QGIS AND ITS ANALYSIS TOOLS

Anita Graser, 2018-04-18

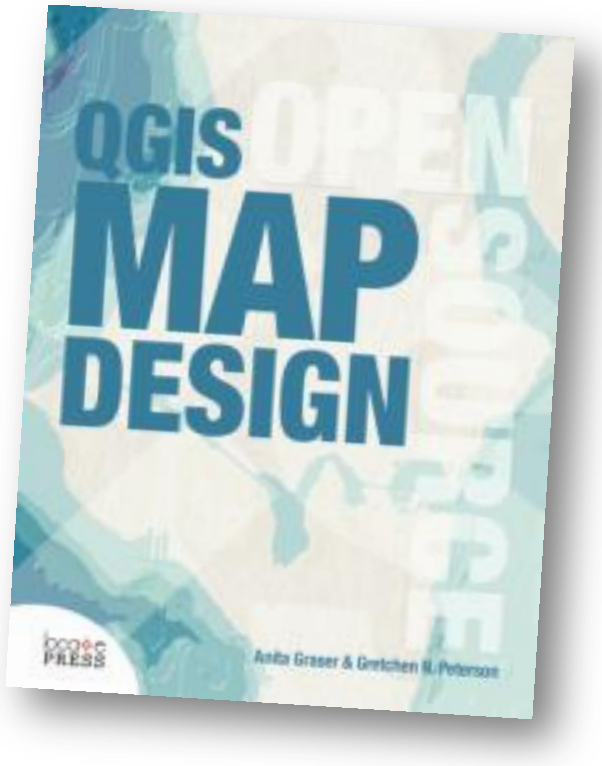
ABOUT

Anita Graser

Scientist @ AIT Austrian Institute of Technology

- QGIS user since 2008
- QGIS Project Steering Committee since 2013
- OSGeo Board of Directors 2015-17
- Moderator on GIS.StackExchange.com
- Author of „Learning QGIS“ (1st ed 2013), „QGIS Map Design“ (2016) & „QGIS 2 Cookbook“ (2016)

@underdarkGIS



ABOUT – QGIS

2002 developed as a C++ Postgis Viewer by Gary Sherman

Early professional users:
- Kanton Solothurn (2005/2006)
- City of Uster (2007)
- Tuscany Regional Administration (2009)

2007 OSGEO incubator project → formation of the PSC

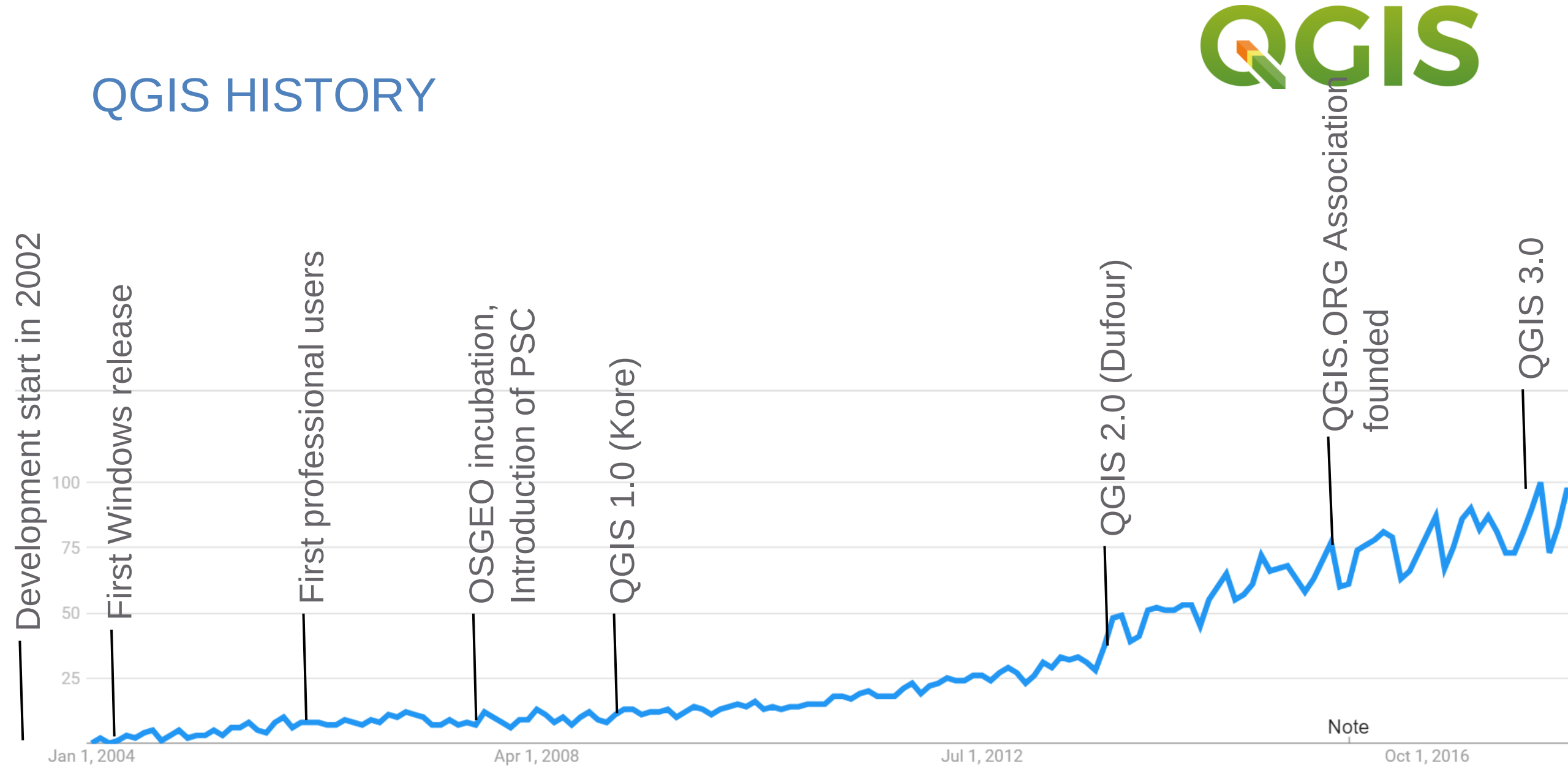
2015 QGIS.ORG founded

QGIS IS AN OSGEO PROJECT

established 2006

Mission: Foster global adoption of **open geospatial technology** by being an **inclusive software foundation** devoted to an open philosophy and participatory **community driven development**.

QGIS HISTORY



Source of Search volume interests: https://trends.google.com/

GOOGLE TRENDS

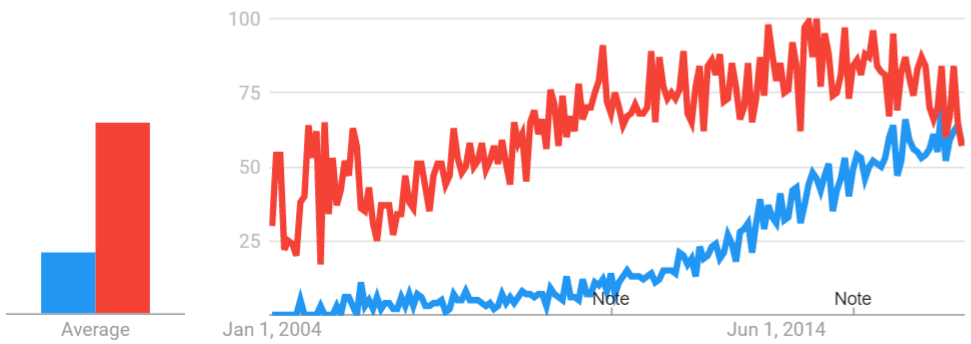
QGIS
Search term

ArcGIS
System software

Germany | 2004 - present | All categories | Web Search

Note: This comparison contains both Search terms and Topics, which are measured differently. LEARN MORE

Interest over time



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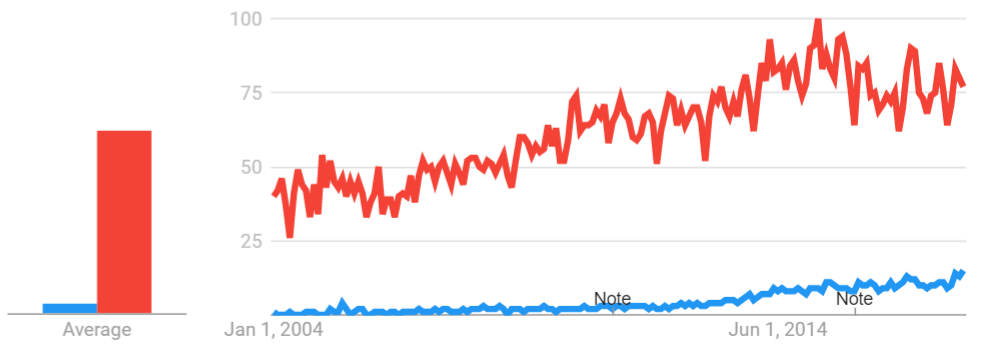


QGIS TODAY

Most popular Open Source Desktop GIS

Available for: Linux, Windows, OSX (and Android)

Translated in > 40 languages

More than desktop:

- QGIS Server,
- Web clients (QWC2, LizMap),
- Data collection solutions (QField, Intramaps Roam)

UPCOMING …

Developer meeting in Zanzibar

User conference at FOSS4G in Dar es Salaam

LTR 3.4 release end of October 2018

http://qgis.org/en/site/getinvolved/development/roadmap.html

QGIS TEAM

QGIS Do-ocracy

Developers	Translators	Infrastructure Managers	Documentation writers
Community Managers	Designers	Users	Donors & Sponsors

Project Steering Committee

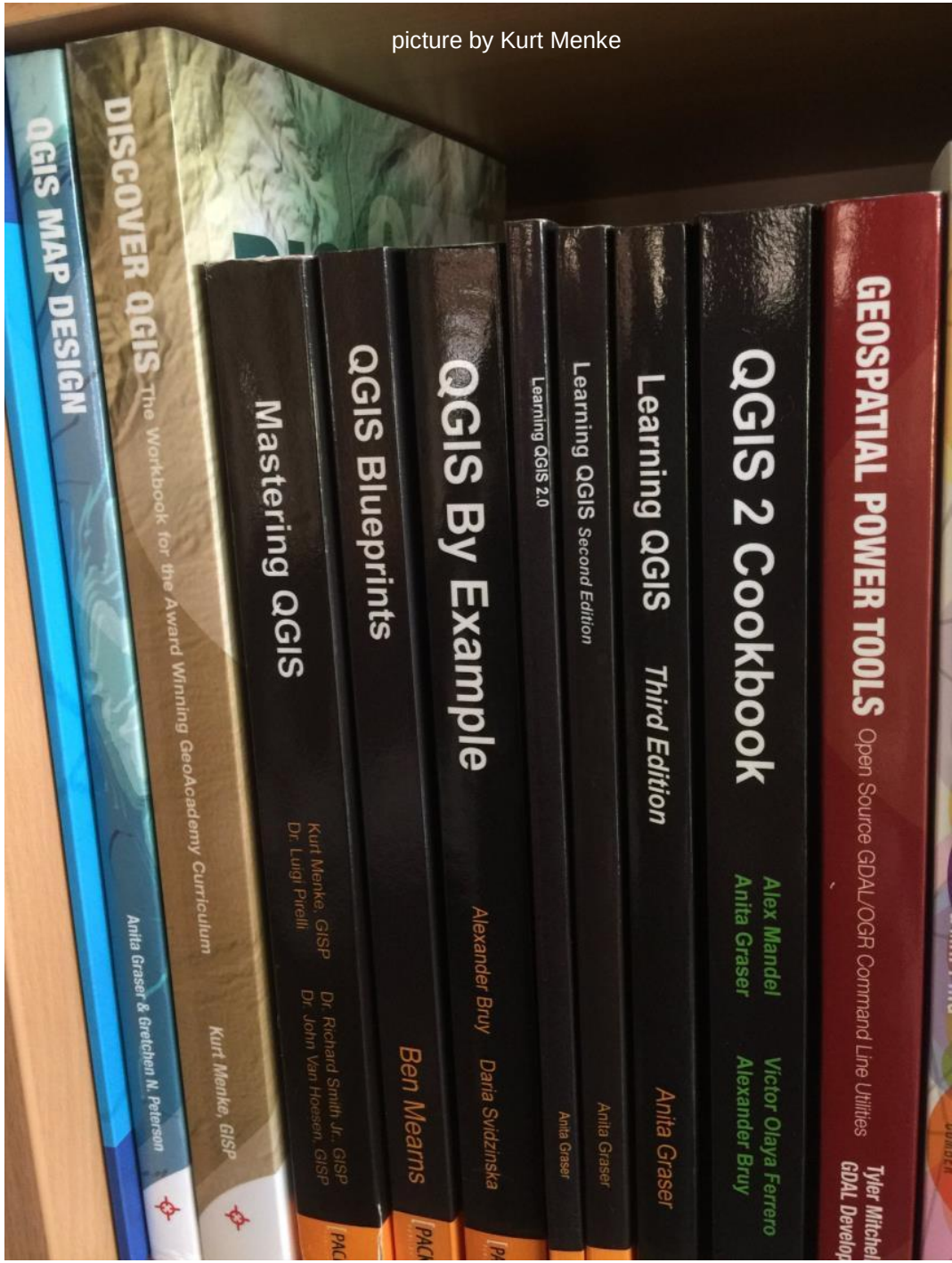
DEVELOPERMEETING, LINUXHOTEL ESSEN

DOCUMENTATION

official documentation

docs.qgis.org

and many books …



SUPPORT CHANNELS

- Mailing lists
- gis.stackexchange.com
- User groups
- Commercial Support

QGIS USER GROUPS

- Australia
- Brasil
- Denmark
- UK
- France
- Germany
- Georgia
- Italy
- Japan
- Kenya
- Mexico
- New Zealand
- Norway
- Peru
- Poland
- Portugal
- Romania
- Scotland
- Switzerland
- USA
- Wales/Cymru
- South Africa
- Sweden

+ Elected community members

= QGIS.ORG voting members …

… elect
- PSC
- Board
- Chair
- Financial auditors

… decide on
- Grants
- Matters that need community decisions

… approve
- Yearly report
- Financial report
- Budget

http://www.qgis.org/en/site/forusers/usergroups.html

QGIS USER EXAMPLES – WORLDWIDE

Government, e.g. US Census

4 Getting Started

4.1 System and Hardware Requirements

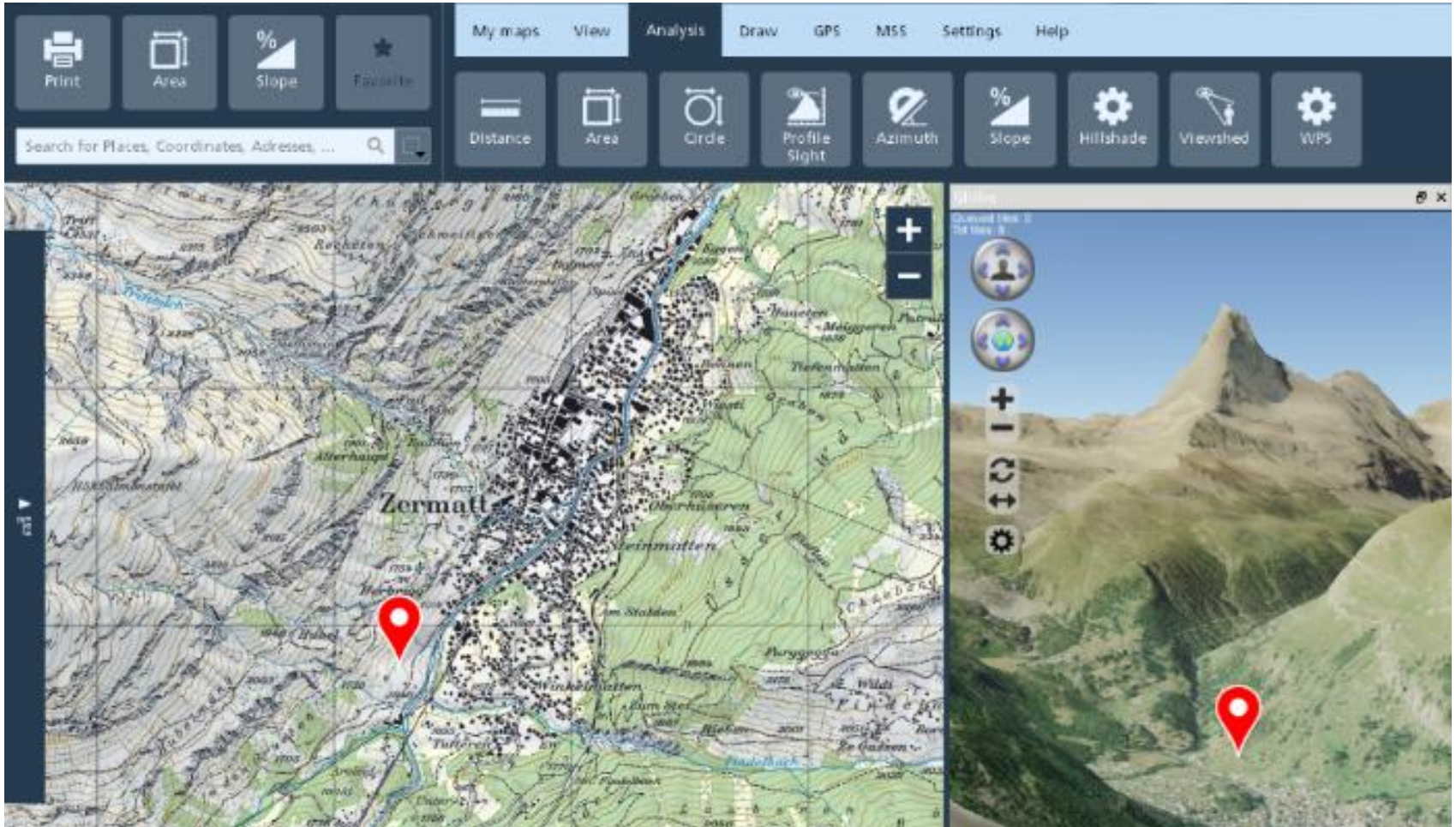
The Geographic Update Partnership Software (GUPS) is based on QGIS (formerly known as Quantum GIS), a free and open-source desktop geographic information system application. You can learn more about QGIS at *http://www.qgis.org/en/site/*.

Table 2 below lists the hardware and software requirements to install and run the GUPS, submit files through the Secure Web Incoming Module (SWIM) website, and play the training videos available in the GUPS application.

https://www.census.gov/programs-surveys/bas/technical-documentation/gups-instructions.html

QGIS USER EXAMPLES – WORLDWIDE

Military, e.g. at the Swiss Army



QGIS USER EXAMPLES – WORLDWIDE

Journalists

QGIS @ Financial Times

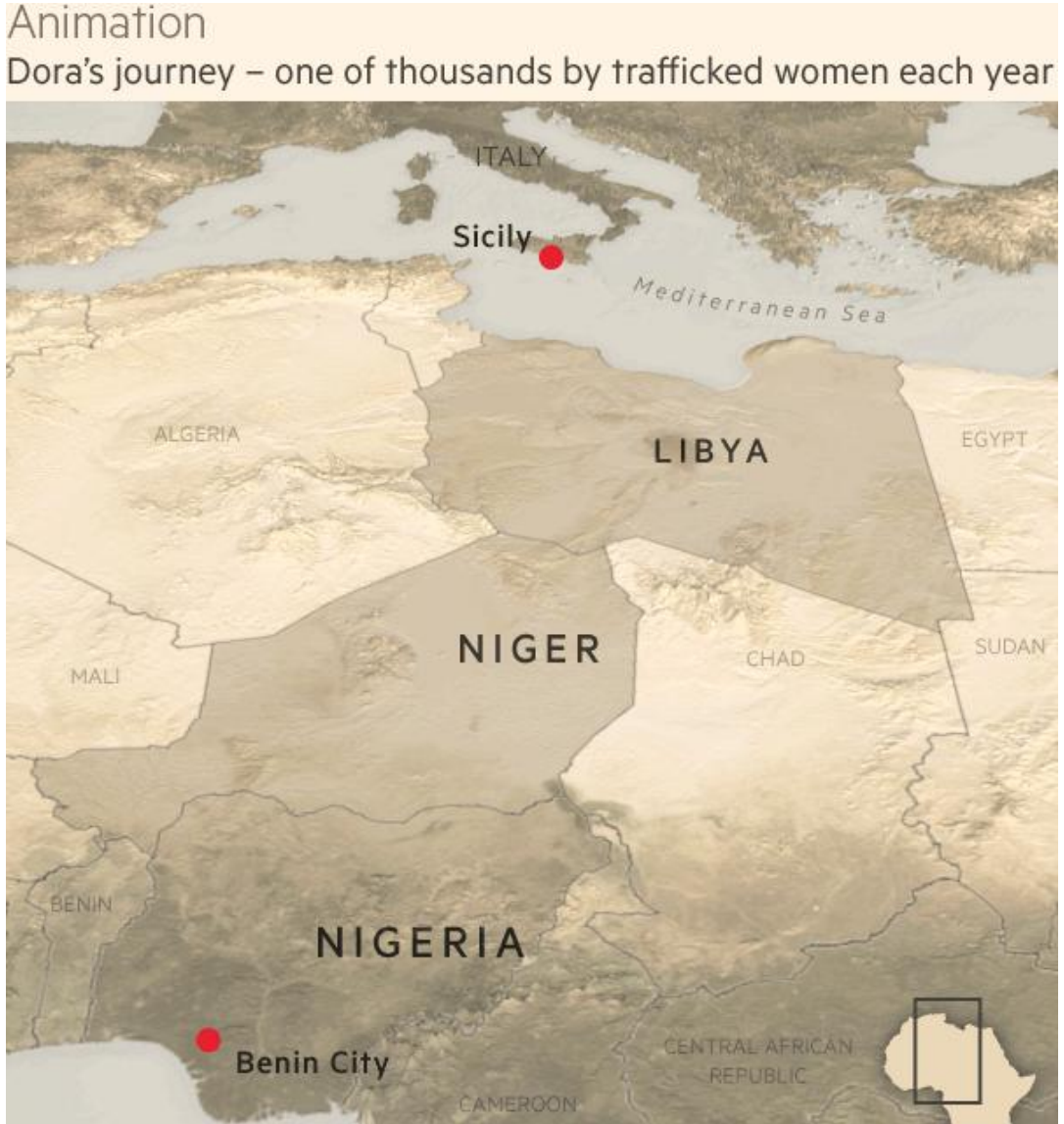
http://qgis.org/en/site/about/case_studies/qgis_at_financial_times.html

ORF.at

https://github.com/orfon/bulkvectorexport

Spiegel.de

http://www.spiegel.de/wissenschaft/natur/gewitter-atlas-so-haeufig-sind-blitze-in-deutschland-a-1104658.html



CHALLENGES

- QGIS is developed “bottom up”

  → driven by user demand

- QGIS.ORG does not have any employees

  → no direct influence of board & PSC on developers

- QGIS developers run their own businesses or are employed by FOSSGIS companies

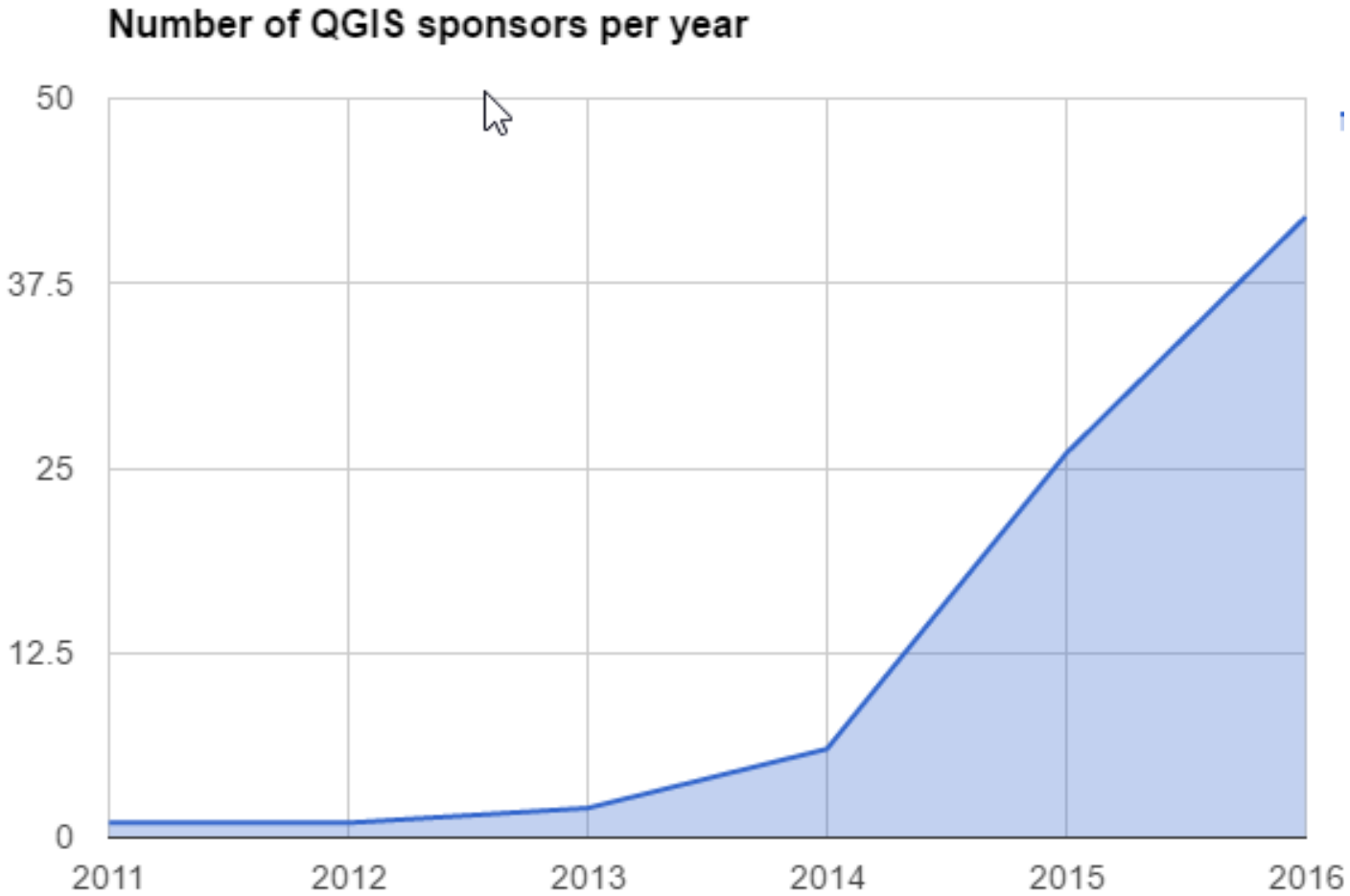
- QGIS.ORG funds are limited (approx. 100k € in 2017)

  → Marketing resources

  → Documentation

  → Bug fixing and Quality Assurance

PROJECT FINANCES



QGIS

Financial Report for 2017

The reporting period starts on **January 1, 2017** and ends on **December 31, 2017**. Accrued expenses for work that has been done in 2017 but where the invoices were received in 2018 were included. The currency of all items is Euro (€).

Balance sheet

Account balance on January 1, 2017	45'370.00
Account balance on December 31 2017 (incl. QGIS-IT)	63'123.43
Accrued expenses (deferrals) made in 2018 for work done in 2017	10'595.26
Account balance QGIS-IT (included in main account balance)	906.00
Income:	
Sponsoring payments	64'206.05
PayPal donations (excl. sponsorships and QGIS-IT income)	20'984.13
Direct donations to bank account (wire transfer)	10'183.52
Dedicated contributions for QGIS bug fixing	7'800.00
Dedicated contributions to QGIS dev meetings	6'269.25
QGIS training certificates	1'120.00
Liquidation of old bank account still run by Swiss QGIS user group	444.80
QGIS Shop income	147.52
QGIS books royalty scheme (Packt Publishing)	89.68
Paypal test payment	0.17
QGIS-IT membership fees	465.00
Total Income	**111'710.12**
Expenses	
Bug fixing and QA (incl. bug tracking queue management)	50'966.62
Expenses developer meetings	9'075.67
Infrastructure Expenses (incl. benchmarks QGIS Server)	1'899.46
QGIS grants program (incl. payment from 2016)	34'800.00
QGIS documentation (processing)	4'000.00
Cost around logo, trademark and trade registry	2'937.90
Bank account and transfer fees	272.30
QGIS-IT expenses	600.00
Total Expenses	**104'551.95**

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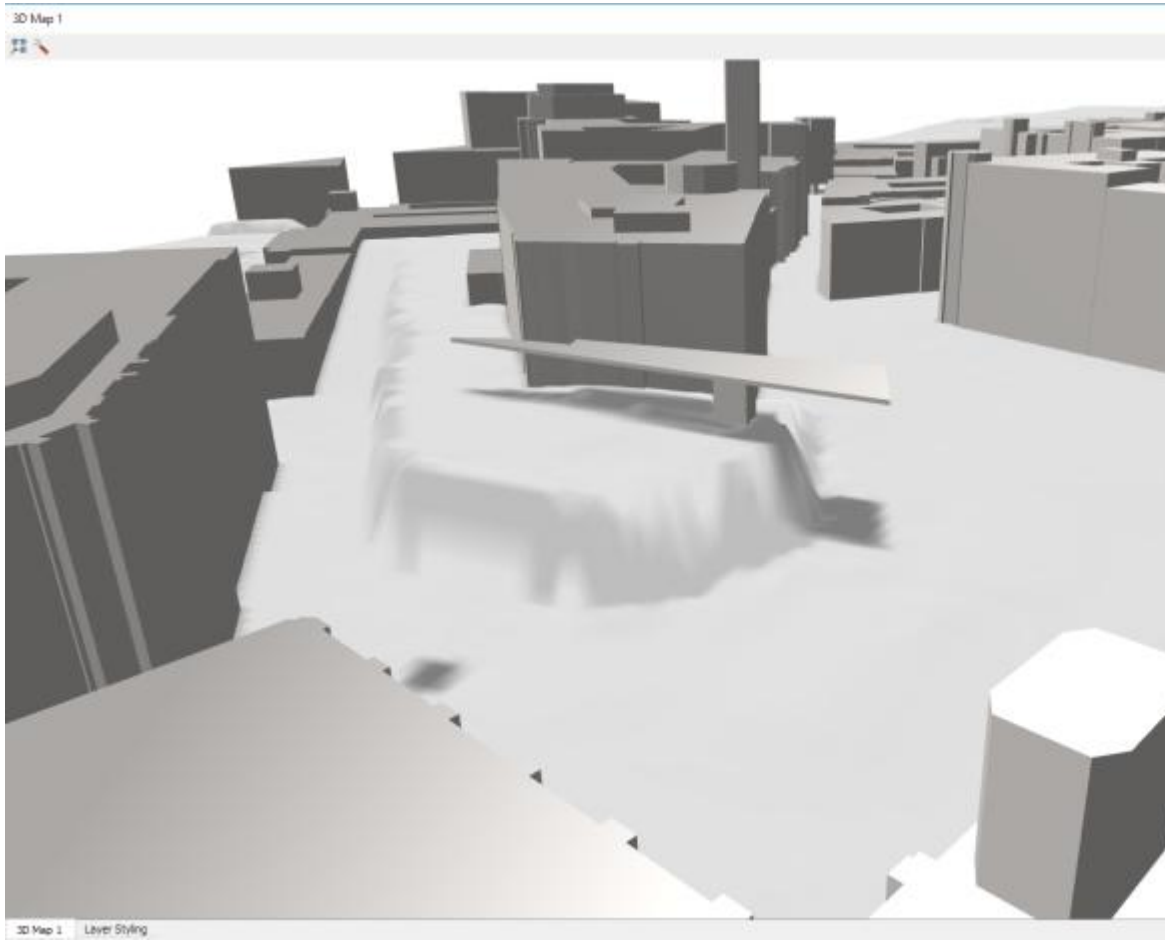
http://www.qgis.org/en/site/getinvolved/governance/finance/index.html

QGIS GRANTS

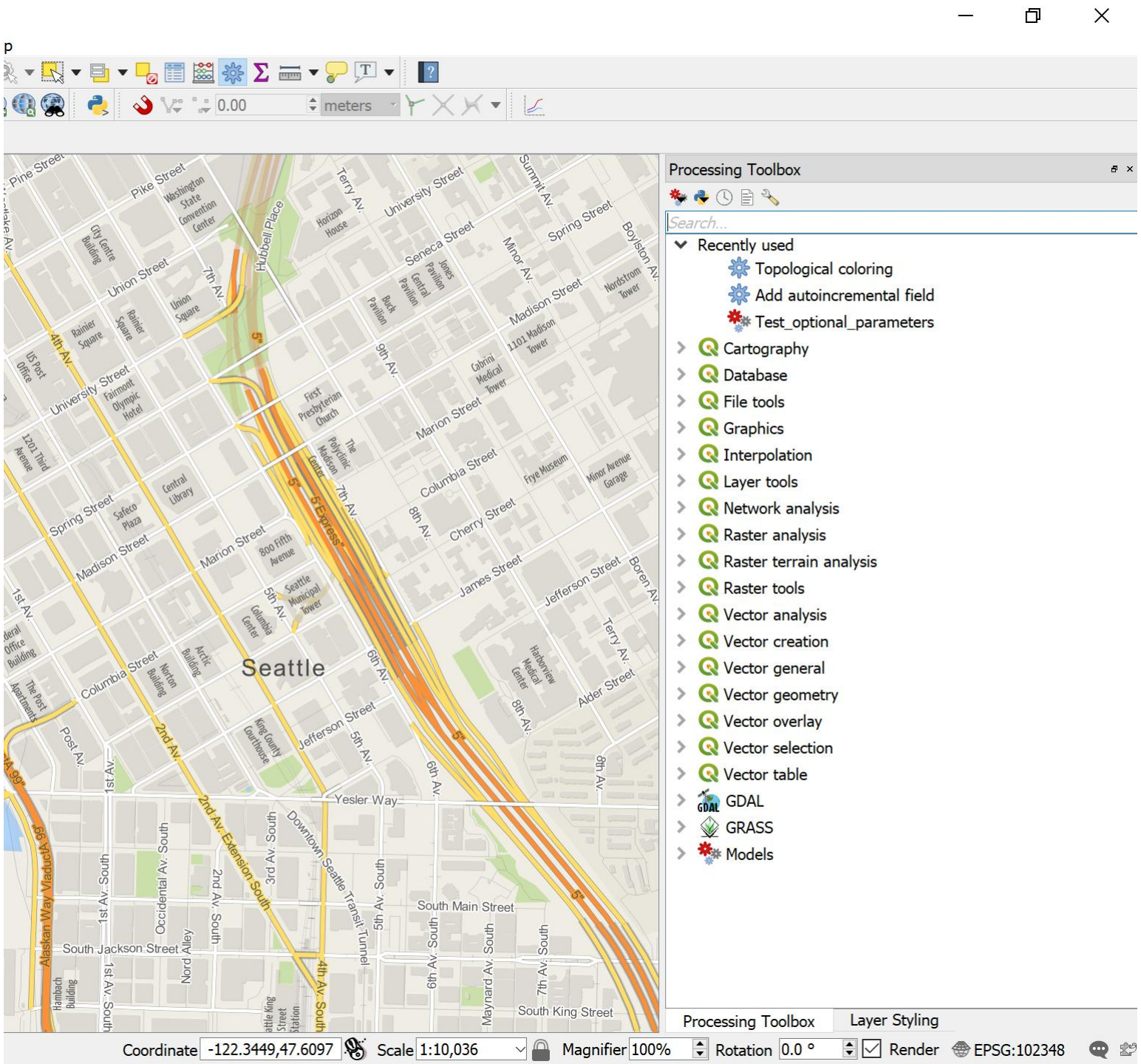
- Improved UI-controls consistency
- Extended unit test coverage for geometry classes
- QGIS 3D
- Improved deep relations with PostgreSQL editing

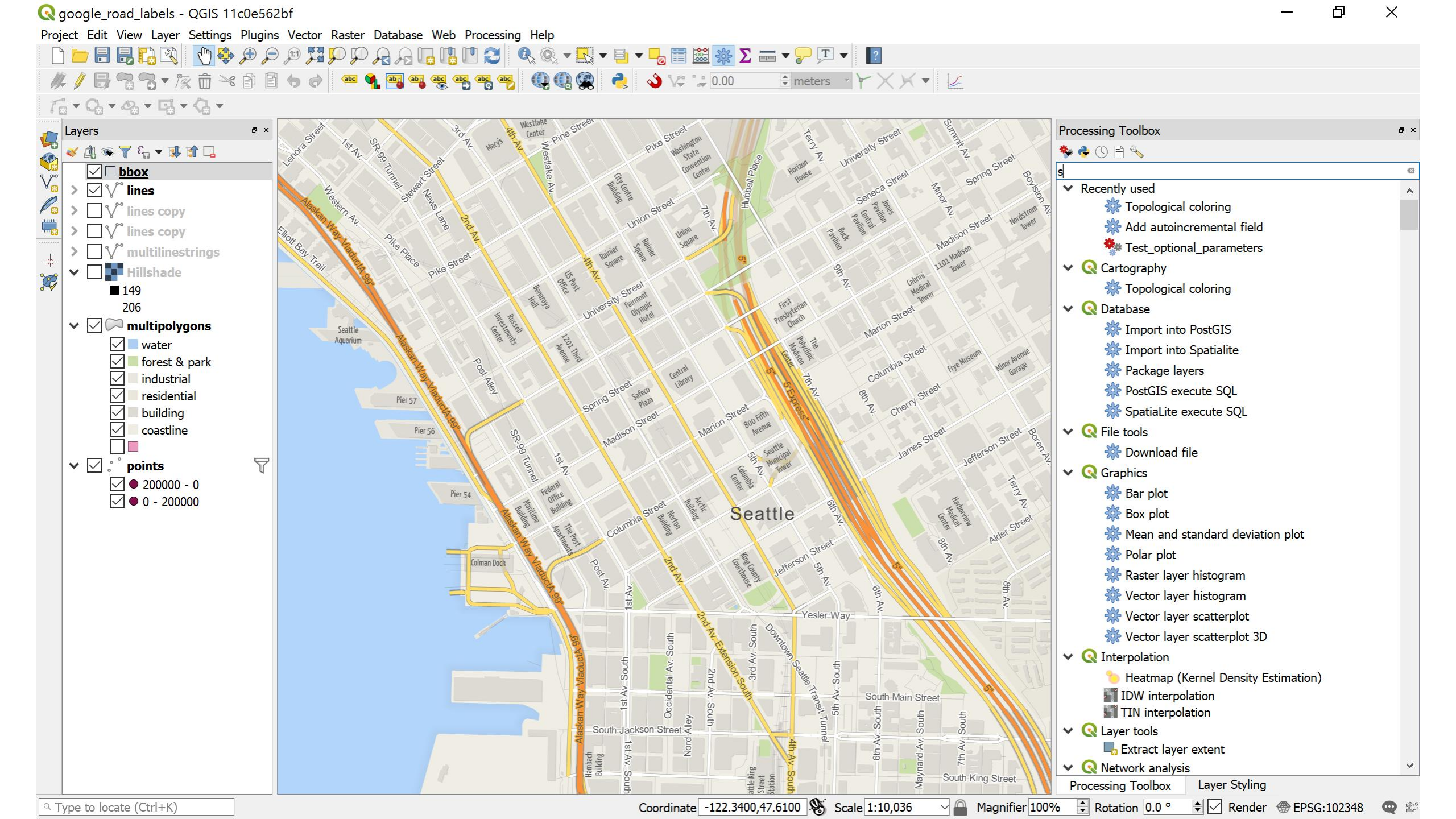
+ Processing algorithm documentation



PROCESSING

QGIS‘ analysis toolbox

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Hillshade
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multipolygons
water
forest & park
industrial
residential
building
coastline
points
200000 - 0
0 - 200000
Seattle
Processing Toolbox
Recently used
Topological coloring
Add autoincremental field
Test_optional_parameters
Cartography
Topological coloring
Database
Import into PostGIS
Import into Spatialite
Package layers
PostGIS execute SQL
SpatiaLite execute SQL
File tools
Download file
Graphics
Bar plot
Box plot
Mean and standard deviation plot
Polar plot
Raster layer histogram
Vector layer histogram
Vector layer scatterplot
Vector layer scatterplot 3D
Interpolation
Heatmap (Kernel Density Estimation)
IDW interpolation
TIN interpolation
Layer tools
Extract layer extent
Network analysis
Processing Toolbox
Layer Styling
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Magnifier 100%
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Render
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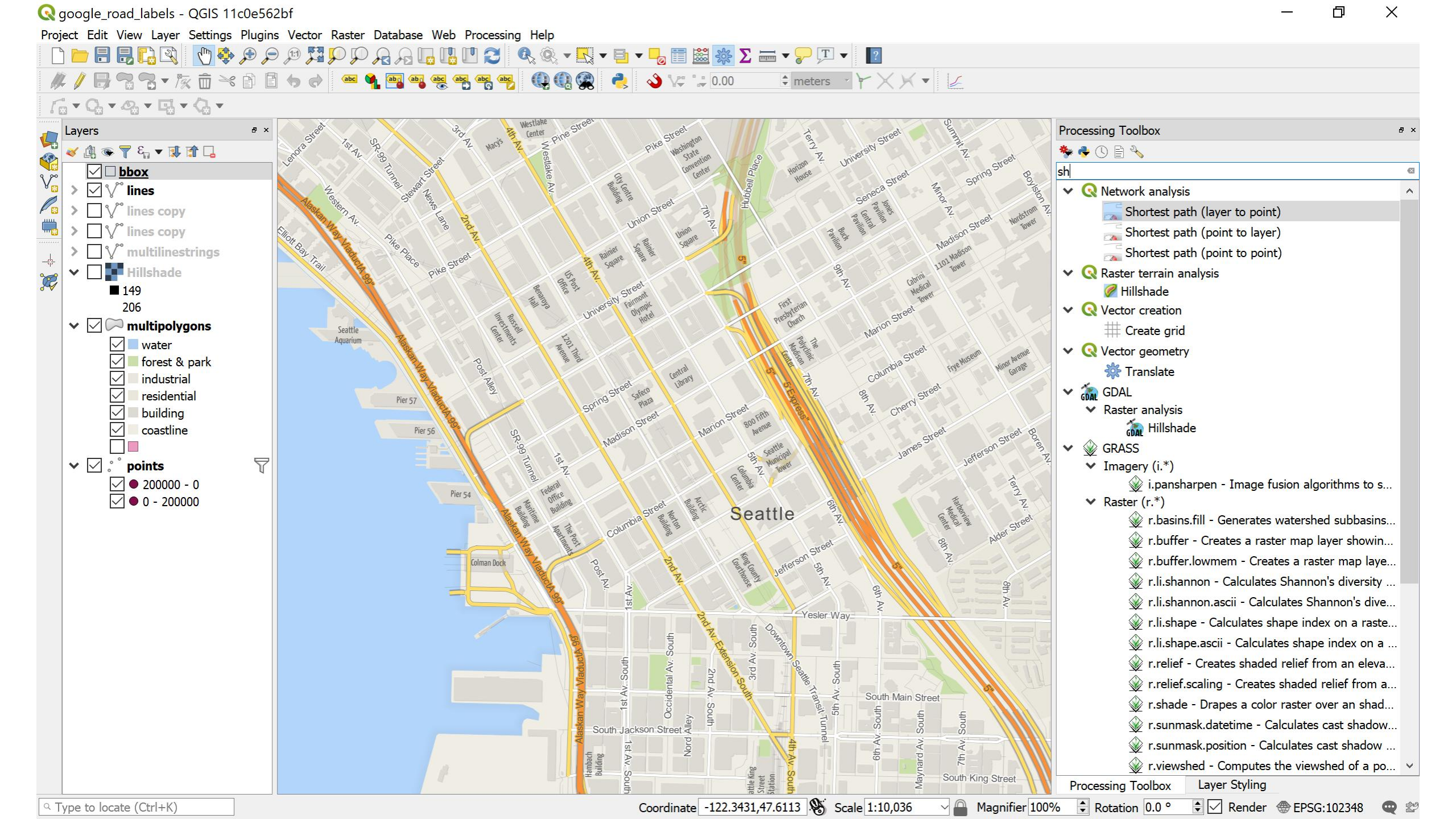
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200000 - 0
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Seattle
Processing Toolbox
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Network analysis
Shortest path (layer to point)
Shortest path (point to layer)
Shortest path (point to point)
Raster terrain analysis
Hillshade
Vector creation
Create grid
Vector geometry
Translate
GDAL
Raster analysis
Hillshade
GRASS
Imagery (i.*)
i.pansharpen - Image fusion algorithms to s...
Raster (r.*)
r.basins.fill - Generates watershed subbasins...
r.buffer - Creates a raster map layer showin...
r.buffer.lowmem - Creates a raster map laye...
r.li.shannon - Calculates Shannon's diversity ...
r.li.shannon.ascii - Calculates Shannon's dive...
r.li.shape - Calculates shape index on a raste...
r.li.shape.ascii - Calculates shape index on a ...
r.relief - Creates shaded relief from an eleva...
r.relief.scaling - Creates shaded relief from a...
r.shade - Drapes a color raster over an shad...
r.sunmask.datetime - Calculates cast shadow...
r.sunmask.position - Calculates cast shadow ...
r.viewshed - Computes the viewshed of a po...
Processing Toolbox
Layer Styling
Type to locate (Ctrl+K)
Coordinate -122.3431,47.6113
Scale 1:10,036
Magnifier 100%
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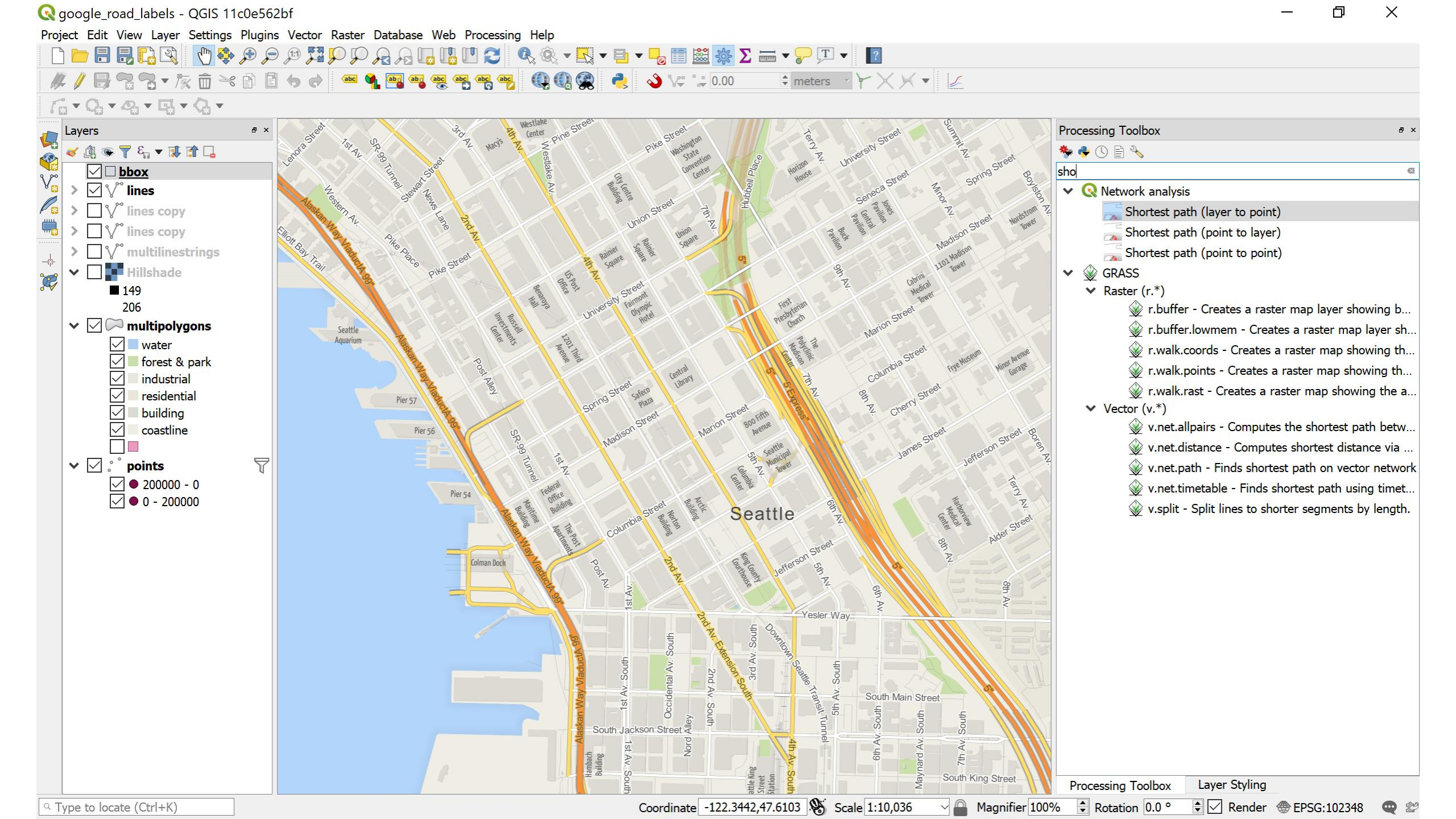
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Shortest path (layer to point)
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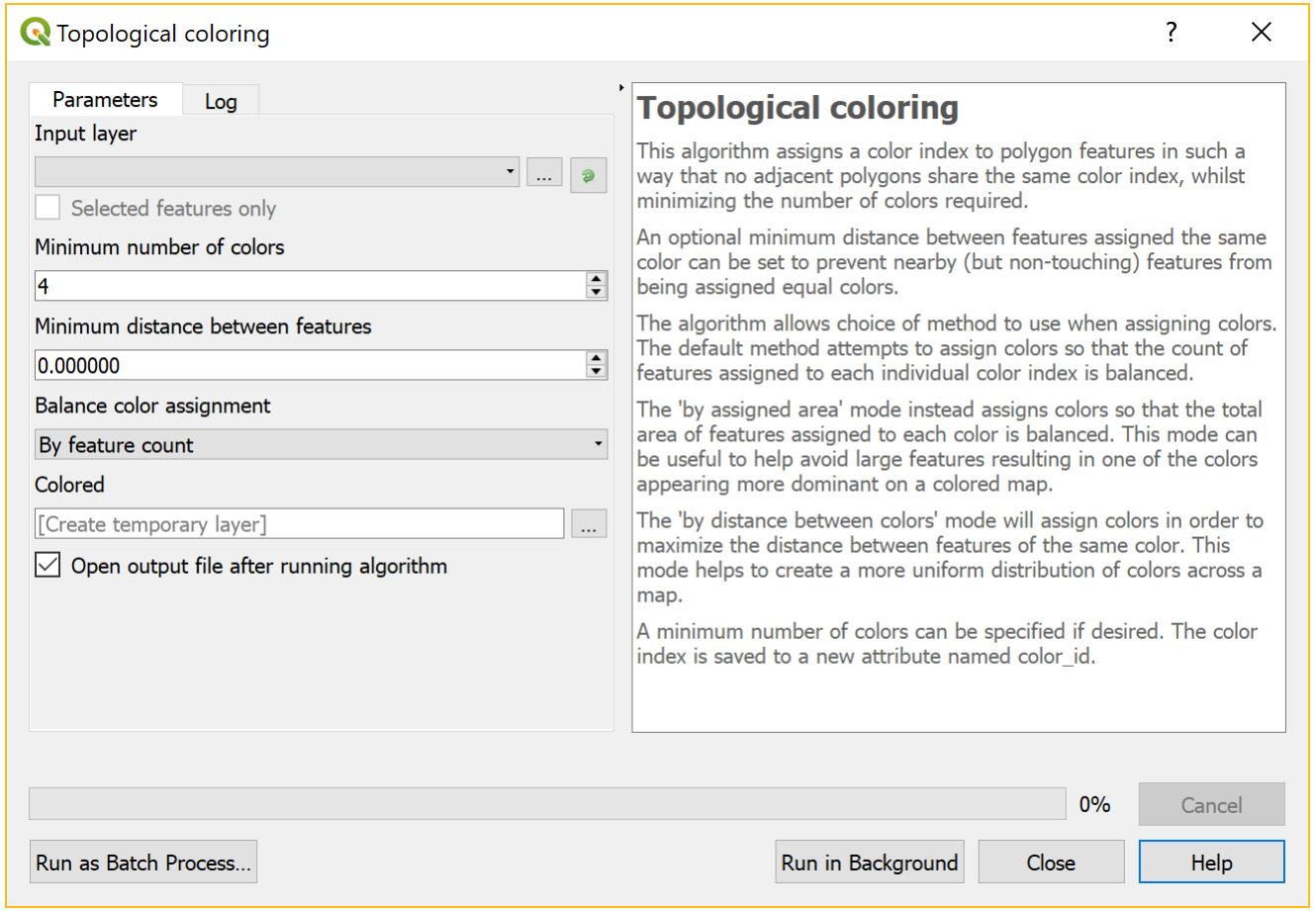
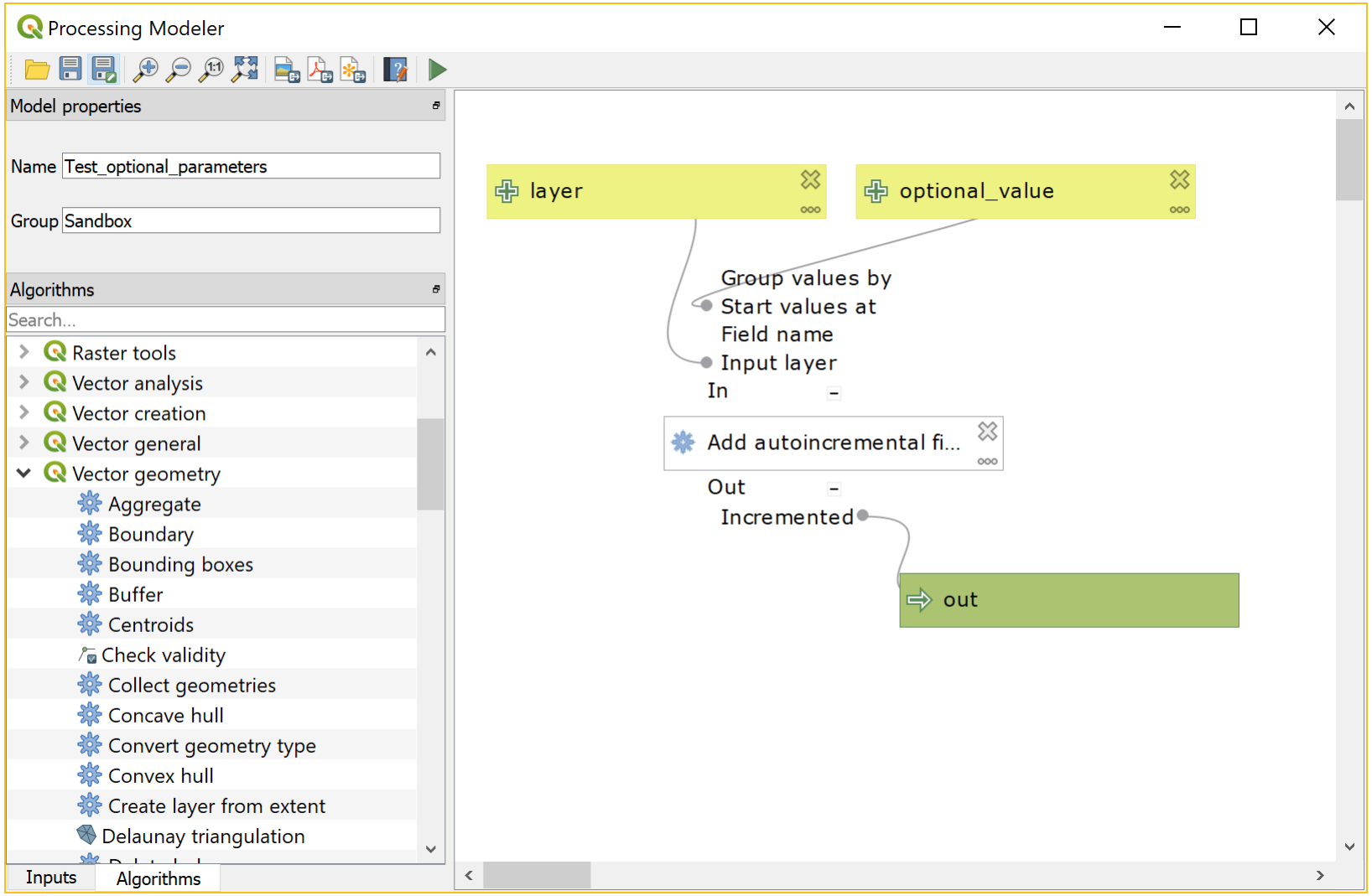
GRASS
Raster (r.*)
r.buffer - Creates a raster map layer showing b...
r.buffer.lowmem - Creates a raster map layer sh...
r.walk.coords - Creates a raster map showing th...
r.walk.points - Creates a raster map showing th...
r.walk.rast - Creates a raster map showing the a...
Vector (v.*)
v.net.allpairs - Computes the shortest path betw...
v.net.distance - Computes shortest distance via ...
v.net.path - Finds shortest path on vector network
v.net.timetable - Finds shortest path using timet...
v.split - Split lines to shorter segments by length.
Processing Toolbox
Layer Styling
Type to locate (Ctrl+K)
Coordinate -122.3442,47.6103
Scale 1:10,036
Magnifier 100%
Rotation 0.0 °
Render
EPSG:102348

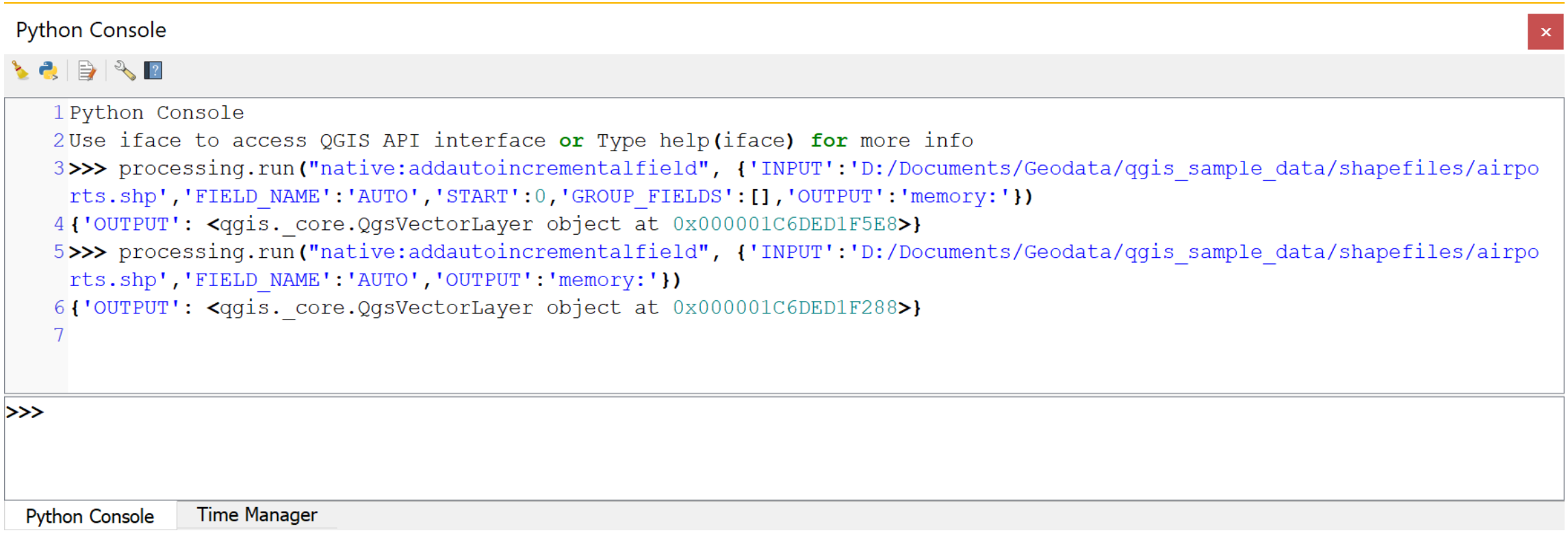
PROCESSING TOOLS



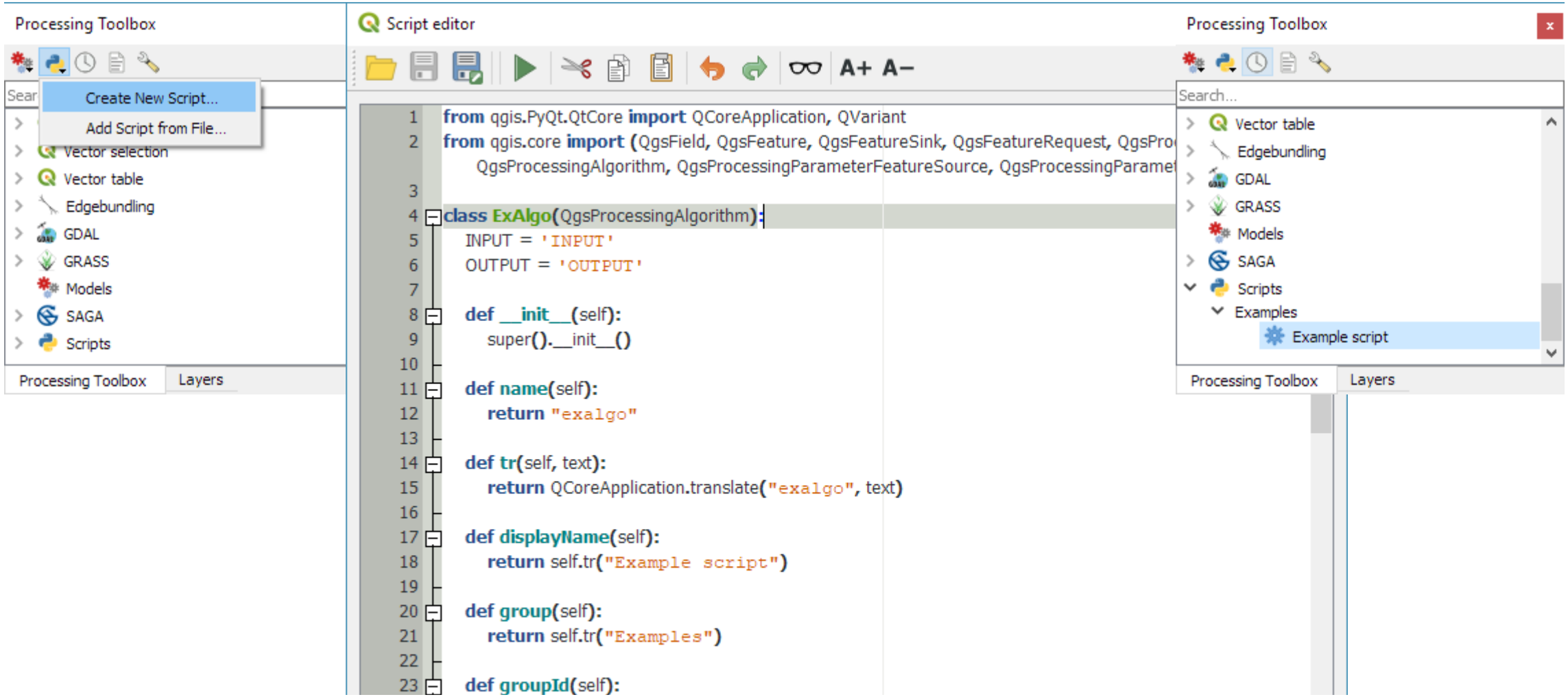
PROCESSING MODELER



PROCESSING & PYQGIS

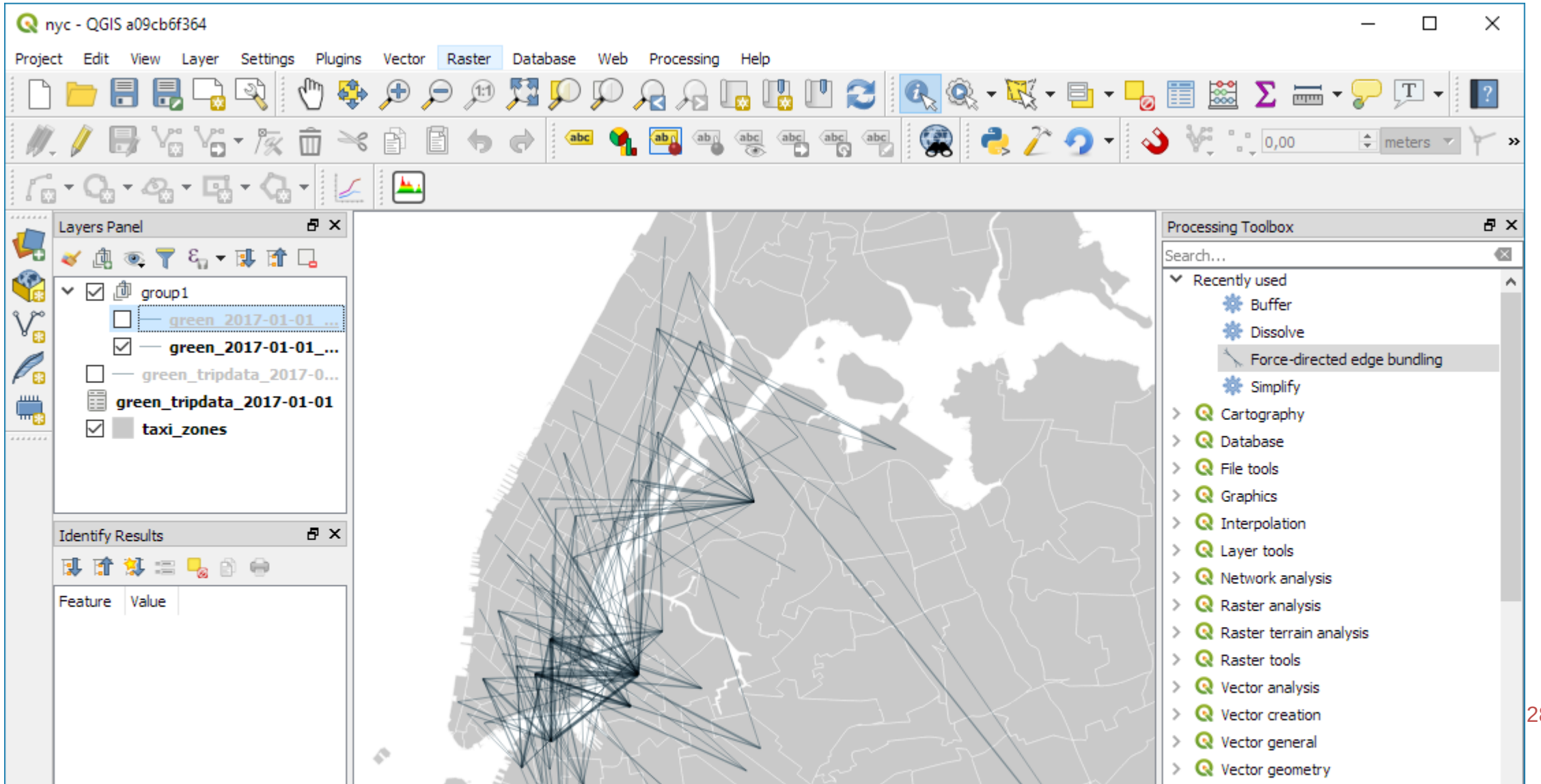


CUSTOM SCRIPTS



https://anitagraser.com/2018/03/25/processing-script-template-for-qgis3/

CUSTOM SCRIPT EXAMPLE



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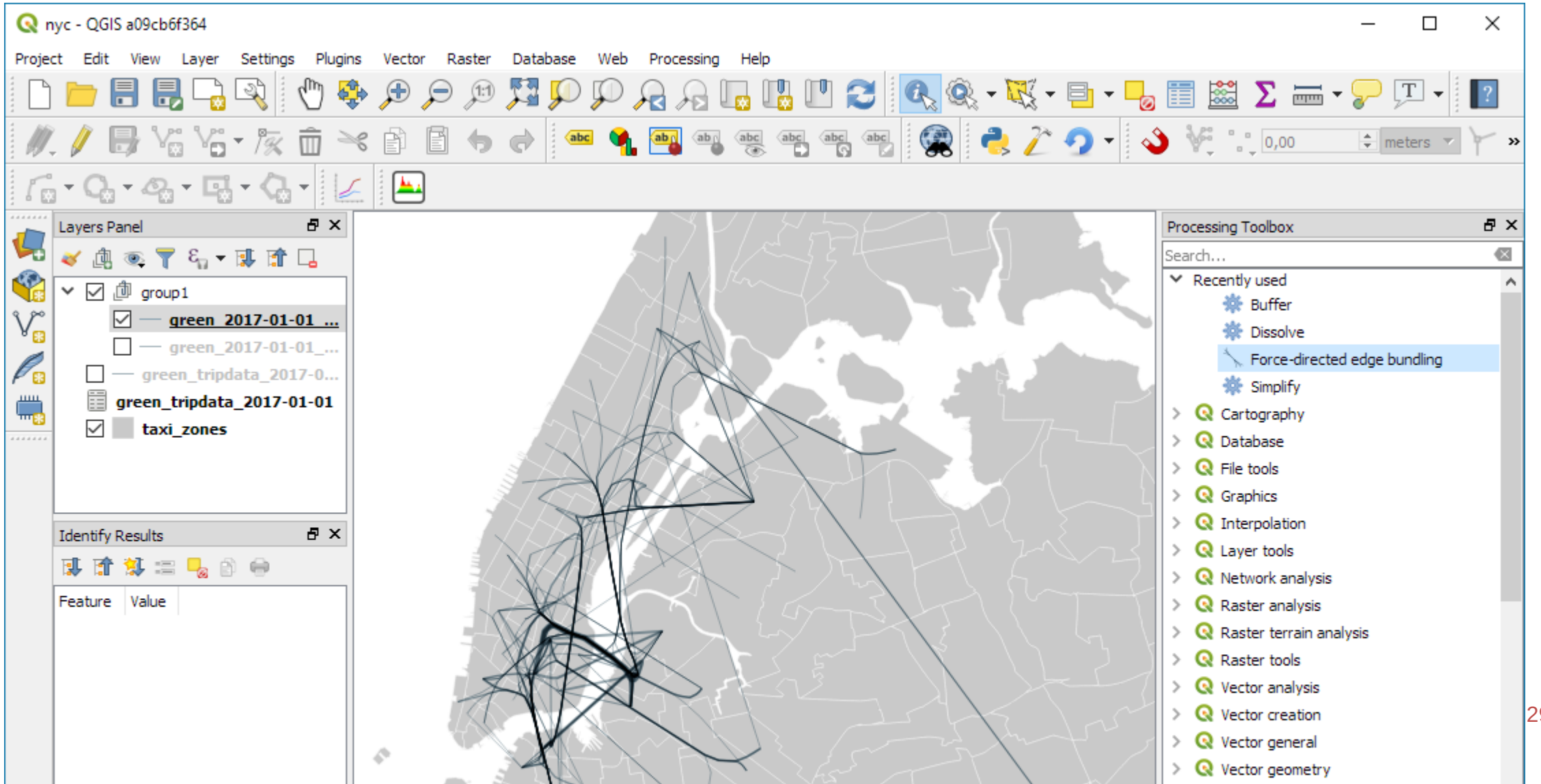
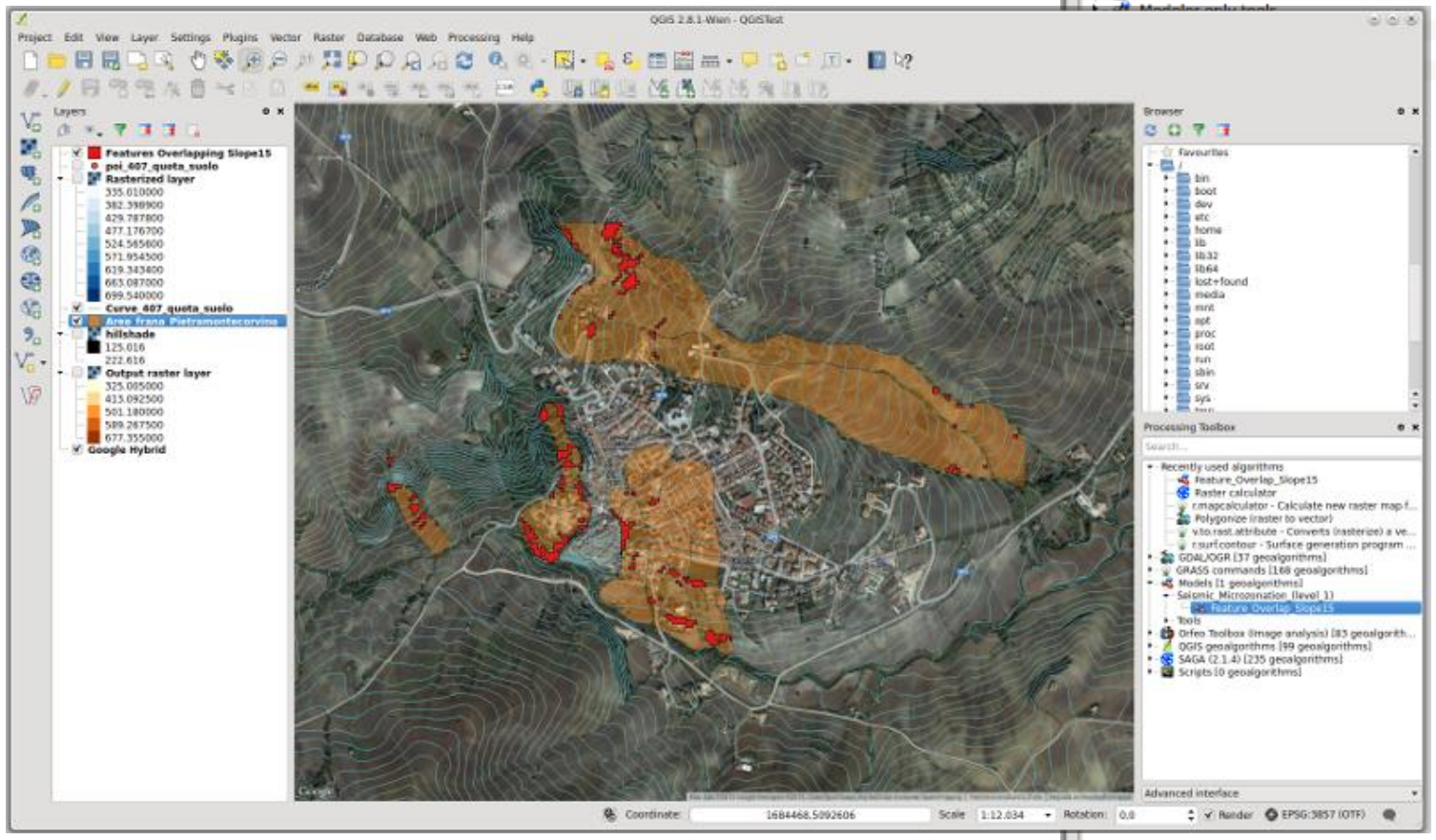
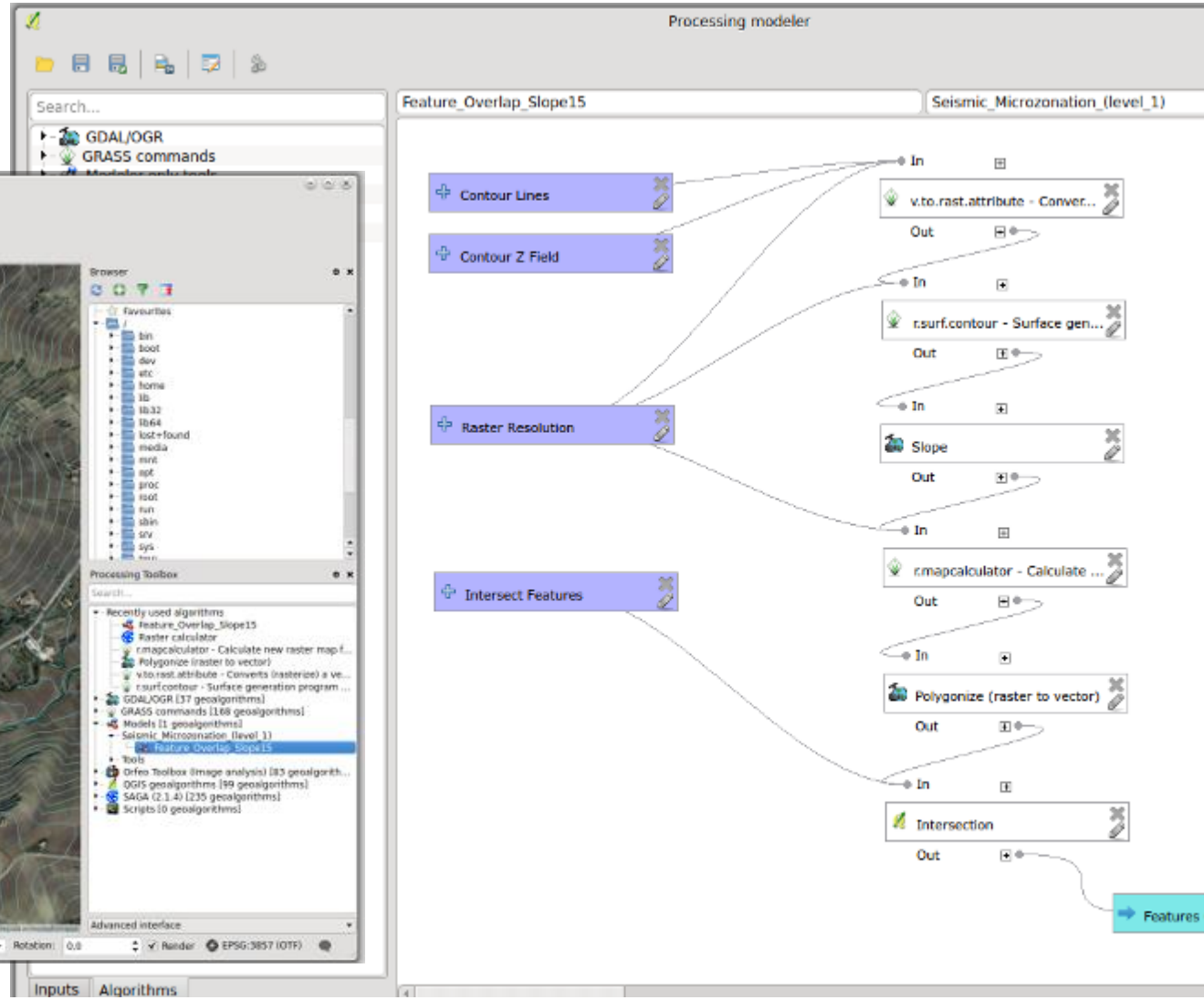


ANALYSIS EXAMPLES

e.g. modeling geologically unstable zones

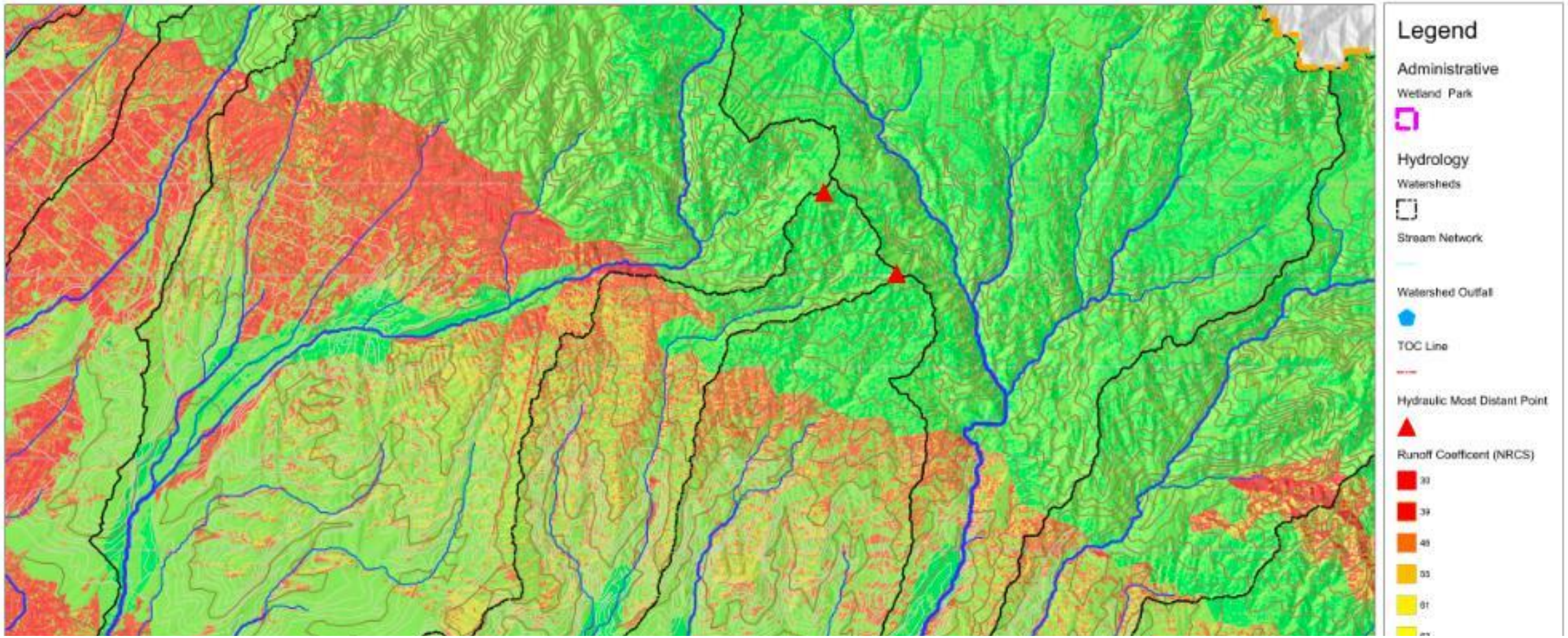




https://qgis.org/en/site/about/case_studies/italy_rome.html

ANALYSIS EXAMPLES

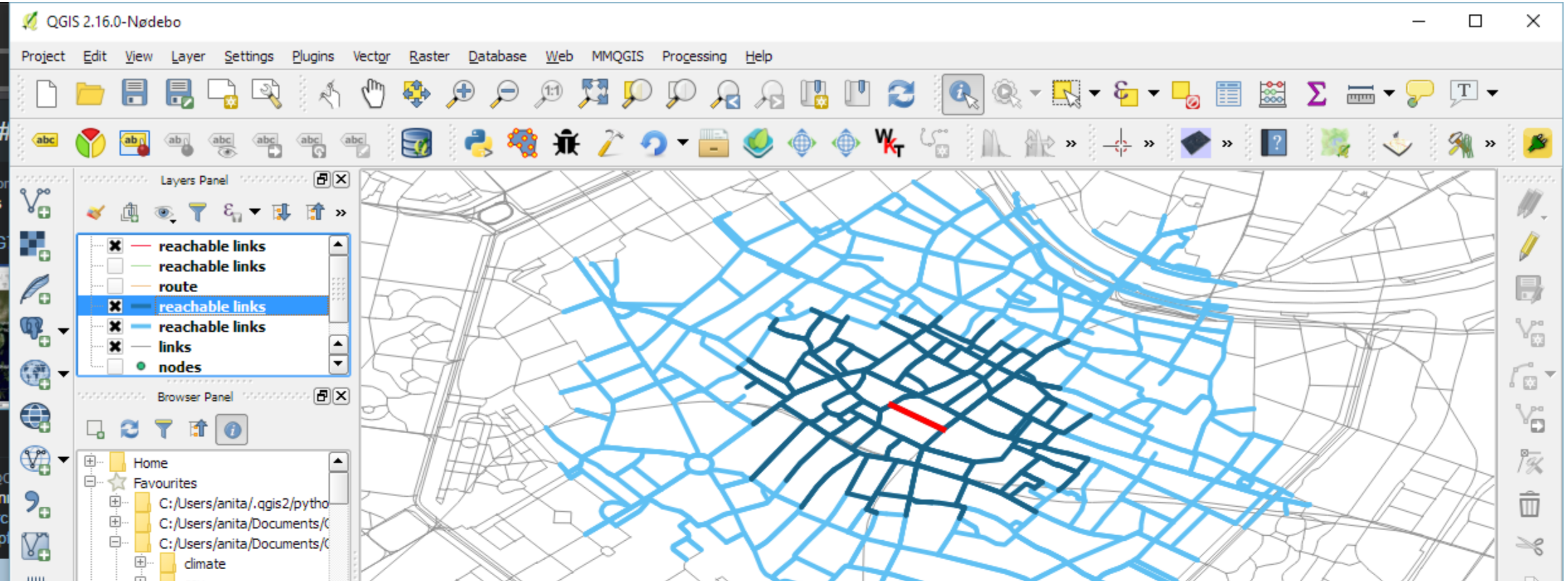
e.g. hydrological analysis



https://qgis.org/en/site/about/case_studies/china_hydro.html

ANALYSIS EXAMPLES

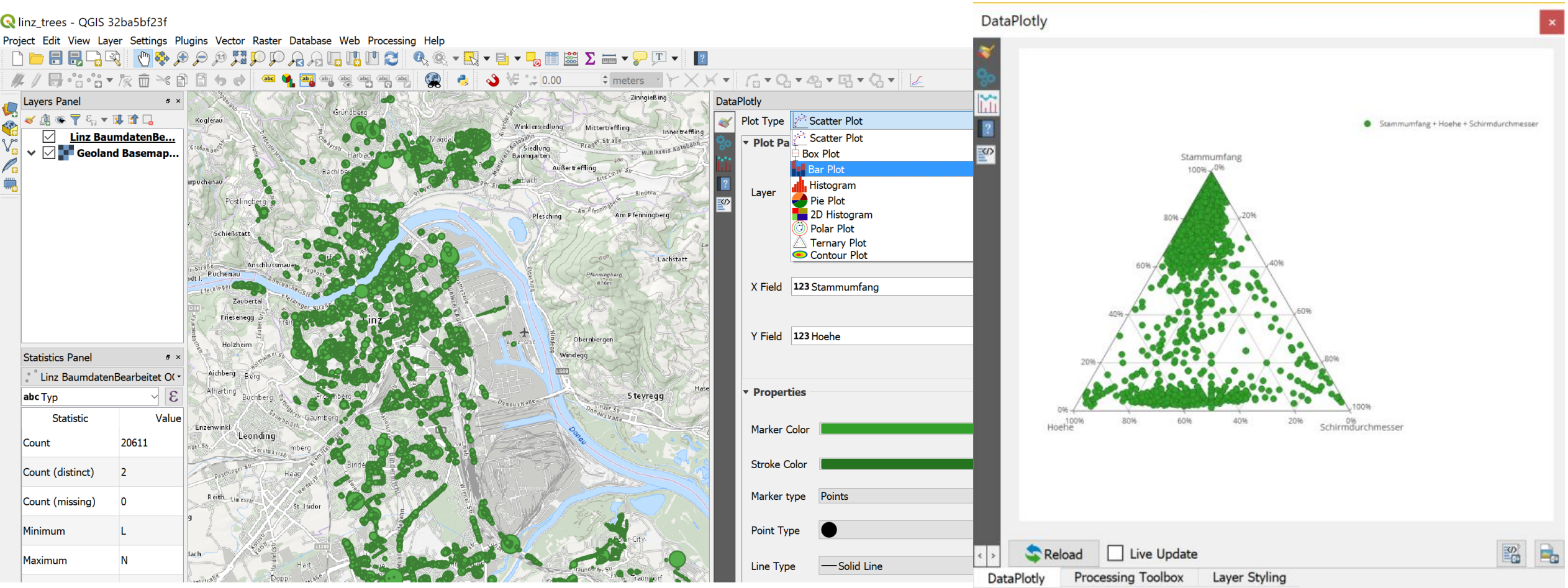
e.g. network analysis



https://anitagraser.com/2016/07/17/traveltime-routing-catchment-extension-for-the-qgis-idf-router/

ANALYSIS EXAMPLES

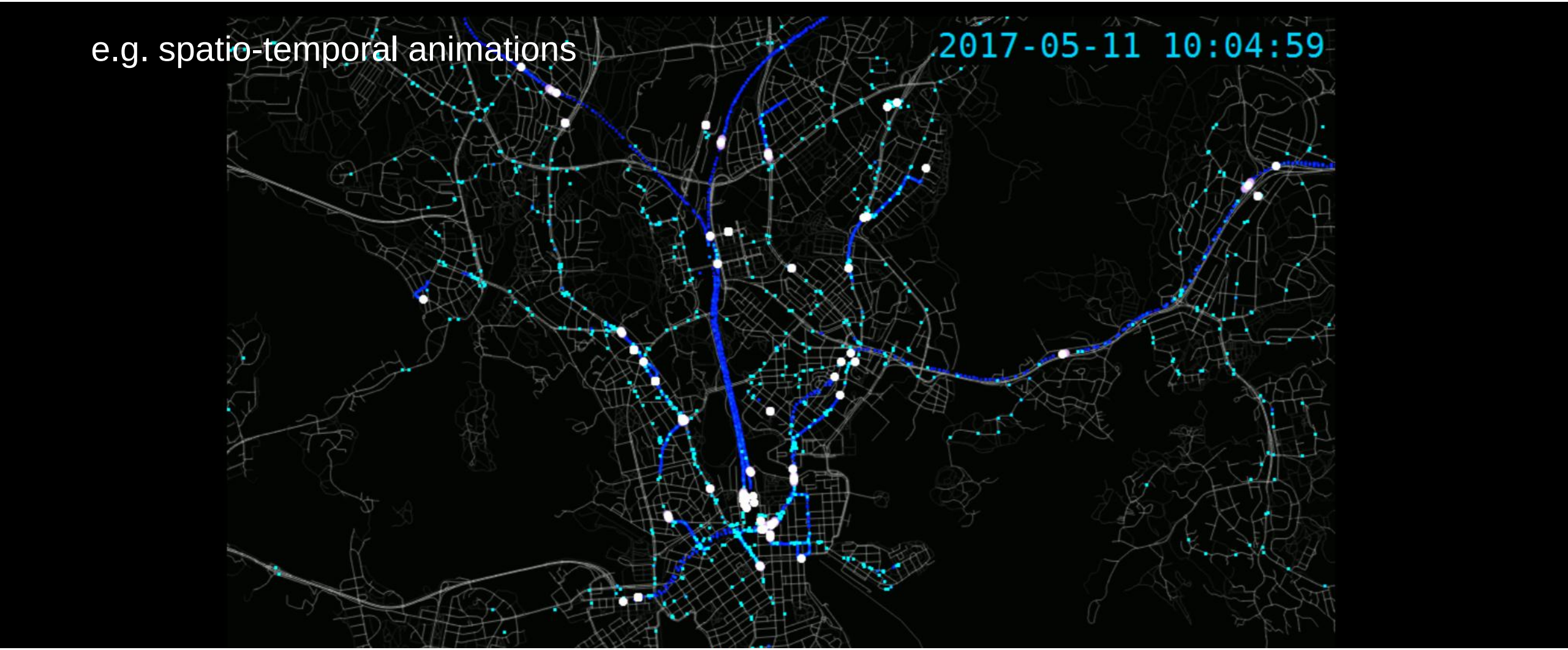
e.g. graph-based diagrams



https://anitagraser.com/2017/12/06/data-exploration-with-data-plotly-for-qgis3/

ANALYSIS EXAMPLES

e.g. spatio-temporal animations



https://anitagraser.com/projects/time-manager/

HOW TO CONTRIBUTE

- Report issues
- Help translating/documenting
- Raise funding
- Answer user questions
- Help fixing issues
- Help developing

https://nyalldawson.net/2016/08/how-to-effectively-get-things-changed-in-qgis/

CONTACT

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