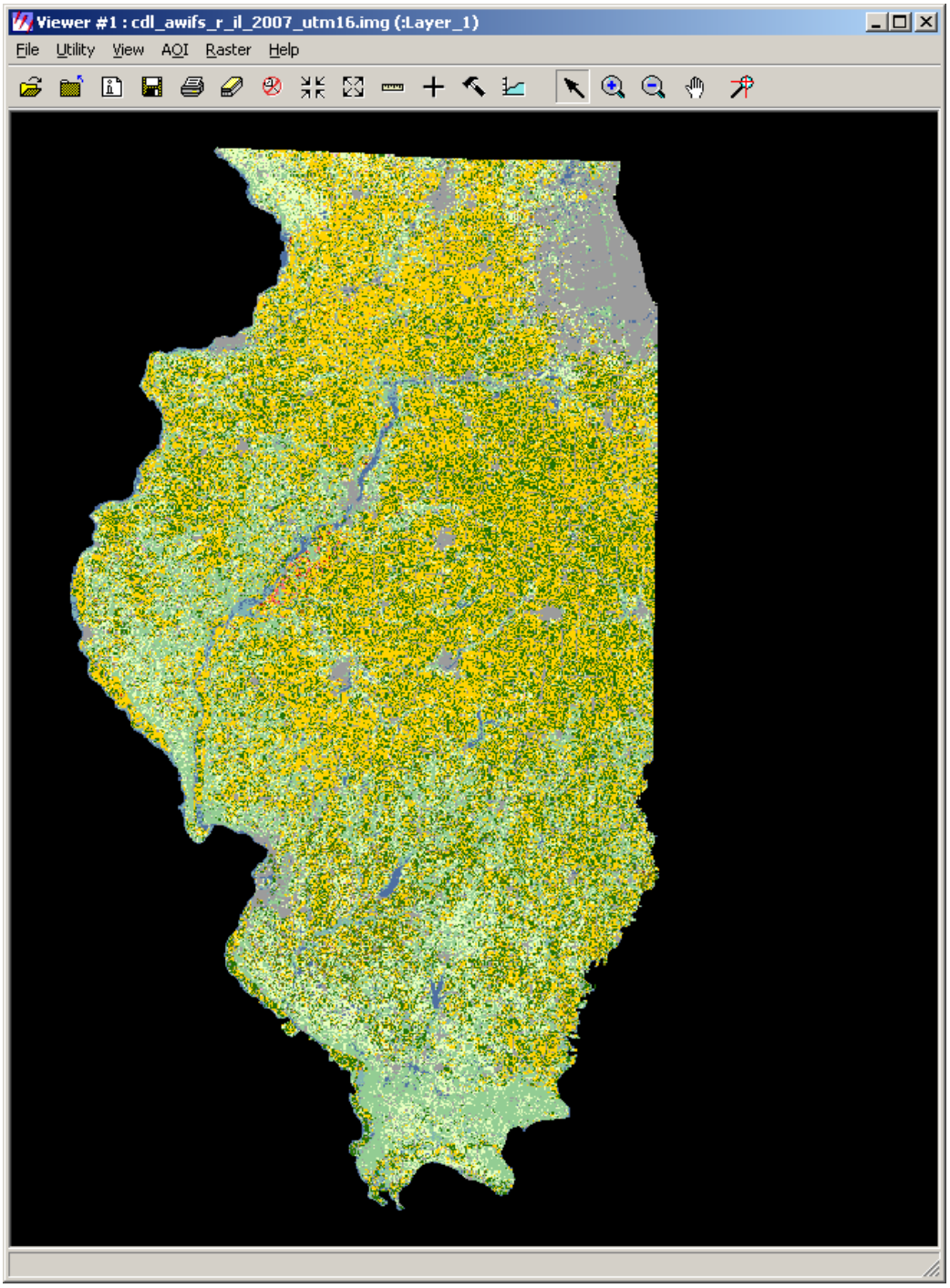
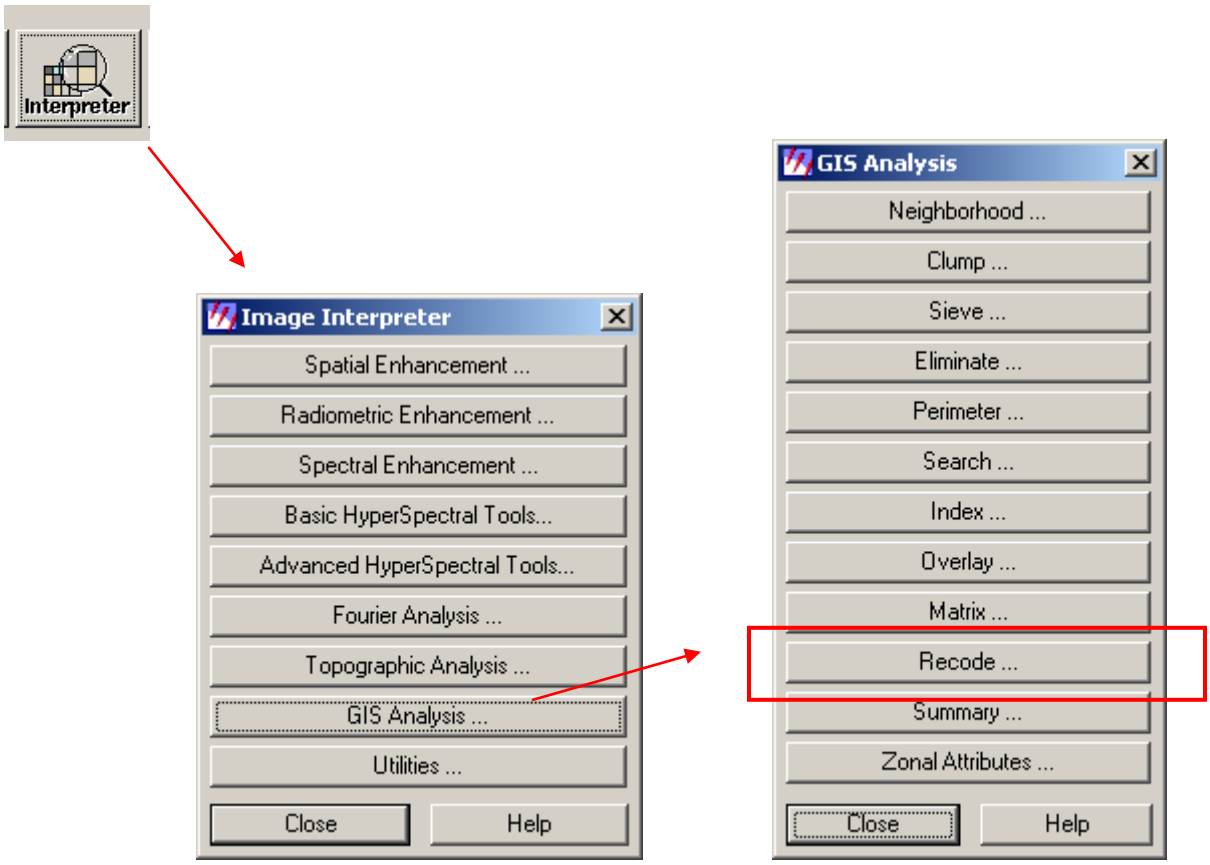
Process Steps and Procedures for 2007 Illinois NASS-CDL Accuracy Assessment of Non-Agriculture Categories

(1) Recode the 2007 Illinois NASS-CDL to the 11 categories used to conduct the accuracy assessment

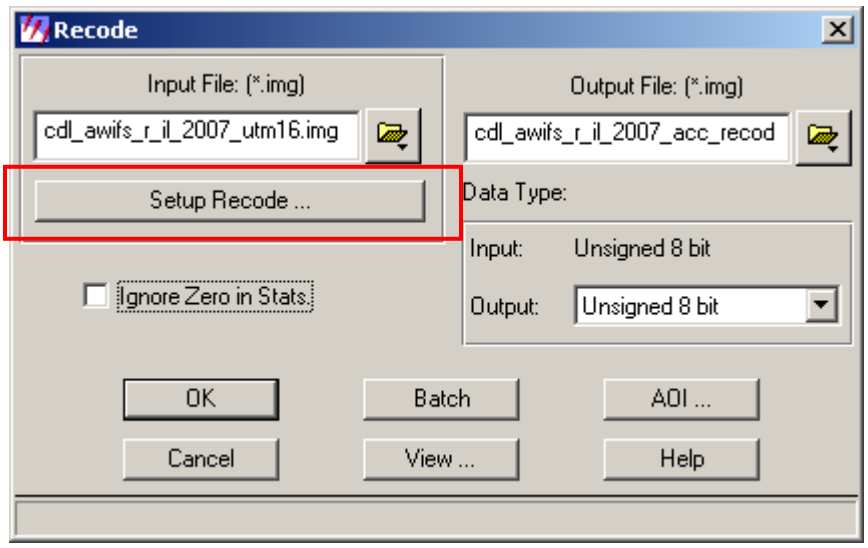
In Imagine, open **cdl_awifs_r_il_2007_utm16.img** in a Viewer window



Click on **Interpreter – GIS Analysis - Recode**



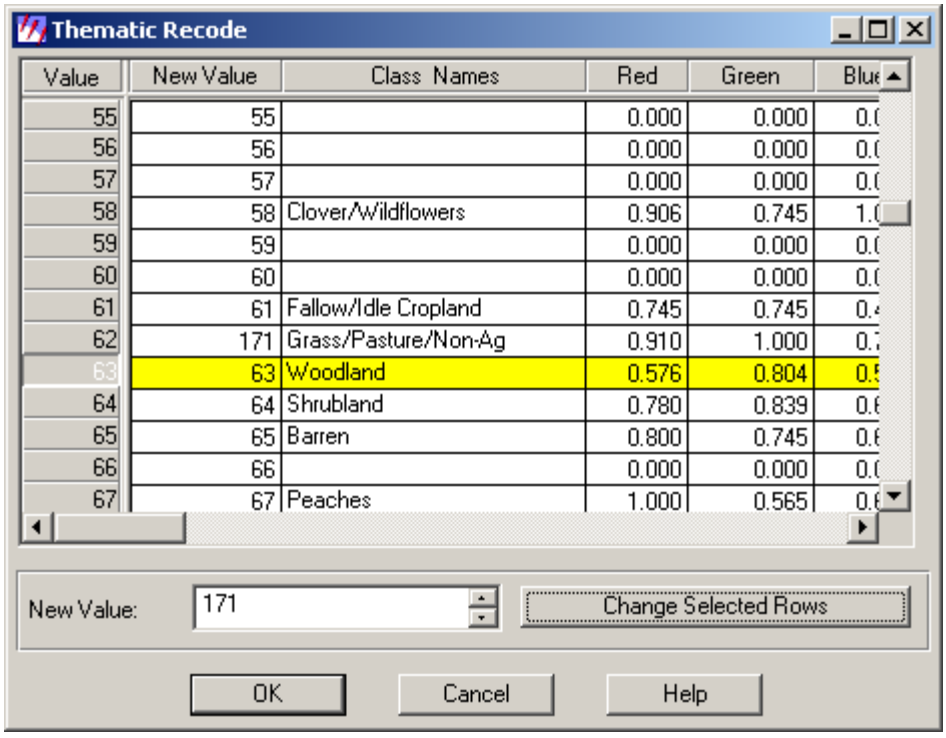
Input file is **cdl_awifs_r_il_2007_utm16.img**
Output file is **cdl_awifs_r_il_2007_acc_recode.img**



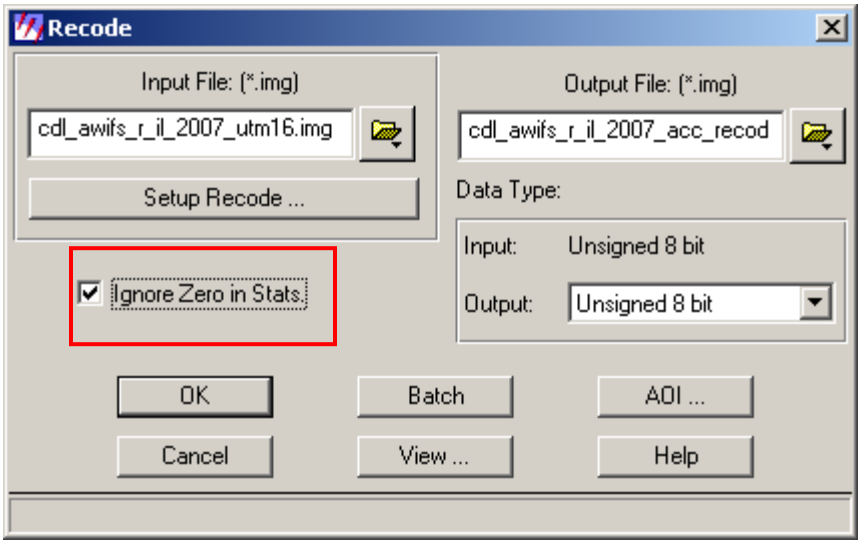
Click on **Setup Recode**. This opens a new window.

Select a category to recode (62 – Grass/Pasture/Non-Ag). Type in the new Value (181) and click on **change selected rows**. Repeat for each category that needs to be recoded (see above).

Then click OK



Make sure to check the Ignore Zero in Stats box
Then click OK

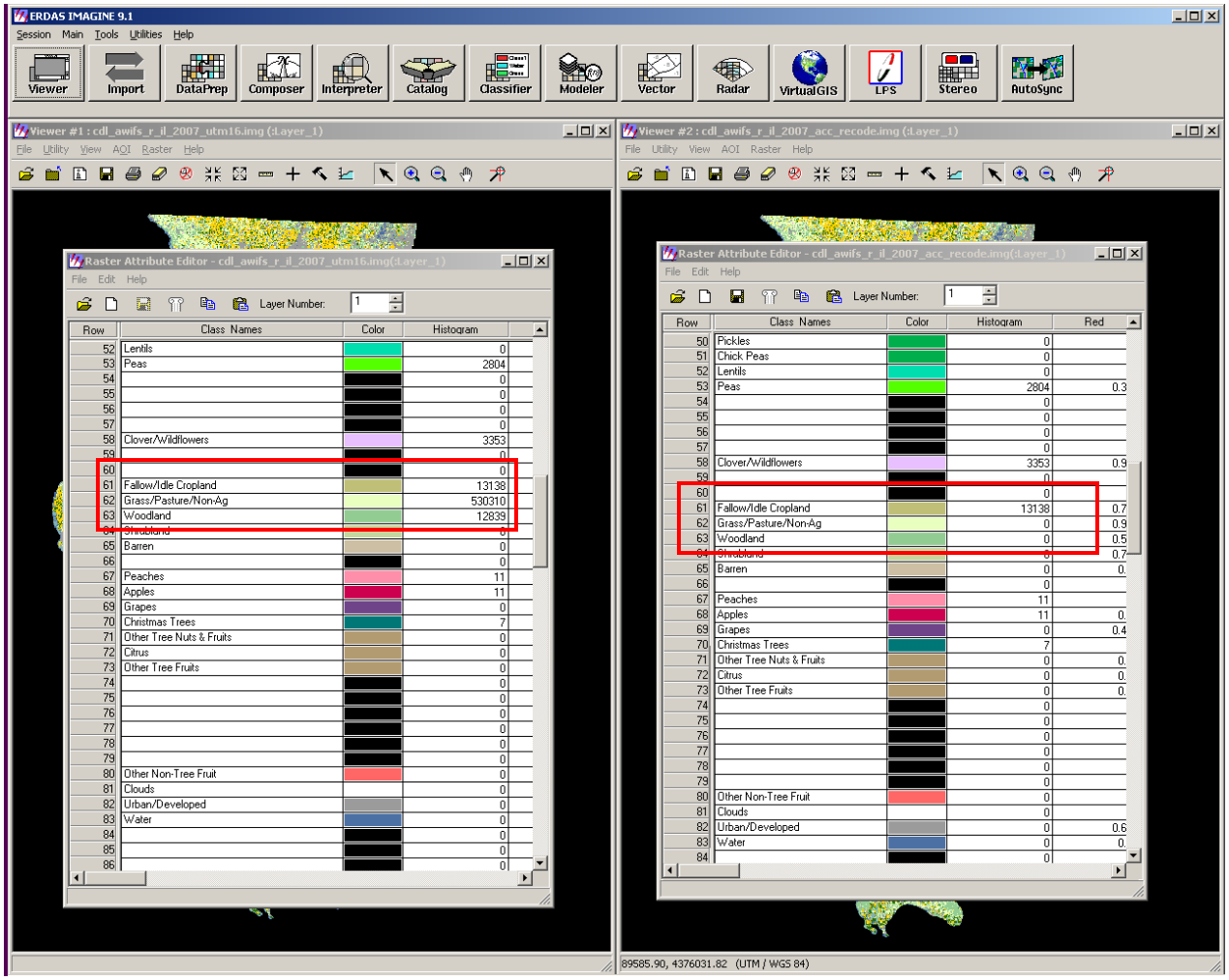


Open the recoded image in a new window (**cdl_awifs_r_il_2007_acc_recode.img**) and double check histogram to make sure image was recoded correctly.

Need to add the Class Name column back into the attribute table as it has been removed after running the recode function.

Click on **Raster – Attributes** to view the attribute table.
Click on **Edit – Add Class Names**. Then Copy and Paste the Class Names column from the original image.

Next, double checks the histogram to make sure values were recoded correctly.



(2) Create a shapefile of the 40 counties that will be used in the accuracy assessment

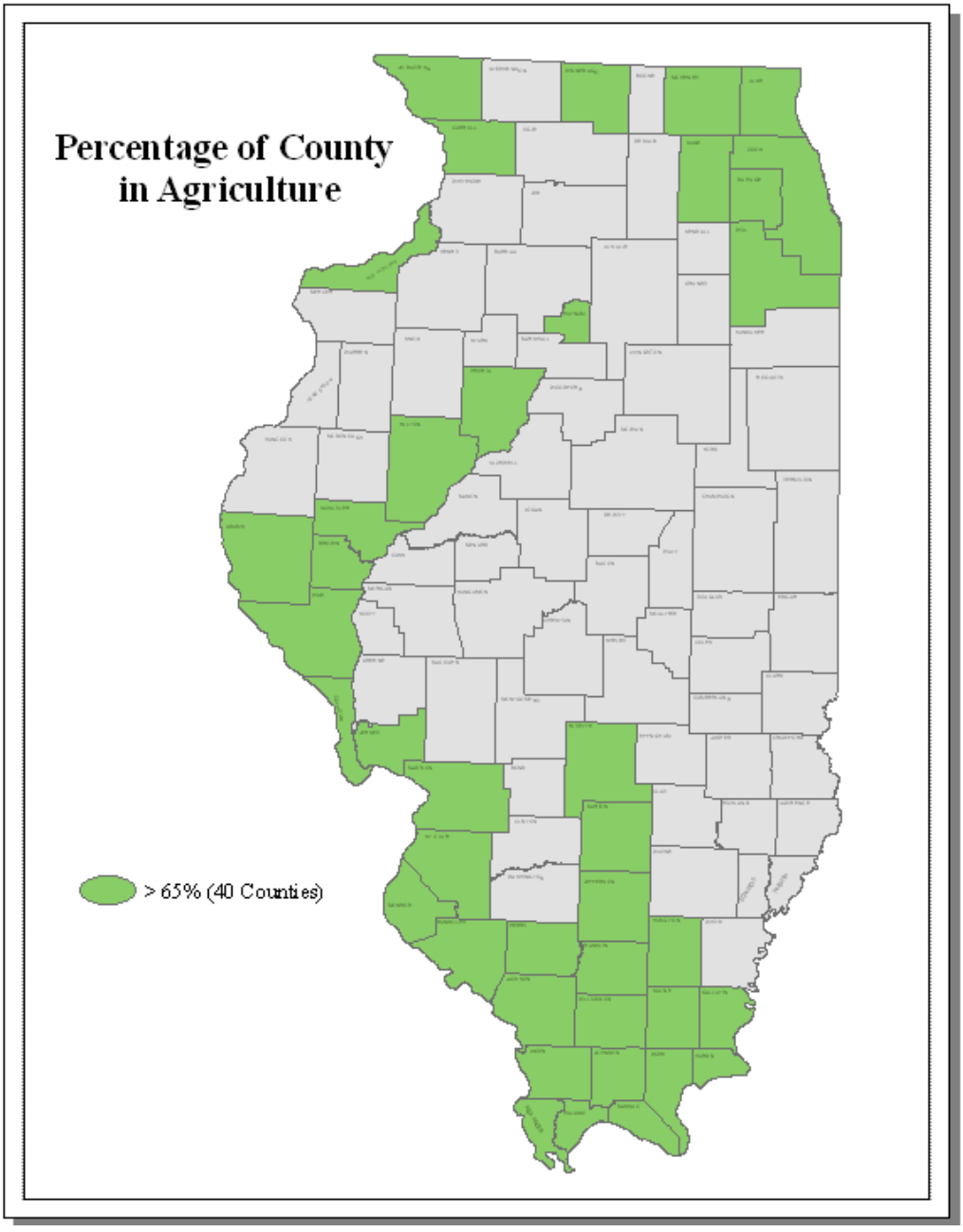
In ArcMap, load the counties feature class (IL_BNDY_County_Py)
Select the 40 counties from **lc99_00_ag_rank_w_incnty_2008.xls**

Right Click on the feature class (IL_BNDY_County_Py)in the Table of Contents and select Export – Data

Save file as lc_40acc_counties.shp

In ArcCatalog (Data Management Tools – Projections and Transformations – Feature – Project) reproject lc_40acc_coutnies.shp from GCS – Lat, Long to UTM, Zone 16 – Datum WGS 1984.

Save file as **lc_40acc_counties_utm16_wgs84.shp**



(3) Subset (or clip) the recoded NASS-CDL layer to include only the counties that will be used in the accuracy assessment

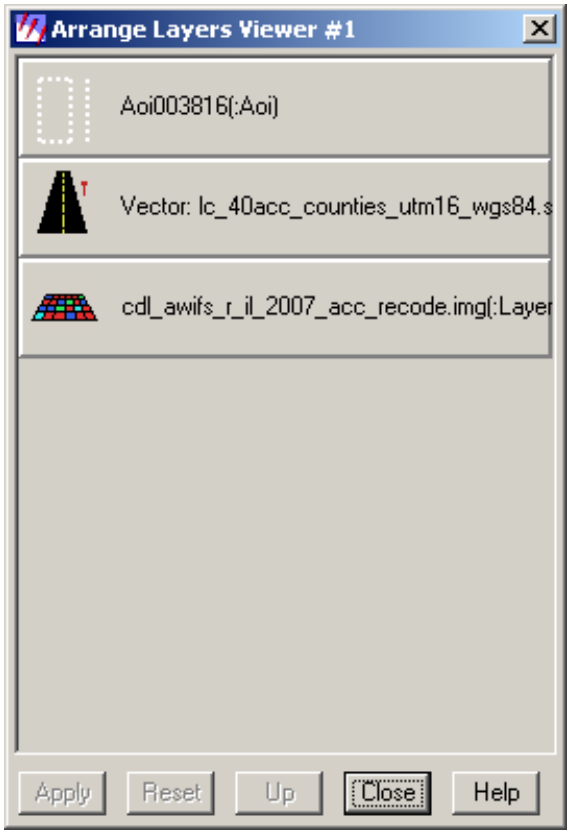
In Imagine, open **cdl_awifs_r_il_2007_acc_recode.img** in a Viewer window

Open the vector layer **lc_40acc_counties_utm16_wgs84.shp** on top of re-coded NASS-CDL Land Cover layer

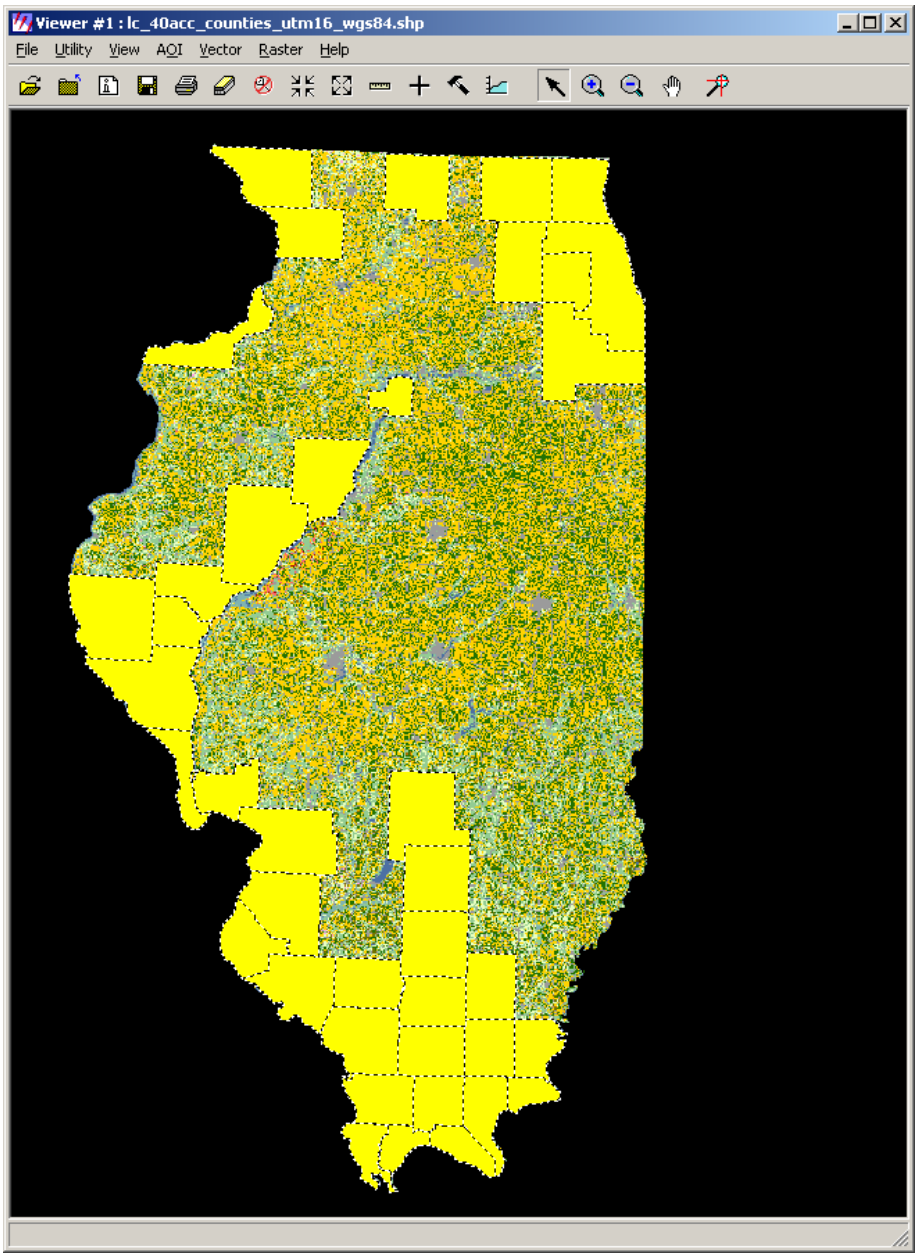
Open the attribute table for the counties by selecting Vector – Attributes from the menu. Right click on the records and select all.

Select **File --- New --- AOI Layer**

To make sure you have created a new AOI layer select View Arrange layers to view all layers that are currently opened in the viewer.

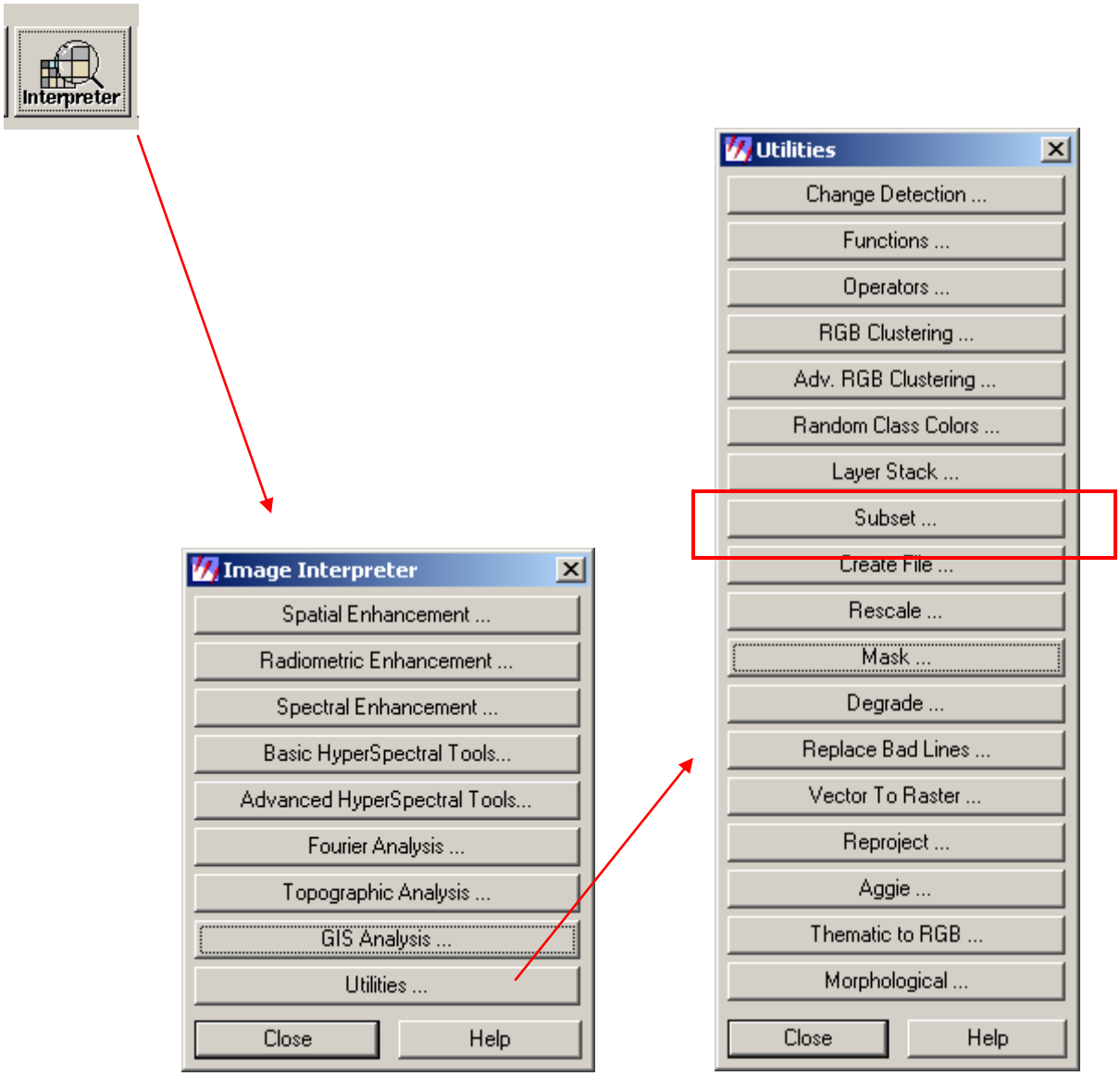


Select **AOI --- Copy Selection to AOI….** You should see dashed lines around all of the selected counties.

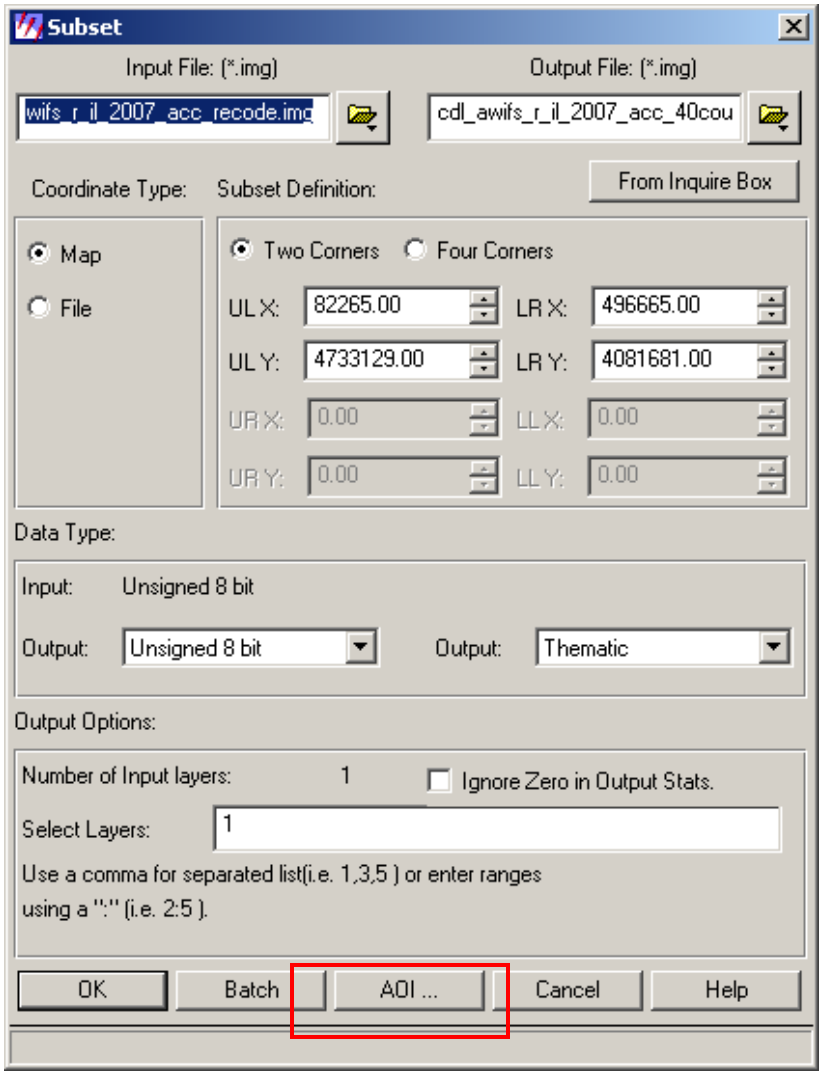


Then select **File --- Save AOI As… (lc_40acc_counties.aoi)**

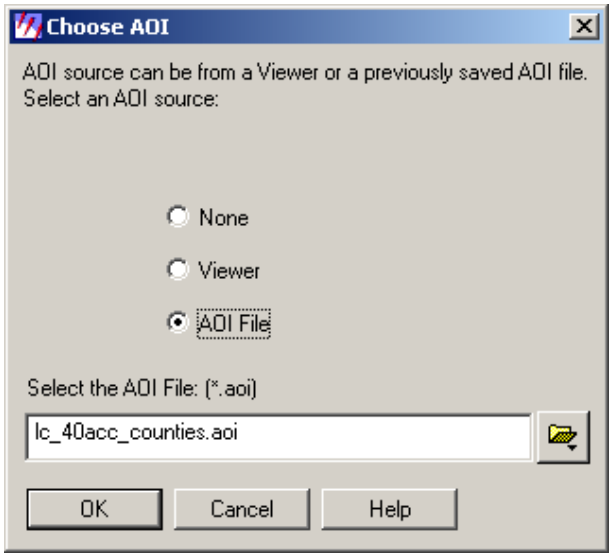
Click on **Interpreter – Utilities – Subset**



Input file is **cdl_awifs_r_il_2007_acc_recode.img**
Output file is **cdl_awifs_r_il_2007_acc_40counties.img**

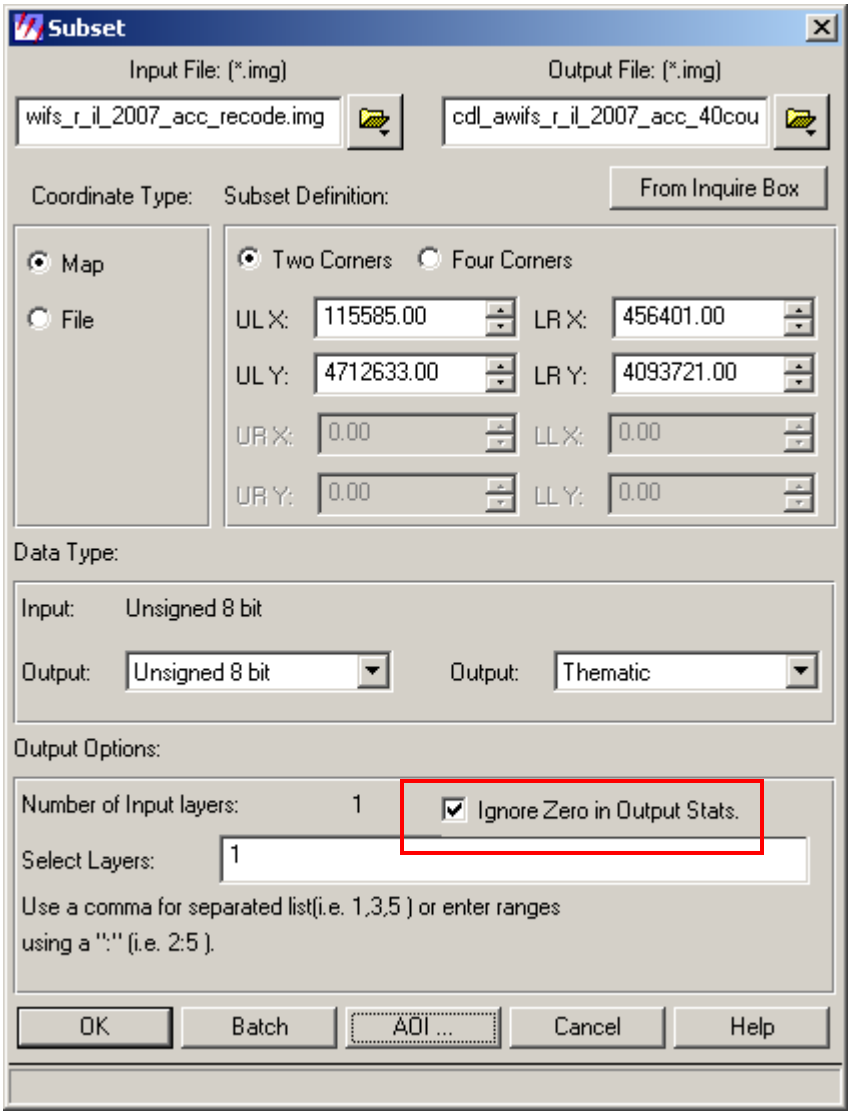


Click on **AOI** and select the **AOI File (lc_40acc_counties.aoi)**



Click OK

Make sure to check the **Ignore Zero** in Stats box
Then click OK

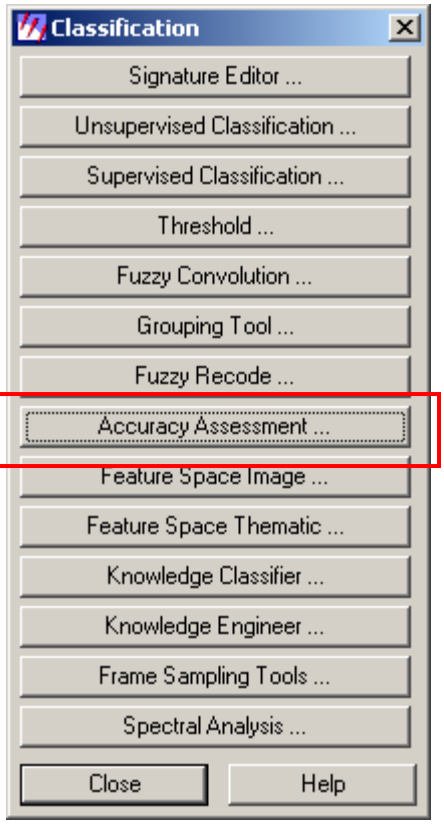


Next, double check the subset image to make sure it was clipped properly.

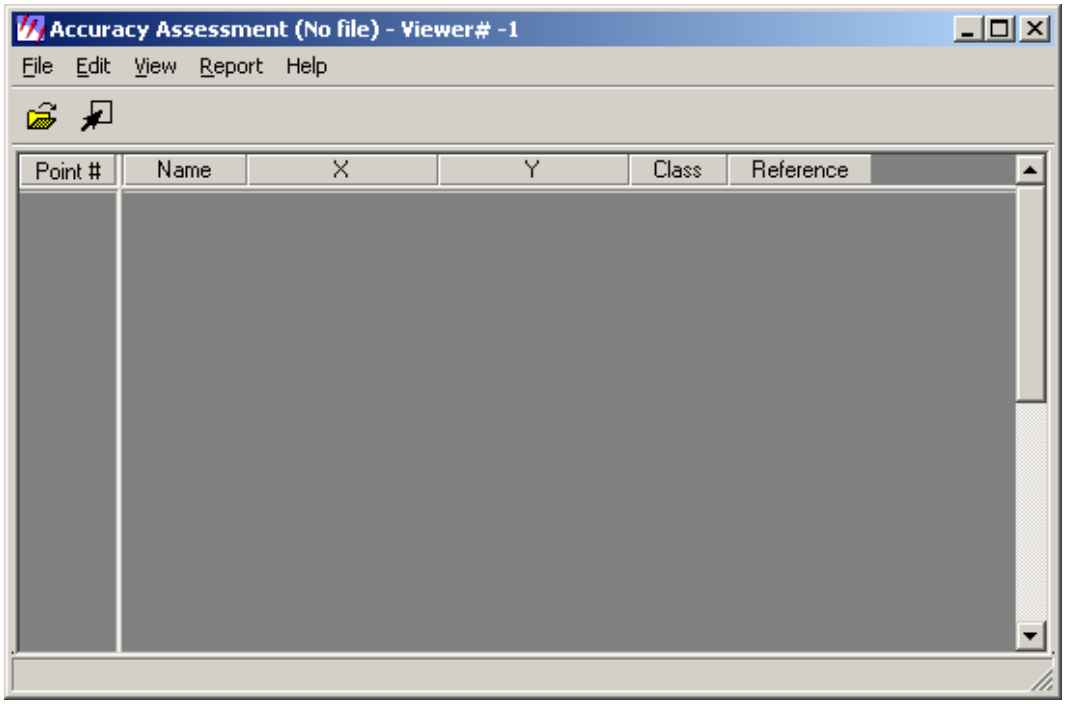
(4) Generate a specified number of stratified random sampling points to be used for the accuracy assessment. *We determined we would create a minimum of 70 points per category. (11 categories x 70 points per category = 770 points. Creating 825 will allow us extra 55 extra points in can we need to throw out any duplicate points or points that occur may occur in agricultural areas)*

In Imagine, click on **Classifier --- Accuracy Assessment**



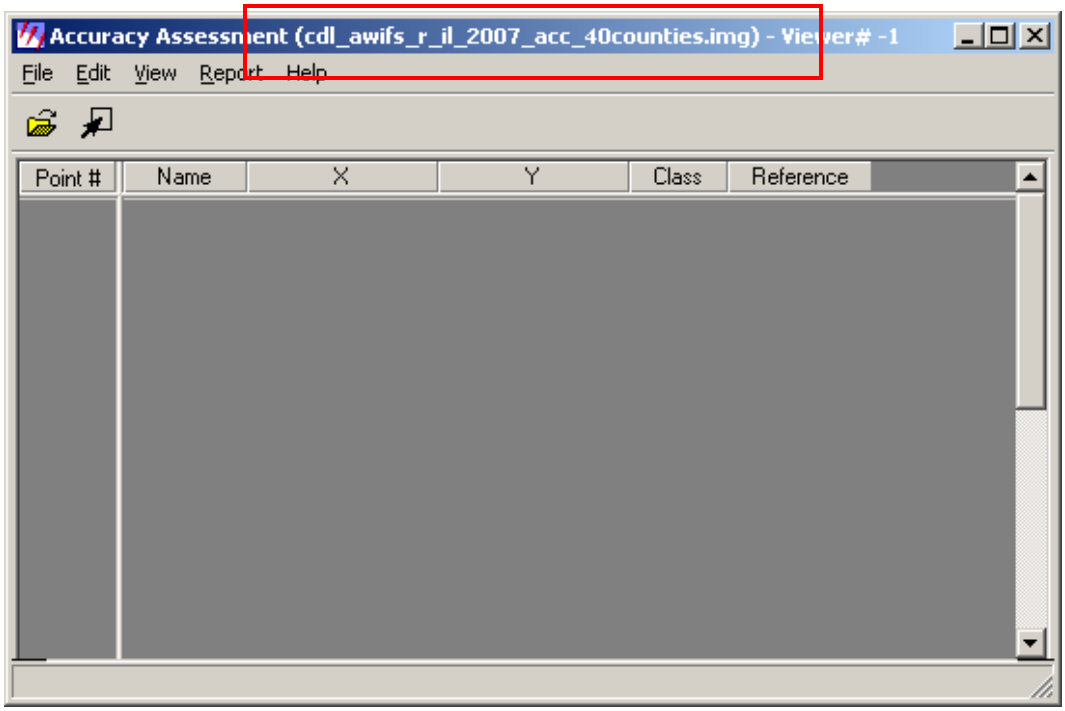


This brings up a blank “cell array” window.



In the Accuracy Assessment Window click on **File --- Open**

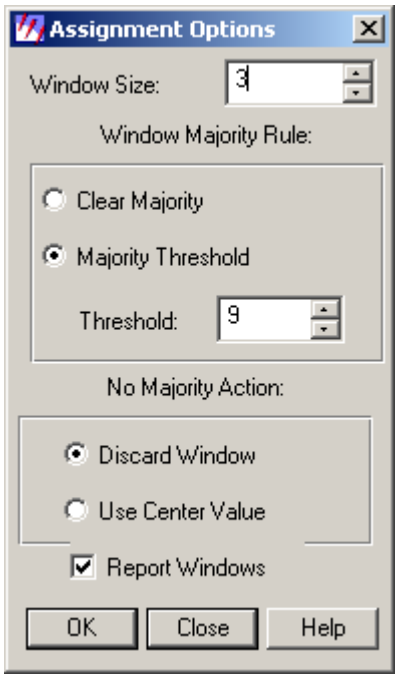
This will allow the user to open a *.img file. The file you want to open is your classified image. NOTE: The points are saved within the classified image you specify and if you have already saved accuracy assessment points to this same file, then those saved point will open up in the Accuracy Assessment viewer.



Then click on **Edit --- Class Value Assignment Options**

The following criteria will be used

- window size = 3 x 3
- window majority rule =majority threshold
- majority threshold = 9
- no majority action = discard window



Click OK

Then click on **Edit --- Create/Add Random Points**

This dialog enables you to randomly select points from the classified image to be used in the accuracy assessment process.

A search window is used to derive the class value for a selected pixel. The center pixel of the search window is the selected pixel if the pixel values in the window meet the criteria set by you. For example, you may specify that a majority of pixel values must exist in the search window in order for it to be used. If a majority does not exist, then the center pixel for the search window is not selected and the window is discarded. If a majority does exist, then the center pixel is selected and it is assigned the majority class value.

After the points are generated, you must enter the estimated class values for the points into the Accuracy Assessment CellArray. These reference values are compared to the values that were assigned when the pixels were selected.

Select **Edit -> Create/Add Random Points** from the Accuracy Assessment dialog menu bar to open this dialog.

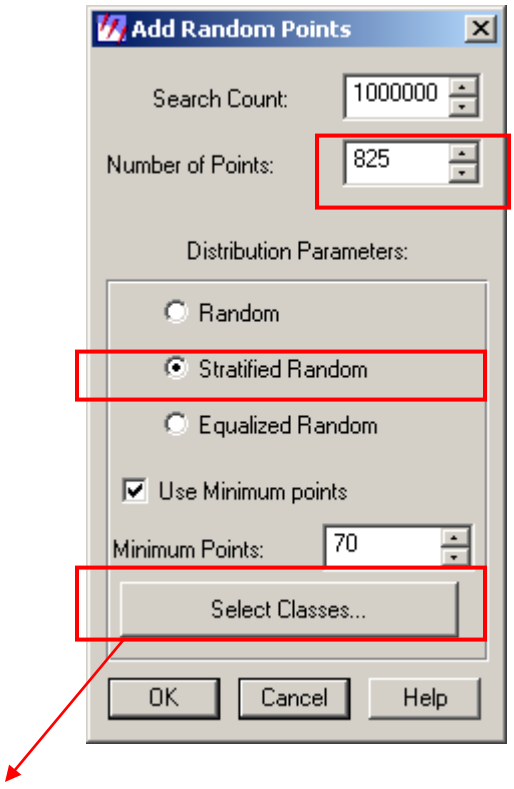
Search Count This is the number of search windows that will be used for gathering the random points per run. For example, if you enter 100, then a maximum of 100 search windows will be used throughout the image for gathering the points. (**1,000,000**)

NOTE: If you are having trouble (that is, the application exhausts the search count quickly or gets only a few points per run) increase this number to a very large one so you do not need to interact with the application often.

Number of Points: Enter the total number of random points to be generated. (**825**)

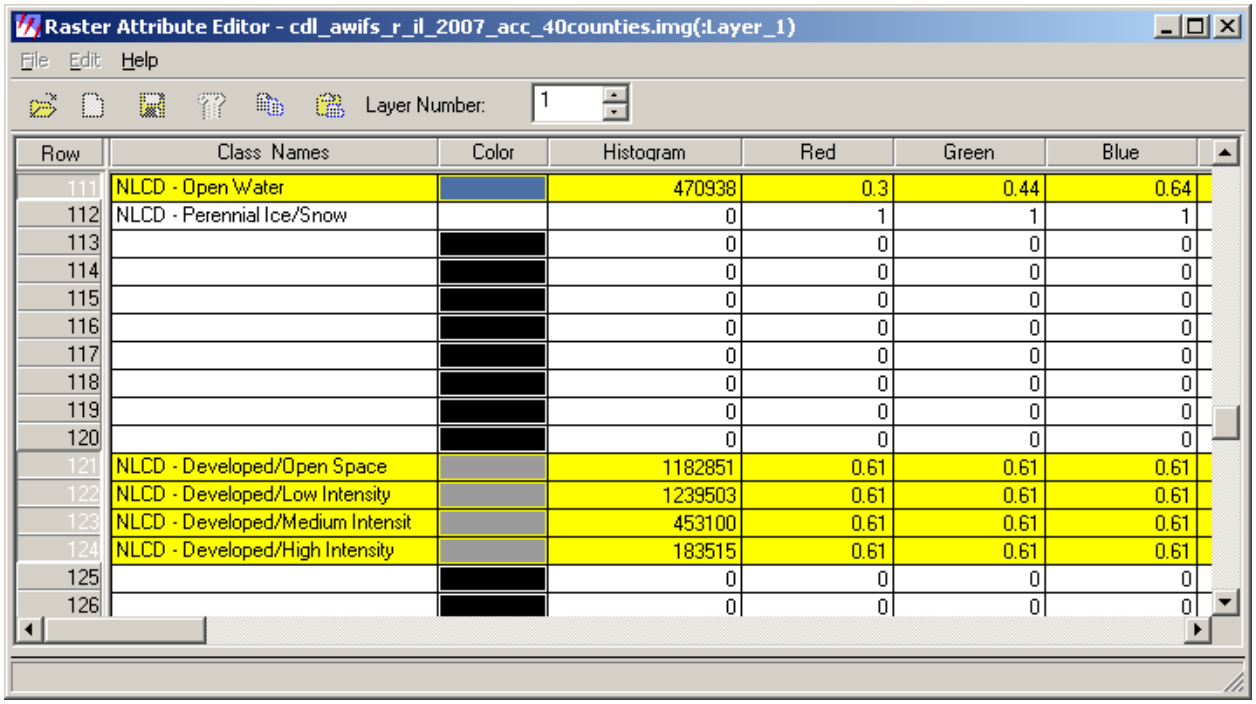
Select **Stratifed Random** from the **Distribution Parameters:**

NOTE: If you select Stratified Random above, you can select the minimum number of points for each class. This ensures that the smallest class has enough points for a true measure of accuracy assessment. (**70**)



Then Click the **Select Classes** box to specify the classes in the thematic layer to be used in selecting the random points. The Raster Attribute Editor opens. Select the classes in the Raster Attribute Editor CellArray that you want to be used in selecting random points. By default, all of the classes are selected. Choose the following:

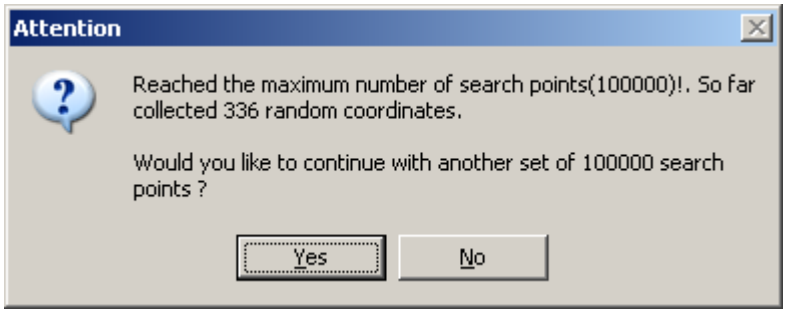
"111" NLCD - Open Water
"121" NLCD - Developed/Open Space
"122" NLCD - Developed/Low Intensity
"123" NLCD - Developed/Medium Intensity
"124" NLCD - Developed/High Intensity
"131" NLCD - Barren
"141" NLCD - Deciduous Forest
"142" NLCD - Evergreen Forest
"171" NLCD - Grassland Herbaceous
"190" NLCD - Woody Wetlands
"195" NLCD - Herbaceous Wetlands



Row	Class Names	Color	Histogram	Red	Green	Blue
111	NLCD - Open Water		470938	0.3	0.44	0.64
112	NLCD - Perennial Ice/Snow		0	1	1	1
113			0	0	0	0
114			0	0	0	0
115			0	0	0	0
116			0	0	0	0
117			0	0	0	0
118			0	0	0	0
119			0	0	0	0
120			0	0	0	0
121	NLCD - Developed/Open Space		1182851	0.61	0.61	0.61
122	NLCD - Developed/Low Intensity		1239503	0.61	0.61	0.61
123	NLCD - Developed/Medium Intensit		453100	0.61	0.61	0.61
124	NLCD - Developed/High Intensity		183515	0.61	0.61	0.61
125			0	0	0	0
126			0	0	0	0

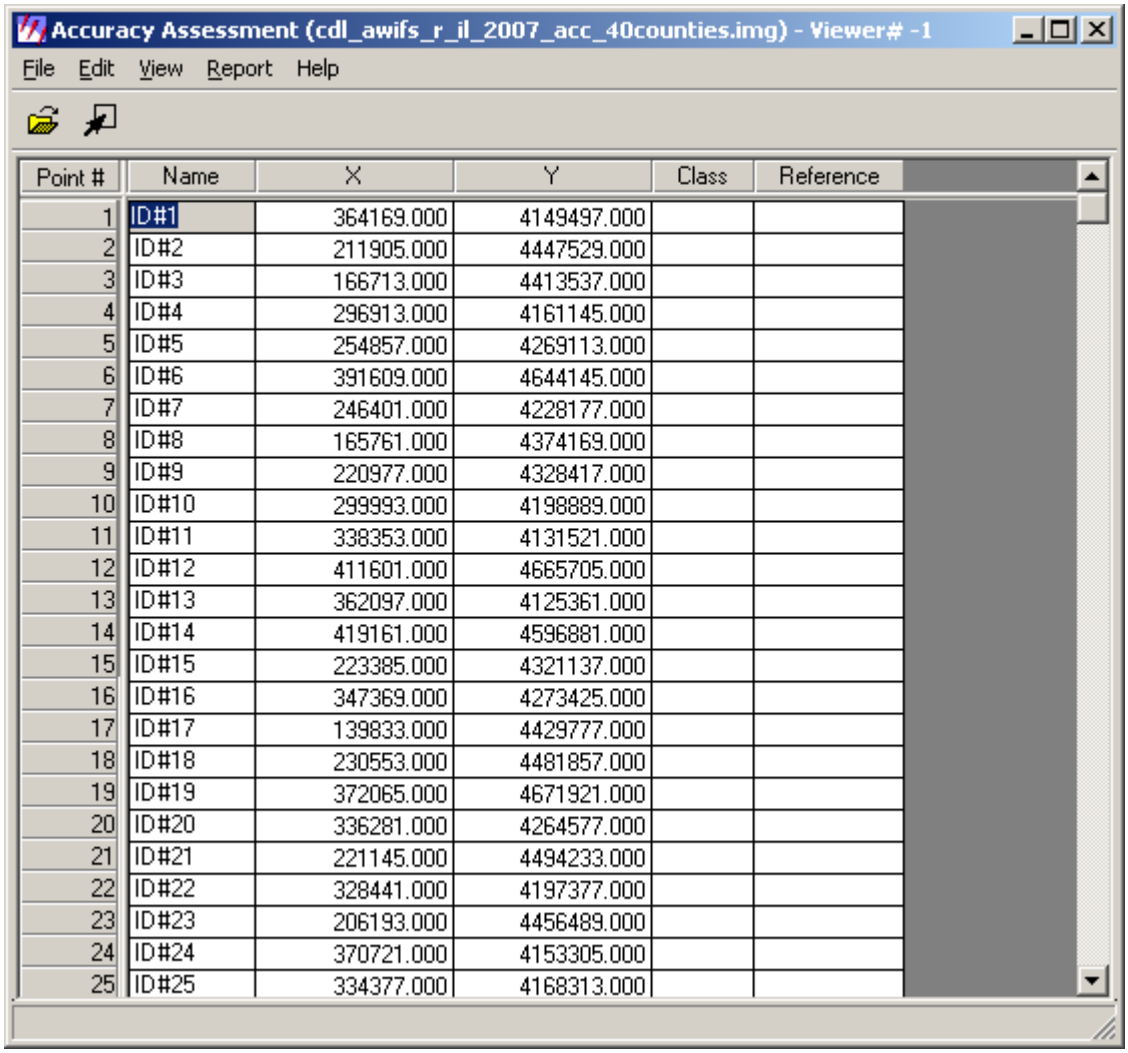
DO not close the Raster Attribute Editor, it closes automatically.

Click **OK** to run this process with the options selected and close this dialog.



If the above box appears click **Yes** until the program reaches the number of random point requested. NOTE: This may take clicking OK many times.

Once you reach the desired number you will see the points appear in the Accuracy Assessment Window



Point #	Name	X	Y	Class	Reference
1	ID#1	364169.000	4149497.000		
2	ID#2	211905.000	4447529.000		
3	ID#3	166713.000	4413537.000		
4	ID#4	296913.000	4161145.000		
5	ID#5	254857.000	4269113.000		
6	ID#6	391609.000	4644145.000		
7	ID#7	246401.000	4228177.000		
8	ID#8	165761.000	4374169.000		
9	ID#9	220977.000	4328417.000		
10	ID#10	299993.000	4198889.000		
11	ID#11	338353.000	4131521.000		
12	ID#12	411601.000	4665705.000		
13	ID#13	362097.000	4125361.000		
14	ID#14	419161.000	4596881.000		
15	ID#15	223385.000	4321137.000		
16	ID#16	347369.000	4273425.000		
17	ID#17	139833.000	4429777.000		
18	ID#18	230553.000	4481857.000		
19	ID#19	372065.000	4671921.000		
20	ID#20	336281.000	4264577.000		
21	ID#21	221145.000	4494233.000		
22	ID#22	328441.000	4197377.000		
23	ID#23	206193.000	4456489.000		
24	ID#24	370721.000	4153305.000		
25	ID#25	334377.000	4168313.000		

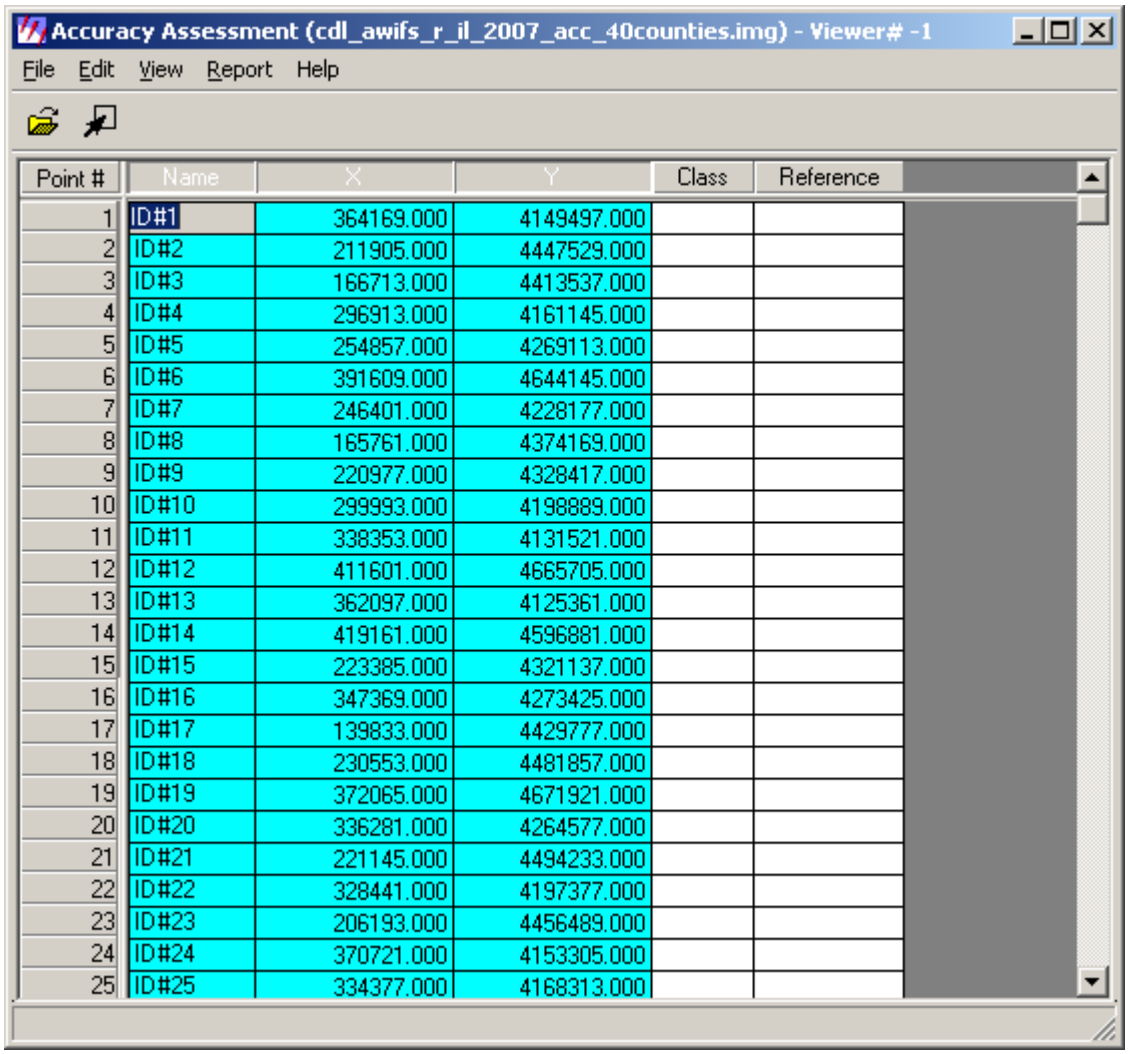
Select **File --- Save Table**. This will save the points to the image.

To check to make sure the class value assignments were used you can create a cell report for each of the points.

Select **Report --- Cell Report** from the menu

Then select File --- Save As to save as an ASCII text file.
(**40counties_825pts_3x3_cellreport.txt**)

Select all the columns you want to use and then right click and select Export to a *.dat file or copy and paste into excel and save as a both and *.xls and *.dbf file.

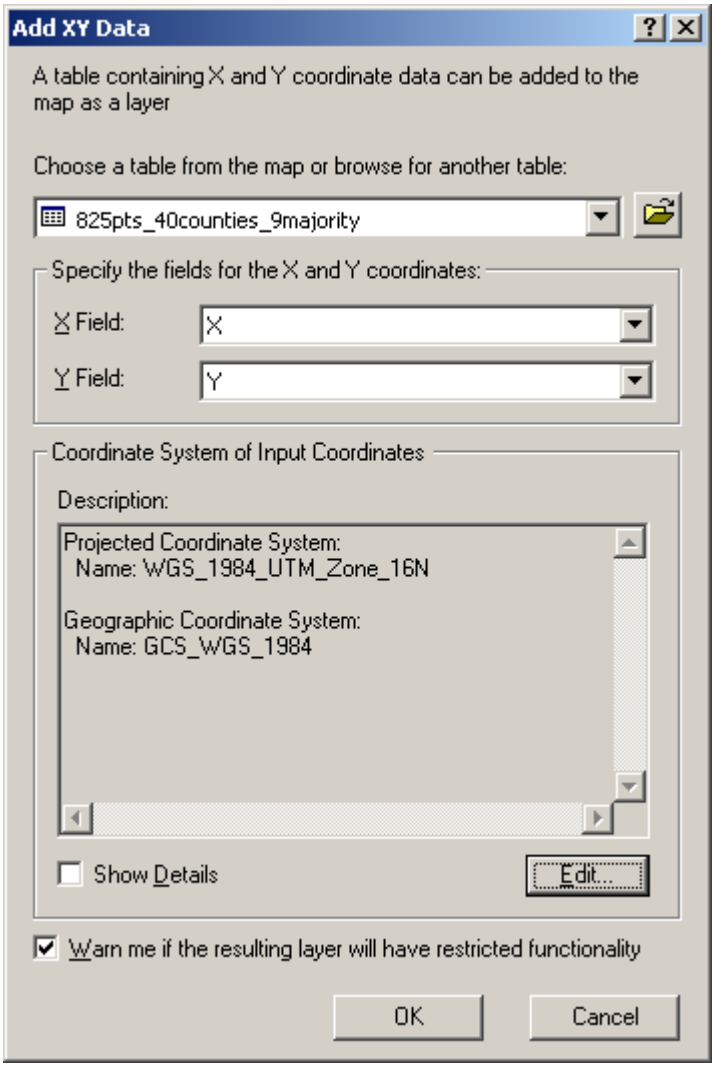


Point #	Name	X	Y	Class	Reference
1	ID#1	364169.000	4149497.000		
2	ID#2	211905.000	4447529.000		
3	ID#3	166713.000	4413537.000		
4	ID#4	296913.000	4161145.000		
5	ID#5	254857.000	4269113.000		
6	ID#6	391609.000	4644145.000		
7	ID#7	246401.000	4228177.000		
8	ID#8	165761.000	4374169.000		
9	ID#9	220977.000	4328417.000		
10	ID#10	299993.000	4198889.000		
11	ID#11	338353.000	4131521.000		
12	ID#12	411601.000	4665705.000		
13	ID#13	362097.000	4125361.000		
14	ID#14	419161.000	4596881.000		
15	ID#15	223385.000	4321137.000		
16	ID#16	347369.000	4273425.000		
17	ID#17	139833.000	4429777.000		
18	ID#18	230553.000	4481857.000		
19	ID#19	372065.000	4671921.000		
20	ID#20	336281.000	4264577.000		
21	ID#21	221145.000	4494233.000		
22	ID#22	328441.000	4197377.000		
23	ID#23	206193.000	4456489.000		
24	ID#24	370721.000	4153305.000		
25	ID#25	334377.000	4168313.000		

Then in ArcMap, make a shapefile out of the saved *.dbf file using the Add XY data feature under the Tools menu.

Add the saved *.dbf file (**825pt_40counties_3x3_majthreshold9.dbf**)

Select **Tools --- Add XY Data**



Then Export your 825_points events feature to a shapefile by right clicking on the feature then selecting **Data --- Export data**. (825pts_40counties_maj9.shp)

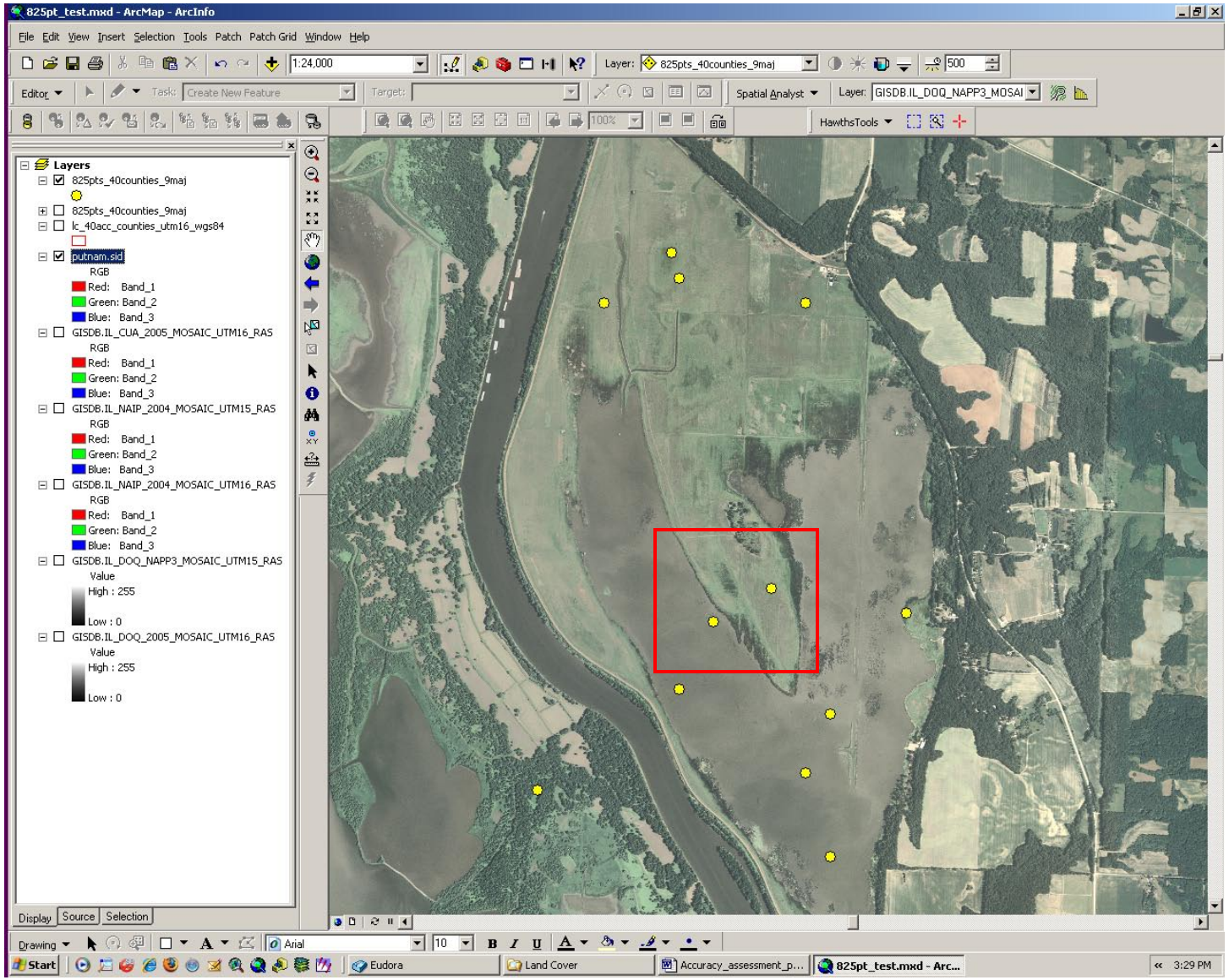
Then using the 2007 NAIP aerial photography and other ancillary data sources, fill in the reference column for each point with the appropriate land cover type code.

Attributes of 825pts_40counties_9maj

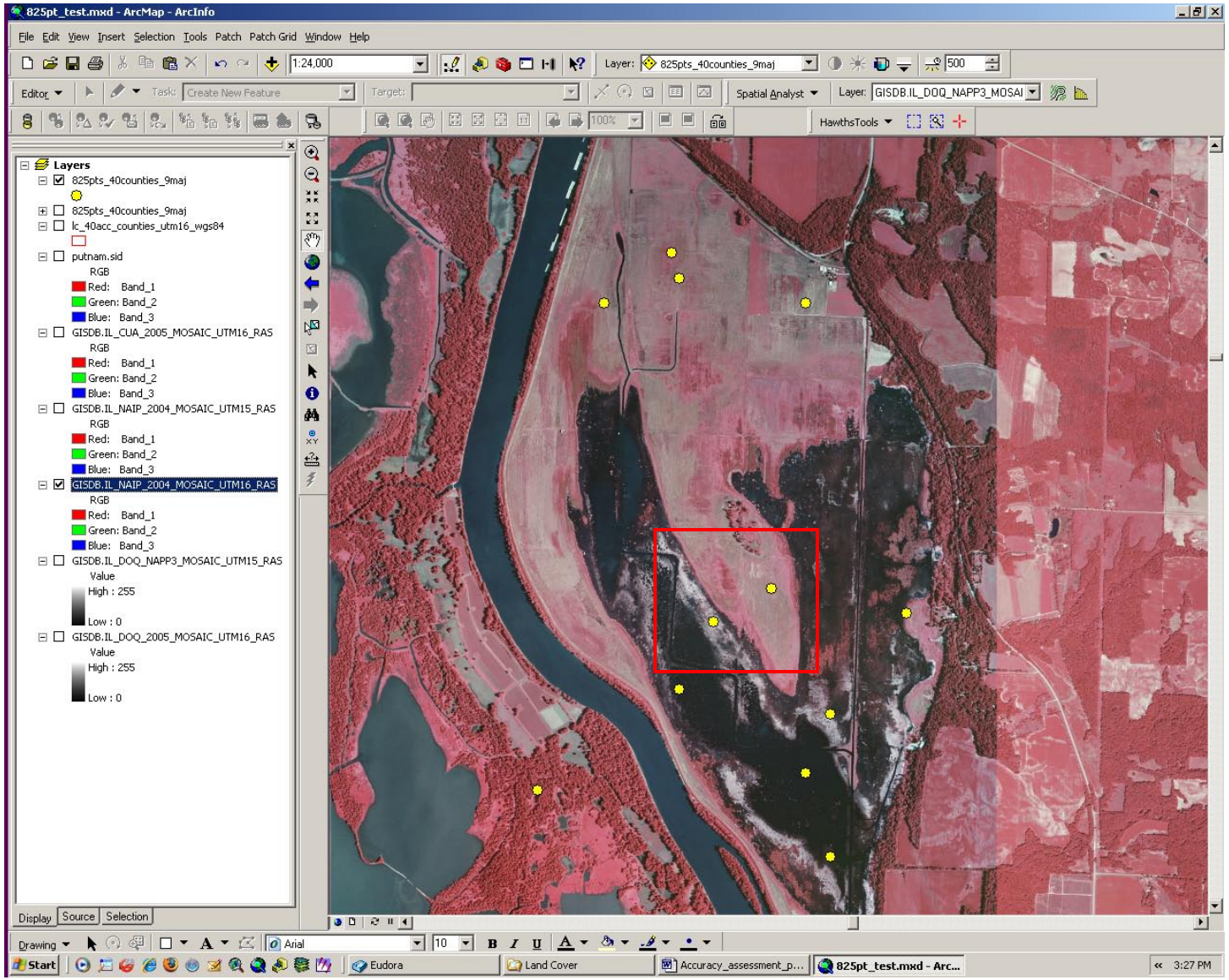
FID	Shape	ID	X	Y	REFERENCE	COMMENTS
0	Point	ID#1	345857	4150617		
1	Point	ID#2	279217	4170833		
2	Point	ID#3	310689	4133929		
3	Point	ID#4	356945	4207345		
4	Point	ID#5	376601	4155937		
5	Point	ID#6	346025	4290001		
6	Point	ID#7	392113	4626001		
7	Point	ID#8	212465	4243969		

Record: 0 Show: All Selected Records (0 out of 825 Selected) Options

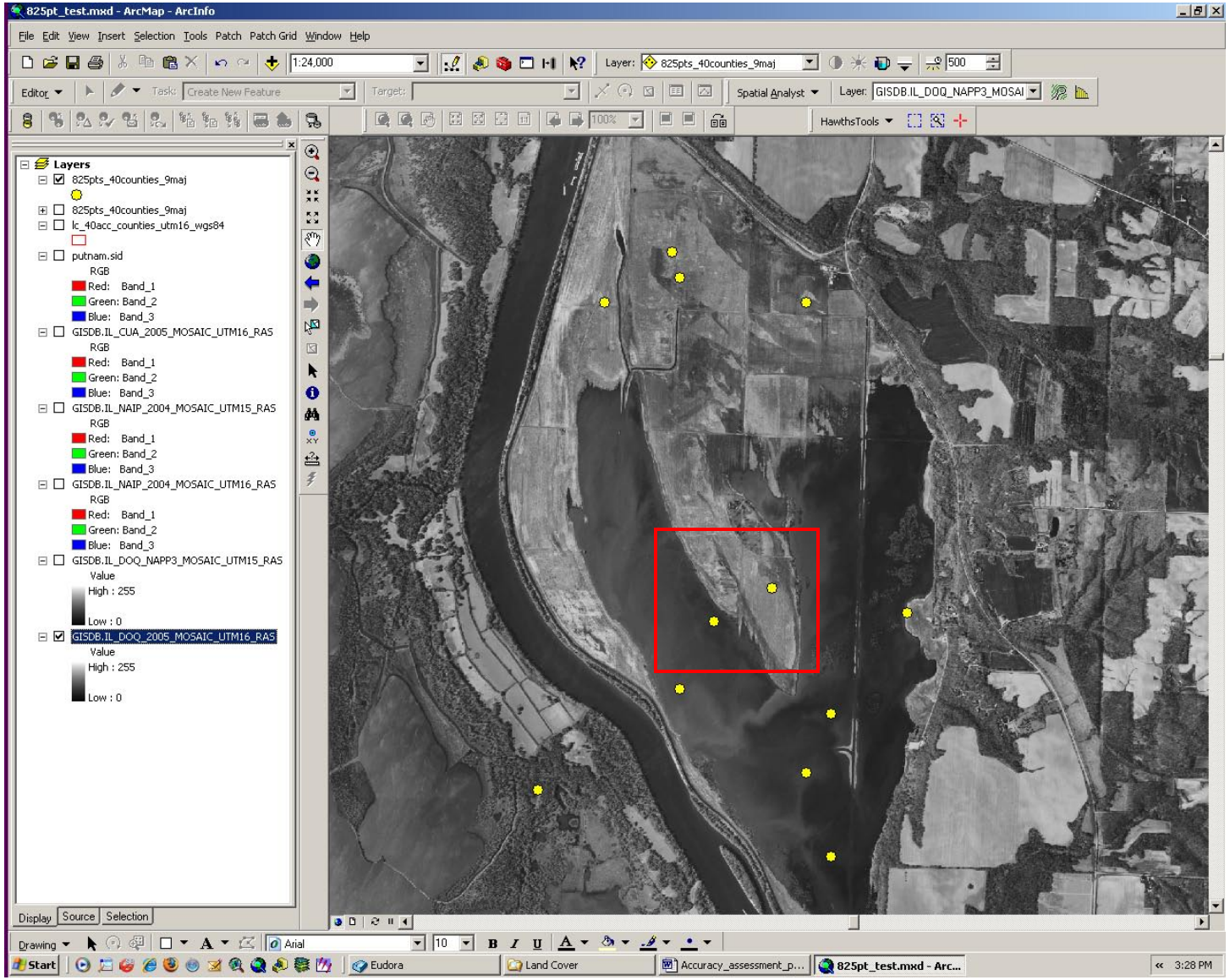
The 1 meter 2007 NAIP true color imagery is used as the primary source data layer when determining the reference categories



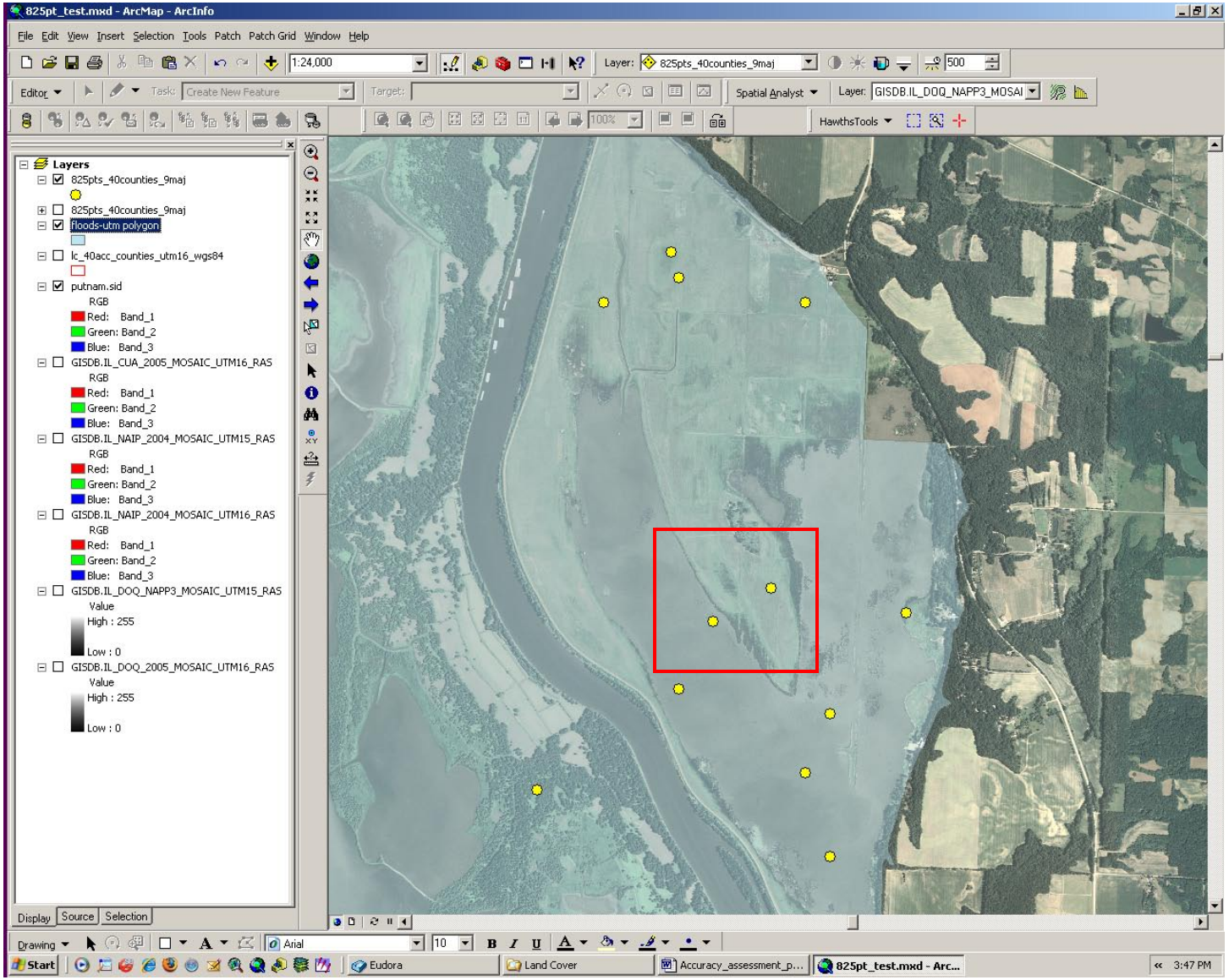
The 2 meter 2004 NAIP color infrared imagery will be as an ancillary data source to help identify the reference categories



The 0.5 meter 2005 NAPP black and white imagery will be used as another ancillary data source to help identify the reference categories



The 100-year floodzones will be another ancillary data source to help identify the reference categories, especially herbaceous and wooded wetlands



A scale of 1:4,800 will be used to identify the final reference categories. A box representing a 3x3 cluster of Awifs pixels is shown below.

