Bundesamt für
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Hydro-layer for the Grand Region

Content

1 Purpose

The aim of this task was to create a continuous hydro-layer for the Grand Region for the GeoConnectGR project. This hydro-layer is based on the CRD (Core Reference Data) data model. CRD is a simplified INSPIRE data model developed by EuroGeographics.

The task was carried out by the Federal Agency for Cartography and Geodesy (BKG), Germany. Main point of contact:

- For EuroGeographics:

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- For BKG:

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2 Source data

2.1 National hydro data

2.1.1 Belgium

Data was provided in CRD data model as ESRI file geodatabase. Date of data provision: 17.9.2018.

2.1.2 France

Data was provided in CRD data model as ESRI file geodatabase. Date of data provision: 14.9.2018.

2.1.3 Luxembourg

Data was provided in INSPIRE data model as gml file. Date of data provision: 11.4.2019.

2.1.4 Rhineland-Palatinate

Data was provided in INSPIRE data model as gml file. Date of data provision: 4.7.2019.

2.1.5 Saarland

Data was provided in INSPIRE data model as gml file. Date of data provision: 30.7.2019 and 26.8.2019.

2.2 International boundaries

The international boundaries were taken from the national data provisions for the following borders:

- Belgium – Rhineland-Palatinate / Germany; including also connecting features. The Connecting feature points were slightly moved to match vertices of the boundary line.

All other international boundaries were taken from a EuroGeographics dataset, which contains the boundaries provided and agreed by the National Mapping and Cadastre Authorities (NMCAs). This dataset has been established in the EuroGeographics projects ELF and Open ELS.

A special case is Belgium – Luxembourg, where the source is in fact the EuroGeographics dataset SBE (State Boundaries of Europe). This data was provided by the General Administration of Patrimonial Documentation / Belgium. This boundary is a cadastral boundary – it's different from the topographic representations in the delivered source data of Belgium and Luxembourg. But both national topographic boundaries are different as well. The matching to the cadastral boundary (from SBE) is a first approach. The final representation of this boundary has to be agreed between Belgium and Luxembourg.

Another special case is the border between Germany and Luxembourg. The areal watercourses Our, Sauer / Sûre and Mosel / Moselle are a condominium between both countries. For edge matching purpose, the fictitious watercourse axis have been used as matching line.

2.3 Outlines of the Grand Region

The outer limits of the Gran Region have been taken from the EuroGeographics product EuroBoundaryMap (EBM) v13. This includes:

- For Belgium: Région Wallone
- For France: Départements Meurthe-et-Moselle, Meuse, Moselle, Vosges
- Grand-Duché Luxembourg
- For Germany: Bundesländer Rheinland-Pfalz, Saarland

3 Schema transformation

All data has been transformed into the CRD data model, which is a simplified INSPIRE data model. This concerns the feature types Watercourse_L (linear watercourses), Watercourse_A (areal watercourses), StandingWaters (lakes and reservoirs) and the data type GeographicalName.

Few attributes have been adapted where the values didn't match the attribute domains (e.g. 'language' changed from 'deu' to 'ger').

Further adaptions have not been applied. There are options for corrections of some systematic bugs, e.g.:

- Attribute 'fictious' of feature type Watercourse_L can be corrected based on Watercourse_A and StandingWaters,
- Empty attributes can be filled with the default values,
- Missing geographical names of Watercourse_A can be adopted from Watercourse_L (or vice versa).

Instead of corrections in CRD, the quality of the source datasets should be improved.

4 Edge matching

All data has been matched along the international boundaries to realise a harmonised cross-border dataset.

The concept of connecting features, described in EuroGeographics' guideline documents, has been applied. The process was carried out semi-automatic:

- Automatic analysis of cross-border features
- Manual improvement of the analysis results
- Automatic creation of connecting features
- Automatic edge matching
- Manual quality check of edge matching results

The edge matching was rather simple for boundaries where the neighboring countries have already discussed and clarified the matching issue, e.g. Belgium – Rhineland-Palatinate.

For the other boundaries a number of substantial changes have been applied to reach a cross-border harmonisation. This includes for instance:

- Skipping all features outside the national responsibility.
- Skipping of small feature which have no matching feature on the other side of the border,
- Proper splitting of features along the border (this causes new features with artificial IDs),
- Watercourse lines located on the border are presented as single features without any overlay.

5 Result

The resulting hydro-layer is provided as ESRI Geodatabase. The used Coordinate Reference System (CRS) is ETRS89 UTM Zone 31 – Transverse Mercator (EPSG code 3043), as requested by GeoConnectGR.

The geodatabase contains a continuous, cross-border hydro-layer for the Grand Region as well as all used source data.

6 Open Issues

BKG is responsible only for the edge matching of the geometries along the international borders, including the correct links between the border features and the names table.

During edge matching some problems were encountered that could only be solved by a pragmatic approach (for example: country A delivered the watercourse on the boundary as line feature, country B delivered the same watercourse as polygon feature but only half of the watercourse). BKG did not ask the data providers for advice or approval of the applied changes. The project partners will have to evaluate the edge matching result.

Any errors or missing attribute values inside the countries were not corrected or added, as written above. This applies especially for names. For future updates of the GeoConnectGR dataset it would be desirable to include more attributes and attribute values.

BKG did not harmonise the data semantically. Any semantical differences in the national data sets were not changed and are still present in the dataset. Semantical harmonisation should be investigated and implemented in future in order to achieve a really harmonised data set.

BKG did not harmonise the data concerning the selection criteria. This issue should be discussed for future updates.