

The homogeneity filters reduced the assessable area to 67.3% and 48.6% of the original after the 3x3 (Table 107) and the 5x5 (Table 108) procedures. The least retained classes included mixed forest, shrub, water, and disturbed. The number of points used in the accuracy evaluation was 278 for the every-pixel (Table 109), 183 for the 3x3 filter evaluation (Table 111), and 140 for the 5x5 filter evaluation (Table 113). The overall accuracy was reasonably high at the every-pixel level (63.7%, Table 110) and grew steadily following the homogeneity filters. The overall accuracy was 77% for the 3x3 (Table 112) and 80% for the 5x5 filter procedures (Table 114). The highest individual class accuracies were coniferous producer's, herbaceous user's, and disturbed user's, all with 100%. Both deciduous forest accuracies were also over 83%. The Kappa was fairly low (compared to other scenes) throughout the evaluations, ending at 0.34 after the 5x5 procedure. The discrepancy between relatively high overall accuracy and relatively low Kappa value was probably due to the high proportion of one cover type (deciduous forest).

Scene 1835

Scene 1835 (Figure 23) contained part of each of the 3 mountainous physiographic provinces, Appalachian Plateau, Ridge and Valley, and Blue Ridge. This topographically diverse area was classified using expert knowledge and overlap from other scenes. Deciduous forest was found on 57.4% of the area (Table 115). Herbaceous was the second most common cover type at 20%.

The homogeneity filters reduced the assessable area to 51.6% of the original area following the 3x3 filter (Table 116), and to 28.9% of the original area following the 5x5

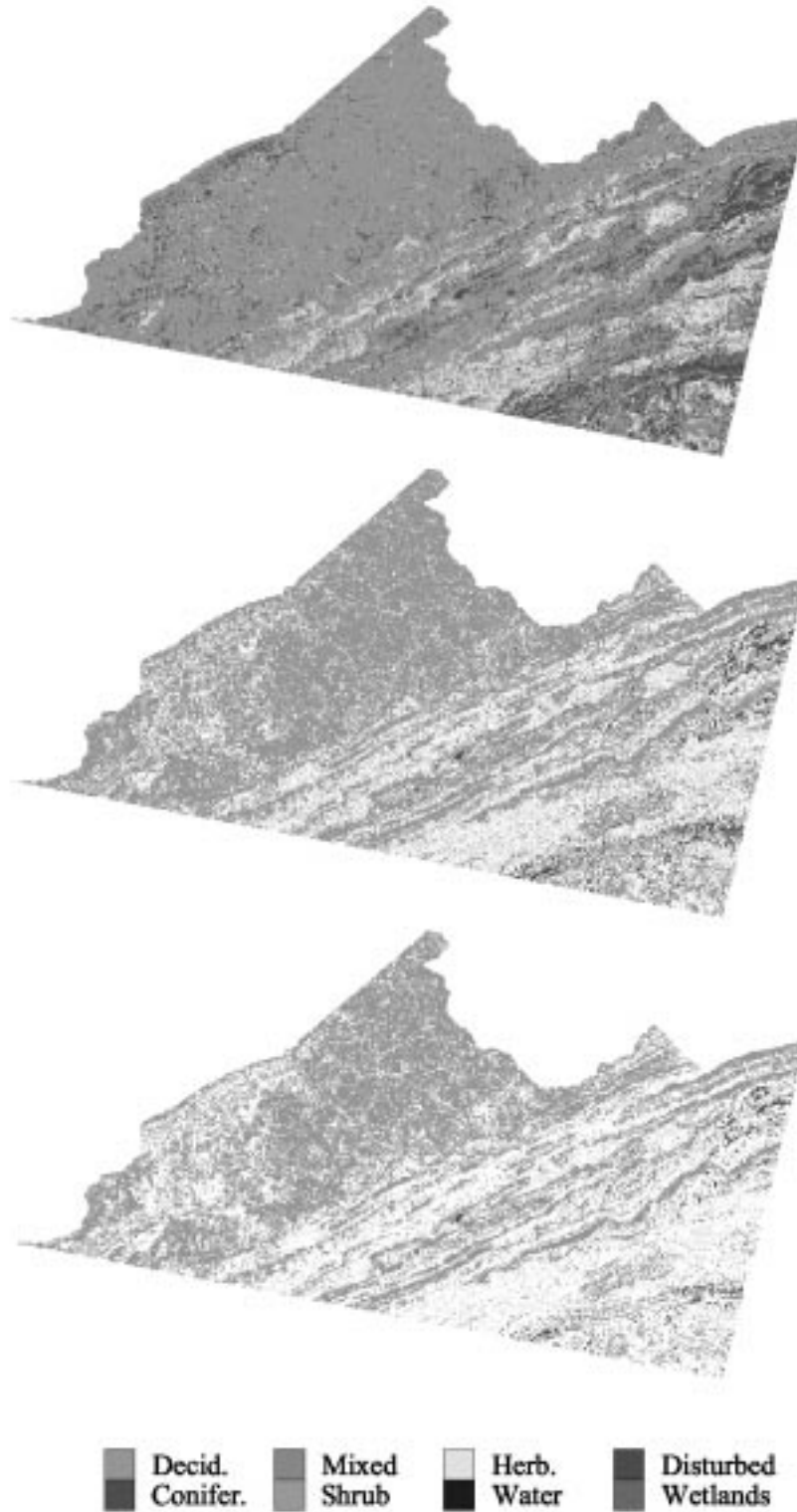


Figure 22. Classification output for scene 1834 full, 3x3 homogeneous, and 5x5 homogeneous.

Table 106. Total area and proportion of each land cover type for scene 1834 when analyzed at the every-pixel level.

	Pixels	Hectares	Acres	Proportion of Total Area
Deciduous Forest	7,722,696	695,043.0	1,717,450.0	0.680
Coniferous Forest	1,430,868	128,778.0	318,211.0	0.126
Mixed Forest	72,312	6,508.1	16,081.5	0.006
Shrub/Scrub	642,832	57,854.9	142,959.0	0.057
Herbaceous	1,334,222	120,080.0	296,718.0	0.117
Open Water	14,488	1,303.9	3,222.0	0.001
Disturbed	147,459	13,271.3	32,793.4	0.013
Coastal Wetland	0	0	0	0.000
Total	11,364,877	1,022,839.0	2,527,435.0	1.000

Table 107. Results of the 3x3 homogeneous filter on land cover types within scene 1834 in area, proportion of total area, and proportion remaining from the 1834 every-pixel level.

	Pixels	Hectares	Acres	Proportion of Total Area	Proportion of Every-Pixel
Deciduous Forest	6,200,680	558,061.0	1,378,969.0	0.811	0.803
Coniferous Forest	590,717	53,164.5	131,370.0	0.077	0.413
Mixed Forest	3,121	280.9	694.1	0.000	0.043
Shrub/Scrub	129,402	11,646.2	28,777.7	0.017	0.201
Herbaceous	684,790	61,631.1	152,290.0	0.090	0.513
Open Water	2,238	201.4	497.7	0.000	0.154
Disturbed	38,447	3,460.2	8,550.2	0.005	0.261
Coastal Wetland	0	0	0	0.000	0.000
Total	7,649,395	688,446.0	1,701,149.0	1.000	0.673

Table 108. Results of the 5x5 homogeneous filter on land cover types within scene 1834 in area, proportion of total area, and proportion remaining from 1834 every-pixel level.

	Pixels	Hectares	Acres	Proportion of Total Area	Proportion of Every-Pixel
Deciduous Forest	4,911,001	441,990.1	1,092,158.0	0.889	0.636
Coniferous Forest	257,921	23,212.9	57,359.1	0.047	0.180
Mixed Forest	57	5.1	12.7	0.000	0.001
Shrub/Scrub	19,099	1,718.9	4,247.4	0.003	0.030
Herbaceous	325,532	29,297.9	72,395.1	0.059	0.244
Open Water	478	43.0	106.3	0.000	0.033
Disturbed	9,510	855.9	2,114.9	0.002	0.064
Coastal Wetland	0	0	0	0.000	0.000
Total	5,523,598	497,123.8	1,228,393.0	1.000	0.486

Table 109. Error matrix for scene 1834 at the every-pixel level. Reference data (aerial videography points) are shown as column headings, while actual pixel values are displayed in the left column as row headings. The number of points classified correctly in each cover-type is in bold.

	Deciduous Forest	Coniferous Forest	Mixed Forest	Shrub/ Scrub	Herbaceous	Water Open	Disturbed	Coastal Wetland	Total
Deciduous Forest	151	1	3	21	6		8		190
Coniferous Forest	29	3	6	1	9				48
Mixed Forest	3								3
Shrub/Scrub				1	4		2		7
Herbaceous	2				20		2		24
Open Water									0
Disturbed							2		2
Coastal Wetland									0
Other	3						1		4
Total	188	4	9	23	39	0	15	0	278

Table 110. User's and producer's accuracy for each land cover class, along with overall accuracy and the Kappa statistic, for scene 1834 at the every-pixel level.

	User's	Producer's
Deciduous Forest	0.795	0.803
Coniferous Forest	0.063	0.750
Mixed Forest	0.000	0.000
Shrub/Scrub	0.143	0.043
Herbaceous	0.833	0.513
Open Water		
Disturbed	1.000	0.133
Coastal Wetland		
Overall Accuracy	0.637	
Kappa	0.302	

Table 111. Error matrix for scene 1834 at the 3x3 homogeneous level. Reference data (aerial videography points) are shown as column headings, while actual pixel values are displayed in the left column as row headings. The number of points classified correctly in each cover-type is in bold. The number of reference points for each category that falls on non-homogeneous pixels is shown in the last row.

	Deciduous Forest	Conifer Forest	Mixed Forest	Shrub/ Scrub	Herbaceous	Open Water	Disturbed	Coastal Wetland	Total
Deciduous Forest	127		2	18	3		1		151
Coniferous Forest	8	3	5	1	2				19
Mixed Forest									0
Shrub/Scrub				1					1
Herbaceous					9		2		11
Open Water									0
Disturbed							1		1
Coastal Wetland									0
Other									0
Total	135	3	7	20	14	0	4	0	183
Non-Homogeneous	53	1	2	3	25		11		95

Table 112. User's and producer's accuracy for each category, along with overall accuracy and Kappa statistic, for scene 1834 at the 3x3 homogeneous level.

	User's	Producer's
Deciduous Forest	0.841	0.941
Coniferous Forest	0.158	1.000
Mixed Forest		0.000
Shrub/Scrub	1.000	0.050
Herbaceous	0.818	0.643
Open Water		
Disturbed	1.000	0.250
Coastal Wetland		
Overall Accuracy	0.770	
Kappa	0.403	

Table 113. Error matrix for scene 1834 at the 5x5 homogeneous level. Reference data (aerial videography points) are shown as column headings, while actual pixel values are displayed in the left column as row headings. The number of points correctly classified in each cover-type is in bold. The number of reference points for each category that falls on non-homogeneous pixels is shown in the last row.

	Deciduous Forest	Coniferous Forest	Mixed Forest	Shrub/ Shrub	Herbaceous	Open Water	Disturbed	Coastal Wetland	Total
Deciduous Forest	105		2	15	3		1		126
Coniferous Forest	3	3	4						10
Mixed Forest									0
Shrub/Scrub									0
Herbaceous					3				3
Open Water									0
Disturbed							1		1
Coastal Wetland									0
Other									0
Total	108	3	6	15	6	0	2	0	140
Non-Homogeneous	80	1	3	8	33		13		138

Table 114. User's and producer's accuracy for each land cover class, along with overall accuracy and Kappa statistic, for scene 1834 at the 5x5 homogeneous level.

	User's	Producer's
Deciduous Forest	0.833	0.972
Conifer Forest	0.300	1.000
Mixed Forest		0.000
Shrub/Scrub		0.000
Herbaceous	1.000	0.500
Open Water		
Disturbed	1.000	0.500
Coastal Wetland		
Overall Accuracy	0.800	
Kappa	0.340	