



## Geometry Cleaning Plugins

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# Motivation

- **Fix errors and imprecisions in vector datasets**
  - Improve the results of analysis operations

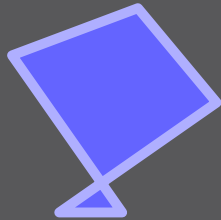
# **Geometry Checker**

**Detect and fix geometry and topology errors  
and imprecisions**

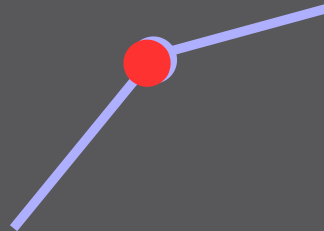


# Geometry Checker - Errors

Self intersections



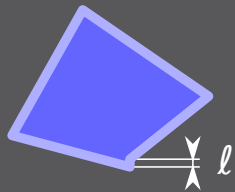
Duplicate nodes



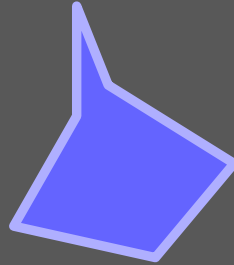
Holes



Segment length



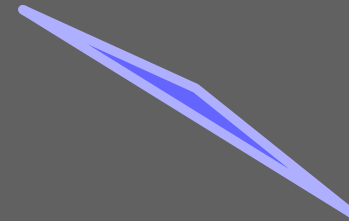
Minimum angle



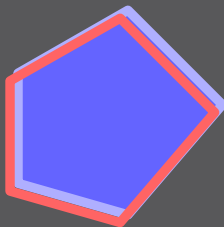
Minimum area



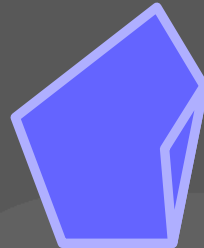
Sliver polygons



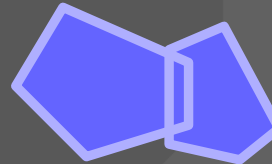
Duplicates



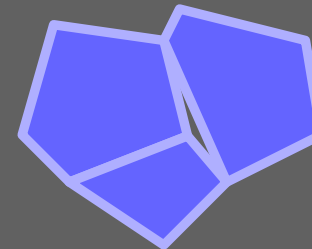
Feature within feature



Overlaps



Gaps





# Geometry Checker - Setup

➤ Select checks to perform

Check Geometries

Setup Result

Input vector layer  
demo  
 Only selected features

Geometry validity:  
 Self intersections  
 Duplicate nodes  
 Polygon with less than 3 nodes

Allowed geometry types:  
 Point  Line  Polygon  
 Multipoint  Multiline  Multipolygon

Geometry properties:  
 Polygons and multipolygons may not contain any holes  
 Multipart objects must consist of more than one part

Geometry conditions:  
 Minimal segment length (map units): 0.005000  
 Minimum angle between segments (deg): 10.000000  
 Minimal polygon area (map units sqr.): 0.010000  
 No sliver polygons: Maximum thinness: 1  
 Max. area (map units sqr.): 70.000000

Topology checks:  
 Check for duplicates  
 Check for features within other features  
 Check for overlaps smaller than (map units sqr.): 1.000000  
 Check for gaps smaller than (map units sqr.): 1.000000

Tolerance: 1E-8

Output vector layer  
 Modify input layer  
 Create new layer  Browse

Run

Close

# Geometry Checker – Errors overview

QGIS Enterprise 1c400d3

Check Geometries

Setup Result

Geometry check result:

Object ID	Error	Coordinates	Value	Resolution
	Gap	638284.80, 248287.89	0.000752629	
7	Minimal area	638089.91, 248256.89	0.00102234	
8	Minimal area	638089.92, 248256.62	0.00105286	
9	Minimal area	638089.93, 248256.35	0.0010376	
10	Minimal area	638089.96, 248256.07	0.00100708	
11	Minimal area	638090.23, 248254.73	0.000946045	
18	Minimal area	638090.84, 248253.23	0.00088501	
19	Minimal area	638090.97, 248252.99	0.000686646	
20	Minimal area	638091.29, 248252.48	0.00167847	
21	Minimal area	638091.56, 248252.10	0.000808716	
22	Minimal area	638091.81, 248251.79	0.000747681	
23	Minimal area	638092.03, 248251.54	0.00152588	
24	Minimal area	638092.36, 248251.21	0.000717163	
25	Minimal area	638093.93, 248250.04	0.0012207	
		638094.15		

Export Total errors: 73, fixed errors: 1

When a row is selected, move to:

Error  Feature  Don't move

Highlight contour of selected features

Show selected features in attribute table

Fix selected errors using default resolution

Fix selected errors, prompt for resolution method

Error resolution settings

Attribute to use when merging features by attribute value: id

Close

Coordinate: 638090.1412,248254.7822 Scale 1:2 Render EPSG:21781



# Geometry Checker – Fix error

QGIS Enterprise 1c400d3

Check Geometries

Setup Result

Geometry check result:

Object ID	Error	Coordinates	Value	Resolution
	Gap	638284.80, 248287.89	0.000752629	
7	Minimal area	638089.91, 248256.89	0.00102234	
8	Minimal area	638089.92, 248256.62	0.00105286	
9	Minimal area	638089.93, 248256.35	0.0010376	
10	Minimal area	638089.96, 248256.07	0.00100708	
11	Minimal area	638090.23, 248254.73	0.000946045	
18	Minimal area	638090.84, 248253.23	0.00088501	
19	Minimal area	638090.97, 248252.99	0.000686646	
20	Minimal area	638091.29, 248252.48	0.00167847	
21	Minimal area	638091.56, 248252.48	0.00167847	
22	Minimal area	638091.56, 248252.48	0.00167847	
23	Minimal area	638091.56, 248252.48	0.00167847	
24	Minimal area	638091.56, 248252.48	0.00167847	
25	Minimal area	638091.56, 248252.48	0.00167847	

Fix errors

Select how to fix error "Minimal area":

- Merge with neighboring polygon with longest shared edge
- Merge with neighboring polygon with largest area
- Merge with neighboring polygon with identical attribute value, if any, or leave as is
- Delete feature
- No action

When a

Error

High

Fix

Skip

Abort

0%

Show selected features in attribute table

Fix selected errors using default resolution

Fix selected errors, prompt for resolution method

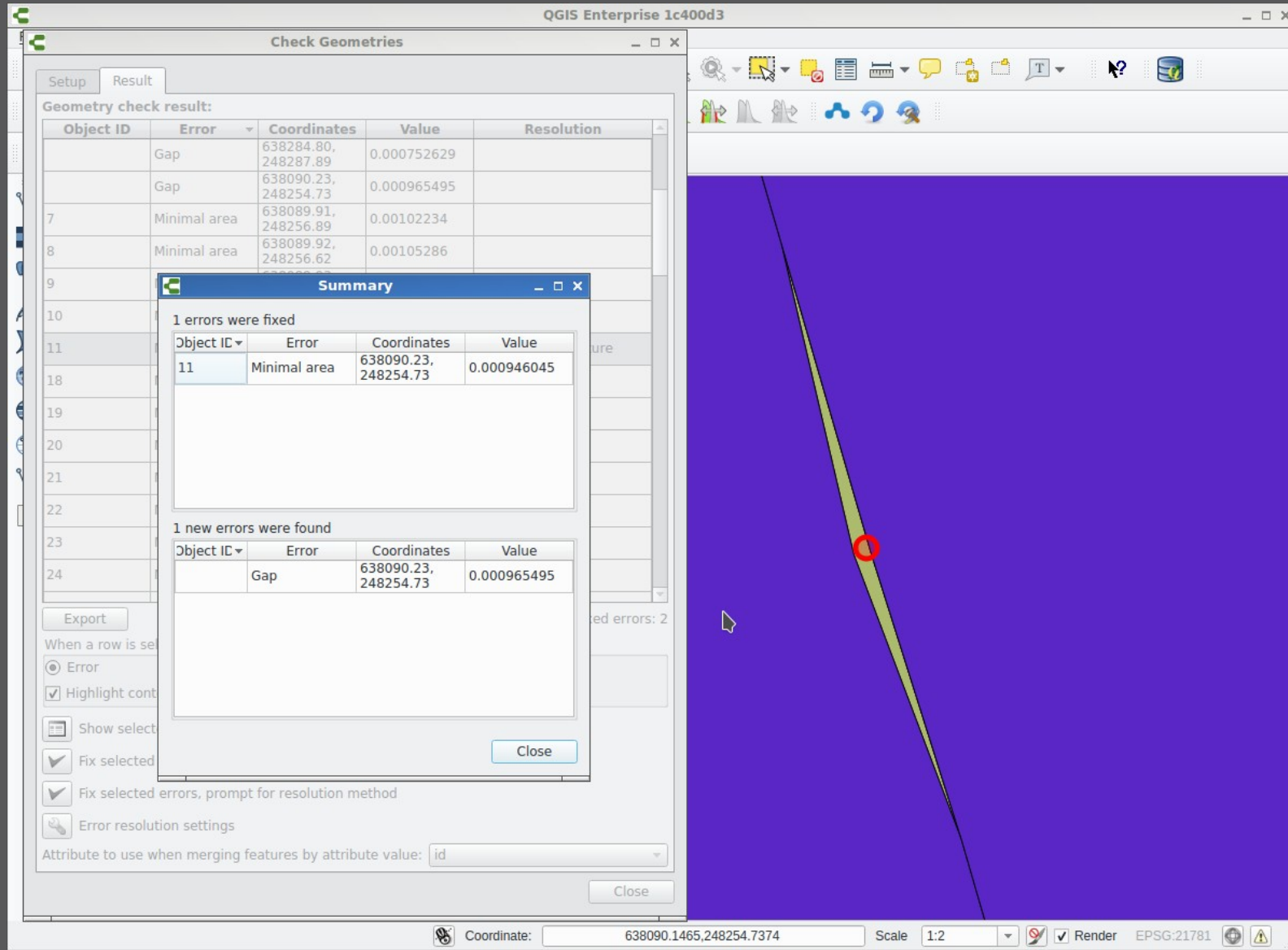
Error resolution settings

Attribute to use when merging features by attribute value: id

Close

Coordinate: 638090.1470,248254.7466 Scale 1:2 Render EPSG:21781

# Geometry Checker – Error tracking



QGIS Enterprise 1c400d3

Check Geometries

Setup Result

Geometry check result:

Object ID	Error	Coordinates	Value	Resolution
	Gap	638284.80, 248287.89	0.000752629	
	Gap	638090.23, 248254.73	0.000965495	
7	Minimal area	638089.91, 248256.89	0.00102234	
8	Minimal area	638089.92, 248256.62	0.00105286	
9				
10				
11				
18				
19				
20				
21				
22				
23				
24				

Summary

1 errors were fixed

Object ID	Error	Coordinates	Value
11	Minimal area	638090.23, 248254.73	0.000946045

1 new errors were found

Object ID	Error	Coordinates	Value
	Gap	638090.23, 248254.73	0.000965495

Export

When a row is selected:

- Error
- Highlight content
- Show selection
- Fix selected
- Fix selected errors, prompt for resolution method
- Error resolution settings

Attribute to use when merging features by attribute value: id

Coordinate: 638090.1465,248254.7374 Scale: 1:2 Render: EPSG:21781





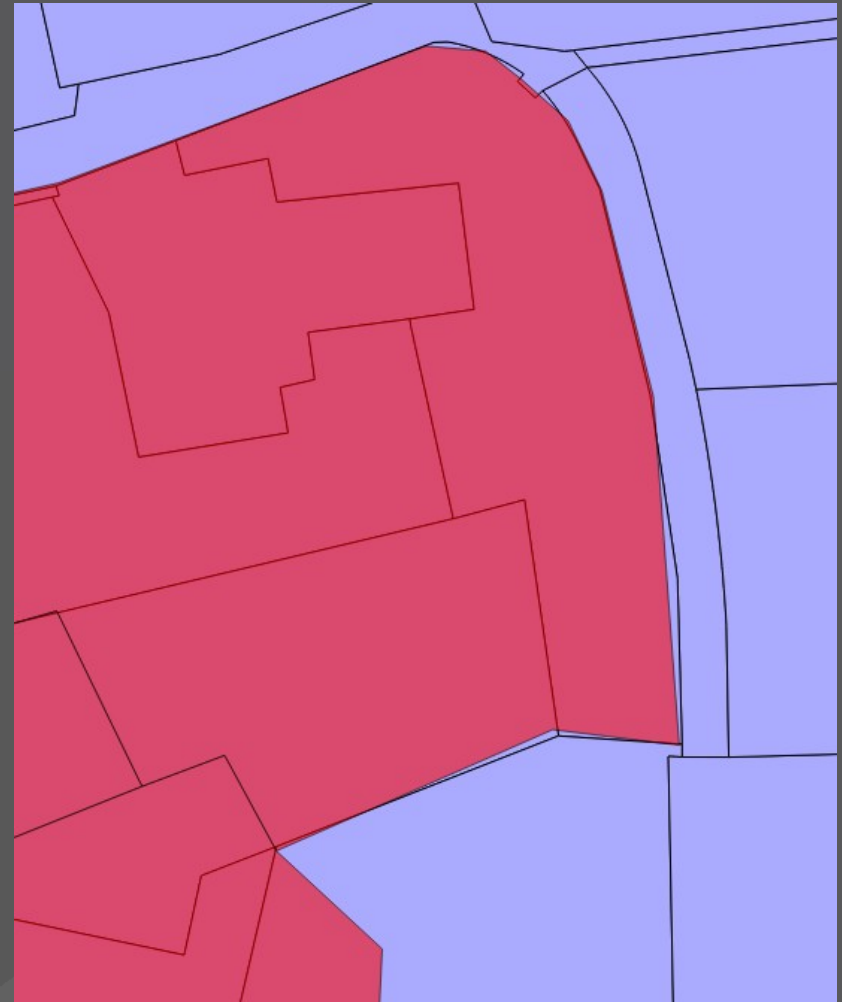
# **Geometry snapper**

**Align features to reference layer**



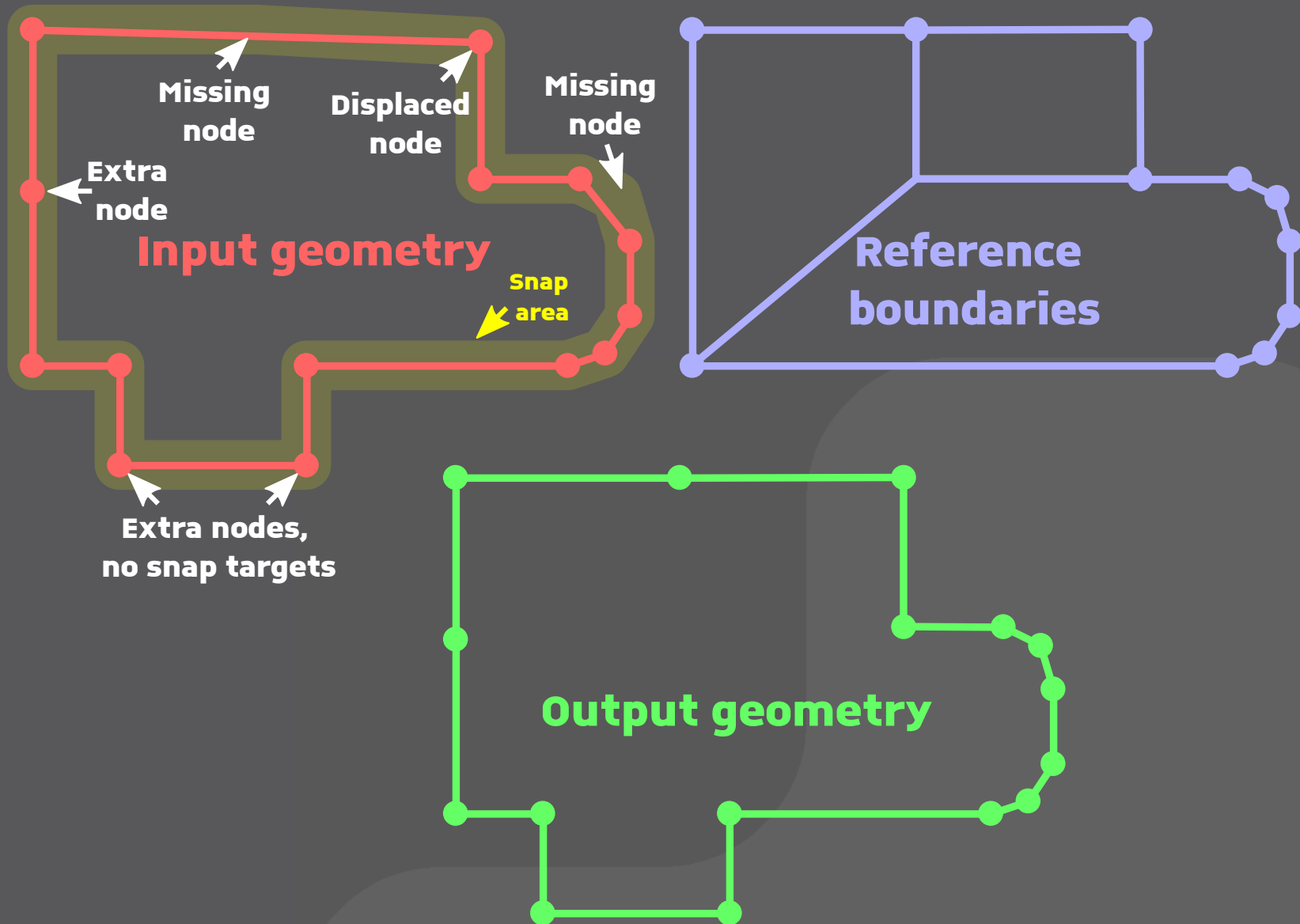
# Geometry Snapper – Problem

- › Features of an “input” layer do not match with reference layer feature boundaries



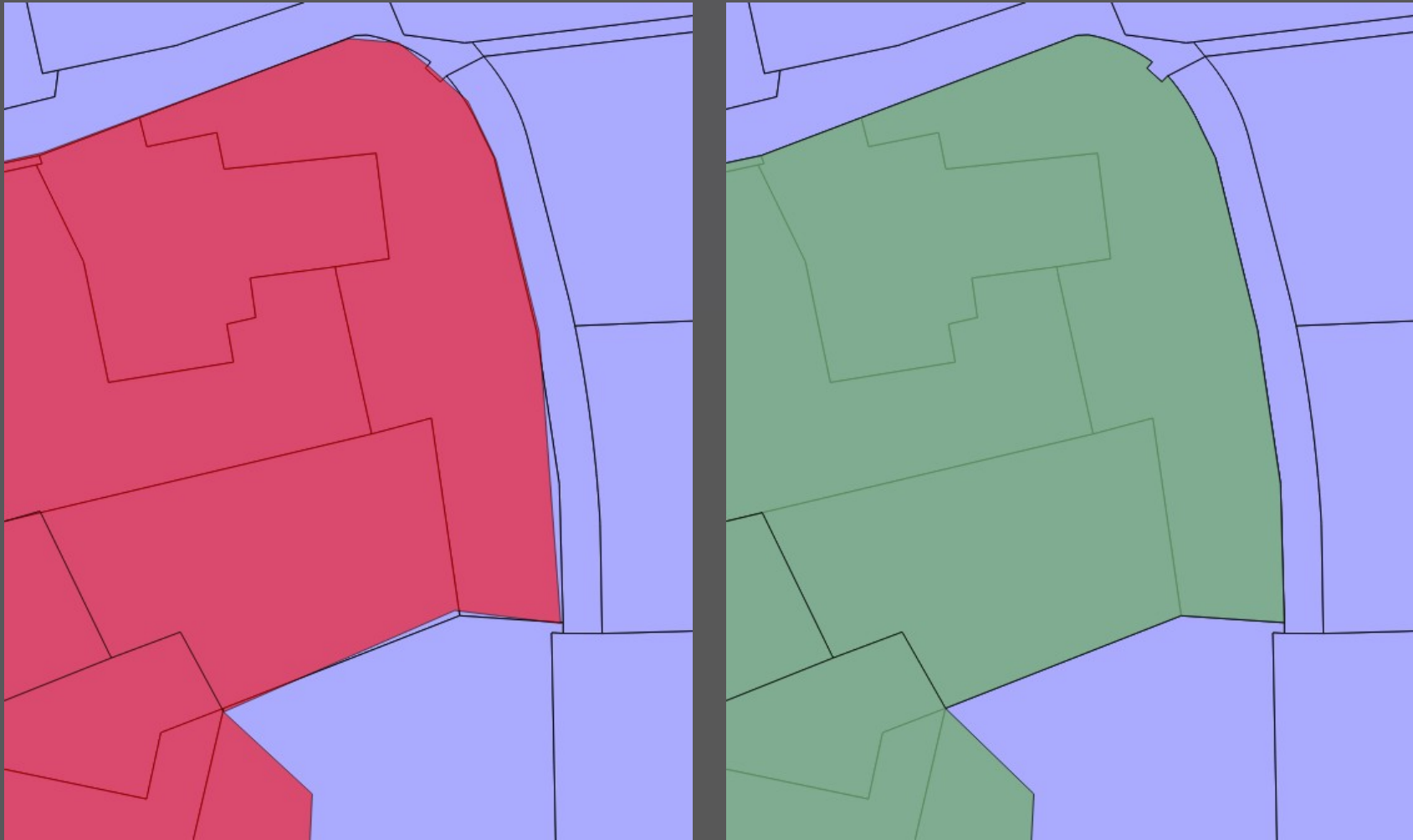


# Geometry Snapper - Snapping





# Geometry Snapper - Result



↳ Works with line and polygon layers

**Status**



# Status

- › **QGIS C++ Plugins**
- › **Funded by Canton Solothurn**
- › **Available in QGIS Enterprise**
- › **Master port pending:**
  - › ✓ New geometry kernel
  - › ✗ GEOS (geometry library) changes



## Thank you! - Questions?

