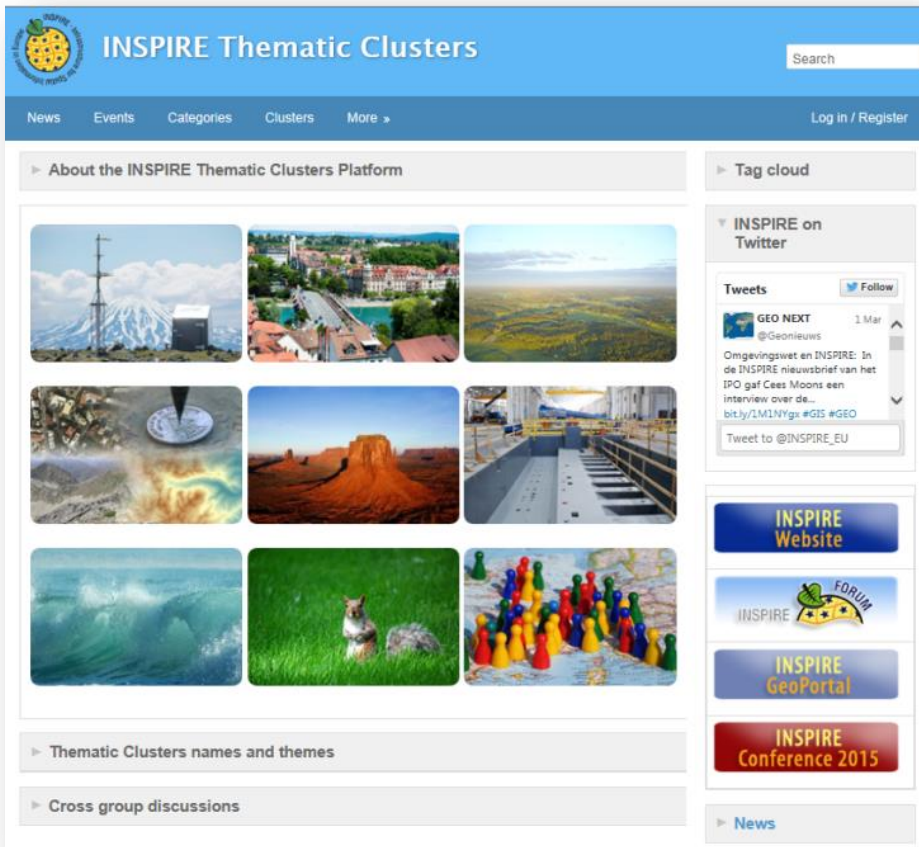


INSPIRE Land Cover and Land Use Data Specifications



The screenshot shows the 'INSPIRE Thematic Clusters' website. The header includes the INSPIRE logo, a search bar, and navigation links for News, Events, Categories, Clusters, and More. Below the header, there are several sections: 'About the INSPIRE Thematic Clusters Platform' with a grid of nine images; 'Tag cloud'; 'INSPIRE on Twitter' featuring a tweet from GEO NEXT; and a vertical sidebar with buttons for 'INSPIRE Website', 'INSPIRE Forum', 'INSPIRE GeoPortal', and 'INSPIRE Conference 2015'. At the bottom, there are sections for 'Thematic Clusters names and themes', 'Cross group discussions', and 'News'.

[Lena Hallin-Pihlatie](#)
Facilitator of the Land
Cover and Land Use
INSPIRE Thematic Cluster

www.jrc.ec.europa.eu

*Serving society
Stimulating innovation
Supporting legislation*

INSPIRE

- Based on technical standards (ISO, OGC)
 - Re-use of standards
 - metadata, data modelling models, data encoding and for services (WMS, WFS, WCS, etc.)
 - INSPIRE specific requirements and extensions
- Defines its own semantic standards for
 - Data models in 34 themes
 - Applications schemas (xsd)
 - Code lists (classification values to use)
 - Layer naming (WMS) requirements
- Obligation on MS data providers to meet all requirements
 - Annex I datasets 11/2017
 - Annex II (Land Cover) and III (Land Use) datasets 10/2020

INSPIRE Land Cover and Land Use

Land Cover



Definition: Physical and biological cover of the earth's surface including artificial surfaces, agricultural areas, forests, (semi-) natural areas, wetlands, water bodies. [Directive 2007/2/EC, Annex II]

Description: Land cover is an abstraction of the physical and **biophysical cover** on the earth's surface. [Technical Guidelines on LC]

Land Use





Definition: Territory characterised according to its current and future planned functional dimension or socio-economic purpose (e.g. residential, industrial, commercial, agricultural, forestry, recreational). [Directive 2007/2/EC, Annex III]

Description: Land Use is defined as the **use** and **functions** of a territory. Land Use is itself split up into two different types: **Existing Land Use** and **Planned Land Use** [Technical Guidelines on LU]

INSPIRE Data Specifications

- Guidance documents to support implementation
- All legal obligations included in the Implementing Rule on Interoperability of Spatial Data Sets and Services (IR)







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 <i>Land Cover</i> – Technical Guidelines
Creator	INSPIRE Thematic Working Group <i>Land Cover</i>
Date	2013-12-10
Subject	INSPIRE Data Specification for the spatial data theme <i>Land Cover</i>
Publisher	European Commission Joint Research Centre
Type	Text
Description	This document describes the INSPIRE Data Specification for the spatial data theme <i>Land Cover</i>
Contributor	Members of the INSPIRE Thematic Working Group <i>Land Cover</i>
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



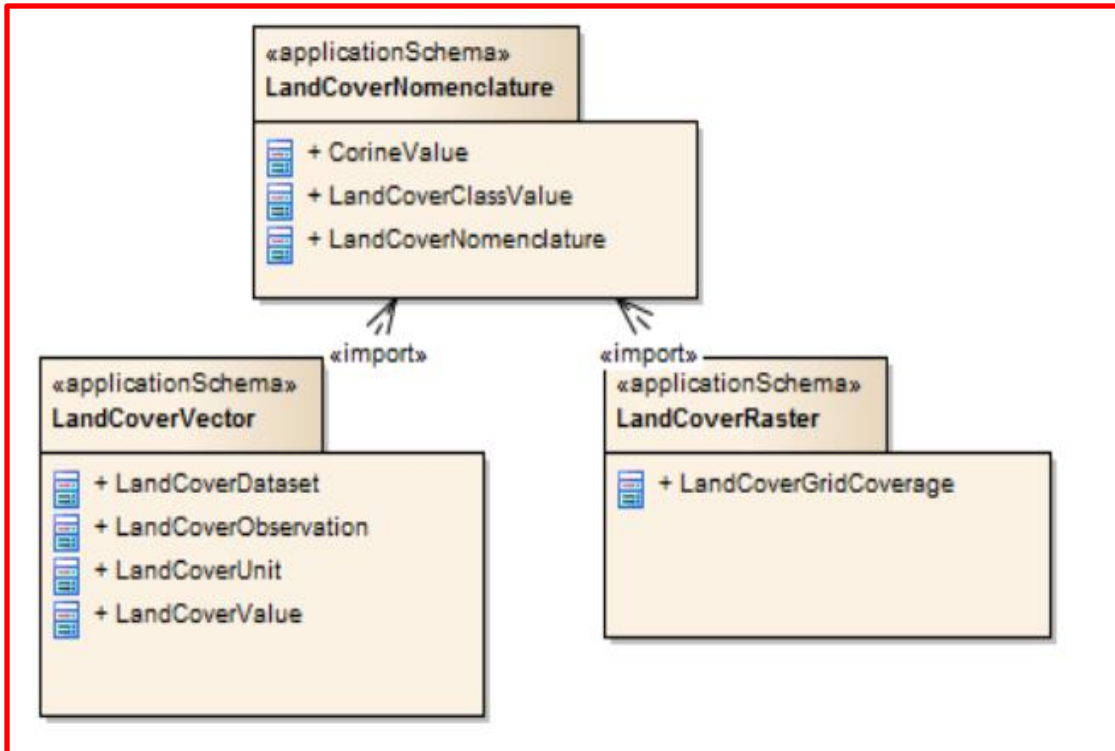


INSPIRE
Infrastructure for Spatial Information in Europe

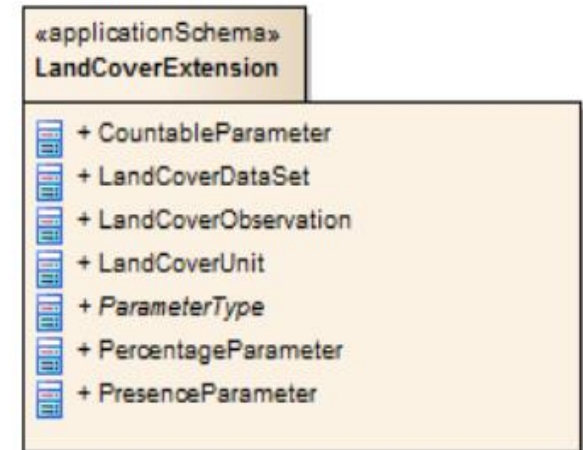
D2.8.III.4 Data Specification on *Land Use* – Technical Guidelines

Title	D2.8.III.4 INSPIRE Data Specification on <i>Land Use</i> – Technical Guidelines
Creator	INSPIRE Thematic Working Group <i>Land Use</i>
Date	2013-12-10
Subject	INSPIRE Data Specification for the spatial data theme <i>Land Use</i>
Publisher	European Commission Joint Research Centre
Type	Text
Description	This document describes the INSPIRE Data Specification for the spatial data theme <i>Land Use</i>
Contributor	Members of the INSPIRE Thematic Working Group <i>Land Use</i>
Format	Portable Document Format (pdf)
Source	
Rights	Public
Identifier	D2.8.III.4_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

INSPIRE Land Cover - overview



Informative only
Schema not endorsed



- Source: INSPIRE Consolidated UML Model

Land Cover Nomenclature

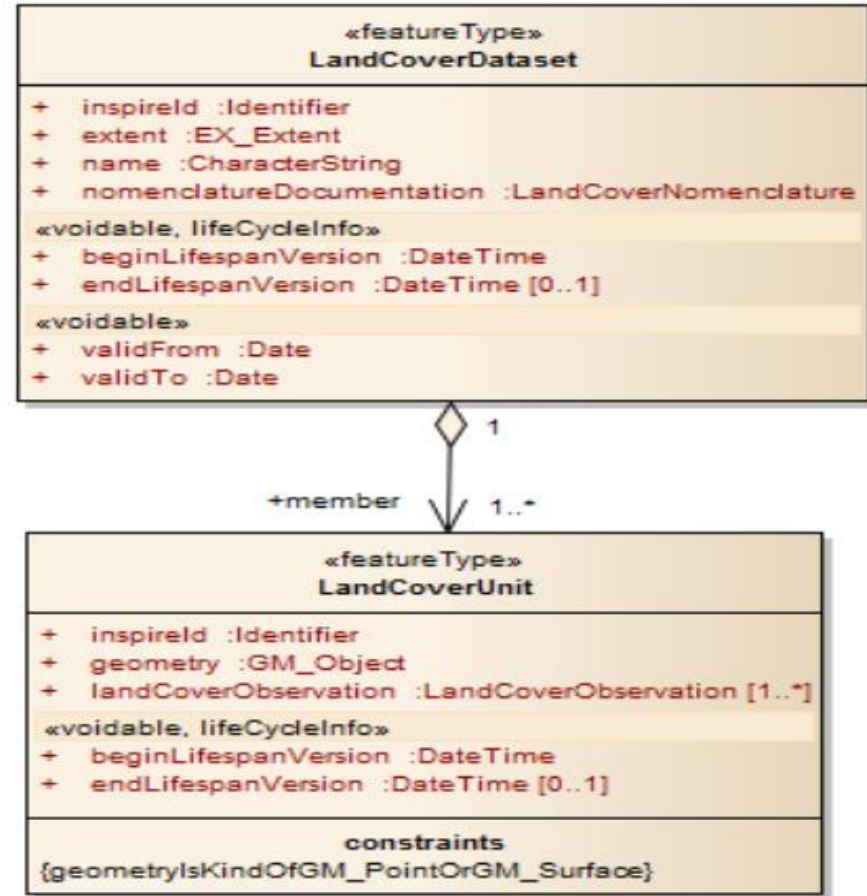
- Requirement to provide:
 - an Identifier, that is the localId + namespace + possible versionId of the Land Cover Classification
 - the URI to the Land Cover Classification in use
 - information on the party responsible for the classification using the Related Party data type
 - the description of the classification by using the embeddedDescription attribute **OR** the externalDescription attribute
 - embeddedDescription uses ISO 19144 LCML
 - ExternalDescription uses the DocumentCitation data type

«dataType» LandCoverNomenclature::LandCoverNomenclature
+ inspireId :Identifier + nomenclatureCodeList :URI + responsibleParty :RelatedParty
«avoidable» + embeddedDescription :LC_LandCoverClassificationSystem [0..1] + externalDescription :DocumentCitation [0..*]
constraints {ExternalOrEmbeddedDescription}

Land Cover Vector: Dataset & Unit

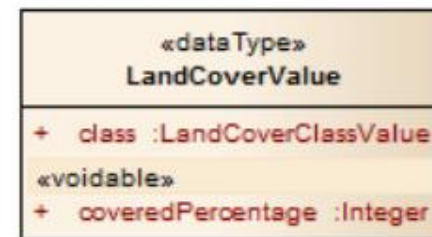
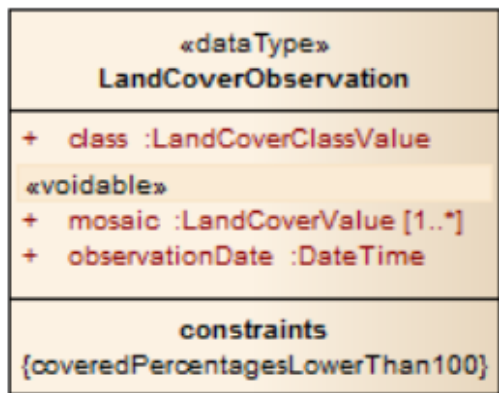
- LandCoverDataset
 - **localId + namespace + possible versionId of the dataset**
 - the extent using EX_Extent
 - use LandCoverNomenclature application schema
 - if available also:
 - **lifeCycleInfo**
 - **ValidFrom, validTo**

- LandCoverUnit
 - **localId + namespace + possible versionId of a single spatial object**
 - **geometry** provided as GM_Point or GM_Surface
 - landCoverObservation (see next slide)
 - if available:
 - **lifeCycleInfo**



Land Cover Vector: Observation

- LandCoverObservation
 - provide the class attribute using <http://inspire.ec.europa.eu/codelist/LandCoverClassValue>
 - if available
 - Provide the observation date (DateTime)
 - If applicable
 - All the land cover classes in percentages (integer values) within the unit. Each percentage has to be lower than 100.



Land Cover Class code list



Land Cover Class

Check the news related to the HTTP/HTTPS URIs for the INSPIRE registry at <http://inspire.ec.europa.eu/news/httphttps-inspire-registry>

ID:
<http://inspire.ec.europa.eu/codelist/LandCoverClassValue>

This version:
<http://inspire.ec.europa.eu/codelist/LandCoverClassValue:1>

Latest version:
<http://inspire.ec.europa.eu/codelist/LandCoverClassValue>

Label:
Land Cover Class

Definition:
Land cover code list or classification.

Description:
An empty code list that act as a container for Corine, other european, national or local code list for LC nomenclature.

This code list codeValue is empty in the INSPIRE context and must be extended by each data provider in their own codeList register and shall be accessible trough the http URI provided by the "nomenclatureCodeList" attribute.



Extensions of Land Cover Class code list

- Corine Land Cover
- URI:
<http://dd.eionet.europa.eu/vocabulary/landcover/clc/>

- Urban Atlas 2012
- URI:
<http://dd.eionet.europa.eu/vocabulary/landcover/uatl2012/>

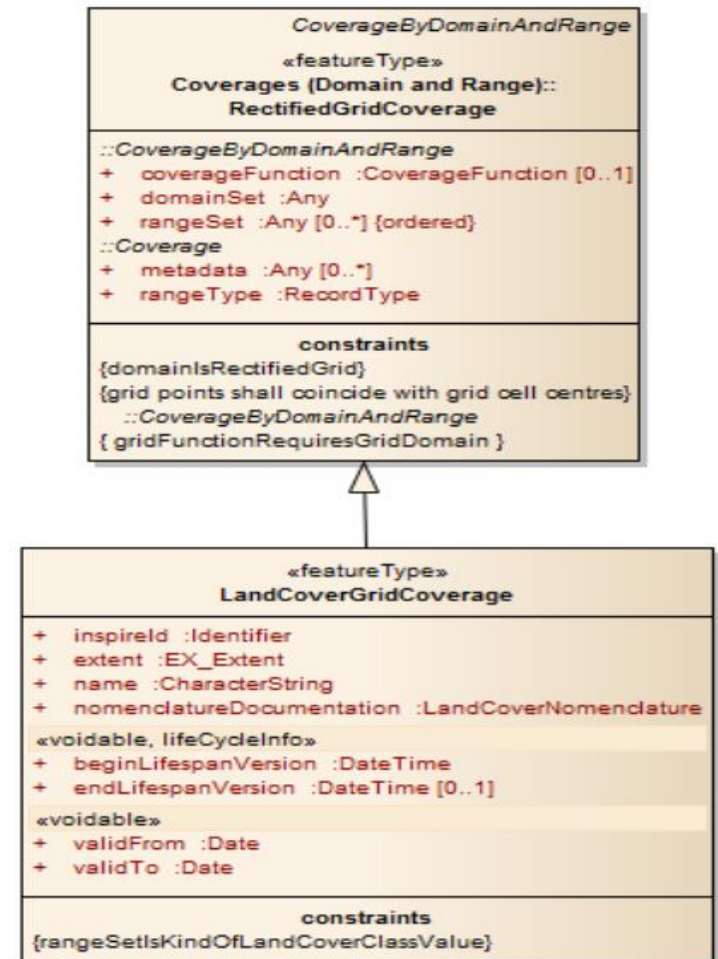
First Prev 1 2 3 Next Last				
Id	Label	Status	Status Modified	Notation
111	Continuous urban fabric	Valid	23.04.2015	111
112	Discontinuous urban fabric	Valid	23.04.2015	112
121	Industrial or commercial units	Valid	23.04.2015	121
122	Road and rail networks and associated ...	Valid	23.04.2015	122
123	Port areas	Valid	23.04.2015	123
124	Airports	Valid	23.04.2015	124
131	Mineral extraction sites	Valid	23.04.2015	131
132	Dump sites	Valid	23.04.2015	132
133	Construction sites	Valid	23.04.2015	133
141	Green urban areas	Valid	23.04.2015	141
142	Sport and leisure facilities	Valid	23.04.2015	142
211	Non-irrigated arable land	Valid	23.04.2015	211
212	Permanently irrigated land	Valid	23.04.2015	212
213	Rice fields	Valid	23.04.2015	213
221	Vineyards	Valid	23.04.2015	221
222	Fruit trees and berry plantations	Valid	23.04.2015	222

First Prev 1 2 Next Last				
Id	Label	Status	Status Modified	Notation
11100	Continuous Urban Fabric (S.L. > 80%)	Valid	12.05.2015	11100
11210	Discontinuous Dense Urban Fabric (S.L. : ...	Valid	12.05.2015	11210
11220	Discontinuous Medium Density Urban ...	Valid	12.05.2015	11220
11230	Discontinuous Low Density Urban Fabric ...	Valid	12.05.2015	11230
11240	Discontinuous Very Low Density Urban ...	Valid	12.05.2015	11240
11300	Isolated Structures	Valid	12.05.2015	11300
12100	Industrial, commercial, public, military ...	Valid	12.05.2015	12100
12210	Fast transit roads and associated land	Valid	12.05.2015	12210
12220	Other roads and associated land	Valid	12.05.2015	12220
12230	Railways and associated land	Valid	12.05.2015	12230
12300	Port areas	Valid	12.05.2015	12300
12400	Airports	Valid	12.05.2015	12400
13100	Mineral extraction and dump sites	Valid	12.05.2015	13100
13300	Construction sites	Valid	12.05.2015	13300

Land Cover Raster

- LandCoverGridCoverage
 - **INSPIRE extension of RectifiedGridCoverage**
 - **localId + namespace + possible versionId of the dataset**
 - **extent using EX_Extent**
 - use LandCoverNomenclature application schema
 - If available also:
 - lifeCycleInfo
 - ValidFrom, validTo

- Constraint: rangeSet = LandCoverClassValue



INSPIRE Land Use - overview

- Application schemas:
 - Existing Land Use
 - Existing Land Use (ELU) -polygons
 - Gridded Land Use (GLU) - raster
 - Sampled Land Use (SLU) - points
 - Planned Land Use
 - Planned Land Use (PLU)
 - Nomenclature
 - Land Use Nomenclature

		Temporal reference	
		Existing Land Use	Planned Land Use
Geometry	Vector data	Polygons	ELU
		Polygons, lines, points	PLU
		Points	SLU
	Raster data	GLU	PLU

Table 3 – Classification of the *Land Use* application schemas according to their temporal reference and geometry definition

Use of HILUCS code list values mandatory

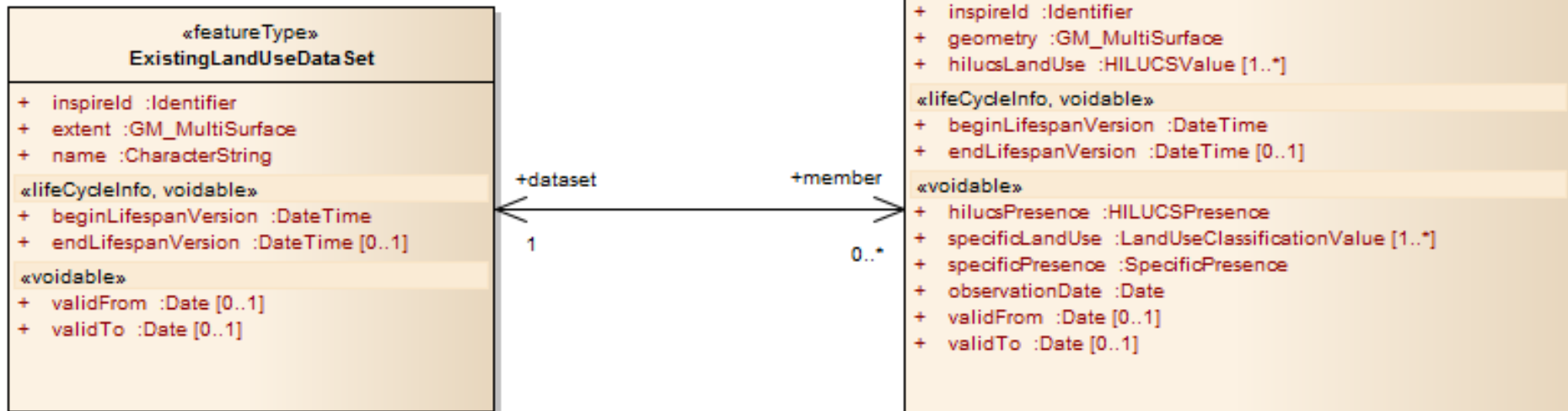
- Theme-specific Requirement
 - Any Land Use data sets shall assign to each polygon, pixel or location a land use type from the **Hierarchical INSPIRE Land Use Classification System (HILUCS)** at the most appropriate and detailed level of the hierarchy. (Source: INSPIRE legislation)
 - <http://inspire.ec.europa.eu/codelist/HILUCSValue/>
 - HILUCS 1 hierarchy level:

primary production		eu-legal	Valid
residential use		eu-legal	Valid
secondary production		eu-legal	Valid
tertiary production		eu-legal	Valid
other uses		eu-legal	Valid

Existing Land Use

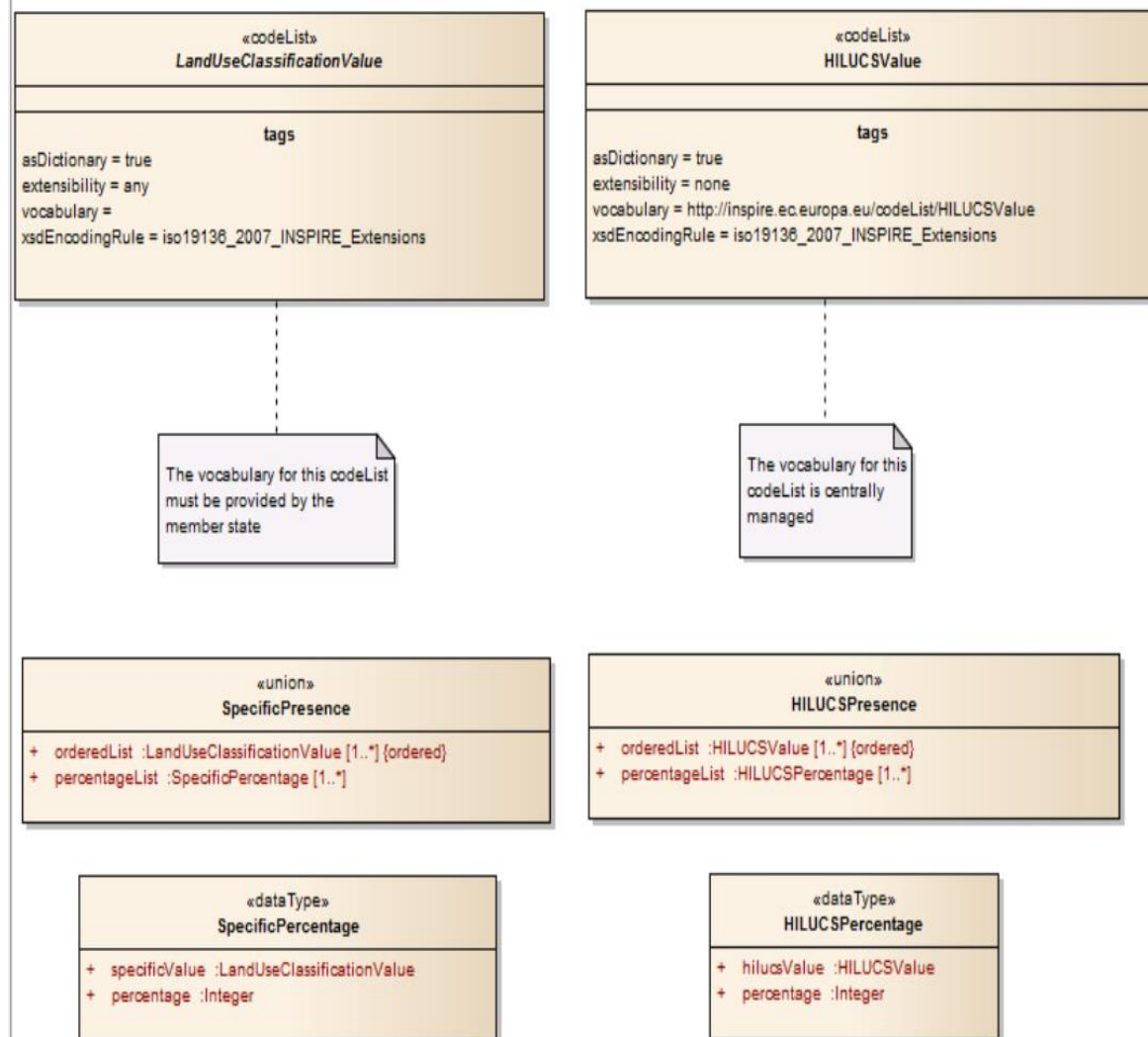
- ExistingLandUseDataSet
 - localId + namespace + possible versionId of the dataset
 - the extent using GM_MultiSurface
 - name of the dataset
 - if available also:
 - lifeCycleInfo
 - ValidFrom, validTo

- ExistingLandUseObject
 - localId + namespace + possible versionId of the spatial objects
 - geometry provided as GM_MultiSurface
 - provide HILUCSValue 1..* for each spatial object
 - if available also:
 - lifeCycleInfo
 - use HILUCSPresence data type
 - Provide 1..* values of another LU classification (LandUseClassificationValue)
 - use SpecificPresence data type
 - provide observation date
 - ValidFrom, validTo



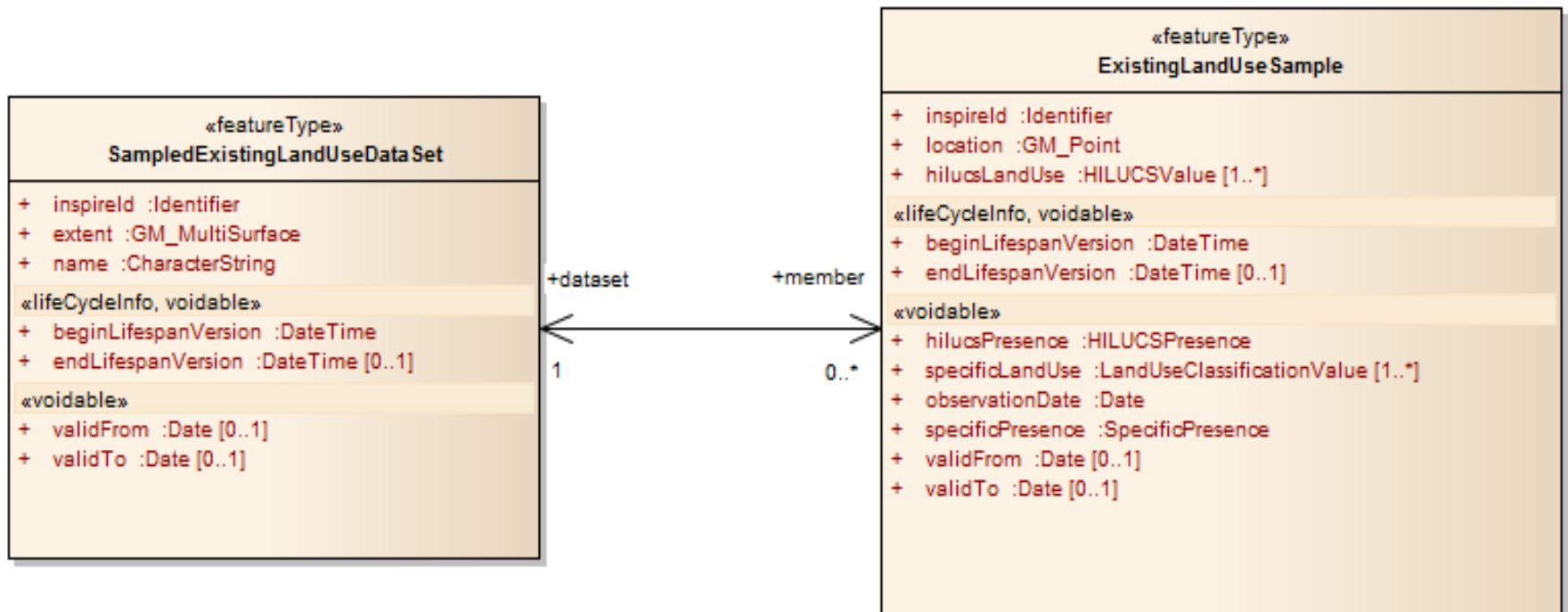
Land Use Nomenclature

- Makes is possible to provide information on the presence of HILUCS classes and LU classes of another LU classification (LandUseClassificationValue, SpecificPresence, SpecificPercentage)



Sampled Land Use

- Application schema for point datasets
 - Geometry of ExistingLandUseSample = GM_Point
- Otherwise, the same attributes as Existing Land Use application schema

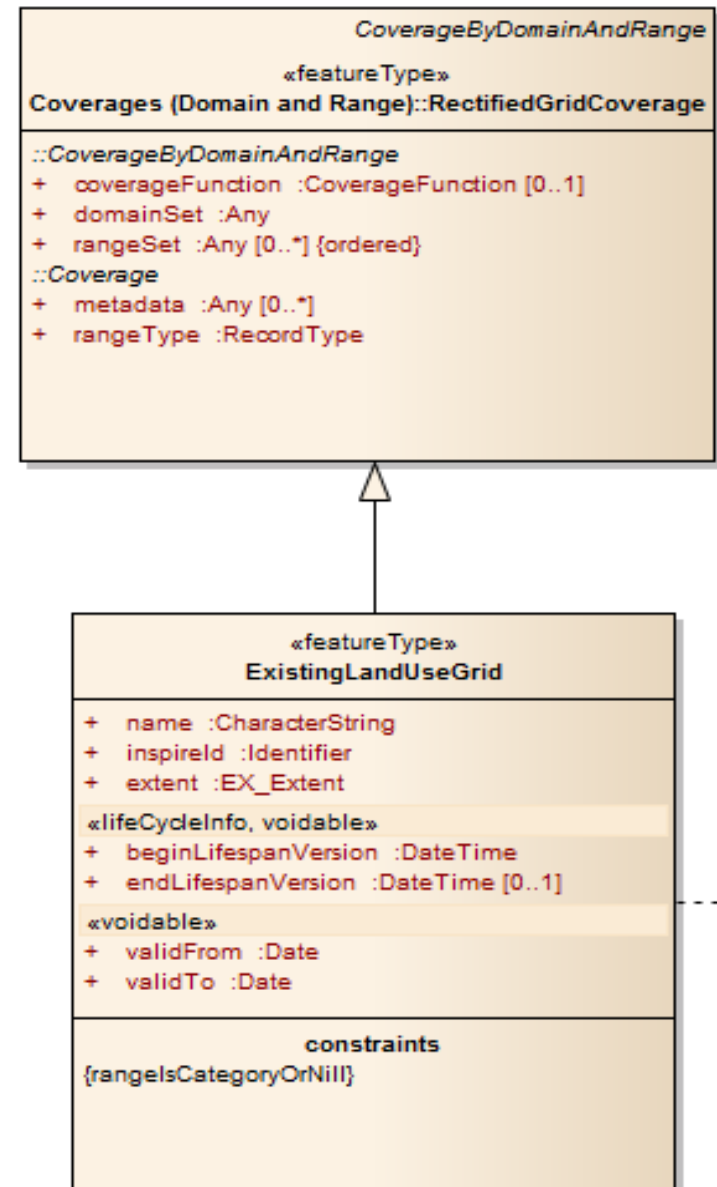


Gridded Land Use

- ExistingLandUseGrid
 - **INSPIRE extension of RectifiedGridCoverage**
 - name
 - **localId+namespace+possible versionId**
 - **Extent using EX_Extent**
 - If available also:
 - **lifeCycleInfo**
 - **ValidFrom, validTo**

- Constraints: typo?

NOTE: Range is based on either HILUCS or on a specific land use classification system defined by the data provider



Summary

- A lot of commonalities, but also some differences, for example:
- Land Cover
 - Any land cover classification can be used
 - The endorsed application schemas support only the use of one classification at a time
- Land Use
 - HILUCS classification has to be used
 - IR requirement: Any *Land Use* data sets shall assign to each polygon, pixel or location a land use type from the Hierarchical INSPIRE *Land Use* Classification System (HILUCS) at the most appropriate and detailed level of the hierarchy
 - In addition another classification can be used

Questions?

<https://themes.jrc.ec.europa.eu/>

