Urban Forests for Climate Justice

AMERICAN FORESTS

CLIMATE CHANGE & EXTREME HEAT

CAUSES MORE DEATHS

each year than hurrricanes, lightning, tornadoes, earthquakes, and floods **COMBINED!**
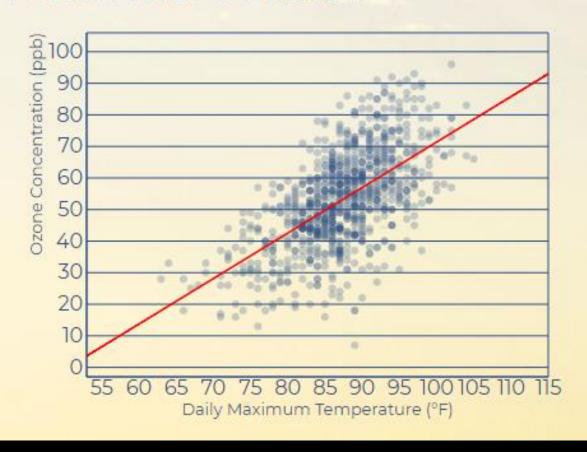
WHO'S AT RISK?

Temperature (left) vs vegetation (right) in D.C.
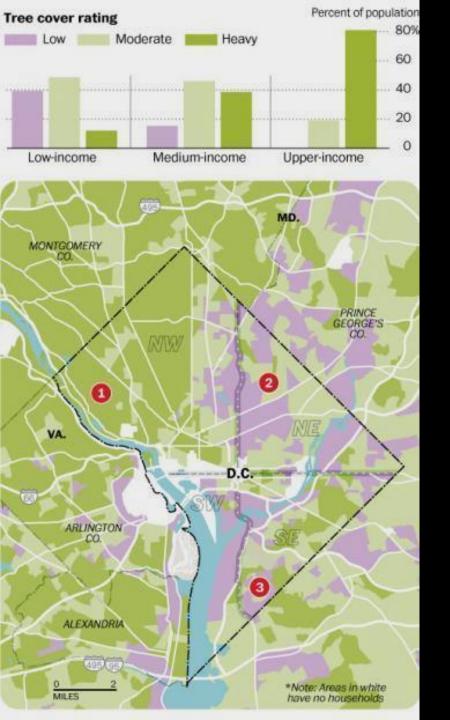
Tree cover rating

Low (purple) | Moderate (light green) | Heavy (dark green)

Percent of population

- Low-income
- Medium-income
- Upper-income

80%
60
40
20
0

MONTGOMERY CO.

MD.

PRINCE GEORGE'S CO.

NW

VA.

NE

D.C.

SW

SE

ARLINGTON CO.

ALEXANDRIA

① ② ③

0 — 2 MILES

*Note: Areas in white have no households

①
Tree-cover rating:
81%
Median household income:
$205,750

②
Tree-cover rating:
64%
Median household income:
$78,523
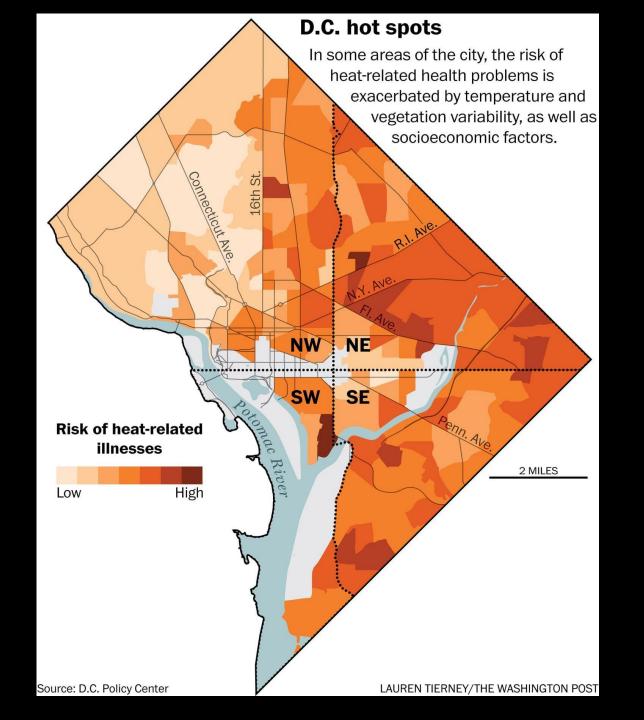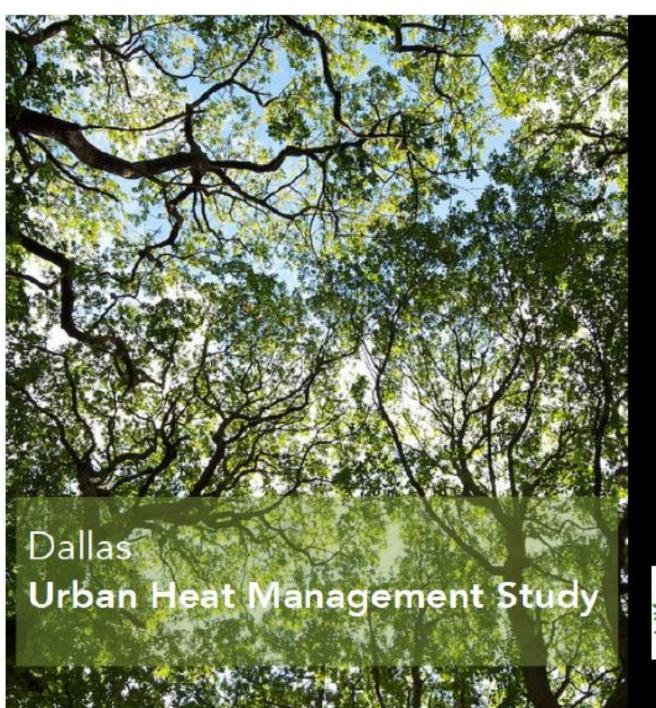
③
Tree-cover rating:
48%
Median household income:
$36,250

D.C. hot spots

In some areas of the city, the risk of heat-related health problems is exacerbated by temperature and vegetation variability, as well as socioeconomic factors.

Connecticut Ave.

19th St.

R.I. Ave.

N.Y. Ave.

Fl. Ave.

NW **NE**

SW **SE**

Penn. Ave.

Potomac River

Risk of heat-related illnesses

Low High

2 MILES

Source: D.C. Policy Center

LAUREN TIERNEY/THE WASHINGTON POST

tree loss scenario

combined strategies scenario

UHI-attributable heat mortality 2011

Low   Medium   High

0 1.5 3   6   9   12   Miles
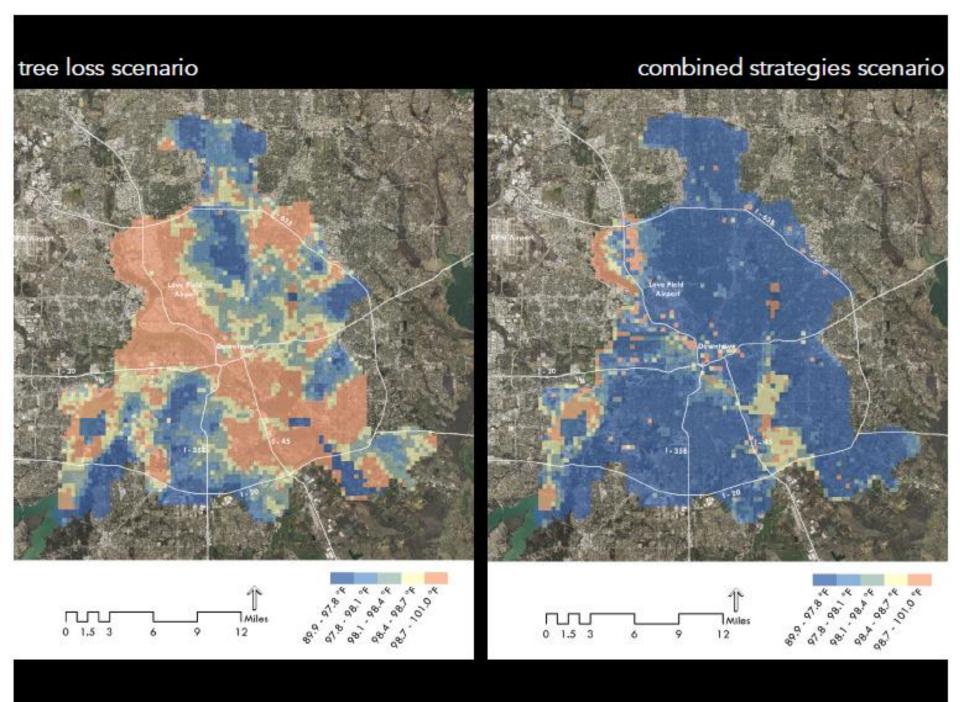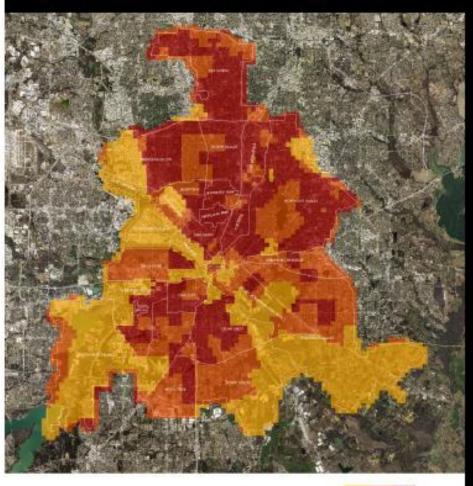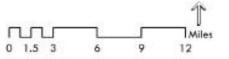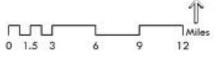
distribution of senior population

<5   5 - 20   20 - 30   30 - 50   50 - 215

0 1.5 3   6   9   12   Miles
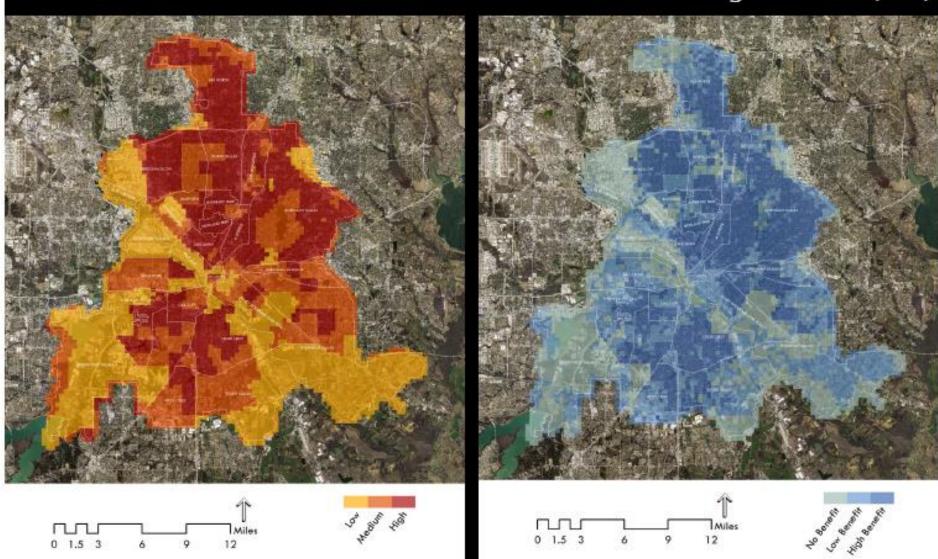
UHI-attributable heat mortality 2011
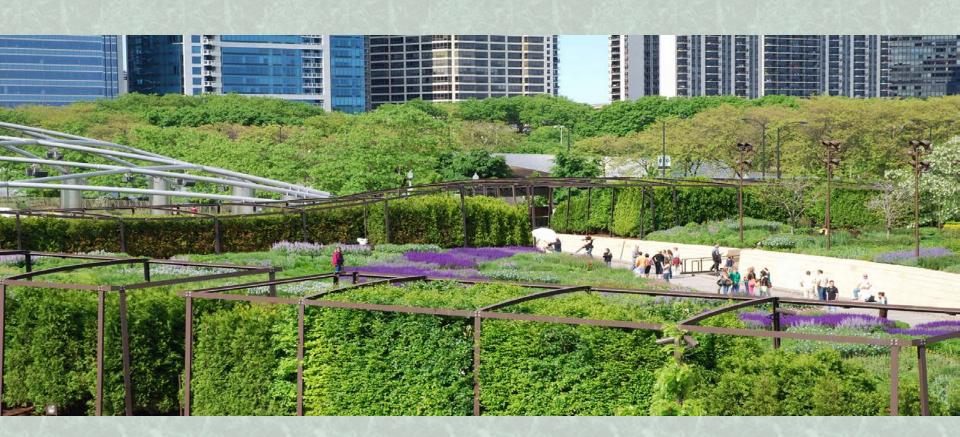
offset mortality under combined strategies scenario (22%)

Low Medium High

0 1.5 3 6 9 12 Miles

No Benefit Low Benefit High Benefit

0 1.5 3 6 9 12 Miles

Trees and forests in U.S. urban areas annually save **$4.7** billion in electricity

and **$3.1** billion in heating costs.

7.2% The average reduction in national residential energy use due to trees is 7.2 percent.

Forest Service
Research and Development
Highlights from the World Leader in Forestry Research

Climate Change, Urban Forestry & the California Commitment

Chuck Mills, Director
Grants and Public Policy

CALIFORNIA
ReLEAF

September 11, 2018
San Francisco, CA

GLOBAL CLIMATE ACTION SUMMIT
AFFILIATE EVENT

Commitment from Community Groups

Commitment from Governor Brown

California Forest Carbon Plan

Managing Our Forest Landscapes in a Changing Climate

May 2018

Manage California's forests as multi-benefit carbon sinks.

Increase total urban tree canopy statewide by 10 percent above current levels by 2030.

Ensure that tree canopy cover is prioritized in underserved communities.

Continue investing in urban forestry to enhance and augment the health of current urban forests statewide.

Safeguarding California Plan: 2018 Update

California's Climate Adaptation Strategy | January 2018

Support the creation of jobs, training programs, and workforce development in urban forest management and development.

Commitment from CAL FIRE

CAL FIRE Urban and Community Forestry Program:

- $64 million awarded over four fiscal years

- $59 million invested to support 89 projects

- Planting 99,000 trees

- Projects will reduce GHGs by 210,000 MTCO2e

- Over 75% of awarded projects serving DACs

- Projects address climate adaption and resiliency

- Projects include UF inventories and tree reutilization

Greening San Francisco

- Plant and maintain 2,000 site appropriate trees in the Southeastern region of San Francisco.

- Employ 114 local residents from the city's most underserved areas to promote tree benefits.

- San Francisco's Bureau of Urban Forestry will perform long-term maintenance on these trees.

Commitment from CA Natural Resources Agency

CA Natural Resources Agency Urban Greening Program:

- $126 million awarded over three years

- $80 million out supporting 39 projects

- Projects reduce GHGs by 21,626 MTC02e

- 92% of awarded projects are in DACs

- Projects address adaption and resiliency

- Projects include parks, trails, bioswales

San Leandro Creek Urban Greenway, Phase 1

- Multi-phased project connecting the MLK Regional Shoreline, Downtown San Leandro BART and the Lake Chabot/Bay Area Ridge trail.

- Creates a 1.2-mile greenway linking MLK Shoreline Park to 105th Ave along San Leandro Creek in Oakland.

- Plants 300-500 new trees as part of a linear green space with native riparian landscape installation and amenities.
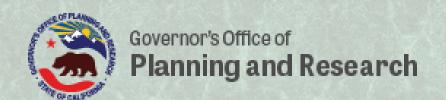
Commitment from other State Agencies

Commitment in other Climate Change Programs

Affordable Housing and Sustainable Communities
Integrating affordable homes and sustainable transportation

Projects can infiltrate storm water, recharge groundwater, reduce urban heat island effects, sequester carbon, improve air quality, and create safe public green spaces and trails.

Coastal Conservancy
STATE of CALIFORNIA

CALIFORNIA CLIMATE INVESTMENTS
Cap and Trade Dollars at Work

Climate Ready Grant Announcement

Nature-Based Solutions for Climate Adaptation
Funded by the Greenhouse Gas Reduction Fund

The AHSC-funded components of the Project <u>must</u> incorporate more than one urban greening feature as defined with dedicated maintenance for at least two years.

"AHSC helps create holistic communities with affordable housing & transportation options near jobs & other key destinations."

CALIFORNIA CLIMATE INVESTMENTS
Cap and Trade Dollars at Work

Urban greening and forestry is one of eight eligible project types. 7,000 trees planted from Round One.

Transformative Climate Communities Strategic Growth Council

$70 million
Fresno

$35 million
Los Angeles

$140 million

Total Funds

$35 million

Third Location
Determined Competitively

* These funding amounts are for the FY 2016-2017 TCC Program

Commitment from the State Legislature

Signed by Governor Brown in 2017 after receiving full support of <u>all</u> members of the State Legislature, AB 1530:

- Permanently protects the Urban Forestry Program in California – <u>one of the very few state's to have such a requirement.</u>

- Integrates climate adaption and workforce development as critical components of the Program.

- Requires regional targets for urban tree canopy with attention to tree species' adaptability and resiliency.

- Cites urban forests as a key mechanism to sequester carbon, reduce energy consumption, manage stormwater and mitigate urban heat island effect.

Assembly Bill 1530 (Lorena Gonzalez Fletcher) – Urban Forestry Act
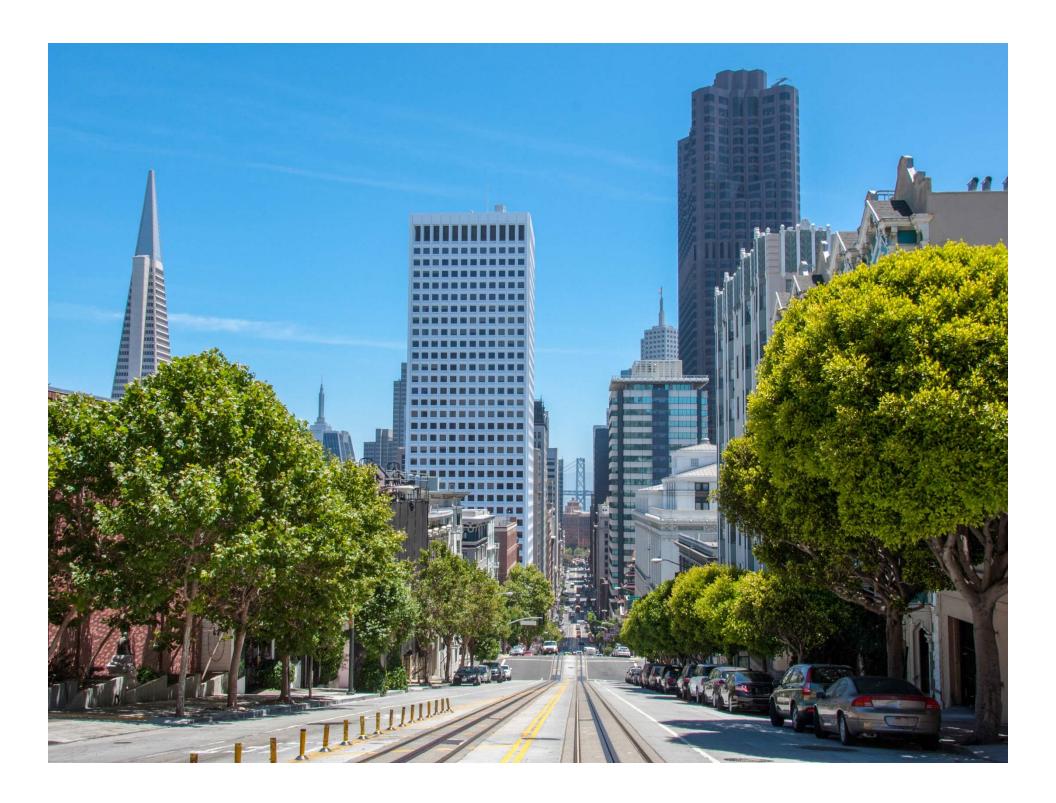
Commitment from Californians

Stand up for our land, water, and natural resources.
Yes on 68

California Drought, Water, Parks, Climate, Coastal Protection, and Outdoor Access For All Act of 2018.

- Passed by 57.4% of California Voters.

- Record $4.1 billion investment in parks & water

- First California park bond to devote an entire chapter to climate preparedness.

- Encourage entities to measure GHG reductions and carbon sequestrations associated with projects that receive funding from the bond.

- Prioritizes projects that provide workforce training in disadvantaged communities.

- Includes not less than $15 million for urban forestry and $20 million for multibenefit green infrastructure investments in or benefiting disadvantaged communities.

999 Third Ave. Suite 4600
Seattle, WA 98104
mark@cityforestcredits.org
(206) 623-1823

36,000,000

Puget Sound

175,000 per Year

New York City
Atlanta
Philadelphia
Miami
Boston
Cleveland, Pittsburgh, St. Louis, Portland, OR, San Francisco, Seattle, and Boise

$700,000,000

$600,000,000
2016

$15,000,000,000

2016

How Much of That to Our City Forests?

The Product – Not BitCoin - TreeCoin

City Forest Carbon+ Credit

➤ Metric ton of CO_2, plus quantified rainfall interception, air quality, energy savings

➤ National credit, national standard, certified by national non-profit registry

➤ Planting and, for first time anywhere, **<u>preservation</u>**

Benefits Beyond Carbon

➢ Locally sourced credits

➢ Favorable media coverage for everyone

➢ Addresses global issue, delivers local benefits

➢ *No losers – everyone wins*

Who Are We?

City Forest Credits

- 501(c)(3) non-profit incorporated in Seattle in 2015
- Formed to develop city forest protocols and serve as the certification registry
- We are of, by, and for urban forestry

City Forest Projects and Programs

- Austin: water quality, storm water, flood control
- King County, WA: Preservation of several thousands of acres of UF
- Pittsburgh: Preservation project
- San Francisco: Buyer recruitment for planting after Prop E
- Dallas: preservation in GTF and planting
- Shoreline, WA: 3-acres of inaccessible open space; environmental justice

The tree in front of my home is a **word**

The trees on my street are a **sentence**
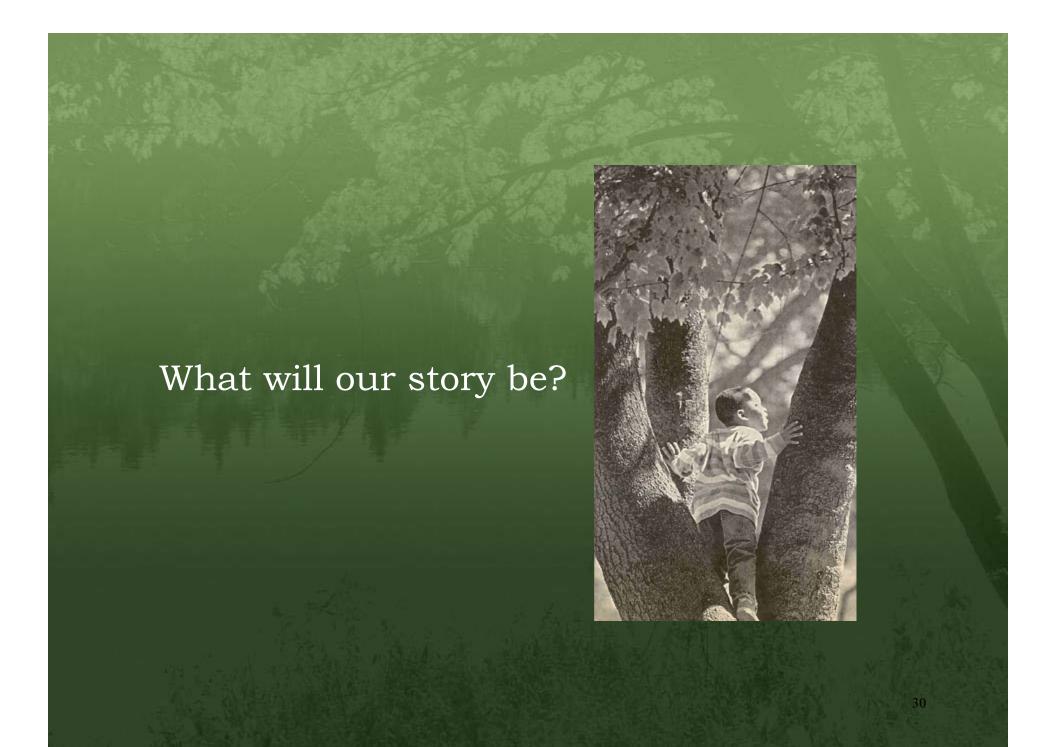
The trees in my neighborhood are a **paragraph**

All the trees in my community are a **story**
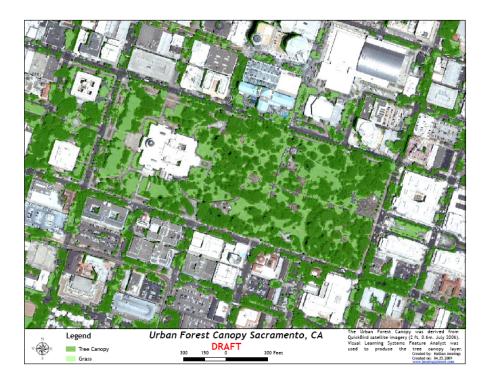
What will our story be?

999 Third Ave. Suite 4600
Seattle, WA 98104
mark@cityforestcredits.org
(206) 623-1823

Sacramento Shade +

Urban Forests for Climate Solutions at the Global Climate Action Summit
September 11, 2018

Kathleen Ave (with thanks to Amy Young)
Climate Program Manager
SMUD Energy Research & Development
and
Chair, Capital Region Climate Readiness Collaborative

Powering forward. Together.

SMUD™

Summary

- Sacramento Shade Program Overview
- SMUD Landscape Carbon Assessment
- Regional Collaboration

Urban Forest Canopy Sacramento, CA
DRAFT

Legend
Tree Canopy
Grass

300 150 0   300 Feet

The Urban Forest Canopy was derived from QuickBird satellite imagery (2 ft, 0.6m, July 2006). Visual Learning Systems Feature Analyst was used to produce the tree canopy layer.
Created by: Nathan Jennings
Created on: 04.25.2009
www.jenningsplanet.com

The History of SMUD Shade Trees

- Established in 1990 as a direct result of the closure of Rancho Seco Nuclear Power Plant
- Partnership between SMUD and the Sacramento Tree Foundation
- Goal was 1,000,000 trees in the yards of Sacramento residents to reduce peak power load
- Close to 600,000 planted so far

Current Program—Energy Efficiency Focus

- Sacramento Shade
  - Home owners and renters (with their landlords' permission) can receive up to ten free shade trees to cool their home
- Community Shade
  - Trees are available for parks, schools and other publically owned land (shading a building is not a requirement)
- Energy Efficiency model has been outpaced by
  - residential new construction trends—Title 24
  - solar requirements
  - smaller lot sizes

SMUD

Key Features of the Proposed Redesign

- Modify available tree species
  - Add trees that store more carbon (evergreens)
  - Remove trees that require large amounts of water
- Improve tree survivability
  - Continuous stewardship
  - Test new tree species that are more resilient to climate change
- Focus on environmental justice/equitable canopy growth
- Align program goals with environmental benefits of trees—measure carbon storage and monitor:
  - Carbon stored by trees planted
  - Number of trees each customer plants
  - Carbon saved by shading homes
- SMUD will be the first utility in the nation to offer such an all encompassing tree program

SMUD

Customer Benefits

- Customers will continue to receive in person education from Community Foresters to help them make an environmental impact with their landscape planning
- Offer <u>every</u> customer their very own "best urban forest"
- Continue to work with communities to bring trees to neighborhood parks, schools and streets
- New planting scenarios will allow for more trees to be planted per lot
- Continue to grow Neighborwoods program by creating community sustainability in underserved areas
  - Arden Arcade, Del Paso Heights, Foothill Farms, Rio Linda, South Sacramento, and more

Broader Context:
SMUD Landscape Carbon Assessment

Photo: P. Huber

- Carbon sequestered in biomass and soils (landscape carbon) represents a large pool of potential greenhouse gas (GHG) emissions
- Losses or additional sequestration are impacted by land use changes and management practices
- The outcomes from this assessment can be used to identify the locations most susceptible to conflict between the carbon goals of the region and the expansion of urban areas.

SMUD®

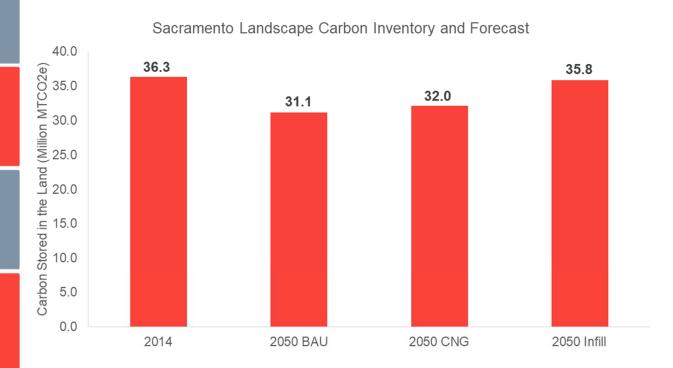## CLASSIFY THE LANDSCAPE BASED ON SPECIFIC LULCs

IDENTIFY RELEVANT CARBON POOLS FOR EACH LULC

DEVELOP A PER ACRE CARBON DENSITY BASED ON LULC IN THE STUDY AREA

APPLY CARBON FACTORS TO CURRENT LULC LAYERS

OVERLAY FUTURE DEVELOPMENT SCENARIOS ON THE CURRENT LULC LAYER

APPLY CARBON FACTORS TO SCENARIO-BASED LULC LAYERS

Sacramento Landscape Carbon Inventory and Forecast

Carbon Stored in the Land (Million MTCO2e)

Year	Value
2014	36.3
2050 BAU	31.1
2050 CNG	32.0
2050 Infill	35.8

— BAU forecast results in 5.2 million MTCO2e loss by 2050
— Driven by conversion to urban/developed with lower carbon density

SMUD®

Project Concepts

Urban Forestry

Storage of atmospheric CO_2 in aerial and subterranean tree biomass

— Co-benefits include reduction of urban heat island, indoor heating and cooling, and improvement of air quality and runoff

— Existing tree programs and General Plan support urban forestry

— Doubling canopy (consistent with General Plan) could sequester an additional 1.9 million $MTCO_2e$

Nutrient Management

Optimizing nutrient application can increase carbon sequestration and reduce nitrous oxide emissions (change rate, source, timing, placement)

— Co-benefits include improved groundwater and ag runoff quality

— Various practices that can sequester ~0.21 MTCO2e per acre per year

— 50% of agricultural land converted to manure ~ 280 thousand MTCO2e sequestered by 2050

Biochar

Partially combusted biomass that results in stabilized carbon (charcoal), and can be integrated into agricultural soils as a soil amendment

— Co-benefits are highly variable but include increased water holding capacity and improved soil health, and studies are not conclusive as to whether biochar affects crop yield in Sacramento County

— More research is needed in the region prior to implementing a biochar program

SMUD

Technical potential from activities

Density + Project Concept Technical Potential = **6.9 million MTC02e**

Additional sequestration potential from other initiatives not evaluated

— Combining density with activity-based opportunities can result in net increase in landscape carbon

— Multiple additional opportunities can further drive up landscape carbon

Assessment Conclusions

— Findings
  — *Landscape carbon can be estimated using existing data*
  — *The sequestered carbon in the landscape and potential losses are significant, and justify proactive planning*
  — *Carbon can be integrated into multivariable conservation and land planning frameworks in a spatially explicit manner*
  — *Projects and activities can sequester additional carbon*
  — *There are multiple opportunities to evolve the methodology*

— Recommended next steps
  — *Expand study region, evolve methodology, and incorporate economic metrics*
  — *Coordinate outreach and engagement alongside the analytical framework*
  — *Integrate carbon as a priority in land use planning*
  — *Coordinate as California utilities to share findings, expand dialog, and explore policy and other initiatives that support the energy sector's carbon objectives*

SMUD

Membership

Capital Region **CLIMATE READINESS COLLABORATIVE**

350 sacramento

AECOM

AMERICAN RIVER PARKWAY FOUNDATION

ASCENT ENVIRONMENTAL

CALIFORNIA CENTER FOR CIVIC PARTICIPATION

COMMUNITY RESOURCE PROJECT INC.

Cool Davis

Davis California

DUDEK

CITY OF FOLSOM DISTINCTIVE BY NATURE

indigo HAMMOND+PLAYLE ARCHITECTS, LLP

ILG INSTITUTE FOR LOCAL GOVERNMENT℠

iWEST SACRAMENTO STATE — WATER ENERGY SUSTAINABILITY TECHNOLOGY

metrochamber SACRAMENTO METROPOLITAN CHAMBER OF COMMERCE

PG&E Pacific Gas and Electric Company®

Placer County AIR POLLUTION CONTROL DISTRICT

Propel®

SACOG

SACRAMENTO COUNTY

City of SACRAMENTO Community Development

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

SMUD™

N&R NEWS & REVIEW

SACRAMENTO TREE FOUNDATION

UCDAVIS UNIVERSITY OF CALIFORNIA

UCDAVIS POLICY INSTITUTE FOR ENERGY, ENVIRONMENT AND THE ECONOMY

VALLEY VISION Connect. Partner. Impact.

WATER FORUM
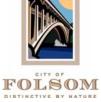
YOLO-SOLANO AIR QUALITY MANAGEMENT DISTRICT

The Capital Region Climate Readiness Collaborative is a program of the Local Government Commission.

Local Government Commission *Leaders for Livable Communities*

Channel Partners

APA CA American Planning Association California Chapter Sacramento Valley

Franciscans For Justice

THANK YOU!

kathleen.ave@smud.org

smud.org/shadetrees

Sacramento Tree Foundation

916-924-TREE(8733)

SMUD

Growing Futures: Youth, Jobs, and Workforce Development

Brigitte Orrick

Director of Recruiting and Employee Development

The Davey Tree Expert Company

Dan Herms, PhD

Vice President of Research and Development
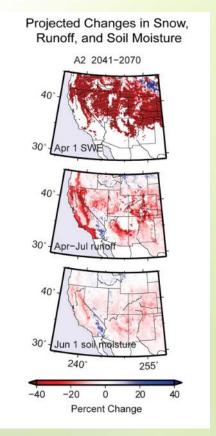
The Davey Institute of Tree Science

DAVEY
Proven Solutions for a Growing World

Climate Change Projections (US EPA)

- **Continued warming**
- **More drought**
- **Reduced snowpack**
- **Less water resources**
- **More wildfire**

Pinyon pine mortality

Projected Changes in Snow, Runoff, and Soil Moisture

A2 2041–2070

Apr 1 SWE

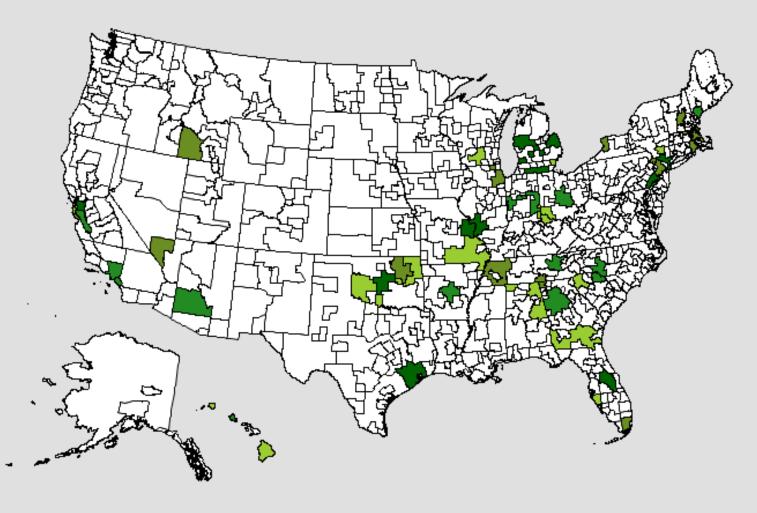Apr–Jul runoff

Jun 1 soil moisture

Percent Change

Arboriculture implications next 30 years according to Dr. Herms

- **Increasing temperature nationwide**

- **Increasing storm intensity NE, SE, MW**

- **Decreasing precipitation SE, West**

- **Increasing insect pest pressure**

- **Increased stress for some trees; increased growth for others**

- **Increasing wildfire**

- **Increased worker stress, especially in southern US**

- **Trees can help mitigate effects of climate change**

Demand for tree work will increase! Need more urban foresters & arborists!

Growing the Diversity of the Tree Care Industry

Employment of tree trimmers and pruners, by area, May 2017

Source: US Bureau of Labor Statistics
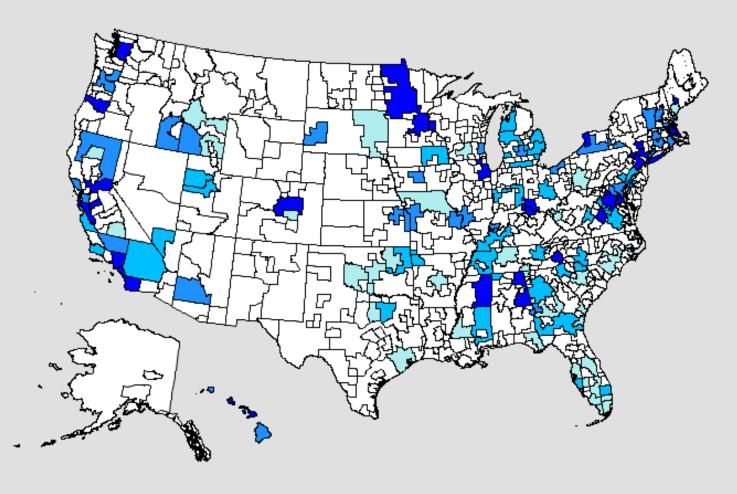
Employment
☐ 30 - 50   ☐ 60 - 140
☐ 190 - 560   ■ 580 - 1,780

Blank areas indicate data not available.

Annual mean wage of tree trimmers and pruners, by area, May 2017

Source: US Bureau of Labor Statistics

Annual mean wage

- ☐ $22,100 - $33,800
- ☐ $34,030 - $37,780
- ☐ $38,080 - $45,200
- ☐ $45,630 - $66,330

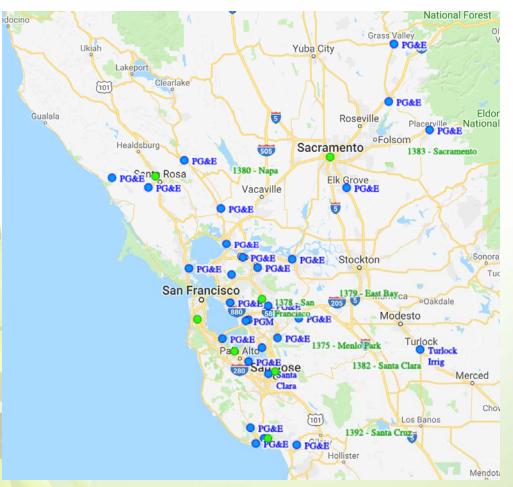Blank areas indicate data not available.

Tree Trimmers & Pruners

Top paying metropolitan areas for this occupation:

Metropolitan area	Employment (1)	Employment per thousand jobs	Location quotient (9)	Hourly mean wage	Annual mean wage (2)
San Francisco-Redwood City-South San Francisco, CA Metropolitan Division	40	0.04	0.13	$31.89	$66,330
Chicago-Naperville-Arlington Heights, IL Metropolitan Division	140	0.04	0.13	$29.29	$60,920
New York-Jersey City-White Plains, NY-NJ Metropolitan Division	730	0.11	0.38	$27.98	$58,200
Asheville, NC	(8)	(8)	(8)	$27.73	$57,670
Los Angeles-Long Beach-Glendale, CA Metropolitan Division	560	0.13	0.44	$27.66	$57,520
Kahului-Wailuku-Lahaina, HI	(8)	(8)	(8)	$27.30	$56,780
Charlottesville, VA	(8)	(8)	(8)	$26.25	$54,610
Minneapolis-St. Paul-Bloomington, MN-WI	(8)	(8)	(8)	$26.13	$54,350
San Jose-Sunnyvale-Santa Clara, CA	540	0.50	1.73	$25.73	$53,530
Lewiston-Auburn, ME	(8)	(8)	(8)	$25.41	$52,860

Source: US Bureau of Labor Statistics

The Davey Tree Expert Co. & Surgery Co.

- Davey employs 9000 people nation-wide
- Company will double in size in 10 years by business growth projections – not including factors such as climate change
- Recruiting & Employee Development is a high priority

Making the Connection

Source: https://leadersup.org

Opportunities in San Francisco & East Bay Region

- **Climate Change = More Trees (Installation & Maintenance)**

- **More Tree Care = More Urban Foresters & Arborists**

- **Significant Workforce Gap = Tap New Job Seeker Populations**
  - **Increase worker training programs in the green sector**
  - **Identify funding to support workforce training & urban canopy**
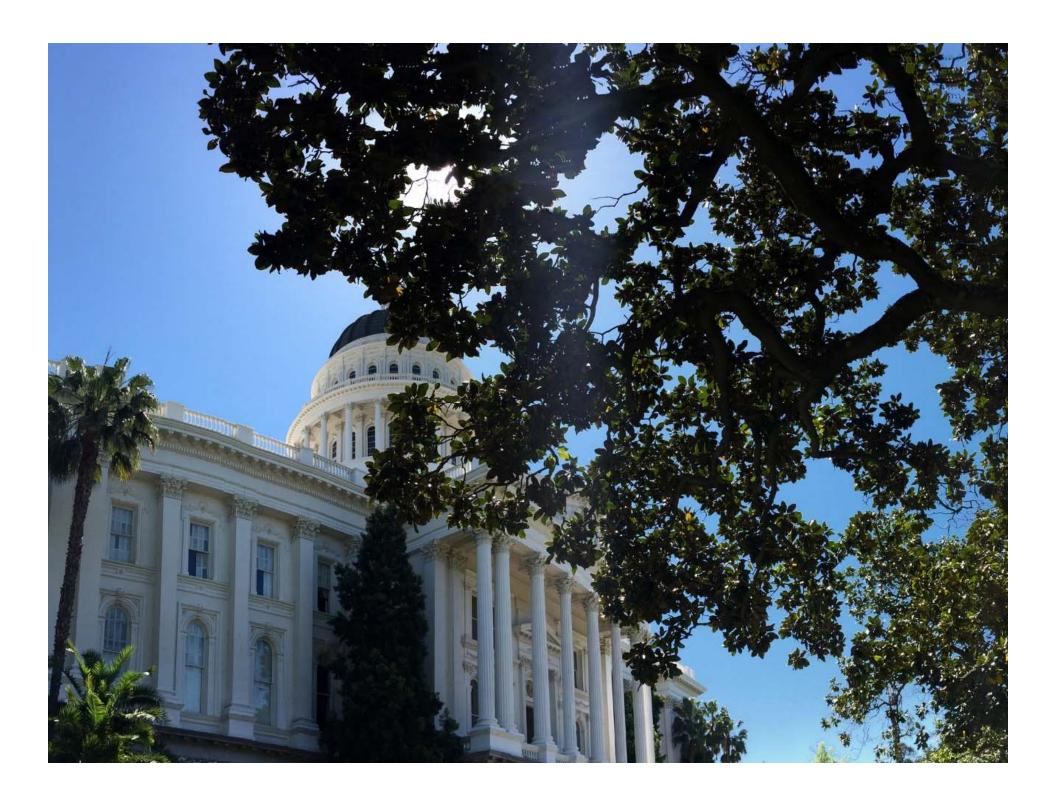
Thank You!

Brigitte Orrick

Director of Recruiting & Employee Development

The Davey Tree Expert Company

Brigitte.Orrick@davey.com

(330) 673-9515 ext. 8470

DAVEY
Proven Solutions for a Growing World

VibrantCitiesLab.com

iTreeTools.org

CityForestCredits.org

UrbanForestPlan.org

UrbanForestCoalition.org

CAL FIRE Urban & Community Forestry
Climate Grants

Thank you for your time!

**Please join us at the
Tree Planting
at the corner of
Hyde and Turk Streets –
3 minutes walk
from here
*(near 161 Hyde St.)***