

Proposed Land Cover and Land Cover Change Accuracy Assessment

Peter R. Claggett¹, Labeeb Ahmed¹, Jacob Czawlytco², Sean MacFaden³, Sarah McDonald¹, Jarlath O'Neil-Dunne³, Stephen Stehman⁴, and Katie Walker²

¹ Presenting Author, Lower Mississippi-Gulf Water Science Center, U.S. Geological Survey, Annapolis, MD 21403

² Chesapeake Conservancy, Annapolis, MD 21403

³ University of Vermont Spatial Analysis Laboratory, Burlington, VT 05405

⁴ SUNY College of Environmental Science and Forestry, Syracuse, NY 13210

**Land Use Workgroup Meeting
February 16, 2022**

Primary Goal: assess accuracy of land cover change with known confidence and precision

1. Stratify by state
2. Ensure accuracy of change classes encompassing 99% of all mapped change is directly assessed
3. Estimate sample size for 95% confidence and either $\pm 5\%$ or $\pm 10\%$ precision depending on class target accuracy
4. Allocate 1000 samples per state to assess the accuracy of no change areas with 500 samples randomly allocated near mapped change and 500 randomly allocated to other no change areas.

Primary Goal: assess accuracy of land cover change

with known confidence and precision

1. Stratify by state
2. Ensure accuracy of change classes encompassing 99% of all mapped change is directly assessed
3. Estimate sample size for 95% confidence and either +/- 5% or +/- 10% precision depending on class target accuracy
4. Allocate 1000 samples per state to assess the accuracy of no change areas with 500 samples randomly allocated near mapped change and 500 randomly allocated to other no change areas.

Time 1 (T1)	Time 2 (T2)	Acres	Pct	CumPct	Expected Accuracy	Confid. Int. (95%)	Precision (+/- %)	MinSamples
Tree Canopy	Low Vegetation	264,077	64.40%	64.40%	0.95	1.96	0.05	73
Tree Canopy	Barren	28,157	6.87%	71.27%	0.9	1.96	0.05	138
Barren	Low Vegetation	26,204	6.39%	77.66%	0.9	1.96	0.05	138
Low Vegetation	Other Impervious Surfaces	23,088	5.63%	83.29%	0.9	1.96	0.05	138
Low Vegetation	Barren	17,068	4.16%	87.45%	0.9	1.96	0.05	138
Tree Canopy	Other Impervious Surfaces	13,340	3.25%	90.71%	0.9	1.96	0.05	138
Low Vegetation	Structures	7,346	1.79%	92.50%	0.95	1.96	0.05	73
Other Impervious Surfaces	Low Vegetation	6,802	1.66%	94.16%	0.9	1.96	0.05	138
Tree Canopy	Structures	3,721	0.91%	95.06%	0.95	1.96	0.05	73
Low Vegetation	Scrub\Shrub	3,615	0.88%	95.94%	0.6	1.96	0.1	92
Other Impervious Surfaces	Structures	2,995	0.73%	96.68%	0.9	1.96	0.05	138
Tree Canopy Over Other Impervious Surfaces	Low Vegetation	2,120	0.52%	97.19%	0.6	1.96	0.1	92
Other Impervious Surfaces	Tree Canopy Over Other Impervious Surfaces	1,595	0.39%	97.58%	0.6	1.96	0.1	92
Tree Canopy Over Roads	Low Vegetation	1,470	0.36%	97.94%	0.6	1.96	0.1	92
Scrub\Shrub	Barren	1,160	0.28%	98.22%	0.6	1.96	0.1	92
Scrub\Shrub	Low Vegetation	1,019	0.25%	98.47%	0.6	1.96	0.1	92
Roads	Tree Canopy Over Roads	888	0.22%	98.69%	0.6	1.96	0.1	92
Structures	Other Impervious Surfaces	766	0.19%	98.87%	0.9	1.96	0.05	138
Other Impervious Surfaces	Barren	540	0.13%	99.01%	0.9	1.96	0.05	138
All other classes	All other classes	4,073	0.99%	100.00%	0.8	1.96	0.1	61

Primary Goal: assess accuracy of land cover change with known confidence and precision

1. Stratify by state
2. Ensure accuracy of change classes encompassing 99% of all mapped change is directly assessed
3. Estimate sample size for 95% confidence and either +/- 5% or +/- 10% precision depending on class target accuracy
4. Allocate 1000 samples per state to assess the accuracy of no change areas with 500 samples randomly allocated near mapped change and 500 randomly allocated to other no change areas.

Jurisdiction	Samples
District of Columbia	3,455
Delaware	3,571
Maryland	4,696
New York	3,040
Pennsylvania	3,547
Virginia	3,474
West Virginia	3,151
Total	24,934

Secondary Goal: assess accuracy of static 2017/18 land cover in the Bay watershed

1. No stratification
2. Estimate sample size for 95% confidence and either +/- 5% or +/- 10% precision depending on class target accuracy

Classes (11)	Expected Accuracy	Confid. Int. (95%)	Precision (+/- %)	MinSamples	Total
Water	0.95	1.96	0.05	73	1,137
Emergent Wetlands	0.8	1.96	0.1	61	
Tree Canopy	0.95	1.96	0.05	73	
Low Vegetation	0.95	1.96	0.05	73	
Scrub\Shrub	0.6	1.96	0.1	92	
Barren	0.9	1.96	0.05	138	
Structures	0.95	1.96	0.05	73	
Roads	0.9	1.96	0.05	138	
Other Impervious Surfaces	0.9	1.96	0.05	138	
Tree Canopy over Structures	0.6	1.96	0.1	92	
Tree Canopy Over Roads	0.6	1.96	0.1	92	
Tree Canopy Over Other Impervious Surfaces	0.6	1.96	0.1	92	



science for a changing world