



The Effect of Forest Canopy on Air Quality

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Background

I chose this topic after working some on the Arbor Day Foundation project. First, we were interested in looking into the economic effects of trees, but data and methodology constraints made this unrealistic. Next, I looked at health effects of trees—specifically the effect that tree cover has on air quality at the county level. While air quality is not necessarily an economic measure, it is linked to a number of social and economic issues and is therefore important to study.

Methodology

To assess the effects of tree canopy cover on air quality, I used a simple ordinary least squares (OLS) regression. The dependent variable is the percentage of days that a given county has ‘good’ air quality, according to the Environmental Protection Agency’s Air Quality Index. In addition to the independent variable, % of land covered by forest canopy, several control variables are included—percentage of urban area, population, manufacturing, GDP, and climate.

Regression Results

Table 1

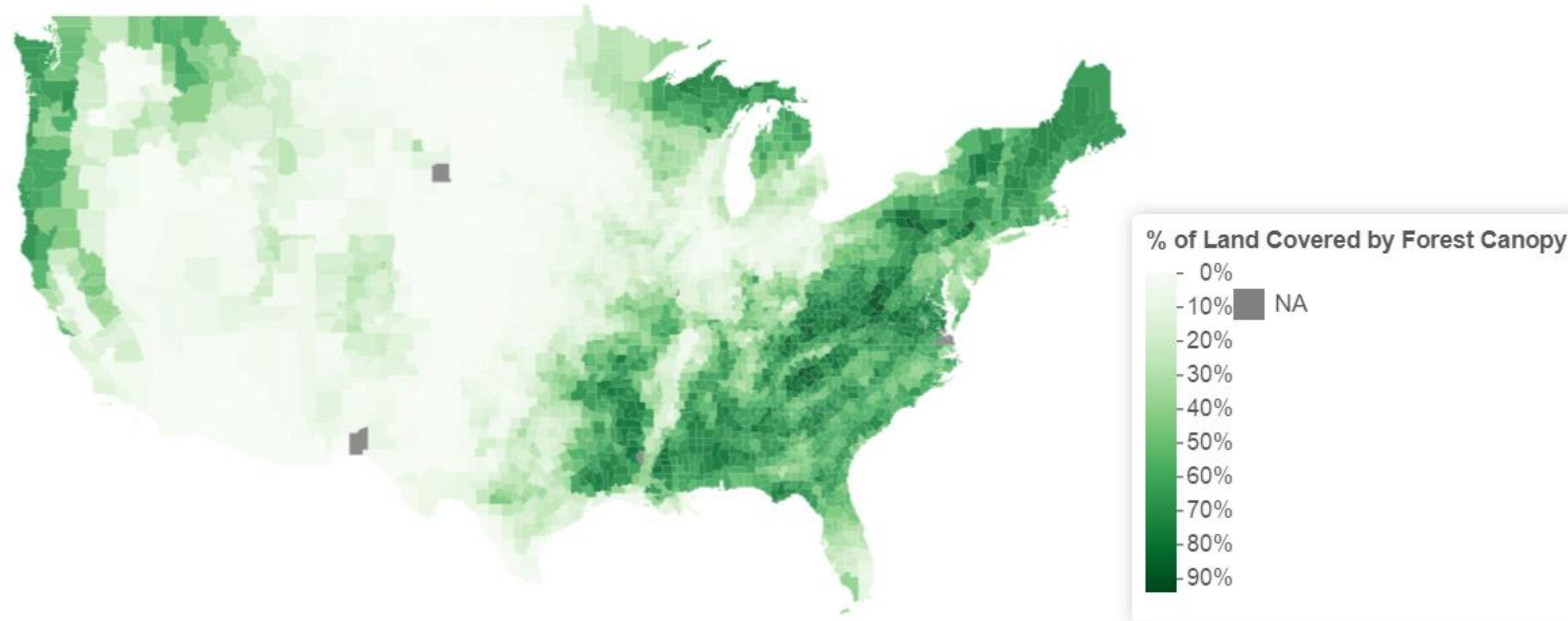
	Dependent variable:	
	Percentage of Days with 'Good' Air Quality	
% of Area that is Urban	-0.081***	(0.020)
% of Land Covered by Forest Canopy	0.099***	(0.016)
Population	-0.00001***	(0.00000)
Manufacturing Employment	-0.0001**	(0.00004)
Gross Domestic Product	0.00000	(0.00000)
Hot-Dry Climate	-21.911***	(1.877)
Hot-Humid Climate	3.148***	(1.167)
Marine Climate	-0.108	(1.890)
Mixed-Dry Climate	-14.595***	(2.805)
Mixed-Humid Climate	0.713	(0.913)
Very Cold Climate	1.454	(2.052)
Constant	81.211***	(0.751)
Observations	996	
R ²	0.362	
Adjusted R ²	0.355	
Residual Std. Error	2	11.298 (df = 984)
F Statistic	50.754*** (df = 11; 984)	

Note: *p<0.1; **p<0.05; ***p<0.01

Conclusions

My analysis shows that the amount of forest canopy in a county does have a significant effect on the air quality in that county. At the 1% significance level, an increase of **1%** in the proportion of land in a county covered by trees leads to an increase of **0.099%** in the percentage of days in a year that the county’s air quality is considered ‘good.’ I would be interested in conducting further research into more/better control variables, as well as make a more direct link between air quality and economic indicators. However, planting more trees is definitely good for air quality.

Canopy Cover in the United States



Data Sources

- Air Quality....EPA
- Urbanity.....
- Canopy.....i-Tree
- Population....Bureau of Economic Analysis
- Manuf.....Bureau of Economic Analysis
- GDP.....Bureau of Economic Analysis
- Climate.....U.S. Department of Energy