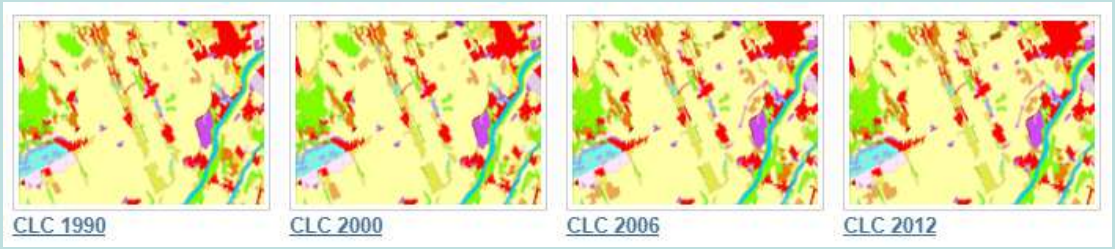
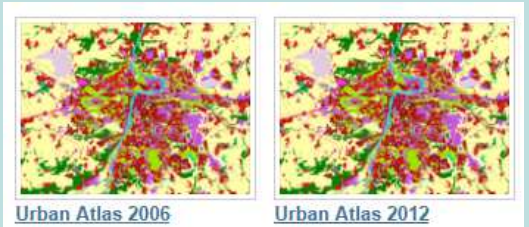
PERSPEKTIVEN FÜR UMWELT & GESELLSCHAFT umweltbundesamt





Traum und Albtraum der perfekten Datenharmonisierung im Annex II Thema Bodenbedeckung

EEA-Auftrag: Harmonisierung CORINE Land Cover und Urban Atlas

Gebhard Banko, Roland Grillmayer, Thomas Rossmann

17. November 2015, Wien

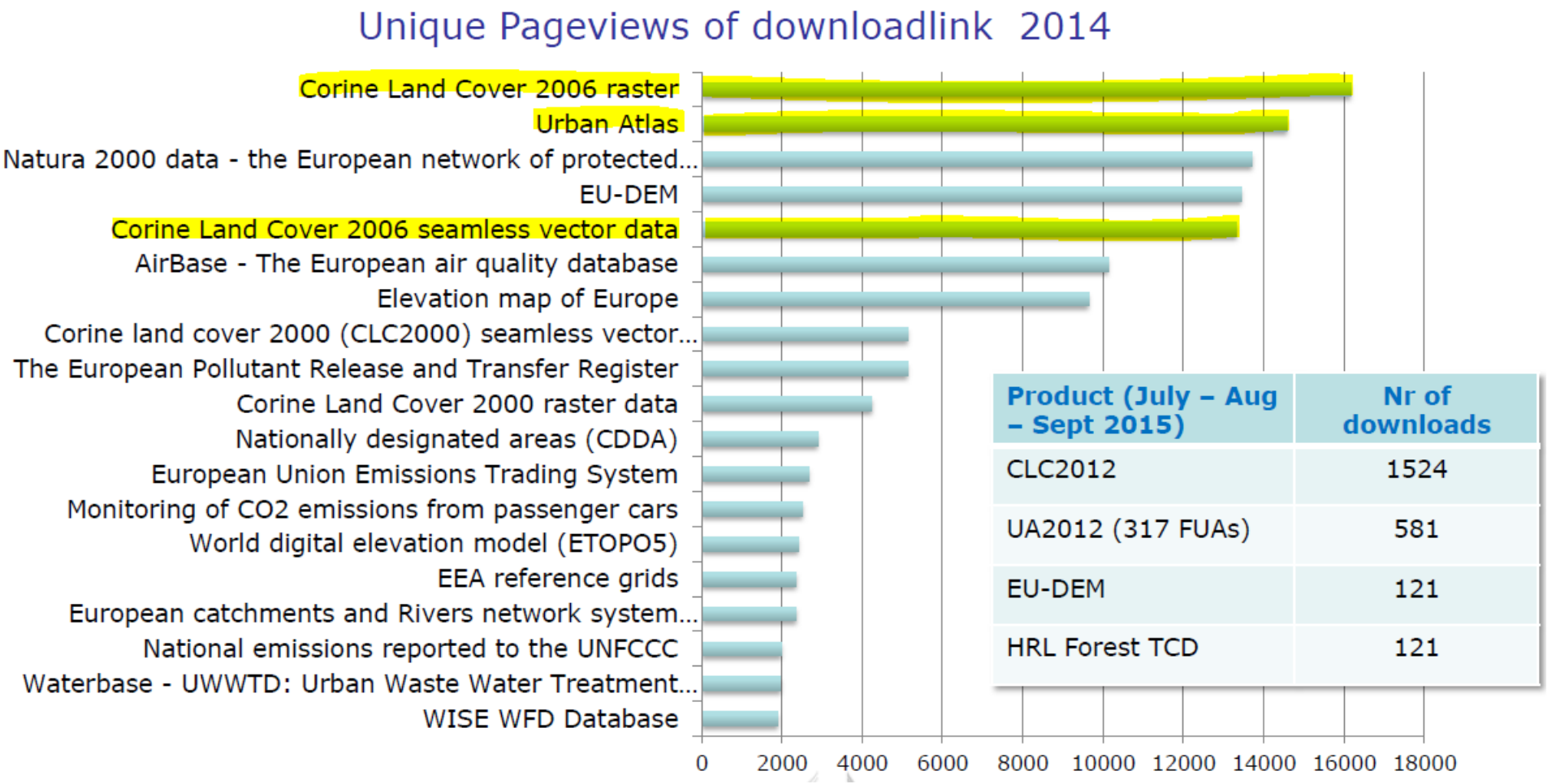
Projekt

- Auftrag der Europäischen Umweltagentur:
  - März 2015 - September 2015

- **Inhalt**
  - Erstellung von harmonisierten Beispielsdatensätzen für CORINE Land Cover und Urban Atlas (UA)
    - INSPIRE Annex II: Bodenbedeckung, Vektormodell
  - Nicht-Inhalt:
    - Transformation des gesamten CORINE Land Cover/UA Datensatzes

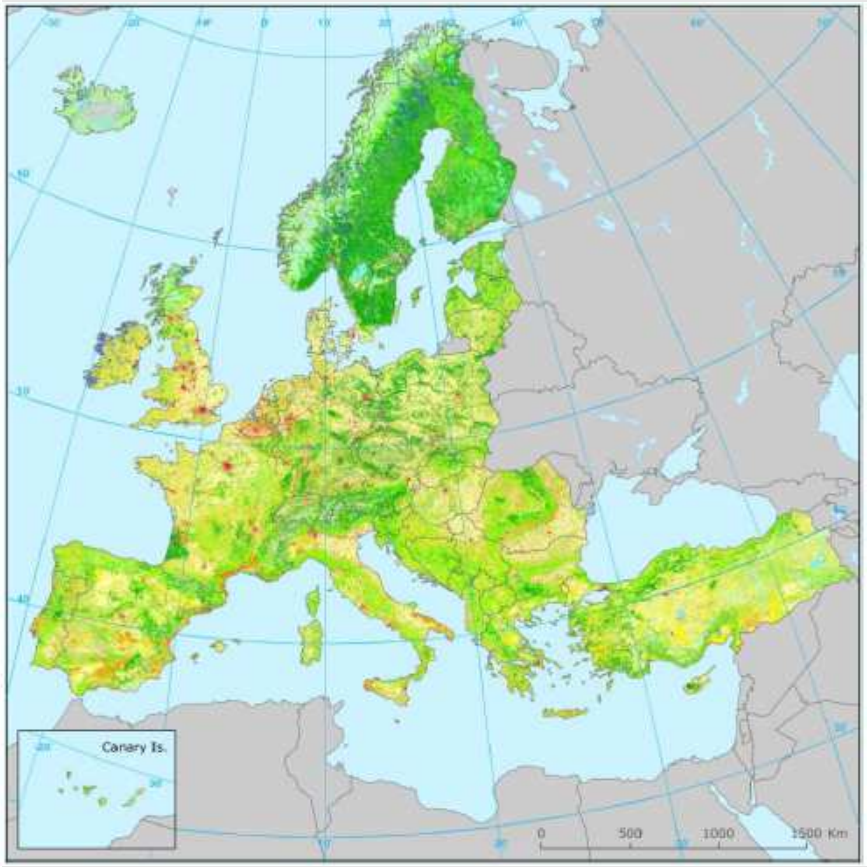
- **Bearbeitung**
  - Lead: Umweltbundesamt
  - Co-Lead: SYKE, Finland, INSPIRE MIG Facilitator
  - Partner: ALTERRA, Spanien (Uni Malaga, Barcelona), FH Wiener Neustadt,

Auswahl Datensätze



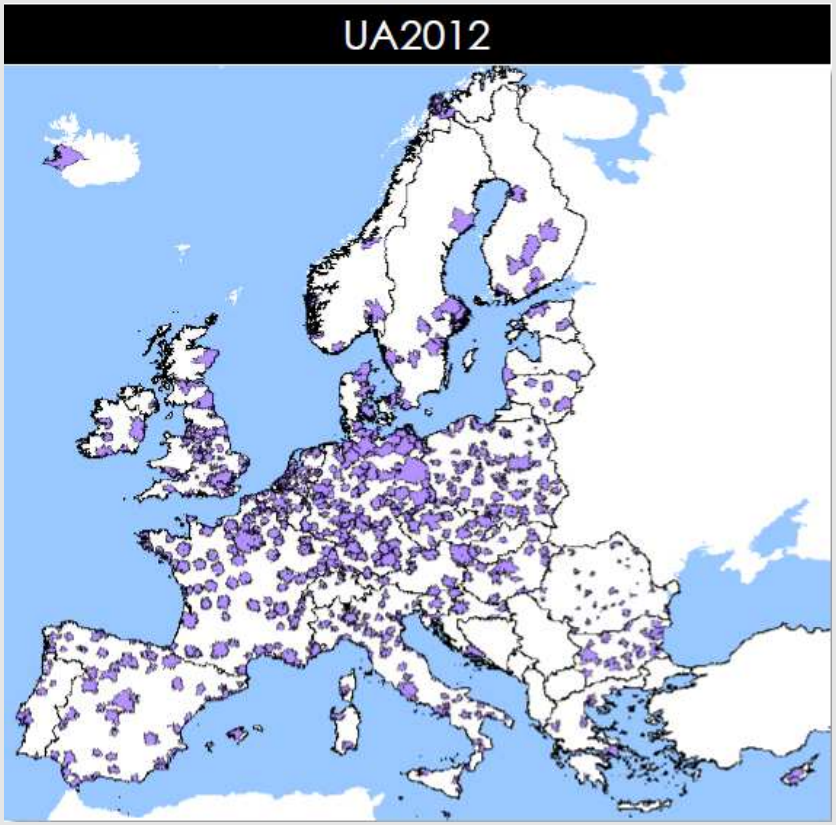
Product (July – Aug – Sept 2015)	Nr of downloads
CLC2012	1524
UA2012 (317 FUAs)	581
EU-DEM	121
HRL Forest TCD	121

CORINE Land Cover



- Inventuren: 1990, 2000, 2006, 2012
- MMU: 25 ha, Breite: min. 100m, 1:100.000
- Nomenklatur: 44 Klassen
- Methodik: visuelle Interpretation aus Satellitenbilddaten
- Zusatzdaten: Orthofotos, topographische Karten, etc.
- Nächstes Update: 2018

Urban Atlas

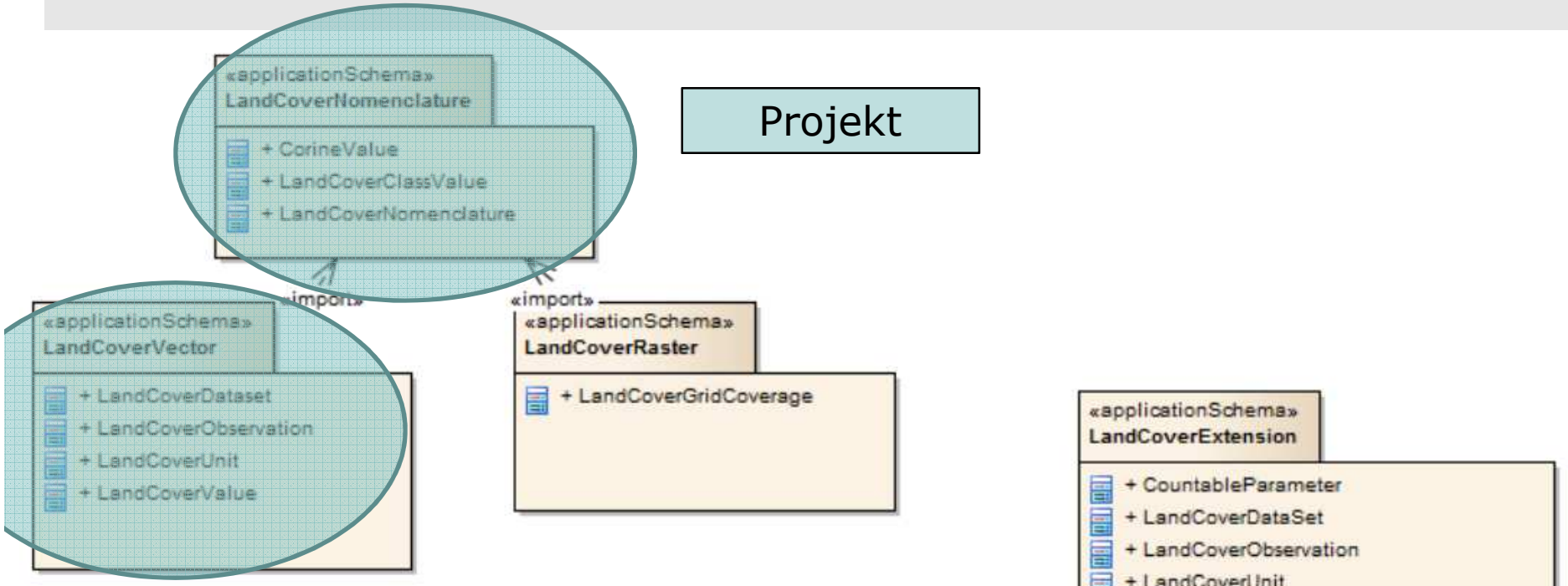


- Inventuren: 2006, 2012
- Ca. 700 Städte (>50.000 EW)
- MMU: 0,25 ha (Stadt) und 1 ha (Land)
- Nomenklatur: 17 Klassen (Stadt), 10 Klassen (Land)
- Methodik: visuelle Interpretation aus Satellitenbilddaten (2,5m Auflösung)
- Zusatzdaten: Orthofotos, Straßendaten, etc.
- Nächstes Update: 2018

Transformationsschritte

- **1. Erstellung der mapping rules**
  - Quellmodell: CORINE Land Cover / Urban Atlas
  - Zielmodell: INSPIRE Annex II Bodenbedeckung – Vektormodell
    - EXCEL-file
- **2. Umsetzung der Transformation**
  - Transformation in GML 3.2.1
    - FME
- **3. Validierung und Test**
  - Validitätsprüfung
    - Schematron
  - begrenzter räumlicher Datensatz
- **Task x: Upscaling**
  - Versuch: Transformation des österreichischen CLC-Datensatzes

Auswahl Zielmodell / Applikationsschema



Projekt

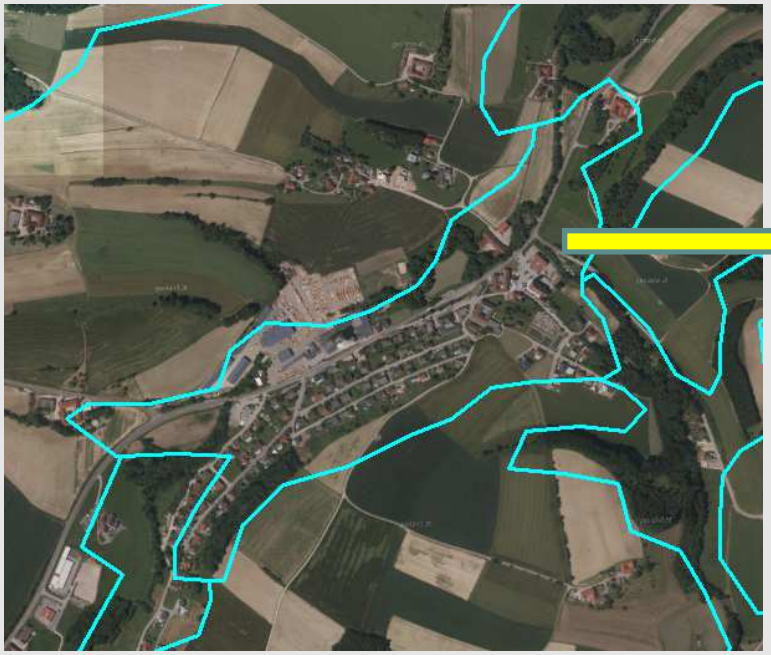
Vektor

Raster

„Pflicht"

„Kür"

Datenmodell



Geometrie | Code | ID

FID	Shape *	code_06	ID	Area_ha
41	Polygon	111	AT-42	27,058658
1443	Polygon	112	AT-2002	377,664907
1444	Polygon	112	AT-2003	166,582546
1447	Polygon	112	AT-2006	38,172177
1454	Polygon	112	AT-2013	146,580296
1456	Polygon	112	AT-2015	40,946137
1459	Polygon	112	AT-2018	49,056836
1467	Polygon	112	AT-2026	37,706236
1474	Polygon	112	AT-2033	86,068167
1479	Polygon	112	AT-2038	38,433761
1483	Polygon	112	AT-2042	32,217324

1: Mapping Rules

- **Ziel:**
  - menschenlesbare Transformationsregeln
  - EXCEL-file
  - von Quellmodell → Zielmodell
- **Vorlagen**
  - JRC http://inspire.ec.europa.eu/data-model/approved/r4618/mapping/
  - ESDIN www.esdin.eu
- **Beurteilung**
  - Bestehende Vorlagen nicht praktikabel
    - fehlende Angaben
    - fehlende Detaillierung
  - Entscheidung: inwieweit sollen hierarchisch strukturierte GML Klassen abgebildet werden

Offizielle mapping tables

INSPIRE

Infrastructure for Spatial Information in the European Community

> Data Specifications

Data Specifications

Legislation | Who | Consultations | Testing | Roadmap | Library | News | Themes | Data Models | xml schemas

INSPIRE data models

The INSPIRE Implementing Rules on interoperability of spatial data sets and services and the data specification guidance documents are based on the UML data models developed by the INSPIRE Thematic Working Groups. These data models are managed in a common UML repository, which also stores older revisions of the models.

This page makes different revisions of the INSPIRE UML models available in different formats and views (see below). Each of these revisions corresponds to a specific set of (draft or approved) Data Specification Technical Guidance (TG) documents and/or Implementing Rules.

Revision	Corresponding TG and IRs	Status	Feature catalogue	HTML view	Mapping Tables	EA project / XMI	SVN	GML & code lists
4618	**This version corresponds to the content of the Implementing Rules (EU) No 1089/2010, No 102/2011, No 1253/2013 and the latest publicly available version of the data specifications of Annex I, II+III.**							
	This distribution contains only those data models that are contained in the amendment to the Implementing Rules for Annex II+III themes, including the updates of the Annex I data themes.	APPROVED	FC	HTML	Mapping Tables	EA / XMI	SVN	Schema repository
	This distribution combines the data models contained in the amendment to the Implementing Rules (see above) and the extended data models contained in the data specification Technical Guidelines (but not in the IRs). Please note that the extended data models not included in the IRs should be considered as draft and therefore be used with caution.	APPROVED (IR models) DRAFT (extended models)	FC	HTML	Mapping Tables	EA / XMI	SVN	Schema repository (IR models) Schema repository (extended models)

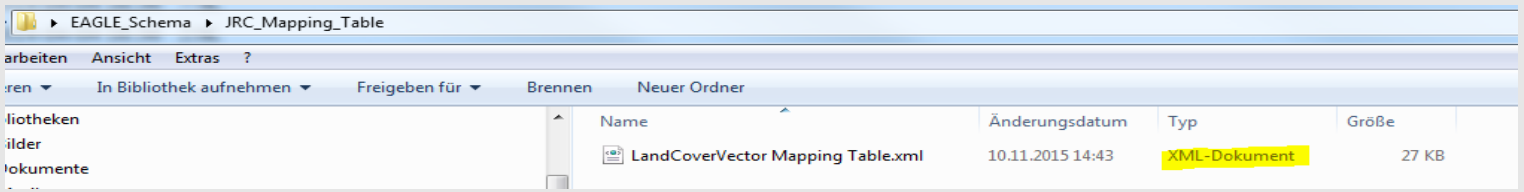
Download Mapping Table

Index of /data-model/approved/r4618-ir/mapping

Name	Last modified	Size	Description
Parent Directory		-	
Activity Complex Map..>	2014-04-04 16:36	46K	
Addresses Mapping Ta..>	2014-04-17 13:05	117K	
AdministrativeAndSoc..>	2014-04-04 16:36	24K	
AdministrativeUnits ..>	2013-10-28 09:36	39K	
Agricultural and Aqu..>	2014-04-04 16:36	26K	
Air Transport Networ..>	2013-10-28 13:35	238K	
Area Management Rest..>	2014-04-04 16:36	23K	
Atmospheric Conditio..>	2014-04-04 16:36	7.6K	
LandCoverVector Mapp..>	2014-04-04 16:37	27K	

Download

File als *.xml



Öffnen der JRC mapping table

```
<?xml version="1.0" encoding="UTF-8"?>
- <Workbook xmlns:x="urn:schemas-microsoft-com:office:excel" xmlns:ss="urn:schemas-microsoft-com:office:spreadsheet" xmlns:o="urn:schemas-microsoft-com:office:office"
xmlns:html="http://www.w3.org/TR/REC-html40" xmlns="urn:schemas-microsoft-com:office:spreadsheet">
  - <DocumentProperties xmlns="urn:schemas-microsoft-com:office:office">
      <Author>ShapeChange</Author>
    </DocumentProperties>
  - <Styles>
    - <Style ss:Name="Normal" ss:ID="Default">
        <Alignment/>
        <Borders/>
        <Font/>
        <Interior/>
        <NumberFormat/>
        <Protection/>
      </Style>
    - <Style ss:ID="s0">
        <Alignment ss:WrapText="1" ss:Vertical="Top" ss:Horizontal="Center"/>
        <Font ss:Size="8.0"/>
      </Style>
    - <Style ss:ID="s1">
        <Alignment ss:WrapText="1" ss:Vertical="Top" ss:Horizontal="Center"/>
        <Font ss:Size="8.0"/>
        <Interior ss:Pattern="Solid" ss:Color="#FCF305"/>
      </Style>
    - <Style ss:ID="s2">
        <Alignment ss:WrapText="1" ss:Vertical="Top" ss:Horizontal="Center"/>
      - <Borders>
          <Border ss:Weight="2" ss:Position="Bottom" ss:LineStyle="Continuous"/>
          <Border ss:Weight="2" ss:Position="Left" ss:LineStyle="Continuous"/>
          <Border ss:Weight="2" ss:Position="Right" ss:LineStyle="Continuous"/>
          <Border ss:Weight="2" ss:Position="Top" ss:LineStyle="Continuous"/>
        </Borders>
        <Font ss:Size="12.0" ss:Bold="1"/>
        <Interior ss:Pattern="Solid" ss:Color="#99CCFF"/>
      </Style>
    - <Style ss:ID="s3">
        <Alignment ss:WrapText="1" ss:Vertical="Top" ss:Horizontal="Center"/>
      - <Borders>
          <Border ss:Weight="2" ss:Position="Bottom" ss:LineStyle="Continuous"/>
          <Border ss:Weight="1" ss:Position="Left" ss:LineStyle="Continuous"/>
```

Also doch umbenennen: .xml → .xls

Application Schema 'LandCoverVector' (version 3.0)								
Type	Documentation	Attribute Association role Constraint	Attribute / Association role / Constraint	Values / Enumerations	Multiplicity	Voidable / Non-Voidable	Type	Documen
LandCoverUnit	-- Name -- Land Cover Unit An individual element of the LC dataset represented by a point or polygon.Every unit support Land Cover information.							
		inspireId	-- Name -- inspireId External object identifier	Identifier	1			
		beginLifespanVersi	-- Name -- beginLifespanVersion	DateTime	1	voidable		
		endLifespanVersion	-- Name -- endLifespanVersion	DateTime	0..1	voidable		
		geometry	-- Name -- geometry Spatial representation	GM_Object	1			
		landCoverObservati	-- Name -- landCoverObservation	LandCoverObservation	1..*			
LandCoverDataset	-- Name -- Land Cover Data set A vector representation for Land Cover data.This representation allows Land Cover data being supported by a vector geometry.							
		inspireId	-- Name -- inspireId External object identifier	Identifier	1			
		beginLifespanVersi	-- Name -- beginLifespanVersion	DateTime	1	voidable		
		endLifespanVersion	-- Name -- endLifespanVersion	DateTime	0..1	voidable		
		extent	-- Name -- extent Contains the extent of the	EX_Extent	1			
		name	-- Name -- name Name of the Land Cover	CharacterString	1			
		nomenclatureDocu	-- Name -- nomenclatureDocumentati	LandCoverNomenclature	1			
		validFrom	-- Name -- validFrom The time when the	Date	1	voidable		
		validTo	-- Name -- validTo The time from which the	Date	1	voidable		
		member	-- Name -- element A Land Cover Unit being	LandCoverUnit	1..*			
LandCoverObservation	-- Name -- Land Cover Observation Land Cover information interpreted at a specific time and place.							
		class	-- Name -- class The assignment of a land	LandCoverClassValue	1			
		mosaic	-- Name -- mosaic List of classification	LandCoverValue	1..*	voidable		
		observationDate	-- Name -- observationDate	DateTime	1	voidable		
LandCoverValue	-- Name -- Land Cover Value Generic class supporting Land Cover value and percentage.							
		class	-- Name -- class Assignment of a land	LandCoverClassValue	1			
		coveredPercentage	-- Name -- Covered percentage Fraction	Integer	1	voidable		

Beispiel: EX_Extent

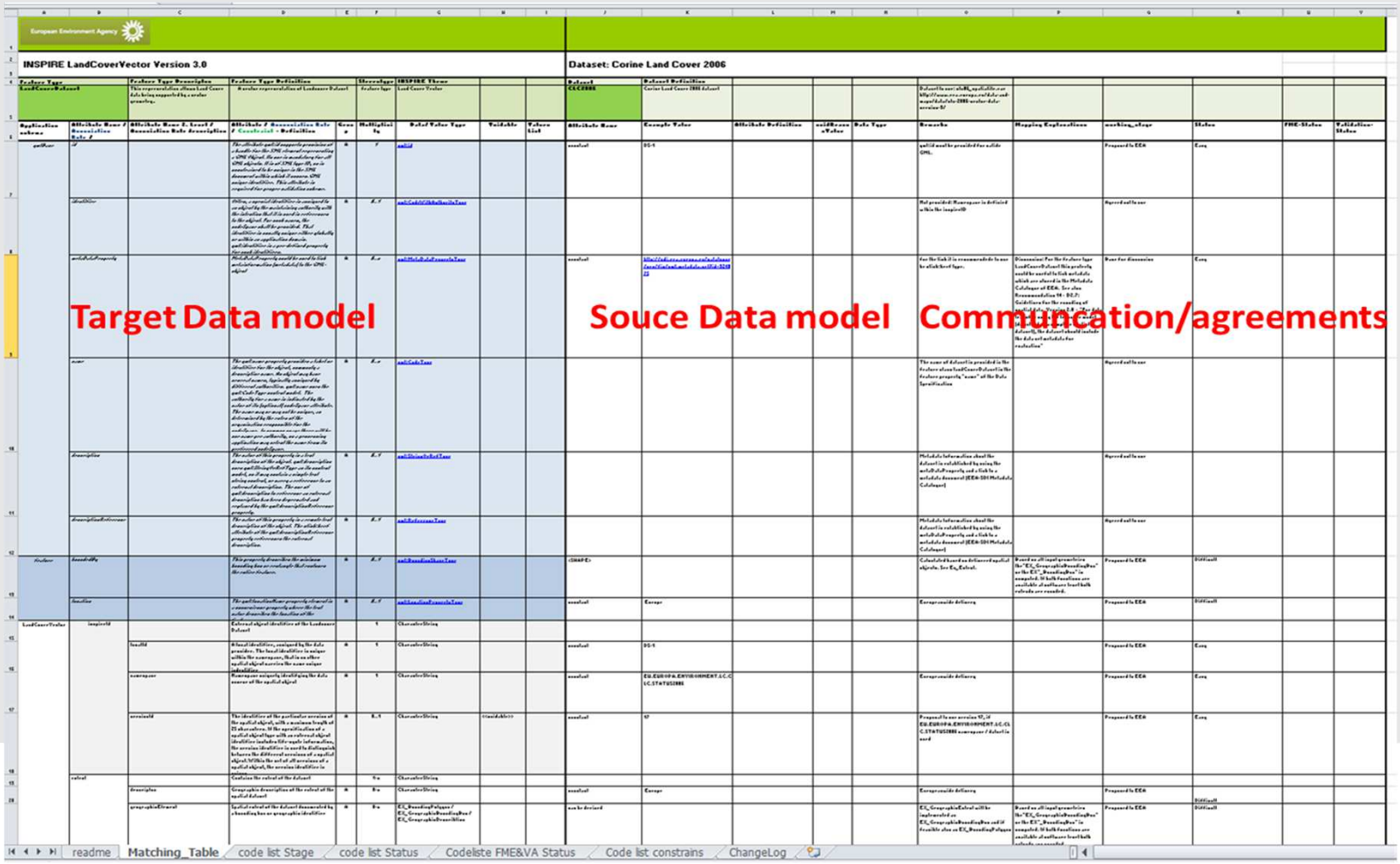
LandCoverDataset	-- Name -- Land Cover Data set A vector representation for Land Cover data.This representation allows Land Cover data being supported by a vector geometry.						
		inspireId	-- Name -- inspireId External object identifier	Identifier	1		
		beginLifespanVersi	-- Name -- beginLifespanVersion	DateTime	1		voidable
		endLifespanVersion	-- Name -- endLifespanVersion	DateTime	0..1		voidable
		extent	-- Name -- extent Contains the extent of the	EX_Extent	1		
		name	-- Name -- name	CharacterString	1		

Komplexer Datentyp:
nicht in 1 Zeile darstellbar

extent		Contains the extent of the dataset		1-n	CharacterString		
	descripton	Geographic description of the extent of the spatial dataset	A	0-n	CharacterString	constant	Europe
	geographicElement	Spatial extent of the dataset documented by a bounding box or geographic identifier	A	0-n	EX_BoundingPolygon / EX_GeographicBoundingBox / EX_GeographicDescribtion	can be derived	EX_GeographicBoundingBox
	temporalElement / verticalElement	Element for the documentation of spatial extent with respect to date and time (EX_SpatialTemporalExtent) or using EX_TemporalExtend for the documentation of the time periode covered by the dataset / Element for the documentation of spatial	A	0-n	EX_SpatialTemporalExtent / EX_TemporalExtent / EX_VerticalExtent	not available	

ABER: nicht vollständig, daher Eigenentwicklung

- Basierend auf ELF-Projekt + JRC mapping table



Umfassende Dokumentation der „mandatory attributes“

- **Aus GIS-Datensatz**
  - ID, Geometrie, Code
- **In GIS-Datensatzdokumentation**
  - beginLifeSpanVersion „2013-12-01T00:00:00+01:00“
  - Responsible Agency
  - Nomenklatur
    - INSPIRE Registry http://dd.eionet.europa.eu/vocabulary/landcover/clc
    - Land Cover Code: permanente URL !!

Vocabulary concepts

Filtering text | Status: Accepted

44 concepts found, displaying 1 to 20.[First/Prev] **1**, 2, 3 [Next/Last]

Id	Preferred 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

Concept: *Discontinuous urban fabric* in the *clc* vocabulary

Concept URI	http://dd.eionet.europa.eu/vocabulary/landcover/clc/112
Preferred label	Discontinuous urban fabric
Definition	
Notation	112
Status	Valid
Status Modified	23.04.2015
Accepted Date	
Not Accepted Date	
Level 1 category	Artificial surfaces
Level 2 category	Urban fabric

Code Listen und Registry

- **IR 1253/2013**
  - Art. 6
  - Code Lists and Enumerations
- **Verwendung**
  - In fast allen Annex-Themen
  - Z.B.: Landbedeckungs-Wert, Kategorie Naturschutzgebiet, Biotoptyp, etc.
- **Implementierung**
  - Registry
  - Dauerhafte URL
  - Z.B.: http://dd.eionet.europa.eu/vocabulary/landcover/clc/112

1. Code lists shall be of one of the following types, as specified in the Annexes:

(d) code lists, whose allowed values comprise any values defined by data providers.

3. Where, for an attribute whose type is a code list as referred to in points (b), (c) or (d) of paragraph 1, a data provider provides a value that is not specified in this Regulation, that value and its definition shall be made available in a register.

Beispiel: gekürzte Mapping table

- **Land Cover Dataset**
  - Mit Angabe des VOID-Reason Valu

Welcher Namespace soll in Österreich verwendet werden?

Attribute	Data value or type	Constant/voidRe
localId	constant	'DS-1'
namespace	constant	'EU.EUROPA.ENVIRONMENT.LC.CLC.STATUS2006'
versionId	constant	'17'
name	constant	'CorineLandCover2006'
beginLifespanVersion	constant	'2013-12-01T00:00:00+01:00'
endLifespanVersion	not available	'unpopulated'
validFrom	not available	'unpopulated'
validTo	not available	'unpopulated'

  - Zulässige VOID Reason values

Name
Unknown
Unpopulated
Withheld

Notwendige Vereinfachungen

- **Z.B. Adresse**
  - notwendig für Adresser der Organisation, die die Nomenklatur erstellt hat
  - Referenzierung auf INSPIRE Annex I: addresses
  - Nicht-Ziel
    - komplette Befüllung des INSPIRE-Adress-Schemas in allen Details
  - Ziel
    - Nutzerfreundliche Information („normale Schreibadresse“)
    - In Matching-Table über GML-fragment abgebildet

```
<base2:address>
    <ad:AddressRepresentation>
        <ad:adminUnit>
            <gn:GeographicalName>
                <gn:language>eng</gn:language>
                <gn:nativeness xlink:href="http://inspire.ec.europa.eu/codelist/NativenessValue/endonym"/>
                <gn:nameStatus xlink:href="http://inspire.ec.europa.eu/codelist/NameStatusValue/standardised"/>
                <gn:sourceOfName nilReason="unknown"/>
                <gn:pronunciation xsi:nil="true"/>
                <gn:spelling>
                    <gn:SpellingOfName>
                        <gn:text>Kongens Nytorv 6, 1050 Copenhagen K, Denmark</gn:text>
                        <gn:script xsi:nil="true"/>
                    </gn:SpellingOfName>
                </gn:spelling>
            </gn:GeographicalName>
        </ad:adminUnit>
        <ad:locatorDesignator>Copenhagen</ad:locatorDesignator>
        <ad:postCode>1050</ad:postCode>
    </ad:AddressRepresentation>
</base2:address>
```

GML Testinstanz erstellen

- **Vor Start der Datentransformation → GML-Testinstanz erstellen!!**
- **Warum?**
  - XML-Spy / Qxygene (IntelliSense)
  - Ermöglicht besseres Verständnis für die Struktur der GML-Instanz
  - Aufzeigen von eventuellen Fehlern der XSD-Schemata
  - Abschätzung Praxistauglichkeit der GML Instanz
- **Kritik: Erstellung von Test-Instanzierung wäre eigentlich ein unerlässlicher Arbeitsschritt bei der Erarbeitung der DS gewesen.**

```
<lcv:validTo>2017-12-31</lcv:validTo>
<lcv:member>
    <lcv:LandCoverUnit gml:id="FR001L1-17192">
        <lcv:inspireId>
            <base:Identifier>
                <base:localId>FR001L1-17192</base:localId>
                <base:namespace>EU.EUROPA.ENVIRONMENT.LC.UA.STATUS2012</base:namespace>
            </base:Identifier>
        </lcv:inspireId>
        <lcv:beginLifespanVersion>2015-05-15T11:22:43</lcv:beginLifespanVersion>
        <lcv:geometry>
            <gml:Surface gml:id="FR001L1-17192-0" srsName="EPSG:3042" srsDimension="2">
                <gml:patches>
                    <gml:PolygonPatch>
                        <gml:exterior>
                            <gml:LinearRing>
```

Task 2: GML Transformation

- **Implementierung der Transformationsregeln in**
  - HALE oder
  - FME
- **Transformation in valides INPSIRE konformes GML 3.2.1**

- **Vorteil HALE:**
  - Dynamische Entwicklung, vollständige Implementierung von INSPIRE Annex Themen, bedienerfreundlich
- **Vorteile FME:**
  - Stabile kommerzielle Software mit gesichertem Support, Bearbeitung von „operativen Daten“ und „Datenmengen“ (tbc.!)

Task 3: Testdaten

- **Testdaten**
  - CORINE Land Cover
    - 300 polygone aus 3 Ländern
  - Urban Atlas
    - Test site: Teile von Paris + Stockholme
      - Paris 190.000 Polygone Shape-file: 6 MB
      - GML-file: 10 MB

Output: GML-encoding z.B. LC-unit

```
<lcv:member>
    <lcv:LandCoverUnit gml:id="EU-13632">
        <gml:description nilReason="unpopulated"/>
        <gml:descriptionReference nilReason="unpopulated"/>
        <lcv:inspireId>
            <base:Identifier>
                <base:localId>EU-13632</base:localId>
                <base:namespace>EU.EUROPA.ENVIRONMENT.LC.CLC.STATUS2006</base:namespace>
                <base:versionId nilReason="unpopulated" xsi:nil="true"/>
            </base:Identifier>
        </lcv:inspireId>
        <lcv:beginLifespanVersion>2013-12-01T00:00:00+01:00</lcv:beginLifespanVersion>
        <lcv:endLifespanVersion nilReason="unpopulated" xsi:nil="true"/>
        <lcv:geometry>
            <gml:MultiSurface gml:id="EU-13632-0" srsName="urn:ogc:def:crs:EPSG::3035" srsDimension="2">
                <gml:surfaceMember>
                    <gml:Surface gml:id="EU-13632-1">
                        <gml:patches>
                            <gml:PolygonPatch>
                                <gml:exterior>
                                    <gml:LinearRing>
                                        <gml:posList>1854002.186 2715610.608 1853925.393 2715260.816 1853939.074 2715169.807 1854037.743 2715080.116 185
                                    </gml:LinearRing>
                                </gml:exterior>
                            </gml:PolygonPatch>
                        </gml:patches>
                    </gml:Surface>
                </gml:surfaceMember>
            </gml:MultiSurface>
        </lcv:geometry>
        <lcv:landCoverObservation>
            <lcv:LandCoverObservation>
                <lcv:class xlink:href="http://dd.eionet.europa.eu/vocabulary/landcover/clc/132"/>
                <lcv:mosaic>
                    <lcv:LandCoverValue>
                        <lcv:class xlink:href="http://dd.eionet.europa.eu/vocabulary/landcover/clc/132"/>
                        <lcv:coveredPercentage>100</lcv:coveredPercentage>
                    </lcv:LandCoverValue>
                </lcv:mosaic>
                <lcv:observationDate>2006-01-01T00:00:00+01:00</lcv:observationDate>
            </lcv:LandCoverObservation>
        </lcv:landCoverObservation>
    </lcv:LandCoverUnit>
</lcv:member>
```

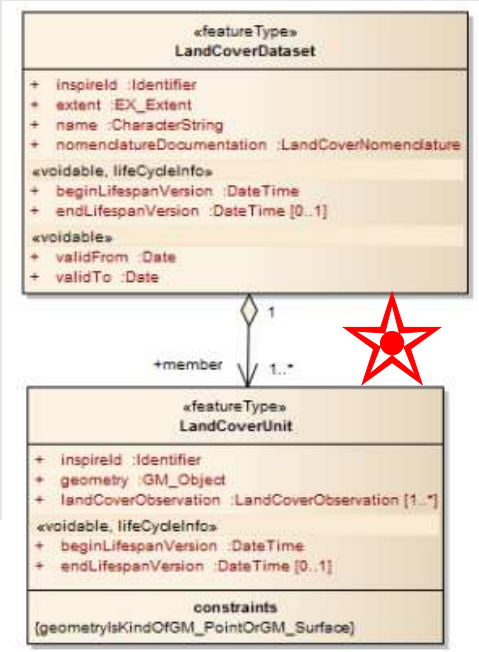
ID

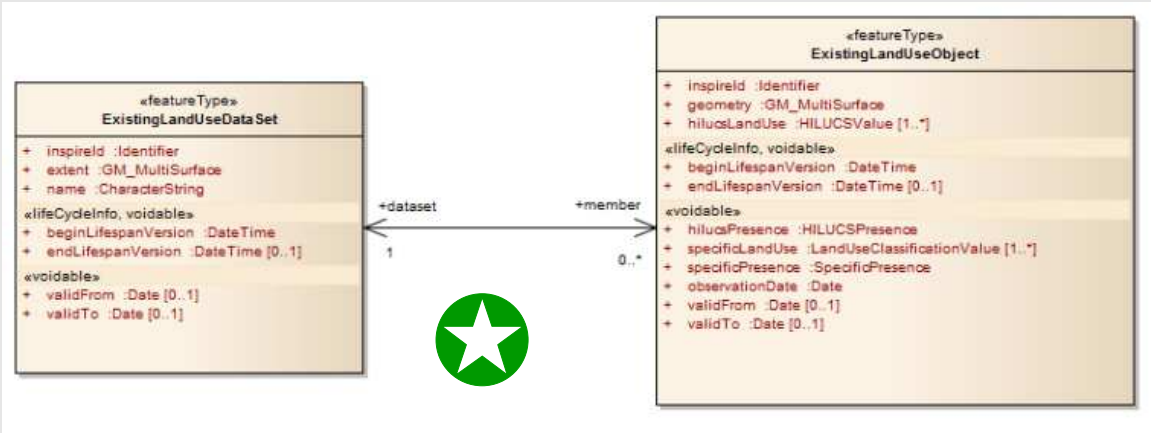
Geometrie

Code

GML-Darstellungsproblem

- **Gravierender Unterschied in Modellierung „association role“**
  - Dataset < -- > Unit
    - Annex II: Bodenbedeckung — in derzeitigen GIS-Browsern nicht darstellbar
      - Hierarchisch strukturiert
    - Annex III: Landnutzung — mit derzeitigem GIS-Browsern darstellbar
      - Flache Struktur
      - Referenzierung über „xlink:hrev“





Land Cover

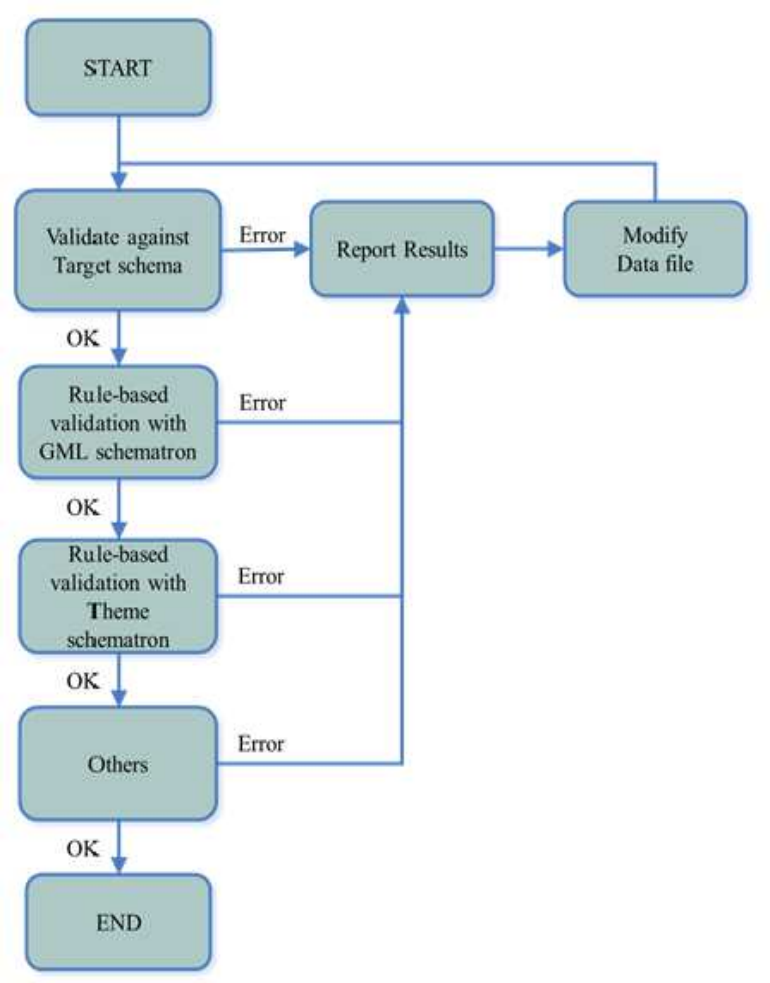
```
▼<gml:boundedBy>
  ▼<gml:Envelope srsName="EPSG:3042" srsDimension=
      <gml:lowerCorner>860648.69 5426007.469</gml:l
      <gml:upperCorner>878212.243 5429200.77</gml:u
    </gml:Envelope>
  </gml:boundedBy>
▼<gml:featureMembers>
  ▼<lcv:LandCoverDataset gml:id="FR001L1">
      <gml:metaDataProperty xlink:href="http://144.
    ▶<lcv:inspireId>...</lcv:inspireId>
      <lcv:beginLifespanVersion>2015-05-15T11:22:45
      <lcv:endLifespanVersion xsi:nil="true" nilRea
    ▶<lcv:extent>...</lcv:extent>
      <lcv:name>Urban Atlas 2012 - Paris</lcv:name>
    ▶<lcv:nomenclatureDocumentation>...</lcv:nomen
      <lcv:validFrom>2012-01-01</lcv:validFrom>
      <lcv:validTo>2017-12-31</lcv:validTo>
    ▼<lcv:member>
      ▼<lcv:LandCoverUnit gml:id="FR001L1-17192">
        ▼<lcv:inspireId>
          ▶<base:Identifier>...</base:Identifier>
          </lcv:inspireId>
          <lcv:beginLifespanVersion>2015-05-15T11:2
        ▶<lcv:geometry>...</lcv:geometry>
        ▼<lcv:landCoverObservation>
          ▼<lcv:LandCoverObservation>
              <lcv:class xlink:href="http://dd.eione
            ▶<lcv:mosaic>...</lcv:mosaic>
              <lcv:observationDate>2012-01-01T00:00:
            </lcv:LandCoverObservation>
          </lcv:landCoverObservation>
        </lcv:LandCoverUnit>
      </lcv:member>
    ▶<lcv:member>...</lcv:member>
    ▶<lcv:member>...</lcv:member>
    </lcv:LandCoverDataset>
  </gml:featureMembers>
</gml:FeatureCollection>
```

Land Use

```
▼<gml:featureMember>
  ▶<elu:ExistingLandUseDataSet gml:id="idS2005">...</elu
  </gml:featureMember>
▼<gml:featureMember>
  ▼<elu:ExistingLandUseObject gml:id="id118b6d92-8083-4a
    ▶<elu:inspireId>...</elu:inspireId>
      <elu:beginLifespanVersion>2015-05-21T15:19:08</elu:
    ▶<elu:geometry>...</elu:geometry>
      <elu:hilucsLandUse xlink:href="http://inspire.ec.eu
      <elu:hilucsPresence xsi:nil="true"/>
      <elu:specificLandUse xsi:nil="true"/>
      <elu:specificPresence xsi:nil="true"/>
      <elu:observationDate>2011-08-01</elu:observationDat
      <elu:validFrom>2005-01-01</elu:validFrom>
      <elu:validTo>2008-12-31</elu:validTo>
      <elu:dataset xlink:href="idS2005"/>
    </elu:ExistingLandUseObject>
  </gml:featureMember>
```

aber: wahrscheinlich nur temporäres Problem, bis GIS-Software dies berücksichtigt

Task 3: Validierung



- **Arbeitsschritte**
  - 1. Schema-Validierung
  - 2. GML schematron
  - 3. Themenspezifisches Schematron

Conformance Classes

	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

Fehlerbeispiele

Datumsangabe mit Schreibfehler

Element	<lcv:observationDate>
Description	<lcv:observationDate>2006-01-01T:00:00:00+01:00</lcv:observationDate> Severity: error Description: cvc-complex-type.2.2: Element 'lcv:observationDate' must have no element [children], and the value must be valid.
Rectification	Fix: <lcv:observationDate>2006-01-01T00:00:00+01:00</lcv:observationDate>
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)* *It is also related with Art.11 (1) of Commission Regulation 1089/2010 as it is described in A.2.5. Temporal reference system test. Tested also in thematic schematron file.*

- Falsch: „2013-12-01T:00:00:00+01:00"
- Richtig: „2013-12-01T00:00:00+01:00"

Projektion

- **Data Specifications on Coordinate Reference Systems**
  - ETRS89-LAEA
    - for pan-European spatial analysis and reporting, where true area representation is required;
    - EPSG 3035
  - ETRS89-LCC
    - for conformal pan-European mapping at scales smaller than or equal to 1:500,000
    - EPSG 3034
  - ETRS89-TMzn (26N-39N)
    - conformal pan-European mapping at scales larger than 1:500,000
    - EPSG 3038- EPSG 3051

Fehlerquelle: coordinate reference system

- 3 prinzipielle Möglichkeiten des Encodings:
  - EPSG:3035
  - http://www.opengis.net/def/crs/EPSG/0/3035
  - urn:ogc:def:crs:EPSG::3035

- GÜLTIG in GML 3.2.1
  - urn:ogc:def:crs:EPSG::3035
  - <gml:Surface gml:id="EU-1804437-1" srsName="urn:ogc:def:crs:EPSG::3035">

```
<lcv:geometry>
    <gml:MultiSurface gml:id="EU-431-0" srsName="urn:ogc:def:crs:EPSG::3035" srsDimension="2">
        <gml:surfaceMember>
            <gml:Surface gml:id="EU-431-1">
                <gml:patches>
                    <gml:PolygonPatch>
                        <gml:exterior>
                            <gml:LinearRing>
                                <gml:posList>1526638.04 1822432.173 1526611.883 1822443.798 15265
                            </gml:LinearRing>
                        </gml:exterior>
                    </gml:PolygonPatch>
                </gml:patches>
            </gml:Surface>
        </gml:surfaceMember>
    </gml:MultiSurface>
</lcv:geometry>
```

Überprüfung der Nomenklatur

- **Nomenklatur**
  - Beschreibung entweder mit
    - Embedded description
      - LCML…land cover modelling language
    - ODER
    - External Description
      - zitierbares Dokument

- **Problem: embedded description**
  - kein offizielles ISO-Schema verfügbar
  - daher nicht prüfbar

- **external description**
  - Im Gesetzestext „external description" verwechselt mit „online description"
  - Angabe von Code, Label, Definition, RBG-Darstellung

Registry erforderlich !

IR Requirement
Annex III, Section 2.6
Theme-specific Requirements

If an onlineDescription attribute is provided for a LandCoverNomenclature data type, the referenced online description shall define, for each class, at least a code, a name, a definition and a RGB value to be used for portrayal. If the online description describes the nomenclature for a LandCoverGridCoverage object, an integer grid code shall also be provided for each class. This code shall be used in the range of the LandCoverGridCoverage to represent the corresponding class.

Erkenntnisse Validierung

- Keine „ready-to-go“ Validierungstools verfügbar
- Prüfung gegen Schema
  - Z.B. Oxygen
- Programmierungsaufwand
  - Schematron-Regeln

Versuch Upscaling

- **funktionierendes FME-Tranformationsfile**
- **Anwendung für österreichischen CORINE-Datensatz**
  - 37.000 Polygone
  - 100 MB
- **Problem:**
  - „Feature Merger"-Transformer speichern viele Properties der Polygone (Vertex-Orientierung, etc.)
  - Arbeitsspeicher stößt bald an Grenzen (3GB-Begrenzung)
  - Auslagerung auf Festplatte → Temp-Files
- **Lösung**
  - Optimierung der FME-Transformation
  - Prozeßanalyse

Erfahrungen

- Problem: fehlende beispielhafte Umsetzungen (Instanzierung) pro Annex-Thema
- INSPIRE Schemata waren noch nicht fehlerfrei
  - Versionsänderung von INSPIRE Schema während Bearbeitung
- Harmonisierung Bodenbedeckung
  - kaum fachlich-inhaltliche Hürden (Zuordnung meist relativ trivial)
    - Registry für Landbedeckungskategorie-Einträge erforderlich
  - Technisch-formelle Herausforderung
- Abstimmung Annex – Themen
  - Gleiche Struktur, aber unterschiedliche Modellierungen (Association role)
- Upscaling
  - Technische FME-Probleme, Optimierungsbedarf
- Validierung
  - Siehe Vortrag morgen

Veröffentlichungen

- **Europäische Umweltagentur**
  - Matching Table
  - FME-Transformationsfile
  - GML-Beispielsfile
  - Validierung: Schematron-file
- **Termin**
  - tbd. Dezember 2015

Kontakt

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