

USDA Forest Service

URBAN FOREST CONNECTIONS

webinar series

Second Wednesdays | 1:00 – 2:15 pm ET

www.fs.fed.us/research/urban-webinars



INTEGRATING EXPERTS, COMMUNITIES, AND ONLINE RESOURCES FOR EQUITABLY EXPANDING URBAN TREE CANOPY



Angie DiSalvo

Outreach and Science Supervisor, Urban Forestry
Portland Parks & Recreation
angie.disalvo@portlandoregon.gov



Vivek Shandas

Professor, Urban Studies and Planning
Portland State University
vshandas@pdx.edu



Experts and Online Resources for Equitably Expanding Urban Tree Canopy

Vivek Shandas

*Professor, Urban Studies and Planning
Research Director, Institute for Sustainable Solutions*



Portland State
UNIVERSITY

City-University Partnership

Goal: identify tree planting opportunities and priority areas

- a. Improve equity of forest services distribution
- b. Expand tree canopy

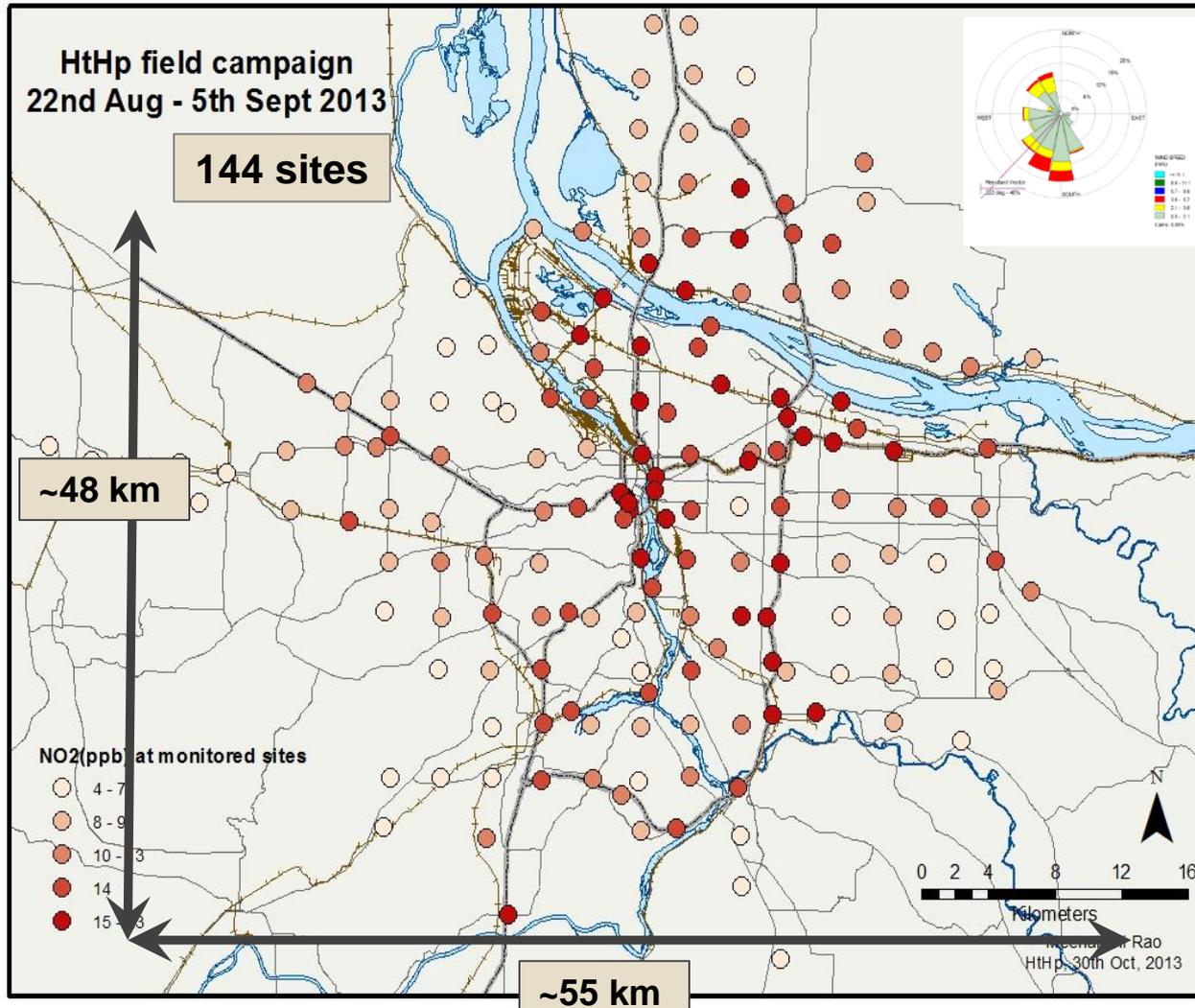
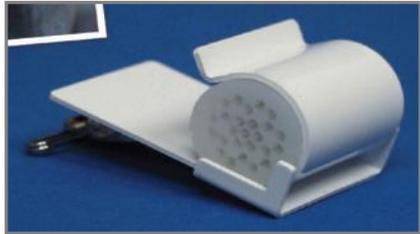
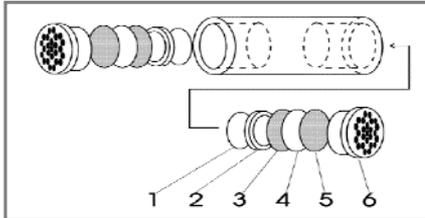
Stages

1. Best Practices -- city plans evaluation
2. Stakeholder input -- underserved communities
3. GIS Analysis based on recent LiDaR information

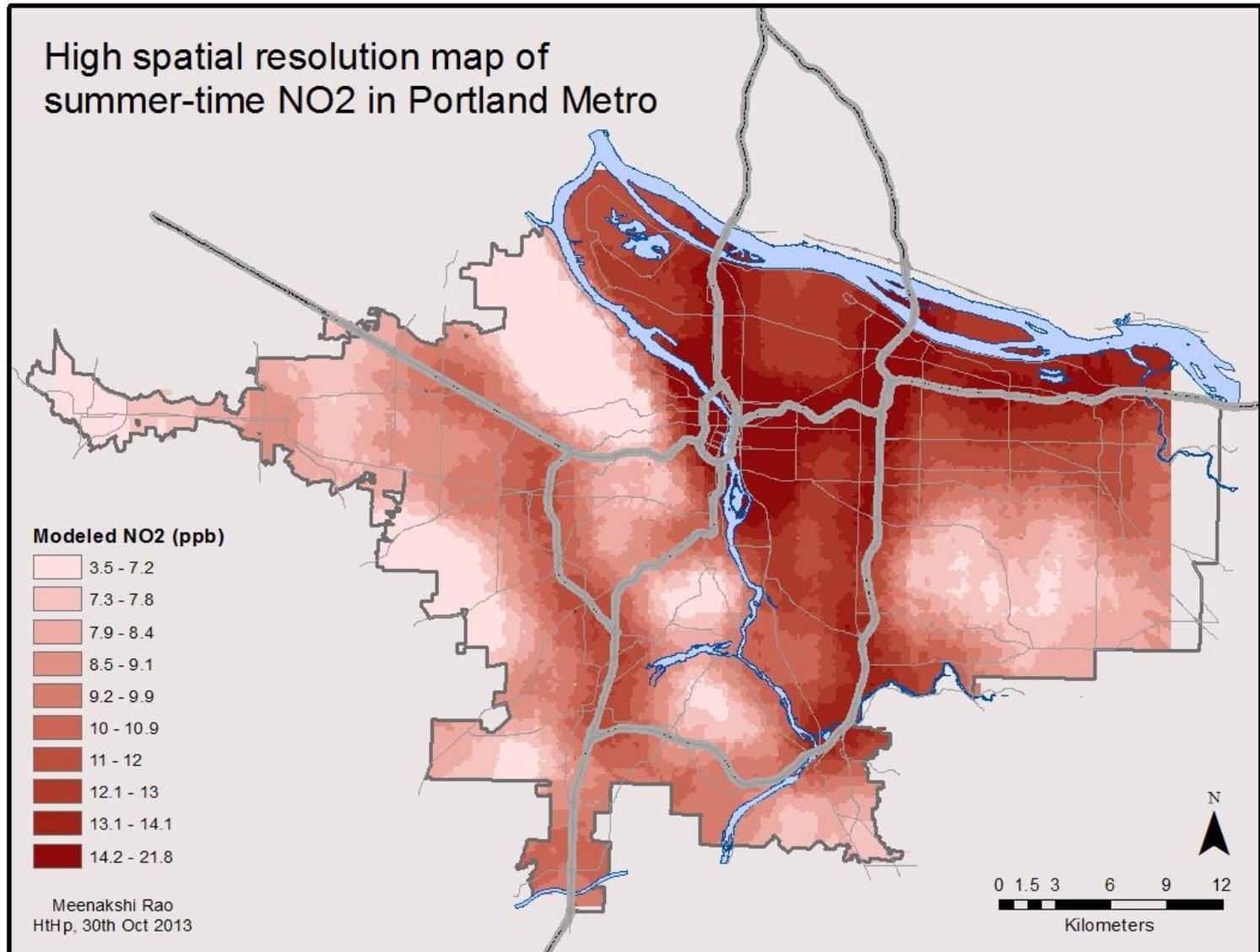
Healthy Trees Healthy People (HtHp)

- Provide a scientific basis for integrating trees into cities
 - *Trees as one part of your health care plan (\$)*
- Develop a trees and health online resource for strategically expanding tree canopy in 13 cities of the U.S.
 - *Support a culture of trees into human dominated landscapes*
- Engage non-traditional community members to integrate trees with city operations
 - *Start telling stories about the benefits and challenges of integrating trees into our culture*

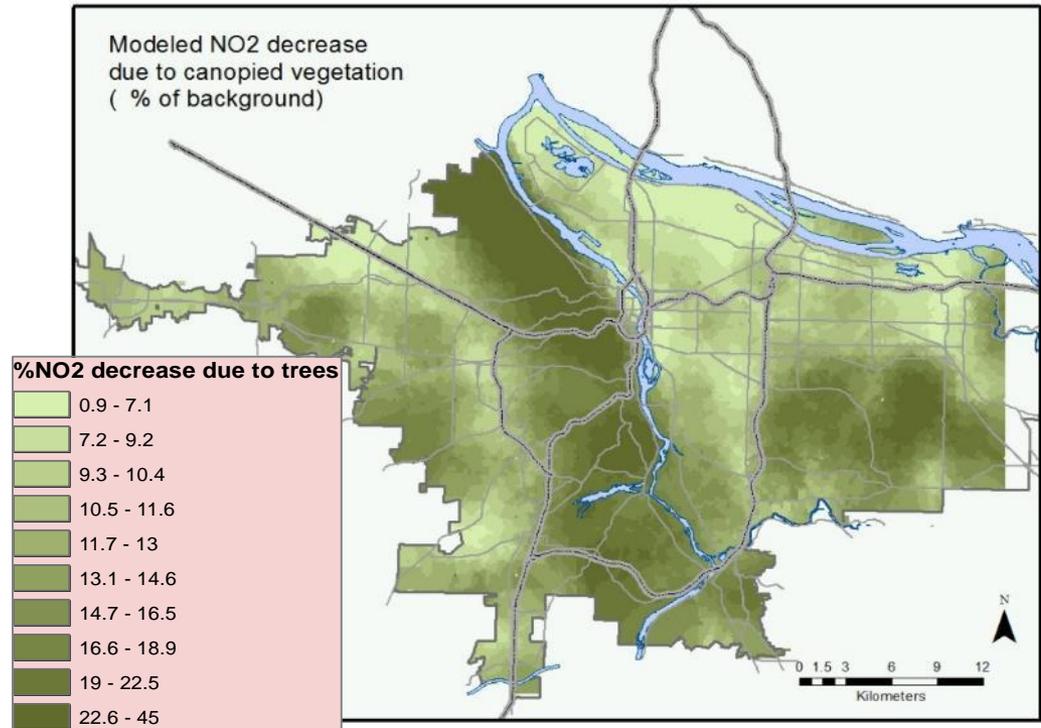
Neighborhood Air Quality



Mobile Air Pollutants



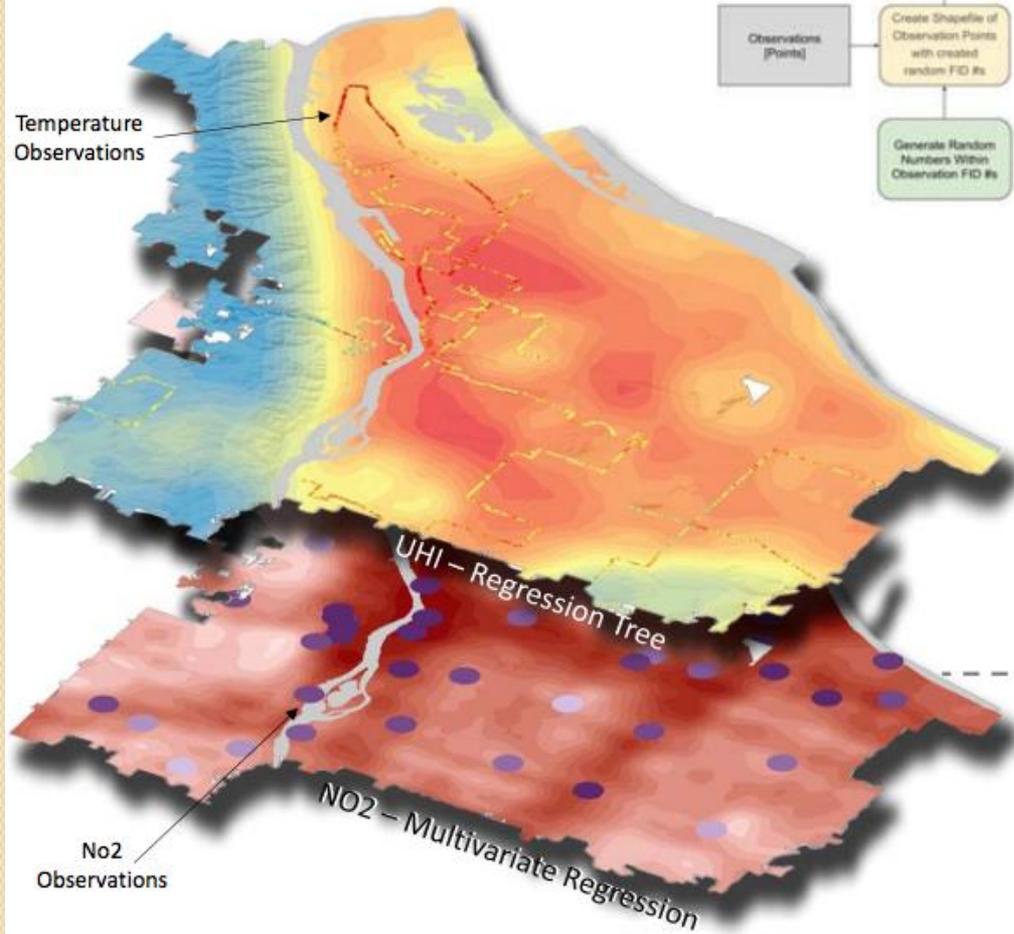
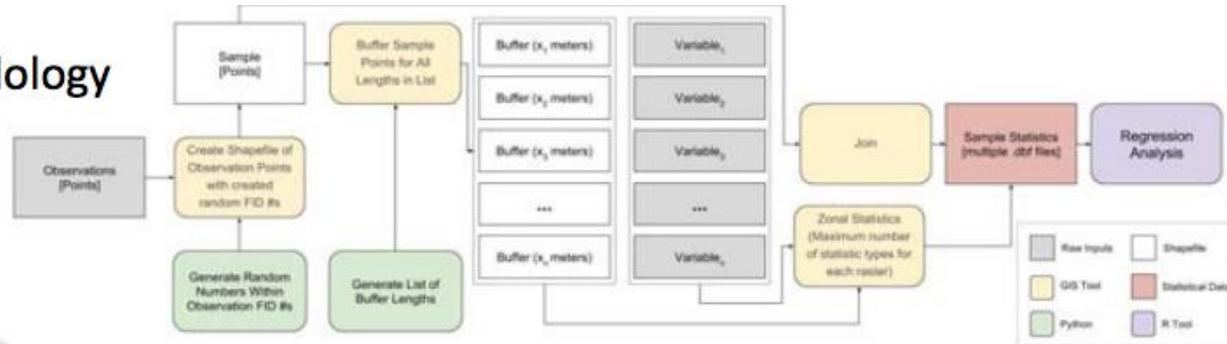
Health Value of Trees



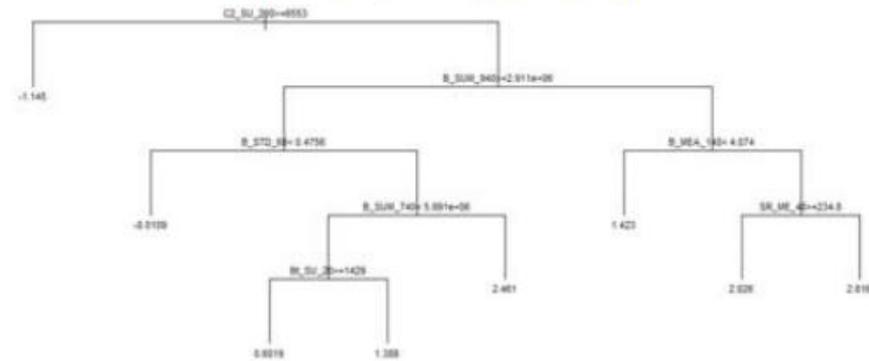
Health Impact	Reduced Incidence due to Trees	Valuation of Benefit (in \$1,000,000)
Asthma Exacerbation, Missed school days (4-12 years)	6083	0.52
Asthma Exacerbation, One or More Symptoms (4-12 years)	17,663	2.76
Emergency Room Visits, Asthma (all ages)	46	0.01
HA, All Respiratory (65 and older)	49	0.92
HA, Chronic Lung Disease (less Asthma) (65 and older)	24	0.33
	Sum Value:	\$4.54

Integrating Urban Heat and Air Quality

Environmental Variable Methodology



ANOVA Regression Tree Analysis

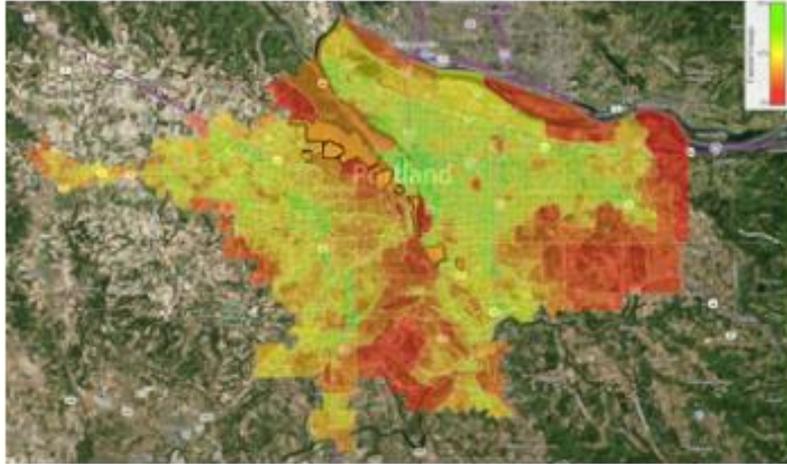


Multivariate Regression Analysis

$$NO_2(i) = 7.7 + 1.1 \times 10^{-8} * FWY_{1200} + 6.5 \times 10^{-4} * MAJ_ART_{500} + 1.7 \times 10^{-3} * ARTERIES_{350} + 10.8 \times 10^{-8} * STREETS(POP)_{800} + 1.0 \times 10^{-3} * RAILS_{350} - 1.0 \times 10^{-2} * ELEVATION + 1.4 \times 10^{-5} * (ELEVATION)^2 - 5.73 \times 10^{-6} * TREES_{400} + 1.1 \times 10^{-4} * X_DIST$$

APP: Call to Action

Health and Trees APP



Urban trees do more than make streets more safe and beautiful. They also improve air quality and reduce the urban heat island effect, which leads directly to improved health outcomes for vulnerable populations such as the young, old, and poor. Distributing neighborhood trees in relation to the presence of harmful environmental conditions such as poor air quality can help to ensure that all citizens in the city live healthy and productive lives. By considering the geography of vulnerability, communities can improve their urban canopy for those most in need, and in a way that returns the greatest benefits per tree planted.

access

Where places in your city have the dirtiest air quality and hottest days during the summer?

select a city:

prioritize

What neighborhoods and citizens of your city can benefit most with more trees?

want a guided tutorial?

yes no

plan

What will you have to do to the trees in each neighborhood to improve city neighborhoods?

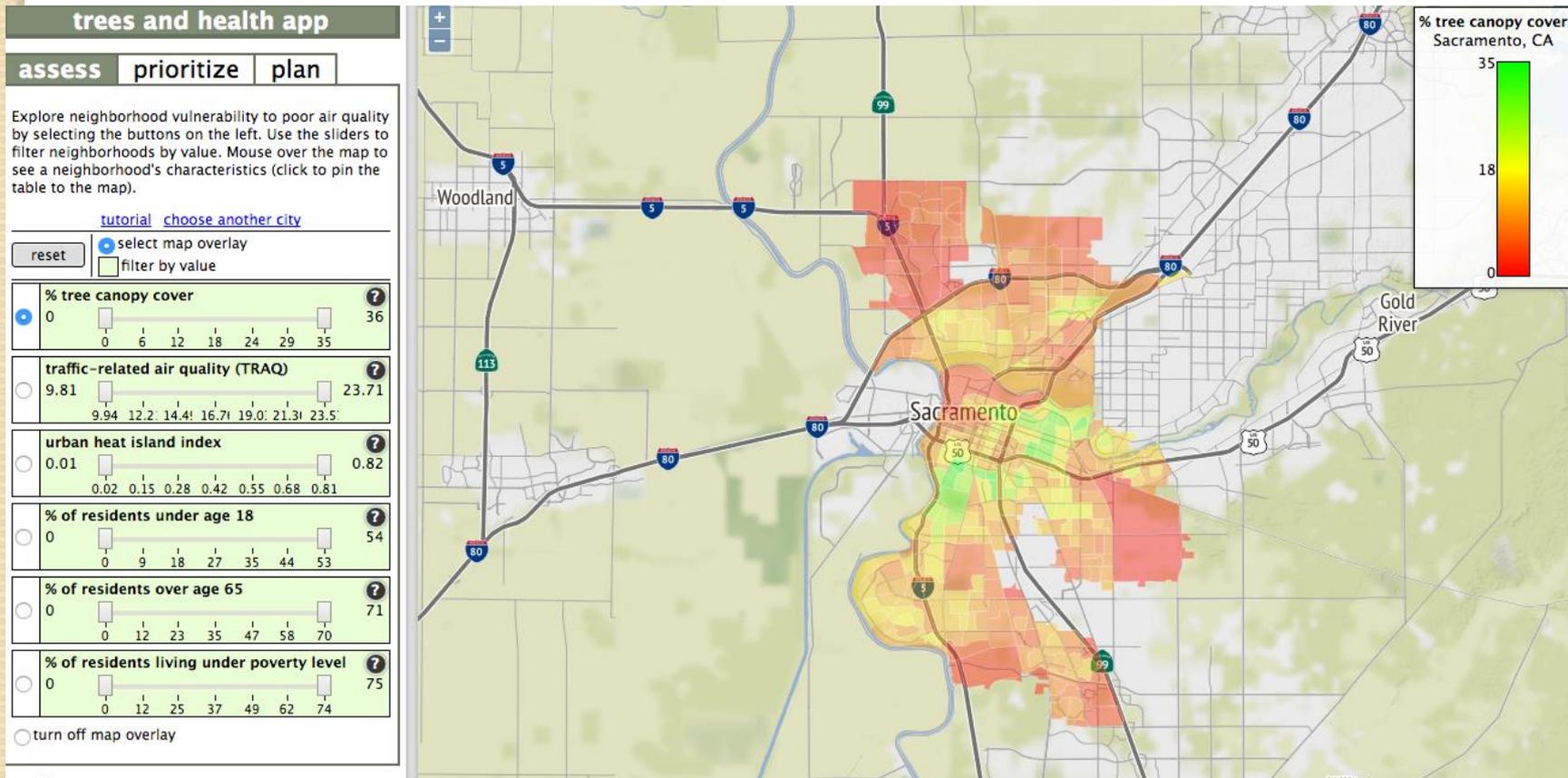


[read](#) the science behind urban canopy and our methodology

map.treesandhealth.org

Trees and Health: Assess

1. Explore neighborhood vulnerability to poor air quality and urban heat
2. Use the sliders to filter neighborhoods by value.
3. Mouse over the map to see a neighborhood's characteristics.



Trees and Health: Prioritize

access & prioritize plan

move the sliders to prioritize variables contributing to the vulnerability score, or select a single component of vulnerability to view

Show me the Worst census blocks by Weighted Score

Prioritize Mode

Air Quality 0
 9.77 9.95 12.8 15.7 18.6 21.5 24.4 27.3

Urban Heat Island 0
 0.01 0.02 0.15 0.28 0.42 0.55 0.68 0.81

Current Canopy 0
 0% 6% 12% 18% 24% 29% 35% 36%

Vulnerable Populations 0

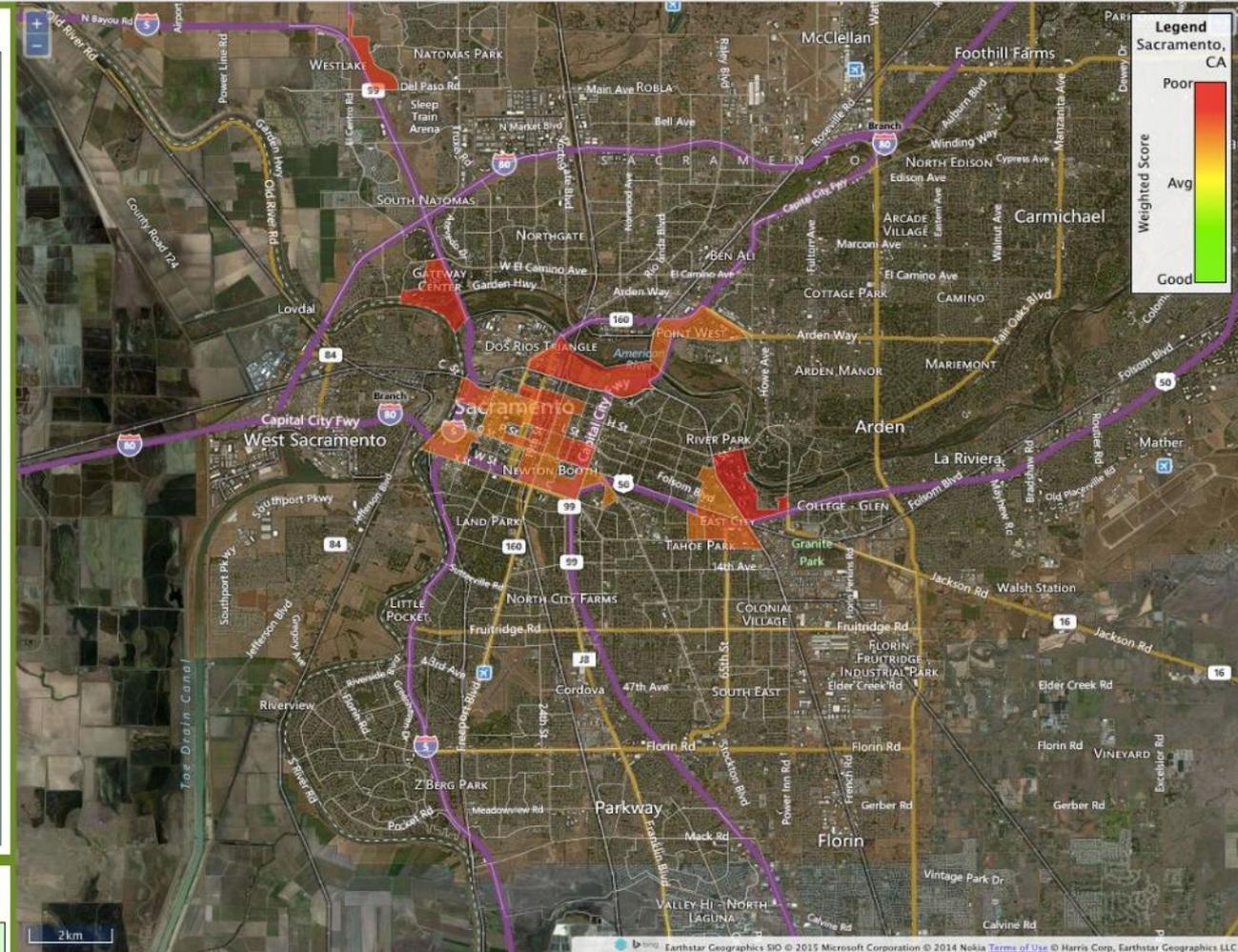
% Pop < 18 -5
 0% 9% 17% 26% 34% 43% 51% 52%

% Pop > 65 -5
 0% 12% 23% 35% 46% 58% 69% 70%

% Pop in Poverty 0
 0% 8% 15% 23% 31% 38% 46%

None

Map Controls



Trees and Health: Plan

access & prioritize **plan**

Canopy Simulator

Reset

Addition Type: Individual

Target Canopy %
 % Increase

Target Canopy % 30

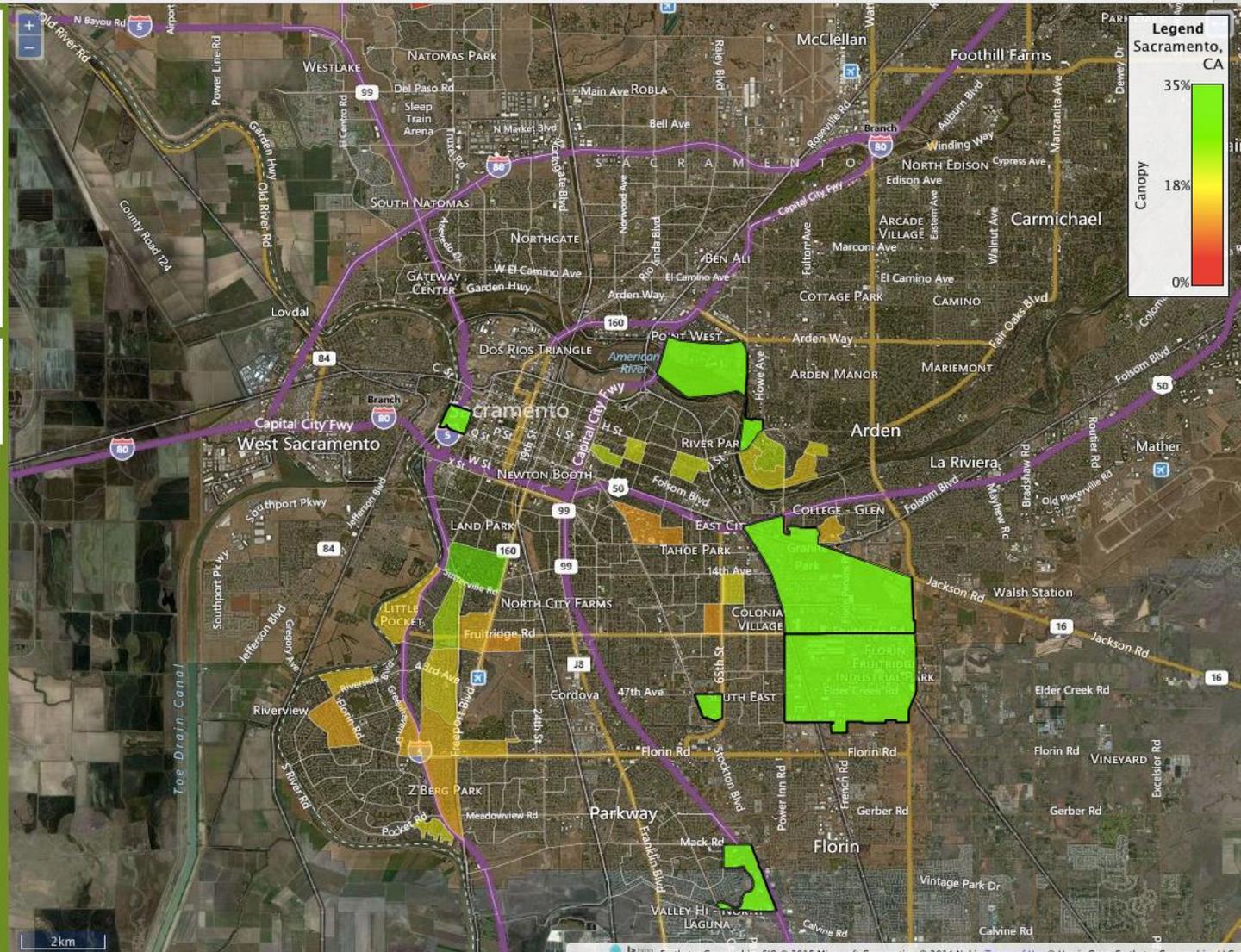
Average Tree Size 30

17,533 trees to add.

Map Controls

Print Export Map Type Color Scheme Other

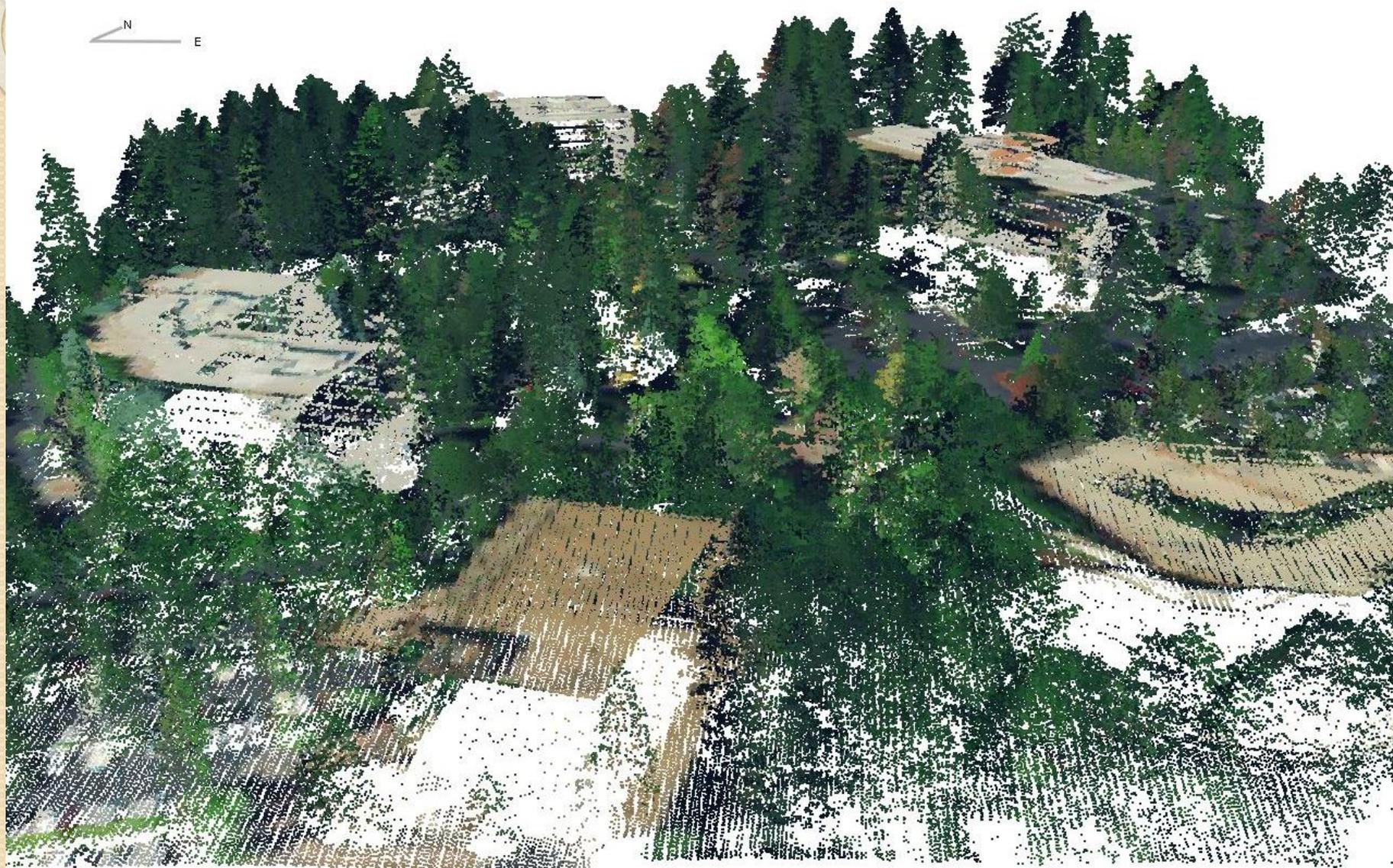
JPG



Feedback on Application

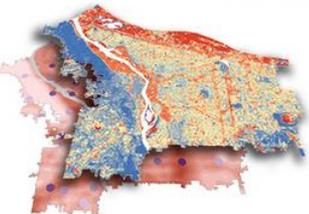
1. Helpful for identifying neighborhoods with low canopy and high socio-economic need
 - *Need #1: Greater resolution*
2. Better description of social vulnerability
 - *Need #2: Tailoring the input variables*
3. Information on threats to current canopy
 - *Need #3: Integrating policy components into location of large trees*
4. Lack of engagement with large trees
 - *Need #4: Opportunities to tell stories about large trees*
5. Need for integrating data into planting strategy
 - *Need #5: Canopy 'plant-ability' analysis*

Need #1: Greater Resolution



Need #2: Tailoring Variables

PDX Resiliency App



Access
Where places in your city have the dirtiest air quality and hottest days during the summer?

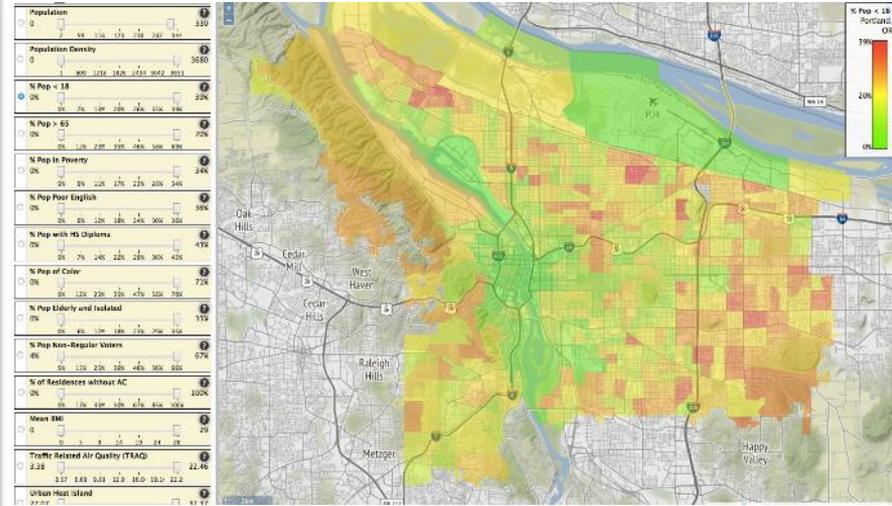
Ready?
[Launch the App!](#)

Prioritize
What neighborhoods and citizens of your city can benefit most with more trees?

Want a guided tutorial?
 yes no

[Learn More About Portland's 2015 Climate Action Plan](#)



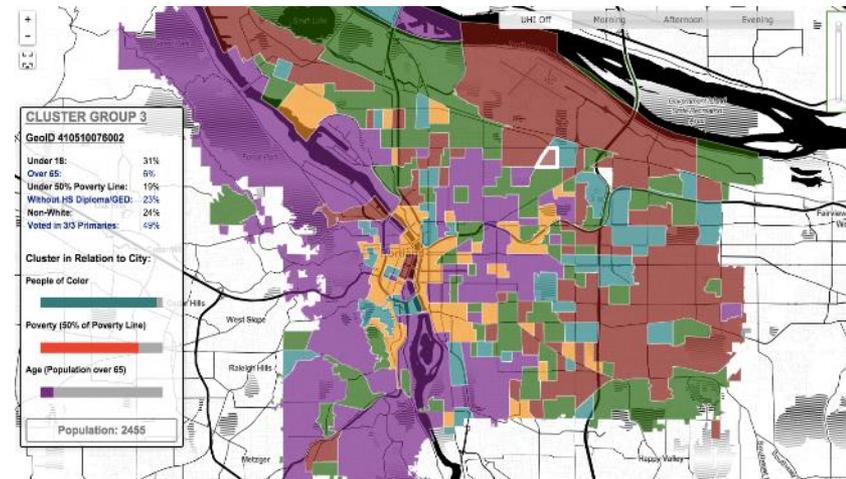


Workshops with community members to evaluate needs for a tailored platform

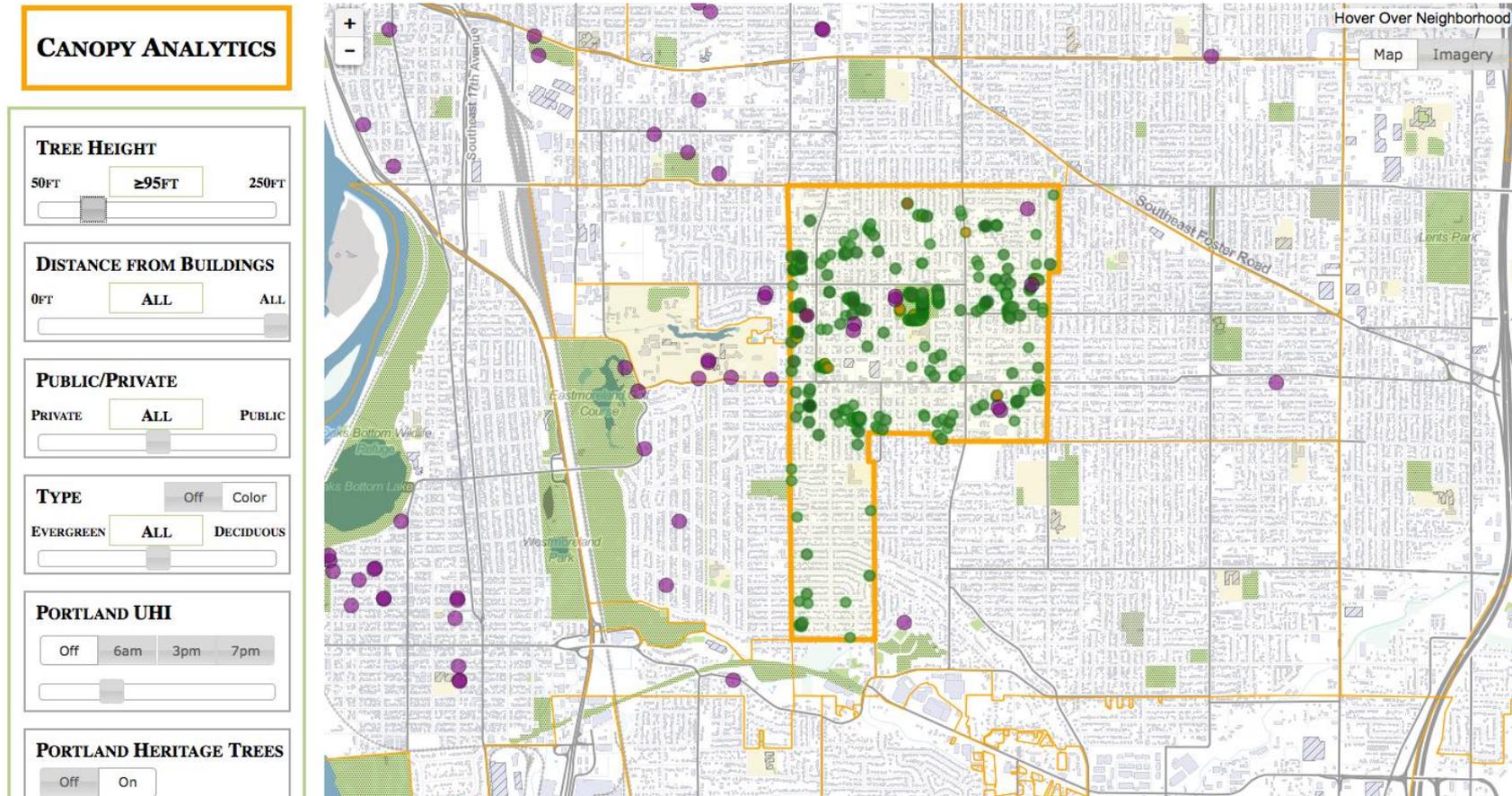
RAPID ASSESSMENT FOR VULNERABILITY AND ENVIRONMENTAL STRESSORS (RAVES)

RAVES is a rapid assessment tool that aims to provide public decision makers with spatial information about the environmental stressors that can amplify social vulnerability. With a focus on the City of Portland (with intentions to expand to other cities/regions), RAVES describes vulnerability as those communities who have historically experienced health impacts from heat waves, including older adults, communities of color, and those in poverty. The application uses a mapping platform and a series of colors, each of which define a cluster of communities based on their similarity of these demographic variables. Using U.S.Census information, users can hover their cursor over different parts of the city, and identify areas where urban heat and vulnerability overlap.

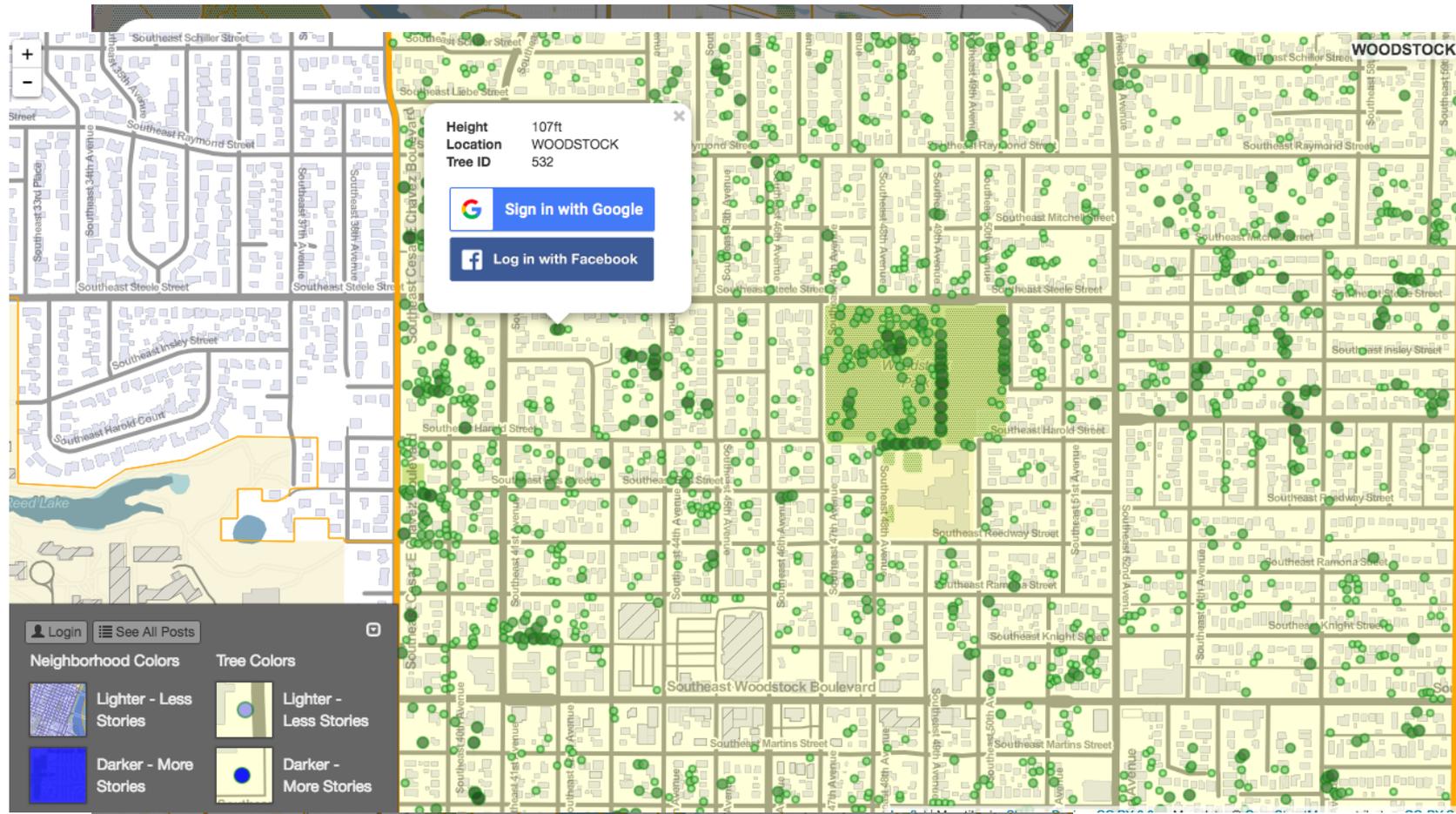
[LAUNCH THE APPLICATION](#)



Need #3: Threat to Current Canopy

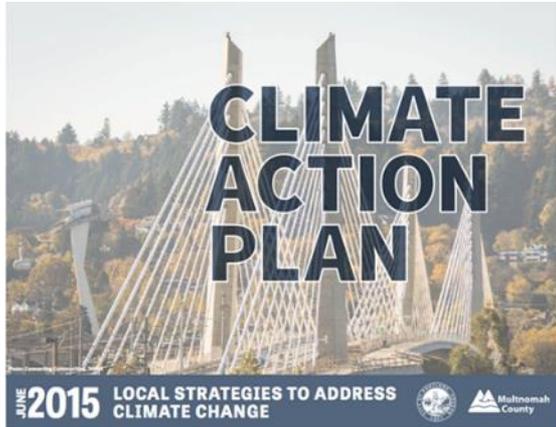


Need #4: Engagement with Stories



“This is my pee-tree. My great grandfather told me stories about how his pee helped this tree to grow, and so I, along with my dogs, kids and friends have also helped the tree grow. Now it’s over 140 feet tall, thanks to this hydrated community.”

The City that Plans

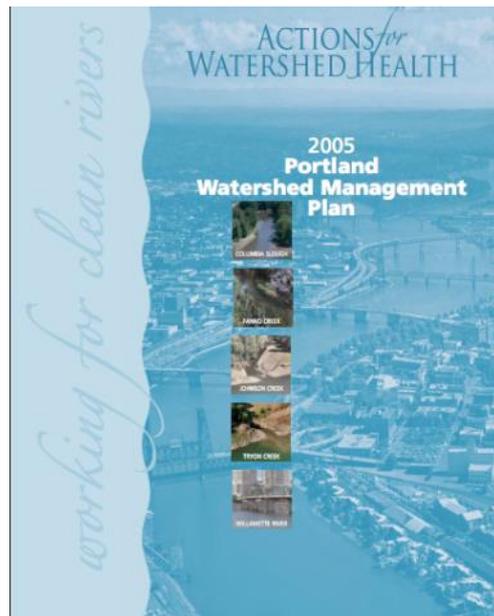
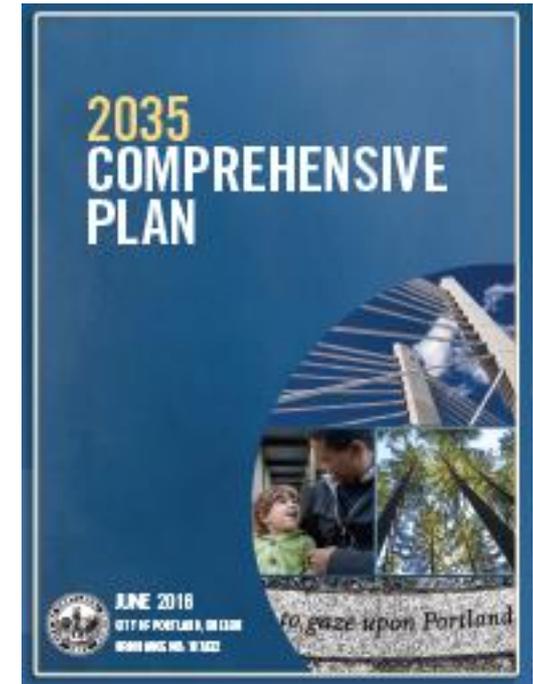


 **PORTLAND
PARKS & RECREATION**
Healthy Parks, Healthy Portland



Urban Forest Action Plan
2015 Implementation Update

October 2016



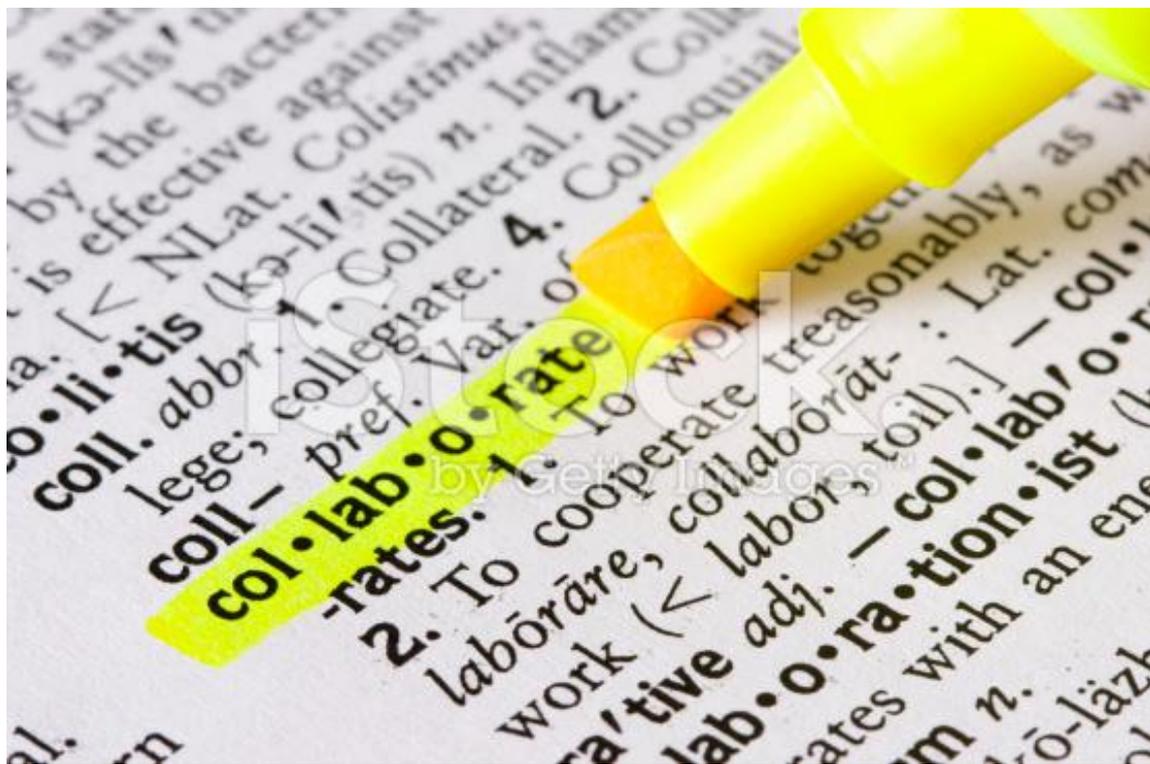
2011-13 STRATEGIC PLAN
PORTLAND HOUSING BUREAU



**Regional
Transportation Plan**
Adopted July 17, 2014
www.streg.metro.gov **2014**



Goal: Increase urban forest services and tree canopy in historically underserved neighborhoods to create equitable access for all residents.



Contact:

Contact Vivek Shandas

Email: vshandas@pdx.edu

Tel. 503-725-5222

www.suprlab.org