

QGIS is dead! Long live QGIS!

The very best new features of QGIS 3.x

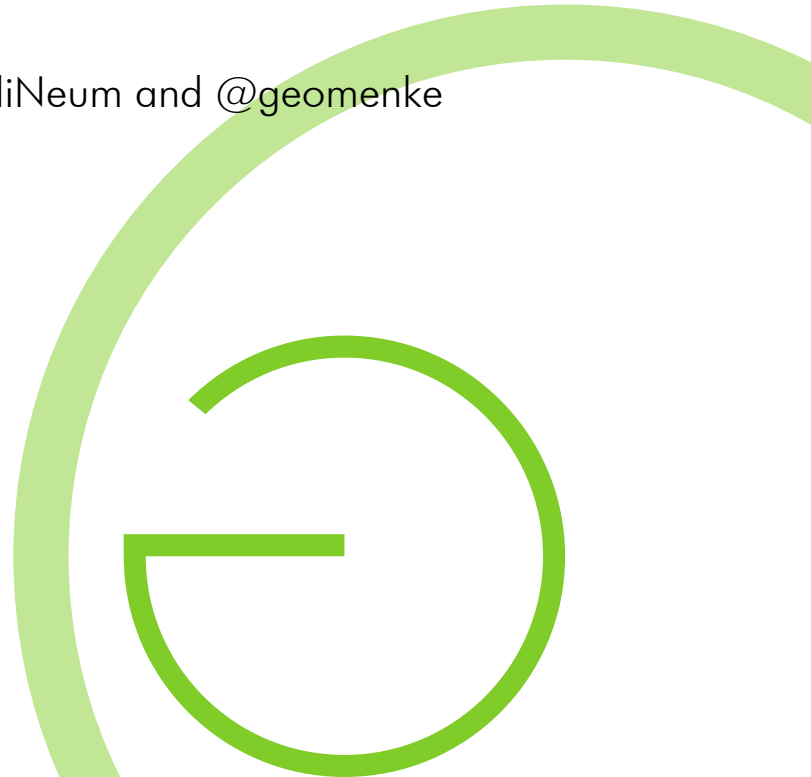
Based on previous presentations by @AndiNeum and @geomenke

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 @mbernasocchi
marco@opengis.ch

OPENGIS.ch

MOBILE · QGIS · POSTGIS



@mbernasocchi?

- QGIS Co-Chair
- QGIS on Android dad
- OPENGIS.ch director

OPENGIS.ch

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OPENGIS.ch LLC

Opensource geospatial experts at your doorsteps

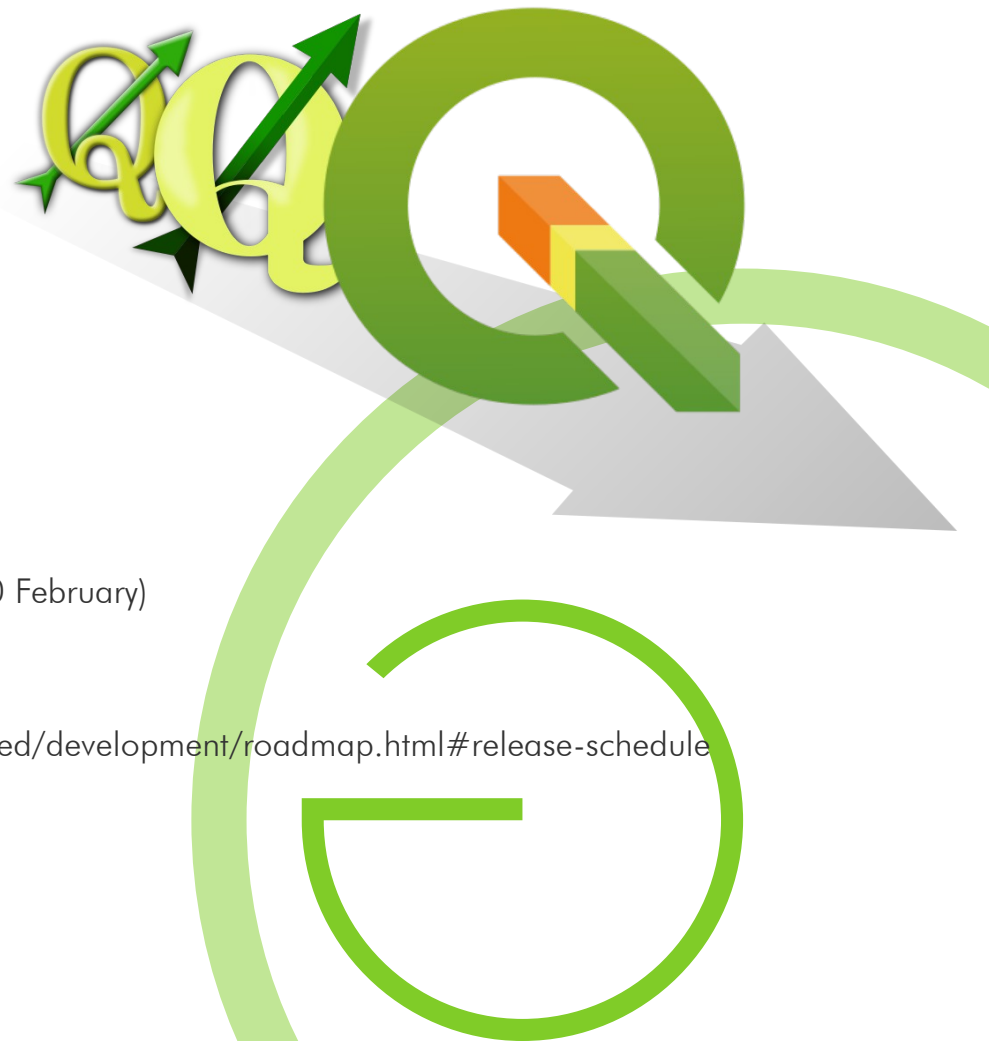


OPENGIS.ch

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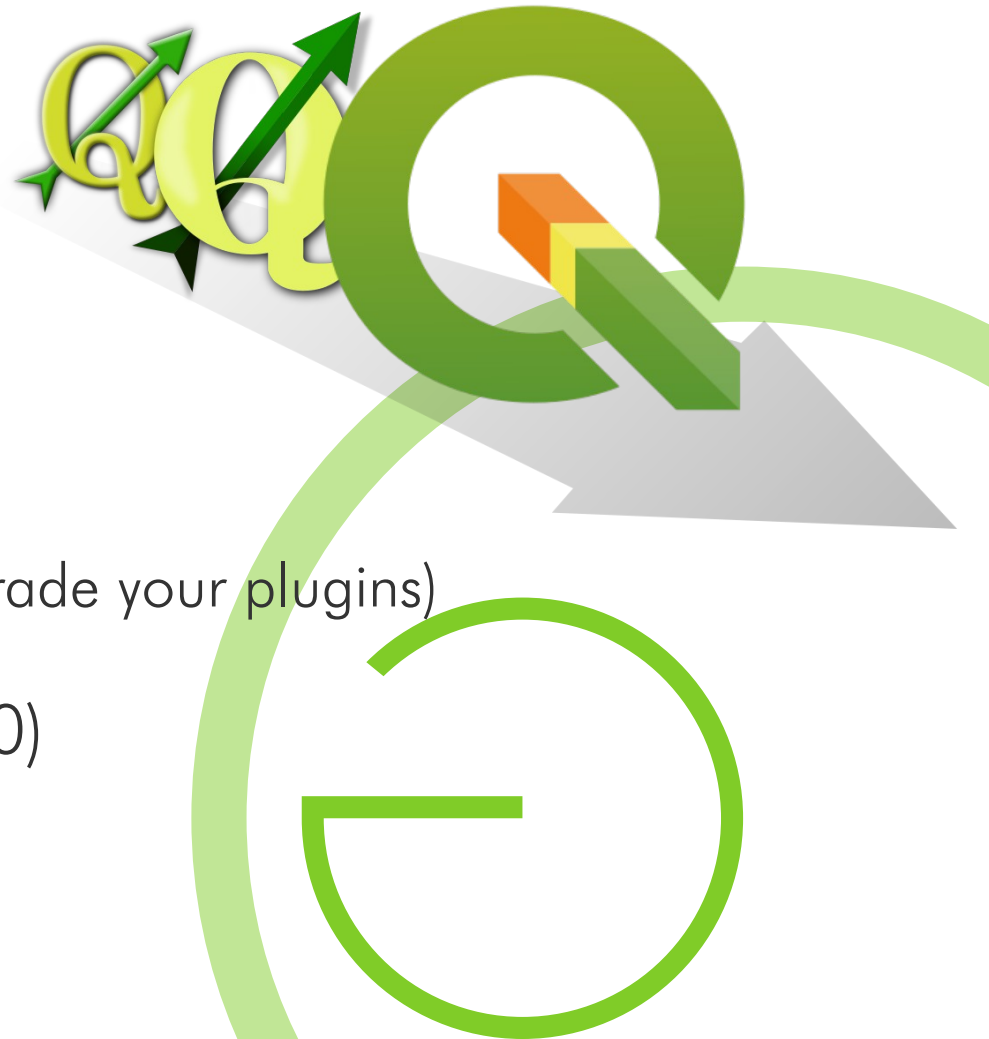
QGIS Evolution

- QGIS 0.0.1: 2002
- QGIS 1.0 "Kore": 2009
- QGIS 2.0 "Dufour": 2013
- QGIS 2.18 "Las Palmas": 2016 (October)
- QGIS 3.0 "Girona": 2018 (February)
- QGIS 3.4 "Madeira" (LTR version): 2018 (October)
- QGIS 3.6 "Noosa": 2019 (February)
- QGIS 3.8 "Zanzibar": 2019 (June)
- QGIS 3.10 "A Coruña (?)": 2019 (October) - LTR (2020 February)
- QGIS road map: <https://www.qgis.org/en/site/getinvolved/development/roadmap.html#release-schedule>



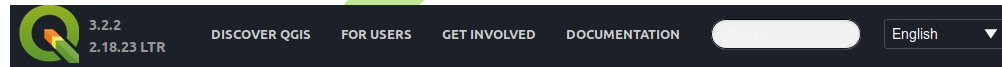
2.18 LTR → 3.4 LTR

- 2.18 End of life
 - No more releases
 - No more bugfixes
- 3.4.8 Current LTR
 - Time to upgrade (and upgrade your plugins)
- 3.10.4 Next LTR (21.02.20)



QGIS visual changelogs

- When you install a new QGIS version, always have a look at the visual changelogs:
- <https://www.qgis.org/en/site/forusers/visualchangelogs.html>



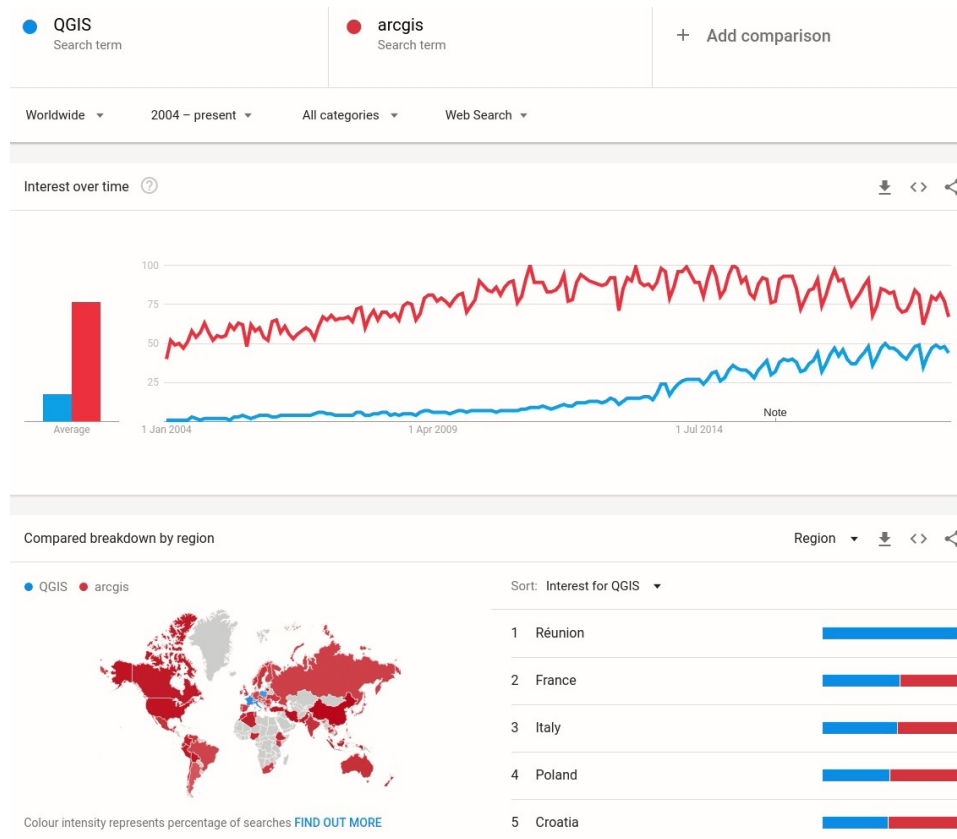
Feature: FULL screen Map via Ctrl-Shift-Tab

Besides Ctrl-Tab you can now do Ctrl-Shift-Tab, which will show you the Map and ONLY the Map, no more toolbars or buttons (or even without Window Title, in combination with F11). Great for Full Screen Map projection via Beamer or on Big Screens. You can still zoom and pan! (Based on work of Mathieu Pellerin)



This feature was developed by Richard Duivenvoorde

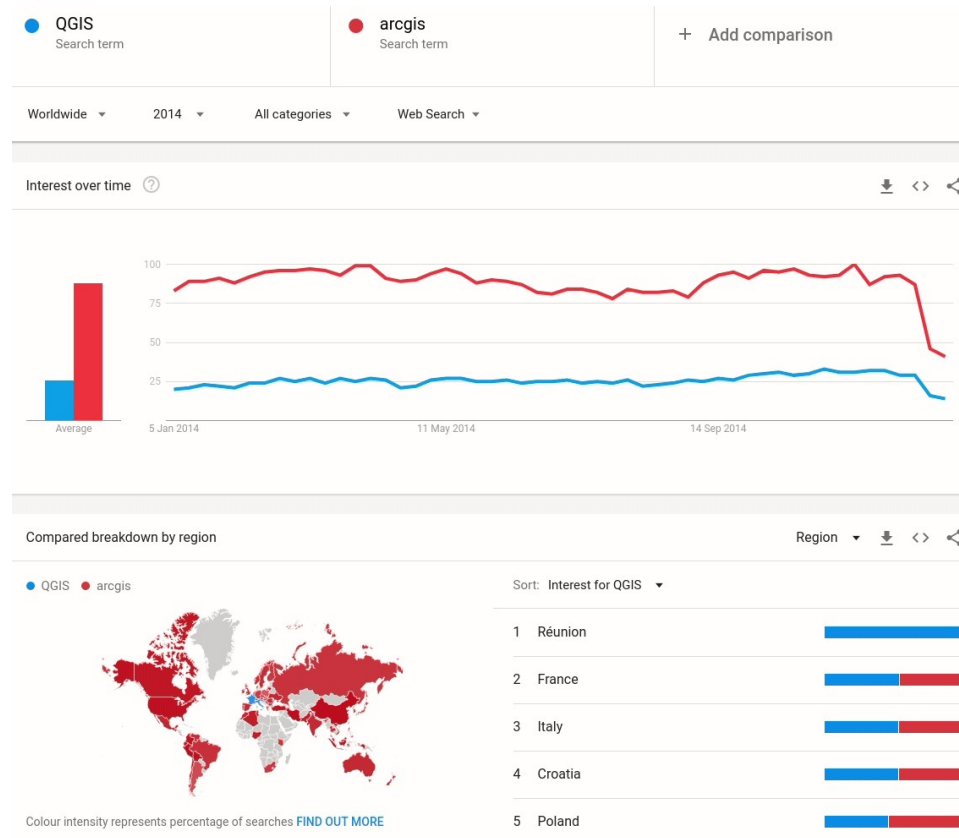
QGIS vs ArcGIS 2004 - 2019



Google trends 12.06.19

QGIS vs ArcGIS

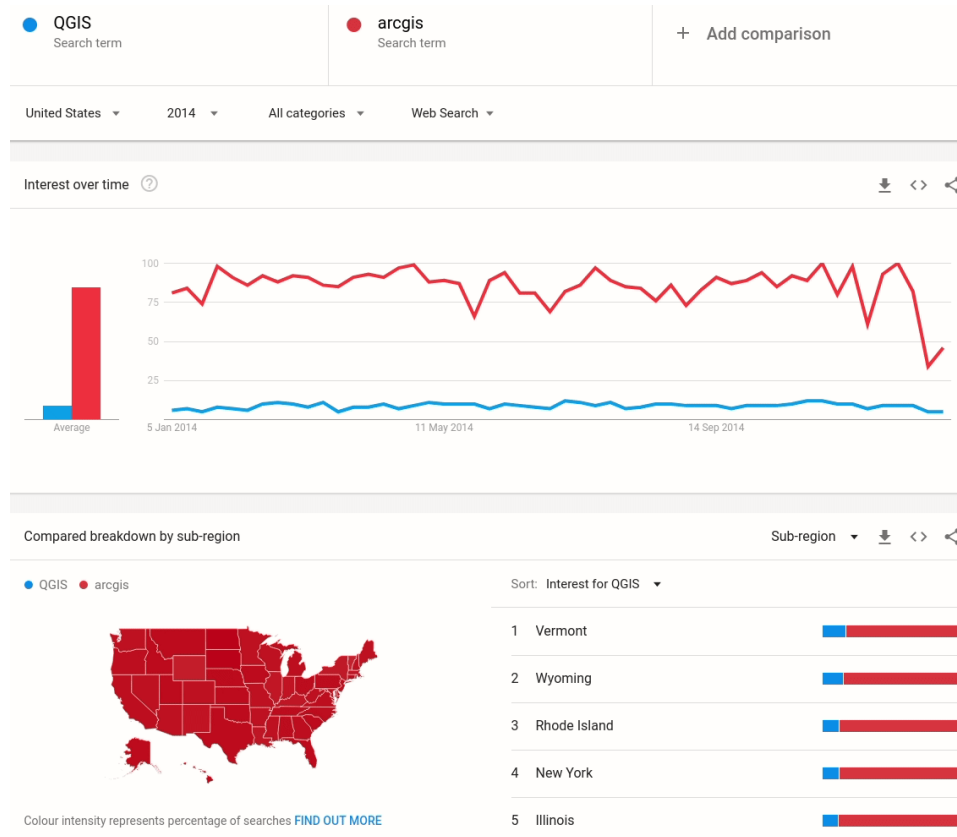
2014 - 2019 Worldwide



Google trends 12.06.19

QGIS vs ArcGIS

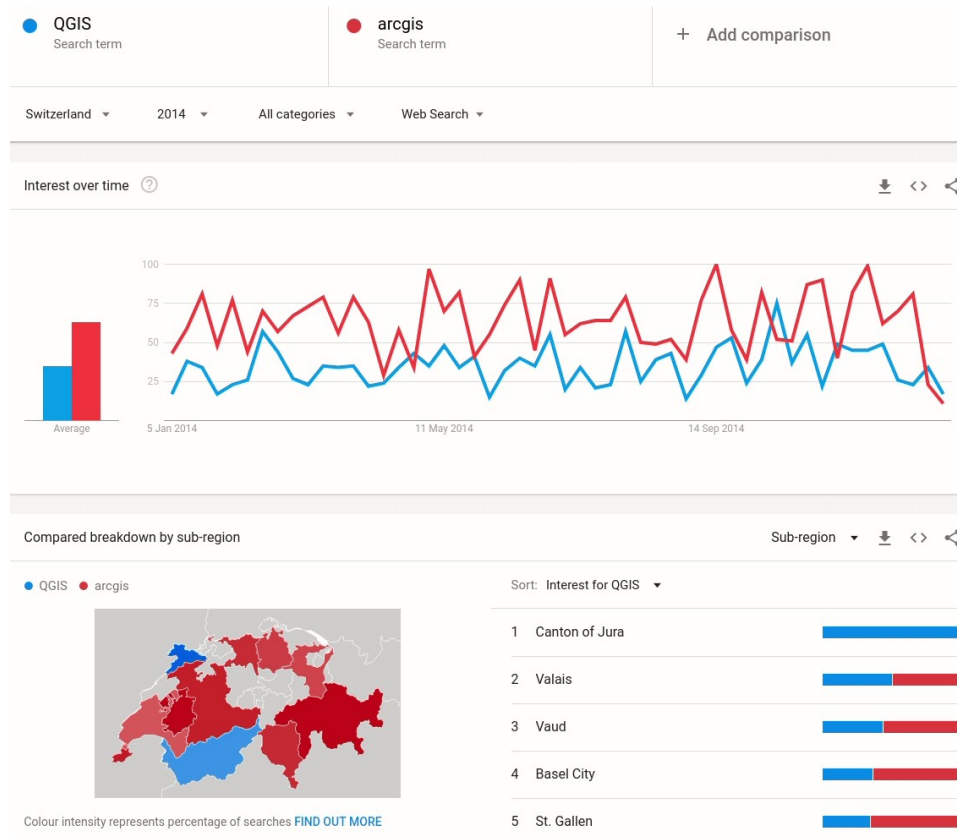
2014 - 2019 USA



Google trends 12.06.19

QGIS vs ArcGIS

2014 - 2019 Switzerland



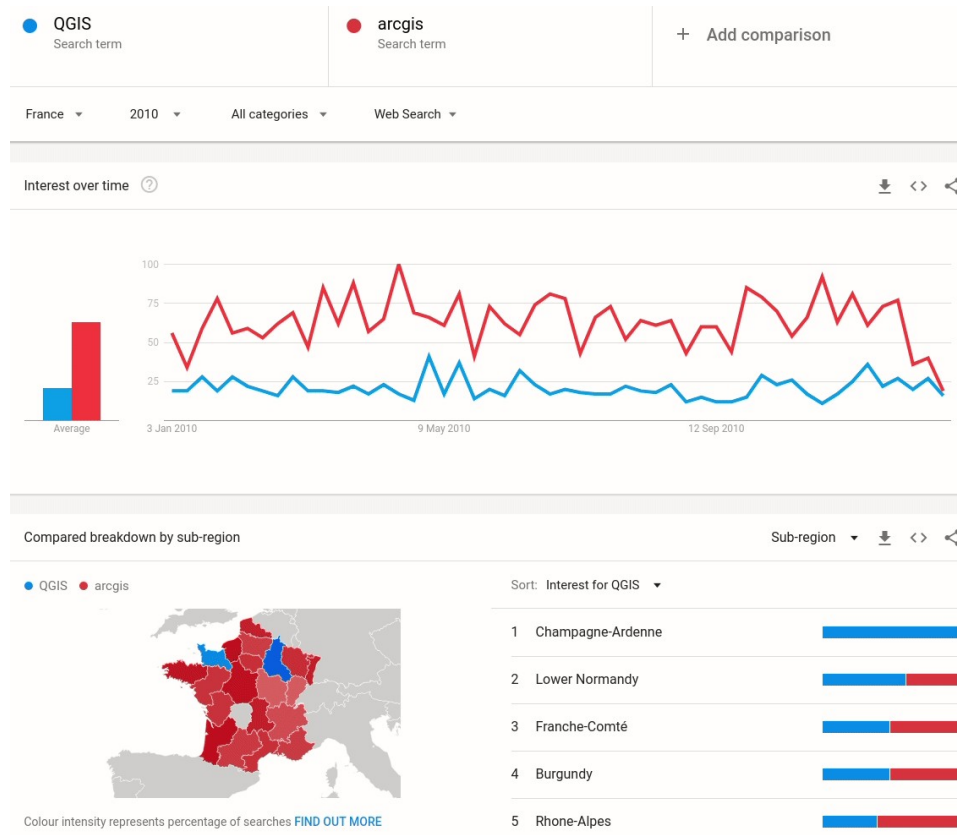
Google trends 12.06.19

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QGIS vs ArcGIS

2010 - 2019 France



Google trends 12.06.19

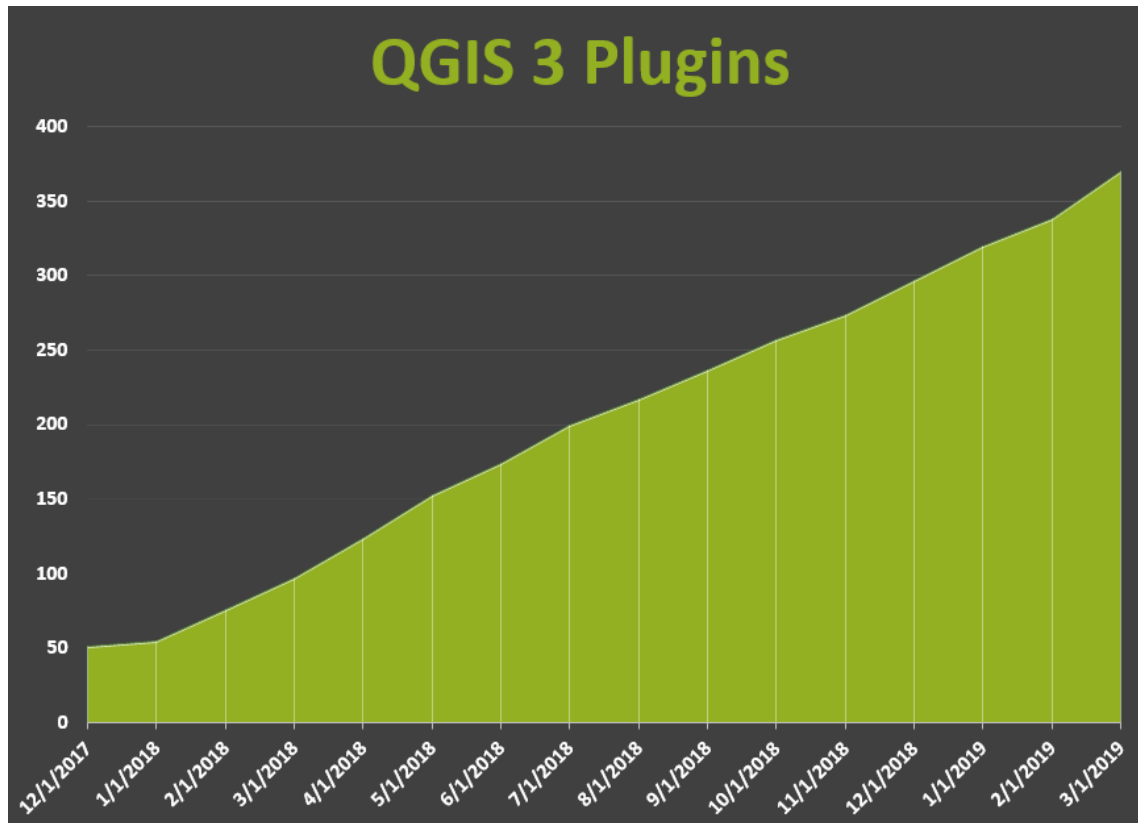
Infrastructure improvements: Issue tracker on GitHub

The screenshot displays the GitHub Issues page for the qgis/QGIS repository. The browser address bar shows the URL https://github.com/qgis/QGIS/issues. The repository name is qgis / QGIS, with 3,041 issues, 311 watchers, 2,720 stars, and 1,502 forks. The page is filtered to show 3,041 open issues. The list of issues includes:

- locator bar "Actions" filter is badly named (Bug)
- Error writing to pivot table in many-to-many relations when adding related feature (Bug, Feedback, Vectors)
- Mesh calculator is sluggish and unresponsive (Bug, Mesh)
- Crashed on re-loading Recent (Feedback)
- Split table in merge attributes dialog (Bug, Editing, GUI/UX)
- Split feature doesn't trigger default widget expression (Bug)
- Adding a north arrow is too hard (Bug, GUI/UX, Print Layouts)
- Remove verbose wording on layout toolbar buttons (Bug, GUI/UX, Print Layouts)
- Label position tab is too far away. Position is a primary action so should be close to the front (Bug, GUI/UX, Labeling)
- Label panel wording for combo/expression box. (Bug, GUI/UX)
- Adding choropleth with dialog "layer already exists" (Bug, Driver)

Infrastructure improvements: Plugin Ecosystem Back

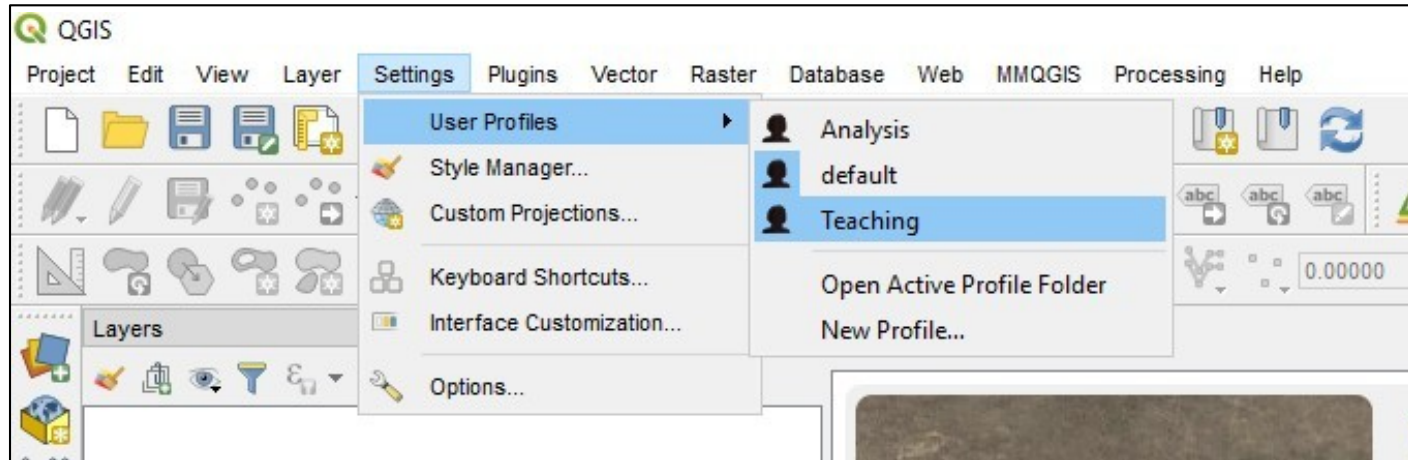
- DataPlotly
- GroupStats
- Map Swipe Tool
- MMQGIS
- QGIS2ThreeJS
- QGIS2Web
- QuickMapServices
- QuickOSM
- Semi-Automatic Classification
- Sentinel Hub
- ShapeTools
- TauDEM
- Time Manager
- Whitebox
- QGIS Hats



Infrastructure improvements: Mac one-click installers (dmg)



User Profiles



Set up GUI for different activities

- Plugins
- Toolbars/Panels
- Symbols

NOTE

- Stored in QGIS3 folder
- QGIS 3 folder has moved to a more standard location for your OS

Linux:

.local/share/QGIS/QGIS3/profiles/default

Mac OS X:

Library/Application

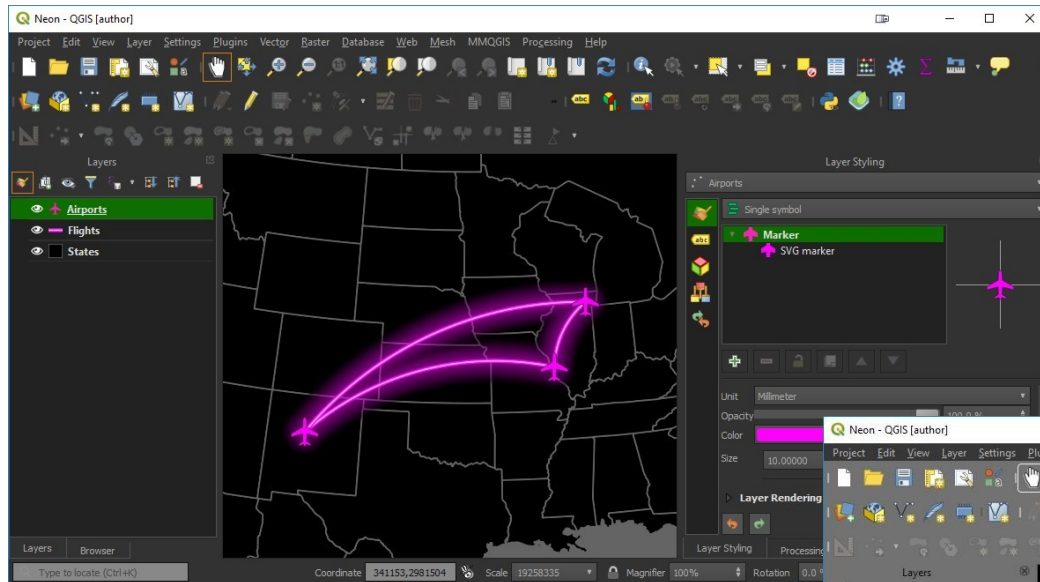
Support/QGIS/QGIS3/profiles/default

Windows: AppData\Roaming\QGIS\QGIS3\profiles\default

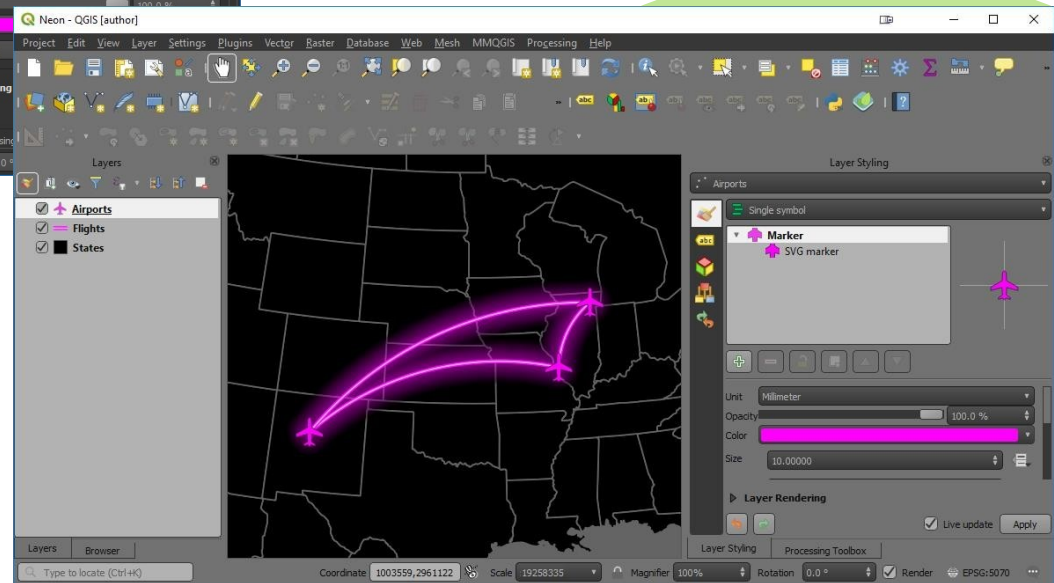
New UI Themes



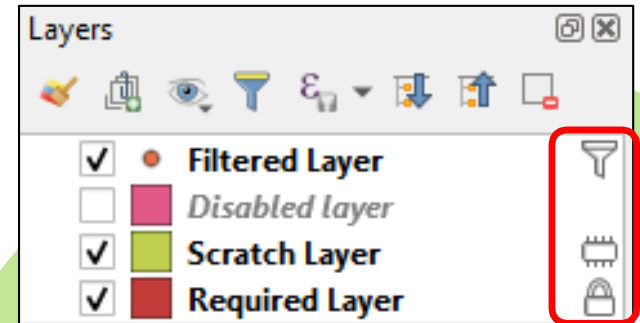
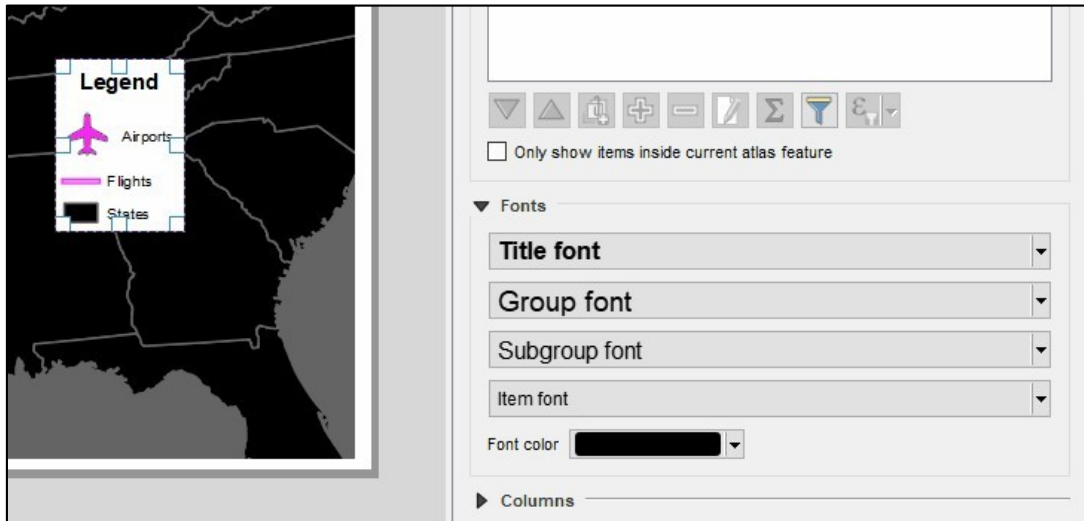
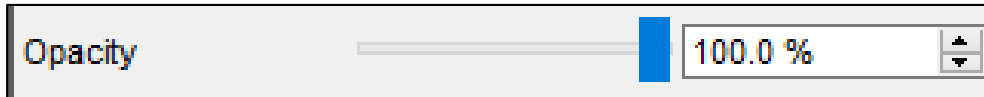
Blend of Gray



Night Mapping



Lots of UI Improvements

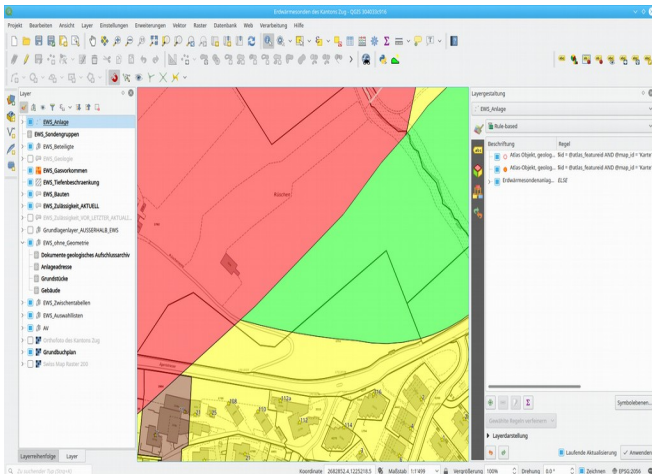
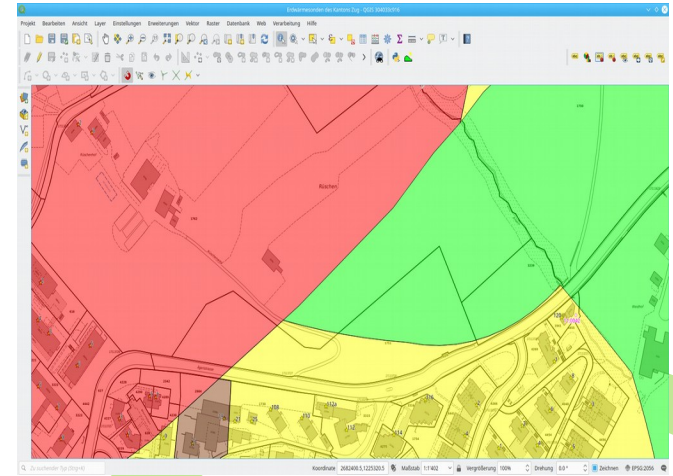
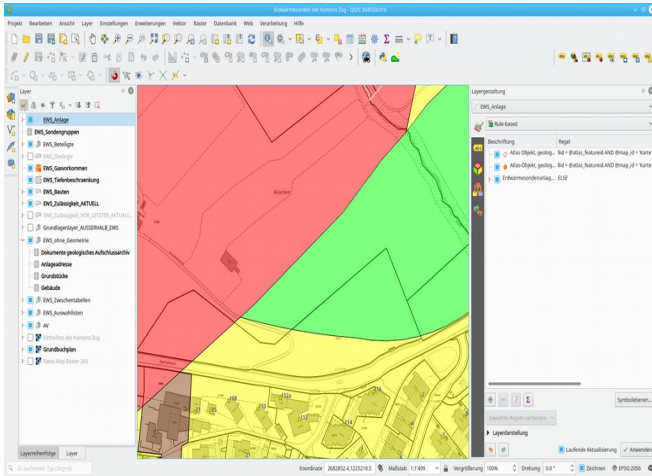


Optionally show/hide Panels and

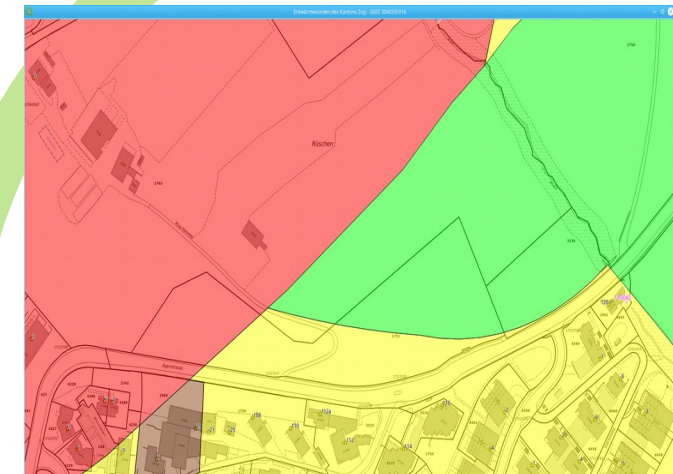
GUI



Ctrl-Tab
Hide/Show all Panels

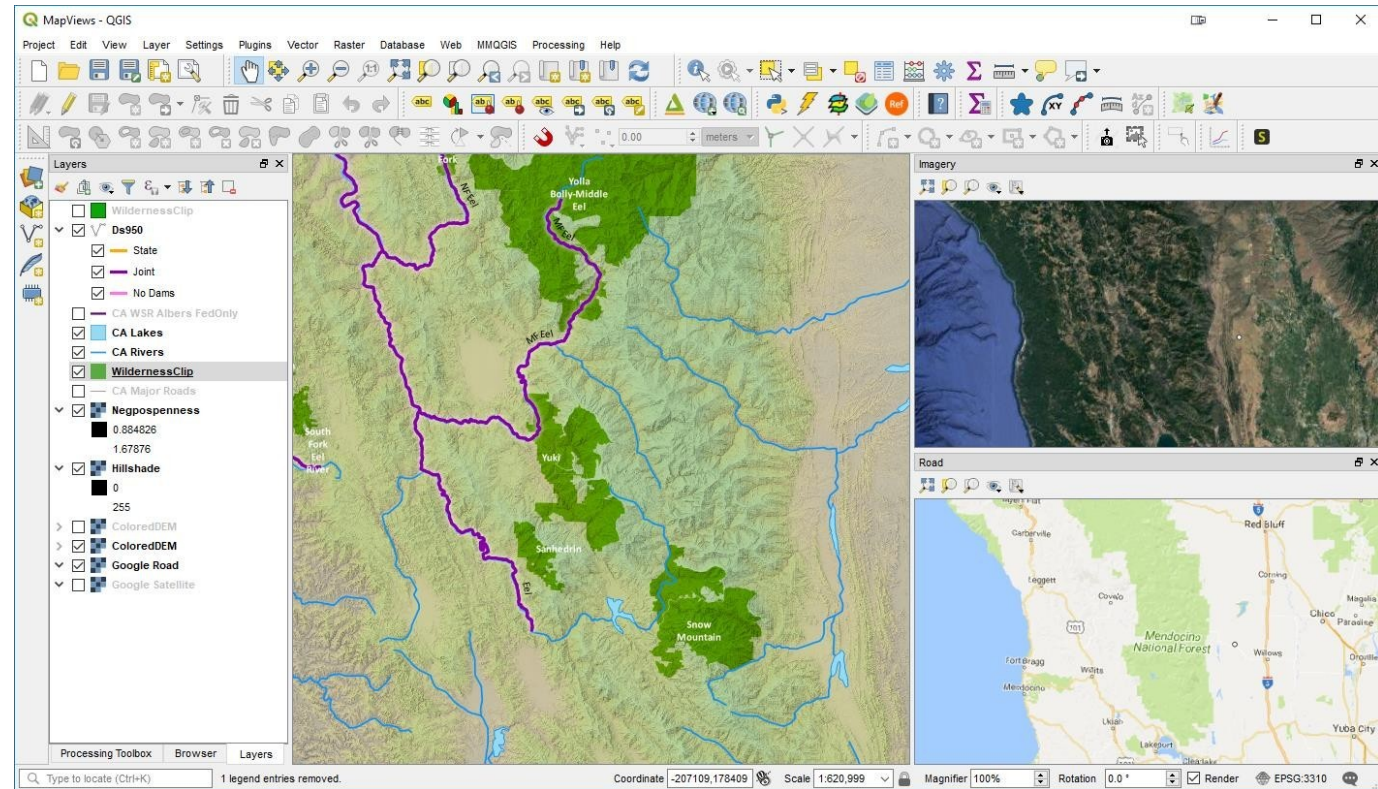


Ctrl-Shift-Tab
Hide/Show all of the
GUI

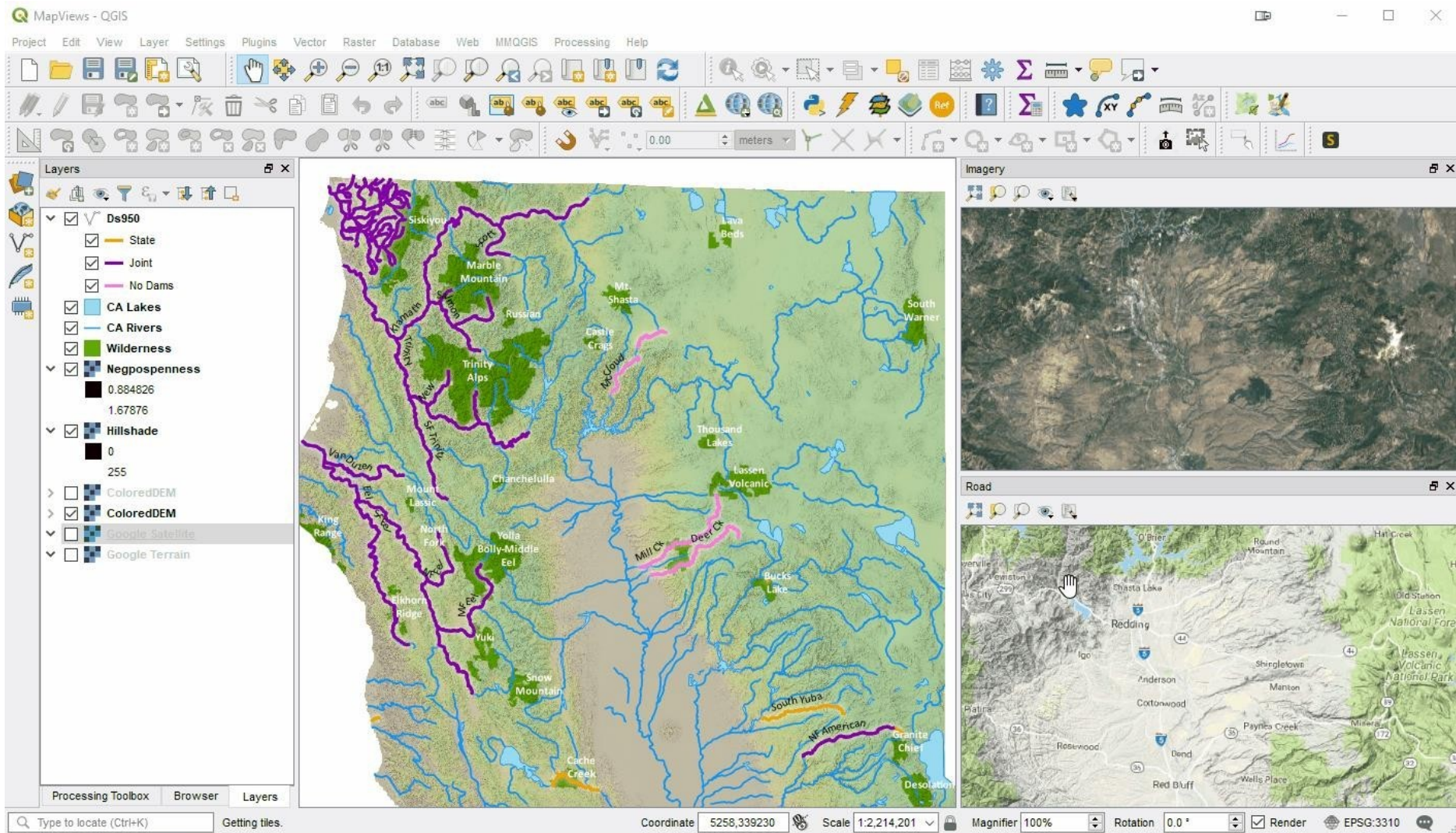


Multiple Map Views

- Dockable panels
- Honor Themes
- Can link to main view
- Set scale
- Each canvas can have its own visibility preset
- Each canvas can have different CRS
- Optionally show annotations
- Show cursor locations and extent
- Each canvas can show magnified or rotated views

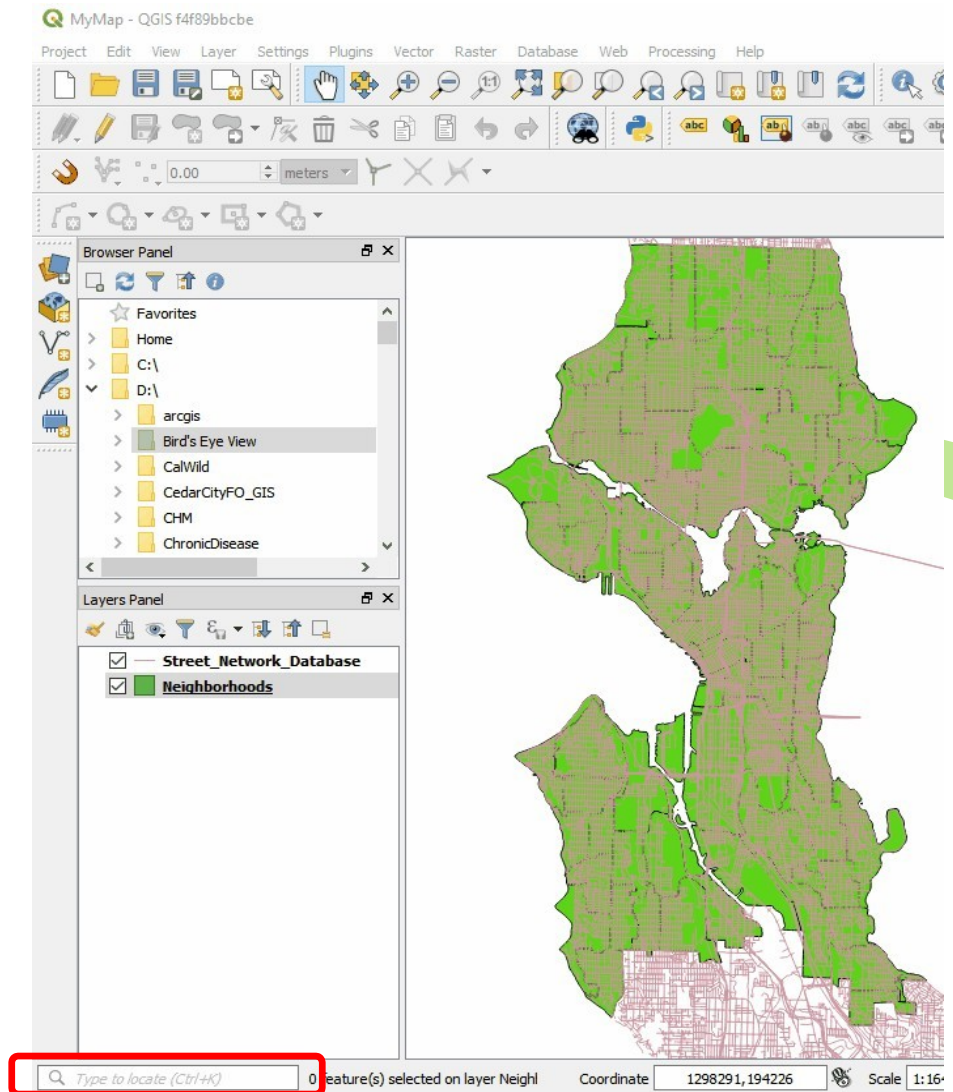


Multiple Map Views



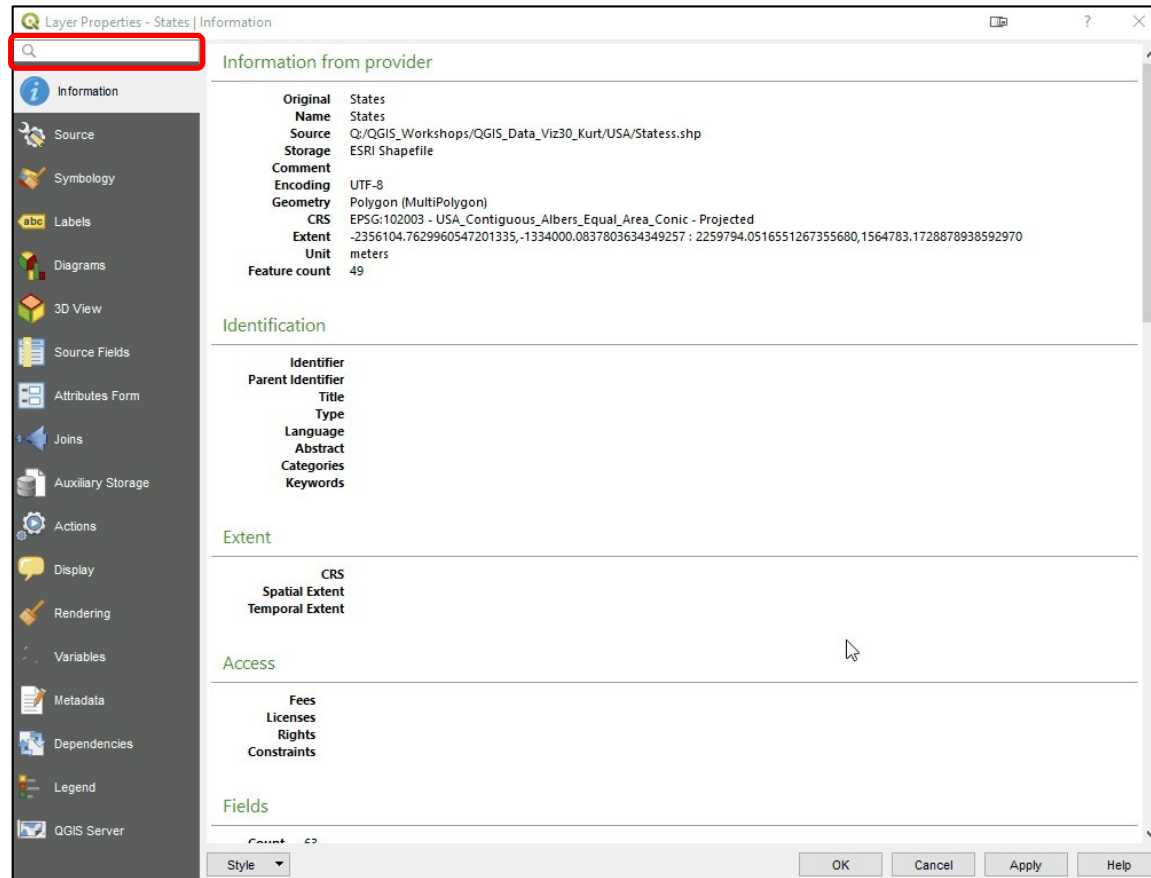
Locator Bar

- Autocompletes
- Processing Tools
- Layers
- Features
- Actions
- Calculator

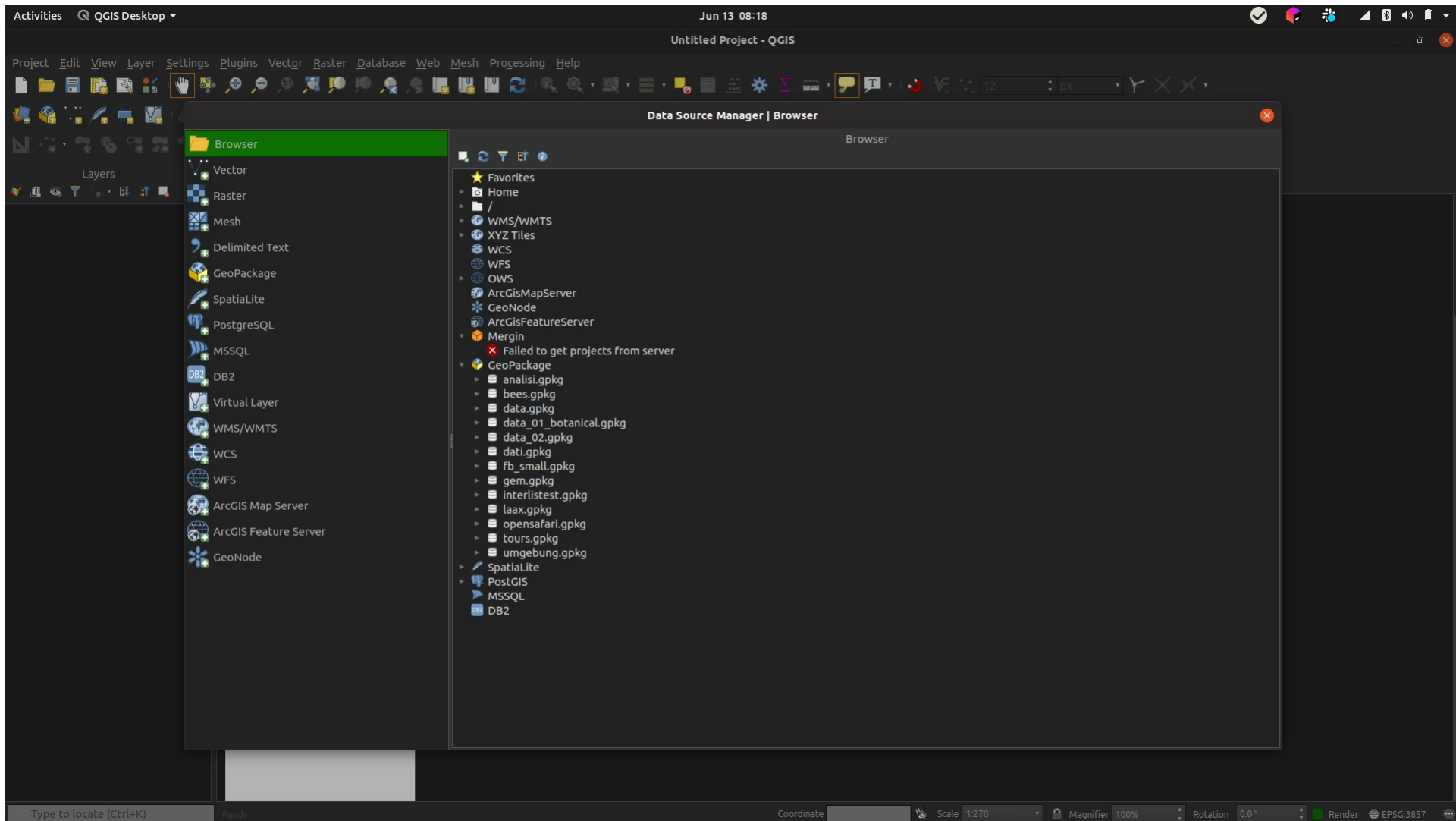


Autocomplete Search Boxes Everywhere

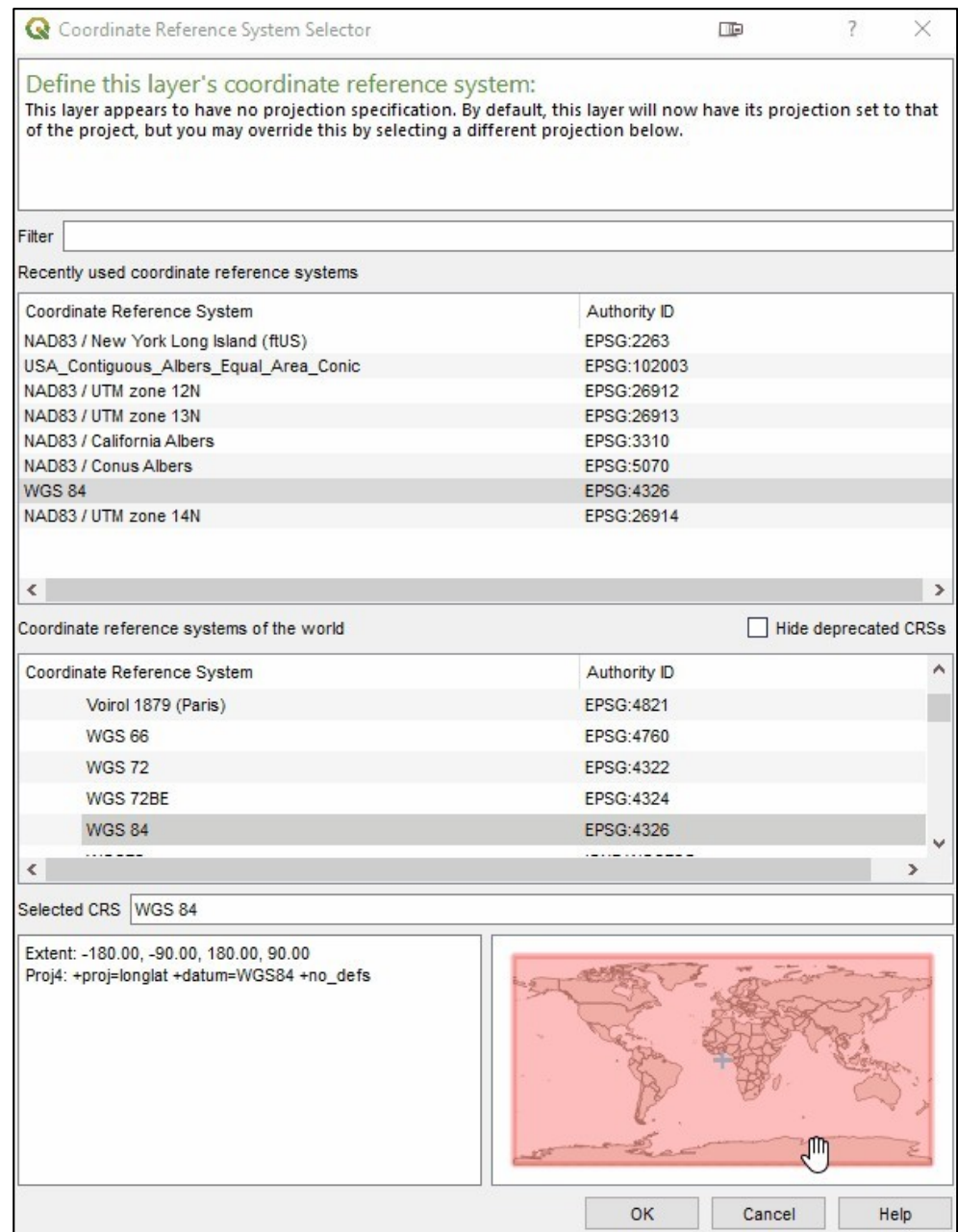
- Processing Toolbox
- Project Settings
- Layer Properties
- Plugin Manager
- CRS's
- Functions



Unified Data Source Manager



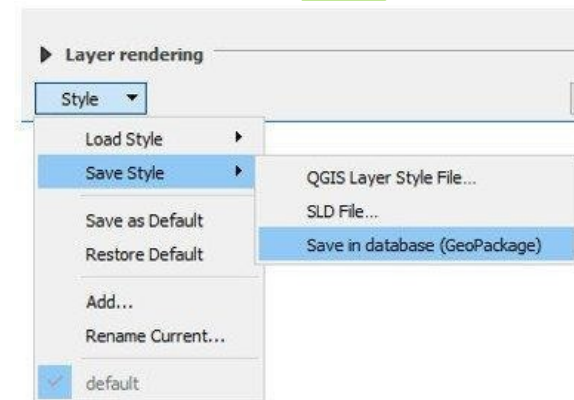
Valid CRS Extents Preview



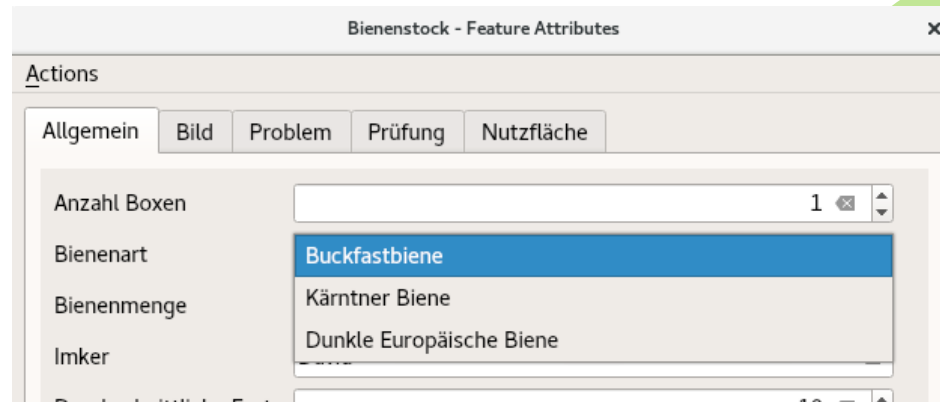
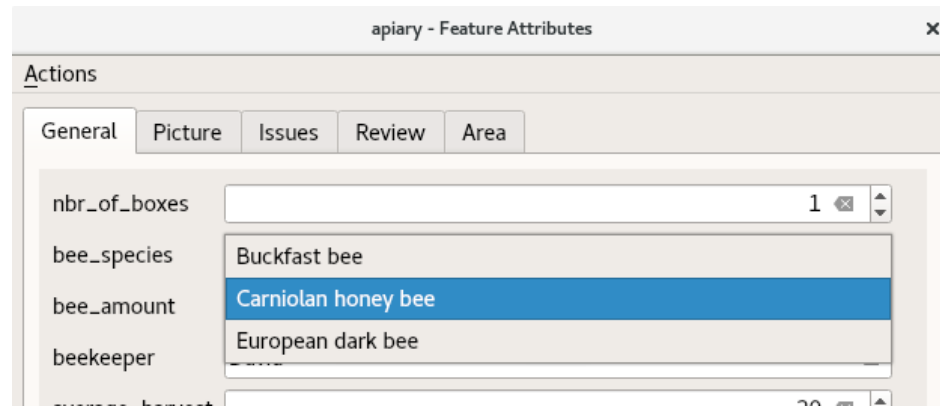
Geopackage Improvements

- Standard format for processing and “Save As”
- Easier to save additional tables into existing Geopackages
- Integration in DB-Manager
- Save styles in GPKG
- <http://switchfromshapefile.org/>

I  SHP



Projects Translation using Qt Linguist



JSON/JSONB Type support

- JSON Data can be displayed in the widgets as “Key/Value” (maps), as “List” (arrays) or as text.

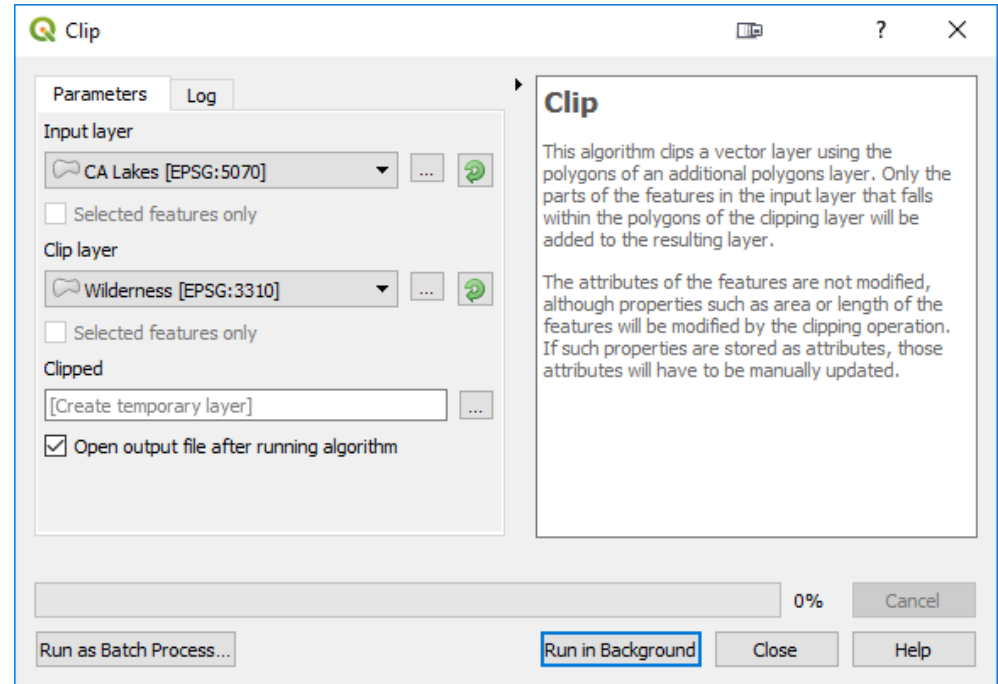
The image shows two data widgets. The top widget, labeled 'jvalue', displays a list of values: 1, 2, 3. The bottom widget, labeled 'jbvalue', displays a key-value map with two rows: (a, b) and (c, d).

Value	
1	
2	
3	

Key	Value
a	b
c	d

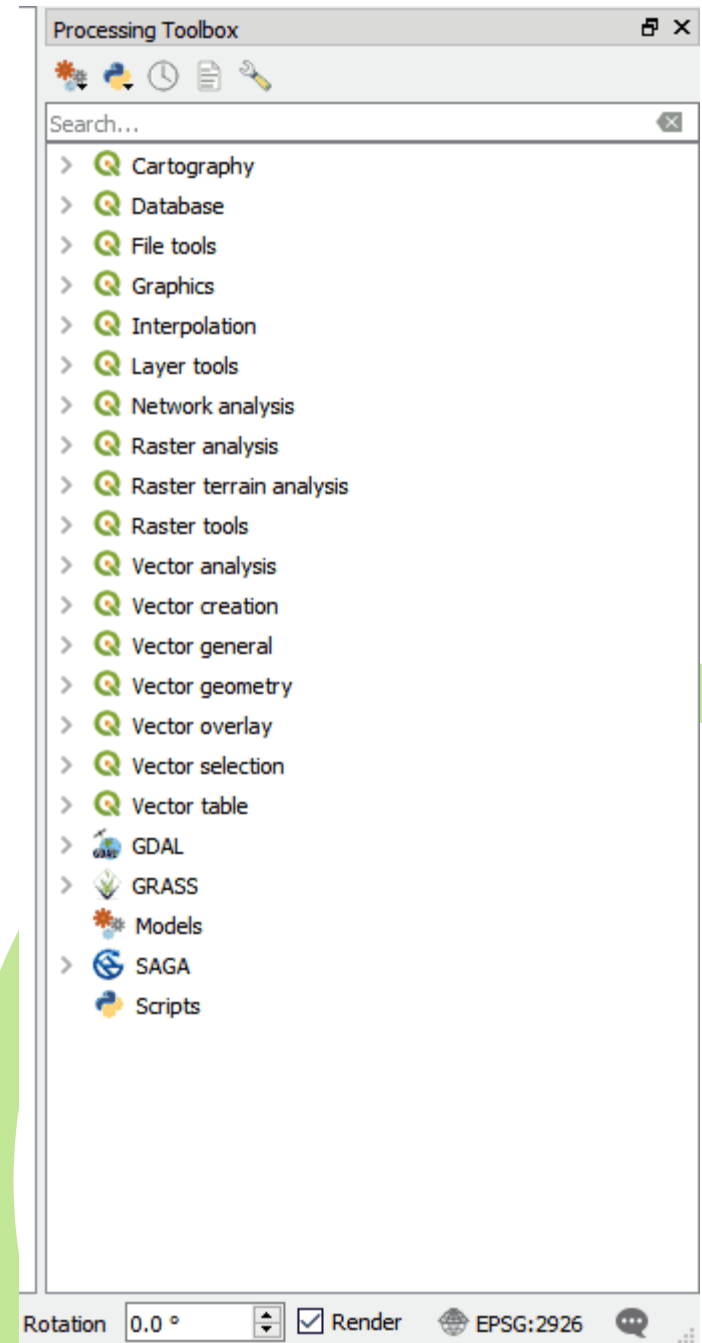
Processing Improvements

- Processing was rewritten in c++
- Many tools now native c++ algs
 - Optimized
 - Faster
- All tasks Run in Background!
- Many new tools
- Better Documentation
- Automatic reprojection of layers in processing algorithms



Processing Toolbox

- Native QGIS algs
- 3rd Party Providers will become plugins
- Graphical Modeler
- Models can again be exported to Python



Package Layers tool

Package layers

Parameters | Log

Processing algorithm...
Algorithm 'Package layers' starting...
Input parameters:
{ 'LAYERS' : ['D:/PEW/Final/Western_Nine_States.gdb|layerid=3', 'D:/PEW/Final/Western_Nine_States.gdb|layerid=1', 'D:/PEW/Final/Western_Nine_States.gdb|layerid=7', 'D:/PEW/Final/Western_Nine_States.gdb|layerid=2', 'D:/PEW/Final/Western_Nine_States.gdb|layerid=6', 'D:/PEW/Final/Western_Nine_States.gdb|layerid=8', 'D:/PEW/Final/Western_Nine_States.gdb|layerid=9', 'D:/PEW/Final/Western_Nine_States.gdb|layerid=5', 'D:/PEW/Final/Western_Nine_States.gdb|layerid=4'], 'OUTPUT' : 'D:/PEW/Western_Nine_States.gpkg', 'OVERWRITE' : False }

Packaging layer 1/10: BLM_in_Populated_places_gt30k

Processing algorithm...
9%
Cancel

Run as Batch Process... Run in Background Close Help

Package layers
This algorithm collects a number of existing layers and packages them together into a single GeoPackage database.

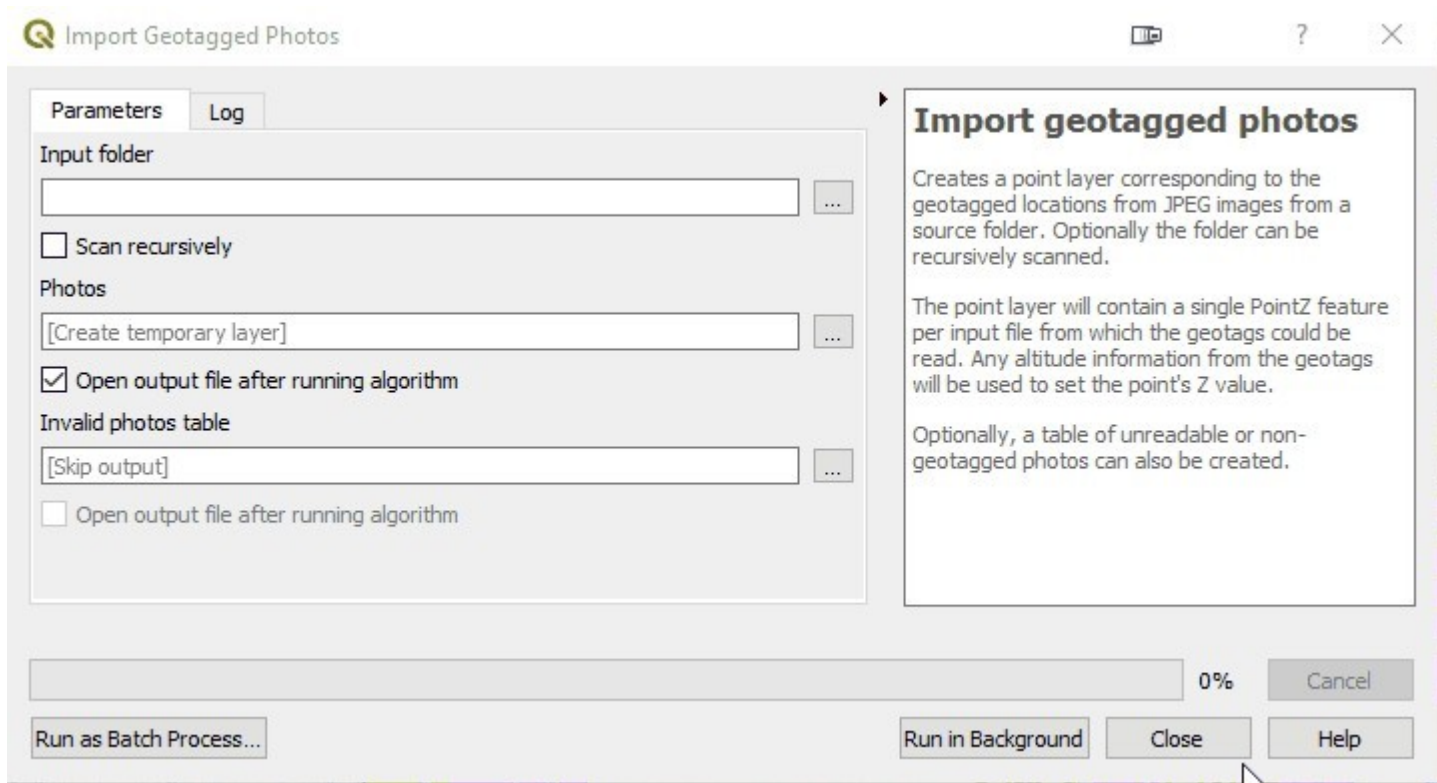
Processing Toolbox

Search...

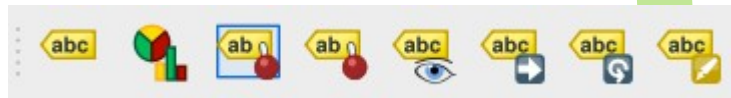
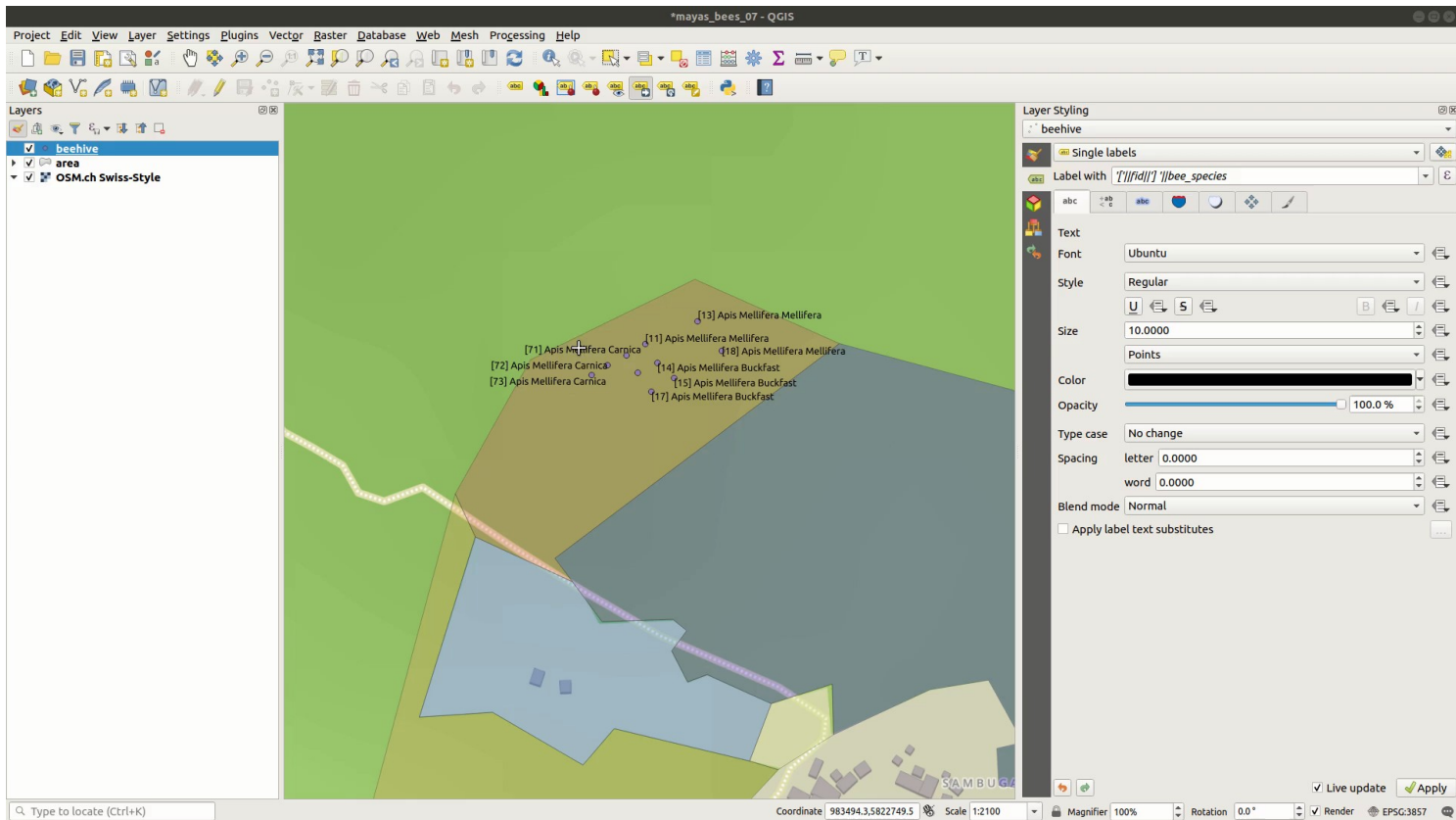
- Recently used
 - Raster layer unique values r
 - Package layers
- Cartography
- Database
 - Import into PostGIS
 - Import into Spatialite
 - Package layers**
 - PostGIS execute SQL
 - Spatialite execute SQL
- File tools
 - Download file
- Graphics
- Interpolation
- Layer tools
- Modeler tools
- Network analysis
- Raster analysis
- Raster terrain analysis
- Raster tools
- Vector analysis
- Vector creation
- Vector general
- Vector geometry
 - Aggregate
 - Boundary

Import Geotagged Photos

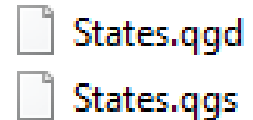
- Processing Toolbox → Vector Creation



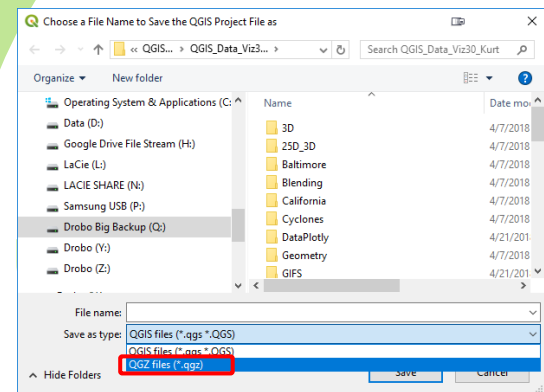
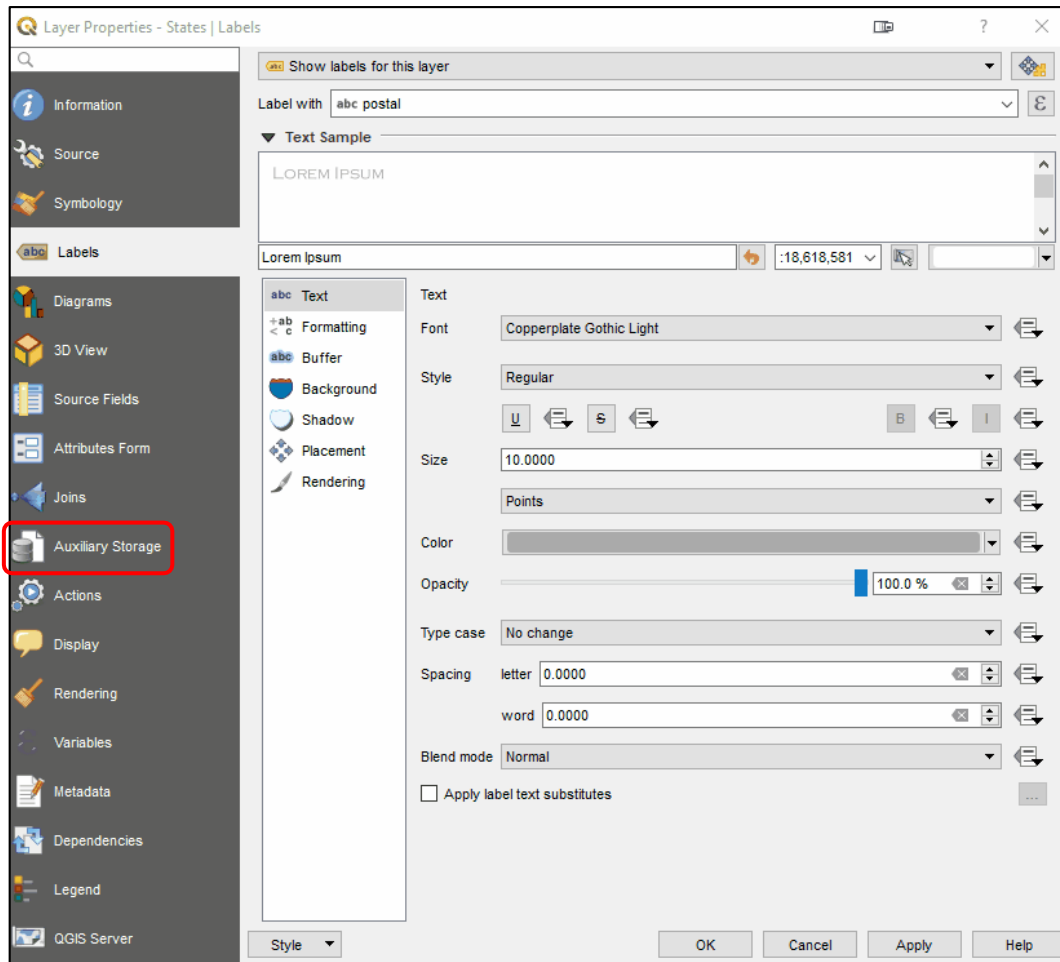
Easy Custom Labeling



Made Possible by Auxiliary Storage

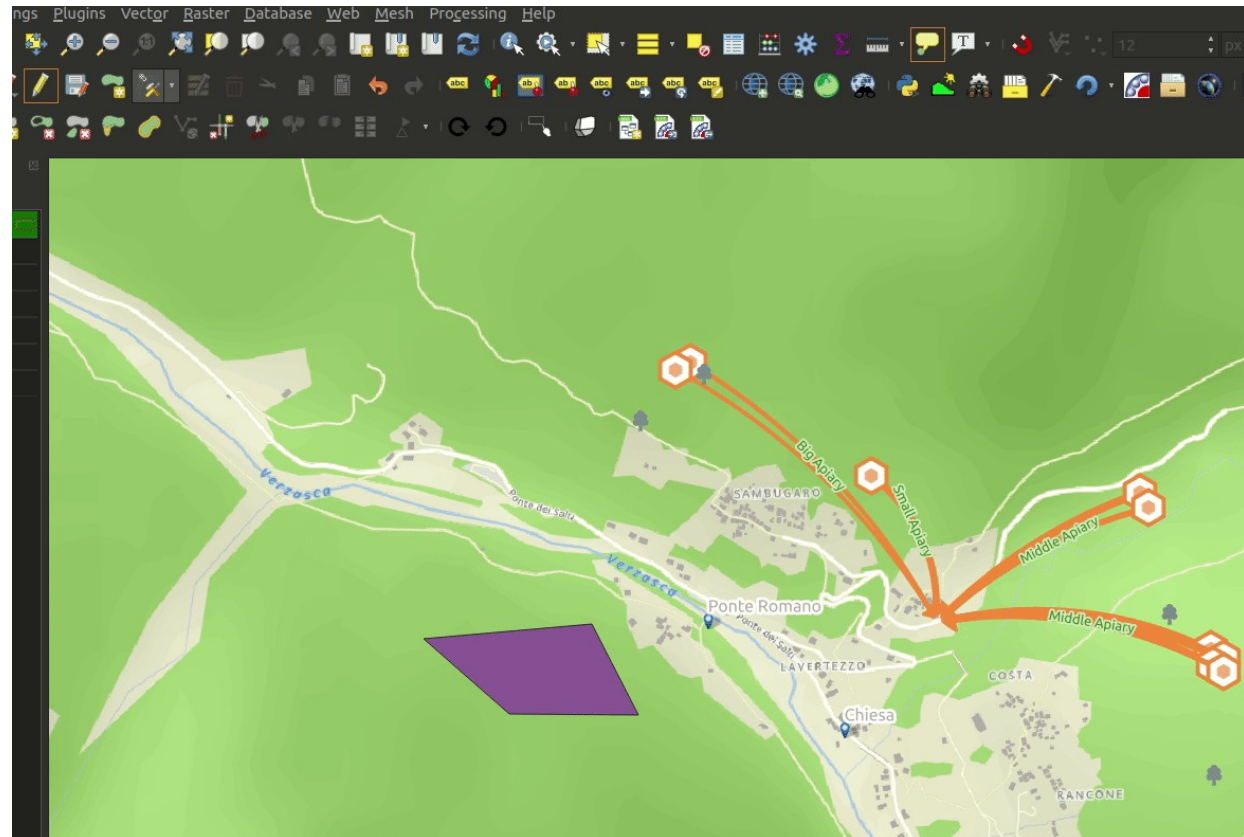


- SQLite db
- Stored as *.qgd file with QGIS project
- Identify primary key for the join
- QGZ files – combine both qgs and qgd

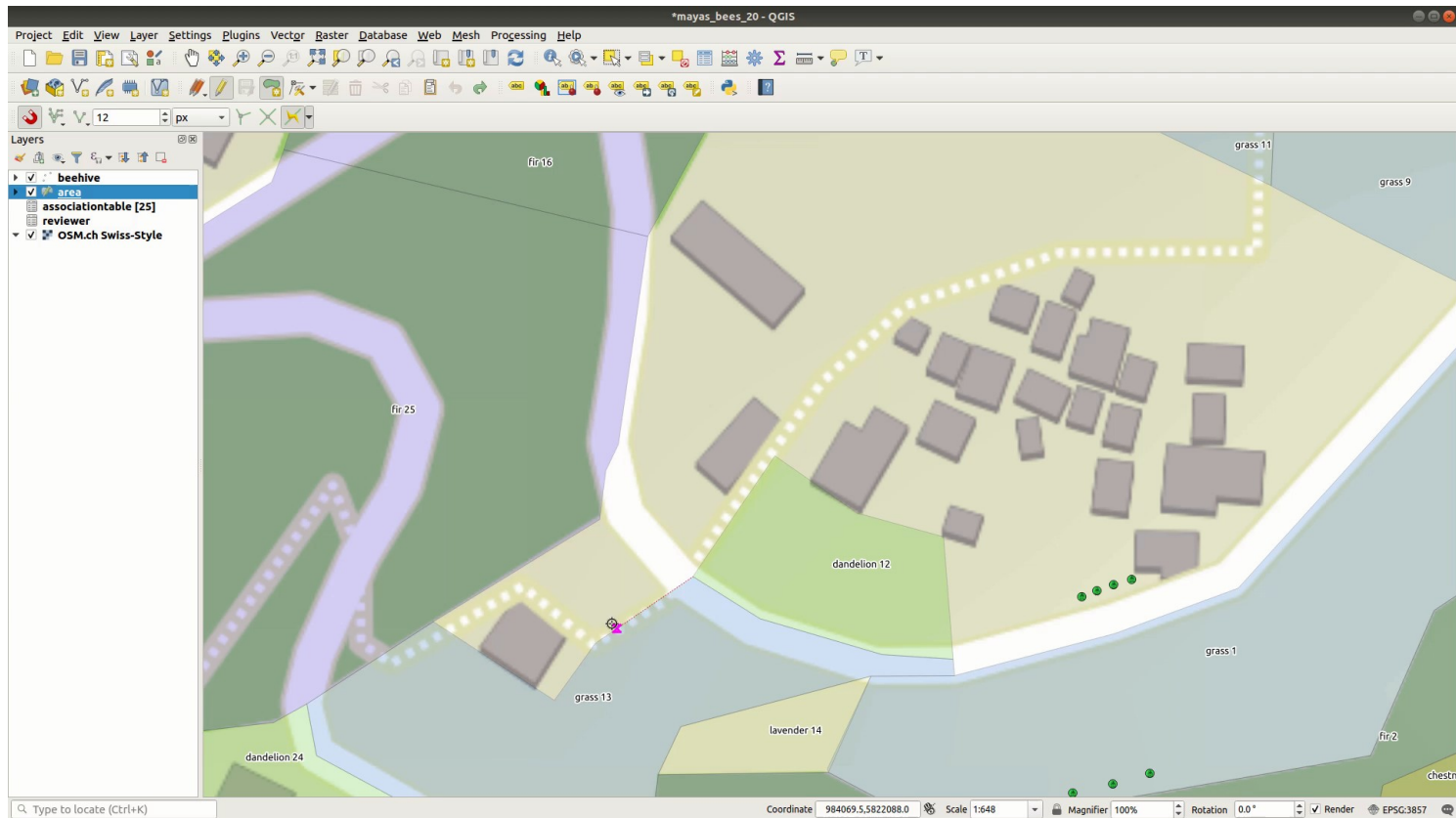


Editing Improvements

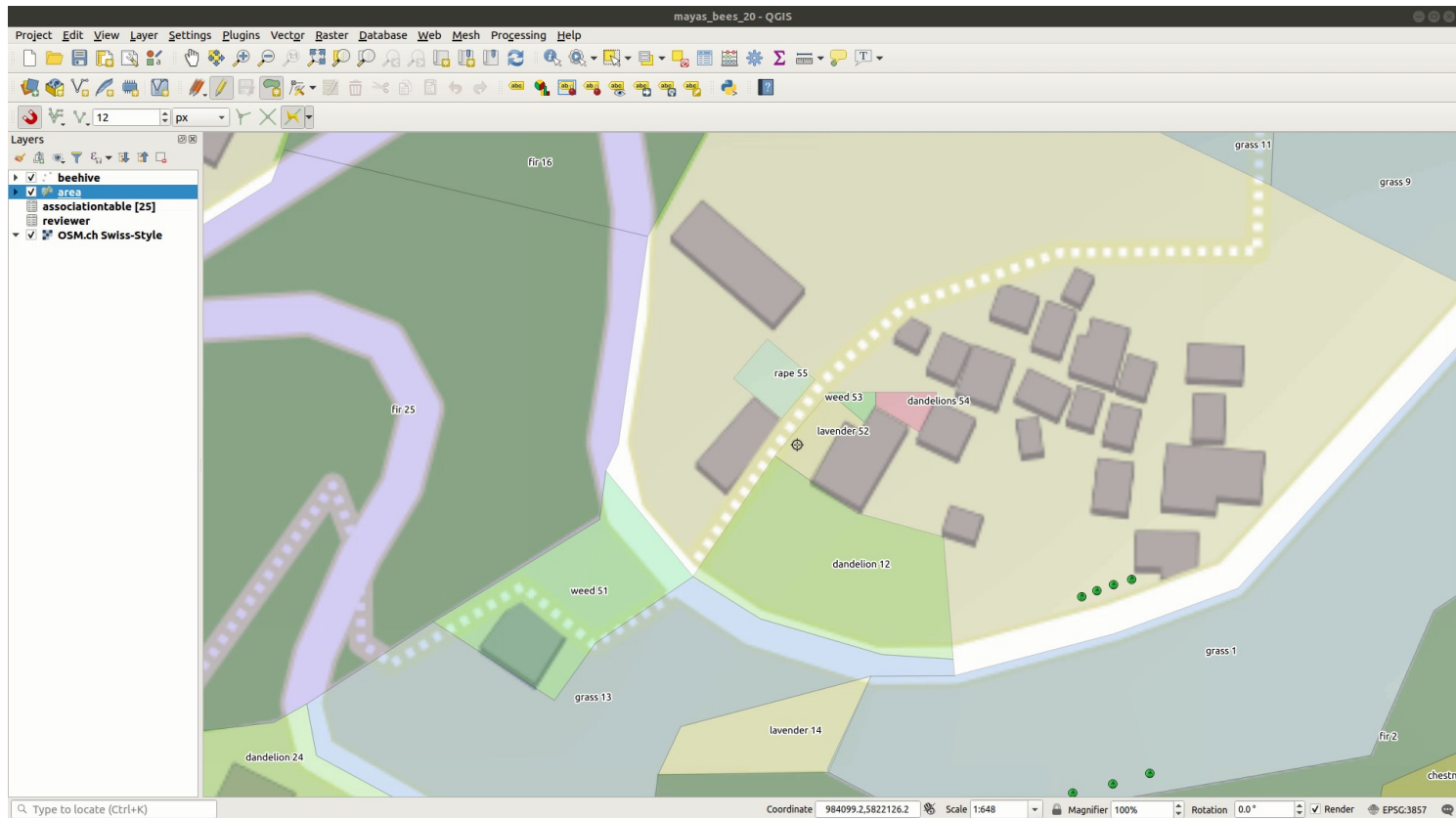
- New Vertex Tool
- CAD Tools
- Tracing at offsets



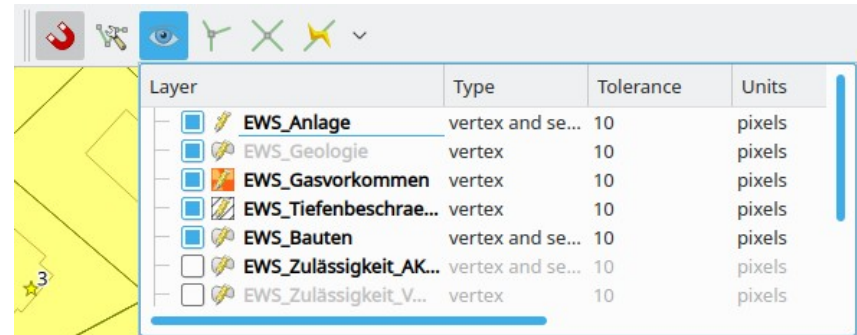
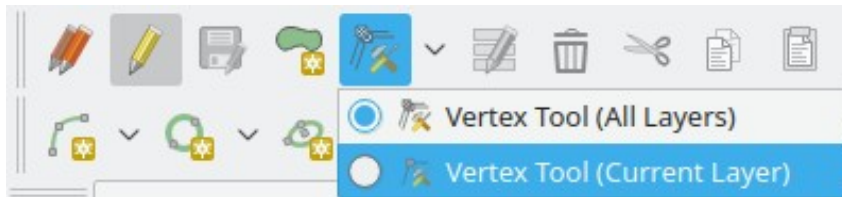
Editing Improvements



Editing Improvements - CAD



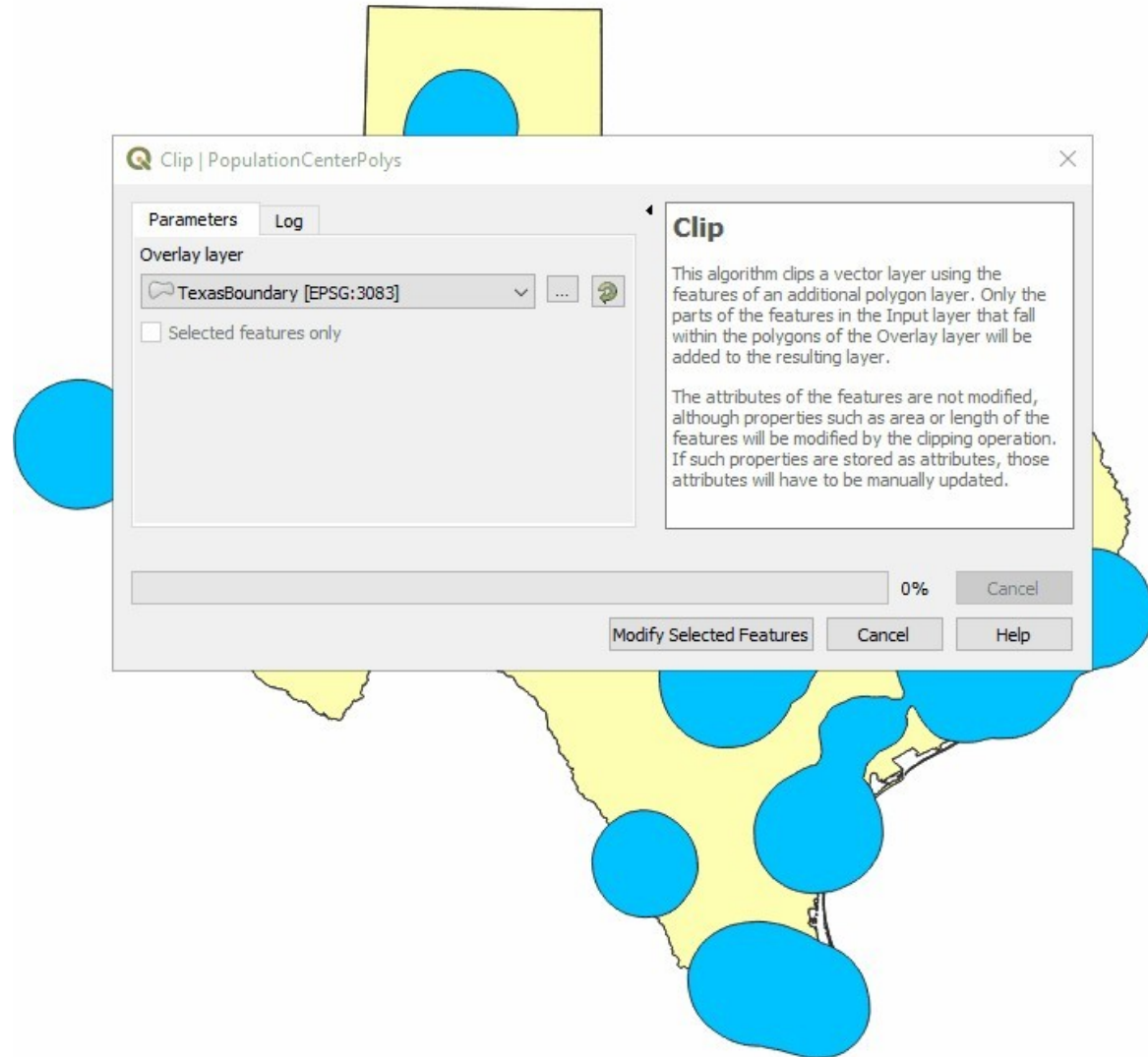
Editing tools enhancements



- MultiLayer or SingleLayer editing modes
- Edition of vertices of polygons and linestring
- Change from click-drag to click-click mode in order to allow numeric input
 - Range vertex selection in node tool (Shift-R). Selects all vertices between start and end-point
 - New modes to create mid-point vertices and to extend lines at the ends
- Node tool can be combined with “advanced digitizing” (construction) tool for precise placement of vertices
- Tracing now allows offset for parallel lines
- Snapping settings are available in toolbar

Editing In Place

- Run processing tools against layers without having to produce a new output layer.



Select Features By Value



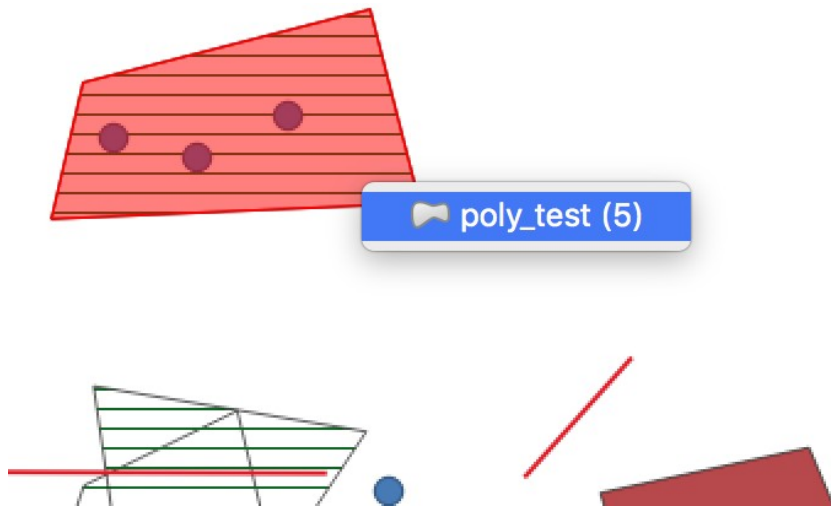
Select Features by Value

PERMANENT_	<input type="text"/>	<input type="checkbox"/> Case sensitive	Exclude field
FDATE	<input type="text"/>		Exclude field
RESOLUTION	<input type="text"/>		Exclude field
GNIS_ID	<input type="text"/>	<input type="checkbox"/> Case sensitive	Exclude field
GNIS_NAME	<input type="text"/>	<input type="checkbox"/> Case sensitive	Exclude field
LENGTHKM	<input type="text"/>		Exclude field
REACHCODE	<input type="text"/>	<input type="checkbox"/> Case sensitive	Exclude field
FLOWDIR	<input type="text"/>		Exclude field
WBAREA_PER	<input type="text"/>	<input type="checkbox"/> Case sensitive	Exclude field
FTYPE	<input type="text"/>		Exclude field
FCODE	<input type="text"/>		Exclude field
SHAPE_LEN	<input type="text"/>		Exclude field
PWSR	<input type="text"/>		Exclude field
PWSRType	<input type="text"/>	<input type="checkbox"/> Case sensitive	Exclude field
Miles	<input type="text"/>		Exclude field
Label	<input type="text"/>	<input type="checkbox"/> Case sensitive	Exclude field
orig_ogc_fid	<input type="text"/>		Exclude field

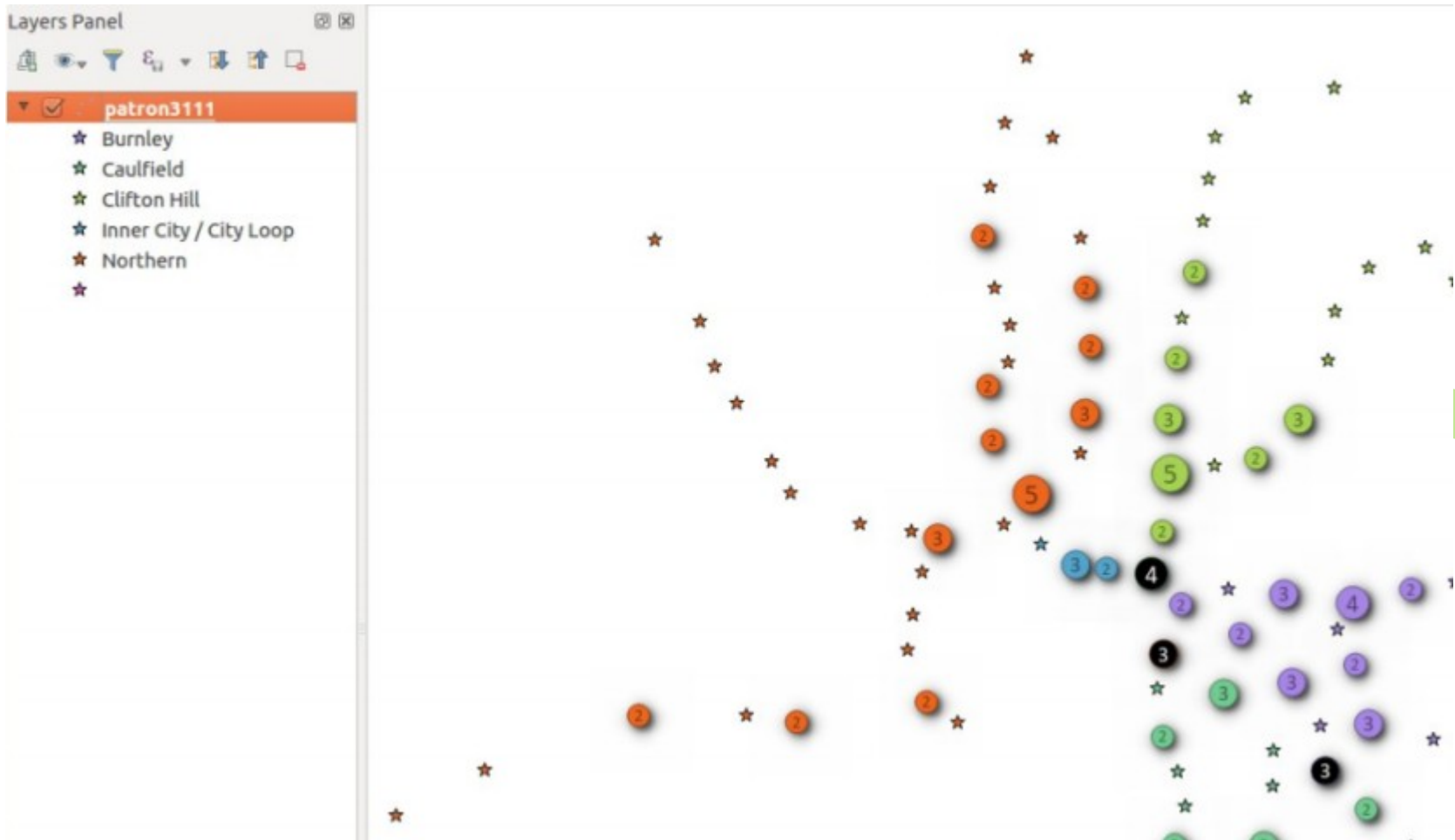
Reset form Flash features Zoom to features Select features Close

Select Features based on existing polygon

- allows user to right click on the map and pick an existing polygon feature at that location from popup menu - that polygon will be used as input for selection or identification.



Point Cluster Renderer



QML widget

The screenshot displays the QGIS desktop environment. The main map area shows a land use map with various colored polygons representing different vegetation types. A red circle highlights a specific feature on the map. The Identify Results panel on the right shows the details for the selected feature.

Layers

- beehive
- area
- associationtable [25]
- reviewer
- OSM.ch Swiss-Style

Identify Results

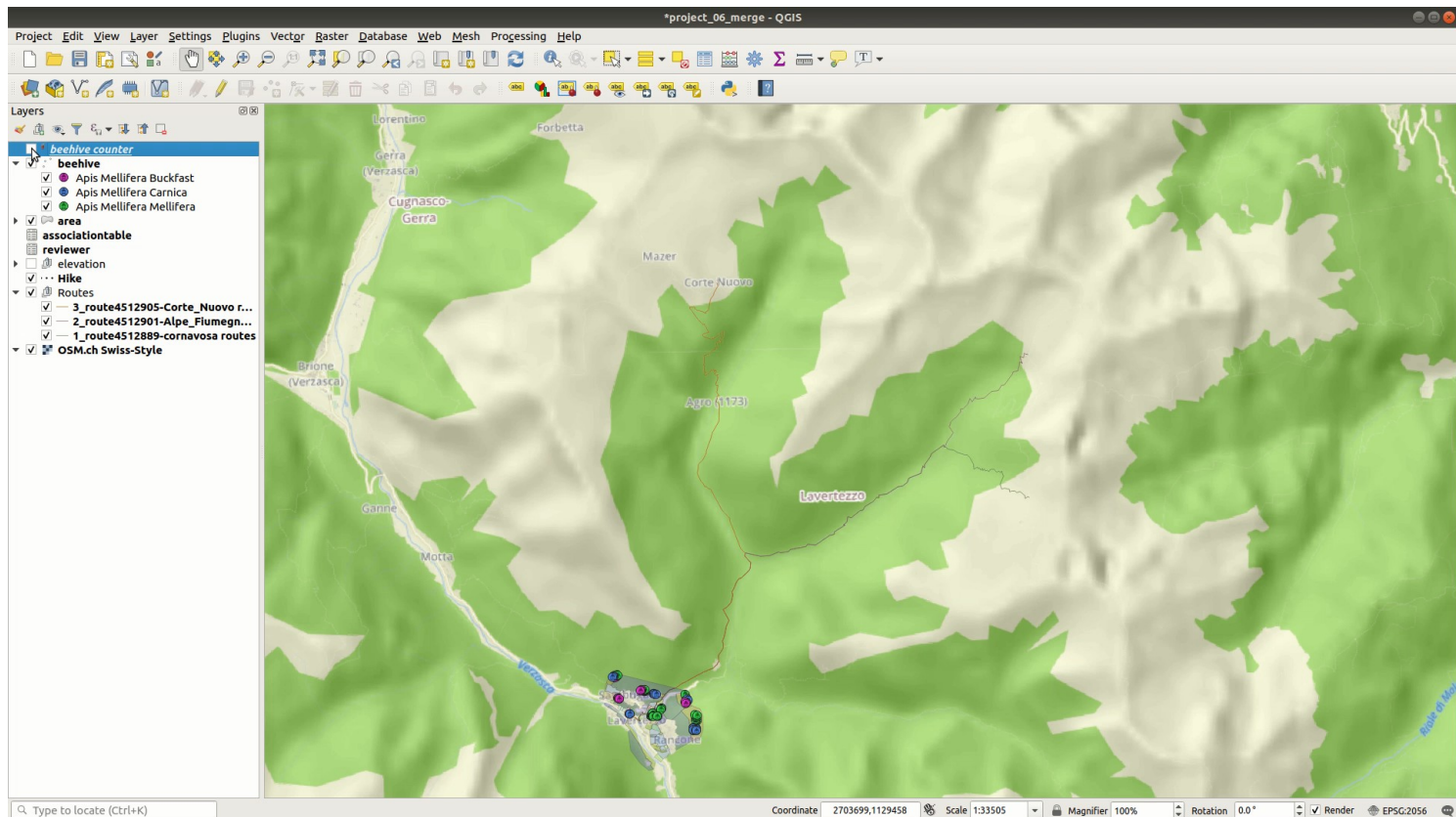
Feature	Value
beehive	
fid	1
(Derived)	
(Actions)	
fid	1
Species	European Dark Bee
Date	2019-05-08
Populated	true
Harvest (aver...	3
Reviewer	Matteo Molino
Infected	false
Kind of Disease	(NULL)
Dead	false
fid	50
fid	51
fid	52

Mode: Current layer Auto open form

View: Tree

Coordinate: 984191.1,5822097.1 Scale: 1:905 Magnifier: 100% Rotation: 0.0° Render: EPSG:3857

Live layers





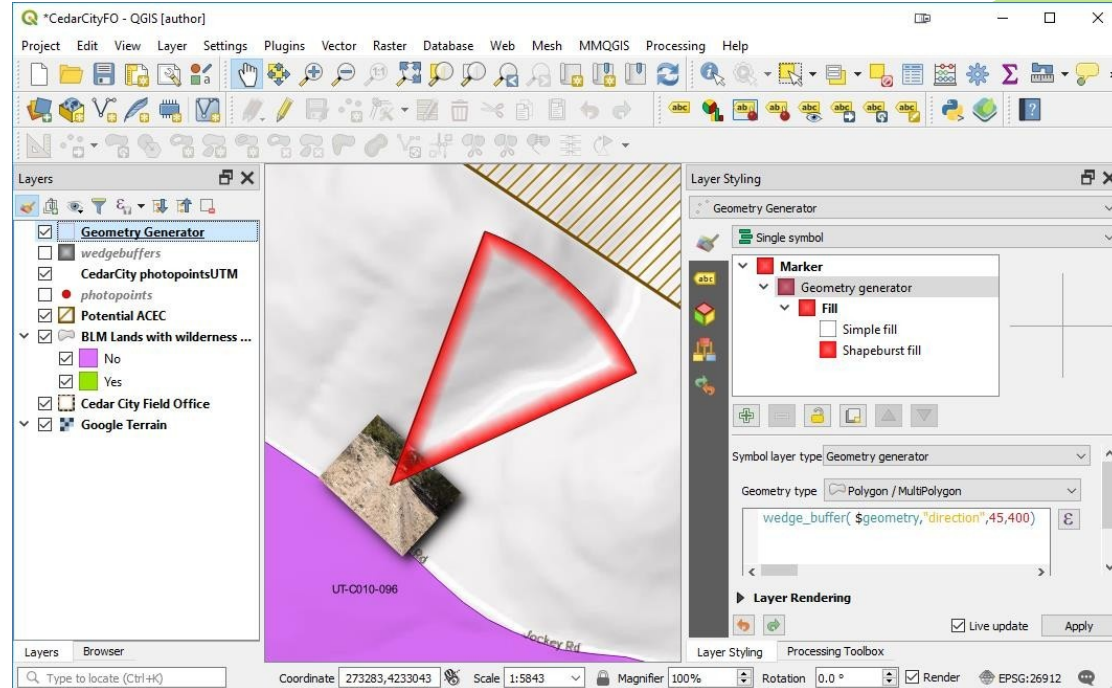
Raster Image Marker

The screenshot shows the QGIS desktop environment. The main map window displays a topographic map of a coastal area with a "QGIS" logo marker placed on the land. The "Layers" panel on the left shows a tree view with "Main Map" expanded to "Hackfest". The "Layer Styling" panel on the right is open for the "Hackfest" layer, showing the "Marker" section with "Raster image marker" selected. Below this, "Filled marker" is checked, and "Fill" is selected. The "Layer Rendering" section at the bottom right has "Live update" checked. The status bar at the bottom shows "Coordinate: 219393,984821", "Scale: 1:22205", "Magnifier: 100%", "Rotation: 0,0 °", and "Render" button.

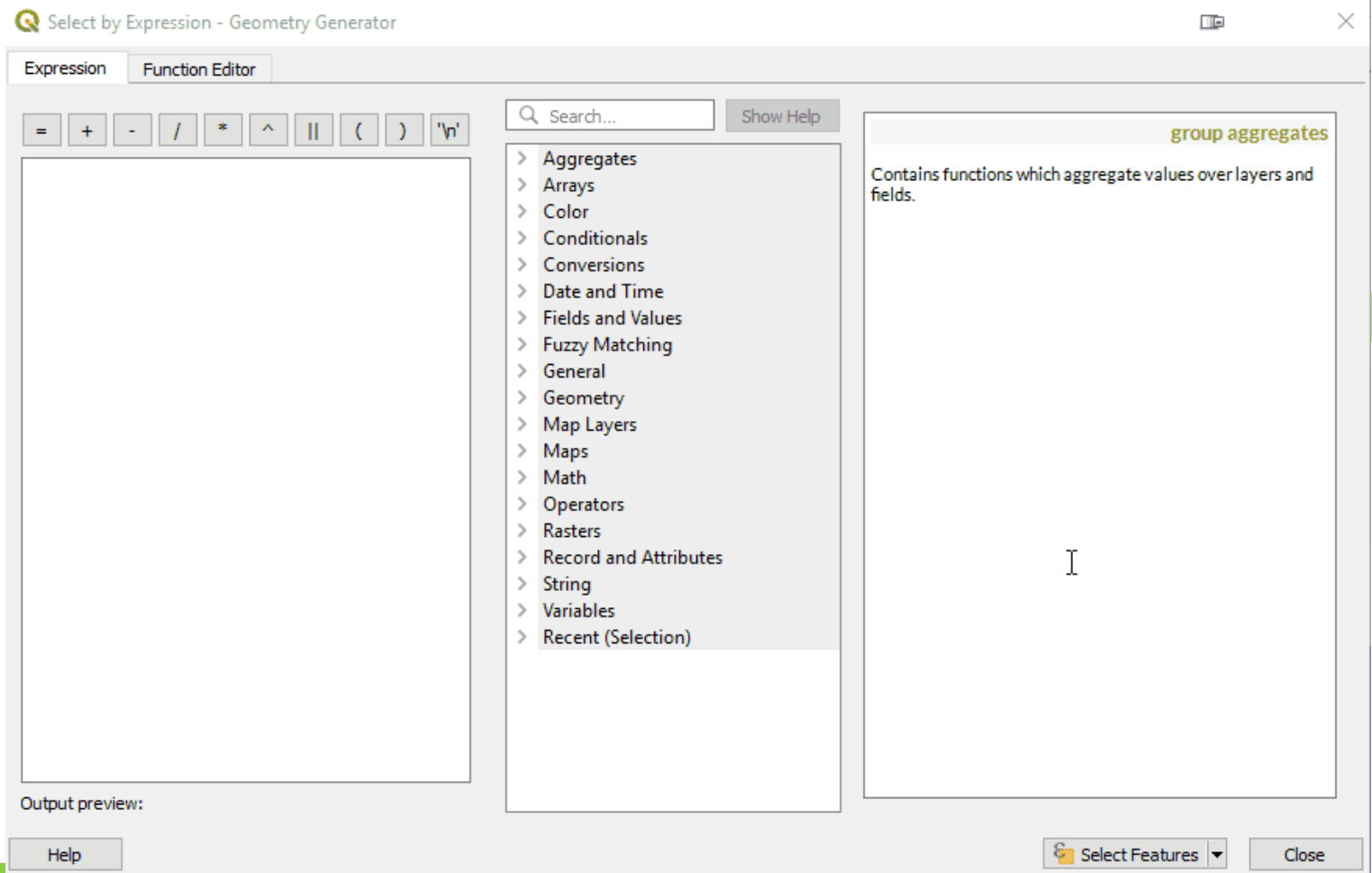


Raster Image Marker

- Use the Raster Image Marker with output from the Import Geotagged Photos tool with Data Defined Overrides for Angle & Size along with Wedge buffer geometry generators for some great effects

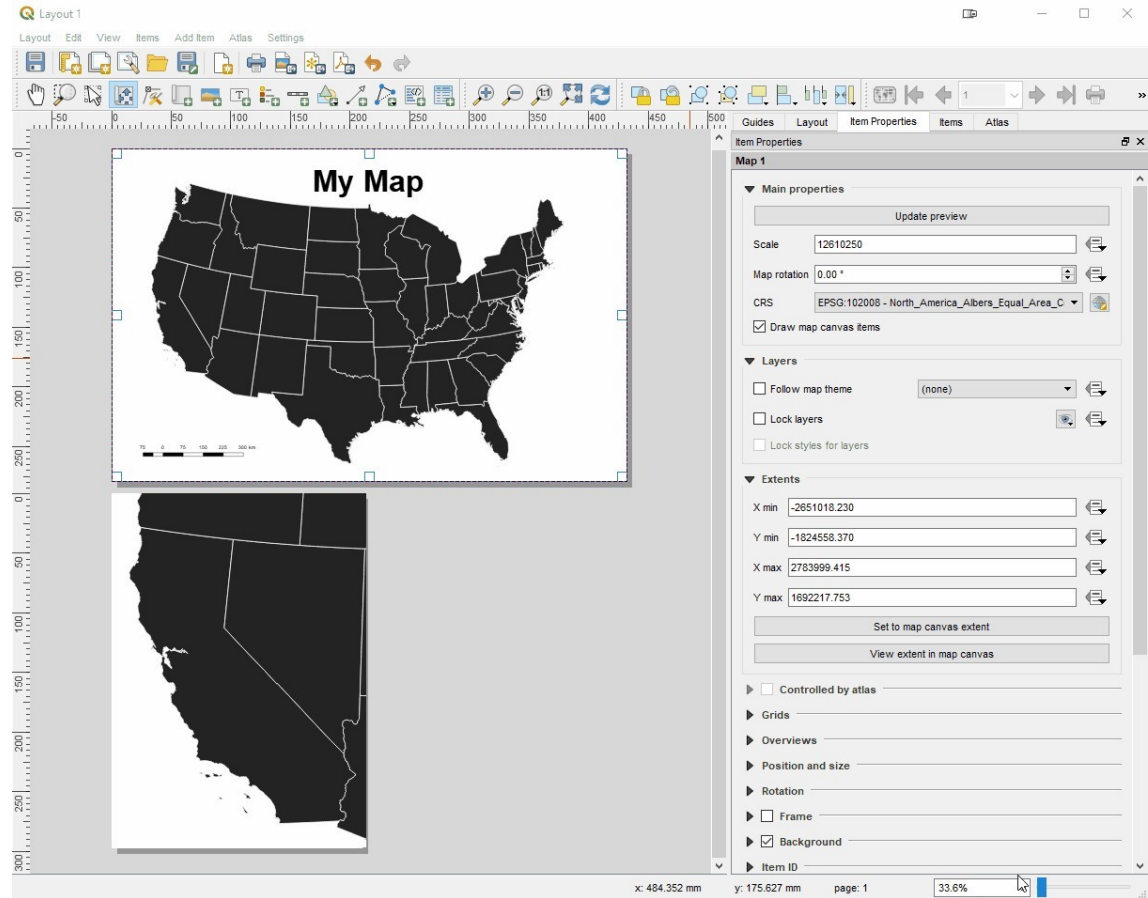


Even More Expressions | Variables & Data Defined Overrides

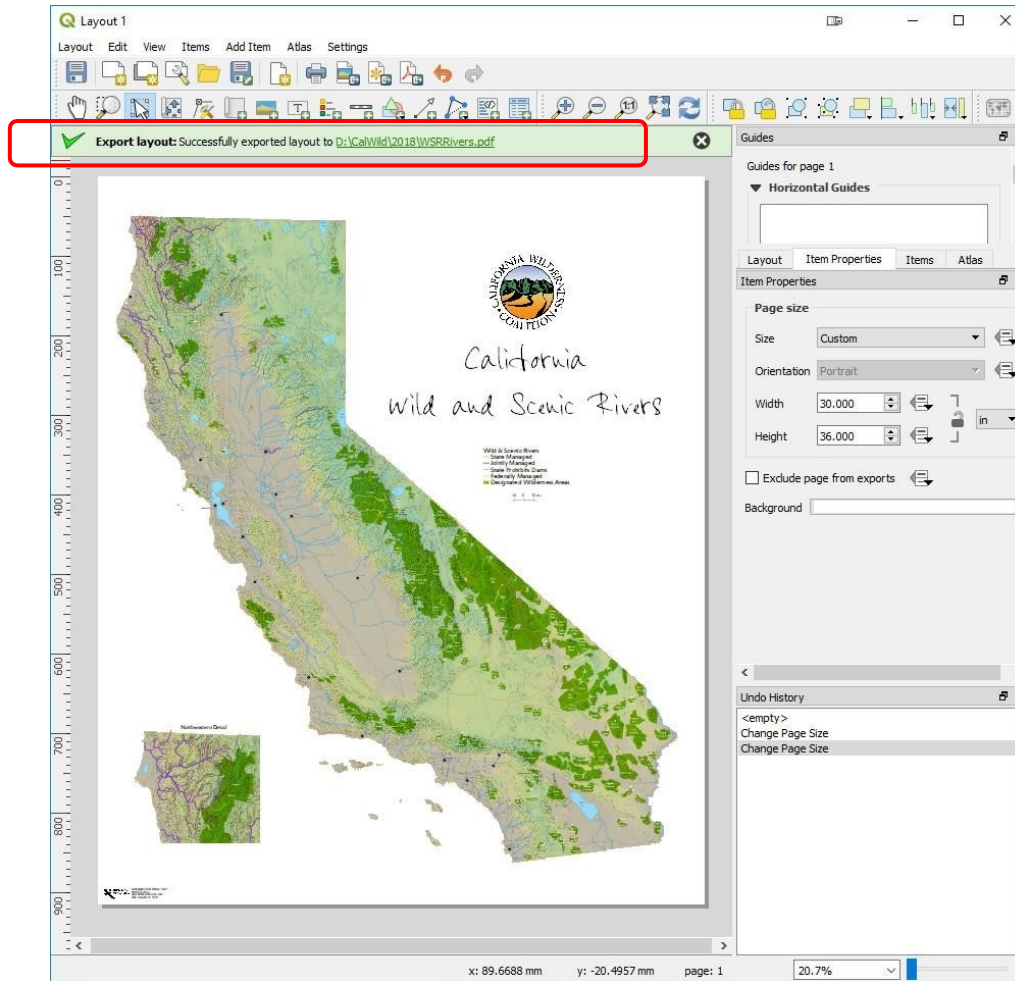


Print Composer

- Completely rewritten
- Can have multiple sheets per layout of different orientation and sizes
- New Reports



Hyperlinks to export folder



Print Composer...

- Scalebars more user friendly
- All units available including inches (mm, cm, m, in, ft, pt, pica & px)
- Better grid snapping
- Change CRS of Layout independent of QGIS map
- Exposed to plugins!
- New Map Extent Toolbar



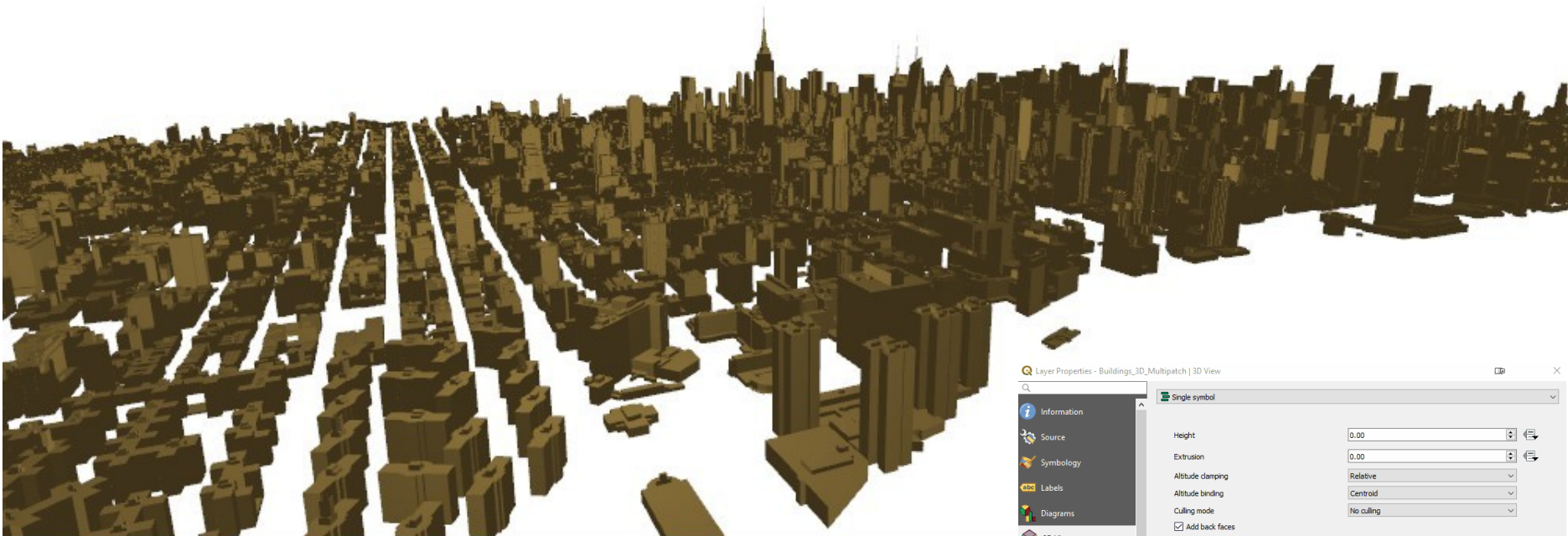
- Expressions supported for legend items

Print Composer - Layout items can “block” map labels



3D Extrusion of Vector Data & Animations

3D Map 1



Keyframe 0 s



Layer Properties - Buildings_3D_Multipatch | 3D View

Single symbol

Height: 0.00

Extrusion: 0.00

Altitude damping: Relative

Altitude binding: Centroid

Culling mode: No culling

Add back faces

Invert normals (experimental)

Diffuse: [Color swatch]

Ambient: [Color swatch]

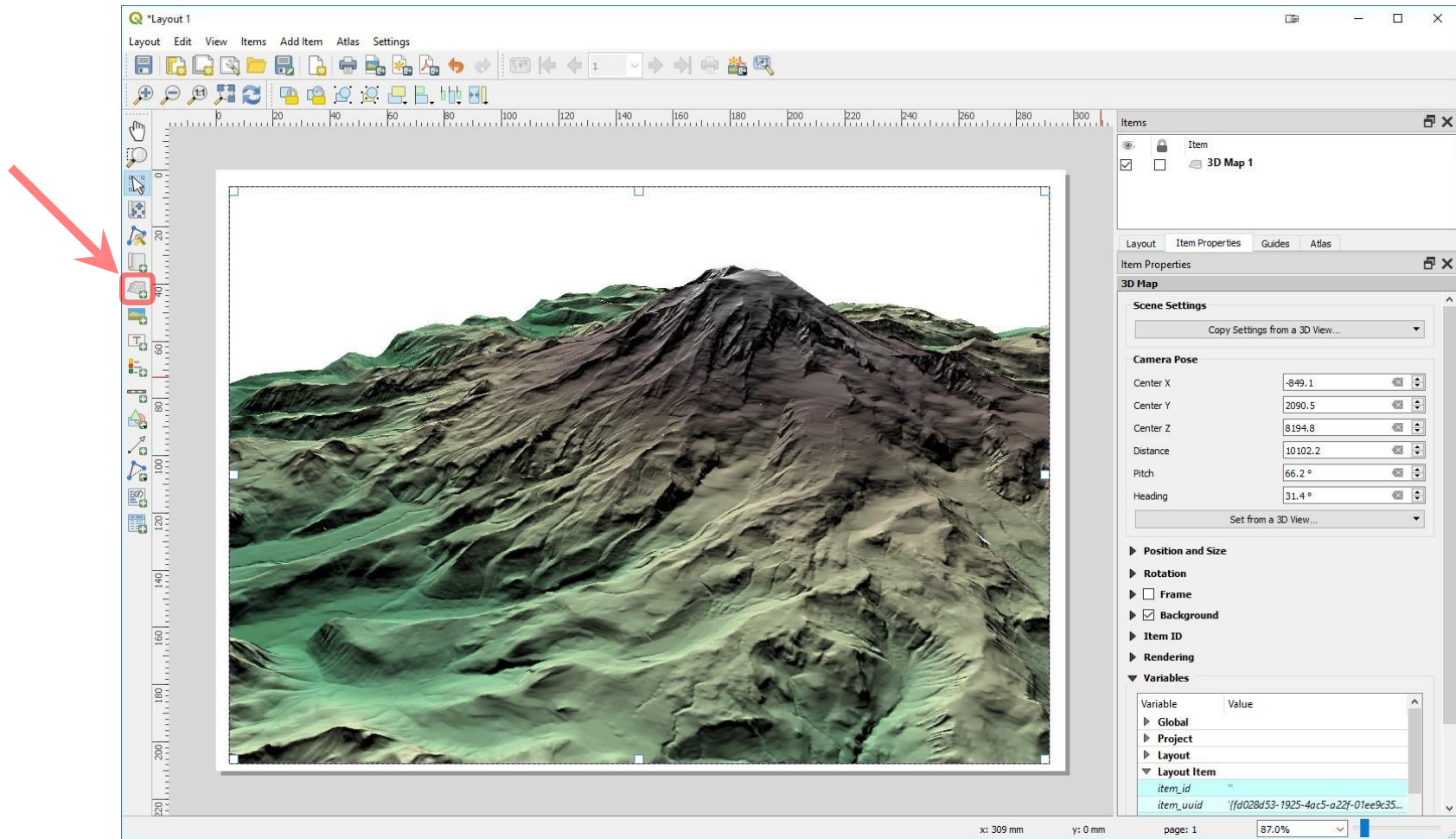
Specular: [Color swatch]

Shininess: 0.00

Style

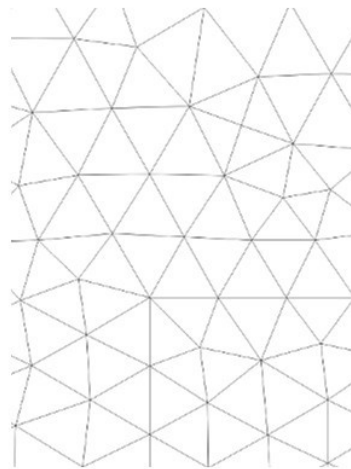
OK Cancel Apply Help

3D Support in Print Layout

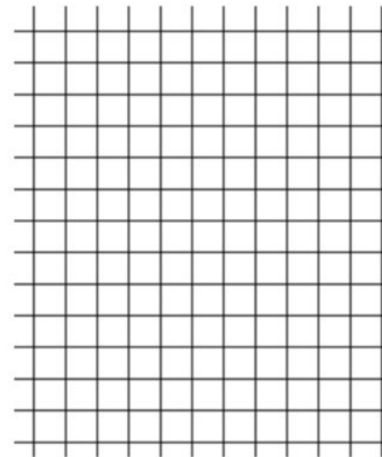


Support for Mesh Data

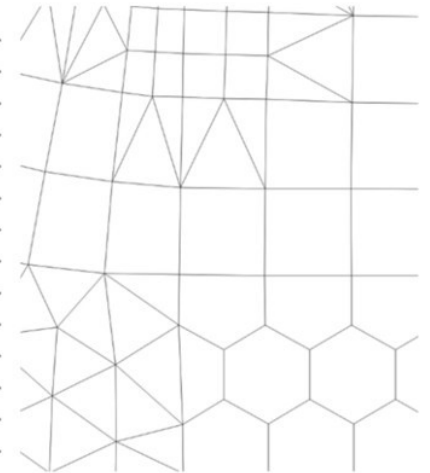
- Used for meteorological, hydrological, and oceanographic datasets and model outputs.
- Mesh Calculator
- Supports Identify features
- 3D support for mesh data



Triangular mesh



Quad mesh (regular grid)



Mesh with mixed element types

Style Contour and Vectors & Use Time Slider

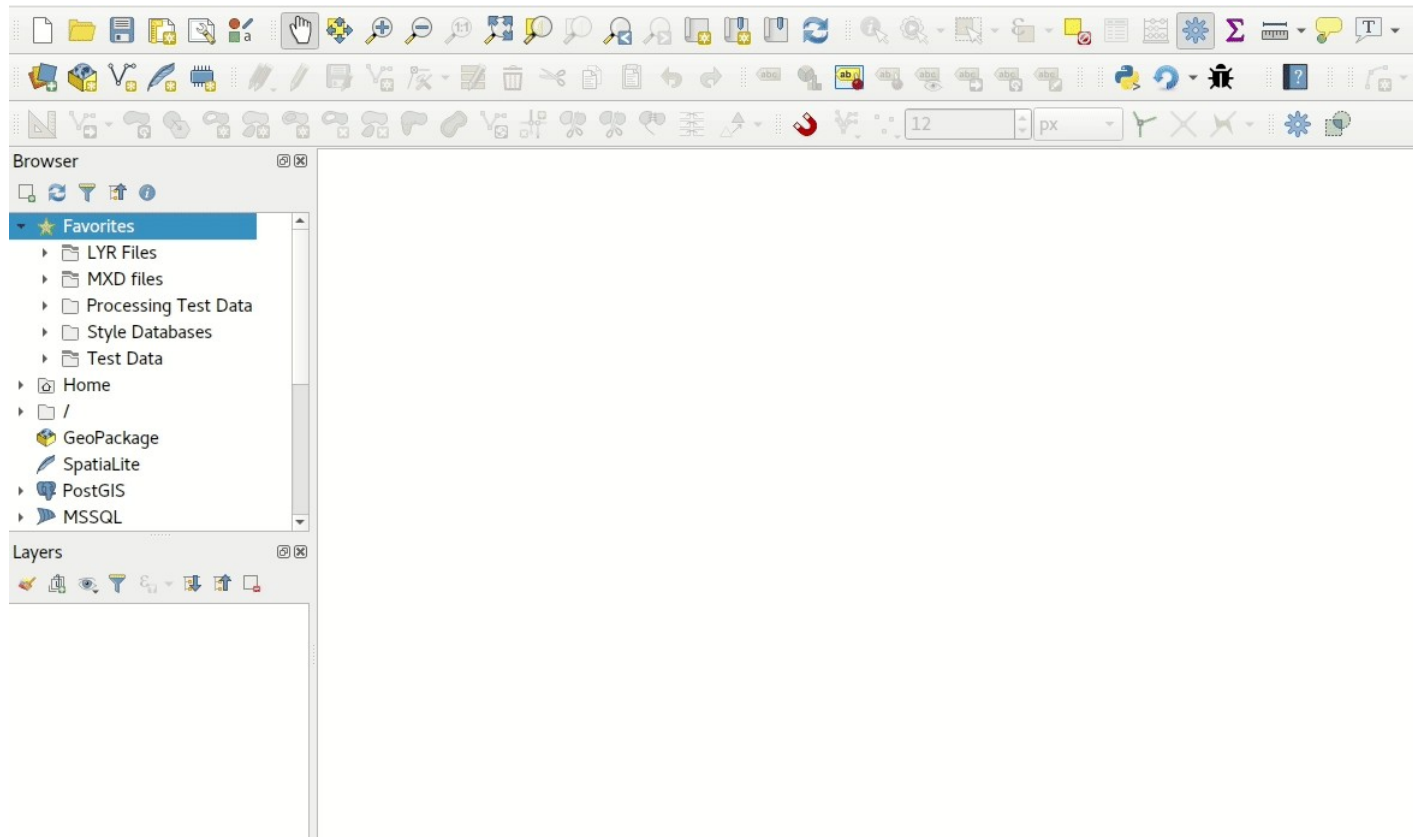
The screenshot displays the QGIS desktop environment. The main map area shows a vector field of wind directions and a color-coded contour map of temperature over the Atlantic Ocean. The Layers panel on the left shows the following layers:

- ne_10m_admin_0_countries
- Irma_Maria_Atlantic
 - 10 metre wind
 - 0.000412
 - 5
 - 10
 - 15
 - 20
- Google Satellite

The Layer Styling panel on the right is configured for the 'Irma_Maria_Atlantic' layer. It shows a 'Groups' list with '10 metre wind', '2 metre temperature', and 'Total precipitation'. The 'Dataset in Selected Group(s)' is set to '00:00:00'. The 'Metadata' section indicates the layer is valid, has a time of 0, and is a vector layer named '10 metre wind'. The 'Layer Rendering' section shows the 'Blending mode' set to 'Normal'.

The status bar at the bottom indicates the project is saved to 'C:\Geo\Mesh\IrmaMariaAtlantic.gqz', the coordinate is '-52.02,13.16', the scale is '1:13678474', and the magnifier is at '100%'. The rotation is '0.0°' and the user is 'USER:100027'.

ESRI .mdx to .qgs (Beta, in foundrising)



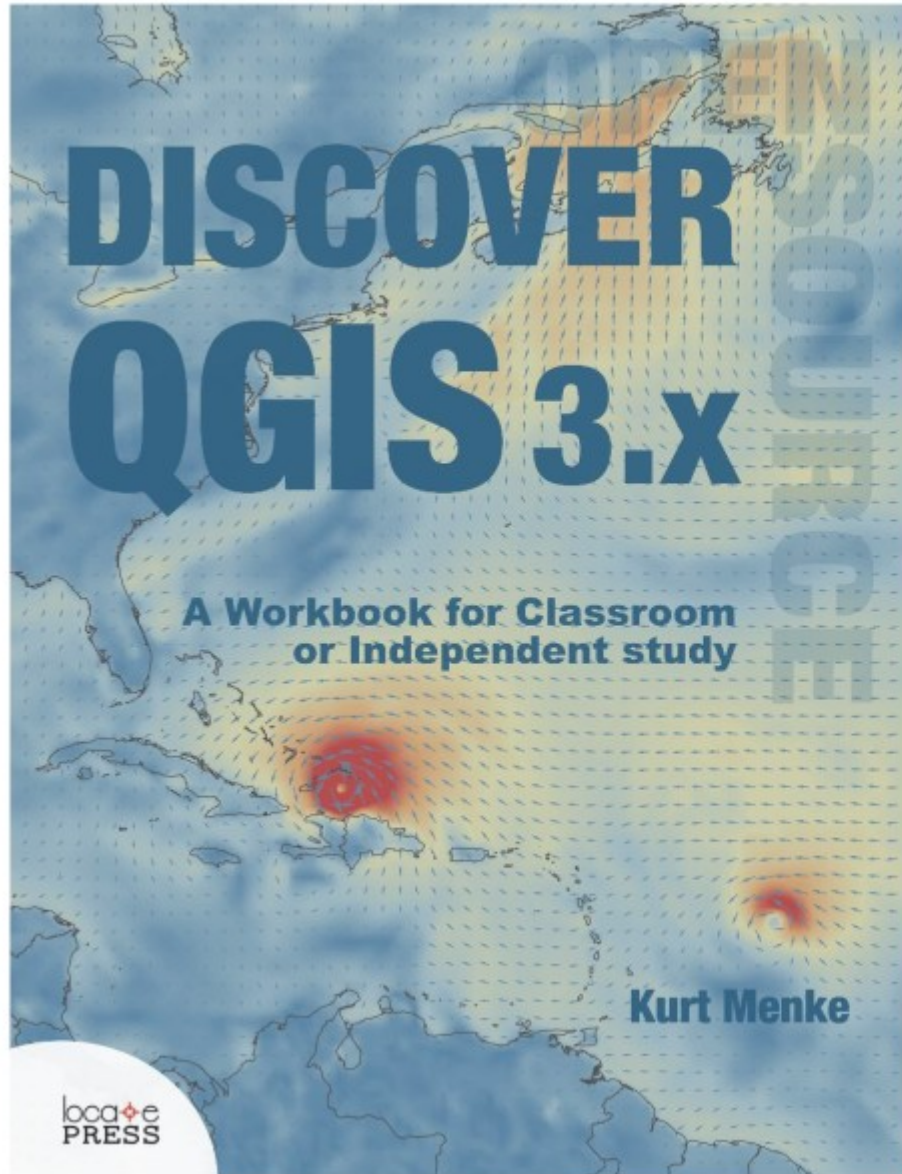
QGIS Server

- Totally refactored, rewritten and modularized
- Now a OGC reference implementation for WMS
- Tested as compliant against OGC WMS testsuit
- Much more unit tests
 - Ongoing work
 - Compliance work for WFS ongoing
 - WMTS support
 - Performance: currently still slightly worse than version 2x, but being worked on



Shameless Plug #1

Spring 2019



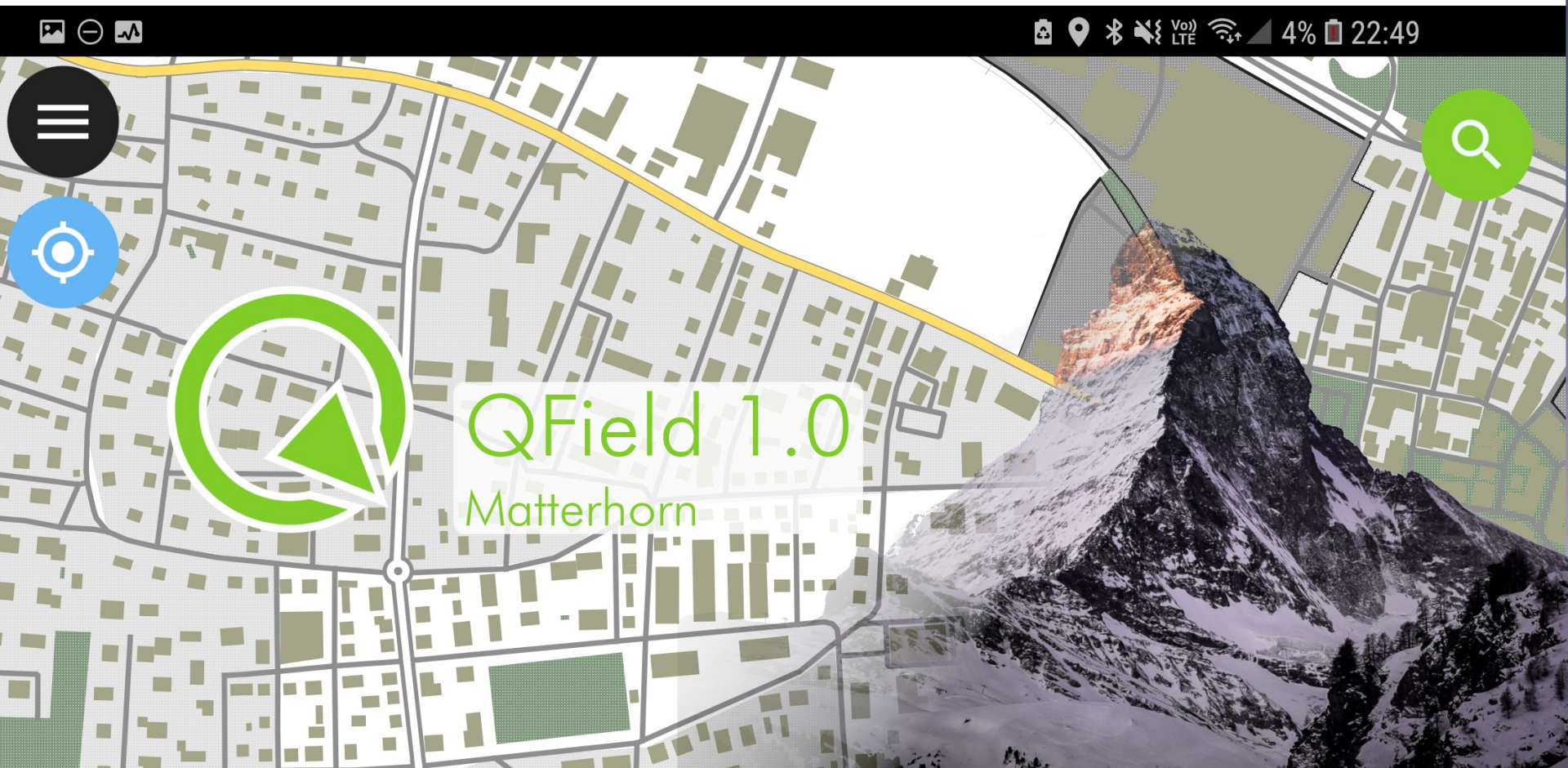
- ✓ Updated for QGIS 3.6
 - ✓ A workbook for classroom or independent study
 - ✓ Lab exercises based on the GeoAcademy
 - ✓ Data, Discussion questions & Solution files included
 - ✓ Challenge exercises
 - ✓ Learn enhanced workflows with QGIS 3.x
 - ✓ Covers Spatial analysis, Data management & Cartography
 - ✓ New section → Advanced Data Visualization
 - Blending modes | Live layer effects | Expression-based symbology | Geometry generators | Time Manager | 3D | Mesh data
 - ✓ Available in Print and e-Book
 - ✓ 400 pages
 - ✓ \$35
- Appendices**
- Keyboard shortcuts
 - Useful plugins
 - Getting involved



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<https://locatepress.com/dq3>

Shameless Plug #2



Shameless Plug #3



<https://opengis.ch/qgis-on-the-road>



QGIS needs you!

QGIS needs more contributors



- Users, Testers
- Contributors of case studies
- Documentors and Translators
- Hosts of meetings and hackfests
- Developers
- Sysadmins for infrastructure
- Funders, Donors, Sponsors



We strive for a friendly, welcoming and diverse worldwide community!

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Thanks! Questions?

A photograph showing four men in a brewery setting. They are gathered around a large, horizontal wooden barrel, which is tilted. The men are looking at the barrel with interest. The background features stone walls, wooden beams, and a sign that reads "WENGERT Brenner- und Brautechnik".

Get in touch
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