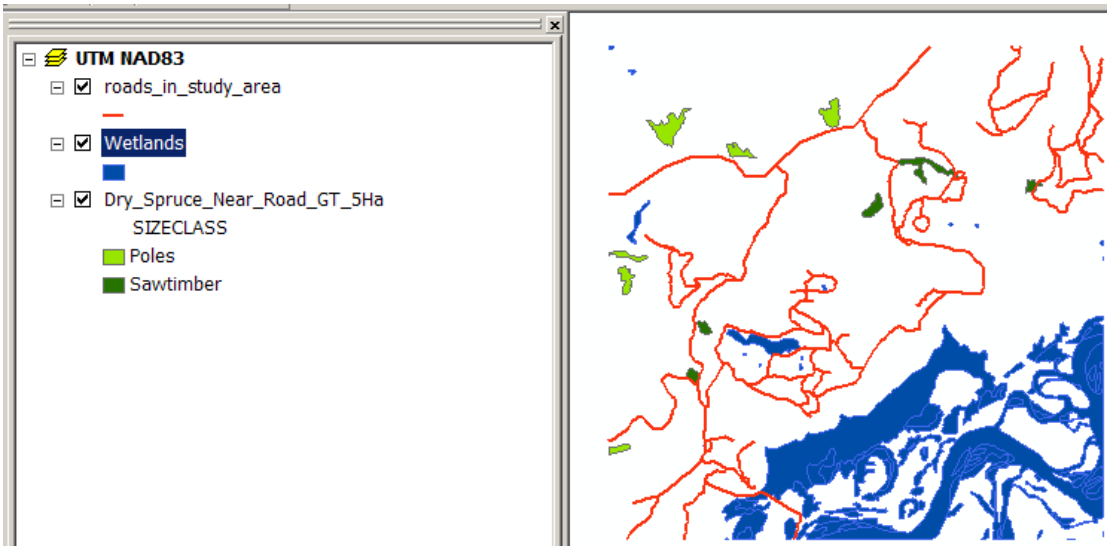
Feature Analysis

In this lab you will create a map of all spruce sawtimber or pole stands with an area greater than 5 hectares that are

- Within 1000 meters of an existing road
- At least 100 meters away from any wetland

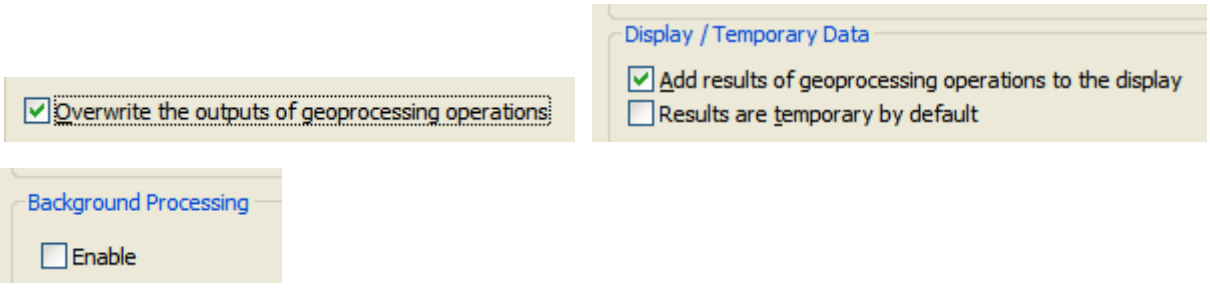


Download the and unzip ***Lab11_feature_analysis. zip*** from :

http://dverbyla.net/nrm338/data/

There are three feature classes in this geodatabase ***veg_polys*** and ***study_area*** in UTM coordinates, and ***roads*** in longitude, latitude (recorded using a GPS).

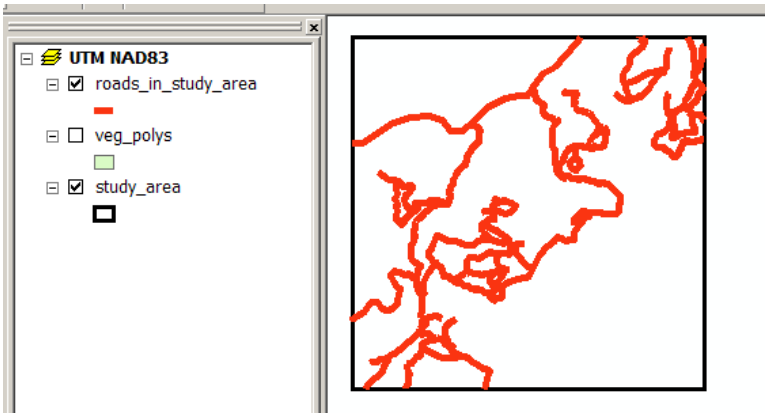
First make sure your output from Geoprocessing can overwrite existing data,output is automatically added to your Arcmap data frame, and geoprocessing is not in the background. ***Geoprocessing Menu--->Options…***



Also specify your home workspace by saving your Arcmap document to your folder.

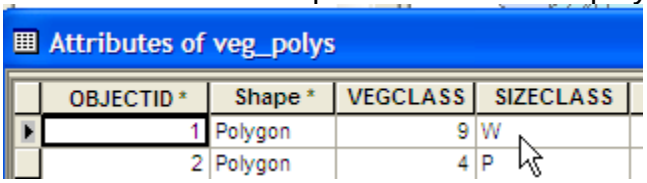
Step 1) Project your roads features from Geographic NAD83 to UTM NAD83.

Step 2) Clip roads inside study area polygon. The extent of the roads layer is about 100km…from Fairbanks to Nenana, yet we are interested only in the area bounded by the study area polygon. Use the ***clip tool*** to cut out the roads inside that polygon. Then remove your larger extent roads layer from your data frame.



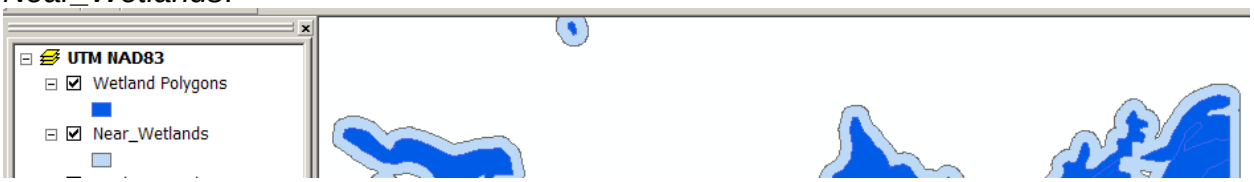
Step 3) Determine area within 1km of a road. Use the ***Buffer tool*** to create a new polygon layer of all areas within 1000 meters of any road. ***Dissolve*** your buffer polygons and name your output ***Near_Road***.

Step 4) Determine the area near wetlands. . In your ***veg_polys*** feature class, SIZECLASS of "W" represents a wetland polygon.



Copy and paste your veg_polys layer in your data frame. Then change the duplicate layer properties: name to *Wetland Polygons*, definition query for W SIZECLASS, polygon color to blue.

Next use the ***Buffer tool*** to create a new polygon layer of all areas within 100m of any wetland, dissolving the output buffers, and naming the output polygon layer *Near_Wetlands*.



Use your measure tool to visually check that the buffers are indeed 100 meter from wetlands.

Step 5) Create a layer of sawtimber/pole spruce polygons. The *veg_polys* feature class has a field named *vegclass* (spruce is vegclass of 4 and a field named *sizeclass* (S for sawtimber, P for poles).

Use the ***frequency*** tool to create a table of vegclass and size class in each veg class.

Attributes of veg_polys_Frequency

OID	FREQUENCY	VEGCLASS	SIZECLASS
11	17	3	R
12	29	3	S
13	17	4	B
14	5	4	D
15	18	4	P
16	36	4	R
17	28	4	S
18	1	5	B
19	41	5	W
20	14	6	B
21	7	6	W
22	16	7	W

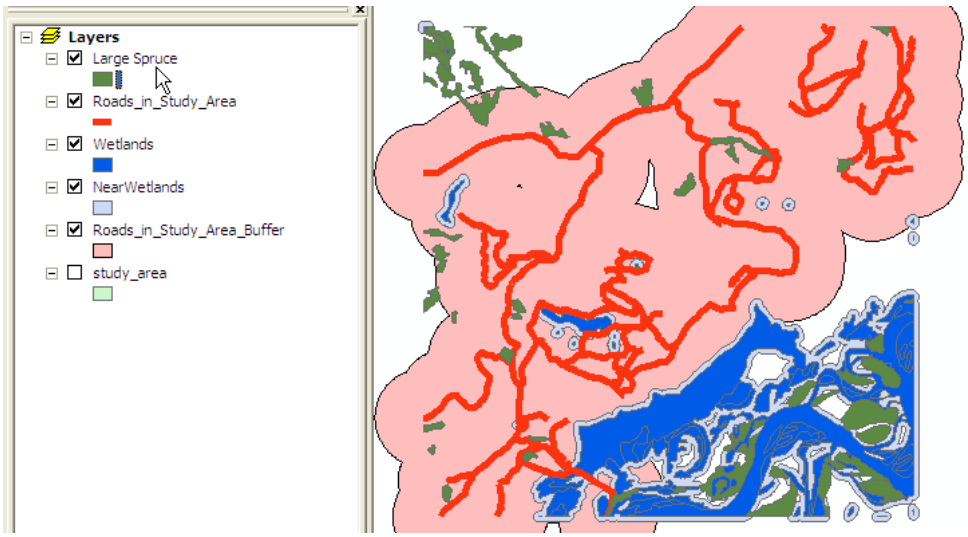
Notice that there are 18+28 = 46 polygons that are spruce and pole or sawtimber size.

Use a definition query to create a layer of spruce polygons with a sawtimber or pole size class. (*"SIZECLASS" in ('P', 'S')) AND ("VEGCLASS" = 4)*
Name this layer *Large_Spruce*. ***You should have 46 polygons*** that meet these criteria.

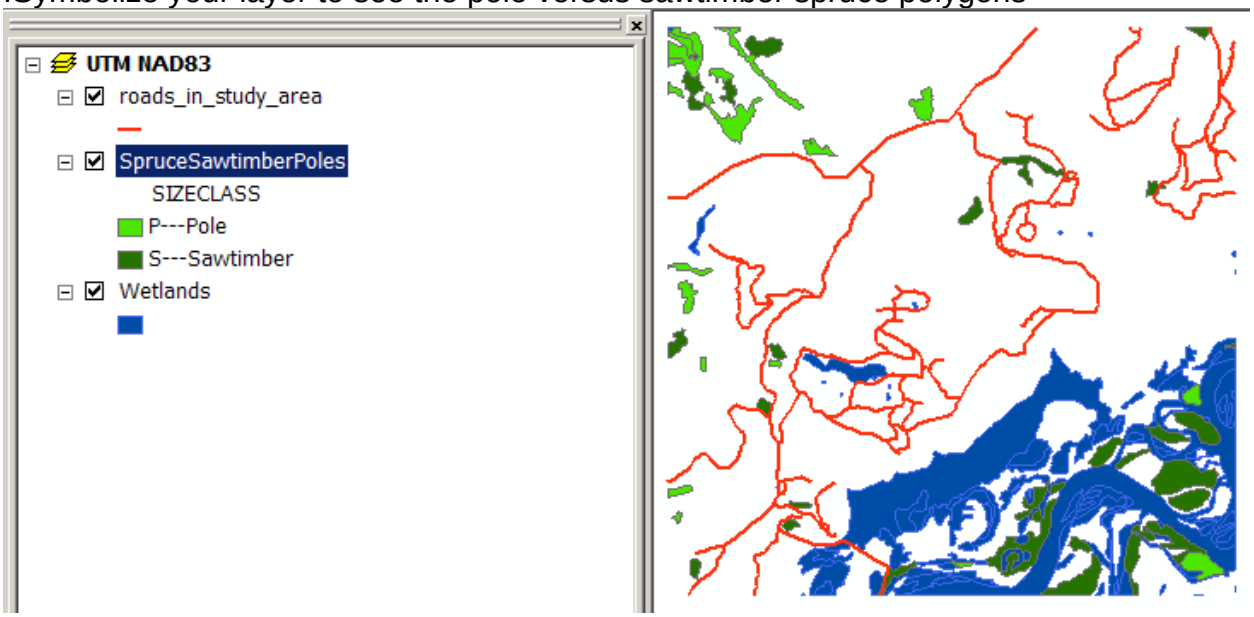
Attributes of Large Spruce

OBJECTID *	Shape *	VEGCLASS	SIZECLASS	Shape_Length	Shape_Area
2	Polygon	4	P	4230.669341	257637.089789
6	Polygon	4	P	5002.482504	199661.186713
30	Polygon	4	S	1021.708266	40384.995049
34	Polygon	4	P	1488.86797	63403.796888
38	Polygon	4	S	1786.46192	161925.295344
47	Polygon	4	P	757.053598	23342.748504
52	Polygon	4	P	1295.571513	64061.408398

Record: 1 Show: All Selected Records (0 out of 46 Selected)

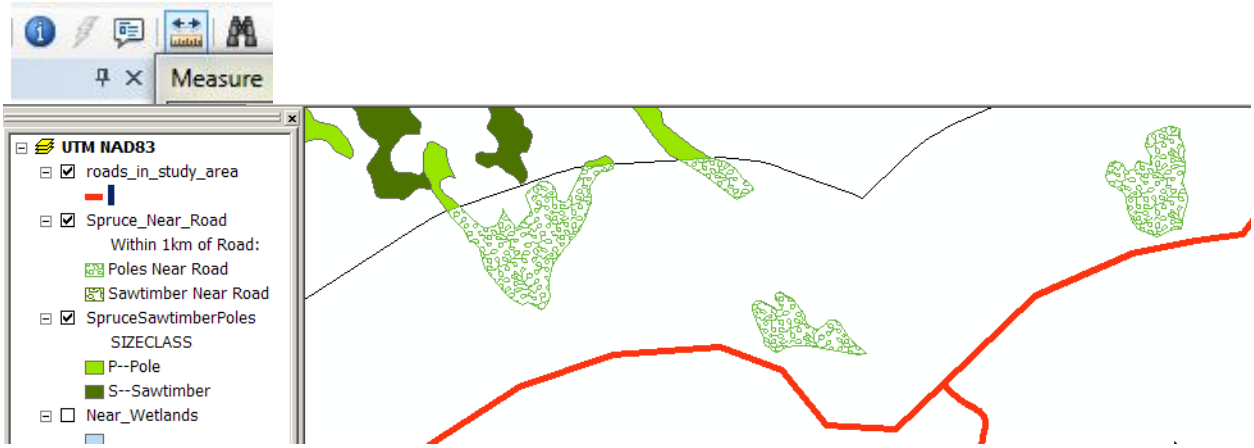


.Symbolize your layer to see the pole versus sawtimber spruce polygons

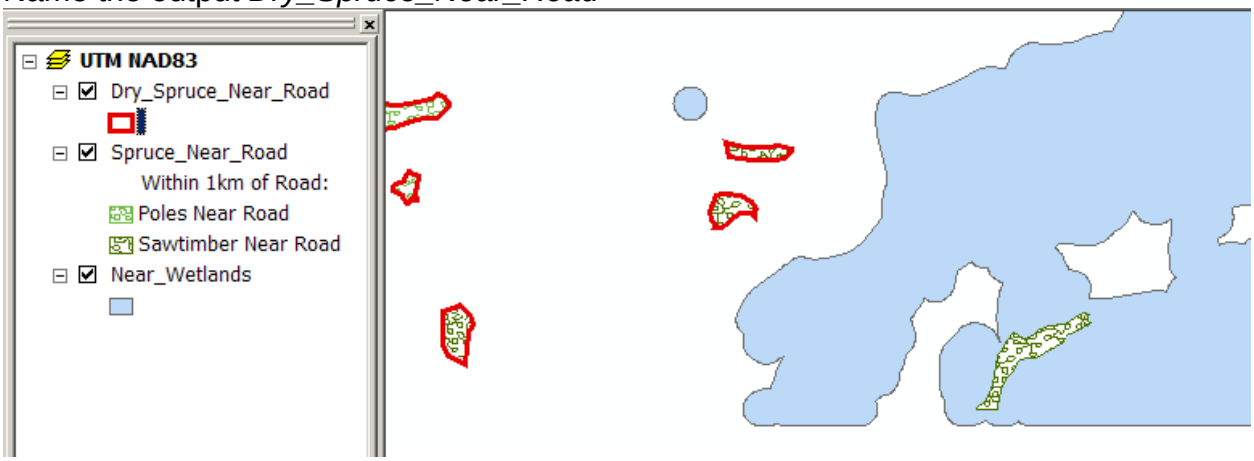


Step 6) Find spruce sawtimber/pole areas close enough to a road. Use your ***Clip*** tool to cut out the spruce sawtimber/pole polygons that are within 1km of a road. Name your clip output *Spruce_Near_Road*.

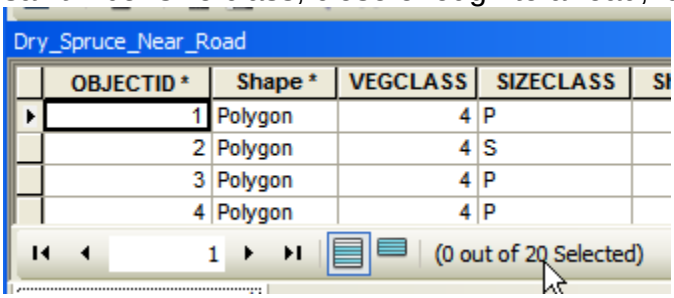
Use your measure tool to visually check that the output polygons are indeed 1000 meter or less to a road.



Step 7) Erase any areas too close to a wetland polygon. Use the ***Erase*** tool with your wetlands buffer to eliminate any area that are within 100 meters of a wetland. Name the output *Dry_Spruce_Near_Road*



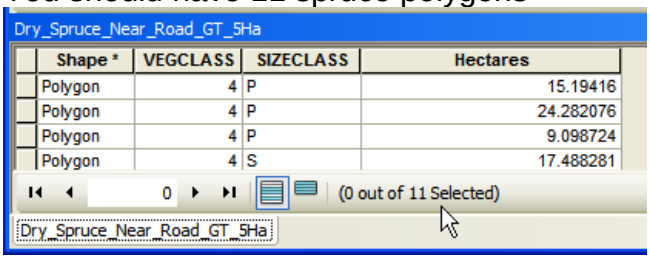
At this point you should have 20 polygons that meet your criteria as spruce, pole or sawtimber size class, close enough to a road, far enough away from a wetland.



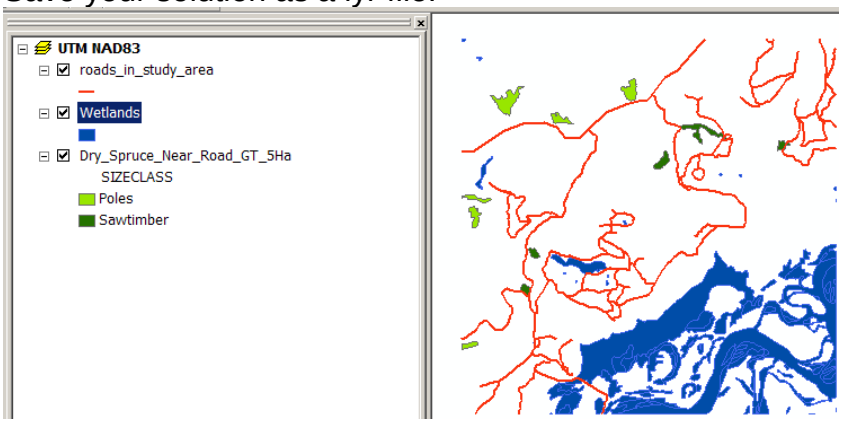
Step 8) Determine polygons that meet area criteria. Our area criteria is polygons that are greater 5 hectares in area. The coordinate system in the UTM_NAD83 feature dataset is in meters, so the area of each polygon feature class is automatically added as Shape_Area field in m^2. There are 10,000 m^2 in a hectare. So add a field for hectares and calculate geometry and select the unit of hectares.

Define your polygons with the area size criteria of hectares greater than 5. Name this layer *Dry_Spruce_Near_Road_GT_5Ha*

You should have 11 spruce polygons



Save your solution as a lyr file.



How many total hectares by size class? Use the ***Frequency or Summary Statistics tool*** to create a table by size class.

SIZECLASS	FREQUENCY	SUM_HA
P	6	70.48
S	5	42.97

How will the answer change if the away from wetlands constraint is 200 meters and the near road constraint is within 100 meters, and there is no minimum area constraint on the spruce polygons?

SIZECL	FREQUENCY	SUM_
P	3	0.70
S	8	15.26