

# Changes in Land Use in Columbia, Pennsylvania and Surrounding Areas

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## Abstract

*Lancaster County as a whole has seen steady population growth in recent years. Quantifying changes in land usage can be done using publicly available aerial imagery and the Envi software package. The area surrounding Columbia, PA was chosen as an area of focus in order to quantify the changes in land use between the years 2015 and 2019. The imagery was acquired from the USDA National Agricultural Imagery Program. Contrary to expectations, the amount of open space increased in the study period. Further studies should cover a greater area and attempt to determine the impact of zoning regulations on land use.*

Lancaster County as a whole has seen steady population growth in recent years. This growth has been accompanied by the development of formerly open space, including former agricultural fields and forested areas. Quantifying changes in land usage can be done using publicly available aerial imagery and the Envi software package. The area surrounding Columbia, PA was chosen as an area of focus in order to quantify the changes in land use.

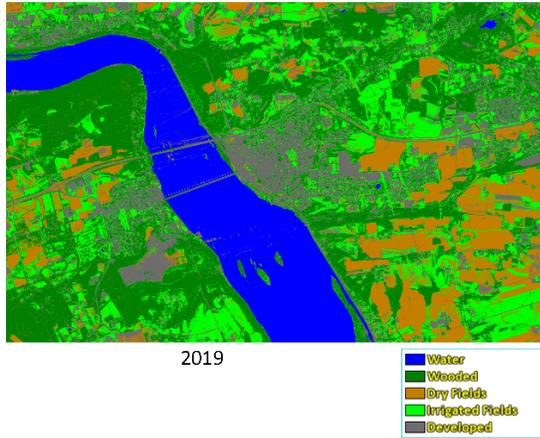
Aerial imagery of the area acquired as part of the USDA National Agricultural Imagery Program was downloaded from the PASDA geospatial clearing house for the years 2015 and 2019. The imagery captured both the visual light spectrum and infrared. The imagery was classified using Maximum Likelihood Classification using the Envi

Software program. Five classifications of land cover were defined, and the software assigned units of area to each classification based on spectral characteristics. After classification, a Majority/Minority Analysis was performed to eliminate noise. Statistics for each classification were obtained.

Fig. 1: Classification Maps



2015



Contrary to expectations, the percentage of developed land in the area studied actually decreased between 2015 and 2019. The most significant increase in non-developed land cover occurred for Wooded Areas. Columbia is in the vicinity of several nature preserves; it is possible they grew in size over the time period.

Fig. 2: Land Usage Percentages

	2015	2019
Water	15.05%	14.28%
Wooded	26.04%	32.98%
Dry Fields	15.88%	14.81%
Irrigated Fields	18.56%	21.08%
Developed	24.46%	16.91%
Total Non-Developed	60.48%	68.67%

Further studies should focus on comparing the changes in land cover between different areas and determining the impact of zoning laws.