

Nature Based Solutions as an Energy Efficiency Strategy

Tessa Charnofsky, Los Angeles County, SoCalREN



Panel Discussion

- I. Welcome
- II. Panel Discussion
 - A. Dr. Edith de Guzman
 - B. Nurit Katz
 - C. Dr. Cassie Rauser
- III. Small group discussion at each table, report back
- IV. Closing Remarks





Dr. Edith de Guzman UCLA Cooperative Extension Specialist

Edith de Guzman (she/her) is an interdisciplinary researcher, practitioner, educator, and curator working with diverse audiences to understand and address the impacts of climate change in under-represented communities. She is a Cooperative Extension specialist at the UCLA Luskin Center for Innovation.

Her work investigates best practices on water management, climate adaptation, heat mitigation, and urban forestry for the sustainable transformation of the Los Angeles region and beyond.

From 2014 to 2020, Edith served as Director of Research at TreePeople. Edith co-founded the Los Angeles Urban Cooling Collaborative, Los Angeles Urban Forest Equity Collective, and ShadeLA — each a multisectoral partnership working to make LA livable in a warming climate.

In 2023, Edith concluded her Ph.D. studies at the UCLA Institute of the Environment & Sustainability. For her dissertation, she conducted three applied, interdisciplinary studies on climate adaptation and climate health equity using community-based methods. She earned a master's in urban planning from the UCLA Luskin School of Public Affairs and a bachelor's degree in history and art history, also from UCLA.





Nurit Katz

Vice Chair, Board of L.A. Department of Water & Power

UCLA Chief Sustainability Officer

As Chief Sustainability Officer for UCLA, Nurit led the development of the university's first comprehensive sustainability plan, award winning landscape plan and biodiversity commitment, and fosters collaboration across the leading public university to advance sustainability through education, research, operations, and community partnerships.

Ms. Katz serves as Vice Chair of the Commission on the Board of the Los Angeles Department of Water and Power (LADWP), the largest public utility in the US. As Commissioner she led a major motion on biodiversity, access to nature, and nature-based solutions. She currently serves on the Biodiversity Expert Council for the City of Los Angeles, and the Sepulveda Basin Wildlife Areas Steering Committee.

Nurit has over 15 years of teaching experience and is an Instructor for the UCLA Extension Sustainability Certificate Program. She has also taught for the UCLA Institute of Environment and Sustainability and prior to UCLA taught in environmental and outdoor education through a range of programs including Americorps Garden Education, Los Angeles County Parks and Recreation, and a farm to school program. Nurit serves as the Outreach Coordinator for the Los Angeles Raptor Study, a community science based study of nesting raptors in LA, supported by Friends of Griffith Park, volunteers with the Ojai Raptor Center.



Ms. Katz holds an MBA and a Masters in Public Policy from the UCLA, and a BA in Environmental Education from Humboldt State University. She is currently a PhD candidate in Ecology and Evolutionary Biology at UCLA



Dr. Cassie Rauser The Fielding Family Chief Executive Officer TreePeople

Dr. Cassie Rauser is a climate and sustainability leader who works at the intersection of science, policy, and community to advance equitable, nature-based solutions. She serves as The Fielding Family Chief Executive Officer of TreePeople, where she leads efforts to grow climate-resilient landscapes, strengthen communities, and restore the connection between people and nature across Southern California.

Earlier in her career, Cassie worked in Costa Rica, partnering with local communities, governments, and private organizations to help establish a public-private nature preserve. She later served as Executive Director of UCLA Sustainable LA Grand Challenge, shaping regional sustainability, clean energy, resilient water supply and biodiversity plans and strategies, including the first L.A. County sustainability plan, OurCounty (2019) and the Los Angeles Department of Water & Power's LA100 Equity Strategies (2023) for transitioning to clean energy by 2035. Just prior to joining TreePeople she worked to co-develop Los Angeles Mayor Bass' 2026 Climate Implementation Plan.

A trained biologist, Dr. Rauser has served on the City of L.A.'s biodiversity expert council since its inception (2018) and co-developed the first comprehensive county-wide ecosystem assessment in the Ecosystem Health Report Card for L.A. County (2021). Her work is grounded in a lifelong love of nature—especially butterflies—and a belief that people and ecosystems are most resilient when they thrive together.



UCLA

Luskin Center
for Innovation

UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources

Nature Based Solutions as an Energy Efficiency Strategy

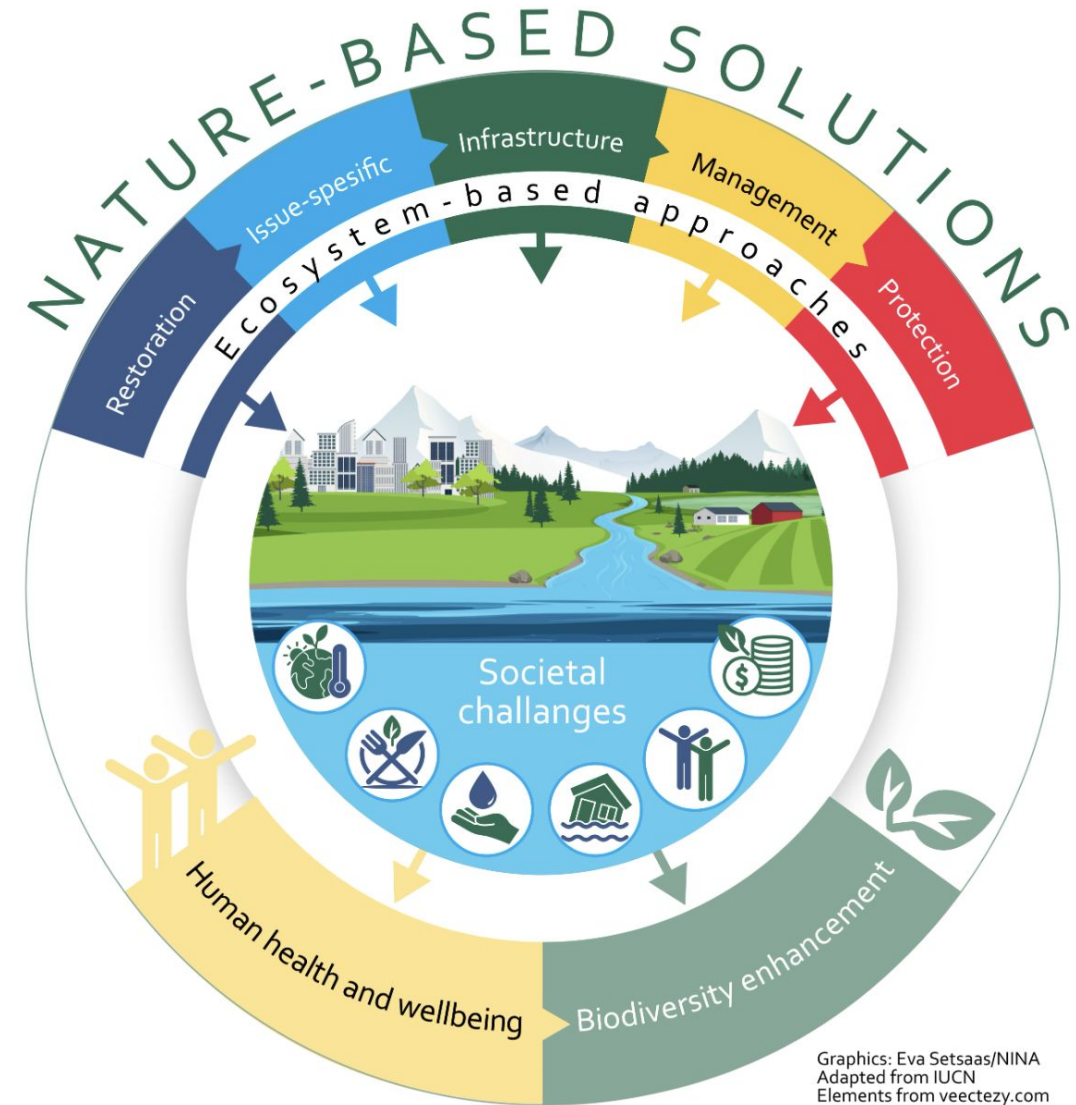
Edith de Guzman, PhD

June 24, 2026

Nature-based solutions

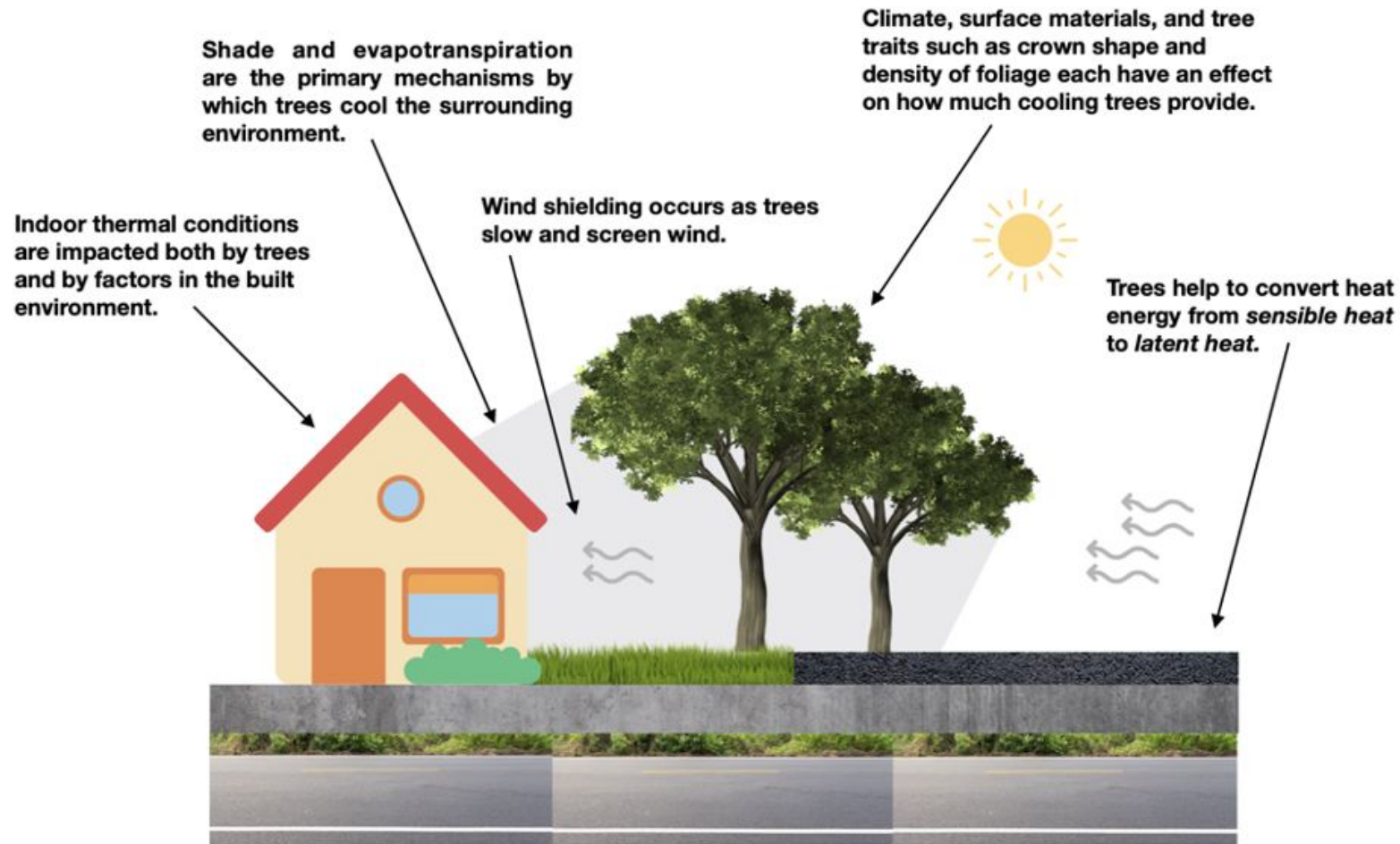
Actions to protect, conserve, restore, and sustainably use and manage ecosystems in a way that addresses social, economic and environmental challenges while simultaneously benefiting human well-being and biodiversity.ⁱ

- Co-benefits are key
- Potential to provide benefits as effectively as gray infrastructure
- NBS = only type of infrastructure that appreciates in value



ⁱWorld Resources Institute, <https://www.wri.org/insights/what-exactly-are-nature-based-solutions>

Cooling and energy demand functions - how trees do it



de Guzman, E. B. (2023). Evaluating the impact of trees on residential thermal conditions in los angeles using community science. *Cities and the Environment (CATE)*, 16(2), 8.

Climate, tree species, and placement

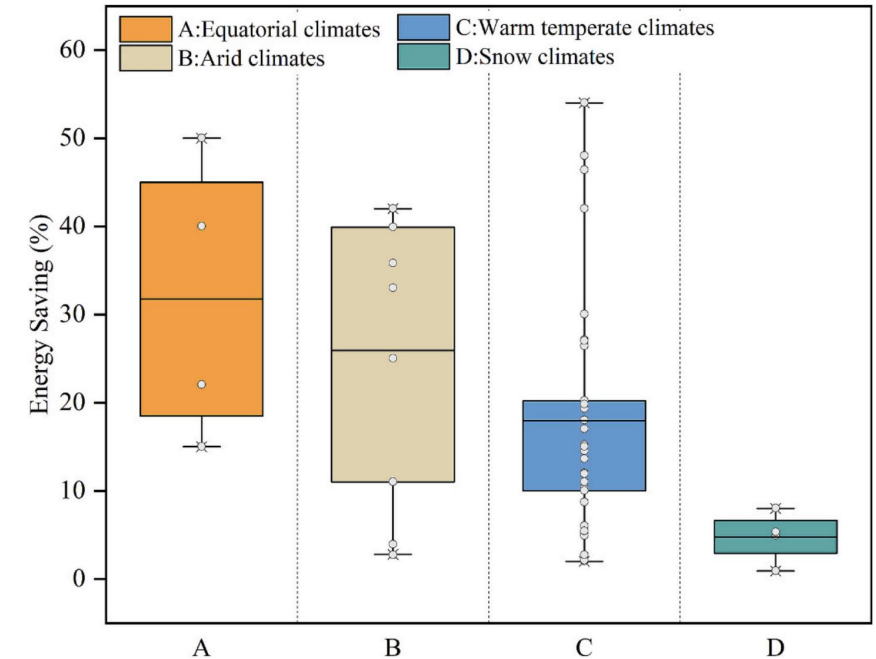
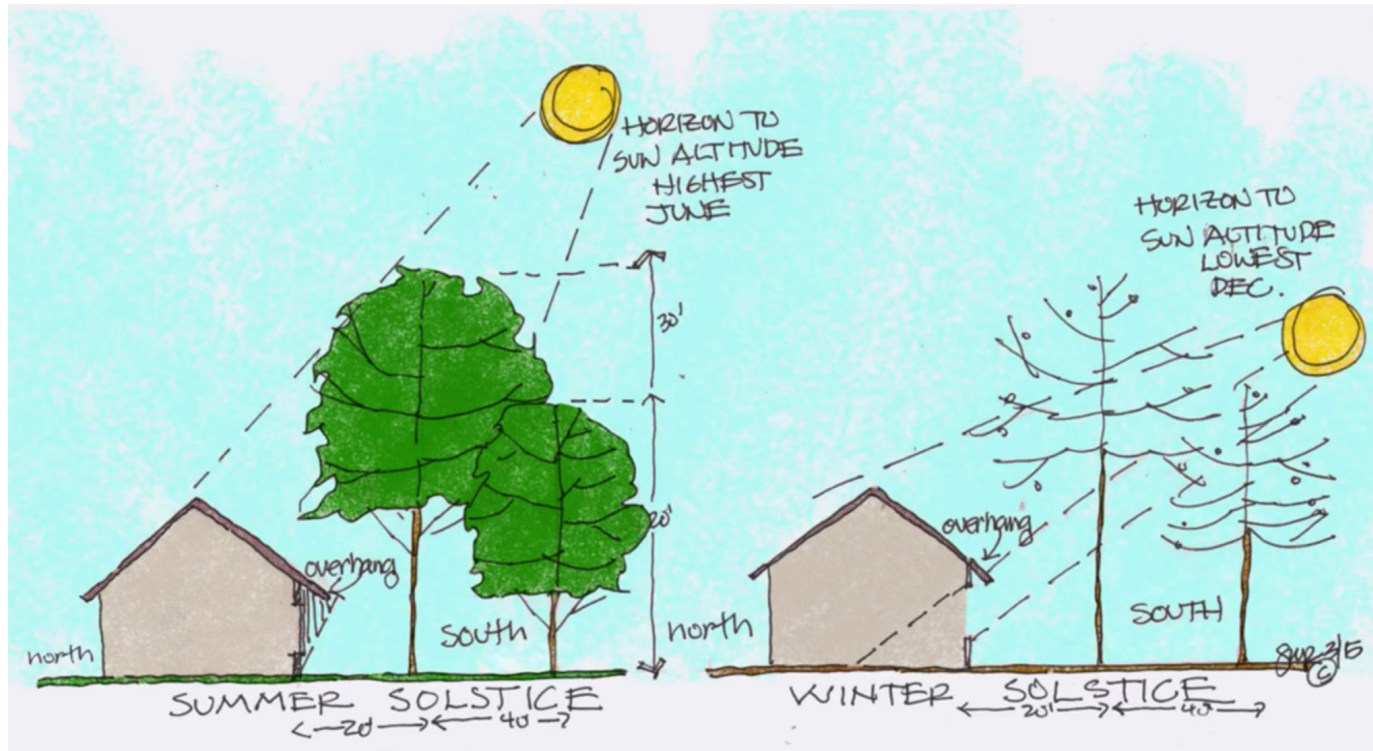


Fig. 2. Comparison of results across the four climate zones.

- Trees can reduce cooling energy use by up to 60 %
- Savings typically range from 32% in equatorial climates to 5% in snow climates.

Image: Purdue Extension Forestry & Natural Resources

Graph: Yang, C., Xie, M., & Mendis, T. (2025). Evaluating the role of urban trees on building energy use: a global literature review. *Landscape and Urban Planning*, 264, 105475.

Calculating and verifying benefits

18% of global energy consumption is used to cool and heat buildingsⁱ

Welcome to the i-Tree Planting Calculator!

Easily estimate the long-term environmental benefits from a tree planting project in terms of **carbon dioxide**, **air pollution**, **stormwater** impacts, **energy savings**, and **canopy cover**.



Location Parameters **Trees** Report

Tree Planting Configurations

ATTENTION: Please, limit projects to batches of 100 or less tree groups.

Enter the tree groups for the project - use the "+" button to enter additional groups. Search for a species by entering at least 2 characters of its name. DBH and Tree Details are for the time of planting. Building information is used to estimate the impact of trees on building energy usage; enter "None" for Climate Controls to exclude these estimates.

Units
☒ English (feet & inches) ☐ Metric (meters & cm)

Nomenclature
☒ Common Name ☐ Scientific Name

Tree Group Information				Building Information				Tree Details		
	Group Number	Species	DBH in inches	Distance to Nearest in feet	Tree is ____ of Building	Building Vintage	Building Climate Control	Condition	Exposure to Sunlight	Number of Trees
	1	Bauhinia spp (Genus)	1	0-19	South (180°)	Built after 1980	Heat & Cool	Excellent	Full Sun	1
	2	Bauhinia spp (Genus)	1	0-19	South (180°)	Built after 1980	Heat & Cool	Excellent	Full Sun	1
	3	Searsia spp (Genus)	1	20-39	South (180°)	Built after 1980	Heat & Cool	Excellent	Full Sun	1

ⁱInternational Energy Agency <https://www.iea.org/energy-system/buildings>

ⁱⁱ i-Tree Planting Calculator <https://planting.itreetools.org/>

Trees for energy efficiency: Examples beyond LA



PHOENIX GREEN

*Designing a Community
Tree Planting Program for
Phoenix, Arizona*



Tree canopy cover is an equity issue

07.2021

NATIONAL GEOGRAPHIC



Along one Los Angeles street, wealthy areas are shady and cool.



The tree canopy decreases and temperatures rise as you drive south.



On a warming planet, this divide between rich and poor leaves many at risk.



BEATING THE HEAT

Trees and shade as necessary infrastructure

Hottest day in L.A. County's recorded history:

121°F on Sept. 6, 2020

Study site with no trees or AC in southeast LA (high of 111°F) :

107.4°F indoors



de Guzman, E. B. (2023). Evaluating the impact of trees on residential thermal conditions in los angeles using community science. *Cities and the Environment (CATE)*, 16(2), 8.
Photo: Associated Press/M. Spencer Green

Concluding thoughts

- In a hotter world, trees+ are infrastructure
- ROI increases with time
- Benefits extend beyond energy →
- Challenges:
 - Insufficient space for nature-based solutions
 - Maintenance support isn't equally available in all communities
 - Transitioning to treating trees+ as infrastructure (extending protection, budgets, maintenance)

City Trees Save Lives

Green spaces significantly cool our ever-hotter cities. New research suggests more trees could cut heat-related ER visits in LA by up to two-thirds.



Case Study: LADWP Shade Tree Program

Nurit Katz

Vice President, Board of Water and Power Commissioners



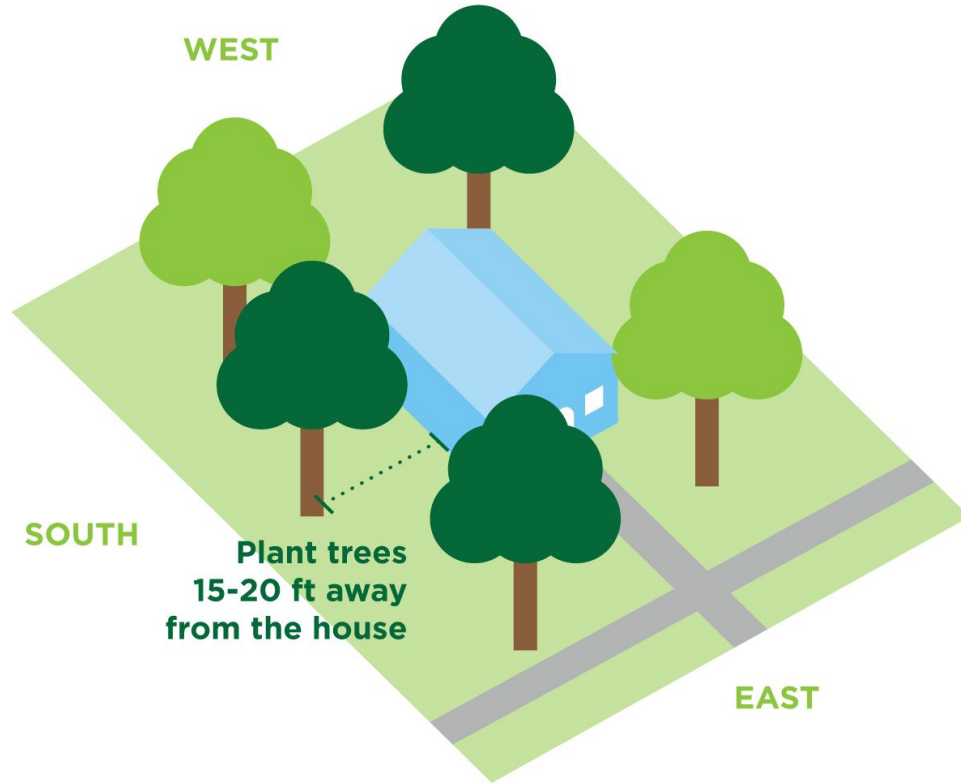
Benefits of Shade Trees



- Long-term legacy
- Supporting public health
- Delivering equitable urban cooling
- Supporting urban biodiversity



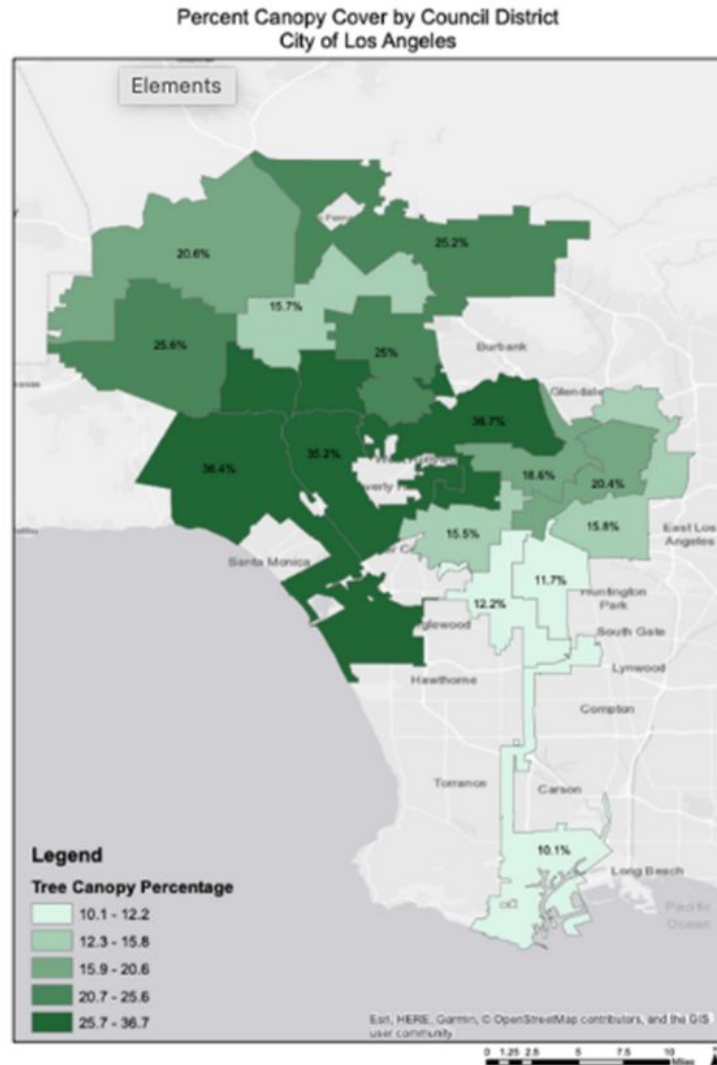
How Shade Trees Reduce Energy Demand



- West- and south-facing placement reduces solar heat gain on building surfaces.
- Lower indoor temperatures reduce AC usage and peak energy demand.
- Benefits increase year-over-year as tree canopy expands.
- Citywide canopy growth eases heat island effects, enhancing grid resilience.



LADWP's Shade Tree Program (formerly City Plants)



- Provides free shade trees to homes and businesses to reduce cooling loads and energy use
- Strategically selects and sites trees to maximize energy savings and minimize water use
- Prioritizes low-canopy, heat-vulnerable communities, guided by UFEC equity framework



Program Model



- Under most recent agreement, more than 54,000 trees will be planted across yard tree distributions, street tree installations, and community planting events
- Tree delivery involves coordinated work between Los Angeles Conservation Corps (LACC) and planting partners
- Commonwealth Nursery maintains over 3,000 young trees, with hundreds distributed to the community



Energy Savings: LADWP's Shade Trees



- **~8,000,000 kWh** of annual direct energy savings
- **Over 5,000 metric tons** of greenhouse gas emissions avoided annually
- Supports LADWP's cumulative 15% energy savings target



Data, Tracking & Verification



- Energy savings are modeled using:
 - Simulations of shading effects based on tree characteristics and placement
 - Building performance factors including insulation levels, window size, equipment efficiency, and envelope characteristics
 - Historical weather data to estimate heating and cooling impacts
 - Long-term USFS tree-growth research across multiple climate zones
 - Validation against standard ASHRAE reference models
- GIS tracking (EcoLayers) to document planting locations and counts
- Transparent reporting supports future funding, ratepayer benefits, and regulatory engagement.



Workforce Development and Community-led Stewardship



- Community-led events
- Youth opportunities through the LACC
- Funding for Tree Ambassador/ Promotor Forestal Program
- Partnerships with nonprofits



Key Takeaways



- Nature-based solutions like shade trees should be treated as **core energy infrastructure**, not optional beautification.
- Shade trees are an **equitable solution**, providing cooling, resilience, improved air quality, and public health benefits in low-canopy neighborhoods.
- LADWP's Shade Tree Program is a **national model** for combining energy efficiency and urban greening.



Beyond Energy: The Multiple Benefits of Nature-Based Solutions

Trees reduce energy demand and deliver multiple benefits that strengthen climate resilience.

Cassie Rauser, Ph.D.

The Fielding Family Chief Executive Officer
TreePeople
Los Angeles, CA

June 24, 2026



TreePeople



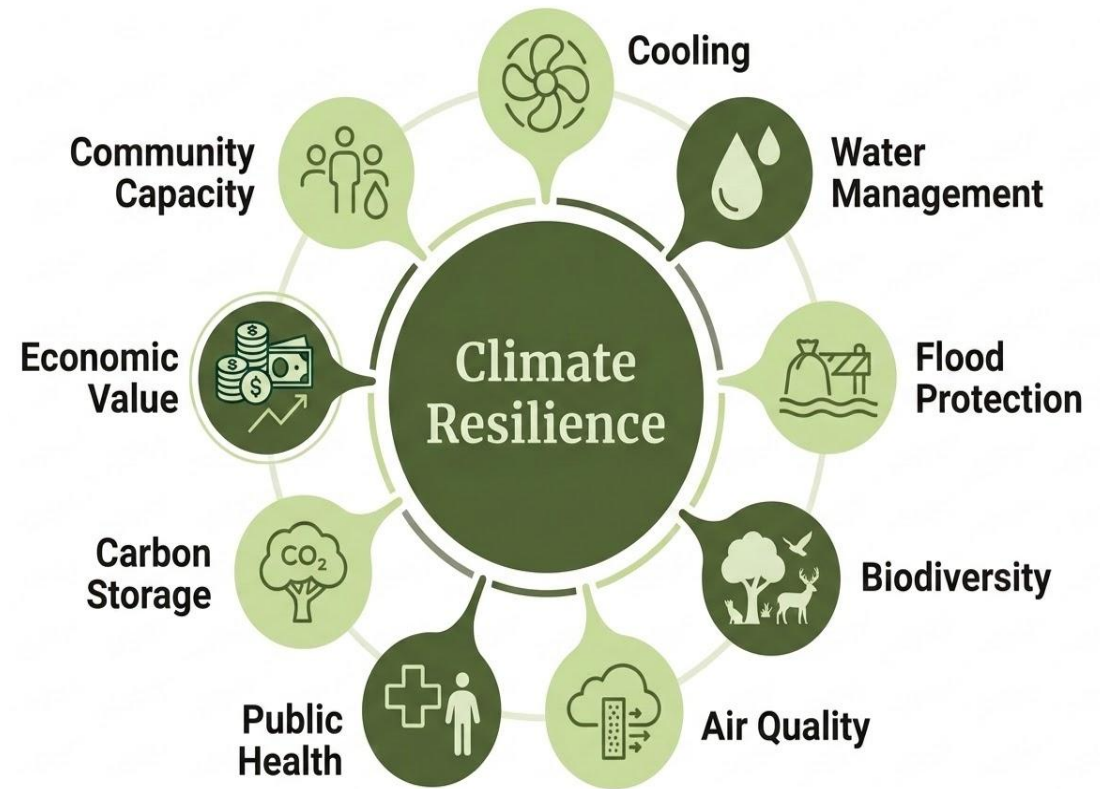
Trees: The Co-Benefit Multiplier

Energy benefits

- Reduced cooling load
- Lower peak demand
- Lower energy bills

Co-benefits

- Cools neighborhoods
- Stormwater management
- Biodiversity
- Air quality
- Public health
- Mental well-being
- Carbon mitigation
- Economic value
- Community



One intervention. Multiple returns.

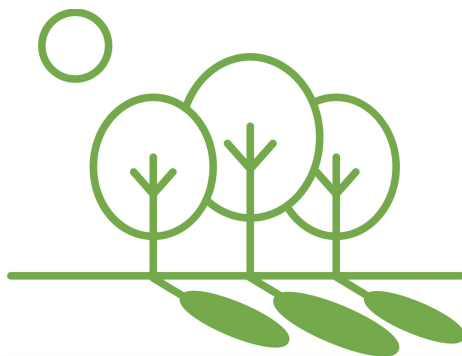
Trees are one of the few investments that generate environmental, economic, and social returns simultaneously.



Trees Improve Human Health

Trees Serve as Public Health Infrastructure

- Lower heat exposure
- Reduced heat illness risk
- Better air quality
- More opportunities for outdoor activity
- Improved mental health, stress, and learning



Cooling the city

Extreme heat is now one of the leading weather-related causes of death.



Filtering air

Trees remove air pollutants and improve respiratory health.



Fostering well being

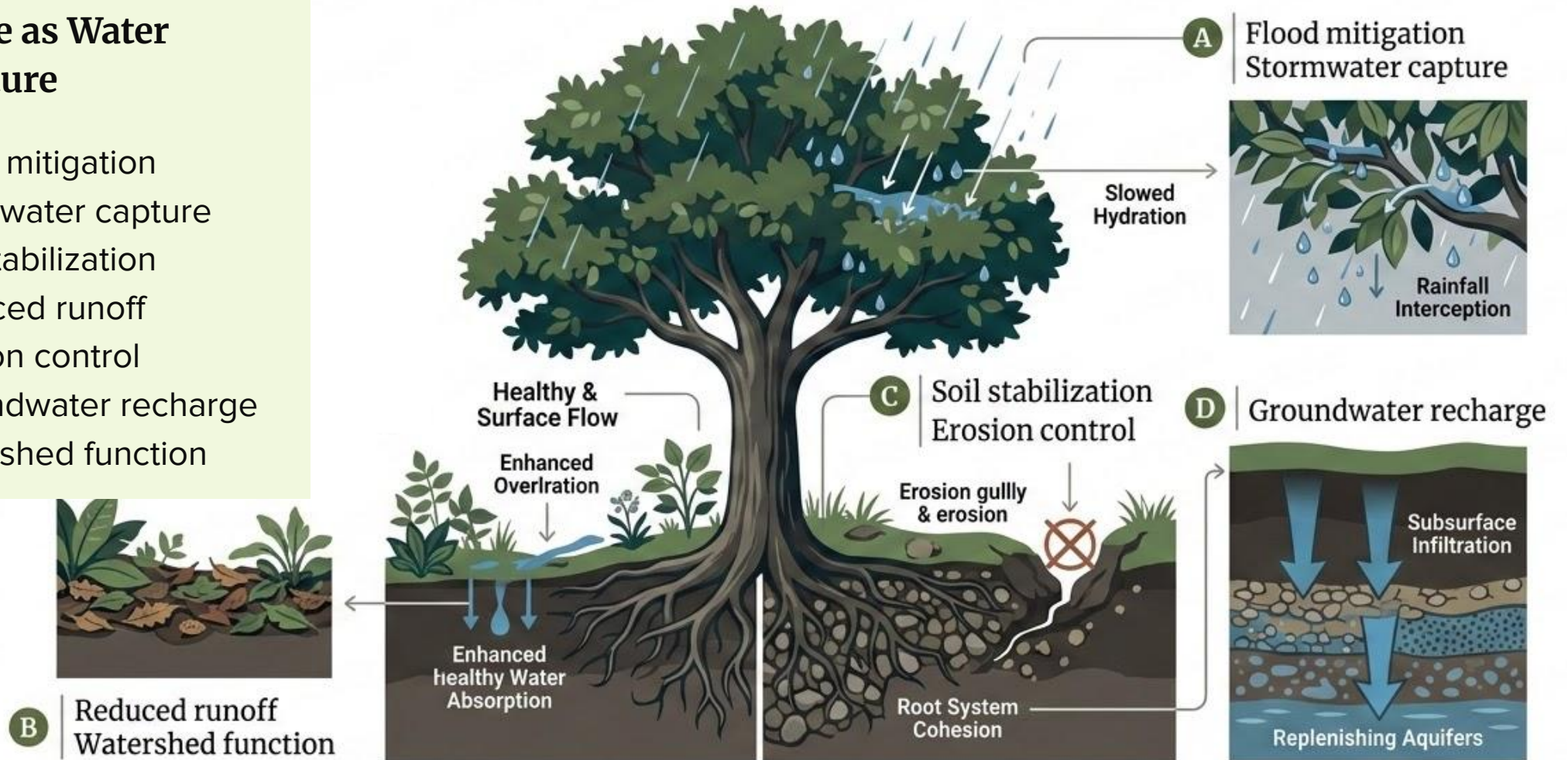
Access to green space is associated with lower stress, anxiety, and depression.



Trees Improve Watershed

Trees Serve as Water Infrastructure

- Flood mitigation
- Stormwater capture
- Soil stabilization
- Reduced runoff
- Erosion control
- Groundwater recharge
- Watershed function



Trees Support Biodiversity & Ecosystem Health

Trees Serve as Living, Green Infrastructure

- Species selection matters
- Native trees
- Native habitat
- Enhance urban biodiversity
 - Pollinators
 - Birds
 - Soil health
- Ecosystem resilience



City of L.A.'s Biodiversity Report (2018) and Biodiversity Index



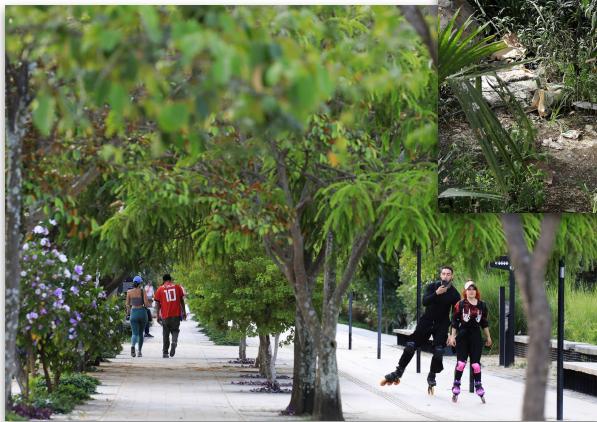
Ecosystem Health Report Card for LA County (2021)



Medellín: One Intervention, Multiple Returns

The Corridors

- 30 green corridors
- 880,000 trees
- 2.5M plants



This wasn't a tree project. It was an urban systems project.



Photos: Jaime Saldarriaga/Guardian
theguardian.com/environment/gallery/2025/jun/09/medellin-sublime-return-to-nature-in-pictures



Medellín Demonstrates Almost Every Co-Benefit

Benefit	Medellín Example
Energy / Cooling	~2°C reduction in urban temperatures
Public Health	Reduced heat exposure
Air Quality	Improved air quality
Biodiversity	880,000 trees + 2.5M plants
Mobility	Improved walkability/public realm
Equity	Investment in historically underserved neighborhoods
Economic Value	Increased livability and attractiveness
Workforce	Long-term maintenance crews



Photo: Jaime Saldarriaga/Guardian
theguardian.com/environment/gallery/2025/jun/09/medellin-sublime-return-to-nature-in-pictures



Community-Centered Resilience: Designing for Long-Term Success

Communities Tell Us What Matters

San Fernando

- Cooling & Shade

Paramount

- Mental Health & Well-Being

Huntington Park

- Recreation & Outdoor Activity



Different communities prioritize different benefits based on lived experience. Successful projects begin by understanding what success means locally.

What Success Requires

Community

- Understand local priorities
- Build trust
- Co-design solutions

Partnerships

- Utilities
- Parks
- Public Works
- NGOs
- Community organizations

Stewardship

- Workforce development
- Maintenance
- Long-term investment



The Most Valuable Tree Is the One We Already Have

- Planting is important
- Maintenance is equally important
- Workforce development matters
- Long-term stewardship matters
- Annual benefits increase as trees mature
- Larger trees provide disproportionately greater benefits



TreePeople: Multi-Benefit Resilience



7,000+ urban trees planted
& distributed
650+ volunteer events



65.7k sq ft of new green space
1000+ students impacted

Community Forestry

→ strategic canopy expansion for
Cooling + Health + Equity

School Greening → reducing heat
exposure and cooling surfaces for
Health + Cooling + Learning



TreePeople: Multi-Benefit Resilience

Native Landscapes (Native Garden Kits) → lower water demand and ecological benefits for **Water + Biodiversity**

Post-Fire Recovery

→ testing soil, managing invasive fire-prone plants, urban canopy recovery for **Climate Resilience + Stewardship**

200+ fire-impacted residents supported through soil testing



42.5k sq ft lawn converted to native habitat





Pacoima Middle School

Removed more than 14,000 square feet of asphalt

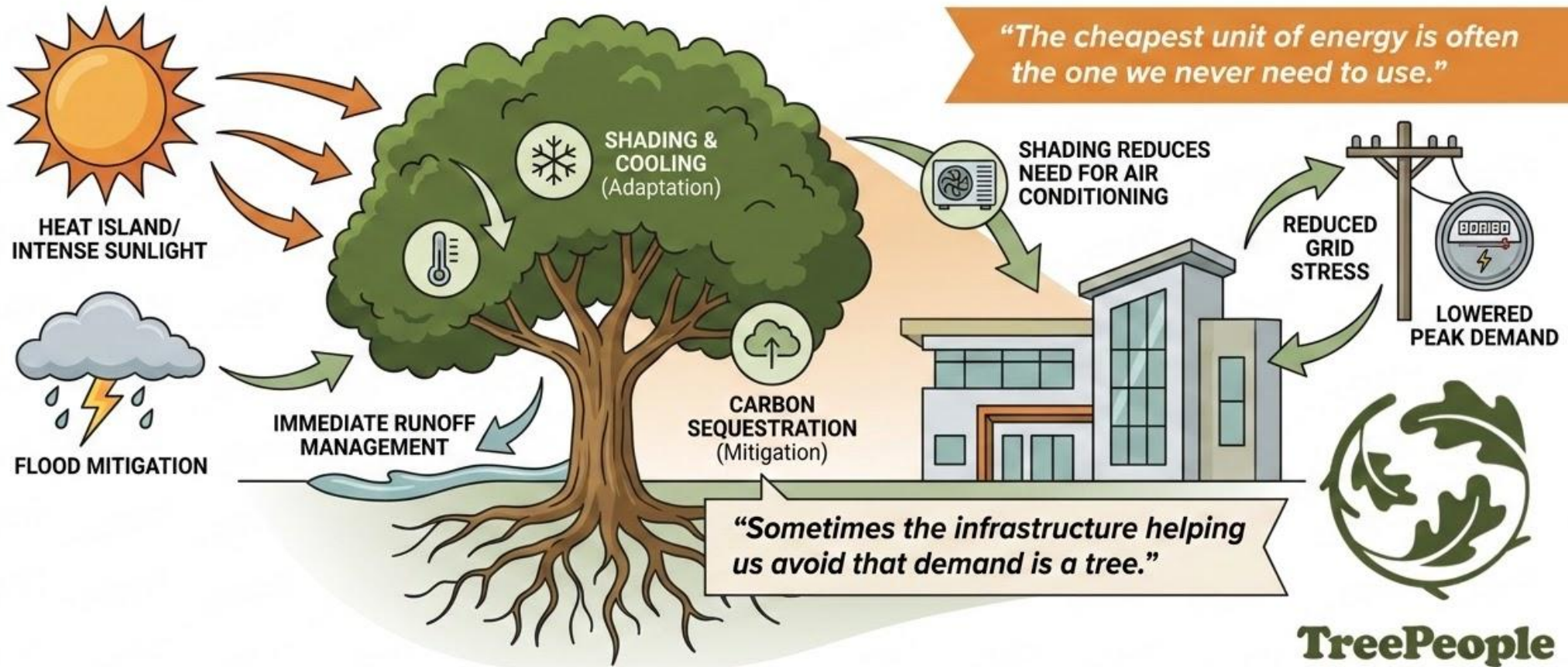
Replaced it with:

- drought-resistant landscaping
- gathering spaces
- gardens, and
- 107 trees in student-accessible areas

Designed to serve more than 1,000 students



Trees Support Climate Adaptation + Climate Mitigation



Designing Cities Where People & Nature Thrive Together

- Infrastructure that cools.
- Infrastructure that captures water.
- Infrastructure that supports biodiversity.
- Infrastructure that improves health.
- Infrastructure that becomes more valuable over time.
- Communities are part of the solution.

**Trees need people.
People need trees.**

To learn more, please visit: treepeople.org
Follow us on social media: [@treepeople_org](https://twitter.com/treepeople_org)



TreePeople



Question and Answer

How to reach us:

Edith de Guzman eb3@ucla.edu

Katz, Nurit nkatz@fm.ucla.edu

Cassie Rauser crauser@treepeople.org

Tessa Charnofsky tcharnofsky@isd.lacounty.gov



Small Group Discussion (15 minutes)



Questions

- Do you believe trees and other nature-based strategies should be adopted as an energy efficiency measure by regulatory agencies? Why/why not?
- How do trees create a more equitable society?
- Do you have any existing programs in your portfolio that relate to nature?
- How could nature-based solutions and shade fit into your work as a utility, Regional Energy Network, Community Choice Aggregator, business, etc.
- How will you take what you learned today and integrate it into your work?

