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GEOG 342, Tue 6-9:30P

Fall 2017

Remote Sensing Final Project

Project Summary:

A comparison of land cover using 2003 and 2014 imagery in the rural Elk Grove area. Current City policies state that this area is to be preserved. The area is approximately 5,000 acres.

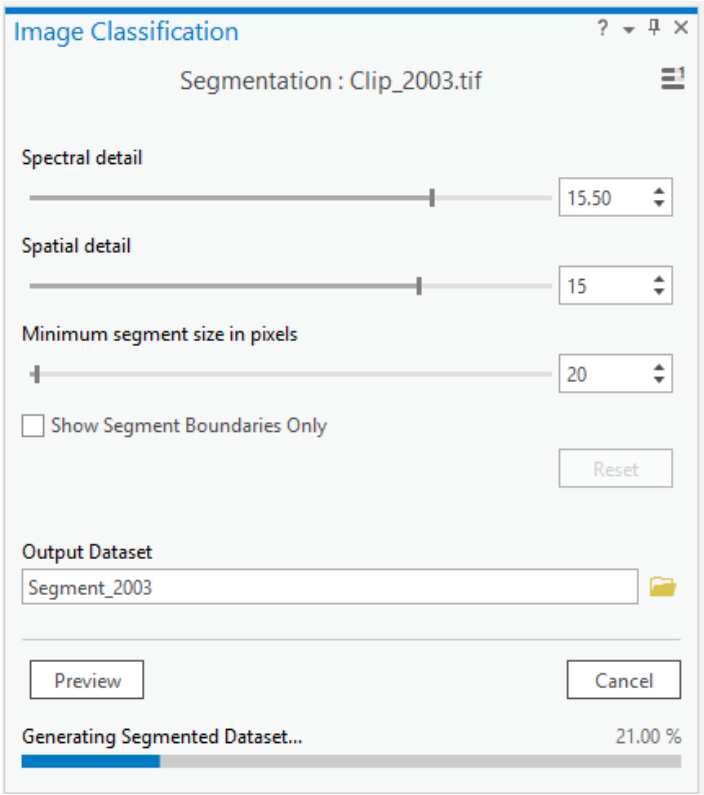
Purpose:

To conduct a land cover type change using 2003 imagery (3 bands) and 2014 imagery (4 bands) for the Sheldon Area (rural area) of Elk Grove. To see how much of the rural area was developed between 2003 and 2014.

Description of the image processing tasks and methods used to create the output(s):

I used the boundary of the rural Elk Grove area to clip the two images. I exported the images using the nearest neighbor sampling as a tif file. Then I used the Segmentation tool to segment the images into spectrally & spatially similar areas. Then I used the image classification wizard in ArcPro to conduct a supervised classification for each image. On both images I used two sample categories: developed and undeveloped. I chose many samples by drawing a polygon for each category.

2003 Imagery (Segmented):



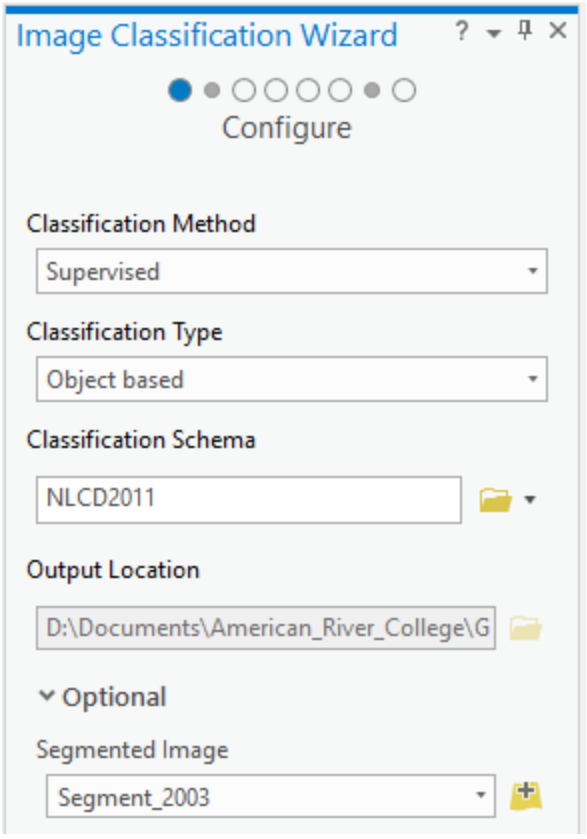
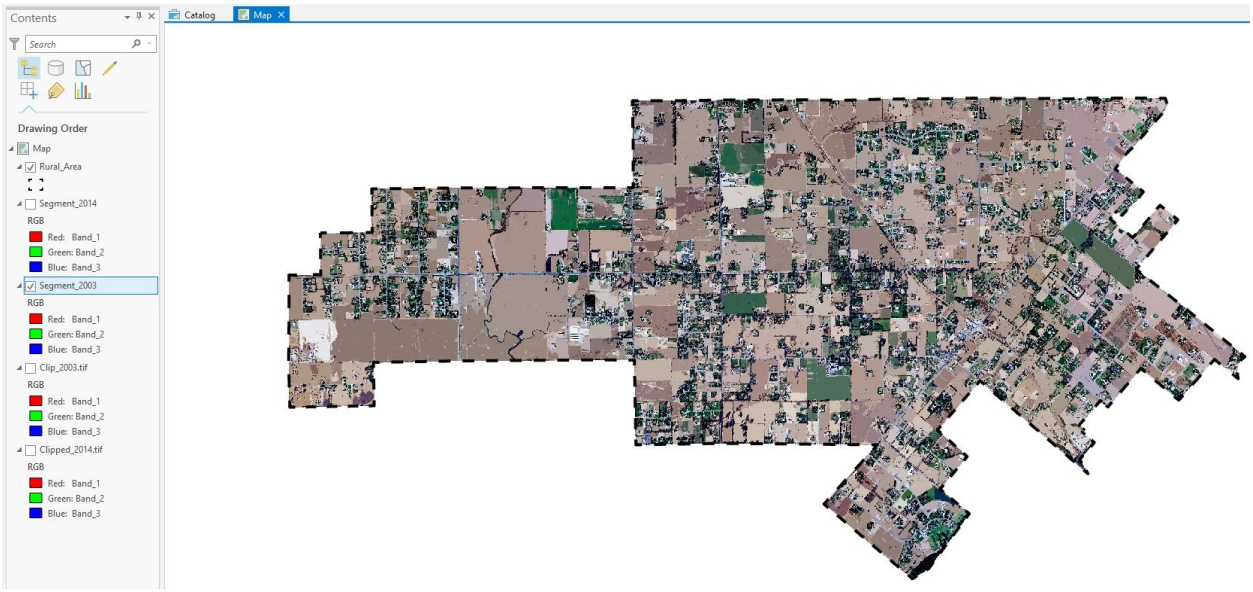
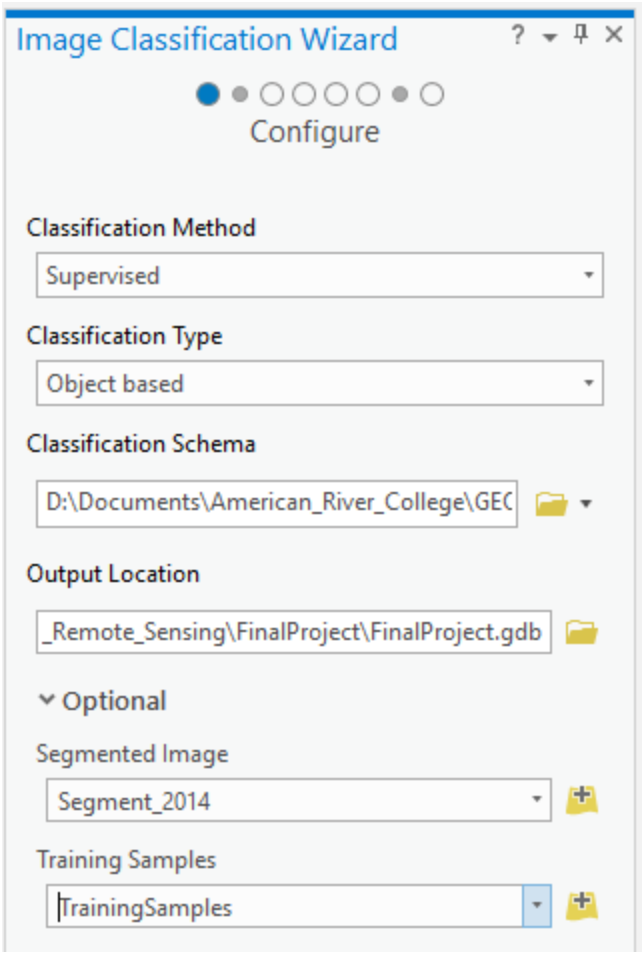


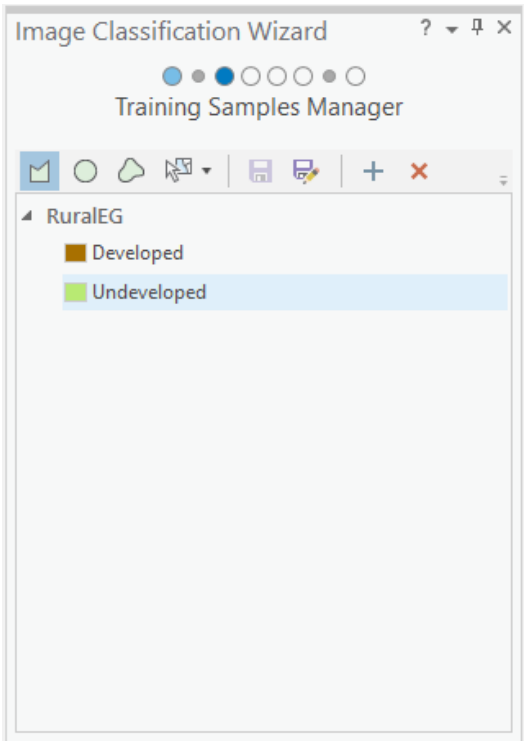
Image Classification Wizard
Configure
Classification Method
Supervised
Classification Type
Object based
Classification Schema
NLCD2011
Output Location
D:\Documents\American_River_College\G
Optional
Segmented Image
Segment_2003

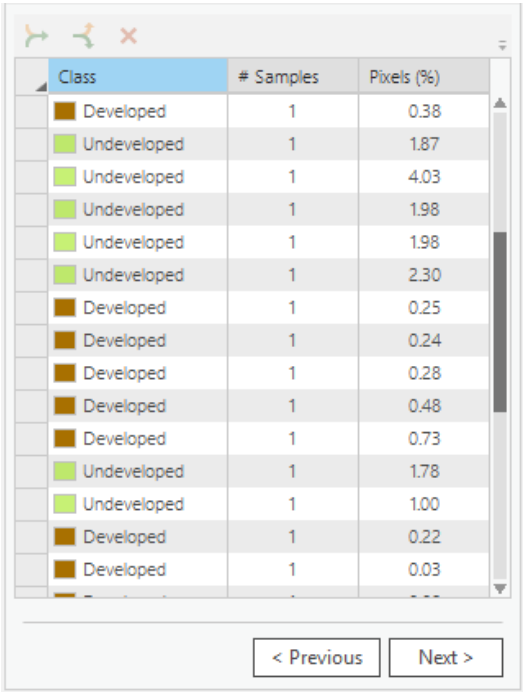

Contents
Search
Drawing Order
Map
Rural_Area
Segment_2014
RGB
Red: Band_1
Green: Band_2
Blue: Band_3
Segment_2003
RGB
Red: Band_1
Green: Band_2
Blue: Band_3
Clip_2003.tif
RGB
Red: Band_1
Green: Band_2
Blue: Band_3
Clipped_2014.tif
RGB
Red: Band_1
Green: Band_2
Blue: Band_3
Catalog
Map

2014 Imagery (Segmented):



Training Sample Manager:





Discussion of any difficulties/issues encountered and how you resolved them:

Firstly, acquiring the desired imagery at the desired resolution was difficult. I was unable to acquire IR banded images for my area of interest. This made classifying true color difficult. I used reference imagery such as Google Earth and NAIP to supplement.

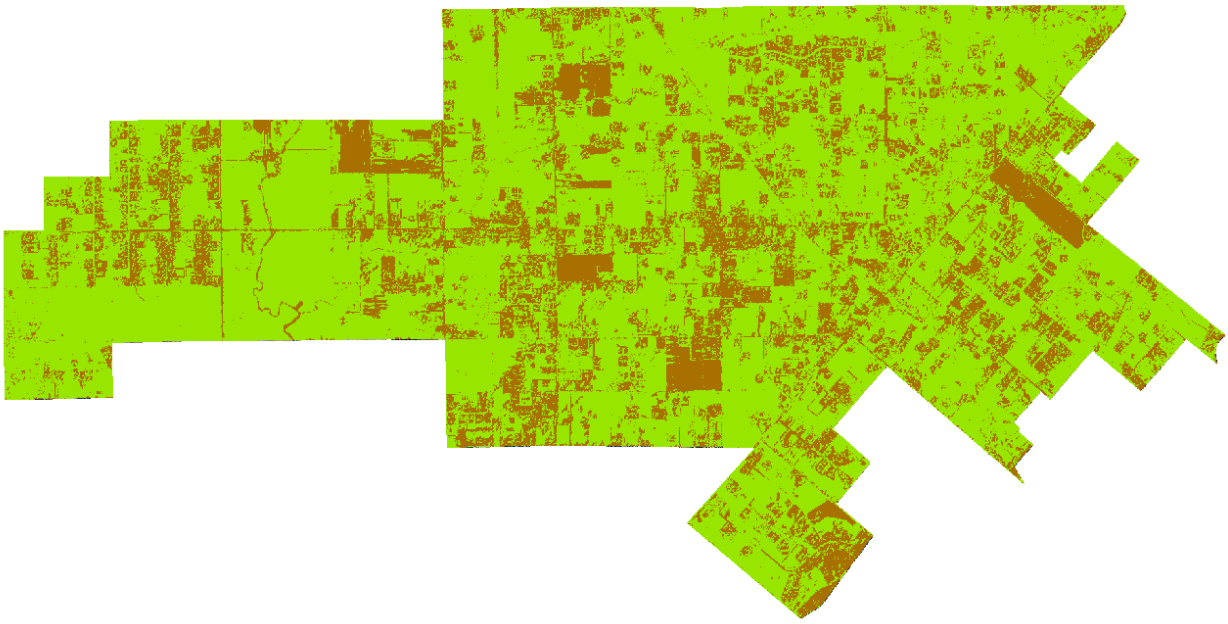
I initially tried to conduct an unsupervised classification method but the tool failed on an “cannot invert covariance matrix…” error. I believe it had something to do with the segmentation part of the process. To get around this I segmented the images first and then conducted a supervised classification method instead. Another difficulty I had was that the segment picker did not work so I had to use the drawing tool to select my samples.

Another issue I encountered was the wait time for segmenting the 2014 imagery. It took about two hours to segment that image while the 2003 imagery took 15 minutes. The 2014 imagery was 9GB while the 2003 imagery was 500MB.

Discussion of the output, the interpretation(s) made on the output and/or intermediate image files:

Through conducting the supervised classification, the 2014 imagery showed a lot of area had been developed since 2003. I believe this is an error, as I chose the same amount of samples for both images. The 2014 imagery is 6inch versus the 2003 imagery being 2FT resolution. I believe the higher resolution imagery required more samples to achieve the desired result. It looked like there was a 40% increase in developed area. However I believe it to be closer to a ten percent change from 2003. In the future I’d like to further re-classify the 2014 imagery and conduct an accuracy assessment.

2003 Imagery (Supervised Classification):



2014 Imagery (Supervised Classification):