

Triangulating Point Data in MineSight® 3-D

Triangulating point data in MineSight 3-D (MS3D) can be accomplished in various ways. In this article, we'll examine two of the most common.

Both methods begin the same way: by using the **Data Manager** to import the data. Both methods produce identical triangulations and work well on a large amount of data. But, the first method is preferred if you want to display your point data as points. If you don't care about point data display, then the second method has one less step.

We'll use the same data for both examples. We have a file containing in excess of 150,000 points. The points represent a surface that is roughly horizontal.

Example 1 Displaying the Data as Points and Triangulate in Plan

Use this method if you want to view your point data as points. The steps will be:

- 1 Import the data as one polyline
- 2 Attribute the polyline with the Point material
- 3 Triangulate the polyline in plan

Both methods have the same first step. From the **Data Manager**, use the right-click menu to access the **Import | 3D Points (ASCII) file** option in Figure 1.

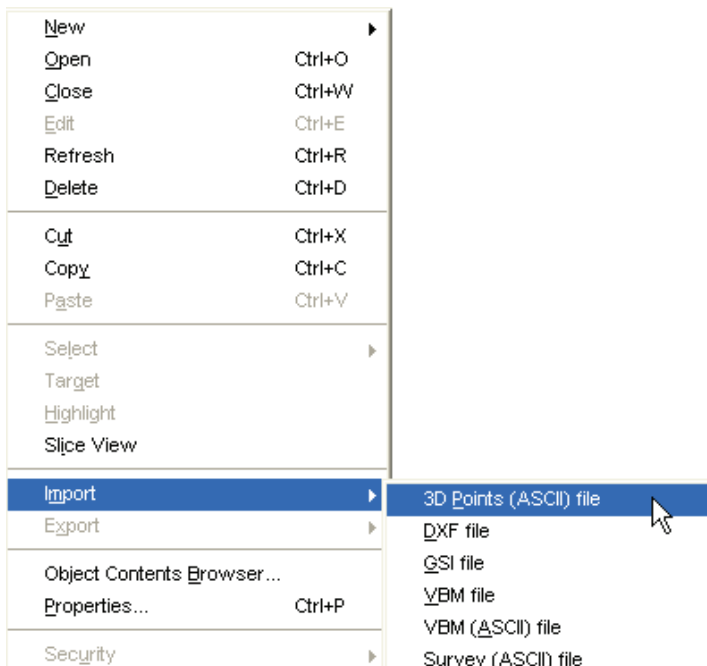


Figure 1. 3D Points (ASCII) file Import Option accessed via the Data Manager

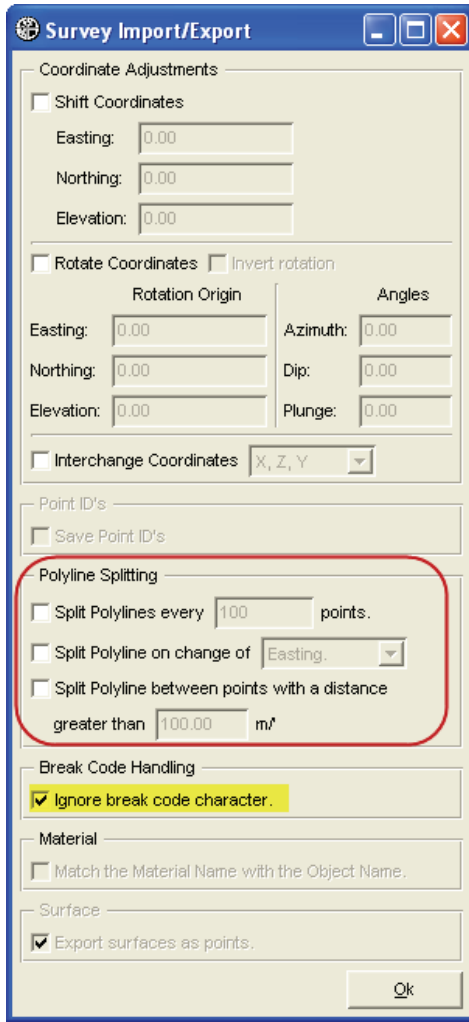
Tip: To Split or Not to Split

It is possible to triangulate the points as separate elements by using Polyline Splitting at each point. However, this is not recommended. Creating many points, as opposed to fewer polylines, taxes computer memory (5,000 point elements require more memory than one 5,000-point polyline element) and will add unnecessary time to your triangulation.

For data with less than 500,000 points, importing one large polyline (no Polyline Splitting) usually works well.

For larger data sets consider splitting the data into many 1,000-point polylines.

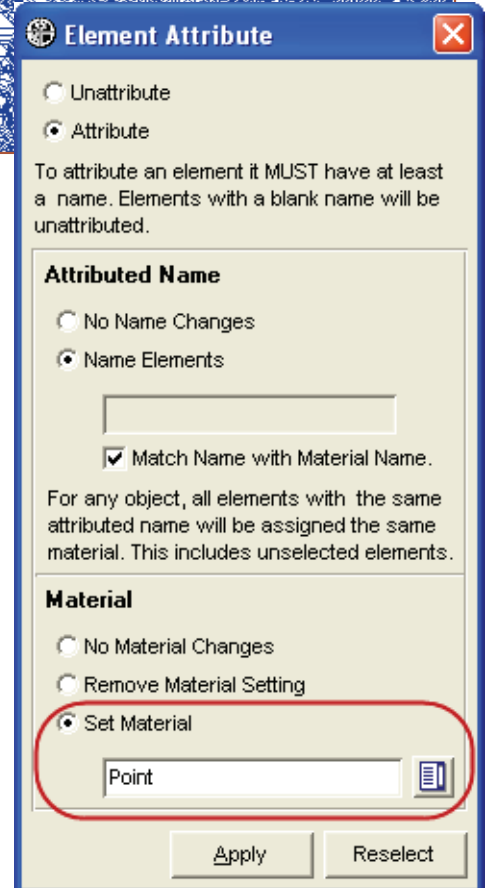
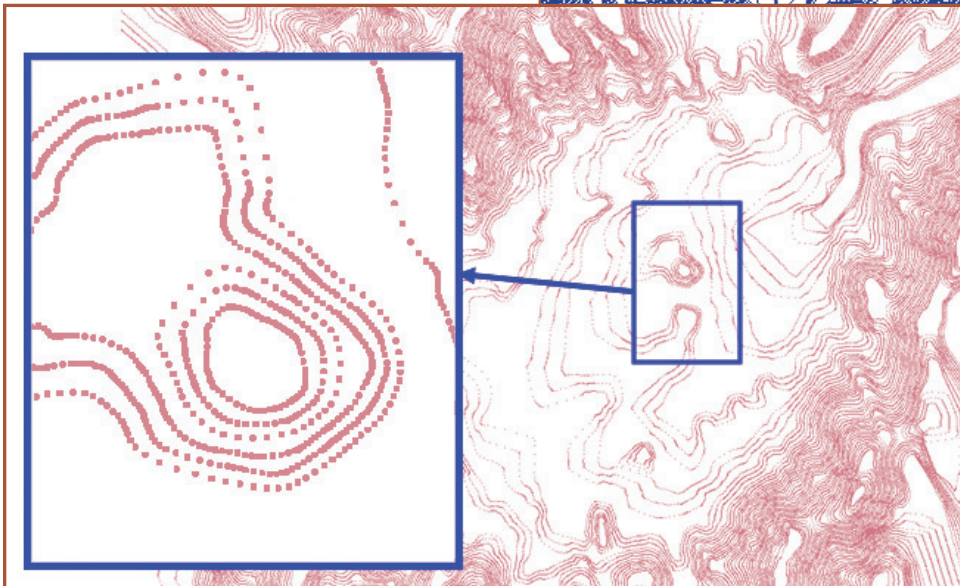
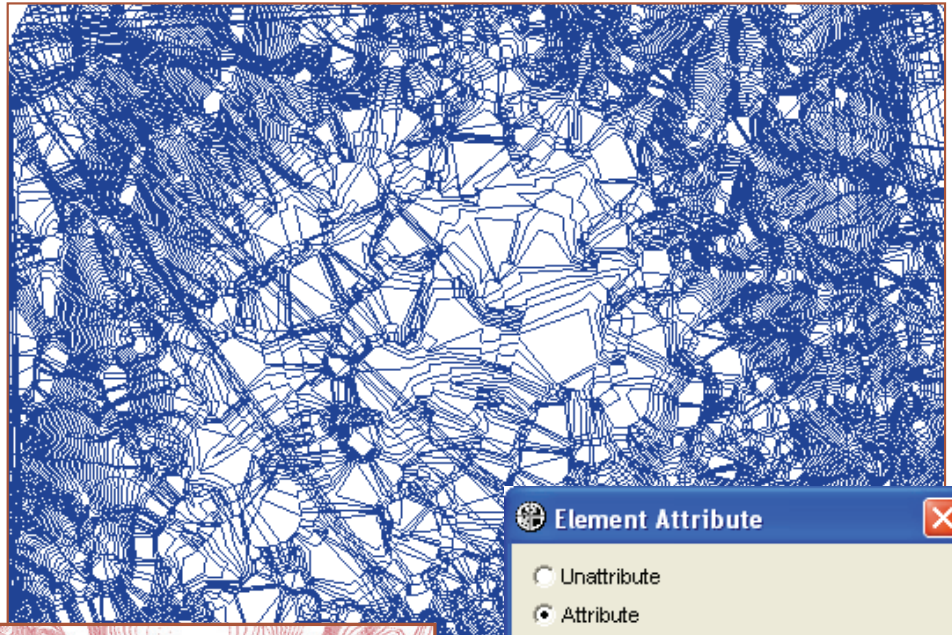
Alternatively, the data can be imported into a Large Gridded Object (LGO). However, this is different from triangulation since points are being estimated on a user-defined grid. For more information on LGOs, see the MS3D helpdoc.



In the **Survey Import/Export** dialog shown in Figure 2, toggle **OFF** the **Polyline Splitting** options. We'll also, choose the option to **Ignore break code character**. This combination of options will ensure the data is imported as one super-polyline.

Upon import, the data will look like a polyline as shown in Figure 3. Notice the polyline segments crossing the display. This isn't a good representation of the point data.

Next, we'll display the polyline as point data. From the MS3D desktop menu, choose **Element | Attribute** and assign the **Point** material to the imported polyline as shown in Figure 4. This serves two functions. First it will display your polyline as point data (Figure 5). Second, **it will alert the triangulation function to treat the polyline as points**. This is vital because triangulating the data as a polyline will not result in the same triangulation.



Clockwise top to bottom:
 Figure 2. Survey Import/Export dialog ignoring Polyline Splitting and break codes
 Figure 3. Data imported as one polyline
 Figure 4. Use the **Element | Attribute** function to assign the **Point** material to the imported polyline
 Figure 5. Imported polyline displayed using the **Point** material

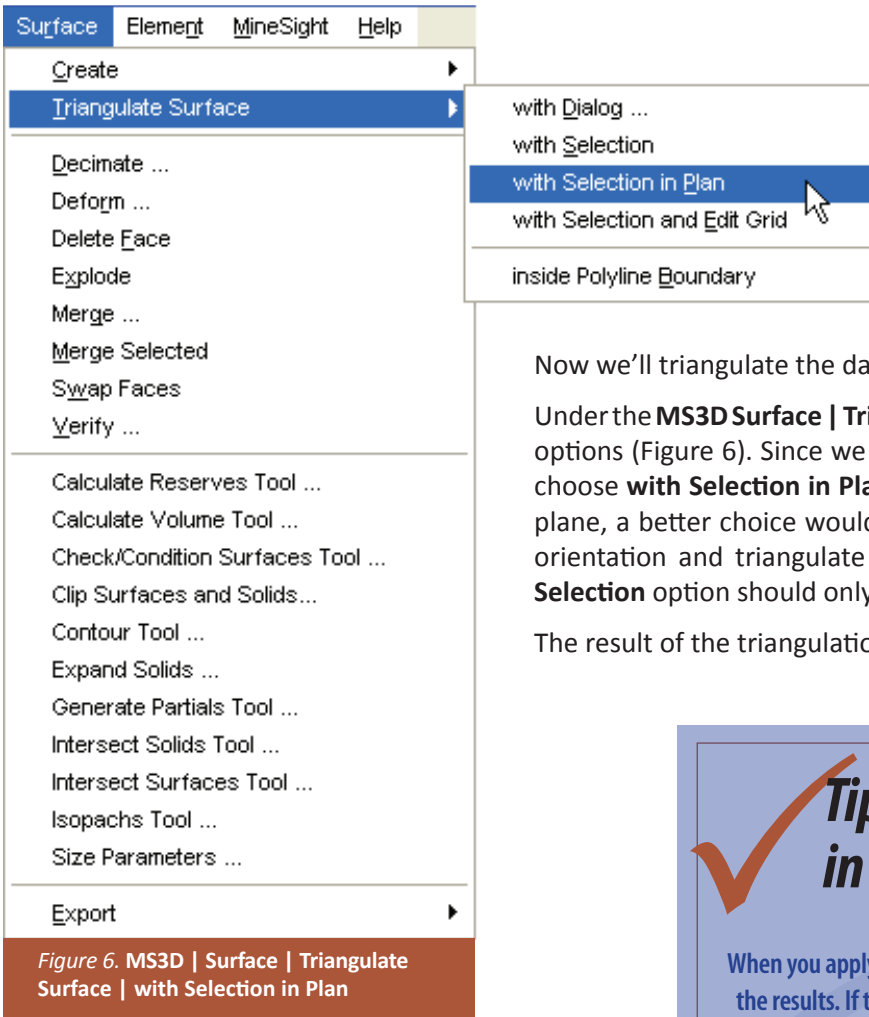


Figure 6. MS3D | Surface | Triangulate Surface | with Selection in Plan

Now we'll triangulate the data, so first select the polyline.

Under the **MS3D Surface | Triangulate Surface** menu, there are several triangulation options (Figure 6). Since we already know our points are roughly horizontal, we'll choose **with Selection in Plan**. Had our surface been oriented in a non-horizontal plane, a better choice would be to create an Edit Grid approximating the surface orientation and triangulate **with Selection and Edit Grid**. The triangulate **with Selection** option should only be used if all the data lies in the same plane.

The result of the triangulation is shown in Figure 7.



Figure 7. Triangulated point data

Tip: Creating a Triangulation in a Closed Object

When you apply the triangulation, you will be asked where you want to store the results. If the resulting triangulation is large, you can send it to a closed object (so it won't display) using the Send Results to Selected Object option of the Surface Storage Redirection dialog (Figure A). This dialog is always displayed when applying a triangulation.

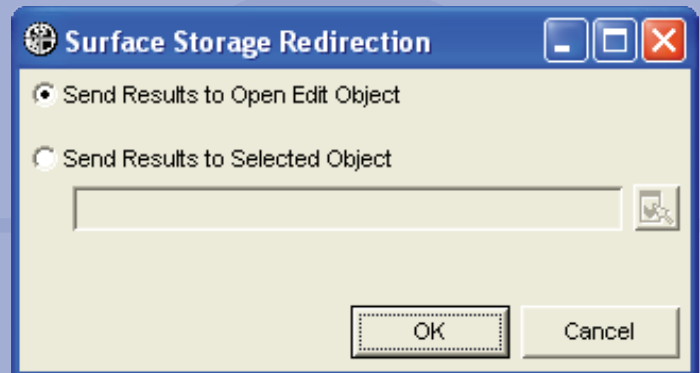


Figure A. You can send the triangulation results to the Open Edit Object or any other geometry object, even a closed one

Example 2 Triangulating With Dialog

This method has fewer steps, but the imported data will be displayed as a polyline and not as points.

The steps will be:

- 1 Import the data as one polyline
- 2 Triangulate the polyline as points

Begin as before by accessing the **Import | 3D Points (ASCII) file** option from the **Data Manager** right-click menu. In the **Survey Import/Export** dialog, toggle **OFF** the **Polyline Splitting** options while once again choosing to **Ignore break code character** as shown in Figure 2.

Select the polyline. To triangulate, select **Surface | Triangulate Surface | with dialog** from the MS3D desktop menu. From the dialog, we'll both alert the triangulation to operate in plan and to treat each polyline node as a point as shown in Figures 8 and 9.

Both triangulation methods give identical results because both triangulations operated on points in the same order (the order in which the points occur in the data file). If you choose to use polyline splitting, the order of the points will depend on the order in which the **polylines** are selected for triangulation. In general, triangulations from split polylines will not be identical, but the triangulations will be equally valid.

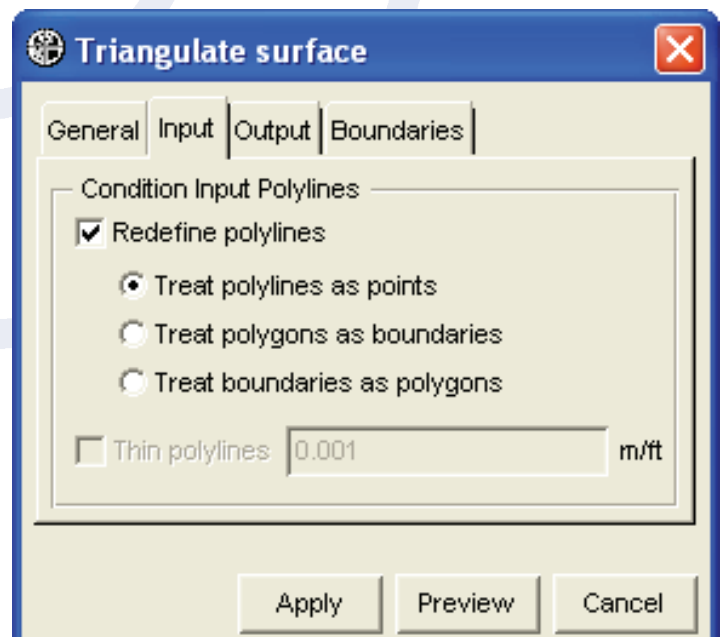
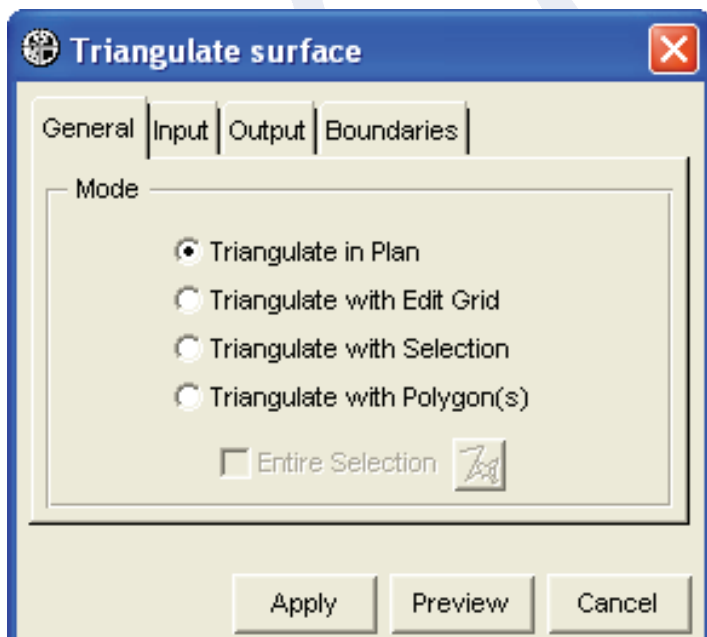


Figure 8. From the **General** page of the **Triangulate Surface** dialog, choose to **Triangulate in Plan**

Figure 9. From the **Input** page of the **Triangulate Surface** dialog, choose to **Treat polylines as points**