

(Table 129), and 7 were used in the 5x5 assessment (Table 131). The overall accuracy was 27.6% at the every-pixel level (Table 128), 60% at the 3x3 level (Table 130), and 71.4% at the 5x5 level (Table 132). Because of the low number of reference points available for the 3x3 and 5x5 level assessments, only 6 of the possible 14 individual class accuracies were calculated. The Kappa increased following the use of the filters, resulting in its highest value for this scene at 0.56 after the 5x5 level assessment.

### **Statewide Mosaic Land Cover Map**

The statewide mosaic of the land cover map shows a relatively seamless image of the Commonwealth (Figure 25). The 14 scenes were formed as a mosaic according to their 5x5 level accuracy (Table 133). All of scene 1733 is present in the statewide mosaic because it had the highest overall 5x5 accuracy. Other scenes with high evaluation results, having the majority of their overlap area represented in the Commonwealth composite, were 1835, 1735, 1535, 1533, and 1633.

Accounting for 38% of the land area, deciduous forest is the most dominant cover type in Virginia (Table 134). The second highest land cover class is herbaceous at 20% of the area. Coniferous forest, the next highest, covers 19.5%. The area of open water is 8.9%. Shrub lands are found on 7.8% of the land. About 3% of the Commonwealth was classified as disturbed. Two percent of Virginia is in mixed forest. Less than 1% of the land area is coastal wetland.

Combining the first 3 categories showed that approximately 60% of the Commonwealth is forested. Almost 30% is in herbaceous or scrub/shrub vegetation. The remaining 10% is a combination of open water, disturbed lands, and coastal wetlands.



Figure 24. Classification output for scene 1935 full, 3x3 homogeneous, and 5x5 homogeneous.

Table 124. Total area and proportion of each land cover type for scene 1935 when analyzed at the every-pixel level.

	Pixels	Hectares	Acres	Proportion of Total Area
Deciduous Forest	552,143	49,692.9	122,791.0	0.559
Coniferous Forest	83,199	7,487.9	18,502.6	0.084
Mixed Forest	24,074	2,166.7	5,353.8	0.024
Shrub/Scrub	95,876	8,628.8	21,321.9	0.097
Herbaceous	209,914	18,892.3	46,682.8	0.212
Open Water	495	44.6	110.1	0.001
Disturbed	22,157	1,994.1	4,927.5	0.022
Coastal Wetland	0	0	0	0.000
Total	987,858	88,907.2	219,690.0	1.000

Table 125. Results of the 3x3 homogeneous filter on land cover types within scene 1935 in area, proportion of total area, and proportion remaining from the 1935 every-pixel level.

	Pixels	Hectares	Acres	Proportion of Total Area	Proportion of Every-Pixel
Deciduous Forest	552,866	49,757.9	122,952.0	0.703	1.001
Coniferous Forest	33,747	3,037.2	7,505.0	0.043	0.406
Mixed Forest	6,911	622.0	1,536.9	0.009	0.287
Shrub/Scrub	26,958	2,426.2	5,995.2	0.034	0.281
Herbaceous	161,001	14,490.1	35,805.0	0.205	0.767
Open Water	6	0.5	1.3	0.000	0.012
Disturbed	4,678	421.0	1,040.3	0.006	0.211
Coastal Wetland	0	0	0	0.000	0.000
Total	786,167	70,755.0	174,836.0	1.000	0.796

Table 126. Results of the 5x5 homogeneous filter on land cover types within scene 1935 in area, proportion of total area, and proportion remaining from 1935 every-pixel level.

	Pixels	Hectares	Acres	Proportion of Total Area	Proportion of Every-Pixel
Deciduous Forest	394,036	35,463.2	87,629.7	0.799	0.714
Coniferous Forest	9,517	856.5	2,116.5	0.019	0.114
Mixed Forest	808	72.7	179.7	0.002	0.034
Shrub/Scrub	3,951	355.6	878.7	0.008	0.041
Herbaceous	84,360	7,592.4	18,760.8	0.171	0.402
Open Water	0	0	0	0.000	0.000
Disturbed	730	65.7	162.3	0.001	0.033
Coastal Wetland	0	0	0	0.000	0.000
Total	493,402	44,406.2	109,728.0	1.000	0.499

Table 127. Error matrix for scene 1935 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	<b>3</b>	4	2	1					10
Coniferous Forest									0
Mixed Forest									0
Shrub/Scrub					1				1
Herbaceous				2	<b>4</b>		1		7
Open Water									0
Disturbed				1			<b>1</b>		2
Coastal Wetland									0
Other	1	1	1	1	4	1			9
Total	4	5	3	5	9	1	2	0	29

Table 128. User's and producer's accuracy for each land cover class, along with overall accuracy and the Kappa statistic, for scene 1935 at the every-pixel level.

	User's	Producer's
Deciduous Forest	0.300	0.750
Coniferous Forest		0.000
Mixed Forest		0.000
Shrub/Scrub	0.000	0.000
Herbaceous	0.571	0.444
Open Water		0.000
Disturbed	0.500	0.500
Coastal Wetland		
Overall Accuracy	0.276	
Kappa	0.176	

Table 129. Error matrix for scene 1935 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	<b>3</b>	2	2						7
Coniferous Forest									0
Mixed Forest									0
Shrub/Scrub									0
Herbaceous					<b>3</b>				3
Open Water									0
Disturbed									0
Coastal Wetland									0
Other									0
Total	3	2	2	0	3	0	0	0	10
Non-Homogeneous	1	3	1	5	6	1		2	19

Table 130. User's and producer's accuracy for each category, along with overall accuracy and Kappa statistic, for scene 1935 at the 3x3 homogeneous level.

	User's	Producer's
Deciduous Forest	0.429	1.000
Coniferous Forest		0.000
Mixed Forest		0.000
Shrub/Scrub		
Herbaceous	1.000	1.000
Open Water		
Disturbed		
Coastal Wetland		
Overall Accuracy	0.600	
Kappa	0.429	

Table 131. Error matrix for scene 1935 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	<b>2</b>	1	1						4
Coniferous Forest									0
Mixed Forest									0
Shrub/Scrub									0
Herbaceous					<b>3</b>				3
Open Water									0
Disturbed									0
Coastal Wetland									0
Other									0
Total	2	1	1	0	3	0	0	0	7
Non-Homogeneous	2	4	2	5	6	1	5	0	25



Table 132. User's and producer's accuracy for each land cover class, along with overall accuracy and Kappa statistic, for scene 1935 at the 5x5 homogeneous level.

	User's	Producer's
Deciduous Forest	0.500	1.000
Conifer Forest		0.000
Mixed Forest		0.000
Shrub/Scrub		
Herbaceous	1.000	1.000
Open Water		
Disturbed		
Coastal Wetland		
Overall Accuracy	0.714	
Kappa	0.563	