

Guiding equitable changes through multi-benefit land use decisions

2021 Esri User Conference

Breece Robertson

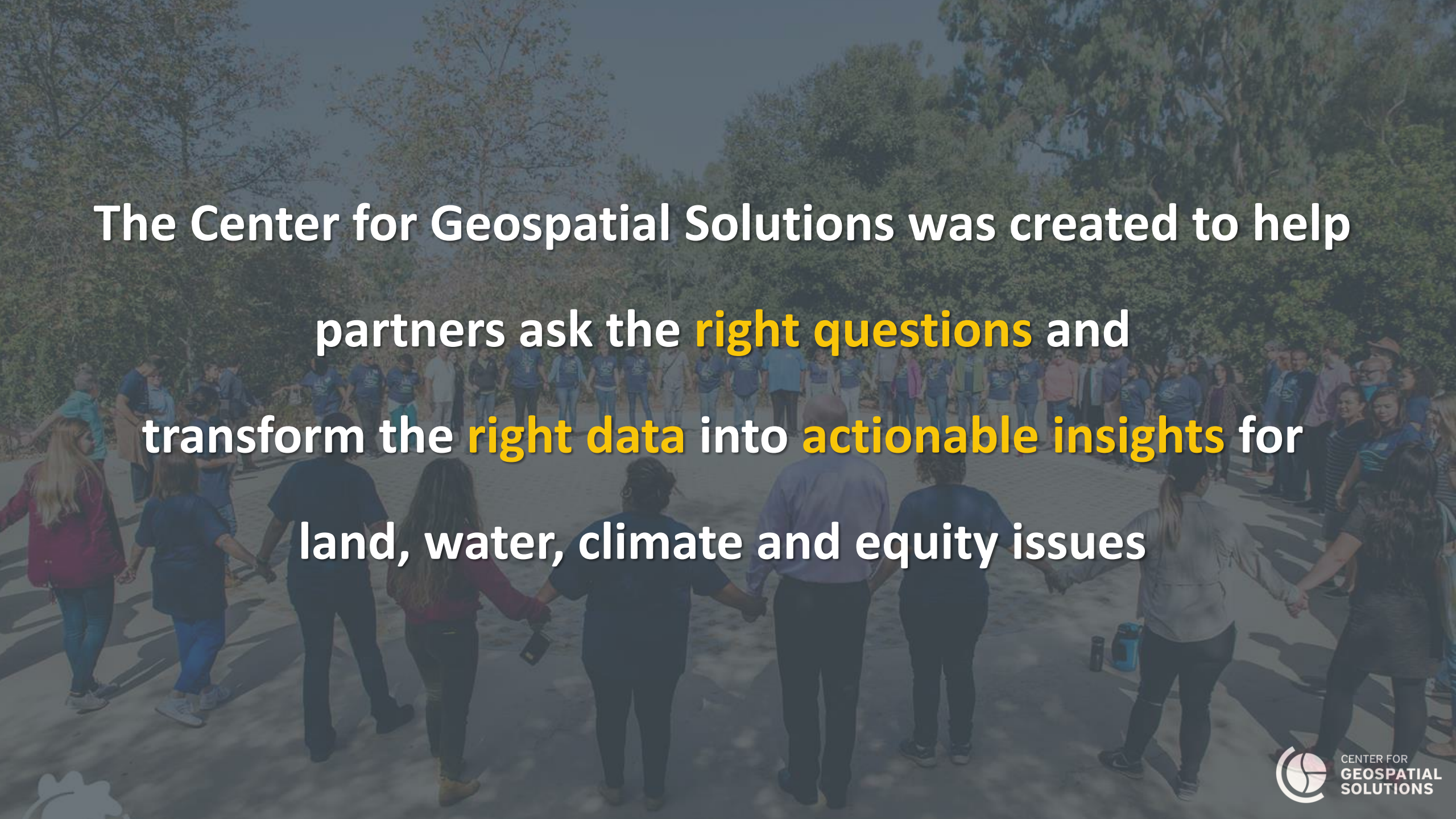
Director of Partnerships and Strategy



CENTER FOR
**GEOSPATIAL
SOLUTIONS**



LINCOLN INSTITUTE
OF LAND POLICY

A large group of people, mostly wearing blue t-shirts, are holding hands in a large circle on a paved path outdoors. The background is filled with lush green trees. The scene is overlaid with a semi-transparent dark blue filter.

The Center for Geospatial Solutions was created to help
partners ask the **right questions** and
transform the **right data** into **actionable insights** for
land, water, climate and equity issues

Our Purpose

To accelerate progress in addressing challenges that threaten the quality of life for all people and to support equitable access to:

Resilient Climates

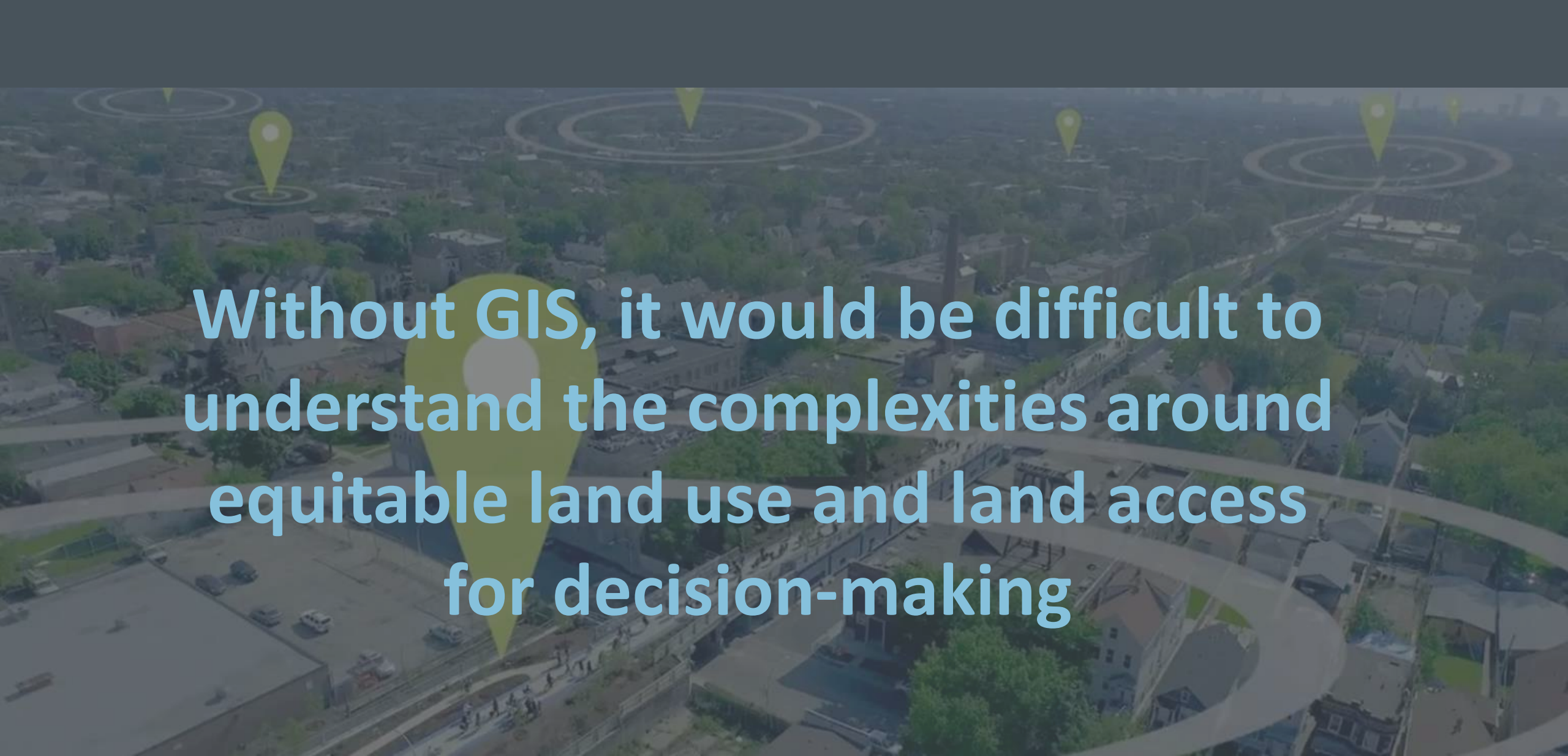
Thriving Habitats

Clean and Abundant Water

Food security

Decision-Making and Resources



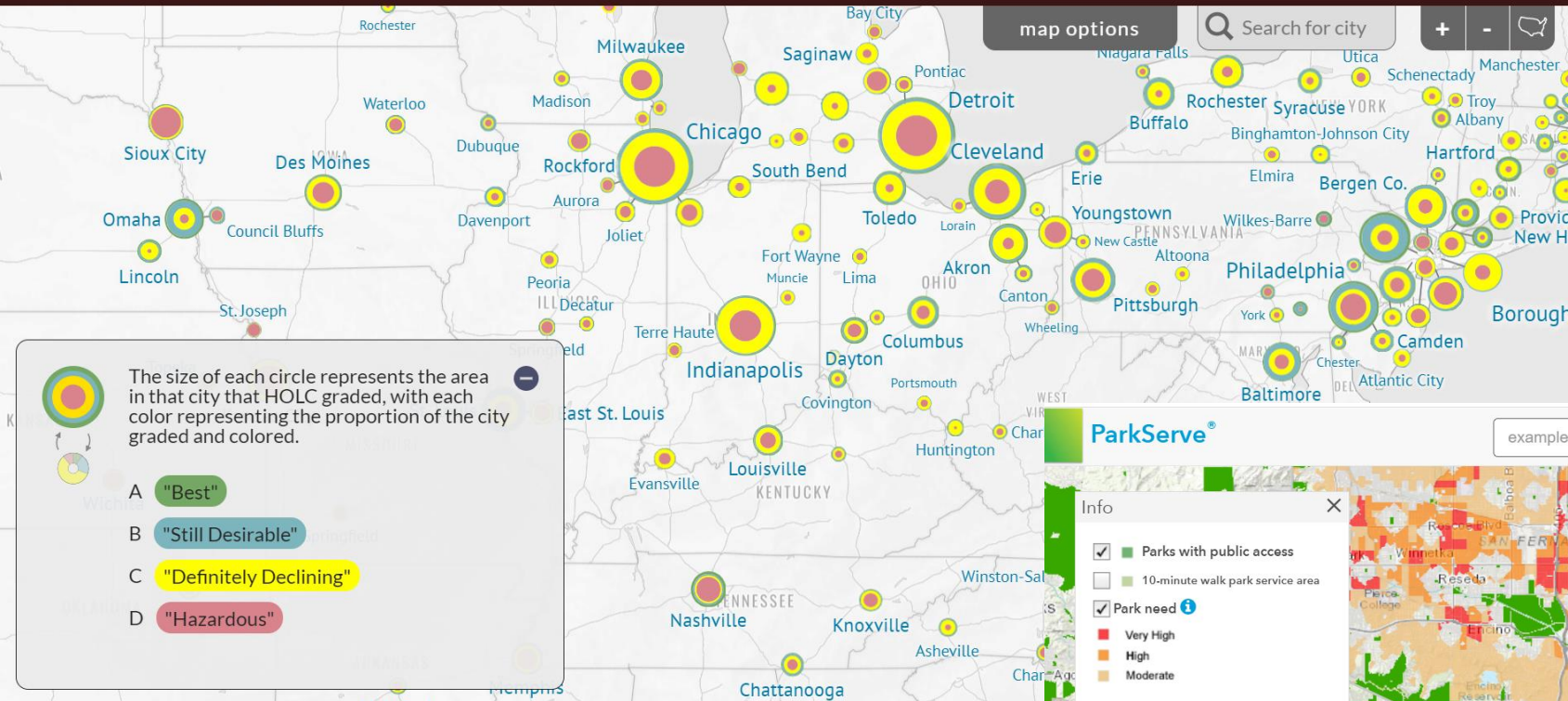
An aerial photograph of a city street grid, overlaid with semi-transparent GIS elements. Several yellow location pins are placed at various points, each with concentric white circles radiating from it, representing a spatial analysis or search radius. The text is centered over the image in a large, white, sans-serif font.

**Without GIS, it would be difficult to
understand the complexities around
equitable land use and land access
for decision-making**

Inequity through lens of location

Mapping Inequality Redlining in New Deal America

[Introduction](#) [Downloads & Data](#) [About](#) [Contact Us](#) [American Panorama](#)



ParkServe®

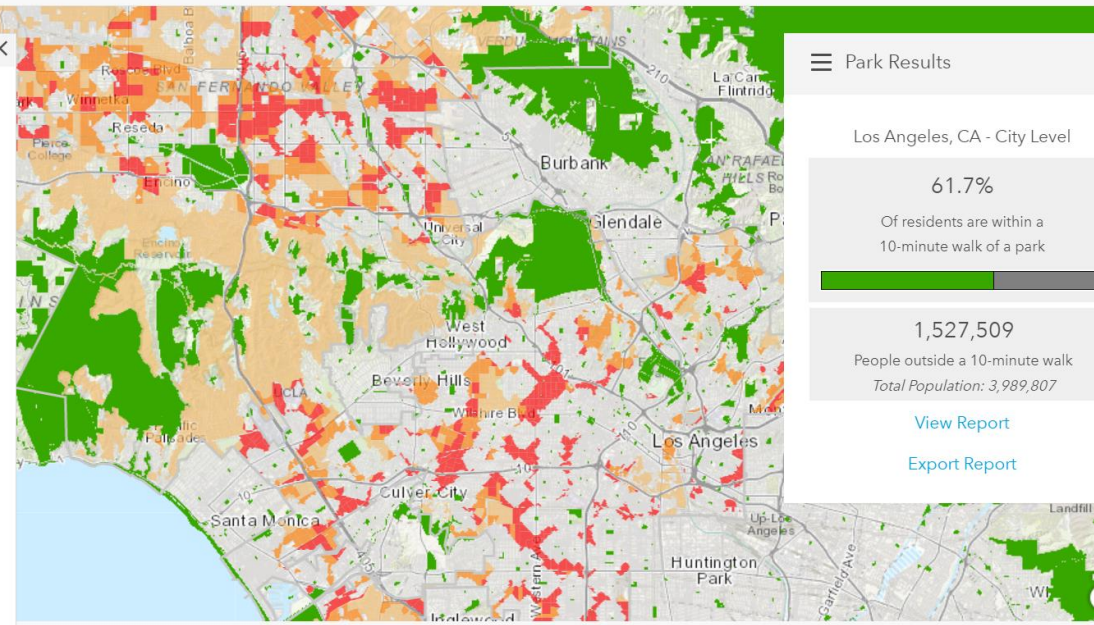
example: Seattle WA



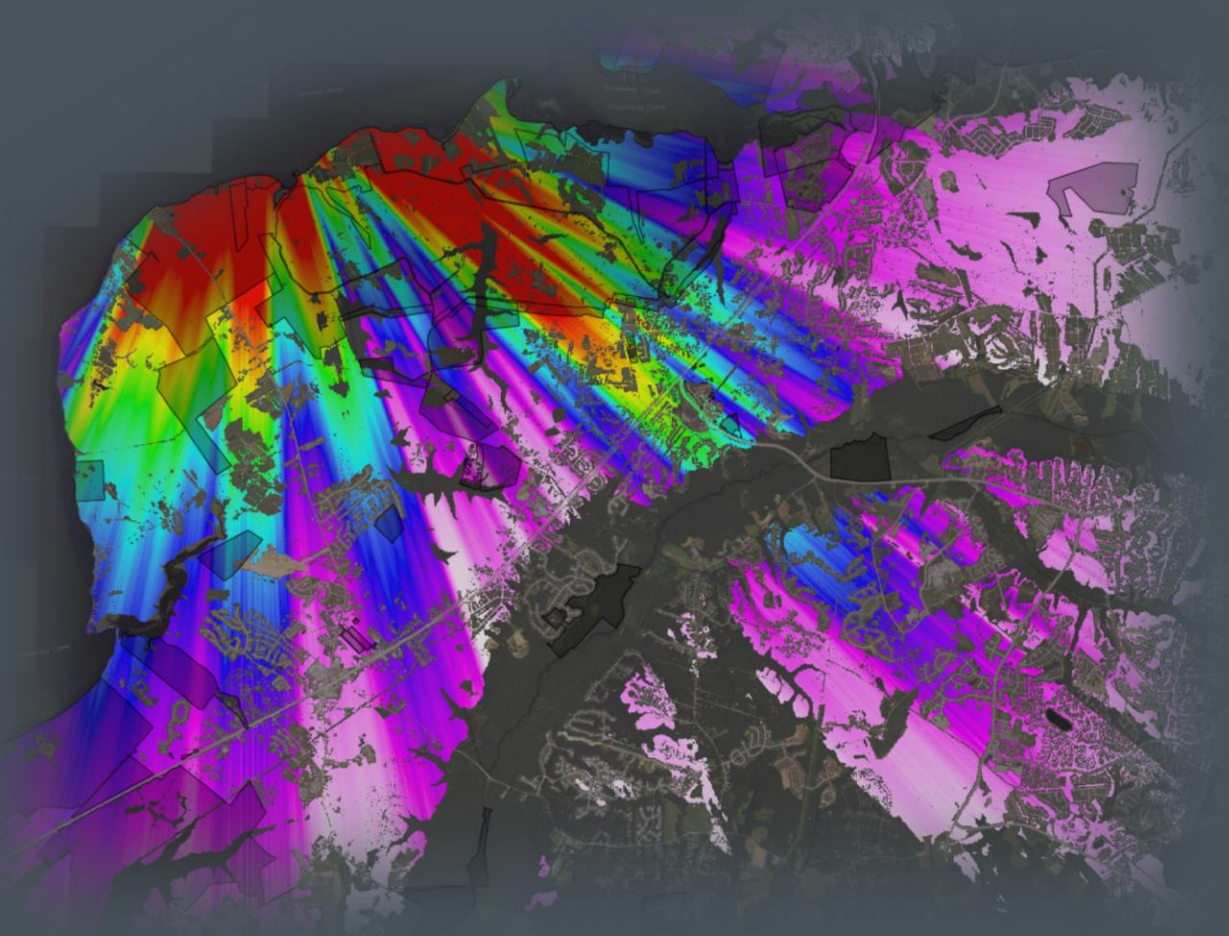
[Info](#) [Menu](#) [Home](#) [Survey](#)

Info

- ☒ Parks with public access
- ☐ 10-minute walk park service area
- ☒ Park need [i](#)
 - Very High
 - High
 - Moderate
- ☐ [s](#) Optimized points [i](#)
- ☐ Urban heat islands [i](#)
 - Mild
 - Mild to Moderate
 - Moderate
 - Moderate to High
 - Severe
- ☐ [s](#) Heat Island influenced optimized points [i](#)
- [Explore more map layers](#)
- [Use ParkEvaluator®](#)
- [ParkEvaluator® User Manual](#)



Multi-dimensional problems need multi-benefit solutions



Structural racism

Housing

Jobs

Poverty

Food insecurity

Park access

Social isolation

Health

The difference “right location” makes

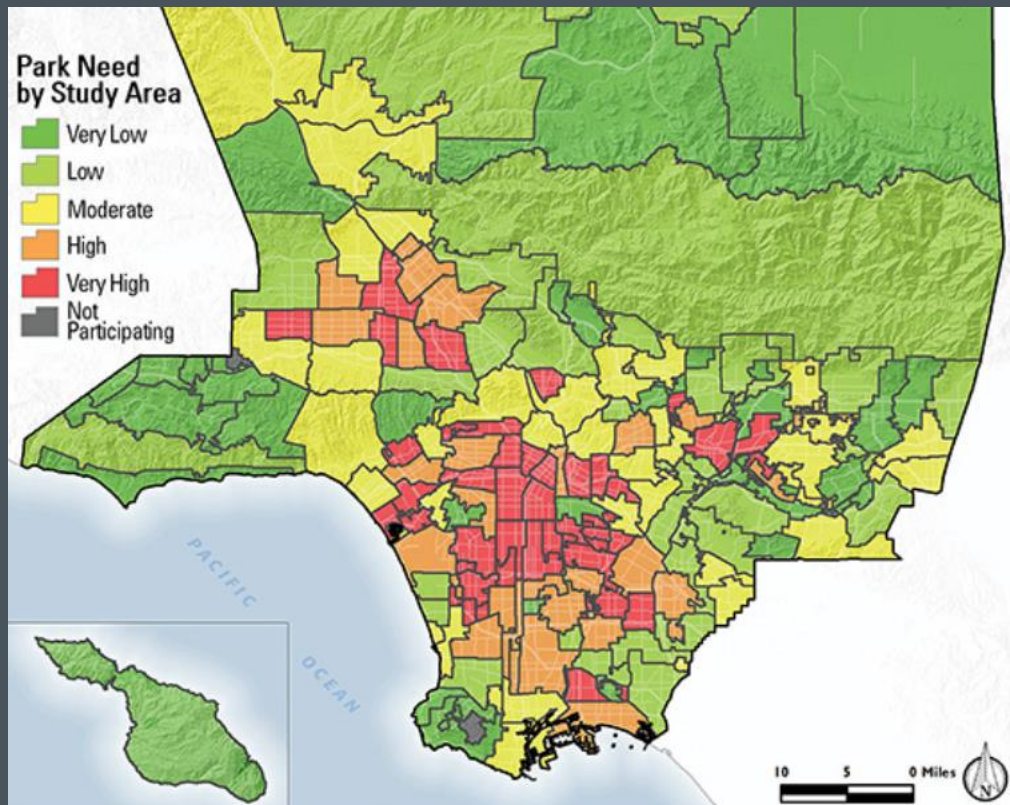
Park access and quality provide multiple benefits

New York PS7X – Before and After
The Trust for Public Land

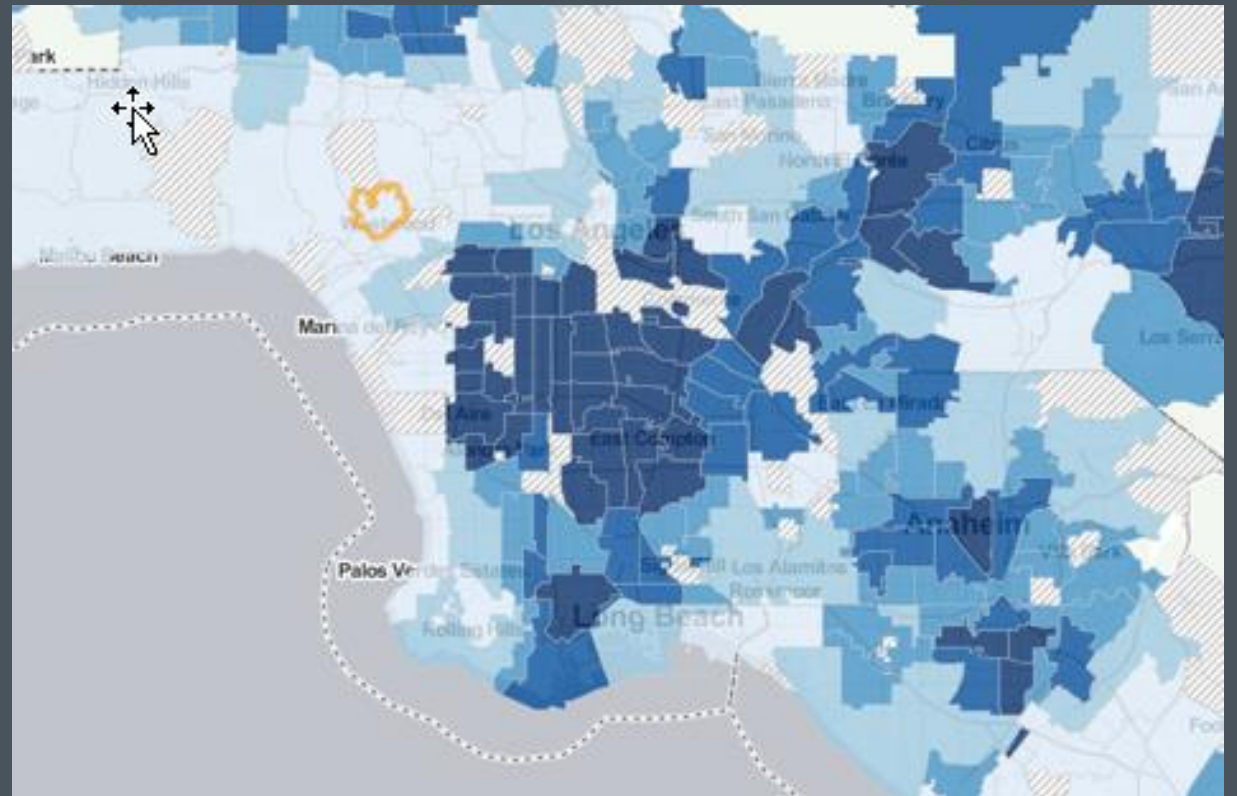


Uses of multi-benefit data for equity

- Identify needs
- Track changes
- Identify disparities
- Analyze causes and consequences
- Recommendations on how and where implementations can impact equity

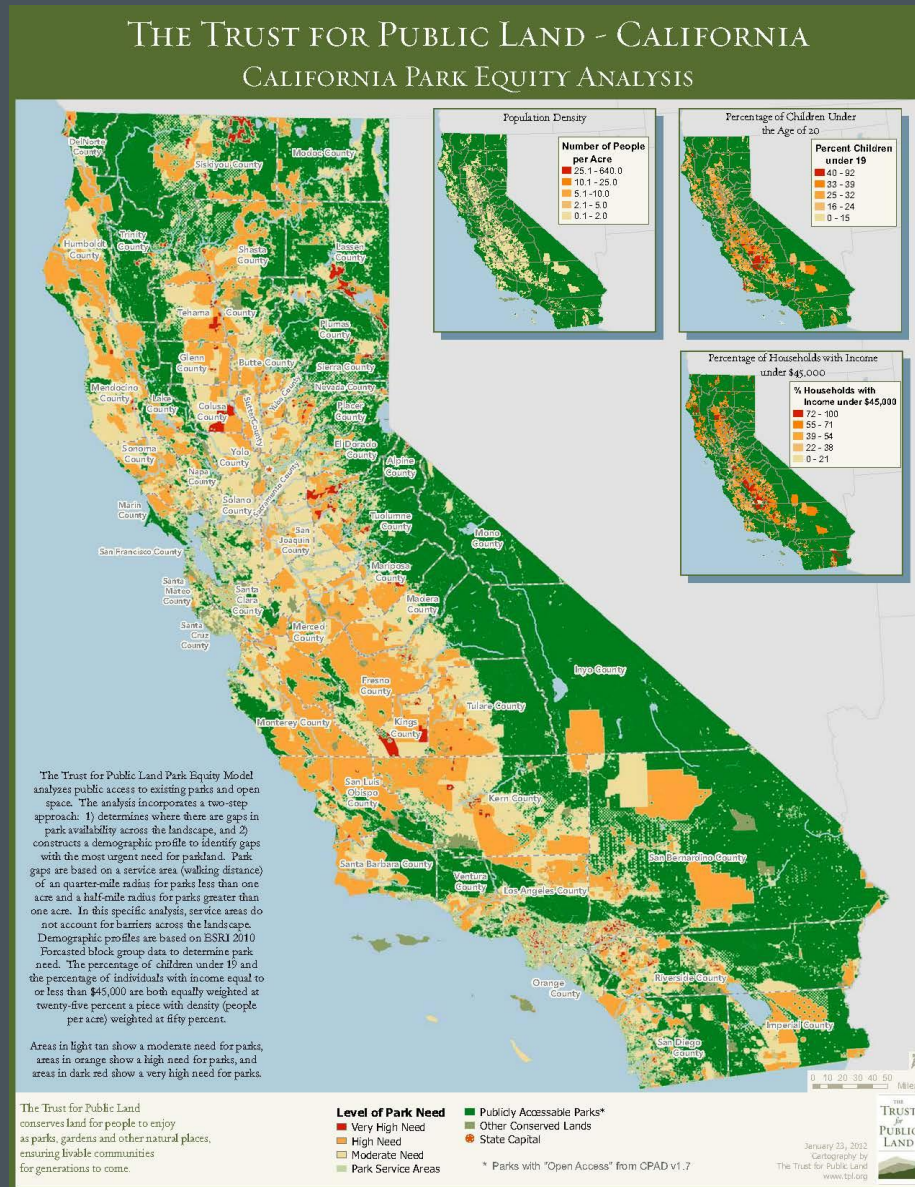


Park Need by Census Tract
LA County Parks and Recreation Dept.



Obesity by Zipcode in Los Angeles, CA, USA
UCLA Center for Health Policy Research

Geospatial Data + Research = Evidence



Health Policy Brief

March 2013

Physical Activity, Park Access and Park Use among California Adolescents

Susan H. Babey, Joelle Wolstein, Samuel Krumholz, Breece Robertson, Allison L. Diamant

SUMMARY: In California, 2.15 million adolescents (62.9%) do not engage in at least 60 minutes of physical activity five or more days per week. Adolescents who visited a park in the past month and those who live in a park service area are more likely to meet this goal. Lower-income California adolescents are less

likely to visit local parks and more likely to believe local parks are unsafe. Actions by state and local policymakers to increase park access and attractiveness, especially to underserved populations, may be an effective way to promote physical activity among California's adolescents.

"Teens with access to a park are more likely to engage in regular physical activity."

Participating in regular physical activity is an important factor in preventing obesity and maintaining health, while also providing many other benefits.¹ Lack of physical activity contributes to obesity and is a risk factor for chronic health conditions including diabetes, coronary heart disease, hypertension, colon cancer and osteoporosis.² Physical activity is also associated with increased mental alertness and higher academic achievement, as well as lower levels of stress and depression.³

Parks, playgrounds and other open spaces provide important opportunities for youth to engage in physical activity and to lead more active lifestyles. In 2007, more than 25 million Californians reported recently visiting a park or playground.⁴ However, many Californians, especially in underserved communities, lack access to safe parks and other open spaces.⁵

This policy brief examines the relationship between California adolescents' proximity to parks, use of parks and level of physical activity. It also examines disparities in park- and activity-related outcomes as a function


Park Service Areas


Park service areas were determined by using Geographic Information Systems (GIS) to map locations of parks and public open spaces. Park service area buffers were drawn around the perimeter of public parks in California. A one-quarter mile buffer was drawn around small parks (under one acre), and a one-half mile buffer was drawn around larger parks (one acre or greater). These park service areas were linked to CHHS data based on household locations of CHHS respondents. If a household was located within the park service area buffer, that respondent was considered to live in a park service area. Data on the locations of parks are from the California Protected Areas Database. The Trust for Public Land performed the GIS mapping, identifying park service areas in California, prior to the park service area locations being linked with CHHS.

The California Endowment
Supported by a grant from The California Endowment

Democratizing Data for Policy and Advocacy

Policy makers, advocates, community organizations and others can use data and research evidence to support policy change to support equitable outcomes


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Literature Reviews

NATURE CONTACT AND HUMAN HEALTH: A RESEARCH AGENDA


This literature review by Frumkin et al. (2017), builds upon current



Databases

CHILDREN & NATURE RESEARCH LIBRARY

The Children & Nature research library provides summaries of peer-reviewed literature on the health benefits of nature for



Data Considerations for Equity



Recommendations for Equitable Open Data

Winter 2017

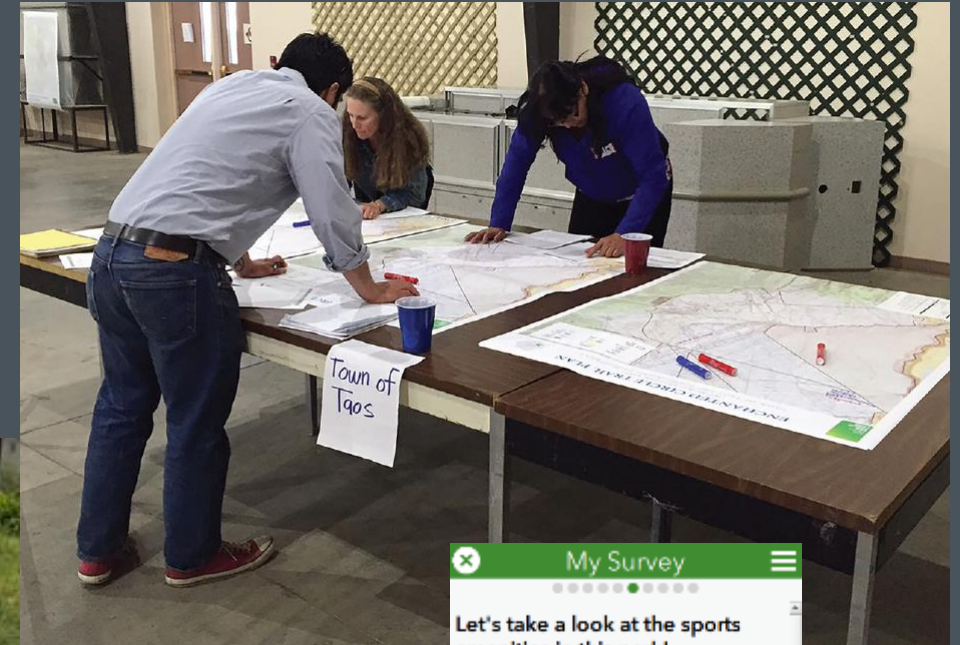
Detroit Digital Justice Coalition

Detroit Community Technology Project

Engaging the community unearths deep collective knowledge, passion and group participation

Community engagement strategies:

- **Inform and Consult** – get public feedback on analysis, designs and results.
- **Involve and collaborate** – use intensive engagement strategies throughout the entire process.
- **Empower** – use advocacy training tools and fiscal/policy processes.



My Survey

Let's take a look at the sports amenities in this park!

Here are some top amenities. Which of the following are in this park?

- ☐ Baseball/Softball Diamonds
- ☒ Basketball Hoops
- ☐ Mixed Use Field
- ☐ Paths/Trails - Paved
- ☐ Paths/Trails - Unpaved
- ☐ Skate Park
- ☐ Soccer Field
- ☐ Tennis Court
- ☐ Running Track

What is the quality of the basketball hoops?

Not Good 2 3 4 Great

How many basketball hoops are there?

- 2 +





Los Angeles Green Alley Before and After



Common Data Types used in Equity Analyses

We hear equity but what does that mean?

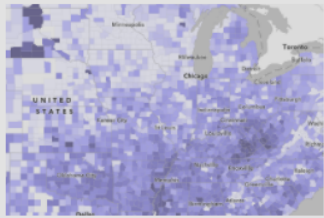
Defined many ways – social, environmental, racial, housing

- Housing (ex. Redlining)
- Socio-economics (ex. Race and ethnicity, income, age)
- Social cohesion (ex. Gathering places, connectivity)
- Health (ex. Chronic disease measures like obesity and asthma, access)
- Economics (ex. Per capita spending on community services like parks and health)
- Environmental (ex. water quality, pollution)
- Climate (ex. Communities impacted by heat and flooding)

Accessing Data for Equity Analyses



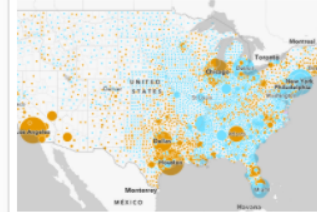
ArcGIS Living Atlas of the World



Where should we focus on improving life expectan...

Web Map By [dianaclavery_uo](#)

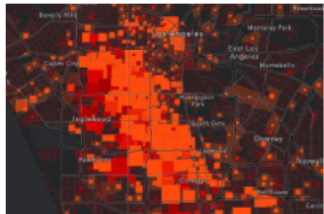
This multi-scale map shows life expectancy - a widely-used measure of health and mortality. Breakdown by race/ethnicity in pop-up. Data from County Health Rankings 2020, available for nation, state, and county.



Where are Black populations impacted by drinking ...

Web Map By [MarthaSolo_UO](#)

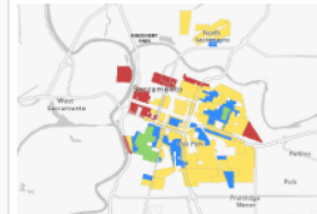
This map shows where the Black population is being affected by drinking water violations at a county level.



Where do Black or African Americans not have an i...

Web Map By [lisa_berry](#)

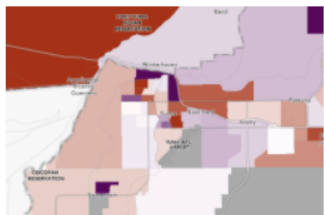
This map highlights areas across the entire US where the Black/African American population does not have an internet subscription in their household. This is shown by states, counties, and tracts. The data comes from the most recent release of ACS.



Home Owners' Loan Corporation (HOLC) Neighbor...

Web Map By [dianaclavery_uo](#)

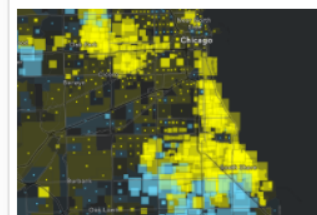
This map contains of the Home Owners' Loan Corporation (HOLC)'s historical redlining grade includes 7,148 neighborhoods spanning 143 cities across the continental United States. Opens in Sacramento, CA.



Homeownership among Hispanic and Latino vs. no...

Web Map By [dianaclavery_uo](#)

This multiscale map compares homeownership rates among Hispanic and Latino households to homeownership rates among non-Hispanic White householders. Data for states, counties, and tracts from most recent 5-year American Community Survey estimates.



Do Black or African Americans own or rent their ho...

Web Map By [lisa_berry](#)

This map shows if Black or African American householders are more likely to be owners or renters. This is shown for the entire US by states, counties, and tracts. The data comes from the most current American Community Survey (ACS) data.

Esri maps for public policy

[ArcGIS](#)[Industries](#)[About](#)[Support](#)[Sign In](#)[Esri Maps for Public Policy](#)[Overview](#)[Explore](#)[Issues](#)[Resources](#)

Social Equity and Health

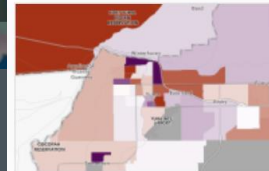
Understanding the state of humans in crisis and at-risk populations presents decision makers with opportunities to intervene. With access to datasets on homelessness, opioid abuse, housing, infrastructure, poverty, education and more, you are given the chance to ensure a stronger tomorrow for everyone.

[Social Equity and Health](#)[Economic Opportunity](#)[Transportation and Infrastructure](#)[Resilience and Sustainability](#)[Public Safety](#)

Where are Mobile Homes?

Web Map by [dianaclavery_uo](#)

This multi-scale map shows both the count of mobile homes, and the percentage of total housing units that are mobile homes. Data from most recent American Community Survey for states, counties, and tracts.



Homeownership among Hispanic and Latino vs. non-Hispanic White households

Web Map by [dianaclavery_uo](#)

This multiscale map compares homeownership rates among Hispanic and Latino households to homeownership rates among non-Hispanic White householders. Data for states, counties, and tracts from most recent 5-year American Community Survey estimates.



Owner households with a mortgage that are affected by severe housing costs

Web Map by [UOdocent](#)

This map shows housing costs as a percentage of household income.



Renter households that are affected by severe housing costs

Web Map by [UOdocent](#)

This map shows housing costs as a percentage of household income, according to latest U.S. Census figures from

Esri Racial Equity GIS Hub

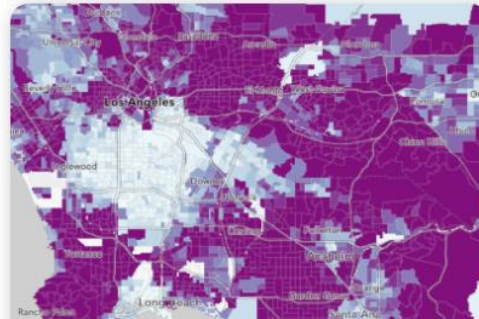


Data is critical to understanding where racial inequities exist within a community or jurisdiction. Explore a growing collection of geospatial data sourced from the global GIS community and our trusted partners. Add these datasets directly to maps and apps to visualize and analyze racial inequities in the context of your community. When using this data, please reference this article on ethics from the Urban and Regional Information Systems Association on [The Role of the GIS Professional in Issues of Equity and Social Justice](#).

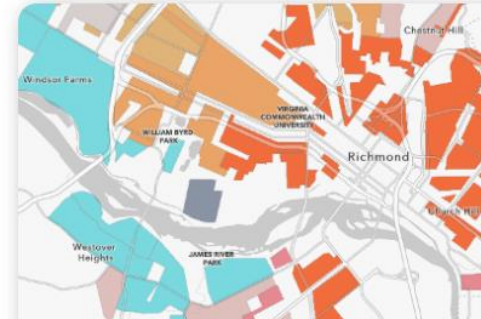
View additional datasets [here](#).



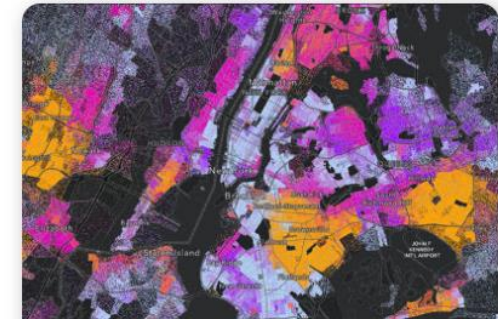
Detailed Asian Ethnicities
by Tract, 2012-2016



Asian Population in the US
(Current ACS)

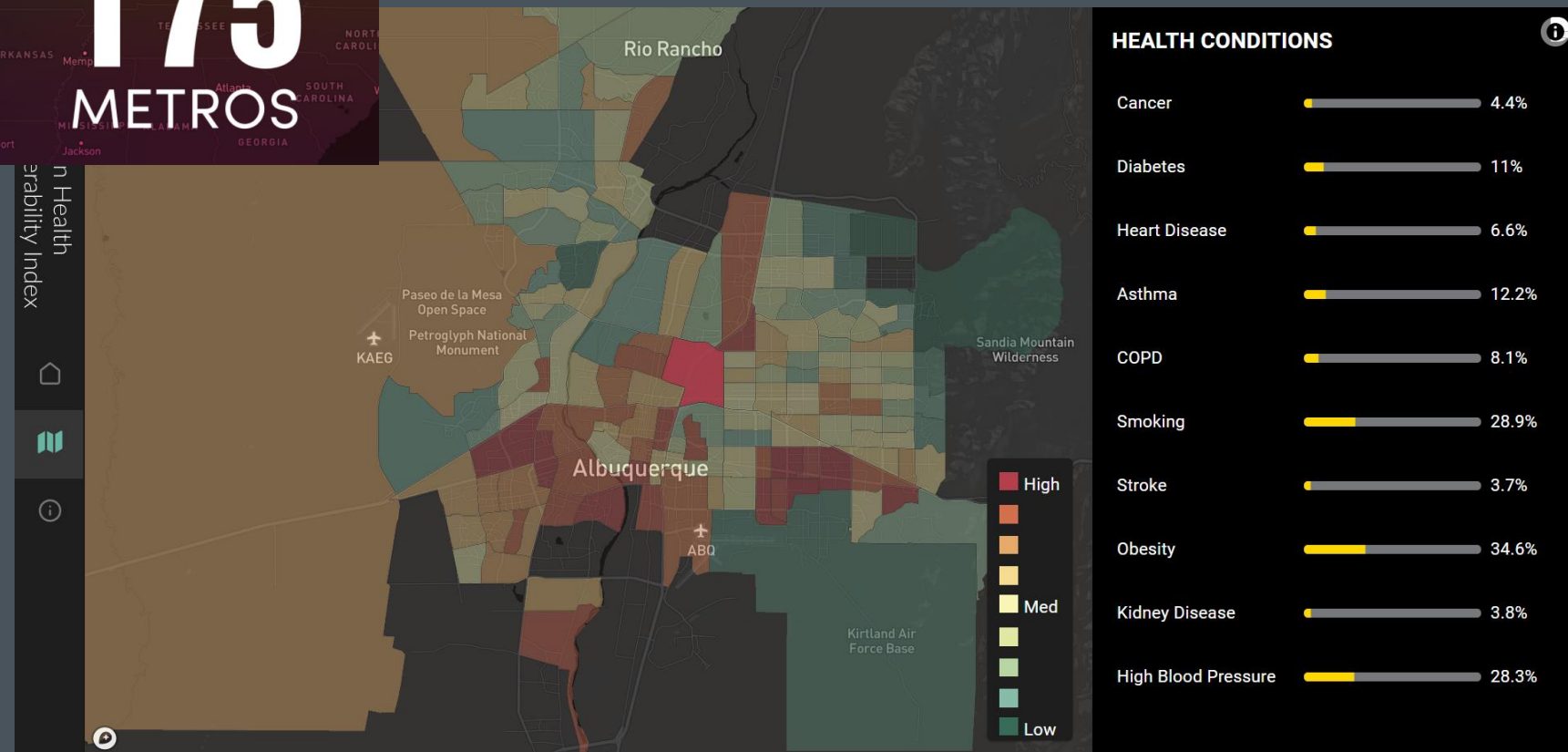


"Redlining" and Exposure to
Urban Heat Islands



Health, Racial & Economic
Equity Data Group

RS21 Urban Health Vulnerability Index



Environmental Justice and Land Conservation

Research questions for New England case study:

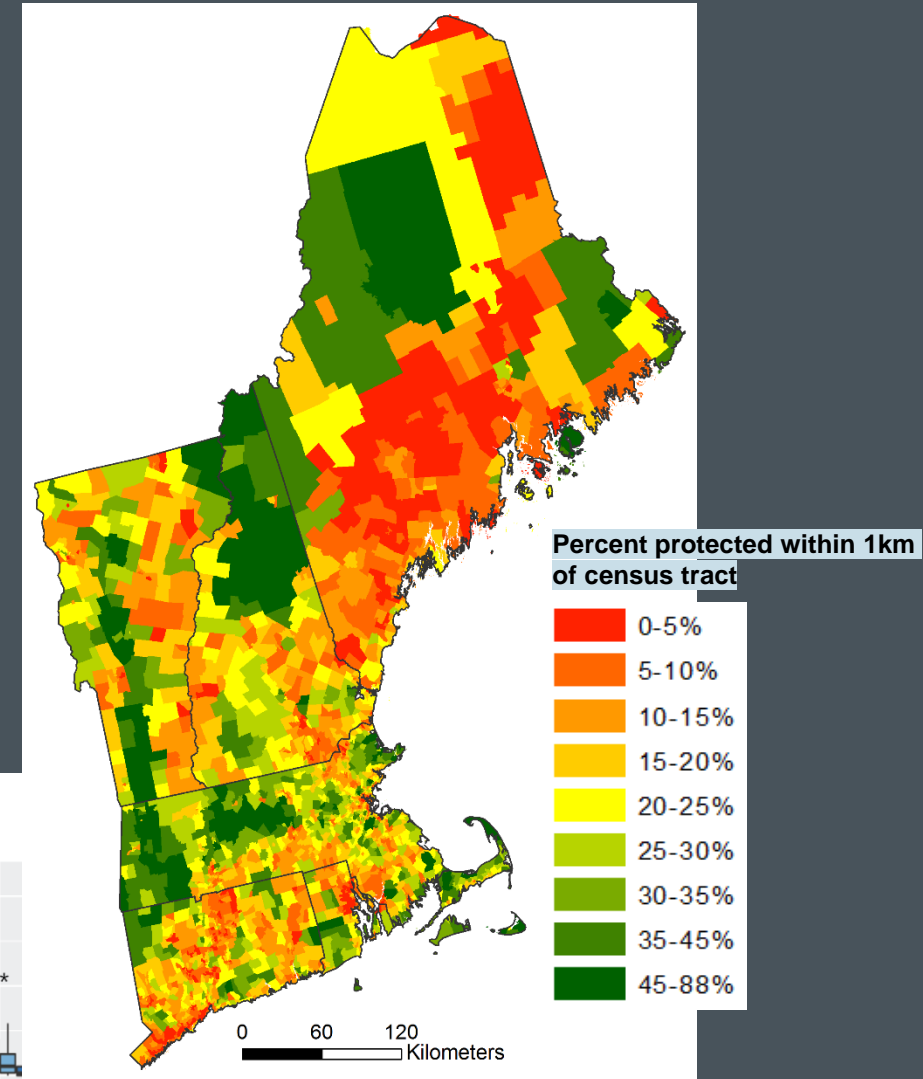
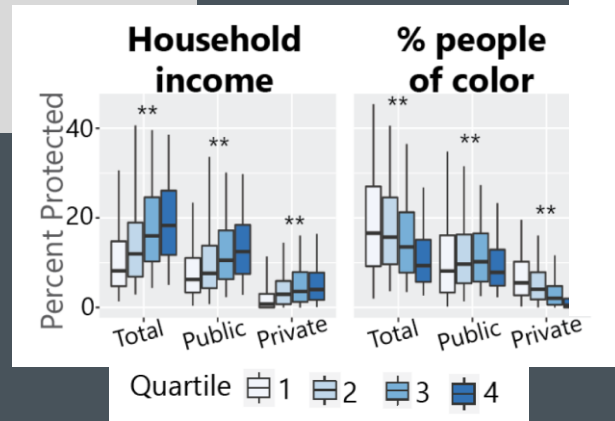
- Are there disparities in access to protected open space by factors of social marginalization?**
- How can we incorporate environmental justice criteria into priorities for new land protection?**
- How would that change the focus of land protection?**



Mapping and Statistical Analyses Reveal Disparities

- Households in census tracts in the lowest income quartile tend to have half as much available protected land as those in the highest quartile.
- Similar results for communities with the highest proportion of people of color.

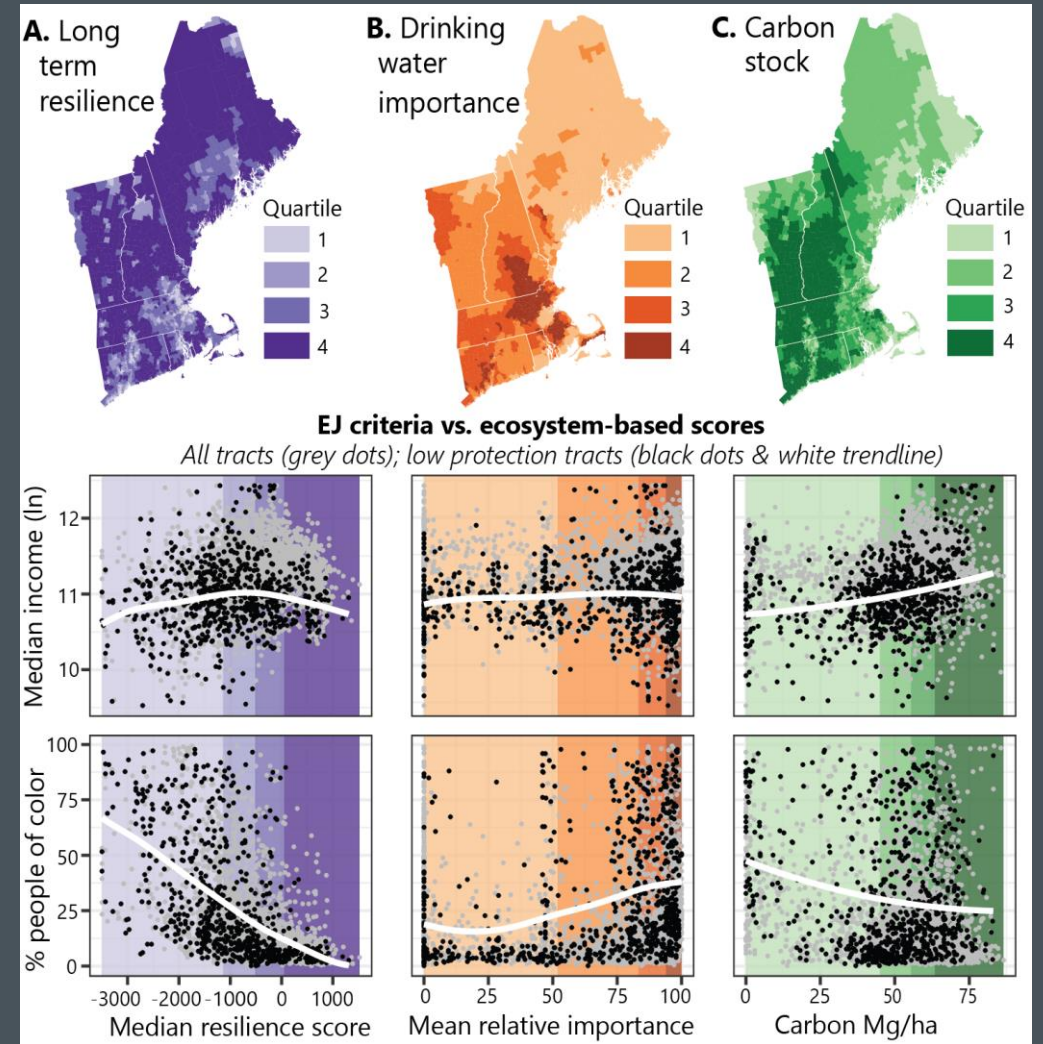
In general, these patterns persist across rural, exurban, and urban areas, and are present in historical as well as recent patterns of land protection.



How would EJ priorities change the focus of protection?

EJ criteria align better with some conventional conservation criteria (e.g., drinking water) than with others (e.g., TNC's Climate Resilience).

Adopting a focus on environmental justice criteria could substantially shift priorities for new protection.



Dr. Jonathan Thompson, Senior Ecologist,
Harvard Forest, Harvard University;
jthomps@fas.harvard.edu

Explore EJ Priority Areas on
web map: bit.ly/EJ-OS-NE



MAPPING INDIGENOUS TERRITORY IN LATIN AMERICA TO LEGALIZE AND PROTECT THEIR LAND.

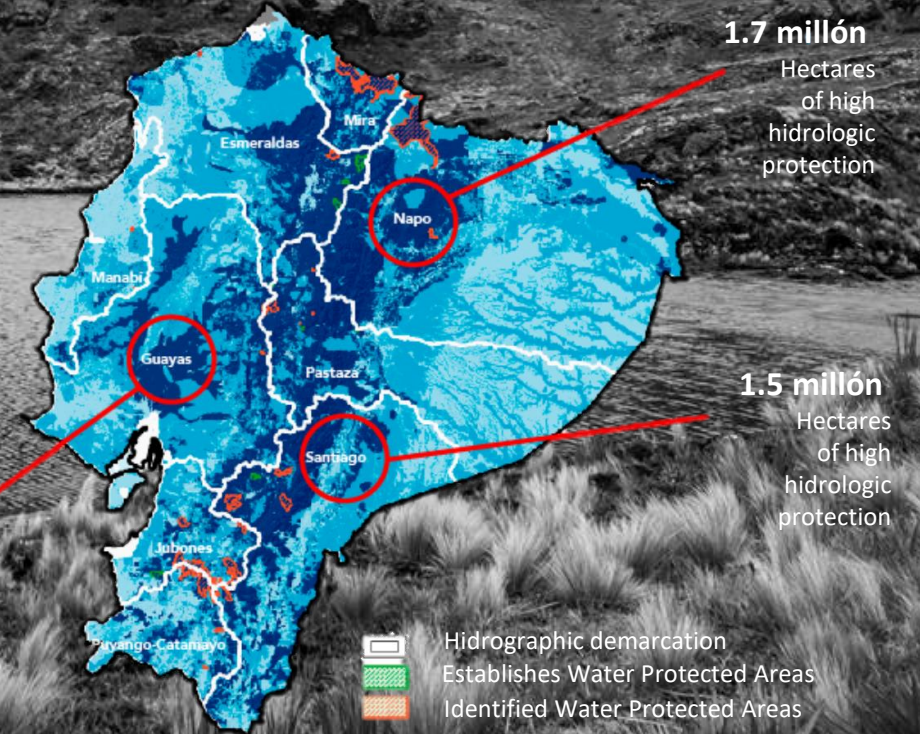
Since 1996, protected over 21 million acres of endangered ecosystems for people using bottom-up conservation strategies.

Nature and Culture International helped the Shuar community El Kiim (in Ecuador) to legalize and gain title to their land. With their land title they will be able to legally protect their forests.

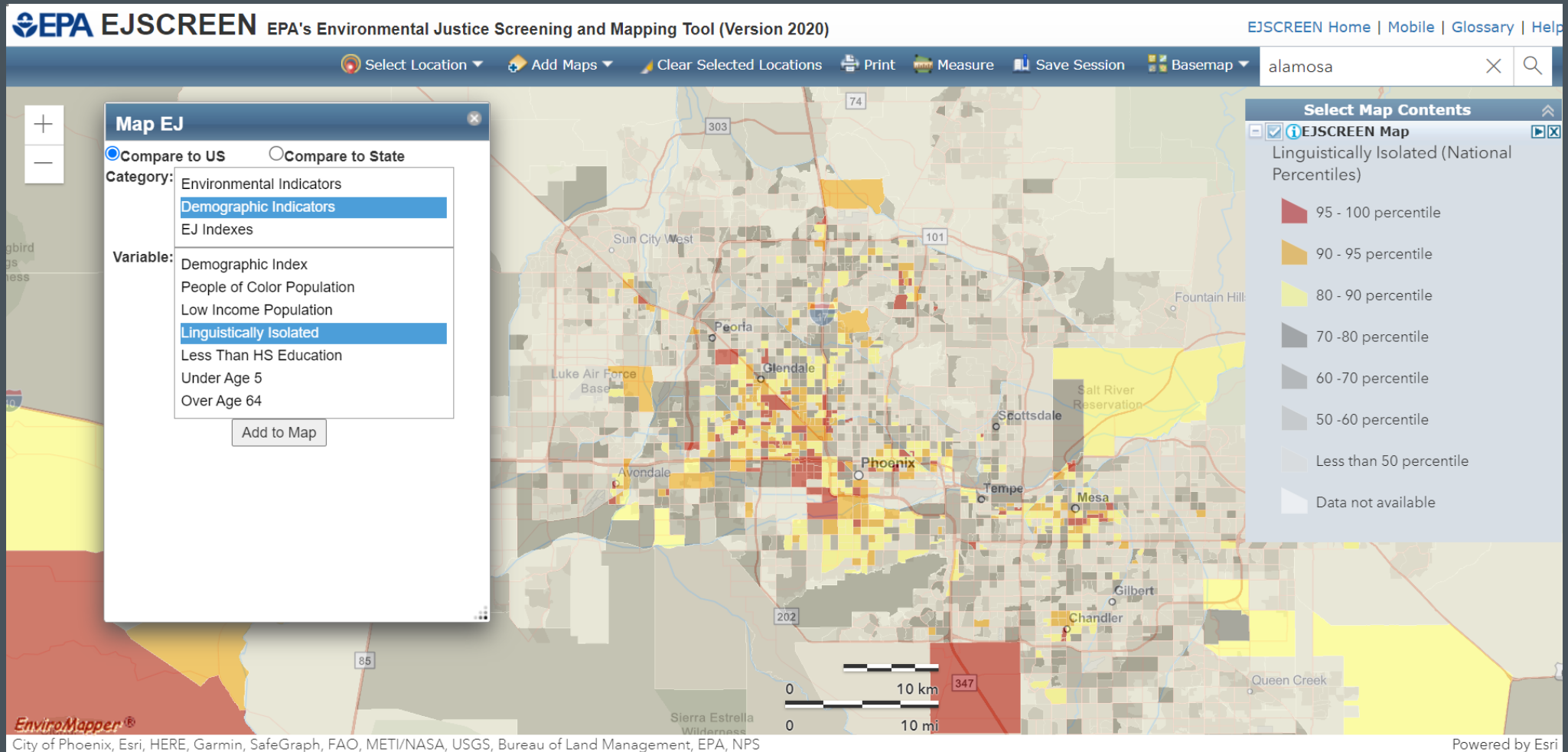
 Natural Patrimony Areas of the State
 Municipal Conservation and Sustainable Use Areas



1.4 millón
Hectares
of high
hidrologic
protection



US Environmental Protection Agency's EJSCREEN



Thank You!

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LinkedIn: breecerobertson

