Buffer Without Overlaps Ver 0.5

QGis 3.34

WARNING

This plugin uses SAGA algorithms. Users must have QGis 3.34 or newer with SAGANG enabled. SAGA 9.1 or newer must be installed in your PC. See page 5 for more information.

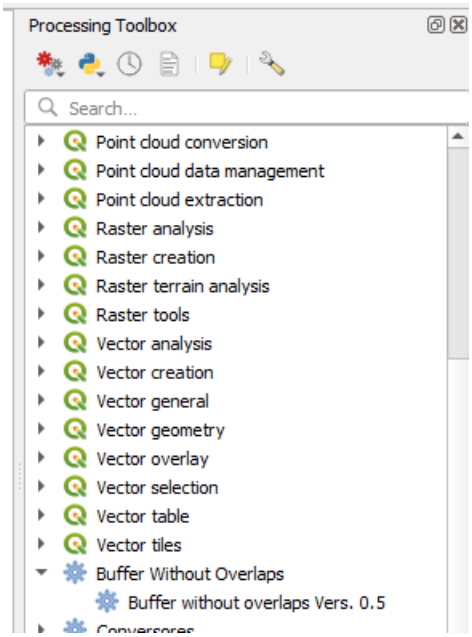
1. Introduction

The current "buffer" algorithms on the QGis environment (QGis, GDAL, SAGA and GRASS) which perform the "buffer" operation, normally create a series overlaps, which can lead to more or less gross errors in the evaluation of the total area of the resulting buffer layer.

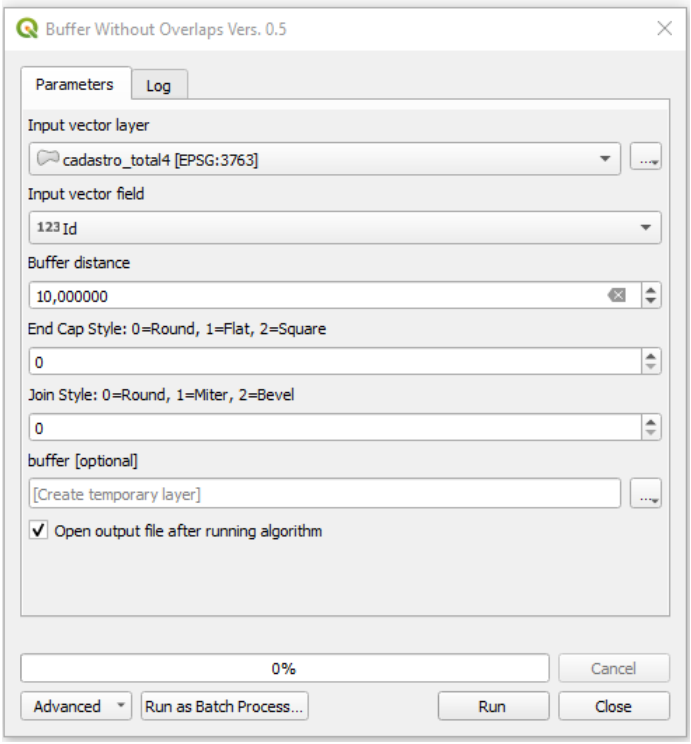
This plugin avoids this, dissecting the overlapping features and correctly calculating the total area of the resulting layer.

2. Using the plugin

Run the plugin by double clicking *Processing Toolbox -> Buffer Without Overlaps* like the following image:

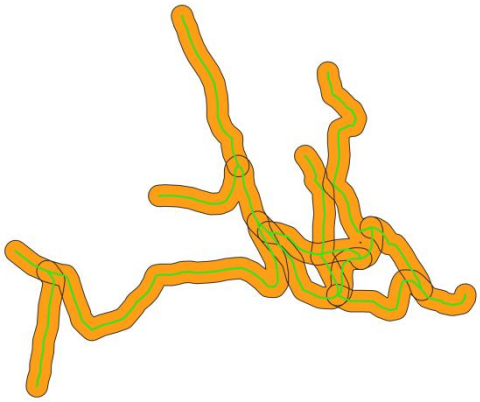


This action opens the following plugin parameters window:

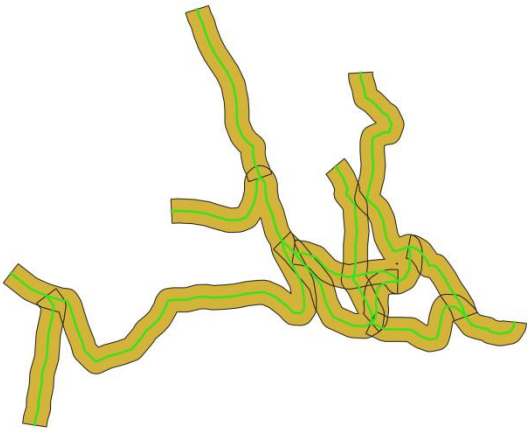


Where:

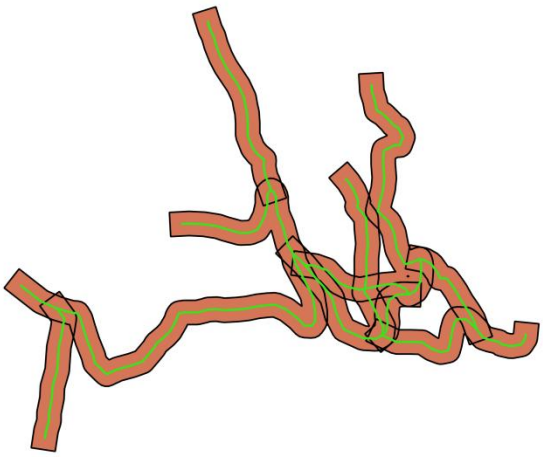
- ***Input vector layer*: user must choose a vector layer in order to create a buffer around its features, according to options chosen below;**
- ***Input vector field:* user must choose a field in order to have a reference between input layer and result (buffer) layer features; <u>this field should preferably be a sequentially numbered "Id" reference field</u>;**
- ***Buffer distance:* user must choose a buffer distance, in map units; using a buffer distance of 0 (zero) will produce a copy of the input polygon layer;**
- ***End cap style*: options for the end cap style are Round (0), Flat (1) or Square (2); see example images below;**
- ***Join style*: options for the join style are Round (0), Miter (1) or Bevel (2).**



End cap style = 0, Join style = 0



End cap style = 1, Join style = 0



End cap style = 2, Join style = 0

3. Results

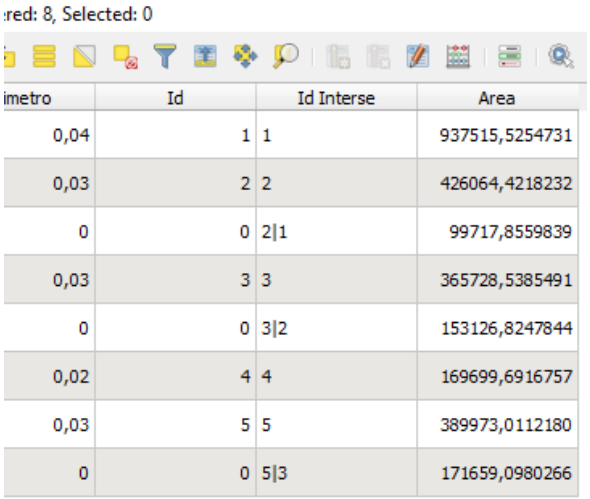
Running the plugin will produce a new polygon layer – the *buffer* – around the input layer features, according to the buffer distance and the other options the user have selected.

This new polygon layer is saved in the Processing Output folder as a shapefile, with the name "_Buffer.shp" preceded by a time stamp (HourMinuteSecond) like "101745_Buffer.shp", so the user can retrieve the previous buffer shapefiles when trying several options.

The Processing Output folder can be accessed at the menu *Settings -> User Profiles -> Open Active Profile Folder*, and then going to folder *processing/outputs*.

The buffer shapefile attribute table has a new field, named "Id_Interse" (if, and only if the input polygon layer has a field named "Id", and this field has been selected as the *Input Vector Field*), which exhibits the relation of the buffer features to the input layer. In the following excerpt of a buffer attribute table, the "Id" field is related to the same "Id" input layer sequentially numbered field (chosen by the user in the plugin parameters window), and the "Id Interse" field, created by the plugin, relates each buffer feature with the input layer.

A value like "2|1" in the field "Id Interse" means that this feature of the buffer layer was an overlap of three features of the input layer with "Id" values of 2 and 1. In the case of overlays, the "Id" value in the buffer attribute table is 0 (zero). Hence, the buffer layer has no overlaps.



imetro	Id	Id Interse	Area
0,04	1	1	937515,5254731
0,03	2	2	426064,4218232
0	0	2|1	99717,8559839
0,03	3	3	365728,5385491
0	0	3|2	153126,8247844
0,02	4	4	169699,6916757
0,03	5	5	389973,0112180
0	0	5|3	171659,0980266

The area values, in square map units, are calculated at the last stage of the plugin algorithm, giving a correct value of the buffer layer; these values are saved in the field named "Area" (or "Area_1"

if a previous field named "Area" already exists, and so on). Be shure to use only polygon input layers in projected coordinate systems.
Any previous selection on the input layer is discarded while creating the buffer.

4. Preparing your QGis 3.34 (or higher) to work with SAGA Next Generation (SAGANG)

To use the "Dissect and dissolve overlaps" plugin, you need to install and enable the "Processing Saga NextGen Provider" plugin, along with the latest SAGA GIS version (9.x):

0 **download the latest version 9.x of SAGA GIS [1];**
1 **unzip the file "saga-9.3.2_x64.zip" (or higher) and place the unzipped folder anywhere in your PC;**
2 **in the unzipped folder look for the file "saga4qgis.zip"; unzip this file and follow the instructions contained therein;**
3 **install the "Processing Saga NextGen Provider" plugin by going to menu Plugins->Manage and Install Plugins->All->Processing Saga NextGen Provider;**
4 **activate the "Processing Saga NextGen Provider" plugin by going to Settings->Options->Processing->Providers->SAGANG and enable SAGA, and look for the folder where "saga-9.3.2_x64" was unzipped (this folder must be kept in your PC).**

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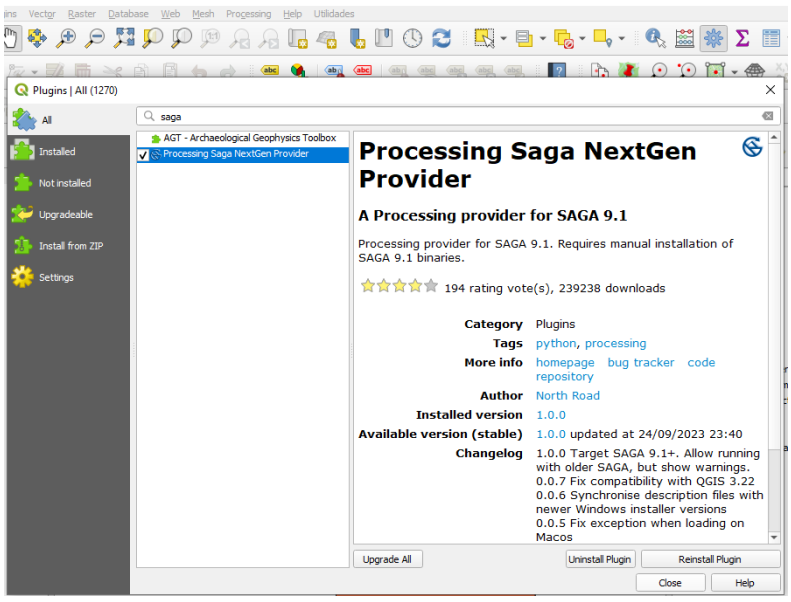

[1] **Try this link to download SAGA binaries: https://sourceforge.net/projects/saga-gis/files/**

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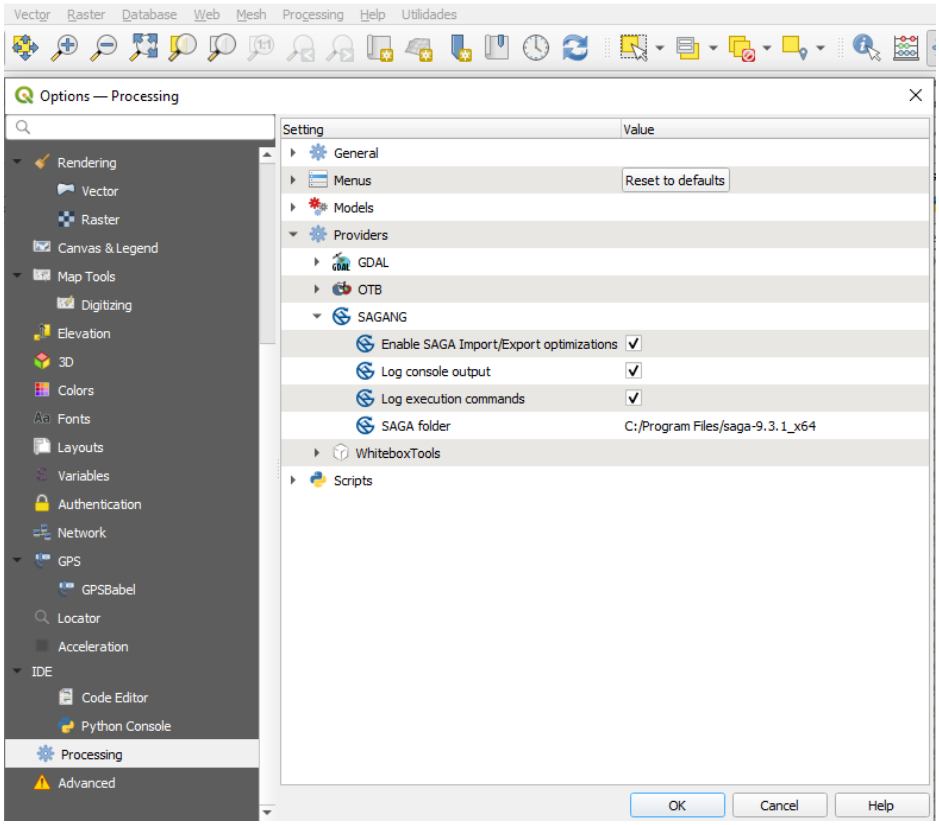
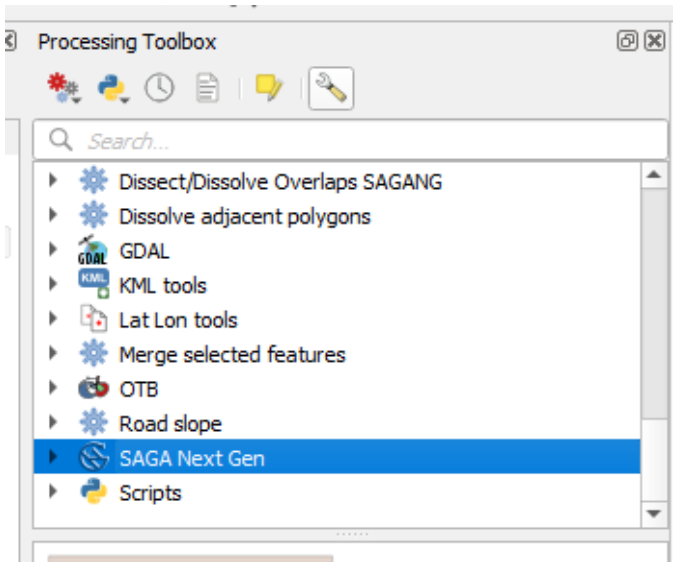
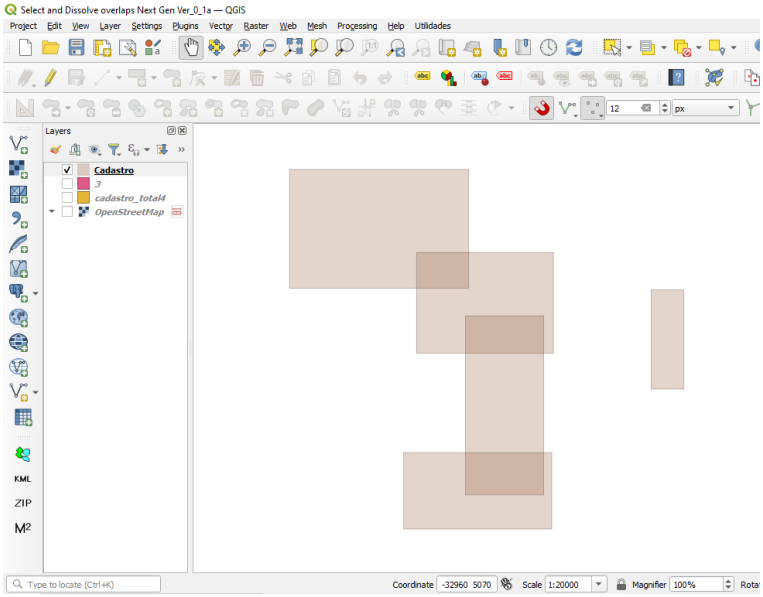


Check if your SAGA Next Generation installation is working correctly

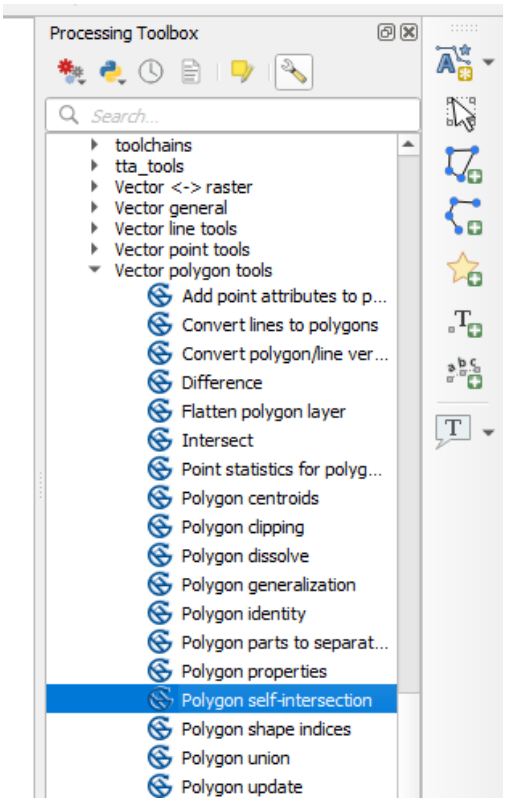
1 – check if there is an entry for SAGA Next Gen in the Processor Toolbox;



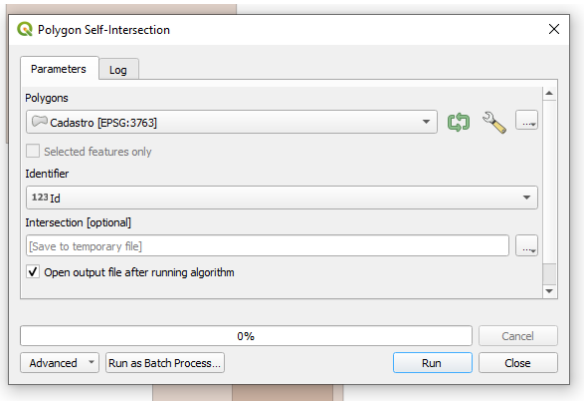
2 – Choose (or create) a polygon shapefile with a few overlaps, like the following image:



3 – find the "Polygon self-intersection" in the "SAGA Next Gen" toolbox, and run this script by clicking twice on it:



Select the polygon layer with some overlaps, select any identifier field, and RUN the script;



4 – If SAGA Next Generation plugin is correctly installed, then you should get a LOG similar to the one in the image below, and a new shapefile called "Intersection" should have been created and placed in the layers list of your QGis project: