

# PHASE 7 Land Use: CONSTRUCTION

**Peter Claggett, Research Geographer  
U.S. Geological Survey**

**February 24, 2025  
Water Quality Goal Implementation Team Meeting**



# Proposed Rollup of High-Res Land Use Classes for Phase 7

## 1. Impervious, Roads

20 Roads

## 2. Impervious, Non-Roads

21 Structures

22 Other Impervious (Parking lots, driveways)

31 Extractive Impervious

## 3. Tree Canopy Over Impervious

23 TC over Roads

24 TC over Structures

25 TC over Other Impervious

## 4. Turf Grass

27 Turf Grass

## 5. Tree Canopy over Turf Grass

26 Tree Canopy over Turf Grass

## 6. Solar Infrastructure

32 Solar Field Panel Arrays

## 7. Solar Pervious

34 Solar Field Herbaceous

35 Solar Field Shrubland

## 8. Compacted Pervious

30 Extractive Barren

36 Suspended Succession Barren

37 Suspended Succession Herbaceous

38 Suspended Succession Shrubland

43 Natural Succession Herbaceous (urban areas)

## 9. Construction

28 Bare Developed (Urban areas?)

33 Solar Field Barren

42 Natural Succession Barren (Urban areas)

Reported Data from States

## 9. Forest

40 Forest

41 Tree Canopy, Other

43 Natural Succession Herbaceous (rural areas)

44 Natural Succession Shrubland

53 Riverine Wetlands Tree Canopy

54 Riverine Wetlands Forest

63 Terrene Wetlands Tree Canopy

64 Terrene Wetlands Forest

## 15. Harvested Forest (2)

45 Harvested Forest Barren

46 Harvested Forest Herbaceous

42 Natural Succession Barren (Rural areas)

Reported Data from States

## 10. Wetlands, Riverine Non-forested

50 Riverine Wetlands Barren

51 Riverine Wetlands Herbaceous

52 Riverine Wetlands Shrubland

55 Riverine Wetlands Harvested Forest

## 11. Wetlands, Terrene Non-forested

60 Terrene Wetlands Barren

61 Terrene Wetlands Herbaceous

62 Terrene Wetlands Shrubland

65 Terrene Wetlands Harvested Forest

## 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 and Hay

85 Pasture and Hay Barren

86 Pasture and Hay Herbaceous

## 14. Water

11 Lakes & Reservoirs

12 Riverine Ponds

13 Terrene Ponds

14 Streams and Rivers (visible water)

15 Bare Shore- adjacent to lakes

Blue = mapped 56-class schema

White = Phase 7 schema

# State Reporting

DE- Sydney Hall, [Sydney.Hall@delaware.gov](mailto:Sydney.Hall@delaware.gov)

DC - Alicia Ritzenthaler, [alicia.ritzenthaler@dc.gov](mailto:alicia.ritzenthaler@dc.gov)

NY - Cassandra Davis, [Cassandra.Davis@dec.ny.gov](mailto:Cassandra.Davis@dec.ny.gov)

PA- Tyler Trostle, [tytrostle@pa.gov](mailto:tytrostle@pa.gov)

VA - William Keeling, [william.keeling@deq.virginia.gov](mailto:william.keeling@deq.virginia.gov)

WV - Samuel Canfield, [samuel.a.canfield@wv.gov](mailto:samuel.a.canfield@wv.gov)

MD- None. Construction estimated by CBPO.

# Phase 6 Construction

## Option 1: Reported by states

- Permitted (E&S) disturbed area per year per county (NY, PA, WV, DC) or HUC12 (DE, VA);
- Allocated from HUC12 or county to land-river segments in proportion to mapped developed area;
- Subtracted from mapped developed area in each land-river segment

## Option 2: Mapped by CBPO (Maryland only)

- 1.29 \* (estimated annual change in impervious surfaces in each land-river segment)
- Subtracted from mapped developed area in each land-river segment

# Phase 7 Construction

## Option 1: Reported by states

- Permitted (E&S) disturbed area per year per county or HUC12;
- Allocated from HUC12 or county to land-river segments in proportion to mapped developed area;
- Subtracted from mapped developed area in each land-river segment.

## Option 2: Mapped by CBPO

- $X$  \* (estimated annual change in impervious surfaces in each land-river segment) in non-mapped years;
- Mapped bare construction + natural succession-barren acres for mapping years;
- Subtracted from mapped developed area in each land-river segment.

# Phase 7 Construction - considerations

## Why map construction?

- Exposed and disturbed soil is prone to erosion and contributes nutrients and sediment to streams even when permitted with Erosion and Sediment Control BMPs.
- Average noBMP loading rates (lbs./acre/yr.): 21.7 TN, 3.5 TP, and 8025 SED
- Average WIP loading rates (lbs./acre/yr.): 19.4 TN, 3.5 TP, and 2337 SED

## Difference between reported and mapped construction

- Reported construction represents permitted disturbed areas multiplied by an implementation/compliance rate, potentially averaged over multiple years and may not reflect actual disturbed areas.
- Mapped construction represents bare ground areas that are presumed to be associated with the land development process but include lands unvegetated for other reasons.





# Natural Succession Barren

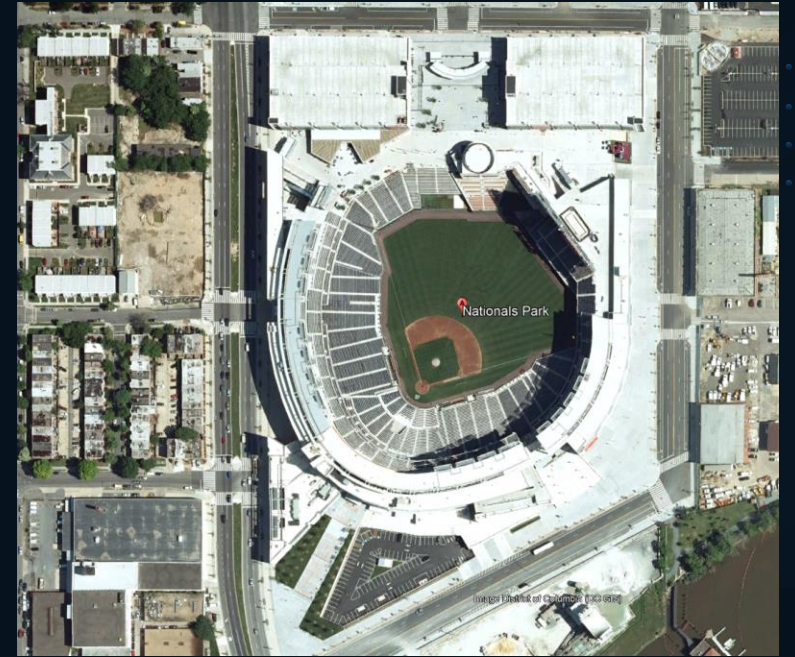




2005



2006



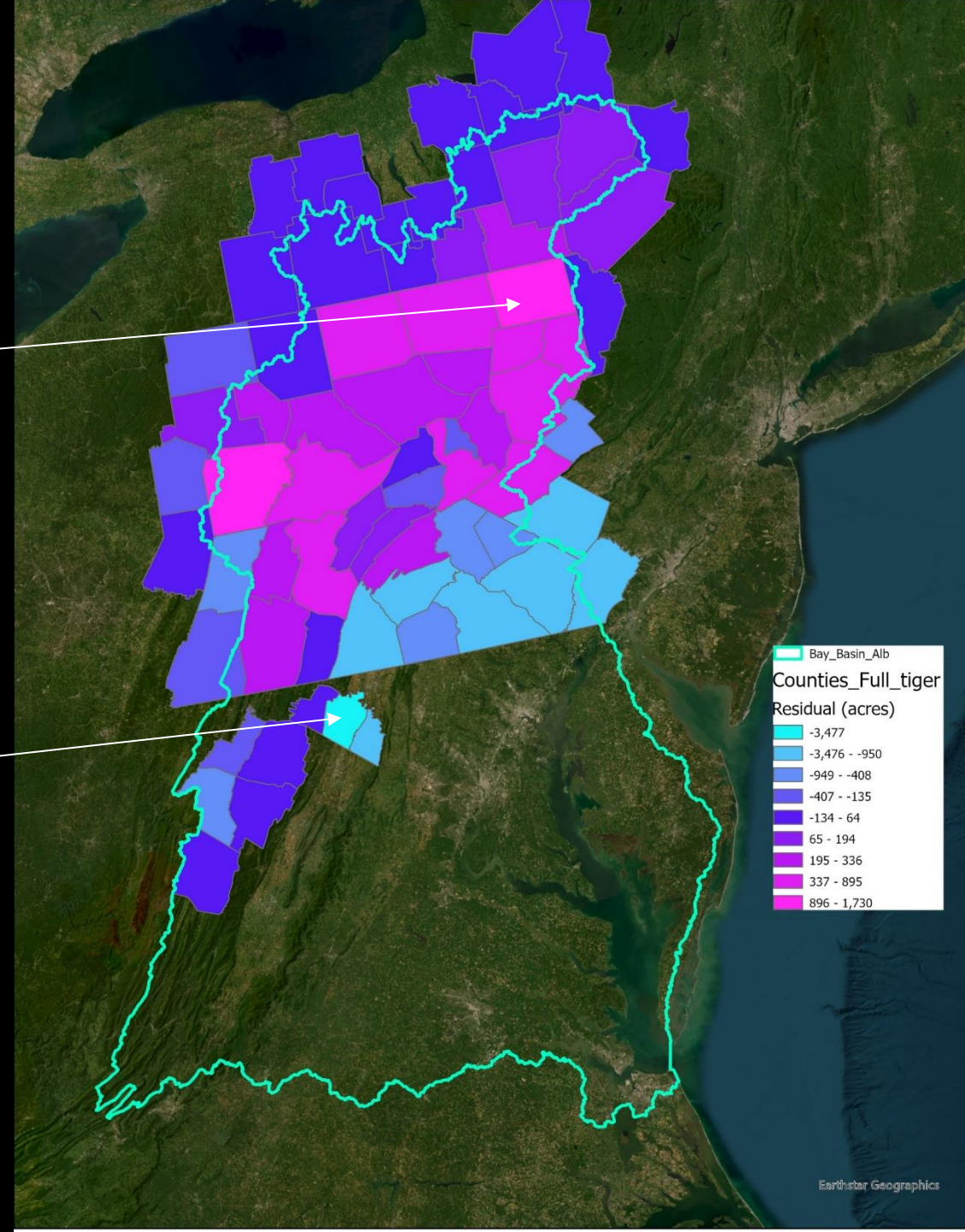
2008

Bare  
Developed



Mapped land use  
overestimates reported  
construction

Mapped land use  
underestimates reported  
construction





Example: mapped "Bare Construction" in Susquehanna County, PA





**Example: mapped “Bare Construction” in Northumberland County, PA**





# Proposed Rollup of High-Res Land Use Classes for Phase 7

## 1. Impervious, Roads

20 Roads

## 2. Impervious, Non-Roads

21 Structures

22 Other Impervious (Parking lots, driveways)

31 Extractive Impervious

## 3. Tree Canopy Over Impervious

23 TC over Roads

24 TC over Structures

25 TC over Other Impervious

## 4. Turf Grass

27 Turf Grass

## 5. Tree Canopy over Turf Grass

26 Tree Canopy over Turf Grass

## 6. Solar Infrastructure

32 Solar Field Panel Arrays

## 7. Solar Pervious

34 Solar Field Herbaceous

35 Solar Field Shrubland

## 8. Compacted Pervious

30 Extractive Barren

36 Suspended Succession Barren

37 Suspended Succession Herbaceous

38 Suspended Succession Shrubland

43 Natural Succession Herbaceous (urban areas)

## 9. Construction

28 Bare Developed

33 Solar Field Barren

42 Natural Succession Barren (Urban areas)

Reported Data from States

## 9. Forest

40 Forest

41 Tree Canopy, Other

43 Natural Succession Herbaceous (rural areas)

44 Natural Succession Shrubland

53 Riverine Wetlands Tree Canopy

54 Riverine Wetlands Forest

63 Terrene Wetlands Tree Canopy

64 Terrene Wetlands Forest

## 15. Harvested Forest (2)

45 Harvested Forest Barren

46 Harvested Forest Herbaceous

42 Natural Succession Barren (Rural areas)

Reported Data from States

## 10. Wetlands, Riverine Non-forested

50 Riverine Wetlands Barren

51 Riverine Wetlands Herbaceous

52 Riverine Wetlands Shrubland

55 Riverine Wetlands Harvested Forest

## 11. Wetlands, Terrene Non-forested

60 Terrene Wetlands Barren

61 Terrene Wetlands Herbaceous

62 Terrene Wetlands Shrubland

65 Terrene Wetlands Harvested Forest

## 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 and Hay

85 Pasture and Hay Barren

86 Pasture and Hay Herbaceous

## 14. Water

11 Lakes & Reservoirs

12 Riverine Ponds

13 Terrene Ponds

14 Streams and Rivers (visible water)

15 Bare Shore- adjacent to lakes

Blue = mapped 56-class schema

White = Phase 7 schema



# Next Steps

Compare remotely-sensed “bare developed” post-2012 with spatially-explicit construction data reported by the jurisdictions.

Further refine mapping of areas under construction vs areas that are maintained in a barren state.

Consider changes to loading rates for the Phase 7 “compacted pervious” class (permanently barren areas).

Consider changes to loading rates for construction associated with infill and redevelopment vs greenfield development.