QGIS Application - Bug report #14513
Bad Interpolation TIN (displacement and hole) when too many points inside pixel...

2016-03-16 10:46 AM - Olivier ATHIMON

Status:	Closed			
Priority:	Normal			
Assignee:				
Category:	Analysis library			
Affected QGIS version:	2.99(master)	**Regression?:**	No	
Operating System:		**Easy fix?:**	No	
Pull Request or Patch supplied:		**Resolution:**	end of life	
Crashes QGIS or corrupts data:		**Copied to github as #:**	22486	

Description

Hello,

I have got my problem with **QGIS 2.12.x, 2.14.x, and QGIS 2.15.0 Master** (installation OSGeo4W64) under Windows 64 bits...

The interpolation TIN with QGIS only (Menu **Raster > Interpolation > Interpolation**, and select a shapefile with points for the Interpolation TIN) **give displacements and holes**...

I suppose that the problem appear when we have too many points (the input) in a pixel (the output)... I don't know if this is the right reason...

To compare: the same shapefile with QGIS and : **Processing > SAGA > Grid-Gridding > Triangulation** give a nice interpolation TIN...

The problem of the interpolation TIN is maybe with the **library GDAL (2.0.2) and/or QGIS**...

To help to understand my problem, i join 3 pics (3 jpeg) and my data (in a archive .zip)

Thanks for all.
Olivier ATHIMON

History

#1 - 2016-03-17 02:14 PM - Maximilian Krambach

- File interpolation.jpg added

When trying with evenly distributed OSM data, I (debian testing, qgis 2.14) get a triangle of data (see interpolation.jpg). It is not a case of "too many points per pixel", as it only searches in the center of the pixel.

The creation of triangles for the TIN (as seen in "export triangles for the triangulation") seems correct.

I think the source is hidden somewhere in "DualEdgeTriangulation::getTriangle"

https://github.com/qgis/QGIS/blob/00633811c9ed40cfc4bdbf2ed66cda5b8c081c27/src/analysis/interpolation/DualEdgeTriangulation.cc#L1082

which returns false in cases of "too many triangles around".

My way there is something like that::;
interpolation/QgsTINInterpolator.cpp: 47: interpolatePoint -->
interpolation/LinTriangleInterpolator.cc : 101: CalcPoint-->

interpolation/dualedgetriangulation.cc: 1082: getTriangle -->

(maybe: interpolation/dualedgetriangulation.cc: 477: baseEdgeOfTriangle)

I don't fully understand the last two functions.

#2 - 2016-03-20 10:25 AM - Maximilian Krambach

I tested it in debug mode. For many points, function DualEdgeTriangulation::baseEdgeOfTriangle (477) is entering an endless loop, which is stopped after 300000 runs with an error code, which is then passed down to other functions; those fail because the triangle searched is "-100"

BaseEdgeofTriangle iterates through "mHalfEdge" to find 3 points "on the left side" (494). The counter does not reach 3, because "else" (538) is triggered, which resets the counter to 1.

As it seems, the error lies between line 538 and 546, maybe in which edge is selected next for the leftOf-Test.

#3 - 2016-03-28 06:15 PM - Maximilian Krambach

In DualEdgeTriangulation:pointVectorCount there is only one definition of mEdgeInside = 3, if mPointVector.count() == 2 (182).
The other options (mPointVector.count() 1,3, >3) miss the appropiate mEdgeInside values, which seem to be different, something between 0 and 5.
This value tells baseEdgeofTriangle (477) on which given edge to start searching. Setting it (479) to 3 results in misses, setting it to 2 results in different misses. 1 or 0 result in QGIS crashing because of index error.
So I guess the value has to be updated according to pointVectorCount for all cases.

#4 - 2016-04-09 10:53 AM - Giovanni Manghi

- Priority changed from High to Normal

- Target version deleted (Future Release - High Priority)

@ Maximilian Krambach can you propose a patch?

#5 - 2016-10-20 04:03 AM - Olivier ATHIMON

- Assignee set to Even Rouault

The problem of TIN Interpolation always exists in QGIS LTR 2.14.7, QGIS 2.16.3 and QGIS 2.17...

Any solution Maximilian Krambach?...

Maybe, a solution with the interpolation with library gdal??? I request Mister Even Rouault?...

#6 - 2017-01-02 01:09 AM - Giovanni Manghi

- Category changed from 116 to Analysis library

#7 - 2017-01-02 01:27 AM - Giovanni Manghi

- Target version set to Version 3.0

#8 - 2017-05-01 01:05 AM - Giovanni Manghi

- Regression? set to No

- Easy fix? set to No

#9 - 2017-11-09 03:30 PM - Even Rouault

- Assignee deleted (Even Rouault)

- Description updated

#10 - 2018-02-15 10:47 AM - Olivier ATHIMON

- File Result_Bad_interpolation.jpg added

- File Parameters.jpg added

I have tried the same interpolation TIN with QGIS 3 (exactly QGIS 2.99, QGIS b6ad920404)...

and i get the same problem, a bad interpolation...

I join the result (Result_Bad_interpolation.jpg) and my parameters (Parameters.jpg) for the tool :

Processing > QGIS > Interpolation > Interpolation TIN

I used the same input data :**2009_06_bathy_L93_NGFN.zip** (joined in my first message)...

#11 - 2018-03-04 11:12 AM - Giovanni Manghi

- Affected QGIS version changed from master to 2.99(master)

#12 - 2019-03-09 03:12 PM - Giovanni Manghi

- Status changed from Open to Closed

- Resolution set to end of life

End of life notice: QGIS 2.18 LTR

Source:

http://blog.qgis.org/2019/03/09/end-of-life-notice-qgis-2-18-ltr/

Files

Diapositive1.JPG	74.2 KB	2016-03-16	Olivier ATHIMON
Diapositive2.JPG	115 KB	2016-03-16	Olivier ATHIMON
Diapositive3.JPG	73.8 KB	2016-03-16	Olivier ATHIMON
2009_06_bathy_L93_NGFN.zip	747 KB	2016-03-16	Olivier ATHIMON
interpolation.jpg	48.1 KB	2016-03-17	Maximilian Krambach
Parameters.jpg	150 KB	2018-02-15	Olivier ATHIMON
Result_Bad_interpolation.jpg	460 KB	2018-02-15	Olivier ATHIMON