Federal Facility Area Estimates – Phase 7

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U.S. Geological Survey

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Federal Facilities Workgroup Meeting

U.S. Department of the Interior
U.S. Geological Survey

Proposed Phase 7 Mapped Land Uses

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**
   - 33 Solar Field Barren (- construction)
   - 34 Solar Field Herbaceous
   - 35 Solar Field Shrubland

Blue = mapped 56-class schema
White = Phase 7 schema

8. **Compacted Pervious**
   - 28 Bare Developed (- construction)
   - 30 Extractive Barren
   - 36 Suspended Succession Barren (- construction)
   - 37 Suspended Succession Herbaceous
   - 38 Suspended Succession Shrubland
   - 42 Natural Succession Barren (urban areas - construction)
   - 43 Natural Succession Herbaceous (urban areas)

9. **Construction**
   - All barren lands (except bare shore and extractive barren) that became developed in the next 3-5 years.
   - 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**
   - 45 Harvested Forest Barren (- construction)
   - 46 Harvested Forest Herbaceous
   - 42 Natural Succession Barren (rural areas – construction)
   - Reported Data from States

10. **Wetlands, Riverine Non-forested**
   - 50 Riverine Wetlands Barren (- construction)
   - 51 Riverine Wetlands Herbaceous
   - 52 Riverine Wetlands Shrubland
   - 55 Riverine Wetlands Harvested Forest

11. **Wetlands, Terrene Non-forested**
   - 60 Terrene Wetlands Barren (- construction)
   - 61 Terrene Wetlands Herbaceous
   - 62 Terrene Wetlands Shrubland
   - 65 Terrene Wetlands Harvested Forest

12. **Cropland**
   - 80 Cropland Barren (- construction)
   - 81 Cropland Herbaceous
   - 82 Orchards and Vineyards Barren (- construction)
   - 83 Orchards and Vineyards Herbaceous
   - 84 Orchards and Vineyards Shrubland

13. **Pasture and Hay**
   - 85 Pasture and Hay Barren (- construction)
   - 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

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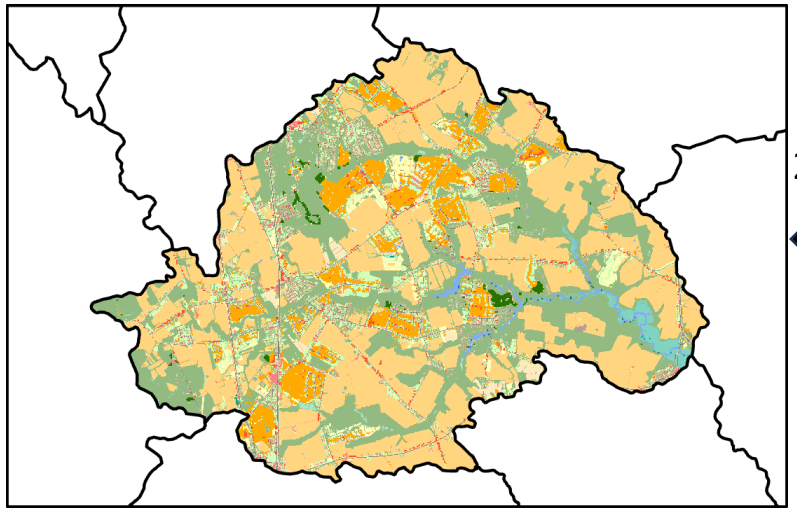
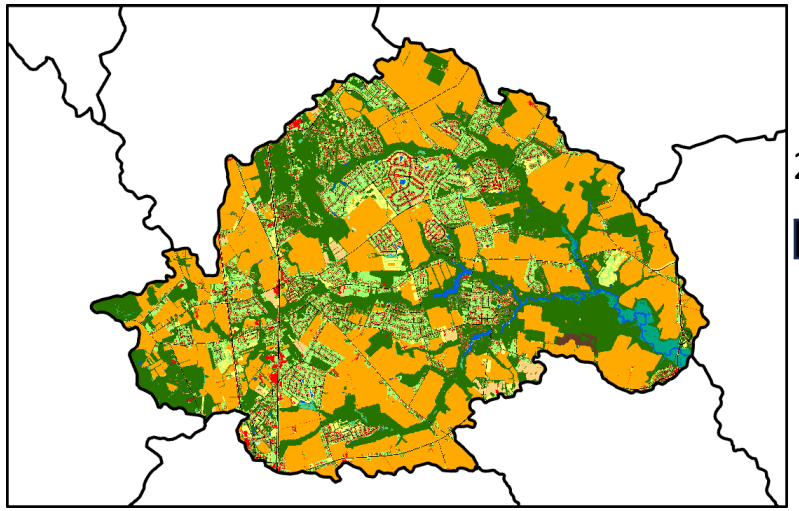
How do we assess land use over time?

Past Land Use (30m)
1985-2012



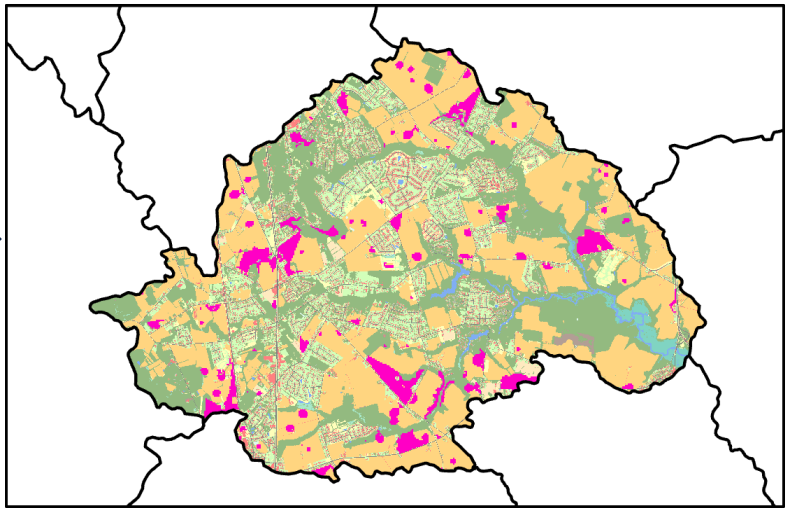
2013

Present Land Use (1m)
2013-2022



2022

Future Land Use (30m)
2023-2100



Annual historic land use condition and trends by summary unit. NLCD detects and classifies change back through time with historical satellite imagery from Landsat at 30-meter resolution. The present is deconstructed where change is detected and summarized by summary unit.

LULC = Land Use/Land Cover
LRSEG = Land River Segment
NLCD = National Land Cover Database

The land use conditions in the present, derived from the LULC at 1-meter resolution and by summary unit. Annualized from the mapped dates 2013/14, 2017/18, and 2021/22. Serves as the starting point for the back-cast and forecasts.

Future land use trends modeled with the Chesapeake Bay Land Change Model (CBLCM). Urban growth model that converts forest and farmland to development to allocate for population growth. Usually predicted in 5- or 10-year increments. Modeled at 30-meter resolution and summarizes land use by summary unit for modeled years.

How do we assess land use over time?

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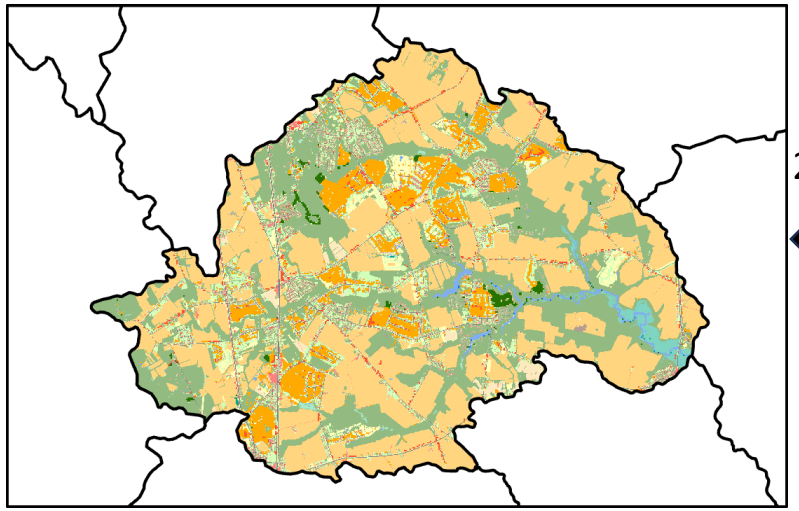

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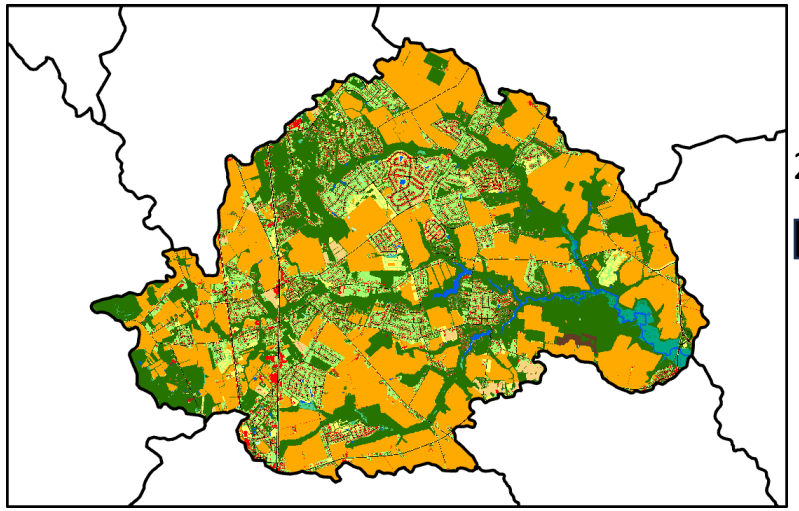

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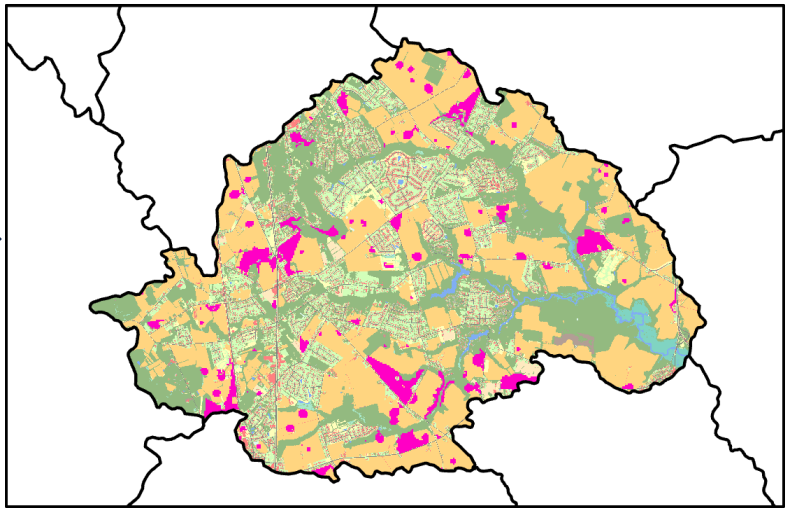

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Land uses change over time but federal facility acreages, less agriculture and tidal wetlands, must be held constant.

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Estimating Federal Facility Area:

How many Phase 7 acres are within each federal facility:

1. Establish a base year as the latest vintage of high-resolution land use/land cover data: 2022
2. Assess Phase 7 land uses within each federal facility
3. Reclass Construction and Harvested Forest to Compacted Pervious
4. Remove Cropland and Pasture/Hay acres (shift to state responsibility)
5. Remove Tidal Wetlands (shift to Main Bay Model for simulation)

Maintaining fixed federal facility area estimates:

Agriculture

1. If past agriculture (pre-2022) or agriculture mapped in future high-res land use data > 2022 mapped agriculture (cropland + pasture/hay),
    - Reclass the additional agricultural acres as “compacted pervious”
2. If past agriculture (pre-2022) < 2022 mapped agriculture (cropland + pasture/hay),
    - Subtract deficit acres proportionally from “forest” or “compacted pervious” based on proportions of wooded and herbaceous pre-agricultural land use
3. If agriculture mapped in future high-res land use data < 2022 mapped agriculture (cropland + pasture/hay),
    - Subtract deficit acres from whatever P7 classes agriculture transitioned into.

Tidal Wetlands

1. If tidal wetlands (pre-2022) or tidal wetlands mapped in future high-res land use data > 2022 tidal wetlands
    - Reclass the additional tidal wetland acres as “water”
2. If tidal wetlands (pre-2022) < 2022 tidal wetlands
    - Subtract deficit acres from “water”
3. If tidal wetlands mapped in future high-res land use data < 2022 tidal wetlands
    - Subtract deficit acres from whatever P7 classes tidal wetlands transitioned into