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GES 481

Lab 1

Classification of HLS Data: Unsupervised Classification using ISODATA

ENVI is an important software used in remote sensing to be able to create landcover maps throughout the entire world. In this lab, a Landover classification map was made of an area north of Washington, DC. The images below show the processing that went into the classification. Figure 2 shows the original RGB images taken from three different periods throughout the year. The images were taken in September, March, and July to show the Fall, Spring, and Summer seasons of the respective year. The different bands in the imagery were stacked in ENVI classic to be able to show the image in true color rather than using a single band. Using the stacked imagery, Figure 1 was able to create a false color image using a band combination of 5,4,3. This band combination of Landsat imagery creates a false color image where vegetation/forested areas are shown in red. This false color imagery helps to better understand the area of interest you are working in. The unsupervised classification of the area of interest was conducted using ISODATA. The maps below show us the classes of Vegetation, Forest, Urban, Water, and Agriculture. The shades of green are darker where the land becomes more densely forested while the light green shows areas of grass. Water is classified as blue, Urban is white, and Agriculture is yellow. The classification was done using the reflectance of the areas and Google Earth imagery. Due to reflectance's histograms having consistent shapes it is easy to tell what landcover is over the areas. The different months show us important things about the area and seasons. The area of interest is a very urban area but also has areas of dense vegetation and forests. July shows more vegetation and green than found in March. The main issue in the results is in the month of September. Due to the presence of clouds, there were some

issues with classifying and shadows ended up classifying as water. This is an issue and makes it a little harder to see the overall change throughout the year. Overall, the classification of the other months was successful in seeing the differences in the months. The Histograms show us a lot about the reflectance of the different classes. The histograms show the reflectance of the forested and grass spaces and they are what we would expect. Overall, the reflectance of each class helped to create the classification of the landcover.

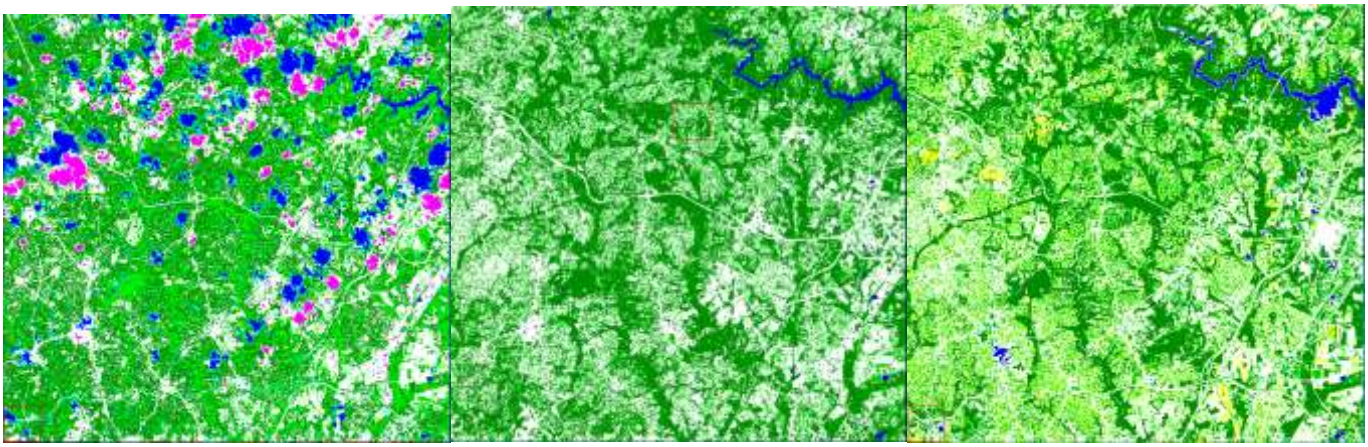
False Color Images (Figure1)

September March July

RGB Images (Figure 2)

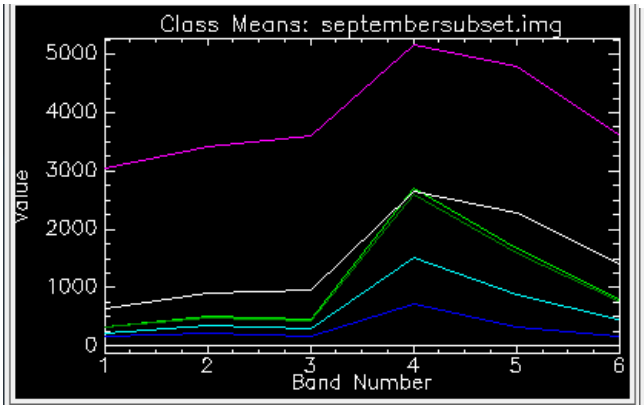
September March July

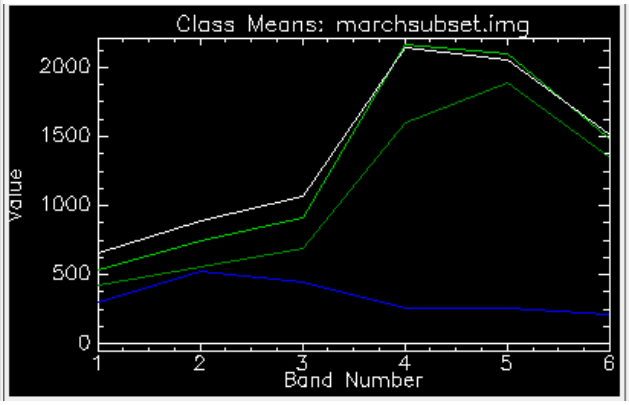
Classified Images (Figure 3)

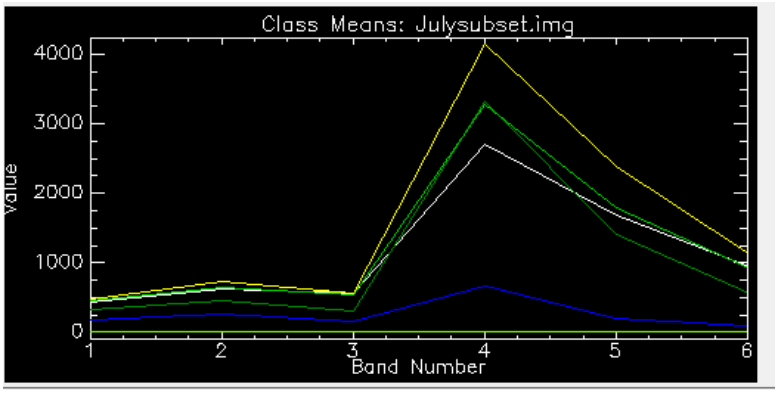


September March July

Histograms


Class Means: septembersubset.img
Value
5000
4000
3000
2000
1000
0
1
2
3
4
5
6
Band Number


Class Means: marchsubset.img
Value
2000
1500
1000
500
0
1
2
3
4
5
6
Band Number


Class Means: Julysubset.img
Value
4000
3000
2000
1000
0
1
2
3
4
5
6
Band Number