

Impervious density for Chesapeake Bay Watershed States

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This document includes the state specific equations that are used to convert simulated development to land use. Specifically, they calculate the % of simulated development that is impervious based on the lot size, where lot size is derived from the residential and commercial density layers. These are the equations that are referenced in the crosswalk table and were shown in the "[CBLCM Phase 7 Land Use Conversion](#)" presentation. These coefficients should not be conflated with surface residential (HD) and commercial (JD) densities.

Model development

To estimate impervious density for predicted residential and commercial development in the CBLCM, models and coefficients were developed using observed impervious density within property parcels boundaries.

Parcel boundary data for six Chesapeake Bay states and Washington, D.C. was acquired from REGRID, representing 2023 boundaries. High Resolution LULC data for 2021/22 (CBP, 2025) and additional attributes available in the REGRID dataset were used to classify parcels into residential and commercial classes.

To generate models, residential and commercial parcels were binned by area into 0.1-acre interval bins. Median percent imperviousness was calculated for each bin. Power functions were fit to median percent imperviousness values for residential and commercial parcels in each State, excluding Washington, D.C.

Equations by State

Delaware

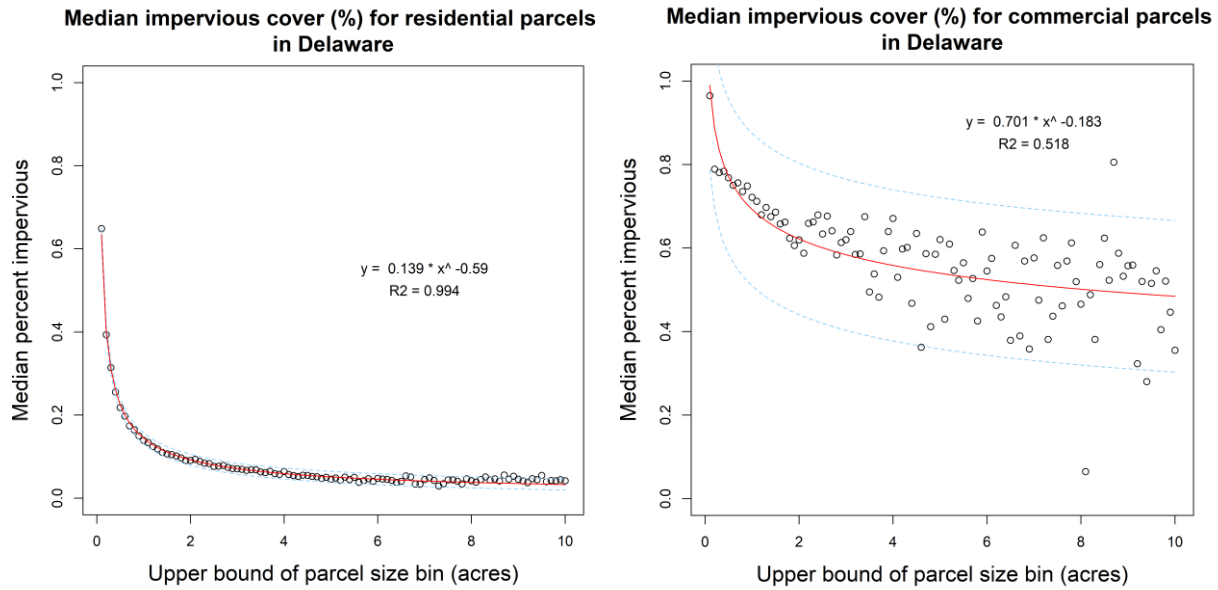


Figure 1. Models predicting impervious cover for residential (left) and commercial (right) parcels in Delaware.

Maryland

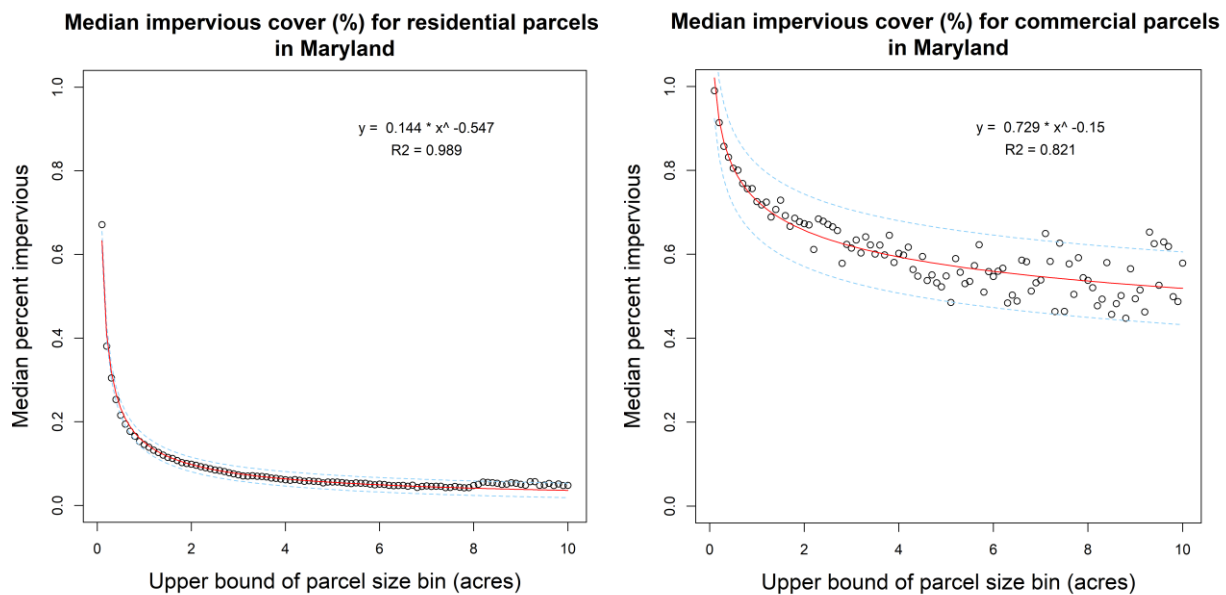


Figure 2. Models predicting impervious cover for residential (left) and commercial (right) parcels in Maryland.

New York

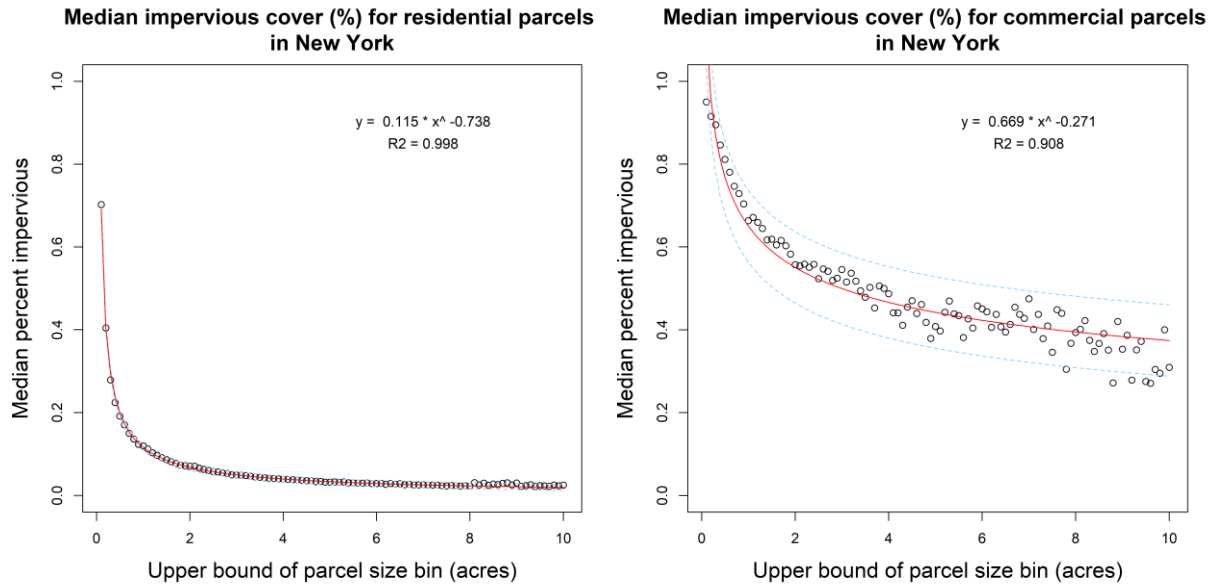


Figure 3. Models predicting impervious cover for residential (left) and commercial (right) parcels in New York.

Pennsylvania

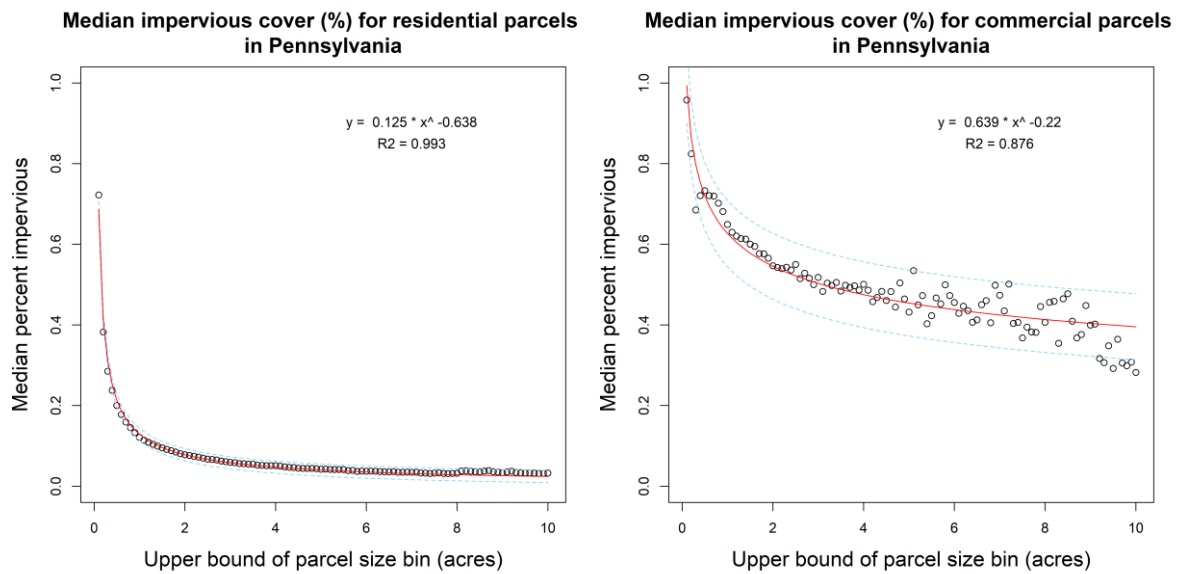


Figure 4. Models predicting impervious cover for residential (left) and commercial (right) parcels in Pennsylvania.

Virginia

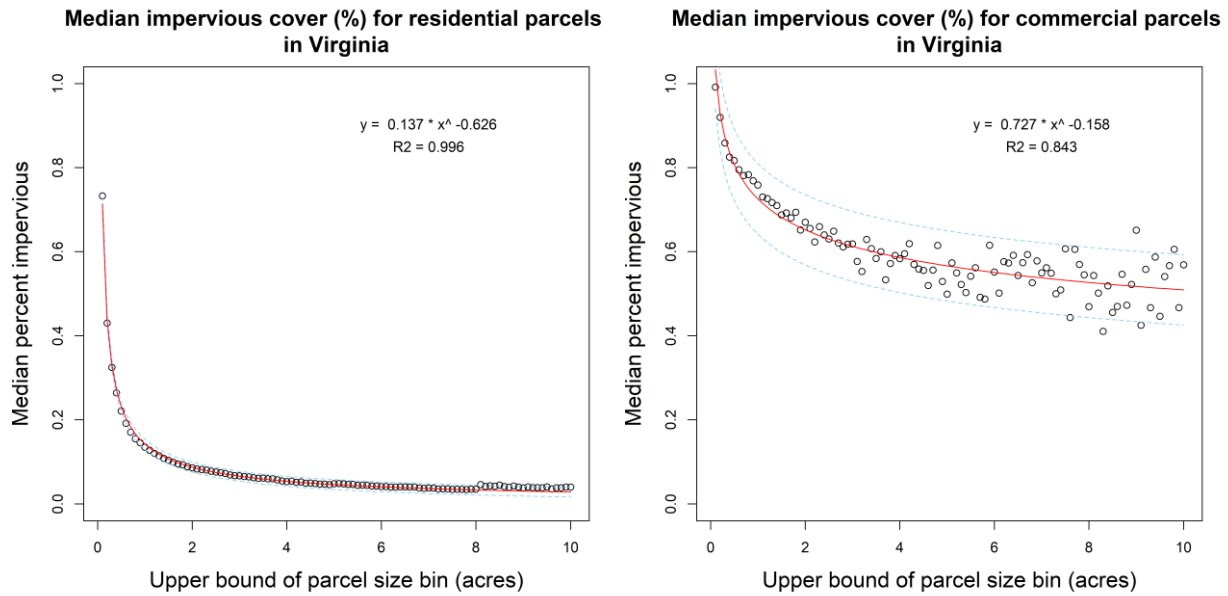


Figure 5. Models predicting impervious cover for residential (left) and commercial (right) parcels in Virginia.

West Virginia

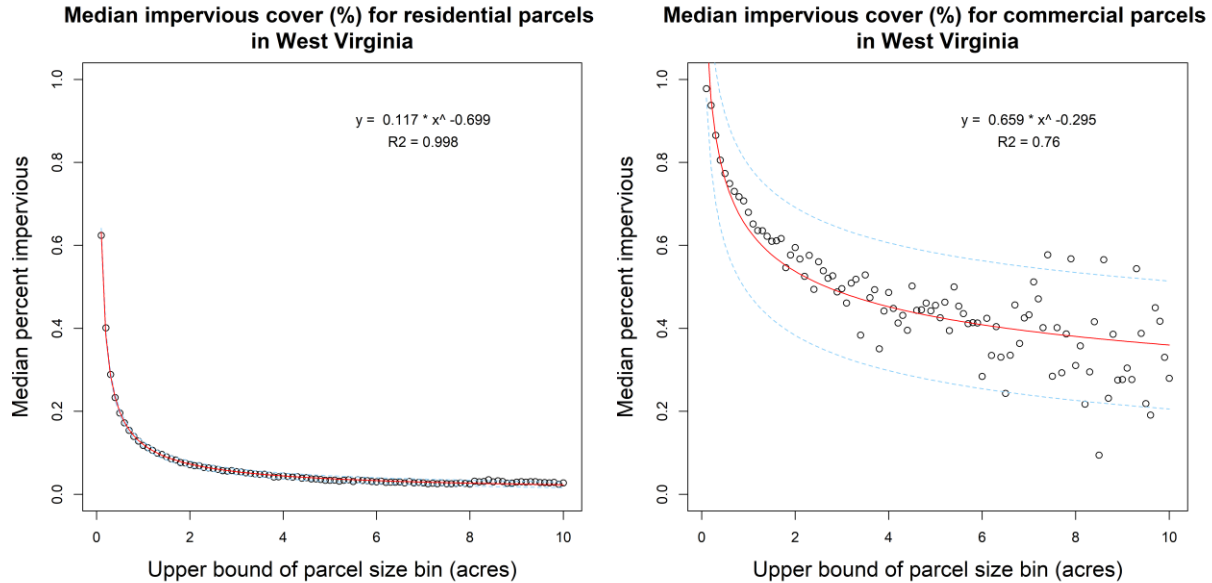


Figure 6. Models predicting impervious cover for residential (left) and commercial (right) parcels in West Virginia.

Washington D.C.

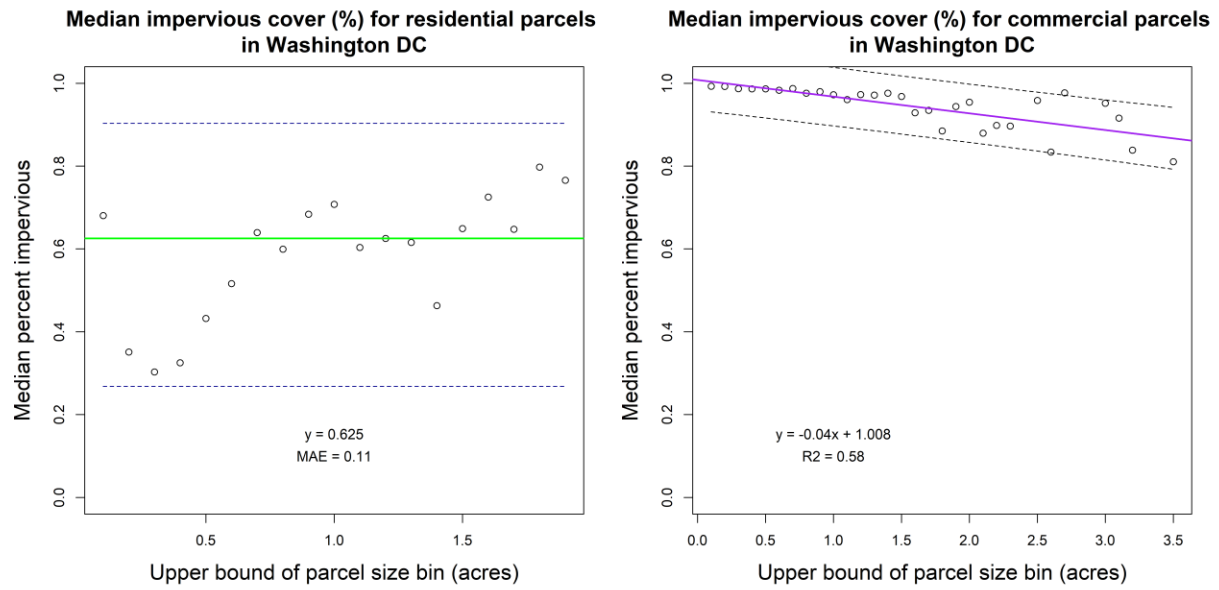


Figure 7. Models predicting impervious cover for residential (left) and commercial (right) parcels in Washington, D.C.