Principes de base*

“I am confused by all these numbers!”



Implementation work

Available on github



The screenshot shows a GitHub repository page for 'ISO-TC211/XML'. The repository is owned by 'fxprunayre' and has 166 commits, 18 branches, 0 releases, and 3 contributors. A merge pull request #79 is visible, authored by 'smrazgs' 22 days ago. The repository contains several directories and files, including 'ISO19110', 'ISO19115-2/gmi/1.0', 'ISO19115-3', 'ISO19135', 'ISO19157-2', 'MaintenanceTools', 'resources', 'standards.iso.org', and 'README.md'. The 'README.md' file is open, showing the title 'XML' and the following text:

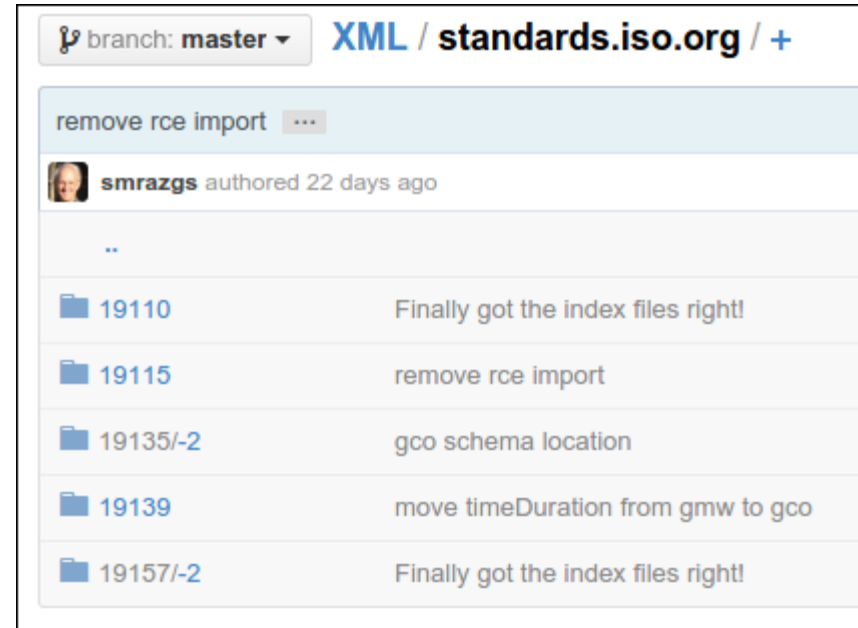
XML schema, transforms, schematron rules, and examples for ISO TC211 Metadata Standards

This repository contains draft XML schema and related documents for the ISO TC211 metadata (ISO 19115-1) and data quality (ISO 19157). These are not final schemas for these standards but may be suitable for initial testing and familiarization. They are provided here to support those kinds of use cases without any expectation for persistence.

Implementation contains

the schemas

XSDs for each standards



The screenshot shows a GitHub commit page for the repository `XML / standards.iso.org` on the `master` branch. The commit message is `remove rce import`, authored by `smrazgs` 22 days ago. The commit includes a list of files:

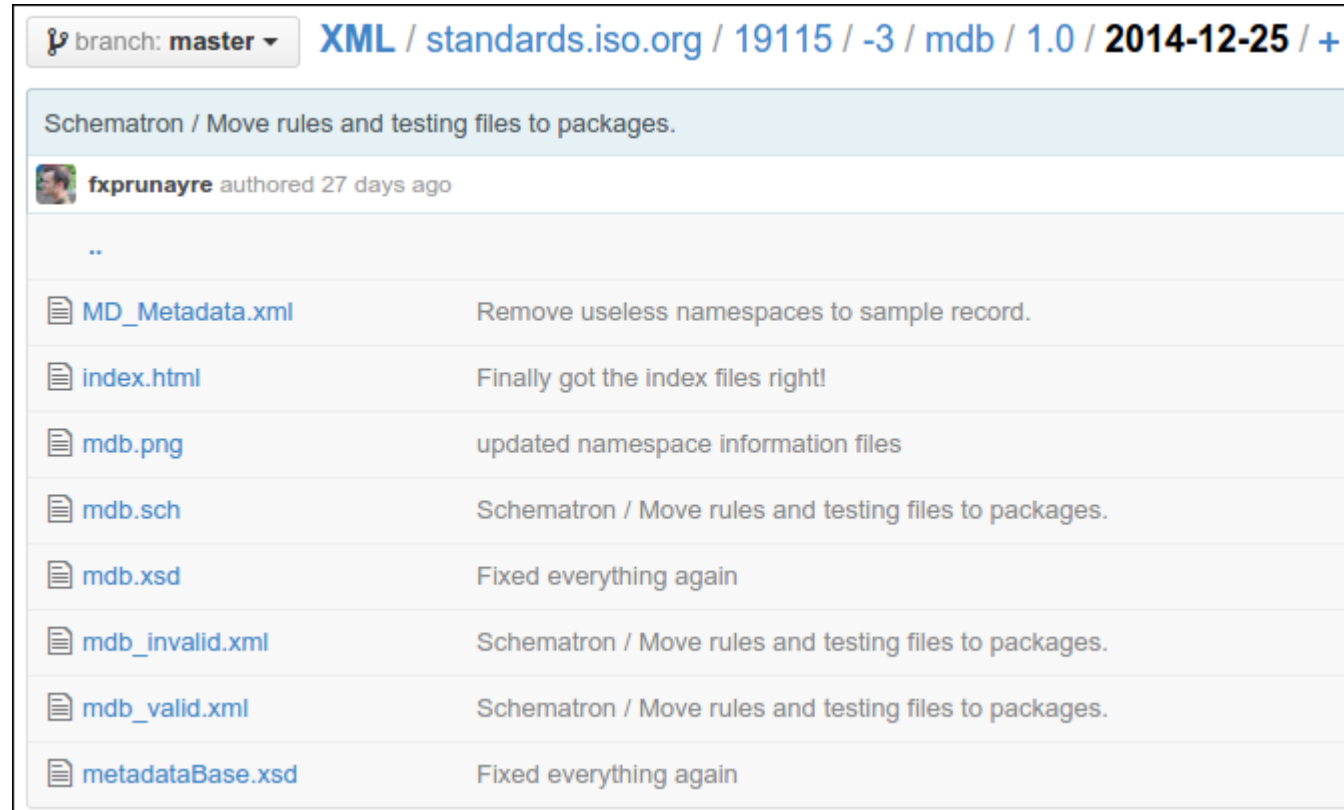
File	Description
<code>19110</code>	Finally got the index files right!
<code>19115</code>	remove rce import
<code>19135/-2</code>	gco schema location
<code>19139</code>	move timeDuration from gmw to gco
<code>19157/-2</code>	Finally got the index files right!

Each packages contains

XSDs

[Multilingual
schematron
rules](#)

Diagrams

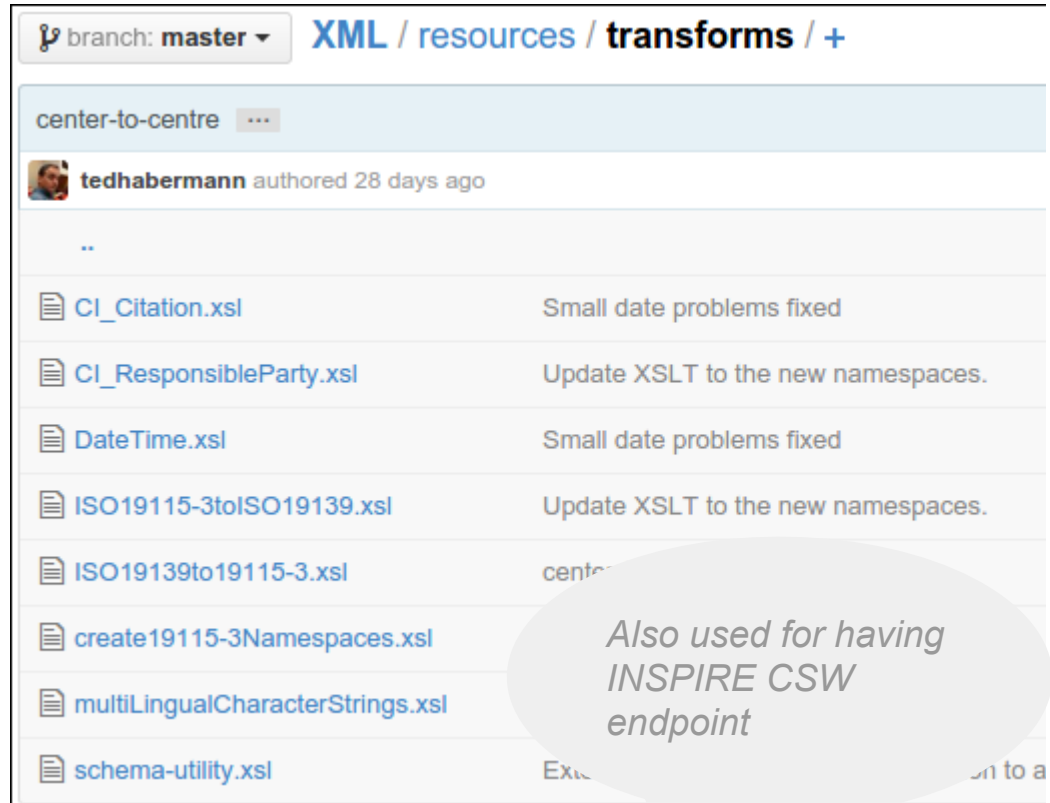


The screenshot shows a Git commit diff for the 'mdb' package. The commit message is 'Schematron / Move rules and testing files to packages.' and it was authored by 'fxprunayre' 27 days ago. The diff shows several files being added or modified:

File	Description
..	
MD_Metadata.xml	Remove useless namespaces to sample record.
index.html	Finally got the index files right!
mdb.png	updated namespace information files
mdb.sch	Schematron / Move rules and testing files to packages.
mdb.xsd	Fixed everything again
mdb_invalid.xml	Schematron / Move rules and testing files to packages.
mdb_valid.xml	Schematron / Move rules and testing files to packages.
metadataBase.xsd	Fixed everything again

Implementation contains also

How to
migrate
from/to
ISO19139 ?



branch: master XML / resources / transforms / +

center-to-centre ...

tedhabermann authored 28 days ago

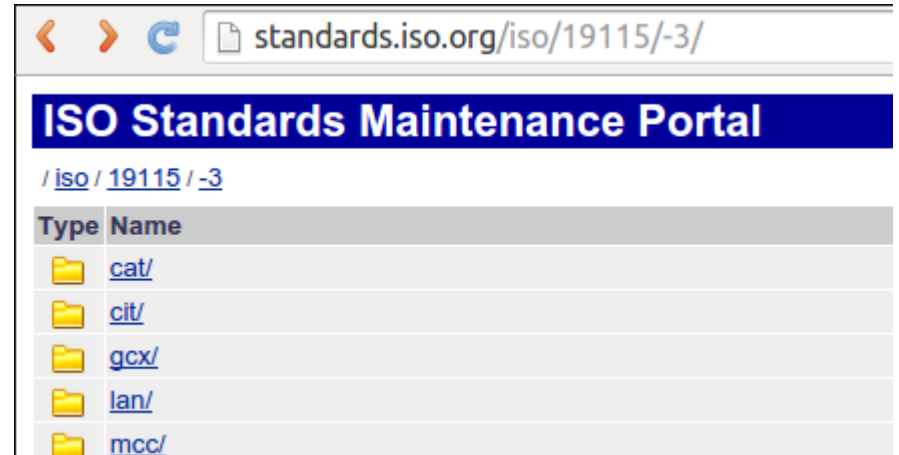
..

CI_Citation.xsl	Small date problems fixed
CI_ResponsibleParty.xsl	Update XSLT to the new namespaces.
DateTime.xsl	Small date problems fixed
ISO19115-3toISO19139.xsl	Update XSLT to the new namespaces.
ISO19139to19115-3.xsl	center-to-centre
create19115-3Namespaces.xsl	
multiLingualCharacterStrings.xsl	
schema-utility.xsl	Exclude schema-utility.xsl from the build to a

*Also used for having
INSPIRE CSW
endpoint*

Implementation

Will be published on standards.iso.org



ISO19115-3 GeoNetwork plugin



GeoNetwork
open source

The ISO19115-3 plugin

Supported in [GeoNetwork 3+](#)

All features supported by ISO19139
(search, view, edit, multilingual,
validation)



admin admin (Administrator)



Sign out

English



Metadata & templates

Formatter

Schematron

Load samples and templates for metadata standards

Standards available

0 selected

Dublin Core - CSW

Metadata records produced by CSW services.

Dublin Core

The Dublin Core metadata standard

Geographic information - Methodology for feature cataloguing (ISO 19110:2005)

ISO 19110 standard for describing Feature Types

Geographic information - Metadata (ISO ISO19115-3)

iso19115-3 metadata standard

Geographic information - Metadata (ISO/TS 19139:2007)

ISO19139 metadata standard



admin admin (Admi

Create a

Create a
Dataset



Dataset



Map



Service

From **Multilingual template for Vector data**

Multilingual template for Vector data

Template for Vector data (preferred!)

Template for map

+ Create



▼ Identification info ✖

Title *

Alternate title

Date * Creation 🕒 ✖

Date * Publication 🕒 ✖

Date * Revision 🕒 ✖

▼ Identifier ✖

Code *

Codespace Recommended ▼ ✖

Abstract *

Rassemble les dispositions temporaires de navigation sur l'ensemble des voies navigables. Permet d'établir pour chaque voie la liste de ces dispositions toujours d'actualité. Le positionnement géographique des événements perturbateurs -voie, cumulée, rive, etc.- est essentiel pour l'utilisateur.

N.B. :

- il s'agit de dérogations temporaires aux dispositions réglementaires, elles

🔗 Associated resources +

🔗 Online resources +

📄 fichier xml des avis à la batellerie et événements d'actualité, selon norme SIF-RIS garantissant l'interopérabilité. ✖

🔗 Service -Site internet ✖

🗨 Validation 👍 🗨 🔄

Compliance to metadata standard (XML Schema) 0 / 1

XSD Validation Error 0 Error

INSPIRE rules 0 / 0

Règles de validation pour le standard ISO 19115-1:2014 26 / 26

The ISO19115-3 plugin

Includes also DataQuality, Imagery,
Feature catalogue sections

Translated in English & French

Published in metadata101

<https://github.com/metadata101/iso19115-3>

```
<metadata>  
  <title>Metadata 101</title>  
  <subject>A repository of metadata profiles</subject>  
</metadata>
```

This website hosts metadata profiles developed for use in catalog systems. Metadata documents describe data. Metadata profiles are usually subsets of existing metadata standards developed by subject matter expert groups.

Examples of such metadata profiles are the set of XML schema's and Schematron rules that define the structure of a particular metadata file like Dublin Core, ISO19139 and others.

“The ISO standards are evolving”

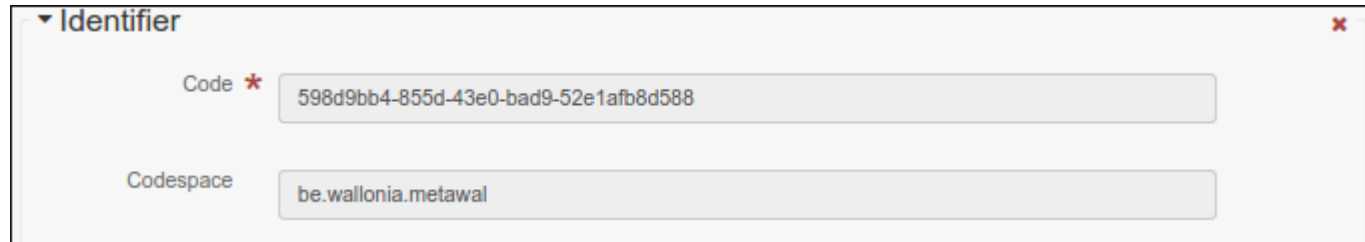
Wallonia

Problem solved by the new standard



Identifying metadata records

A codespace is added to the metadata identifier for unambiguous identification.



The image shows a screenshot of a web form titled "Identifier" with a dropdown arrow and a close button (red 'x') in the top right corner. The form contains two input fields. The first field is labeled "Code *" and contains the hexadecimal string "598d9bb4-855d-43e0-bad9-52e1afb8d588". The second field is labeled "Codespace" and contains the string "be.wallonia.metawal".

Field	Value
Code *	598d9bb4-855d-43e0-bad9-52e1afb8d588
Codespace	be.wallonia.metawal

Point of truth URL

▼ Metadata linkage

Linkage *

<http://apps.titellus.net/geonetwork/srv/eng/metadata/a68db6b9-e05f-4075-aca6-34399a7fd194>

Fonction

Complete Metadata



INSPIRE Download service Gebiedsbeheer, gebieden waar beperkingen gelden, geregeleerde gebieden en rapportage-eenheden

INSPIRE View service Gebiedsbeheer, gebieden waar beperkingen gelden, geregeleerde gebieden en rapportage-eenheden

Geluidszones vliegvelden waarvoor de provincie vergoedingen verleent en toezicht houdt

Windsnelheden op 100m hoogte in m/s

Third party app harvesting records



Relief de la Wallonie - Modèle Numérique de Terrain (MNT) 2013-2014 - Sans Interpolation

Modèle Numérique de Terrain (MNT) non-interpolé de la Wallonie d'une résolution d'un mètre issu d'acquisitions LIDAR effectuées entre le 12/12/2012 et le 09/03/2014

Certaines parties du territoire (notamment les plans d'eau et les zones bâties) n'ont pu faire l'objet d'une acquisition de données par la méthode LIDAR. Ces zones sont caractérisées par la valeur "NoData". Cela a pour conséquence que le MNT n'est pas continu sur l'ensemble de la Wallonie. Néanmoins, une interpolation pour combler les "petits trous" a été réalisée pour un remplissage à partir des voisins jusqu'à deux pixels.

Si vous souhaitez une couverture complète du territoire, utilisez préférentiellement la donnée "Relief de la Wallonie - Modèle Numérique de Terrain (MNT) 2013-2014" (<http://geoportail.wallonie.be/cms/rendre/visites/geoportail/home/geocalogues.html?mdlJUID=60296735-029-438b-b10a-85e67777a952>) pour laquelle toutes les valeurs manquantes ont été comblées par interpolation.

Le système de coordonnées de la donnée est le Lambert Belge 72 (EPSG:31370). La référence altimétrique est le Deuxième Nivellement Général (EPSG:5710). La précision planimétrique est inférieure à la résolution du MNS (1 m), et la précision altimétrique est de l'ordre de 0,12 m en absolu sur l'ensemble du territoire.

Metadonnées des services et applications associées	Relief de la Wallonie - Modèle Numérique de Terrain (MNT) 2013-2014 - Sans interpolation (Service de visualisation)
Adresse Internet (URL)	Voir cette donnée sur WalOnMap
ESRI-REST GeoService	Service de visualisation REST
OGC-WMS Web Map Service	Service de visualisation WMS

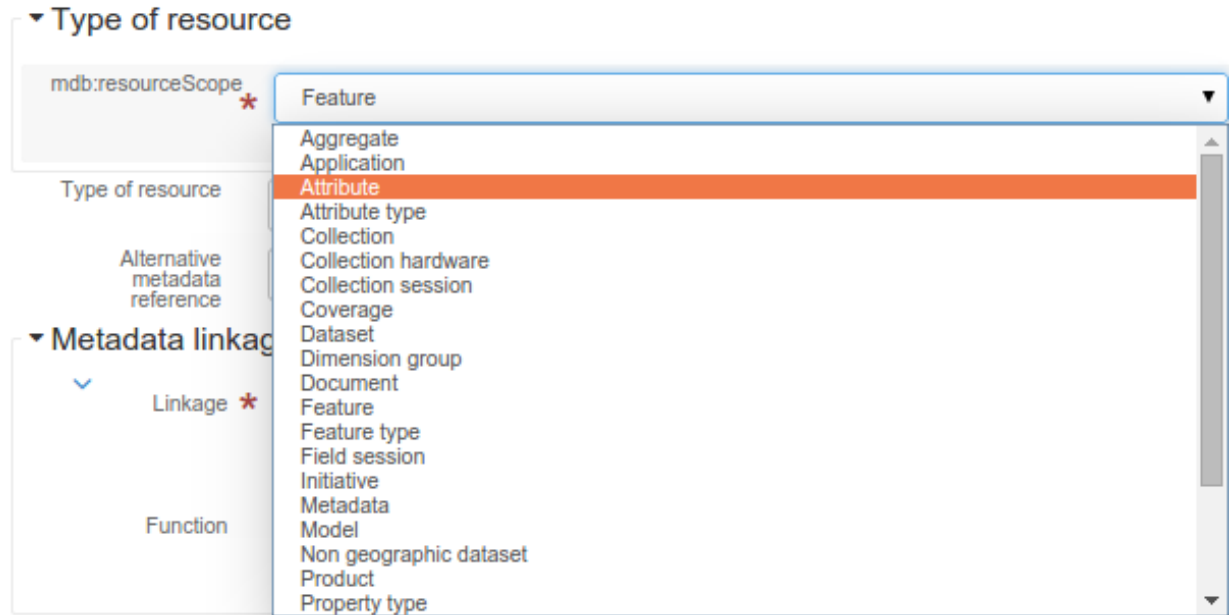
Comprendre la ressource

Date(s) de référence	2015-02-17 (Création: Date à laquelle la ressource est créée) 2015-02-17 (Révision: Date à laquelle la ressource est révisée)
Référence(s) temporelle(s)	Date de début: 2012-12-12 Date de fin: 2014-03-09
Aperçu	
Mots clés	MNT, Terrain, DNG, Z. LIDAR, Sol, Modélisation, DTM, Topographie

“Have access to other representations of the metadata (other format and/or other content)”

Different types of resources

Metawal is also cataloging maps & apps.



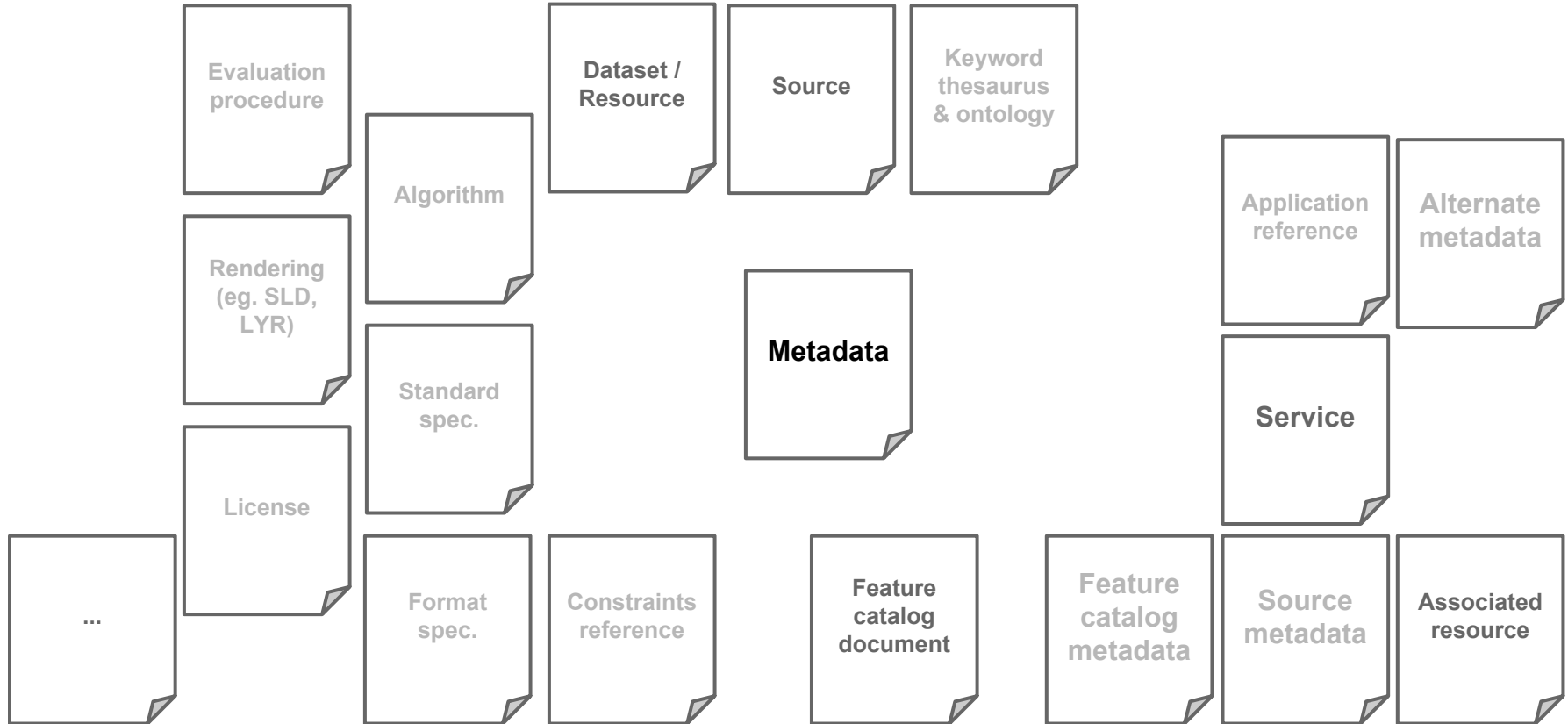
Tracking life cycle

Date includes
13 new data
types

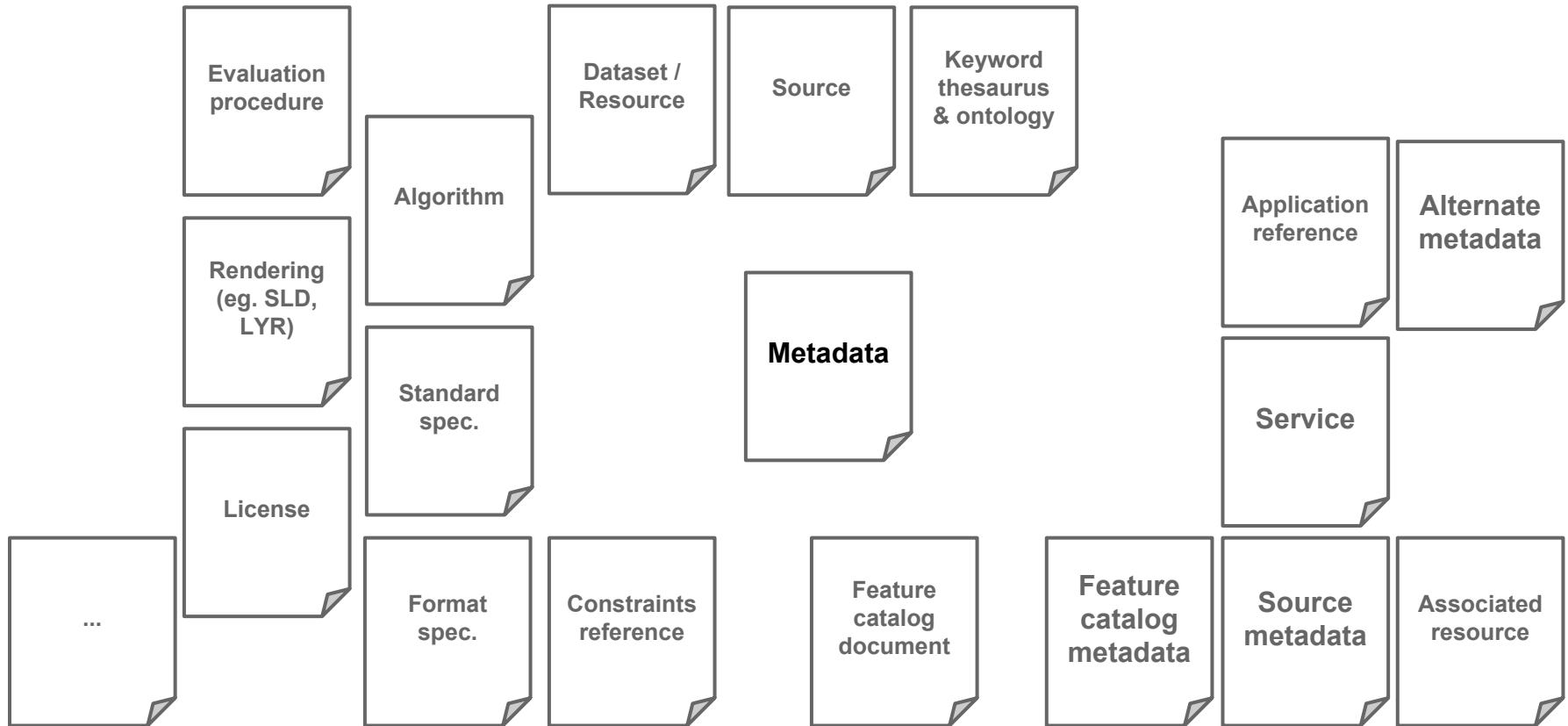
The screenshot displays a user interface for selecting date types. On the left, a vertical list of data types is partially visible, including 'Edition', 'In date', 'Citation identifier', 'Cited', 'Responsible party', and 'Citation'. The 'Date' field is highlighted, and a dropdown menu is open, listing 13 date types: 'Adopted', 'Creation', 'Deprecated', 'Distribution', 'Expiry', 'In Force', 'Last Review', 'Last Update', 'Next Update' (highlighted in orange), 'Publication', 'Released', 'Revision', 'Superseded', 'Unavailable', 'Validity Begins', and 'Validity Expires'. To the right, a grid of date input fields is shown, with the first row containing 'November 2015' and a calendar icon. Below it, three rows show date pickers for '11/26/20', '12/01/20', and '?/01/2015', each with a calendar icon.

Date *	Creation	November 2015
Date *	Last Review	11/26/20
Date *	Publication	12/01/20
Date *	Next Update	?/01/2015

Connecting other documentation



Connecting other documentation



Connecting other documentation

“A reference to documents where there is more information about the resource”

The citation now support:

- online resource
- graphics

Connecting rendering style

QML, SLD, LYR
could be described
in the metadata
record.

▼ Informations sur la représentation

Titre *	Fichier de rendu de la couche vecteur pour le type NIVEAU1
Adresse Internet *	http://style.data.wallonie.be/occsol/niveau1.lyr
Protocole	ESRI:LYR
Nom	Fichier de style pour ArcMap
Adresse Internet *	http://style.data.wallonie.be/occsol/niveau1.qgs
Protocole	QGIS:STYLE
Nom	Fichier de style pour QGIS

Describing feature catalogue

By citation or embedded

▼ Description d'une propriété

Définition

Table des communes

Code

COMMUNE

Élément abstrait *

▼ Caractéristiques des attributs

Définition

Code de la commune

Cardinalités *

1..1

Code

CD_COM

Nom du type *

INTEGER

Valeurs recommandées ▼

Attribute name

Definition

VALUE (INTEGER)

[List of values](#)

Name	Code	Definition
Low coasts	1	Areas within 10km from the coastline and with an elevation below 50m.
High coasts	2	Areas within 10km from the coastline and with an elevation above 50m.
Inlands	3	Areas between 0 and 200 m outside the coastal strip.
Uplands	4	Zones between 200 and 500 m plus the flat areas between 500 and 1000m.
Mountains	5	Slopy areas between 500 and 1000m and all the areas over 1000m.

Aggregates

Link a resource to the current metadata

Association type: Larger work citation

Initiative type: Collection

Search: Maquette 3D texturée de Lyon (largerWorkCitation / collection)

Link to other resources

- Campaign
- Collection
- Exercise
- Experiment
- Investigation
- Mission
- Sensor
- Operation
- Platform
- Process
- Program
- Project
- Study
- Task
- Trial

«CodeList»
DS_AssociationTypeCode

- + crossReference
- + largerWorkCitation
- + partOfSeamlessDatabase
- + stereoMate
- + isComposedOf
- + collectiveTitle
- + series
- + dependency
- + revisionOf

«CodeList»
DS_InitiativeTypeCode

- + campaign
- + collection
- + exercise
- + experiment
- + investigation
- + mission
- + sensor
- + operation
- + platform
- + process
- + program
- + project
- + study
- + task
- + trial

Constraints

“Reference the licence or the law that applies”

▼ Resource constraints

Hierarchy level *

File name *

Title *

Linkage *



Constraints

“Know who can access the data”

▼ Acteur

Nom

Autorité publique

Indication

Accès libre et gratuit pour les autorités publiques

Contraintes de
diffusion

Non restreint

Constraints

“Know who can access the data”

▼ Acteur

Nom

Société privée dans le cadre d'un marché public

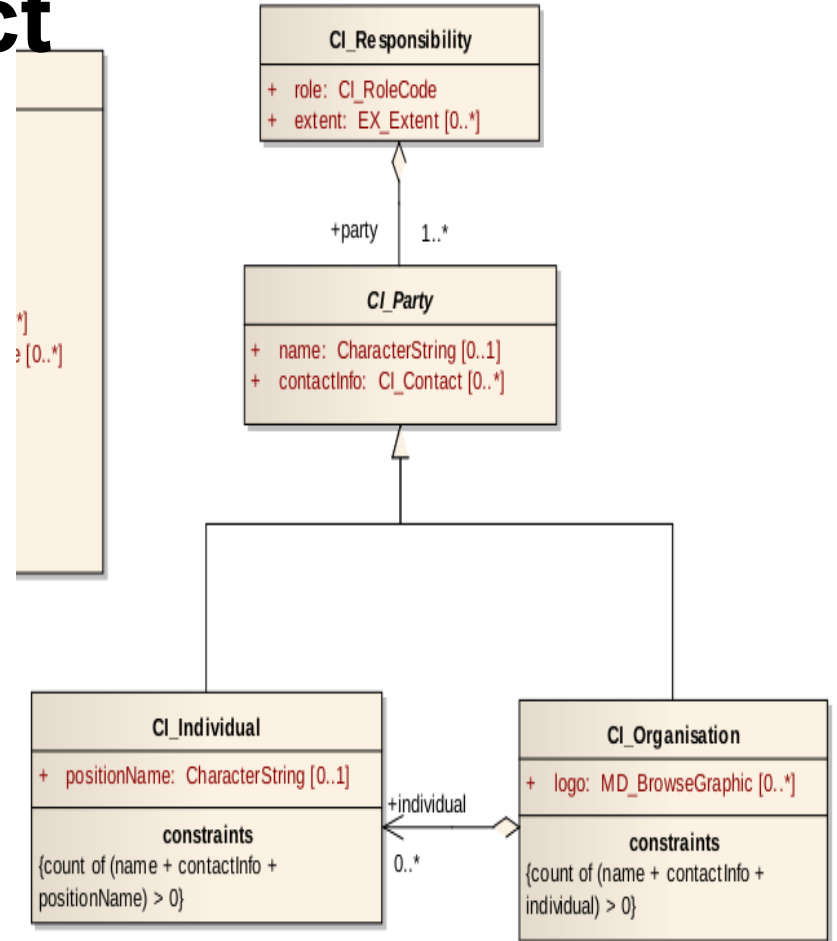
Indication

Donnée accessible aux prestataires de marché public dans le cadre strict de la réalisation du marché

Contraintes de diffusion

Licence

More flexible contact & organisation



Data quality to evaluate usage

Ongoing work to populate quality information on the MedSea checkpoint project

The screenshot shows a user interface for data quality management. At the top, there is a search bar containing the character '1'. Below the search bar, on the left, is a label 'Data quality info' with a plus sign icon. To the right of the search bar is a dropdown menu with a list of data quality rules. The second rule, 'DQ_CompletenessCommission / Excess item', is highlighted in blue. Each rule in the list has a plus sign icon to its right.

Search	Quality Rule	Action
1	DQ_AbsoluteExternalPositionalAccuracy / Depth horizontal position accuracy better than 250m	+
	DQ_CompletenessCommission / Excess item	+
	DQ_CompletenessOmission / Missing item	+
	DQ_ConceptualConsistency / Conceptual schema non-compliance	+
	DQ_DomainConsistency / Number of items not in conformance with their value domain	+
	DQ_DomainConsistency / Value domain conformance	+

**Using ISO19115-3 for
INSPIRE ?**

IR for INSPIRE

“Use ISO19115/119”

“Use of ISO 19139 in the context of a
Catalogue Service”

= A conversion from ISO19115-3 to ISO19139
is required and rules need to be defined

TG for INSPIRE discovery service

Implementation Requirement 1 An INSPIRE Discovery Service shall implement the mandatory behaviour of a [CSW ISO AP] compliant service and the extensions as required by the INSPIRE Directive and its associated Regulations.

= ISO19115-3 record should be accessible using CSW

Virtual CSW

- csw-cadgjs
- csw-inspire
- csw-opendata

[+ New virtual CSW](#)

Update **csw-inspire** (capabilities) [Delete](#) [Save](#)

Service description

Name

csw-inspire

The virtual CSW name MUST start with csw-.

Description

A short description of this endpoint.

Explicit Query (advanced) [Show](#)

Filters

Add filter

keyword [v](#) inspire [+](#)

Clause MUST match [v](#)

A virtual CSW for INSPIRE

CSW request

csw-GetRecords | filter "service"

```
<?xml version="1.0"?>
<csw:GetRecords xmlns:csw="http://www.opengis.net/cat/csw/2.0.2" service="CSW" version="2.0.2"
  resultType="results" outputSchema="own">
  <csw:Query typeName="gmd:MD_Metadata">
    <csw:Constraint version="1.1.0">
      <Filter xmlns="http://www.opengis.net/ogc" xmlns:gml="http://www.opengis.net/gml">
        <PropertyIsLike wildCard="%" singleChar="_" escapeChar="\\">
          <PropertyName>AnyText</PropertyName>
        </PropertyIsLike>
      </Filter>
    </csw:Constraint>
  </csw:Query>
</csw:GetRecords>
```

▶ Send CSW request

CSW response

```
<?xml version="1.0" encoding="UTF-8"?>
<csw:GetRecordsResponse xmlns:csw="http://www.opengis.net/cat/csw/2.0.2" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.opengis.net/cat/csw/2.0.2 http://schemas.opengis.net/csw/2.0.2/CSW-2.0.2.xsd">
  <csw:SearchStatus timestamp="2015-05-26T08:40:03" />
  <csw:SearchResults numberOfRecordsMatched="103" numberOfRecordsReturned="10" elementSet="1">
    <mdb:MD_Metadata xmlns:mdb="http://standards.iso.org/19115-3/mdb/1.0" xmlns:cat="http://standards.iso.org/19115-3/cat/1.0"
      xmlns:cit="http://standards.iso.org/19115-3/cit/1.0" xmlns:gmx="http://standards.iso.org/19115-3/gmx/1.0"
      xmlns:lan="http://standards.iso.org/19115-3/lan/1.0" xmlns:srv="http://standards.iso.org/19115-3/srv/2.0"
      xmlns:mcc="http://standards.iso.org/19115-3/mcc/1.0" xmlns:mco="http://standards.iso.org/19115-3/mco/1.0"
      xmlns:mda="http://standards.iso.org/19115-3/mda/1.0" xmlns:mdb="http://standards.iso.org/19115-3/mdb/1.0"
      xmlns:mdt="http://standards.iso.org/19115-3/mdt/1.0" xmlns:mex="http://standards.iso.org/19115-3/mex/1.0"
      xmlns:mmi="http://standards.iso.org/19115-3/mmi/1.0" xmlns:mpc="http://standards.iso.org/19115-3/mpc/1.0"
      xmlns:mrc="http://standards.iso.org/19115-3/mrc/1.0" xmlns:mrd="http://standards.iso.org/19115-3/mrd/1.0"
      xmlns:mrl="http://standards.iso.org/19115-3/mrl/1.0" xmlns:mrs="http://standards.iso.org/19115-3/mrs/1.0"
      xmlns:mdq="http://standards.iso.org/19157-2/mdq/1.0" xmlns:mac="http://standards.iso.org/19115-3/mac/1.0"
      xmlns:gco="http://standards.iso.org/19115-3/gco/1.0" xmlns:gml="http://www.opengis.net/gml/3.2" xmlns:geonet="http://www.fao.org/geonetwork">
      <mdb:metadataIdentifier>
        <mcc:MD_Identifier>
          <mcc:code>
```

CSW request

csw-GetRecords | filter "service"

```
<?xml version="1.0"?>
<csw:GetRecords xmlns:csw="http://www.opengis.net/cat/csw/2.0.2" service="CSW" version="2.0.2"
  resultType="results" outputSchema="csw:IsoRecord">
  <csw:Query typeName="gmd:MD_Metadata">
    <csw:Constraint version="1.1.0">
      <Filter xmlns="http://www.opengis.net/ogc" xmlns:gml="http://www.opengis.net/gml">
        <PropertyIsLike wildCard="%" singleChar="_" escapeChar="\\">
          <PropertyName>AnyText</PropertyName>
        </PropertyIsLike>
      </Filter>
    </csw:Constraint>
  </csw:Query>
</csw:GetRecords>
```

▶ Send CSW request

CSW response

```
<?xml version="1.0" encoding="UTF-8"?>
<csw:GetRecordsResponse xmlns:csw="http://www.opengis.net/cat/csw/2.0.2" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.opengis.net/cat/csw/2.0.2 http://schemas.opengis.net/csw/2.0.2/CSW-2.0.2.xsd">
  <csw:SearchStatus timestamp="2015-05-26T08:40:26" />
  <csw:SearchResults numberOfRecordsMatched="103" numberOfRecordsReturned="10" elementSet="1">
    <gmd:MD_Metadata xmlns:gmd="http://www.isotc211.org/2005/gmd" xmlns:gco="http://www.isotc211.org/2005/gco"
      xmlns:srv="http://www.isotc211.org/2005/srv" xmlns:gmx="http://www.isotc211.org/2005/gmx" xmlns:gsr="http://www.isotc211.org/2005/gsr"
      xmlns:gmi="http://www.isotc211.org/2005/gmi" xmlns:xlink="http://www.w3.org/1999/xlink">
      <gmd:fileIdentifier>
        <gco:CharacterString>3e501c87-9146-4d9b-9237-8165c8f7cd51</gco:CharacterString>
      </gmd:fileIdentifier>
      <gmd:language>
        <gmd:LanguageCode codeList="http://www.loc.gov/standards/iso639-2/" codeListValue="" />
      </gmd:language>
      <gmd:characterSet>
        <gmd:MD_CharacterSetCode codeListValue="utf8" codeList="http://www.isotc211.org/namespaces/gmd/2005/gmd#MD_CharacterSetCode" />
      </gmd:characterSet>
      <gmd:parentIdentifier>
        <gco:CharacterString />
      </gmd:parentIdentifier>
```

The ISO19115-3 plugin / What's next?

Improve associated resources management

Improve directory support (for licenses, graphics, ...)

Workflow eg. obsolete/superseded record

Use feature catalogue for data preview in the mapviewer

FGDC to ISO19115-3 conversion

Thanks to all contributors

- Wallonia region users; Vincent Bombaerts (SPW)
- [TC211](#); Ted Habermann (hdfgroup)
- Tufts university
- GeoNetwork community; Simon Pigot (CSIRO), François Prunayre (titellus), Arnaud De Groof (Spacebel), Jose Garcia & Maria Arias de Reyna (GeoCat.BV)