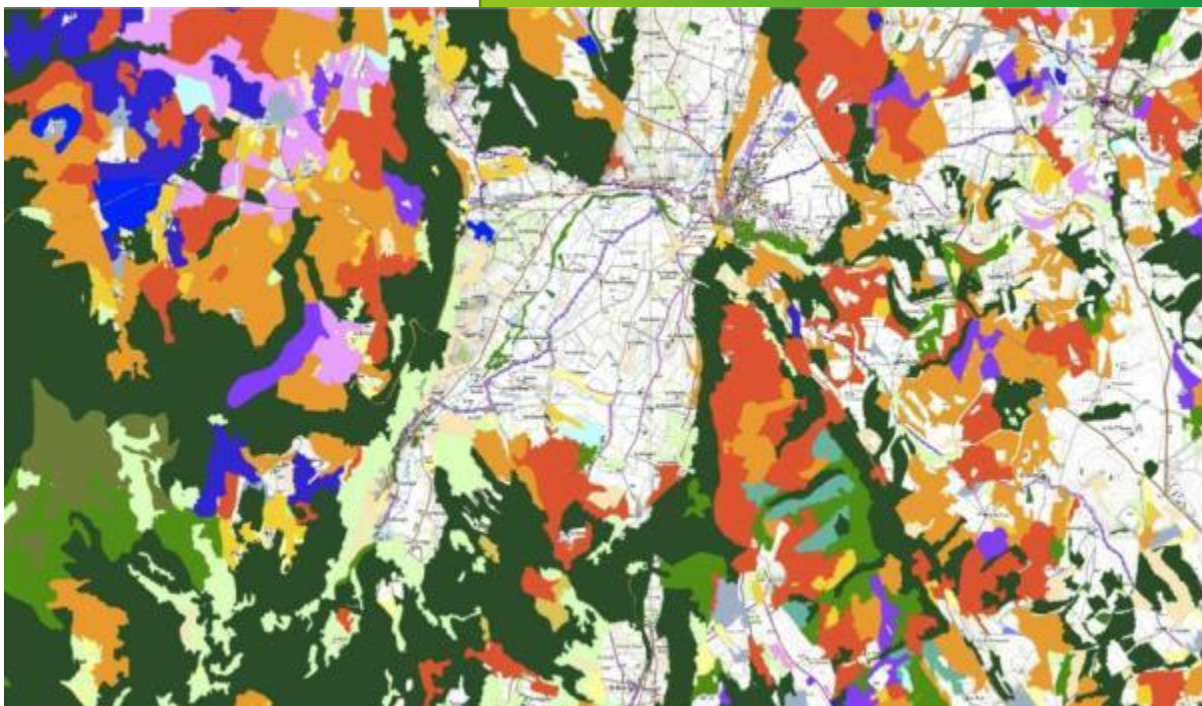# IGN

INSTITUT NATIONAL DE L'INFORMATION GÉOGRAPHIQUE ET FORESTIÈRE

CORINE LAND COVER 2ND GENERATION

Policy KEN 2-3 November 2017

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RATIONALE OF
CORINE LAND COVER 2ND GENERATION

First draft of technical specifications for the future CLC+ product

- Call for tender → EEA tasked the EAGLE Group for developing technical specifications
- Presented at Eionet NRC Land Cover meeting 2017, 9 - 10 October 2017

LULC products produced independently at the global, European, national and sub-national levels

- Such diversity leads to reduced interoperability, duplication of work, inefficient use of resources

CLC well established and successfully used

- Mainly at the pan-European level

Limitations that restrict its wider exploitation at the MS level and below

- Many MS have access to more detailed information from national programs
- MMU of CLC (25ha) is too coarse for fine details of the landscape at regional scales

USER REQUIREMENTS ANALYSIS FOR CORINE LAND COVER 2ND GENERATION

Supporting European policies

- Assist reporting obligations on European level on land use, land use change and forestry (LULUCF)

- Long-term climate mitigation

- Improving knowledge of ecosystems and their services in the EU

  - Member States will map ecosystems and their services in their national territory

What spatial resolution is required?

- Higher spatial resolution is required

  - MMU of 0.5 ha

  - Based on EO data with a spatial resolution of between 10 and 20 m

- A more detailed thematic characterisation and classification is required

  - Refinement of the current CLC nomenclature

- Temporal update:

  - from 6 years to 3 years in the short-term, and potentially to 1 year in the longer-term

THE 4 PRODUCTS OF
CORINE LAND COVER 2ND GENERATION

1. CLC-Backbone

- Vector format
- Large scale, spatially detailed (0.5 ha)
- Geometric backbone with limited land cover thematic detail on which to build other products

2. CLC-Core

- Grid database populated with a broad range of land cover, land use and ancillary data
- Geometric detail: 10*10 m or 100*100 m
- Information engine to deliver tailored thematic information.

3. CLC+

- Derived vector product from the CLC-Core and CLC-Backbone
- LULC monitoring product with improved spatial and thematic performance relative to CLC for reporting and assessment.

4. Existing CLC, or CLC-Legacy

- Geometric detail: 25 ha
- Well-established and agreed specification, consistent time series analysis

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CLC-Backbone → CLC-Core → CLC+ → CLC-Legacy

CLC-BACKBONE

Persistent features of the landscape

- Linear networks: roads, railways and rivers
- Stable reference geometry of main dividing polygons

Input EO data

- Sentinel-2: 10-20 m spatial resolution imagery
- VHR: 0.5 m spatial resolution imagery (if full European-wide coverage available in 2018)
- Sentinel-1: (SAR) imagery to enhance the thematic information

Ancillary data sets for delineating landscape objects

- Open Street Map – roads, railways
- Open Street Map – buildings

Input National Data

- Variety of products for land cover, land use, population, environmental variables
- Reference data on roads and buildings: not considered
- Member countries can be asked to populate the resulting geometries with national data following the prescribed classification system

CLC-CORE

CLC-Core as a "data container"

- Holding land monitoring information from different sources in a **grid-based information system**

Populating the database

- Copernicus Local Component data (Urban Atlas, N2000, Riparian Zones)
- Copernicus High Resolution Layers (Imperviousness, Forest, Grassland, Water & Wetness)
- CLC-Backbone
- In-situ data
- Upon agreement, Member States are invited to provide their national information, mainly on land use and agricultural themes
- ELS Basemap (not mentioned in CLC+ Spec) would have been interesting

CLC-CORE (CONT.)

Data modelling in CLC-Core

- A raster cell (pixel) is classified to a particular land cover class or single characteristic

- A grid cell is characterized by how much it contains of each land cover class

→ The grid is a more information-rich data model than the raster

→ CLC-Core integrating individual input data sets to create new value added information

→ Technically CLC-Core shall:

  - Allow for inclusion of Copernicus High Resolution Layers and local component products

  - Allow the best possible transformation of National datasets into CLC+ (capturing the wealth of MS knowledge)

- Grid structure will help to overcome the problem of different geometries

  - data converted to grid cells, differences in vector geometries lesser impact

CLC+

CLC+ as a realisation of CLC-Core

- Many land monitoring products with various nomenclatures may **derived from CLC-Core**

- Enabling to address various reporting obligations

  - Examples: EU Energy Union, Paris Agreement, Mapping and Assessment of Ecosystems and their Services, Land use, land use change and forestry (LULUCF)

- Information on Land Cover provided by the Copernicus Land Monitoring Service

- **Information on Land Use** could be provided by the **Member States** as their contribution to CLC-Core

COMPARISON MS DATA / OSM DATA AS ANCILLARY DATA FOR CLC+

	MS data	OSM data
Source	Authoritative	Crowd Sourcing
Road Nomenclature	Harmonised in ELS	Harmonised
Edge-Matching	Ongoing	Completed
INSPIRE Coverage	Roads and Railways shall be available 23 Nov. 2017	Outside INSPIRE
ELS Coverage	20 countries in ELS	All Europe
Licence	Harmonisation ongoing in ELS Harmonised evaluation and development licence in ELS	ODBL: May prevent enterprises to develop and sell value added services and products based on CLC+

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CONCLUSION

- ## Regrettable:

- OSM is viewed as a **reference**

- MS data are **not considered** as potential source for CLC-Backbone

- MS efforts to implement **INSPIRE and ELF** not sufficiently considered

- ## Desirable:

- The Member States which made the **effort to implement INSPIRE and ELF** on themes TN and BU can legitimately ask these data to be taken into account before OSM

- NMCAs to advance **harmonisation within ELS** in order to be more easily integrated by Copernicus