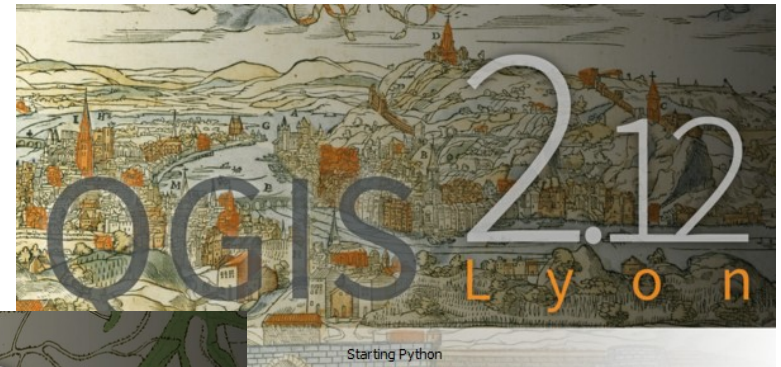
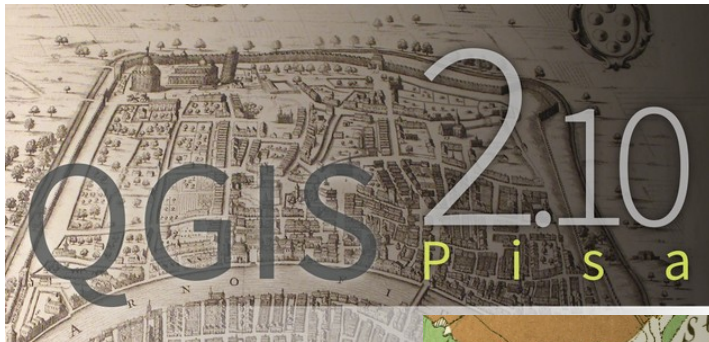


---

# Selected QGIS Improvements



---

2.10 to 2.16



Kanton Zug



Andreas Neumann (GIS-Fachstelle, Kanton Zug, Switzerland)

---

# Visual Change Logs

---

- <http://www.qgis.org/en/site/forusers/visualchangelogs.html>
- Since QGIS 2.0



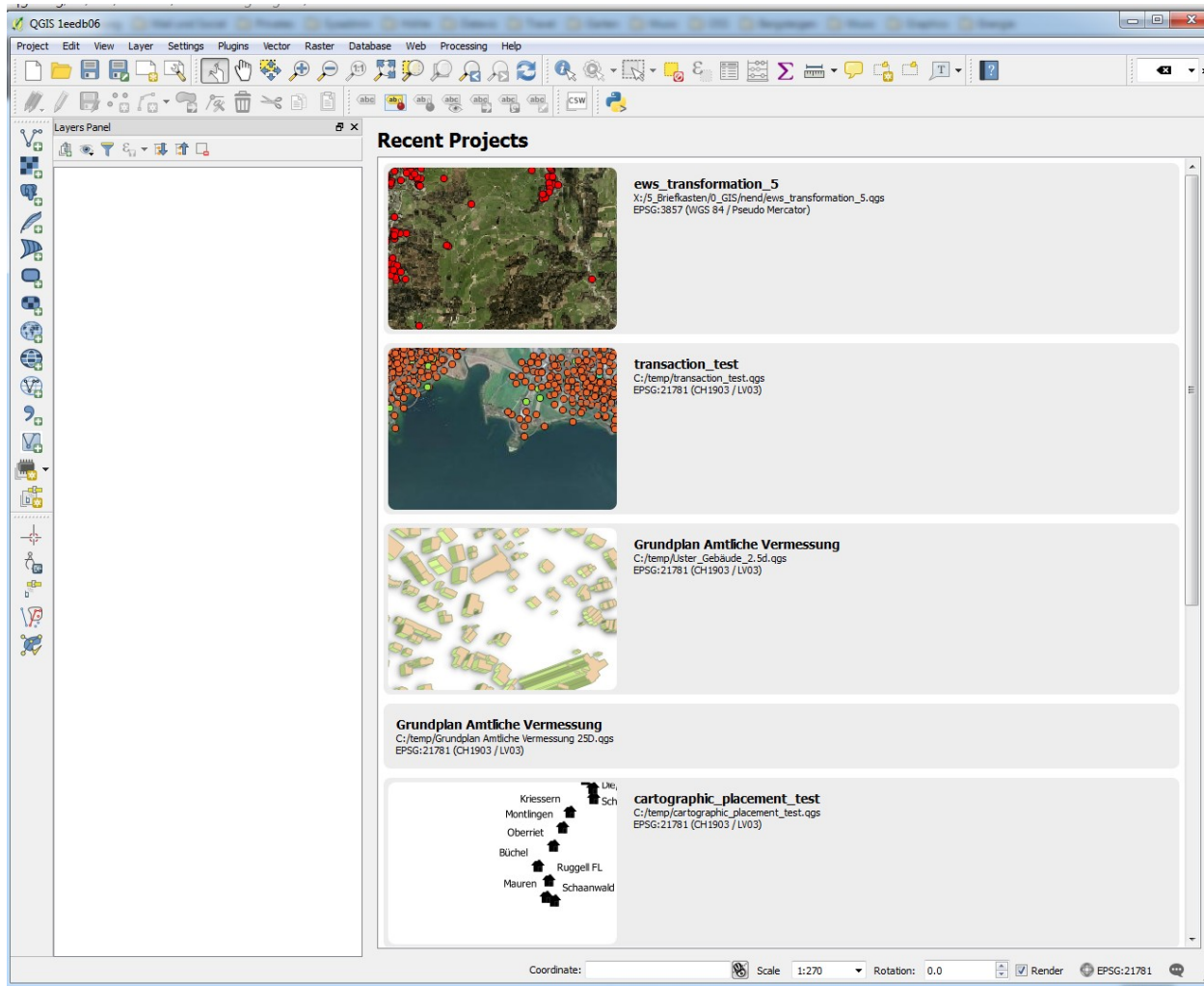
The screenshot shows the QGIS website's visual changelog page for version 2.14. The top navigation bar includes the QGIS logo, version numbers (2.14.3 and 2.8.9 (LTR)), and links for 'DISCOVER QGIS', 'FOR USERS', 'GET INVOLVED', and 'DOCUMENTATION'. A search bar and a language dropdown set to 'English' are also present.

The main content area features a large heading 'Changelog for QGIS 2.14' above a banner image. The banner image shows a historical map of Essen with the text 'QGIS 2.14 Essen' overlaid. Below the banner, the text reads: 'This is the changelog for the next release of QGIS - version 2.14 'Essen'. Essen was the host city to our developer meet ups in October 2012 and 2014.'

Under the heading 'Long Term Release', the text states: 'This is a special release since it is designated an 'LTR' (Long Term Release). LTR releases will be supported with backported bug fixes for **one year**, and will be in permanent feature freeze (i.e.

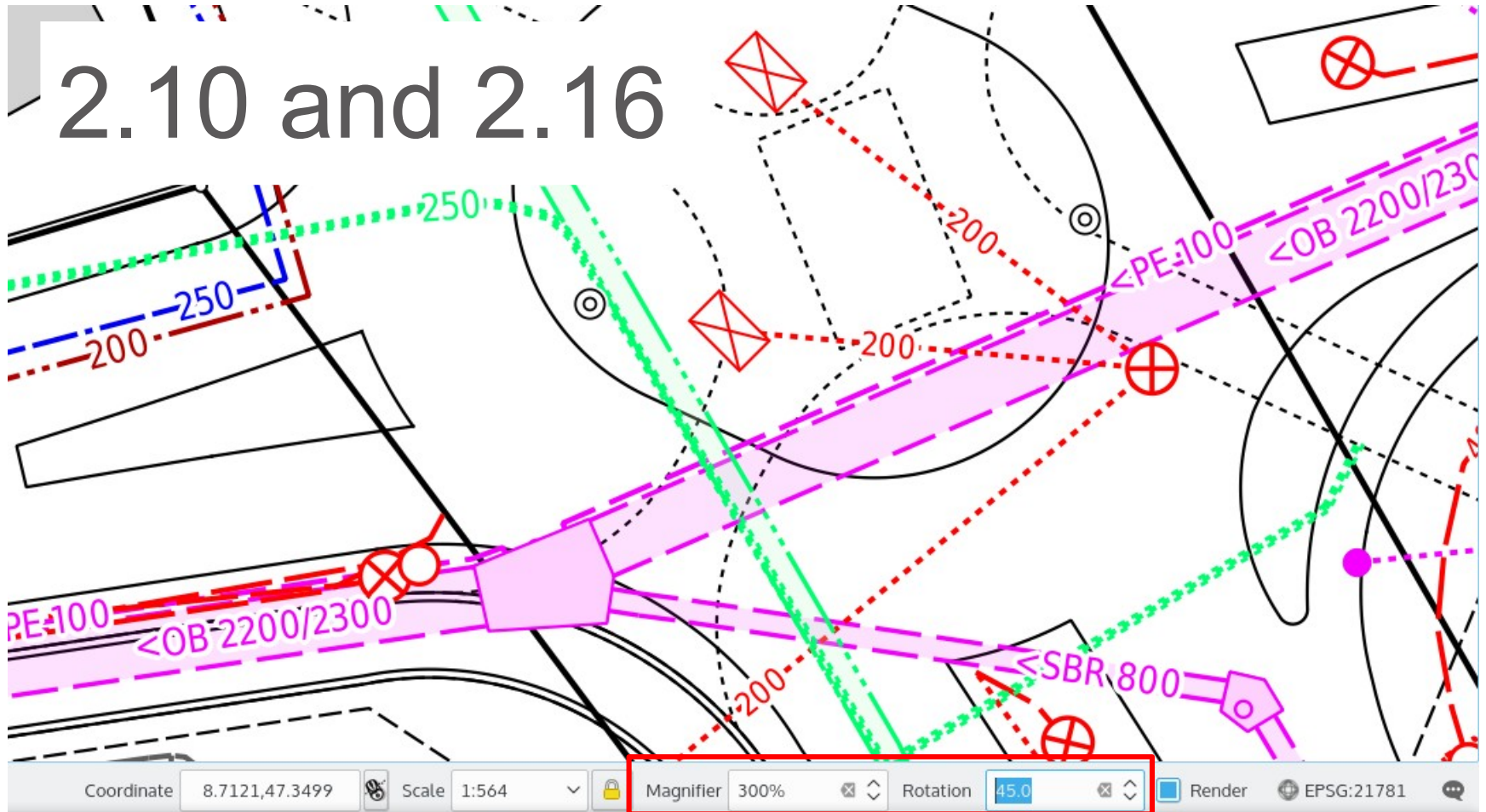
The left sidebar contains a 'FOR USERS' section with the following links: 'Download QGIS', 'Visual Changelogs', 'Changelog for QGIS 2.14' (highlighted), 'Current QGIS Sponsors', 'General', 'Analysis tools', 'Browser', 'Data Providers', 'Data management', 'Digitising', 'Labelling', 'Layer Legend', 'Map Composer', 'Plugins', 'Processing', and 'Programmability'.

# Startscreen with recent projects



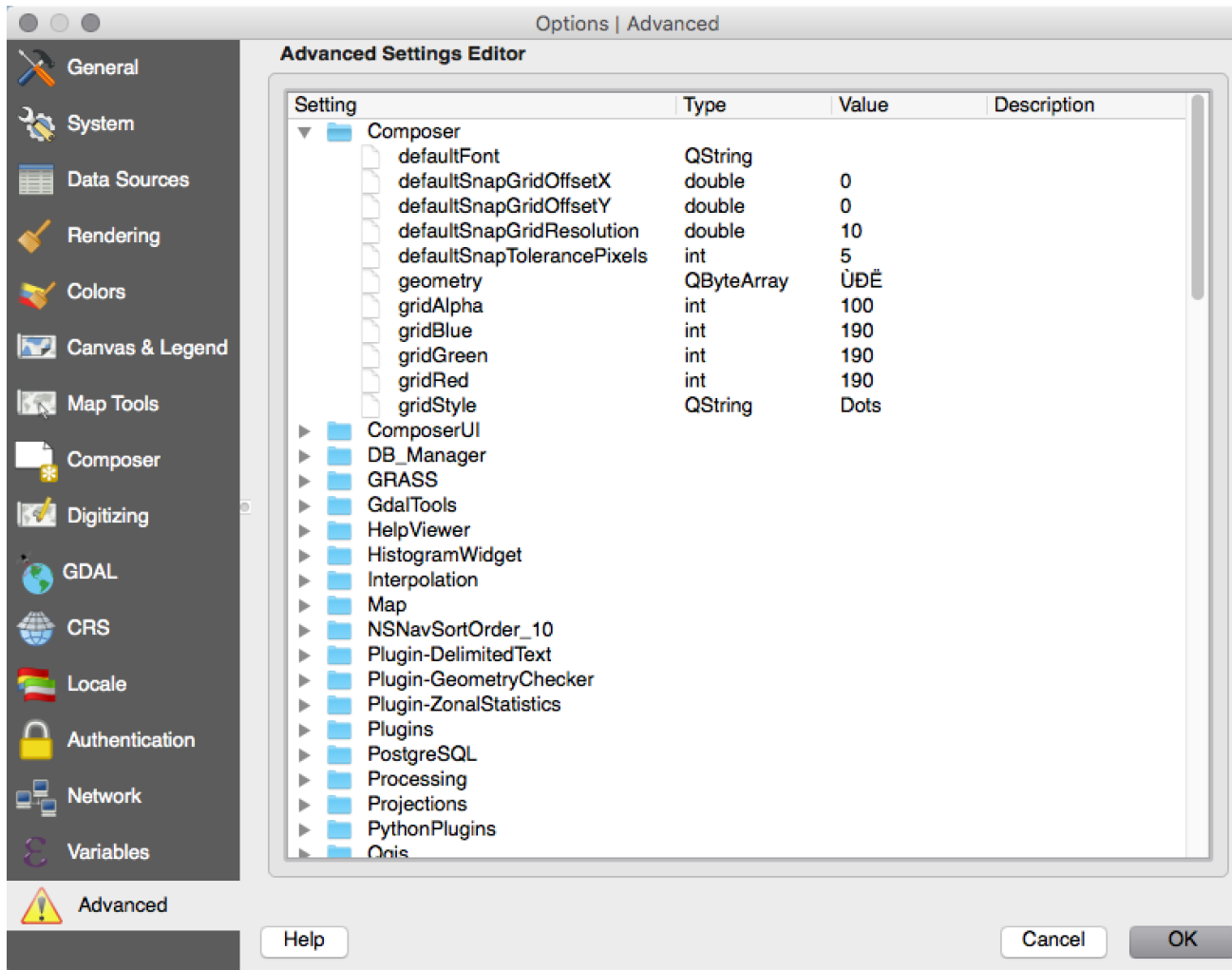
2.12

# Rotation and Magnifier Controls in Status Bar





# Central Settings Editor

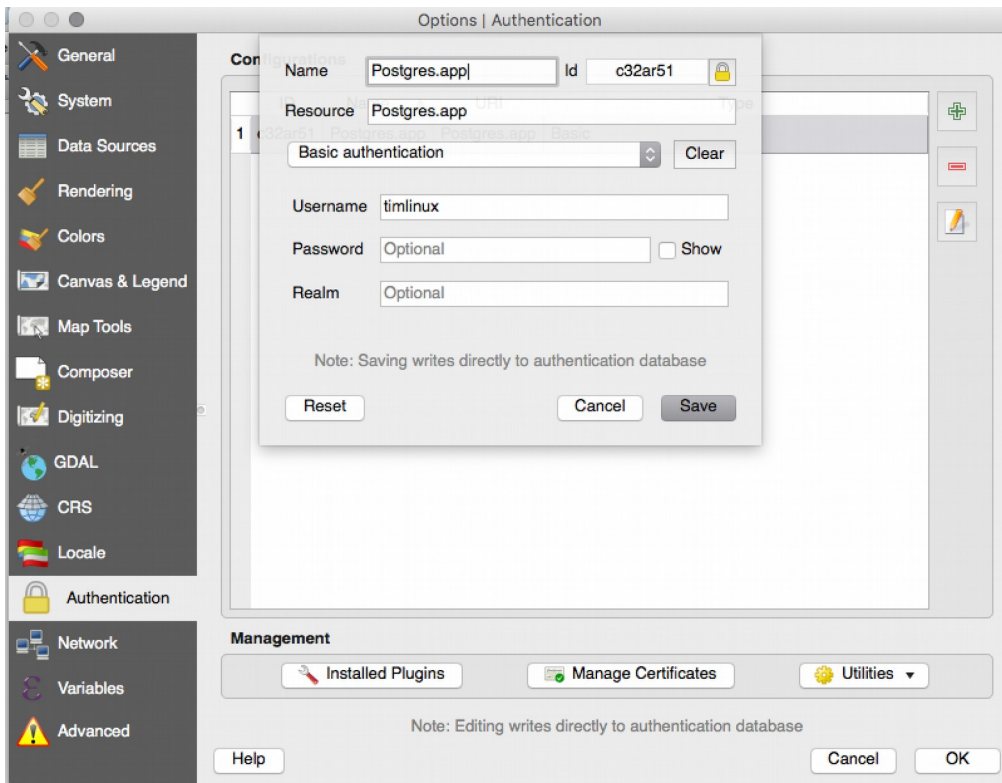


Alternative  
central view to  
all settings in  
QGIS

Be careful!

2.12

# Security - Encrypted passwords



Integrated password manager with master password

Encrypted passwords stored in SQLite DB

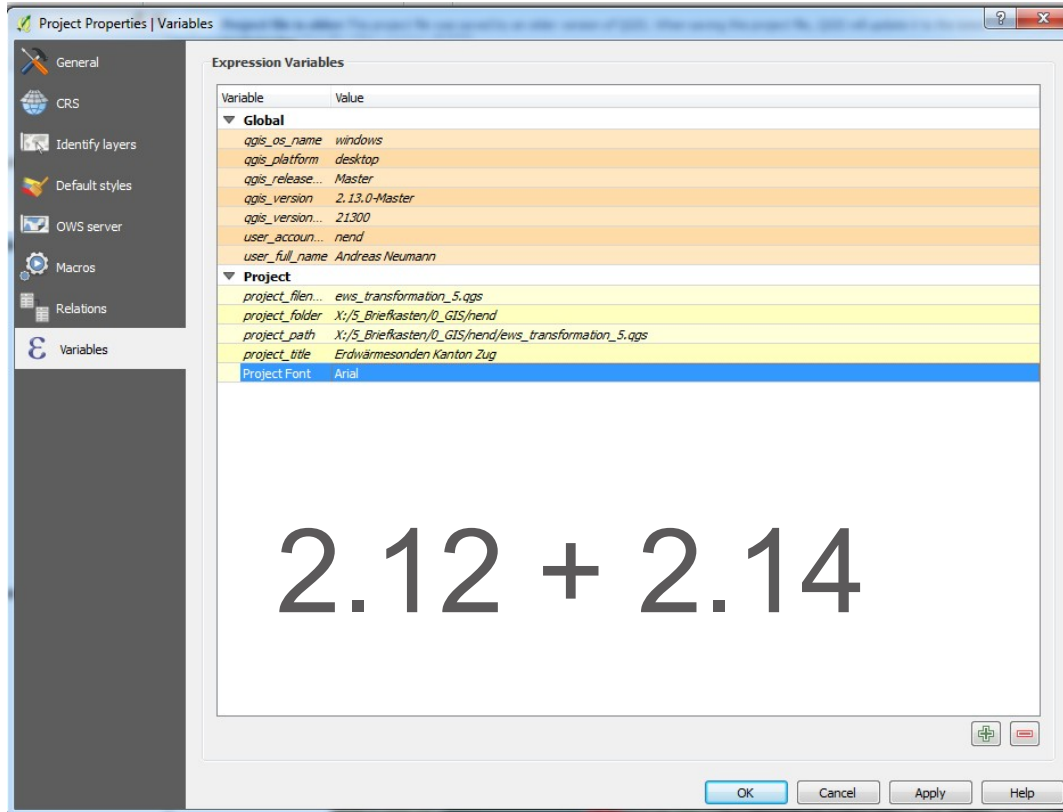
PKI authentication with keys

Available for different providers, e.g.:

- Postgis
- WMS
- WFS

2.12 + 2.14

# Variables



Can be defined:

- globally
- on project
- on layer
- in print composer

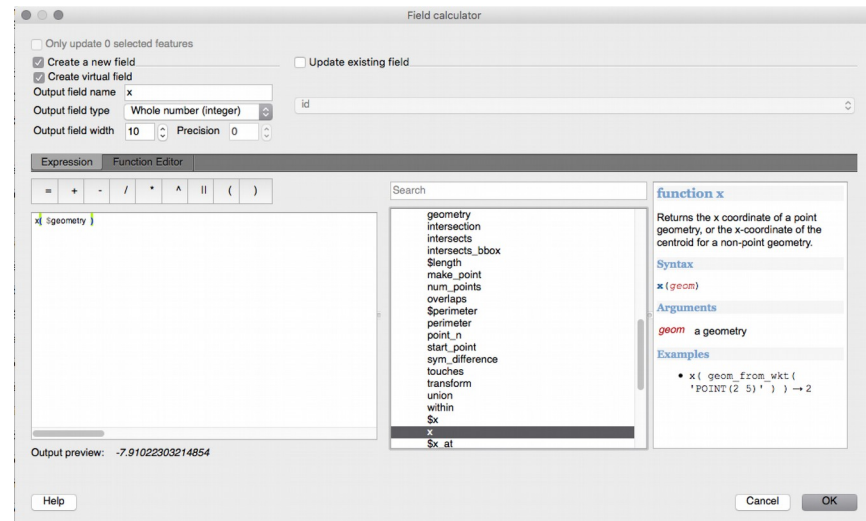
Different scopes with inheritance

Automatic variables (like QGIS version, OS, User, Project file path) or custom user defined variables

New in version 2.14: @qgis\_os\_name [Linux|Windows|OSX], @qgis\_platform [Desktop|Server], @user\_account\_name, @user\_full\_name, @geometry\_part\_count, @geometry\_part\_num, @map\_extent\_width, @map\_extent\_height, @map\_extent\_center

# New expression functions

- num\_points(geom)
- area(geom)
- length(geom)
- perimeter(geom)
- start\_point(geom)
- end\_point(geom)
- point\_n(geom,n)
- make\_point(x,y)
- x(geom)
- y(geom)



- project\_color
- color\_part (e.g. red, hue, alpha)
- set\_color\_part
- day\_of\_week

2.12



# New expression functions

---

- relate (DE-9IM)
- m/z additions for many functions
- reverse (linestring)
- eval(function)
- translate
- darker|lighter
- radians|degrees
- point\_on\_surface
- exterior\_ring
- is\_closed
- geometry\_n
- num\_geometries
- num\_rings
- num\_interior
- nodes\_to\_points
- segments\_to\_lines
- closest\_point
- shortest\_line

# New expression functions

---

- aggregate (with filter/group by)
- relation\_aggregate (for related features in other tables)
- Improved date/time calculations

# GDAL/OGR 2.x in QGIS Windows

---

- Better Geopackage support
- Support for curves in more data providers (e.g. Geopackage, GML, Interlis, Postgis)
- Support for reading and writing spreadsheet files (Libreoffice and Excel)
- more options for GDAL/OGR based Processing providers or format translations

# Export of Display Values in Save As

- Export of human-readable values instead of internal representation or codes
- For certain widgets
  - Date/Time
  - Value Relation
  - Relation Reference Widget
  - Boolean
- Default for Spreadsheet and CSV export

2.16

Save vector layer as...

Format: Comma Separated Value [CSV]

Save as:

CRS: Selected CRS (EPSG:21781, CH1903 / LV03)

Encoding: UTF-8

Save only selected features

▼ Select fields to export and their export options

Name	Type	Replace with displayed values
<input checked="" type="checkbox"/> waermetraegerfluessigkeit	int4	<input checked="" type="checkbox"/> Use Relation Reference
<input checked="" type="checkbox"/> gesamtfuellmenge	int4	
<input checked="" type="checkbox"/> max_leistung	numeric	
<input checked="" type="checkbox"/> verwendungszweck	int4	<input checked="" type="checkbox"/> Use Value Relation
<input checked="" type="checkbox"/> fabrikat_waermepumpe	vchar	
<input checked="" type="checkbox"/> ...	...	<input checked="" type="checkbox"/> Use Value Relation

Select All Deselect All

Replace all selected raw field values by displayed values

Add saved file to map

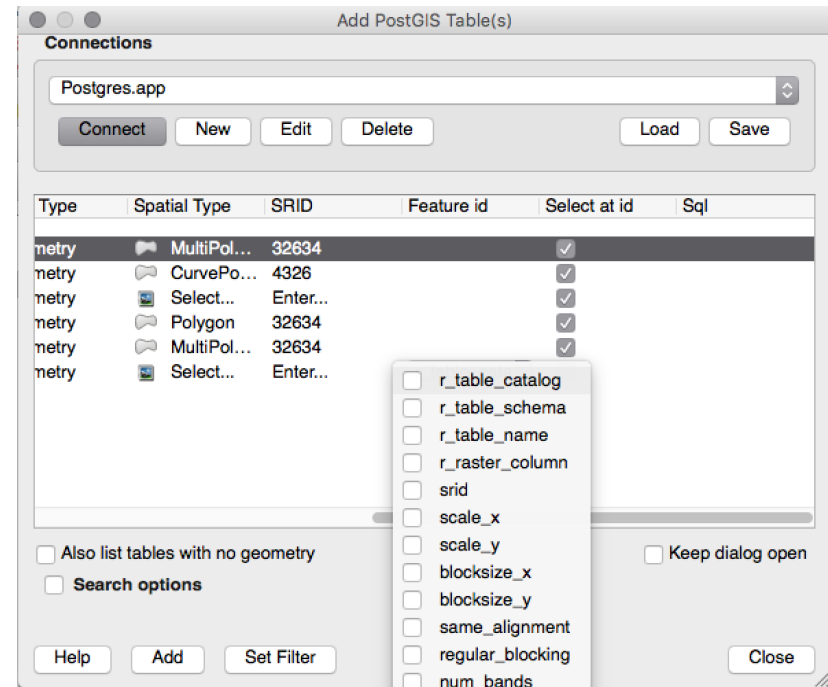
Symbology export: No symbology

Scale: 1:50000

Help

# Postgis Provider

- Performance improvements for rule-based renderer
- Support for compound primary keys on tables/views
- Timestamp data type support (2.14)
- Transaction groups for editing (2.14 / 2.16)
- PKI auth support (2.14)



2.12 - 2.16



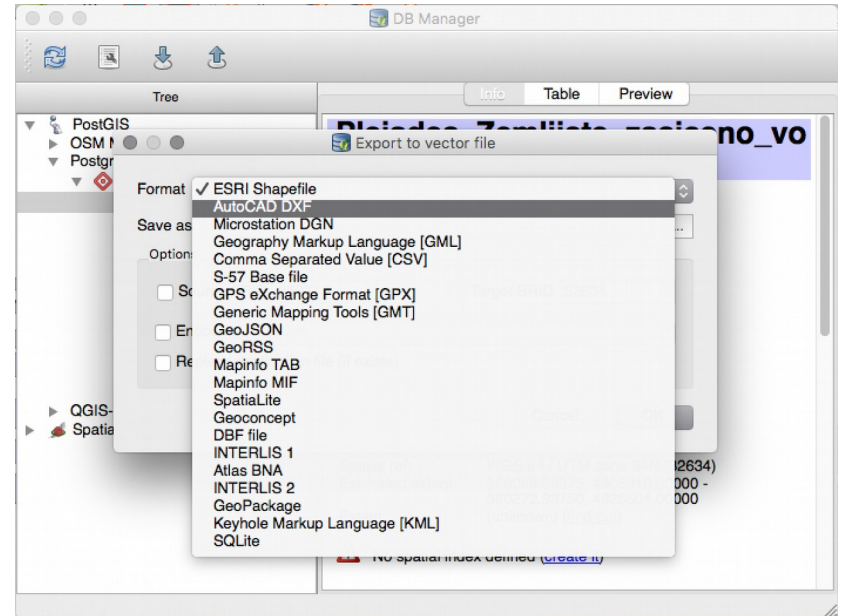
# WFS Client

---

- Version auto-detection
- Implements WFS 1.0, 1.1 and 2.0
- Local cache in SpatiaLite
- Background download and progressive rendering
- URI parameter with sql with SELECT / FROM / JOIN / WHERE / ORDER BY clauses
- WFS 2.0 joins
- “Only request features overlapping the view extent” setting by default
- Many behind the scenes improvements / tests

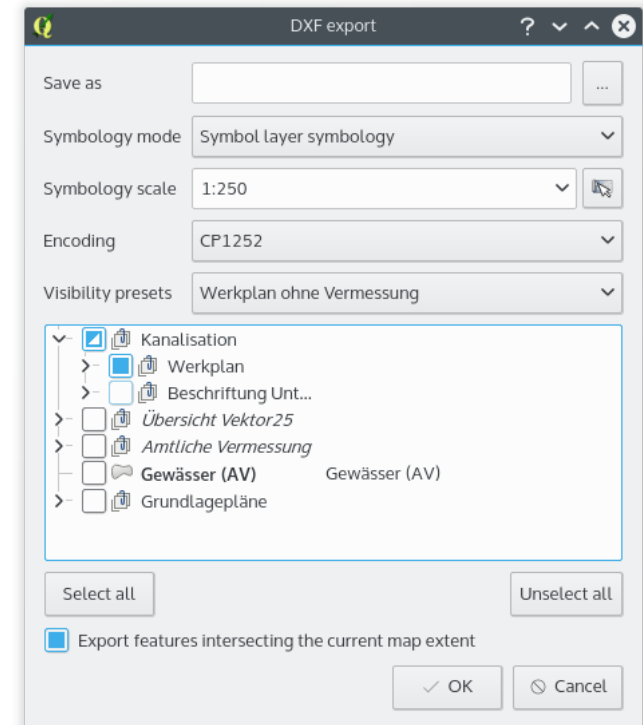
# DB-Manager

- Export to OGR supported formats
- Support Oracle connections
- Import only selected features
- Query windows as tabs (good for multiple SQL queries)



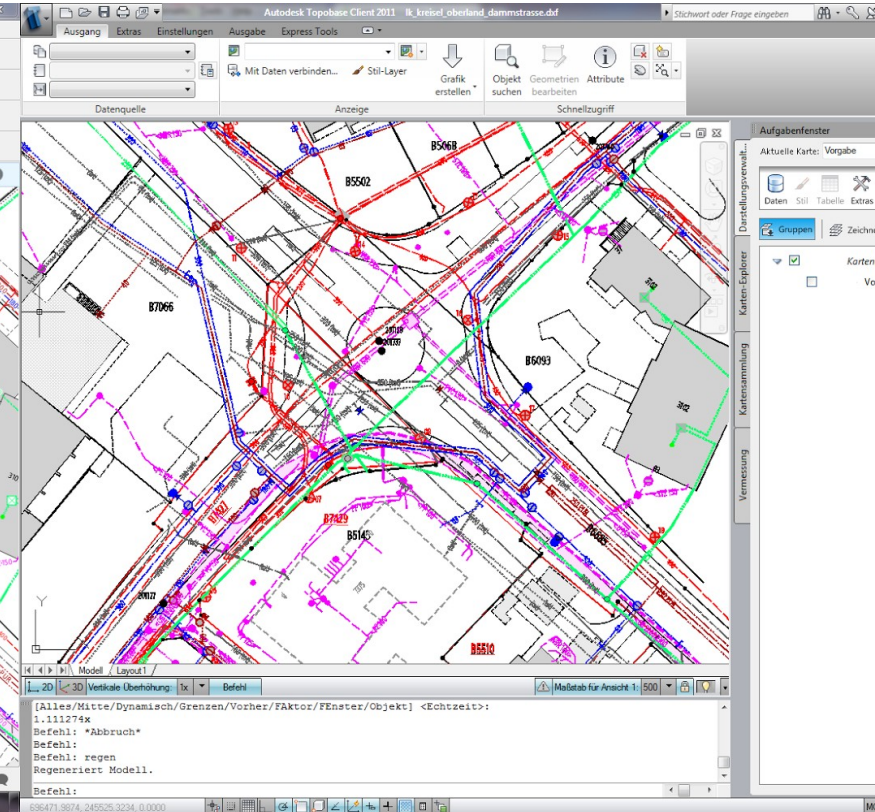
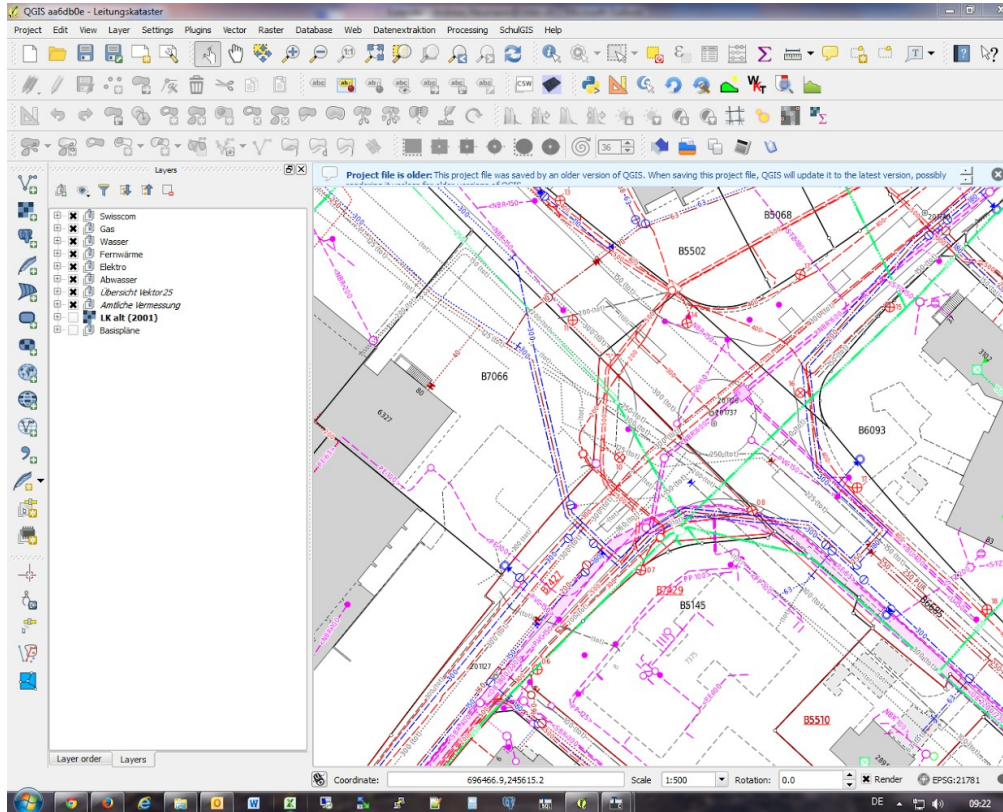
# DXF Export Improvements

- Export with or without symbology
- Export everything or visible extent
- Set scale for rendering rules and filters
- Use QGIS layer names, layer title or layer attribute to determine layer name
- Support of visibility presets
- Support multiline text
- Support solid fills
- Support transparency
- Support line offsets and units properly
- Automatic conversion of simple and SVG symbols to DXF blocks



2.8 - 2.14

# DXF Export Improvements



2.8 - 2.14

# New geometry model

---

Circular Arcs, 3D, M-Values

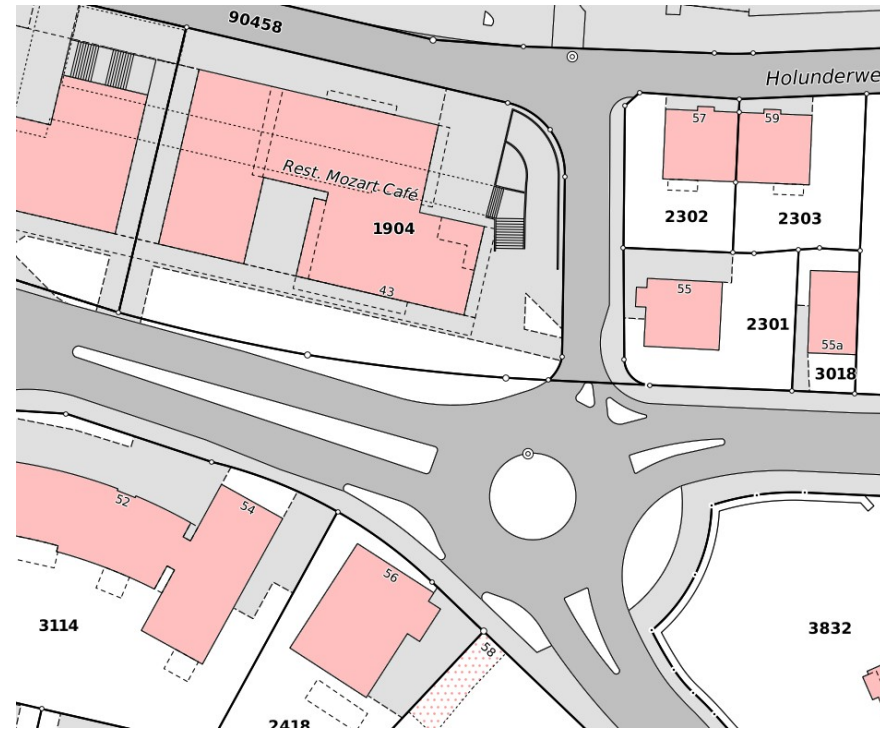
2.10: possibility to display features with curved type

2.12: editing of curved geometry types, z/m-values

2.14: curve support in WKT and GML

2.16: Curve support in Geopackage (through OGR)

3.x: ?????



2.10 - 2.16

---



# Conditional formatting in attribute table

Attribute table - TA Lower Shire :: Features total: 30, filtered: 30, selected: 0

VE1_	NAME2_	NAME3_	Area	Code	Total	Male	Female	area_km2	dense_km2	
0	malala	Balaka	South	TA Msamala	AFRMWI31201	172286.0000...	82743.00000...	89543.00000...	1379.16460	125
1	ambo	Balaka	South	TA Kalembo	AFRMWI31204	122305.0000...	58151.00000...	64154.00000...	745.71926	164
2	mbe	Zomba	South	TA Mlumbe	AFRMWI30306	132340.0000...	62539.00000...	69801.00000...	668.51746	198
3	3 Nati...	Chikhwawa	South	Lengwe Nat...	AFRMWI31008	53.00000000...	34.00000000...	19.00000000...	928.19352	0
4	Gam...	Chikhwawa	South	Majete Gam...	AFRMWI31009	0.00000000...	0.00000000...	0.00000000...	646.31668	0
5	imera	Nsanje	South	TA Ndamera	AFRMWI31101	26596.0000...	12671.0000...	13925.0000...	188.70402	141
6	Boma	Nsanje	South	Nsanje Boma	AFRMWI31120	20179.0000...	10051.0000...	10128.0000...	15.70644	1285
7	nombo	Nsanje	South	TA Chimombo	AFRMWI31102	10239.0000...	4898.00000...	5341.00000...	35.62549	287
8	chika...	Nsanje	South	TA Nyachik...	AFRMWI31103	3640.00000...	1772.00000...	1868.00000...	78.06751	47
9	lo	Nsanje	South	TA Mlolo	AFRMWI31104	57937.0000...	27743.0000...	30194.0000...	343.18648	169
10	gani	Nsanje	South	TA Tengani	AFRMWI31105	34690.0000...	16953.0000...	17737.0000...	347.31809	100
11	enje	Nsanje	South	TA Mbenje	AFRMWI31106	43394.0000...	21330.0000...	22064.0000...	318.15937	136
12	emia	Nsanje	South	TA Malemia	AFRMWI31107	18033.0000...	8746.00000...	9287.00000...	144.01756	125
13	ibu	Nsanje	South	TA Ngabu	AFRMWI31108	11146.0000...	5365.00000...	5781.00000...	59.03138	189
14	uli	Neno	South	TA Mlauli	AFRMWI31302	24775.0000...	12059.0000...	12716.0000...	562.80138	44
15	ton	Neno	South	TA Symon	AFRMWI31303	38179.0000...	18671.0000...	19508.0000...	416.56050	92
16	Gam...	Neno	South	Majete Gam...	AFRMWI31305	36.00000000...	19.00000000...	17.00000000...	58.38459	1
17	la	Machinga	South	TA Sitola	AFRMWI30202	38611.0000...	18015.0000...	20596.0000...	327.15124	118
18	e Town	Machinga	South	Liwonde Tow...	AFRMWI30222	22927.0000...	11035.0000...	11892.0000...	36.18189	634
19	wa B...	Chikhwawa	South	Chikwawa B...	AFRMWI31020	6987.00000...	3786.00000...	3201.00000...	8.41015	831
20	ibu	Chikhwawa	South	TA Ngabu	AFRMWI31001	149490.0000...	74222.0000...	75268.0000...	1085.64258	138
21	du	Chikhwawa	South	TA Lundu	AFRMWI31002	46372.0000...	24473.0000...	21899.0000...	199.50341	232
22	pana...	Chikhwawa	South	TA Chapana...	AFRMWI31003	86495.0000...	41985.0000...	44510.0000...	836.06846	103
23	seyaya	Chikhwawa	South	TA Maseya	AFRMWI31004	26639.0000...	13323.0000...	13316.0000...	145.34759	183
24	inga	Chikhwawa	South	TA Katunga	AFRMWI31005	24680.0000...	11960.0000...	12720.0000...	161.29650	153

Conditional Format Rules

Name: Smaller ares

Condition: "Female" < 10000

Preset: abc - 123

Background: [Red] Text: [White]

Icon

**B** **I** U **S** Helvetica

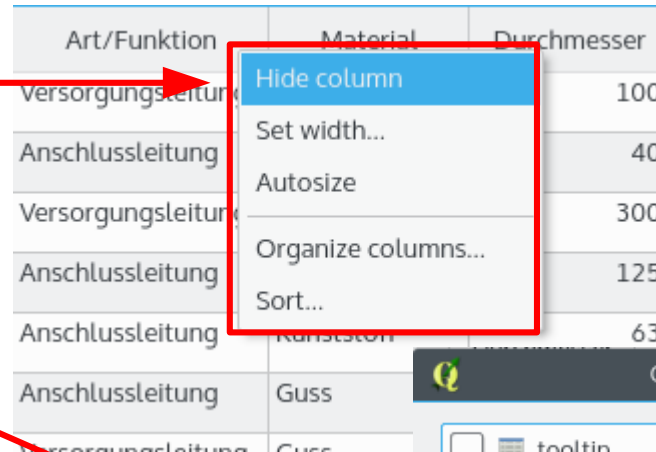
Done Cancel Delete

Show All Features

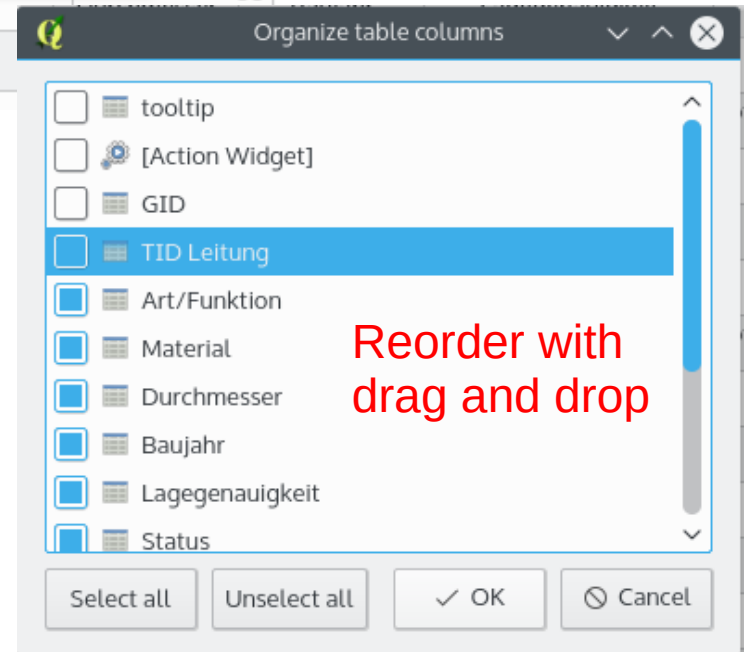
2.12

# Attribute table improvements

- Context menus for columns, rows and cells
- Reorder columns
- Hide specific columns
- Sort based on expressions and multiple columns
- New action columns



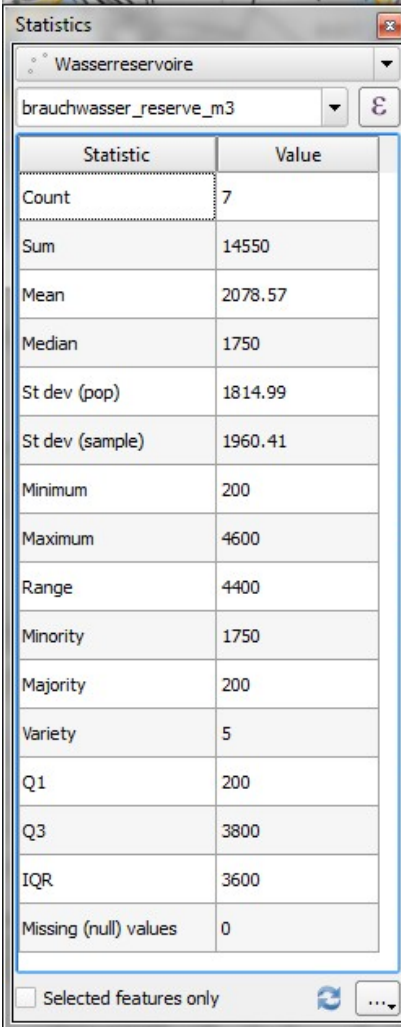
Art/Funktion	Material	Durchmesser
Versorgungsleitung		100
Anschlussleitung		40
Versorgungsleitung		300
Anschlussleitung		125
Anschlussleitung	Kunststoff	63
Anschlussleitung	Guss	
Versorgungsleitung	Guss	



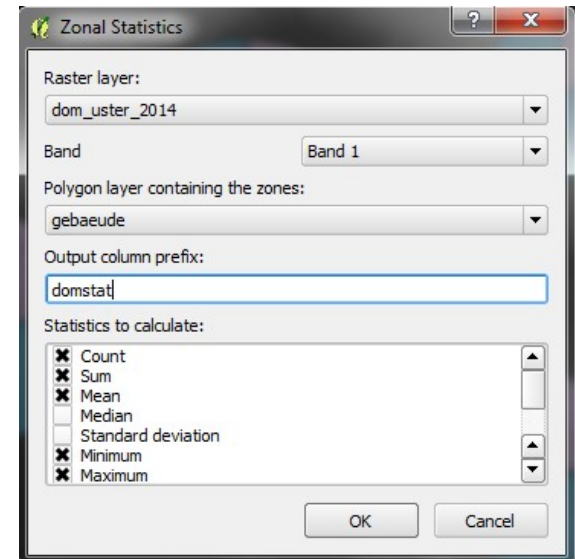
2.16

# Statistics Summary Panel

- Various statistical parameters for all or selected features of a layer
- Total count and count of NULL values
- Improved zonal stats plugin - to generate raster/vector overlay statistics



Statistic	Value
Count	7
Sum	14550
Mean	2078.57
Median	1750
St dev (pop)	1814.99
St dev (sample)	1960.41
Minimum	200
Maximum	4600
Range	4400
Minority	1750
Majority	200
Variety	5
Q1	200
Q3	3800
IQR	3600
Missing (null) values	0



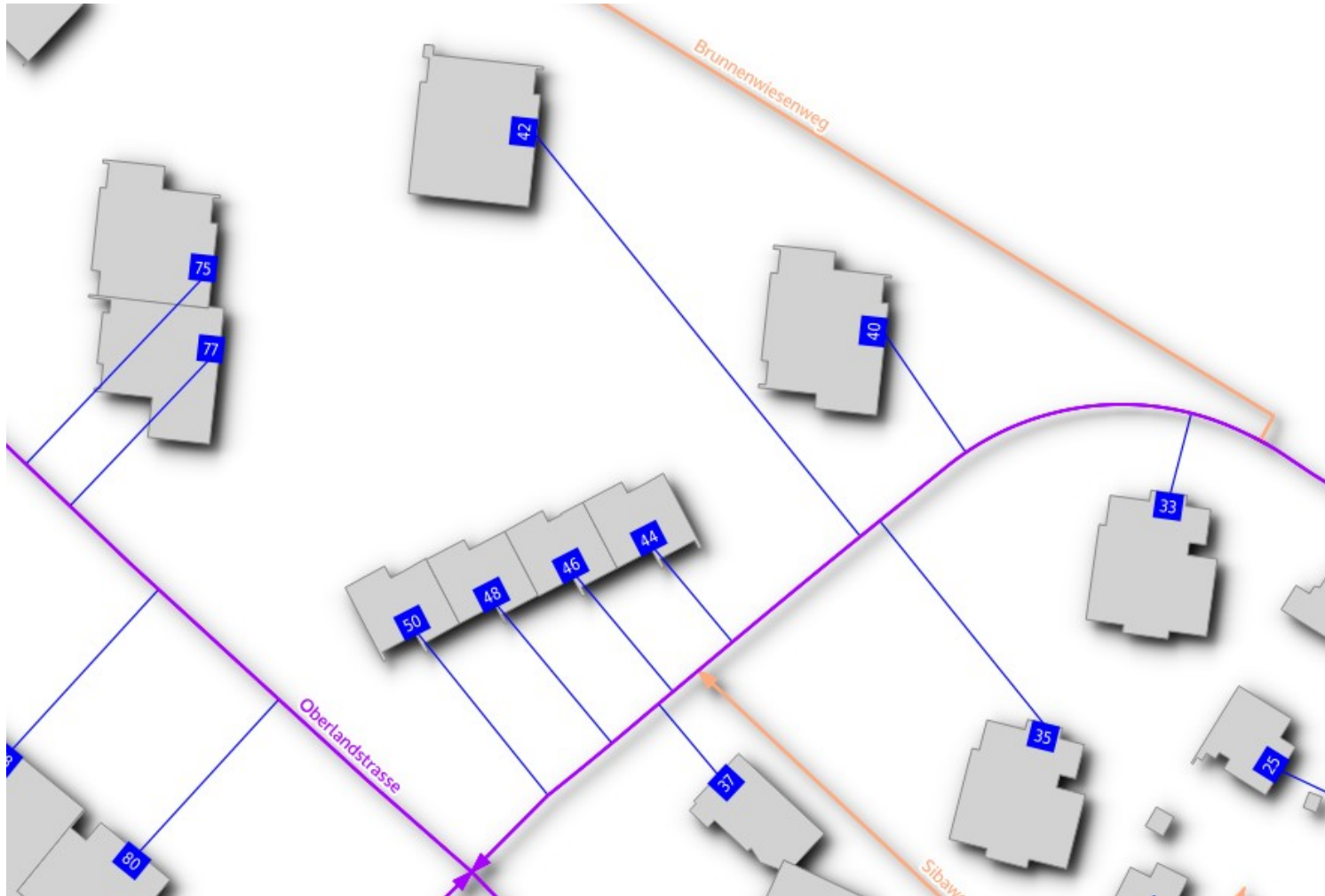
# Live Layer Effects

---

- Applies to all vector geometries of a layer
- Chainable combination of
  - Source
  - Transform
  - Blur
  - Drop Shadow / Inner Shadow
    - Inner glow / Outer glow
    - Colorize
- Combine with transparency and blend modes

# Live Layer Effects

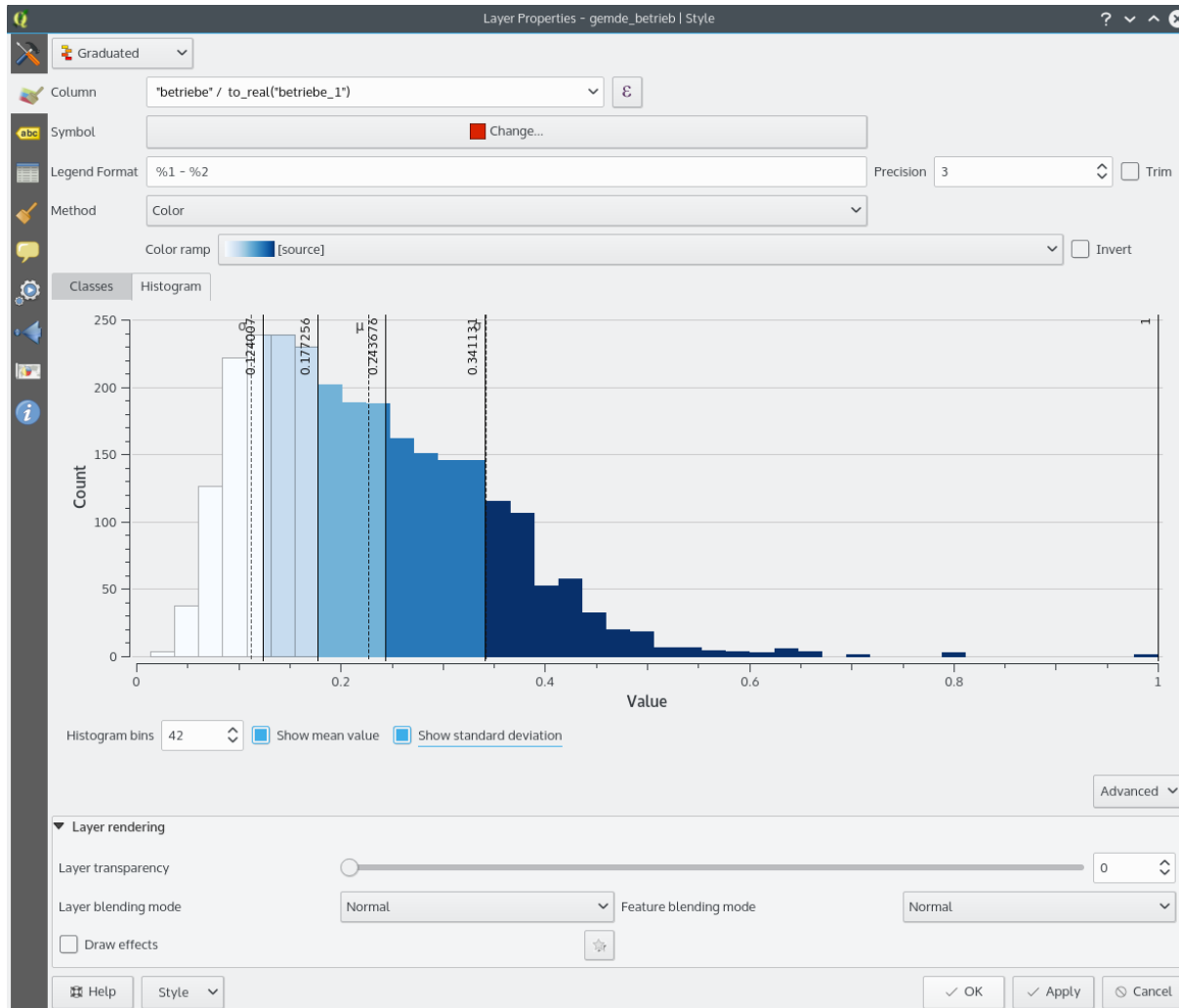
---



2.10



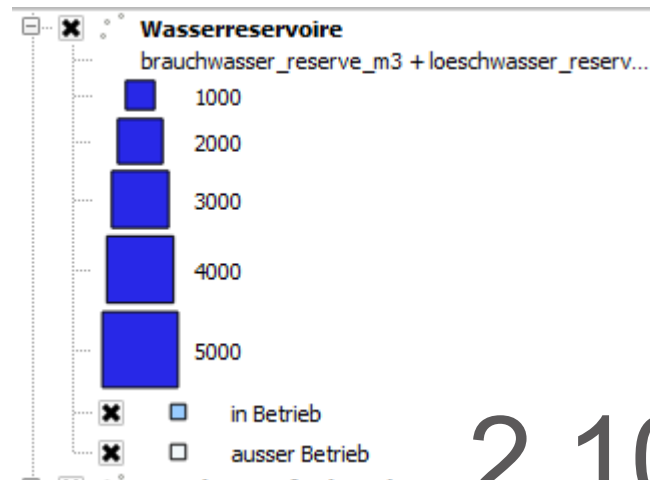
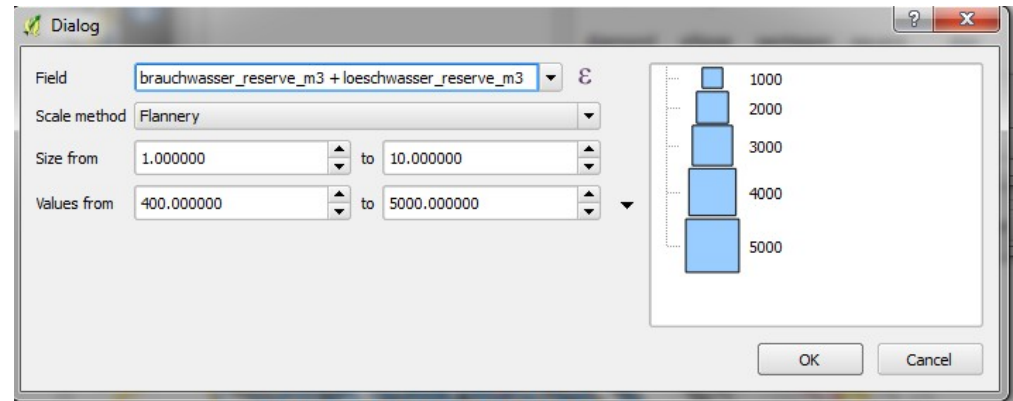
# Graduated Renderer Histogram



2.10

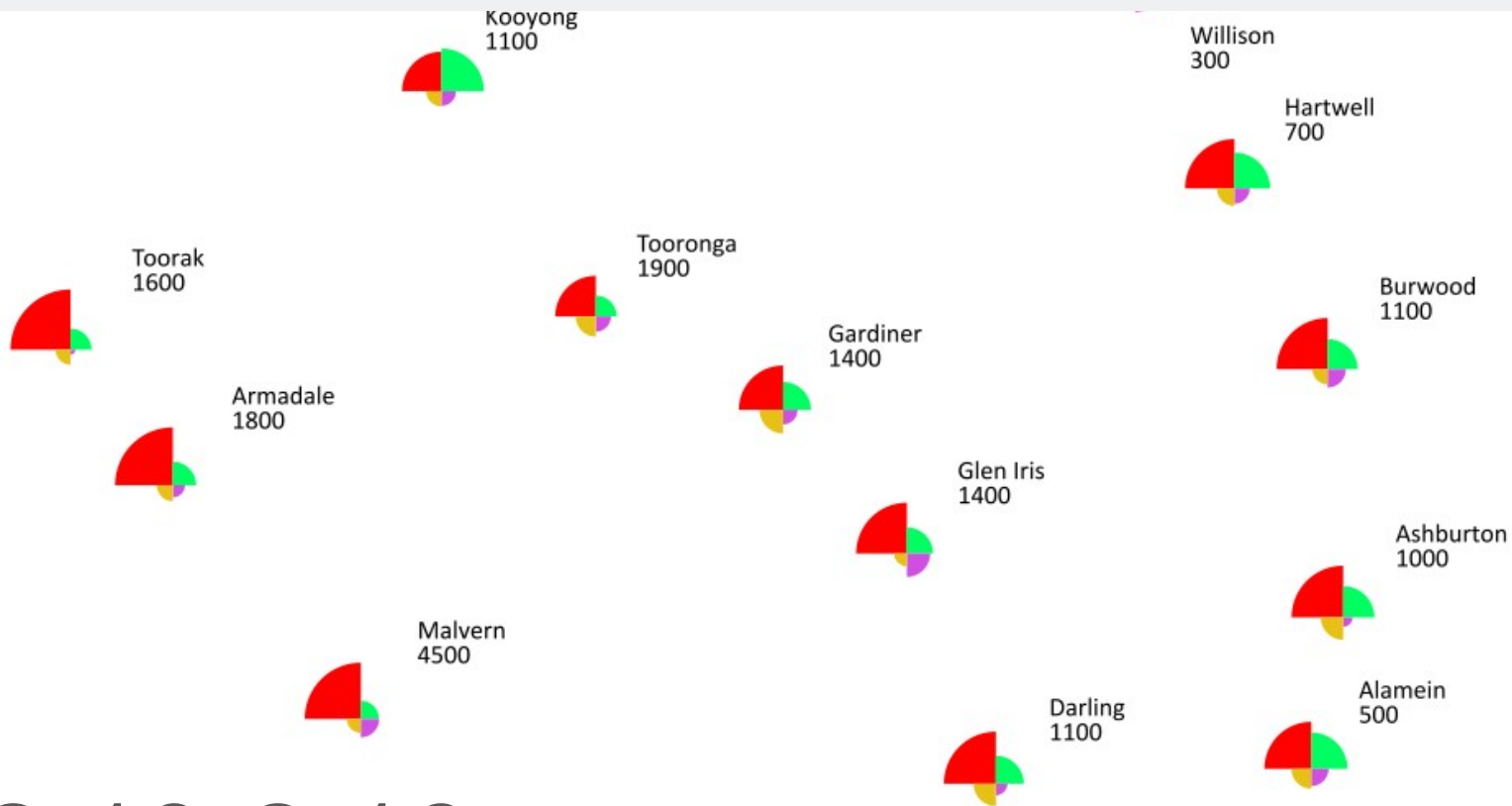
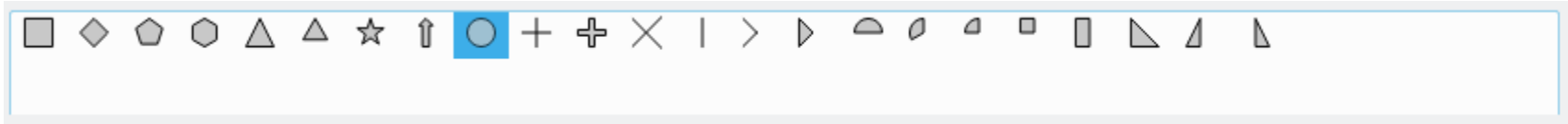
# Scaled symbols improvements

- Assistant for different scaling modes and mapping min/max to actual sizes
- Legend in legend tree and print composer
- Legend for components of diagrams (without size)



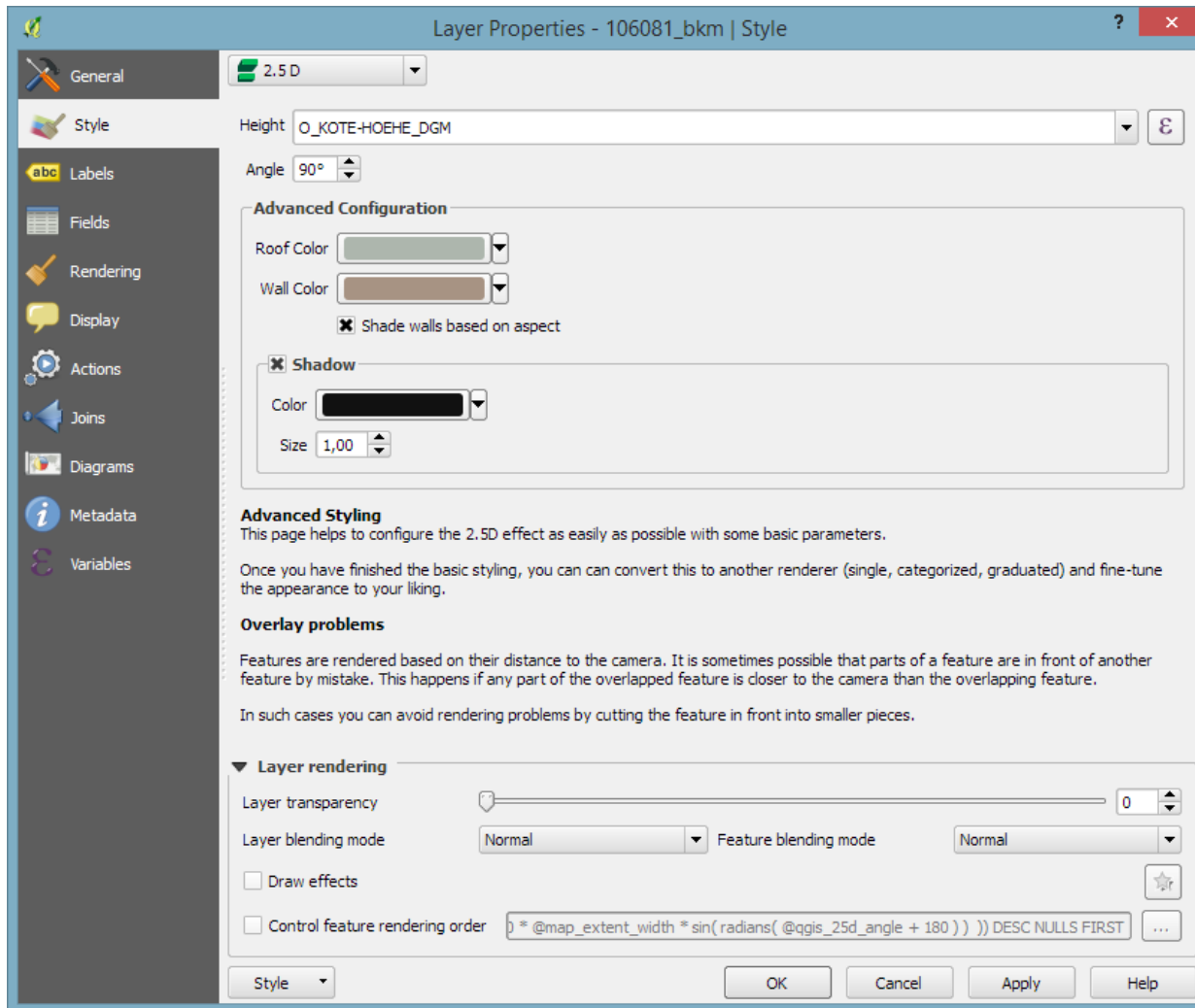
2.10+2.14

# Size Assistant / New simple markers



2.10-2.16

# 2.5D Rendering



# 2.5D Rendering

---

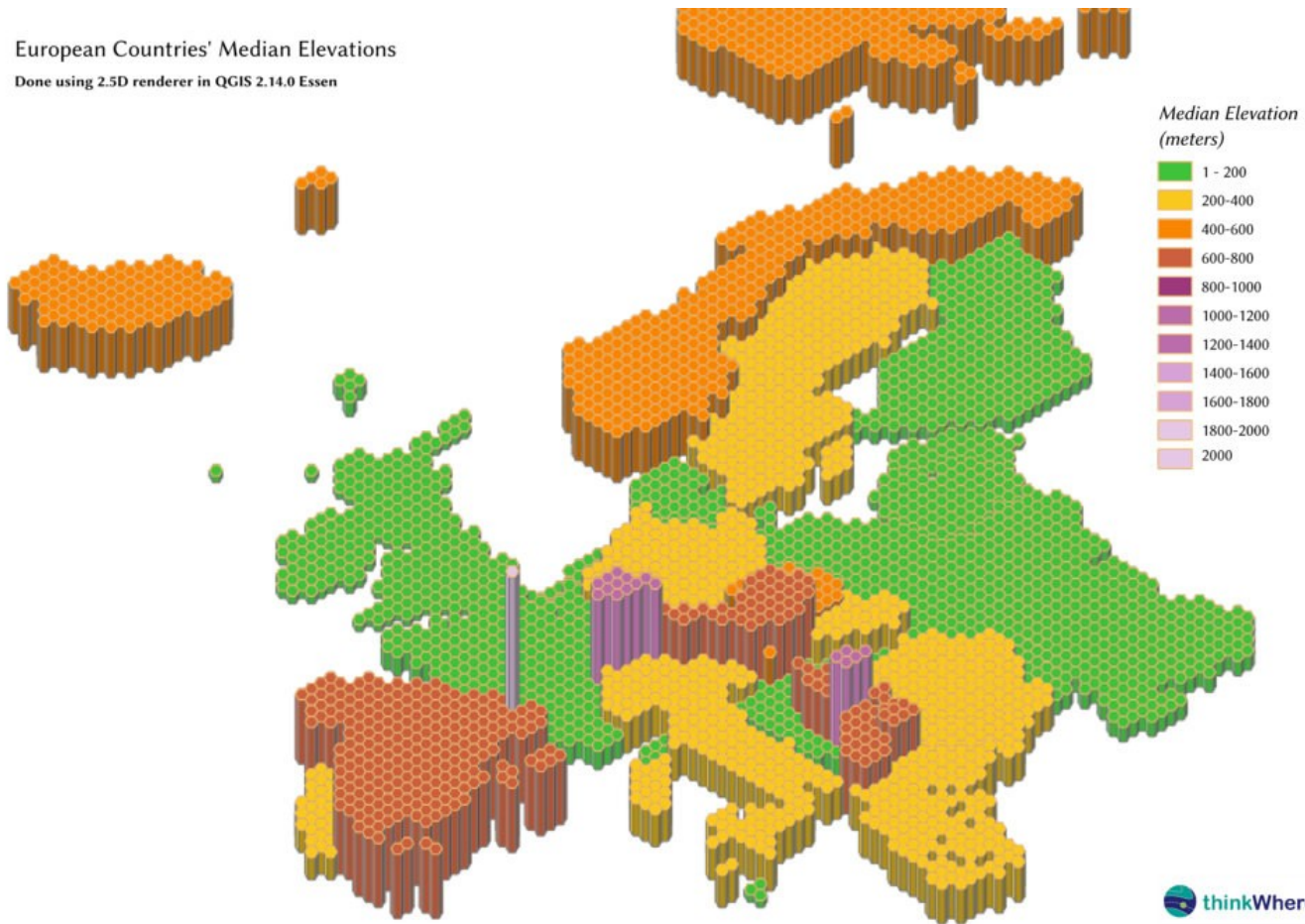




# 2.5D Rendering

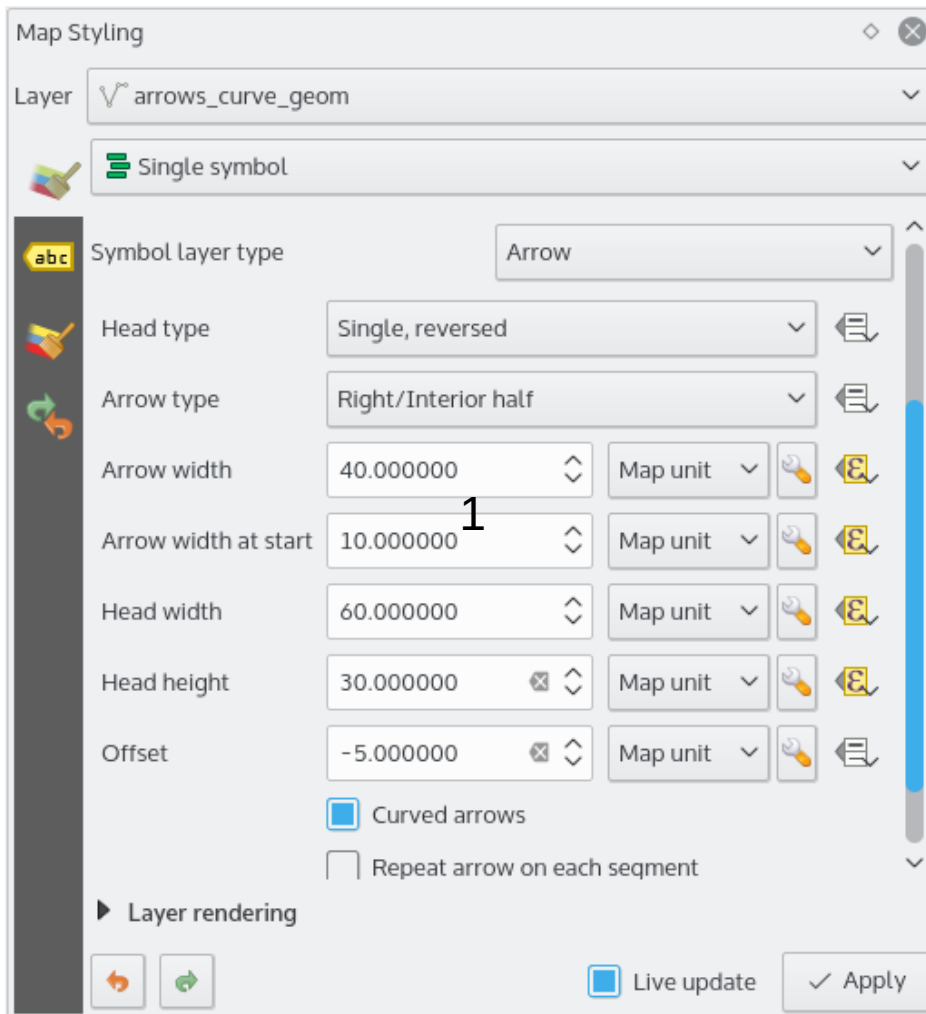
European Countries' Median Elevations

Done using 2.5D renderer in QGIS 2.14.0 Essen





# Curved Arrow Renderer

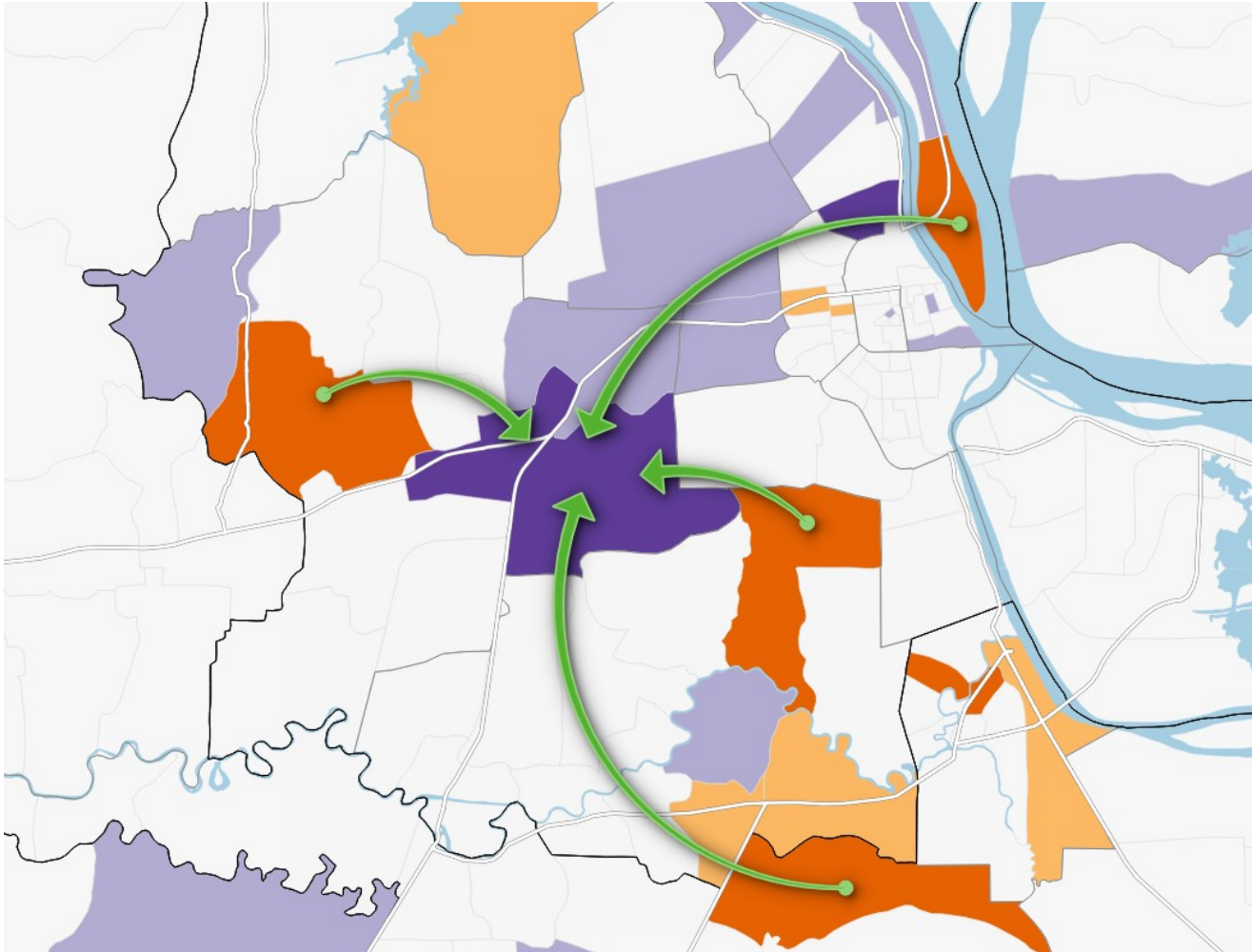


- Geometry:
  - 3 points (lines)
  - or circular arcs
- Head types:
  - single
  - single, reversed
  - double
- Arrow types:
  - plain
  - left / interior half
  - right / exterior half
- Head: separate width/height
- Offsets for arrow

2.16

# Curved Arrow Renderer

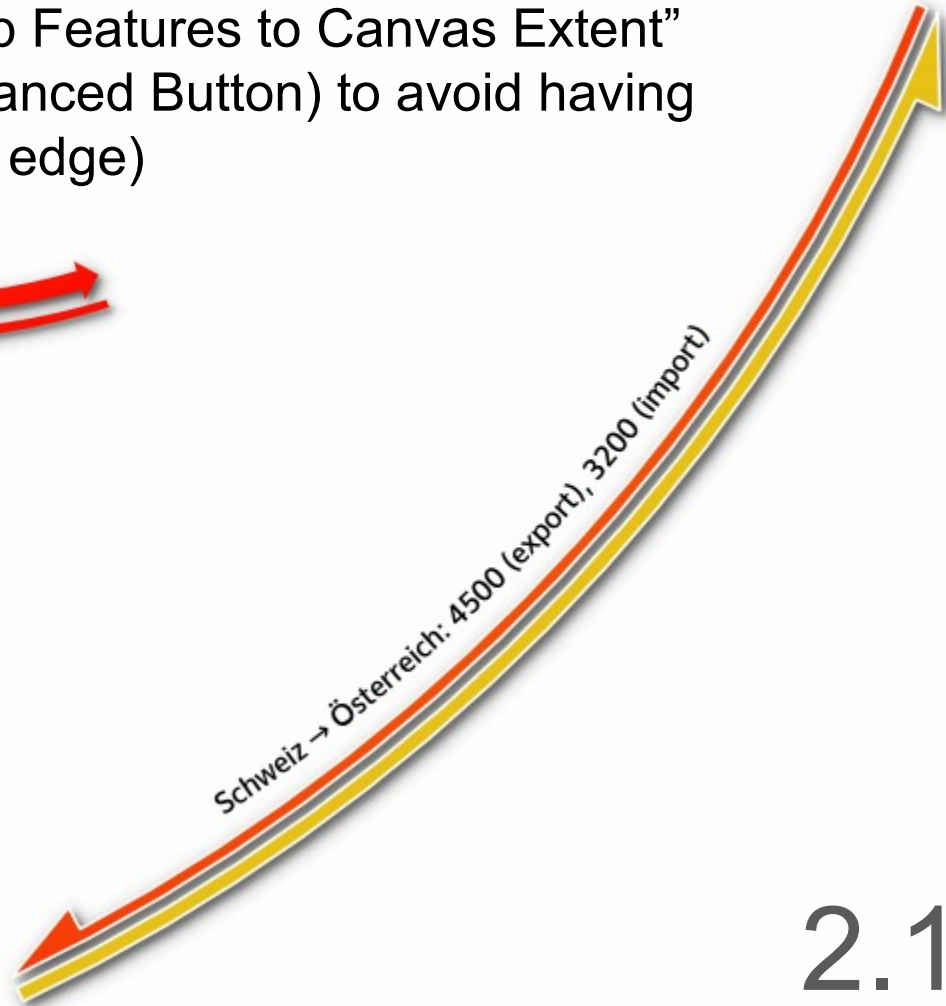
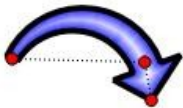
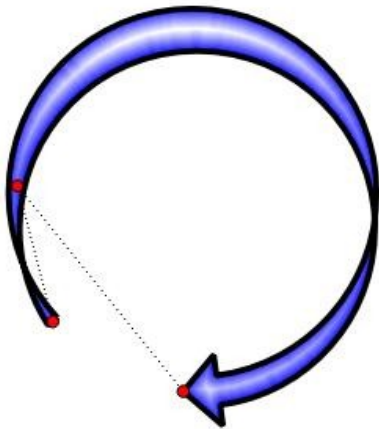
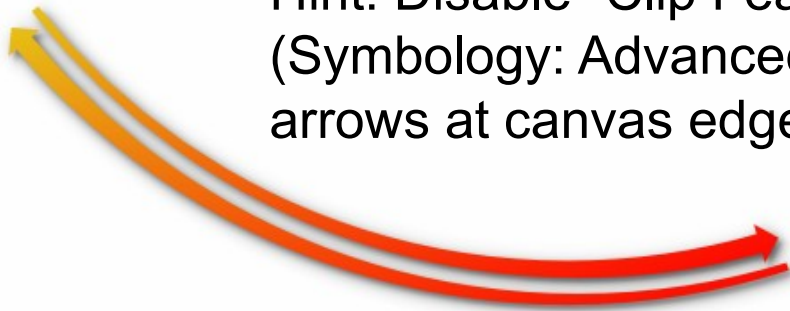
---



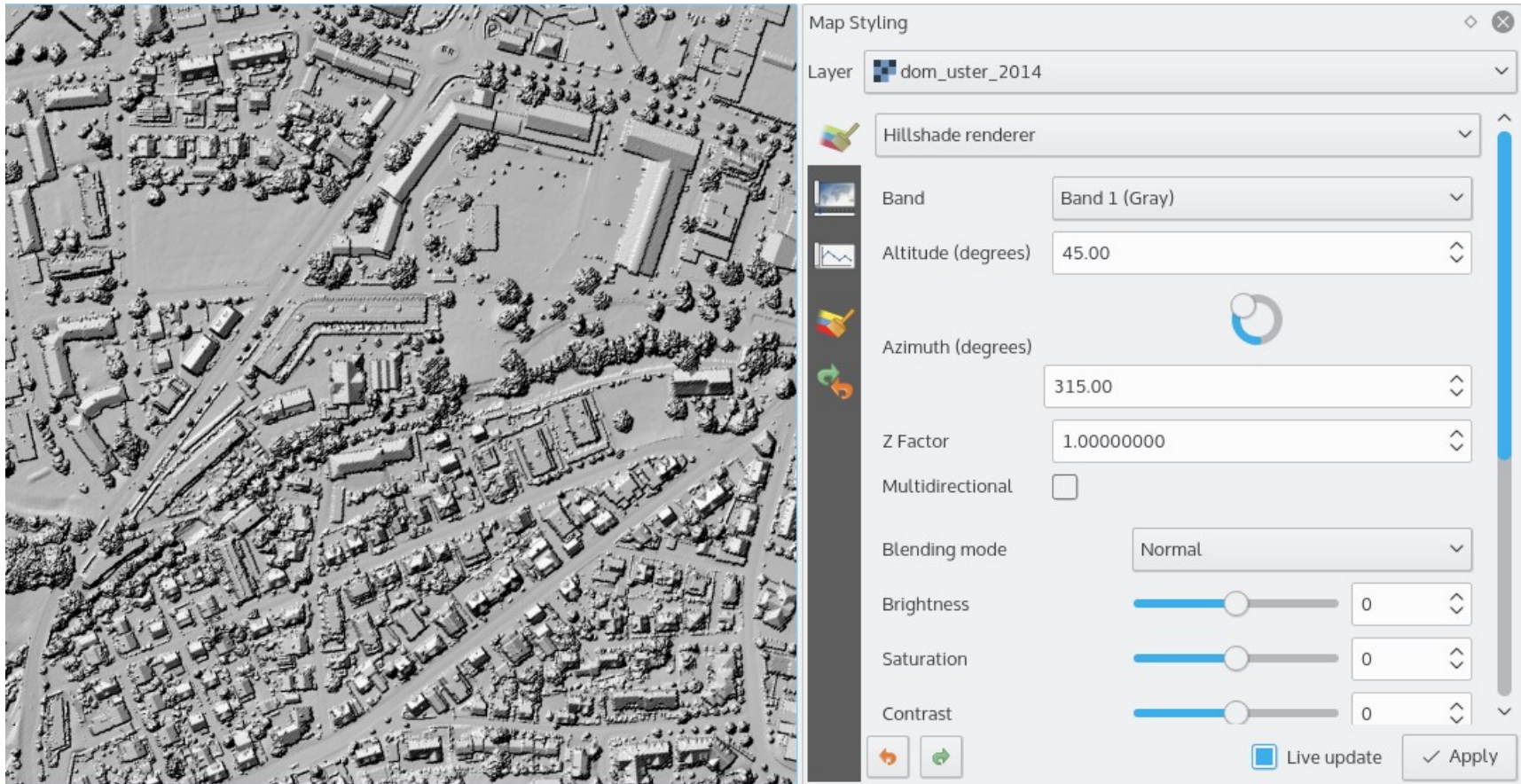
# Curved Arrow Renderer

---

Hint: Disable “Clip Features to Canvas Extent”  
(Symbology: Advanced Button) to avoid having  
arrows at canvas edge)



# Live Hillshade Renderer



The image displays a GIS application interface. On the left, a grayscale hillshade rendering of a Digital Object Model (DOM) is shown, depicting a dense urban area with buildings and trees. On the right, a 'Map Styling' panel is visible, showing the following settings:

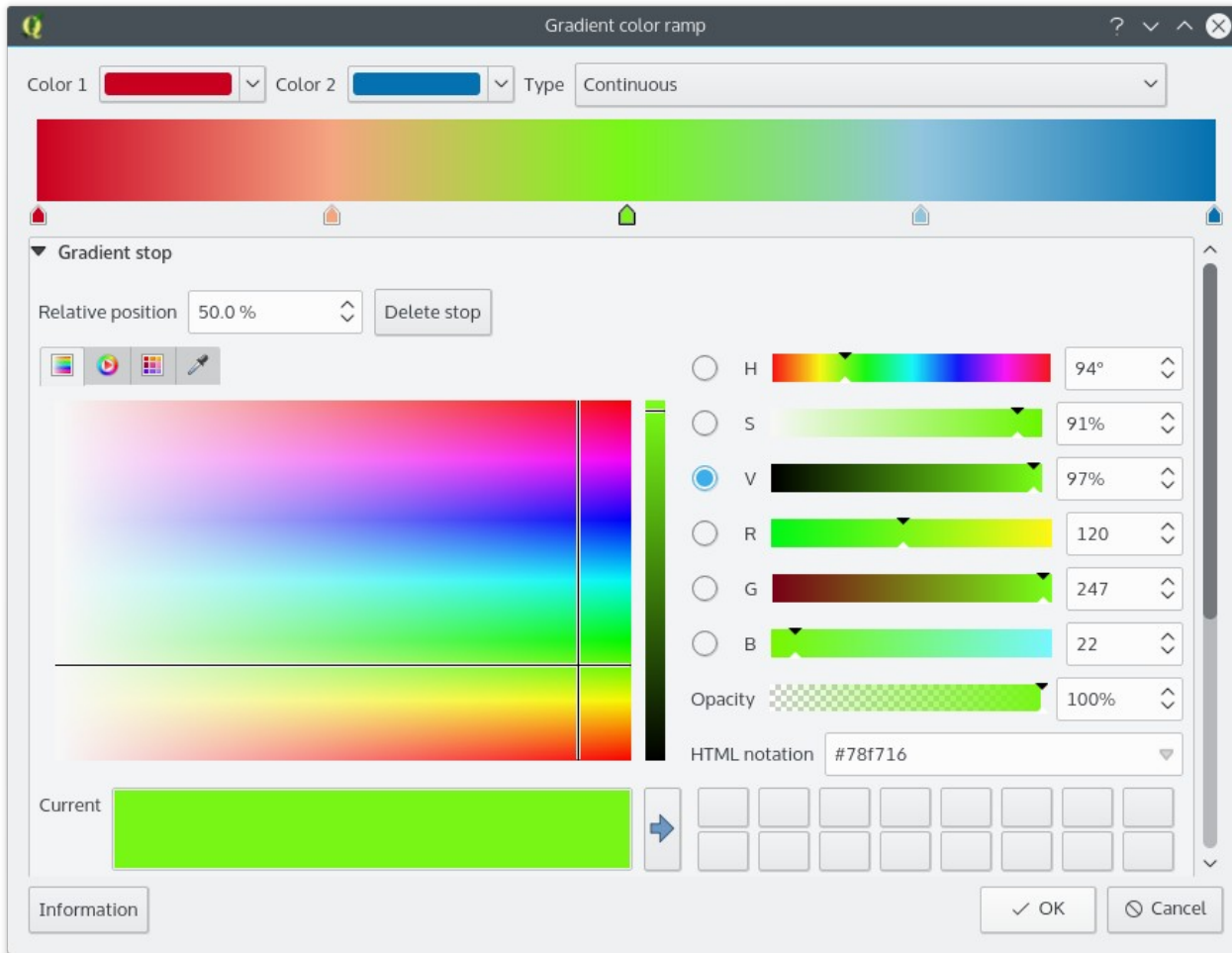
- Layer: dom\_uster\_2014
- Renderer: Hillshade renderer
- Band: Band 1 (Gray)
- Altitude (degrees): 45.00
- Azimuth (degrees): 315.00
- Z Factor: 1.00000000
- Multidirectional:
- Blending mode: Normal
- Brightness: 0
- Saturation: 0
- Contrast: 0

At the bottom of the panel, there are 'Live update' and 'Apply' buttons.

On the fly hillshade rendering of  
DTM or DOM models

2.16

# New Interactive Gradient Editor



2.16



# Rule-based labels

QGIS ed32f49 - QGIS2015

Layer Properties - countries | Labels

Rule-based labeling

Label	Rule	Min. scale	Max. scale	Text
<input checked="" type="checkbox"/> Large countries	$\$area > 600$			sovereight
<input checked="" type="checkbox"/> Small Labels	$\$area < 600$			sovereight

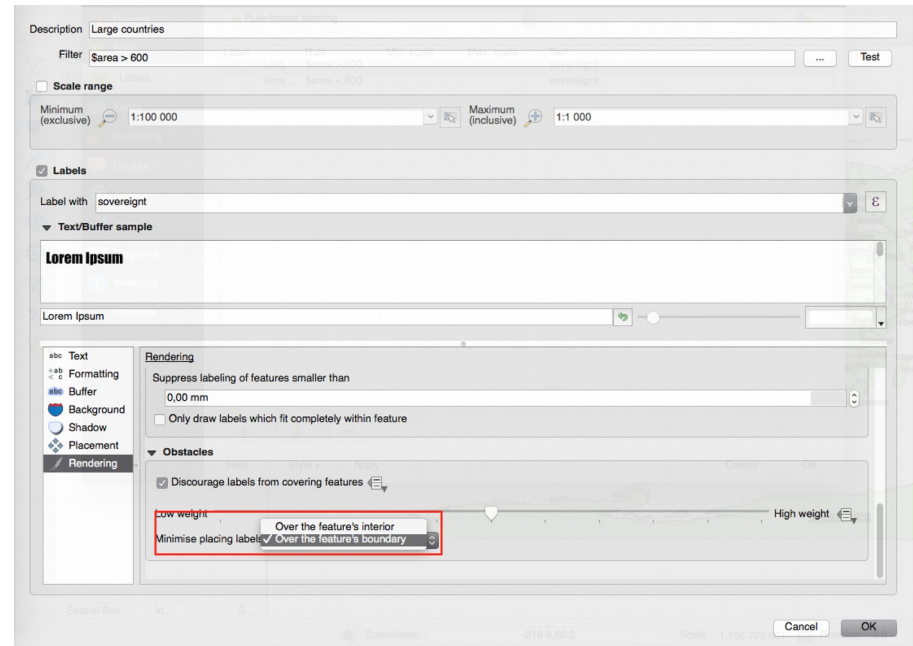
2.12

Coordinate: -220,9,97.4 Scale: 1:106 729 001 Rotation: 0,0 Render EPSG:4326



# Label Improvements

- Data-defined Quadrant for point labels
- Draw only labels in polygons, if label fits
- Control priority of label obstacles
- avoid polygon borders (obstacles)
- obstacle only layers



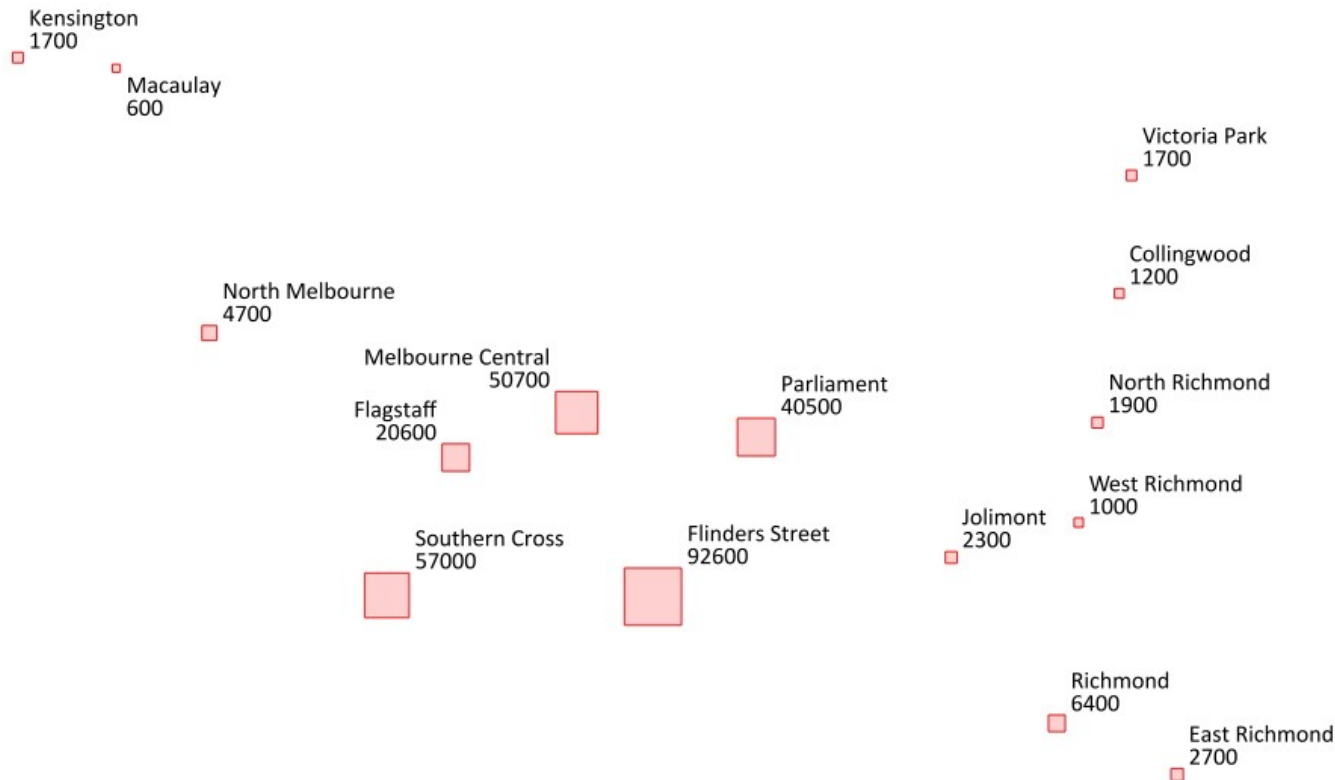
# Label Improvements

---

- Control label rendering order
- Point labeling according to Krygier/Wood (2011): use “cartographic” priorities for positioning: top right, top left, bottom right, bottom left, middle right, middle left, top (slightly right), bottom (slightly left)
- Consider actual rendered symbol size for labeling point features
  - apply rendered size to label distance - only available for “cartographic” positioning
  - consider symbol bounding box as obstacle

# Label Improvements

---



Consider actual rendered symbol size  
for automatic labeling offsets of point features

# Map Styling and Labeling Dock

QGIS 2b80176 - project\_10\_simple\_markers

Project Edit View Layer Settings Plugins Vector Raster Database Web Processing Help

Layers Panel

- rivers
- rail\_lines
- stations**
- regions

Map Styling

stations  Live update

Single symbol

Marker

- Simple marker
- Simple marker
- Simple marker

Unit: Millimeter

Transparency: 0%

Layer rendering

Layer transparency: 0

Layer blending mode: Normal

Feature blending mode: Normal

Draw effects

Control feature rendering order

2.16

Apply

Statistics Panel Layers Panel

There is a new plugin available Coordinate 2505786,2402860 Scale 1:31'931 Magnifier 100% Rotation 0.0 Render EPSG:3111 (OTF)

Non blocking

Immediate feedback

History

Open dock here

# Editing

---

- Autotrace digitizing function improved and in QGIS core (2.14) – press “t” while digitizing. See <http://www.lutraconsulting.co.uk/products/autotrace/TraceDigitising> for details with videos
  - Extend linestring with reshape tool (2.16)
  - Point Features: interactive editing of symbol offsets (2.16)
-

# Widget Improvements

---

- Line edit with auto-completer for ValueRelation edit widget (2.10)
  - Relation Reference Widget with Drilldown (2.10)
  - Relative path support in file widget, photo widget and webview widget (2.12)
  - External Resource Widget (for linking file and web resources) (2.14)
  - Client-side constraints on input widgets (2.16)
  - Server-side default values (PostgreSQL) (2.16)
-



# Multi-Attribute Search in Form View

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- Start with CTRL-F or Button
- Select Features or Filter table
- Combine selection/filter rules from multiple fields
- Add or remove from selection or create new selection
- Filter with AND / OR
- Select search operator
  - equal/not equal to value
  - greater/lower than value
  - is/is not NULL

# Multi-Attribute Search in Form View

Attribute table - pvanlagen :: Features total: 51, filtered: 51, selected: 5

Expression

- Stefan und Evelyn Haebler
- Franzisca und Urs Altorfer
- Christian Früh
- Andreas Neumann
- Fam. Hasler und Kurt Walter
- Martin Bachmann
- Roger Gubler
- Karin und Christoph Reinhardt
- Dominik Hürlimann
- Hürlimann?
- Peter Rüttimann
- Gaby und Erwin Brändli
- Nannette und Martin Bratteler
- Marc Vollenweider
- Andreas Wegmann
- Michel Marti
- Felix Scheuner
- Hans Kaufmann
- alenergy invest AG
- Andreas Leutenegger
- Andreas Leutenegger

Strasse	<input type="text"/>	<input type="checkbox"/> Case sensitive	Exclude field
Hausnummer	<input type="text"/>	<input type="checkbox"/> Case sensitive	Exclude field
PLZ	8624	<input checked="" type="checkbox"/>	Equal to (=)
Ort	<input type="text"/>	<input type="checkbox"/> Case sensitive	Exclude field
Rechtswert	<input type="text"/>		Exclude field
Hochwert	<input type="text"/>		Exclude field
Fläche	5	<input checked="" type="checkbox"/>	Equal to (=)
Leistung	10	<input checked="" type="checkbox"/>	Exclude field
Datum Inbetriebnahme	<input type="text"/>		Equal to (=)
Kontakt	<input type="text"/>	<input type="checkbox"/> Case sensitive	Not equal to
Installationsfirma	<input type="text"/>	<input type="checkbox"/> Case sensitive	Greater than (>)
Bemerkung	<input type="text"/>	<input type="checkbox"/> Case sensitive	Less than (<)

Reset form      Select features

Show All Features

2.16

# Multi-Attribute Editing of Selected Features

ews\_anlage - Feature Attributes

Actions

Anlage | Eigentümer | Bohrfirma | Geologe | Heizungsplaner | Weitere Planer

**Eigenschaften**

t\_id

Anlage-Nr.

Max. Leistung [kW]

Gesamtfüllmenge [Ltr.]

Wärmeträgerflüssigkeit

faonkat.waermepumpe NULL

Verwendungszweck

**Sondengruppen**

**Adresse der Anlage**

Adresse Anlage

Moosmattstrasse 1 - 7 , Cham

ews\_anlage\_adresse

Adresse Anlage

t\_id

Gemeinde

OK Cancel

2.16

# Credits

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## To all who paid for new features / bug fixing

QGIS-CH, QGIS-UK

SIGE, Uster, Morges, Vevey, Nyon, Pully

Kt. Solothurn, Kt. Glarus, Kt. Zug, Kt. Basel Stadt, Land Vorarlberg

DFAT/Inasafe

Alta ehf, GIS3W

Province Tuscany

Boundless, iTOpen, Sourcepole, Camptocamp, OpenGIS, Norbit, Lutra, etc.

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Asger Petersen, Even Rouault, Denis Rouzaud, Sandro Santilli

Larry Shaffer, Nathan Woodrow

list is probably not complete ...

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