

Farm to Home

The supplementation of agricultural land by residential land in Maryland counties near Washington, D.C. and Baltimore City, from 1973 to 2010.

Introduction

Developments have been popping up all over the Washington-Baltimore Metro area where lush farmland used to stand. This is not a unique problem to this area, but a pattern that has emerged in the last 40 years in almost all parts of the United States where the population has increased, specifically around growing towns and cities.

I come from Frederick, Maryland; a city that is just 45 miles from Washington, D.C. and 50 miles from Baltimore City. These two cities have very different, but similar population stories from the early 1970s till now.

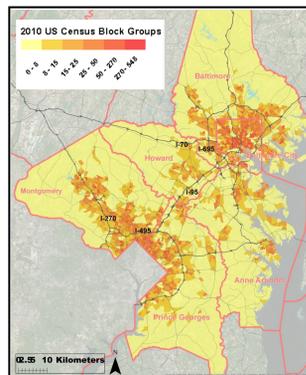
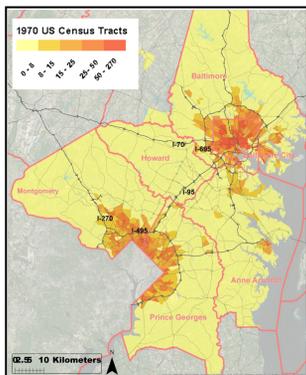


Source: National Geographic, <http://environment.nationalgeographic.com/environment/habitats/urban-sprawl/>

Both cities have experienced a decrease in the total number of people living within the city limits, and both have experienced an increase in the number of people living within the metropolitan area. Washington, D.C.'s metropolitan area, which includes Frederick, has increased at an aggressive rate since 1970, with a population around 5.8 million, in 2010. Usually these two metropolitan areas are combined to create a larger one called, the Baltimore-Washington metropolitan area.

Why is this farmland being parceled up and sold?

To answer simply: *something has got to go to make room for more people*; farmland is being sold because there is more value in selling over farming the land. With the continued growth and expansion of the Baltimore-Washington metropolitan area, land that was farmland has been sold to create housing for the increasing population.



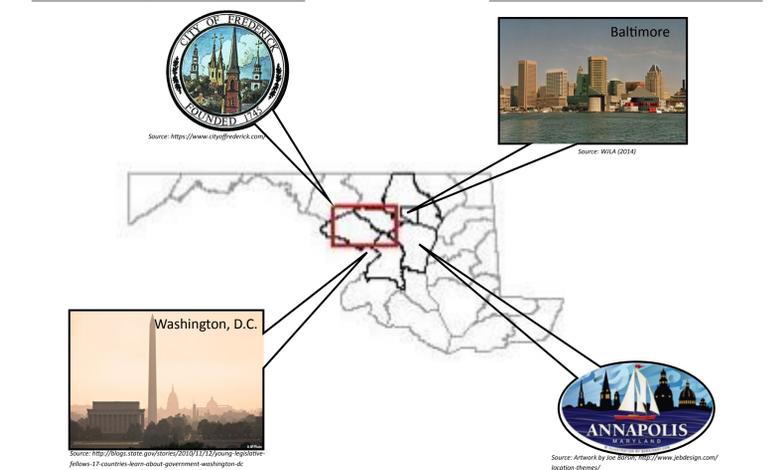
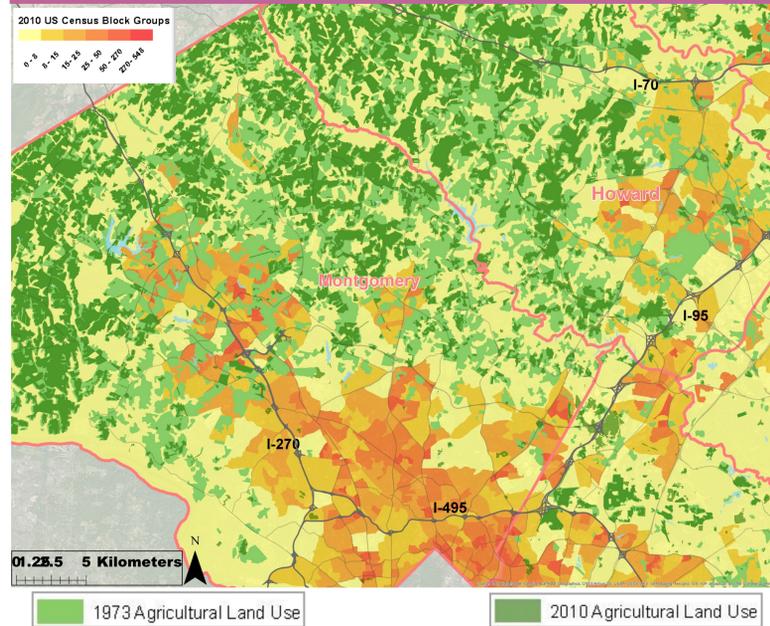
Methodology

There are five main layers used to represent the data. The first layer is the Maryland Counties layer from MD iMap (Maryland's Mapping and GIS Data Portal), which I used to create a layer that only highlighted the information for Howard, Montgomery, Prince George's, Anne Arundel, and Baltimore counties, and Baltimore City.

The second two are US Census layers for the state of Maryland obtained from NHGIS. One layer is the 1970s historic Census data, and the other is from the most recent US Census (2010). Both layers were normalized by people per hectares within each block group or tract group (1970). The 1970s layer was divided into five population density classes, and the 2010 layer was divided into six population density classes. The population density for the first five 2010 classes and for all of 1970s classes are the same, e.g., the first class for both census years is a range of 0 to 8 people per hectare. The only class that is not the same is the sixth 2010 class. This includes a population density range that is higher than the highest population density in 1970 (the 2010 sixth class range is 270-546 people per hectare).

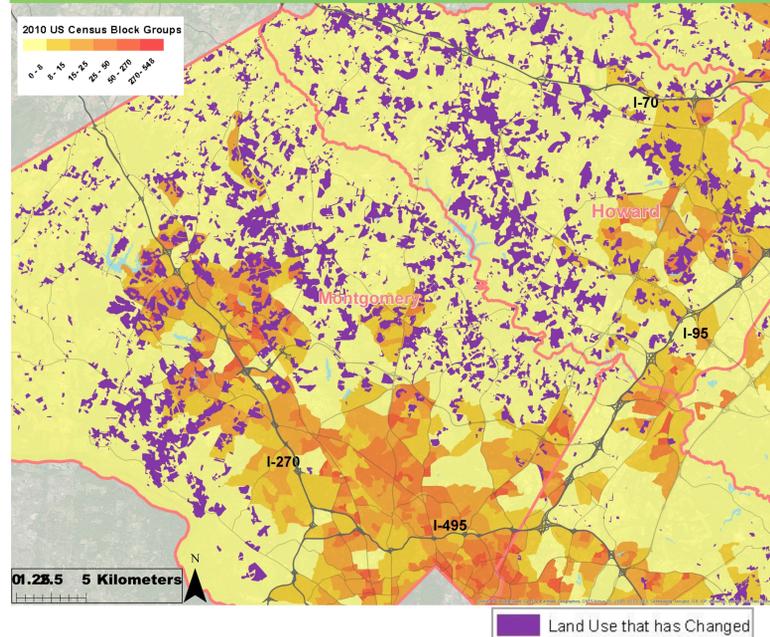
The other two major layers used were the 1973 Archived Land Use layer and the 2010 Land Use layer, both from the MD iMap. The Land Use layers are divided into different land use categories. The "agriculture" category was selected from the 1973 Land Use data layer and combined with all the residential categories from the 2010 Land Use data later, which include, "high density residential," "low density residential," "medium density residential," and "very low density residential" using the intersect tool. This created a layer that showed land that was both agricultural in 1973 and residential in 2010. This new layer is named, "Land Use that has Changed."

Agricultural Land Use in 1973 and 2010



Land that was Agricultural Land in 1973 and Residential Land in 2010.

Labeled as "Land Changed."



Example of increasing residential developments: The Kentlands, Gaithersburg, MA

1973



Source: photo taken by: E. Russell Gloyd; from Gaithersburg: Then and Now; <http://www.gaithersburghistory.com/aerials.html>

2010



Source: Duany Plater-Zyberk Company; <http://www.dpz.com/projects/8805>

Conclusions

Most of the population density increase has occurred along major corridors that lead to the cities, these include Interstates 270, 70, and 95.

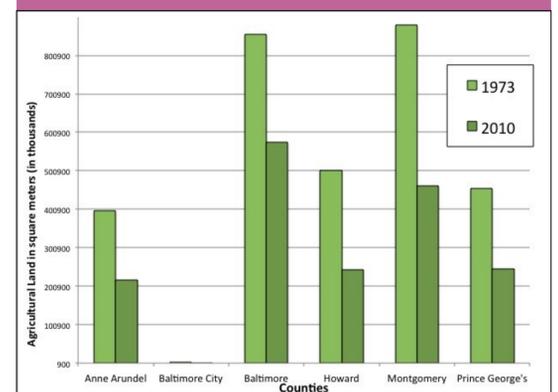
Smaller towns within counties surround the cities have grown.

My model only accounts for the amount of agricultural land use that became residential; agricultural land between 1973 and 2010 was also lost to commercial land use, industrial land use, and infrastructure, causing my model to underestimate the actual amount of agricultural land that was lost between 1973 and 2010.

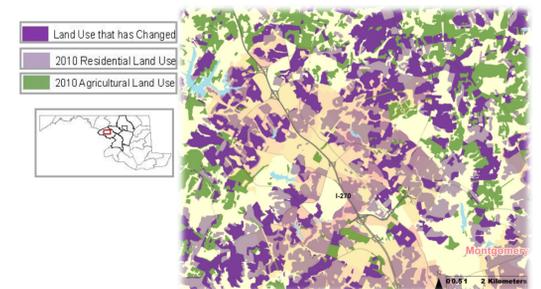
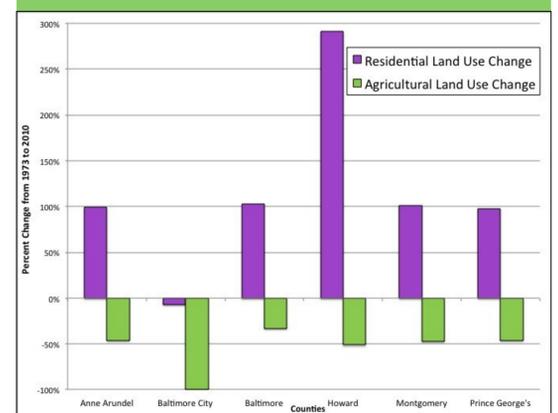
Comparison of Residential Land Use in 1973 and 2010



Comparison of Agricultural Land Use in 1973 and 2010



The percent change in both Agricultural Land Use and Residential Land Use from 1973 to 2010



The map directly above is a close up of agricultural and residential land use in 2010, and the change of land that was agricultural land in 1973 and residential land in 2010.

Cartographer: Jody Kenworthy

Course: Fundamentals of GIS



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Instructor: Paul Cote

Projection: NAD1983 StatePlane Maryland FIPS 1900 (Meters)

Sources: MD iMAP (2013); MD State Highway Administration (2013); Maryland Department of Planning; MD Department of Natural Resources; NHGIS (for U.S. 1970 and 2010 Census Data); Historical Metropolitan Populations of the United States (<http://www.peakbagger.com/pbgeog/histmetropop.aspx>)