Validação da harmonização de dados geográficos : o projecto EAGLE

Alexandra Fonseca, Danilo Furtado, Ana Luisa Gomes

Projecto EAGLE

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	Alexandra Fonseca	WP 3
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ReSAC	Pavel Milenov	reviewer
	Radko Radkov	reviewer
UMA	Emanuele Mancosu	reviewer
GeoVille	Stefan Kleeschulte	management

Service contract for the provision of assistance to the EEA in the production of the new CORINE Land Cover (CLC) inventory, including the support to the harmonisation of national monitoring for integration at pan-European level:

Transformation rules for CORINE land cover and Urban Atlas according to INSPIRE Land Cover theme

Setembro 2015

MoU entre a DGT e a eENVplus validation team

eENVplus eEnvironmental services for advanced applications within INSPIRE
http://www.eenvplus.eu/

Objectivo

- Este projecto piloto visou apoiar o desenvolvimento de um procedimento que permita à Agência Europeia do Ambiente (AEA) fornecer os conjuntos de dados geográficos CORINE Land Cover (CLC) e Urban Atlas (UA) em conformidade com a Directiva INSPIRE.

- A concretização do projecto lida com a harmonização de dados geográficos de acordo com as especificações de dados INSPIRE do tema Ocupação do solo (INSPIRE Data Specification on Land Cover).

Harmonização/EAGLE

1º Passo (WP1)

Estabelecer as correspondências entre os dados existentes (CLC and UA) e as especificações INSPIRE usando uma matching table (*human readable*).

2º Passo (WP2)

Desenvolver processos automáticos de realizar o mapeamento usando regras de transformação (*machine-readable*) procedendo à transformação para GML 3.2.

3 º Passo (WP3)

Validar o resultado (ficheiro GML) como prova de conceito de modo a viabilizar a transformação de uma amostra representantiva do CDG.

Harmonização/EAGLE

1º Passo (WP1)

Estabelecer as correspondências entre os dados existentes (CLC and UA) e as especificações INSPIRE usando uma matching table (*human readable*).

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Desenvolver processos automáticos de realizar o mapeamento usando regras de transformação (*machine-readable*) procedendo à transformação para GML 3.2.

3 º Passo (WP3)

Validar o resultado (ficheiro GML) como prova de conceito de modo a viabilizar a transformação de uma amostra representantiva do CDG.

Harmonização/EAGLE

- Criação de um ficheiro vectorial para CDG Corine Land Cover e Urban Atlas de acordo com as especificações de dados INSPIRE sobre o tema “Land Cover”.
- Land Cover Vector data model descrito nas *INSPIRE Data Specification on Land Cover e* versão 4.0 do LandCoverVector XML schema.

- Outputs:

Relatório	
Anexos	Matching tables, Regras de transformação (FME Workbench), Ficheiros GML Representativos dos *test-sites* e Ficheiro schematron file (protocolos de validação)

Relatório EAGLE

Harmonização/EAGLE

Referências Normativas

Infrastructure for Spatial Information in Europe (INSPIRE) Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007

COMMISSION REGULATION (EU) No 1253/2013 of 21 October 2013 amending Regulation (EU) No 1089/2010 implementing Directive 2007/2/EC as regards interoperability of spatial data sets and services

D2.8.II.2 INSPIRE Data Specification on Land Cover – Technical Guidelines

D2.5: INSPIRE Generic Conceptual Model, Version 3.4

D2.7: Guidelines for the encoding of spatial data, Version 3.3

Land Cover Vector xml schema version 4.0
http://inspire.ec.europa.eu/schemas/lcv/4.0/LandCoverVector.xsd

Validação

- Utilização de CDG vectoriais CORINE Land Cover (CLC) e Urban Atlas (UA).
- O processo de validação avalia a conformidade dos CDG com as disposições de execução e guidelines técnicas da Directiva.

- <u>Abordagem teórica à validação</u>

  - Estudo do Abstract Test Suite (ATS) do INSPIRE Land Cover (LC), incluido no Anexo A das Technical Guidelines.

  - Descrição de métodos de validação a utilizar

- <u>Abordagem prática à validação</u>

  - Considerar os diferentes tipos de testes do ATS, identificando os erros obtidos e apresentando as soluções para os resolver.

Validação

- Utilização de CDG vectoriais CORINE Land Cover (CLC) e Urban Atlas (UA).
- O processo de validação avalia a conformidade dos CDG com as disposições de execução e guidelines técnicas da Directiva.

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- Abordagem prática à validação

  Considerar os diferentes tipos de testes do ATS, identificando os erros obtidos e apresentando as soluções para os resolver.

Abstract Test Suit

	CONFORMANCE CLASS	TEST
nity with Commission Regulation 089/2010	**A.1 Application Schema Conformance Class**	A.1.1 Schema element denomination test
		A.1.2 Value type test
		A.1.3 Value test
		A.1.4 Attributes/associations completeness test
		A.1.5 Abstract spatial object test
		A.1.6 Constraints test (theme)
		A.1.7 Geometry representation test
	A.2 Reference Systems Conformance Class	A.2.1 Datum test
		A.2.2 Coordinate reference system test
		A.2.3 Grid test
		A.2.4 View service coordinate reference system test
		A.2.5 Temporal reference system test
		A.2.6 Units of measurements test

Cada teste do ATS segue a mesma estrutura:

Abstract test title

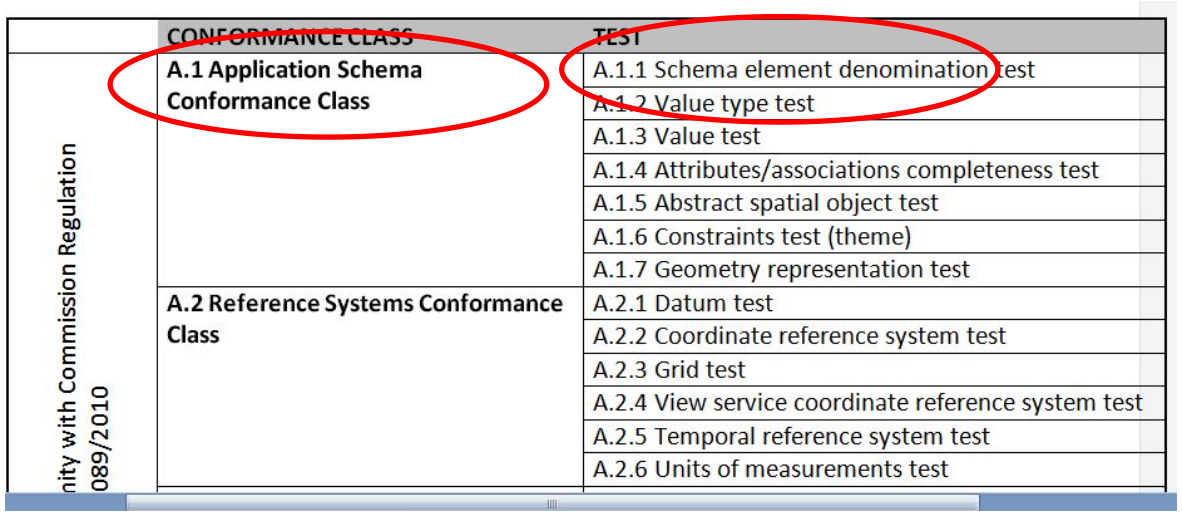
a) Purpose: definition of the scope of the test;

b) Reference: citation from the legal texts (ISDSS Regulation requirements) or the technical guidelines (TG requirements);

c) Test method: description of the testing procedure

NOTES: additional explanations, conditions and links to any material that may be useful during the test.

Abstract Test Suit



	CONFORMANCE CLASS	TEST
nity with Commission Regulation 089/2010	**A.1 Application Schema Conformance Class**	A.1.1 Schema element denomination test
		A.1.2 Value type test
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Cada teste do ATS segue a mesma estrutura:

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b) Reference: citation from the legal texts (ISDSS Regulation requirements) or the technical guidelines (TG requirements);

c) Test method: description of the testing procedure

NOTES: additional explanations, conditions and links to any material that may be useful during the test.

Abstract Test Suit

Table 6.2 Application Schema Conformance Class (A.1) tests

A.1. Application Schema Conformance Class (*Annex A of the INSPIRE LC TG*)	
Conformance classes: http://inspire.ec.europa.eu/conformance-class/ir/lc/as/LandCoverNomenclature; http://inspire.ec.europa.eu/conformance-class/ir/lc/as/LandCoverVector; http://inspire.ec.europa.eu/conformance-class/ir/lc/as/LandCoverRaster.	
A.1.1 Schema element denomination test	
***a) Purpose**: Verification whether each element of the dataset under inspection carries a name specified in the target application schema(s).* ***b) Reference**: Art. 3 and Art. 4 of Commission Regulation No 1089/2010.*	***c) Test Method:** Examine whether the corresponding elements of the source schema (spatial object types, data types, attributes, association roles, code lists, and enumerations) are mapped to the target schema with the correct designation of mnemonic names.* *NOTE: Further technical information is in the Feature catalogue and UML diagram of the application schema(s) in section 5.2.*
A.1.2 Value type test	
***a) Purpose**: Verification whether all attributes or association roles use the corresponding value types specified in the application schema(s).*	***c) Test Method**: Examine whether the value type of each provided attribute or association role adheres to the corresponding value type specified in the target specification.*

Os Abstract tests da *Application Schema Conformance Class* estão directamente relacionados com as regras incluidas no *application schema* (XSD) do INSPIRE LC, em que são descritos elementos como o nome dos atributos, os tipos e valores dos dados e as associações ou regras entre eles.

Implementação do ATS

	LAND COVER		XSD LandCoverVector	GML schematron	Thematic schematron	others
PART 1: (normative) conformity with Commission Regulation No. 1089/2010	A.1 Application Schema Conformance Class	A.1.1 Schema element denomination test	X			
		A.1.2 Value type test	X			
		A.1.3 Value test	X		X	
		A.1.4 Attributes/associations completeness test	X			
		A.1.5 Abstract spatial object test	X			
		A.1.6 Constraints test (theme)			X	
		A.1.7 Geometry representation test	X		X	
	A.2 Reference Systems Conformance Class	A.2.1 Datum test			X	
		A.2.2 Coordinate reference system test			X	
		A.2.3 Grid test				X
		A.2.4 View service coordinate reference system test				X
		A.2.5 Temporal reference system test			X	
		A.2.6 Units of measurements test			X	
	A.3 Data Consistency Conformance Class	A.3.1 Unique identifier persistency test				X
		A.3.2 Version consistency test				X
		A.3.3 Life cycle time sequence test	X		X	
		A.3.4 Validity time sequence test	X		X	
		A.3.5 Update frequency test				X
	A.4 Metadata IR Conformance Class	A.4.1 Metadata for interoperabili				
	A.5 Information Accessibility Conformance Class	A.5.1 Code list publication test				
		A.5.2 CRS publication test				
		A.5.3 CRS identification test				
		A.5.4 Grid identification test				
	A.6 Data Delivery Conformance Class	A.6.1 Encoding compliance test				
	A.7 Portrayal Conformance Class	A.7.1 Layer designation test				
PART 2: (Informative) conformity with technical guidelines (TG) requirements	A.8 Technical Guideline Conformance Class	A.8.1 Multiplicity test				
		A.8.2 CRS http URI test				
		A.8.3 Metadata encoding schema				
		A.8.4 Metadata occurrence test				
		A.8.5 Metadata consistency test				
		A.8.6 Encoding schema validation				
		A.8.7 Coverage multipart represe				
		A.8.8 Coverage domain consisten				
		A.8.9 Style test				

Metodologia de validação que considera 4 grupos de métodos diferentes (Tracasa, 2014):

- perante o target schema – XSD;
- usando o GML Schematron;
- Usando o Schematron temático
- Outros testes

Implementação do ATS

	LAND COVER		XSD LandCoverVector	GML schematron	Thematic schematron	others
PART 1: (normative) conformity with Commission Regulation No. 1089/2010	A.1 Application Schema Conformance Class	A.1.1 Schema element denomination test	X			
		A.1.2 Value type test	X			
		A.1.3 Value test	X		X	
		A.1.4 Attributes/associations completeness test	X			
		A.1.5 Abstract spatial object test	X			
		A.1.6 Constraints test (theme)			X	
		A.1.7 Geometry representation test	X		X	
	A.2 Reference Systems Conformance Class	A.2.1 Datum test			X	
		A.2.2 Coordinate reference system test			X	
		A.2.3 Grid test				X
		A.2.4 View service coordinate reference system test				X
		A.2.5 Temporal reference system test			X	
		A.2.6 Units of measurements test			X	
	A.3 Data Consistency Conformance Class	A.3.1 Unique identifier persistency test				X
		A.3.2 Version consistency test				X
		A.3.3 Life cycle time sequence test	X		X	
		A.3.4 Validity time sequence test	X		X	
		A.3.5 Update frequency test				X
	A.4 Metadata IR Conformance Class	A.4.1 Metadata for interoperability test				X
	A.5 Information Accessibility Conformance Class	A.5.1 Code list publication test			X	
		A.5.2 CRS publication test			X	
		A.5.3 CRS identification test			X	
		A.5.4 Grid identification test				X
	A.6 Data Delivery Conformance Class	A.6.1 Encoding compliance test		X		
	A.7 Portrayal Conformance Class	A.7.1 Layer designation test				X
PART 2: (informative) conformity with technical guidelines (TG) requirements	A.8 Technical Guideline Conformance Class	A.8.1 Multiplicity test	X			
		A.8.2 CRS http URI test			X	
		A.8.3 Metadata encoding schema validation test				X
		A.8.4 Metadata occurrence test				X
		A.8.5 Metadata consistency test				X
		A.8.6 Encoding schema validation test	X	X		
		A.8.7 Coverage multipart representation test		X		
		A.8.8 Coverage domain consistency test		X		
		A.8.9 Style test				X

Aplicação dos testes

Para a realização e reporte dos testes foi acordada uma forma de os identificar e de apresentar os respectivos erros e sua correcção.

Date of the test	
Test author	
Implementation Under Test (IUT)	
IUT description	
Reference schema	
Summary	☐ The results did not show any Non Conformity ☐ The test results showed Non Conformities
Comments	
Tool used	

Element	
Description	
Rectification	
Comments	

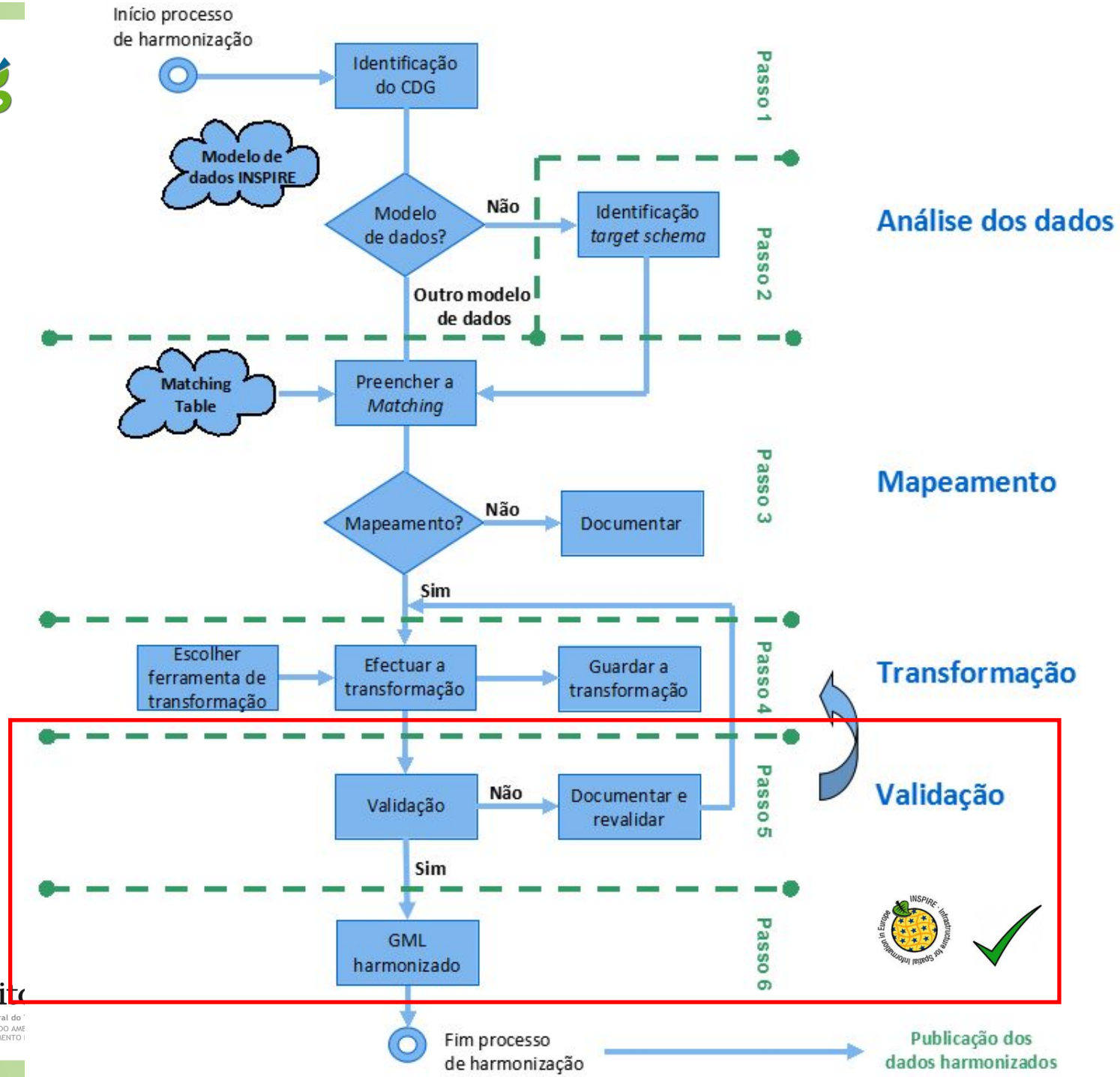
Cor vermelha: identifica o erro.

Cor azul escura: identifica a correcção.

Ferramentas de validação

Para executar parte dos testes utilizam-se ferramentas específicas que têm a capacidade de lidar com dados XML.

Validation software tools	
Oxygen XML Editor	Under proprietary License *http://www.oxygenxml.com/*
eENVplus validator	Free online validation tool *http://cloud.epsilon-italia.it/eenvplus_new/ATS.htm*


Início processo de harmonização
Identificação do CDG
Modelo de dados INSPIRE
Modelo de dados?
Não
Identificação target schema
Outro modelo de dados
Matching Table
Preencher a Matching
Mapeamento?
Não
Documentar
Sim
Escolher ferramenta de transformação
Efectuar a transformação
Guardar a transformação
Validação
Não
Documentar e revalidar
Sim
GML harmonizado
Fim processo de harmonização
Publicação dos dados harmonizados
Passo 1
Passo 2
Passo 3
Passo 4
Passo 5
Passo 6
Análise dos dados
Mapeamento
Transformação
Validação

Validação de dados

- Especificação de Dados para o Land Cover (v3.0)

INSPIRE
Infrastructure for Spatial Information in Europe

D2.8.II.2 Data Specification on *Land Cover* – Technical Guidelines

Title	D2.8.II.2 INSPIRE Data Specification on *Land Cover* – Technical Guidelines
Creator	INSPIRE Thematic Working Group *Land Cover*
Date	2013-12-10
Subject	INSPIRE Data Specification for the spatial data theme *Land Cover*
Publisher	European Commission Joint Research Centre
Type	Text
Description	This document describes the INSPIRE Data Specification for the spatial data theme *Land Cover*
Contributor	Members of the INSPIRE Thematic Working Group *Land Cover*
Format	Portable Document Format (pdf)
Source	
Rights	Public
Identifier	D2.8.II.2_v3.0
Language	En
Relation	Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)
Coverage	Project duration

Validação de dados

- **Abstract Test Suite (ATS)**, incluídas em todas as Especificações de Dados dos anexos.
  - **Anexo A - Parte 1:** inclui testes com o objetivo de avaliar a conformidade dos conjuntos de dados (GML), de acordo com o **Regulamento** (UE) nº **1089/2010** da Comissão, de 23 de Novembro de 2010, que estabelece as **Disposições de Execução** da Directiva 2007/2/CE do Parlamento Europeu e do Conselho relativamente à **interoperabilidade dos conjuntos e serviços de dados geográficos** e as sucessivas alterações incluídas no Regulamento (UE) nº 1253/2013.

  - **Anexo A - Parte2:** inclui testes que visam avaliar a conformidade dos conjuntos de dados geográficos relativamente aos **requisitos** das **Technical Guidelines**.

Validação de dados

- Abstract Test Suite (ATS)
  - Validação aos Dados.
  - Não foram incluídos nos teste a validação de metadados e de dados *raster.*

	CONFORMANCE CLASS	TEST
PART 1: (normative) conformity with Commission Regulation No. 1089/2010	**A.1 Application Schema Conformance Class**	A.1.1 Schema element denomination test
		A.1.2 Value type test
		A.1.3 Value test
		A.1.4 Attributes/associations completeness test
		A.1.5 Abstract spatial object test
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		A.1.7 Geometry representation test
	A.2 Reference Systems Conformance Class	A.2.1 Datum test
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		A.2.3 Grid test
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		A.2.5 Temporal reference system test
		A.2.6 Units of measurements test
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		A.3.3 Life cycle time sequence test
		A.3.4 Validity time sequence test
		A.3.5 Update frequency test
	A.4 Metadata IR Conformance Class	A.4.1 Metadata for interoperability test
	A.5 Information Accessibility Conformance Class	A.5.1 Code list publication test
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	A.7 Portrayal Conformance Class	A.7.1 Layer designation test
PART 2: (informative) conformity with technical guidelines (TG) requirements	**A.8 Technical Guideline Conformance Class**	A.8.1 Multiplicity test
		A.8.2 CRS http URI test
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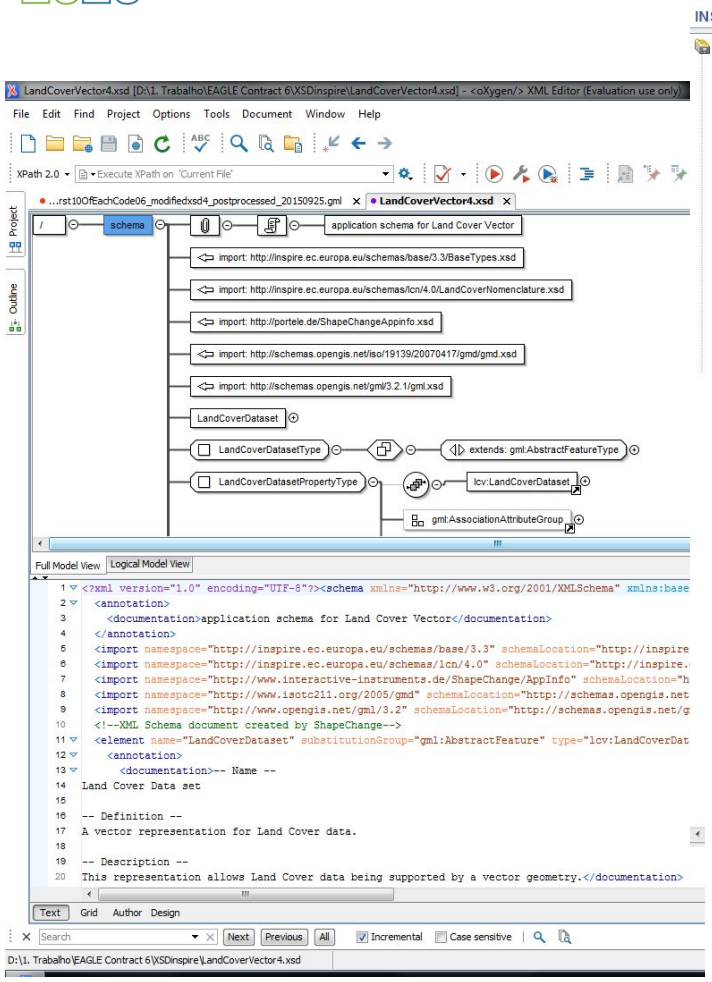
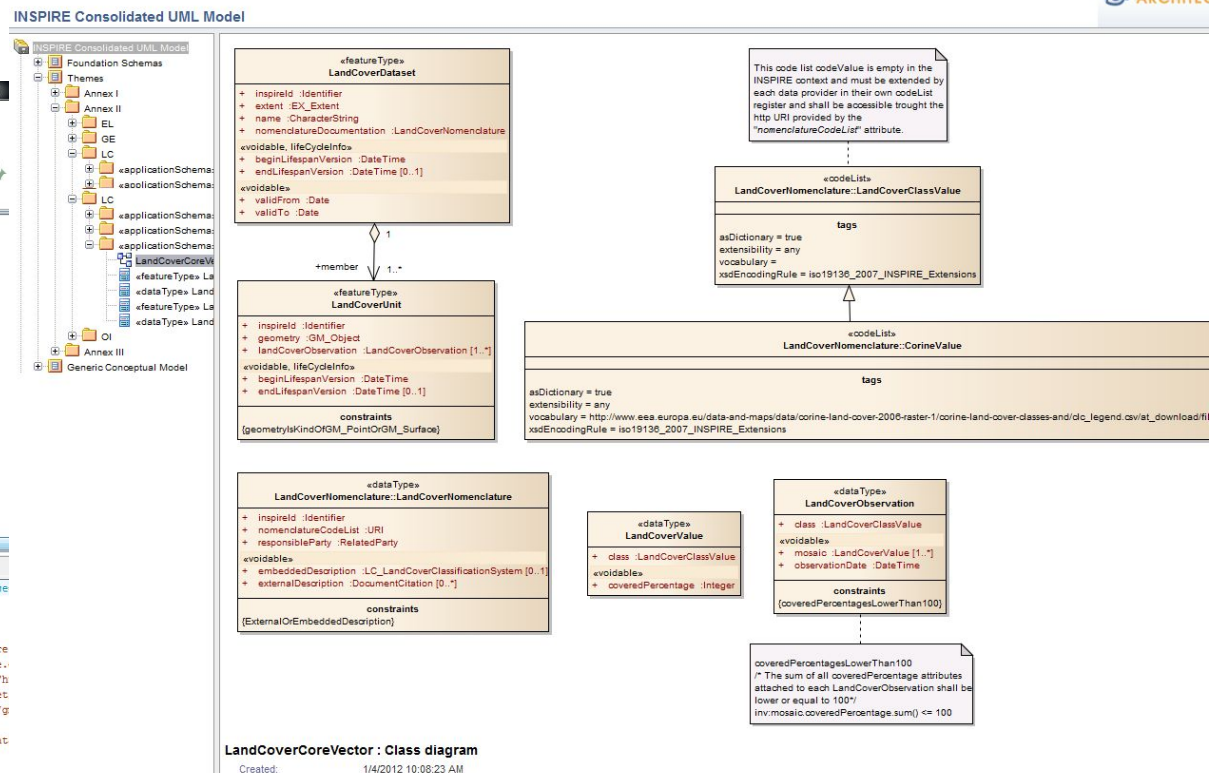
		A.8.4 Metadata occurrence test
		A.8.5 Metadata consistency test
		A.8.6 Encoding schema validation test
		A.8.7 Coverage multipart representation test
		A.8.8 Coverage domain consistency test
		A.8.9 Style test

Validação de dados





INSPIRE
Infrastructure for Spatial Information in Europe

D2.8.II.2 Data Specification on *Land Cover* – Technical Guidelines

d.gTerritório
Direção-Geral do Território
MINISTÉRIO DO AMBIENTE DO ORDENAMENTO DO TERRITÓRIO E ENERGIA

Title	D2.8.II.2 INSPIRE Data Specification on *Land Cover* – Technical Guidelines
Creator	INSPIRE Thematic Working Group *Land Cover*

Validação de dados

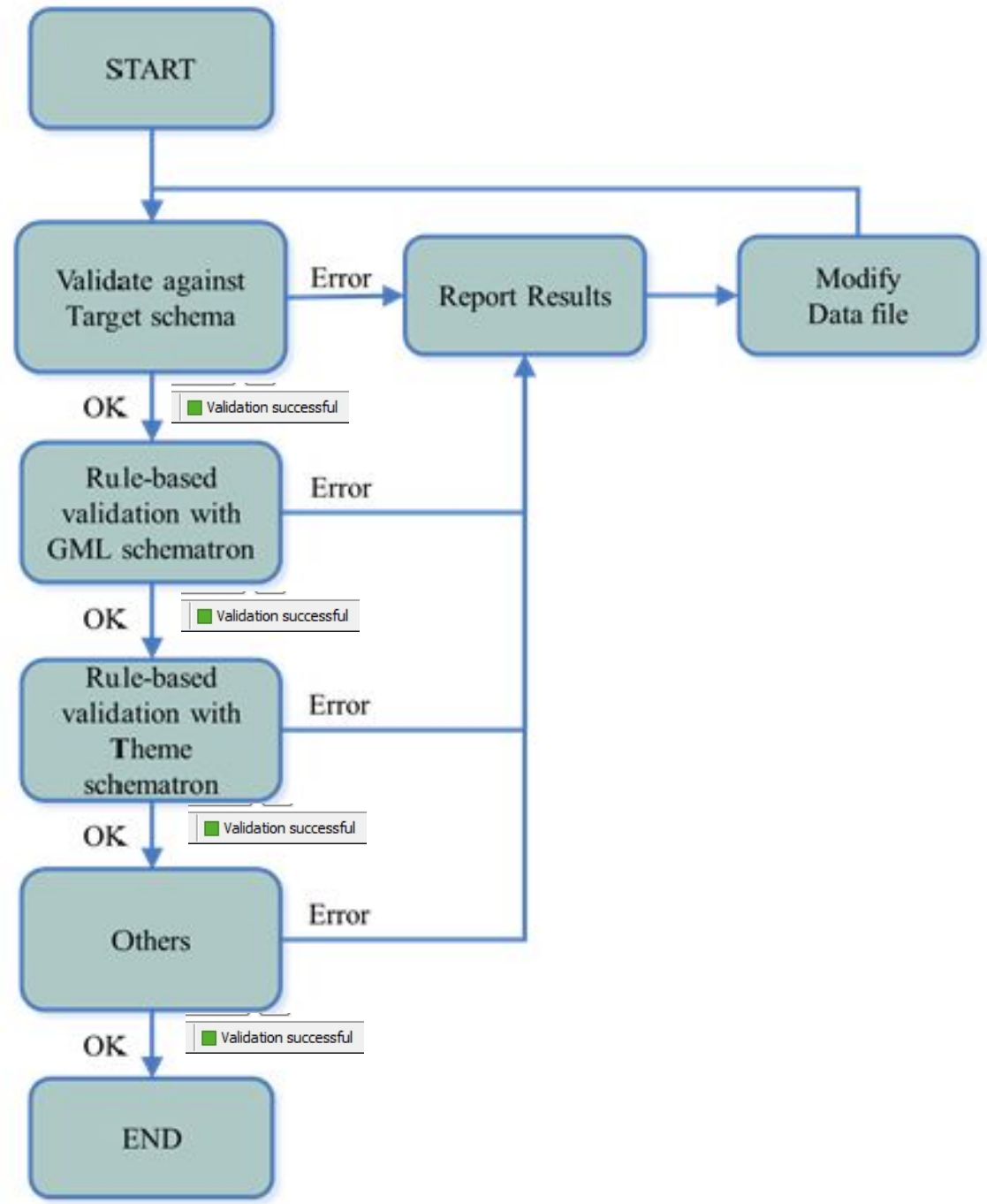
- Matching Table

Remarks	Mapping Explanations	working_stage	Status	FME-Status	Validation-Status	Validation comment	Rectification
				Finished	Finished		
Europeanwide delivery		Proposed to EEA		Finished	Finished		
EX_GeographicExtent will be implemented as EX_GeographicBoundingBox and if feasible also as EX_BoundingPolygon	Based on allinput geometries the"EX_GeographicBoundingBox" or the EX"_BoundingBox" is computed. If both functions are available at software level both extends are encoded.	Proposed to EEA	Difficult	Finished	Finished		
Using p. 39-40 recommendations and Recommendation 8		Agreed not to use		Finished	Finished		
Europeanwide delivery		Proposed to EEA	Difficult	Finished	Finished		
Proposal to use version 17, if EU.EUROPA.ENVIRONMENT.LC.CLC.STATUS2006 namespace / datset is used		Proposed to EEA	Easy	Finished	To do	Element 'lcv:observationDate' value must be valid.	2006-01-01T00:00:00+01:00
To be provided by EEA if needed		Proposed to EEA	Not Available	Finished	Finished		
To be provided by EEA if needed. Reference to DS LC p. 38-40 for event dates		Proposed to EEA	Not Available	Finished	Finished		
To be provided by EEA if needed. Reference to DS LC p. 38-40 for event dates		Proposed to EEA	Not Available	Finished	Finished		
Association is not available at data set level		Proposed to EEA	Easy	Finished	Finished		

Validação de dados

- Validação: visão geral
  - Alguns testes contidos no ATS podem ser automatizados usando ferramentas de validação:
    - target XSD (XML Schema Definition), disponibilizado pela CE.
    - GML schematron - Estrutura do GML (3.2.1).

      http://schemas.opengis.net/gml/3.2.1/SchematronConstraints.xml
    - Schematron temáticos
  - Os testes que não podem ser automatizados, terão de ser realizados manualmente.


START
Validate against Target schema
Error
Report Results
Modify Data file
OK
Validation successful
Rule-based validation with GML schematron
Error
OK
Validation successful
Rule-based validation with Theme schematron
Error
OK
Validation successful
Others
Error
OK
Validation successful
END

Validação de dados

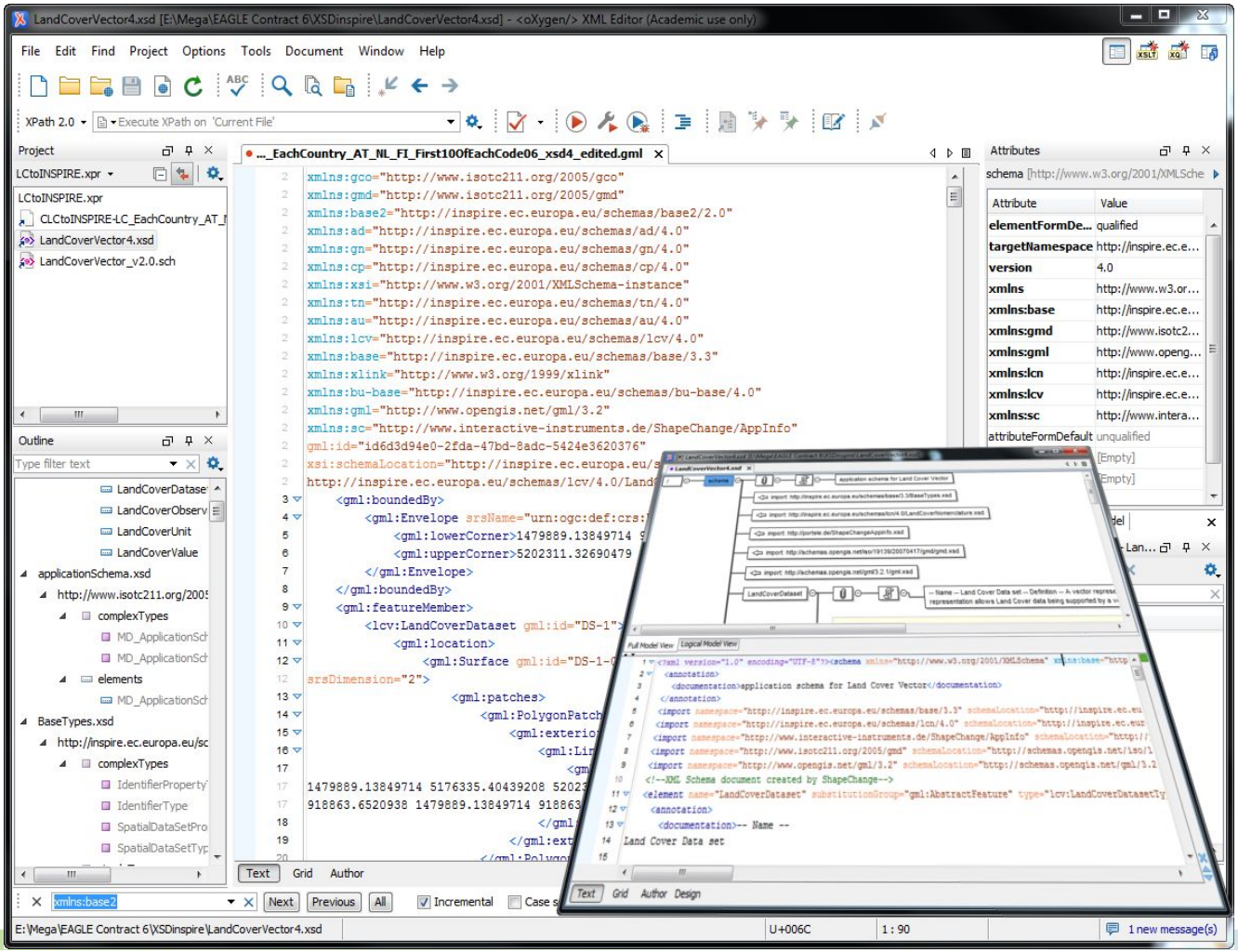
LAND COVER		XSD LandCoverVector	GML schematron	Thematic schematron	others
A.1 Application Schema Conformance Class	A.1.1 Schema element denomination test	X			
	A.1.2 Value type test	X			
	A.1.3 Value test	X		X	
	A.1.4 Attributes/associations completeness test	X			
	A.1.5 Abstract spatial object test	X			
	A.1.6 Constraints test (theme)			X	
	A.1.7 Geometry representation test	X		X	
A.2 Reference Systems Conformance Class	A.2.1 Datum test			X	
	A.2.2 Coordinate reference system test			X	
	A.2.3 Grid test				X
	A.2.4 View service coordinate reference system test				X
	A.2.5 Temporal reference system test			X	
	A.2.6 Units of measurements test			X	
A.3 Data Consistency Conformance Class	A.3.1 Unique identifier persistency test				X
	A.3.2 Version consistency test				X
	A.3.3 Life cycle time sequence test	X		X	
	A.3.4 Validity time sequence test	X		X	
	A.3.5 Update frequency test				X
A.4 Metadata IR Conformance Class	A.4.1 Metadata for interoperability test				X
A.5 Information Accessibility Conformance Class	A.5.1 Code list publication test			X	
	A.5.2 CRS publication test			X	
	A.5.3 CRS identification test			X	
	A.5.4 Grid identification test				X
A.6 Data Delivery Conformance Class	A.6.1 Encoding compliance test		X		
A.7 Portrayal Conformance Class	A.7.1 Layer designation test				X
A.8 Technical Guideline Conformance Class	A.8.1 Multiplicity test	X			
	A.8.2 CRS http URI test			X	
	A.8.3 Metadata encoding schema validation test				X
	A.8.4 Metadata occurrence test				X
	A.8.5 Metadata consistency test				X
	A.8.6 Encoding schema validation test	X	X		
	A.8.7 Coverage multipart representation test		X		
	A.8.8 Coverage domain consistency test		X		
	A.8.9 Style test				X

done

out of project scope

Validação de dados

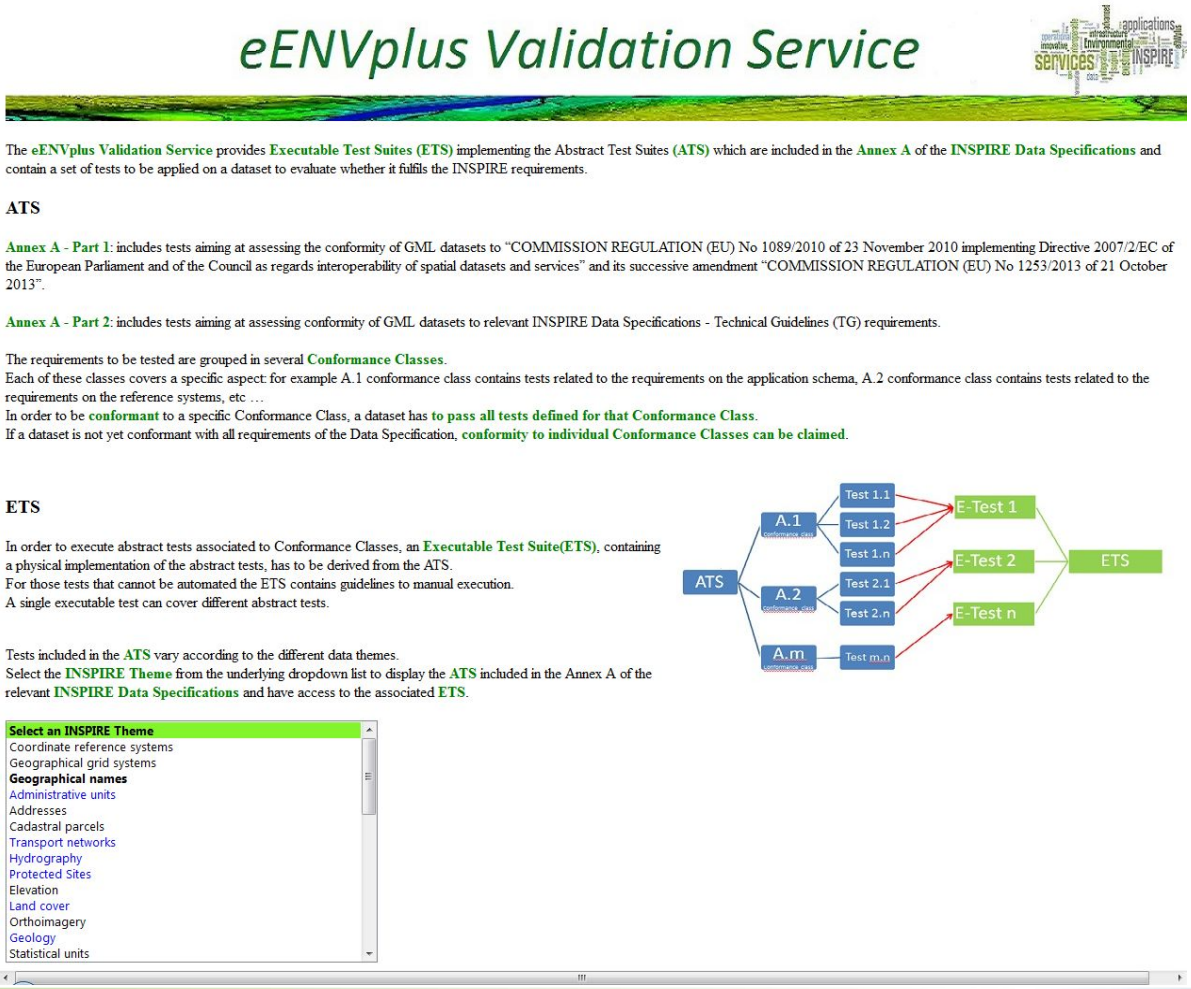
- Ferramenta de validação
  - Oxygen XML Editor 17.0



Validação de dados

- eENVplus validator

http://cloud.epsilon-italia.it/eenvplus_new/ATS.htm



eENVplus Validation Service

The **eENVplus Validation Service** provides **Executable Test Suites (ETS)** implementing the Abstract Test Suites **(ATS)** which are included in the **Annex A** of the **INSPIRE Data Specifications** and contain a set of tests to be applied on a dataset to evaluate whether it fulfils the INSPIRE requirements.

ATS

Annex A - Part 1: includes tests aiming at assessing the conformity of GML datasets to "COMMISSION REGULATION (EU) No 1089/2010 of 23 November 2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial datasets and services" and its successive amendment "COMMISSION REGULATION (EU) No 1253/2013 of 21 October 2013".

Annex A - Part 2: includes tests aiming at assessing conformity of GML datasets to relevant INSPIRE Data Specifications - Technical Guidelines (TG) requirements.

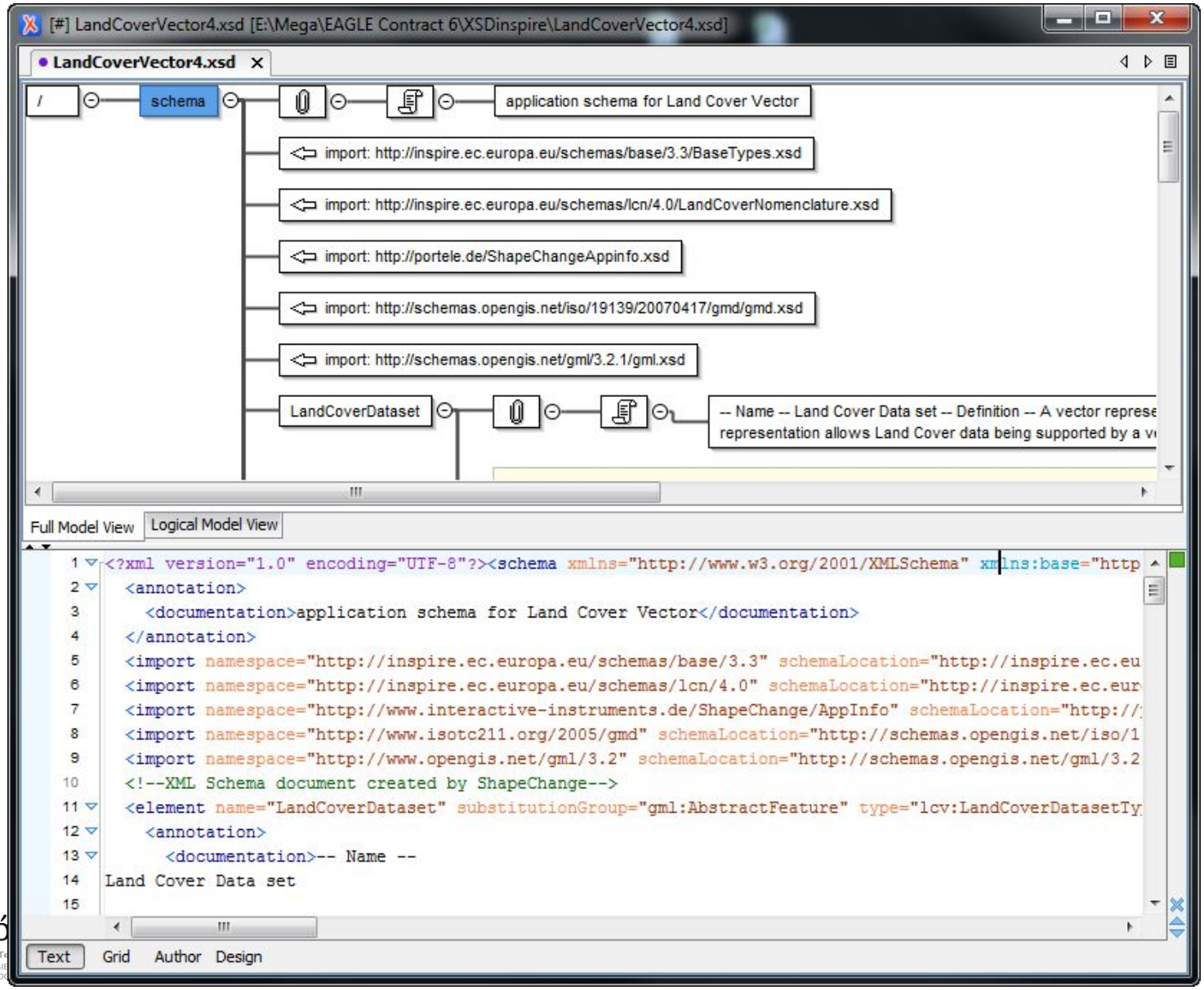
The requirements to be tested are grouped in several **Conformance Classes**.
Each of these classes covers a specific aspect: for example A.1 conformance class contains tests related to the requirements on the application schema, A.2 conformance class contains tests related to the requirements on the reference systems, etc …
In order to be **conformant** to a specific Conformance Class, a dataset has **to pass all tests defined for that Conformance Class**.
If a dataset is not yet conformant with all requirements of the Data Specification, **conformity to individual Conformance Classes can be claimed**.

ETS

In order to execute abstract tests associated to Conformance Classes, an **Executable Test Suite(ETS)**, containing a physical implementation of the abstract tests, has to be derived from the ATS.
For those tests that cannot be automated the ETS contains guidelines to manual execution.
A single executable test can cover different abstract tests.

Tests included in the **ATS** vary according to the different data themes.
Select the **INSPIRE Theme** from the underlying dropdown list to display the **ATS** included in the Annex A of the relevant **INSPIRE Data Specifications** and have access to the associated **ETS**.

Validação de dados



Validação de dados

- Validação do *schema* INSPIRE (xsd)
  - Erros relacionados com a validação do XML Schema

    Errors related to A.1.1. - Schema element denomination test

Element	<gn:sourceOfName>
Description	<gn:sourceOfname xsi:nil="true"/> Severity: error Description: cvc-complex-type.2.4.a: Invalid content was found starting with element '{"urn:x-inspire:specification:gmlas:GeographicalNames:4.0":sourceOfname}'. One of '{"urn:x-inspire:specification:gmlas:GeographicalNames:4.0":sourceOfName}' is expected.
Rectification	Fix. <gn:sourceOfName xsi:nil="true"/>
Comments	The element is misspelled, the tiny **n** should be in uppercase. The correct designation of mnemonic names for the attributes has been analysed with this test.

Validação de dados

- Validação do *schema* INSPIRE (xsd)
  - Erros relacionados com a validação do XML Schema

    Errors related to A.1.1. - Schema element denomination test

Element	<base2:positionName> <base2:positionName nilReason="unpopulated" xsi:nil="true"/>
Description	Severity: error Description: cvc-complex-type.3.2.2: Attribute 'nilReason' is not allowed to appear in element 'base2:positionName'.
Rectification	Fix: <base2:positionName xsi:nil="true"/>
Comments	The element **positionName**, as defined in: xmlns:base2=http://inspire.ec.europa.eu/schemas/base2/2.0 It does not support nilReason attribute Remove the nilReason="unpopulated".

Validação de dados

- Schematrons

ATS test		Developed by:
A.1 Application Schema Conformance Class	A.1.3 Value test	UBA-V/(eENVplus+DGT)
	A.1.6 Constraints test (theme)	UBA-V/(eENVplus+DGT)
	A.1.7 Geometry Representation test	UBA-V/(eENVplus+DGT)
A.2. Reference Systems Conformance Class	A.2.1 Datum test	(eENVplus+DGT)
	A.2.2 Coordinate reference system test	(eENVplus+DGT)
	A.2.5 Temporal reference system test	(eENVplus+DGT)
A.3 Data Consistency Conformance Class	A.3.3 Life cycle time sequence test	(eENVplus+DGT)
	A.3.4 Validity time sequence test	(eENVplus+DGT)
A.5 Information Accessibility Conformance Class	A.5.1 Code list publication test	(eENVplus+DGT)/UBA-V
	A.5.2 CRS publication test	(eENVplus+DGT)
	A.5.3 CRS identification test	(eENVplus+DGT)
A.8 Technical Guideline Conformance Class	A.8.2 CRS http URI test	(eENVplus+DGT)/UBA-V

Validação de dados

- Schematrons

```
<!--
Following patterns test compliance to
A.2.1 Datum test (Verify whether each instance of a spatial object type is given with reference to one of the (geodetic) datums specified in the target specification)
A.2.2 Coordinate reference system test (Verify whether the two- and three-dimensional coordinate reference systems are used as defined in section 6.)
A.5.2 CRS publication test (Verify whether the identifiers and the parameters of coordinate reference system are published in common registers)
As implemented by Stephania
-->
<sch:pattern>
    <sch:rule context="lcv:geometry/*">
        <sch:assert test="@srsDimension">ERROR: [lcv:geometry @ srsDimension] without coordinate reference dimension.</sch:assert>
        <sch:assert test="@srsName">ERROR: [lcv:geometry @ srsName] without coordinate reference system.</sch:assert>
        <sch:assert test="@srsDimension &gt; 0 and @srsDimension &lt; 4">ERROR: [lcv:geometry @ srsDimension] invalid value.
        </sch:assert>
        <sch:assert test="@srsName = ('http://www.opengis.net/def/crs/EPSG/0/4936','http://www.opengis.net/def/crs/EPSG/0/4937','
        http://www.opengis.net/def/crs/EPSG/0/4258','http://www.opengis.net/def/crs/EPSG/0/3035','
        http://www.opengis.net/def/crs/EPSG/0/3034','http://www.opengis.net/def/crs/EPSG/0/3038','
        http://www.opengis.net/def/crs/EPSG/0/3039','http://www.opengis.net/def/crs/EPSG/0/3040','
        http://www.opengis.net/def/crs/EPSG/0/3041','http://www.opengis.net/def/crs/EPSG/0/3042','
        http://www.opengis.net/def/crs/EPSG/0/3043','http://www.opengis.net/def/crs/EPSG/0/3044','
        http://www.opengis.net/def/crs/EPSG/0/3045','http://www.opengis.net/def/crs/EPSG/0/3046','
        http://www.opengis.net/def/crs/EPSG/0/3047','http://www.opengis.net/def/crs/EPSG/0/3048','
        http://www.opengis.net/def/crs/EPSG/0/3049','http://www.opengis.net/def/crs/EPSG/0/3050','
        http://www.opengis.net/def/crs/EPSG/0/3051','http://www.opengis.net/def/crs/EPSG/0/5730','
        http://www.opengis.net/def/crs/EPSG/0/7409') or
        @srsName =
        ('urn:ogc:def:crs:EPSG::4936','urn:ogc:def:crs:EPSG::4937','urn:ogc:def:crs:EPSG::4258','urn:ogc:def:crs:EPSG::3035','urn:ogc:def:crs:EPSG::3034','urn:ogc:def:crs:EPSG::3038','urn:ogc:def:crs:EPSG::3039','urn:ogc:def:crs:EPSG::3040','urn:ogc:def:crs:EPSG::3041','urn:ogc:def:crs:EPSG::3042','urn:ogc:def:crs:EPSG::3043','urn:ogc:def:crs:EPSG::3044','urn:ogc:def:crs:EPSG::3045','urn:ogc:def:crs:EPSG::3046','urn:ogc:def:crs:EPSG::3047','urn:ogc:def:crs:EPSG::3048','urn:ogc:def:crs:EPSG::3049','urn:ogc:def:crs:EPSG::3050','urn:ogc:def:crs:EPSG::3051','urn:ogc:def:crs:EPSG::5730','urn:ogc:def:crs:EPSG::7409')">
            ERROR: [lcv:geometry @ srsName] invalid coordinate reference system.
        </sch:assert>
    </sch:rule>
</sch:pattern>
```

Validação de dados

- Validação temática (schematron)

  Errors related to A.2.1 - Datum test

Element	<gml:Surface gml>
Description	<gml:Surface gml:id="EU-1804437-1"> ERROR DESCRIPTION: Coordinate reference system missing.
Rectification	Fix: <gml:Surface gml:id="EU-1804437-1" srsName="urn:ogc:def:crs:EPSG::3035">
	ATS test: Purpose: Verify whether each instance of a spatial object type is given with reference to one of the (geodetic) datums specified in the target specification.
Comments	Only the Coordinate Reference Systems listed in Table 8 of LC Data Specification are allowed. CRS identifiers can be expressed with reference to OGC urn: or OGC http:// ("urn:ogc:def:crs:EPSG::4258" and "http://www.opengis.net/def/crs/EPSG/0/4258" are examples of valid CRSs).

Validação de dados

- Validação temática (schematron)

  Errors related to A.2.5 - Temporal reference system Test

Element	<lcv:beginLifespanVersion>
Description	<lcv:beginLifespanVersion>2013-12-01T:00:00:00+01:00</lcv:beginLifespanVersion> Severity: error Description: cvc-datatype-valid.1.2.1: '2013-12-01T:00:00:00+01:00' is not a valid value for 'dateTime'.
Rectification	Fix: <lcv:beginLifespanVersion>2013-12-01T00:00:00+01:00</lcv:beginLifespanVersion>
Comments	"Commision Regulation 1205/2008" refers ISO 8601 dataTime format: *Complete date plus hours, minutes and seconds:* *YYYY-MM-DDThh:mm:ssTZD (eg 1997-07-16T19:20:30+01:00)*

Validação de dados

- Validação temática (schematron)

  Errors related to A.5.2 - CRS publication test and A.8.2 CRS http URI test

Element	<gml:Envelope>
Description	<gml:Envelope srsName="EPSG:3035" srsDimension="2"> ERROR DESCRIPTION: The Coordinate reference system value **srsName="EPSG:3035"** defined for the dataset is not allowed! Allowed identifiers are those referring to EPSG codes listed in Table 8 of Land Cover Data Specification.
Rectification	Fix: <gml:Envelope srsName="urn:ogc:def:crs:EPSG::3035" srsDimension="2">
Comments	Test Method: Compare the URI of the dataset with the URIs in the table. NOTE 1 'Passing this test implies the fulfilment of test 'CRS publication test' (should be numbered as A.5.2 while it's numbered A.6.2)'. Only the Coordinate Reference Systems listed in Table 8 of LC Data Specification are allowed. CRS identifiers can be expressed with reference to OGC urn: or OGC http:// ("urn:ogc:def:crs:EPSG::4258" and "http://www.opengis.net/def/crs/EPSG/0/4258" are examples of valid CRSs).

Notas Finais

- O projecto testou a harmonização e validação de dados INSPIRE para o tema Land Cover.
- As Especificações de Dados contém as ATS que definem quais os testes que os CDG tem de cumprir para estar em conformidade.
- O GML "transformado" foi validado usando o schema INSPIRE, e os schematrons GML e temático.
- De realçar a importância da colaboração estabelecida com a equipa do projecto eENVplus no desenvolvimento dos schematrons.
- Foram levantadas algumas questões relacionadas com as Especificações e Modelos de Dados e algumas deficiências no software FME relacionadas com as obrigações INSPIRE.

Notas Finais

- Os resultados (relatório, regras de mapeamento e exemplos de codificação GML etc.) beneficiarão toda a comunidade INSPIRE Land Cover já que exemplos concretos e abrangentes como este não estão ainda disponíveis.

- Este projecto-piloto irá, desta forma apoiar a implementação global da directiva INSPIRE, nomeadamente no âmbito do tema INSPIRE Land Cover.