



Sharing and Migrating GIS Projects

with OGC GeoPackage

Joana Simões ¹ Pirmin Kalberer ² Paul van Genuchten ¹
August 17, 2017

¹ Geocat bv

² Sourcepole

Motivation

Let us Picture some Scenarios...



Sharing QGIS Projects

- *Leno has been creating a QGIS project, assembling information about his favorite holiday spot.*
- *Now he wants to share this project with his neighbor, which does **not** have an Internet connection.*



What if he could just pop the project in an USB stick?



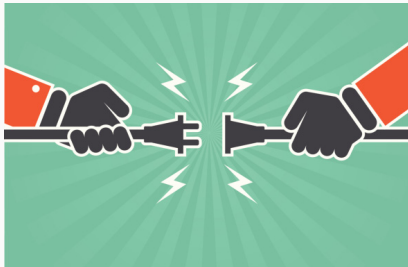
Migrating GIS Projects

- *At his daytime job, Leno has been developing a project in ArcGIS.*
- *He would like to share his project with a different office, but they only work with FOSS4G.*



Migrating GIS Projects (cont.)

What if he could export the project in ArcGIS and then read it in QGIS?



How can we support these scenarios?

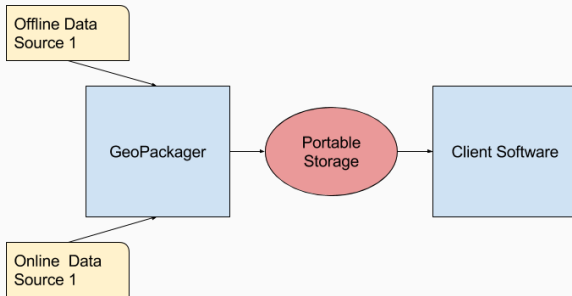


OGC Geopackage

The Geopackage Standard

OGC **Geopackage**:

- Interoperable across a range of environments, in particular mobile devices operating in offline scenarios.
- SQLite database.
- Extensions.




Registered Extensions:

- Non-Linear Geometry Types.
- RTree Spatial Indexes.
- ...

http://www.geopackage.org/spec/#registered_extensions

GeoPackage Extensions (cont.)

3rd party extension registry



OGC[®]
Making location count.

GeoPackage Extensions

This page lists GeoPackage extensions that are not currently part of the GeoPackage Encoding Standard developed outside of OGC. It is often preferable to use an existing extension (even if it is proprietary) of your own. Extensions that have widespread adoption will be considered for OGC approval.

Related Tables	This extension provides a mechanism for associating tables with existing feature or attribute tables. Things, it can be used to establish a many-to-many relationship between features and multimedia files. Consult and the plan is to test it during an upcoming OGC Interoperability Experiment.
OWS Context	The main goal of the extension is to store context and styling of a mapping project as part of a GeoPackage. The extension aims at similar use cases as presented in The USGS GeoPackage Styling . The approach is a bit different.
Feature Tile Link	This extension creates a link between a feature and a tile table. A tile table containing tiles that represent can be linked to the feature table. The link enables feature queries when dealing with tiles representing. This extension defines a SQLite version agnostic way to index user feature table geometries by the searches. Mobile implementations, including Android and iOS, use earlier versions of SQLite and its implementation. Each geometry in a feature table is indexed by its geometry id and x, y, z, and m values be queried for fast retrieval of only geometries overlapping a desired envelope bounds.
Geometry Index	Support for spatial data (i.e. SQLite tables/views without a geometry column), potentially with associated GDAL 2.0 and GDAL 2.1, before the introduction of the 'attributes' data_type of GeoPackage v1.2. It be used by default instead.
Aspatial Support (Legacy)	Defines the rules for encoding and storing 16-bit and 32-bit tiled regular grid coverages composed of elevation. This extension is currently under revision and this document is scheduled to be updated. Enables encoding of additional user-defined geometry types in ExtendedGeoPackageBinary format. Removed from GeoPackage 1.2 due to interoperability reasons.
Tiled Gridded Elevation Data Extension (Draft)	Geometry type triggers prevent the storage of geometries of types that are not assignable from the geometry columns table in the geometry columns of the specified tables. Removed from GeoPackage 1.2.
User Defined Geometry Types (Deprecated)	
Geometry Type Triggers (Deprecated)	

<http://www.geopackage.org/extensions.html>

The Qgpkg Plugin

The **qgpkg** QGIS plugin implements a GeoPackage extension to store QGIS mapping information in a GeoPackage database file:

- It was started on github, by Cédric Christen and Pirmin Kalberer (Sourcepole).
- Initially it was only aimed at supporting scenario 1.
- Later it was forked by GeoCat, which envisioned supporting scenario 2.

Description

The plugin adds buttons in QGIS, to read and write an extended geopackage.



- It packages **self-contained map projects**, including data, style, and related resources.

Description

The plugin adds buttons in QGIS, to read and write an extended geopackage.



- It packages **self-contained map projects**, including data, style, and related resources.
- It features a command line tool to convert to/from QGIS projects.

Description

The plugin adds buttons in QGIS, to read and write an extended geopackage.



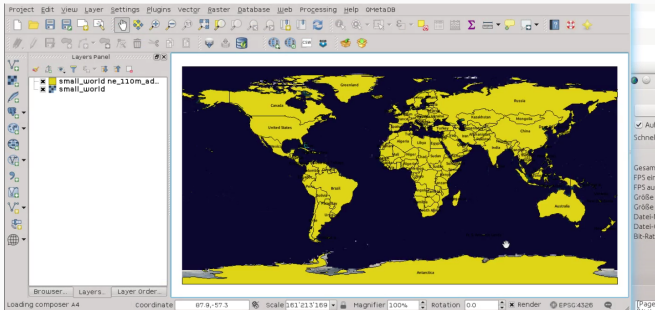
- It packages **self-contained map projects**, including data, style, and related resources.
- It features a command line tool to convert to/from QGIS projects.
- It supports the **qgis** and **ows** geopackage extensions.

The Qgis Extension

- The goal is to enable users to share their QGIS projects.
- Stores a QGIS project file in one of the extension tables.



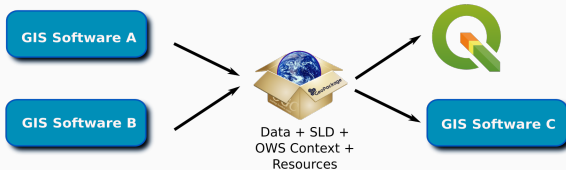
Demo



<https://www.youtube.com/watch?v=Jwi9IK6YeDs&feature=youtu.be>

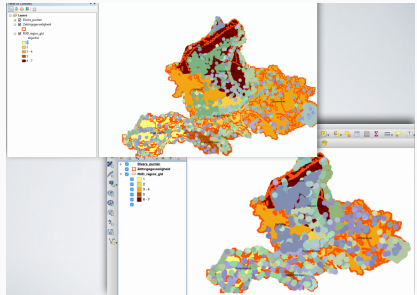
The OWS Extension

- The goal is to enable interoperability with other GIS software.
- It is completely standards based.



GeoCat Bridge is an ArcGIS extension which supports migration to FOSS4G.

- It encodes an ESRI project in a ows extended geopackage.
- This enables us to decode it in QGIS, using the qgpkg plugin.





<https://www.youtube.com/watch?v=CM9LSnMUfQU>

Current State & Future Developments

- The pull request was merged on July 2017.
- The new version of the plugin was just released on the QGIS repository.

- The pull request was merged on July 2017.
- The new version of the plugin was just released on the QGIS repository.
- We still miss writing support for the ows geopackage extension.

- The pull request was merged on July 2017.
- The new version of the plugin was just released on the QGIS repository.
- We still miss writing support for the ows geopackage extension.
- The cli is only supported for the qgis geopackage extension.

- The pull request was merged on July 2017.
- The new version of the plugin was just released on the QGIS repository.
- We still miss writing support for the ows geopackage extension.
- The cli is only supported for the qgis geopackage extension.
- QGIS grant application: extend the QGIS Resource sharing plugin with the extended geopackage.

References

- <http://www.geopackage.org/>
- <https://github.com/pka/qgpkg>
- <http://www.geopackage.org/extensions.html>
- https://github.com/pka/qgpkg/blob/master/qgis_geopackage_extension.md
- https://github.com/pka/qgpkg/blob/master/owc_geopackage_extension.md
- <http://geopackage.blogspot.ch/2017/07/lets-make-geopackage-extensions-registry.html>
- <https://www.geocat.net/extending-geopackage-to-include-projectstyling-information/>
- <https://www.geocat.net/announcing-the-extended-geopackage-qgis-plugin/>

Thank you

Thank You

