Chesapeake Bay Program
A Watershed Partnership

Forecasting Agriculture: 2021 Milestones Land Use

October 7, 2020
LUWG Call

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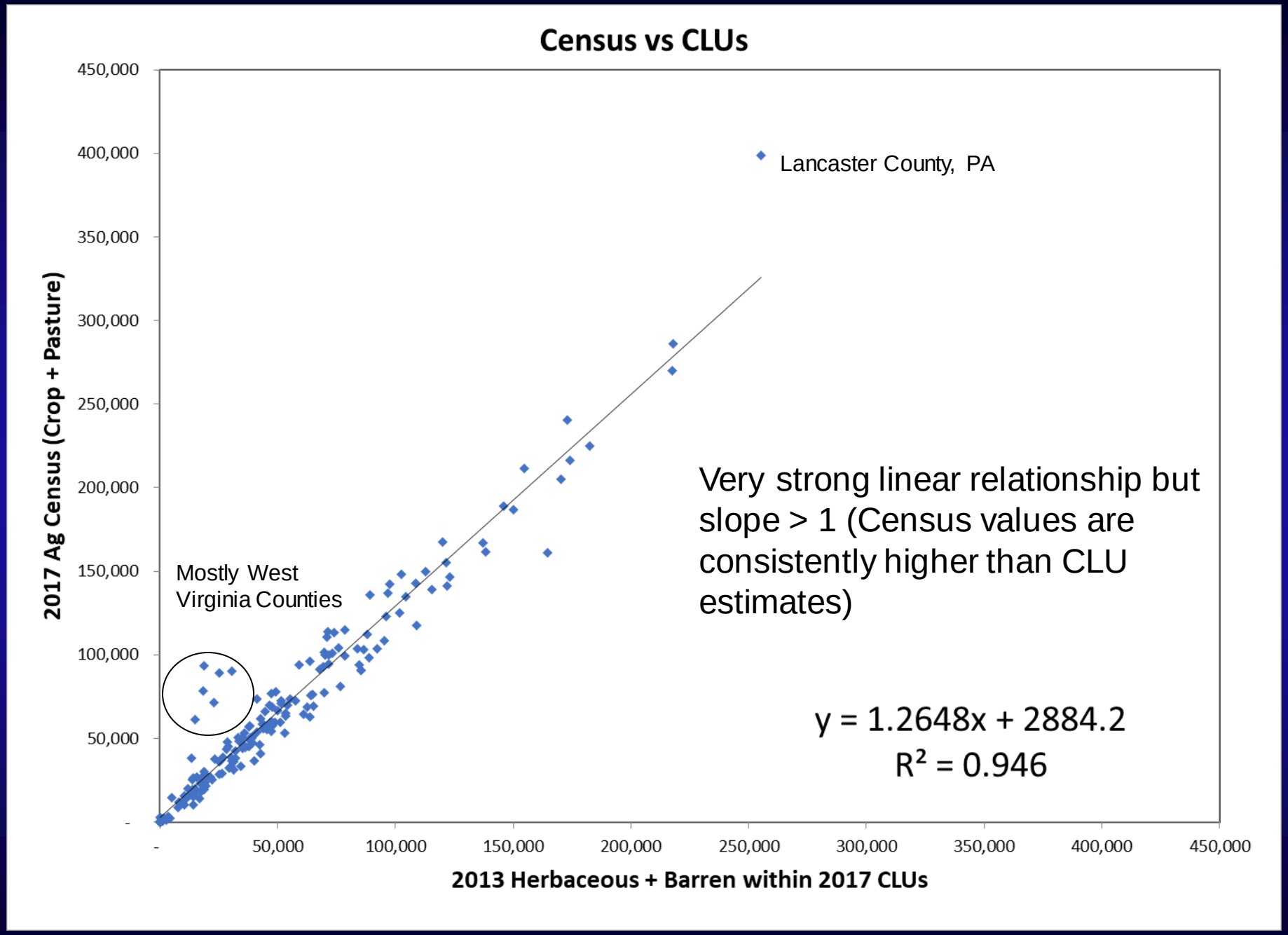
Census vs CLUs
2017 Ag Census (Crop + Pasture)
2013 Herbaceous + Barren within 2017 CLUs
Lancaster County, PA
Mostly West Virginia Counties
Very strong linear relationship but slope > 1 (Census values are consistently higher than CLU estimates)
y = 1.2648x + 2884.2
R² = 0.946
450,000
400,000
350,000
300,000
250,000
200,000
150,000
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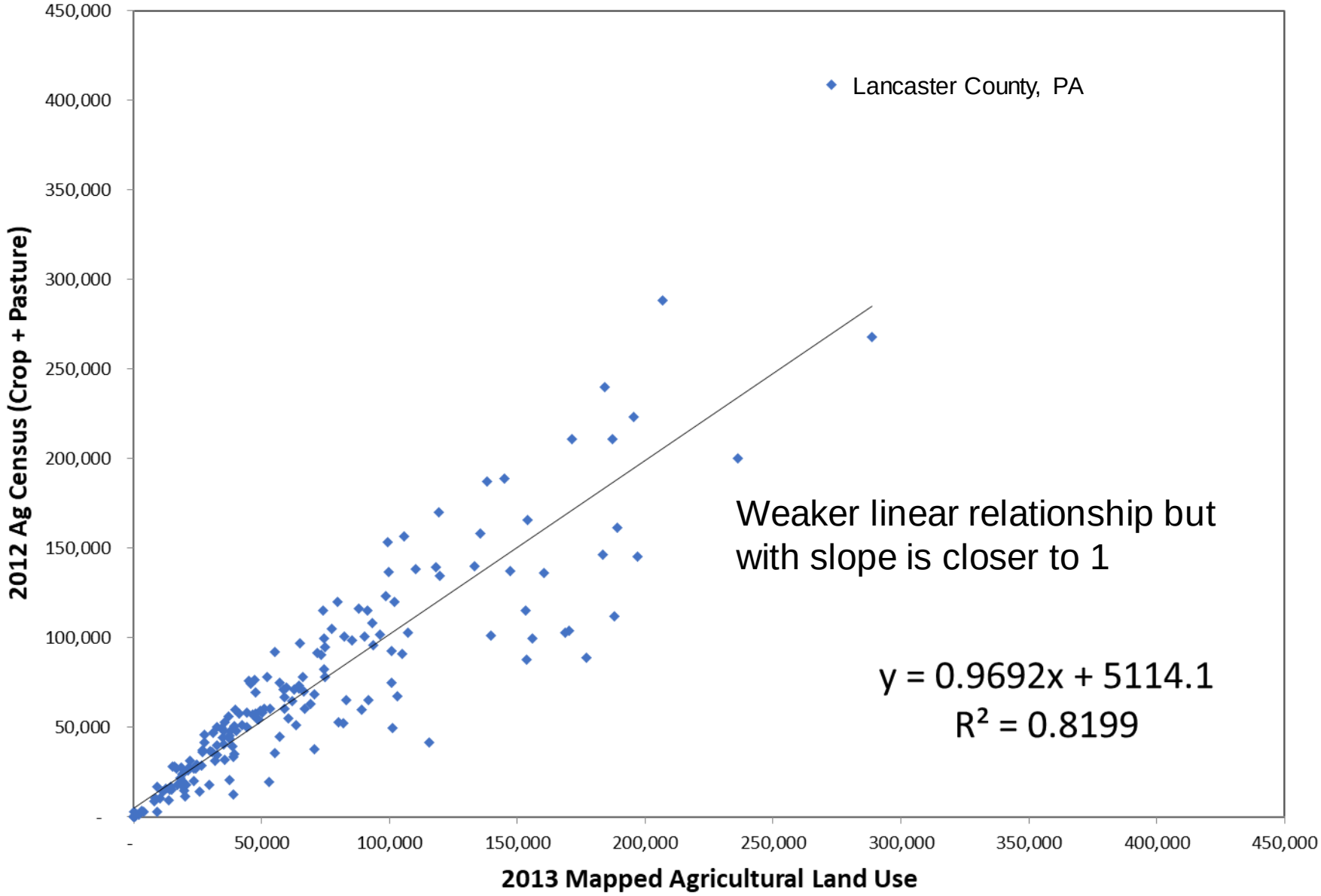
400,000
450,000

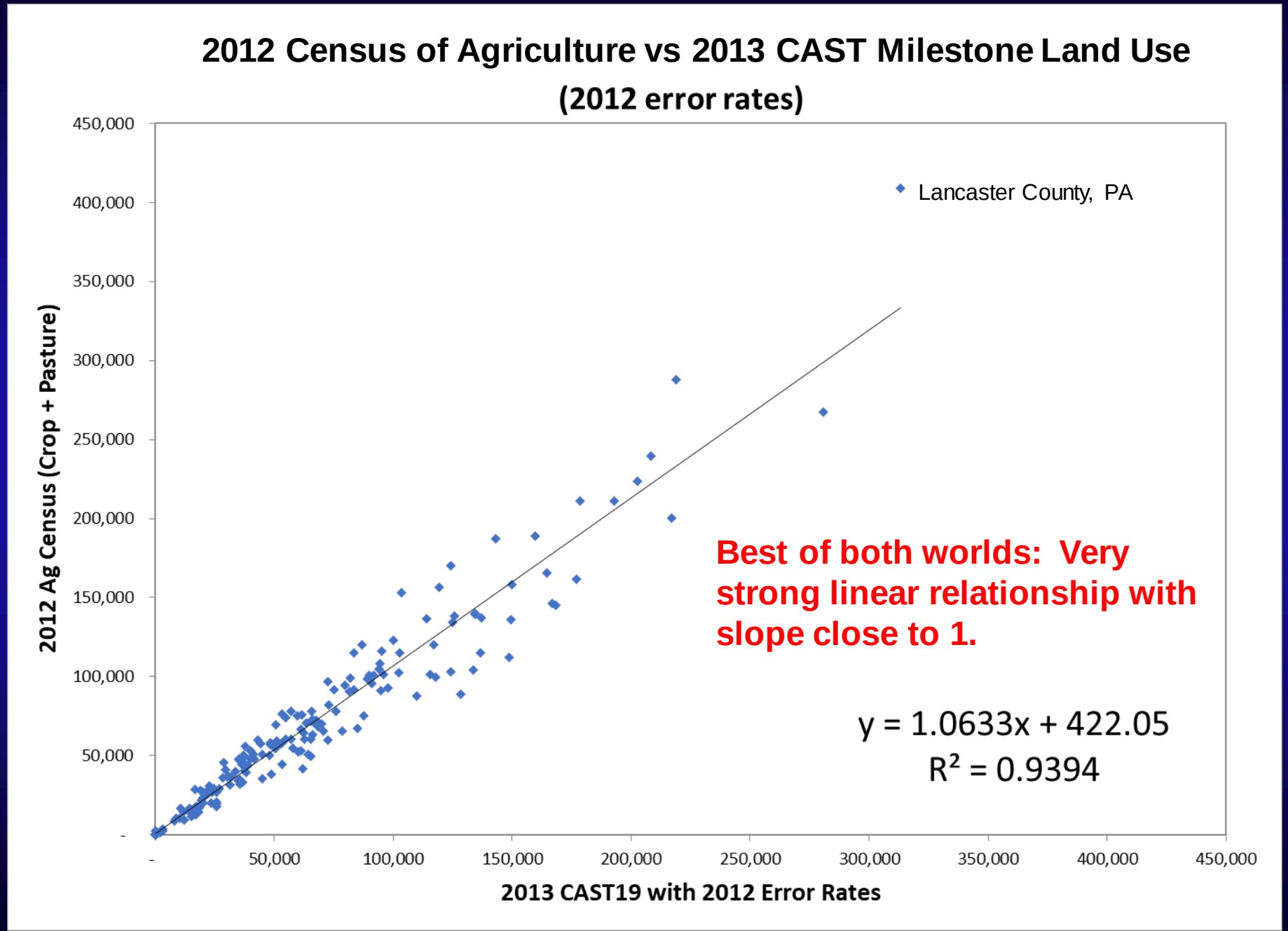
USGS

2012 Census of Agriculture vs 2013 Mapped Land Use



USGS

Balancing the Errors in the Census and Mapped Land Uses (True-up Method)



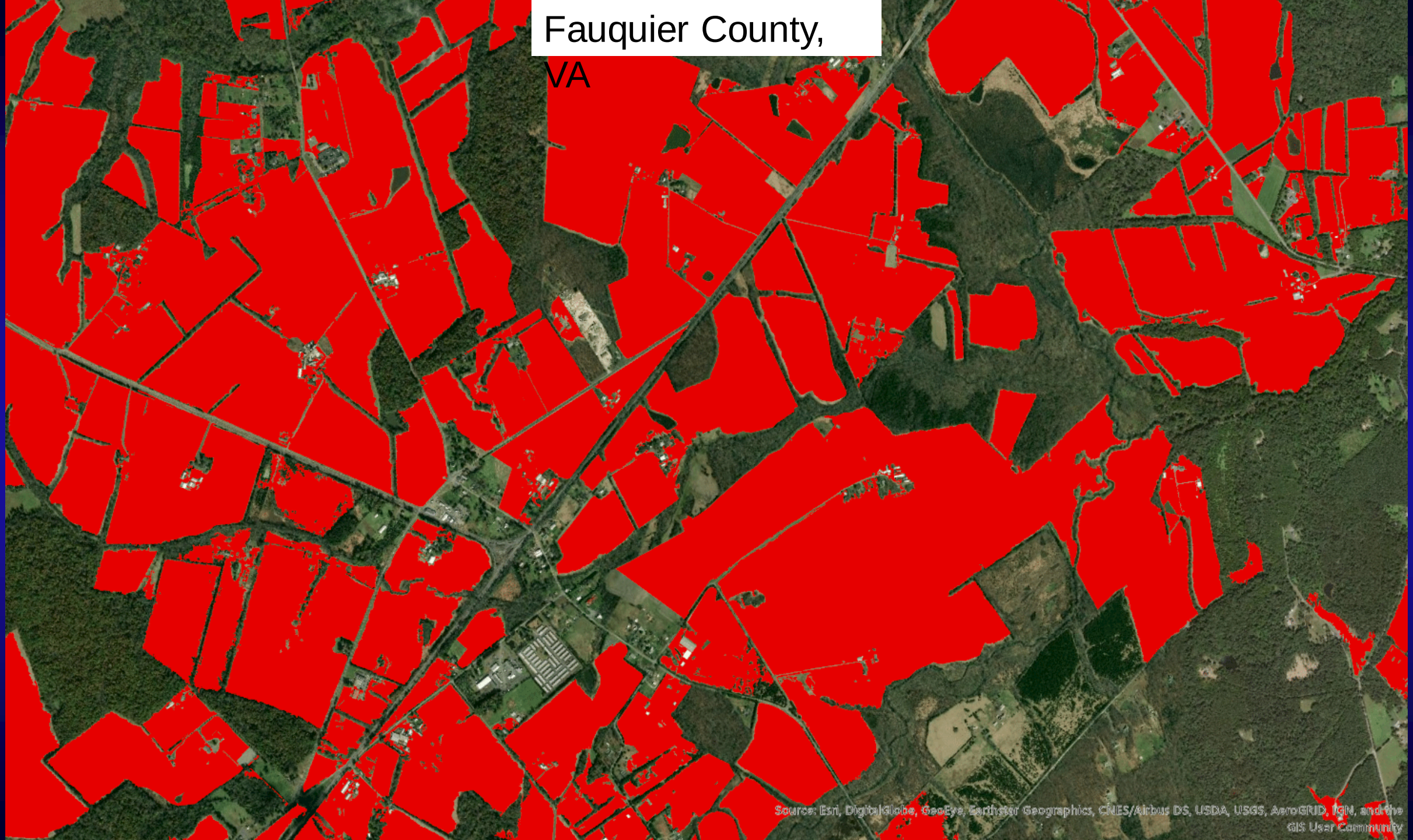
USGS

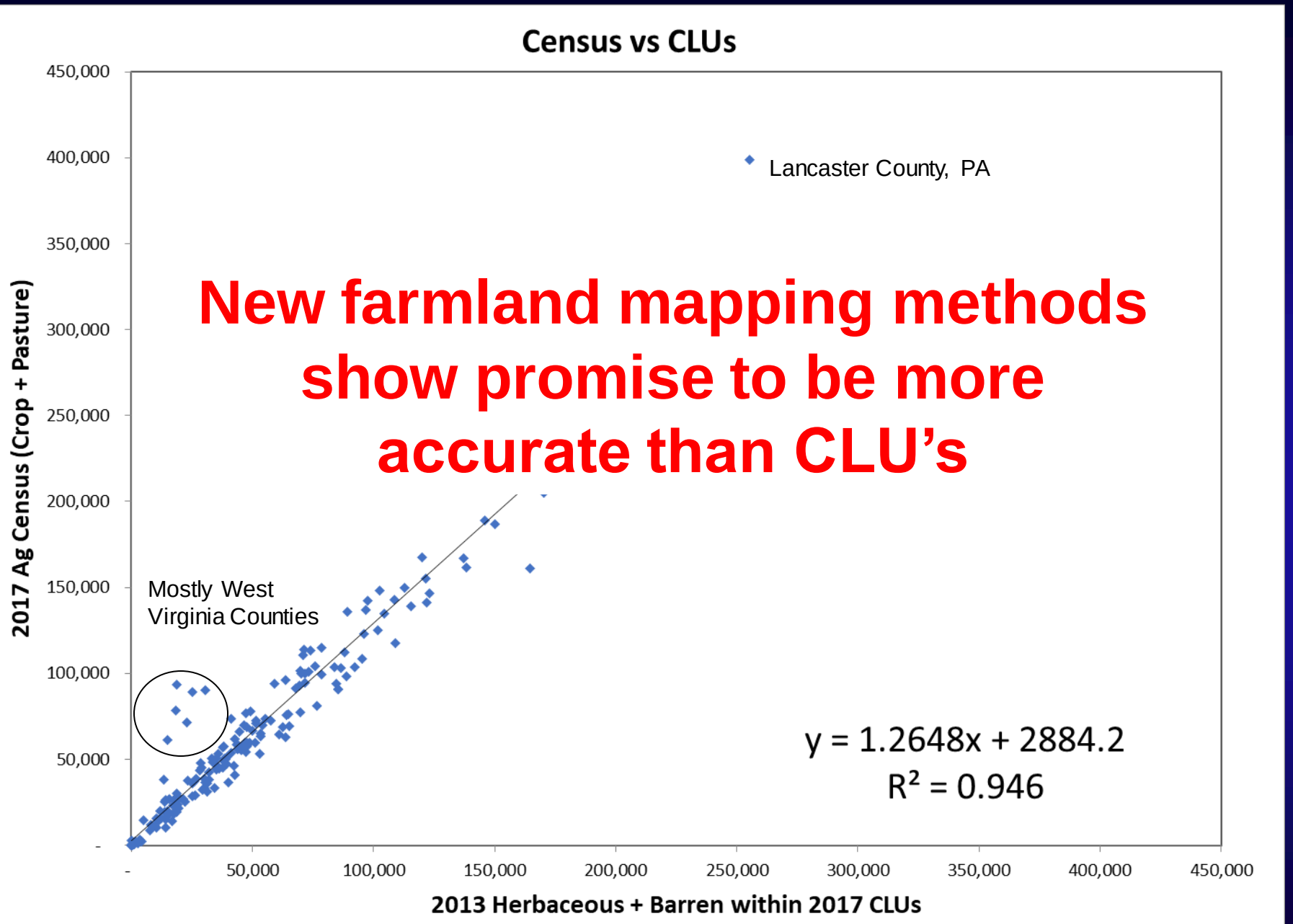
Lancaster County, PA:	Total Farmland
2012 Census of Agriculture:	377,807
2013 High-res Land Use:	272,655
Trial with 2017 Parcel and Patch Data:	303,132

Clearfield County, PA:	Total Farmland
2012 Census of Agriculture:	41,436
2013 High-res Land Use:	115,343
Trial with 2017 Parcel and Patch Data:	67,052

Fauquier County, VA:	Total Farmland
2012 Census of Agriculture:	166,587
2013 High-res Land Use:	119,175
Trial with 2017 Parcel and Patch Data:	135,954

USGS


Fauquier County, VA
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community


Census vs CLUs
Lancaster County, PA
New farmland mapping methods show promise to be more accurate than CLU's
Mostly West Virginia Counties
y = 1.2648x + 2884.2
R² = 0.946
2017 Ag Census (Crop + Pasture)
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450,000

USGS

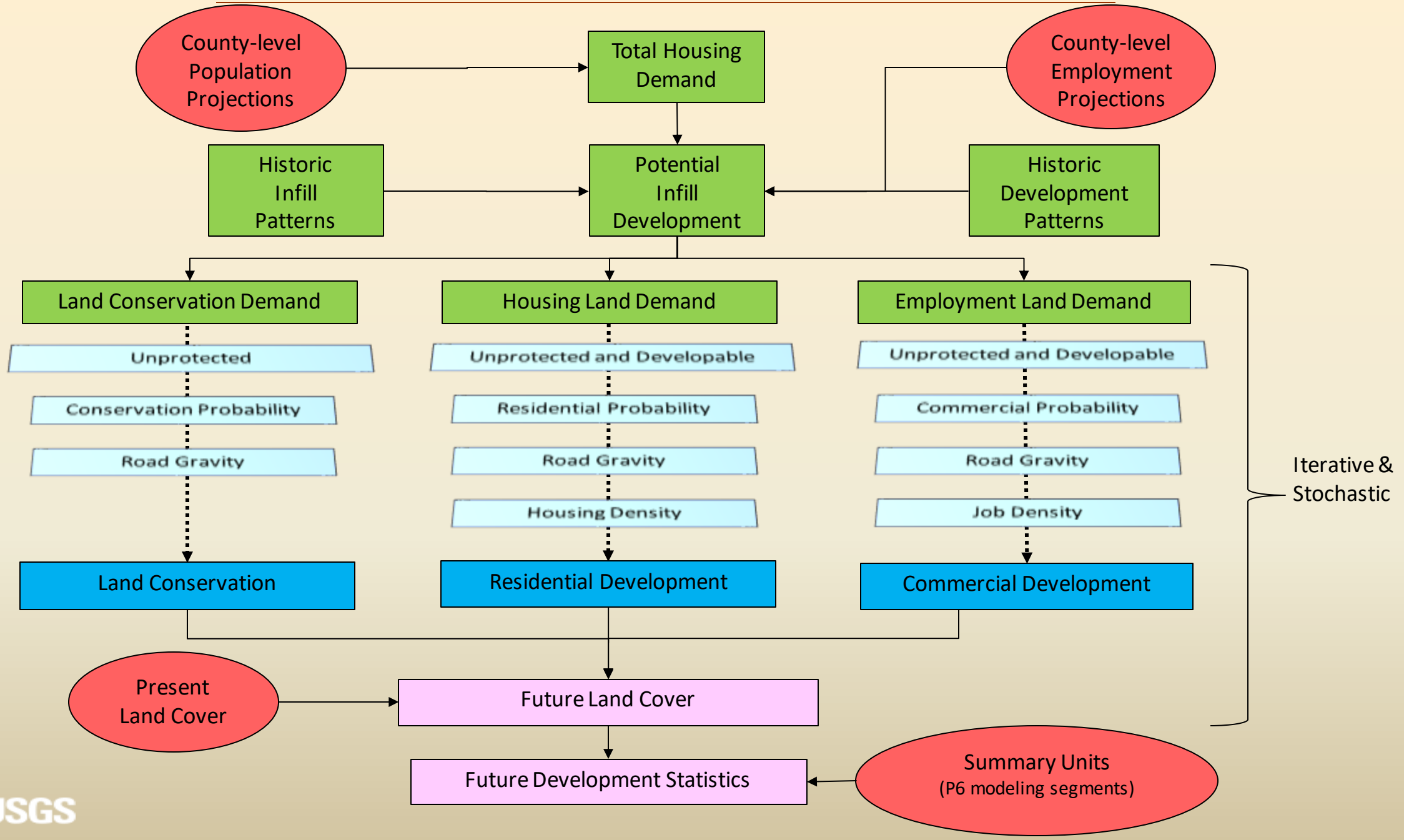
New Farmland Forecasting Method

Use the CBLCM to re-run current zoning scenario and stochastically allocate farmland retirement and ag expansion while simultaneously simulating urban growth.

1. Farmland Retirement = estimated future declines in agriculture from the Census that exceed losses associated with future urbanization.
   - Retirement may be presumed to occur on marginal farmlands

2. Farmland Expansion = estimated future increases in agriculture from the Census that exceed losses due from the Census that exceed losses associated with future urbanization.
   - Expansion may be presumed to occur on lands undergoing natural succession or those that are currently idle/fallow.

Chesapeake Bay Land Change Model v5 (Python & R)



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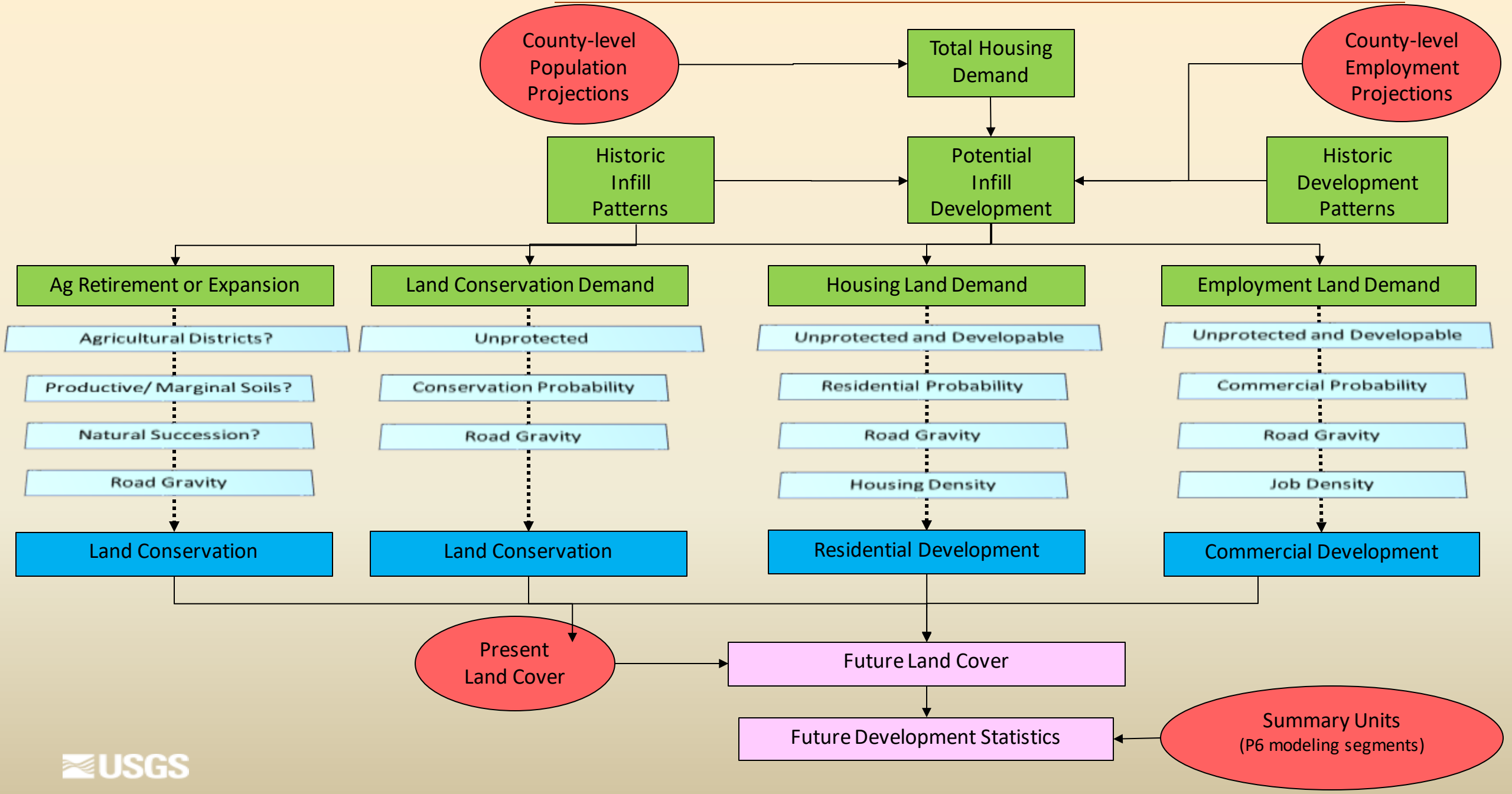
Chesapeake Bay Land Change Model v5.1 (Python & R)



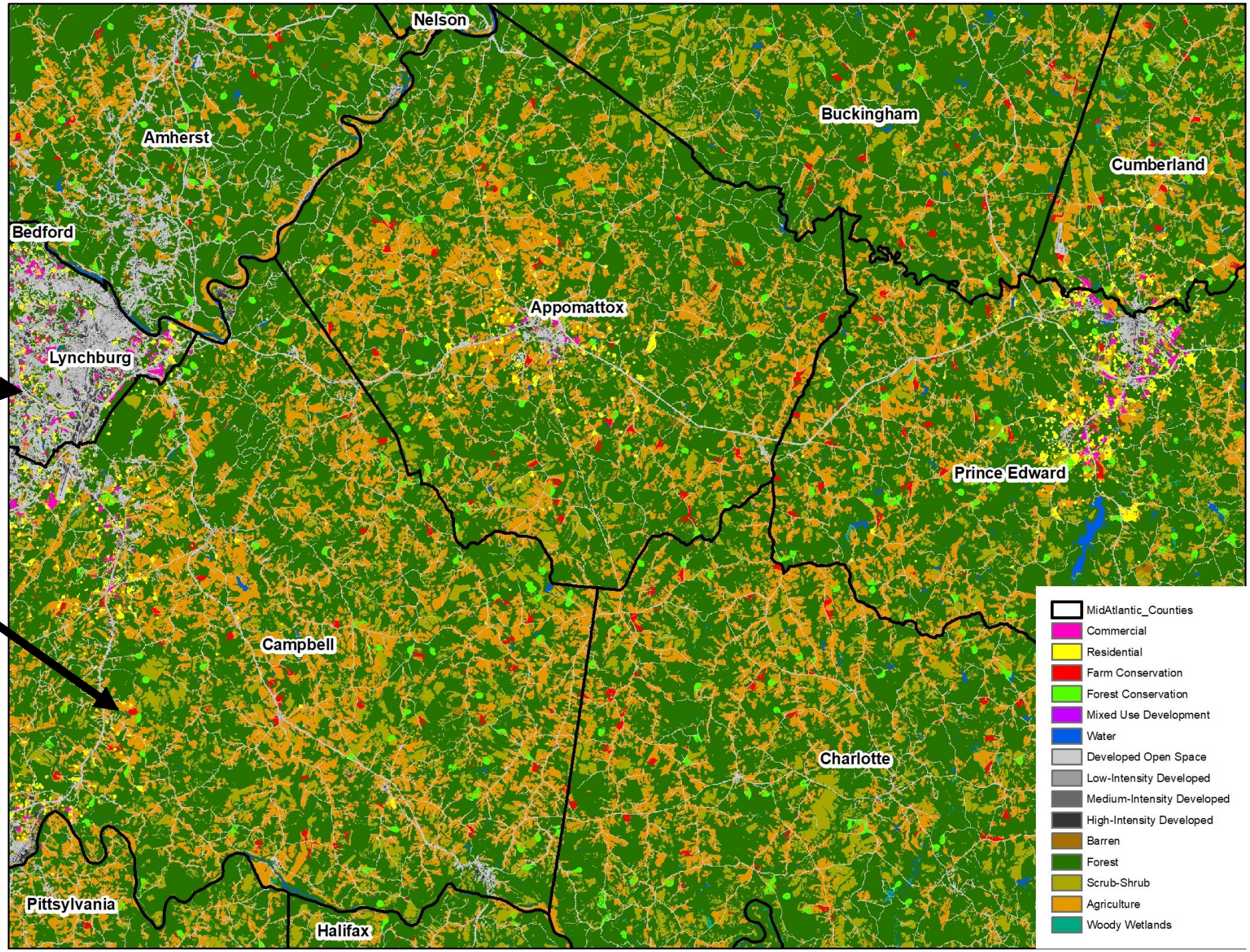
USGS

Land Change Model Outputs

Commercial and Residential Growth

Farmland and Forest Conservation

Farmland Retirement and Expansion



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