CALIFORNIA URBAN FORESTS CONFERENCE

LEAD WITH TREES

Trees For Tomorrow Start Today: Cooling Urban Heat Islands with Drought, Heat and Pest Resistant Species

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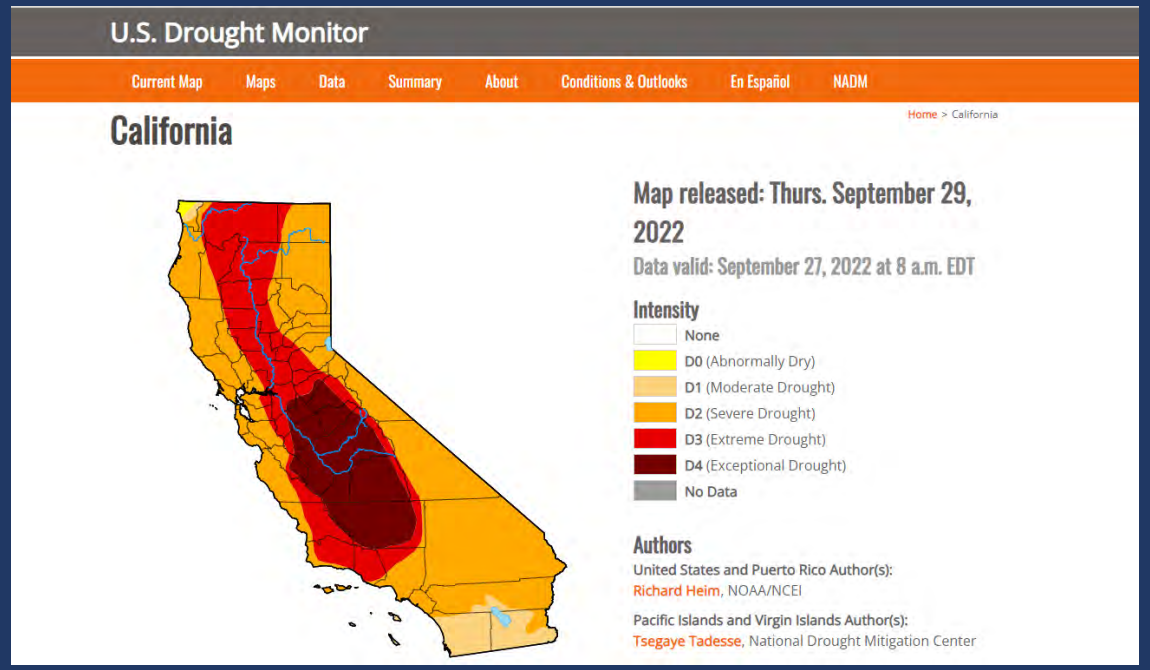
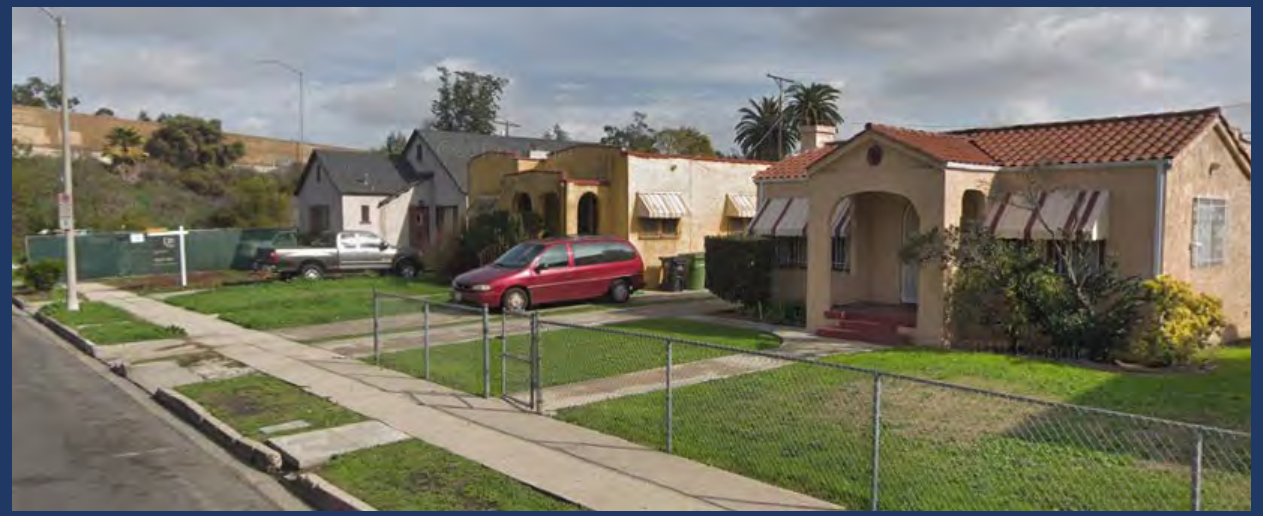
CA Has a ‘Moisture’ and a ‘Tree Drought’

While there are ~ 9 M street trees in California, their density has decreased 30% since 1988. CA cities have the lowest tree canopy per capita (108 yd^2) in the U.S.





https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?CA

Statistics

Statistics type: Cumulative Percent Area Export table: CSV XLS

Week	Date	None	D0-D4	D1-D4 (Moderate)	D2-D4 (Severe)	D3-D4 (Extreme)	D4 (Exceptional)	DSCI
Current	2022-09-27	0.00	100.00	99.76	94.01	40.91	16.57	351
Last Week	2022-09-20	0.00	100.00	99.76	94.06	40.91	16.57	351
3 Months Ago	2022-06-28	0.00	100.00	99.79	97.48	59.81	11.59	369
Start of Calendar Year	2021-12-28	0.00	100.00	100.00	86.28	32.93	0.84	320
Start of Water Year	2021-09-28	0.00	100.00	100.00	93.93	87.88	45.66	427
One Year Ago	2021-09-28	0.00	100.00	100.00	93.93	87.88	45.66	427

Estimated Population in Drought Areas: 37,243,383

View More Statistics

Water Requirements of Landscape Plants Studies Conducted by the University of California Researchers

Janet S. Hartin[1,7], David W. Fujino[2], Lorence R. Oki[3], S. Karrie Reid[4], Charles A. Ingels[5], and Darren Haver[6]

Additional index words. landscape water use, evapotranspiration, landscape irrigation, CIMIS, plant factor, ETAF, WUCOLS

Summary. University of California (UC) researchers have been involved in research and extension pertaining to measuring evapotranspiration (ET) rates and determining the minimum irrigation requirements of landscape plants for more than 30 years. Early work included the design and implementation of the California Irrigation Management Information System (CIMIS) weather station network and determining crop coefficients for warm and cool season turfgrasses based on historical ET and CIMIS data. Other researchers determined the minimum irrigation requirements for several species of established landscape trees, shrubs, and groundcovers in diverse climate zones throughout the state. In addition, the Water Use Classification of Landscape Species (WUCOLS) system was developed by UC personnel in the early 1990s which, to date, has classified more than 3500 landscape species into very low, low, moderate, and high water-use categories based on observation and personal experience by industry experts and UC personnel. Future work in the area of landscape water use and conservation will include updating WUCOLS as more data from replicated trials become available. New research at UC Riverside aims to improve irrigation efficiency (IE) through precision irrigation using smart controllers, remote sensing, and geospatial analysis under controlled conditions. Irrigation training and certification for public and private landscape managers must remain a priority because, even with advanced smart controller technologies, water savings will not occur with poorly designed and functioning irrigation systems.

Between 40% and 70% of water used in urban settings in the United States is applied to landscape plantings (Cabrera et al., 2013; Haley et al., 2007; Kjelgren et al., 2000; St. Hilaire et al., 2008). Water conservation in urban landscapes in California is especially important because of a limited water supply, cyclical droughts, population increases, and a water distribution problem requiring transporting large volumes of water from Northern to Southern California. The population of California is expected to increase from 39 to 60 million by 2050 (Dieter and Maupin, 2017). Since 2005, nearly half of the population growth in the state has occurred in inland Southern California and the Central Valley because of less expensive and more plentiful land than along the coast (Hanak and Davis, 2006). In addition, because inland landscapes tend to be larger and ET rates higher than those in coastal areas, more water is required for their irrigation.

Climate change poses additional challenges to urban landscapes as rising temperatures coupled with limited water exacerbates the need to increase and diversify the palette of trees and other ornamentals adaptable to harsh urban conditions (Bohn et al., 2018; Hanak and Lund, 2008). Furthermore, Fall 2011 through Fall 2015 was the driest 4-year period in recorded history in California since the beginning of weather tracking in 1895, exacerbated with record high temperatures in 2014 and 2015 (Hanak et al., 2015). Although precipitation in 2016 and 2017 rose to near-average levels in much of northern California, all of central and southern California continue to experience moderate or severe drought as of 10 Mar. 2018 (Fenimore, 2018).

An increase in California's population coupled with a multiyear drought in the 1980s requiring greater landscape water conservation led to the enactment of the California Assembly Bill 325 (Water Conservation in Landscaping Act), which became effective in 1993. The act required the California Department of Water Resources (CDWR) to develop a Model Water Efficient Landscape Ordinance (MWELO), intended to increase water conservation in urban landscapes. This included reducing water waste in landscape plantings and listing landscape plants within WUCOLS water-use categories to supplement the small number of actual plants whose water use had been measured in field studies, a lengthy and resource-intensive process.

The assumed a leadership role in WUCOLS, bringing together 36 experts from the landscape industry who categorized thousands of plants in six climate zones (north central valley, central valley, south coastal, south inland valley, high and intermediate desert, and low desert) as very low, low, moderate, or high water users. Since the inception of WUCOLS, additional species were

This article results from the workshop "Maintaining Healthy Landscapes Under Drought and/or Permanent Water Restrictions" held on 20 Sept. 2017, at the ASHS Annual Conference, Waikoloa, HI and sponsored by the Ornamentals/Landscape and Turf (O/LT) Professional Interest Group.

Appreciation is extended to Workshop fellow presenters Raul Cabrera, Michael Dukes, and Ursula Schuch, session attenders, and the O/LT Professional Interest Group.

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https://doi.org/10.21273/HORTTECH04037-18

Units

To convert U.S. to SI, multiply by	U.S. unit	SI unit	To convert SI to U.S., multiply by
0.0929	ft^2	m^2	10.7639
3.7854	gal	L	0.2642
2.54	inch(es)	cm	0.3937

https://doi.org/10.21273/HORTTECH04037-18

RESEARCH ARTICLE

UC ANR research and education influences landscape water conservation and public policy

For more than 30 years, UC has tackled the obstacles that inhibit widespread landscape water conservation, with new science, trainings and contributions to state policy.

by Janet S. Hartin, Lorence R. Oki, David W. Fujino, Karrie Reid, Charles A. Ingels, Darren L. Haver and William N. Baker

For nearly three decades, California has mandated practices to improve landscape water use efficiency and conservation. The goal of state policies has been to ensure a steady and reliable water source while maintaining healthy sustainable landscapes. Strategies have included the adoption of landscape irrigation standards, water budgets and tiered water rates favoring conservation, and also increased education to the landscape industry and the public.

UC has been influential in developing and providing credible science-backed information to inform legislative actions. It has also reduced the obstacles that were inhibiting widespread landscape water conservation: a lack of credible information regarding landscape water requirements, inadequate training across a large segment of the landscape industry, lagging irrigation system technology, and an inadequate supply of locally available drought-resistant landscape plants.

Abstract

UC has been heavily involved in research and extension efforts impacting landscape water conservation legislation for over 30 years. In 1981, UC implemented the California Irrigation Management Information System, a network of weather stations that provides data for local estimates of plant water needs. Those estimates led to UC being able to advise the California Legislature on policies for maximum applied water allowances for residential and large landscaping projects. The allowances have been reduced significantly with UC guidance, and UC has helped landscapers to meet the increasingly restrictive requirements. Best practices that reduce water losses have been developed in collaboration with equipment manufacturers and landscaping specialists, and explained to end users. In addition, UC has developed the WUCOLS database, which classifies over 3,500 plants by their water needs. UC's involvement in landscape water conservation continues on many fronts, developing science and contributing to policy.

Online https://doi.org/10.3733/ca.2019a0041

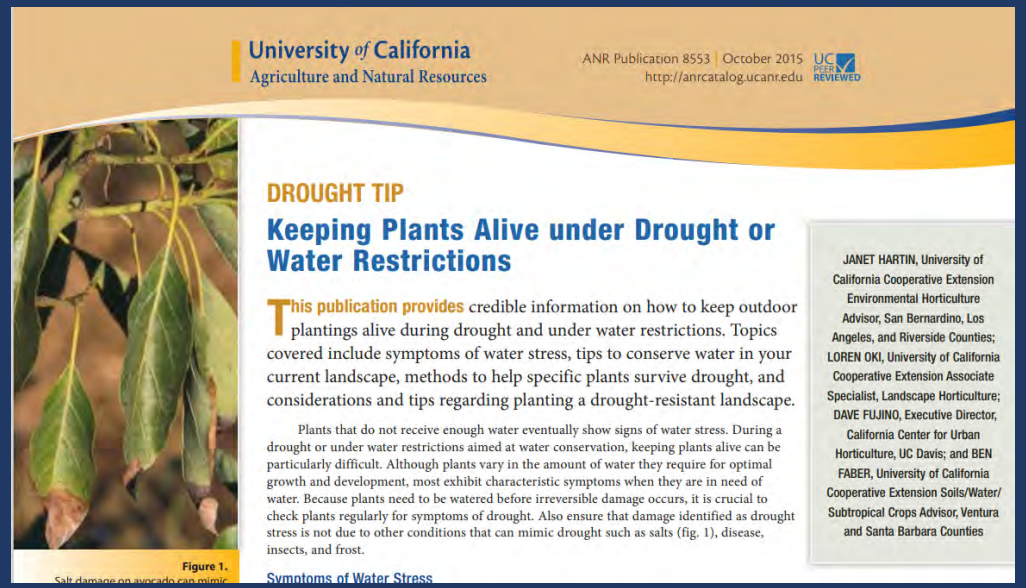
UCCE Advisor Chuck Ingels speaks to the press in Sacramento about water conservation. UC has developed a database that categorizes 3,500 plants by their water needs.

https://escholarship.org/uc/item/5335s6jg

University of California Drought-Related Resources

Free Download Publications: https: anrcatalog.ucanr.edu

- Sustainable Landscaping in California
- Keeping Plants Alive Under Drought and Water Restrictions
- Lawn Watering Guide for California
- Use of Graywater in CA Landscapes



University of California
Agriculture and Natural Resources

ANR Publication 8553 | October 2015
http://anrcatalog.ucanr.edu

UC PEER REVIEWED

DROUGHT TIP

Keeping Plants Alive under Drought or Water Restrictions

This publication provides credible information on how to keep outdoor plantings alive during drought and under water restrictions. Topics covered include symptoms of water stress, tips to conserve water in your current landscape, methods to help specific plants survive drought, and considerations and tips regarding planting a drought-resistant landscape.

Plants that do not receive enough water eventually show signs of water stress. During a drought or under water restrictions aimed at water conservation, keeping plants alive can be particularly difficult. Although plants vary in the amount of water they require for optimal growth and development, most exhibit characteristic symptoms when they are in need of water. Because plants need to be watered before irreversible damage occurs, it is crucial to check plants regularly for symptoms of drought. Also ensure that damage identified as drought stress is not due to other conditions that can mimic drought such as salts (fig. 1), disease, insects, and frost.

Figure 1.

Symptoms of Water Stress

JANET HARTIN, University of California Cooperative Extension Environmental Horticulture Advisor, San Bernardino, Los Angeles, and Riverside Counties; LOREN OKI, University of California Cooperative Extension Associate Specialist, Landscape Horticulture; DAVE FUJINO, Executive Director, California Center for Urban Horticulture, UC Davis; and BEN FABER, University of California Cooperative Extension Soils/Water/ Subtropical Crops Advisor, Ventura and Santa Barbara Counties

CA Institute for Water Resources:
http://ciwr.ucanr.edu/
(blogs, climate-smart ag, podcasts, etc.)

Janet’s Blogs

Trees Come First During Drought:

https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=46513Be

Be Part of the Solution: Plant Drought, Heat, and Pest Resistant Trees:

http://ipm.ucanr.edu/PDF/PUBS/greenbulletin.2017.winter.pdf?sr c=blog26490

What’s Wrong With My Tree:

https://www.parksandrecbusiness.com/articles/2019/9/whats-wrong-with-my-trees

Landscape Damage: It’s Not Always A Pest Issue

https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=26490

Common Landscape Disorders Impacting Trees:

http://ipm.ucanr.edu/PDF/PUBS/greenbulletin.2017.winter.pdf?sr c=blog26490

Benefits of Urban Trees

- Cool urban heat islands (UHI)
- Provide shade
- Save energy
- Clean the air (remove dust, absorb pollutants) and release oxygen
- Absorb and store (sequester) carbon dioxide

- Provide windbreaks
- Capture runoff/stormwater flooding
- Beautify neighborhoods/increase property value/reduce crime
- Improve mental and emotional health
- Reduce glare and reflection
- Reduce noise
- Provide habitat for animals and microorganisms

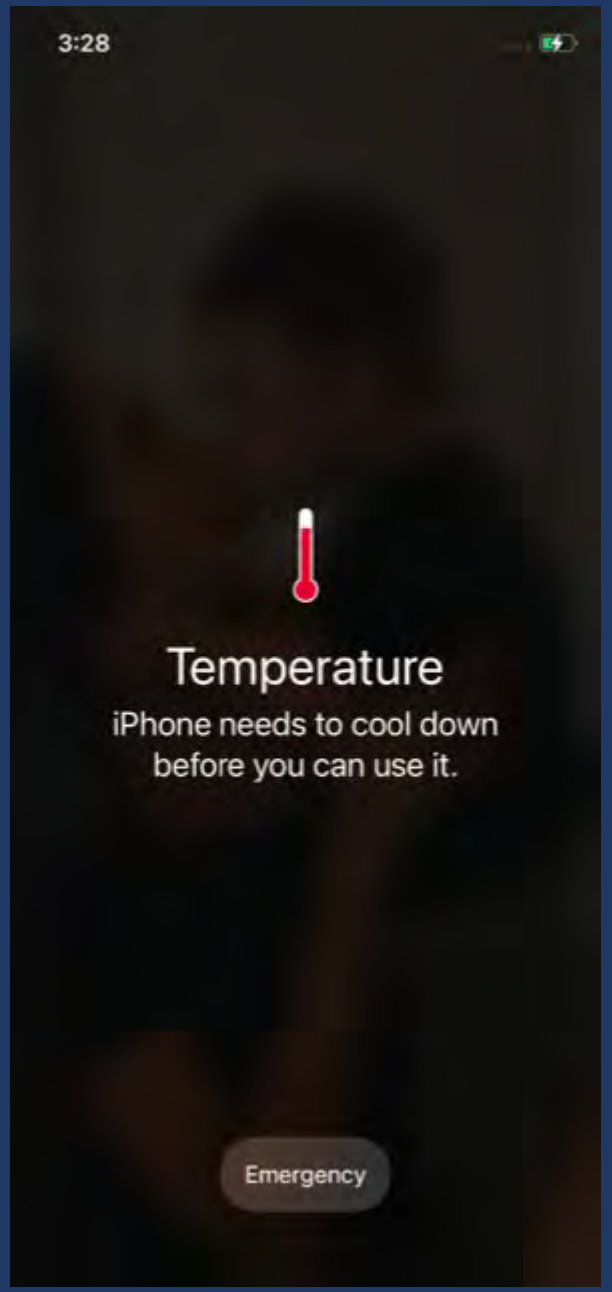
Trees Cool Urban Heat Islands (UHIs)

Surface temperatures of unshaded asphalt can be >60 F hotter than shaded asphalt in summer in inland and desert cities

Temperatures of Unshaded Black Asphalt, Artificial Turf, Concrete (lighter than it looks here), and Living Turf


74.6°C
166.4
°F

Artificial Turf as Hot as Asphalt in Inland and Desert Cities



Pet paws can burn in 60 seconds on a 140°F surface (air temperature ~90°F) and 30 seconds on a 160-degree surface

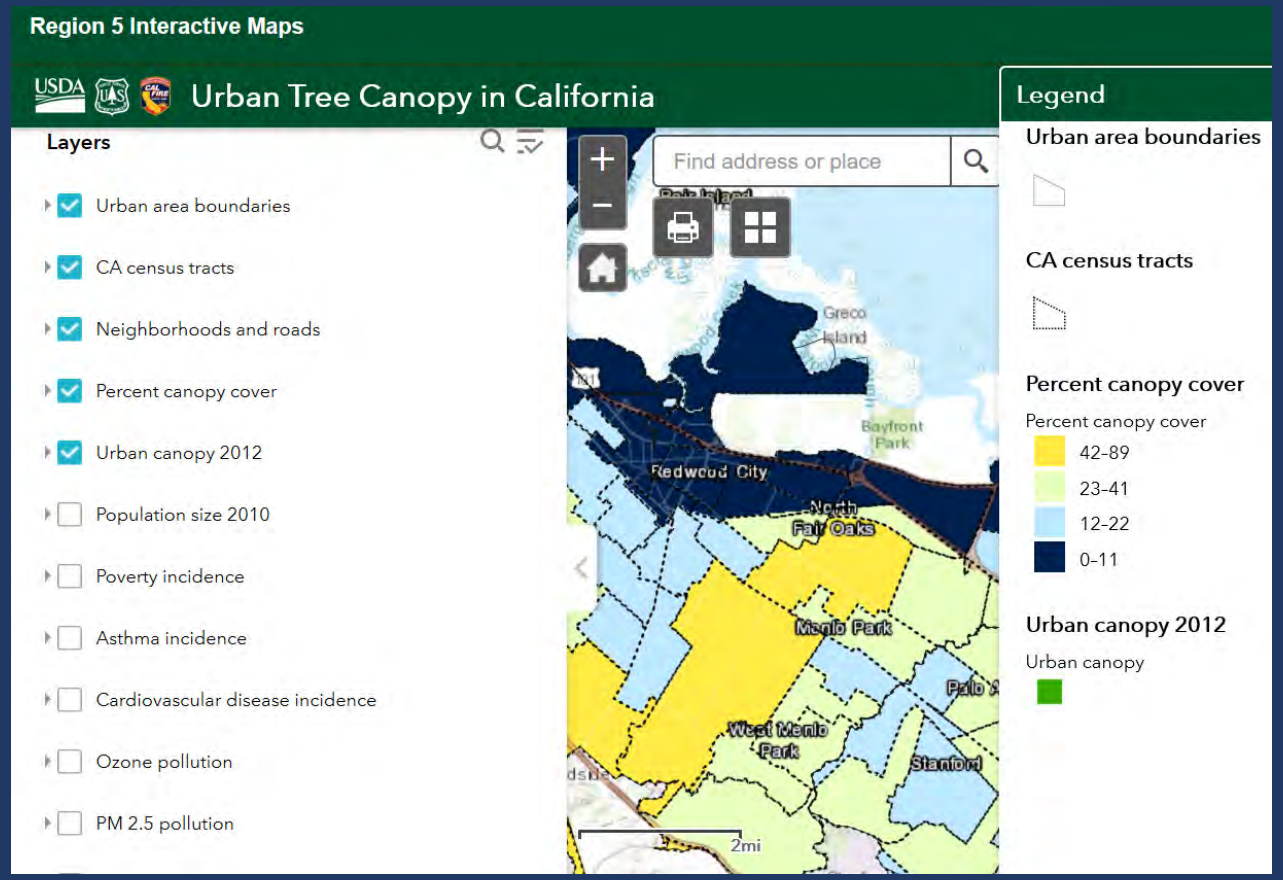
It’s Up to All of Us to Educate Stakeholders and Decision-Makers Regarding the Benefits of Live Plants for Cooling Urban Heat Islands

Hottest June-September periods in Coachella Valley history:

1 **2021:** Average temperature of 94 degrees
2 **2022:** Average temperature of 93.9 degrees
3 **2018:** Average temperature of 93.5 degrees
4 **2020:** Average temperature of 93.4 degrees
5 **2017:** Average temperature of 92.5 degrees

Higher Tree Canopies in Wealthier Neighborhoods
(https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd645759.html)

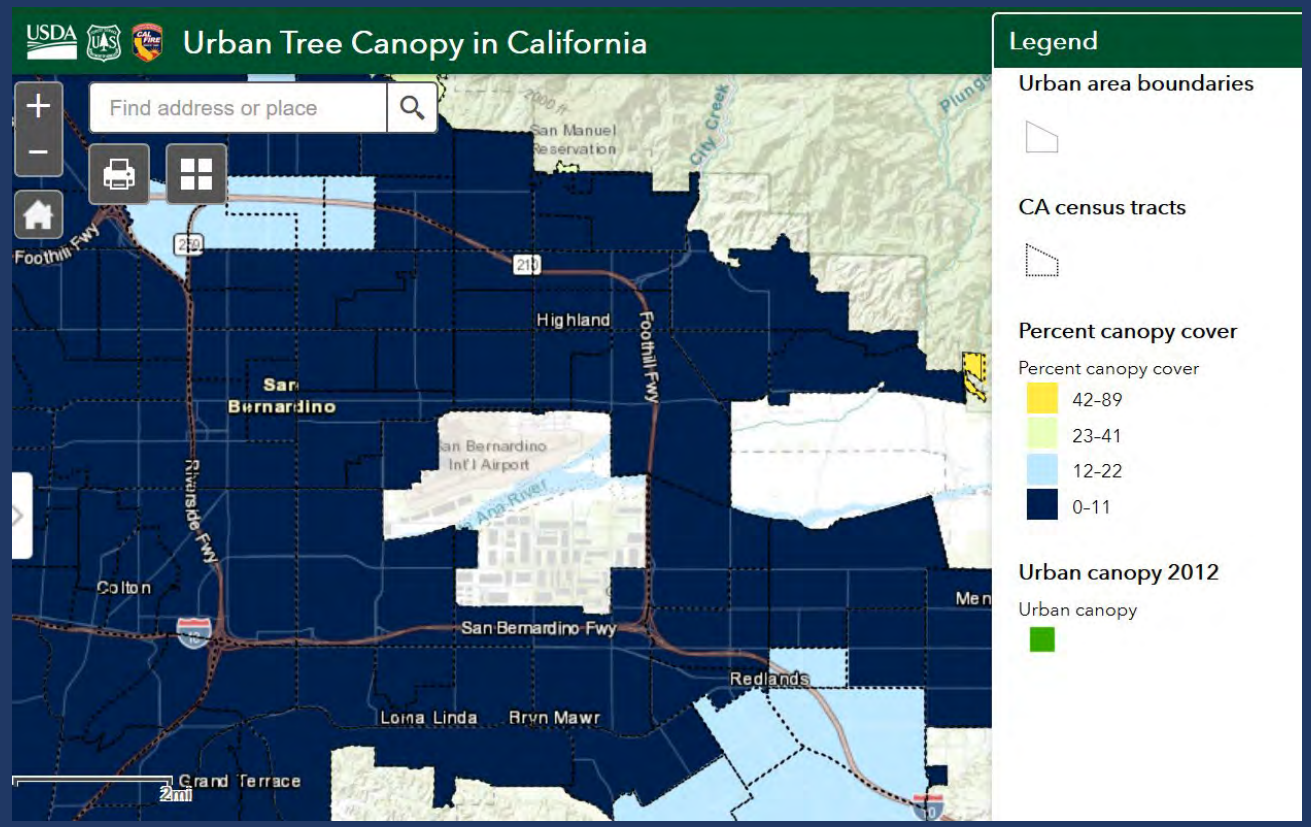
Tract number	6081611400
County	San Mateo
Zip code	94027
City	Atherton
Population 2010	4,237
Percentile poverty incidence	2
Percentile asthma incidence	4
Percentile cardiovascular disease incidence	1
Percentile ozone pollution	11
Percentile PM 2.5 pollution	41
Percentile water body impairment	0



Lower Tree Canopies in Low Wealth Neighborhoods

(https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd645759.html)

Tract number	6071006401
County	San Bernardino
Zip code	92410
City	**San Bernardino**
Population 2010	3,343
Percentile poverty incidence	99
Percentile asthma incidence	84
Percentile cardiovascular disease incidence	74
Percentile ozone pollution	98
Percentile PM 2.5 pollution	82
Percentile water body impairment	0



Addressing Underserved Communities

- Enhancing tree canopies in underinvested, disadvantaged communities
  - Increasing tree canopy cover
  - Empowering residents in the fight against climate change

Installing Trees in North Redlands

Project Partners/Roles

UCANR: Research, problem identification; palette selection

UCCE MGs: expertise (free!) to recipients of trees

CVC: trusted community organization driving resident engagement

City: support for program logistics

CAC: three Fellows coordinating partners and timeline

IERCD: local org. sponsor

U of Redlands: CAC program sponsor; collaborating across projects

ESRI: project trees

SCMF: physical project help

Improper Tree Selection, Location, and Care Reduce Average Lifespan 50-70%


San Pablo Ave
College of the Desert
Civic Center

Suggested Reading:

https://www.isa-arbor.com/education/resources/Vogt_AUFNov2015.pdf

Arboriculture & Urban Forestry 2015. 41(6): 293–323

ISA International Society of Arboriculture

ARBORICULTURE & URBAN FORESTRY
Scientific Journal of the International Society of Arboriculture

The Costs of Maintaining and Not Maintaining the Urban Forest: A Review of the Urban Forestry and Arboriculture Literature

Jess Vogt, Richard J. Hauer, and Burnell C. Fischer

Abstract. Existing urban forest literature is strongest in its quantification and qualification of the benefits and care of trees, and not in its ability to assess the results of lack of investment in trees. This paper presents the results of a literature review on the "Costs of Not Maintaining Trees" commissioned by the ISA Science and Research Committee. The authors summarized the literature from within the field of arboriculture/urban forestry to answer the questions: What are the costs of maintaining trees and the urban forest? And, What are the costs of not maintaining trees? Present here is a detailed summary of the literature on the costs of maintenance and lack of maintenance for types of tree care commonly included in municipal budgets (planting, pruning, removal, pest and disease management) and a brief review of costs associated with less-studied types of tree care (including tree risk management; watering; mulching; fertilizing and nutrient management; staking, cabling, and bracing; tree protection; and infrastructure repair). The authors suggest that future literature should aim to examine the influence of maintenance regimes on costs and tree outcomes, including examining how the frequency, intensity, duration, and extent of tree maintenance activities is connected to the structure, function, and benefits of trees.

Key Words. Cost of Not Maintaining Trees; Literature Review; Maintenance Costs; Pruning; Planting; Removal; Municipal Forestry; Deferred Maintenance; Urban Forestry; Urban Tree Maintenance.

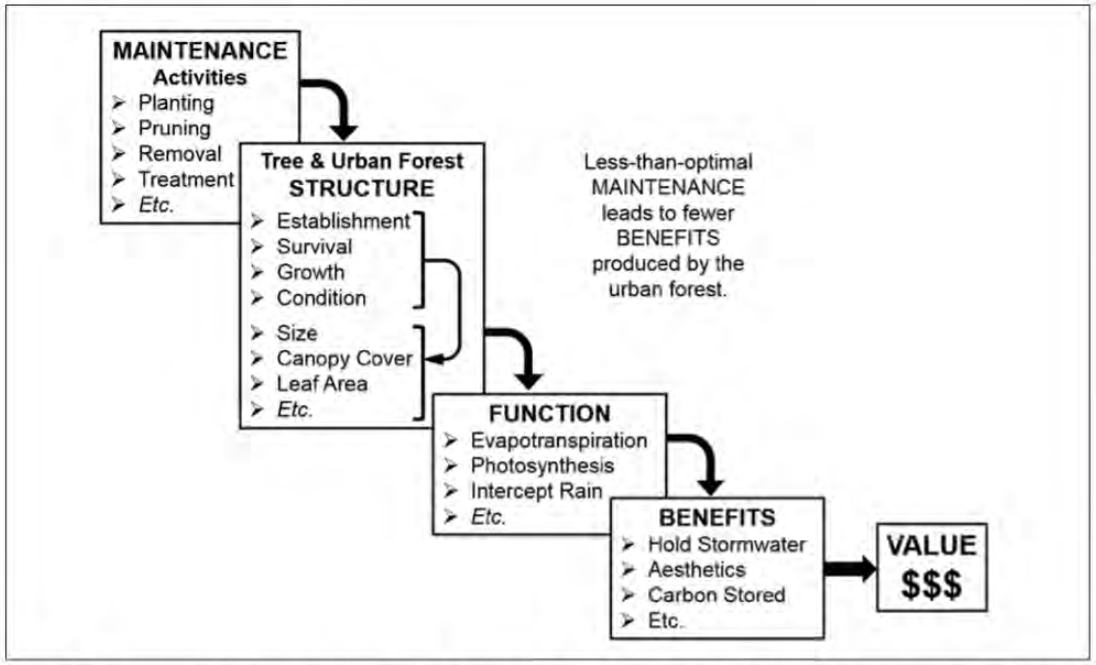


Figure 1. Maintenance directly impacts tree structure, which in turn impacts the functions and benefits provided by the urban forest.

Climate-ready Landscape Trees Study

UC: Alison Berry, Jim Downer, Janet Hartin, Darren Haver
USFS: Greg McPherson, Natalie van Doorn, Erika Teach

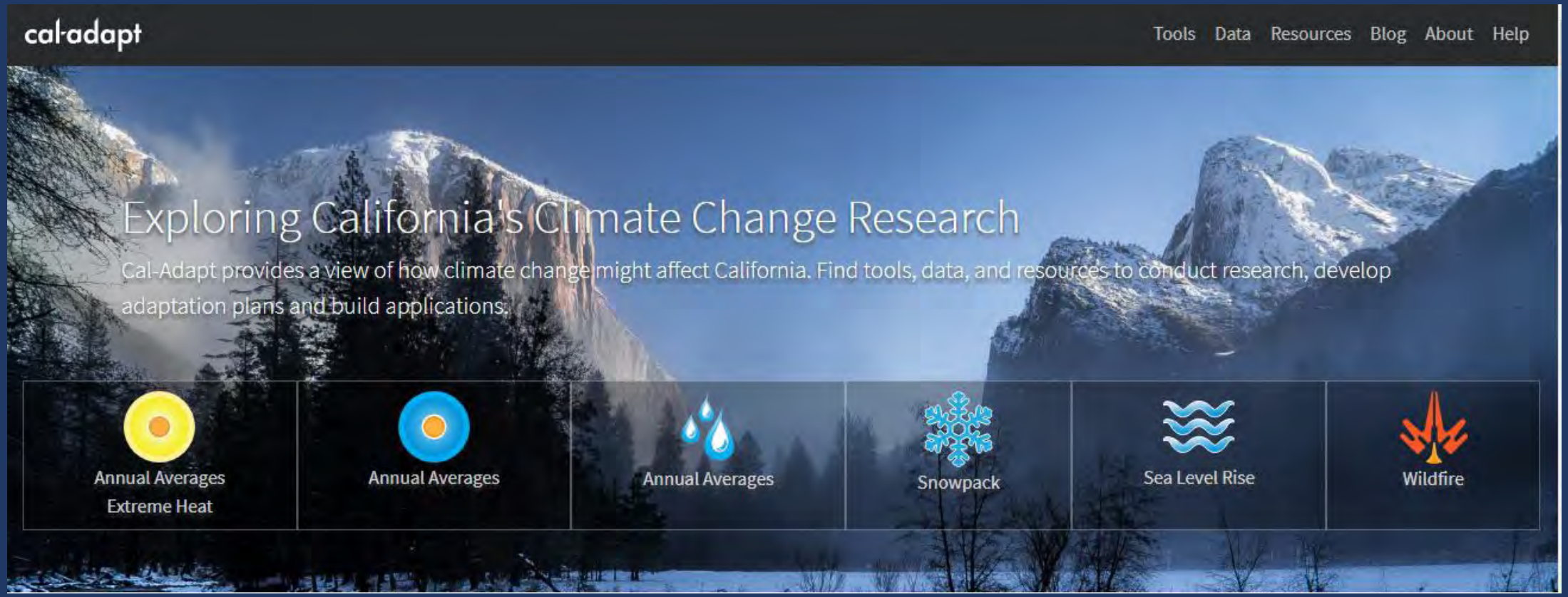
- Measuring performance of select landscape tree species based on heat and drought resistance, CO_2 sequestration, soil tolerance, pest resistance, shade, biodiversity, rareness, longevity, etc.

Step One

Evaluated Climate Trends & Exposures

http://www.interaksyon.com/climate-change-causes-trees-in-eastern-us-to-shift-westward-study/

CalAdapt Climate Model, Next 75 Years



Precipitation & Wind: fewer storms but more precipitation during each event, stronger winds http://cal-adapt.org/tools/

Trees Selected Based on a Vulnerability Matrix

Habitat	Physiology	Biological Interactions
Soil Moisture	Drought Tolerance	Invasiveness
Soil Texture and pH	Wind Tolerance	Current Pest and Disease Threats
Sunlight Exposure	Salt Tolerance	Emerging Pest and Disease Threats
	Cold Hardiness	

System for Assessing Vulnerability of Species (Bagne et al. 2011) and Pest Vulnerability Matrix (Laćan & McBride 2008)

Step Two

Identified Promising Species:

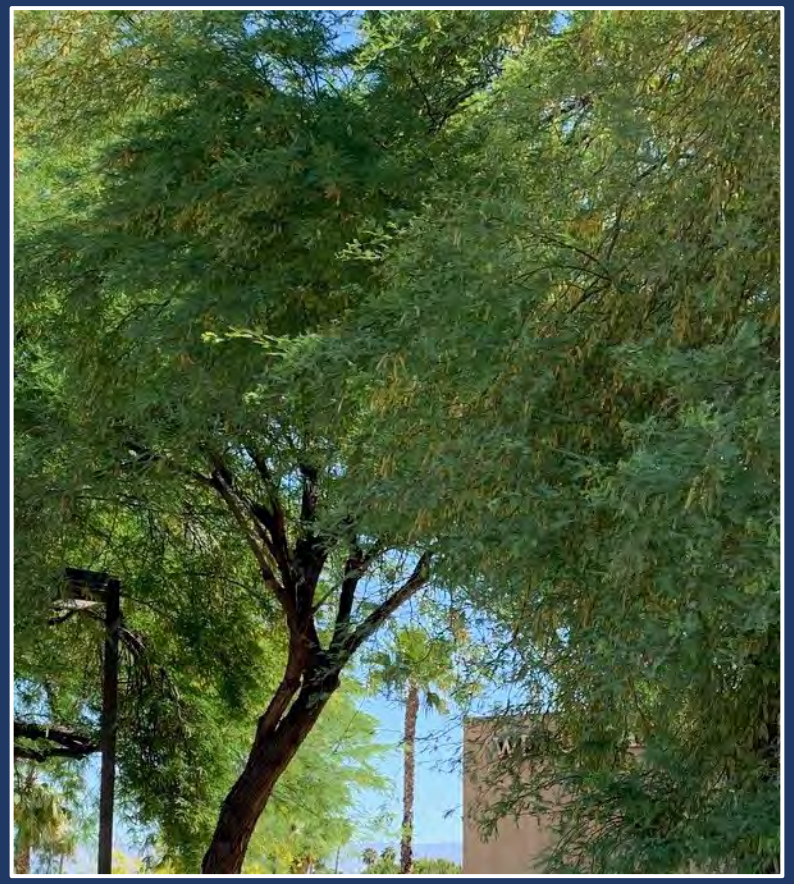
- Consulted other experts
- Compiled tree inventories
- Cross-referenced trees for rarity (<1% of typical Southern California tree canopy)

‘Bubba’, ‘Desert Museum’, Rosewood

Selected Finalists are Native to:

- Australia
- Southwest US
- Oklahoma
- Texas
- Western US
- Asia
- California
- Mexico

Strong Performers to Date



(Photos from Urban Forest Ecosystem https://selectree.calpoly.edu)

Netleaf Hackberry (*Celtis reticulata*)

- CA Native
- Deciduous
- Grows 35’ tall
- Attracts many species of birds
- Inconspicuous flowers

‘Maverick’ Mesquite (*Prosopis glandulosa*)

- Native to Southwestern United States
- Thornless
- Drought/heat/pest tolerant
- Deciduous
- Grows to 35’ tall
- Small yellow flowers in spring/summer
- Large pods

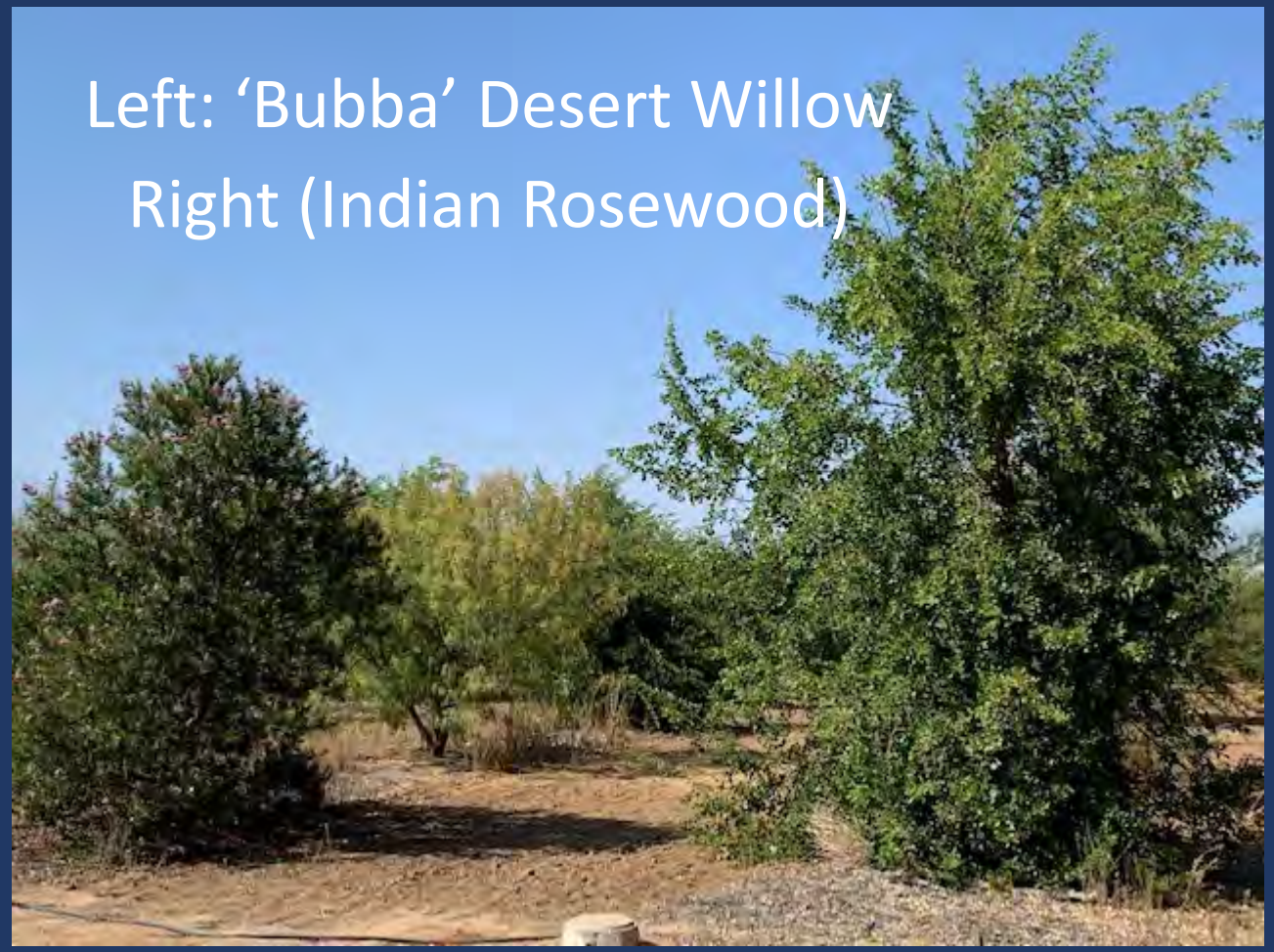
Pistacia 'Red Push'
(A hybrid between *P. atlántica x P. integerrima)*

- Developed in Arizona
- Deciduous
- Grows quickly to 20' tall
- Drought/heat/cold/pest tolerant
- Reddish leaves in fall
- Inconspicuous flowers
- Fruitless

Desert Willow ‘Bubba’
(*Chilopsis linearis*)

- Native to SW USA and Mexico
- Deciduous
- Grows quickly to 30’ tall
- Drought/heat/cold/pest tolerant
- Fragrant showy pinkish flowers
- Attracts hummingbirds and butterflies
- Fewer pods than other Desert Willows

Indian Rosewood
(*Dalbergia sissoo*)



- Native to India
- Semi-deciduous
- Grows quickly to 60’ tall
- Park or street tree
- Drought/heat/pest tolerant
- Legume
- Deer resistant

Ghost Gum
(*Corymbia papuana*)

- Native to Australia
- Evergreen
- Grows quickly to 50’ tall
- Drought/heat tolerant
- Susceptible to armillaria, resistant to verticillium
- Smooth bark

Palo Blanco
(*Acacia willardiana)/Mariosousa heterophylla)*

- Native to Mexico/Sonoran desert
- Deciduous to evergreen
- Grows to 20’ tall
- Drought/heat/pest tolerant
- Showy yellow flowers
- Legume

Tecate Cypress

(Hesperocyparis forbesii/Cupressus forbesii/Cupressus guadalupensis)

- Native to California
- Evergreen
- Grows to 25’ tall
- Drought/heat/pest tolerant
- Withstands low to high pH soils
- Deer resistant/attracts birds

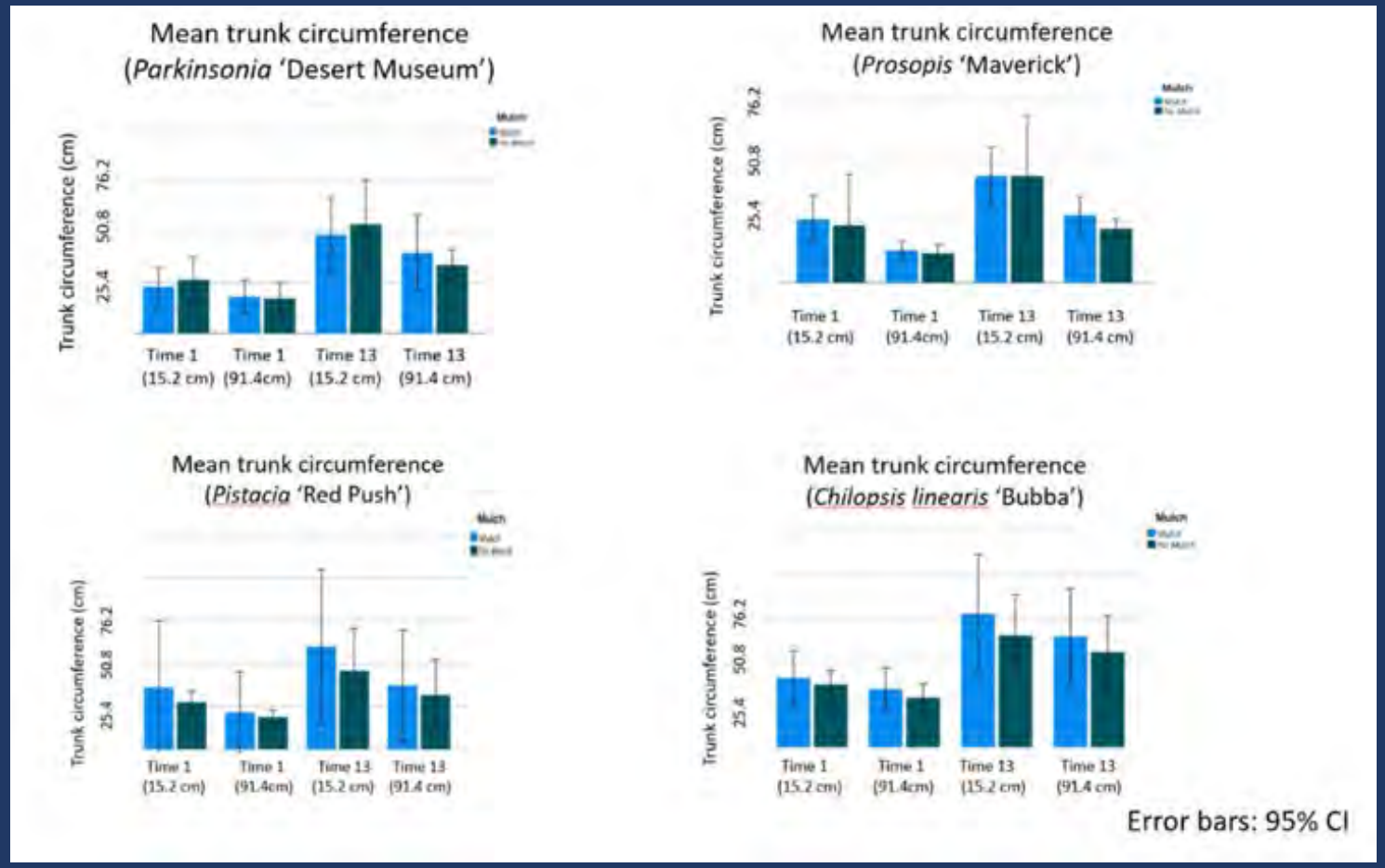
‘Desert Museum' Palo Verde
(3-way cross: *P. aculeata*, *P. microphyllum, and P. florida*)

‘Desert Museum’ Palo Verde

- Drought/heat tolerant
- Native to SW USA
- Deciduous
- Thornless
- Grows quickly to 15’ x 25’
- Prolific yellow flowers in spring/summer
- Susceptible to Shot-hole borer

Mulch/No-Mulch Study
Includes 4 Species from UCR Study

Janet Hartin*, John Bushoven, and Dilruba Yeasman



LUH 2021
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ISHS

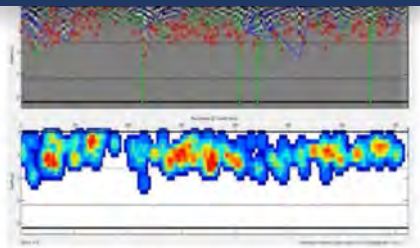

Figure 3: Example B-Scan of **no-mulched** plot (Bed #1) using a 1600 MHz GSSI antenna and TreeRadar™ analysis software. Top panel = Individual Detections (red triangles). Bottom panel = Root Density 2D Virtual Trench (red= greater density).

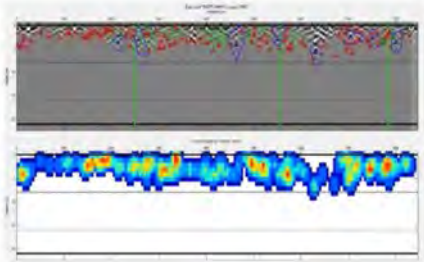

Figure 4: Example B-Scan of **mulched** plot (Bed #2) using a 1600 MHz GSSI antenna and TreeRadar™ analysis software. Top panel = Individual Detections (red triangles). Bottom panel = Root Density 2D Virtual Trench (red= greater density).

Other Recommended Drought, Heat, and Pest (Mostly!) Resistant Trees for Inland Southern CA

Parkinsonia ‘Sonorae’ Sonoran Palo Verde

- Very low water use
- 15 ft wide x 15 ft tall
- Yellow flowers
- Allergenic

Vachelia farnesiana (Acacia farnesiana)
Sweet Acacia

- Very low water use
- Semi evergreen
- 30 ft wide x 30 ft tall (smaller cultivar as well)
- Beautiful yellow flowers
- Tolerant to high pH
- Allergen

Acacia pravissima

- Yellow flowers
- Attract birds
- Fast growing

Olneya tesota
Desert Ironwood

- Low water use
- Up to 45 ft tall
- Dense wood that sinks in water
- Lives longer than 800 years old in Sonoran Desert

Cercis occidentalis
Western Redbud

- Low water use
- 15 ft wide x 15 ft high
- Deciduous
- Beautiful flowers

Ebenopsis ebano
Texas Ebony

- Low to very low water use
- Evergreen (if irrigated)
- Slow growth to 40 ft high (clumps)
- Creamy white flowers in early summer

Gleditsia triacanthos
(*var. inermis*, Thornless Locusts)
Honey Locust (Sunburst or Shademaster cultivars)

- Low water use
- Deciduous
- Thornless, podless
- 30 ft high x 25 ft wide
- Beautiful spring and fall foliage

Prunus ilicifolia

Holly Leaf Cherry

- Very low water use
- Evergreen
- Up to 16 ft wide and tall
- White flowers
- Edible fruits attract birds

Sunset Zones (Southern CA)

- 24: Coast
- 22: 10 miles inland
- 18 & 19: 5-70 miles Inland)
- 13: (Coachella Valley)

Useful Websites With Searchable Plant Selection Engines

- Urban Forest Ecosystem/Cal Poly: https://selectree.calpoly.edu

- California Native Plant Society: http://www.calscape.org

- WUCOLS IV (Water Use Classification of Landscape Species): http://ucanr.edu/sites/WUCOLS

- (For inland, non desert, non mountain sites only): https://inlandvalleygardenplanner.org/

selectree

Urban Forest Ecosystems Institute

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Search Trees by Characteristics

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Right Tree Right Place

Utility Precautions

Browse securely

SelecTree: Right Tree Right Place

Trees & shrubs are an important part of the environment and the communities that we live in. Use the health and safety links below to help avoid future conflicts with your valued plantings.

- Utility Precautions
- Hazardous Trees
- Fire Safety
- Tree Maintenance
- Root Damage
- Allergy & Toxicity
- Invasive Plants
- Biogenic Emissions

Quercus stellata

Branches droop but resist breakage...

Photo by C. Stubler, W. Mark and J. Reimer

Utility Precautions

Planting or pruning trees near utility lines requires careful consideration. Look for the utility friendly icon in search results lists. See Utility Precautions for more information.

selectree.calpoly.edu/tree-detail/1578

UFEI

SELECTREE URBAN TREE KEY CALIFORNIA BIG TREES

Search Trees By Name

Trees can be searched by their common or scientific name.

Enter a tree name...

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION CAL FIRE SINCE 1885

FOREST SERVICE U S DEPARTMENT OF AGRICULTURE

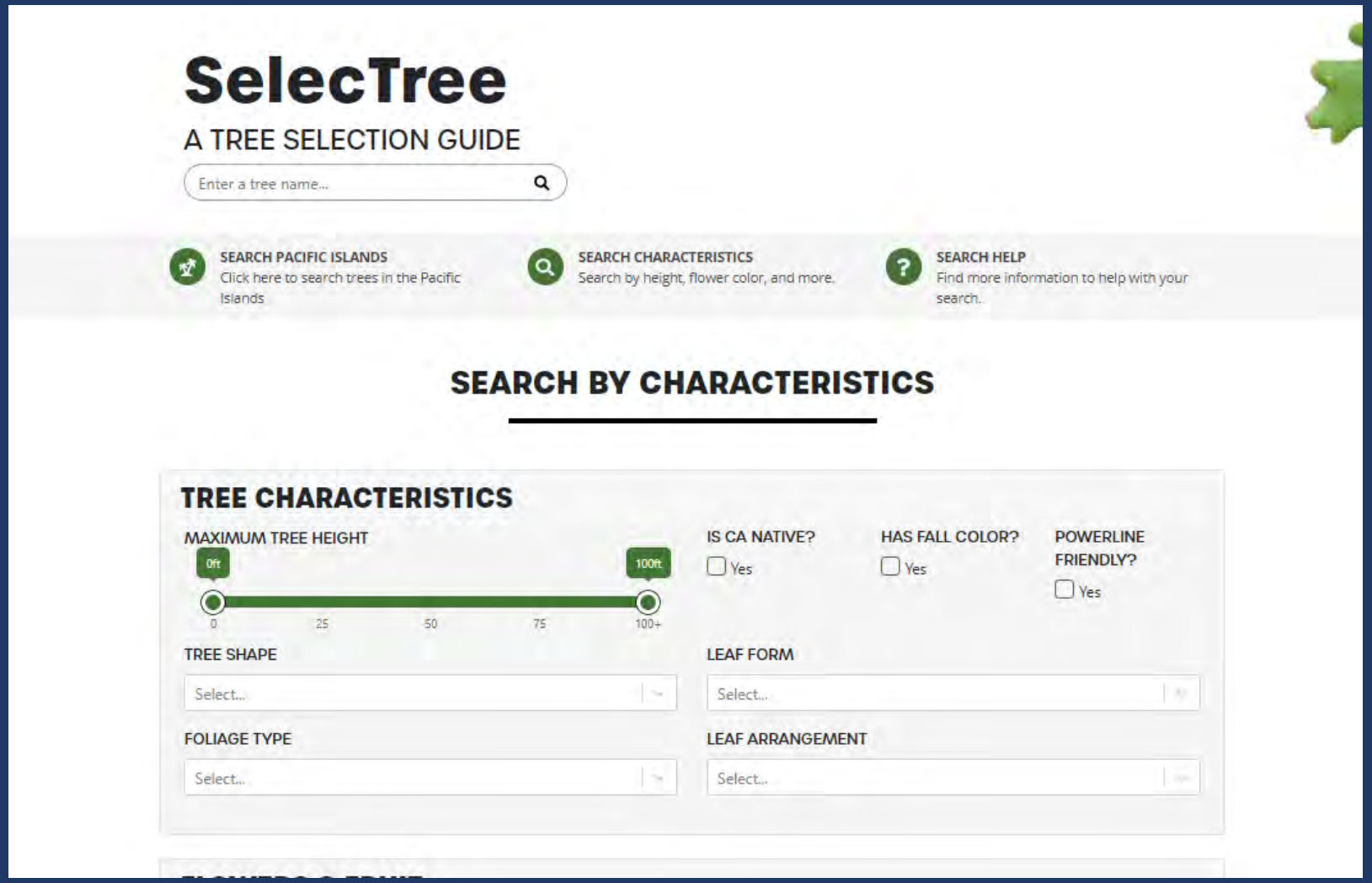
Department of Land and Natural Resources State of Hawaii

FORESTRY AND WILDLIFE HAWAII

LEARN BY DOING

CAL POLY

Urban Forest Ecosystem/Cal Poly: https://selectree.calpoly.edu



SEARCH TERM

TYPE IN A TERM TO SEARCH

SITE CONDITIONS

USDA HARDINESS ZONE

Select...

SUNSET CLIMATE ZONE

13 × 18 × 19 ×

AVAILABLE PLANTING AREA

Select...

DEER RESISTANT

- [ ] Yes

SALINITY TOLERANCE

- [ ] Yes

UTILITY PRECAUTIONS

- [ ] Medium Zone
- [ ] Low Zones

SELECTREE WATER USE RATING

- [x] Very Low
- [x] Low
- [ ] Medium
- [ ] High

SUN EXPOSURE

- [ ] Sun
- [ ] Partial Shade
- [ ] Full Shade

CLEAR ALL FILTERS

SEARCH

SelecTree

A TREE SELECTION GUIDE

Enter a tree name...

SEARCH PACIFIC ISLANDS
Click here to search trees in the Pacific Islands

SEARCH CHARACTERISTICS
Search by height, flower color, and more.

SEARCH HELP
Find more information to help with your search.

312 TREES

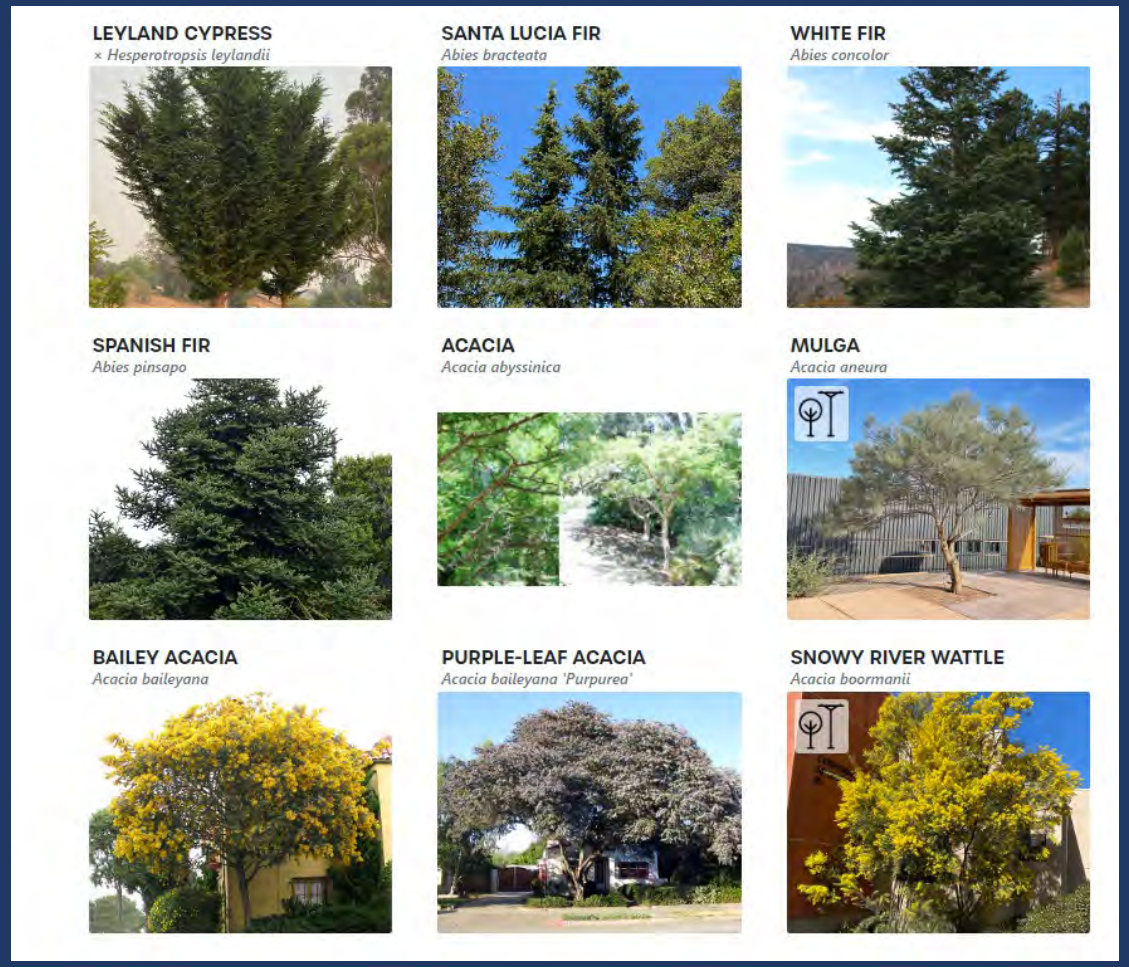
REFINE FILTER

Scientific Name A-Z

30 50 100
results per page

1 2 3 4 ... 11 › »

Example Trees from Search



SelecTree

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Find more information to help with your search.

SEARCH BY CHARACTERISTICS

TREE CHARACTERISTICS

MAXIMUM TREE HEIGHT

0ft 30ft

0 25 50 75 100+

IS CA NATIVE?
☐ Yes

HAS FALL COLOR?
☐ Yes

POWERLINE FRIENDLY?
☐ Yes

TREE SHAPE
Select...

LEAF FORM
Select...

FOLIAGE TYPE
Select...

LEAF ARRANGEMENT
Select...

FLOWERS & FRUIT

FLOWER COLOR
Select...

FRUIT TYPE
Select...

HAS FRAGRANCE?
☐ Yes

SEARCH TERM

TYPE IN A TERM TO SEARCH

SITE CONDITIONS

USDA HARDINESS ZONE

Select...

SUNSET CLIMATE ZONE

13 × 18 × 19 ×

AVAILABLE PLANTING AREA

Select...

DEER RESISTANT

- [ ] Yes

SALINITY TOLERANCE

- [ ] Yes

UTILITY PRECAUTIONS

- [ ] Medium Zone
- [ ] Low Zones

SELECTREE WATER USE RATING

- [x] Very Low
- [x] Low
- [ ] Medium
- [ ] High

SUN EXPOSURE

- [ ] Sun
- [ ] Partial Shade
- [ ] Full Shade

CLEAR ALL FILTERS SEARCH

SelecTree

A TREE SELECTION GUIDE

Enter a tree name...

SEARCH PACIFIC ISLANDS
Click here to search trees in the Pacific Islands

SEARCH CHARACTERISTICS
Search by height, flower color, and more.

SEARCH HELP
Find more information to help with your search.

172 TREES

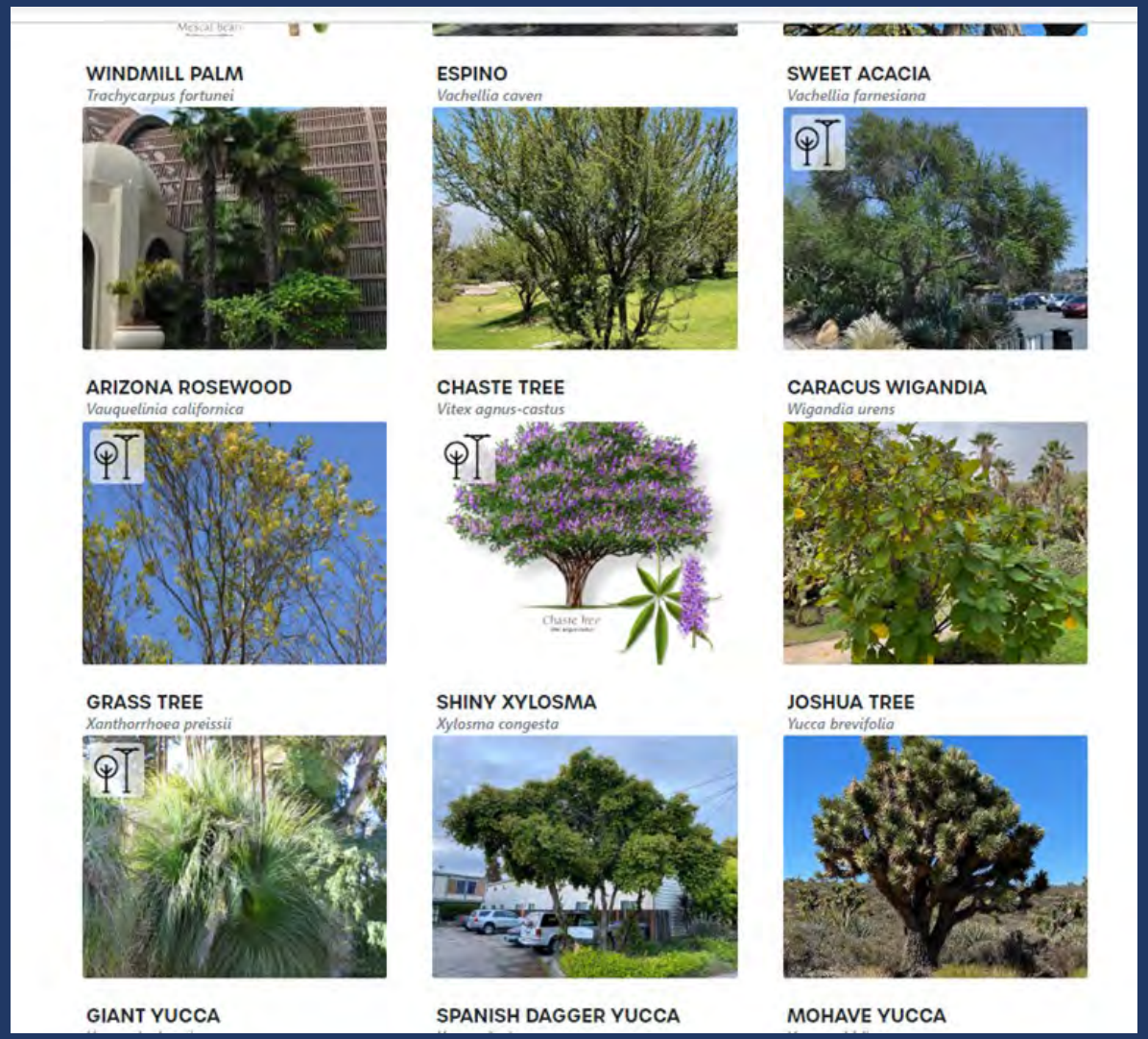
REFINE FILTER

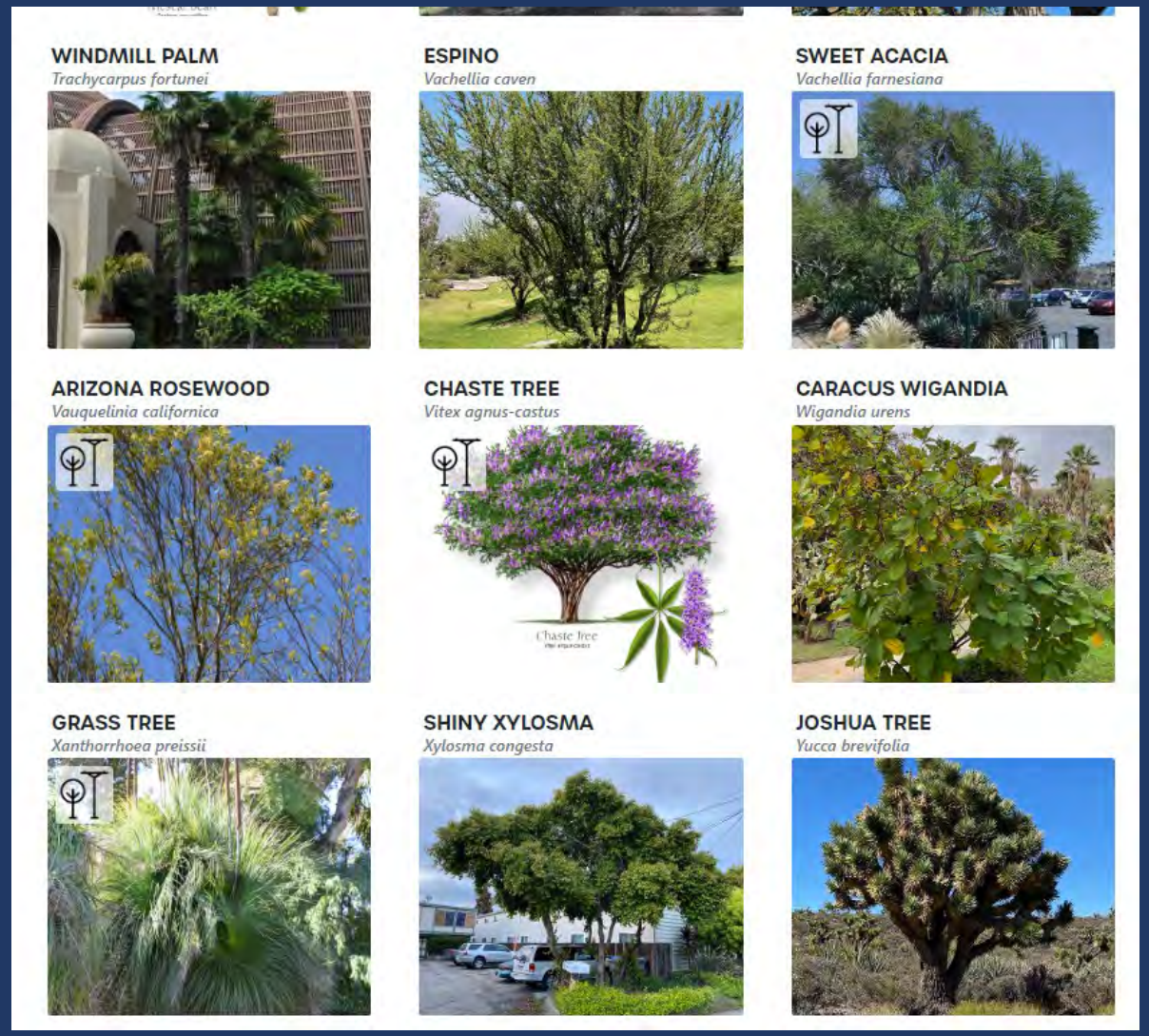
Scientific Name A-Z

30 | 50 | 100
results per page

1 2 3 4 ... 6 › »

Example Trees from Search





CNPS California Native Plant Society

Search cnps.org

About CNPS | Chapters | Join/Support | Publications | Shop | Conservation | Education | Gardening | Rare Plant Science | Vegetation Scienc

Calscape.org

Gardening Program

- About the Program
  - Why Garden with Natives
  - Benefits of Native Plants
- Calscape Native Plant Database
- Native Plant Garden Signs
- The Three 'P's of Native Gardening
- Planning Your Garden
  - Getting Started
  - Habitat Gardening
  - School Gardens
  - Patio Gardens
  - Sample Garden Plans
- Ditch Your Lawn
- Where to Buy Natives
- Events Calendar
- Identifying Native Plants
- Propagation
- Native Plant Resources
  - For Your Home Garden
- Arboretums & Botanic Gardens
- Invasive Weeds & Pest Management
  - Invasive Weeds

Native Plant Lists by Region

In addition to their natural beauty, California natives provide water-conserving, drought-tolerant and sustainable garden design choices. Find native plants for your own garden using the lists below, which are maintained by local CNPS chapters.

More benefits of native plants | Importance of conservation | Find your local chapter

Bay Area
- East Bay
- Napa Valley
- Marin
- Santa Clara Valley
- Yerba Buena

Central Coast
- Santa Cruz
- Monterey Bay
- San Luis Obispo

Central Valley
- Kern County
- Sacramento Valley
- Sequoia

Shasta
- Mount Lassen
- Shasta

Sierra Regions
- Bristlecone
- El Dorado
- Redbud
- Sierra Foothills

Southern Coastal
- San Diego
- South Coast
- LA/Santa Monica
- Channel Islands

Calscape

Find YOUR Native Plants

Help restore nature one garden at a time!

California Native Plants on Calscape

Find native plants for *YOUR* California

calscape.org/loc-Redlands,CA/cat-All-Plants/ord-popular

CNPS California Native Plant Society

Calscape | All plants for Redlands,CA

Search for California native plants by name

Enter a California address to see all plants native to that location

Redlands,ca

Advanced Search

782 all plants native to Redlands,CA

Options

1 
Big Berry Manzanita
Arctostaphylos glauca

2 
Blue Eyed Grass
Sisyrinchium bellum

3 
Nevin's Barberry
Berberis nevinii

4 
Coast Live Oak
Quercus agrifolia

5 
California Fuchsia
Epilobium canum

6 
Showy Penstemon
Penstemon spectabilis

7 
Deergrass
Muhlenbergia rigens

8 
Fremont Cottonwood
Populus fremontii

9 
California Aster
Corethrogyne filaginifolia

10 
Toyon
Heteromeles arbutifolia

11 
Western Sycamore
Platanus racemosa

12 
Blue Elderberry
Sambucus nigra ssp. caerulea


Engelmann


Sugar Sumac


Hoaryleaf


White Sage

https://calscape.org/search/?srchcr=sc6096a802468fa

For quick access, place your favorites here on the favorites bar. Manage favorites now

ABOUT CALSCAPE CONTACT CALSCAPE PLANTING GUIDE NURSERIES MY PLANT LISTS BUTTERFLIES GARDEN PLANNER

CALIFORNIA NATIVE PLANT SOCIETY
Calscape
Restore Nature One Garden at a Time

Search for California native plants by name

HOM

Advanced Search Results

Options Edit Search

2 Plants. Native to: **los angeles**. Type: ***Tree***. Sun: ***Part Shade***. Drainage: ***Medium***. Water Requirement: ***Very Low***. Ease of Care: ***Very Easy***. Height: ***15 - 30 feet***.

1 
Hollyleaf Cherry
Prunus ilicifolia

2 
California Buckeye
Aesculus californica

California Native Plant Society
Calscape
Restore Nature One Garden at a Time

Advanced Search

Search | Clear

Select desired plant characteristics and then click 'Search' to see matching plants

Native To los angeles

Type
- [ ] Annual herb
- [ ] Fern
- [ ] Grass
- [ ] Perennial herb
- [ ] Shrub
- [ ] Succulent
- [x] Tree
- [ ] Vine

Sun
- [x] Full Sun
- [ ] Part Shade
- [ ] Full Shade

Drainage
- [ ] Fast
- [x] Medium
- [ ] Slow
- [ ] Standing

Water Requirement
- [x] Extremely Low
- [x] Very Low
- [x] Low
- [ ] Moderate - High

Ease of Care
- [x] Very Easy
- [x] Moderately Easy
- [ ] Fairly Difficult

https://calscape.org/search.php

For quick access, place your favorites here on the favorites bar. Manage favorites now

Common Uses

- ☐ Bank Stabilization
- ☐ Bee Gardens
- ☐ Bird Gardens
- ☐ Bogs and Ponds
- ☐ Butterfly Gardens
- ☐ Butterfly Host Plants
- ☐ Deer Resistant
- ☐ Groundcovers
- ☐ Hedges
- ☐ Hummingbird Gardens

Availability in Nurseries

- ☐ Commonly Available
- ☐ Sometimes Available
- ☐ Rarely Available
- ☐ Never or Almost Never Available
- ☐ Available Through Seed Stores

Nurseries

- ☐ 3 Rivers Blooms
- ☐ Ackerman Native Plant Nursery
- ☐ Alladin Nursery & Gift Shop
- ☐ Annie's Annuals and Perennials
- ☐ Antelope Valley Resource Conservation Nursery
- ☐ Arboretum & Gardens' Nursery at Turtle Bay Exploration Park
- ☐ Artemisia Nursery
- ☐ Aspen Hollow Nursery
- ☐ Back to Natives Nursery @ Santiago Park
- ☐ Bay Natives
- ☐ Baylands Nursery
- ☐ Belmont Nursery
- ☐ Berkeley Horticultural Nursery

Fragrance

- ☐ Fragrant - Pleasant
- ☐ Fragrant - Unpleasant
- ☐ None
- ☐ Slight

Flower Color

- ☐ Black
- ☐ Blue
- ☐ Brown
- ☐ Cream

Advanced Search Results

Options Edit Search

10 Plants. Native to: **los angeles**. Type: ***Tree***. Sun: ***Full Sun***. Drainage: ***Medium***. Water Requirement: ***Extremely Low, Very Low, Low***. Ease of Care: ***Very Easy, Moderately Easy***.

1.  **Coast Live Oak** Quercus agrifolia
2.  **Engelmann Oak** Quercus engelmannii
3.  **Valley Oak** Quercus lobata
4.  **Scrub Oak** Quercus berberidifolia
5.  **Nuttall's Scrub Oak** Quercus dumosa
6.  **Hollyleaf Cherry** Prunus ilicifolia
7.  **California Buckeye** Aesculus californica
8.  **California Laurel** Umbellularia californica
9.  **California Juniper** Juniperus californica
10.  **Canyon Live Oak** Quercus chrysolepis

https://calscape.org/photos/3133?srchcr=sc6142bbcd7d54d

For quick access, place your favorites here on the favorites bar. Manage favorites now

Other fav

All Photos of Quercus agrifolia

Options | Back to plant page


© 2010 Calscape. Photo taken at Quail Botanical Garden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© 2010 Calscape


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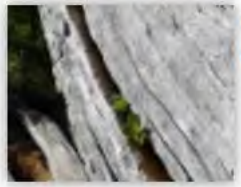
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Landscaping Information

Sun
Full Sun, Part Shade

Moisture
Low

Summer Irrigation
Max 1x / month once established

Nurseries
Carried by 60

Ease of Care
Very Easy

Cold Tolerance
Tolerates cold to 15° F

Soil Drainage
Medium

Soil Description
Tolerates a variety of soils but prefers a deep, well draining loam which it usually develops over time from leaf drop. Soil PH: 4.0 - 8.0

Common uses
Bank Stabilization, Hedges, Deer Resistant, Bird Gardens, Butterfly Gardens

Companion Plants
A wide variety of species work as either understory or companion plants with Coast Live Oak, including Coyote Brush; California Buckwheat; Coast Sagebrush; Toyon; California Coffeeberry; Woolly Bluecurls; Snapdragon Penstemon; Fuchsiaflower Gooseberry; California WildRose; Manzanita sp.; Ceanothus sp.; Salvia sp. and annual wildflowers including Poppy sp. and Chinese Houses; in riparian areas in Encinitas: Salix lasiolepis

Maintenance
Oaks are susceptible to several pests and diseases including Gold Spotted Oak Borer and Sudden Oak Death. The best prevention for these maladies is to avoid moving firewood outside the area where it was grown and sterilizing pruning instruments after each use.. Best to prune during July or August, when the trees are not normally growing, and when the dry weather is less likely to support pathogens that may attack the wounds. As much as possible, avoid pruning large limbs as this exposes the tree to possible infection and can take many years to recover. Avoid over-thinning interior branches or "lion tailing."

Propagation?
Propagation by acorns is relatively simple. Best acorns sink in water, have a more or less even mix of green, yellow and brown color, and pop out of their caps easily. Plant acorns on their sides, at depth of 1.5x its diameter. Keep moist until germinated and at least 3-4 weeks after the seedling pushes out of the ground. For propagating by seed: Fresh seeds sow in fall outdoors or stratify to hold for spring sowing. (USDA Forest Service 1974).

WUCOLS IV (Water Use Classification of Landscape Species): http://ucanr.edu/sites/WUCOLS

WUCOLS IV

Water Use Classification of Landscape Species

Plant Search Database

Select a City by Region

- North Central Coastal - Submit
- Central Valley - Submit
- South Coastal - Submit
- South Inland Valley - Submit
- High and Intermediate Desert - Submit
- Low Desert - Submit

See WUCOLS List for All Regions

WUCOLS IV

fication of Landscape Species

- South Inland Valley -
Alhambra
Arcadia
Azusa
Baldwin Park
Chino
Chino Hills
Claremont
Colton
Corona
Covina
Diamond Bar
Duarte
El Monte
Escondido
Fontana
Glendora
Hemet
La Canada-Flintridge
Lake Elsinore
Loma Linda
Menifee
Monrovia
Montclair
Monterey Park
Moreno Valley
Murrieta
Norco
Ontario

Submit

Submit

Submit

Submit

Submit

Submit

https://ucanr.edu/sites/WUCOLS/Plant_Search/

here on the favorites bar. Manage favorites now

SHARE PRINT SITE MAP Enter Search Terms GIV

WUCOLS IV

Water Use Classification of Landscape Species

Plant Search Database

If you know exactly which plant you are interested in, you may search for it by name (partial names are OK, too). Otherwise, consider searching by plant type and/or water use.

See WUCOLS List for All Regions

City

Search for a city: San Diego — or — Find a city on the map

Plant Name

Common Name or Botanical Name

Water Use

- [x] Very Low
- [x] Low
- [ ] Moderate / Medium
- [ ] High
- [ ] Unknown
- [ ] Not Appropriate for this Region

Plant Type

- [ ] **Gc** (Ground Cover)
- [ ] **P** (Perennial)
- [ ] **S** (Shrub)
- [x] **T** (Tree)
- [ ] **V** (Vine)
- [ ] **Ba** (Bamboo)
- [ ] **Bu** (Bulb)
- [ ] **G** (Ornamental Grass)
- [ ] **Pm** (Palm and Cycad)
- [ ] **Su** (Succulent)
- [ ] **N** (California Native)
- [ ] **A** (Arboretum All-star)

Looking for Turf Grass?

Search Plants

https://ucanr.edu/sites/WUCOLS/Plant_Search/?step=results&city_id=283&plant_name=&water_use=VL&water_use=LO&pl...

ere on the favorites bar. Manage favorites now

SHARE PRINT SITE MAP Enter Search Terms GIVE

WUCOLS IV

Water Use Classification of Landscape Species

Plant Search Database

City	San Diego
Region	South Coastal

Start Over | Search Again | Export List

▼ **Legend: Plant Types**

▼ **Legend: Categories of Water Needs**

Search Results: 249

Type	Photo	Botanical Name	Common Name	Water Use	Export
T	N/A	Abies pinsapo	Spanish fir	Low	☐
T		Acacia baileyana	Bailey acacia	Low	☐
S T	N/A	Acacia berlandieri	guajillo	Low	☐
S T	N/A	Acacia constricta	whitethorn acacia	Low	☐
S T		Acacia craspedocarpa	leatherleaf acacia	Low	☐

Thank You

Questions?

jshartin@ucanr.edu