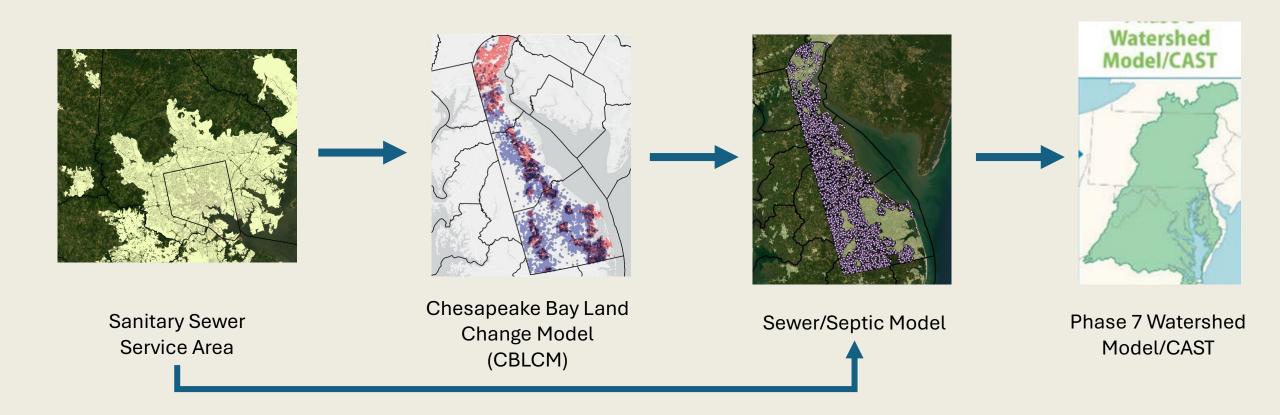


Updates to Modeled Sewer and Septic for the Phase 7 Watershed Model

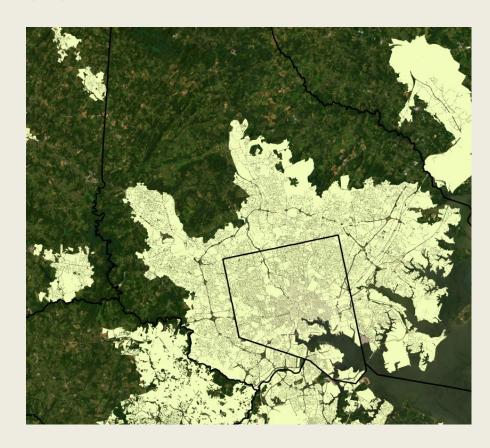
Wastewater Treatment Workgroup Meeting September 25, 2025

Background/Context

The USGS models septic system counts and populations served by sewer and septic within the Chesapeake Bay Watershed from 1985 through future years (e.g., 2050) to inform the Chesapeake Bay Watershed Model and CAST.



Approvals from the WWTWG in July 2025



1. Approved Phase 7 sanitary sewer service area.



2. Approved the updated methods for the sewer/septic model.

Updates* to Methods since July 2025

I. Slight improvements to the 2020 sewer service area

- I. Incorporation of sewer data provided by some jurisdictions that missed the original submission deadline
- II. Adjustments to fix overestimation of septic systems adjacent to the sewer service area
- III. Adjustments to fix overestimation of septic systems in census places

II. Updates to sewer/septic backcast

I. Incorporation of a 1990, 2000, & 2010 sewer service area to better account for changes in sewered area over time

^{*} Incorporating these updates will depend on the input of the WWTWG and will not impact the overall Phase 7 timeline.





Updated sewer data for the following jurisdictions

Hampton Roads, Virginia

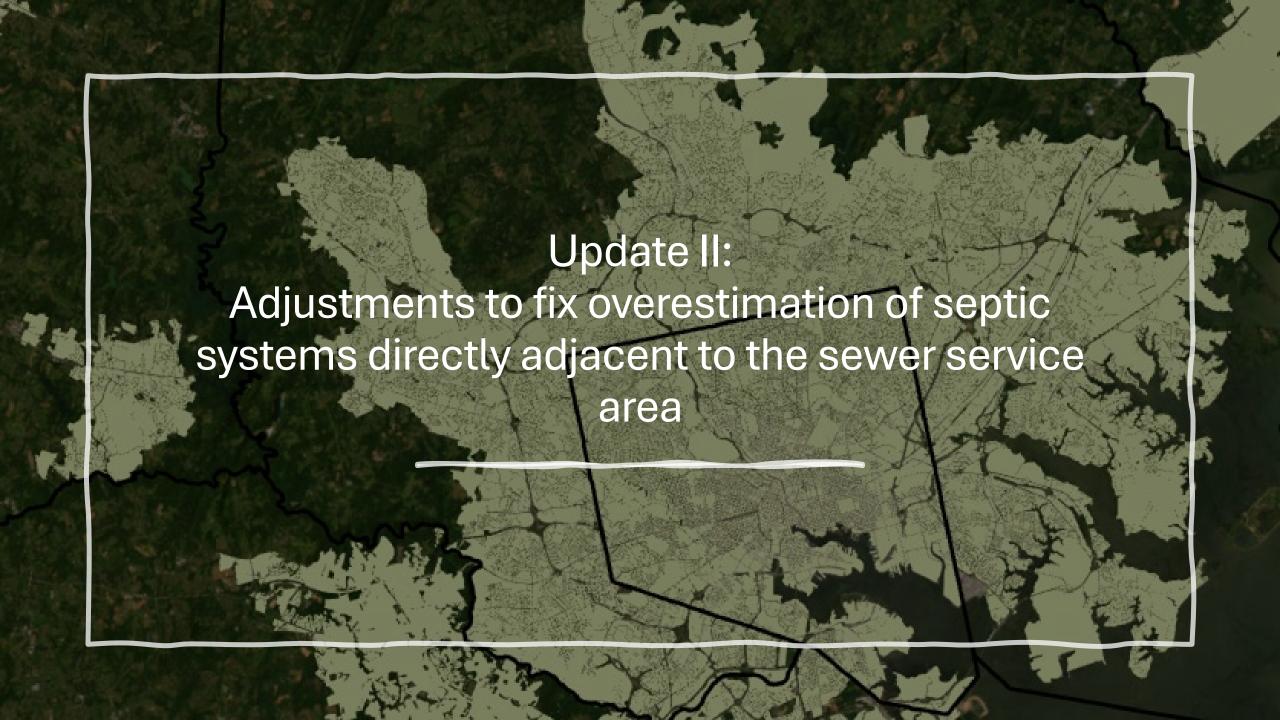
Amelia County, Virginia

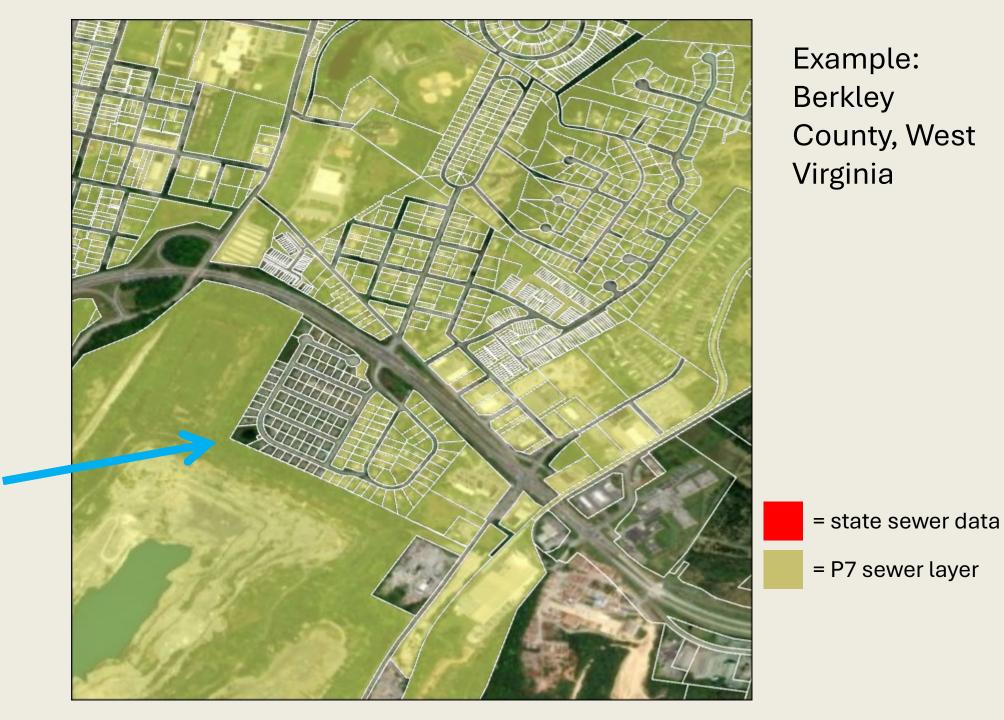
Culpeper County, Virginia

Blair County, Pennsylvania

Perry County, Pennsylvania

Centre County, Pennsylvania







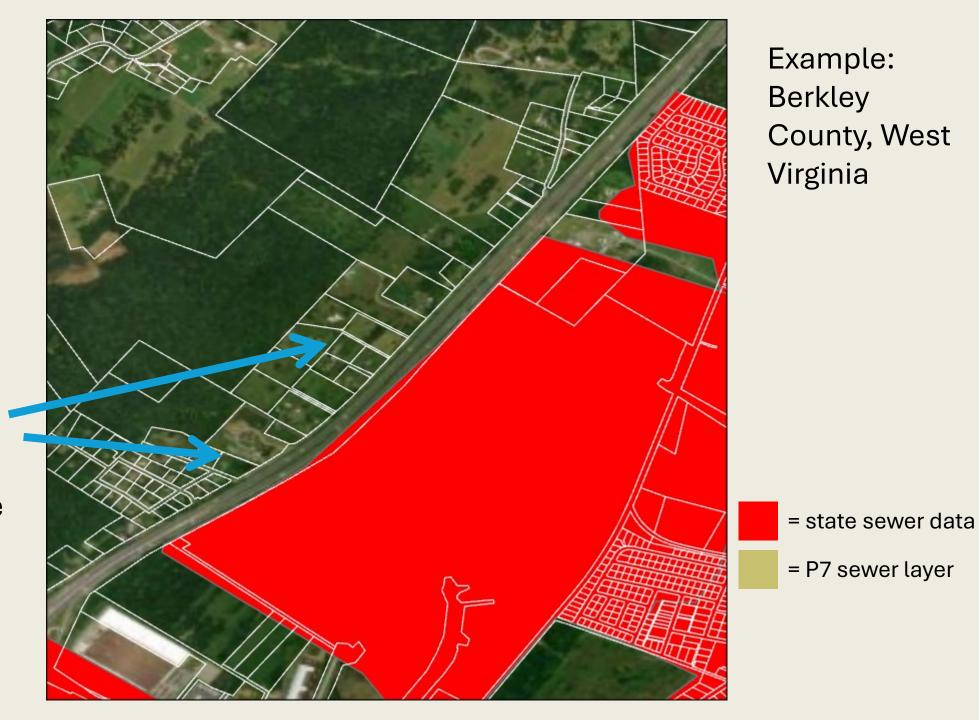
Example:
Berkley
County, West
Virginia

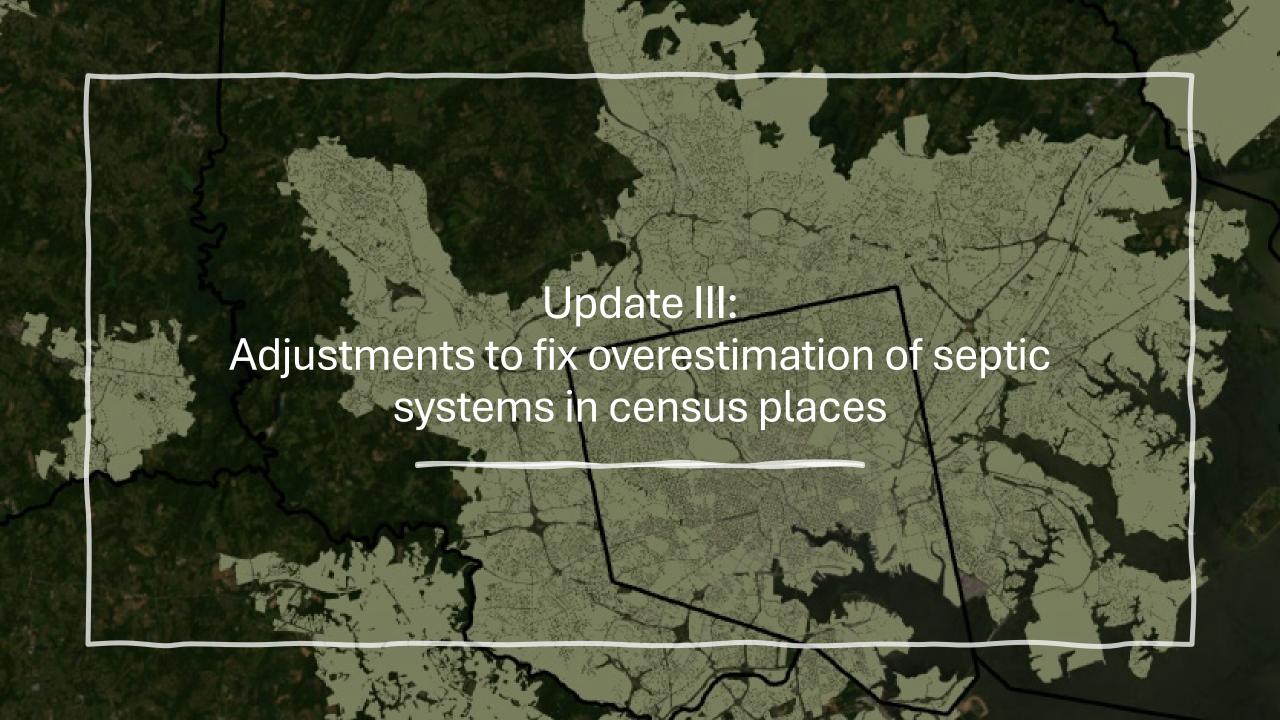
= state sewer data

= P7 sewer layer

Why don't we just expand the state sewer data?

We don't want to include ALL parcels adjacent to the sewer service area.





Issue

County data omits some sewered areas within the county (e.g., the town of Culpeper)



Example: Culpeper, Virginia

= county sewer data

Fixes/Updates

Use 2022 Clean
Water Needs Survey
data to identify
wastewater
treatment plant
locations and tag
overlapping 2020
Census Places
currently excluded
from the 2020 sewer
service area



Example: Culpeper, Virginia

= county sewer data

= updates to the P7 sewer layer

Issue

County data omits some sewered areas within the county (e.g., North Syracuse Village)



Example: Onondaga, New York

= county sewer data

Fixes/Updates

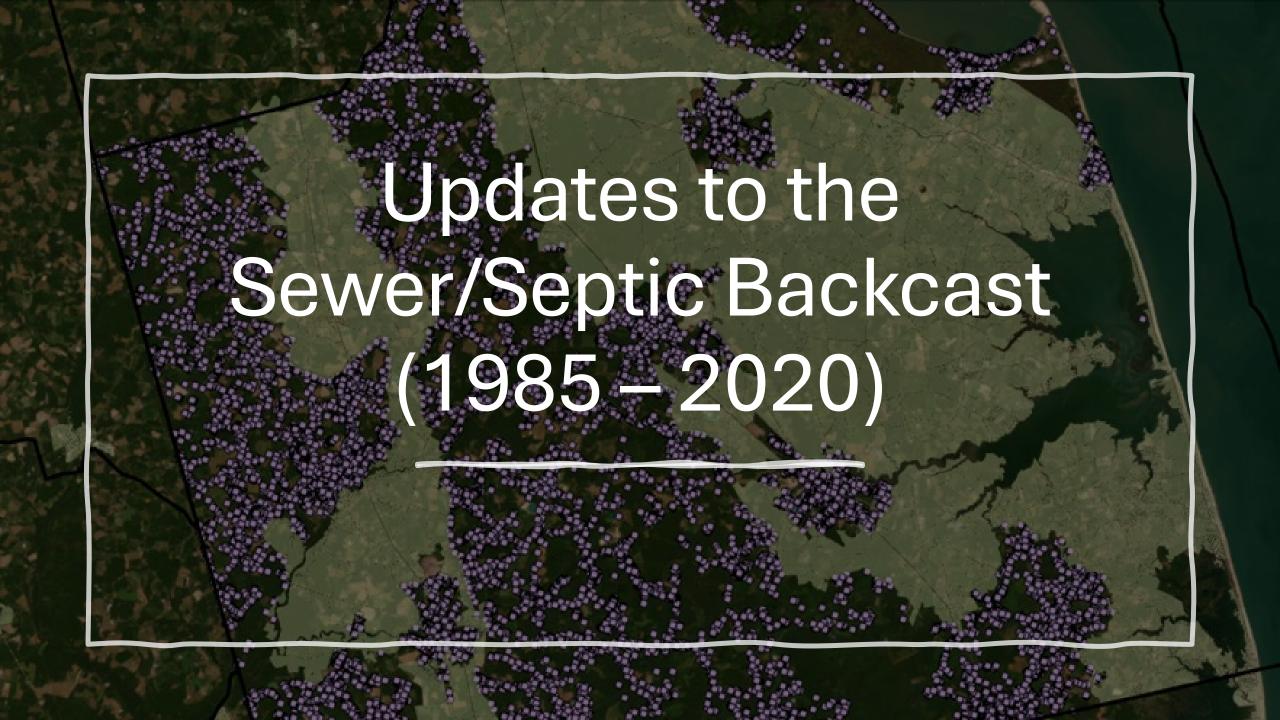
Use 2022 Clean
Water Needs Survey
data to identify
wastewater
treatment plant
locations and tag
overlapping 2020
Census Places
currently excluded
from the 2020 sewer
service area

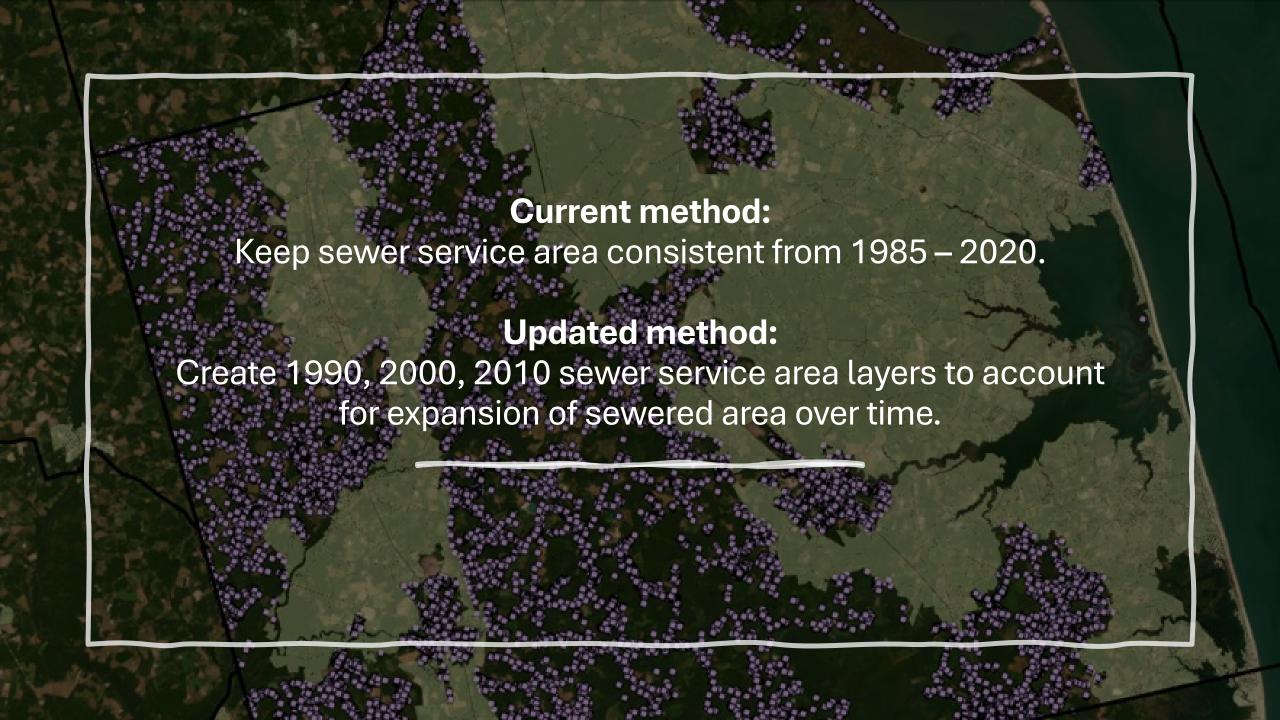


Example: Onondaga, New York

= county sewer data

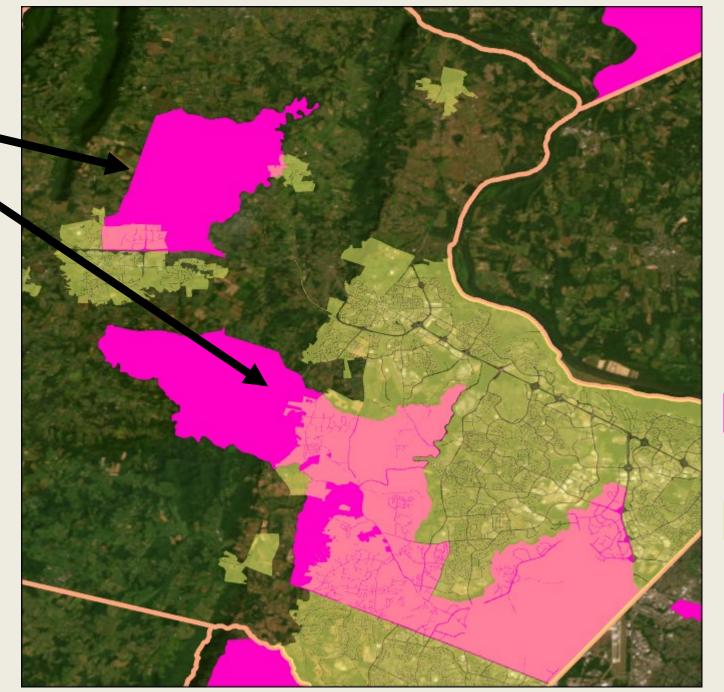
= updates to the P7 sewer layer





Step 1:

Take 2020
sewer service
area and
remove all
census block
groups with 0%
of population
on sewer in
1990



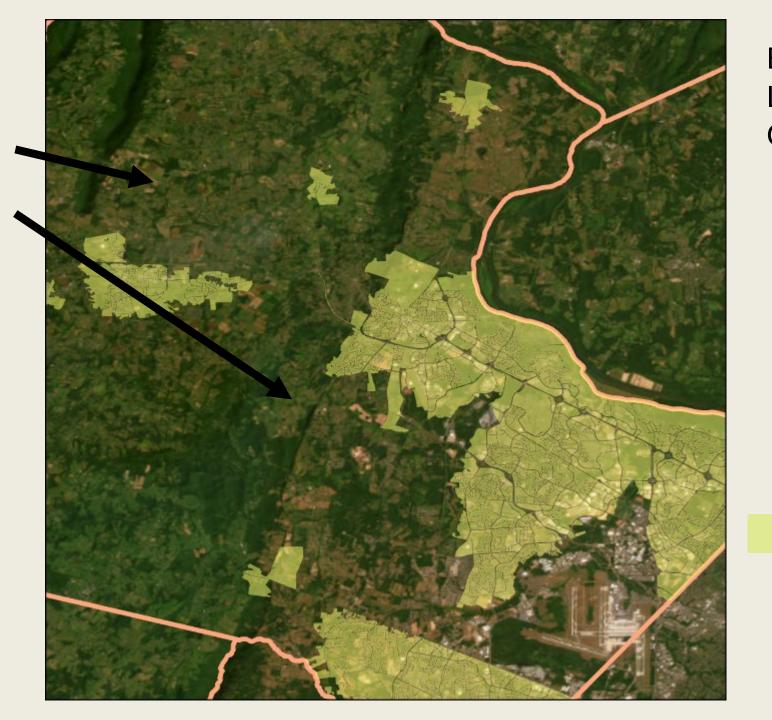
Example: Loudoun County, VA

= Census block groups with 0% population on sewer (1990)

= P7 sewer layer (2020)

Step 1:

Take 2020
sewer service
area and
remove all
census block
groups with 0%
of population
on sewer in
1990

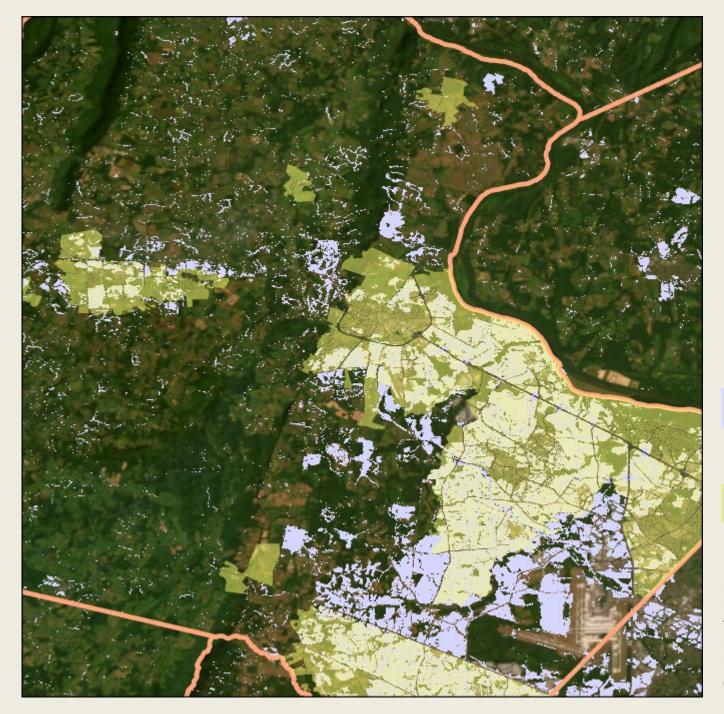


Example: Loudoun County, VA

= P7 sewer layer (2020)

Step 2:

Use change in impervious surface to identify areas that were undeveloped in 1990s and developed in 2020.



Example: Loudoun County, VA

= NLCD* impervious surface change (1990 – 2023)

= P7 sewer layer (2020)

NLCD = National Land Cover Data

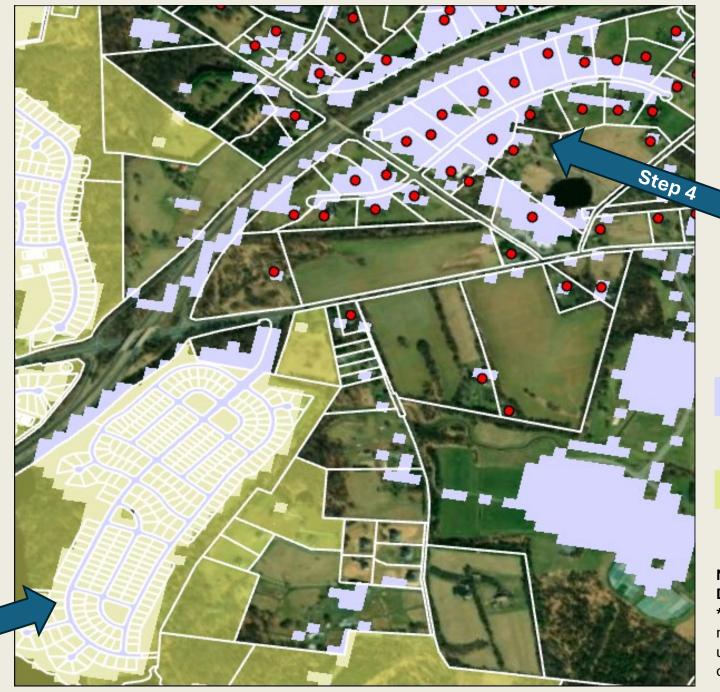
*Image is showing NLCD, but methods will use CBP land use/land cover backcast data, once available.

Step 3:

Remove parcels on sewer overlapping with impervious surface change layer for 1990.

Step 4:

Remove parcels on septic overlapping with impervious surface change layer for 1990.



Example: Loudoun County, VA

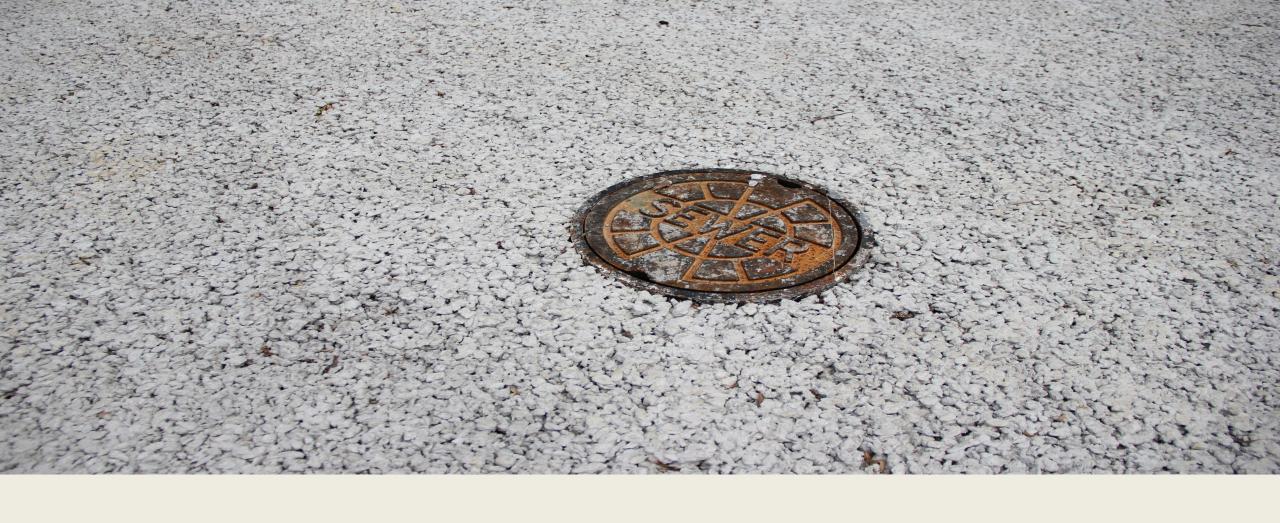
> = NLCD* impervious surface change (1990 – 2023)

= P7 sewer layer (2020)

NLCD = National Land Cover Data

*Image is showing NLCD, but methods will use CBP land use/land cover backcast data, once available.

Step 3



Next Steps

Proposed Timeline End of January WWTWG reviews updated sewer/septic backcast. Feb 15 Final Deadline Nov 20 - Dec 31 Deliver final results to CBP WWTWG reviews updated 2020 modeling team using sewer service area. updated methods. September February October November December January Oct 1 - Nov 20 **Dec 1 – Jan 31** Feb 1 - Feb 15 **Sep 25** Make updates to 2020 sewer Make updates to Run model with updated service area. **WWTWG Meeting** sewer/septic backcast. sewer service areas and Confirm members backcast methods. Fix any "red flag" issues want to make updates identified during the 2020 sewer service area review.



Discussion/Questions?

Acronyms

- CAST: Chesapeake Assessment Scenario Tool
- CBP: Chesapeake Bay Program
- CBLCM: Chesapeake Bay Land Change Model
- CBW: Chesapeake Bay Watershed
- NLCD: National Land Cover Data
- P6: Phase 6 [Watershed Model]
- P7: Phase 7 [Watershed Model]
- SSA: Sewer Service Area
- USGS: United States Geological Survey
- USWG: Urban Stormwater Workgroup
- WWTWG: Wastewater Treatment Workgroup