Tree Planting Prioritization in Baltimore, Maryland

2021 Spring i-Tree Academy Capstone Project

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Purpose

The Maryland State Legislature recently passed HB991, also referred to as the Tree Solutions Now Act of 2021, which requires 5 million trees to be planted in Maryland over the next 10 years. Of those 5 million trees, 10% of them must be planted in "underserved areas", which the bill defines as a Census Designated Urban Area that is also above the State's average unemployment rate, 75% of or lower than the State's median household income, a neighborhood graded as "Hazardous" by the Home Owners' Loan Corporation (i.e. redlined), or a housing project.

Many areas that fit the definition of underserved, like Baltimore City, could likely have lower tree canopy, and thus lower tree benefits, due to systemic lack of resources and the historic/current discrimination these areas experience. To address this issue, I created several tree planting prioritization maps for Baltimore, Maryland to see how well planting trees in underserved areas could address certain environmental health hazards.
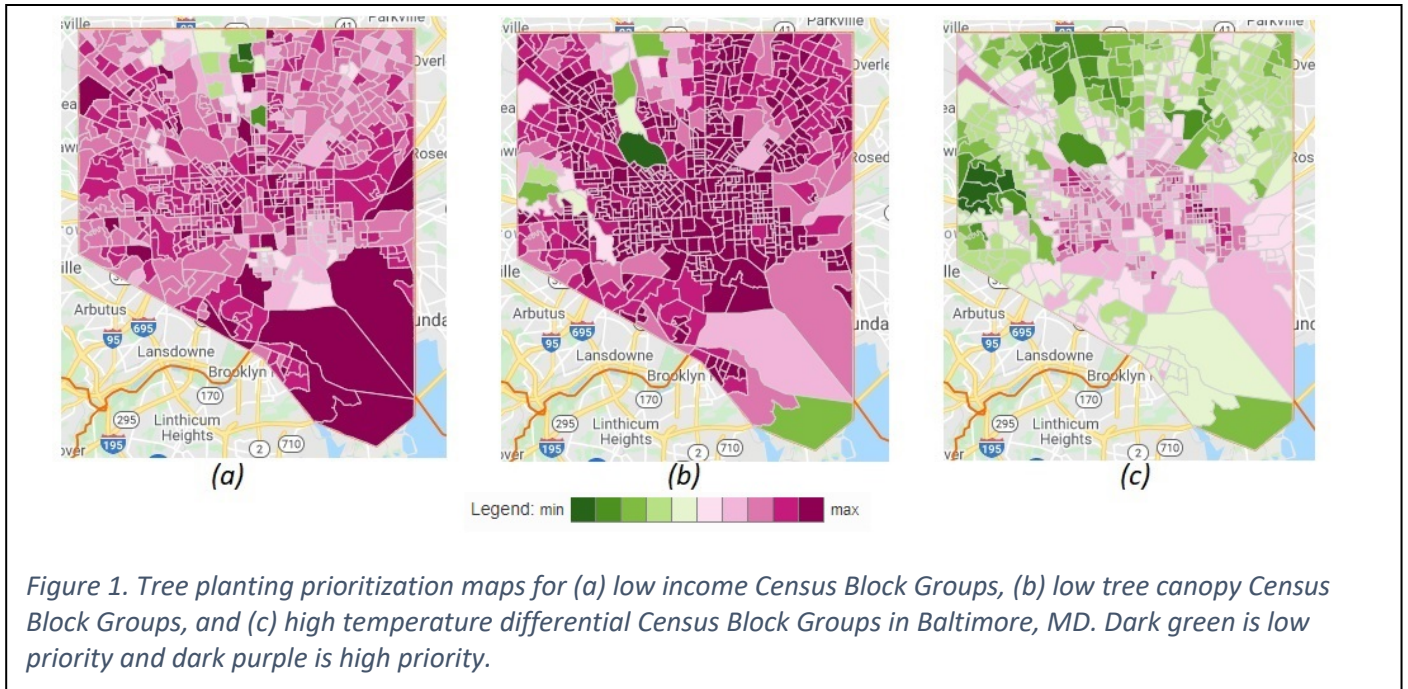
Methods

I considered three criteria for my planting prioritizations maps- low median income, low tree canopy cover, and high temperature differential. I selected low income as it was the only criteria from HB991's definition of underserved available for planting prioritization on i-Tree Landscape. I considered low tree canopy cover for planting prioritization as these areas were likely to experience the highest benefits from tree planting. I chose temperature differential as my environmental factor as it has been highlighted by researchers at University of Maryland as an important issue and is something we at the Maryland Forest Service are working to address. In addition to this, some of the other environmental/health factors I looked into did not show much variation among Census Block Groups in Baltimore.

I used i-Tree Landscape v 4.3.1 to create planting prioritization maps for Census Block Groups in Baltimore, Maryland. The first three maps prioritize just one of the criteria and the fourth map prioritized them all equally. The Census Block Group prioritization rankings for each of the maps were imported into Microsoft Excel for further analysis.

Results

There appears to be a high degree over overlap between the low income, low canopy cover, and high temperature differential tree planting prioritization maps (figure 1). All three of them identify central Baltimore as a high priority place to plant trees. This is also reflected in the planting prioritization map

Figure 1. Tree planting prioritization maps for (a) low income Census Block Groups, (b) low tree canopy Census Block Groups, and (c) high temperature differential Census Block Groups in Baltimore, MD. Dark green is low priority and dark purple is high priority.
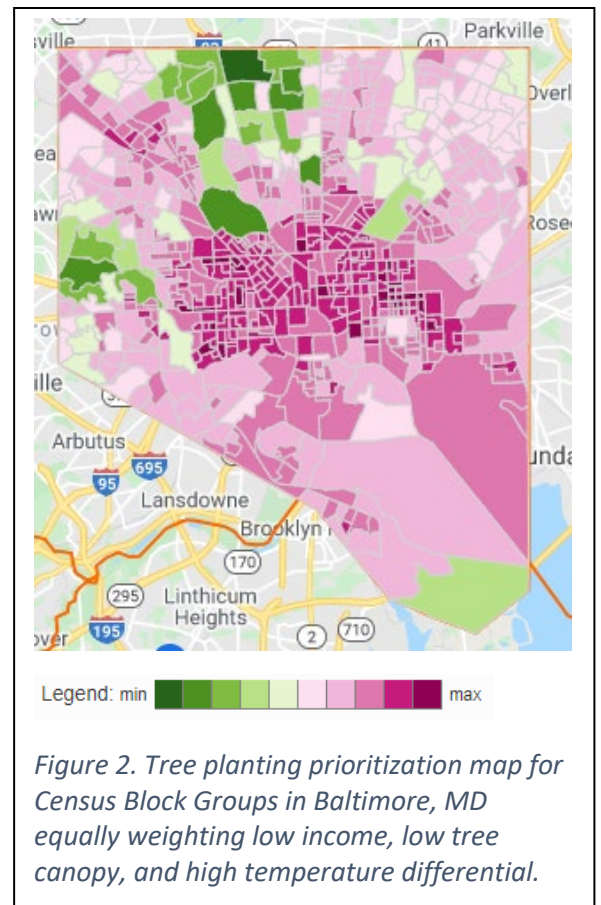
that equally weighted all three criteria (figure 2); central Baltimore has the Census Block Groups with the highest prioritization ranking.

The low income and the low tree canopy cover prioritization maps appear to overlap the most. Of the 125 Block Groups in Baltimore that had a ranking over 90 for the low income prioritization map (1 being the lowest priority and 100 being the highest), 107 of them were Block Groups with the a low tree canopy prioritization ranking over 90. The vast majority of the Census Block Groups in the low income and low tree canopy maps are considered high priority. Of the 653 Block Groups in Baltimore, 641 are ranked 51 or above on the low income prioritization map and 645 are ranked above 51 on the low tree canopy prioritization map. Only 372 of the Block Groups are ranked above 51 on the high temperature differential prioritization map.

Discussion/Conclusion

Baltimore Maryland has a lot to gain from increased tree planting. Many of the neighborhoods have low tree canopy cover, which means there are many opportunities to plant trees. The city also has many low income areas, and planting

Figure 2. Tree planting prioritization map for Census Block Groups in Baltimore, MD equally weighting low income, low tree canopy, and high temperature differential.

and maintaining tree cover there could help increase tree equity and benefits throughout the city. Additionally, targeting central Baltimore for tree planting projects address low income, low tree canopy,

and high temperature areas. As more people and governments start to recognize the importance environmental justice and tree equity, we will hopefully see more legislation similar to the Tree Solutions Now Act that work to increase tree canopy cover in underserved areas.