

Tools

LP360's Features Utility Tool

LP360, versions 2018.1



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As many of you who are involved in LIDAR breakline collection know, we added some very nice feature edit tools to the Standard level of LP360 (Windows standalone version). One of these tools, "Create Features from Selected Features" is a very handy utility tool. Its basic function is to collect features you have *selected* with the feature edit selection tool and convert those selected features to the type designated by the currently active feature edit layer. For example, if you have 3D lines as the currently active edit layer and select some 3D polygons, the tool will create new 3D lines on the edit feature layer based on the conversion from the selected polygons.

We recently had a services customer who needed to provide 3D point samples in DXF format of a stockpile on a 2-foot grid spacing. Of course, you cannot do this by converting subsampled original LAS points since they are random spacing. Using a combination of LP360 feature tools however, it was easy to meet this requirement. There are several methods that will achieve this desired result. Let's examine one of them.

First, define the area for which points are needed by drawing a polygon. In this particular case, that was automatic since the polygon is a stockpile toe; we just use the LP360 automatic toe extractor (see Figure 1).

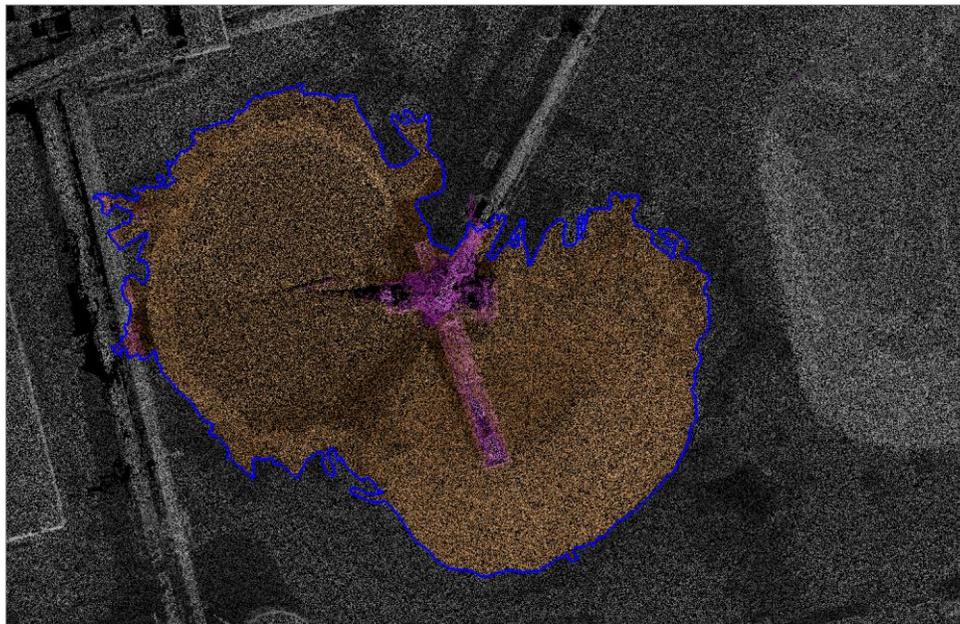


Figure 1: Polygonal area (blue)

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S LP360 Standard Edition
U LP360 sUAS Edition
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We next create a grid over the area by using the Grid Generator Point Cloud Task (PCT). This PCT was described in an earlier newsletter article. The parameters are set to create a 2-foot cell size and clip to the *selected* polygon. The settings of the Grid Generator are shown in Figure 2. You might notice some new tools at the top of the PCT – this is a preview of the new PCT Manager!

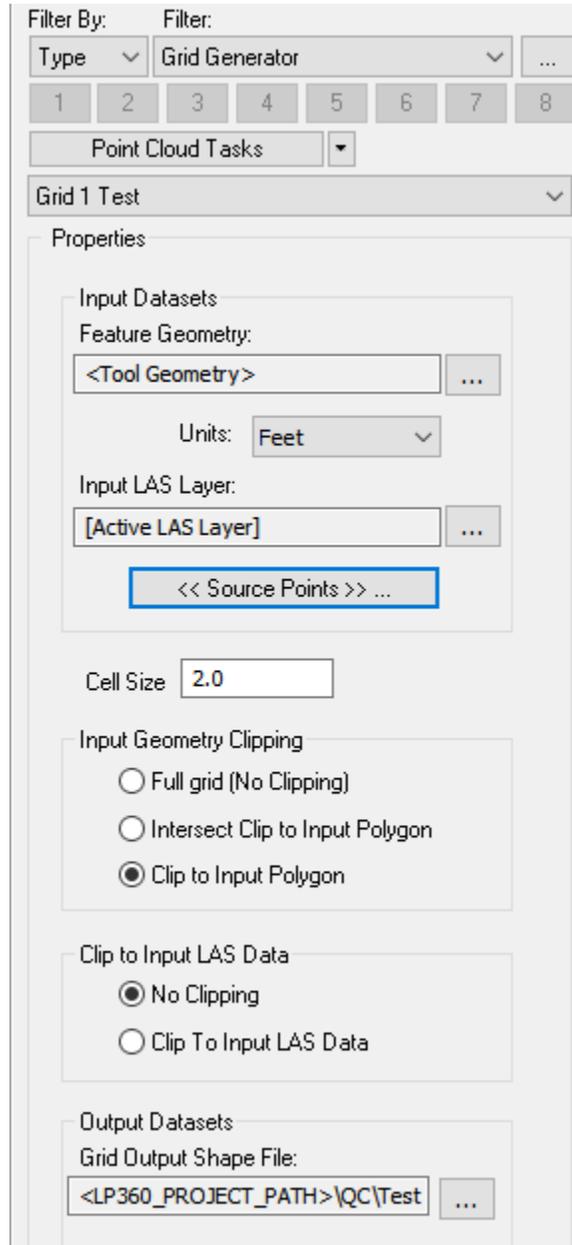


Figure 2: Grid Generator Settings

Next the polygon is selected and the PCT application tool, *Run by Feature Layer* is pressed. The prompt for this tool allows you to choose “Selected Features Only.” The result is shown in Figure 3. This is a grid, clipped to the toe, with a 2-foot cell size.

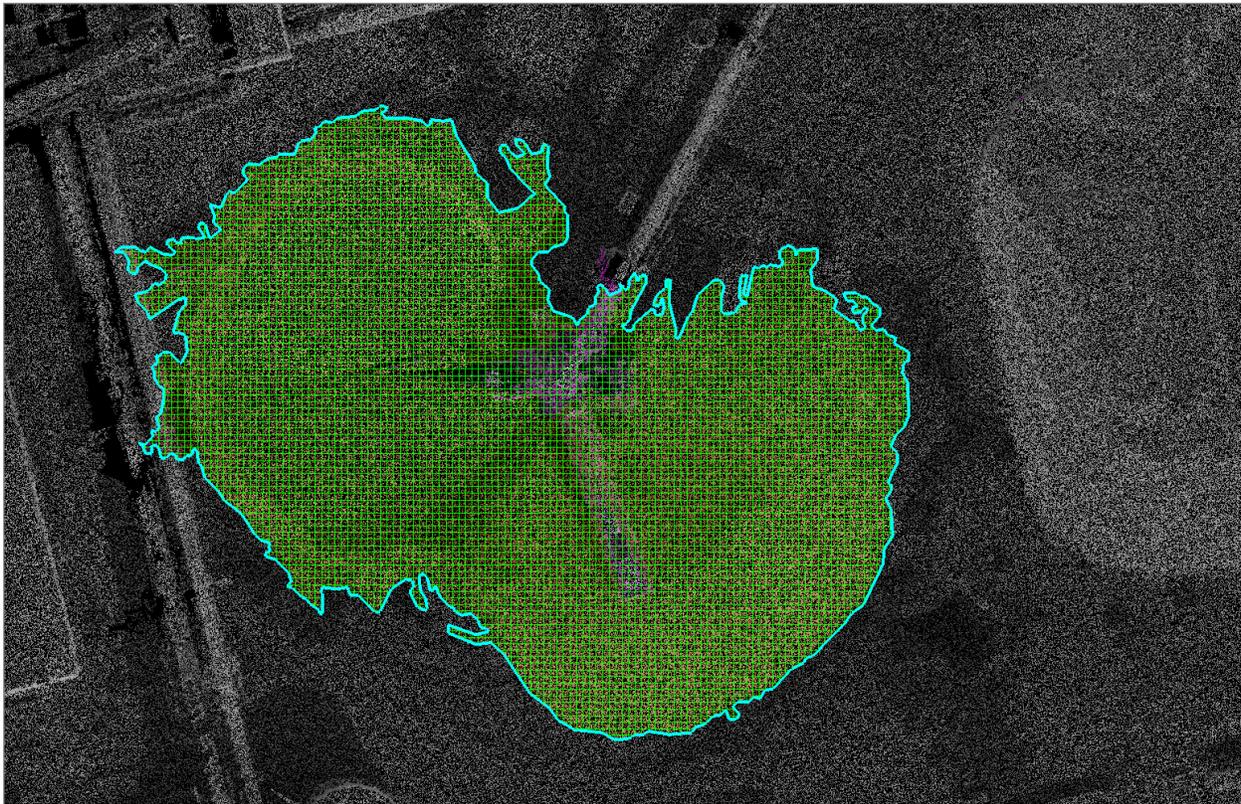


Figure 3: The resultant grid

The next step is to extract the grid intersections to a point layer. A 3D point layer is created using the *Create Feature Layer* tool on the Feature Edit toolbar. The tool that will be used is *Create Features from Selected Features*. The grid tool generates polygons rather than lines so there are 4 points at each interior vertex of the grid. To prevent duplicate points, we adjust the settings of the feature creation tool as shown in Figure 4.

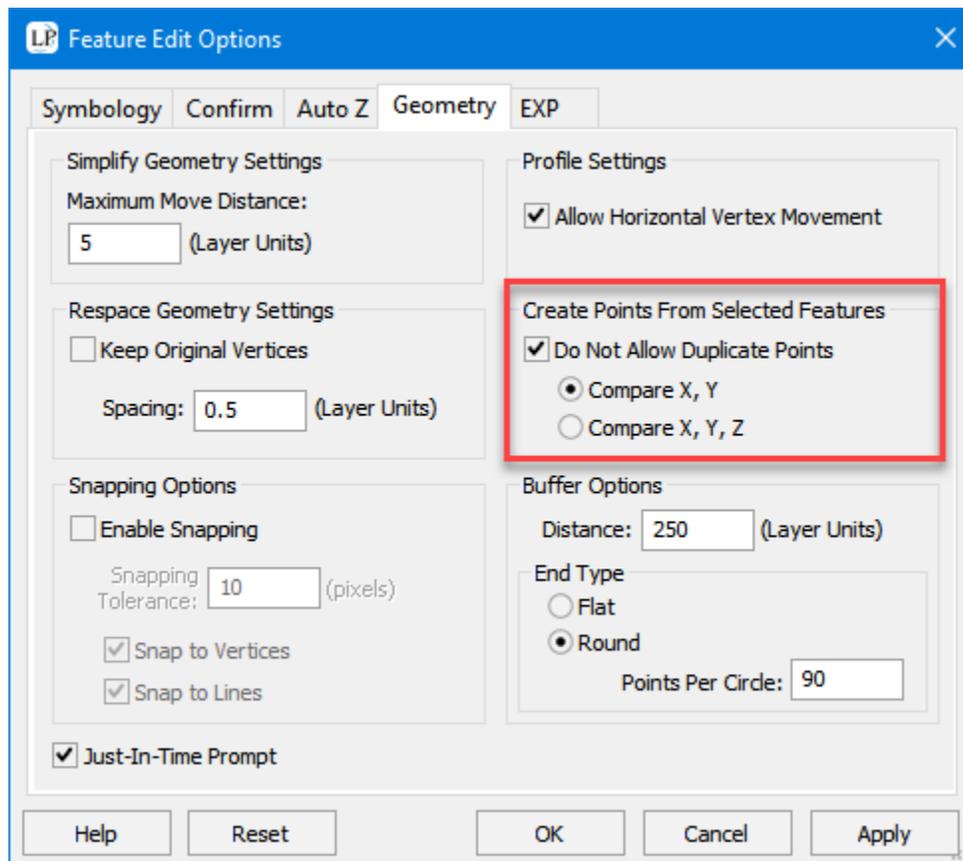


Figure 4: Avoiding duplicate points

The requirement is that these points be 3D. The feature edit tools can apply an elevation value using a wide variety of methods. For example, we could create 2D points and then use either the Feature Edit tools or the Conflation PCT to attribute Z. In this example, we will apply Z at the same time as creating the points. This is done by setting the Auto Z- Create conflation tool in the Feature Edit options dialog. I set this to Closest point but of course, you have the normal range of methods (Surface, Lowest, ...).

After setting the Feature Edit layer to our new point layer, we select all the grid cells (using either the Feature Selection tool or the option from right-clicking in the table of contents). Enable Auto Z by pressing this option on the Feature Edit toolbar (make sure it is set to Surface mode).

Finally, press the Create Features from Selected Features tool (Figure 5). This may take some time to process if you have a large set of intersections. It is the Z conflation that is time consuming since a LAS computation must be made for every point.

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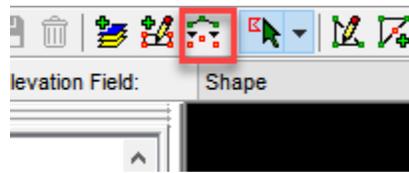


Figure 5: Create Features from Selected Features tool

We now have a grid of points on the new points layer with a 2-foot grid spacing (Figure 6). You can verify the 3D characteristic of the point grid in the profile or 3D view. Of course, you can do a detailed inspection by bringing up the layer in Feature Analyst.

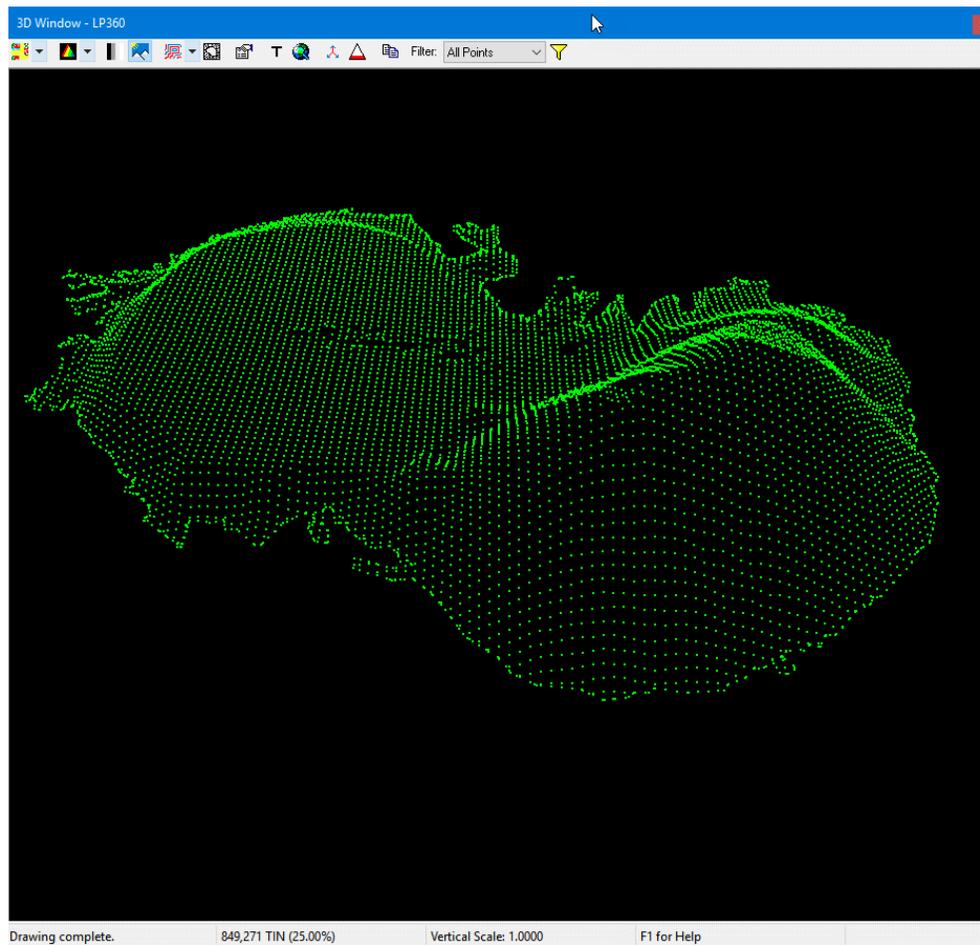


Figure 6: The final 3D point grid

The Feature Edit tools provide a rich set of operations, especially when used in conjunction with point cloud tasks. When faced with challenging tasks involving the creation of features, give these tools some thought. If you just can't see a way to create your desired feature product, send us a note at support@lp360.com.