

Growing Shade

Tree planting, canopy enhancement, and preservation tool

Ellen Esch, PhD

ACS Data Users 2023

17 May 2023



Today's discussion

Outline

- Trees advance planning initiatives
- Trees intersect with regional issues
- Tool demonstration
- Q & A

Trees advance regional planning initiatives



Sustainability

Protecting our regional vitality for generations to come

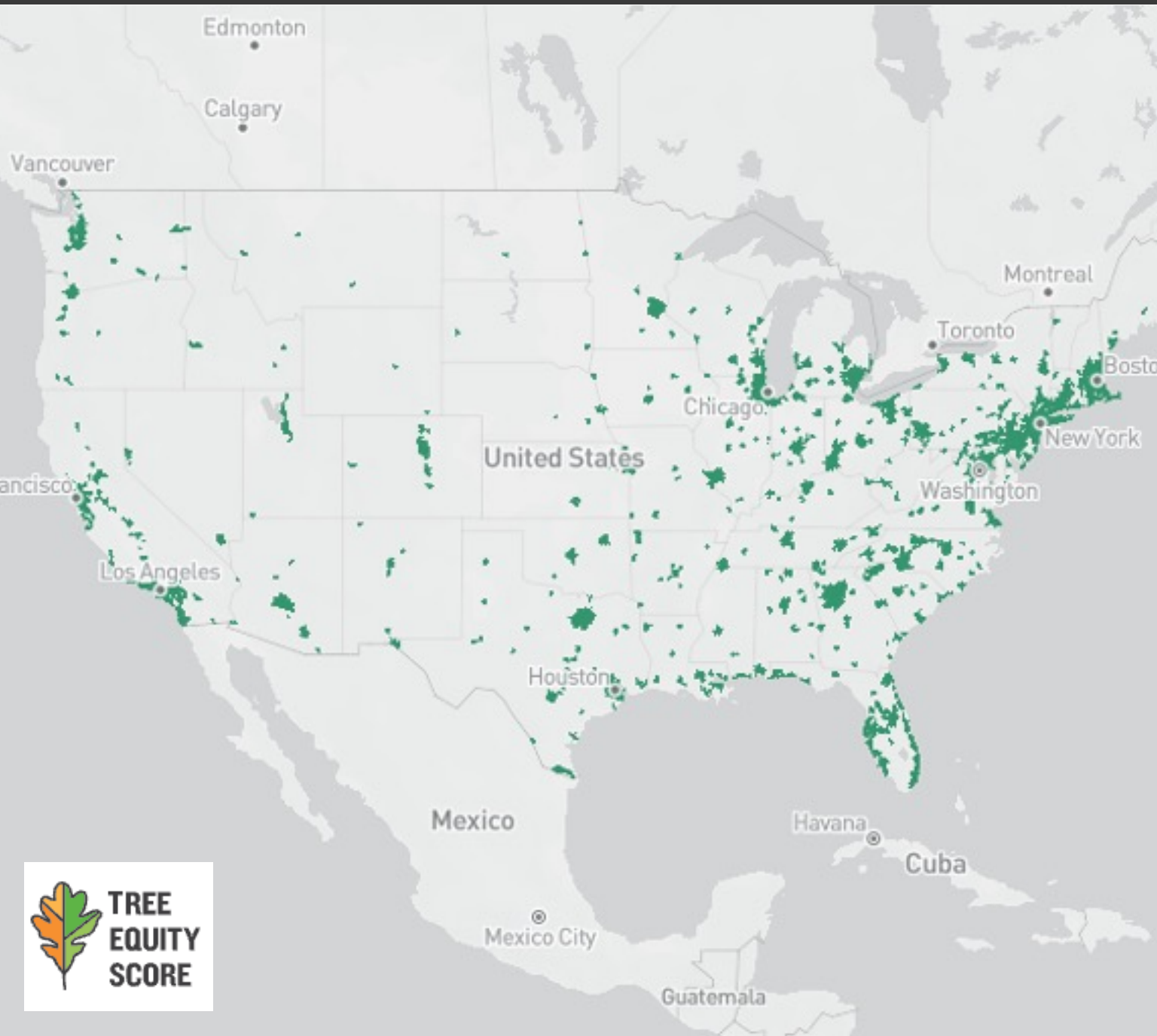
- Lead by example
- Partner with customers and stakeholders

Equity

Recognizing institutional and systemic barriers and creating access and opportunities that benefit all

- Environmental justice

Core principles apply nationwide



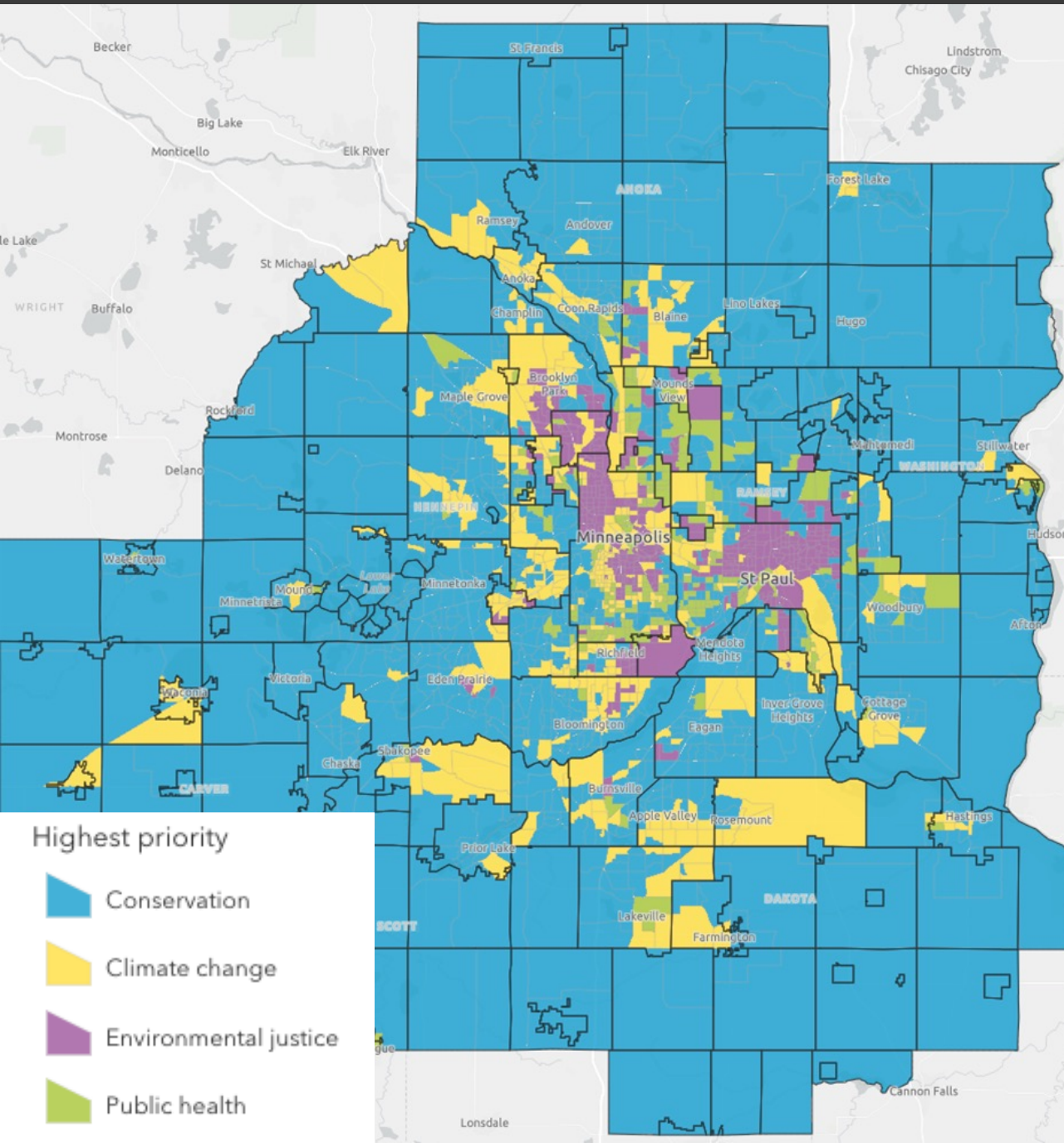
- Sustainability and equity outcomes are goals shared by many regions. Climate action plans are becoming more common.
- Growing Shade offers a nuanced approach informed by stakeholder engagement, but generalized products may fill gaps:
 - Tree Equity Score
 - iTree tools
- Growing Shade's qualitative stories are broadly educational and explore opportunities and challenges with the tree canopy.



<https://github.com/Metropolitan-Council/growing.shade>



Trees intersect with regional issues



Environmental justice

- The need for greening intersects with income, race, and ethnicity.

Climate change

- Trees can mitigate some consequences of climate change by cooling land surface temperatures and reducing flooding.

Conservation of natural resources

- Reducing tree canopy loss will be critical to offset carbon emissions and conserve biodiversity across the region.

Public health

- Trees improve air quality and cool land temperatures leading to better health outcomes.

Racist policies and history influence today's environmental conditions

Systematic seizure of Indigenous land

- Dakota and Ojibwe people were coerced into signing land cession treaties beginning in 1805.

Intentional exclusion of Black families

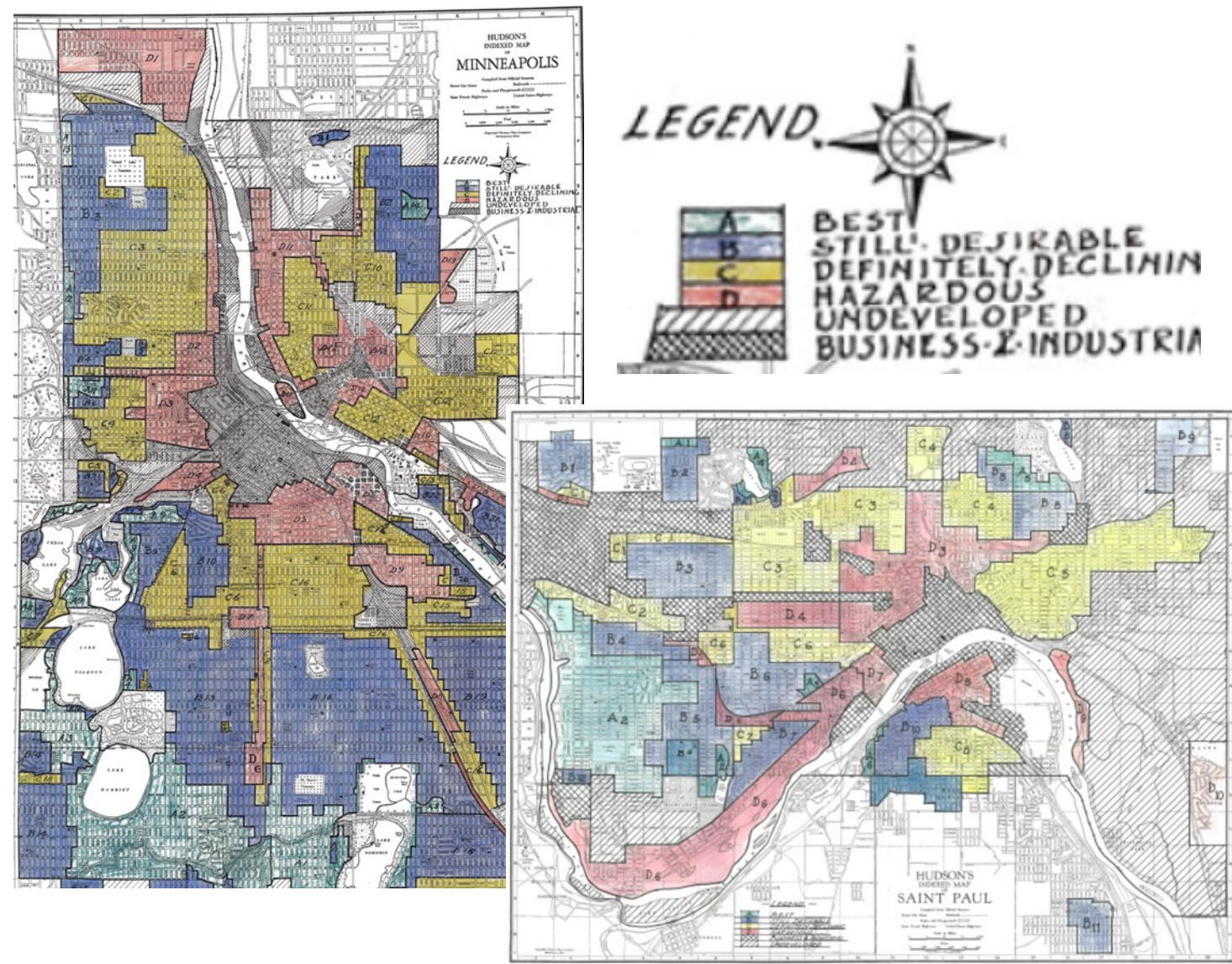
- Home Owners Loan Corporation “redlines” areas in 1934. Racial covenants continue in Hennepin County until 1955.

Infrastructure prioritized over minority communities

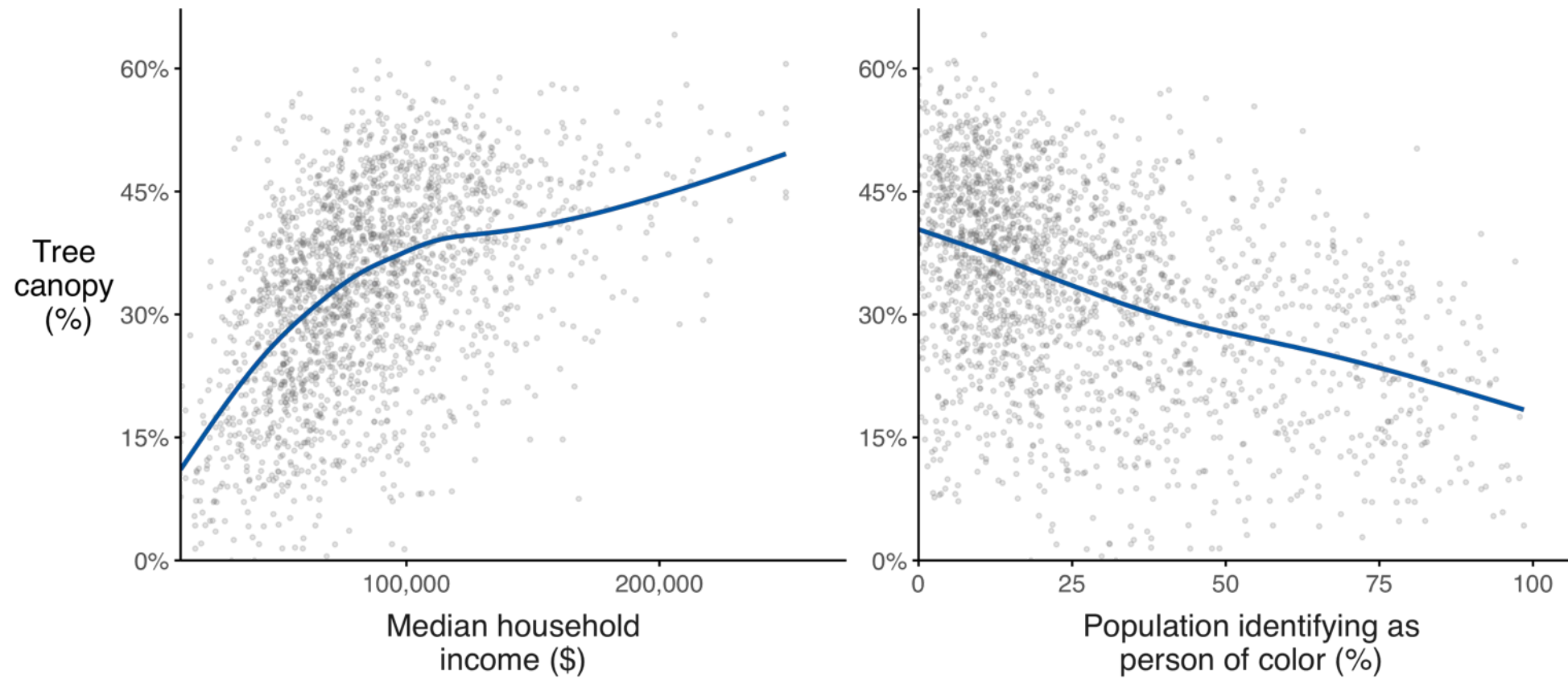
- Federal Aid Highway Act in 1956 followed by the completion of Interstate 35W (1967) and Interstate 94 (1968) displace Black residents and businesses.

Consequences of racist policies persist

- Growing Shade’s environmental justice lens identifies areas and people facing disproportionately negative consequences of land use decisions.

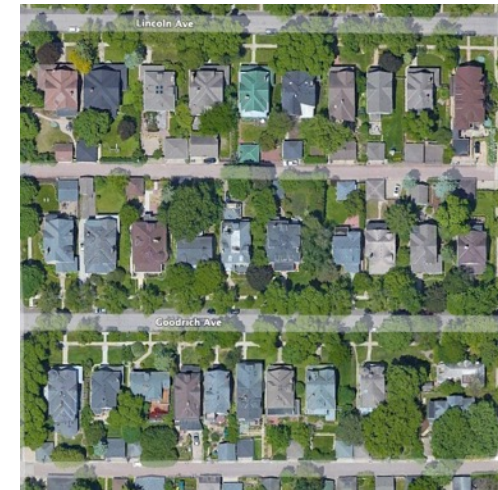
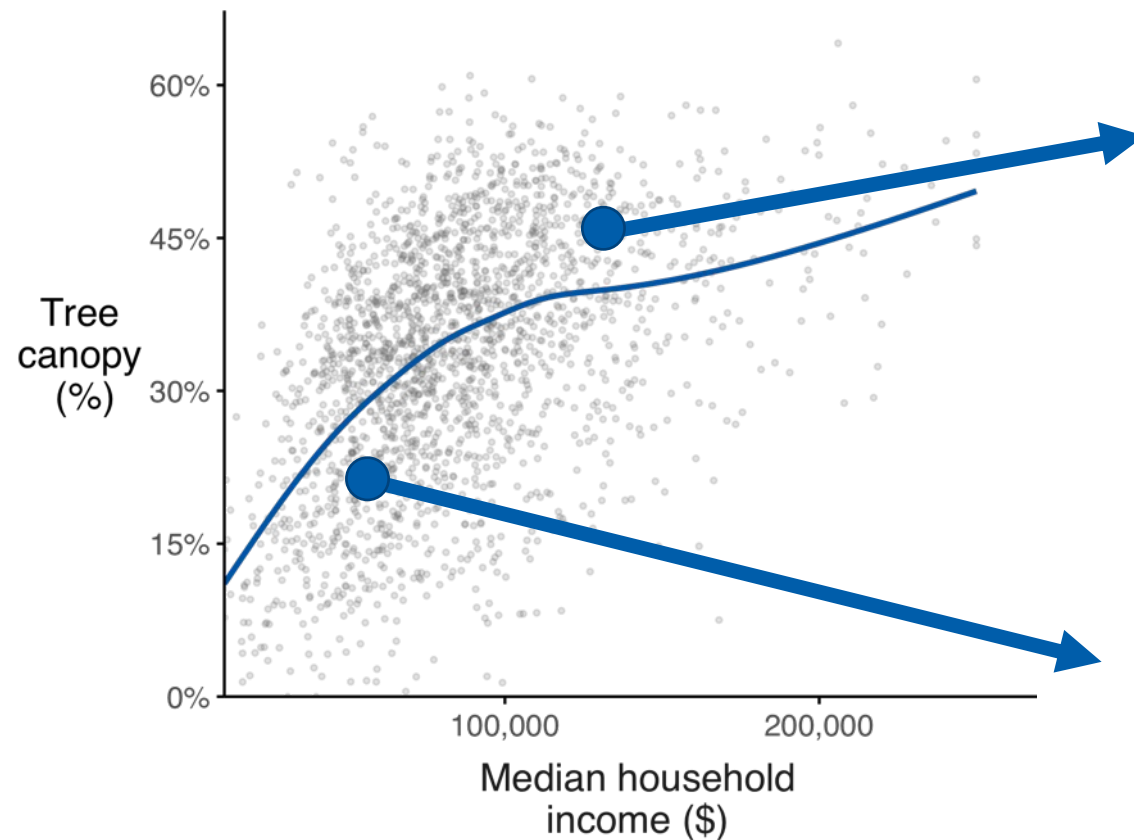


Race and income disparities with tree canopy cover

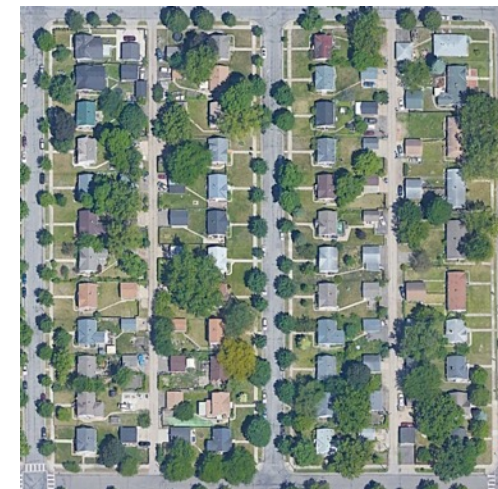


Source: Analysis of Sentinel-2 satellite imagery (2021)
and ACS 5-year estimates (2015-2019)

Race and income disparities with tree canopy cover



Saint Paul's Summit Hill
42% tree canopy
\$118,625 median income
9% residents of color
13.2 people per acre

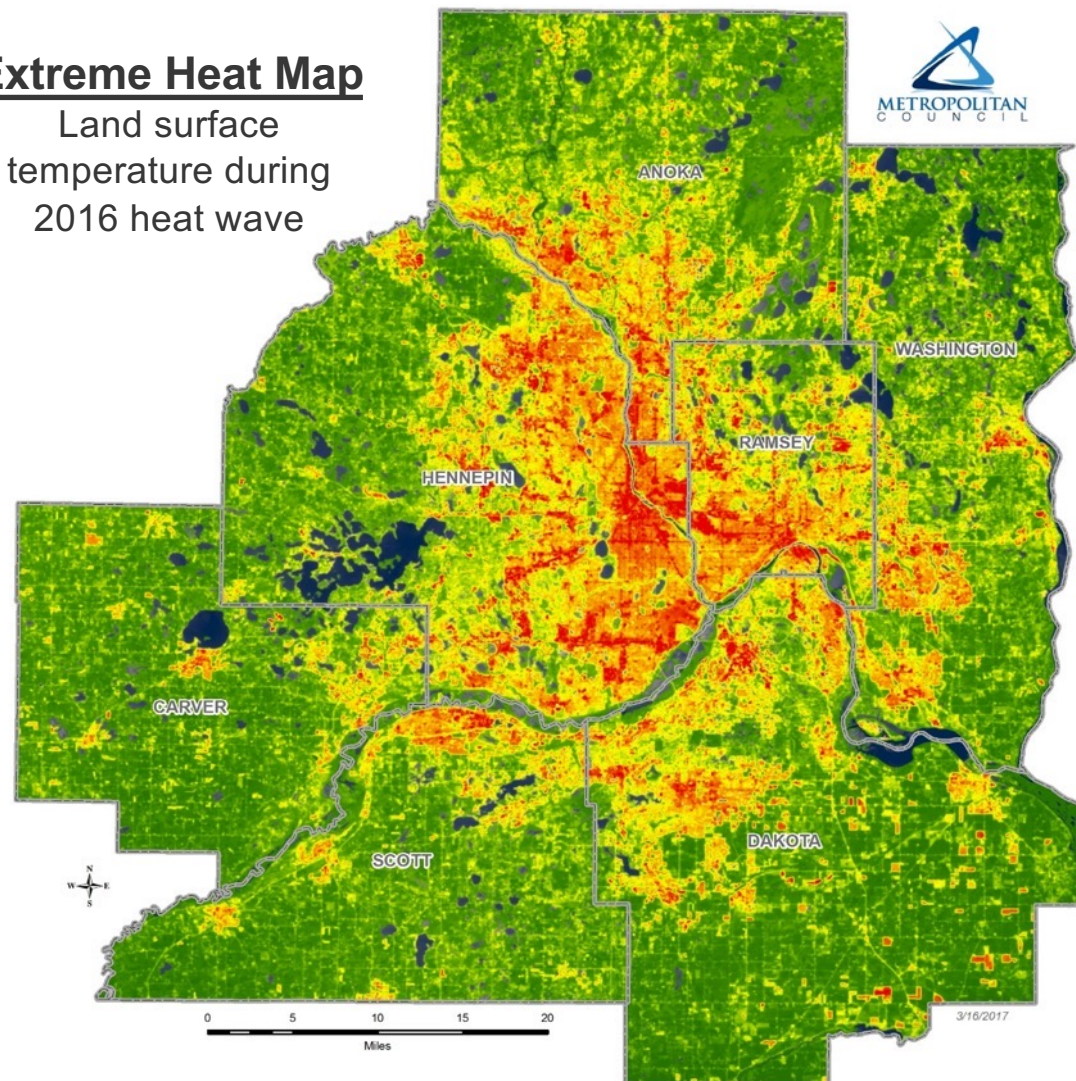


Minneapolis' Camden
16% tree canopy
\$46,528 median income
59% residents of color
13.3 people per acre

Tree inequity creates hotter neighborhoods

Extreme Heat Map

Land surface
temperature during
2016 heat wave



Extreme Heat Tool shows differences of up to 40°F across the region

- Shading from trees and evaporative cooling from all vegetation reduce land temperatures.
- Urban heat islands intensify temperature differences.

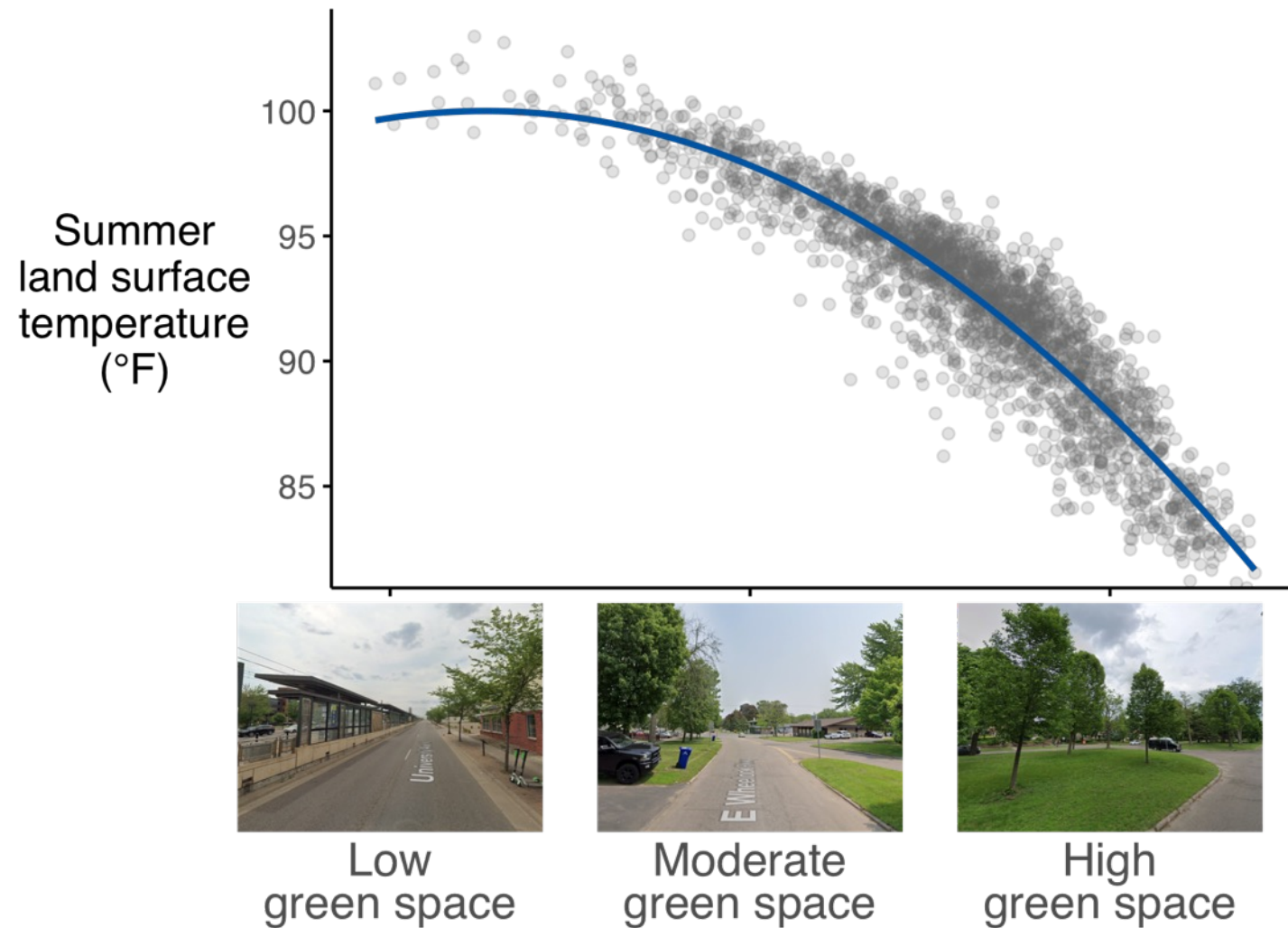
Extreme heat is deadly

- Adding trees can reduce heat related deaths.
- Growing Shade's public health lens identifies areas where trees could most improve health outcomes.

Climate change underscores urgency

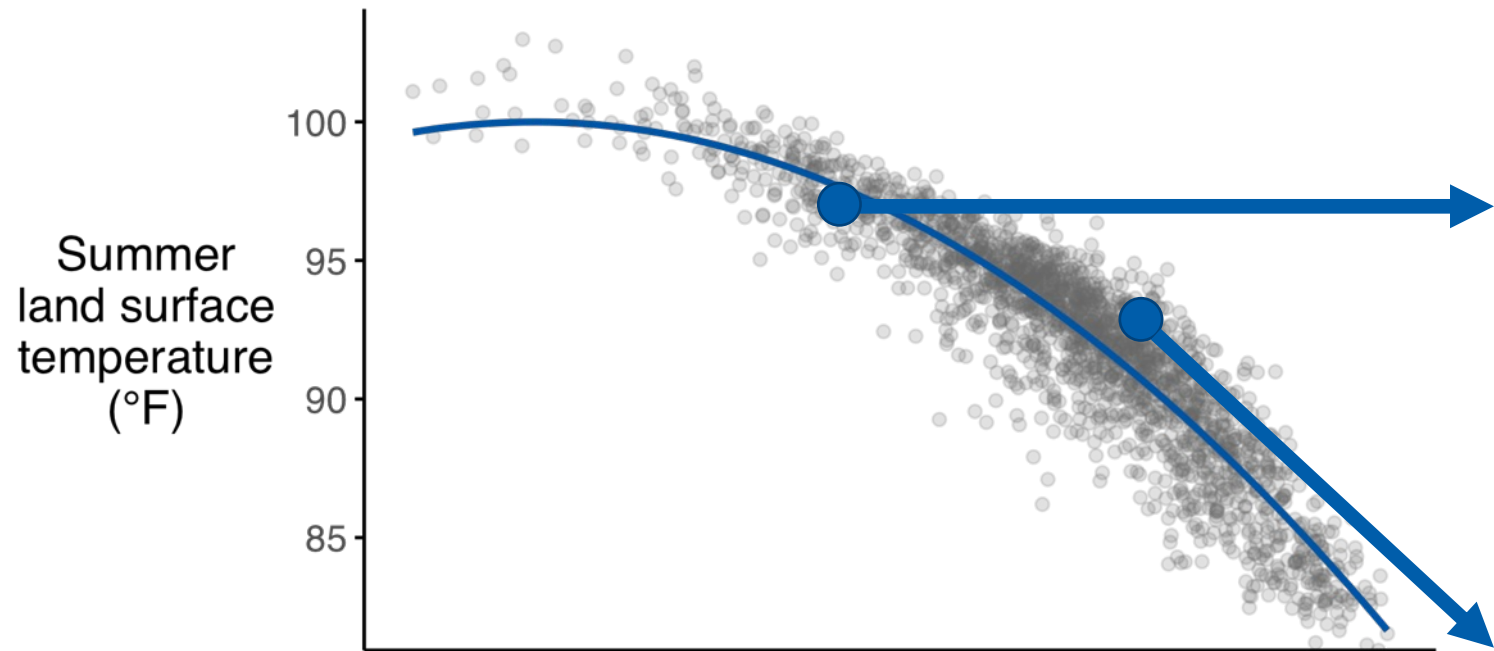
- An additional 40 days above 90°F are projected by 2050.
- Growing Shade's climate change lens identifies areas most at risk from climate change hazards.

Tree inequity creates hotter neighborhoods



Source: Analysis of Sentinel-2 satellite imagery (2021)
and Landsat 8 satellite imagery (2016)

Tree inequity creates hotter neighborhoods



Low green space

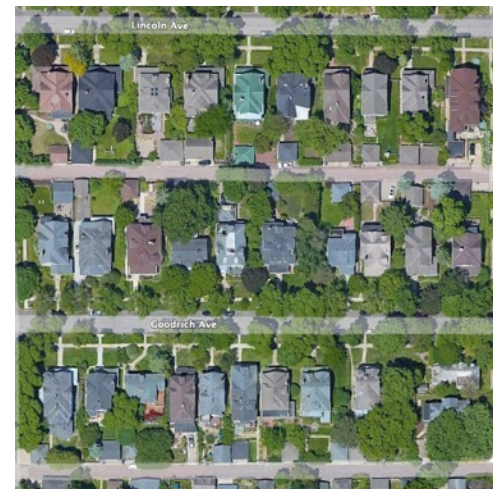
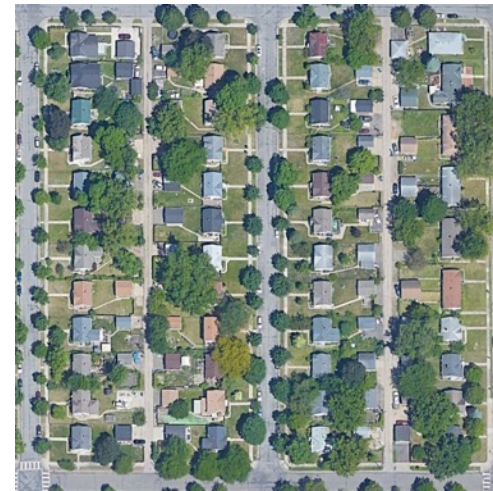


Moderate green space



High green space

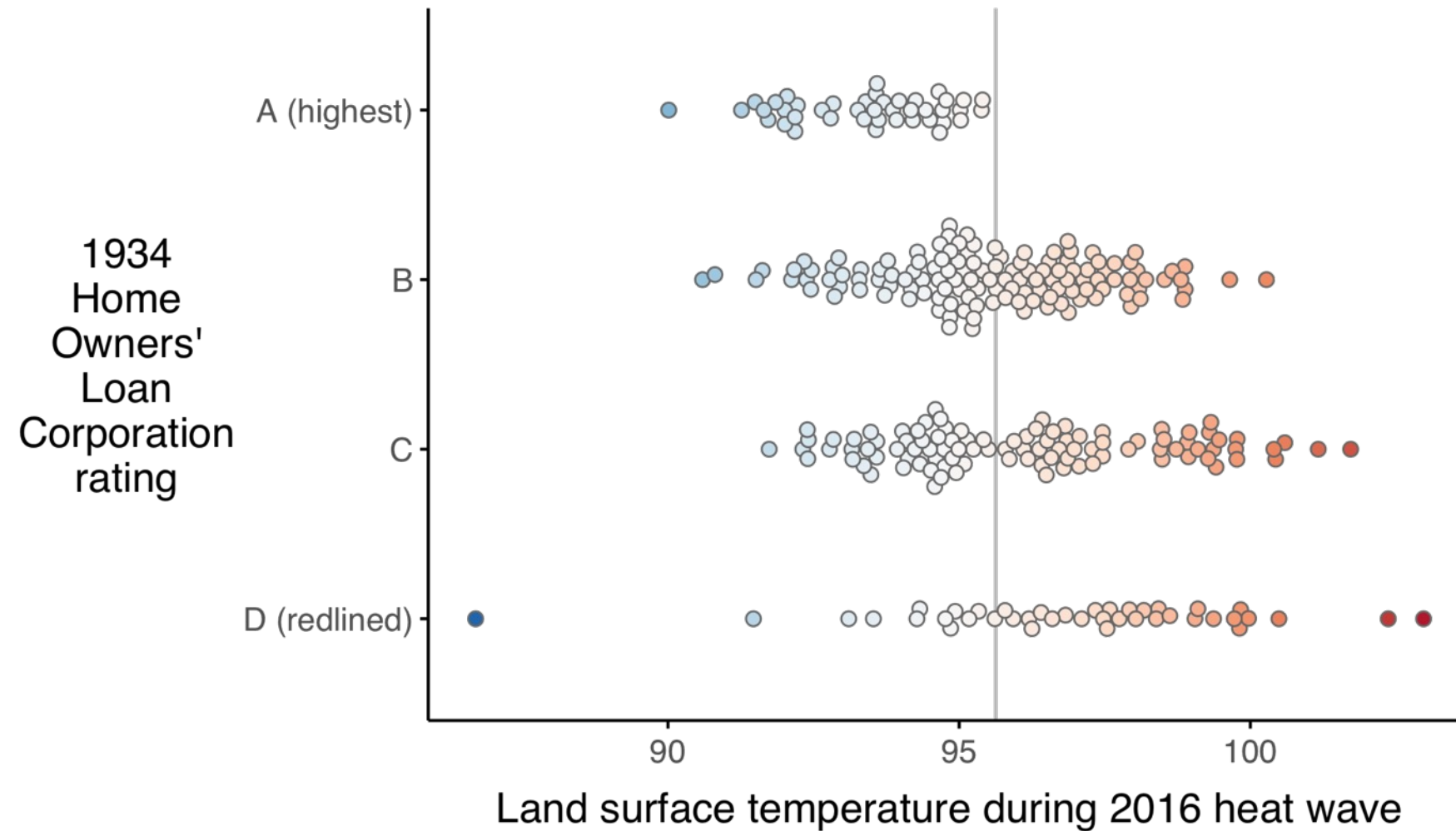
Source: Analysis of Sentinel-2 satellite imagery (2021) and Landsat 8 satellite imagery (2016)



Minneapolis' Camden
 16% tree canopy
 \$46,528 median income
 59% residents of color
 13.3 people per acre
 97 °F

Saint Paul's Summit Hill
 42% tree canopy
 \$118,625 median income
 9% residents of color
 13.2 people per acre
 94 °F

Tree inequity creates hotter neighborhoods



Source: Analysis of Landsat 8 satellite imagery (2016)
and Equity Considerations dataset (2021)

Growing shade means more than planting new trees



Mature trees offer the largest benefits

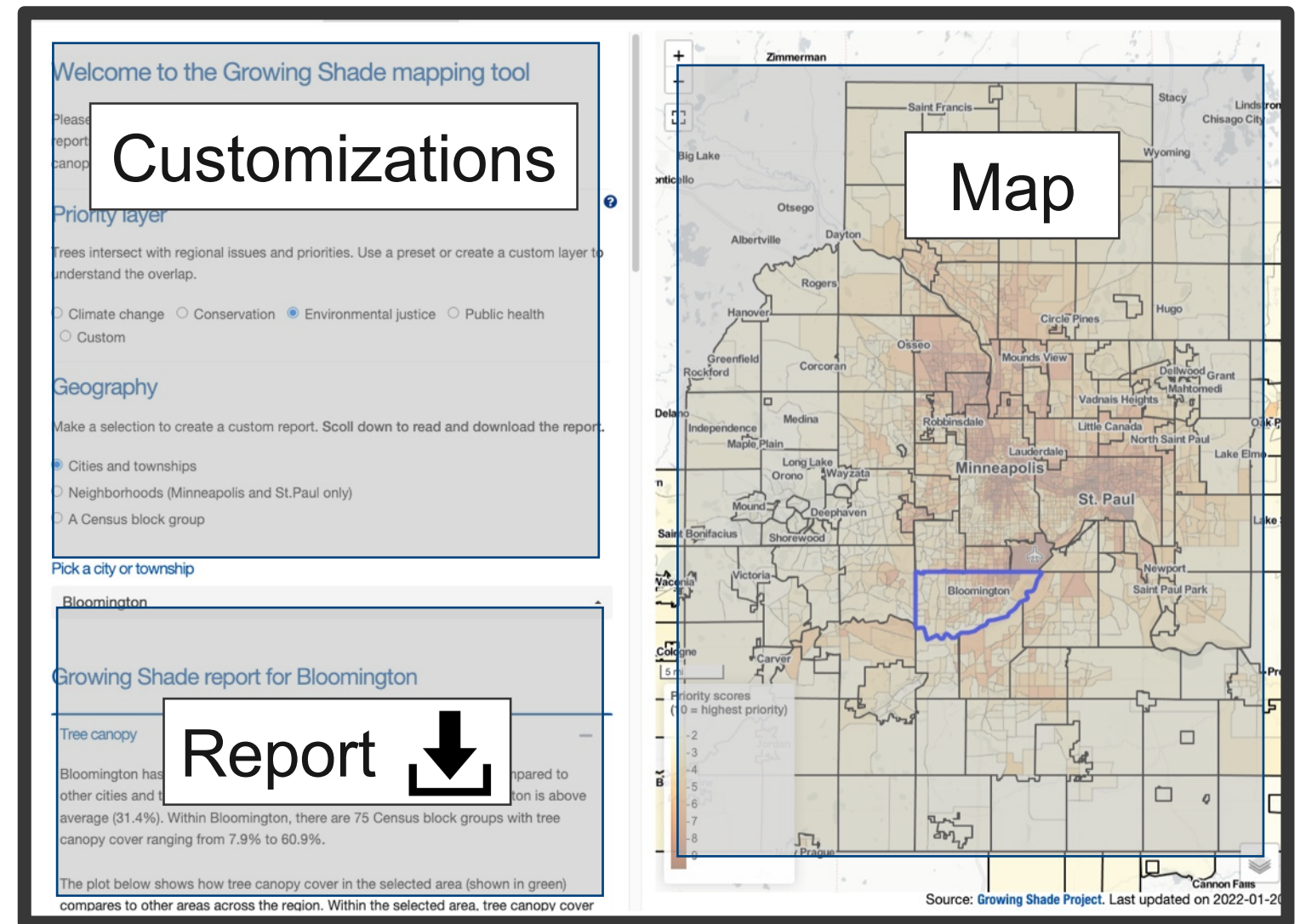
- Larger canopies provide more shade.
- Mature forests store more carbon, are more biodiverse, and better improve water and air quality.
- Ongoing tree care and maintenance programs are needed.

Importance of conservation and management of existing canopy

- Growing Shade's conservation lens identifies areas with the region's highest stock of existing trees and greenspace.

Mapping tool with custom prioritization and reporting

- ACS and other data identifies areas where initiatives may have largest benefits
 - Demographics
 - Socioeconomics
 - Health
 - Environment & Climate
- Growing Shade has resulted in actionable outcomes
 - Cost-sharing planting programs
 - Grant applications
- <https://metro council.org/growingshade>
- GrowingShade.com



Five stories highlight considerations for Growing Shade



Frogtown Green

Equity and environmental justice



Lower Phalen Creek Project

Dakota (Indigenous) perspective



Washington Conservation District

Conservation and climate change



Brooklyn Center Community Schools

Education and temperature



Tree Trust

Tree maintenance and green infrastructure

Recap



- Trees should be considered in planning work
- Adding to or conserving the tree canopy can help tackle big issues:
 - Environmental justice
 - Climate change
 - Public health
 - Natural resource conservation
- Actionable data helps address the following questions:
 - Where can limited resources be directed to have a disproportionately positive impact?
 - What do on-the-ground conditions look like today, and how can that be used to set goals for the future?



<https://metro council.org/growingshade>
www.GrowingShade.com



Ellen Esch, PhD

Senior Data Scientist
Community Development – Research
ellen.esch@metc.state.mn.us

