

Wireframe geological interpretations in the Geosoft 3D viewer

Once you have digitized a geological feature on at least two section maps, you can create a wireframe from the interpretations. This document provides a description of the workflow to join polyline features or polygon features in an Interpretations Geodatabase to form 3D open surfaces or 3D closed bodies that will be stored in a geosurface file. After saving the wireframe to a geosurface file, the total surface area is reported for open surfaces and total volume is reported for closed bodies. A closed surface can also be used to clip or cut voxel block models. This single file solution makes it easy to manage the wireframed results and to share your work with others.

This document will guide you through:

- Starting a Wireframing Session
- Joining Polyline Features to form an Open Surface
- Joining Polygon Features to form a Closed Surface
- Creating Ends for Closed Wireframe Bodies
- Saving Wireframes to a Geosurface file
- Viewing Surface Information a Geosurface file


Start Wireframing

Before you begin wireframing geological interpretations, you must first have created a series of geological interpretations in a Target for ArcGIS Interpretations Geodatabase. See the [Digitizing Geological Interpretations in Target for ArcGIS How-To Guide](#) for more information on how to create geological interpretations.



To start a wireframing session:

1. In the 3D Viewer, on the *Wireframe* menu, select **Start Wireframing**.
The *Start Wireframing* dialog appears.
2. Select the *Geodatabase to wireframe* and the *Feature to wireframe*.
3. Click the **OK** button on the *Start Wireframing* dialog.

The Interpretations Geodatabase will be added to the 3D view (if it was not already present) and the *Wireframing Tools* will display along the right side of the 3D Viewer.

 If you already have added an Interpretations Geodatabase to the 3D view, you can also start wireframing by selecting the name of a feature class in the Interpretations Geodatabase, and click the **Start Wireframing** button that appears in the *Attributes* tab in the 3D Tools panel. You will automatically be in Wireframing Mode for the feature class that you selected.



 If the *Wireframing Tools* are not pinned, they will be hidden when the cursor moves into the 3D model.

 You will know that you are in wireframing mode if you see a set of interpretations highlighted in yellow and the *Wireframing* button is selected .

To join polylines into an open surface wireframe:

1. In the *Wireframing Tools*, change the *Active Feature* to a polyline feature if you previously chose a polygon feature in the *Start Wireframing* dialog.
The polylines will be highlighted in yellow.
2. Click on any polyline interpretation in the 3D model.
The selected polyline will be highlighted in cyan.
3. Click an adjacent polyline to wireframe to the first polyline you selected.
You now have the beginning of a wireframe surface.
4. Continue selecting adjacent polylines in the 3D model to add to the wireframe surface.

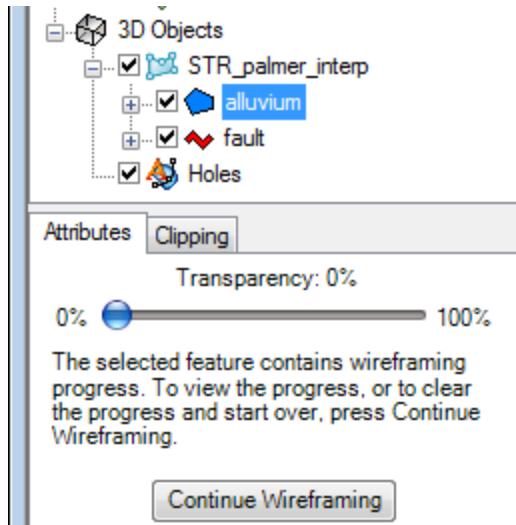


While wireframing, you can use the Undo/Redo options ( ), or use the *Ctrl+Z* or *Ctrl+Y* shortcut keys, respectively.

To join polygons into a closed body wireframe:

1. In the *Wireframing Tools*, change the **Active Feature** to a polygon feature.
The interpretations for the Active Feature will be highlighted in yellow.
2. Click on a polygon interpretation in the 3D model.
The selected polygon will be highlighted in cyan.
3. Click an adjacent polygon to wireframe to the first polygon you selected.
You now have the beginning of a wireframe body. Both ends are highlighted in cyan meaning you could continue adding to the wireframe from either side.
4. Continue selecting polygons in the 3D model to define a larger wireframe body.

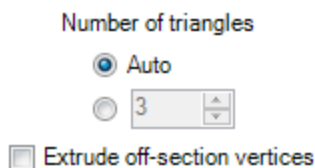
- 💡 The sequence of wireframing actions you perform is stored in the Interpretations Geodatabase; this enables you to pause or stop working on a wireframe and return to it later.
- 💡 To return to a partially completed wireframe for a feature, you can use either the "start a wireframing session" steps listed above, or, select the feature class name below the Interpretations Geodatabase name in the 3D Objects tree and select **Continue Wireframing** from the Attributes tab. If the feature does not contain a saved wireframe sequence, the option will be Start Wireframing instead of Continue Wireframing.



Wireframing Options

While in wireframing mode, there are options available to control how the wireframe segments connect the two selected polygon or polyline interpretations.

– Wireframing Options –



Number of triangles

The **Auto** setting will automatically determine the optimum number of triangles to join two shapes together while maintaining an even distribution of triangle edge sizes.

This automatic option can be overridden by selecting the *radio button* below *Auto*, then specifying the number of triangles to create for each shape edge. You can type in a number or use the up/down arrows to set the number.

Extrude off-section vertices

Specify the *Extrude off-section vertices* option if this error message is returned while wireframing:

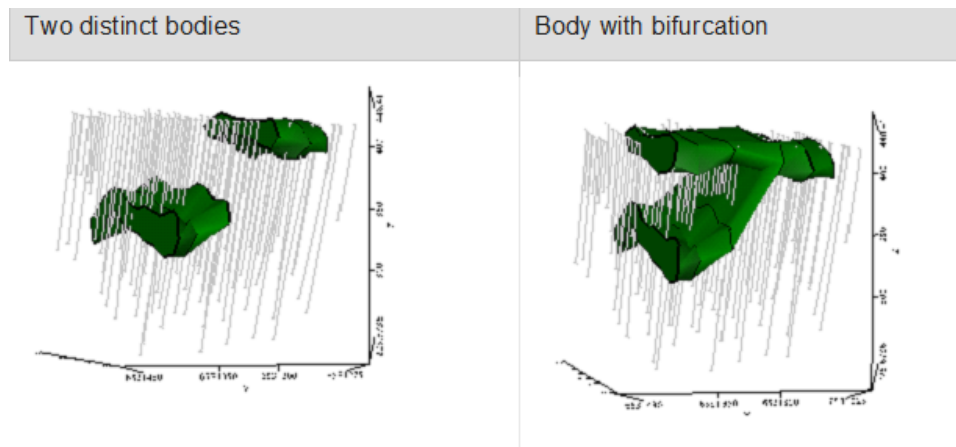
"Wireframing caused an invalid surface due to self-intersection. This can be caused by the angle between the sections being too large or by the use of snapped vertices.

If the latter is true, this may be resolved by checking the 'Extrude off-section vertices' checkbox during wireframing."


This option will extrude the off-plane section points (points that have been snapped to drillholes) of a shape so that the ends of the segment will form flat planes. This will reduce the chance of generating a self-intersecting surface when joining shapes. Self-intersecting surfaces have triangles that "cut into each other" and they cannot be used to form closed bodies suitable for wireframing and geosurface generation.

Add New Segments

If you have interpretations that belong to the same active feature that could be connected as separate wireframe bodies, you can use the **Add New Segments** button to create two distinct wireframe bodies, or to add a bifurcation to a single body. For instance, the same rock type may occur in two separate areas and may or may not be joined.





To add a new segment to the wireframe body:

1. From the *Wireframing Tools*, click **Add New Wireframe Body** .
All of the interpretations for the Active Feature are highlighted in yellow.
2. Select an interpretation in the 3D model.
The selected interpretations will be highlighted by a cyan border.
3. Select an adjacent interpretation to wireframe to the first shape you selected.
4. Continue selecting interpretations to add to the wireframe.

Delete Segments

To select a wireframe segment and delete it:


In the course of creating wireframe shapes, you may find that one or more segments need to be adjusted or modified somehow. If you have created segments of a wireframe that you are unhappy with, you can select individual pieces to delete and then re-create those pieces.

1. Click the **Select Segment(s) or End(s)** button .
2. Select one or more segments of the wireframe body or surface that you wish to delete.
The selected wireframe segments will be highlighted in cyan.
3. Click the **Delete Selected Segment(s) or End(s)** button .

Remove all Wireframe progress

To remove all Wireframe progress for the Active Feature:

If you simply want to start over for the Active Feature, you can remove all wireframing steps and begin again.

1. From the *Wireframing Tools*, select **Remove All Wireframes for Active Feature** .
This only removes the wireframes for the active feature, not for all the features in the Interpretations Geodatabase.
2. Click **Yes** to clear the current wireframe.
Wireframing Mode is active and all the interpretations for the active feature are highlighted in yellow again.

Wireframe Ends for Closed Surfaces

Polygons that have been joined into a wireframe must have closed ends to be saved as a geosurface file. If you do not add ends manually to the wireframe before saving, you will be asked if you would like to auto-close the wireframe with flat ends.


– Ends Options

Flat
 Conical
 Rounded

Level of detail:

Falloff distance: m

To add ends to the wireframe body:

1. In the *Wireframing Tools*, select **Add Ends** .
- The open areas of the wireframe are highlighted in yellow.
2. On the *Ends Options* select a radio button (*Flat*, *Conical* or *Rounded*).
3. Click one of the yellow open areas to create an end for it using the selected option.
4. Continue adding ends to the open areas of the body until no yellow areas remain, or at any time, save the wireframe to a geosurface file and any remaining ends will be auto-closed with flat ends.



While adding ends, you can use the Undo/Redo options ( ), or use the *Ctrl+Z* or *Ctrl+Y* shortcut keys, respectively.

Geosurface Files

Geosurfaces are Geosoft 3D vector files that store the results from wireframing polygon or polyline interpretations to form a closed body or an open surface, respectively.

Geosurfaces store the following information:

- XYZ locations
- Coordinate system
- Attributes including feature names and colours

The coordinate system for the geosurface file is automatically set based on the Interpretations Geodatabase's coordinate system that was used to create the wireframe.

More than one surface from a wireframing session can be saved to the same geosurface file. The surface names in a geosurface file are set based on the feature names from the Interpretations Geodatabase used in the wireframing session.

Open surfaces are the result of wireframing polylines. Closed surfaces are the result of wireframing polygons. Only closed surfaces can be used in voxel math expressions.

To save a wireframe to a new geosurface file :

1. Under the *Wireframing Tools*, select **Save Wireframes as Geosurface File** .
2. Enter a *File name* and click **Save**.



Once you have saved wireframes for an active feature, you can add other wireframes for different active features to the same geosurface file.

To save a wireframe to an existing geosurface:

1. Under *Wireframing Tools*, click **Save Wireframes as Geosurface File** .
2. Browse to and select an existing geosurface file.



Many closed and open surfaces from a wireframing session can be saved to the same geosurface file.



If you save a wireframed feature that already exists to the save geosurface file, you will be asked if you want to overwrite the previously existing wireframe surface.



Remember that the wireframe sequence is saved in the Interpretations Geodatabase. You can Start Wireframing again to revisit a wireframing session undoing and redoing segments and then saving the changes to a new or existing geosurface.

Viewing Total Volume and Total Surface Area

Total Volume can be seen for closed surfaces in a geosurface file and Total Surface Area can be seen for open surfaces in a geosurface file.

To view the Total Volume for a closed surface:

1. In the *3D Objects tree*, select a closed surface.
Information about this surface, including *Total Volume* is provided on the *Attributes* tab.

To view the Total Surface Area for an open surface:

Total Surface Area can be seen for open surfaces in a geosurface file.

1. In the *3D Objects tree*, select an open surface.
Information about this surface, including Total Surface Area is given under the *Attributes* tab.



The Transparency, rendering and colour can be changed to alter how the surface displays.

To use a closed wireframe body to clip a voxel block model, see the [Use Closed Surfaces in Voxel Math Expressions](#) How-To Guide.