Geog 580: Digital Remote Sensing

Lab Assignment 4: Image Classifications

The purpose of this lab assignment is to let you get familiar with techniques for image classifications. In your report, you need to provide required contents and answer questions given at the end of this assignment.

If you have any problem with GeoBrain system, please E-mail Dr. Weiguo Han (whan@gmu.edu, (301)345-3271) and cc to me (ldi@gmu.edu) for technical support. The video demo using the GeoBrain for supervised image classifications is available at http://geobrain.laits.gmu.edu/onasdemo/supererviscdclassification.html

1. Select an area of interests (AOI) and obtain data for your exercise

Please follow the same steps as the previous assignments to select AOI and obtain the data. Please use Landsat ETM or TM images for this assignment and decide yourself how many bands to be used in this assignment.

2. Unsupervised Classification

1) Click *Raster->Classification->Unsupervised*
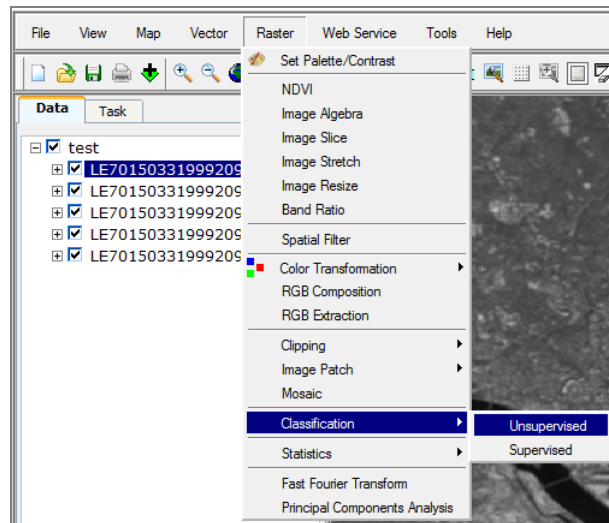
2) Set *Number of Bands* to the bands you want to use in the classification; Select the datasets on the left panel, and click + button to add each band one by one; Set the number of output *Classes* to 6; click *Invoke*;

3) Wait a moment for it to complete; When it is finished, the result URL of unsupervised classification will be shown in the form, click *Add* to add and display it in the project.
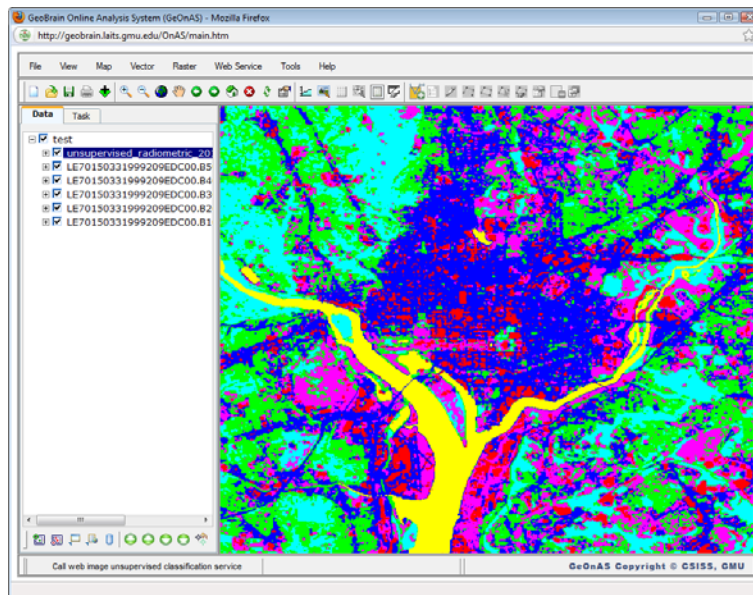

4) Do clustering again for 20 output *Classes*.
5) If only two bands are allowed in the unsupervised classification, please select two bands that you think can generate the best results, and do the unsupervised classification again for 6 and 20 output classes.
6) Do the histograms for 20-class output images from steps 4 and 5.
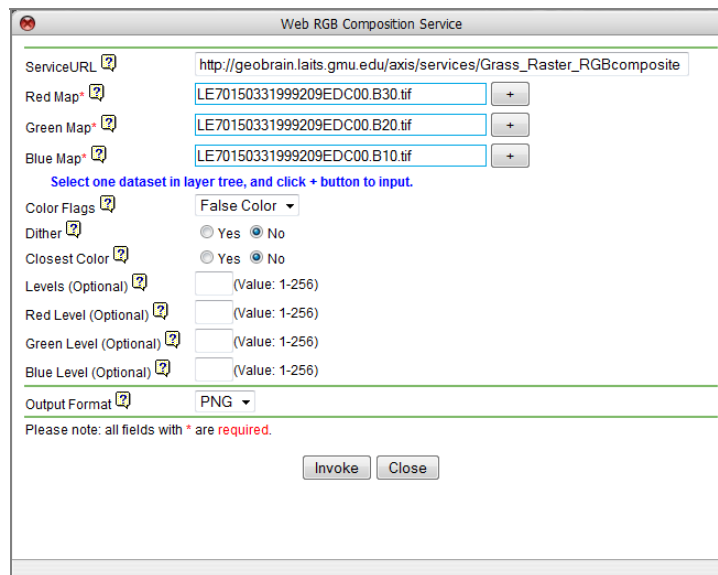
3. Supervised Classification

3.1 Select the training datasets

You can do color composite and select the training datasets from the composite or you can select the training datasets from individual images. The following steps guide you to select training datasets from color composite images.
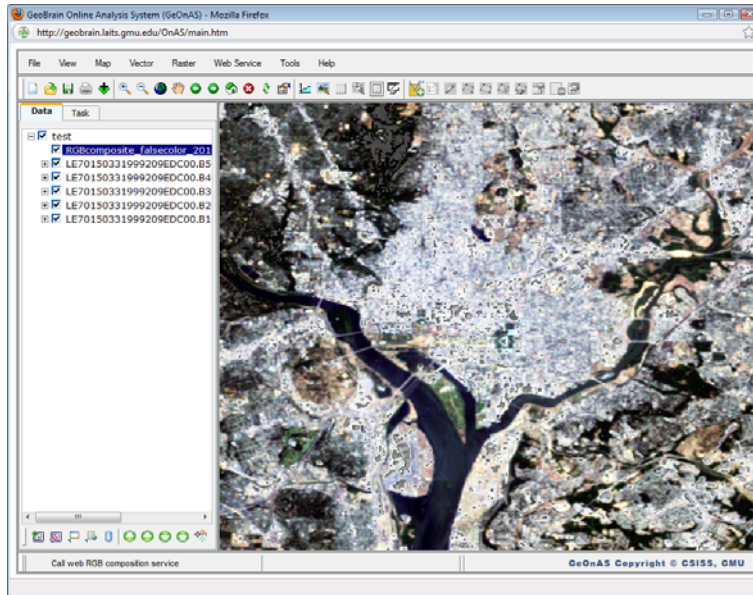
1) Click *Raster->Color Composition*
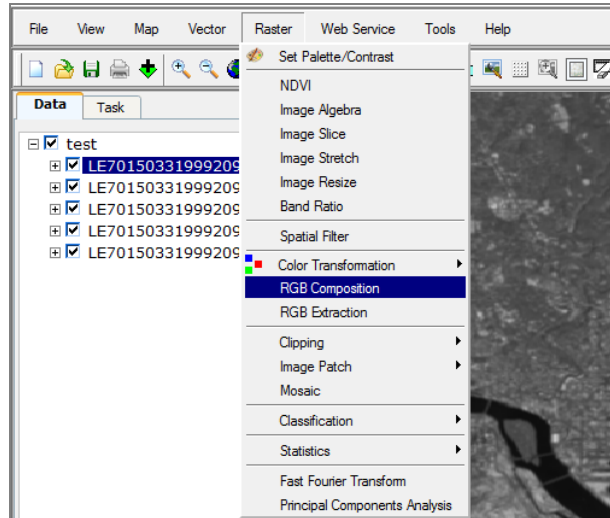
2) Select the datasets on the left panel, and click + button to add band 3 for *Red Map*, band 2 for *Green Map*, and band 1 for *Blue Map*; Select *False Color* as Color Flags; click *Invoke*;

3) Wait a moment for it to complete, when it is finished, the result URL of color composition will be shown in the form, click *Add* to add and display it in the project.

4) Zoom into an area that you can visually identify the ground land cover/use type; Click ⬚ to start screen digitizing, when started, the button is pressed; Click ⬚ to draw a polygon feature in map view, double click the last point to finish this polygon.
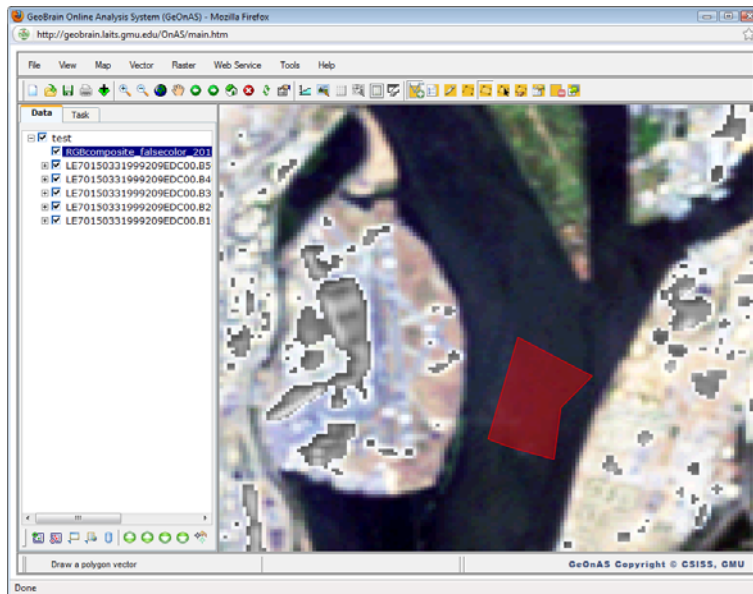
5) Click ⬚ to activate the select control, select the digitized polygon; Click ⬚ to edit its properties, *Label* the ground land use/cover class with a name (e.g., river, building, road, etc), set the *Label ID* to (the class ID, starting from 1. e.g., for river, you give the class id as 1, then road to 2, building to 3, etc), and select a *Color* for the class; Click *Apply* to change the properties of this digitized polygon.

Note: you can have multiple polygons for each class. Please remember that for polygons belonging to the same class, they should be labeled with the same name, ID, and color.

6) Repeat steps 4 and 5 for selecting training datasets for other classes.

7) Zoom to full extent and hide layer of false color composition result; Now you need to rasterize the polygon so that the training datasets can be extracted. Click ![icon] and then Click ![icon] to rasterize these digitized polygon features. When the rasterization is finished, add the result to the project.
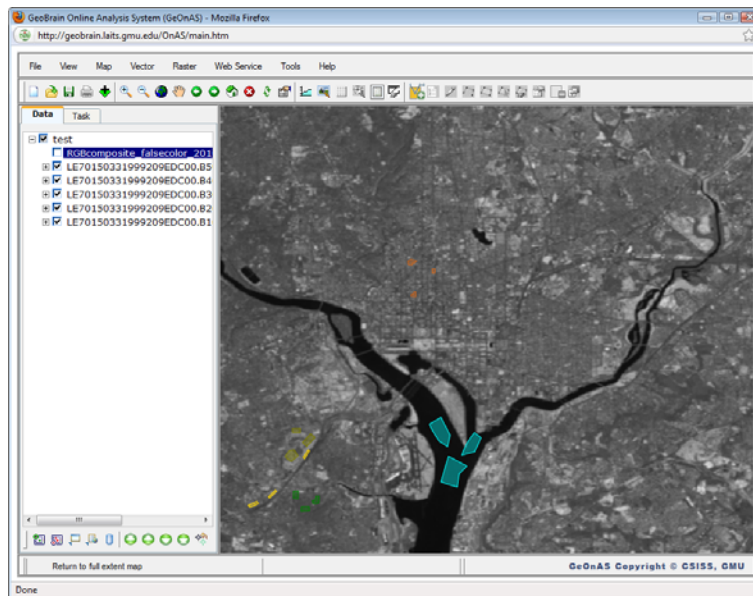
3.2 performing supervised classification
1) Click *Raster->Classification->Supervised*
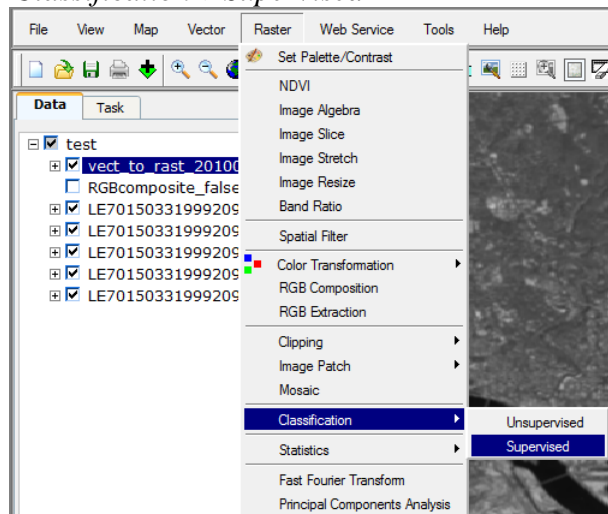
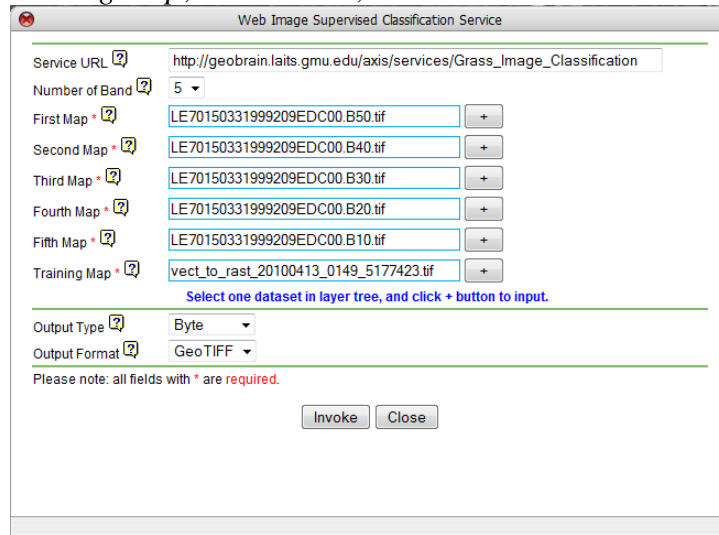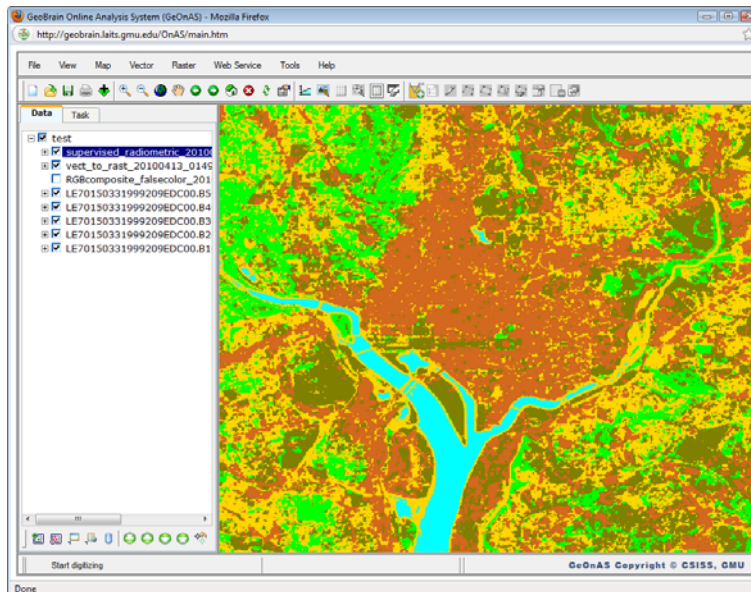2) Set *Number of Band* to the number of bands you have; Select the datasets on the left panel, and click + button to add each band one by one; Add the rasterization result as *Training Map*; click *Invoke*;

3) Wait a moment for it to complete; When it is finished, *Add* to the result to the project.

4) Do the supervised classification again by using the two bands used in the unsupervised classification.
5) Do the histograms for the results from classification using all bands and two bands only.

Report contents and questions:
1) Tell which AOI you have selected for this assignment, and describe why you select this specific AOI for the assignment. How many bands do you selected? Attach one image of AOI in your lab report.

2) For the unsupervised classification, describe the result difference between the 20 output classes and 6 classes resulted from steps 2-1 to 2-4. For Step 2-5, which two bands do you select? Please describe the reasons to select the two bands. Attach the 4 classification images and the 2 histograms in your report.

3) Training datasets selection. Please report how many classes you use, and the name of each classes. Attached the digitized polygon maps in your report.

4) Supervised classification. Please describe any difference in the maps resulted from all bands and two bands. Attached the 2 supervised classification maps and two histograms in your report.

5) (optional). Please feel free to comment on GeoBrain system and provide suggestions on improvement. If you have experiences with other image processing system, please comment on advantages and disadvantages of GeoBrain web-based approach for handling remote sensing data.