



# Core Reference Dataset – CRD

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## Specification and Technical Guidelines – Grand Region

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## References

Re f.	Title/Version/Publication Date/Author
[1]	20180221 Core reference dataset Specification DRAFT.pdf
[2]	EN ISO 19131:2007, Geographic Information – Data product specification
[3]	INSPIRE Data Specifications Template / v3.0rc3 / 04.02.2013 / INSPIRE Drafting Team “Data Specifications” <a href="http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecification_Template_v3.0rc3.pdf">http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecification_Template_v3.0rc3.pdf</a>
[4]	CLCplus draft technical specs v4.pdf
[5]	Data Maintenance and Processing Specification. Deliverable 2.3 of the ELF project. 2016. <a href="http://elfproject.eu/documentation/specification/data-maintenance-and-processing">http://elfproject.eu/documentation/specification/data-maintenance-and-processing</a>
[6]	ELF Basemap. Deliverable 2.4 of the ELF project <a href="http://elfproject.eu/documentation/specification/elf-basemap">http://elfproject.eu/documentation/specification/elf-basemap</a>

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## I Scope

The data specification document is a specification for a production of the Core Reference Dataset for the Grand Region (further – CRD GR) accommodating the data contributions from National Mapping and Cadastral Authorities (NMCAs). The document follows the ISO19131 standard for Data product specifications [2] and the INSPIRE data specification template [3].

CRD builds on mainly three foundations:

- **INSPIRE** is the basis for any provision of authoritative geodata in Europe, as all EU Member States are obliged to fulfill this EU directive. The publication date for the themes needed for CRD was 23.11.2017. By default, all needed data should have been published by the EU Member States.
- The **ELF** project, as part of the ELS strategy of EuroGeographics, has detailed the INSPIRE requirements. The ELF data model contains also Master level of detail. For the ELF central services (TopoBaseMap, Cadastral Index Map, GeoLocator), the data model defines core features and attributes. Furthermore, the ELF/ELS data model contains additional selection criteria, quality requirements and even additional attributes. Under the European Location Service (ELS) programme EuroGeographics and its members are further developing, based on the results of the ELF project, operational technical and organisational infrastructure linking national INSPIRE compliant web-services (WFS, WMS) to centralised pan-European services through one access point.
- **UN-GGIM:Europe** WG Core Data proposes recommendations for core content, that are more ambitious than ELF.

The work of these groups has been used as a starting point for defining the future development of the CRD.

## 2 Overview

### 2.1 Informal description

CRD aims to deliver a dependable, and seamless large scale topographic reference data that is

- Seamless and consistent across borders enabling spatial analysis in an European and regional cross-border context;
- Consistent between themes, so that different themes can be used together;
- Up-to-date, maintained and quality ensured enabling users to meet their requirements;
- Based on INSPIRE requirements but adjusted to an easier structure according to users demands.

**Description:**

In general, reference data fulfils three functional requirements:

- Provide an unambiguous location for user's information,
- Enable the merging of data from various sources, and
- Provide a geographic context to allow others to better understand the spatial information that is being presented.

Usually, this kind of data is handled by NMCA's and recognized by a large community of users as core (basic) geospatial data to reference their (thematic) data upon. It provides the basic geographic framework and the set of relationships between the geographical components that will allow building the assessments, analyses and monitoring from combinations of data sets.

The thematic scope of CRD GR is limited to topographic reference data of the INSPIRE theme Hydrography as usually maintained by the NMCA's in Europe.

The CRD data model is based on the INSPIRE data model, but the CRD will not conform to INSPIRE. Only the required feature types and attributes will be extracted and transformed to a simpler data model.

**Spatial extent:**

The CRD GR covers the following regions:

- Belgium: Wallonie
- France: Grand Est
- Germany: Rheinland-Pfalz und Saarland
- Luxembourg: the whole country

### 2.2 Abbreviations

CLC+	CORINE Land Cover plus
CRD	Core Reference Data
ELF / ELS	The European Location Framework / The European Location Service
INSPIRE	The EU Directive to establish an Infrastructure for Spatial Information in Europe
ISO	International Organization for Standardization
NMCA	National Mapping and Cadastral Agency
WFS	Web Feature Service

### 3 Data content and structure

The CRD GR data specification contains 1 package following INSPIRE Annex I:

- Hydrography

#### 3.1 INSPIRE compliancy

##### 3.1.1 Flattening INSPIRE

For easy use of the data the complex INSPIRE data model has to be flattened into a database structure. This issue has been already raised in the ELF Project, e.g. for the ELF Basemap [6].

The following principles are applied for CRD Hydrography layer:

- Some INSPIRE properties are defined as data type, it means they consist of a set of attributes. For CRD, there are two options:
  - Data types are resolved into a list of attributes. This option is used for:
    - geographicalNames (see also 3.1.2),
    - width
  - Data types are concatenated into a single attribute delimited by a hash (#). This option is used for:
    - inspireId (namespace#localId)
    - hydroid (namespace#localId#ClassificationScheme)
- Some INSPIRE attributes have multiplicity greater than 1 (e.g. [0..\*] or [1..\*]). For CRD, all attributes have multiplicity [0...1] except GeographicalName.
- In INSPIRE, some features may be of different geometric types (point, curve, surface). In CRD, either the feature type is split (e.g. WaterCourse\_L and WaterCourse\_A) or only one option is kept (only surface for StandingWater)

##### 3.1.2 Geographical names

A generic and complex data type is GeographicalName. It is the only case in the CRD data model where the multiplicity allows multiple values. The following solution is applied for CRD:

- Only endonyms are included.
- The first name in the source data is the first name in CRD, despite the fact that endonyms might be of same national importance.
- Names are written in national alphabet using encoding UTF8.
- Each GeographicalName may have one or several spellings, i.e. proper ways of writing it, in one or several scripts like the Latin/Roman, Greek and Cyrillic scripts; one of the given names must be in Latin script.
- It is foreseen that each feature type (StandingWater, Watercourse) may have several geographical names

The GeographicalName table holds the following list of attributes:

Attribute	Remark
inspireId	foreign key to the feature types; identifier of the feature related to the GeographicalName.
spelling	geographical name
language	3-letters ISO code

script	national alphabet or Latin
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### 3.1.3 Extending INSPIRE

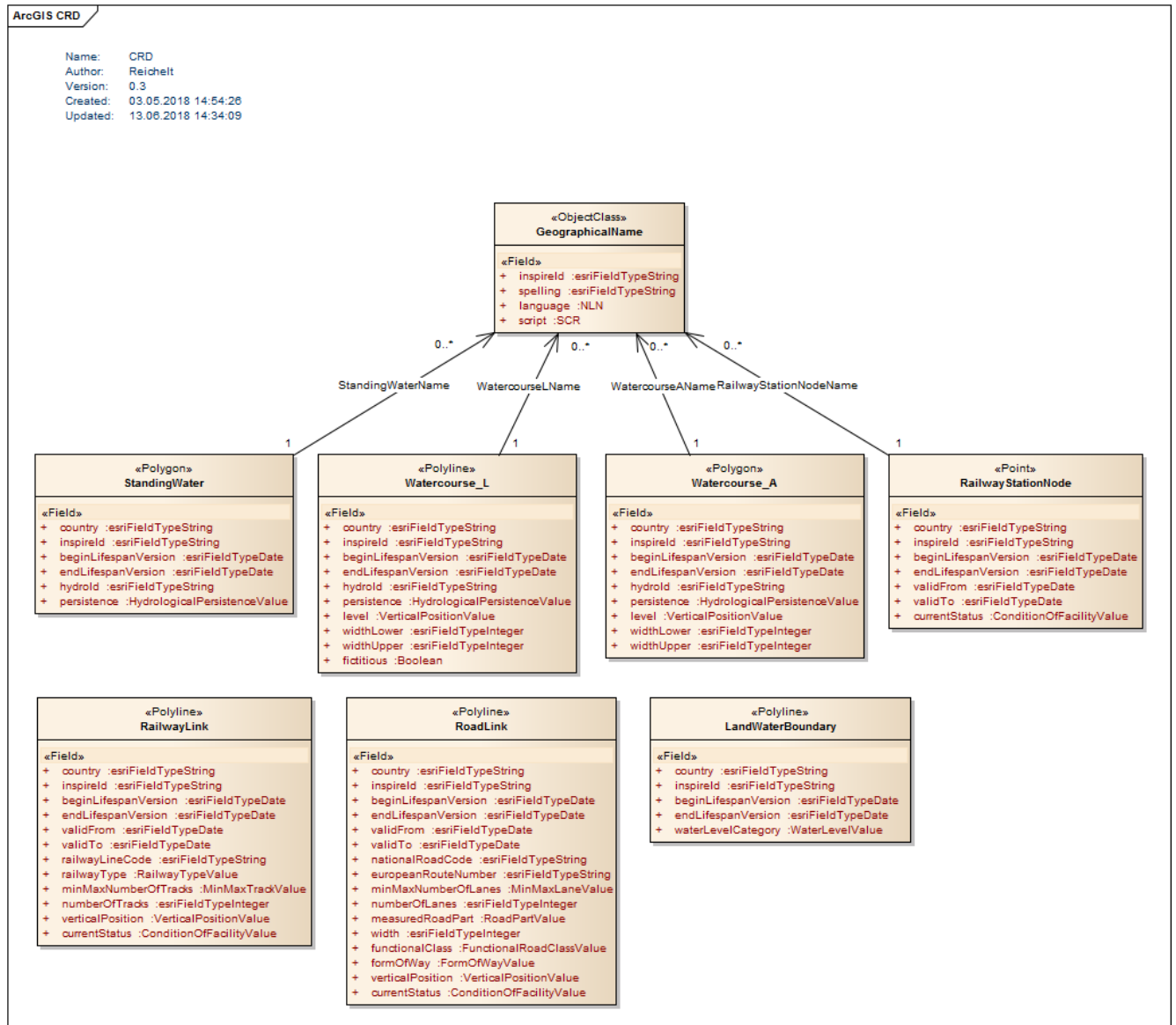
Like the ELF/ELS data model, CRD is extending INSPIRE with additional feature types, attributes and attribute values:

- For simple data selection, all CRD feature types are extended by attribute **country**, as defined in INSPIRE theme AU. The domain are the two-character country code according to the Interinstitutional style guide published by the Publications Office of the European Union (e.g. value 'EL' for Greece instead of ISO code 'GR'). Features located on the international borders have country codes of both neighbouring countries concatenated delimited by a hash (#).

## 3.2 Narrative description

Hydrography consist of physical water features of StandingWater, Watercourse and LandWaterBoundary. The feature type Watercourse is provided as curve and surface geometry. All watercourses are provided as curve to establish a topological network. Watercourses may be provided as surfaces additionally, if the watercourses are of significant width. Fictitious watercourse are included.

### 3.3 UML overview



*LandWaterBoundary is not part of CRD GR, as it does not contain coastal countries. RailwayLink, RailwayStationNode and RoadLink are not part of CRD GR.*

### 3.4 Feature catalogue

All feature types are mandatory and all attributes are optional.

All attributes except GeographicalName have the multiplicity [0...\*]. For GeographicalName please see chapter 3.1.2



### 3.4.1 Hydrography

#### 3.4.1.1 PhysicalWaters

Type	Attribute	Values / enumeration	Remarks
StandingWater (Geometry type surface)	country	CountryCode	see 0
	<i>geographicalName</i>		see 3.1.2
	inspireId	Identifier	see 3.1.1
	beginLifespanVersion	Date Time	
	endLifespanVersion	Date Time	
	hydroId	HydroIdentifier	see 3.1.1
	persistence	HydrologicalPersistenceValue  * dry * ephemeral * intermittent * perennial	default value: perennial
Watercourse_L (Geometry type curve)	country	CountryCode	see 0
	<i>geographicalName</i>		see 3.1.2
	inspireId	Identifier	see 3.1.1
	beginLifespanVersion	Date Time	
	endLifespanVersion	Date Time	
	hydroId	HydroIdentifier	see 3.1.1
	persistence	HydrologicalPersistenceValue  * dry * ephemeral * intermittent * perennial	default value: perennial
	level	VerticalPositionValue  * onGroundSurface * suspendedOrElevated * underground	default value: onGroundSurface
	widthLower	Integer	see 3.1.1
	widthUpper	Integer	see 3.1.1
	fictitious	boolean	
Watercourse_A (Geometry type surface)	country	CountryCode	see 0
	<i>geographicalName</i>		see 3.1.2
	inspireId	Identifier	see 3.1.1
	beginLifespanVersion	Date Time	
	endLifespanVersion	Date Time	
	hydroId	HydroIdentifier	see 3.1.1
	persistence	HydrologicalPersistenceValue  * dry * ephemeral * intermittent * perennial	default value: perennial
	level	VerticalPositionValue  * onGroundSurface * suspendedOrElevated * underground	default value: onGroundSurface
	widthLower	Integer	see 3.1.1
	widthUpper	Integer	see 3.1.1

## 4 Reference Systems

### 4.1 Datum

European Terrestrial Reference System 1989 (ETRS89).

### 4.2 Coordinate reference system

Two-dimensional geodetic coordinates (latitude and longitude) based on ETRS89 and using the parameters of the GRS80 ellipsoid (EPSG code 4258).

For the display or editing of CRD data it might be suitable to apply a projection. The following projected coordinate systems are recommended:

- Plane coordinates using the ETRS89 Lambert Azimuthal Equal Area coordinate reference system (EPSG code 3035),
- Plane coordinates using the ETRS89 Lambert Conformal Conic coordinate reference system (EPSG code 3034).

The CRD GR uses ETRS89 UTM Zone 31 (EPSG code 3043).

### 4.3 Units of measure

As required by INSPIRE, all measurement values shall be expressed using SI units or non-SI units accepted for use with the International System of Units.

## 5 Data quality / Technical guidance

### 5.1 Positional Accuracy

Geometric quality: 5 – 15 m positional accuracy or better. The positional accuracy depends on the availability of the ancillary source data in each individual country.

### 5.2 Quality Requirements

The quality of the CRD product totally relies on the quality of the delivered national data. It is assumed that all national data producers have a data quality evaluation process in place for the national data production. CRD is based on data that is published by NMCAs and therefore fulfills the national quality requirements. For the production of CRD no detailed quality requirements are specified.

Some basic quality checks are applied to the data delivered by data providers. These quality checks are performed by the technical production team.

The aim is to produce a topologically correct spatial dataset.

### 5.3 Edge matching

CRD is a seamless dataset with data matched across international boundaries. It does not imply a representation of international boundaries.

## 6 Metadata

INSPIRE compliant metadata are provided in XML format.

## **7 Delivery**

The standard delivery format is ESRI File Geodatabase ArcGis 10.6.1.

CRD uses the character set UTF8.

## **8 Data capture**

### **8.1 Coverage**

The CRD GR covers the following regions:

- Belgium: Wallonie
- France: Grand Est
- Germany: Rheinland-Pfalz und Saarland
- Luxembourg: the whole country

### **8.2 Multiscale approach**

In general the product is considered to satisfy a map scale range 1:10 000 to 1:50 000. But keeping in mind that different countries have INSPIRE data at different scales in some cases depending on the national core reference INSPIRE compliant data availability large map scale 1:5 000 – 1:10 000 might be accommodated. The data is not generalized geometrically and the spatial resolution of the source data is not changed.

### **8.3 Selection criteria**

The selection of relevant features and attribute values relies on the work done by the NMCA's when preparing their INSPIRE data. No additional data capture rules apply.