



EXERCISE 2 Challenge

Objectives

- Create topology
- Create geodatabase topology
- Convert labels to annotations



Prerequisites

- Completion of Exercise 2

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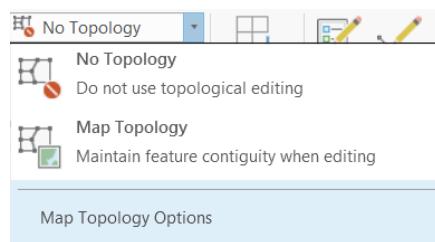
Part 1: Challenge - Topology

There are two types of topology, map topology and geodatabase topology. On the Edit tab, in the Manage Edits group, the Topology arrow toggles topological editing on and off. When you enable **Map Topology**  you can edit topological edges and nodes for all visible features using tools in the Modify Features pane. Enabling a **Geodatabase Topology**  rule limits topological editing to only the layers that participate in the selected topology.

A. Map Topology/Move an Edge

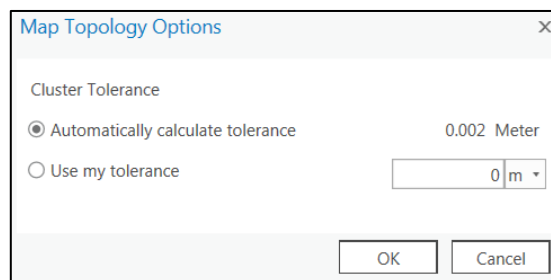
On the Map Topologies Options dialog box, the cluster tolerance is the distance within which edges and vertices are determined to be coincident. You can choose to have ArcGIS Pro automatically calculate a minimum possible value, or you can specify a custom tolerance.

1. From the Edit tab, in the Manage Edits group, **click the topology drop down menu and select Map Topologies Options.**



The Map Topology Options dialog box opens.

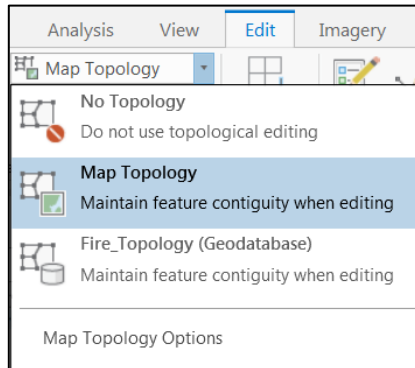
Caution: Increasing the cluster tolerance can potentially reduce the spatial accuracy of your data and cause features to collapse or distort. This occurs as more feature elements are snapped together and determined to be coincident. For most use cases, the automatic setting is the best practice.



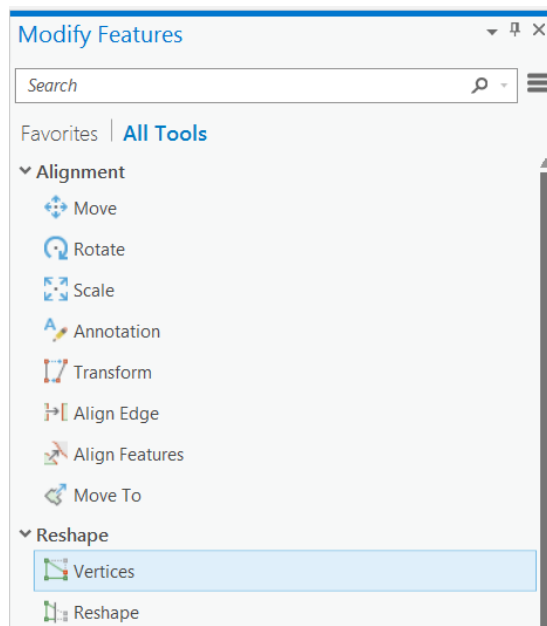
2. Click **cancel** to exit.

Editing features as map topological edges and nodes maintains feature contiguity by enforcing edges to remain coincident as you edit features. Map topology requires no setup. When it is enabled, it appears as a highlighted graph of edges and nodes that correlate directly to the visible features you are editing. The workflow for editing features using map topology is similar to moving or editing features, except the features that share an edge or a node are also automatically edited and remain contiguous when you finish the edit.

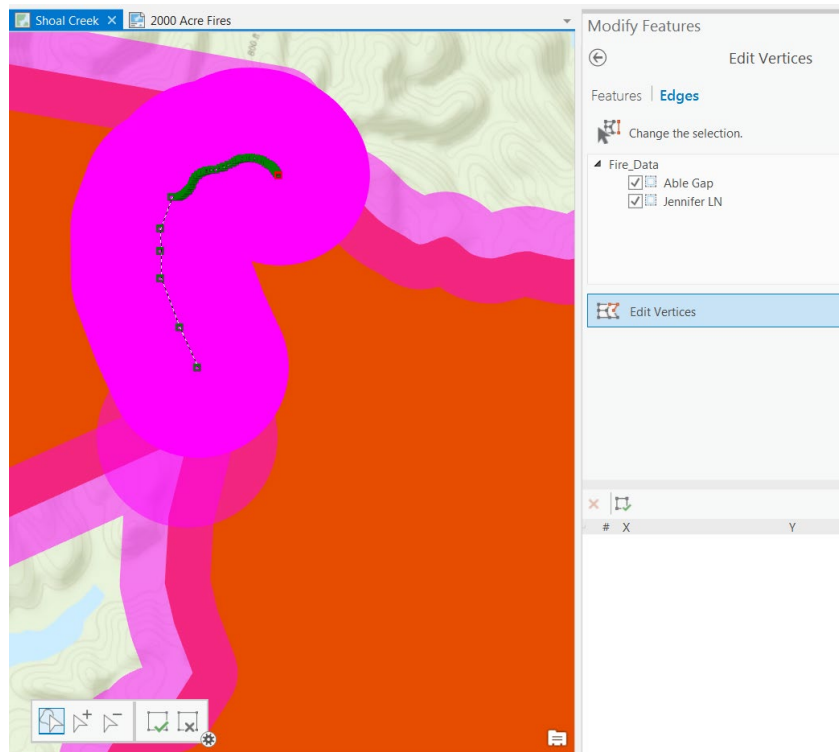
3. From the Map tab click the **Bookmarks** dropdown and **select Hillabee Res.**
4. On the Edit tab, in the Manage Edits group, **enable Map Topology** by clicking the drop down menu and selecting Map Topology.



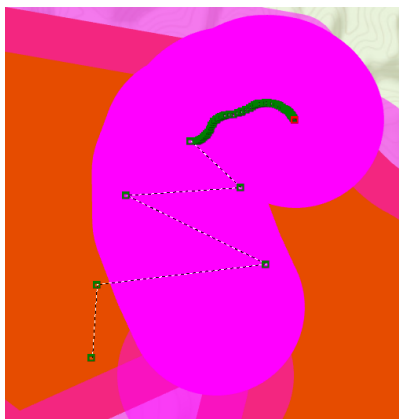
5. On the Edit tab in the Features group, **click Modify.**
6. In the pane, expand **Reshape** and click **Vertices.**



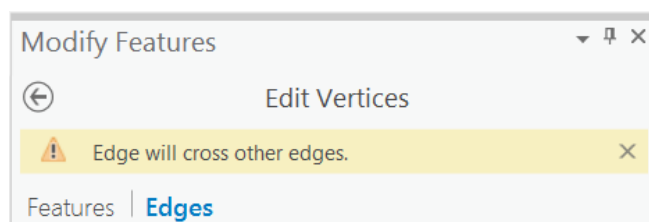
7. In the pane, click the **Edges** tab.
8. In the pane, click **Select** and select the **line segment** between **Able Gap** and **Jennifer LN** polygons by single clicking or drawing a bounding box (you will likely need to zoom in to make selection and edits).



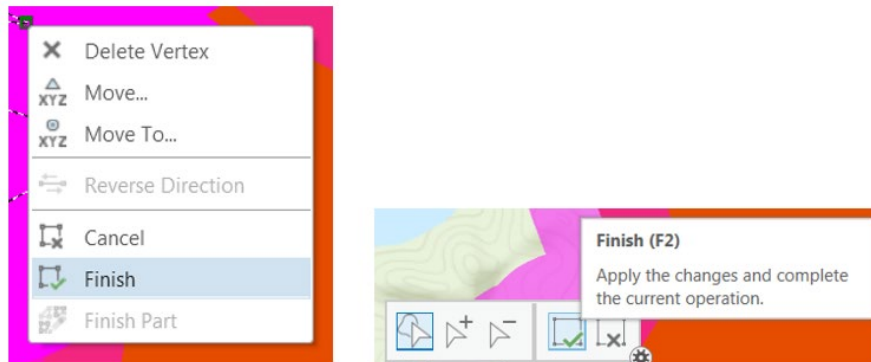
9. **Move** a few **vertices** drastically enough you can see a difference in the shape of the edge when saved.



If you break a topology rule while editing, you will be notified in the Modify Features pane.



10. You may click **apply changes** from the tool set, right click and select **finish** or click **F2** to finish sketching.



11. Click **Save** from the **Edit** tab in the **Manage Edits** group to save the changes.
12. **Close** the **Modify Features** pane.
13. Click on **Select** from the **Edit** tab in the **Selection** group and click on the **Able Gap** or **Jenny LN** polygon to see the outline of the **new edge** (results will vary from exercise screenshots).



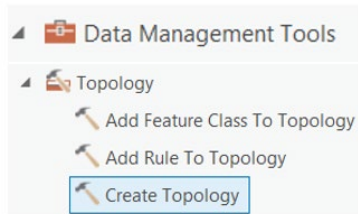
14. Clear selection.
15. Turn off the **Topology** layer.

Part 2: Challenge – Geodatabase Topology

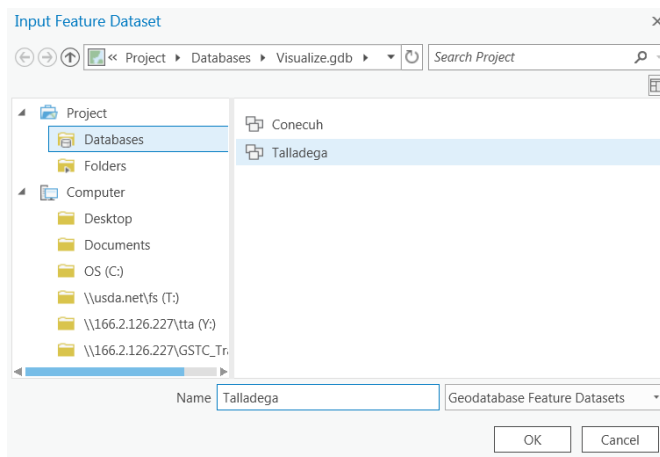
A. Geodatabase Topology

The primary method for creating a new topology in ArcGIS Pro involves the use of geoprocessing tools. ArcToolbox contains a series of geoprocessing tools for topology. The [Topology toolset](#) is located in the Data Management toolbox. These tools can be used to build scripts for creating and modifying geodatabase topologies.

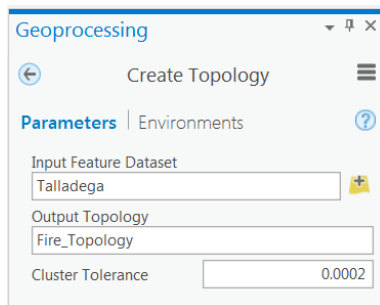
1. Click the **full extent** button.
2. From the Analysis tab, in the geoprocessing group **click Tools**.
3. Expand Data Management Tools then expand Topology toolset and **select the Create Topology Tool**.



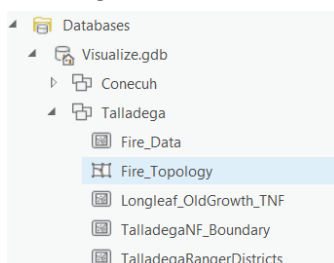
4. For the **input Feature Dataset** navigate to the **Talladega dataset** and select it.



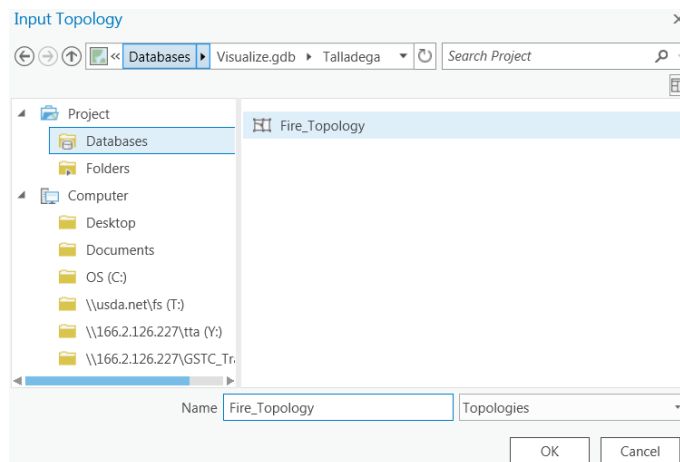
5. Enter the **Output name as Fire_Topology** and leave the cluster tolerance at .0002.



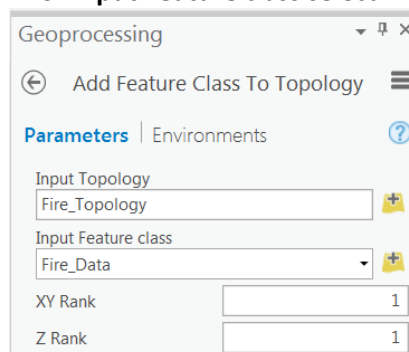
6. Click **Run**.
7. Navigate back to your **Catalog pane** and expand the Databases folder > Visualize.gdb > Talladega to see the new **Fire_Topology** layer.



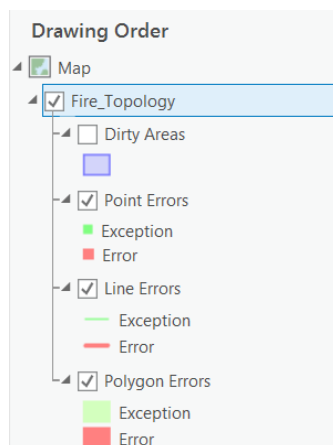
8. Navigate back to your **Geoprocessing** pane and click the **back button** if necessary and click on **Toolboxes**.
9. **Double click** on the **Add Feature Class to Topology** tool to open it.
10. For **Input Topology**, navigate to the **Fire_Topology** layer and click **OK**.



11. For **Input Feature class** select **Fire_Data** and leave the rest as default and click **Run**.



The Fire_Topology is automatically added to the Contents pane.



12. Click the **back button** on the Geoprocessing pane.
13. Select the **Add Rule to Topology** tool to open it.

14. Enter the following parameters.

Note: for a list of topology rule descriptions follow [this link](#).

15. Open the **Catalog** pane and navigate to **Fire_Topology**.

16. Right click **Fire_Topology** and select **properties**.

Feature Class	XY Rank
TalladegaRangerDistricts	1
Fire_Data	1

17. **Explore each tab** to see the feature classes and rules added to the topology layer.

18. Click on the **Errors** tab. There are no errors because it has not been validated.

19. Click **Cancel** to close the topology Properties box.

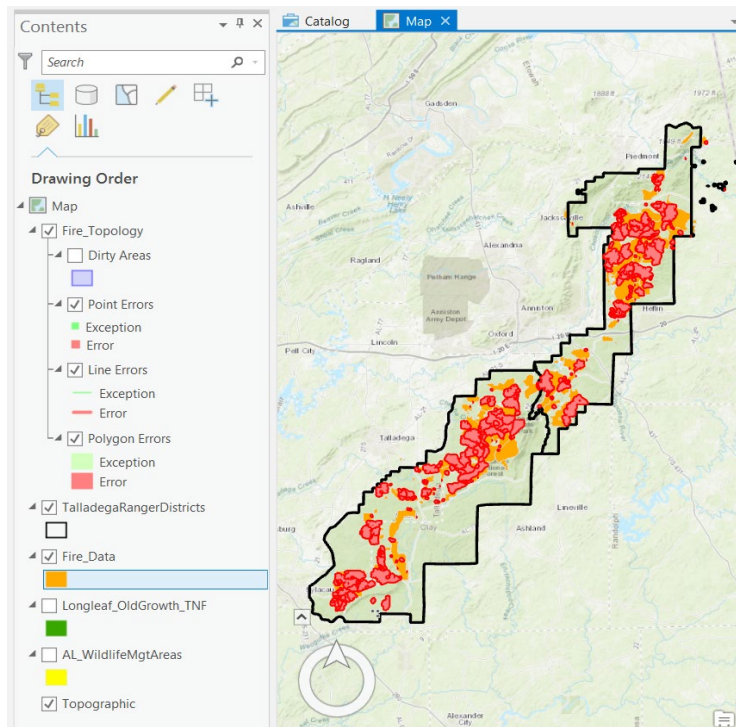
B. Validate and Fix Topology Errors

1. Open the **Geoprocessing** pane (click the back button if necessary) and select the **Validate Topology** tool to open it.

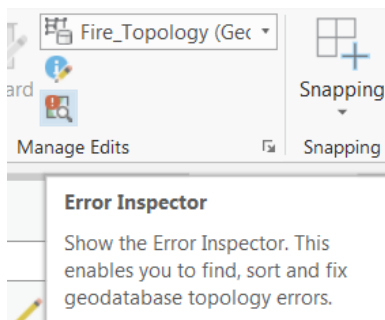
2. For **input** select **Fire_Topology** and click **Run**.

3. From the contents pane click on the **color patch** for **Fire_Data**.

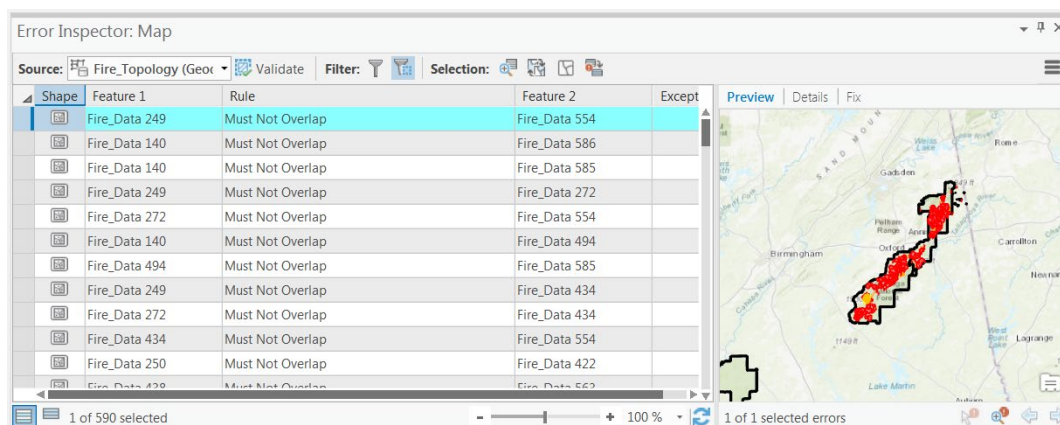
4. Click **properties** to change the color to **Electron Gold** (or something similar) so you can see the difference between the topology errors and the Fire_Data Polygons.



5. On the Edit tab, from the Manage Edit group, select Error Inspector.

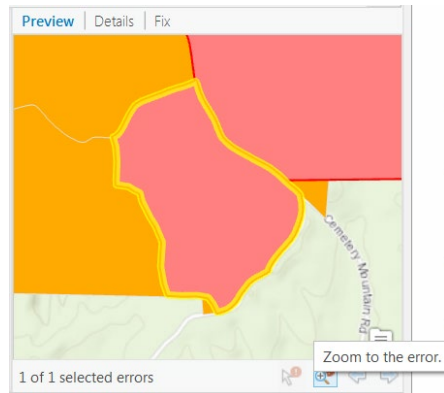


The Error Inspector pane shows topology errors displayed based off the current extent of your map view.



6. Click on any error on the map view.

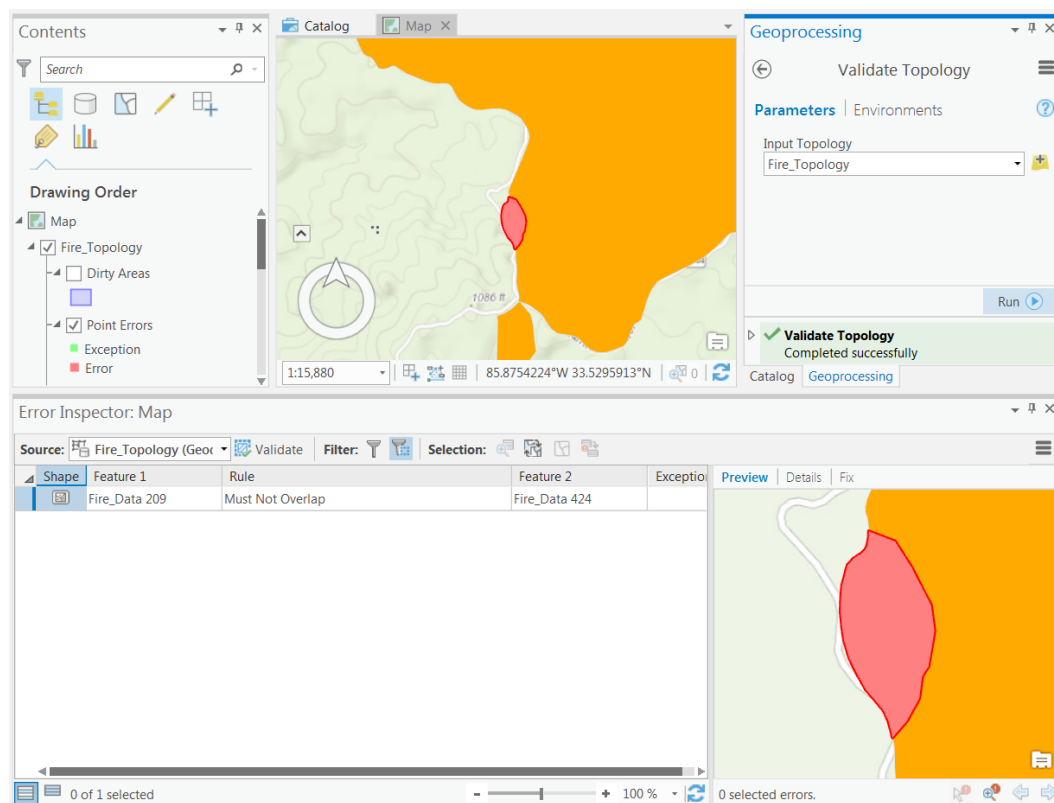
7. Click **Zoom to Error** from the **preview tab** of the Error Inspector.



The preview pane and the map view navigate to the topology error.

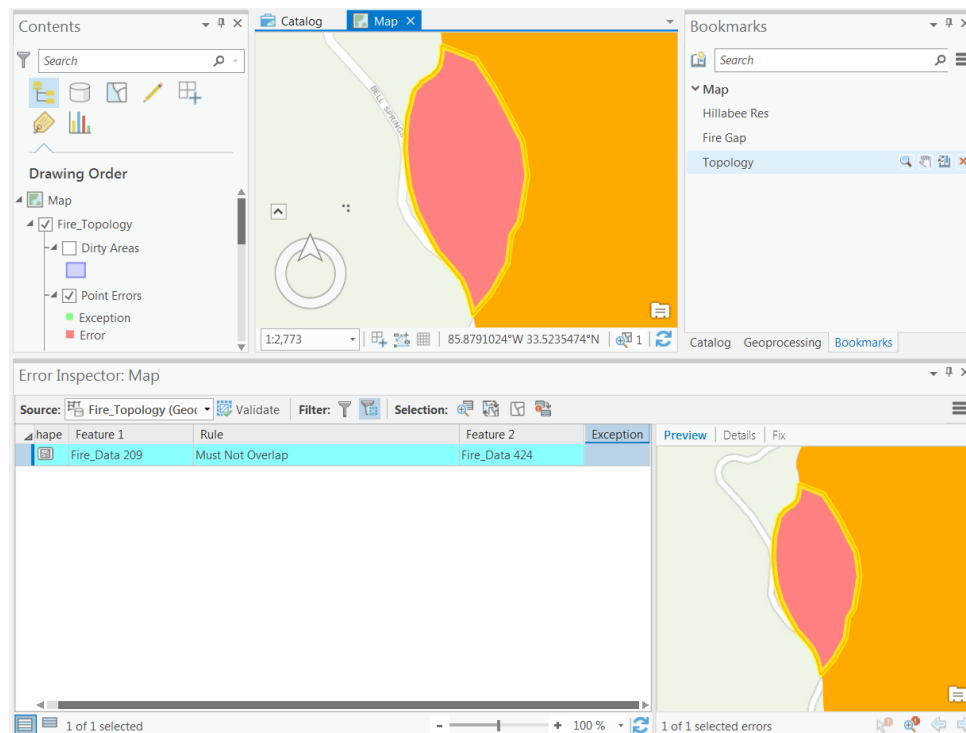
8. On the Map tab, click on the **Bookmarks** drop down and **select the Topology bookmark**.

Only one error should now be displayed in the Error Inspector pane as only one error is visible in the map view. The preview pane may take a second to update, if it does not click the Zoom to Error button again.



9. Click on the **topology error** in the map view or in the box to the left of the feature in the Error Inspector pane.


Note: the selection made is in yellow



10. Click the **Details** tab in the **Error Inspector** map view. The Details page displays detailed information about an error.

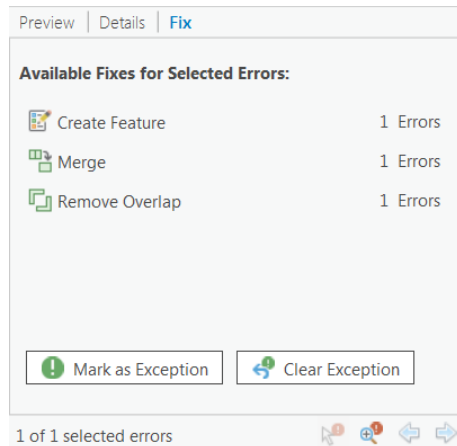
Preview	Details	Fix
Property	Value	
Shape	Polygon	
Feature 1	Fire_Data 209	
Rule	Must Not Overlap	
Feature 2	Fire_Data 424	
Exception	<input type="checkbox"/>	
Length	456.296758	
Area	11457.670929	

1 of 1 selected errors



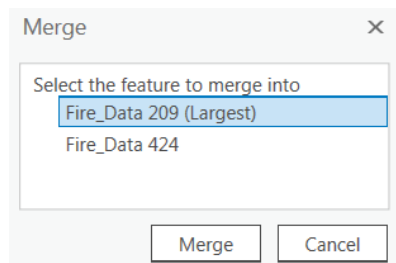
11. Click the **Fix** tab.

A list of options are displayed to fix the error or to mark or clear an exception.



12. Click **Merge** and the Merge dialog window opens.

13. Select **Fire_Data 209 (Largest)** and click **Merge**.



Your map view may change when selecting Merge.

14. From the Map tab click the **Bookmarks** drop down select **Topology** to view that the **polygons have merged**.

15. From the Edit tab, in the **Manage Edits** group, click **save**.

16. Click **yes** from the **save dialog window**.

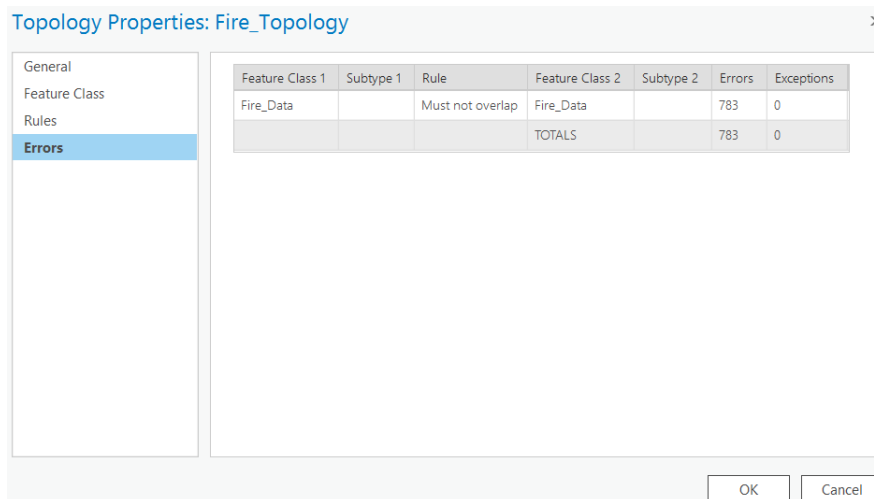
17. **Close** the **Error Inspector**.

18. **Close** the **Geoprocessing** pane.

19. **Zoom** to the **full extent**.

20. Open the Catalog pane and **right click** the **Fire_Topology** layer and open **properties**.

21. Click on the **Errors** tab to display the rules that are in error.



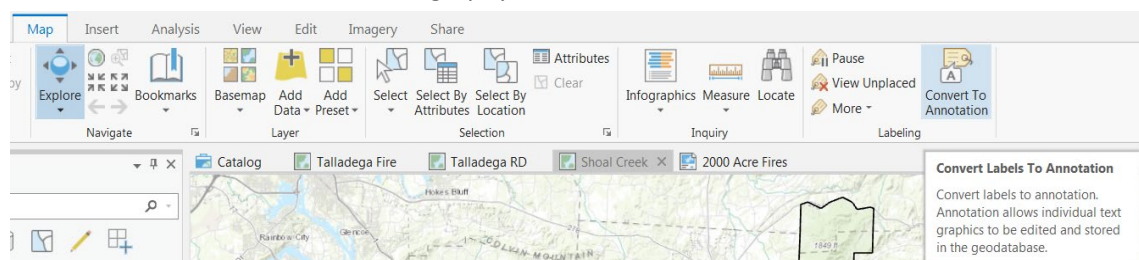
Note: you may have to expand the Topology Properties window to see the full description.

22. Click **Cancel** to close the Topology Properties window.
23. Right click the **Fire_Topology** layer from the **Contents pane** and **select remove**.
24. Save your project.

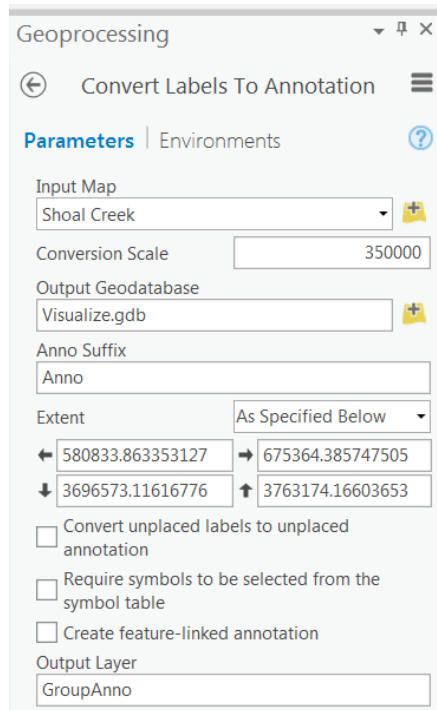
Part 3: Challenge - Convert Labels to Annotations

Geodatabase annotation is stored as an annotation feature class in a geodatabase. You can convert labels to annotation using the [Convert Labels to Annotation](#) tool. You need to set scale and label properties carefully, as they determine the size, position, and appearance of the new annotation. You have already done that. For further information on editing annotations [click here](#).

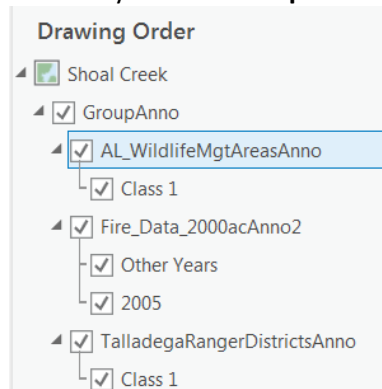
1. Click **Convert Labels to Annotation** from the **Labeling group** on the **Map tab**, or open it from the Annotation toolset in the Cartography toolbox.



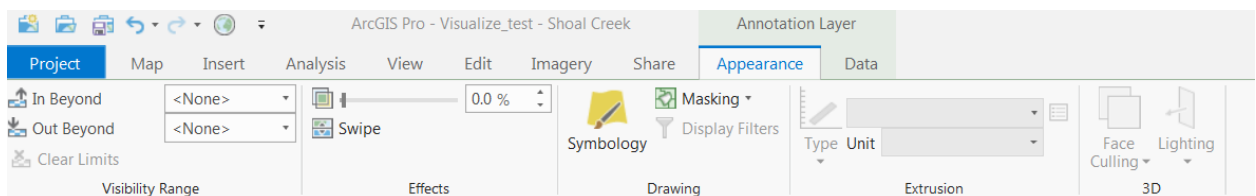
2. Much of the tool should be prepopulated. Enter **Shoal Creek** for the **Input Map**.
3. **Navigate** to the **Visualize.gdb** for the **Output Geodatabase**.
4. Leave the rest as **default**.



5. Click **Run**.
6. **Close the Geoprocessing pane.**
7. A new layer titled **GroupAnno** is added to the **Contents pane**. **Expand and highlight it.**



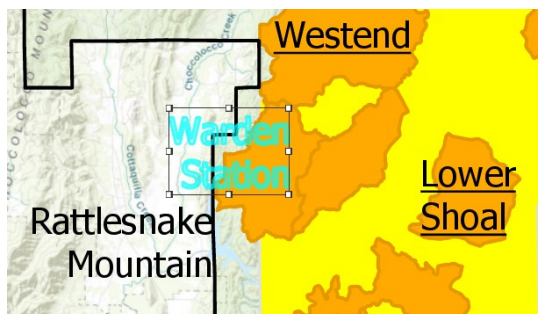
A new Annotation Layer tab also appears.



8. From the **Edit** tab select **Modify** from the **Features** group to open the **Modify Feature** pane.
9. Click on **Move** under the **alignment** group.
10. Select the **Warden Station** fire.

The selected features appear as a list in the pane. A selection rectangle with handles appears around the feature, and the annotation reposition toolbar appears at the bottom of the map.

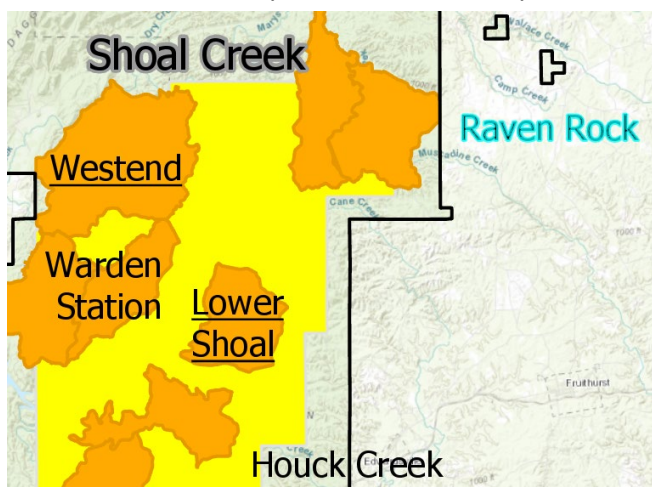
Note: you may also use the Annotation tool found in the Modify Features tool list, however, it appears to not function correctly at version 2.0.



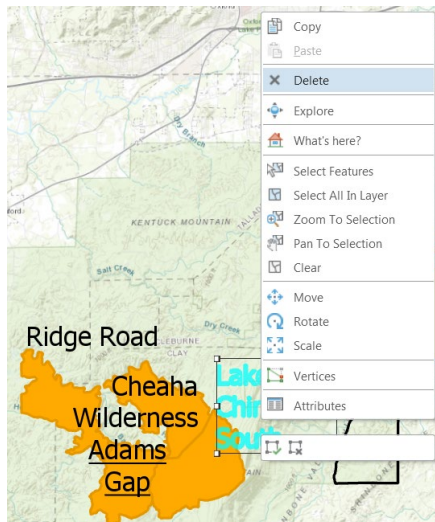
11. **Hover** over a selection handle until the **pointer** changes to the **move symbol**, and **drag the selection** over the polygon to the **bottom right of the Westend polygon**.

Note: you may also use the editing tool Move to move annotations. If you have issues moving annotations using the Annotation editing tool, try using the Move tool for moving annotations.

12. **Select Raven Rock** fire and **move** it to the right **away from the forest boundary**.
13. **Locate and move** any other **Annotations** you think need to be rearranged.

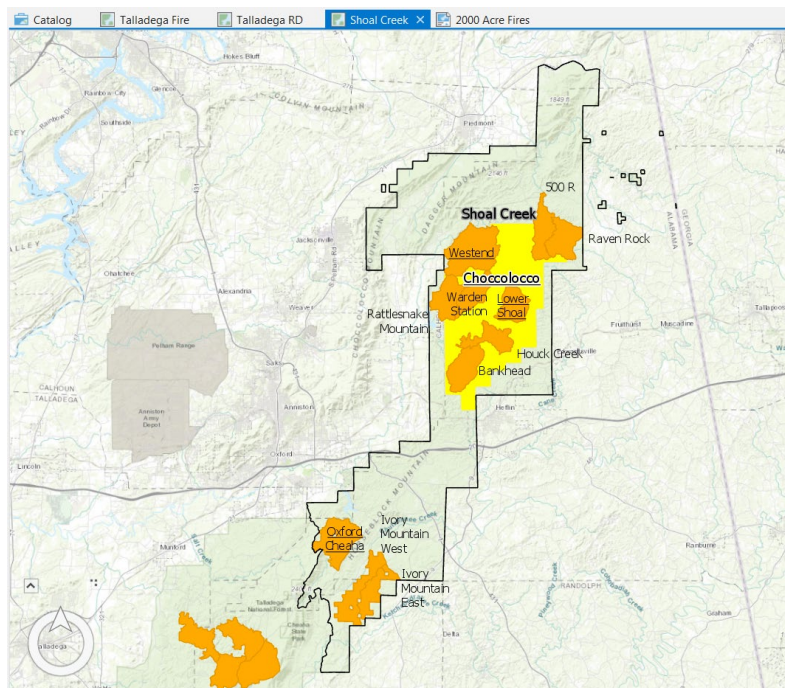


14. **Navigate** to the bottom left of the extent to the **fires that don't fall within the Shoal Creek Ranger District boundary** and **delete them** (keyboard shortcut: hold down C on your keyboard to turn your cursor into the navigation Pan hand).
15. **Highlight an annotation** and **right click** then **select delete** for all fires falling out of the boundary (Keyboard shortcut: click the delete key on your keyboard).



16. When finished with your annotation edits click **Save** from the **Manage Edits** group in the **Edit** tab.

17. Click the **full extent** button and confirm your annotations are acceptable (you may have to adjust some of the annotations further once viewed at full extent).



18. Close the **Modify Features** pane.

19. **Save** your project.

Congratulations! You have successfully completed this exercise.