

Heat & Cooling Strategies and Continuing the Conversation: Cooling Urban Spaces



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Department of Land
and Natural
Resources
Division of Forestry
and Wildlife



Daniel Dinell
Trees for Honolulu's
Future



Neu-Wa O'Neill
Architects
Hawaii Limited
(AHL)



Francis Wiese
Climate, Ocean & People
Anchorage, AK

THROWING SHADE:

Trees as Essential Nature Based Cooling Solutions



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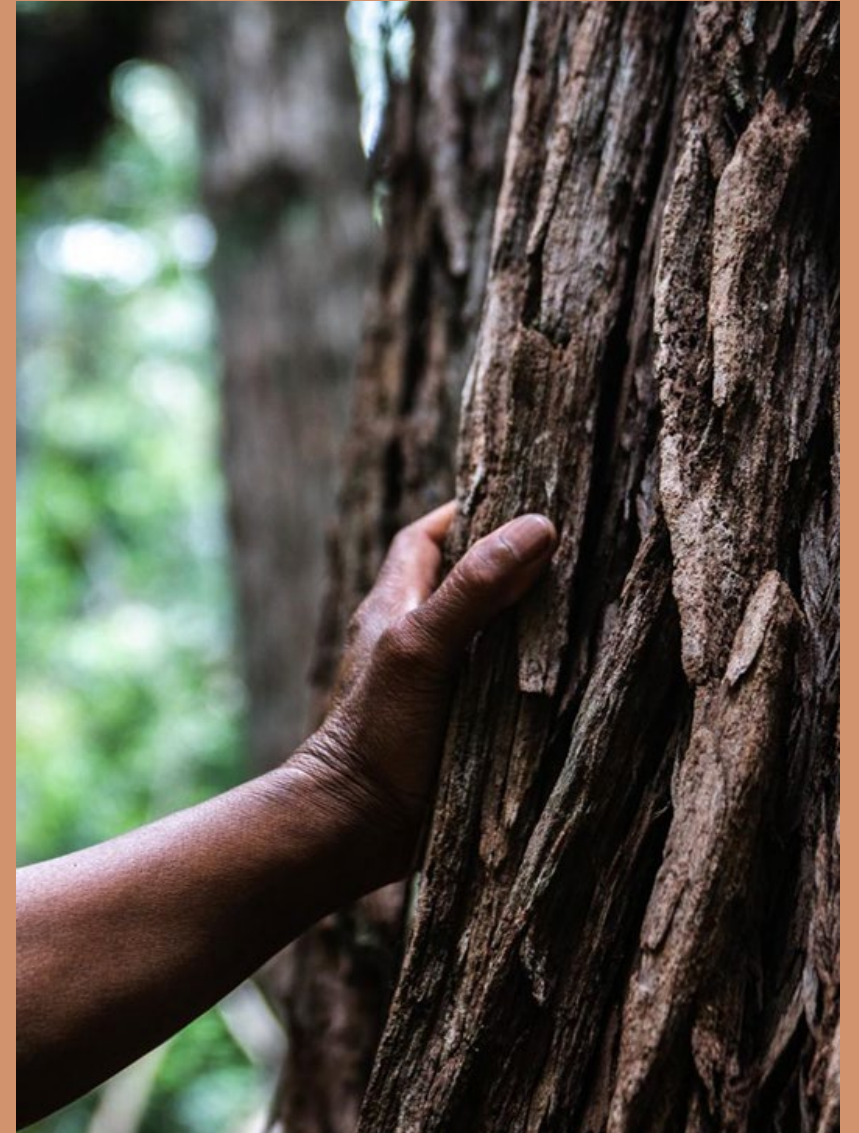
KAULUNANI MISSION

To support all of Hawai‘i’s communities with a focus on equity to cultivate well-being and resilience through restorative & environmental justice, planting, caring for, and growing relationships with the trees and forests where we live, work, learn and play.



EQUITY & JUSTICE STATEMENT

We recognize our mission is best fulfilled through engaging people of diverse backgrounds, beliefs, experiences and cultures with a focus on our underserved and low-income communities as well as Native Hawaiians.



OUR TEAM



**HEATHER
McMILLEN**

*Kaulunani Program
Coordinator*



**KATE
WIECHMANN**

*Partnerships
Coordinator*



**KOKI
ATCHESON**

*IRA Partnerships
Coordinator*



**LE'A
KA'AHA'AINA**

*Communications
Assistant*



**SKYE
HARAGA**

*Kupu 'Āina Corps
Member*



**INDRAJIT
GUNASEKARA**

*Community
Coconut Program
Director*



**KEHAU KAHELE-
MADALI**

*Community
Coconut Program
Assistant*



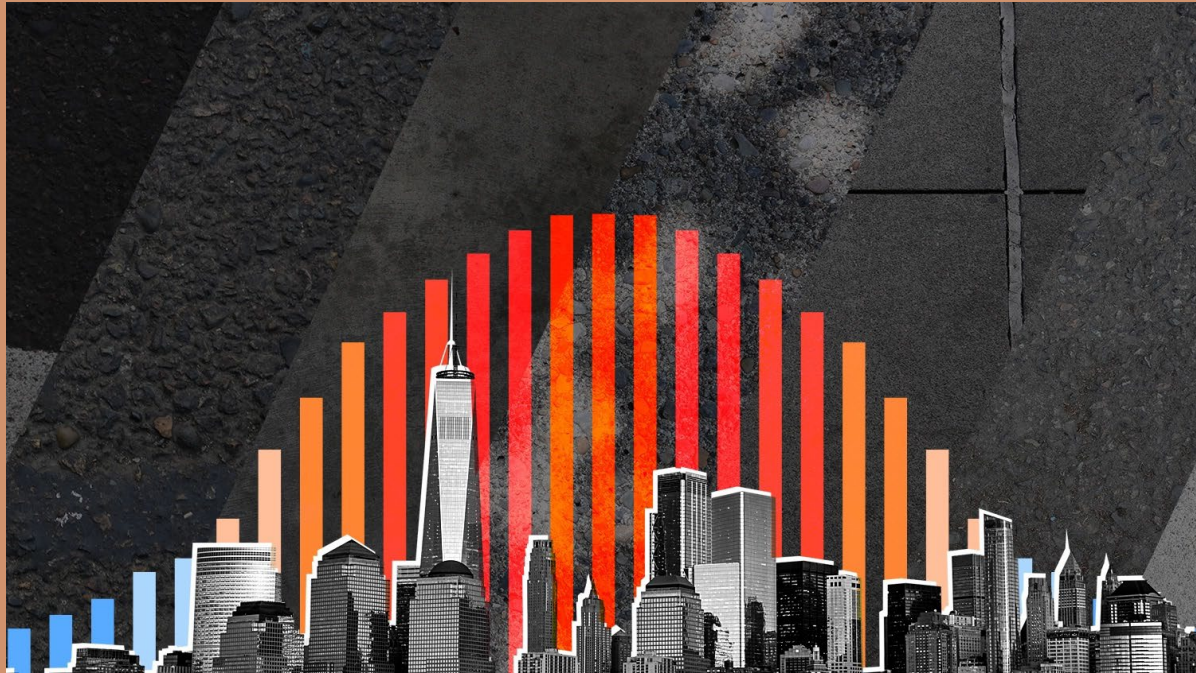
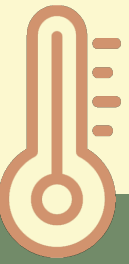
**MALIA
STAAB**

*Campus
Forester*

WHAT WE DO



URBAN HEAT ISLAND EFFECT



PC: Grist

Shaded surfaces may be
45°f cooler

Ambient temps can be
25°f cooler

Must be strategic with
green infrastructure

WHAT IS AN URBAN FOREST?



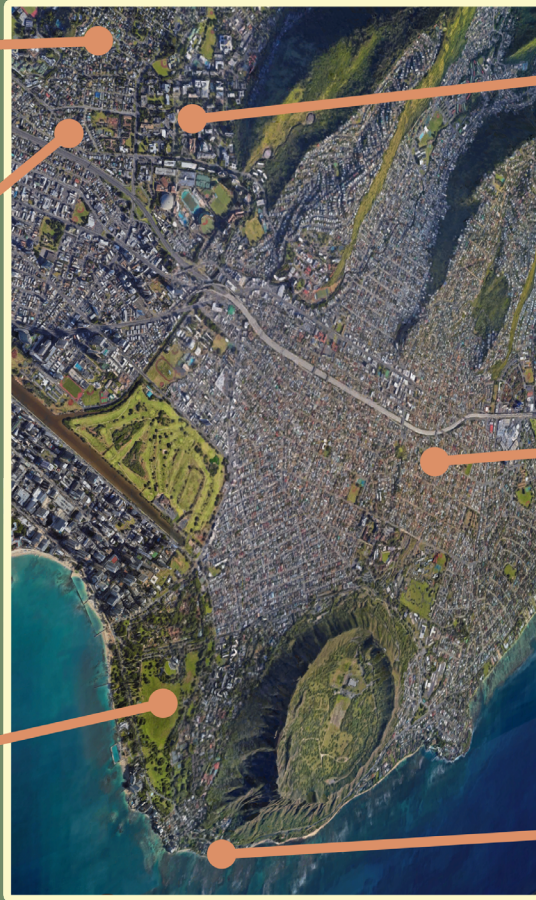
Trees on Private Property



Street Trees



Urban Park



PC: Google Maps



Campus Trees



Rain Garden

PC: Anne Gibson



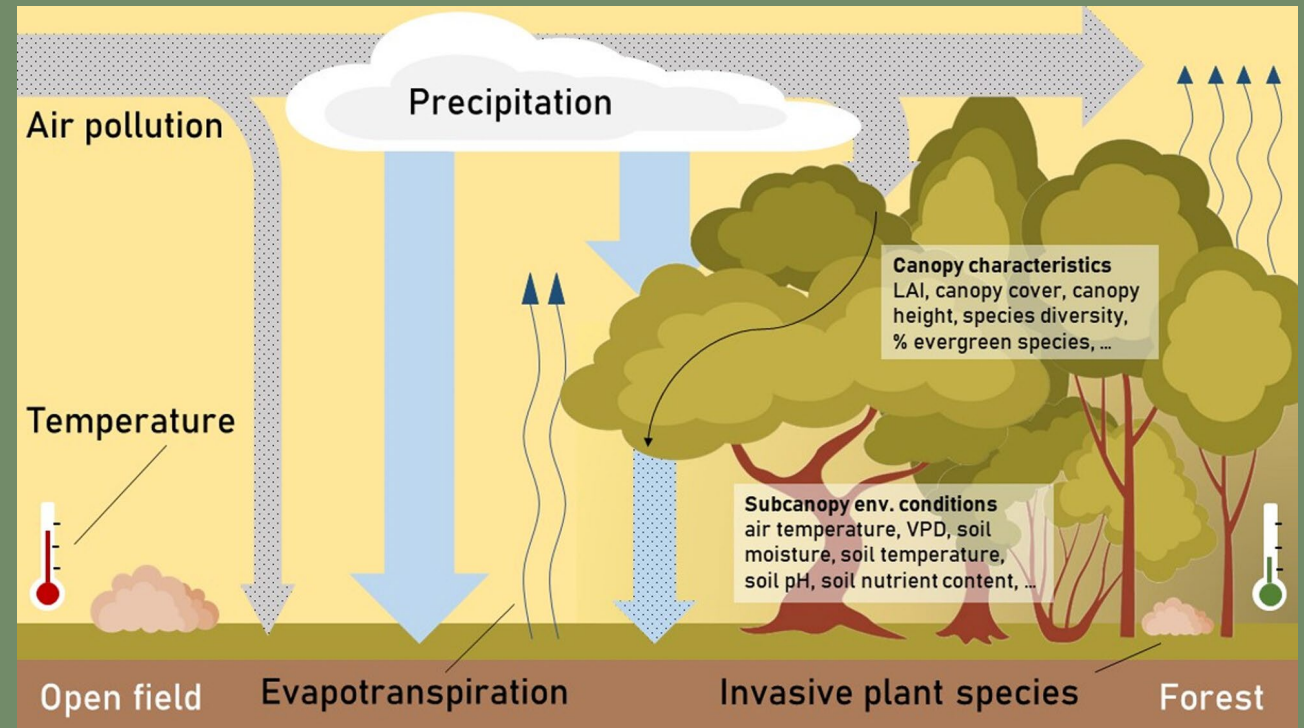
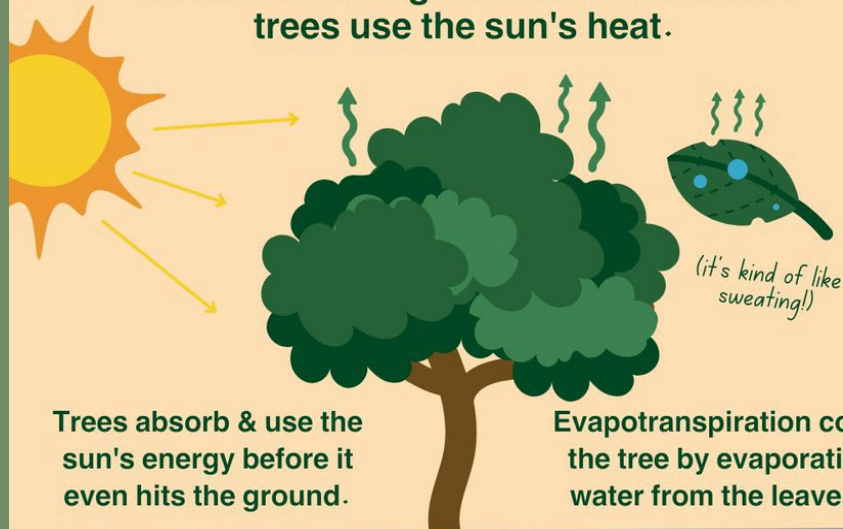
Pocket Park

PC: Kyle Jenkins

HOW TREES KEEP US COOL

HOW DO TREES KEEP CITIES COOL?

The surrounding air is cooler because trees use the sun's heat.

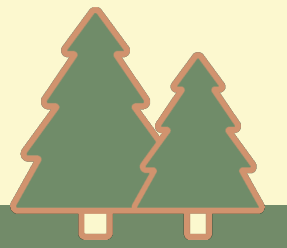


COMMUNITY is KEY





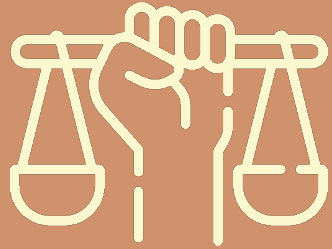
BEYOND COOLING



Credit: Vibrant Cities Lab



human health



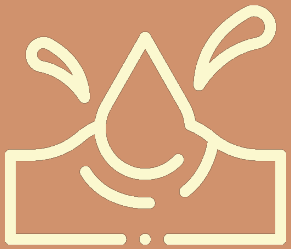
equity



education



economy



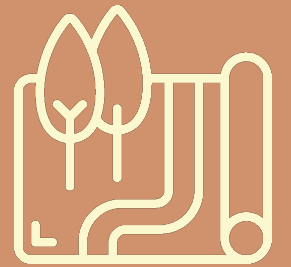
water quality



air quality



resilience



city planning

3 – 30 – 300

URBAN CANOPY TARGET



**Trees (of a decent size)
visible from every home.**



**Percent tree canopy
cover in neighborhood.**



**Meters from nearest
park or green space.**

Konijnendijk van den Bosch, C. (2021). Promoting health and wellbeing through urban forests – Introducing the 3-30-300 rule.



Dr. Cecil Konijnendijk
Nature Based Solutions Institute

[Konijnendijk 2022](#)

3 – 30 – 300

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Nature Based Solutions Institute

HONOLULU

URBAN CANOPY TARGET

35% by 2035



City & County of Honolulu. (2018). Resolution 18-55.

Credit: City & County of Honolulu Resolution 18-553 (2018)

TREE CANOPY VIEWER HAWAII'I

USDA Urban Tree Canopy in Hawaii

Layers

Find address or place

- Ahupua'a
- Tree Inventory (O'ahu and Kaua'i)
- STEW-MAP Stewardship Area (O'ahu and Hawai'i)
- Canopy and Census Statistics
- Tree Canopy
- Urban Canopy Cover
- Impervious Landcover
- Urban Heat Index (UHI)
- Population
- Native Hawaiian Population
- Household Income
- Asthma
- SNAP Recipients
- Cardiovascular Disease

Legend

Tree Canopy
Hawaii 2020

Statewide, all land-use types

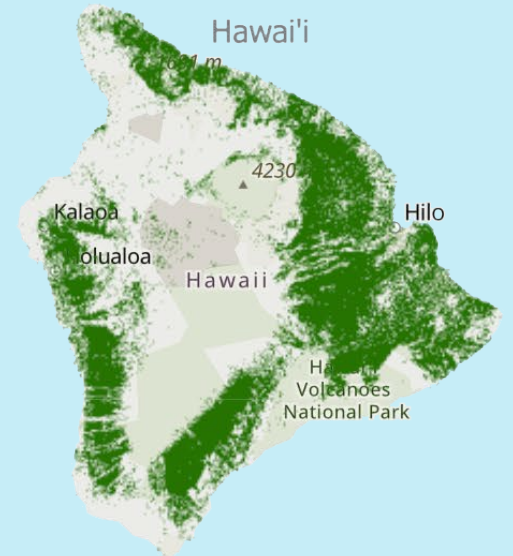
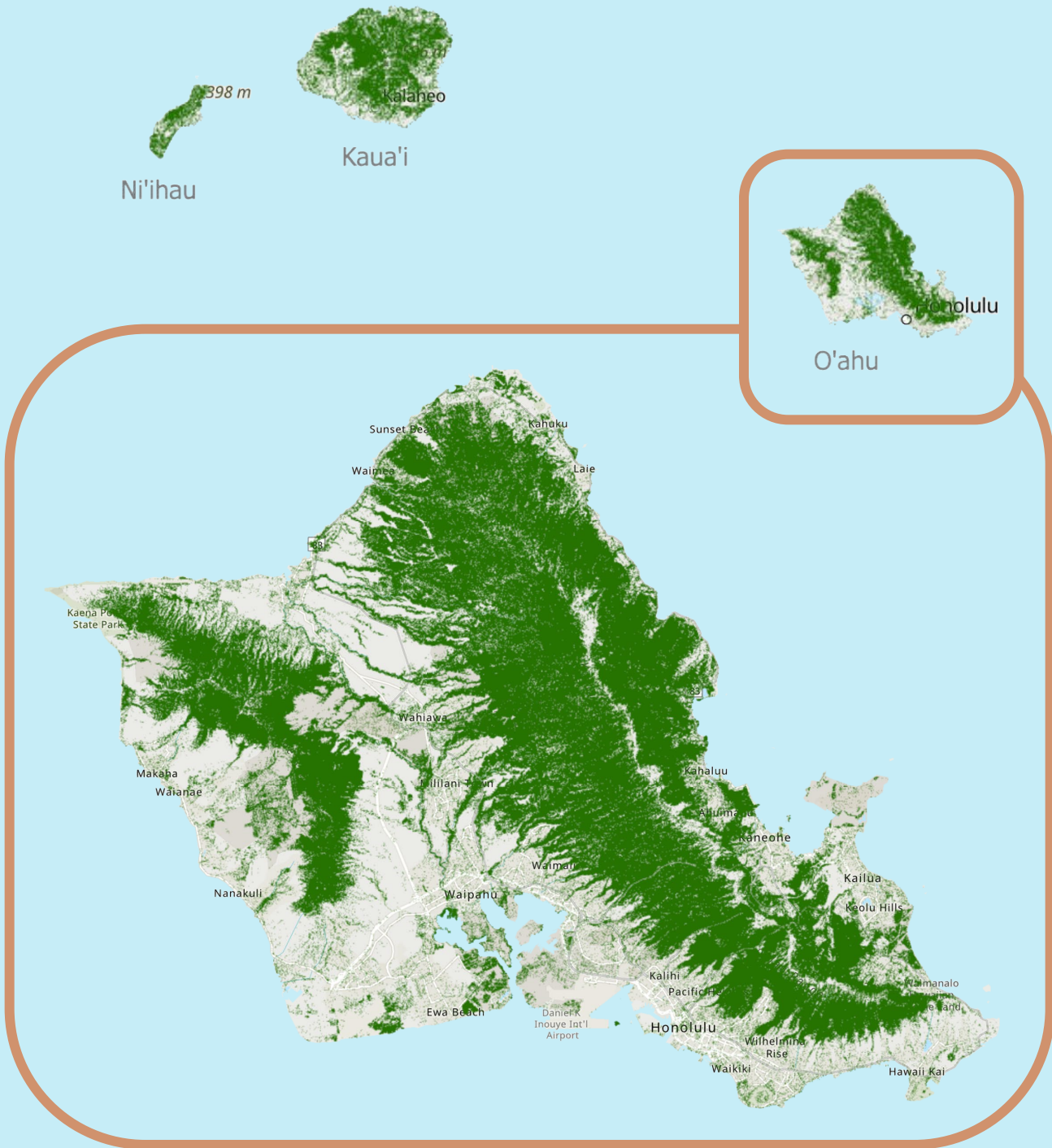
- Canopy data
 - Raster 1-meter resolution
 - MAXAR VIVID & LiDAR Imagery 2013-2020
- Socio-demographic and health data

scan QR code



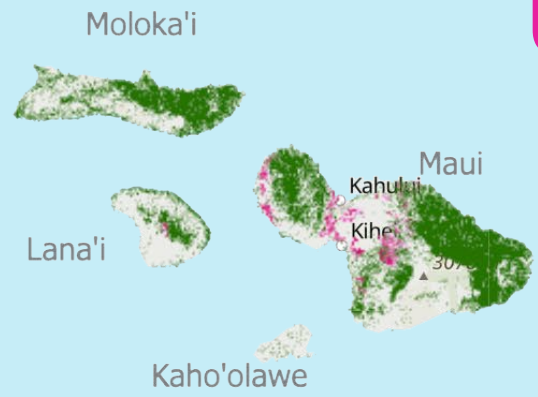
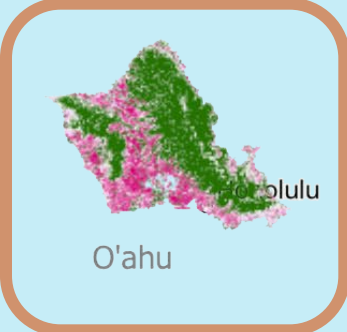
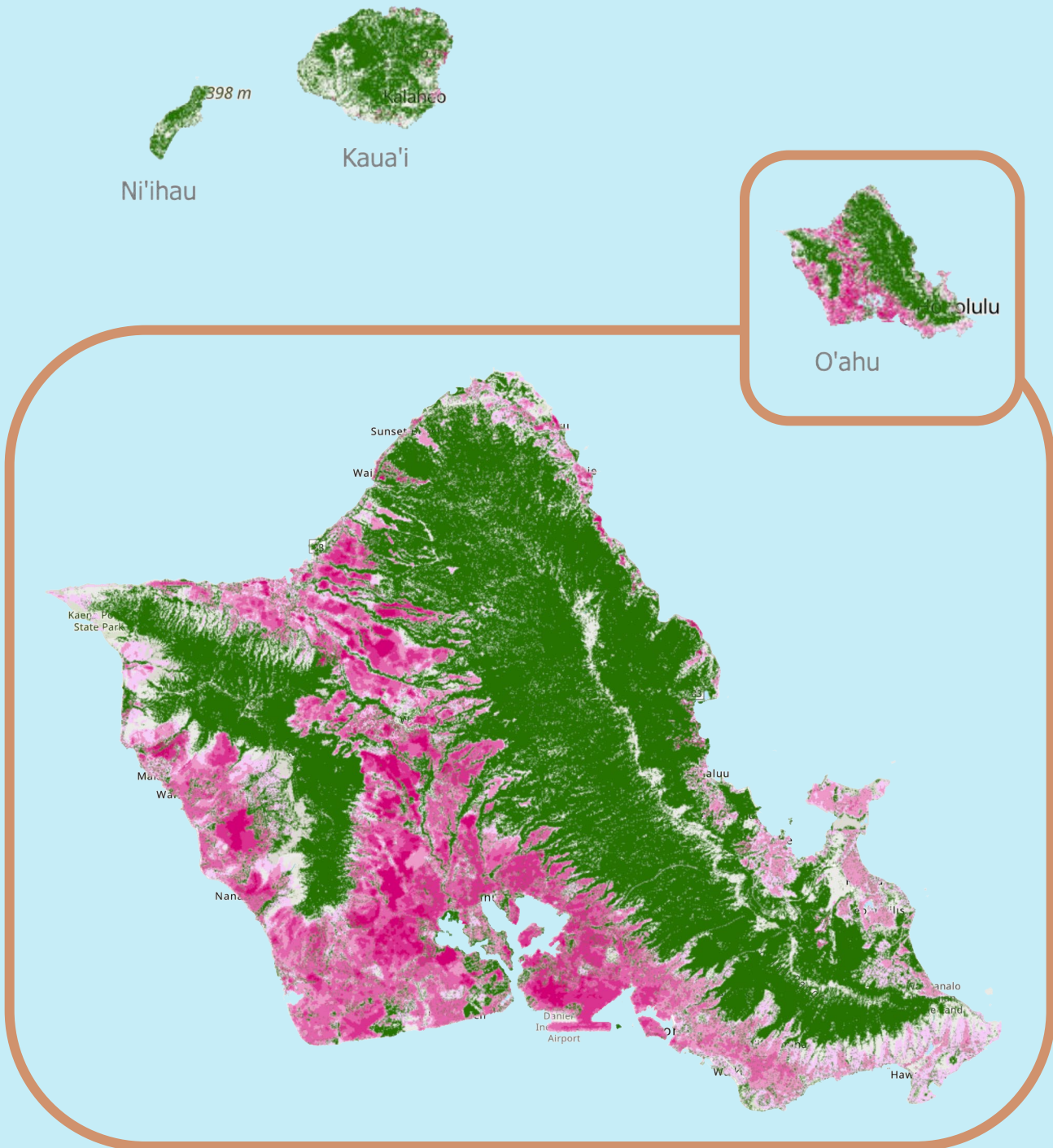
or visit kaulunani.org

Tree Canopy Coverage



Tree Canopy Coverage

Urban Heat Index



URBAN CANOPY

C O V E R A G E

16%

HAWAI'I RESIDENTS



>30%

URBAN CANOPY
C O V E R A G E

URBAN CANOPY

C O V E R A G E

50%

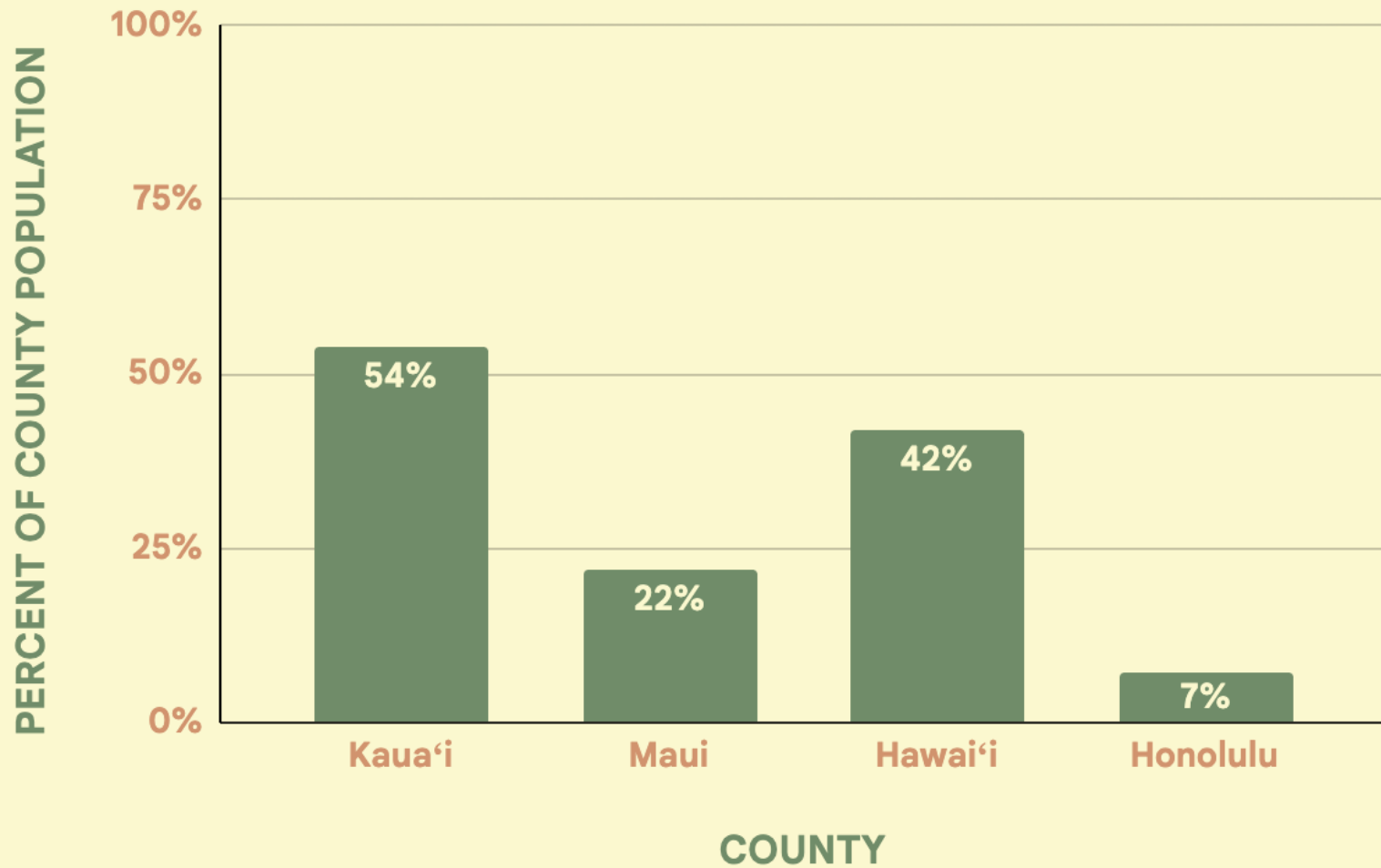
HAWAI'I RESIDENTS



>15%

URBAN CANOPY
C O V E R A G E

% of Residents Living with Over 30% Canopy Coverage



Urban Tree Canopy Area

Honolulu County:

17%

TREES IN & AROUND SCHOOLS

Why focus on schools?

- Heart of community
- One of our most valuable & vulnerable populations
- Big impact, both now & in the future



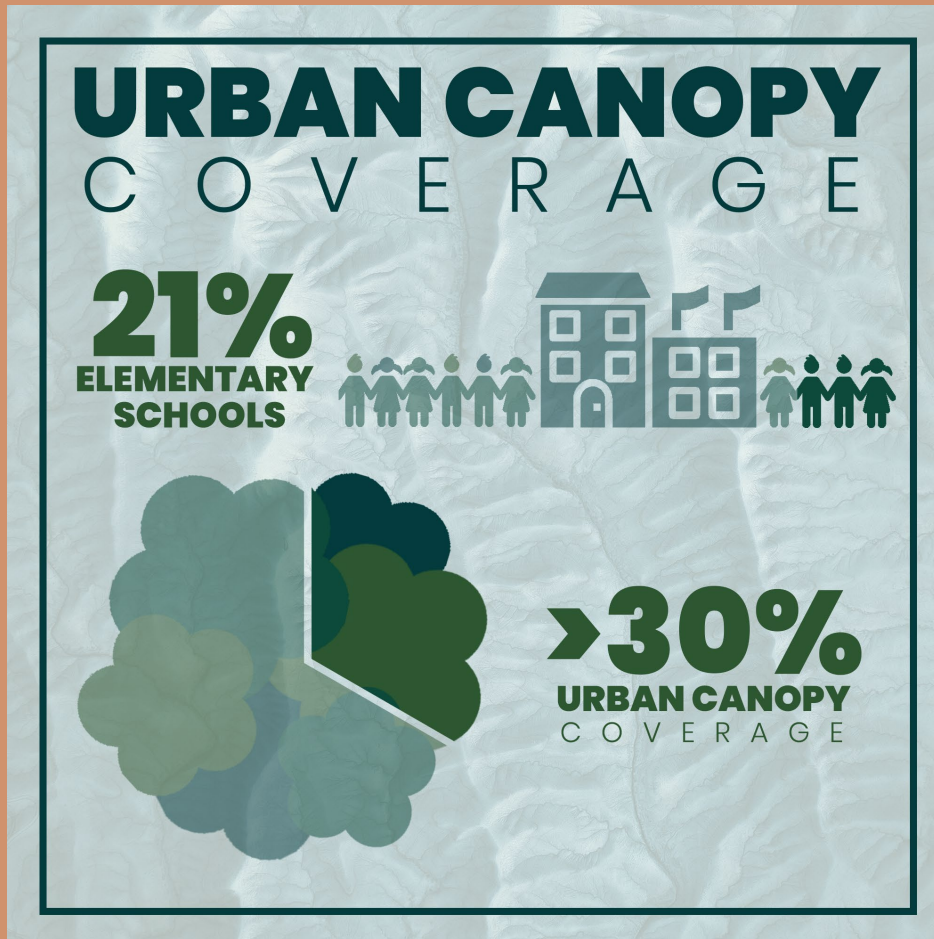
TREE CANOPY & SCHOOLS

- 1/2 mile radius around schools
- shadier, healthier, safer walks to school



ELEMENTARY SCHOOL AREAS

buffer area = 0.5 miles

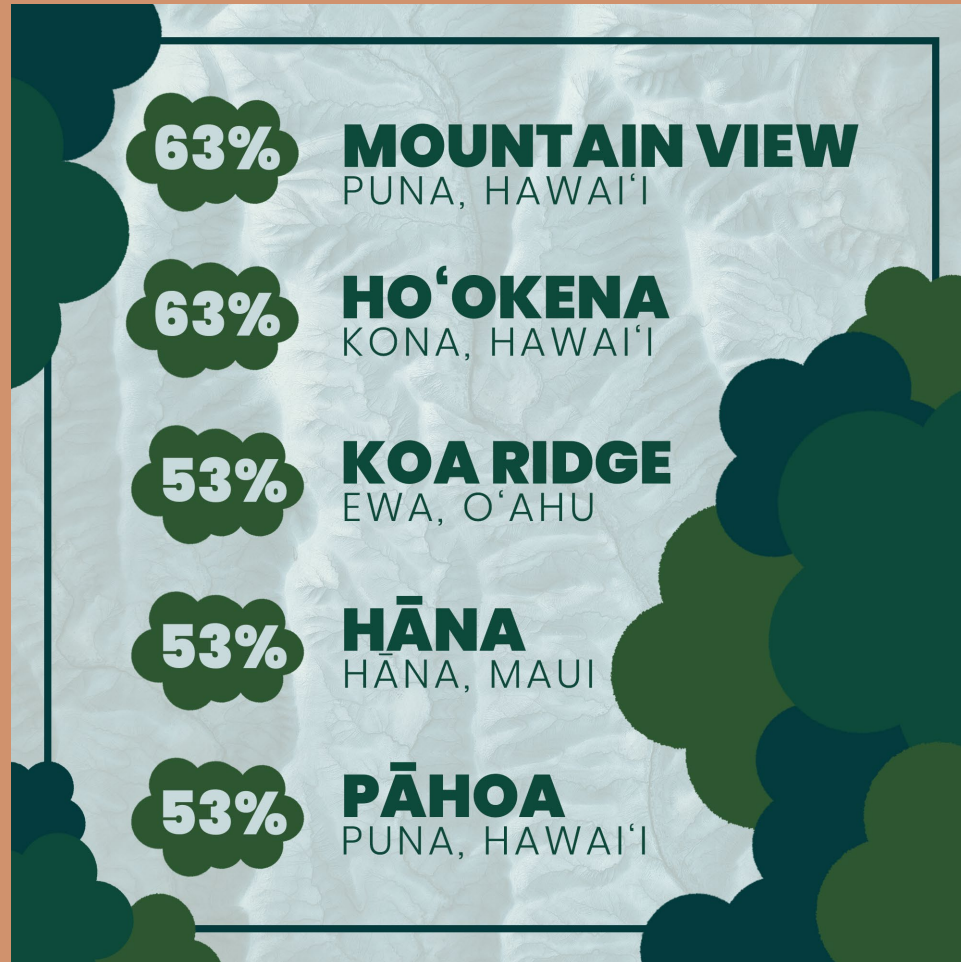


21% of Elementary School areas have **30%** or higher canopy coverage (n= 183)

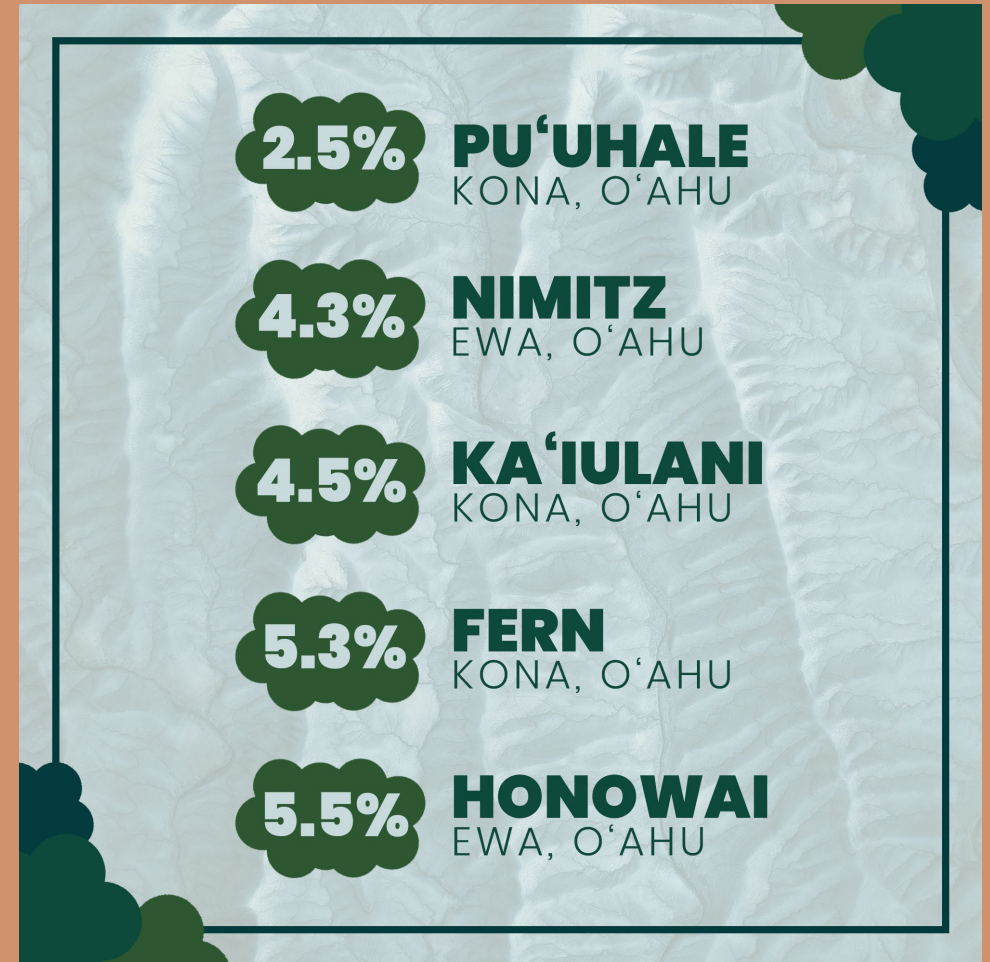
13% of Title I school areas have 30% or higher canopy coverage (n= 134)

-Analyses by Brayden Aki

Elementary School Areas Lowest Canopy Coverage



Elementary School Areas
Highest Canopy Coverage



buffer area = 0.5 miles

CHALLENGES

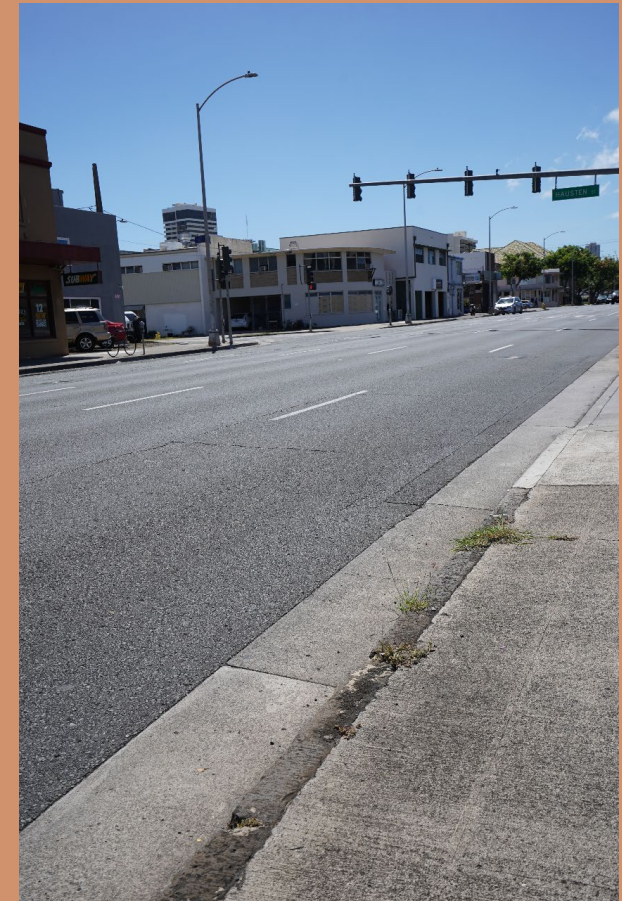


Lack of Tree Canopy in Communities

Lack of Capacity

Inequitable Distribution of Trees

Trees seen as a "nice to do"



STRATEGIES for SHADE

Prioritize native and drought-tolerant species

Right Tree, Right Place, Right Care, AND Right People

Normalize trees along streets, in parks, and public spaces



STRATEGIES for SHADE

Shade Trees for Schools





MAHALO!

Gratitude to:
Skye Haraga, Kupu ʻĀina Corps
Member

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Dan Dinell

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Honolulu is Hot
Trees are Cool



Heat...invisible, creeping disaster



Heat...invisible, creeping disaster

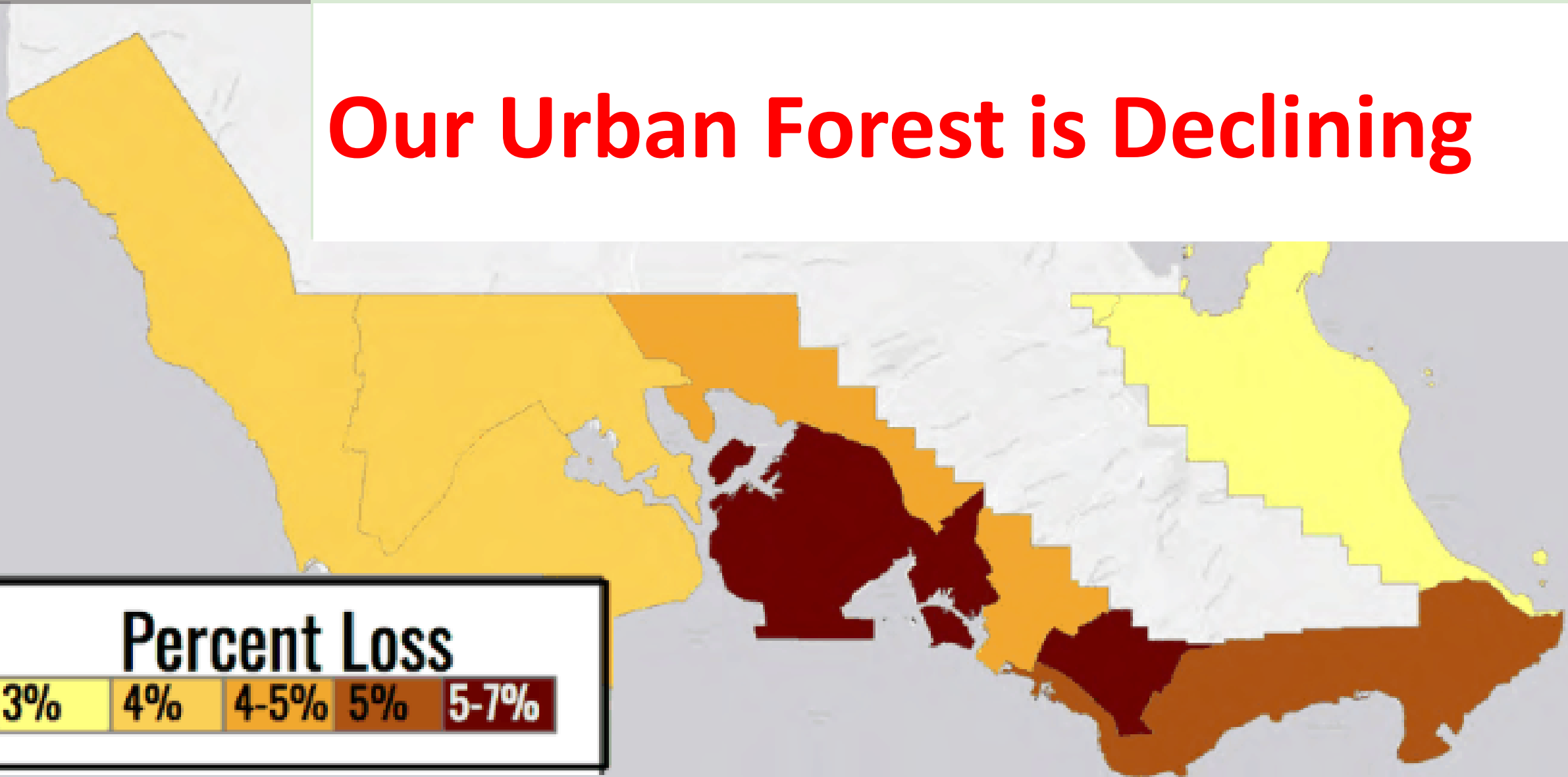


www.TreesForHonolulu.org



Percent Losses of Oahu Urban Tree Canopy

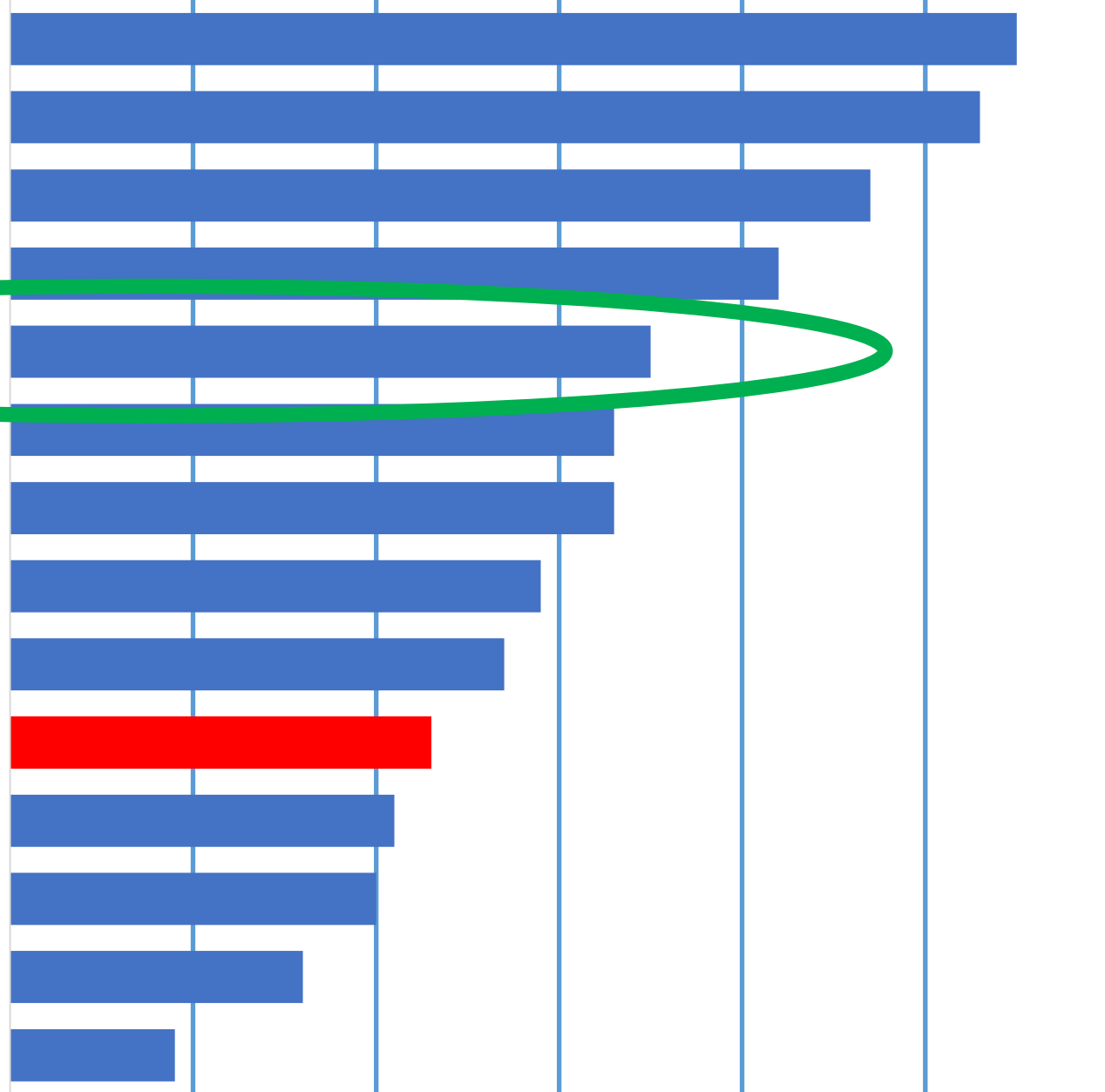
Our Urban Forest is Declining



Tree Canopy

0% 10% 20% 30% 40% 50% 60%

Scranton Metro Area, PA
Fairfax County, VA
Charlotte, NC
Pittsburg, PA
Washington, DC
Indianapolis, IN
South Burlington, VT
Chicago, IL
Baltimore, MD
Honolulu, HI
New York, NY
Philadelphia, PA
Boise, ID
Chelsea, MA





Observations

1. It takes a collective response
2. Nature makes the rules
3. Inequality abounds

D: MITIGATING EXTREME HEAT

Honolulu

The Heat Is Especially Dangerous For Honolulu's Homeless

Honolulu wants to plant 100,000 trees in the next few years to help provide shelter from rising temperatures



JANUARY 31, 2024 MIDWEEK 5



PROOF POSITIVE

The Future Remains Bright For Planting Trees

By Daniel Dinell, president of Trees for Honolulu's Future

If trees could talk, what would they say?

"You humans have a problem," they'd tell us. "It's called climate change. We can help if you let us. We're really good at absorbing CO₂, the gas whose rising concentrations in your atmosphere are messing with your weather. We also reduce stormwater runoff, trap airborne pollutants and cool

communities. Just compare

impervious surfaces. That's where my friends at Trees for Honolulu's Future come in."

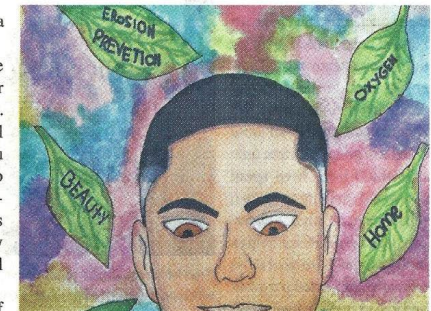
Since 2017, the nonprofit has been building bridges among public/private organizations and local communities by working to increase O'ahu's urban tree canopy.

This organization facilitates tree planting and care, educates the public, and advocates for laws, policies and funding that support trees

cal nursery or talking with a certified arborist.

• If you're fortunate to have city-owned land fronting your property, request a street tree. At no cost to you, the city will plant and prune the tree if you commit to watering it to help get the tree established. Locations must meet various standards, so while not every request will be approved, all will be considered.

Email the city Division of



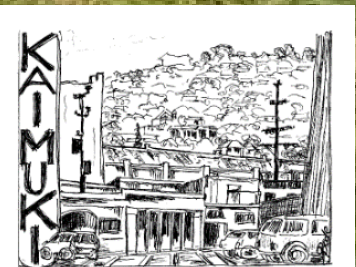
is a good place to start. While on the website, sign up for our free periodic newsletter.

Please, hear what our trees tell us about all they provide for our troubled world. Trees make life better for all of us, if only we could take a moment — stop, look around, take a deep breath and listen. Then, plant the right tree in the right place with the right care.

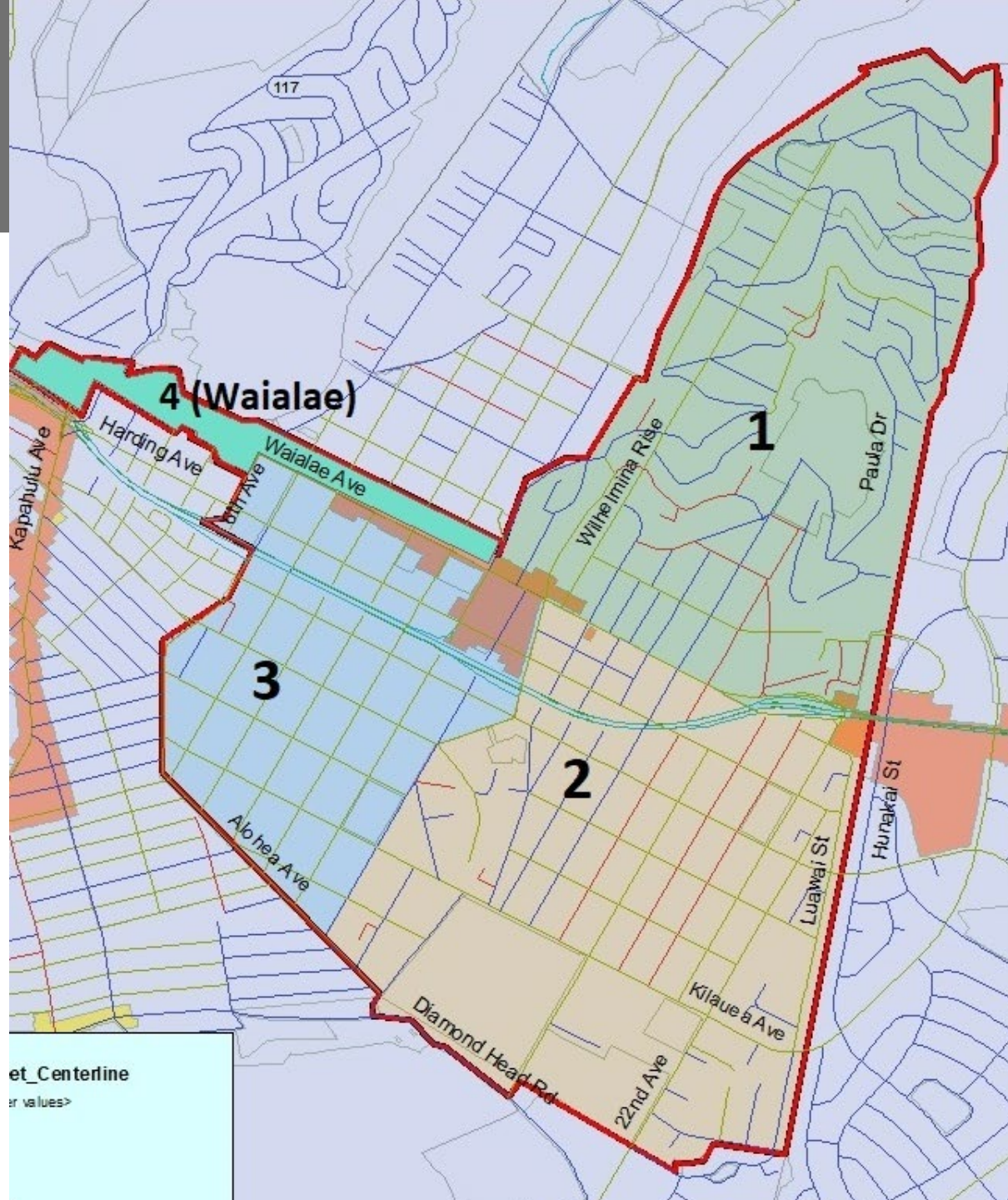
For more information, visit treesforhonolulu.org



Case Study: Kaimukī



#1 Focus Effort



#2 Get Smart/Data



www.pg-cloud.com/hawaii/

OUR FIRST TRAINING IN KAIMUKI!

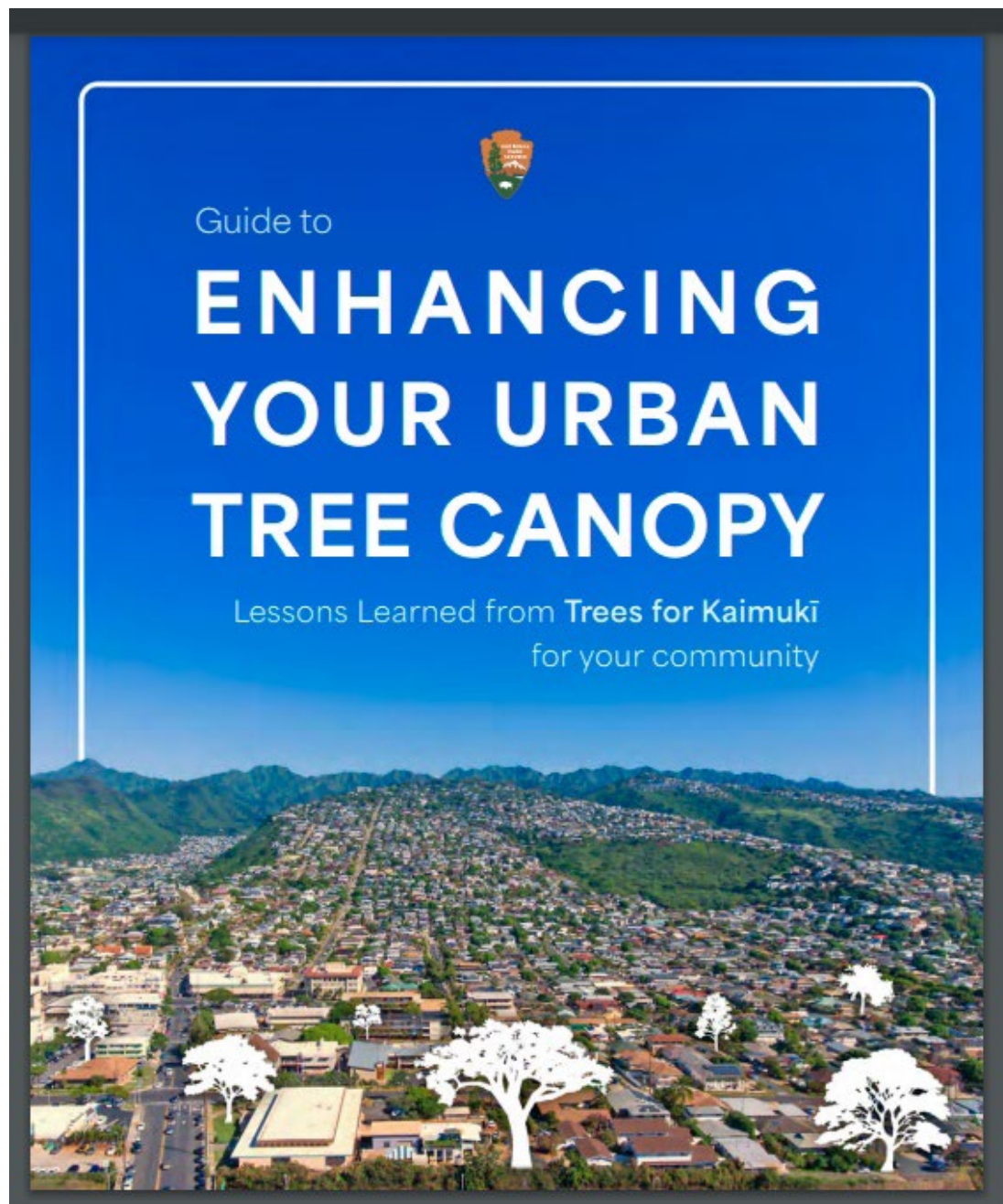
CITIZEN FORESTER TRAINING

Ready to become a Citizen Forester? Complete the 4-day training series & receive your Citizen Forester Certification!



#3 Engage Community





<https://www.treesforhonolulu.org/trees-for-kaimuki/>

Growing our Urban Forest

1. Focus Effort
2. Get Smart
3. Engage Community



Right Tree. Right Place. Right Care.

