EARSC Position Paper

on

Usage of Open Street Map versus National Data for CORINE Land Cover plus (CLC+) – "CLC Backbone"

In the context of the evolution of the Copernicus Land Monitoring Service (CLMS), the European Environment Agency (EEA) is preparing a major upgrade of the European Land Cover/Land Use (LC/LU) information basis: the "2nd generation CORINE Land Cover (CLC) product". The EAGLE[1] group has proposed a conceptual design based on four complementary elements[2]. The first one of these, the "CLC-Backbone" is foreseen as a spatially detailed, EEA-39 wide inventory in vector format, providing a geometric spatial structure for landscape features with limited, but robust EO-based land cover thematic detail on which to build further elements. The second element will be the "CLC Core", a grid database repository populated with land cover/land use (LC/LU) and ancillary data. From the first two elements, a new LC/LU monitoring product shall be created as third element: the "CLC+". As a forth element, the "CLC Legacy" shall ensure time series continuity of the current "traditional" CLC product. DG GROW has expressed that industry shall have an initial role in the production of the CLC-Backbone, and an Open Call for Tender is expected in 2018.

The EO services value-adding sector has a strong interest in the evolution of the CLMS. Therefore we welcome the proposed CLC upgrade towards an independent, high-resolution, cross border coherent, up-to-date information basis for the EEA-39 area, and expect industry to become a core actor for CLC-Backbone production and further activities towards CLC+. A wide range of new commercial as well as scientific and academic applications are expected to emerge from the availability of such state-of-the-art, free and open LC/LU dataset.

In particular, the CLC-Backbone will address a baseline object delineation, building upon and complementing the coverage of the already available CLMS Local Component products (currently 1/3 of EEA-39). CLC-Backbone will resemble persistent features ('hard bones', i.e. settlements or linear networks such as roads, railways and rivers) as well as a subdivision of more dynamic features using multi-temporal Sentinel-2 data ('soft bones'). By definition, in order to meet the standard requirements for the CLMS products (high thematic and geometric quality, comparability of spatial detail and thematic content across borders within EEA-39, temporal consistency in defined time steps), the selection of relevant input data for establishing the 'hard bones' is crucial.

In that sense, the usage of INSPIRE compliant Member States' reference data for that purpose, as proposed by *EuroGeographics* in an open letter to the Director-Generals of the EC in December 2017, is seen critical, as the exact role and capabilities of such data remains unclear. It is acknowledged and very much welcomed that Member States made significant efforts to implement the INSPIRE Directive. In operational pan-European implementations of the CLMS so far, however, the actual use of national in-situ data has been limited to supporting the interpretation of difficult classes and for quality checks. Direct large-scale integration of national in-situ data into pan-European CLMS products has so far not been feasible, as Member States' relevant reference data are often either not fully coherent across borders, have varying recording times, are not regularly updated, show significant coverage gaps or have different thematic contents and spatial resolutions. Moreover, there are still issues in several countries in terms of free data accessibility and licensing conditions.

The above issues have been experienced by the EO value adding industry in the past years with national geodata made available via national geodata portals, and also with those being offered additionally via CORDA (Copernicus Reference Data Access). CORDA serves as a single-entry point for finding and accessing many international and national geospatial reference data across Europe specifically for Copernicus service implementation. Although these datasets have proven valuable for supporting several aspects

[1] EIONET Action Group on Land cover in Europe

[2] https://land.copernicus.eu/user-corner/technical-library/technical-specifications-for-clc-v3

of the CLMS production, most of the datasets listed on CORDA exhibit a high heterogeneity in terms of the above listed criteria and are not accessible on a full, free and open basis, preventing direct integration.

In order to make such reference data usable in a cost-efficient manner for CLMS productions, a European-wide data harmonization as foreseen when the INSPIRE implementation will be finalised, would be indispensable. We are convinced that only such pan-European coordinated effort can ensure that technical specifications in terms of geometry, consistency and thematic content would match with the specifications of the CLMS products.

Operational production experience in previous CLMS mappings has confirmed that quick access to reliable data is key to support the mapping at various stages of the production process. Thus, in the current absence of coherent national data on a pan-European level, the use of proven production processes supported by alternative datasets that do fulfil key requirements, such as Open Street Map (OSM) data, is encouraged. Several studies have compared OSM data with authoritative datasets and showed that they are increasingly gaining in quality, especially in densely populated urban areas where a high number of contributors are active (see e.g. Brovelli et al. (2016); Ludwig et al. (2011), Zheng (2014)). OSM data are consistently available for all Member States with proven thematic quality at high spatial resolution under a fully open license (ODBL – Open DataBase License), are up-to-date and have a full-time history. Therefore it can be deduced that through integration of OSM with existing Copernicus data (CLMS products and Sentinel imagery), 'hard bones' can be efficiently established without leading to significant product inconsistencies along national borders.

As a conclusion, the EO downstream sector strongly suggests for the next generation of European Land Monitoring products the use of proven production processes building upon the CLMS portfolio and any full European coverage ancillary data that are fit for purpose. On the short term, open source data fulfil this need, whereas it is expected that on the longer term (upon finalisation of INSPIRE) national in-situ data will become available and accessible as consistent pan-European coverages in appropriate quality. Therefore EARSC supports the approach as proposed by EAGLE in November 2017.

References:

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