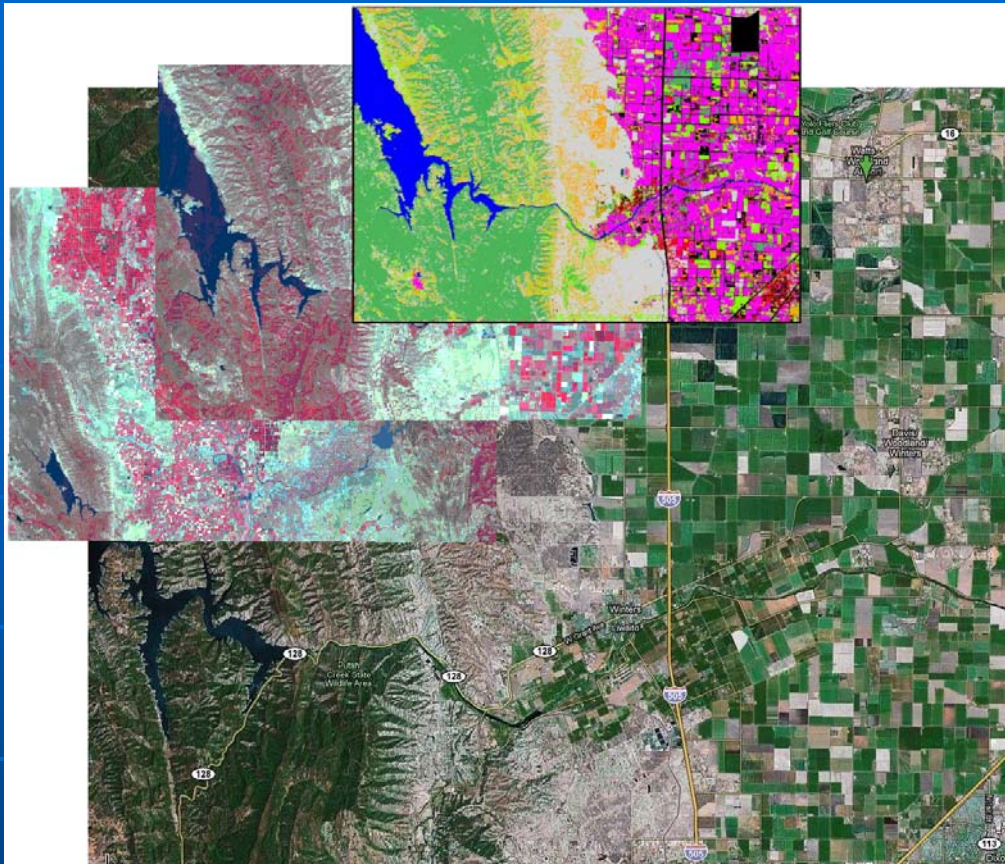


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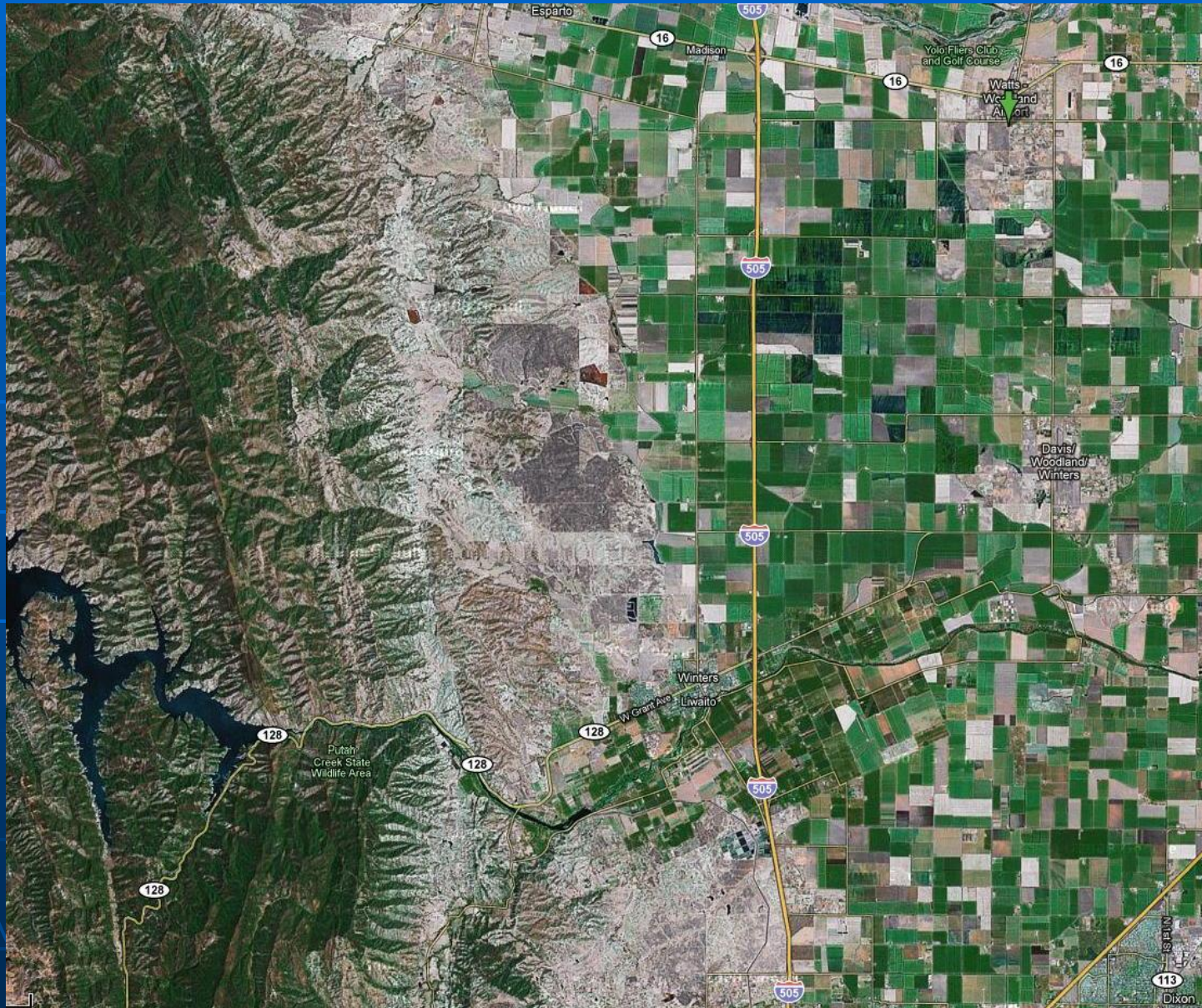
# Introduction to Remote Sensing & Image Interpretation



## Unsupervised Classification of Landsat TM Data Image

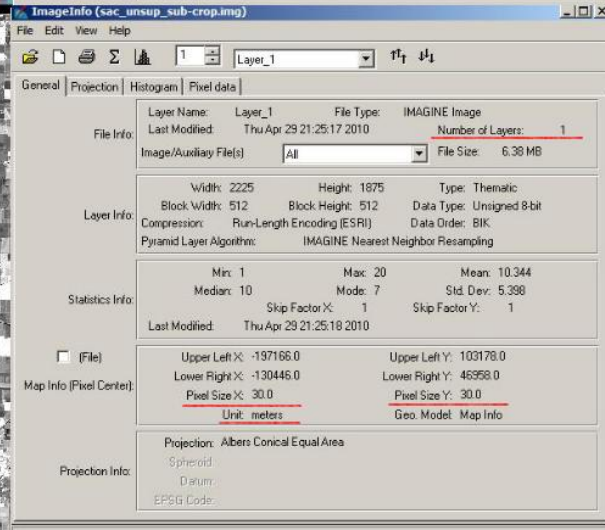
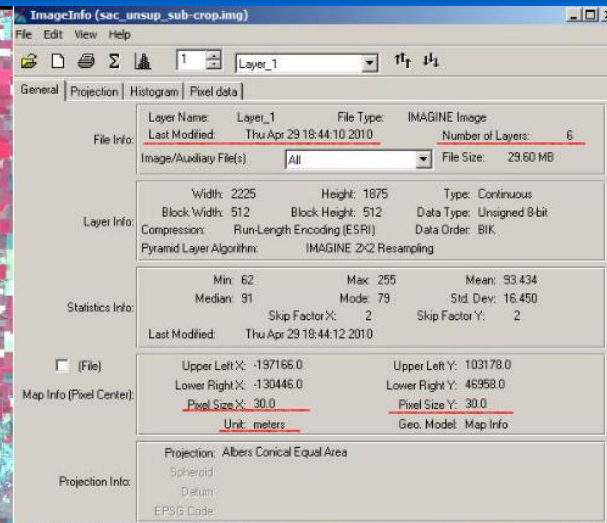
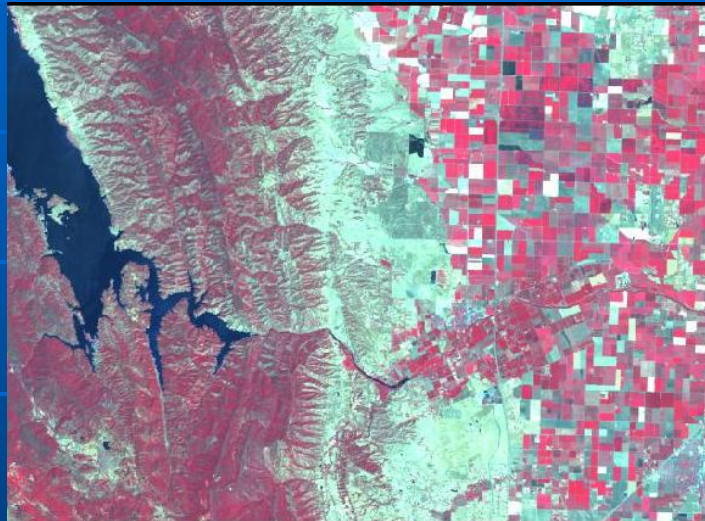
Final project Presentation  
May 2010

## ■ Area of Interest: Google Maps – Satellite Image



## ■ Raw Image

- Landsat TM Image
- Oct 15, 2006
- 6 Layers



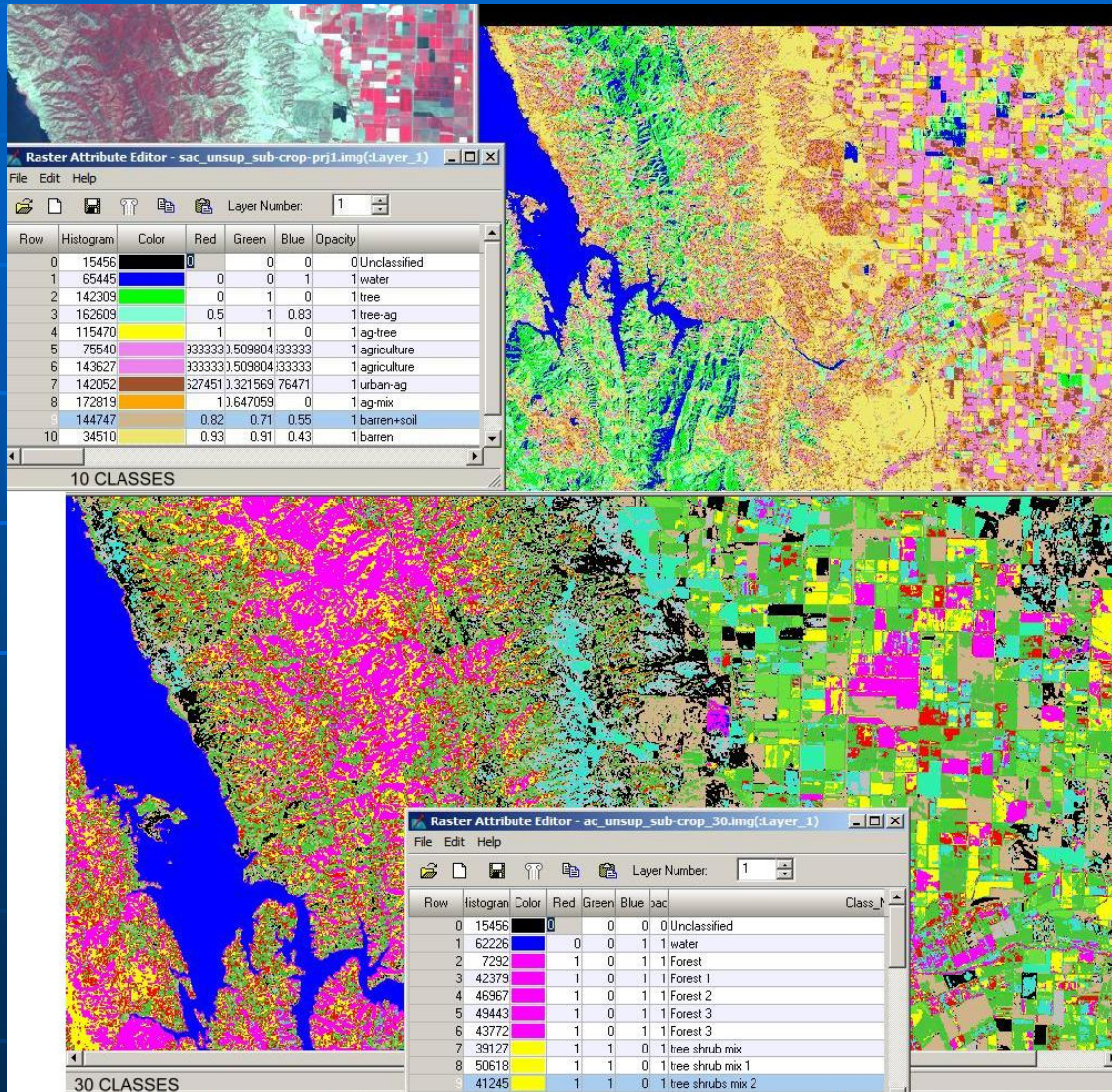
## ■ Unsupervised Classified Image

- 1 Layer
- Pixel Size: 30m

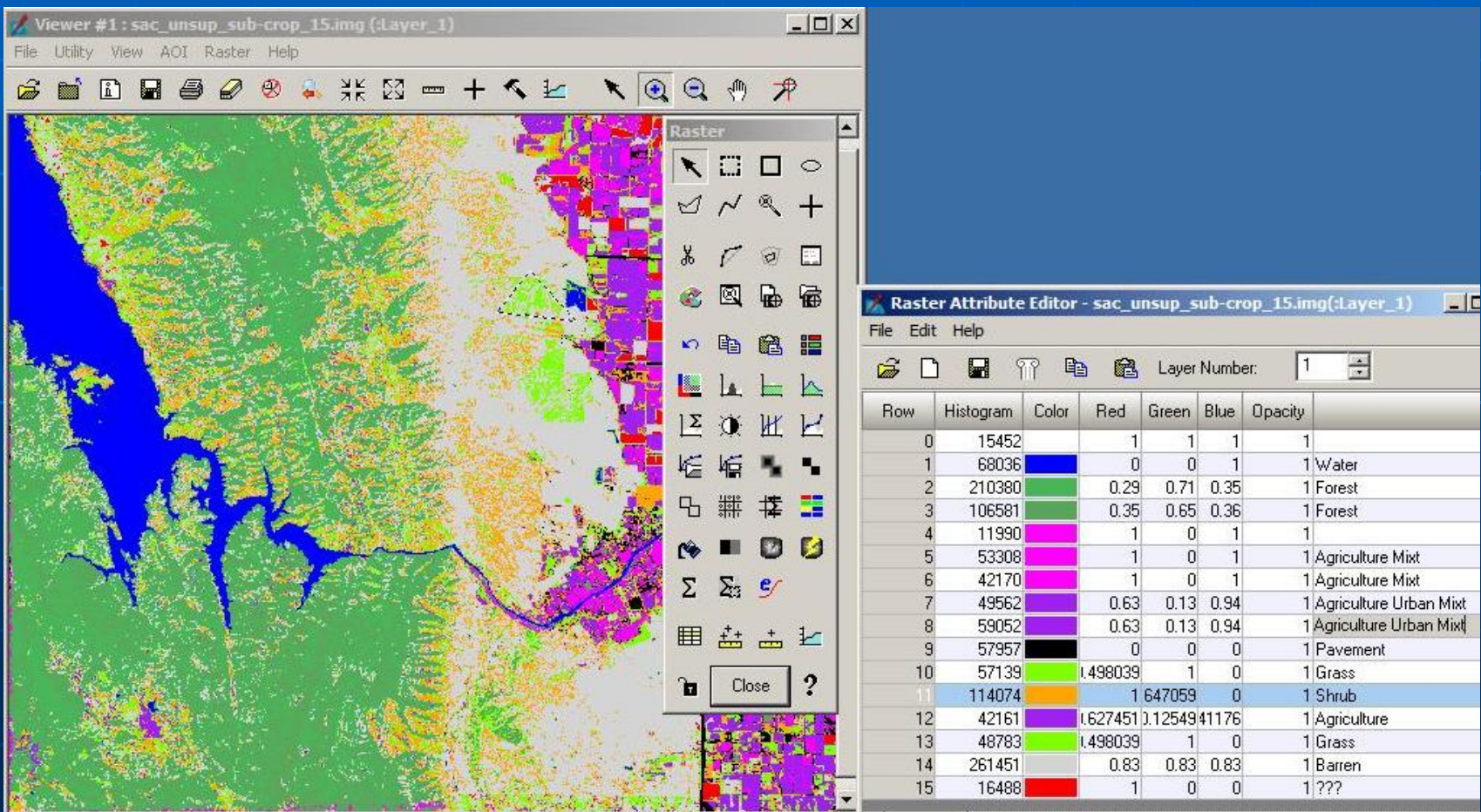
# Issues Encountered

- Choosing the appropriate number of classes
- Choosing too many classes posed the problem of too many classes being recoded during the later part of classification process.
- Choosing less than optimum classes for classification resulted in many pixels being misclassified and also affected the recode process.
- The time of year when the original satellite image was taken
- The vegetation and diverse types of vegetation give a different spectral signatures over the year and also some crops would appear similar to grass, especially if they were very low to the ground, the orchard would be misclassified as forest or shrubs (depending how mature are the tree) and the bare field would be misclassified as barren.

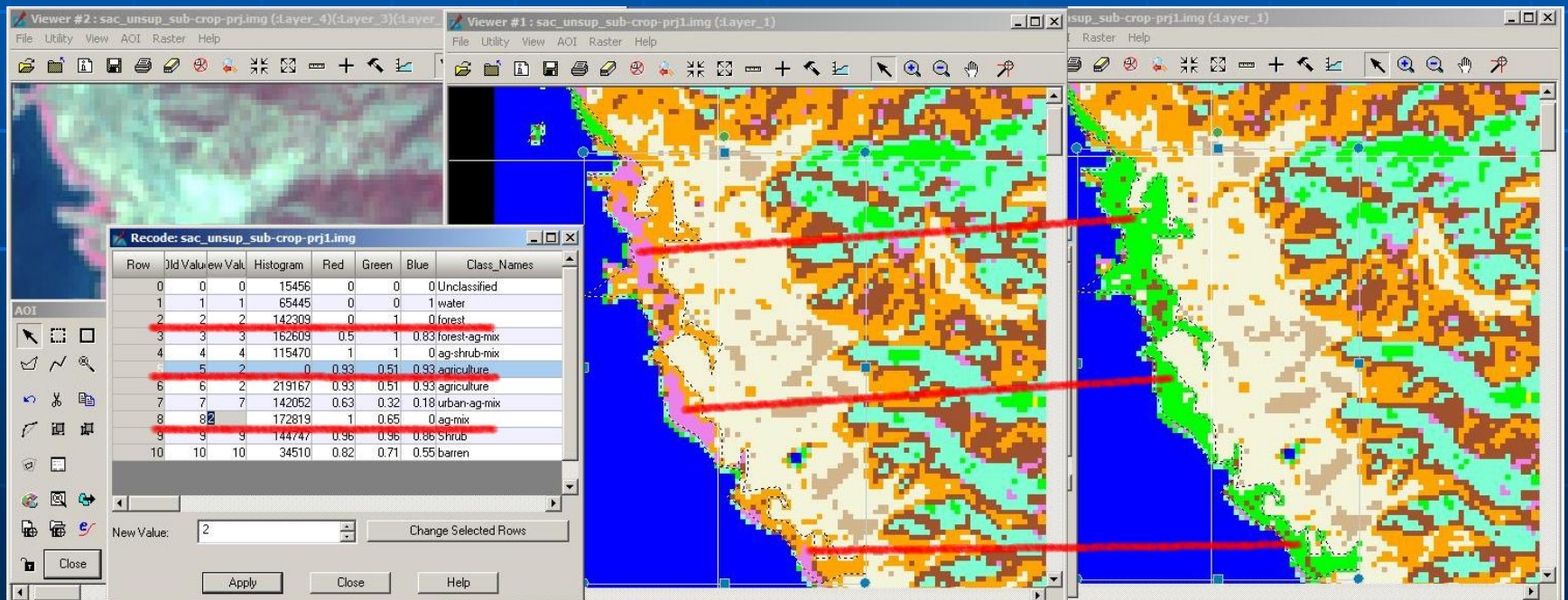
## ■ 10 Classes vs. 30 Classes



- 15 Classes – Recoding Process
- It gave the expected seven classes and additional “mixture classes” making the recode process for misclassified pixels easier.

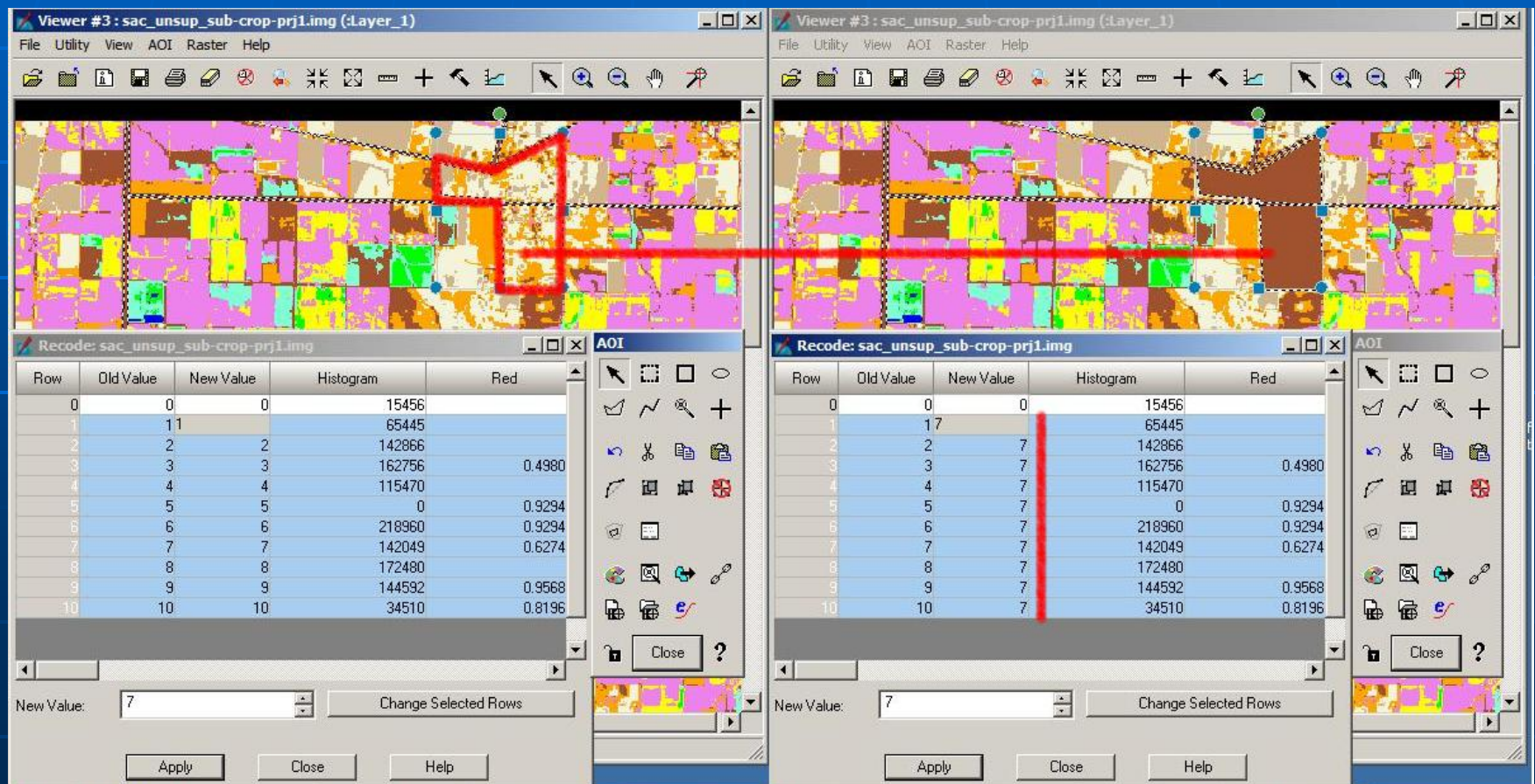


## ■ Recoding "one-by-one"

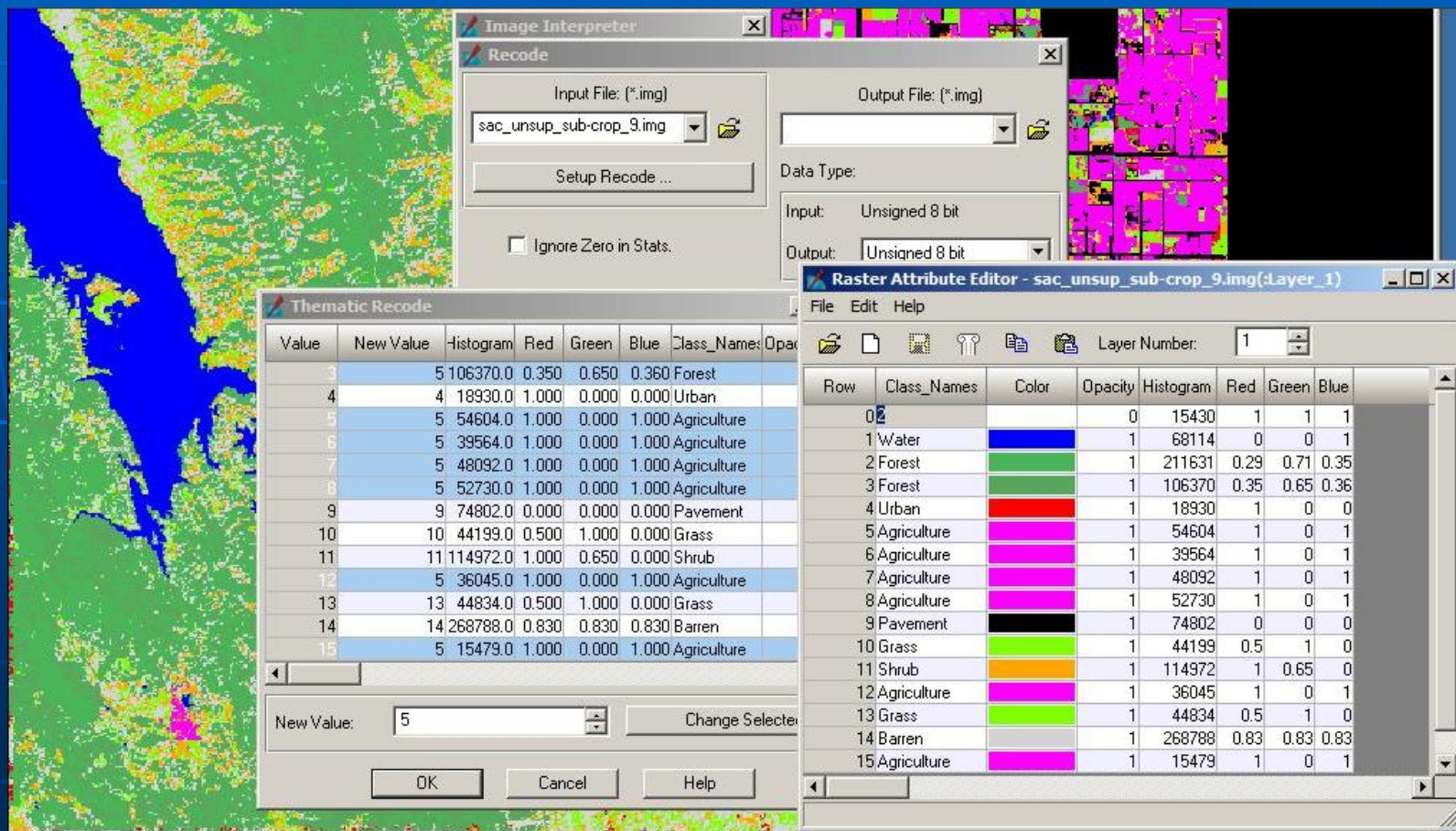


# ■ Recoding “all-to-one”

- The result looks like a “patch” cover. I consider this was not a good idea.



# ■ Setup Recode



The screenshot displays the 'Thematic Recode' dialog box in the foreground, which is used to map input values to new values and colors. The dialog includes a table with columns: Value, New Value, Histogram, Red, Green, Blue, Class\_Names, and Opacity. The 'New Value' field is set to 5. The 'Raster Attribute Editor' window is open in the background, showing the same table with additional columns for color and opacity.

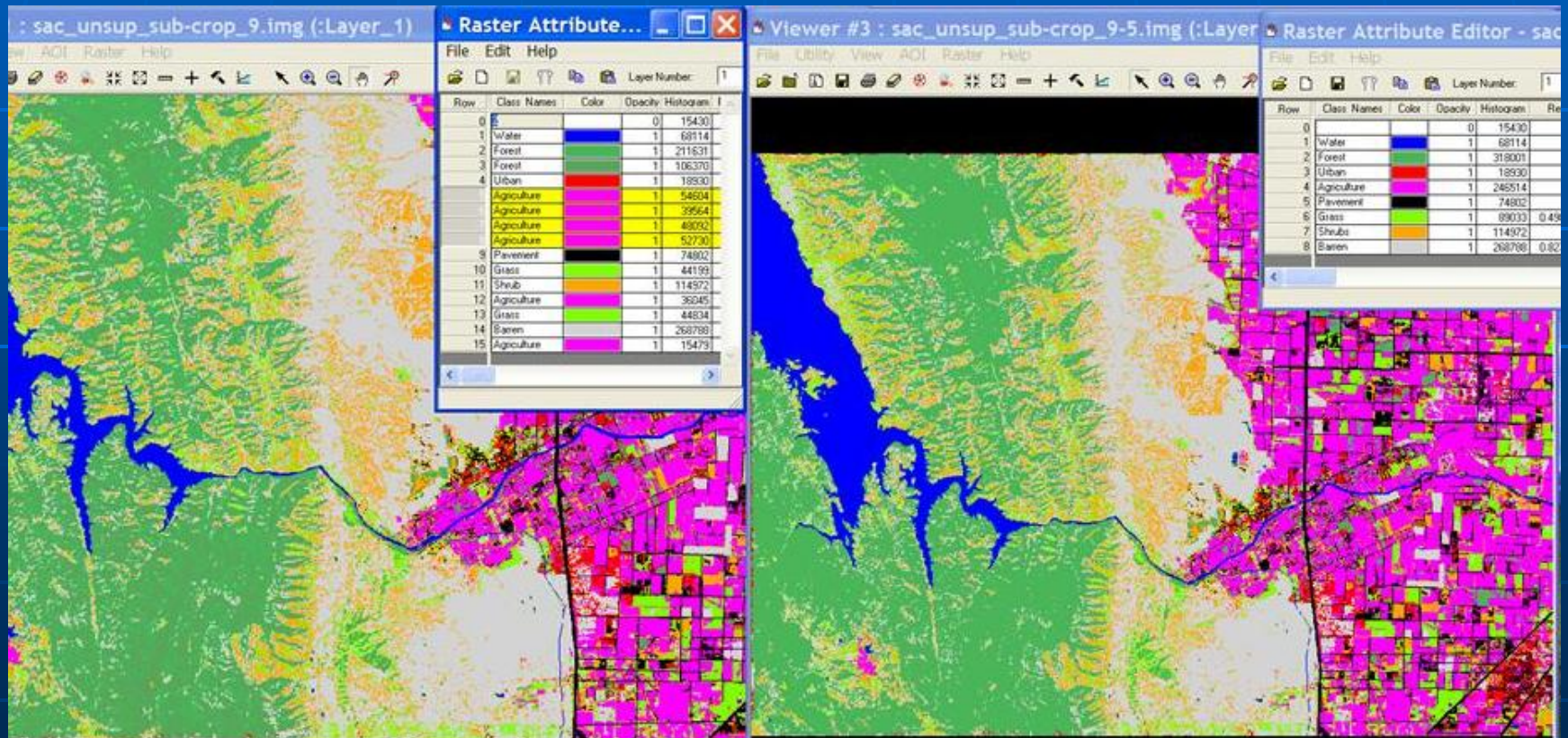
**Thematic Recode Table:**

Value	New Value	Histogram	Red	Green	Blue	Class_Names	Opacity
3	5	106370.0	0.350	0.650	0.360	Forest	
4	4	18930.0	1.000	0.000	0.000	Urban	
5	5	54604.0	1.000	0.000	1.000	Agriculture	
6	5	39564.0	1.000	0.000	1.000	Agriculture	
7	5	48092.0	1.000	0.000	1.000	Agriculture	
8	5	52730.0	1.000	0.000	1.000	Agriculture	
9	9	74802.0	0.000	0.000	0.000	Pavement	
10	10	44199.0	0.500	1.000	0.000	Grass	
11	11	114972.0	1.000	0.650	0.000	Shrub	
12	5	36045.0	1.000	0.000	1.000	Agriculture	
13	13	44834.0	0.500	1.000	0.000	Grass	
14	14	268788.0	0.830	0.830	0.830	Barren	
15	5	15479.0	1.000	0.000	1.000	Agriculture	

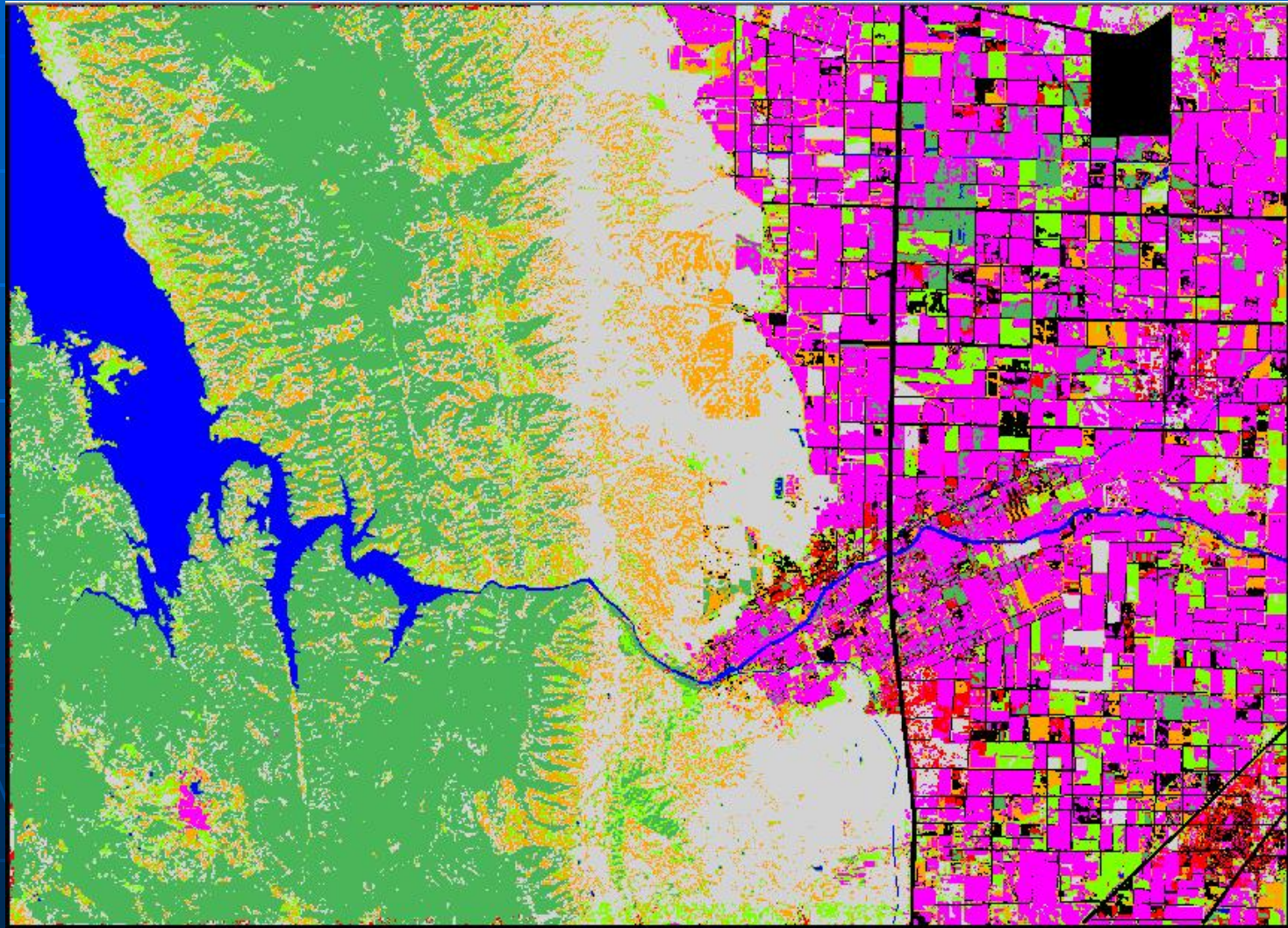
**Raster Attribute Editor Table:**

Row	Class_Names	Color	Opacity	Histogram	Red	Green	Blue
0			0	15430	1	1	1
1	Water	Blue	1	68114	0	0	1
2	Forest	Green	1	211631	0.29	0.71	0.35
3	Forest	Green	1	106370	0.35	0.65	0.36
4	Urban	Red	1	18930	1	0	0
5	Agriculture	Magenta	1	54604	1	0	1
6	Agriculture	Magenta	1	39564	1	0	1
7	Agriculture	Magenta	1	48092	1	0	1
8	Agriculture	Magenta	1	52730	1	0	1
9	Pavement	Black	1	74802	0	0	0
10	Grass	Yellow	1	44199	0.5	1	0
11	Shrub	Orange	1	114972	1	0.65	0
12	Agriculture	Magenta	1	36045	1	0	1
13	Grass	Yellow	1	44834	0.5	1	0
14	Barren	Grey	1	268788	0.83	0.83	0.83
15	Agriculture	Magenta	1	15479	1	0	1

## ■ Setup Recode



In the recode process we decided to keep the lot boundaries (we used the AOI Tools to draw lines and recode them as pavement) and to keep some misclassified lots to emphasize the large variety of the crops.



# Conclusion

This project has helped me learn a lot about several aspects of digital image processing despite shortfall. The results met my objective of finding out whether or not enhanced layers of data could be used to generate a good land cover classification map.