

# **Terrain Reshaper v1.0 beta for SketchUp v5 and v6 (Free and Pro)**

© D. Bur, 07.16.2008

This script is a tool to quickly rebuild a set of faces based on a regular triangular network (aka TRN). It is intended to deliver a much more regular frame to a terrain.

## **1. Installation:**

Unpack the archive in the SketchUp Plugins folder.

You should have:

"trn\_terrain.rb" in your Plugins folder

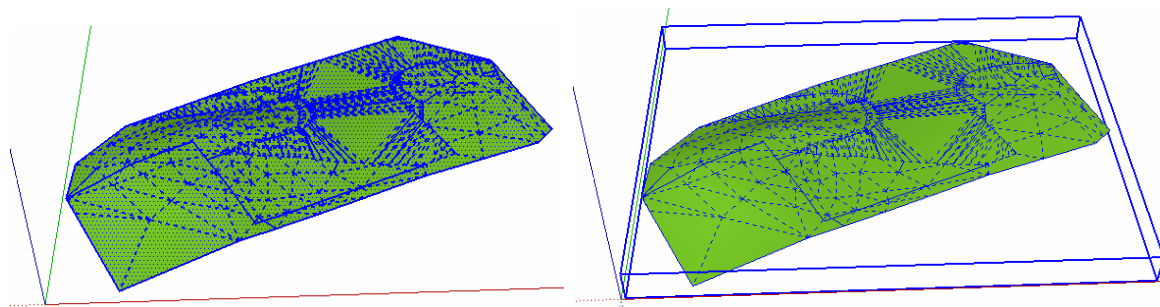
This PDF file also in your Plugins folder. You can move this file where convenient.

## **2. Usage:**

You'll find a new item "Terrain Reshaper" in the "Tools" menu:



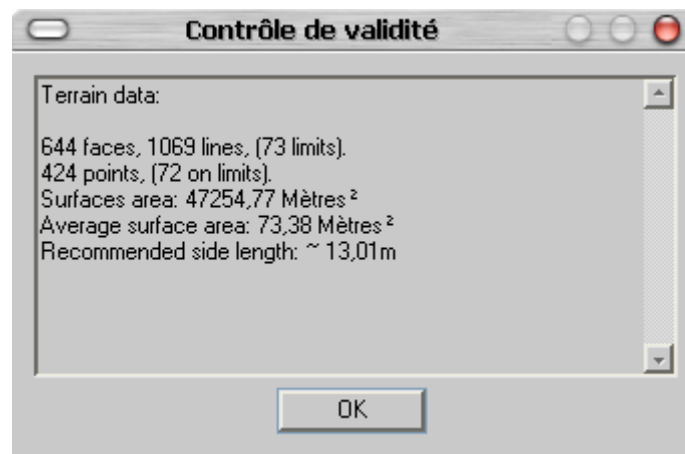
The original terrain must be a set of faces gathered in a group. So before launching the command, select the faces and create a group the usual way:



*Select faces*

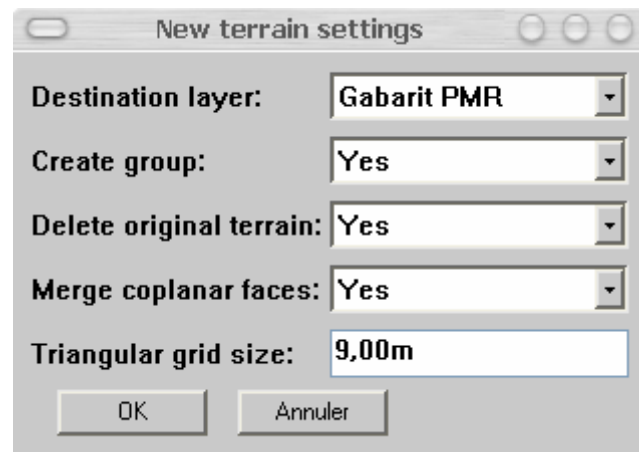
*Create group*

Select the group and select "Terrain Reshaper" in the "Tools" menu. The below dialog box pops up:

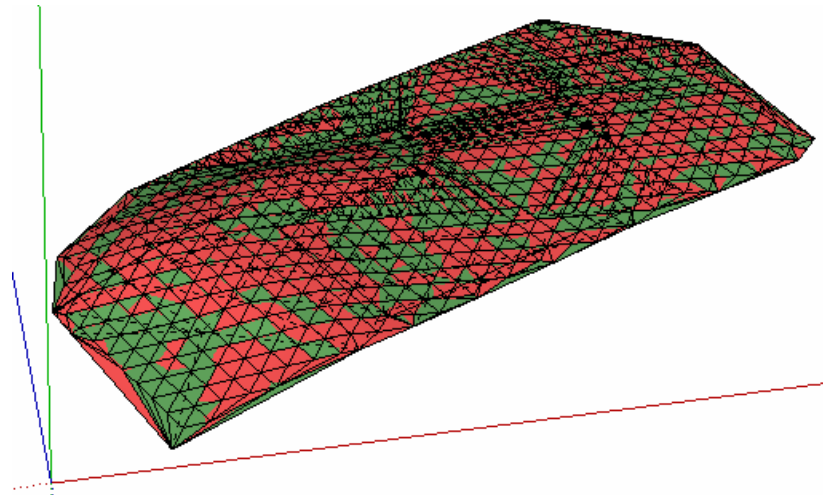


It lists some terrain data. The last line is the most interesting one, it indicates what the triangle side length would be if you want to get about the same number of faces after triangulation.

After hitting OK, the dialog box pops up:



- **Destination layer:** select the layer on which you want the new terrain to be created.
- **Create group:** select Yes if you want to get a group with the new terrain, selecting "No" will create all faces in the current layer.
- **Delete original terrain:** self-explanatory... It is a good idea to keep the original terrain first to see the difference between old and new, and delete it after (See below).



In this image, the original terrain is on a red layer, the new on a green layer. Where the green appears, the new terrain is "higher" than the original.

- **Merge coplanar faces:** after completion, the new triangular faces are merged if they have common edges and have the same normal. This process can be slow and may give unexpected results. Please use with caution! If some holes remain, it is quick to redraw the missing faces with the line tool.
- **Triangular grid size:** this is the length of the side of each equilateral triangle of the network. Enter the recommend length if you want to end up with about the same number of faces than the original terrain, but you are of course free to choose another length. The greater the length, the more inaccurate the shape will be. The smaller the length, the more triangles you'll get, but the more accurate the new terrain will be.

Creating the new terrain can be slow, especially when using small triangles. Watch the status bar to see what the script is doing and when it will end.

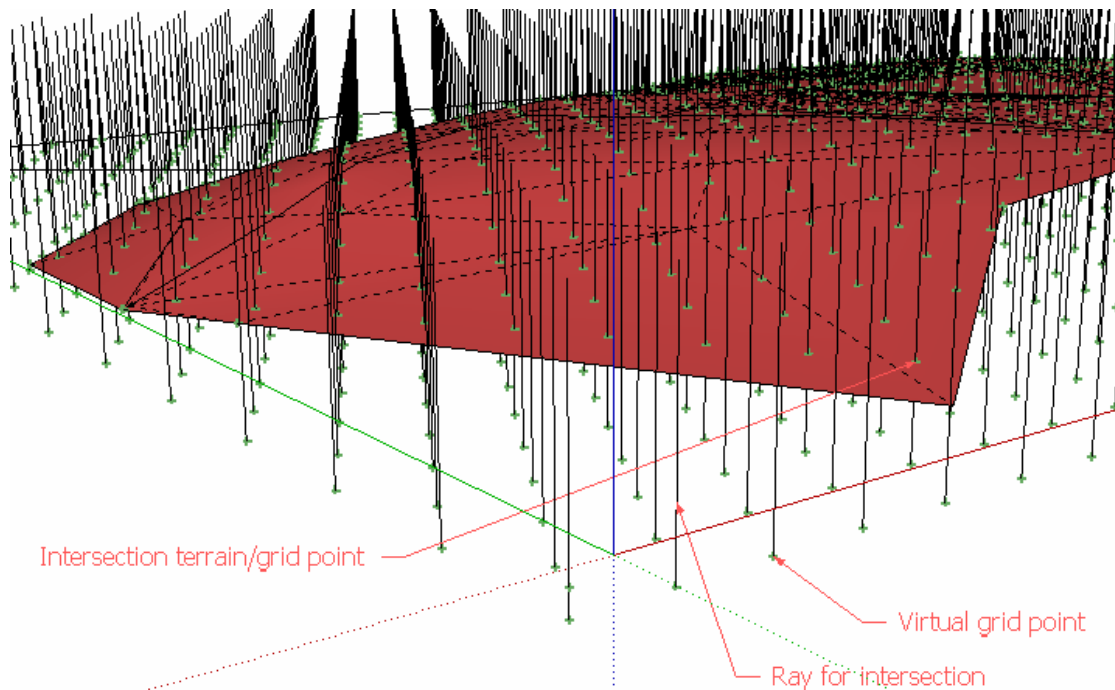
For instance: `Triangulating point 1250 / 2224`

Or: `----->----- 56%. End @ 14:47:50 Merging faces`

### 3. How it works:

For those interested, here is a quick description of the process:

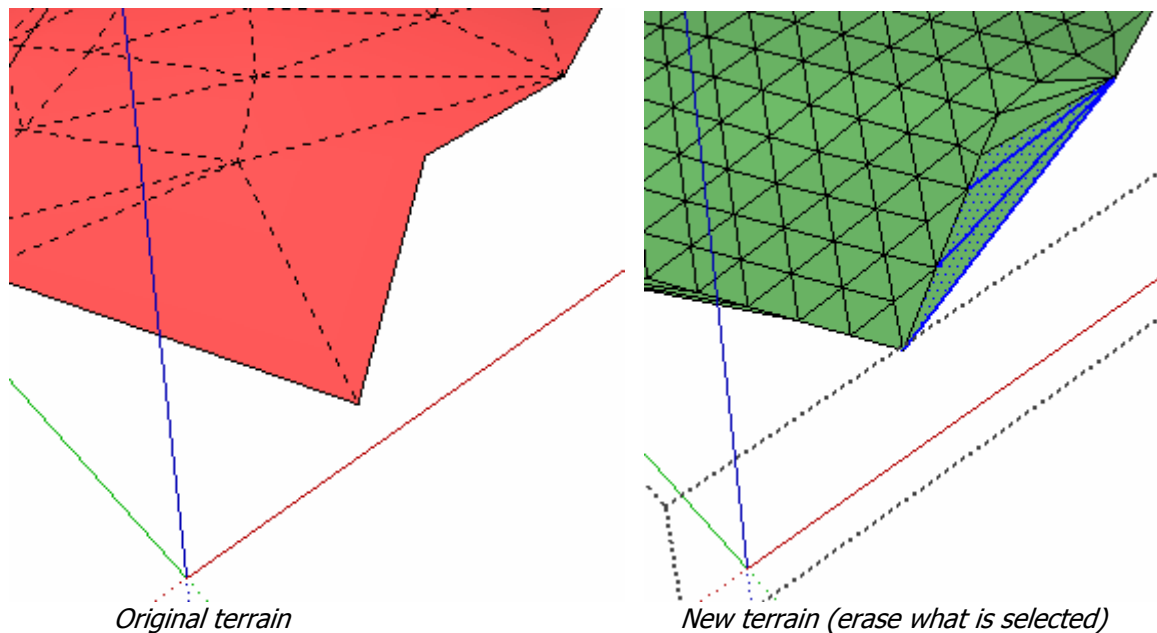
- check selection to ensure only one group is selected,
- sort all lines of the group, sort all faces of the group
- sort all vertices of the group, sort all boundaries in the lines set,
- compute terrain total area (\*), average face area, recommended side length
- build a virtual flat TRN grid under the terrain
- cast a ray through each of the grid point upward to get the intersection with the terrain:



- merge boundaries points and intersection points arrays,
- triangulate this new array of points and draw a triangle for each new triangle set of three indexes,
- merge new triangles if needed, erase edges between two coplanar faces.

#### 4. Known issues:

After merging faces, some holes remain. Don't ask me why, it's a SU mystery...  
 Concave terrain boundaries incorrectly triangulated: inherent to the triangulation algorithm. Just delete the incorrect faces. This issue will be solved in next release.



(\*) Thanks to AdamB for the method to calculate groups/components areas.