

Mapped Land Uses for Phase 6 and Phase 7

Peter Claggett¹, Labeeb Ahmed¹, Elliot Kurtz², Sean MacFaden³, Patrick McCabe², Sarah McDonald¹, Jarlath O'Neill-Dunne³, Katie Walker²

¹ Lower Mississippi-Gulf Water Science Center, U.S. Geological Survey

² Chesapeake Conservancy's Conservation Innovation Center

³ University of Vermont's Spatial Analysis Laboratory

Agriculture Modeling Team

September 8, 2023

Chesapeake Bay Program Office, Annapolis, Maryland

30-meter Resolution

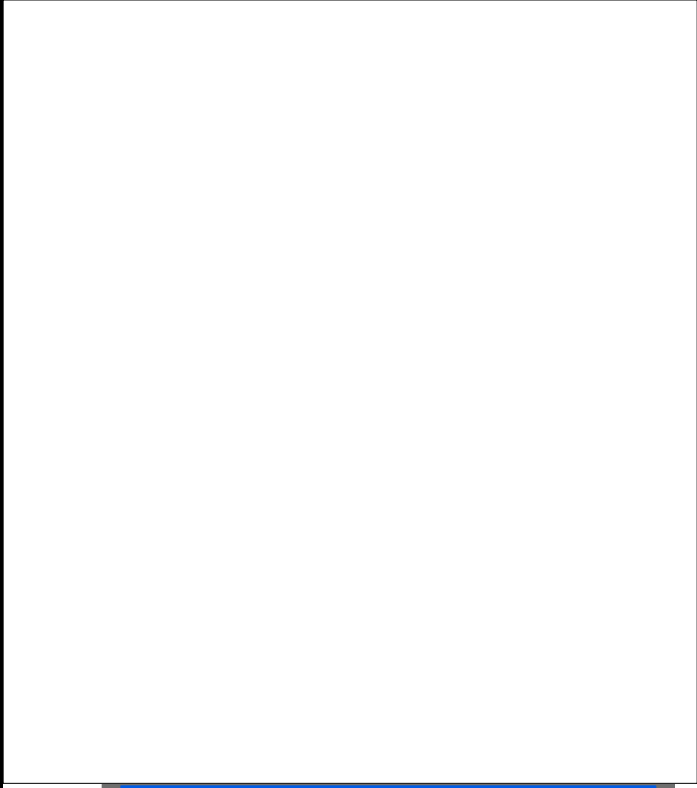


1-meter Resolution



Phase 6 Land Cover and Land Use Data

1m Land Cover (12 classes)



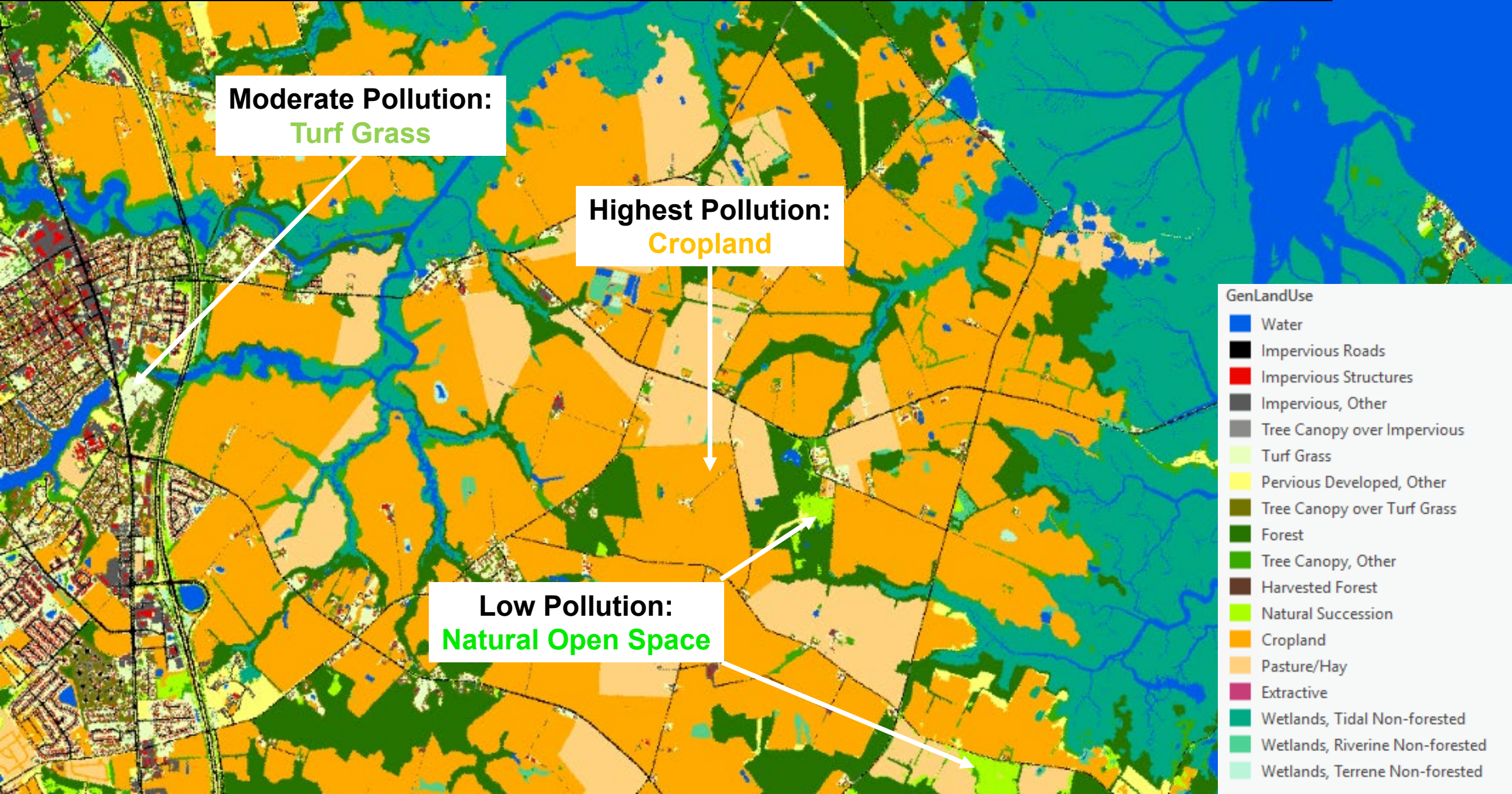
1m Land Use (16 classes)



10m Phase 6 LULC (13 classes)

Impervious Roads
Impervious Non-Roads
Tree Canopy Over Impervious
Tree Canopy Over Turf Grass
Turf Grass
Forest
Wetlands (Floodplain)
Wetlands (Other)
Wetlands (Tidal)
Water
Mixed Open
Cropland
Pasture

<https://chesapeake.usgs.gov/phase6/map/#map=7/-8582732.74/4851421.17/0.0/0,4>



Chesapeake Bay 1-meter Land Use/Cover Classification (64 classes)

Water and Water Margins (6)

10 Tidal Waters

Lentic

11 Lakes & Reservoirs

12 Riverine Ponds

13 Terrene Ponds

Lotic

14 Streams and Rivers (visible water)

15 Bare Shore

Natural Lands (25)

Tree Canopy

40 Forest

41 Tree Canopy, Other

Open Space

42 Natural Succession Barren

43 Natural Succession Herbaceous

44 Natural Succession Shrubland

45 Harvested Forest Barren

46 Harvested Forest Herbaceous

Riverine Wetlands

50 Riverine Wetlands Barren

51 Riverine Wetlands Herbaceous

52 Riverine Wetlands Shrubland

53 Riverine Wetlands Tree Canopy

54 Riverine Wetlands Forest

55 Riverine Wetlands Harvested Forest

Terrene Wetlands (isolated)

60 Terrene Wetlands Barren

61 Terrene Wetlands Herbaceous

62 Terrene Wetlands Shrubland

63 Terrene Wetlands Tree Canopy

64 Terrene Wetlands Forest

65 Terrene Wetlands Harvested Forest

Tidal Wetlands

70 Tidal Wetlands Barren

71 Tidal Wetlands Herbaceous

72 Tidal Wetlands Shrubland

73 Tidal Wetlands Tree Canopy

74 Tidal Wetlands Forest

75 Tidal Wetlands Harvested Forest

Agriculture (15)

Productive Lands

80 Cropland Barren

81 Cropland Herbaceous

82 Orchards and Vineyards Barren

83 Orchards and Vineyards Herbaceous

84 Orchards and Vineyards Shrubland

85 Pasture Barren

86 Pasture Herbaceous

87 Hay Barren

88 Hay Herbaceous

Agricultural Facilities

90 Agricultural Structures

91 Animal Operation Impervious

92 Animal Operation Barren

93 Animal Operation Herbaceous

94 TC over Agricultural Structure

95 TC over Animal Operation Impervious

Development (18)

Impervious

20 Roads

21 Structures

22 Other Impervious (Parking lots, driveways)

23 TC over Roads

24 TC over Structures

25 TC over Other Impervious

31 Extractive Impervious

32 Solar Field Panel Arrays

Pervious

26 Tree Canopy over Turf Grass

27 Turf Grass

28 Bare Developed

30 Extractive Barren

33 Solar Field Barren

34 Solar Field Herbaceous

35 Solar Field Shrubland

36 Suspended Succession Barren

37 Suspended Succession Herbaceous

38 Suspended Succession Shrubland

Grey classes planned for 2021/22
data released in June 2024

Rollup to Phase 6 Land Use/Cover Classes

1. Impervious Roads

20 Roads

2. Impervious Non-Roads

21 Structures

22 Other Impervious (Parking lots, driveways)

31 Extractive Impervious

32 Solar Field Panel Arrays???

90 Agricultural Structures

91 Animal Operation Impervious

3. Tree Canopy Over Impervious

23 TC over Roads

24 TC over Structures

25 TC over Other Impervious

94 TC over Agricultural Structure

95 TC over Animal Operation Impervious

4. Turf Grass

27 Turf Grass

5. Tree Canopy over Turf Grass

26 Tree Canopy over Turf Grass

6. Forest

40 Forest

41 Tree Canopy, Other

7. Wetlands, Floodplain

50 Riverine Wetlands Barren

51 Riverine Wetlands Herbaceous

52 Riverine Wetlands Shrubland

53 Riverine Wetlands Tree Canopy

54 Riverine Wetlands Forest

55 Riverine Wetlands Harvested Forest

8. Wetlands, Other

60 Terrene Wetlands Barren

61 Terrene Wetlands Herbaceous

62 Terrene Wetlands Shrubland

63 Terrene Wetlands Tree Canopy

64 Terrene Wetlands Forest

65 Terrene Wetlands Harvested Forest

9. Wetlands, Tidal

70 Tidal Wetlands Barren

71 Tidal Wetlands Herbaceous

72 Tidal Wetlands Shrubland

73 Tidal Wetlands Tree Canopy

74 Tidal Wetlands Forest

75 Tidal Wetlands Harvested Forest

10. Water

11 Lakes & Reservoirs

12 Riverine Ponds

13 Terrene Ponds

14 Streams and Rivers (visible water)

11. Mixed Open

15 Bare Shore

28 Bare Developed

30 Extractive Barren

33 Solar Field Barren

34 Solar Field Herbaceous

35 Solar Field Shrubland

36 Suspended Succession Barren

37 Suspended Succession Herbaceous

38 Suspended Succession Shrubland

42 Natural Succession Barren

43 Natural Succession Herbaceous

44 Natural Succession Shrubland

45 Harvested Forest Barren

46 Harvested Forest Herbaceous

92 Animal Operation Barren

93 Animal Operation Herbaceous

12. Cropland

80 Cropland Barren

81 Cropland Herbaceous

82 Orchards and Vineyards Barren

83 Orchards and Vineyards Herbaceous

84 Orchards and Vineyards Shrubland

13. Pasture

85 Pasture Barren

86 Pasture Herbaceous

87 Hay Barren

88 Hay Herbaceous

Rollup to Phase 6 Land Use/Cover Classes

1. Impervious Roads

20 Roads

2. Impervious Non-Roads

21 Structures

22 Other Impervious (Parking lots, driveways)

31 Extractive Impervious

32 Solar Field Panel Arrays???

90 Agricultural Structures

91 Animal Operation Impervious

3. Tree Canopy Over Impervious

23 TC over Roads

24 TC over Structures

25 TC over Other Impervious

94 TC over Agricultural Structure

95 TC over Animal Operation Impervious

4. Turf Grass

27 Turf Grass

5. Tree Canopy over Turf Grass

26 Tree Canopy over Turf Grass

6. Forest

40 Forest

41 Tree Canopy, Other

7. Wetlands, Floodplain

50 Riverine Wetlands Barren

51 Riverine Wetlands Herbaceous

52 Riverine Wetlands Shrubland

53 Riverine Wetlands Tree Canopy

54 Riverine Wetlands Forest

55 Riverine Wetlands Harvested Forest

8. Wetlands, Other

60 Terrene Wetlands Barren

61 Terrene Wetlands Herbaceous

62 Terrene Wetlands Shrubland

63 Terrene Wetlands Tree Canopy

64 Terrene Wetlands Forest

65 Terrene Wetlands Harvested Forest

9. Wetlands, Tidal

70 Tidal Wetlands Barren

71 Tidal Wetlands Herbaceous

72 Tidal Wetlands Shrubland

73 Tidal Wetlands Tree Canopy

74 Tidal Wetlands Forest

75 Tidal Wetlands Harvested Forest

10. Water

11 Lakes & Reservoirs

12 Riverine Ponds

13 Terrene Ponds

14 Streams and Rivers (visible water)

11. Mixed Open

15 Bare Shore

28 Bare Developed

30 Extractive Barren

33 Solar Field Barren

34 Solar Field Herbaceous

35 Solar Field Shrubland

36 Suspended Succession Barren

37 Suspended Succession Herbaceous

38 Suspended Succession Shrubland

42 Natural Succession Barren

43 Natural Succession Herbaceous

44 Natural Succession Shrubland

45 Harvested Forest Barren

46 Harvested Forest Herbaceous

92 Animal Operation Barren

93 Animal Operation Herbaceous

12. Cropland

80 Cropland Barren

81 Cropland Herbaceous

82 Orchards and Vineyards Barren

83 Orchards and Vineyards Herbaceous

84 Orchards and Vineyards Shrubland

13. Pasture

85 Pasture Barren

86 Pasture Herbaceous

87 Hay Barren

88 Hay Herbaceous

Potential New Mapped LULC Classes for Phase 7

Non-Agricultural Land Uses

- Impervious Structures
- Solar Fields and/or Panel Arrays
- Extractive
- Timber Harvests (clearcuts)
- Construction (bare developed)
- Suspended Succession

Agricultural Land Uses

- Orchards/Vineyards
- Hay (Legume and Other?)
- Farmsteads
- Animal Operations

Average Land Use Loading Rates (lbs./acre/year) for Select Agricultural Land Uses

Sediment						
Land Use	Delaware	Maryland	New York	Pennsylvania	Virginia	West Virginia
Leguminous Hay	26.66	195.98	102.48	132.75	156.30	105.18
Other Hay	8.48	49.80	25.68	36.09	47.86	28.35
Pasture	16.10	22.62	3.35	6.94	47.77	74.74
Non-Permitted Feeding Space	411.26	3857.20	2994.45	6062.65	14786.60	9138.77
Permitted Feeding Space	168.54	605.98	1963.72	6433.92	16142.68	3817.30
Phosphorus						
Land Use	Delaware	Maryland	New York	Pennsylvania	Virginia	West Virginia
Leguminous Hay	0.08	0.17	0.27	0.41	0.49	0.26
Other Hay	0.41	0.20	0.15	0.36	0.45	0.24
Pasture	0.94	0.94	0.40	1.47	1.11	0.58
Non-Permitted Feeding Space	26.88	15.83	63.23	68.99	6.83	8.54
Permitted Feeding Space	9.59	13.97	25.72	105.52	63.39	2.45
Nitrogen						
Land Use	Delaware	Maryland	New York	Pennsylvania	Virginia	West Virginia
Leguminous Hay	9.43	7.85	5.82	8.40	5.54	6.17
Other Hay	14.97	10.77	10.63	11.79	8.37	10.45
Pasture	14.13	10.97	8.38	14.12	7.79	9.63
Non-Permitted Feeding Space	945.99	272.61	1748.18	2003.47	152.50	310.04
Permitted Feeding Space	334.82	260.89	1020.13	1955.07	1122.49	89.89

Should “leguminous hay” be mapped separately from pasture?

Leguminous hay loads differently than other hay and only constitutes 27% of all hay.

Land may be managed for both hay and pasture confounding the separation.



science for a changing world