

# SMOOTHING

The Smoothing feature allows you to clean up the edges of your polygons. This tool is especially useful when you are extracting buildings and want the resulting feature to closely resemble the actual features. Smoothing decreases the number of vertices used to describe a polygon by culling them based on the tolerance set for the selected option.

- 1 Highlight the result layer you want to smooth in the Table of Contents.
- 2 Select **Smooth Shapes** on the Post Processing menu.

*The Smooth Features dialog box opens.*

The Smooth Features dialog box offers these smoothing options:

| OPTION   | FUNCTION   |
|--|--|
| Douglas-Peucker  | This option takes the first vertex and last vertex in the segment and draws a straight line between them. It then looks at all the other vertices and sees if any one of them is more than X units away from the straight line.  |
| Bezier   | This option takes as input the number of vertices to look to the left and right and will move the vertex in the middle according to the polynomial of one degree less than the total number of vertices that were sampled.<br><br>This option only alters the vertices position. It does not add or remove vertices. |
| Snake*<br><small>*This option is only available from the Convert to Line Smoothing option.</small> | This option adjusts vertices based on the settings you provide, moving forward to alter each vertex progressively.   |

- 3 Select **an option** in the list box and choose **OK** to accept the default settings.

Or

Select **an option** and choose **Modify Algorithm's Parameters** to customize the algorithm's parameters.

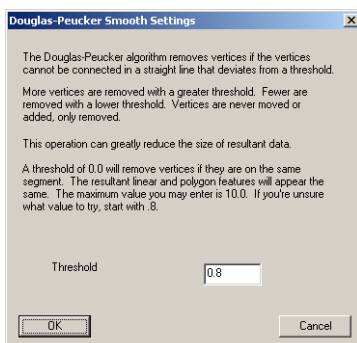
*When you select Douglas-Peucker and then choose Modify Algorithm's Parameters the Douglas-Peucker Smooth Settings dialog box opens, providing you with one additional option.*

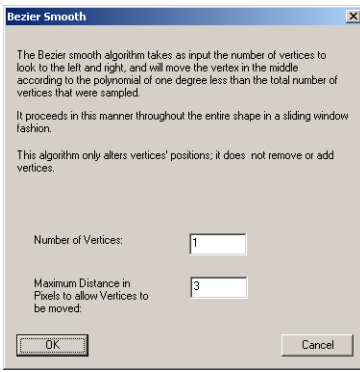
- Enter a **Threshold number** in the available field.

Threshold is the number of pixels away from the straight line to review when smoothing a feature.

- Choose **OK** to close the dialog box.

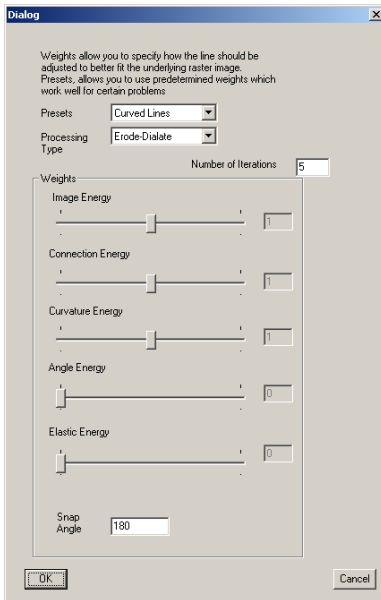
**Tip:** You can add all the Post Processing tools to the Feature Analyst toolbar. See page 7 for more information on customizing toolbars.





When you select *Bezier* in the list box and choose *Modify Algorithm's Parameters*, the *Bezier Smooth Settings* dialog box opens, providing you with two additional options.

- Enter the Number of Vertices to inform the system of the number of pixels the system looks at to determine the best mid-point to create a straight line.
- Enter the maximum distance a pixel may be moved to straighten a line in the Maximum Distance field. If the vertex lies outside this maximum, the system leaves it in place.
- Choose **OK** to close the parameter dialog box.



When you select *Snake* from the *Convert to Line Smoothing* options list and select *Modify Parameters*, the *Snake Smooth Settings* dialog box opens, providing you with several options for modifying the smoothing output. Remember that the *Snake smoothing* parameter is only available when you smooth from the *Convert to Line* feature.

- Set the following options:

**Presets** - Presets provides three additional options:

- Custom – allows you to set the Weights options at the bottom of the dialog box.
- Straight Lines – sets the weights to represent straight lines. Use if your lines are predominantly straight.
- Curved Lines – sets the weights to represent curved lines. Use if your lines are predominantly curved.

**Processing Type** - This option provides two additional options:

- **Number of Iterations** - Enter the number of times you want the system to run the algorithm before return results.
- **Erode/Dilate** – puts the line segments through cycles of dilation and eroding to adjust the alignment.
- **Gaussian Blur** - takes the line results and blurs them.

Both options use the Image Energy setting below to adjust the line segments.

- **Weights** - Weights allow you to individually adjust the settings:
  - **Image Energy** – Line Snake uses the underlying polygon as an image to make adjustments. If you're running line snake within the "convert to line", then the polygon results represent black pixels in an underlying black-and-white image. If the image energy is set really high, then the vertices will want to be pulled into the black pixels. If you're running the line snake on a polygon file, then the outline of the polygon will represent black pixels in a black-and-white image.
  - **Connection Energy** – how evenly spaced you want the vertices.

- **Curvature Energy** – how “curvy” you want the resultant vertices to be.
- **Angle Energy** – how much you want the resultant angles, if there are any, to be snapped to the “snap angle” setting. This setting works against the curvature energy. Typically, if you want curvy lines, you’d set this to zero. If you want lines to snap to a 90-degree angle, you’d set the curvature energy to 0.
- **Snap Angle** - Sets the maximum angle of an intersection of vertices.

- 4 Choose **OK** to close the Smooth Feature dialog box

*The Save Feature As dialog box opens.*

- 5 Enter a **name and path** for the new shape file and choose **Save**.

*The system completes the extraction pass and places the new shape file in the Table of Contents.*