Introduction to QGIS Swedigarch Geotools plugin workflows

Swedigarch Geotools is a QGIS plugin for working with data produced with the program Intrasis to export data to open formats (GPKG and CSV) and work with the GPKG in QGIS. The basic functions and how to export data from an Intrasis PostgreSQL/PostGIS server are described in the <u>GitHub wiki</u>. This tutorial is an introduction to QGIS workflow as a suggested way to explore the content of a GPKG with a few different techniques to make it easier to understand and access the information, based on an example GPKG available from GitHub.

Start QGIS and add the Geopackage <u>uv2010041.gpkg</u>. While not necessary, it is can be good to add all the layers to a group to keep track of the layers.

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attributes	NoGeometry (126259)	
features	NoGeometry (5244)	
object_relations	NoGeometry (6597)	
objects	NoGeometry (8312)	
° Point	PointZM (454)	
Polygon	MultiPolygonZM (4746)	
✓ Polyline	MultiLineStringZM (44)	
° project_information	PointZM (1)	
Select All Deselect All		
▼ Options		
Add layers to a group		
Show system and internal tables		
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A default styling of the layers is stored in the gpkg and should automatically be applied to the geometry layers. Technically, these are layer views from the table features, but QGIS interpret these a regular geometry layers.



General information (metadata) is available in the point layer project information. Open the attribute table, and change to the form view.

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	Lst Dnr	431-1832-10		
	Raä Dnr	423-00781-2010		
	Inventarienummer	MMA48		
	Arkivnummer MK	S02:164		
	U-nummer	3467		
	Projektkod	11744		
	Projektnamn	Malmö, Lindängelund 1, SU		
	Projektledare	Anne Carlie		
	Uppdragsgivare	Malmö Stad		
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From the information we can identify the report for the excavation: https://pub.raa.se/visa/dokumentation/1239ad7f-1d5c-42c6-bd08-afc66b05d941

Comparing the GIS layers to the plans in the report, we can confirm that is it the correct report.

Uncheck the layers box for the point and polyline layers so we only see the polygons in the QGIS map window. To start exploring the content we can apply a few filters. Right-click the *Polygon* layer and *Duplicate Layer* so that we get a copy.

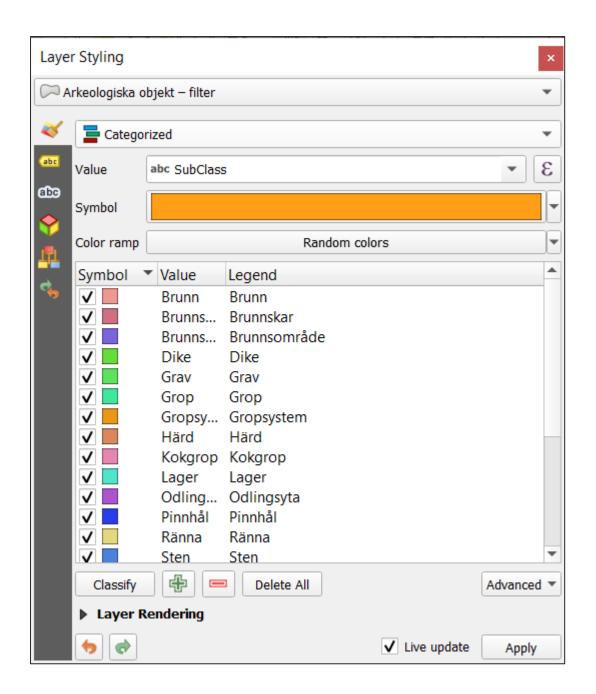
Right-click the new copy and Rename Layer to "Arkeologiska objekt - filter".

Right-click the layer Arkeologiska objekt – filter and click Filter.

Set a filter as: "Class" = 'Arkeologiskt objekt' and click OK.

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Open *Layer Styling* for *Arkeologiska objekt – filter* and, with a *Categorized* type of styling, set *Value* to *SubClass*, click *Classify* and *OK* to the question about deleting existing classification.



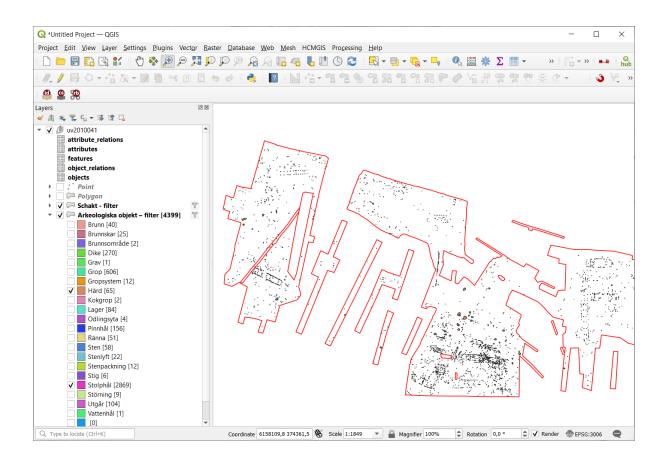
In the original *Polygon* layer, uncheck the box for the item *Arkeologiskt object (Default symbol)* so these are not visible in the view.

To make the view clearer, we can set another filter for trenches. Duplicate the original *Polygon* layer again, and rename this copy to "**Schakt – filter**".

Set a filter for this layer as: "SubClass" = 'Schakt'

Uncheck the box for the original *Polygon* layer so we only see the filtered layers. There should be no need to change the layer styling for the *Schakt* – *filter* layer.

You can explore the content of the layer *Arkeologiska objekt – filter* more by showing the feature count for the layer from the right-click menu from the layer. You can also right-click one of the items in the list, and *Hide All Items*, so you easily can set the visibility to the *SubClass* items you wish to see.



Not all objects in the database are represented by a geometry. A house, for example, can be constituted of a number of postholes that has been grouped together to an object, the house. To work with these we can use the plugin *Swedigarch Geotools*, available from the *Plugins Manager*.

In the Swedigarch Geotools toolbar, click the Class/SubClass Browser.



button to open the tool Intrasis

Set *Class* (the first menu) to *Arkeologiskt objekt*, and *SubClass* (the second menu) to *Stolphus*. Click *Load table*.

This loads 22 houses with all the attributes associated to this *SubClass*. These attributes come from the table *attributes*, joined to the objects through the table *attribute_relations*.

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11	10432	Hus 10	Arkeologiskt	Stolphus	True	Skärslev	50
10	10613	Hus 9	Arkeologiskt	Stolphus	True	Spade	15
12	11041	Hus 11	Arkeologiskt	Stolphus	True	Spade	50
15	11131	Hus 14	Arkeologiskt	Stolphus	True	Spade	50
16	11487	Hus 15	Arkeologiskt	Stolphus	True	Spade	30
3	11488	Hus 2	Arkeologiskt	Stolphus	True	Skärslev	100
4	11489	Hus 3	Arkeologiskt	Stolphus	True	Skärslev	100
5	11490	Hus 4	Arkeologiskt	Stolphus	True	Skärslev	100
6	11491	Hus 5	Arkeologiskt	Stolphus	True	Skärslev	100
7	11492	Hus 6	Arkeologiskt	Stolphus	True	Skärslev	100
9	11493	Hus 7	Arkeologiskt	Stolphus	True	Skärslev	10
13	11494	Hus 12	Arkeologiskt	Stolphus	True	Skärslev	50 🗸
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Click *Create Layer* and close the tool.

Since none of the objects has a geometry, this only produces a table, named after the criteria used for *Class* and *SubClass*.

Open the *Attribute Table* for this table, and again use the form view. Scroll through the objects to see what information that has been recorded.

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Close the *Attribute Table*.

To see the geometries associated to each house we first need to select them in the *object* table. Select this and use the tool *Select Features Through an Expression*, with the query:

"SubClass" = 'Stolphus'

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This should select 22 objects. Open the tool — Intrasis Relationship Browser. All selected objects are available from the menu, and browsing through these also shows their related objects; Closest parents and Children.

Hus 1 has no parents but a number of postholes and environmental samples associated as children. We can create layers of these either as flattened, hierarchical or both. To compare the differences, check both boxes and click *Create Layer from children*.

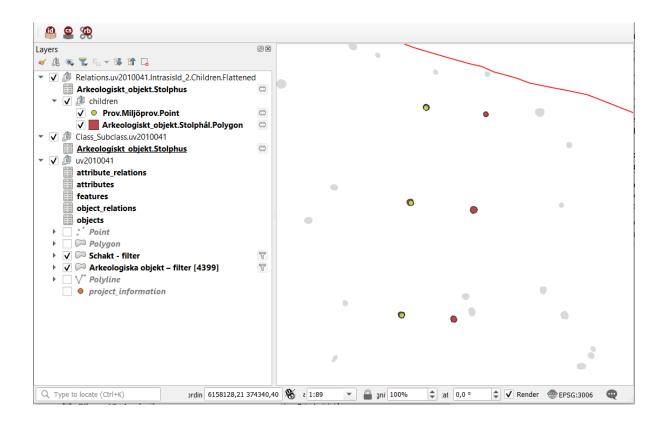
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The next dialog allows you to remove nodes if you wish to limit the result. Click OK to keep all for now.

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We get two new groups of layers. In the hierarchical version, we can see which object each sample (*miljöprov*) is related to. In the flattened version, all samples are merged to one point layer. This is enough for now, so remove the hierarchical group.

Zoom to the group, and make sure you can distinguish the postholes of the house to those in the layer *Arkeologiska objekt – filter* by setting appropriate styling to the layers. We can see that the points representing the samples are from the eastern row of postholes. You can also check the attribute table of the layers.



The group also has a new table *Arkeologiskt_objekt.Stolphus* for this house. Open the *Attribute Table* of *Arkeologiskt_objekt.Stolphus* that we created before. Compare these, and note that the information is slightly different. The CS tool structures the table as it was created in Intrasis, while the RB tool sorts the fields in alphabetical order. The RB tool also gives a NULL value for empty fields.

Compare the information of Hus 1 with the <u>excavation report</u>. The first appendix (*Bilaga 1*) has information about the interpretation of the houses, and page 9 has an overview of house 1. This description is only partly the same as we have in the GIS data. It is important to note that there is only temporary interpretation (at best) in the documentation, made during the excavation phase, and this often changes during the post-excavation phase as results of analysis etc becomes available. For the final interpretation and full description, we need to refer to the published report.