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Geog 342 Fall 2019

Remote Sensing Project

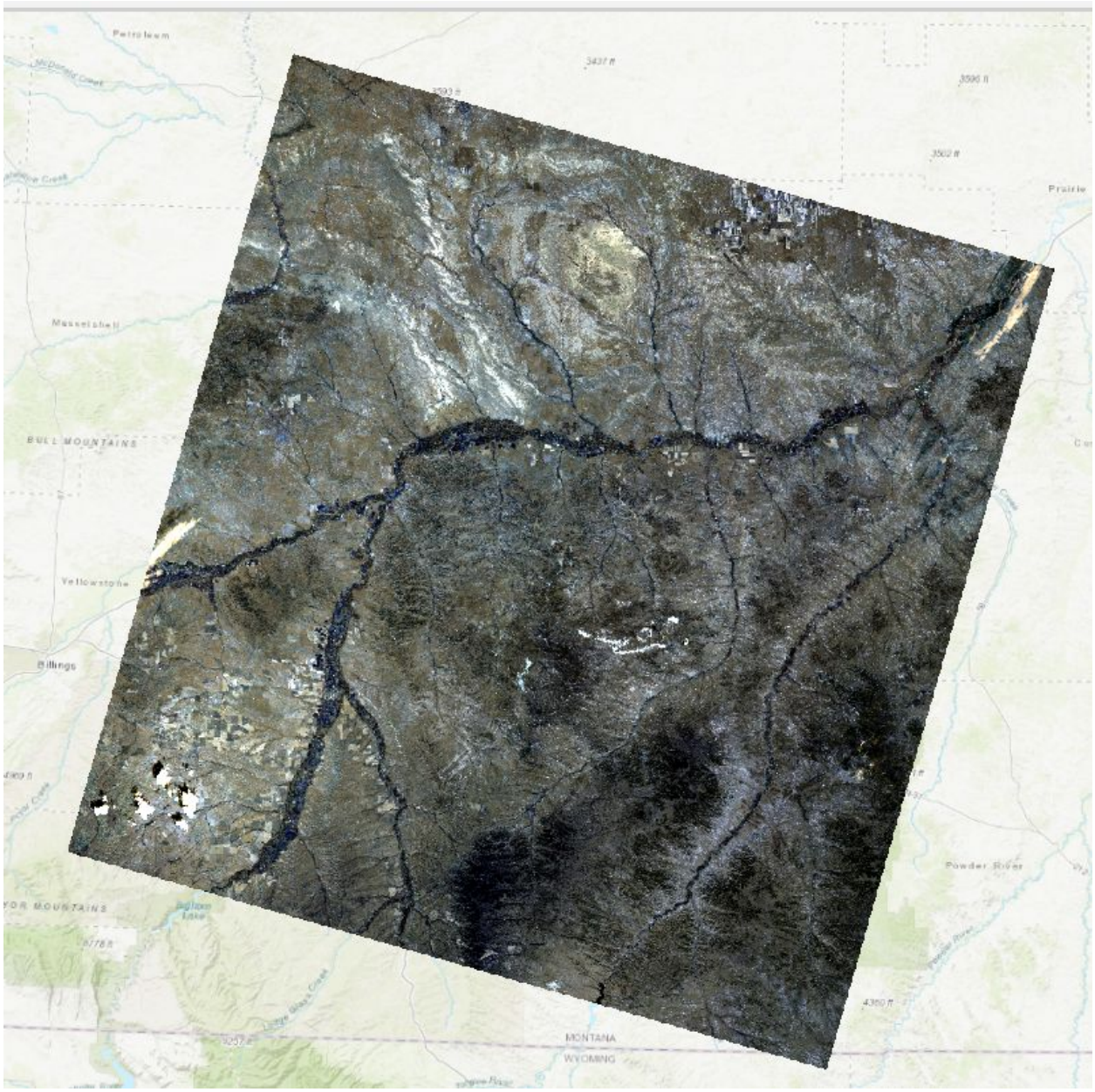
Project Summary:

In this project I compare, with image classification, two Landsat 8 images of Bighorn, Montana land near a river. One image taken in October 2013 and the other July 2013. I wanted to see how much of a difference there was between the landcovers of the dry season and wet season.

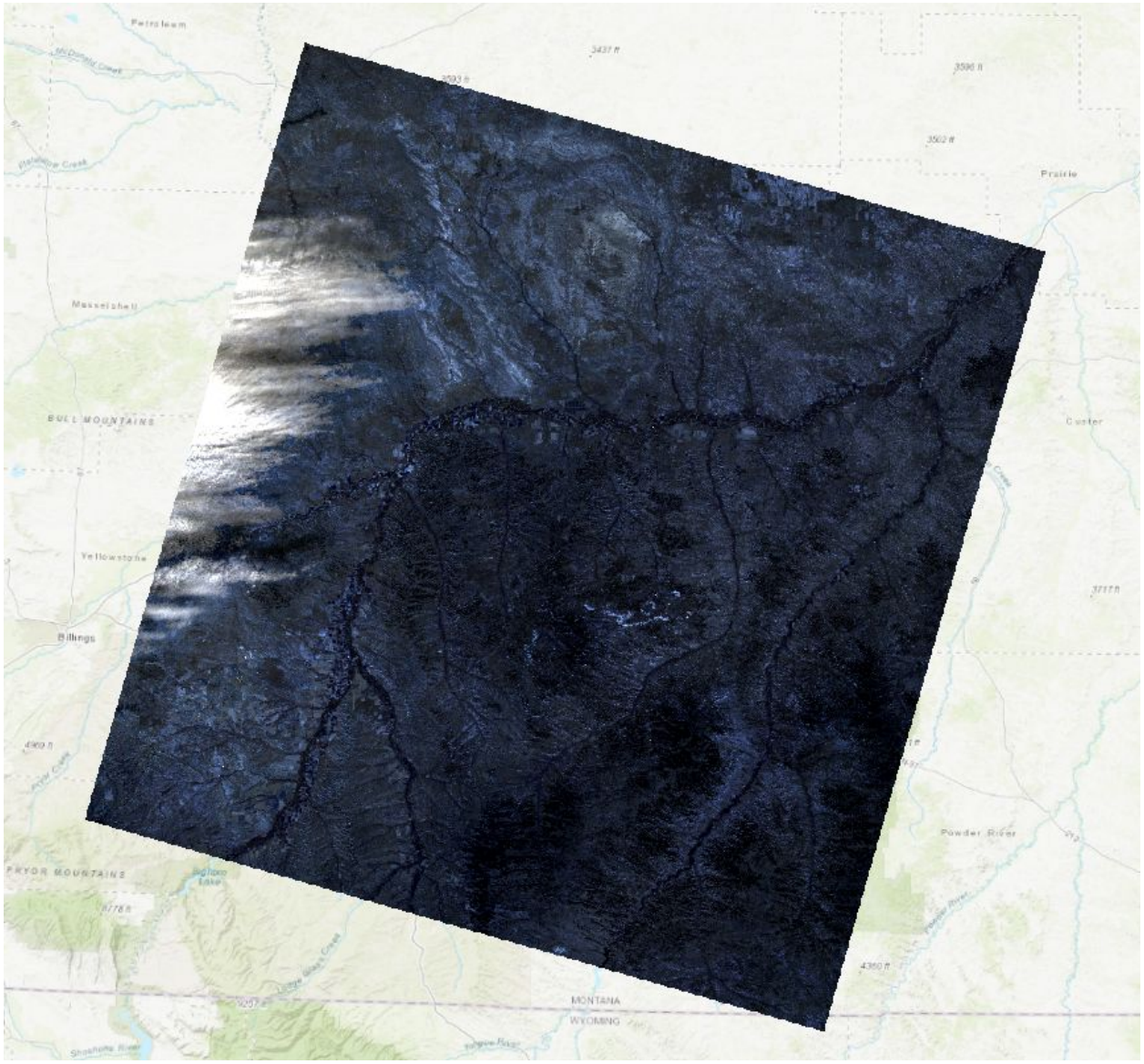
Methodology and image classification process:

I was able to find acceptable images of the Bighorn area using the USGS earth explorer. After finding acceptable images i went through the USGS process of requesting these images and waiting for permission to download. While waiting, I was looking for an appropriate area for cutting and using as the research area. I wanted to use a river valley area with as little farm land around as possible and has some hills with exposed rock. Finding this are was a little tedious due to many farms being placed parallel to Montana rivers. I was able to find an area that had grazing pastures instead of tilled soil for farming, with a good amount of hill and wetlands. Now that I found a good location and was able to download the images i went and immediately exported my preferred research area. With the images cut into the research area I began to segment each image. After the images were segmented I started the classification wizard and began the process of classifying the images. The classes i used; water, barren, shrubland, wetlands, and herbaceous. I used shrubland to represent the pasture land and the shrubland since they are the same agriculture. Herbaceous was used for the areas with thinner plant life and barren was for exposed wrock and truly barren land. It was necessary to do some reclassifying since the barren land was getting mixed with wetland since some barren land is dry wetland and the October image was a bit dark and blue.

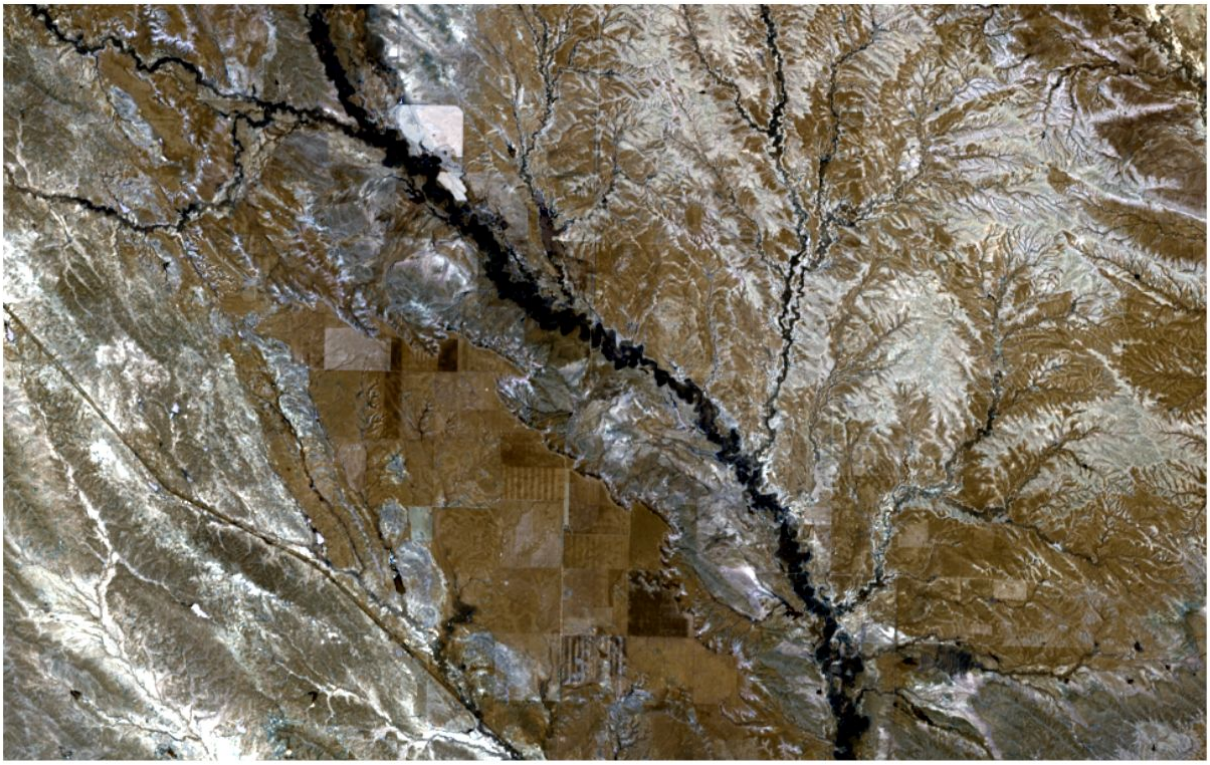
July Image:


Petroleum
Prairie
Musselshell
BULL MOUNTAINS
Yellowstone
Billings
Powder River
MONTANA
WYOMING

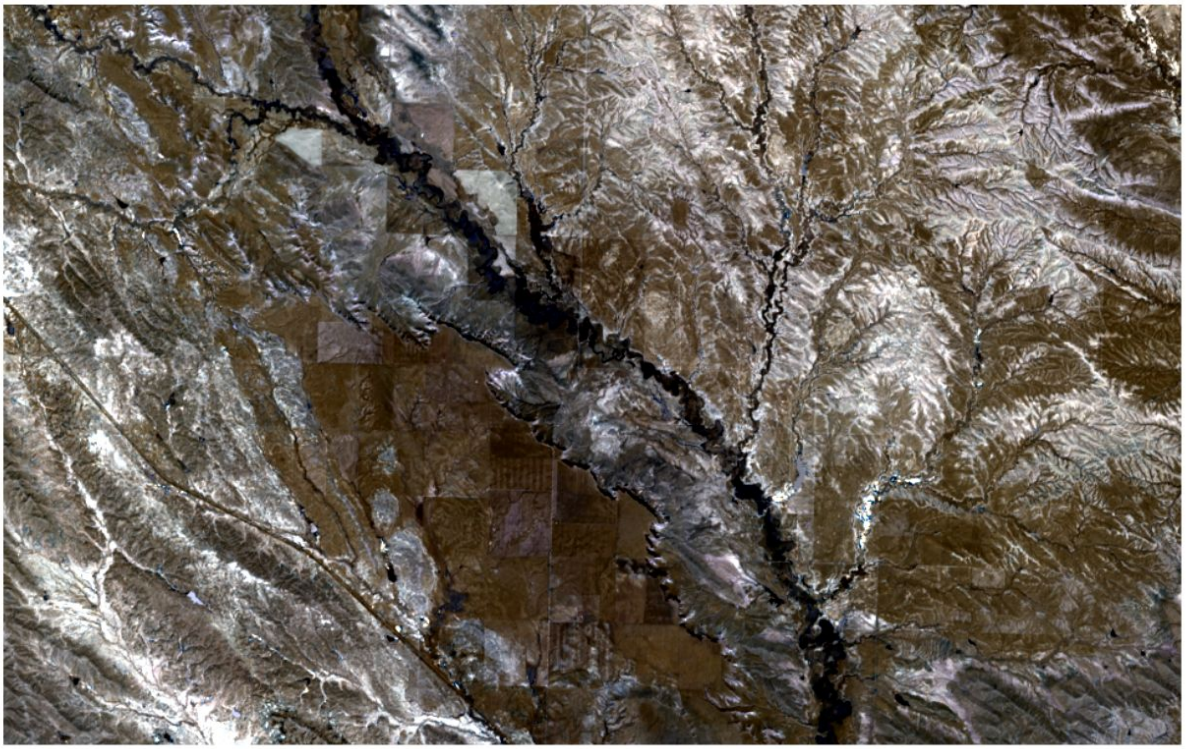
October Image:



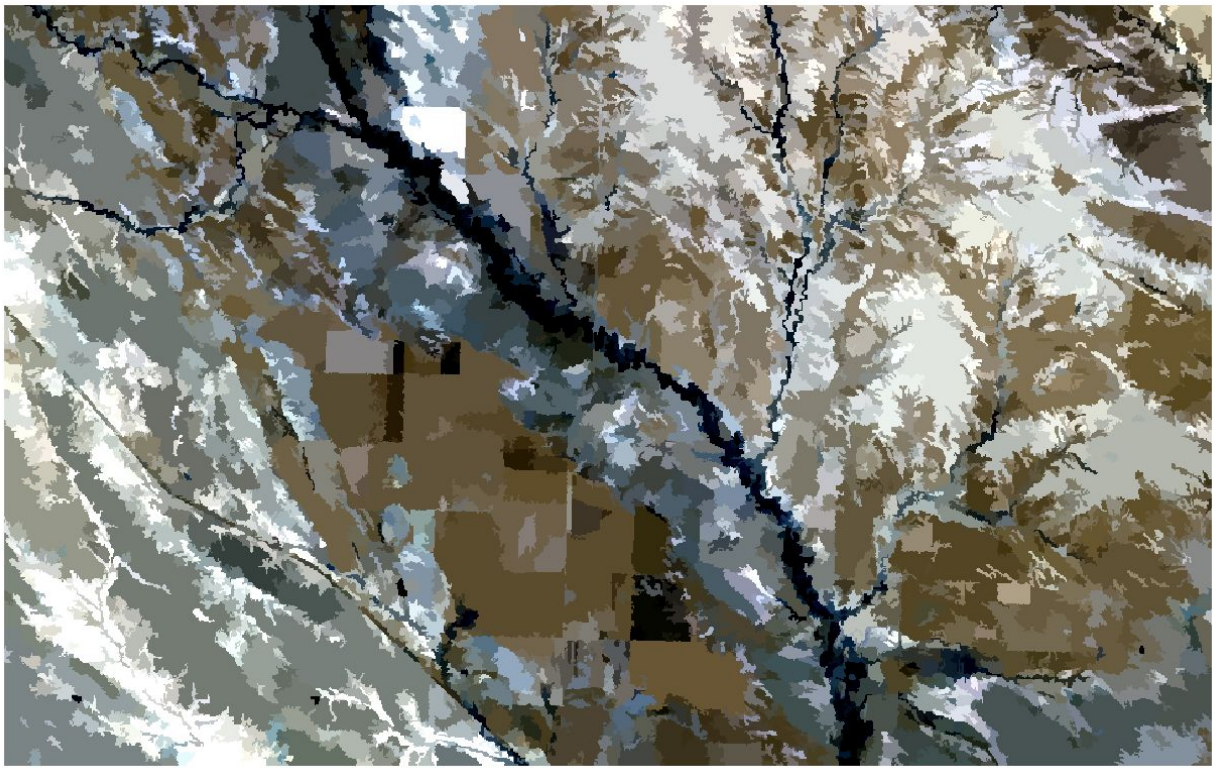
July Clip:



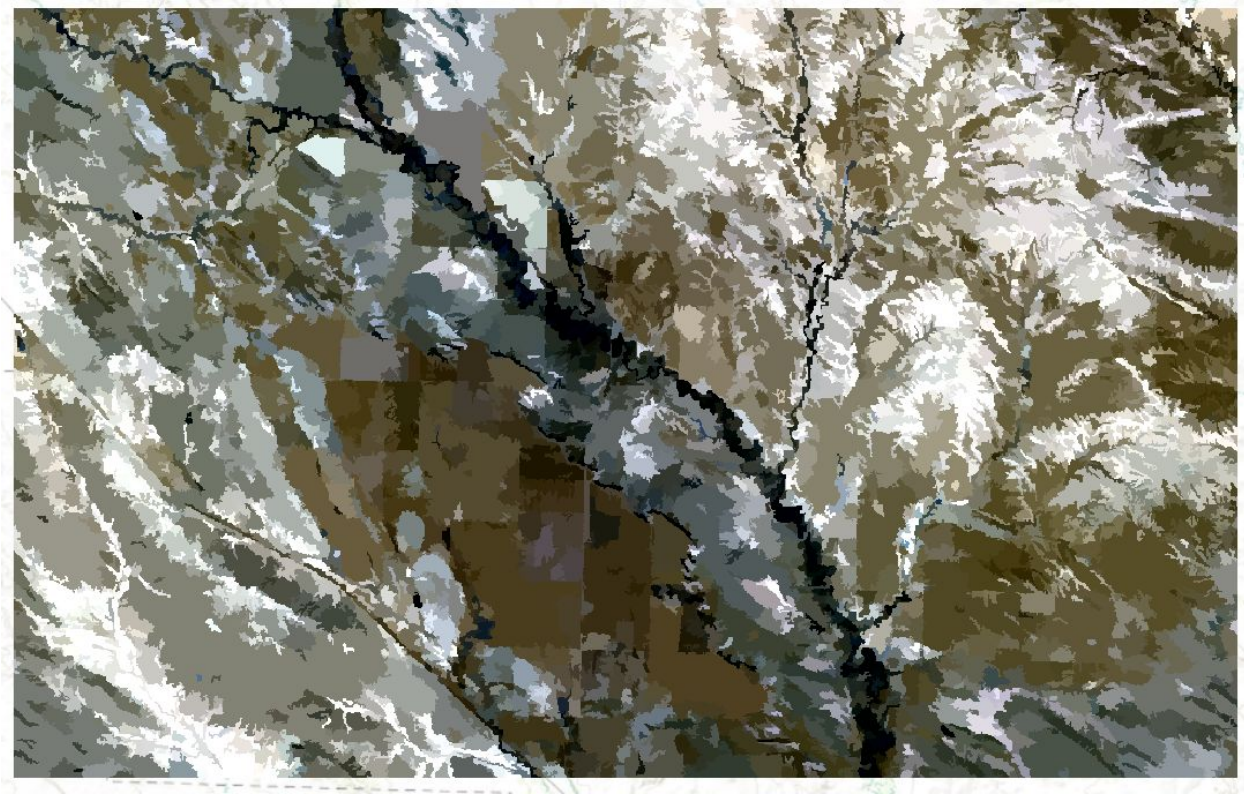
October Clip:



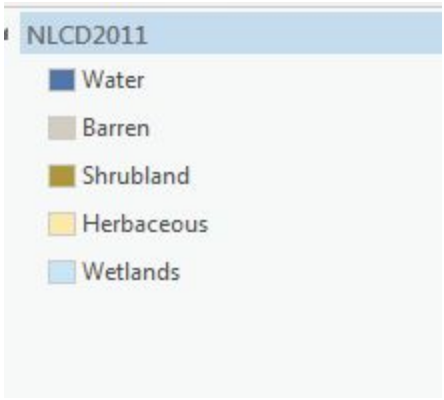
July Segment:



October Segment:

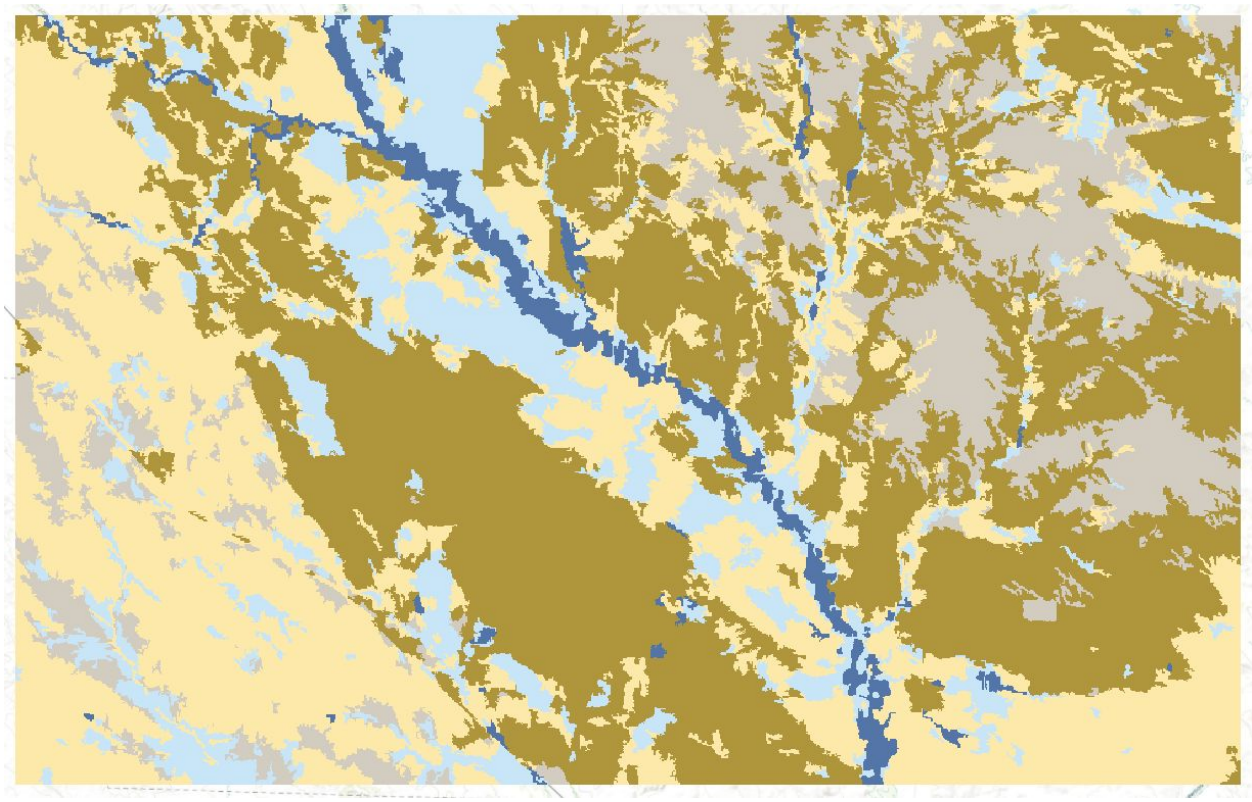


Training Samples:

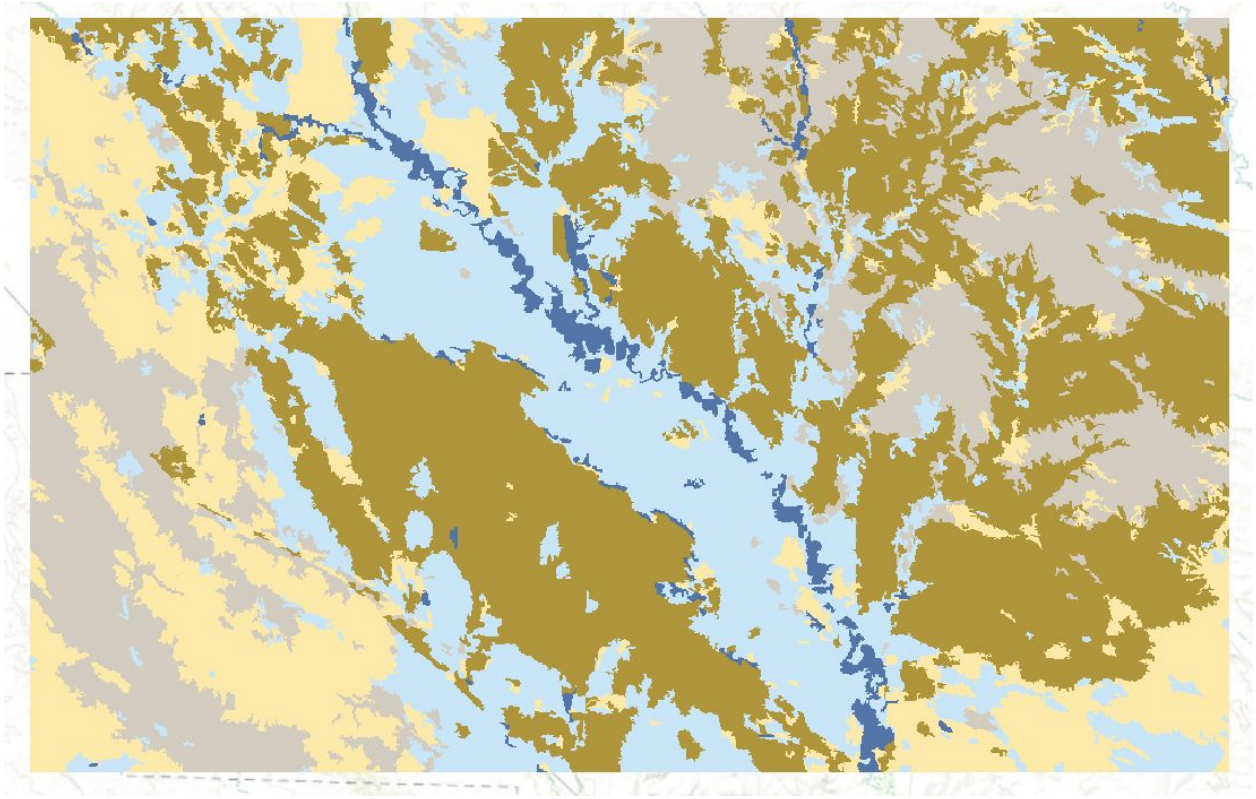


Class	# Samples	Pixels (%)
Water	1	0.53
Barren	1	3.46
Barren	1	2.04
Barren	1	1.45
Barren	1	8.63
Shrubland	1	7.57
Shrubland	1	4.25
Water	1	0.55
Water	1	0.76
Wetlands	1	5.37
Wetlands	1	3.43
Shrubland	1	7.62
Water	1	0.48
Water	1	0.78
Water	1	0.32

July Classified:



October Classified:



Difficulties and Issues:

During this project I had a tough time with training samples since the image was of lower resolution and the area I used was to focused. This caused me to have to use many training samples and had to spend a good amount of time reclassifying some clearly wrong areas.

I had some issues using the reclassifier tool. The tool would reclassify an area then when i went to select a new area the sites would return to original classification. This was solved by canceling the entire classification wizard and starting the process over.

Initially getting the images was somewhat tedious and confusing due to the USGS Earth Explorer needing you to ask permission to download an image and wait for them to say yes. The images I was able to get also weren't as high of resolution as i was hoping for.

Conclusion and Image Interpretation:

The results of the image classification were about what I had expected to find with some surprises. The July image clearly has less wetland then the October counterpart with the wetland increase focused near the river valley. The October image on the other hand has more barren land most likely do to increased rain exposing more rock and also the cold temperatures killing plants on the hills makes for more barren land. I had some errors in my classification that weren't fixable mostly due to the darkness of the October image made the classifier think that some river was wetland. The October image shows a decrease in shrubland on the hills compared to the July image. This is not a bizarre phenomenon for the same reason as the loss of herbaceous land but the amount shown is much too high to believe. If I were to do this task again I would look for higher resolution imagery and with multiple years instead of just one year.