

BEV-KM go Open Source

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Abstract:

The most relevant Cartographic Models (Kartographische Modelle, abbreviated as KM) of the Austrian Federal Office of Metrology and Surveying/Bundesamt für Eich- und Vermessungswesen (BEV) exist in the scales 1:500.000 (KM500), 1:250.000 (KM250) and 1:50.000 (KM50). While the KM500 and KM250 are already available as nationwide (+ sections of neighbouring countries) vector-datasets, the KM50 is currently being built-up in vector-format using automated generalization-processes (s. contribution of G. Felfernig).

Following the European Open Data Directive (<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32019L1024>) the national cartographic products have to be openly provided in terms of FAIR (Findable, Accessible, Interoperable, Reusable; <https://www.go-fair.org/fair-principles/>). This means that cartographic vector products become downloadable in their geospatial format and need to be visualized via spatial data services. Especially the visualization via standardized mapservers seems not to match with the styling procedure of the printing product. Therefore, these first steps of evaluation have been done.

The KM are produced in Oracle's Spatial Databases and ESRI File Geodatabases in ArcGIS Desktop including the extensions ProSuite and Production Mapping. The datasets can be downloaded from the BEV-Geodata Portal as raster tiles or ESRI Shapefiles (without symbology; <https://data.bev.gv.at/>). To offer the full benefit of vector data as well as taking account of Open Data types the project "gdb2gpkg2GeoServer" was initialized. The first aim of the project is to migrate the proprietary geodatabases to GeoPackages including styles and annotations. The second aim is the generation of Styled Layer Descriptor (SLD)-Files that can be used in GeoServer to distribute the data via web services.

In a first attempt the KM500 was converted. The KM500 is maintained in an ESRI File Geodatabase (.gdb) using ArcMap (.mxd). The major challenge was not to transform the geometry features themselves (simple feature types: points, polylines, polygons), but to keep the styling information comprising annotations, representations, symbol levels and the reference scale. Because many concepts of File Geodatabases (like annotation feature classes or representations) do not exist within GeoPackages, bigger schema changes had to be applied. E.g., annotation feature classes were transformed to polygons or the street- and railway-layers had to be summarized to maintain the correct symbol level-information. In a next step the symbology was converted using a workaround via ArcGIS Pro (.aprx) and the QGIS-Plugin qlyrx (Figure 1, 1–2; <https://github.com/arc2qgis/qlyrx>). The style is saved in the .qgz and the .gpkg itself in the 'layer styles' table. From this environment the SLD-Files are exported for the visualization in GeoServer mainly applying the Plugin GeoCat Bridge for QGIS (Figure 1, 2–3; <https://github.com/GeoCat/qgis-bridge-plugin>). Slight manual modifications, e.g., regarding the Map Units, the dashed, opacity or displacement had to be applied manually.

While the open-source provision of national spatial datasets itself is nothing new (respectively the provision in GeoPackage-Format), different approaches regarding the migration process were developed. E.g., the maintenance of the reference scale was one important aspect; a concept that is not existing one-to-one in QGIS and could be achieved by defining the symbology size in Map units. Also, the transformation of the annotation features to polygons can be considered a new approach and helped to preserve the initial appearance.



Figure 1. Transformation of the KM500. 1–2) The .gdb and .mxd are converted to .gpkg and .qgz including styles via Python-Script (schema-transformation) and ArcGIS Pro + QGIS-Plugins (stylings). 2–3) From the .gpkg and the .qgz SLD-Files are generated for usage in GeoServer.

An overview of the visualised GeoPackage in QGIS is given in Figure 2. No significant differences between the KM500 maintained as .gdb/.mxd or .gpkg/.qgz can be seen after the conversion. The presentation will summarize the aims of the project, the most important transformation steps and will give an outlook to the migration of the other Cartographic Models (KM250, KM50).

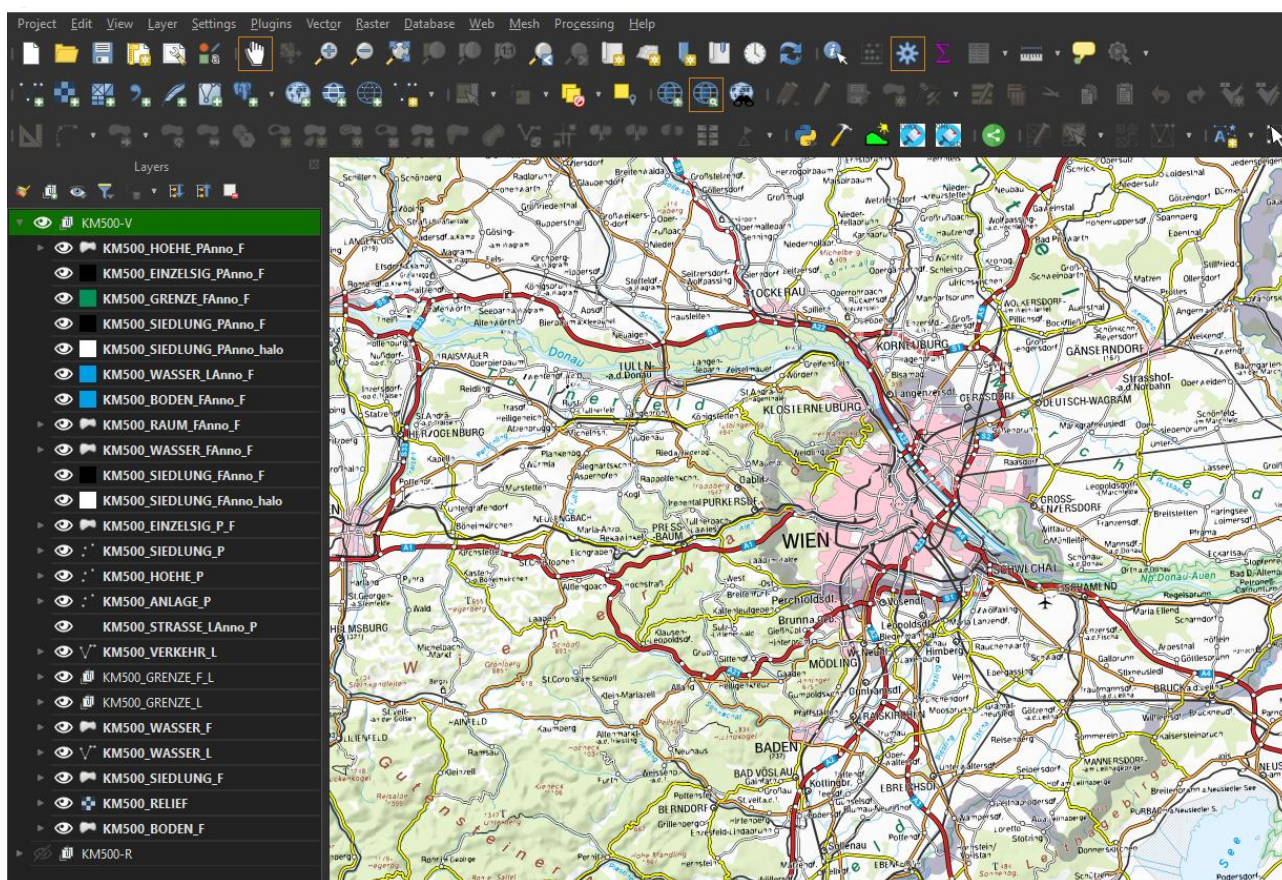


Figure 2. The KM500 in QGIS. The data including the styling are stored in a GeoPackage.