# **Selected QGIS Improvements**



## 2.10 to 2.16





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

## **Visual Change Logs**

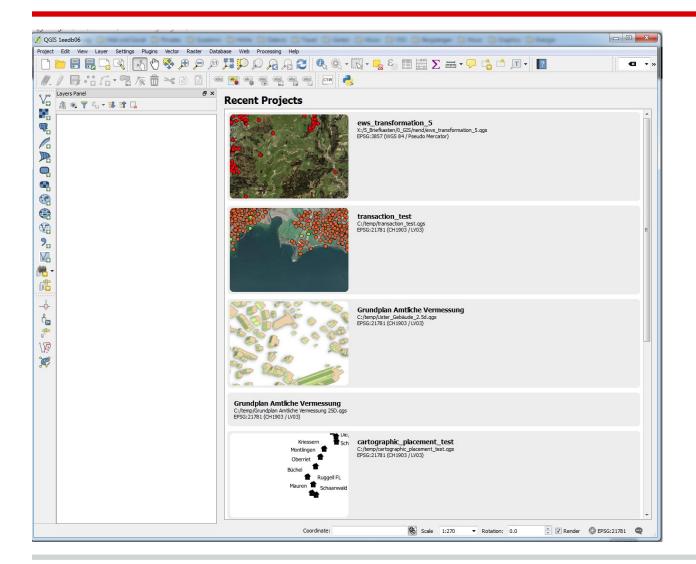
- http://www.qgis.org/en/site/forusers/visualchangelogs.html
- Since QGIS 2.0

Programmability

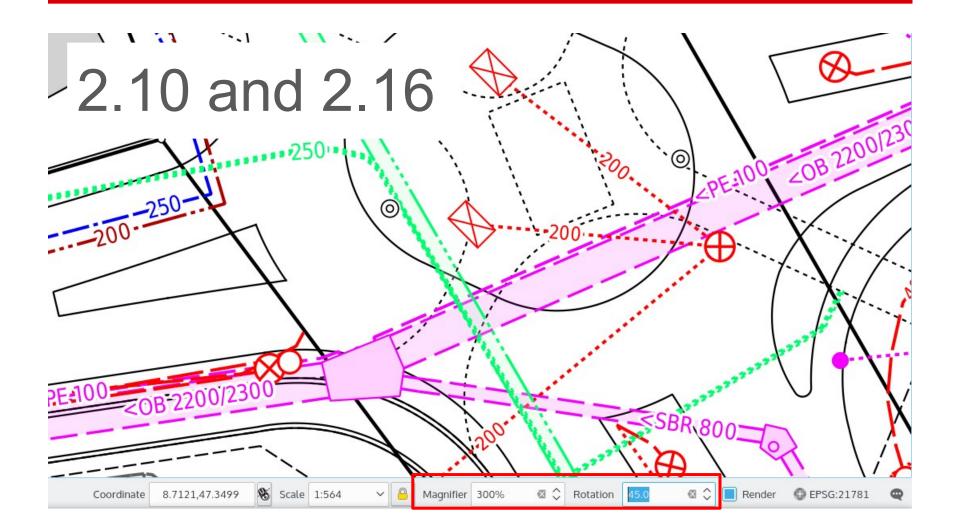


This is a special release since it is designated an 'LTR' (Long Term Release). LTR releases will be supported with backported bug fixes for **one year**, and will be in permanent feature freeze (i.e.

## **Startscreen with recent projects**



# Rotation and Magnifier Controls in Status Bar



# **Central Settings Editor**

	Setting	Туре	Value	Description
System	v E Composer			
	defaultFont	QString		
Data Sources	defaultSnapGridOffsetX	double	0	
	defaultSnapGridOffsetY	double	0	
Rendering	defaultSnapGridResolution	double	10	
	defaultSnapTolerancePixels		5	
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001010	gridAlpha	int	100	
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	gridRed	int	190	
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	GRASS			
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	HelpViewer			
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1 1-	Plugin-GeometryChecker			
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Authentication	PostgreSQL			
	Processing			
Network	Projections			
	PythonPlugins			
Variables	Dais			

Alternative central view to all settings in QGIS

2.12

Be careful!

#### **Security - Encrypted passwords**

000		Options   Authentication
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💸 System	Resource	Postgres.app
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≼ Rendering	Username	ne timlinux
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Map Tools		
Composer		Saving writes directly to authentication database
Digitizing	Reset	Cancel Save
GDAL		
💮 CRS		
🔁 Locale		
Authentication		
■ Network	Management	
E Variables	Insta	alled Plugins 🛛 😹 Manage Certificates 🔗 Utilities 🔻
Advanced	Hala	Note: Editing writes directly to authentication database Cancel OK
	Help	Cancel

2.12 + 2.14

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

# Variables

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Variable	Value
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	ne Andreas Neumann
▼ Project	
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	X:/5_Briefkasten/0_GIS/nend/ews_transformation_5.qgs
	Erdwärmesonden Kanton Zug
Project Font	
	2.12 + 2.14
	. IZ T Z. 14

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)
- Iength(geom)
- perimeter(geom)
- start\_point(geom)
- end\_point(geom)
- point\_n(geom,n)
- make\_point(x,y)
- x(geom)
- y(geom)

Only update 0 s	ield	Update existing field	
Create virtual fi Output field name			
Output field type	Whole number (integer)	id	
Output field width			
Expression F	unction Editor		
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x Sgeometry )		geometry intersection intersects intersects, box Slength make_point num_points operimeter point_n start_point start_point start_point union within sk sk sk sk sk	Returns the x coordinate of a point geometry, or the x-coordinate of the centroid for a non-point geometry.       Syntax       x (geom)       Arguments       geom       geom       x (geom_from_with ( "FOINT (2 5)") ) → 2

- project\_color
- color\_part (e.g. red, hue, aplpha)

2 1 2

- set\_color\_part
- day\_of\_week

# **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

2 1 4

- closest\_point
- shortest\_line

## **New expression functions**

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

2.16

## **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 certainwidgets
  - Date/Time
  - Value Relation
  - Relation Reference Widget
  - Boolean
- Default for Spreadsheet and CSV export

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Format	Comma Separated Value [CSV]					
Save as						
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# **Postgis Provider**

- Performance improvements for rulebased 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)

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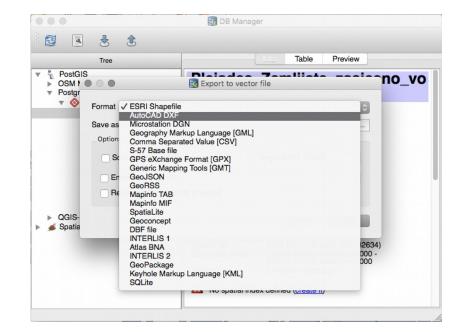
2.12 - 2.16

# **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 2.16

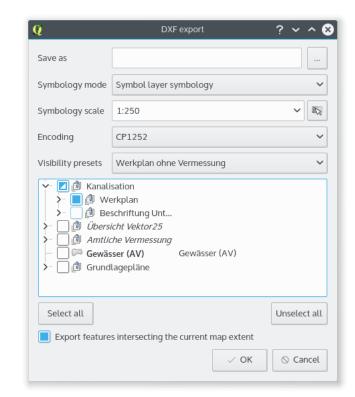
# **DB-Manager**

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



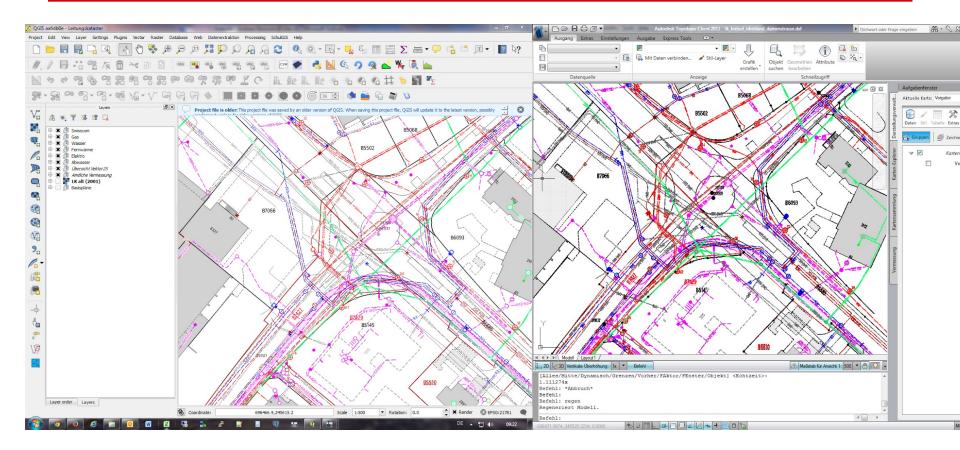
# **DXF Export Improvements**

- Export with our 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**

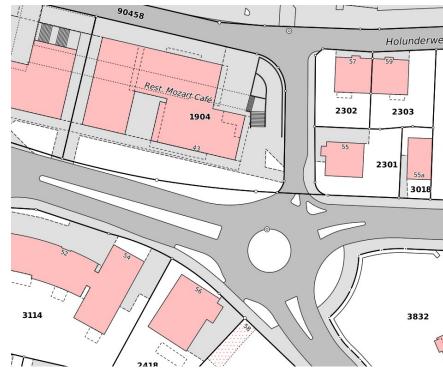


2.8 - 2.14

# **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: ????

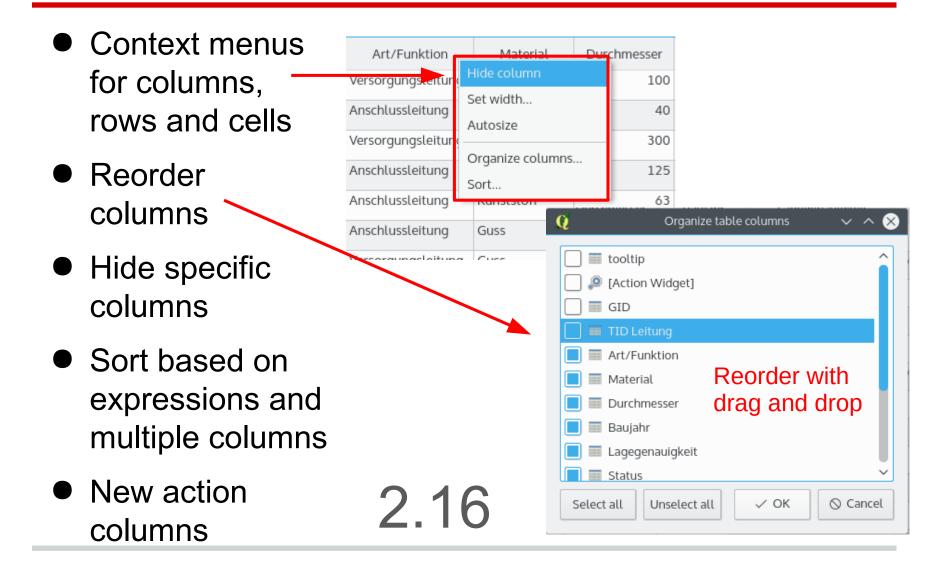


2.10 - 2.16

#### **Conditional formatting in attribute table**

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4 unga	Chikhwawa	South	TA Katunga	AFRMWI31005	24680.00000	11960.00000	12720.00000	161.29650	153	Done Cancel	Delete

#### **Attribute table improvements**



# **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

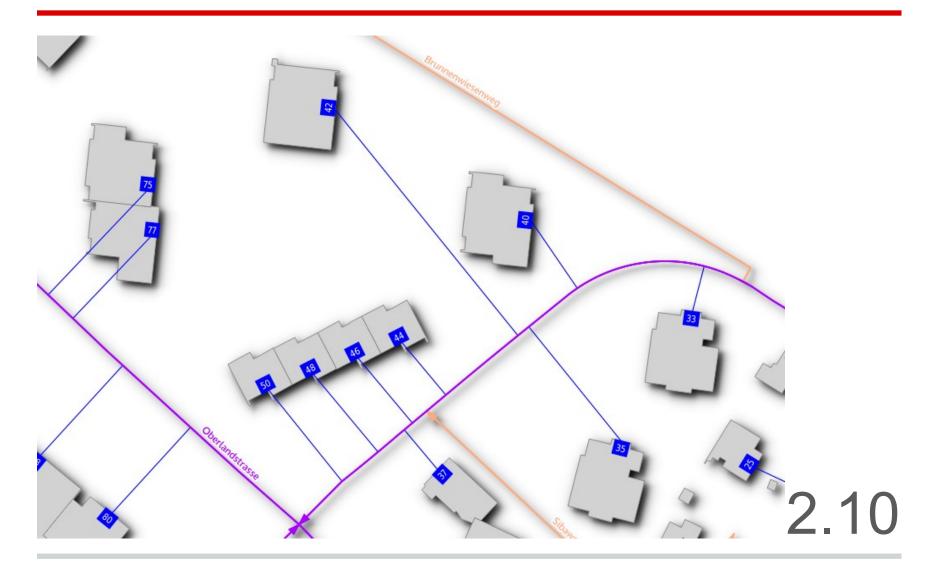
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Count	7
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Minimum	200
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Majority	200
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Q3	3800
IQR	3600
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domstat		
Statistics to calculate:		
X Count		
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Median		
Standard deviation		
X Minimum		-
X Maximum		

# **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**



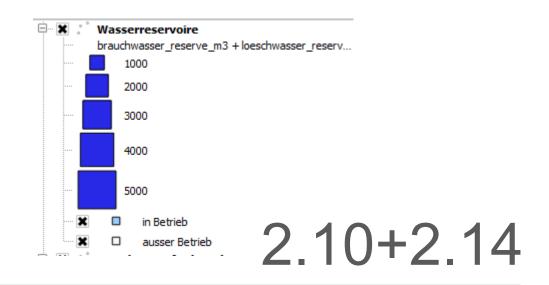
## **Graduated Renderer Histogram**

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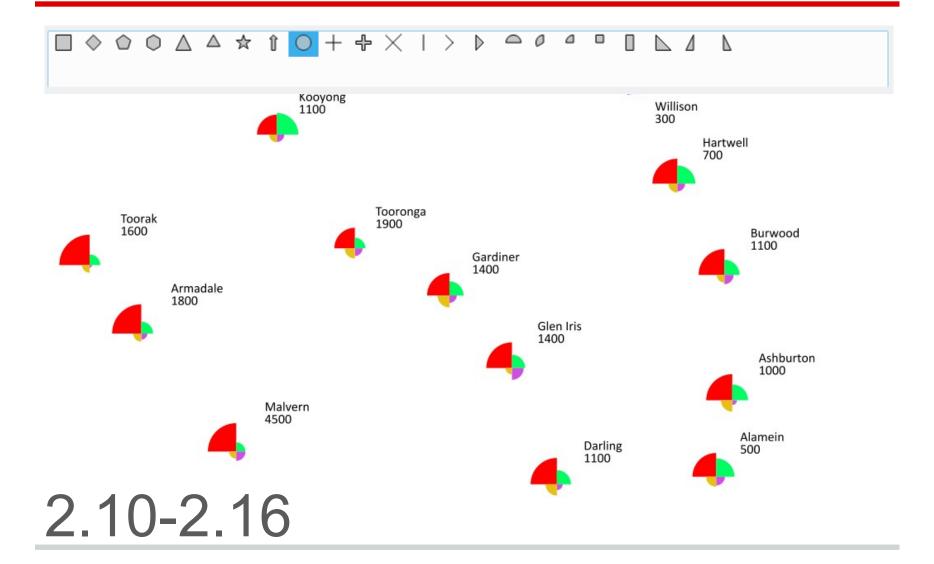
#### **Scaled symbols improvements**

- 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)

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## Size Assistant / New simple markers



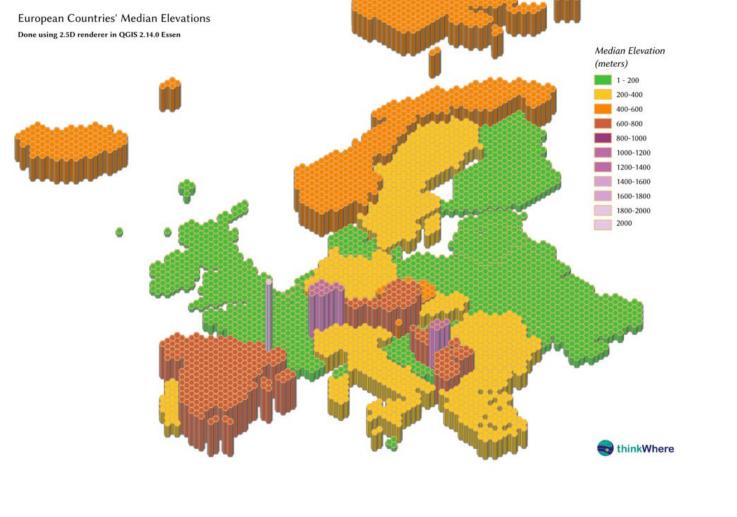
# **2.5D Rendering**

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🧭 Display	Shade walls based on aspect
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阿 Diagrams	Size 1,00 🗢
🥡 Metadata	Advanced Styling This page helps to configure the 2.5D effect as easily as possible with some basic parameters.
Variables	Once you have finished the basic styling, you can can convert this to another renderer (single, categorized, graduated) and fine-tune the appearance to your liking.
	Overlay problems
	Features are rendered based on their distance to the camera. It is sometimes possible that parts of a feature are in front of another feature by mistake. This happens if any part of the overlapped feature is closer to the camera than the overlapping feature.
	In such cases you can avoid rendering problems by cutting the feature in front into smaller pieces.
	▼ Layer rendering
	Layer transparency
	Layer blending mode Normal   Feature blending mode Normal
	Draw effects
	Control feature rendering order (* @map_extent_width * sin(radians( @qgis_25d_angle + 180 ) ) )) DESC NULLS FIRST
	Style   OK Cancel Apply Help

## 2.5D Rendering



# **2.5D Rendering**



# **Curved Arrow Renderer**

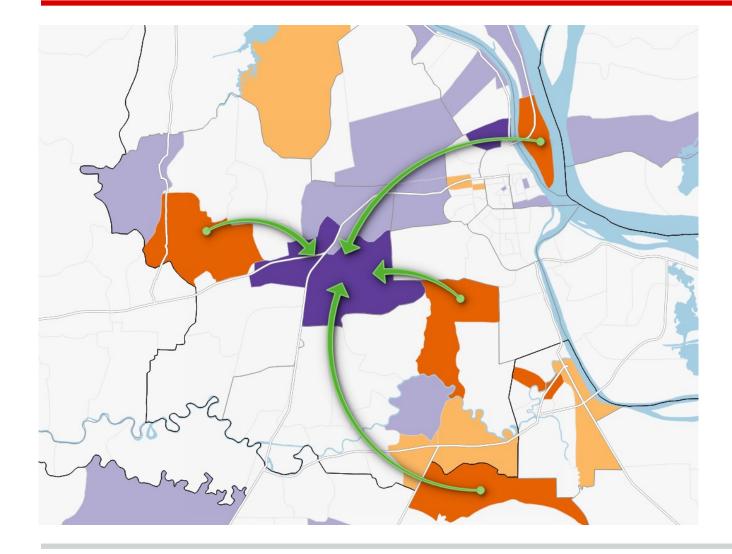
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- Geometry:
  - 3 points (lines)
  - or circular arcs
- Head types:
  - single
  - single, reversed
  - double
- Arrow types:
  - plain
  - left / interior half
  - right / exterior half
- Head: separate width/height

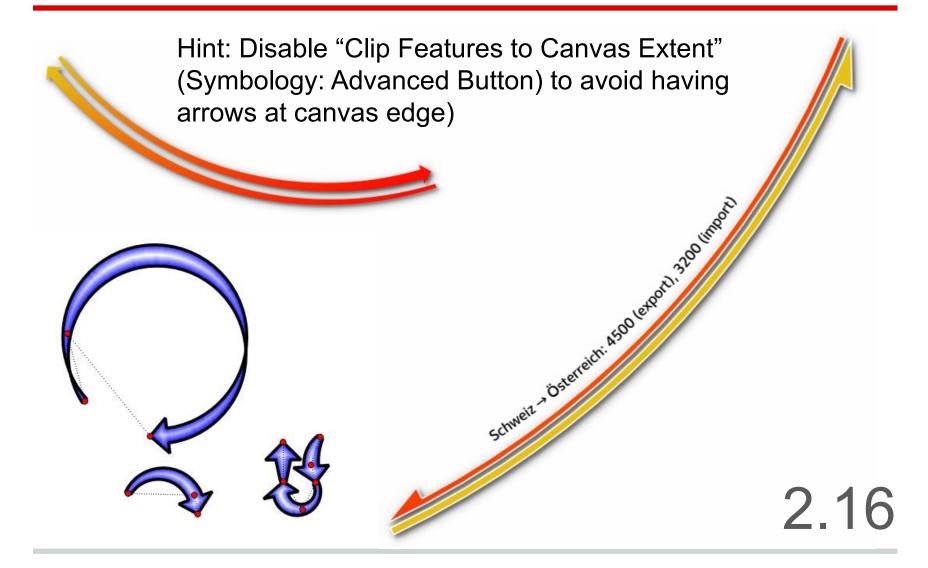
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Offsets for arrow

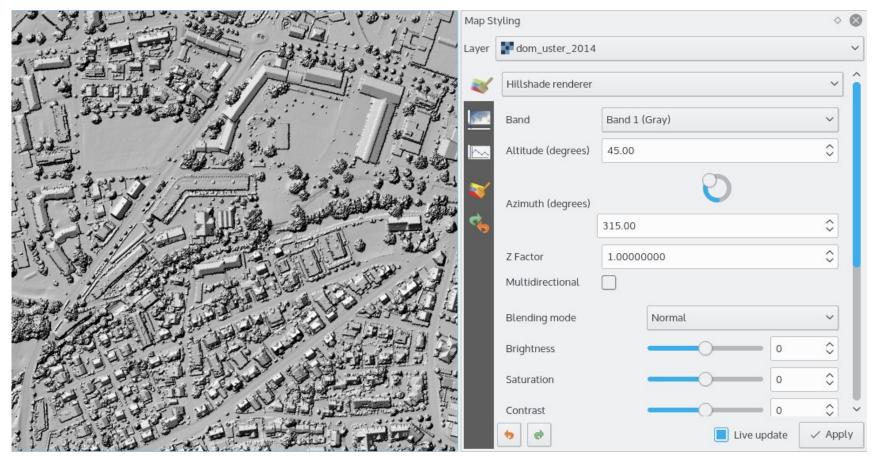
#### **Curved Arrow Renderer**



### **Curved Arrow Renderer**



## **Live Hillshade Renderer**



On the fly hillshade rendering of DTM or DOM models

# **New Interactive Gradient Editor**

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## **Rule-based labels**

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# **Label Improvements**

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

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## **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

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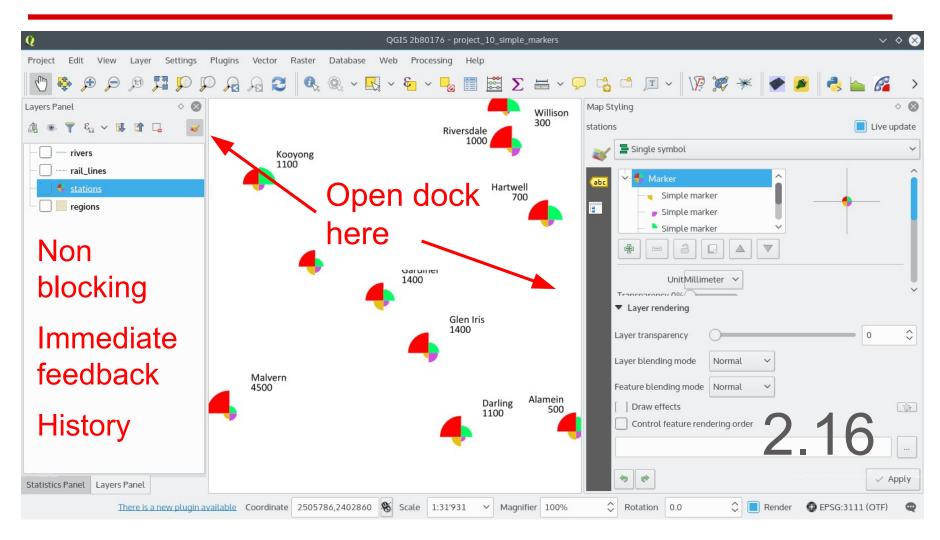
○ consider symbol bounding box as obstacle

# **Label Improvements**



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

# Map Styling and Labeling Dock



# Editing

- Autotrace digitizing function improved and in QGIS core (2.14) – press "t" while digitizing. See http://www.lutraconsulting.co.uk/products/autotrace/Trac eDigitising 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 ressources) (2.14)
- Client-side constraints on input widgets (2.16)
- Server-side default values (PostgreSQL) (2.16)

# **Multi-Attribute Search in Form View**

- 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

2 16

- 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**

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# Multi-Attribute Editing of Selected Features

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## **Credits**

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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list is probably not complete ...