GIS
Tips & Tricks

By Savannah Carter, CMT-L and Al Karlin, Ph.D., CMS-L, GISP

Slivers be Gone!

One of the most annoying aspects of building large polygon datasets by heads-up digitizing occurs when there are small overlaps and/or gaps where the polygons meet. Edge-matching to eliminate slivers between digitized polygons can be a laborious and tedious task. These "slivers", especially voids, can be very difficult to detect by visual means, so the GIS workflow to resolve these issues generally involves building topology, constructing a ruleset, and running advanced GIS tools; a heady operation for a beginning GIS analyst and particularly cumbersome when tracking a few slivers. This month's GIS Tip demonstrates a quick and effective workflow to avoid the build topology route.

TIP #1 — IN ARCGIS DESKTOP USING SHAPEFILES (WILL ALSO WORK WITH FEATURE CLASSES)

Step 1 – Data Preparation: Ensure all polygons that must edge-match are in a single shapefile. If the polygons are in multiple shapefiles, use the Data Management |Merge tool to construct a single shapefile.

Step 2 – Use the Data Management | Dissolve tool (Figure 1) and output to a new shapefile. Uncheck the box for "Create multipart features" so the output is a single, dissolved feature. Add the new dissolved shapefile to the map.
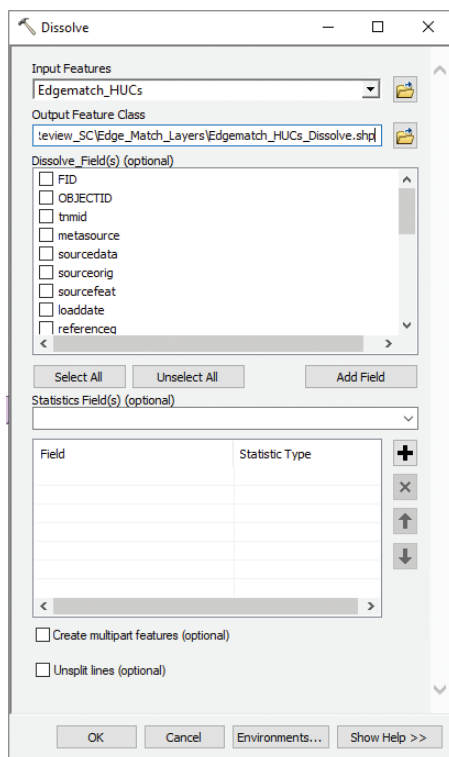

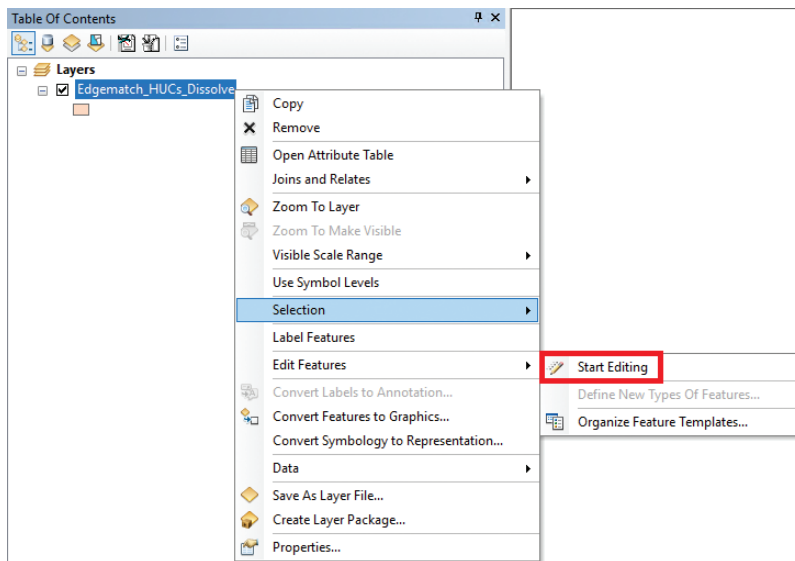Figure 1. "Data Management | Dissolve" tool setup in ArcMap.

Figure 2. Starting an editing session in ArcMap by right-clicking in the Table of Contents.

Step 3 – Start an editing session for the dissolved shapefile. In ArcMap, this can be accomplished by right-clicking on the layer in the Table of Contents (Figure. 2), or by using the editing toolbar (Figure. 3).

Step 4 – Edit vertices of the dissolved shapefile to display all vertices. Using ArcMap, double-click on the feature using the editor selection arrow (Figure 4).
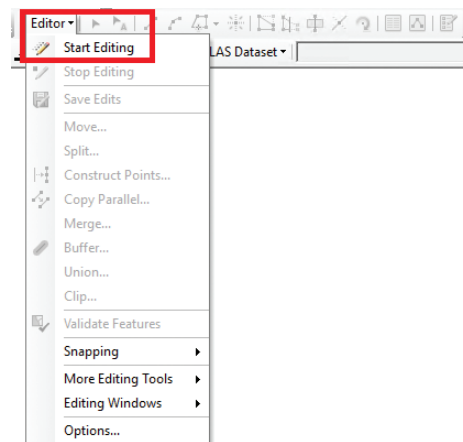

Figure 3. Starting an editing session in ArcMap using the "Editor" toolbar.

If the original, individual features edge-match and contain no gaps, vertices should only exist on the outer edge of the dissolved shape. If there were any small gaps between features, a small "hole" will be formed, and vertices will display in the interior of the dissolved shape (Figure 4). Any interior vertices should be investigated for potential gaps (Figure 5).

Step 5 – Using the "Dissolved Polygon" layer to identify the potential edge-matching errors, edit the "Merged Polygon" layer to resolve the sliver issues.

TIP #2 — IN ARCGIS PRO USING SHAPEFILES OR FEATURE CLASSES

The workflow follows much the same steps as in ArcGIS Desktop, but the dialog boxes for the tools have been updated in ArcGIS Pro. Some may find it easier to use feature classes in a file-Geodatabase than using shapefiles.

Step 1 – Prepare the data: if necessary, use the Data Management | Merge tool to merge multiple polygon feature classes into one feature class.

Step 2 – Use the Data Management | Dissolve tool to dissolve the (merged) polygons into a single polygon. Again, be careful to make certain the "Create multipart features" is NOT checked (Figure 6).

Step 3 – Edit the Dissolved Polygon feature class

In ArcGIS Pro, navigate to the "Edit" tab on the top ribbon (Figure 7).

Step 4 – In ArcGIS Pro, select the feature and choose "Edit Vertices" **(Figure 8)** from the "Edit" tab

Step 5 – Using the "Dissolved Polygon" feature class to identify the potential edge-matching errors, edit the "Merged Polygon" layer to resolve the sliver issues. Remember to save edits when completed.

Send your questions, comments, and tips to GISTT@ ASPRS.org.

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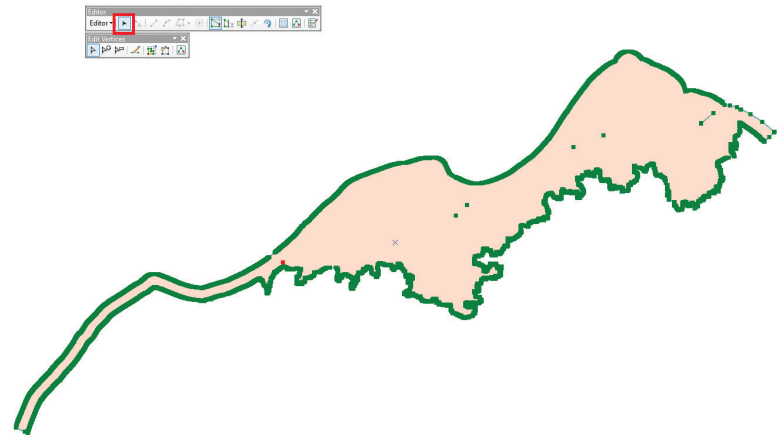

Figure 4. Editing vertices by double-clicking in an editing session.
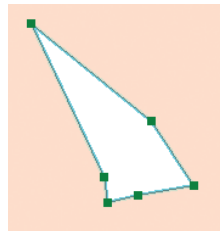

Figure 5. Zooming into one of the interior patches of vertices shows there is a small hole, indicating a gap between features. The gap is very small and only visible around 1:100.
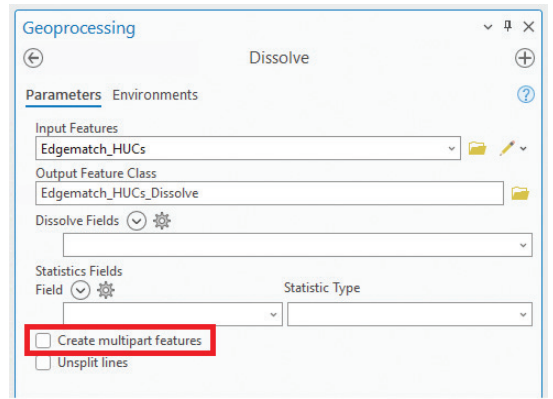

Figure 6. "Data Management | Dissolve" tool setup in ArcGIS Pro.

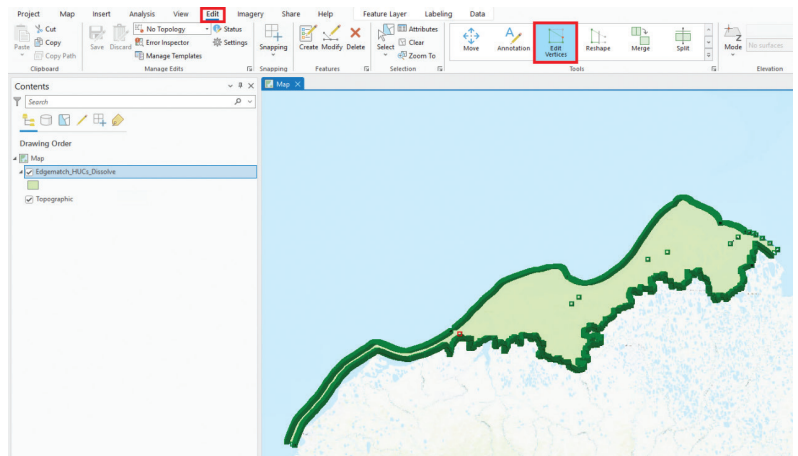Figure 7. Edit in ArcGIS Pro by selecting the "Edit" tab.

Figure 8. "Edit Vertices" tool in ArcGIS Pro.