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GIS 5572
Ex 3

This exercise is to summarize land cover categories for Lake County in Minnesota, and create four different tables. First two tables show the relationship of the land cover categories with elevation. The 3rd and 4th tables show the relationship of the land cover categories with the distance from the railroads. I used ArcMap and Microsoft Excel to complete this assignment.
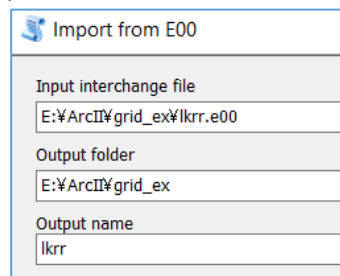This took me about 5 hours to complete including writing this document.

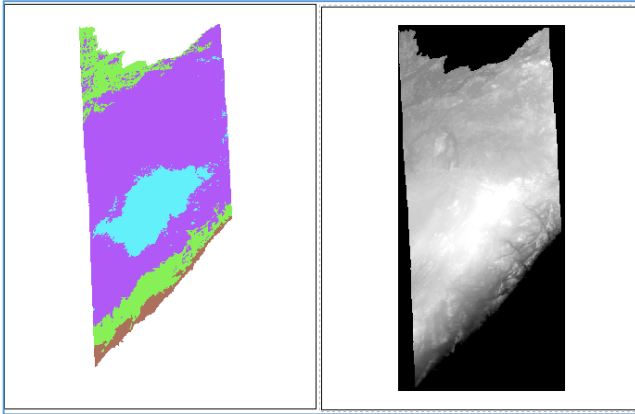**Work Flow**
To Create Table 1,2
1. Define Projection for two raster data. Use the projection which came with the data.
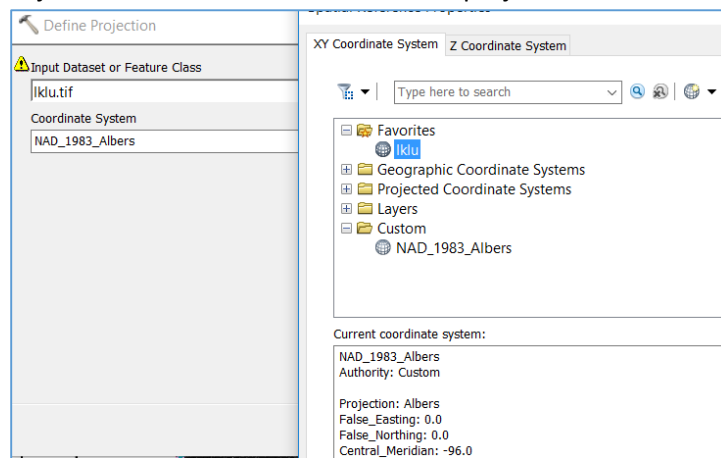
2. Use "import from E00 tool" to obtain railroad layer

3. Reclassify two raster data.
    a. By using "reclassify" tool, reclassify dem raster.
        i. 1 – 1000 ft → 1
        ii. 1001 – 1400 ft → 2
        iii. 1401 – 1800 ft → 3
        iv. 1801 – 2200 ft → 4
        v. 0 → NoData
   vi. NoData → NoData

Right is the reclassified dem, Left is the original dem

b. Reclassify landcover raster. Shrubland and Non-Natural Woody is not in this land cover raster, but I added in the reclassification. (this won't change the result)
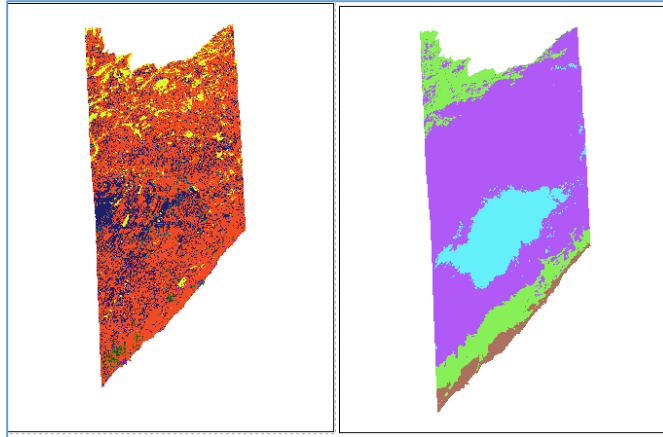
    i. 11 – 12 → 1
    ii. 21 – 23 → 2
    iii. 31 – 33 → 3
    iv. 41 – 43 → 4
    v. 51 → 5
    vi. 61 → 6
    vii. 71 → 7
    viii. 81 – 85 → 8
    ix. 91 – 92 → 9
    x. NoData → NoData
    xi. 0 → NoData

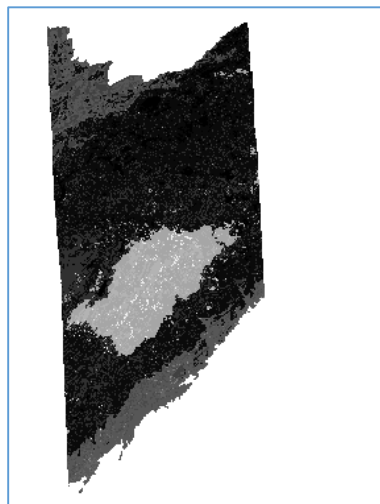c. Add Type column to the attribute table
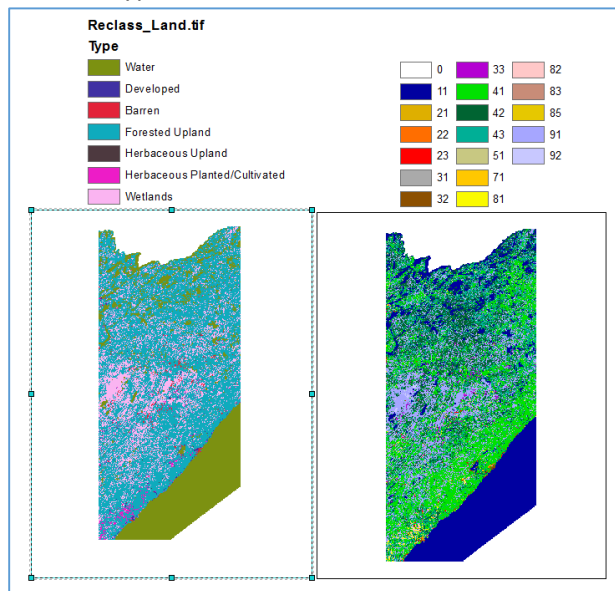
L) Reclassified Land cover, R) Original

4. Use Extract by Mask to overlay the land cover raster to DEM raster

L) LandCover, R) DEM

5. Use "Combine" tool to create a unique combination

Rowid	VALUE	COUNT	LANDCOVERMASK	RECLASS_DEM
0	1	321045	1	3
1	2	2915762	4	3
2	3	25868	8	3
3	4	6026	7	3
4	5	992398	9	3
5	6	197193	1	2
6	7	155796	9	2
7	8	684523	4	2
8	9	32131	8	2
9	10	2491	7	2
10	11	7298	3	2
11	12	6463	2	2
12	13	31589	3	3
13	14	591076	4	4
14	15	288466	9	4
15	16	15399	8	4
16	17	11543	1	4
17	18	1403	7	4

6. Export the attribute table to excel and create a table.
    a. Example) Landcover 1, DEM 1 → number of cells which is water and in 1000ft or less area.

To create Table 2,3
7. Export the railroad layer to shp.
8. Use "Raster to Polygon" to make the dem raster to polygon
9. Use "Dissolve" tool to merge all the polygons to 1 polygon
10. Generalize the railroad shp manually.
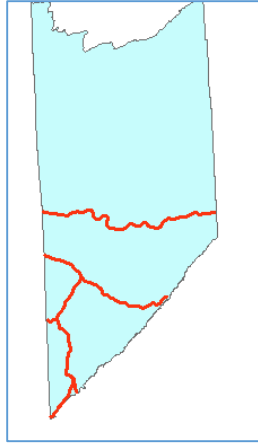
Generalized railroad

11. Create a buffer (Dissolve option = All, Buffer distance = 6 miles)
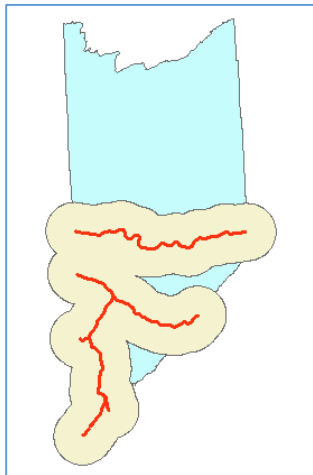
12. Use "Clip" tool to clip the buffer with polygon

The part circled in blue does not have a flat end

13. Manually cut off the rounded part to make the buffer to have a flat end

Manually made the flat end, using editing tool.

14. Use Extract by Mask to get the Pixel Value of Close to RR area.

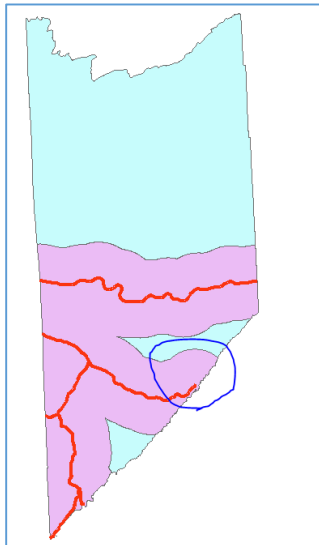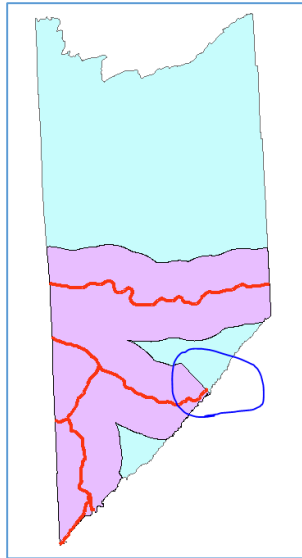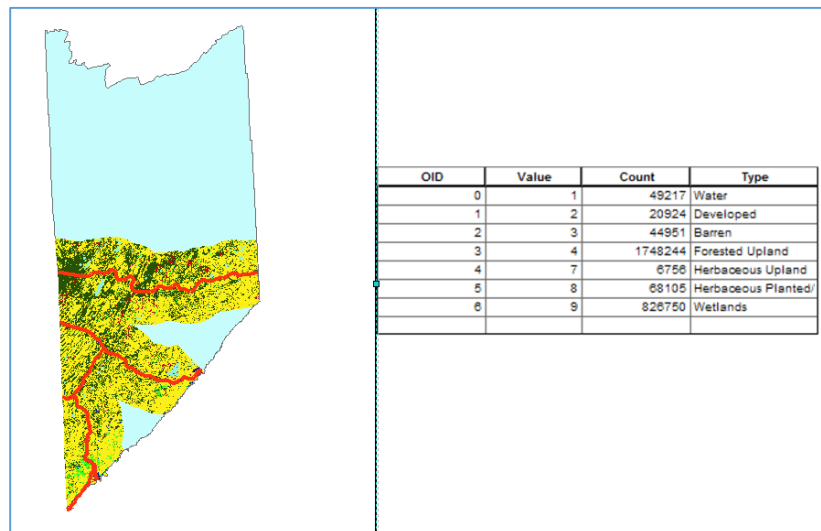| OID	Value	Count	Type
0	1	49217	Water
1	2	20924	Developed
2	3	44951	Barren
3	4	1748244	Forested Upland
4	7	6756	Herbaceous Upland
5	8	68105	Herbaceous Planted/
6	9	826750	Wetlands

15. Join the raster created in step 14 with the whole Land Cover raster which was created in step 4

Table

6milesCloser.tif

6milesCloser.tif.	6milesCloser.ti	6milesCloser.tif.	6milesCloser.tif.vat.	LandCoverm	LandCovermask.tif.v	LandCovermas	LandCovermask.tif.vat.
0	1	49217	Water	0	1	530608	Water
1	2	20924	Developed	1	2	26938	Developed
2	3	44951	Barren	2	3	75800	Barren
3	4	1748244	Forested Upland	3	4	4399747	Forested Upland
4	7	6756	Herbaceous Upland	4	7	10761	Herbaceous Upland
5	8	68105	Herbaceous Planted/	5	8	91517	Herbaceous Planted/Cult
6	9	826750	Wetlands	6	9	1447805	Wetlands

16. Export the joined attribute table to excel
17. Create the table

Table 1, 2

Land Use	1000 ft and less		1001 - 1400		1401 -1800		1801 -2200		Totals	
Water	827	0.321%	197193	18.159%	321045	7.470%	11543	1.225%	530608	8.060%
Developed	13121	5.099%	6463	0.595%	5220	0.121%	2134	0.227%	26938	0.409%
Barren	4861	1.889%	7298	0.672%	31589	0.735%	32052	3.402%	75800	1.151%
Forested Upland	208386	80.990%	684523	63.038%	2915762	67.841%	591076	62.742%	4399747	66.833%
Herbaceous Upland	841	0.327%	2491	0.229%	6026	0.140%	1403	0.149%	10761	0.163%
Herbaceous Planted/ Cultivated	18119	7.042%	32131	2.959%	25868	0.602%	15399	1.635%	91517	1.390%
Wetlands	11145	4.332%	155796	14.347%	992398	23.090%	288466	30.620%	1447805	21.993%
Totals	257300	100.000%	1085895	100.000%	4297908	100.000%	942073	100.000%	6583176	100.000%

Land Use	1000 ft and less		1001 - 1400		1401 -1800		1801 -2200		Totals	
Water	827	0.156%	197193	37.164%	321045	60.505%	11543	2.175%	530608	100.000%
Developed	13121	48.708%	6463	23.992%	5220	19.378%	2134	7.922%	26938	100.000%
Barren	4861	6.413%	7298	9.628%	31589	41.674%	32052	42.285%	75800	100.000%
Forested Upland	208386	4.736%	684523	15.558%	2915762	66.271%	591076	13.434%	4399747	100.000%
Herbaceous Upland	841	7.815%	2491	23.148%	6026	55.999%	1403	13.038%	10761	100.000%
Herbaceous Planted/ Cultivated	18119	19.799%	32131	35.109%	25868	28.266%	15399	16.826%	91517	100.000%
Wetlands	11145	0.770%	155796	10.761%	992398	68.545%	288466	19.924%	1447805	100.000%
Totals	257300	3.908%	1085895	16.495%	4297908	65.286%	942073	14.310%	6583176	100.000%

Table 3, 4

Land Use	Close to RR		Far from RR		Totals	
Water	49217	1.780%	481391	12.608%	530608	8.060%
Developed	20924	0.757%	6014	0.158%	26938	0.409%
Barren	44951	1.626%	30849	0.808%	75800	1.151%
Forested Upland	1748244	63.229%	2651503	69.443%	4399747	66.833%
Herbaceous Upland	6756	0.244%	4005	0.105%	10761	0.163%
Herbaceous Planted/Cultivated	68105	2.463%	23412	0.613%	91517	1.390%
Wetlands	826750	29.901%	621055	16.266%	1447805	21.993%
Totals	2764947	100.000%	3818229	100.000%	6583176	100.000%

Land Use	Close to RR		Far from RR		Totals	
Water	49217	9.276%	481391	90.724%	530608	100.000%
Developed	20924	77.675%	6014	22.325%	26938	100.000%
Barren	44951	59.302%	30849	40.698%	75800	100.000%
Forested Upland	1748244	39.735%	2651503	60.265%	4399747	100.000%
Herbaceous Upland	6756	62.782%	4005	37.218%	10761	100.000%
Herbaceous Planted/Cultivated	68105	74.418%	23412	25.582%	91517	100.000%
Wetlands	826750	57.104%	621055	42.896%	1447805	100.000%
Totals	2764947	42.000%	3818229	58.000%	6583176	100.000%