

FOR 240 – Lab 9 Assignment

Using GIS to Manipulate Spatial Data of Forest Management

Introduction to Computing in Natural Resources

In this lab, we are going to use the ArcGIS to manipulate the spatial data of forest management. The lab consists of two parts. In part I, you need to add the spatial data you collected in the previous lab and add them in the ArcMap to perform data manipulation and create a map. In part II, you are required to perform similar data manipulation and create a map based on real spatial data. Please follow the instructions below to finish this lab.

Part I

1. Create a folder on your desktop and copy all your spatial data from your USB drive to the folder.
2. Start from “Start”->”All Programs”->”ArcGIS”->”ArcMap”, you will see the ArcMap interface. Click the “**Add**” button which looks like a **plus** sign on the top menu, in the pop-up “Add Data” window, navigate to the folder where you saved your file and add all the data into ArcMap. Note that if you add multiple data layers, you can uncheck the checkbox in front of the layers that you don’t want to show in your map.
3. Now, let’s answer some questions based on your own data. What’s the total area if you have a polygon? What’s the total distance of your trails? How many points are within your polygon? How many points are within 10 feet of your trails? To get the answers, you need to do the following steps:
 - (a) Right click the polygon data layer, for example, **G4T2** in my case, select “Open Attribute Table”. Click “options” ->’Add Field” (Figure 1). Then, click “OK”. A new field named as “Area” has been added in the data table. Now go back to the attribute table, right click the field “Area” and select “Calculate Geometry”. When you see a pop-up message, hit “Yes”. In the “Calculate Geometry” window, change the property to “Area” and Units to squared feet (Figure 2). Click “OK”. Now, your area has been computed (Figure 3).

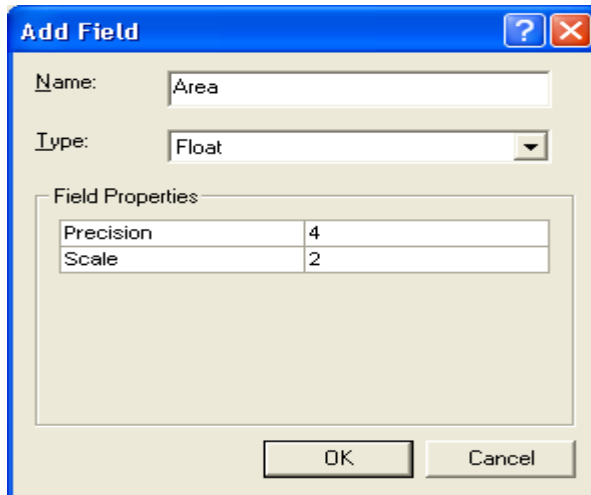


Figure 1

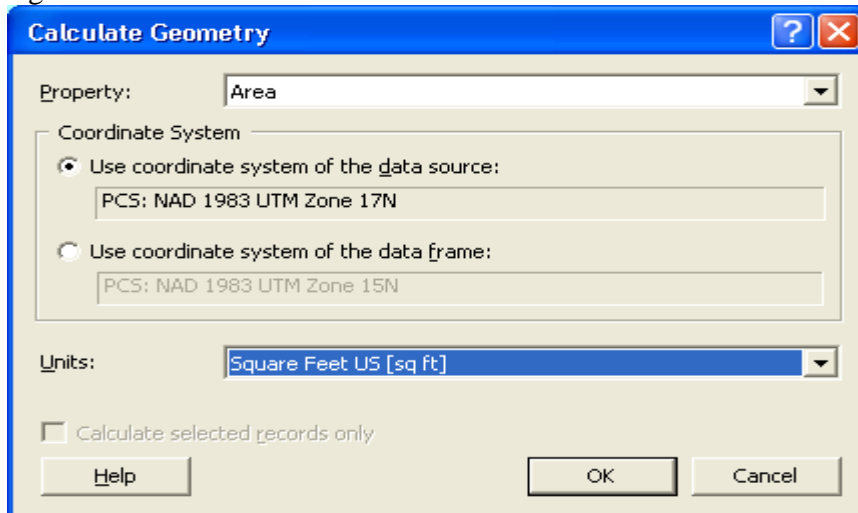


Figure 2

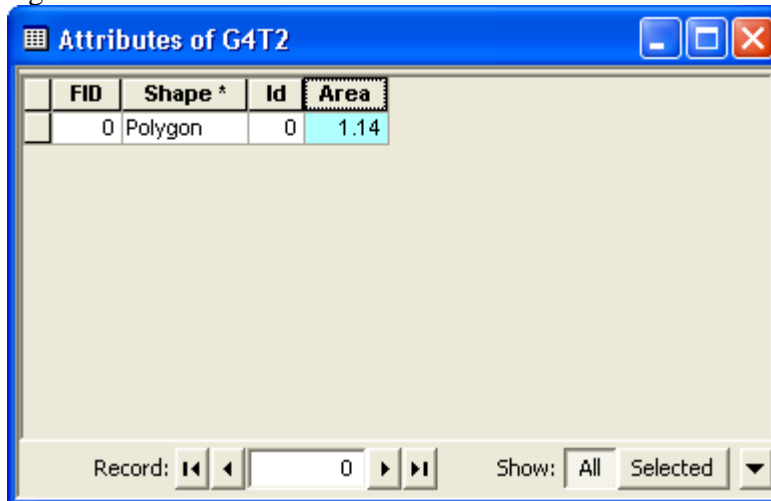


Figure 3

- (b) Similarly, to get the total trail distance, right click the polyline layer, in my case G3t, add a new field “Length” and calculate the length of the trail (Figures 4 and 5). The result will be like Figure 6.

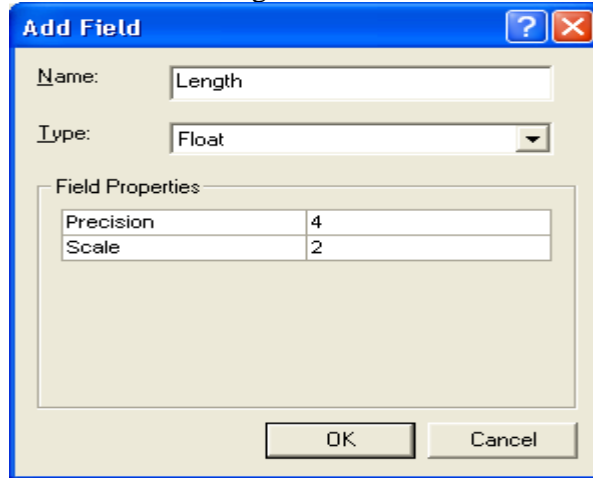


Figure 4

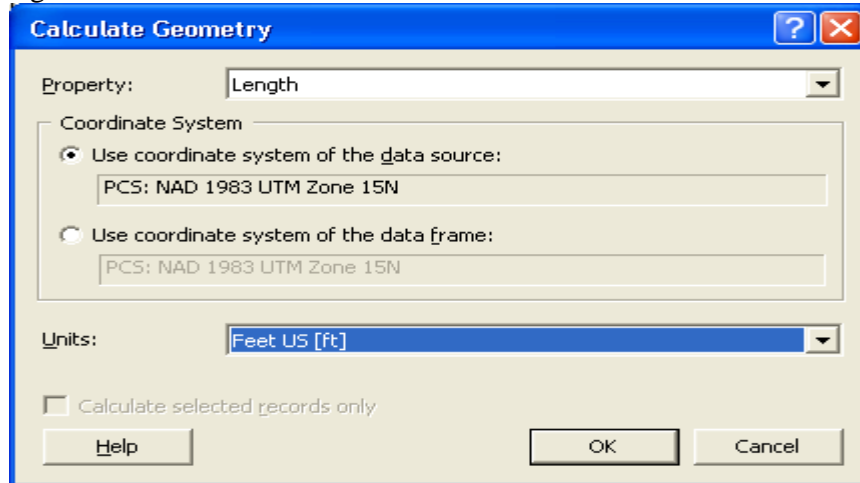


Figure 5

MODEL	FILENAME	LTIME	Length
eTrex LegendCx		1989/1 2/30 18:59:59	0.07
eTrex LegendCx		1989/1 2/30 18:59:59	3.06

Figure 6

- (c) To get the total points within a polygon, select “Selection” on the top ribbon and then select “Select by Location”. In the pop-up window, select all the points displayed in ArcMap, in my case, G5p, G4p, and G2p, “are within”, and “G4T2” layer to complete the spatial query (Figure 7). The results are displayed in Figure 8.

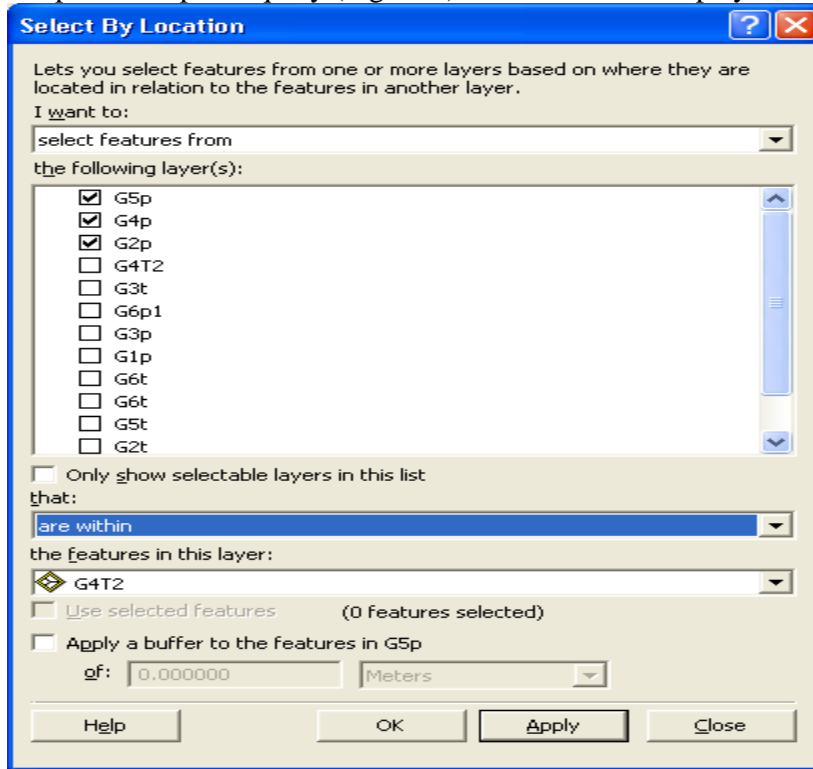


Figure 7

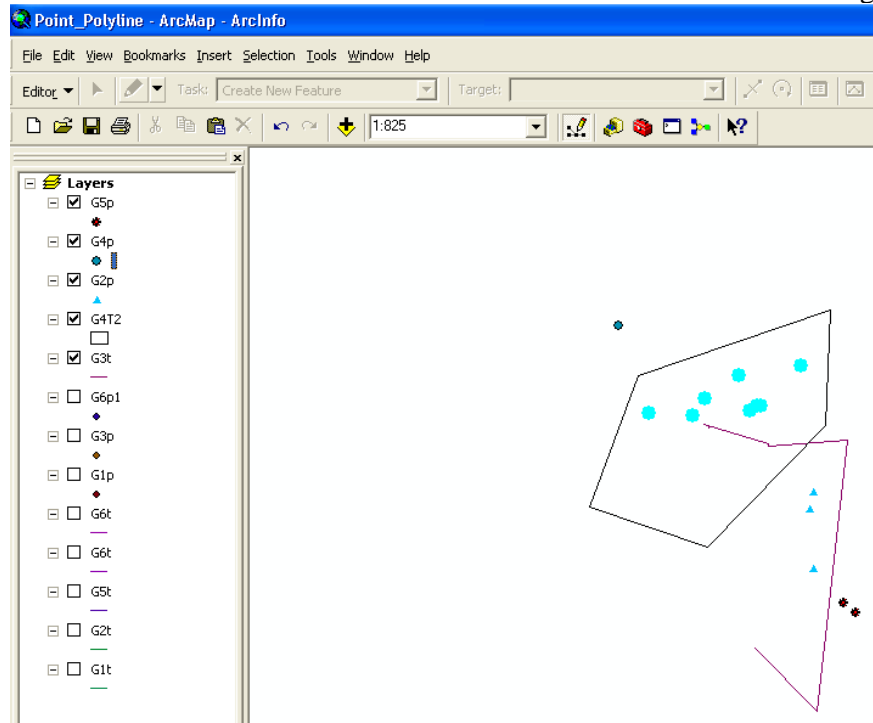


Figure 8

- (d) Similarly, to get the points within 10 feet of your trail, select “Selection”->”Select By Location”. Select the points in G5p, G4p, and G2p, “are within a distance of”, and “G3T”. Your results will be like Figure 9.

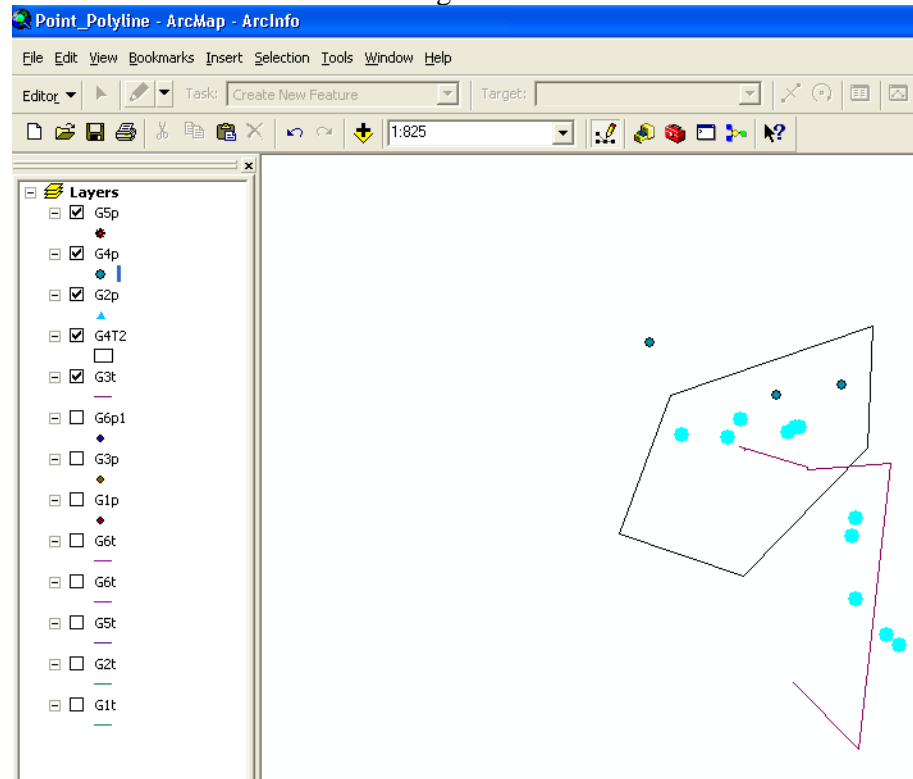


Figure 9

4. Click the “View” menu on the top ribbon and then “Layout View”. Now it is time to add map elements to your map.
5. Click the “insert” menu on the top ribbon and add all the necessary elements of a map such as “**Title**”, “**Legend**”, “**North Arrow**”, and “**Scale Bar**”. Arrange the position of the elements to make a nice map.
6. When you finish your map layout, click **File -> Export Map**, you can save your map in the format of .jpg, .gif, .tif, etc. Save you file to your own folder and print it out. Everyone should hand in a printed map together with your report. A black and white map is ok for this lab.

Part II

In this part, you will use real spatial data to create a map.

1. Download the spatial data from the course website in lab 9. Press the “Add Data” button to add all the spatial data in ArcMap. In the downloaded folder, you will see:
 - FTBIII-2 landing.shp - Existing landing area;
 - Haulroad.shp - Existing haul road;
 - Preston roads.shp - County roads;
 - Preston.tif - Topographic map.

2. Right click “FTBIII-2 landing.shp” and select “Zoom to layer”. Zoom out the layer and move the map to right until you can see the Preston roads and the existing haul roads (Figure 10).

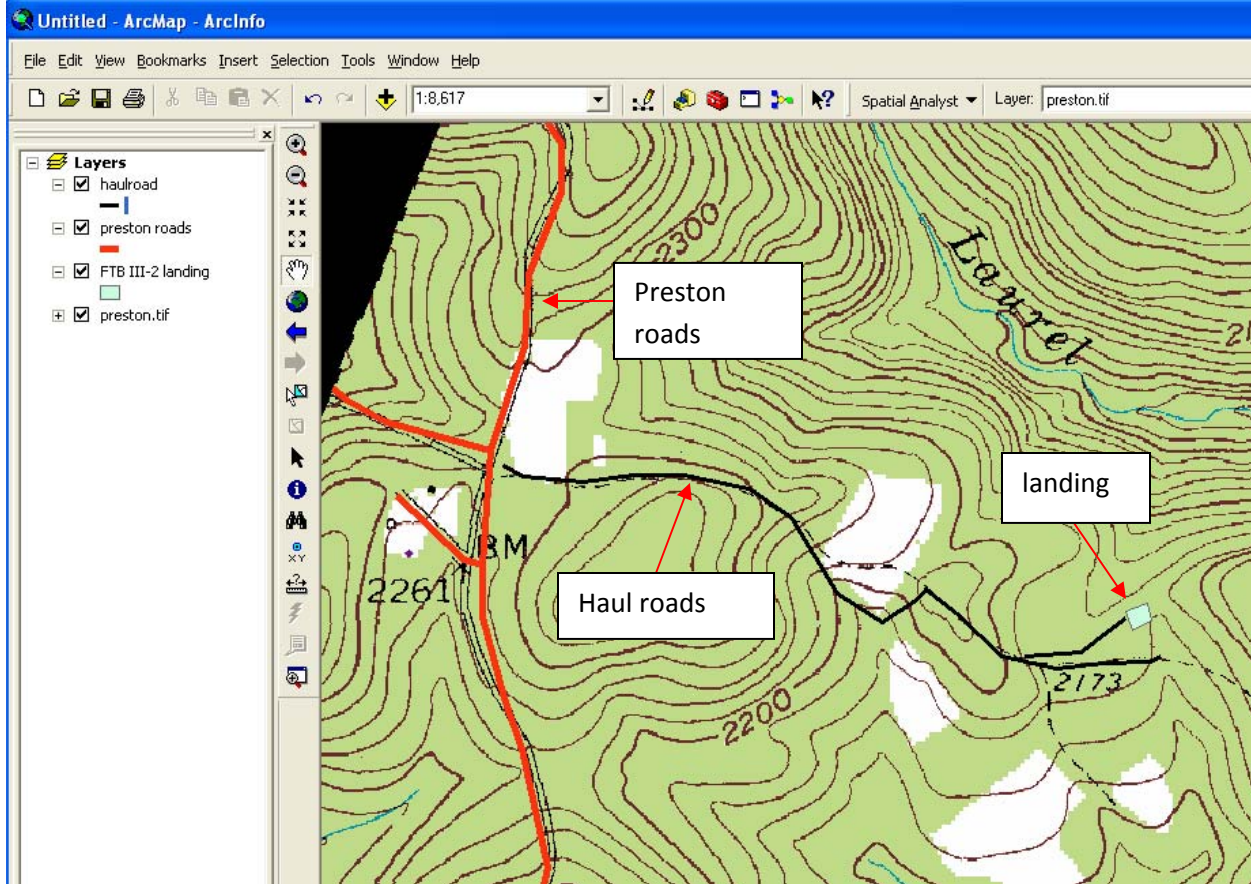


Figure 10

3. Calculate the length of the haul road the landing area based on the instructions on Part I.
4. Create a map which should include the Preston county road, haul road, landing, and the topographic file.

Please provide me a typed summary report that should address your experience of GIS data manipulation. Two maps are required for this lab, one for the tree locations and trail profile, the other is based on the real spatial data in Part II. Please attach the two maps to your report by the beginning of our lab next week.