

working for clean rivers



Supporting private property owners in tree selection for future climate

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Environmental Service Tree Program

March 11, 2024



ENVIRONMENTAL SERVICES
CITY OF PORTLAND

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Mingus Mapps, Commissioner
Dawn Uchiyama, Director

Overview

- Treebate and treebate participants
- Future climate & Treebate trees
- Improving support for property owners in tree selection for future climate

Spoiler Alert

Brought to you by

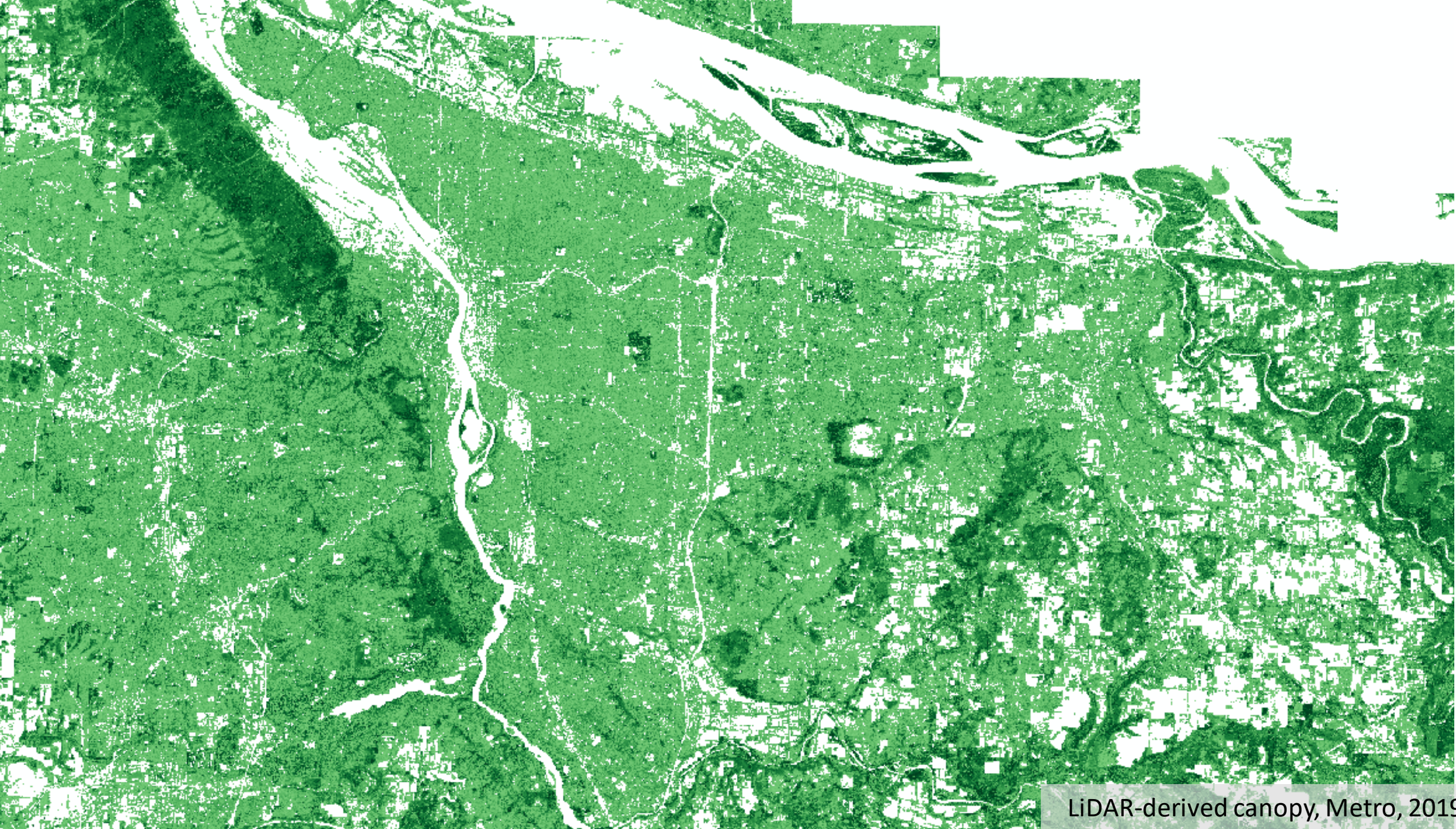


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LiDAR-derived canopy, Metro, 2019

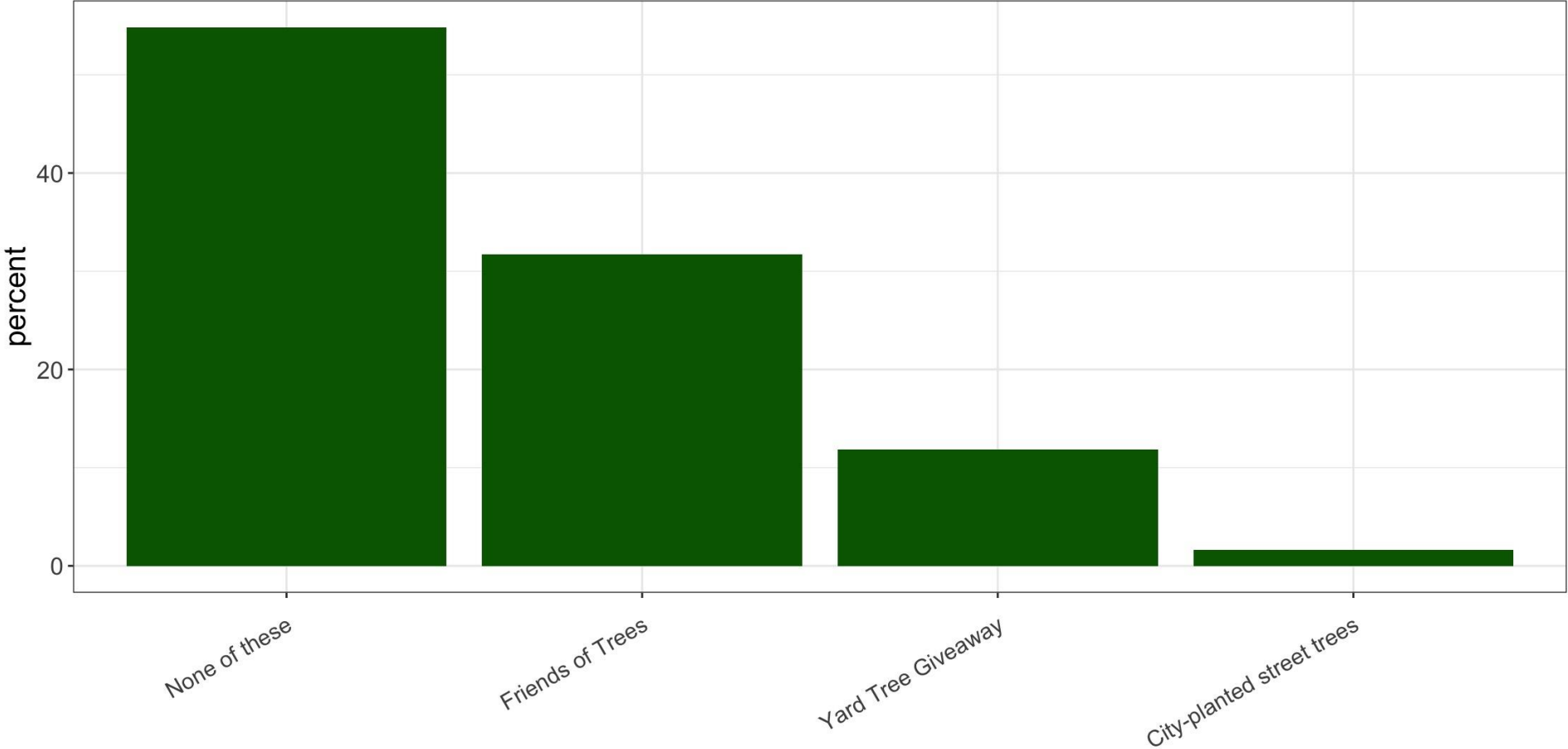
Voluntary

Tree Planting Programs



Participation in other City programming

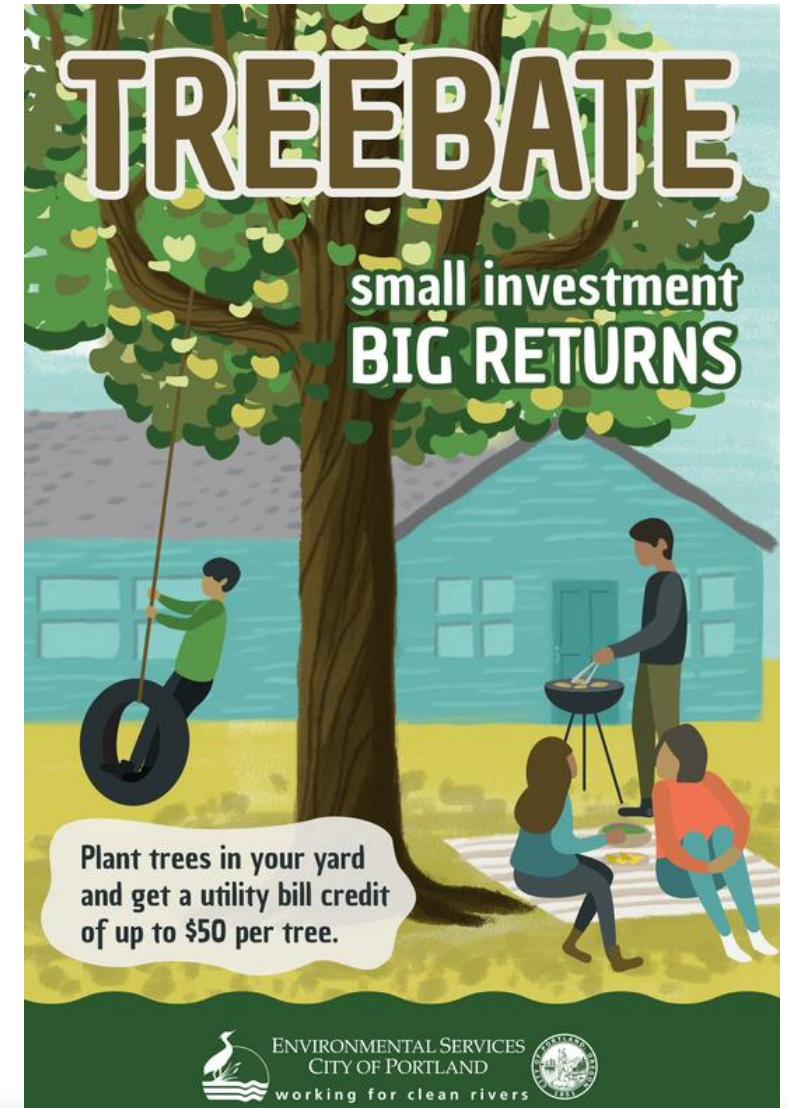
In the last 10 years, have you recieved trees from any of the following programs?
Select all that apply.



Treebate

Treebate offers a one-time (per tree) credit on a customer's water/sewer/stormwater utility bill for planting a new tree on private residential property.

Size category	Maximum credit	Minimum height	Height x width	Examples
Large	\$50	50 feet	>2,500 ft ²	Douglas-fir Oregon white oak
Medium	\$30	30 feet	1,000 - 2,500 ft ²	Silverleaf oak Red maple
Small	\$20	15 feet	<1,000 ft ²	Japanese maple Persian ironwood
Fruit Trees	\$10	N/A	N/A	Apple, pear, peach, <i>etc</i>



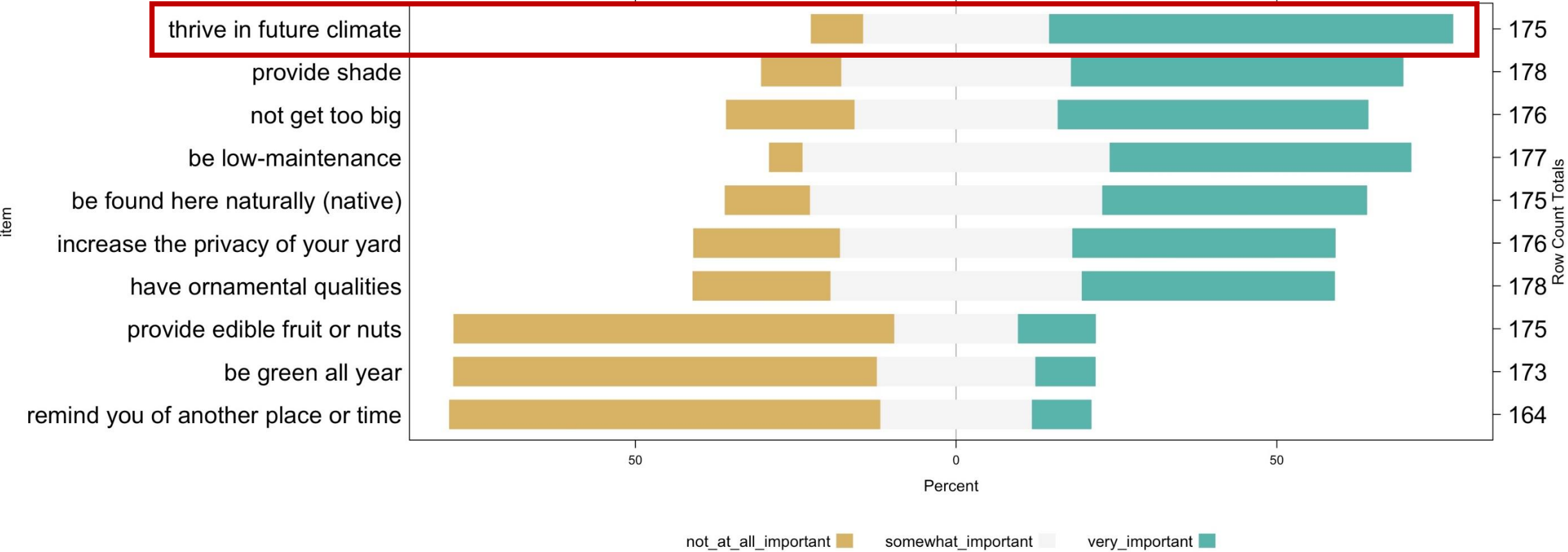
Treebate Participant Survey

- Survey design
 - Anonymous, web-based survey
 - Single postcard invitation
 - 1,728 Treebate-participating tax lots
 - \$5 e-gift card!
- Response
 - 179 former Treebate participants
 - 10%+ response rate



Future climate matters to private property owners

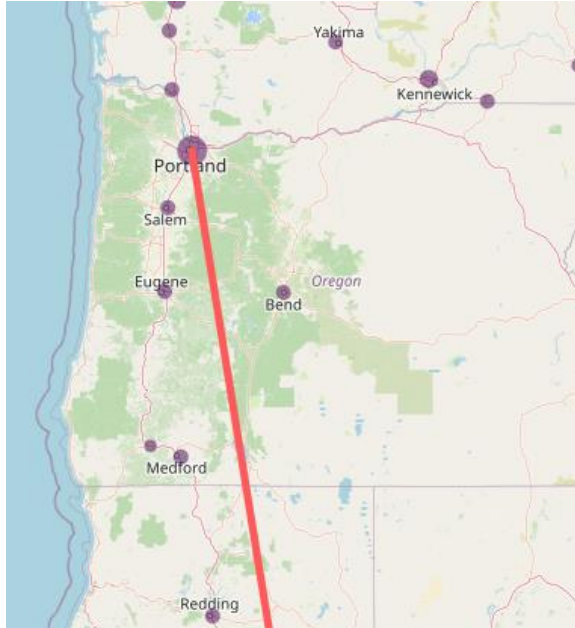
How important was it to choose a tree that would...



Future Climate

Portland's
Climate Analog
60 years from
now

RCP 8.5



California Center for Urban Horticulture

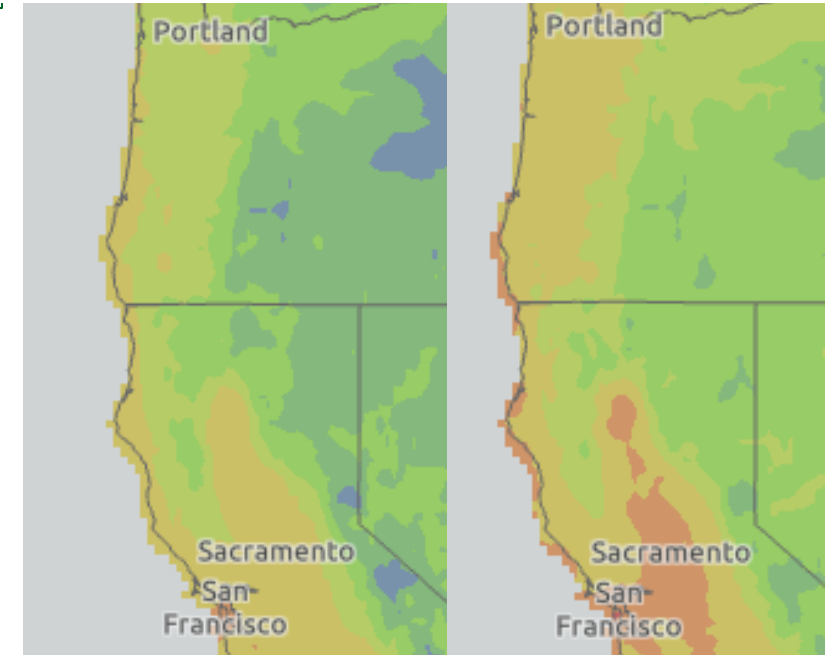
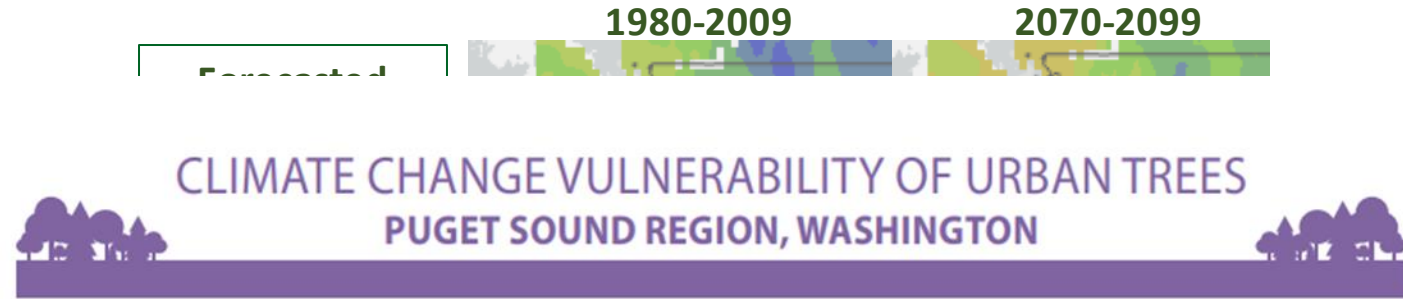
Home About Us > Events Resources > Partnerships Ways to Give Students >

Water Use Classification of Landscape Species (WUCOLS)



Fitzpatrick and Dunn (2019). Contemporary climatic analogs for 540 North American urban areas in the late 21st century. *Nature Communication* 10(1): 614. <https://fitzlab.shinyapps.io/cityapp/>

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Climate Change Pressures in the 21st Century. USDA Forest Service Office of Sustainability and Climate
<https://storymaps.arcgis.com/stories/9ee0cc0a070c409cbde0e3a1d87a487c>

Puget Sound Region Tree Species Vulnerability

<p>URBAN ADAPTABILITY:</p> <ul style="list-style-type: none"> + High: <i>Species may perform better than modeled</i> • Medium - Low: <i>Species may perform worse than modeled</i> 	<p>ZONE SUITABILITY:</p> <ul style="list-style-type: none"> ✓ Suitable ✗ Not Suitable 	<p>VULNERABILITY:</p> <ul style="list-style-type: none"> ▼ Low: <i>Suitable zone, high adaptability</i> ● Low-moderate: <i>Suitable zone, medium adaptability</i> ⊖ Moderate: <i>Suitable zone, low adaptability or zone not suitable, high adaptability</i> ○ Moderate-high: <i>Zone not suitable, medium adaptability</i> △ High: <i>Zone not suitable, low adaptability</i>
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*Invasive species

COMMON NAME	ADAPT	HEAT ONLY		HEAT & HARDINESS	
		ZONE SUIT	ZONE VULN	ZONE SUIT	ZONE VULN
Aleppo pine	•	✓	●	✓	●
Alleghany serviceberry	+	✓	▼	✓	▼
American basswood	•	✓	●	✗	○
American beech	•	✓	●	✓	●
American elm	•	✓	●	✓	●

COMMON NAME	ADAPT	HEAT ONLY		HEAT & HARDINESS	
		ZONE SUIT	ZONE VULN	ZONE SUIT	ZONE VULN
Corkscrew willow	•	N/A	N/A	✓	●
Cornelian cherry	•	✓	●	✗	○
Crabapple	•	✓	●	✗	○
Crepe myrtle	+	✓	▼	✓	▼
Dawn redwood	•	✓	●	✗	○

Climate Change Response Framework. 2022. Puget Sound Region Tree Species Vulnerability. <https://forestadaptation.org/assess/ecosystem-vulnerability/urban/puget-sound-region>

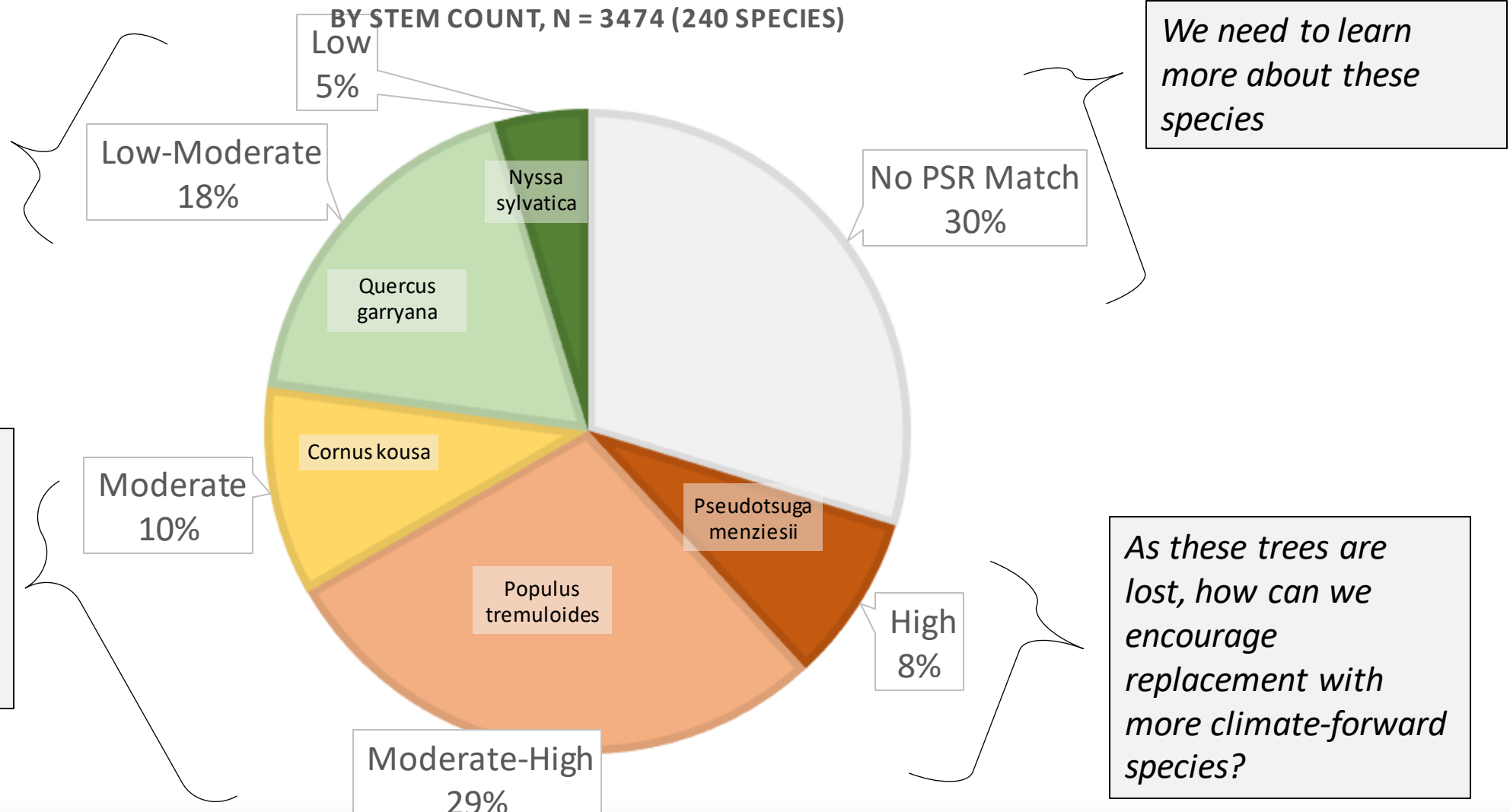
Brandt et al. 2017. Chicago Wilderness region urban forest vulnerability assessment and synthesis: a report from the Urban Forestry Climate Change Response Framework Chicago Wilderness pilot project. <https://www.fs.usda.gov/research/treesearch/54128>



Vulnerability of Treebate trees

PSR TSV VULNERABILITY RATING FOR TREEBATE TREES

BY STEM COUNT, N = 3474 (240 SPECIES)



Water Use Classification of Landscape Species (WUCOLS)

- Classified by region (Sacramento = region 2)
- Compares estimated water use of an established, good-condition landscape plant to a reference water use (ET_0) of 4 to 7-inch cool-season grass not experiencing water stress
- Takes an irrigation perspective, assuming that landscape plants do not have access to groundwater
- Does not consider microclimate modifiers, such as shading or reflected heat

Costello, L.R., Jones, K.S. 2014. Water Use Classification of Landscape Species IV. <https://ccuh.ucdavis.edu/wucols>



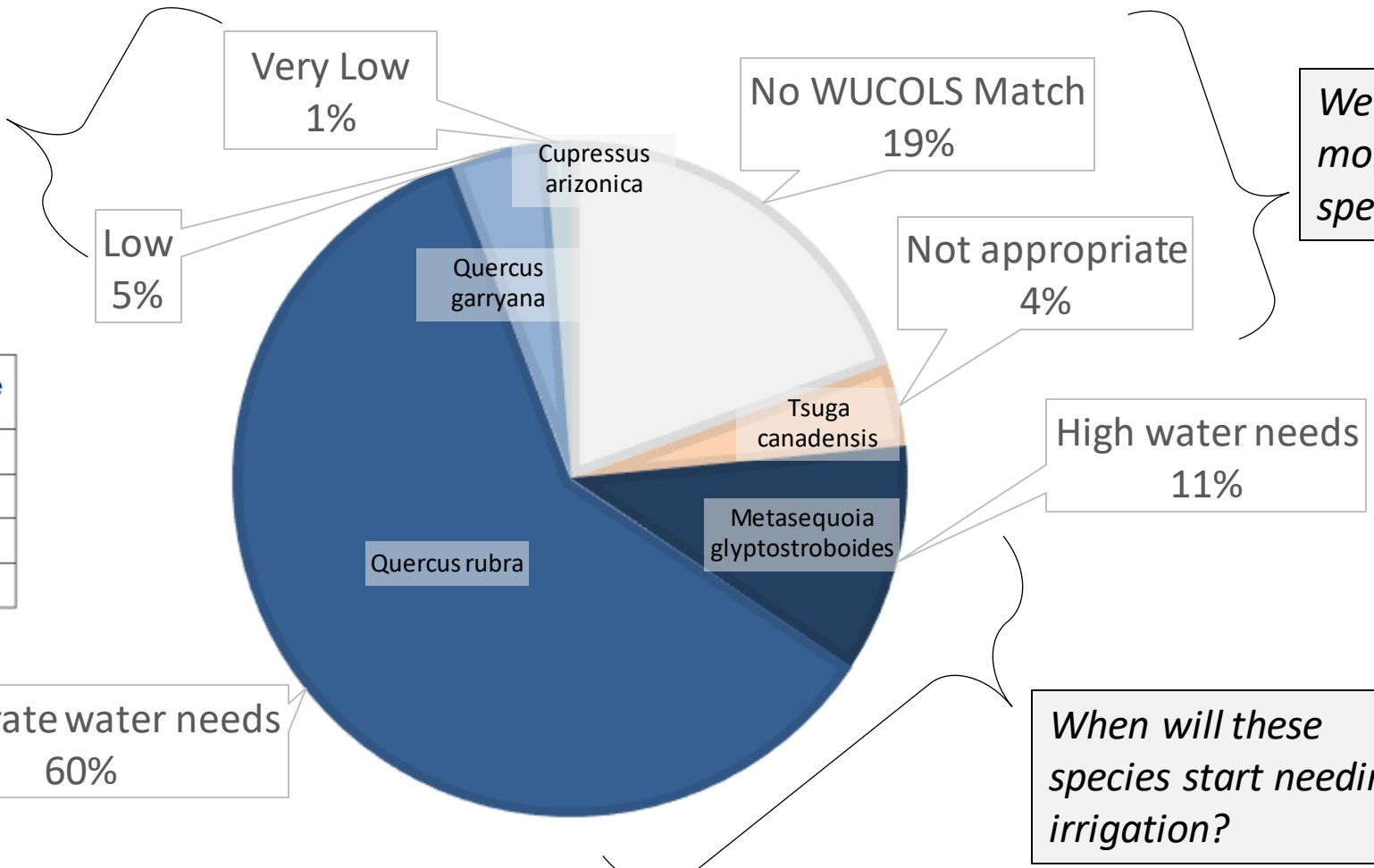
Water Use Classification of Treebate trees

WUCOLS REGION 2 WATER USE CATEGORY FOR TREEBATE TREES
 BY STEM COUNT, N = 3,474 (240 SPECIES)

What is the condition of these trees in our current climate?

We need to learn more about these species

Category	Abbreviation	Percentage of ET _o
High	H	70-90
Moderate	M	40-60
Low	L	10-30
Very Low	VL	< 10

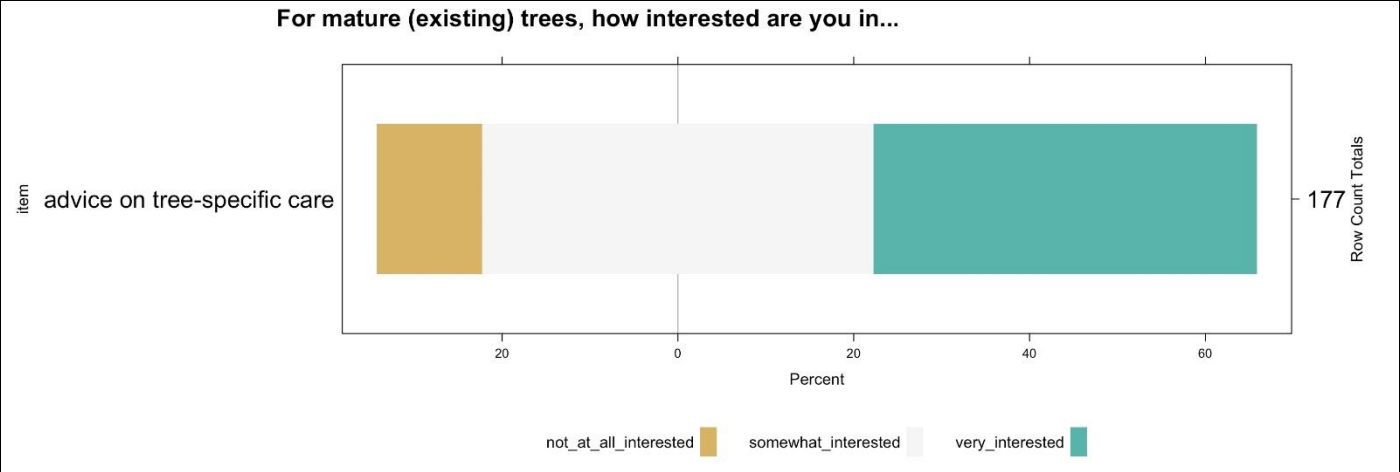
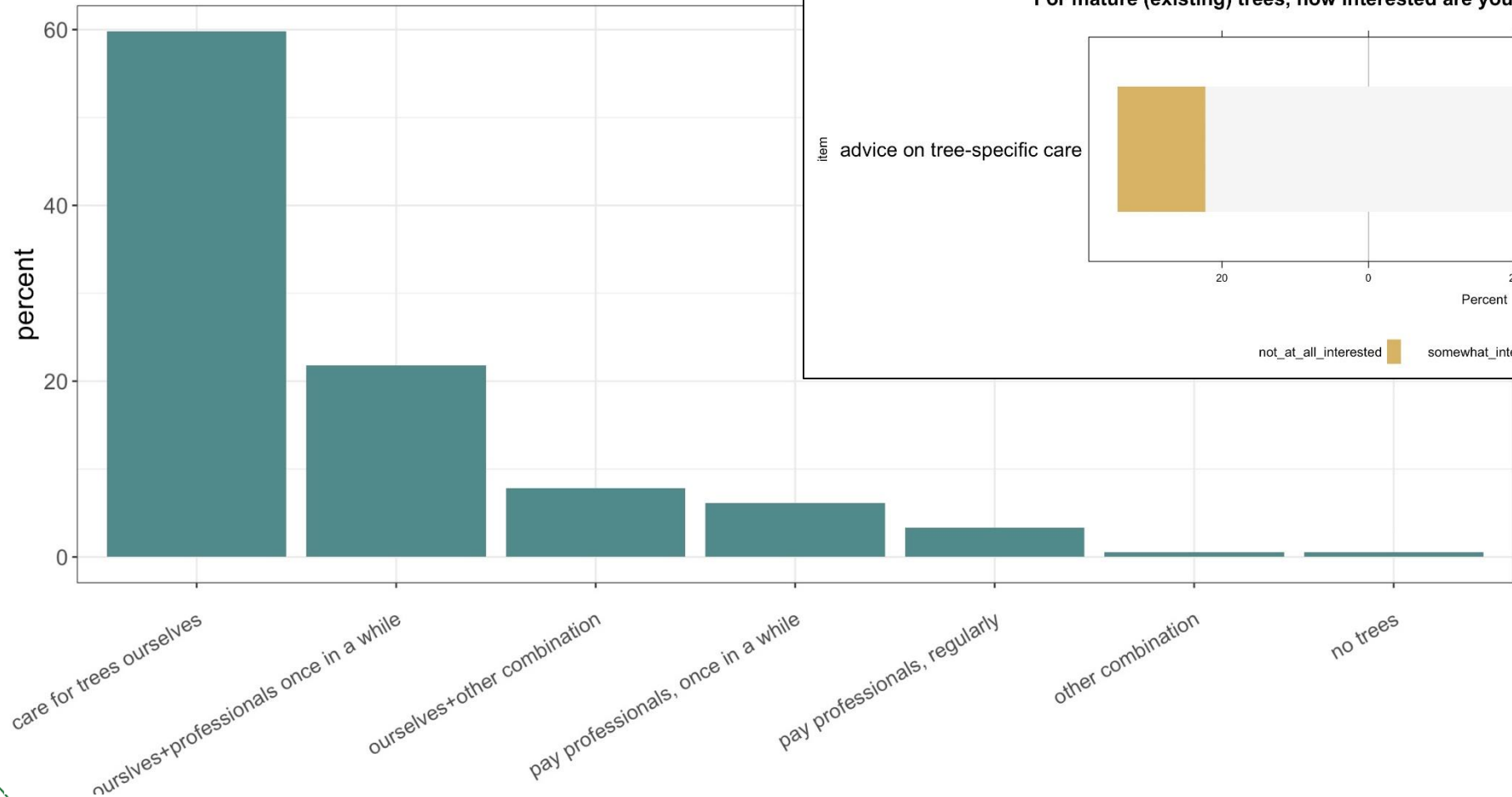


When will these species start needing irrigation?



Care of existing trees

How do you provide care for the trees at your home?
Select all that apply.



1.

Talk about future climate

- Inventory and improve accessibility of best available knowledge
- Promote readily available climate-forward trees (lower water users, lower vulnerability) in the language of homeowner values
 - Talking about trees as future-climate appropriate
 - Emphasizing siting and selection for shade, privacy, habitat, and low-maintenance outcomes



2. Stay connected

- Maintain occasional contact beyond “the establishment phase”
 - Opportunities for long-term monitoring
 - Connection to on-going educational needs
- Resources for identifying, removing, and replacing dying trees



3. Work together

- Education and outreach partnerships between government/extension/non-profits specifically oriented towards urban property owners
- Training (CEU) and workforce development opportunities



Future Research Opportunities

- Compiling a Willamette Valley-specific climate-forward tree list; iterative
- Working with growers on shaping partnerships, incentives and/or interventions to increase availability of climate-forward trees
- Greater understanding of our urban groundwater resource

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Pacific madrone - City of Portland

