CALIFORNIA DEPARTMENT OF WATER RESOURCES

American Water Works Association California-Nevada Section

WTA

CALIFORNIA Water Boards

CALIFORNIA WATER EFFICIENCY PARTNERSHIP

CULTIVATING CLIMATE-READY LANDSCAPES

KARINA HERRERA, STATE WATER BOARD

ANDREW BRENNER, NV5

REGINA HIRSCH, WATERSHED PROGRESSIVE

PAUL PIAZZA, SONOMA WATER

TRATHEN HECKMAN, DAILY ACTS

Making Conservation a California Way of Life

Overview of the Outdoor Standards

Karina Herrera

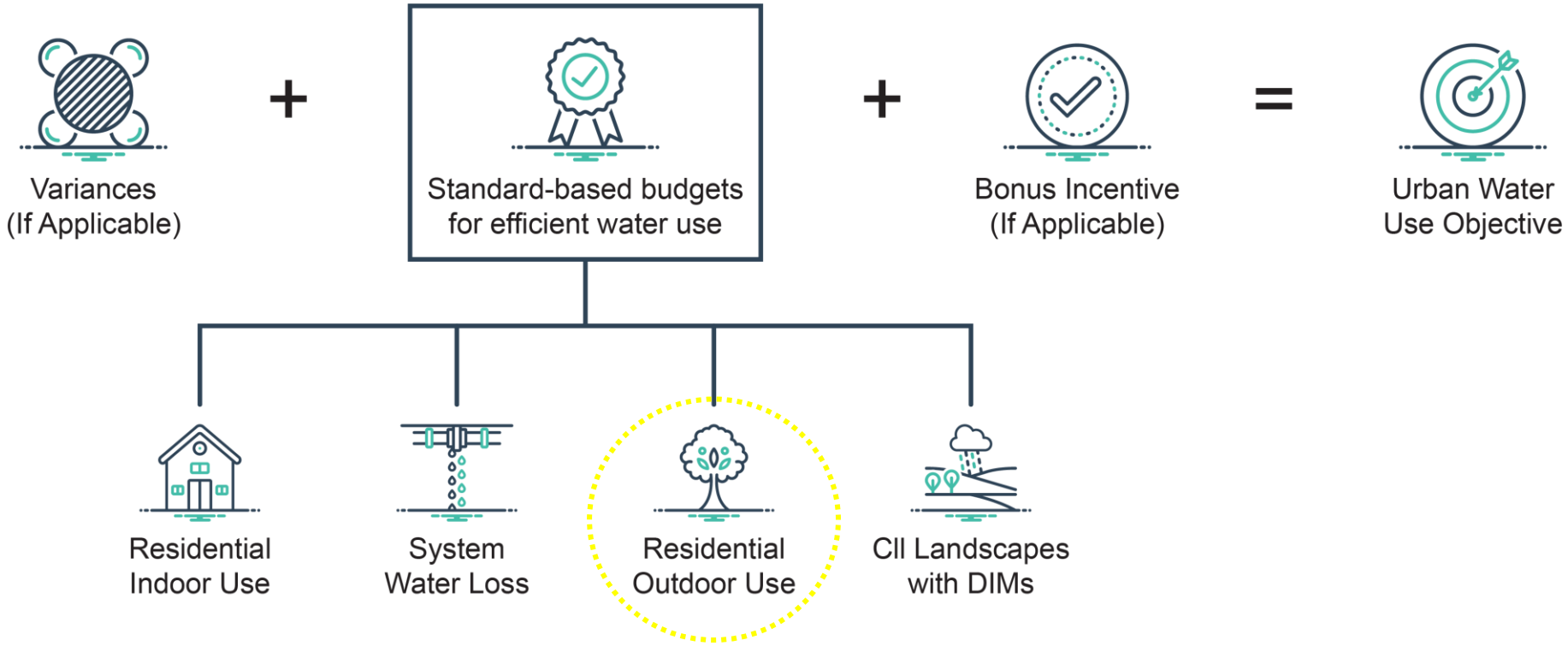
Conservation Supervisor

CALIFORNIA Water Boards

Office of Research, Planning, and Performance

Calculating an Objective

Based on efficiency standards and customized, supplier-specific data



Efficient Residential Outdoor Budget

Example budget for Res-Outdoor use (2019 data)

0.80 * (55 in. - 2 in.) * 324 million sq. Ft. * 0.62 =

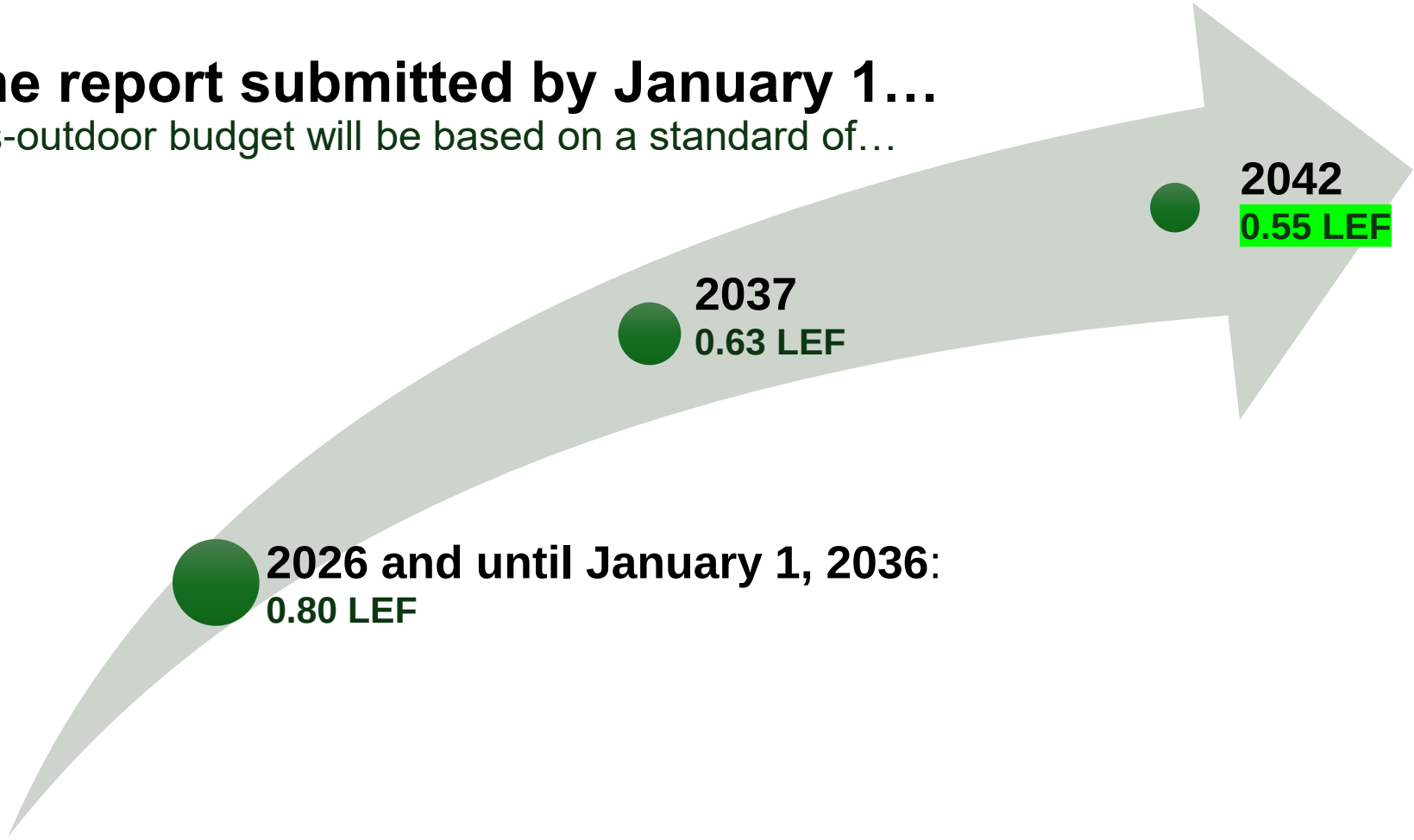
~ 26.1 thousand AF

Residential Outdoor Budget (**§968**)

What is required and by when?

For the report submitted by January 1…

The Res-outdoor budget will be based on a standard of…



§968
Residential Outdoor Budget
What is required and by when?

For a report submitted **any** given year:

- Budgets associated with **newly constructed** residential landscapes are calculated using a LEF of 0.55
- Budgets associated with residential **special landscape areas** are calculated using a LEF of 1.0

If a supplier is not meeting their objective, it can adjust their landscape area by including 20% Irrigable Not Irrigated area.

- This is an option **<u>until</u>** the supplier's landscape area is updated.

A supplier can also adjust landscape area by adding Res-parkway area.

- The Department of Water Resources is providing provisional parkway data with the CII-LUCD data

Water use standard for outdoor use is a **Landscape Efficiency Factor**

Native plant garden on drip and micro spray irrigation with majority low and very low water using plants and a few medium water using plants

0.55

A majority of yard is low water using plants irrigated with drip
+ warm season grass with overhead sprays

This is the <u>2040 standard</u> for residential outdoor use

Warm season grass inefficiently irrigated (e.g., not properly tuned, running too long) with lawn sprinklers

§968
Residential outdoor Budget
What do the data from the 2025 reports show?

Of the **325** suppliers that submitted reports *with adequate data to calculate objectives...*

- **14** suppliers have a Res-outdoor budget that represents 70% or more of their uncapped objective; for **118** suppliers, it represents 30% or less of their uncapped objective.

*The Res-outdoor budget represents, on average, **38%** of the uncapped objective. The median is **37%**.*

Of the **342** suppliers that submitted reports....

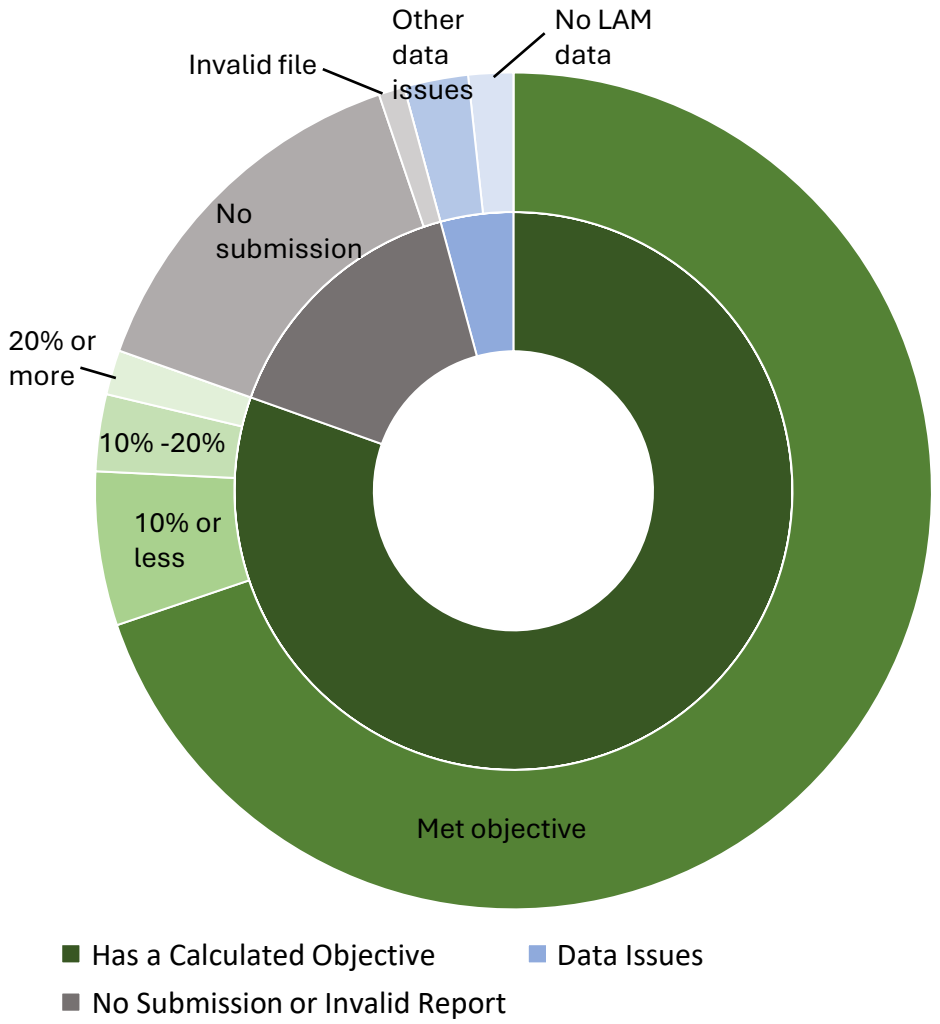
- **1** supplier used their own LAM data to calculate the budget.
- **19** suppliers included data for outdoor variances.
- **82** suppliers included data for newly constructed residential landscapes.
- **17** suppliers included data for residential Special Landscape Areas.

Making Conservation a Way of Life

What do the data from the 2025 reports show?

342 (out of 404) urban retail water suppliers submitted reports. Of the **325** that submitted reports *with adequate data to calculate objectives...*

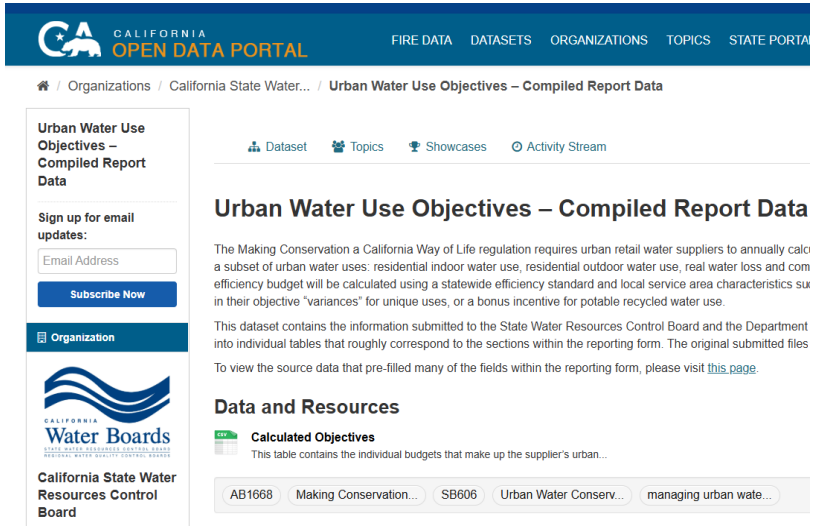
- **282** met the objective for Fiscal Year 2023-2024.
- **24** would have to reduce ‘regulated demand’ by 10% or less.
- **12** suppliers would have to reduce 'regulated demand’ by 10 to 20%.
- **7** suppliers would have to reduce 'regulated demand' by 20% or more



Now also on the Open Data Portal

https://data.ca.gov/dataset/urban-water-use-objectives-compiled-report-data

- FY 23-24 urban water use objective reported data
  - Calculated Objectives table published
  - More coming over the next few months



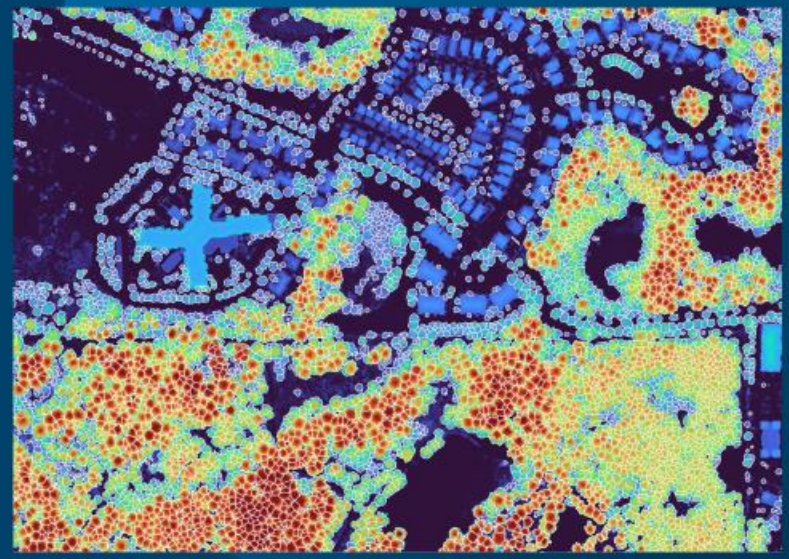
UNDERSTANDING YOUR IRRIGATED LANDSCAPE AND ITS WATER USE THROUGH MAPPING TECHNOLOGIES

Andrew Brenner

Vice-President Solutions Engineering

PRESENTATION OVERVIEW

- Why land cover and land use are so important?
- Mapping vegetation and its irrigation status
- How does this help you
  - Water use efficiency
  - Stormwater & pollution management
  - Tree canopy management, microclimate modification and fire risk
- Summary



WATER CONSERVATION A CALIFORNIAN WAY OF LIFE

URBAN WATER USE EFFICIENCY STANDARDS AND WATER USE OBJECTIVE

Legislation required the state to create equitable allocations for urban water suppliers

https://calwep.org/wp-content/uploads/2021/08/WUE-Standards.png

CALIFORNIA STATEWIDE URBAN IRRIGATED LANDSCAPE PROGRAM

- Equitable assessment of water use
- Good water stewards
- **Water Use Objective** customized to each district
  - Indoor – Population x gallon per person per day
  - Outdoor
    - Landscape area
    - Potential Evapotranspiration ET_0
    - ET factor (0.8 and decreasing)
- NV5 classified
  - For residential landscapes ~ 14,000 square miles
  - For commercial, industrial and institutional landscapes ~ 12,000 square miles
  - Summarized data for over 400 water suppliers
  - Estimated landscape area for over 12 millions individual residential parcels
  - MMU 64 square feet
  - 95% accuracy (residential at supplier level)
  - 95% accuracy (CII at polygon level)

RESIDENTIAL CLASSIFICATION

- Irrigated
  - Lawns
  - Shrubs and trees
  - Ground cover in irrigated areas (mulch/soil)
- Irrigable not Irrigated
  - Dry lawns
  - Dry landscaping that has evidence of irrigation
- Not Irrigable
  - Structures, roads, sidewalks, impervious
  - Undeveloped land
  - Open Water
- Special Cases
  - Horse Corals
  - Artificial Turf

CLASSIFICATION SCHEME CII

LUCD Canopy Priority Classification System		
Level 1	Level 2	Irrigation Status
1. Impervious	Impervious	Not Irrigable
2. Pools	Swimming pools/man made water features	Irrigated
3. Irrigated	3.1 Turf grass 3.1 Vegetation cover	Irrigated (CII Turf grass separated in functional and non-functional turf)
	3.2 Canopy 3.3 Bare Earth	
4. Irrigable not irrigated	4.1 Turf grass/ground cover 4.1 Vegetation Cover	Irrigable not irrigated
	4.2 Canopy 4.3 Bare Earth	
5. Non irrigated vegetation	Undeveloped for the purposes of irrigation	Not Irrigable
6. Undeveloped lands	Undeveloped Lands	Not Irrigable
7. Horse Corrals	Horse Corrals	Irrigated
8. Open Water	Other open natural water (rivers/ponds)	Not Irrigable
9. Artificial Turf	Artificial Turf	Not Irrigable
10. Agricultural Land	Agricultural Land (1 acre of agriculture within a single parcel or 1 acre of contiguous agriculture across 2 or more parcels)	Irrigated

LANDSCAPE AREA ESTIMATES MODELING PROCESS

Imagery Segmentation – Deep learning Classification – Review and QC

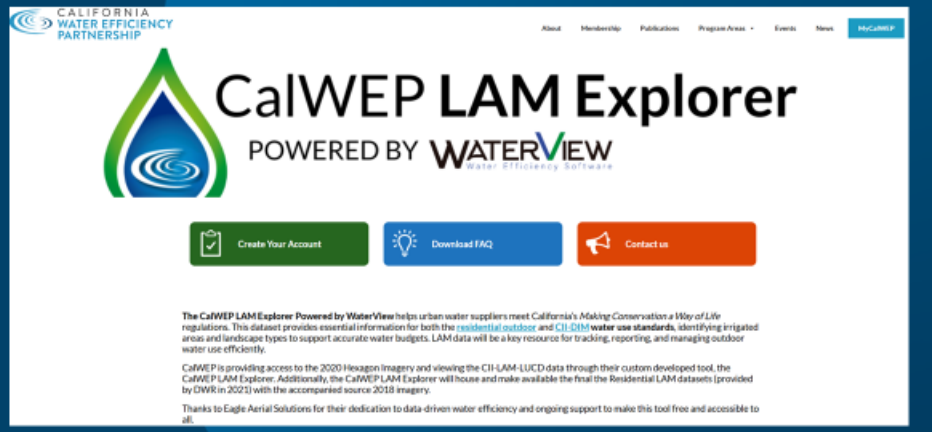
Review & QC

LUCD – Land Use Cover Dataset

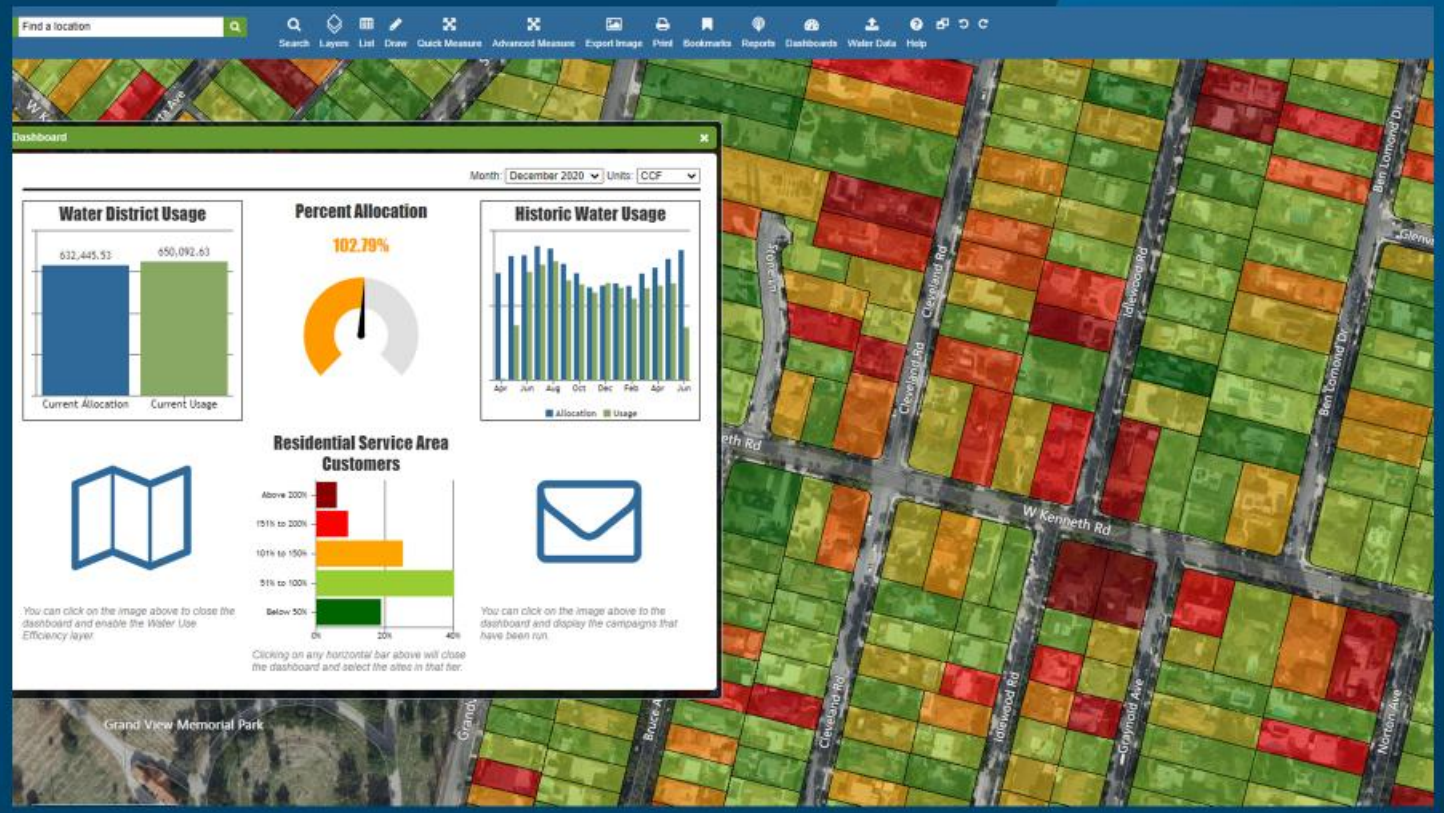
- What is being **irrigated** across the landscape?
- What is **irrigable but not currently being irrigated** across the landscape?
- Where are the areas that are **not being irrigated**?
- Where are some areas that could be targeted for a reduction in irrigation for **water conservation**?

Where are the data?

- Residential
  - Have been provided to suppliers for each parcel and with district summaries
  - All suppliers have these data
- CII
  - Being provided to suppliers
- Data can be seen
  - Through CalWEP viewer
  - [CalWEP LAM Explorer » California Water Efficiency Partnership]



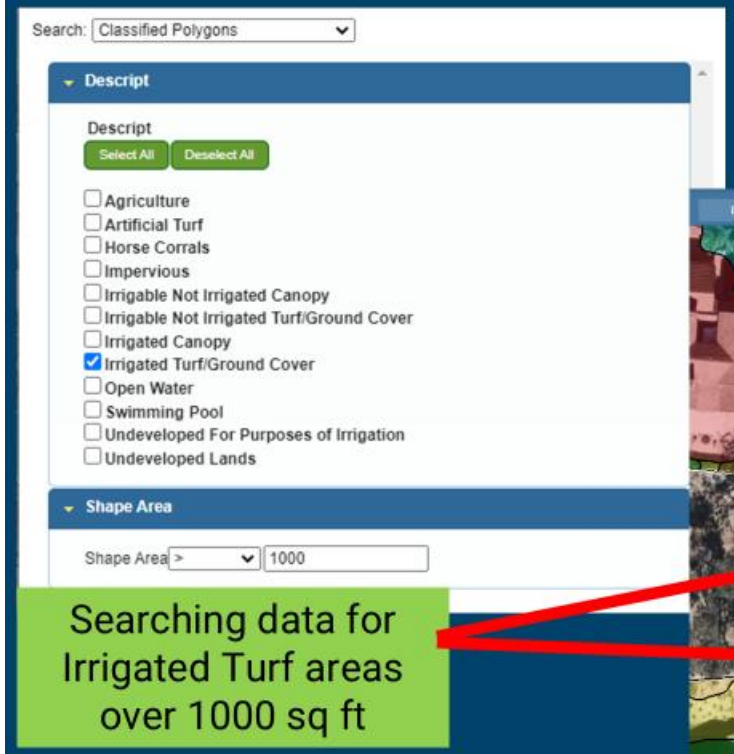
Data Use: Water Conservation



WATER CONSERVATION

NV5

WATERVIEW



Searching data for Irrigated Turf areas over 1000 sq ft

Data Use: Stormwater Runoff & Pollutants

- The LUCD datasets can be used to support stormwater runoff calculations
  - Impervious
  - Pervious
  - Canopy
- Can identify opportunities for water infiltration
- Can also be used to estimate non-point source pollution
  - Residential lawns
  - Commercial impervious
  - Land use x Land cover

Data Use: Canopy and Green Space

- LUCD data can be used to assess tree canopy
  - Microclimate impacts
  - Fire risk
  - Health benefits
- LUCD data in combination with lidar can quantify
  - Carbon storage
  - Carbon fixation
  - Air pollution reduction
  - Canopy health
  - Change detection

Summary

- Land cover and land use determine water requirements
- Remote sensing methods allow the creation of the data over large areas consistently at a reasonable price
- The cost and accuracy depend on the classification system and quality of source data
- These data will support an analysis of
  - Water use efficiency
  - Stormwater runoff
  - Tree canopy and open space questions

QUESTIONS

Contact information

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Stacked Incentives for Healthy Watershed Communities

Global Strategies: Local Action

A Danish-Californian Dialogue

April 10, 2025

WATERSHED PROGRESSIVE

Regina Hirsch

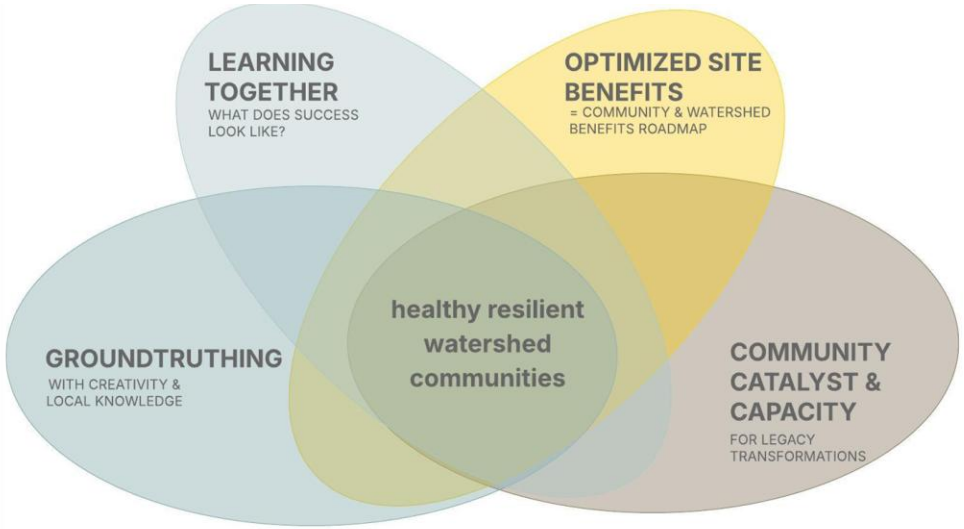
Executive Director

WATERSHED PROGRESSIVE

Watershed Progressive

Connecting Communities with their watersheds through integrated strategies for a healthy resilient future.

Since 2010 we have proudly served our California communities.



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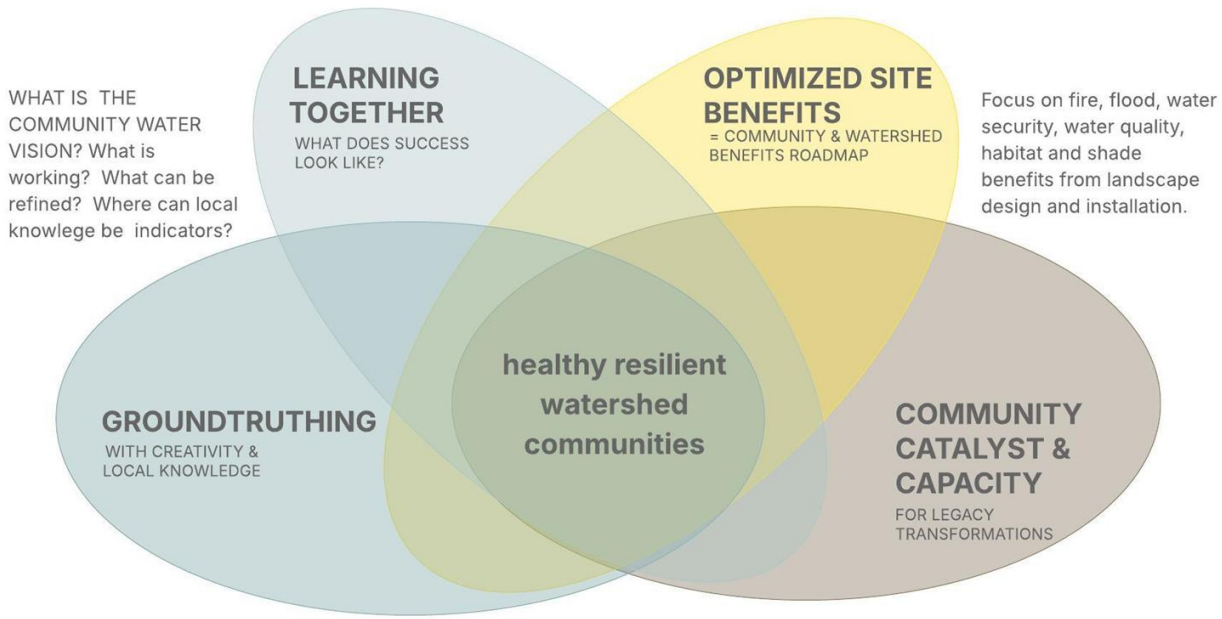
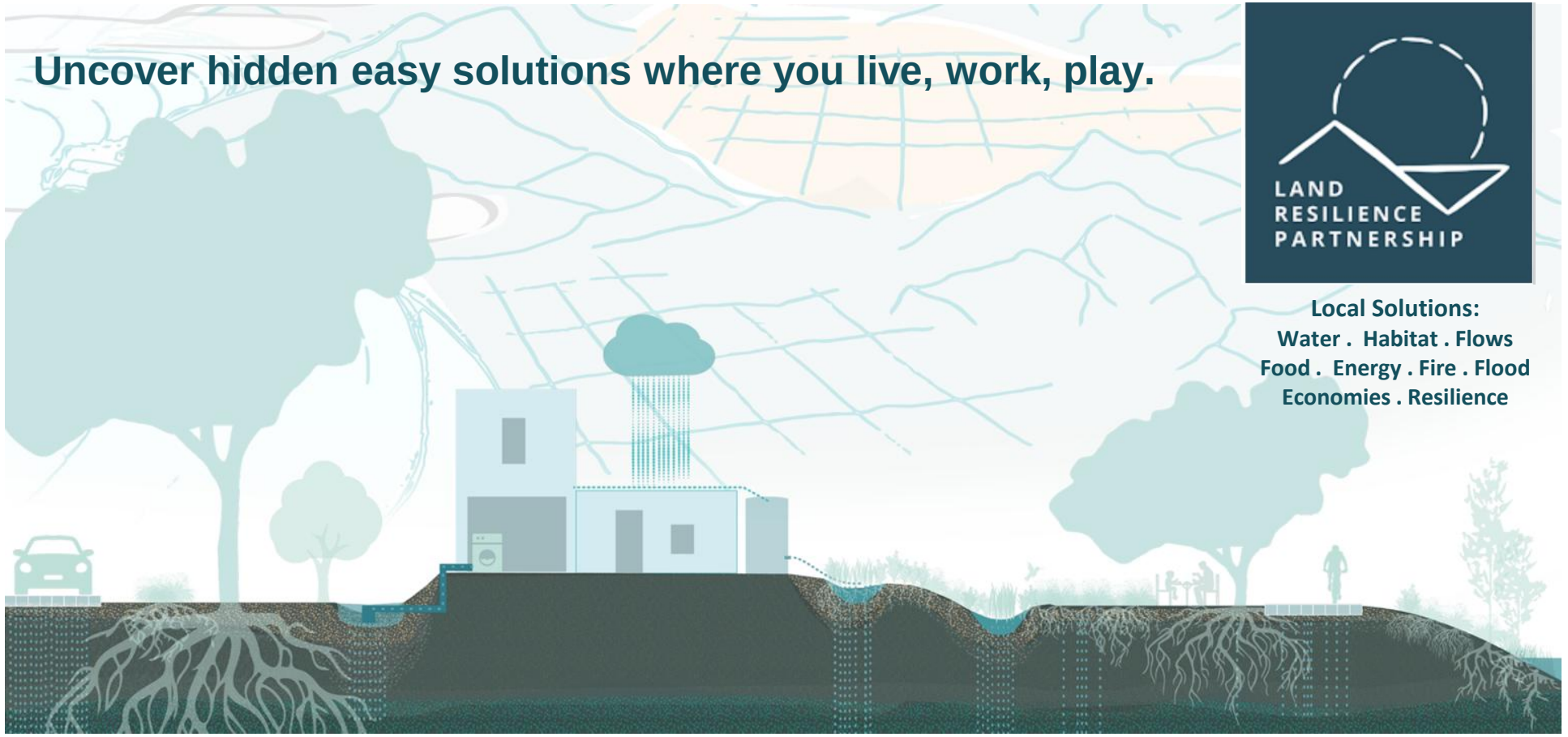


WHAT IS THE COMMUNITY WATER VISION? What is working? What can be refined? Where can local knowlege be indicators?

Focus on fire, flood, water security, water quality, habitat and shade benefits from landscape design and installation.

Design-build commercial, institutional, residential landscape and water management projects.

Capacity for local communities to reach goals including funding, technical, legacy site transformations and outreach.



Land Resilience Partnership (LRP)

How can local options help you? Fire. Drought. Flood. Shade. Food. Energy.

How it Works

Sign Up

Site Assessment & Recommendations

Design & Installation, Guidance

Maintenance & Funding Opportunities

Learn More

Legend

- Site Boundary
- 1-Ft Contours
- 01 Custom Note 1
- 02 Custom Note 2
- A Existing School Garden
- B Existing Storm Drain
- J Create new path for running the mile
- Schools Indoor Fixtures - Standard Flow
- Circulation Flow
- Stormwater Flow
- Medium Water Use Planting w/ Drip Irrigation and no Mulch
- Trees Native, non-irrigated, and Mulch
- Native Habitat Restoration
- Impervious Surface
- Turf w/ Fixed Spray (inefficient)

WWW.WATERSHEDPROGRESSIVE.COM

0 70 140 Feet

N W E S

Assessment Date: 08-20-24

EXISTING CONDITIONS

Not for Construction

Legend

- Site Boundary
- 1-Ft Contours
- (A) Existing School Garden
- (B) Existing Storm Drain
- (C) Potential Terraced Outdoor Classroom Space
- (D) Potential Bouldered Outdoor Classroom Space tied to Italian Creek
- (F) Giant Sequoia Grove
- (G) Install New Efficient Spray Irrigation for reduced footprint lawn
- (H) Existing Playground
- (I) Recommend Removing Junipers for Fire Safety
- (J) Create new path for running the mile
- (K) Small RW tanks for hand watering of existing garden beds
- (L) Proposed Pollinator/Garden Walk
- (M) Proposed Nature Exploration
- Downspout
- Assessed for Fire Resilience
- Schools Indoor Fixtures - Low Flow
- Circulation Flow
- Irrigation Audit/Retrofit
- Pollinator Corridor
- Stormwater Flow
- Tank Overflow
- Rainwater Harvesting
- Pervious Pavement Replacing Impervious Surface
- Rain Garden
- Rainwater Harvesting
- Drainage Area to BMP
- Climate Appropriate Planting w/ Drip Irrigation and Mulch
- Medium Water Use Planting w/ Drip Irrigation and no Mulch
- Fruit Trees w/ Microsprayers or Drip Irrigation and Mulch
- Turf w/ Fixed Spray (efficient)
- Turf Alternative Low Water Use w/ Fixed Spray
- Trees Native Low Water Use w/ Drip Irrigation and Mulch
- Trees Native, non-irrigated, and Mulch
- Bioswale (Proposed)
- Impervious Surface
- Rain Tank - 300 Gallons Capacity
- Rain Tank - 5000 Gallons Capacity

WWW.WATERSHEDPROGRESSIVE.COM

0 70 140 Feet

N W E S

Assessment Date: 08-20-24

CATALOG OF PROJECTS

Not for Construction

Legend

- Site Boundary
- 1-Ft Contours
- (B) Existing Storm Drain
- (E) Native Mountain Meadow to replace soggy turf
- (F) Giant Sequoia Grove
- (G) Install New Efficient Spray Irrigation for reduced footprint lawn
- (H) Existing Playground
- (J) Create new path for running the mile
- (L) Proposed Pollinator/Garden Walk
- (M) Proposed Nature Exploration
- Schools Indoor Fixtures - Low Flow
- Circulation Flow
- Irrigation Audit/Retrofit
- Pollinator Corridor
- Stormwater Flow
- Drainage Area to BMP
- Climate Appropriate Planting w/ Drip Irrigation and Mulch
- Turf w/ Fixed Spray (efficient)
- Turf Alternative Low Water Use w/ Fixed Spray
- Trees Native Low Water Use w/ Drip Irrigation and Mulch
- Trees Native, non-irrigated, and Mulch
- Bioswale (Proposed)
- Impervious Surface

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GROVELAND, CA 95321
(209) 732-0518
INFO@WATERSHEDPROGRESSIVE.COM

0 70 140 Feet

N W E

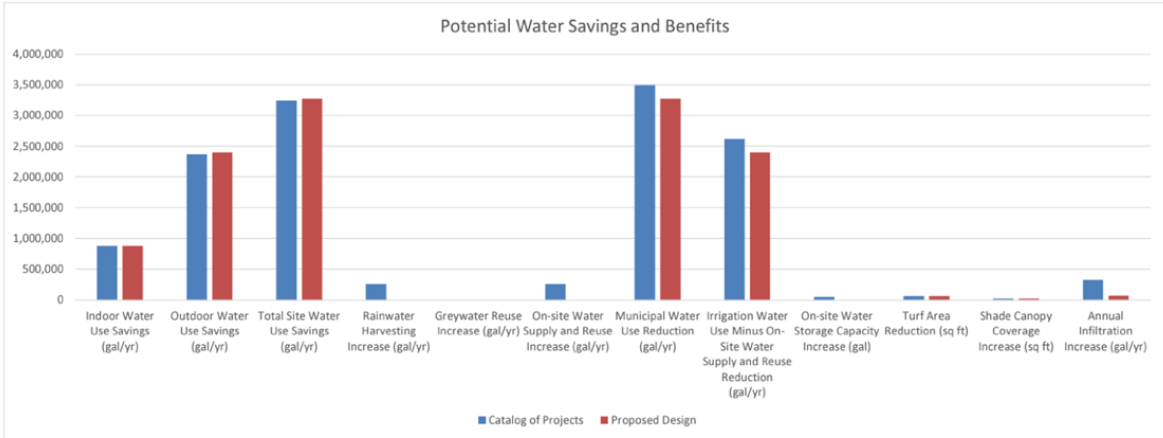
Assessment Date: 08-20-24

PROPOSED DESIGN

Not for Construction

Site Assessment Benefits Report

California Elementary School



Scenario	Indoor Water Use (gal/yr)	Outdoor Water Use (gal/yr)	Total Site Water Use (gal/yr)	Rainwater Harvesting Potential (gal/yr)	Greywater Reuse (gal/yr)	On-site Water Supply and Reuse (gal/yr)	Municipal Water Use (gal/yr)	Irrigation Water Use Minus On-site Water Supply and Reuse (gal/yr)	On-site Water Storage Capacity (gal)	Turf Area (sq ft)	Shade Canopy Coverage (sq ft)	Annual Infiltration Increase (gal/yr)
Existing Conditions	2,219,822	4,501,797	6,721,619	0	0	0	6,721,619	4,501,797	0	114,953	91,124	–
Catalog of Projects	1,343,258	2,135,875	3,479,133	252,994	0	252,994	3,226,139	1,882,880	45,900	54,785	110,561	321,832
Proposed Design	1,343,258	2,104,751	3,448,010	0	0	0	3,448,010	2,104,751	0	54,785	110,143	64,792
Potential Water Savings and Benefits - Catalog of Projects	876,564	2,365,923	3,242,486	252,994	0	252,994	3,495,481	2,618,917	45,900	60,168	19,437	321,832
Potential Water Savings and Benefits - Proposed Design	876,564	2,397,046	3,273,610	0	0	0	3,273,610	2,397,046	0	60,168	19,019	64,792

Definitions

Indoor Water Use
Estimated total amount of water used per year for indoor activities (e.g. washing hands, taking showers, doing laundry, etc.)

Outdoor Water Use
Estimated total amount of water used per year for outdoor activities (e.g. irrigating plants or filling a pool)

Total Site Water Use
Sum of Indoor Water Use and Outdoor Water Use

Rainwater Harvesting Potential
The expected amount of rainwater harvesting in an average water year. Based on the square footage of the collection surface and local precipitation amounts.

Greywater Reuse
The total amount of greywater potential in a year. Based on the amount of indoor water use available for greywater reuse.

On-site Water Supply and Reuse
The sum of rainwater harvesting and greywater reuse

Municipal Water Use
The total site water use minus rainwater harvesting and greywater reuse

Irrigation Water Use Minus On-site Water Supply and Reuse
Amount of water used for irrigation minus rainwater harvesting and greywater reuse

On-site Water Storage Capacity
Total capacity of water storage tanks

Turf Area
Total area of turf grass

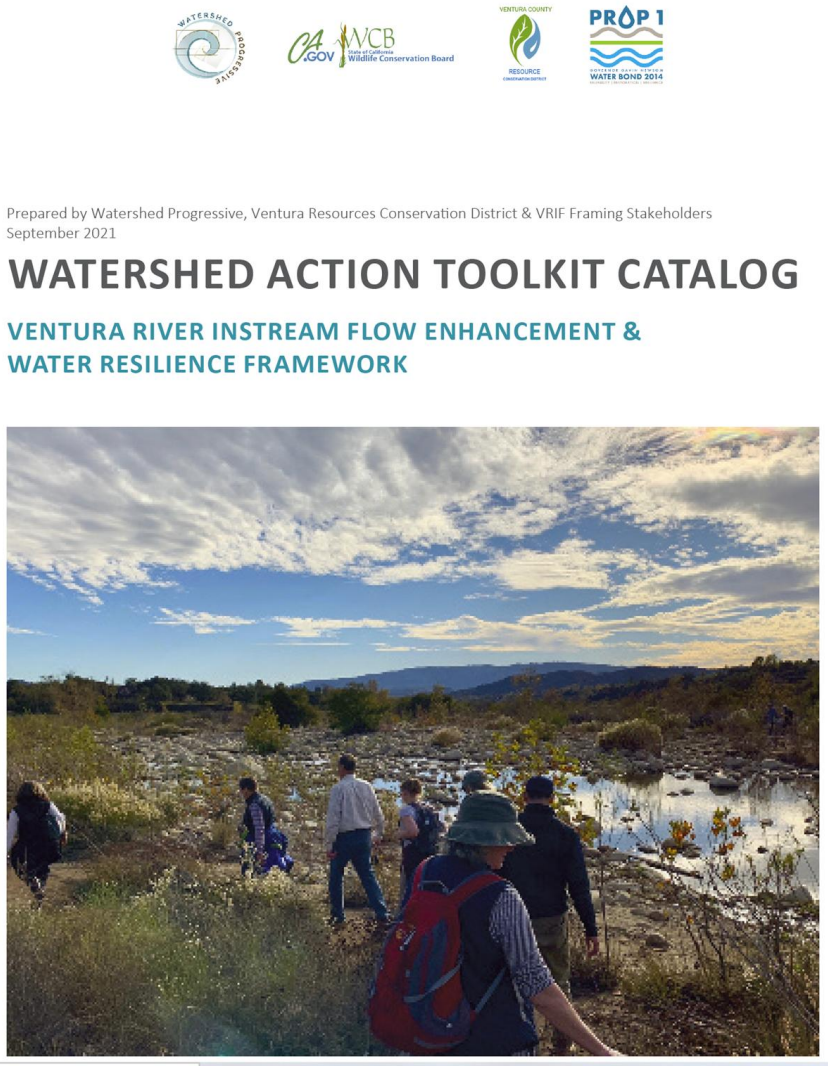
Shade Canopy Coverage
Total area under tree canopy

Annual Infiltration Increase
The annual increase in stormwater infiltration. Increased infiltration occurs when an impervious surface is replaced with a pervious pavement and/or an addition of a rain garden or bioswale.

Case Study Highlight

Ventura Watershed

Instream Flow Enhancement and Water Resilience Regional Framework

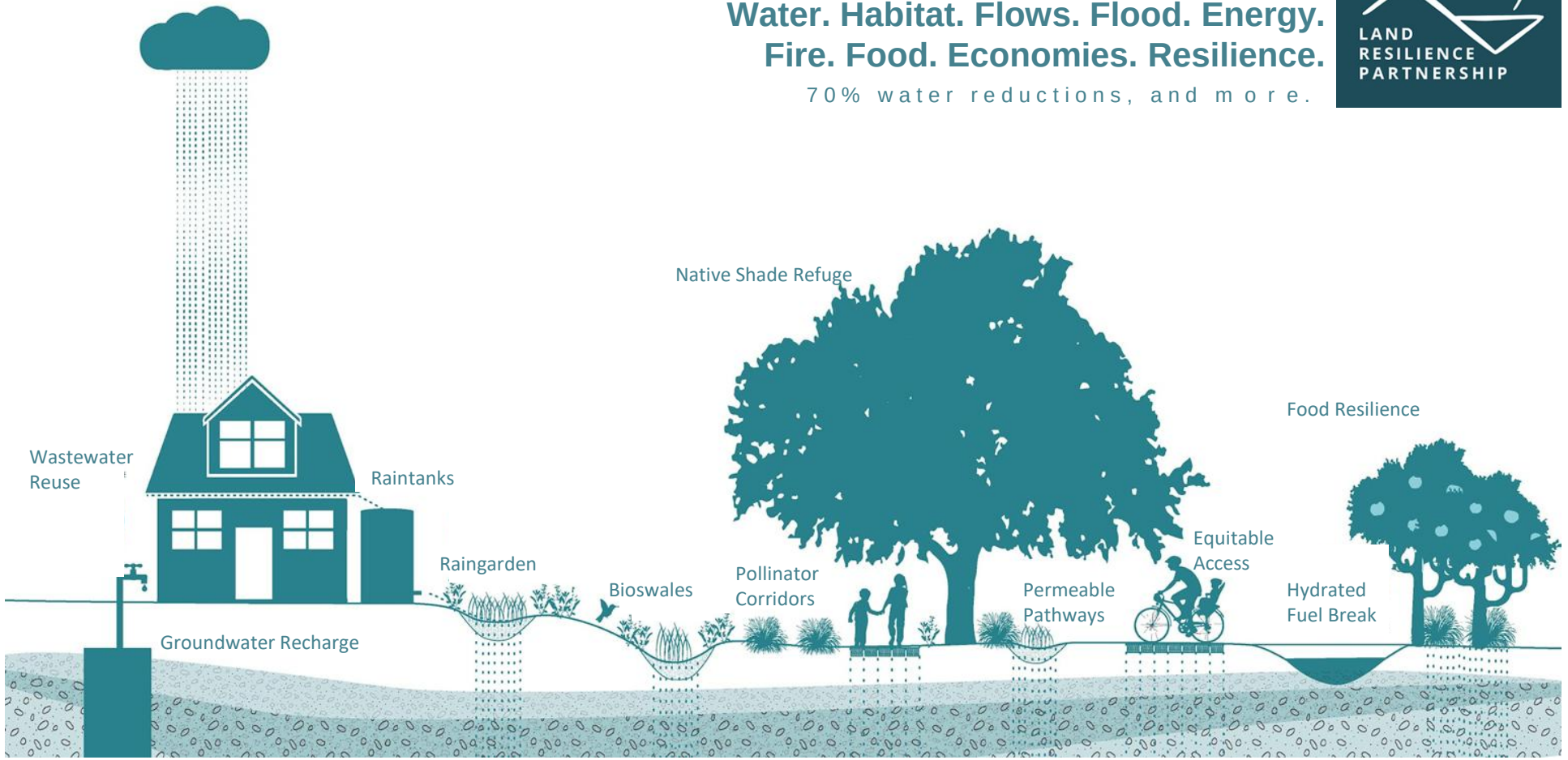


LOCAL SOLUTIONS.

Water. Habitat. Flows. Flood. Energy. Fire. Food. Economies. Resilience.

70% water reductions, and more.

LAND RESILIENCE PARTNERSHIP



action toolkit

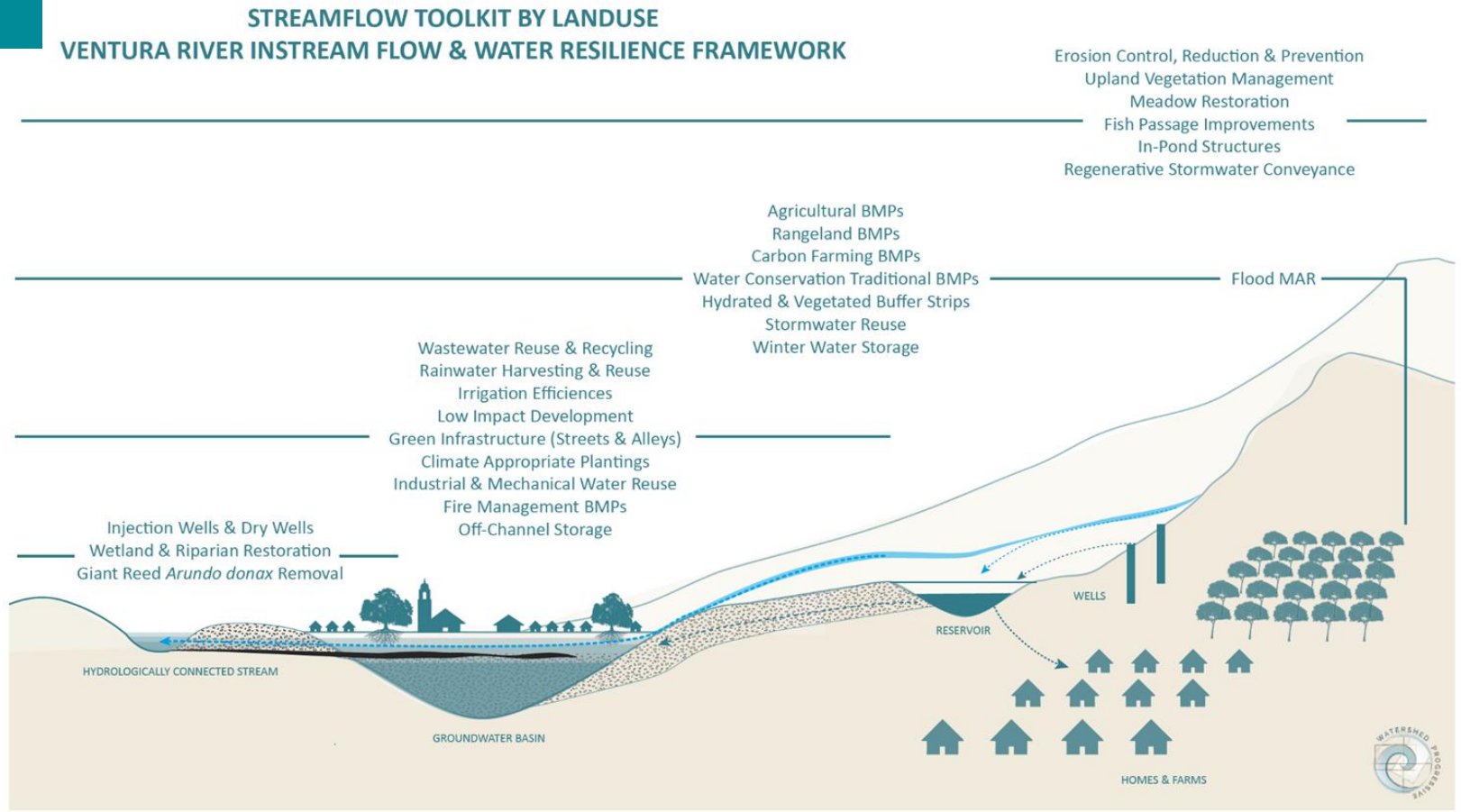
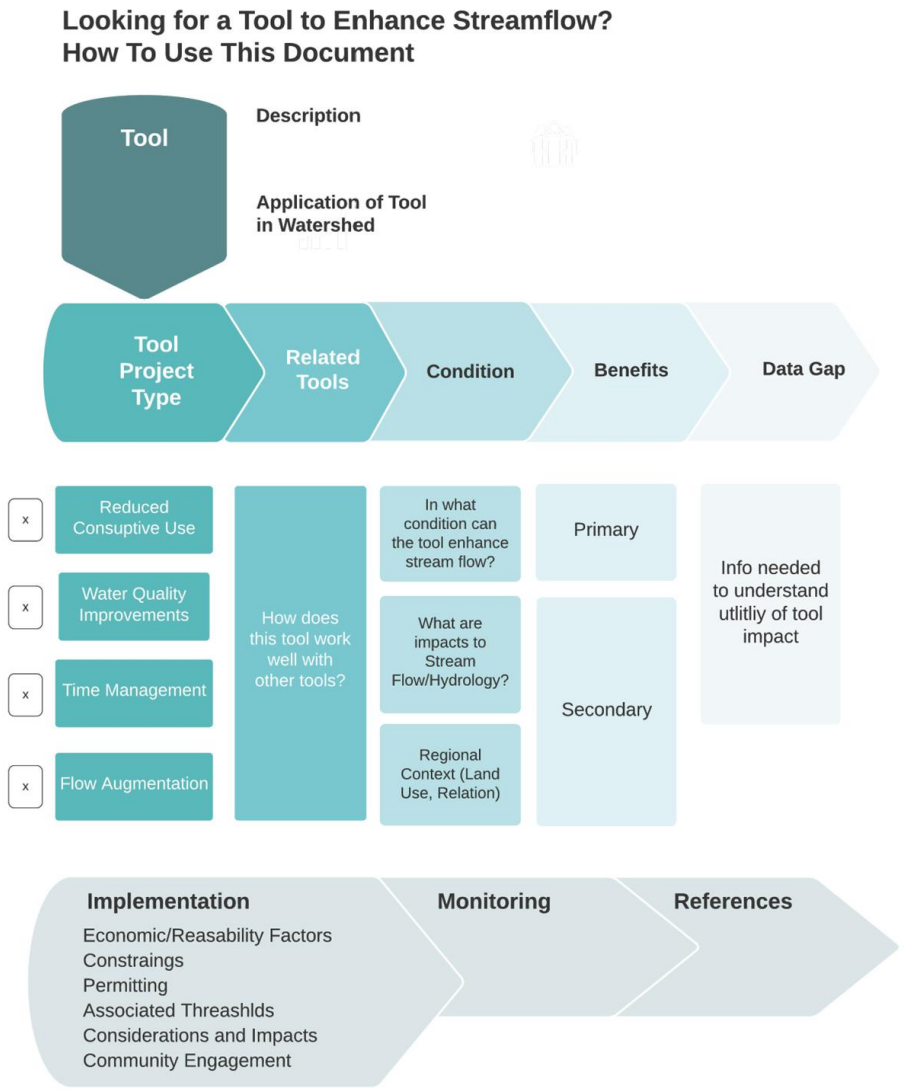
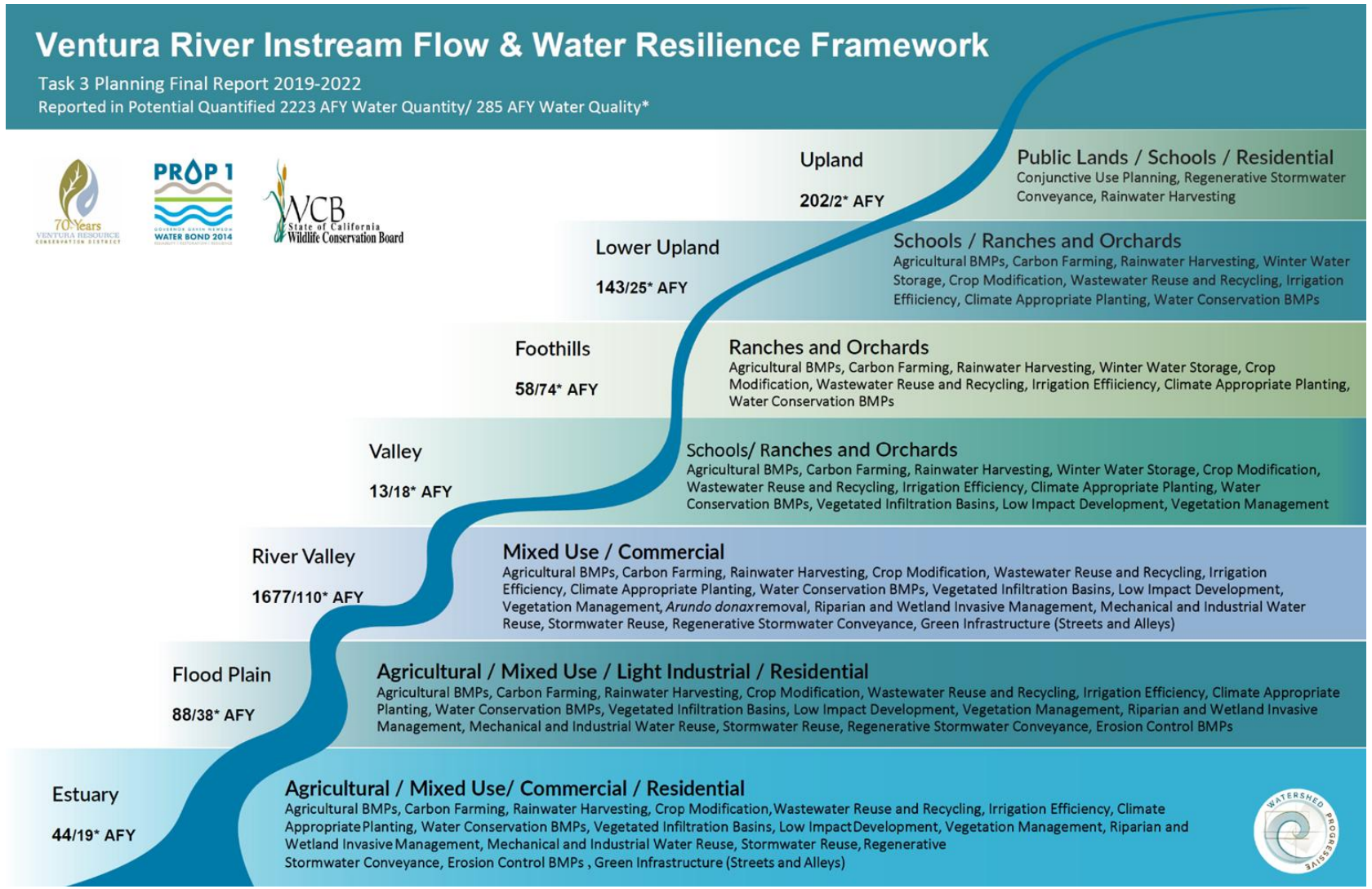


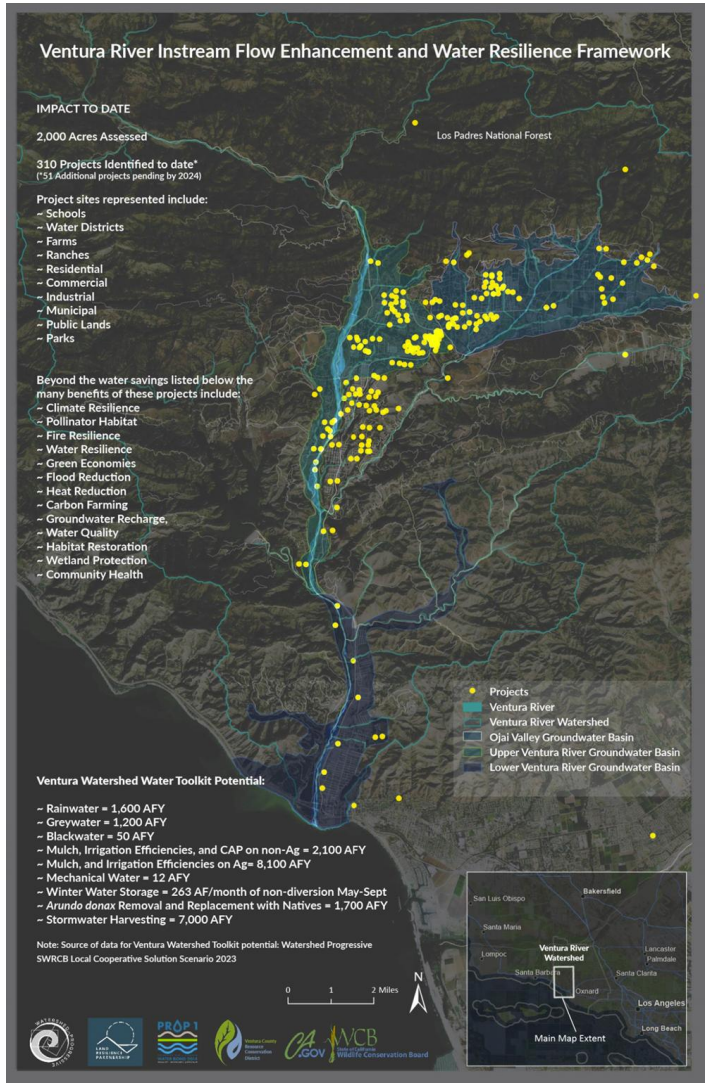
Fig.1: Streamflow toolkit by land-use shows what project types can be used throughout landscapes at a watershed scale to benefit and enhance stream flow for the Ventura River Instream Flow Enhancement and Water Resilience Framework.

action toolkit




Ventura River Instream Flow & Water Resilience Framework
Task 3 Planning Final Report 2019-2022
Reported in Potential Quantified 2223 AFY Water Quantity/ 285 AFY Water Quality*
70 Years
VENTURA RESOURCE CONSERVATION DISTRICT
PROP 1
WATER BOND 2014
WCB
State of California
Wildlife Conservation Board
Upland
202/2* AFY
Public Lands / Schools / Residential
Conjunctive Use Planning, Regenerative Stormwater Conveyance, Rainwater Harvesting
Lower Upland
143/25* AFY
Schools / Ranches and Orchards
Agricultural BMPs, Carbon Farming, Rainwater Harvesting, Winter Water Storage, Crop Modification, Wastewater Reuse and Recycling, Irrigation Effiiciency, Climate Appropriate Planting, Water Conservation BMPs
Foothills
58/74* AFY
Ranches and Orchards
Agricultural BMPs, Carbon Farming, Rainwater Harvesting, Winter Water Storage, Crop Modification, Wastewater Reuse and Recycling, Irrigation Effiiciency, Climate Appropriate Planting, Water Conservation BMPs
Valley
13/18* AFY
Schools/ Ranches and Orchards
Agricultural BMPs, Carbon Farming, Rainwater Harvesting, Winter Water Storage, Crop Modification, Wastewater Reuse and Recycling, Irrigation Efficiency, Climate Appropriate Planting, Water Conservation BMPs, Vegetated Infiltration Basins, Low Impact Development, Vegetation Management
River Valley
1677/110* AFY
Mixed Use / Commercial
Agricultural BMPs, Carbon Farming, Rainwater Harvesting, Crop Modification, Wastewater Reuse and Recycling, Irrigation Efficiency, Climate Appropriate Planting, Water Conservation BMPs, Vegetated Infiltration Basins, Low Impact Development, Vegetation Management, Arundo donax removal, Riparian and Wetland Invasive Management, Mechanical and Industrial Water Reuse, Stormwater Reuse, Regenerative Stormwater Conveyance, Green Infrastructure (Streets and Alleys)
Flood Plain
88/38* AFY
Agricultural / Mixed Use / Light Industrial / Residential
Agricultural BMPs, Carbon Farming, Rainwater Harvesting, Crop Modification, Wastewater Reuse and Recycling, Irrigation Efficiency, Climate Appropriate Planting, Water Conservation BMPs, Vegetated Infiltration Basins, Low Impact Development, Vegetation Management, Riparian and Wetland Invasive Management, Mechanical and Industrial Water Reuse, Stormwater Reuse, Regenerative Stormwater Conveyance, Erosion Control BMPs
Estuary
44/19* AFY
Agricultural / Mixed Use/ Commercial / Residential
Agricultural BMPs, Carbon Farming, Rainwater Harvesting, Crop Modification, Wastewater Reuse and Recycling, Irrigation Efficiency, Climate Appropriate Planting, Water Conservation BMPs, Vegetated Infiltration Basins, Low Impact Development, Vegetation Management, Riparian and Wetland Invasive Management, Mechanical and Industrial Water Reuse, Stormwater Reuse, Regenerative Stormwater Conveyance, Erosion Control BMPs , Green Infrastructure (Streets and Alleys)
WATERSHED PROGRESSIVE

2021-2023


Ventura River Instream Flow Enhancement and Water Resilience Framework
IMPACT TO DATE
2,000 Acres Assessed
310 Projects Identified to date*
(*51 Additional projects pending by 2024)
Project sites represented include:
~ Schools
~ Water Districts
~ Farms
~ Ranches
~ Residential
~ Commercial
~ Industrial
~ Municipal
~ Public Lands
~ Parks
Beyond the water savings listed below the many benefits of these projects include:
~ Climate Resilience
~ Pollinator Habitat
~ Fire Resilience
~ Water Resilience
~ Green Economies
~ Flood Reduction
~ Heat Reduction
~ Carbon Farming
~ Groundwater Recharge.
~ Water Quality
~ Habitat Restoration
~ Wetland Protection
~ Community Health
Los Padres National Forest
Projects
Ventura River
Ventura River Watershed
Ojai Valley Groundwater Basin
Upper Ventura River Groundwater Basin
Lower Ventura River Groundwater Basin
Ventura Watershed Water Toolkit Potential:
~ Rainwater = 1,600 AFY
~ Greywater = 1,200 AFY
~ Blackwater = 50 AFY
~ Mulch, Irrigation Efficiencies, and CAP on non-Ag = 2,100 AFY
~ Mulch, and Irrigation Efficiencies on Ag= 8,100 AFY
~ Mechanical Water = 12 AFY
~ Winter Water Storage = 263 AF/month of non-diversion May-Sept
~ Arundo donax Removal and Replacement with Natives = 1,700 AFY
~ Stormwater Harvesting = 7,000 AFY
Note: Source of data for Ventura Watershed Toolkit potential: Watershed Progressive SWRCB Local Cooperative Solution Scenario 2023
0 1 2 Miles
N
San Luis Obispo
Bakersfield
Santa Maria
Lompoc
Ventura River Watershed
Lancaster
Palmdale
Santa Barbara
Oxnard
Santa Clarita
Los Angeles
Long Beach
Main Map Extent

CLIMATE RESILIENT
LANDSCAPE TRANSFORMATION PILOT PROJECT

ReScape · PACIFIC INSTITUTE · WATERSHED PROGRESSIVE · LAND RESILIENCE PARTNERSHIP · DEPARTMENT OF WATER RESOURCES · STATE OF CALIFORNIA · Martha Davis Consulting · GO golden

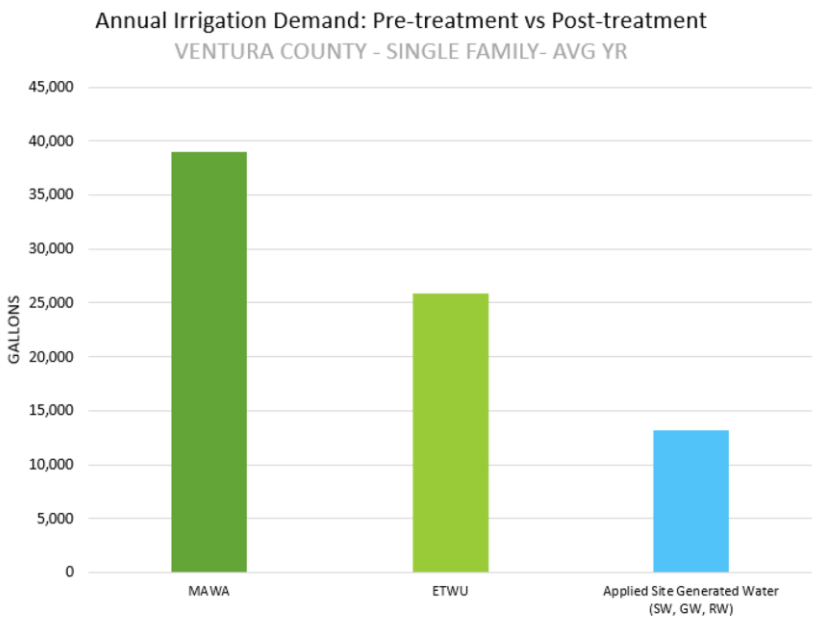
Project 1

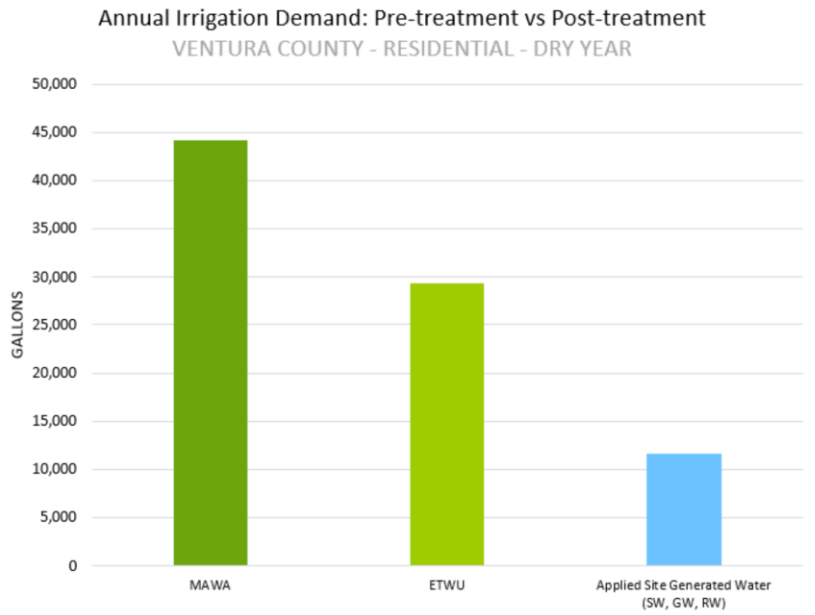
Topic	Project Description
Project type	Residential
Year completed	2021
Climate/conditions	Hot, inland valley, southern exposure.
Primary goal	Water conservation, reduce flooding, streamflow enhancement, demonstration.
Project Benefits	Water conservation, reduced maintenance, native habitat restoration, streamflow enhancement, shade, soil building, food resilience, turf restoration, stormwater runoff, curb appeal, increased property value.
Additional highlights	Fruit trees, Shade Trees. Stormwater capture, rainwater harvesting, greywater, turf conversion, more stormwater, rainwater potential to offset in future.

Project 1: Ventura County Residential

Project	Project type (Res or CII)	Area (sq ft)	ETo (in/yr)	**Peff (in/yr)**	Plant Factor (PF)	Irrigation Efficiency (IE)
No. 1	Residential	3,599	53.04	21.26	0.40	0.81

Maximum Applied Water Allowance		Estimated Total Water Use		Applied Supplier-delivered Water		Applied Site-generated Water	
Gallons	ETAF	Gallons	ETAF	Gallons	ETAF	Gallons	ETAF
39,013	0.55	25,921	0.37	12,679	0.18	13,242	0.19


Annual Irrigation Demand: Pre-treatment vs Post-treatment
VENTURA COUNTY - SINGLE FAMILY- AVG YR
GALLONS
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
MAWA
ETWU
Applied Site Generated Water (SW, GW, RW)


Annual Irrigation Demand: Pre-treatment vs Post-treatment
VENTURA COUNTY - RESIDENTIAL - DRY YEAR
GALLONS
50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
MAWA
ETWU
Applied Site Generated Water (SW, GW, RW)

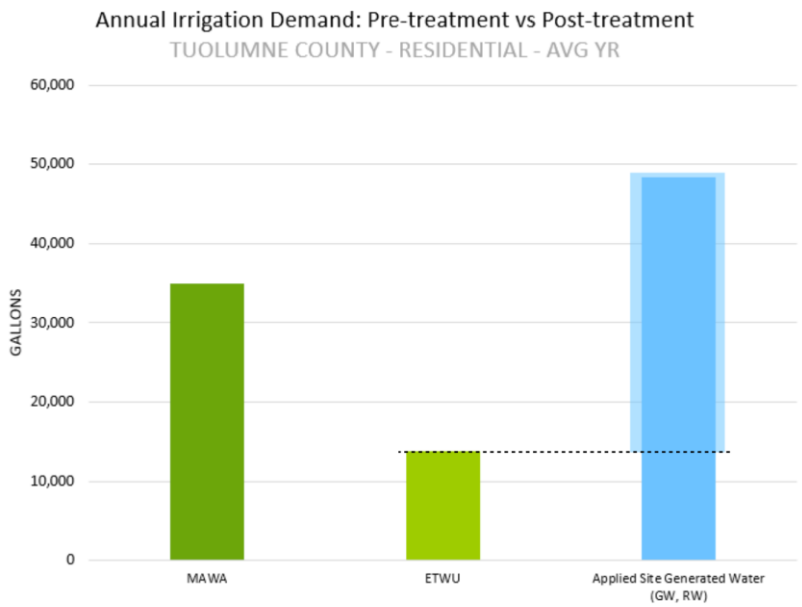
Project 2

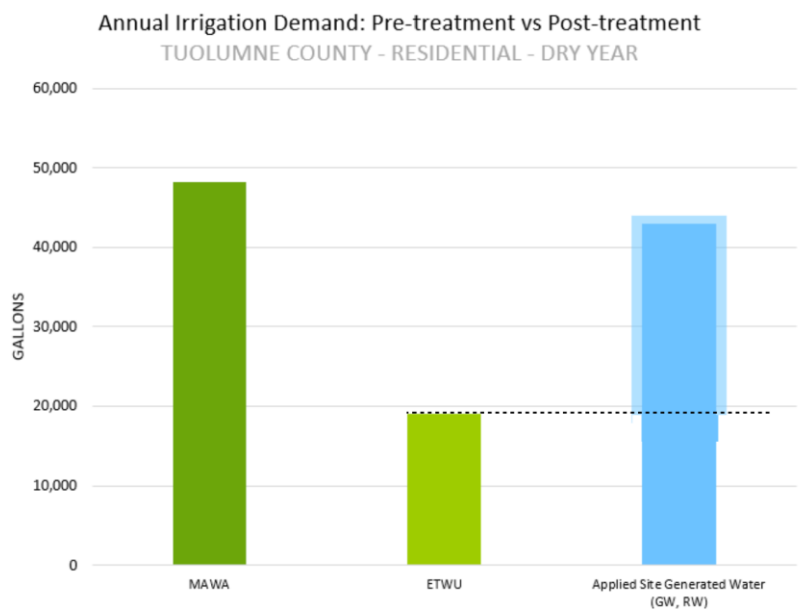
Topic	Project Description
Project type	Residential
Year completed	2013
Climate	Over 118 days over 85 degrees, southern exposure.
Maintenance Costs	$950/year- owner provided-labor.
Project Benefits	Water conservation, water security, reduced maintenance, native habitat restoration, shade, soil building, stormwater runoff, recreation, food resilience, fire mosaic landscaping, increased property value.
Additional highlights	Four aspen mini-forests, herb and culinary garden. Stormwater capture, rainwater harvesting, greywater

Project 2: Tuolumne Residential

Project	Project type (Res or CII)	Area (sq ft)	ETo (in/yr)	**Peff (in/yr)**	Plant Factor (PF)	Irrigation Efficiency (IE)
No. 2	Residential	5,686	53.04	34.71	0.24	0.81

Maximum Applied Water Allowance		Estimated Total Water Use		Applied Supplier-delivered Water		Applied Site-generated Water	
Gallons	ETAF	Gallons	ETAF	Gallons	ETAF	Gallons	ETAF
35,003	0.55	13,780	0.22	0	0.0	13,780	0.22


Annual Irrigation Demand: Pre-treatment vs Post-treatment
TUOLUMNE COUNTY - RESIDENTIAL - AVG YR
GALLONS
60,000
50,000
40,000
30,000
20,000
10,000
0
MAWA
ETWU
Applied Site Generated Water (GW, RW)


Annual Irrigation Demand: Pre-treatment vs Post-treatment
TUOLUMNE COUNTY - RESIDENTIAL - DRY YEAR
GALLONS
60,000
50,000
40,000
30,000
20,000
10,000
0
MAWA
ETWU
Applied Site Generated Water (GW, RW)

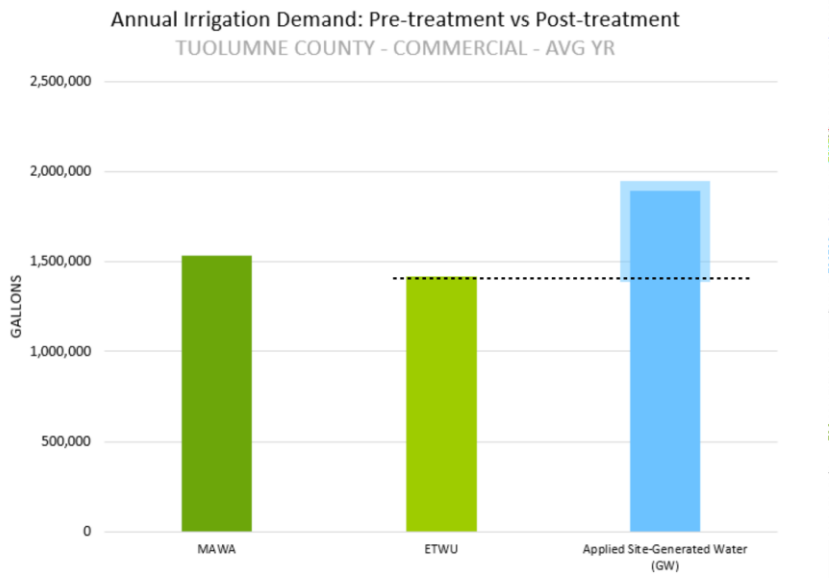
Project 3

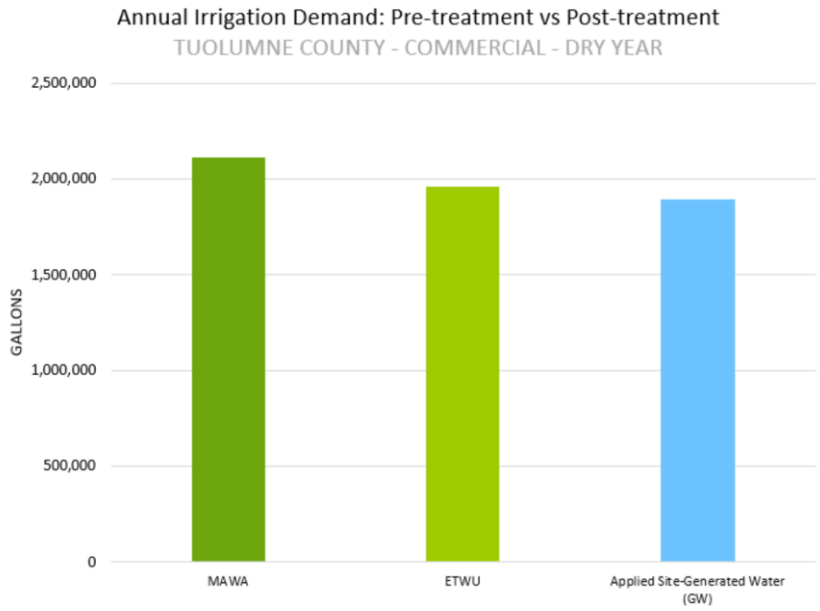
Topic	Project Description
Project type	CII
Year completed	2009-12
Installation Costs	$3,200 per cabin, 70 cabins
Maintenance Costs	$3,800/year
Project Benefits	Water conservation (dry wells) fire resilience, habitat restoration, shade, soil building, stormwater runoff, curb appeal, increased property value, recreational use, educational.
Additional highlights	During Rim Fire, greywater and mulch treated plantings had 98% survival rate. Potable drip system plantings had 3% survival rate.

Project 3: Tuolumne Commercial

Project	Project type (Res or CII)	Area (sq ft)	ETo (in/yr)	**Peff (in/yr)**	Plant Factor (PF)	Irrigation Efficiency (IE)
No. 3	CII	303,327	53.04	34.71	0.40	0.71

Maximum Applied Water Allowance		Estimated Total Water Use		Applied Supplier-delivered Water		Applied Site-generated Water	
Gallons	ETAF	Gallons	ETAF	Gallons	ETAF	Gallons	ETAF
1,534,221	0.45	1,421,375	0.42	0.00	0.00	1,421,375	0.42


Annual Irrigation Demand: Pre-treatment vs Post-treatment
TUOLUMNE COUNTY - COMMERCIAL - AVG YR
GALLONS
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
MAWA
ETWU
Applied Site-Generated Water (GW)


Annual Irrigation Demand: Pre-treatment vs Post-treatment
TUOLUMNE COUNTY - COMMERCIAL - DRY YEAR
GALLONS
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
MAWA
ETWU
Applied Site-Generated Water (GW)

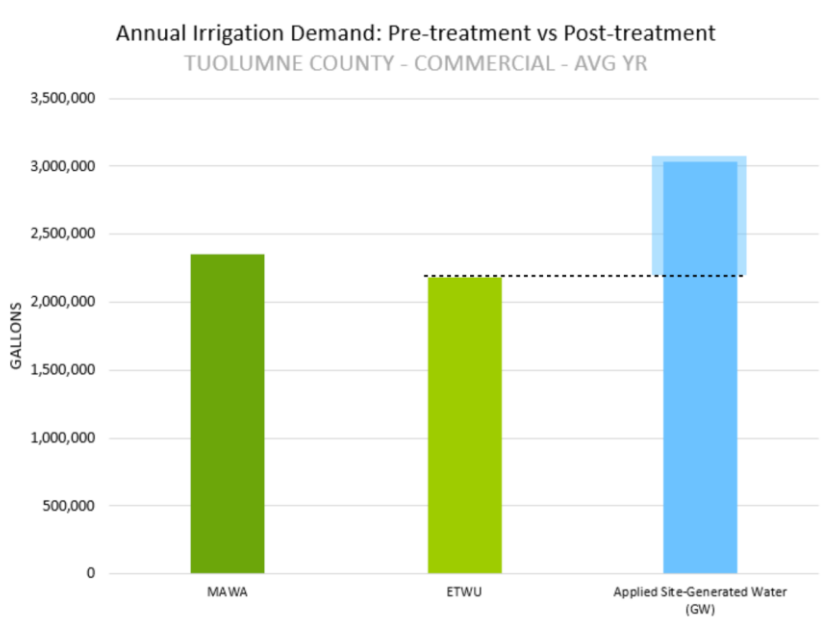
Project 4

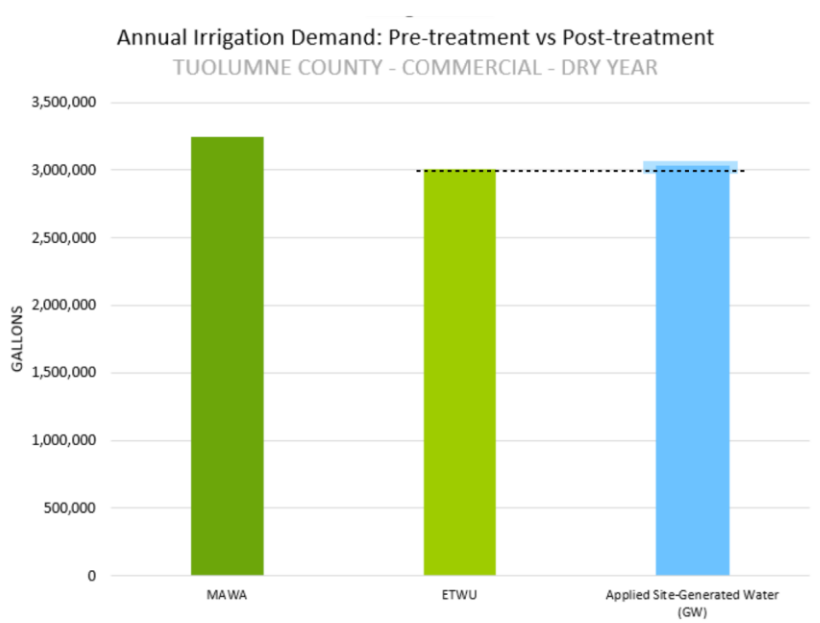
Topic	Project Description
Project type	CII
Year completed	2015
Installation Costs	$112,000
Maintenance Costs	$12,000/year
Project Benefits	Water conservation/security, fire restoration and resilience, habitat restoration, shade, soil building, stormwater runoff, curb appeal, increased property value, recreational use, educational.
Additional highlights	Compacted, dehydrated disturbed soils were remediated through fast growing, shade providing riparian hard and softwoods with high plant moisture index. A hydrated buffer strip of big leaf maple and other riparian vegetation was installed on the perimeter of the project protect the site after a fire during construction, as well as to create soil building, habitat restoration and carbon sequestration.

Project 4: Tuolumne Commercial

Project	Project type (Res or CII)	Area (sq ft)	ETo (in/yr)	**Peff (in/yr)**	Plant Factor (PF)	Irrigation Efficiency (IE)
No. 4	CII	460,500	53.04	34.71	0.40	0.71

Maximum Applied Water Allowance		Estimated Total Water Use		Applied Supplier-delivered Water		Applied Site-generated Water	
Gallons	ETAF	Gallons	ETAF	Gallons	ETAF	Gallons	ETAF
2,355,029	0.45	2,181,811	0.42	0.00	0.00	2,181,811	.42


Annual Irrigation Demand: Pre-treatment vs Post-treatment
TUOLUMNE COUNTY - COMMERCIAL - AVG YR
GALLONS
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
MAWA
ETWU
Applied Site-Generated Water (GW)


Annual Irrigation Demand: Pre-treatment vs Post-treatment
TUOLUMNE COUNTY - COMMERCIAL - DRY YEAR
GALLONS
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
MAWA
ETWU
Applied Site-Generated Water (GW)

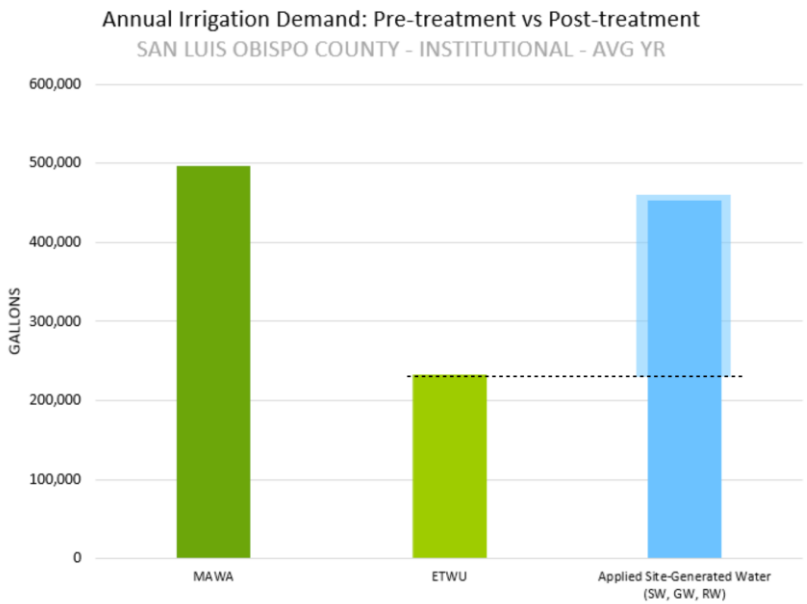
Project 5

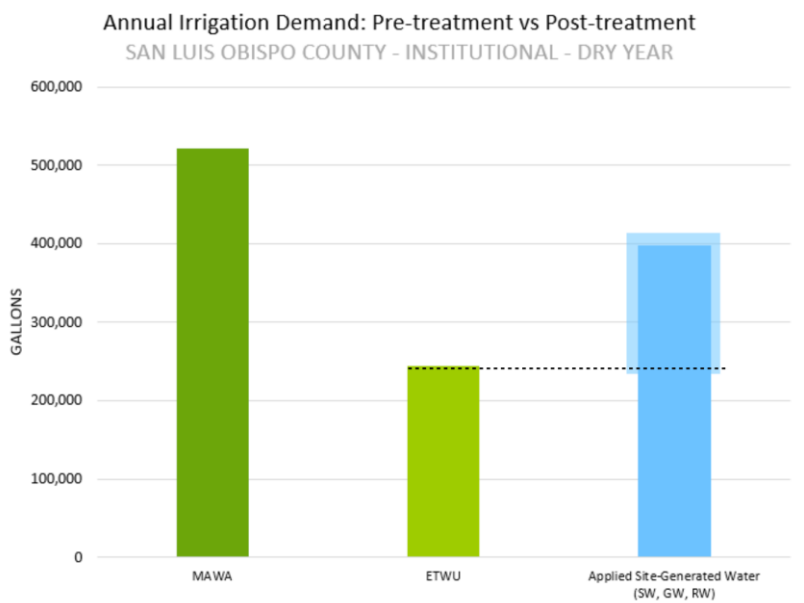
Topic	Project Description
Project type	Institutional
Year completed	2016
Climate/conditions	Hot, inland valley, Diablo clay, southern exposure
Primary goal	Reduce flooding, streamflow enhancement, demonstration.
Project Benefits	Water conservation, reduced structural flooding, reduced maintenance, native habitat restoration, streamflow enhancement (quality/quantity), shade, soil building, stormwater runoff, pollinator corridor, demonstration and on-job training.
Additional highlights	Sycamore forests, community school food garden. Stormwater capture, rainwater harvesting, mechanical water reuse, greywater. Frequent flooding prior to installation. No flooding after installation, including during 2022-23 winter stormevents.

Project 5: San Luis Obispo Institutional

Project	Project type (Res or CII)	Area (sq ft)	ETo (in/yr)	**Peff (in/yr)**	Plant Factor (PF)	Irrigation Efficiency (IE)
No. 3	CII	43,347	51.47	10.41	0.23	0.81

Maximum Applied Water Allowance		Estimated Total Water Use		Applied Supplier-delivered Water		Applied Site-generated Water	
Gallons	ETAF	Gallons	ETAF	Gallons	ETAF	Gallons	ETAF
496,572	0.45	232,878	0.21	0.00	0.0	232,878	0.21

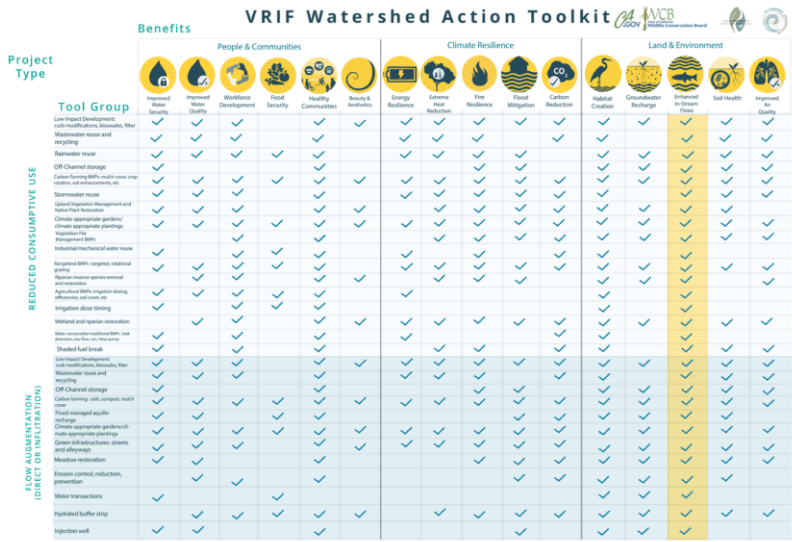

Annual Irrigation Demand: Pre-treatment vs Post-treatment
SAN LUIS OBISPO COUNTY - INSTITUTIONAL - AVG YR
GALLONS
600,000
500,000
400,000
300,000
200,000
100,000
0
MAWA
ETWU
Applied Site-Generated Water (SW, GW, RW)


Annual Irrigation Demand: Pre-treatment vs Post-treatment
SAN LUIS OBISPO COUNTY - INSTITUTIONAL - DRY YEAR
GALLONS
600,000
500,000
400,000
300,000
200,000
100,000
0
MAWA
ETWU
Applied Site-Generated Water (SW, GW, RW)

VRIF Watershed Action Toolkit

Benefits

Tool Group	People & Communities						Climate Resilience					Land & Environment				
	Improved Water Security	Improved Water Quality	Workforce Development	Food Security	Healthy Communities	Beauty & Aesthetics	Energy Resilience	Extreme Heat Reduction	Fire Resilience	Flood Mitigation	Carbon Reduction	Habitat Creation	Groundwater Recharge	Enhanced In-Stream Flows	Soil Health	Improved Air Quality
Low Impact Development: curb modifications, bioswales, filter	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wastewater reuse and recycling	✓	✓	✓		✓		✓	✓	✓		✓	✓		✓	✓	✓
Rainwater reuse	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓

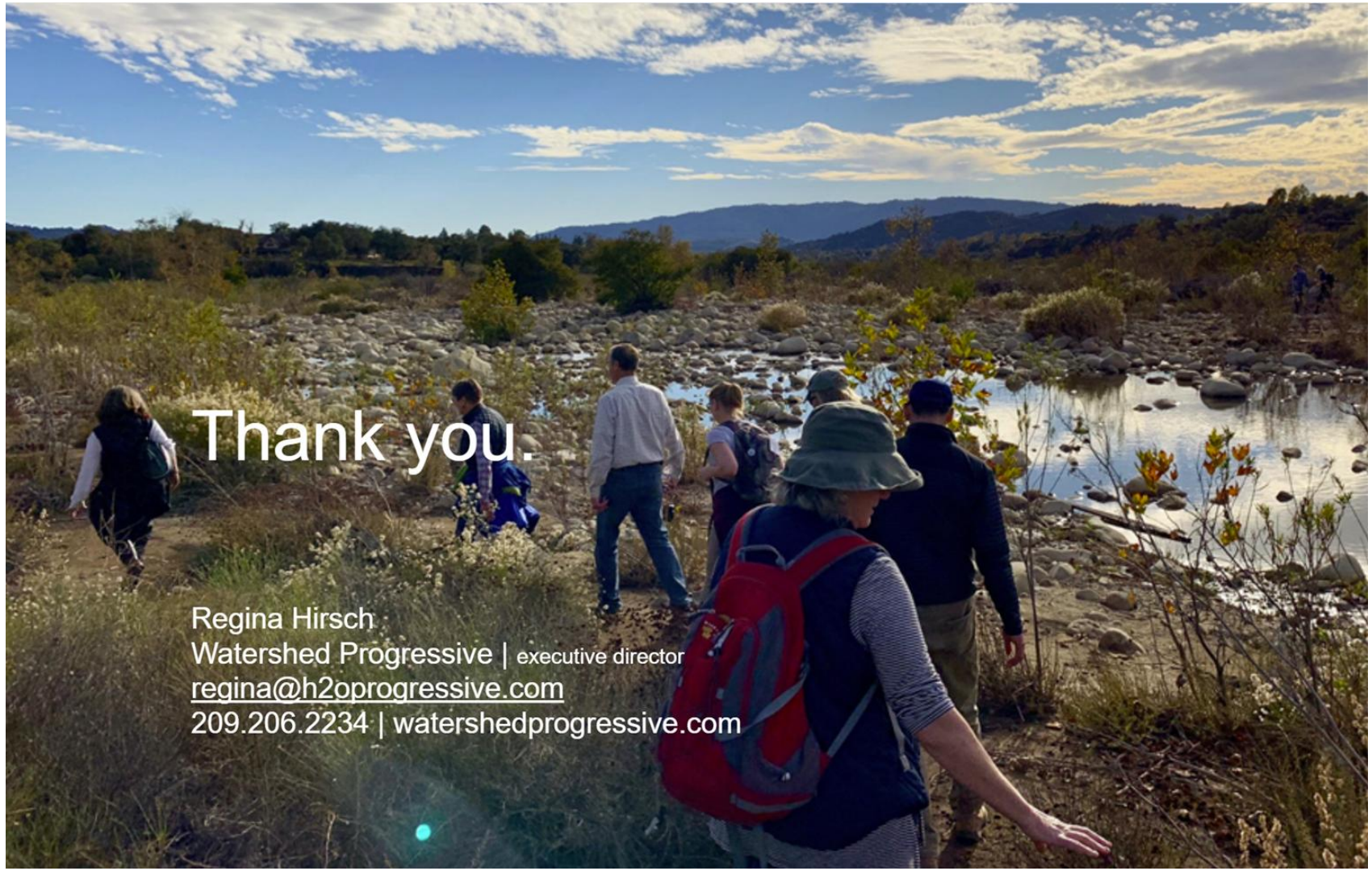


Find the local solutions hidden in your landscape:

Water . Habitat . Flows . Food . Energy . Fire . Flood . Economies . Resilience

LAND RESILIENCE PARTNERSHIP

Need help getting started? Contact your local direct install program or contact **LANDresiliencePARTNERSHIP.org**


Thank you.
Regina Hirsch
Watershed Progressive | executive director
regina@h2oprogressive.com
209.206.2234 | watershedprogressive.com

75 YEARS Sonoma Water

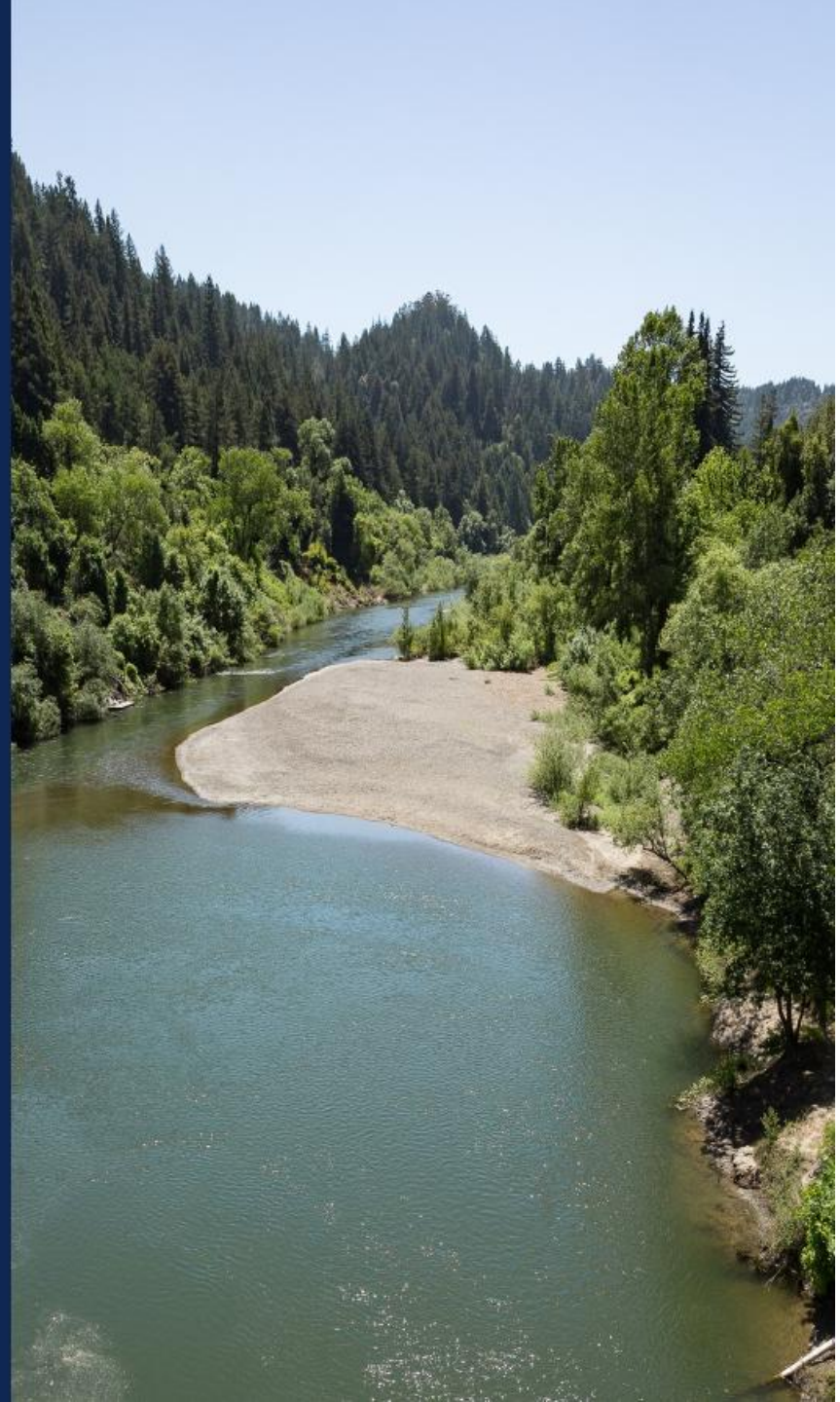
SERVING THE COMMUNITY SINCE 1949

The Partnerships that Changed Perspectives

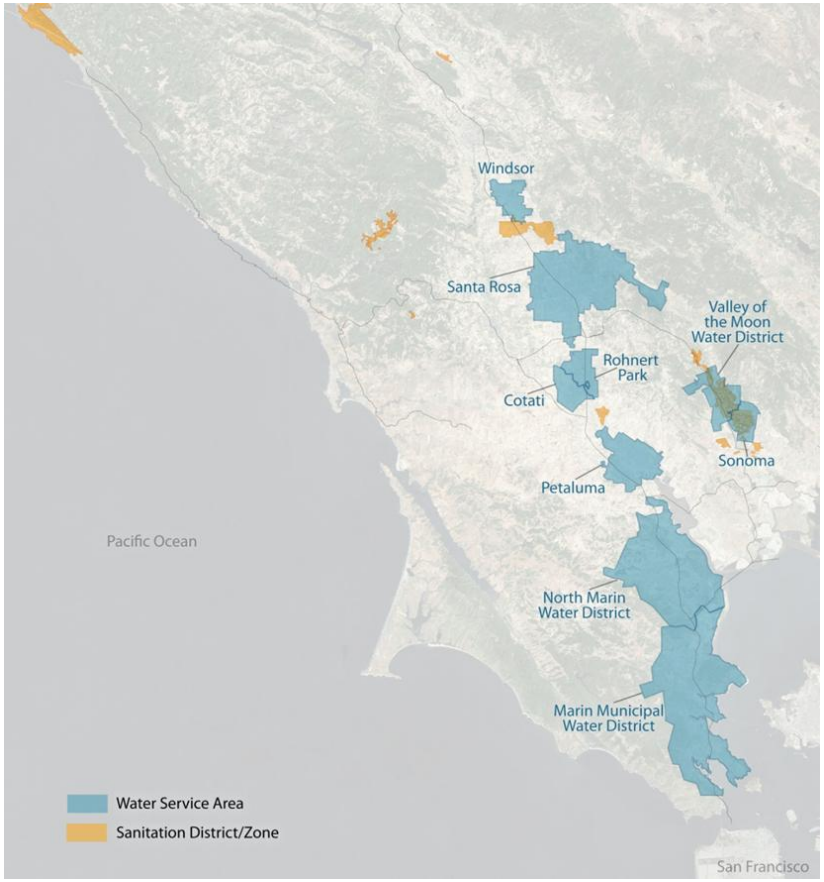
Cultivating Climate-Ready Landscapes

Paul Piazza
Water Use Efficiency Manager
April 10, 2025

sonomawater.org



About Sonoma Water



- Special district created by legislature in 1949
- Wholesale water provider to nine cities and special districts
- Serving 600,000 residents in portions of Sonoma and Marin counties
- Core services include water supply, sanitation, and flood protection services

Sonoma-Marin Saving Water Partnership

Formed in 2010 to identify and recommend implementation of water use efficiency projects and maximize the cost-effectiveness of water use efficiency programs in our region.

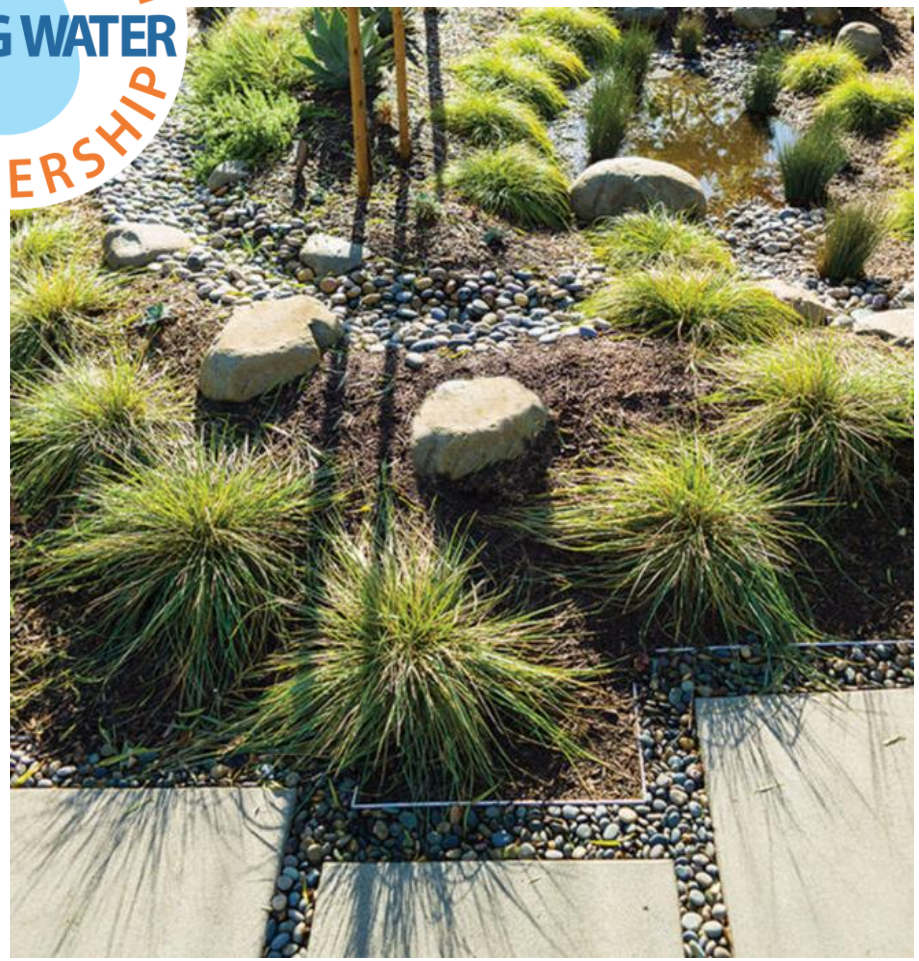
Savingwaterpartnership.org

Sonoma-Marin
Saving Water Partnership

Sonoma-Marin Saving Water Partnership

Important partnerships:

- Education
- Non-Profits
- Professional Associations
- Businesses
- Local agencies



What helped make this possible?

- The Leadership Institute for Ecology and the Economy
  - Cofounded in 2000 by Rick Theis and Carolyn Johnson
  - Educate community leaders to create public policy that balances environmental and social justice with economic interests for a sustainable community
  - Business, Nonprofits, Elected Officials, and Agency Fellows

LEADERSHIP INSTITUTE for ECOLOGY and the ECONOMY

Business Fellows

- Alvarado Street Bakery, Greg Sisneros
- Amy's Kitchen, Paul Schiefer
- Bella Rosa Coffee Company, Nica Poznanovich
- bio365, Deborah Grace Kraft
- Blue Barrel Rainwater Catchment Systems, Jesse (Froehlich) Savou
- CamelBak, Kelsey Metzler
- Clear Blue Commercial, Carolyn Pistone
- Community Soil, Paolo Tantarelli
- Dry Creek Vineyard, Don Wallace
- Equity First Consulting, Ana Lugo
- Fisher Town Design, Lois Fisher
- First Community Bank, Janet Connors
- First Light Farm, Jesse Pizzitola
- Friedman's Home Improvement, Rebecca Bautista
- Global Genesis, Terry Taylor
- Green Mary Zero Waste Events, Mary Munat
- Guayaki, Lucia Abaunza, Kim Fetzer, Janal Cruz
- Jackson Family Wines, Aaron Schreiber-Stainthorp
- Keysight Technologies, Claire McCarthy
- Kindred Fair Trade, Julie Montgomery
- LIFT Economy Partner, Erin Axelrod
- Protected Investors of America, Judy Withee
- Puentes Consulting, Stephanie Puentes
- SHARE Exchange Cooperative, Kelley Rajala
- Solar Works, Laura Goldman
- SomaRosa Farms, Deanna McKenzie
- Sonic, Lincoln Miller
- Sonoma Clean Power, Cordel Stillman
- Sonoma Mountain Village, Tina Montgomery
- Vanguard Properties, Amee Sas
- Ventana Latina, Evelina Molina
- World Centric, Janae Lloyd

Nonprofit Fellows

- Center for Climate Protection, Woody Hastings, Laurie-Ann Barbour
- Community Organizer, Annie Dobbs-Kramer
- Daily Acts, Trathen Heckman, Kerry Fugett
- Farmers Guild/CAFF, Evan Wiig
- Federated Indians of Graton Rancheria, Jenna Brager
- GoLocal, Janeen Murray
- Graton Day Labor Center, Juan Bernal
- Greenbelt Alliance, Teri Shore
- National Parks Conservation Association, Ron Sundergill
- Petaluma Bounty, Suzi Grady
- Regenerative Organic Alliance, Elizabeth Whitlow
- Right to the City Alliance, Davin Cardenas
- Santa Rosa Chamber of Commerce CEO, Peter Rumble
- Santa Rosa Community Health, Beth Dadko
- SEIU Local 1000, Daniel Solnit
- SEIU 1021, Maria Peluso
- Social Advocates for Youth, Serene Cooper
- Sonoma County Resource Conservation District, Valarie Minton
- Sonoma County Trails Council, Ken Wells
- Sonoma County Conservation Action, Denny Rosatti
- Sonoma Ecology Center, Raymond Batlar
- Sonoma Food Runners, June Michalowski
- Sonoma Land Trust, Sheri Cardo, Wendy Eliot
- Sonoma State University Community Partnerships Coordinator, Caroline Bañuelos
- Transition US, Carolyn Stayton
- UFCW Western States Council, Amber Parrish Baur
- Westminster Woods, Jessica Barry
- Womens Earth Alliance, Arielle Molnester

Elected Official and Agency Fellows

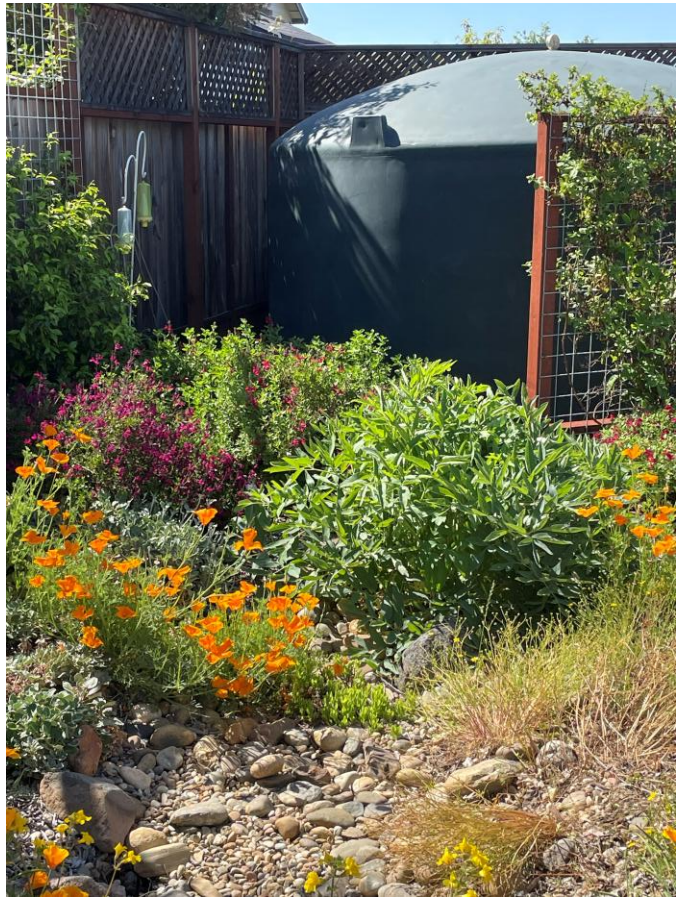
- Assemblymember, Jim Wood
- Former Assemblymember, Michael Allen
- Former Assemblywoman, Senator, and Santa Rosa City Council Member, Noreen Evans
- Chief of Staff for State Senator Mike McGuire, Rebecca Wachsberg
- Sonoma County Supervisor, Susan Gorin
- Environmental Protection Agency, Julie Milazzo
- CalEPA, Tom Lanphar
- Prior City of Petaluma Vice Mayor, Ixchel Lunar (2012)
- City of Santa Rosa Councilman, Chris Rogers
- City of Santa Rosa Councilman, Dick Dowd
- City of Santa Rosa Councilman, John Sawyer
- Prior City of Santa Rosa Councilwoman, Julie Combs
- City of Cloverdale Councilwoman, Melanie Bagby
- City of Sebastopol Councilwoman, Sarah Glade Gurney
- City of Sebastopol Councilwoman, Una Glass
- Prior City of Rohnert Park Councilman, Jake MacKenzie
- Town of Windsor Councilwoman, Deb Fudge
- County of Sonoma Energy and Sustainability Department, Liz Yager, BC Capps
- Santa Rosa Junior College, Kyra Janssen, Kathryn Gerber, Steve Rabinowitsh, David Liebman
- Shift Health Accelerator, Jen Lewis
- Sonoma Water, Grant Davis, Susan Haydon, Candace Messner
- Sonoma County Department of Health Services, ???
- Sonoma County Transit Authority & Regional Climate Protection Authority, Tanya Narath
- US State Department, Jennifer Johnson

What came out of it?

- 2006 Carbon Free Water goal by Sonoma Water (achieved 2015)
- 2009 Sonoma County Regional Climate Protection Authority (RCPA)
- 2010 Sonoma-Marin Saving Water Partnership
- 2012 Sonoma Clean Power (local community choice aggregator)
- 2019 Resolution declaring a climate emergenc
- 2021 Sonoma Water Climate Adaptation Plan
- 2022 RCPA designated California's first "Climate Resilience District" - SB 852 (Dodd)

How it relates to CRLs

- Climate change is here
- Unified leadership helps prioritize appropriate funding and staff support for programs and collective actions
- Solutions should build in multiple benefits for resilience, so collaboration is key to success
- Rapid adoption of climate-ready landscapes requires good data to inform opportunities to focus customer education and resources
- Spur customer action through partner networks



Summary: Partnerships Matter

- Good data informs good decisions, but people do the work
- Identify and connect with cross sector climate champions (diversity of people & organizations)
- Leaders can benefit from leadership training
- Grow and empower change-maker networks
- Cultivate collaborative solutions

75 YEARS Sonoma Water

SERVING THE COMMUNITY SINCE 1949

Paul Piazza
paul.piazza@scwa.ca.gov

sonomawater.org

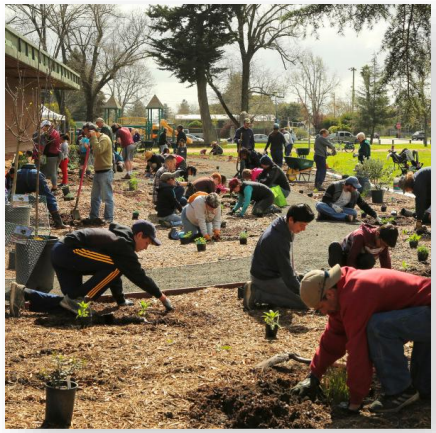
The Power of Community Partnerships

Daily Acts

A Localized Approach to Building Resilience

Community Education & Public Awareness

Providing free hands-on talks, tours and workshops that inspire and empower residents to take action.



Community Mobilization & Design/Install

Installing dozens of demonstration gardens across schools, parks and residences, mobilizing community.

Civic Policy & Program Approaches

Helping innovate and implement new policy and program approaches to spread these accessible solutions.

24 Years of Collaborative Action

78,710
People Educated & Engaged

1,671
Programs Run

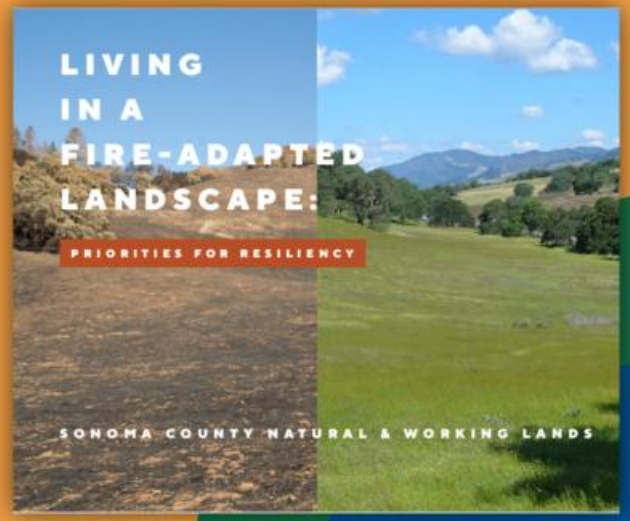
100,000 +
Resilience Building Actions & Projects

20 +
Coalitions & Networks Built

43
Demonstration Gardens Installed

Innovative Partnerships in Times of Crisis

SOCO
SONOMA COUNTY
RISES



Just and Resilient
Future Fund

Free Landscape Design Templates

43% of 504 rebuild plans based off templates

Outstanding Public Engagement Award

SmartWater APPLICATION TECHNOLOGIES®

City of Petaluma

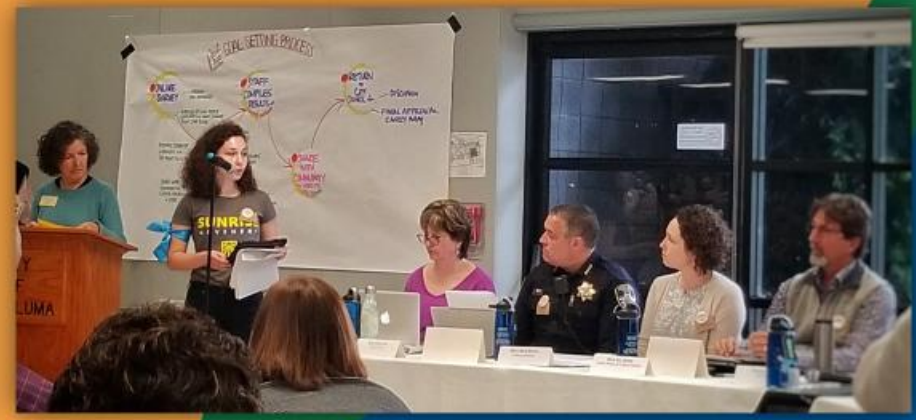
All-America City
NATIONAL CIVIC LEAGUE

Petaluma, CA

2025

All-America City Finalist

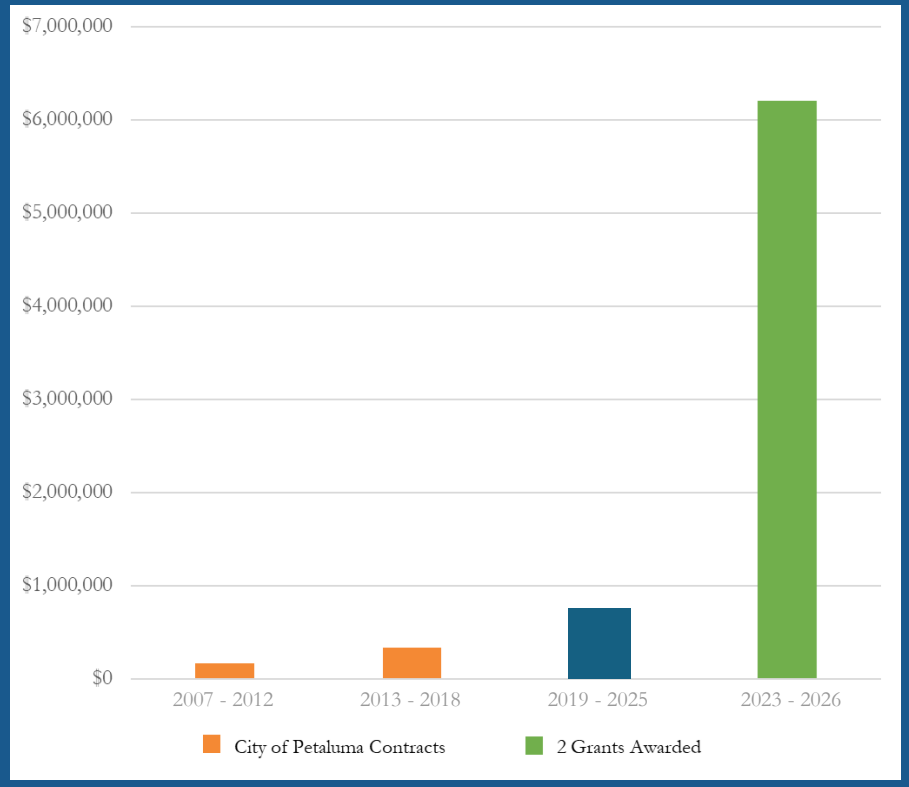
www.nationalcivicleague.org



CITY OF PETALUMA
1858

CLIMATE READY
2030

Non-profit Partnerships, A Good Investment



- We received 1.3 million in contracts in the last 19 years from the City of Petaluma for programs.
- In 2023, we received 2 grants worth 6.2 million.
- That's a significant return on investment!

The Land Resilience Partnership

64 Installations at Schools, Parks and Residences

The Land Resilience Partnership Program

- Lawn Conversion
- Laundry-to-Landscape Greywater Systems
- Rain Gardens & Rain Tanks
- Shade Trees
- Irrigation Efficiency Upgrades

3 Schools

26 Homes

2 Parks

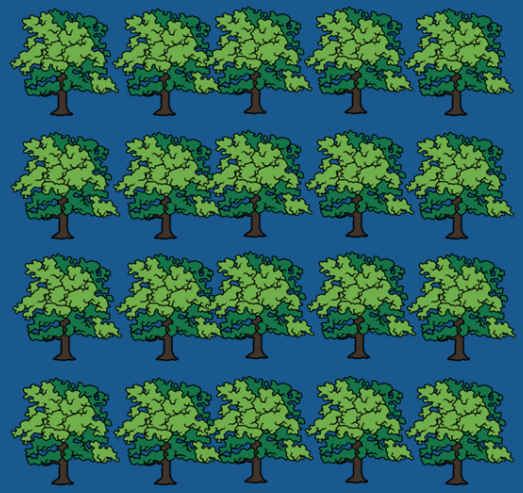
2.3 MILLION

Gallons of Water Saved Every Year

Including these benefits:

- Drought & fire resilience
- Food production
- Flood reduction
- Increased habitat
- Increased shade canopy
- Carbon sequestration
- Community building
- Policy change

Annual Carbon Sequestration = 4,300 lbs. CO_2 or 2 tons!
This also looks like…

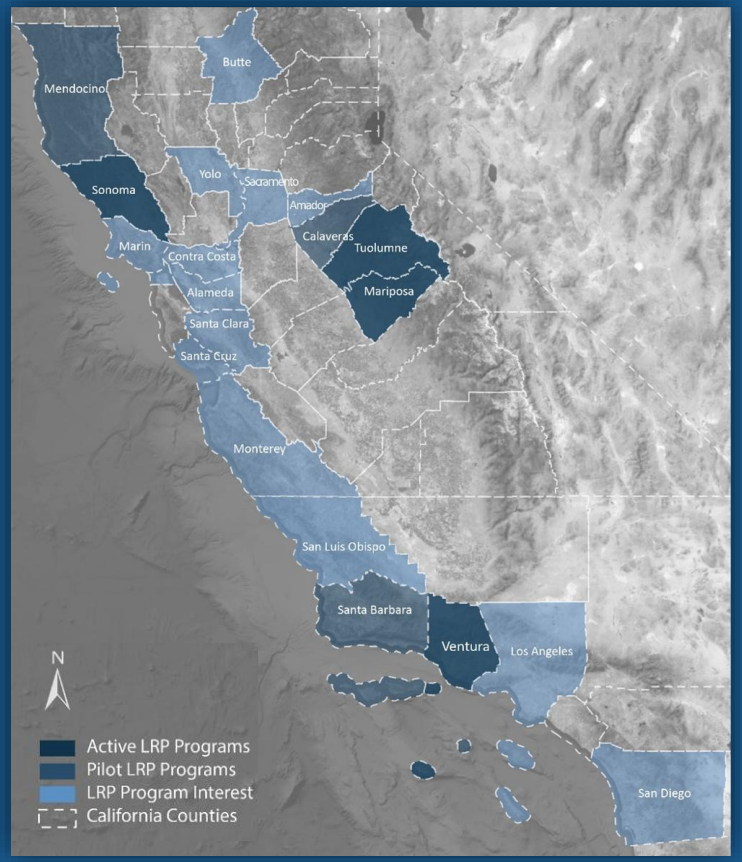


The sequestration power of 20 mature oak trees

Driving around the world

Our electricity usage for the past 3.5 years

Scaling Potential



Interest in ⅓ of California Counties

Across 5 regions by 2027

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