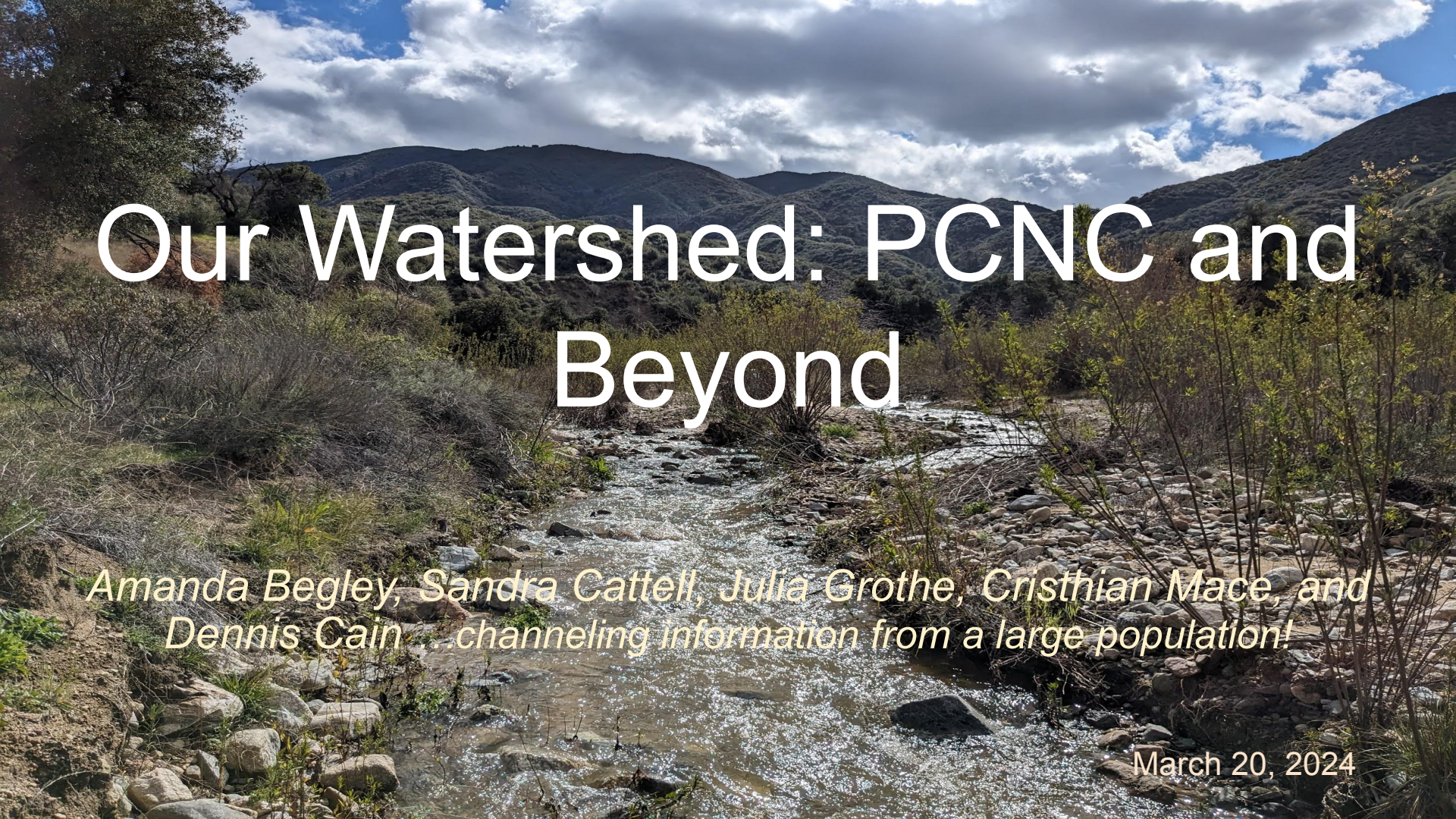


Our Watershed: PCNC and Beyond

Amanda Begley, Sandra Cattell, Julia Grothe, Cristhian Mace, and Dennis Cain … channeling information from a large population!

March 20, 2024

Hydrologic Processes

Watershed Management in Oak Woodlands, Royce Larsen, David Lewis, Yana Valachovic, Chapter 4 of *A Planner's Guide for Oak Woodlands*, University of California Agriculture and Natural Resources Publication 3491 2d Ed.

Water is the driving force of nature. It is the essential medium of the biogeochemical cycles (water cycle, energy flow, mineral cycle, and nutrient cycle) and of life itself. The development of sound management practices that protect watersheds and provide needed water require a clear understanding of hydrologic processes. The primary hydrologic functions of watersheds are to capture, store, and safely release water. Water is captured when it falls to the soil surface as precipitation (fog, rain, and snow) and infiltrates into the soil profile where it moves slowly, recharges groundwater supplies, and eventually is released into streams. Usually, during the wet winter season and more intensely during storms, the storage capacity in watersheds is exceeded, resulting in increased release of water to stream channels. Many streams in oak woodlands are intermittent, with the watershed usually requiring 6 to 10 inches (15 to 25.5 cm) of precipitation to initiate stream flow. The amount of precipitation required to saturate, or prime, a watershed is a function of the underlying geology, soil depth, and soil water-holding capacity.

Today's Panel

Amanda Begley
Watershed Senior Program Manager, TreePeople
Watershed Coordinator, Santa Clara River Watershed - Safe, Clean Water Program

Sandra Cattell
PCNC Docent
Group Chair, Santa Clarita Valley Sierra Club
Vice Chair, Santa Clara Watershed Area Steering Committee - Safe, Clean Water Program

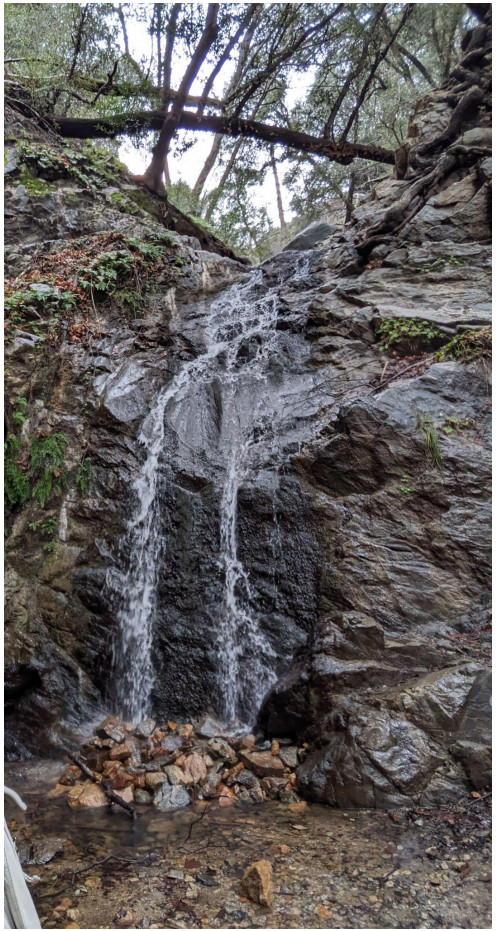
Julia Grothe
Water Conservation Specialist II
Santa Clarita Valley Water Agency (SCV Water)

Cristhian Mace
Natural Areas Biologist
County of Los Angeles
Department of Parks and Recreation

Dennis Cain
PCNC Docent

Agenda

- Welcome & Introduction
- Santa Clara River Watershed Overview
    - Santa Clara River Watershed Definition (Amanda)
    - SCR Water Supply and Demand (Julia)
    - Environmental Perspective (Sandra)
    - Wastewater Management
- Placerita Creek Watershed Overview (Dennis)
    - Placerita Creek Watershed Definition
    - Evapotranspiration: Suburban vs. Natural Areas
    - Historical Climate Metrics
- High-Level Water Planning
    - Santa Clara River, Placerita Creek Watershed Goals
- Watershed Risks/Concerns & Response Actions
    - Climate Change
    - Water Supply Reliability
    - Water Supply Quality
    - Stormwater/Urban Runoff Management
    - Urban Water Conservation & Sustainability Efforts
- Group Discussion
- PCNC Water Audit (Group, led by Amanda)



So What? The Goals are…

Define a Watershed

Recognize how Placerita Creek fits within Santa Clara River Watershed

Understand water supplies and users in both watersheds

See historical climate trends for Placerita Creek Watershed

Identify tools to detect water sources and detect plant and tree stress

Review risk mitigation accomplishments and imagine possible future projects

Create key elements to pass on to the public

Excite desire to share knowledge, ideas, and exploration!

Bottom Line Up Front: Next Steps?

Add PCNC as Groundwater Dependent Ecosystem monitoring site?

How to establish and monitor Oak health?

- Habitat Assessment
- Oak Surveys

Research low-cost creek flow measurement methods

Continue ‘Water Walks’

Develop Watershed Learning Modules?

Continued Trail Erosion Control

Support development of Placerita Canyon Resource Management Plan

PCNC Docent Shared Values

SHARED VALUES

We volunteer at PCNC to:
Educate and learn
Make friends and be part of a community
Preserve, protect and improve the PCNC
Have fun.

Therefore, to the best of my ability, I will
Respectful
Kind
Dependable
Collaborative in Planning
Cooperative in Implementation
Open-minded and Nonjudgmental
Generous with Time and Talent
Inclusive

2005 PCNC Strategic Plan Summary

This plan reportedly was championed by the park superintendent and supported by the PCNCA.

Vision

Connecting People with Nature

Mission

To inspire a passion, awareness and respect for the environment, and to preserve and protect for future generations the history and ecosystem of Placerita Canyon.

2023 Los Angeles County Strategic Plan Summary

Vision

To be a world-class parks and recreation organization.

Mission

- Serve as stewards of parklands.
- Build healthy and resilient communities.
- Advance social equity and cohesion.

Get Value

Generated by ClimateEngine.org

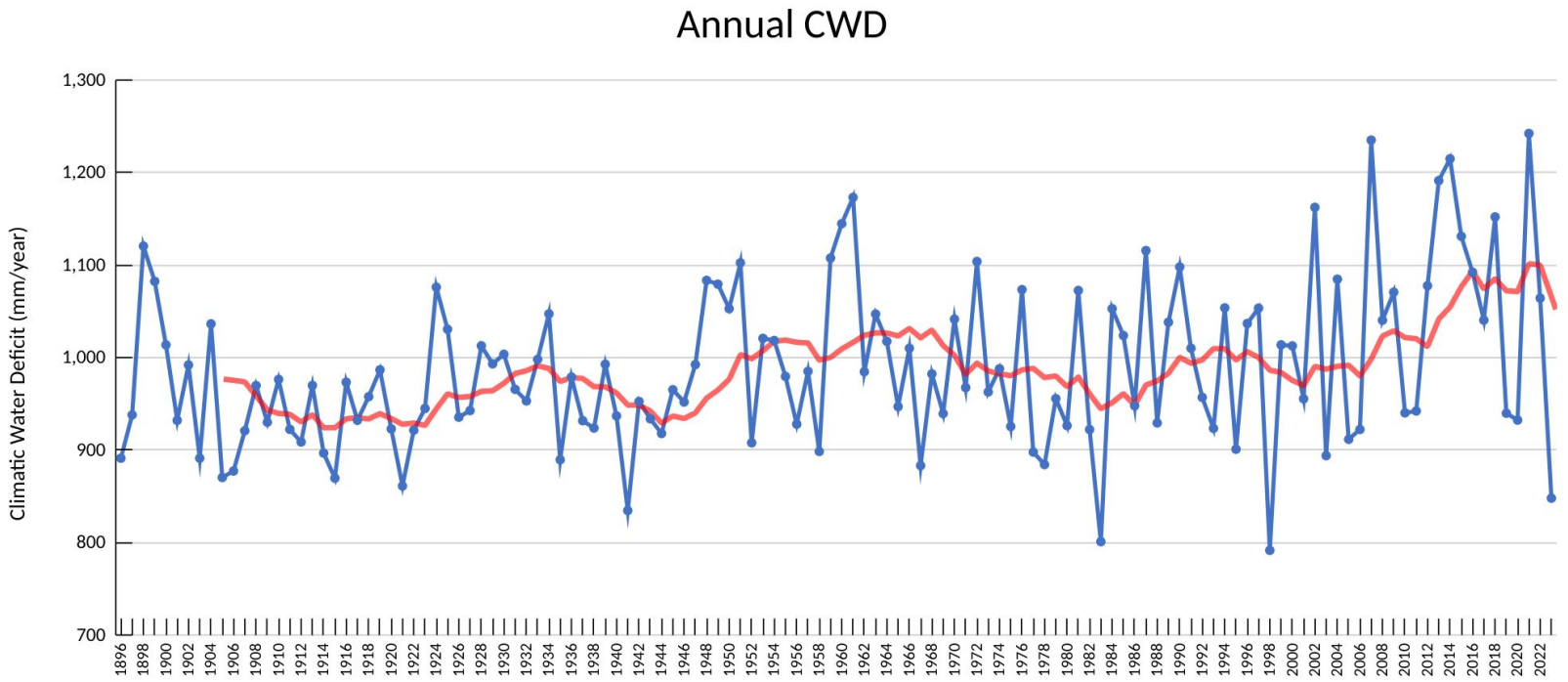
Running at an Average Deficient (Past 5 Years)…

IT IS NOT THIS BAD!!

PCNC Net Water
2019-2024

…but only if it was only grass!

Placerita Creek Watershed Historical Climate Water Deficit



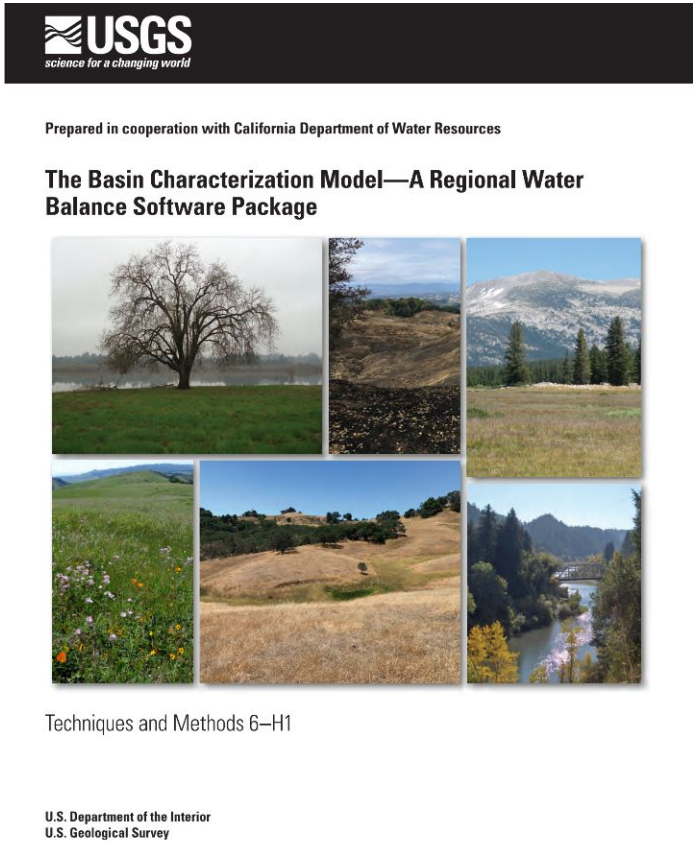
Climatic water deficit (CWD) is the amount of water that plants could use if it were available. It's calculated as potential evapotranspiration minus actual evapotranspiration.

The Basin Characterization Model—A Regional Water Balance Software Package

By Lorraine E. Flint, Alan L. Flint, and Michelle A. Stern

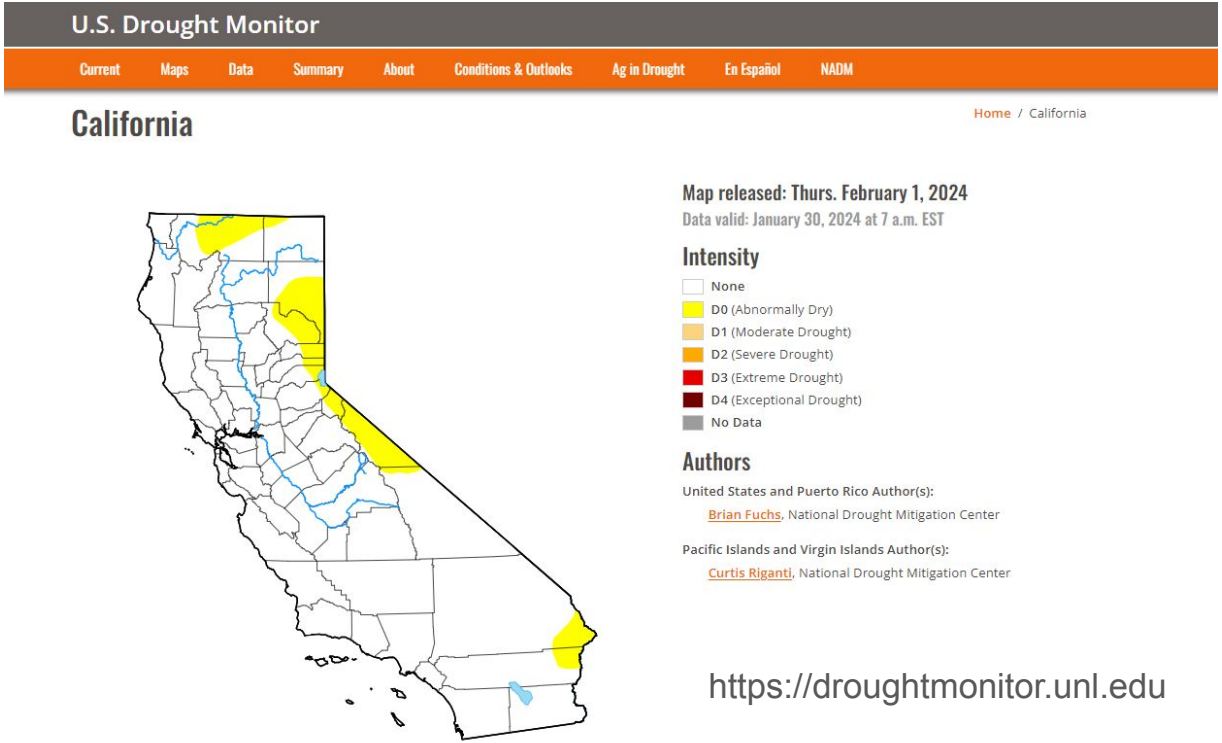
Model used by land resource managers to enable planning for various climate scenarios

How much water has been and will be available?



Flint, L.E., Flint, A.L., and Stern, M.A., 2021, The basin characterization model—A regional water balance software package: U.S. Geological Survey Techniques and Methods 6–H1, 85 p., https://doi.org/10.3133/tm6H1.

…But Not Currently in a Drought



https://droughtmonitor.unl.edu

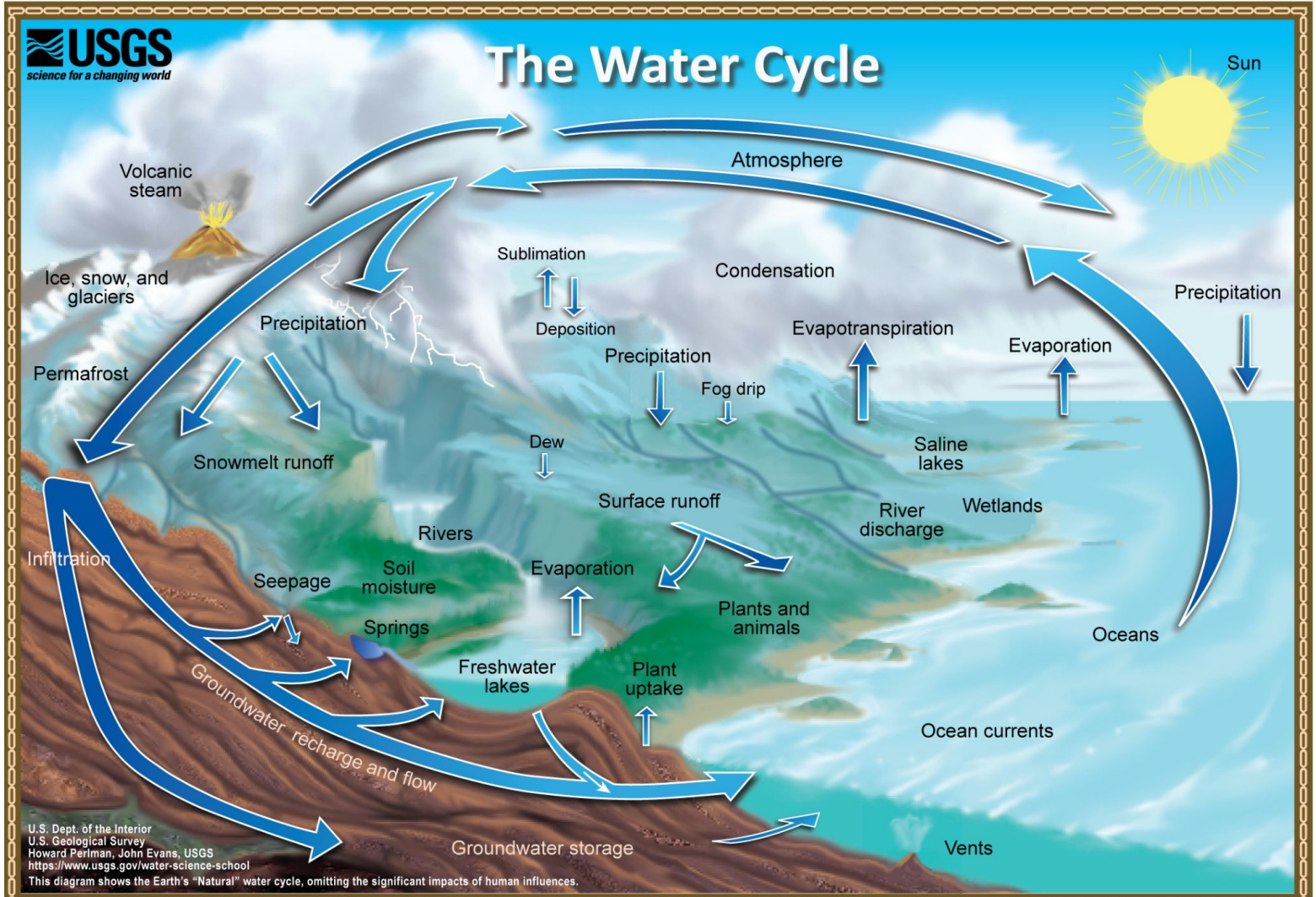
Hefty deposit in the state's water bank
Ian James, L.A. Times, 23Feb2024

"Overall, I'm not worried about drought for the rest of this year," said Jay Lund, a professor emeritus and vice director of the UC Davis Center for Watershed Sciences.
…
"We have serious water problems in California," Lund said. "Because policymakers forget about floods and drought so quickly after they are over, you worry about complacency."
Lund said the state's water decision-makers need to be "somewhere between complacency and panic," like a driver looking ahead on the road for looming problems.
"The last few years, and this year, just reinforced the normal lesson of California hydrology," he said. "Worry about floods and droughts at the same time."

Is the PCNC Ecosystem Currently Under Stress?

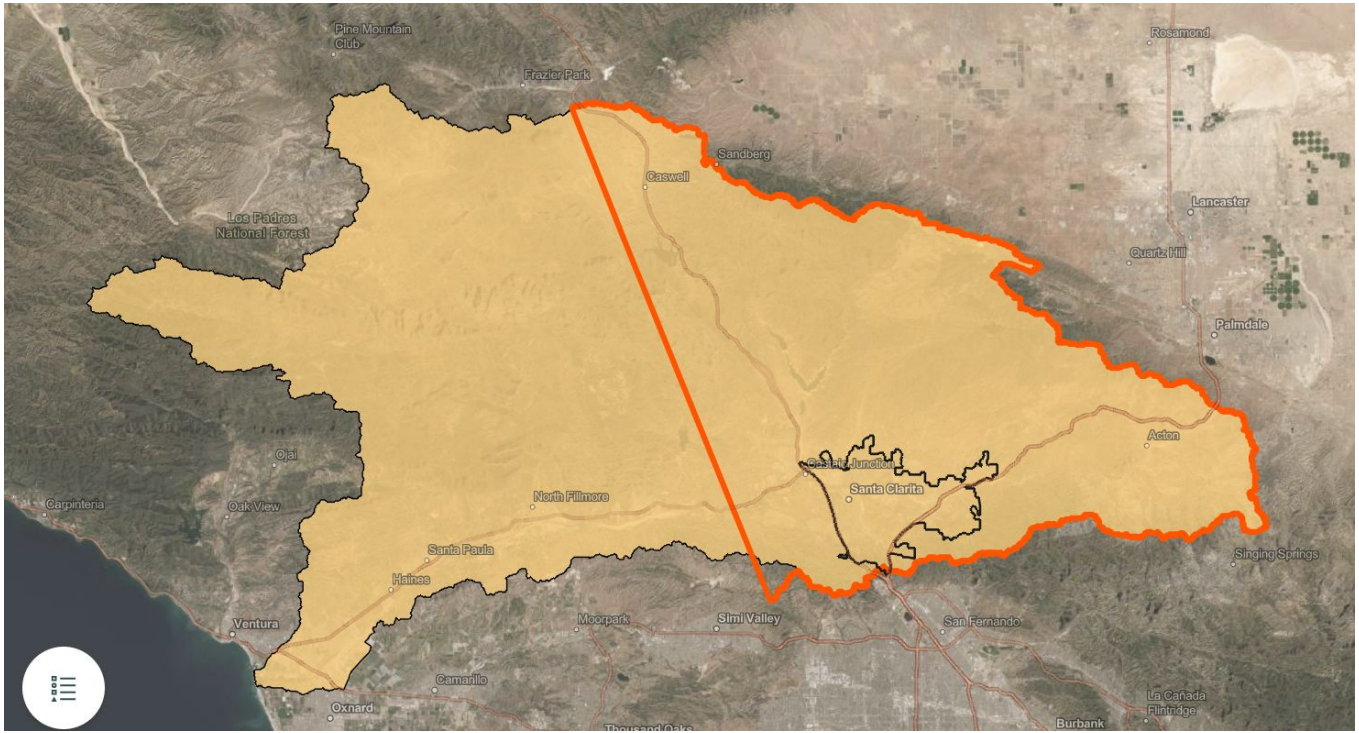
Many Santa Clara River Stakeholders

Related Strategies to Optimize Water Use


USGS
science for a changing world
The Water Cycle
Sun
Atmosphere
Volcanic steam
Ice, snow, and glaciers
Sublimation
Condensation
Deposition
Precipitation
Evapotranspiration
Evaporation
Precipitation
Permafrost
Precipitation
Fog drip
Dew
Saline lakes
Snowmelt runoff
Surface runoff
River discharge
Wetlands
Rivers
Infiltration
Seepage
Soil moisture
Evaporation
Springs
Plants and animals
Oceans
Freshwater lakes
Plant uptake
Groundwater recharge and flow
Ocean currents
Groundwater storage
Vents
U.S. Dept. of the Interior
U.S. Geological Survey
Howard Perlman, John Evans, USGS
https://www.usgs.gov/water-science-school
This diagram shows the Earth's "Natural" water cycle, omitting the significant impacts of human influences.

Santa Clara River Watershed

- Largest river system in Southern California remaining in a relatively natural state
- Area: ~ 1,030 sq. miles

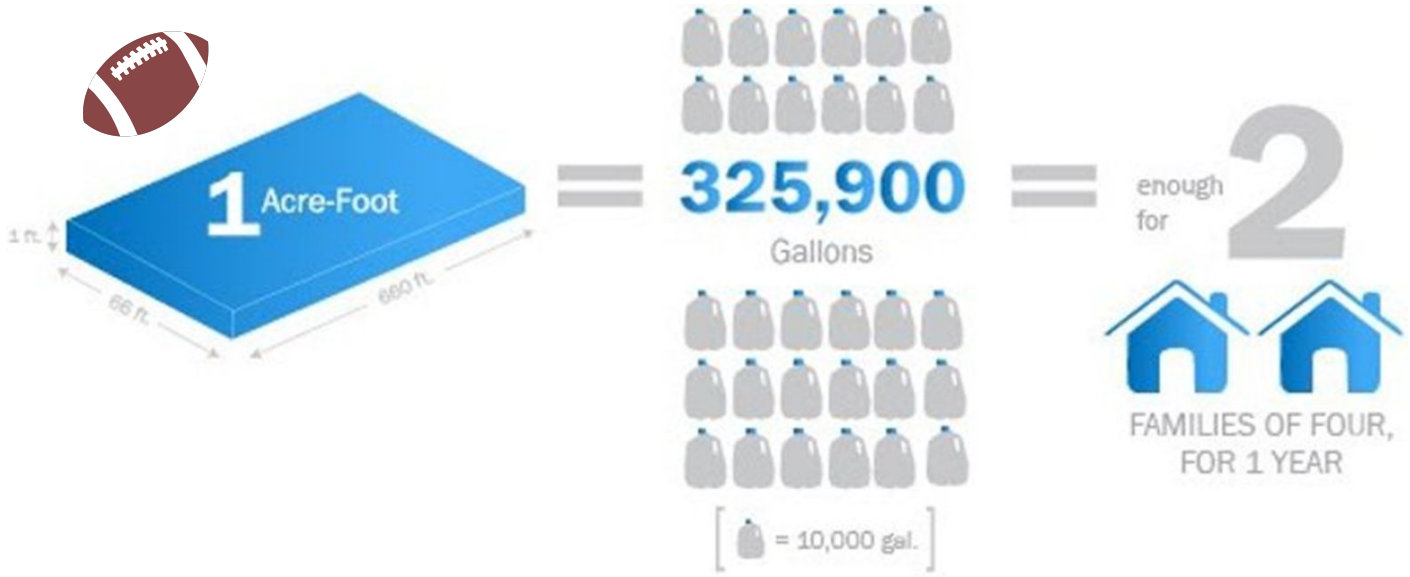


OVERVIEW

- Water Supply Characteristics
- Water Supply Portfolio
- Water Management
- Planning
- Water Use Targets

SCV WATER

WHAT IS AN ACRE FOOT



WATER SUPPLY CHARACTERISTICS

Santa Clarita's
Water Demand

Santa Clarita's
Water Supply Portfolio

SCV WATER

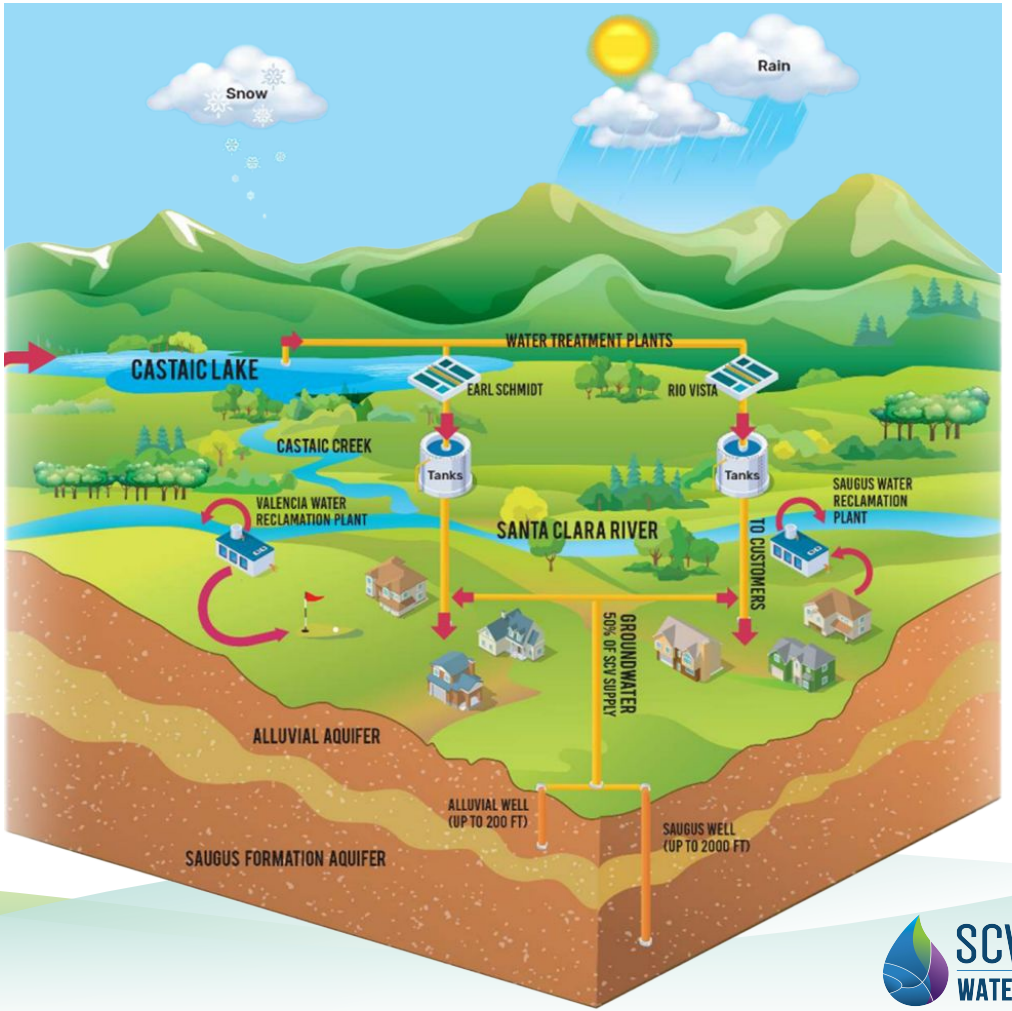
SCV EXISTING WATER SUPPLY PORTFOLIO

Imported Supplies

- State Water Project
- Dry Year Reserves

Local Supplies

- Groundwater
- Recycled Water



SCV WATER

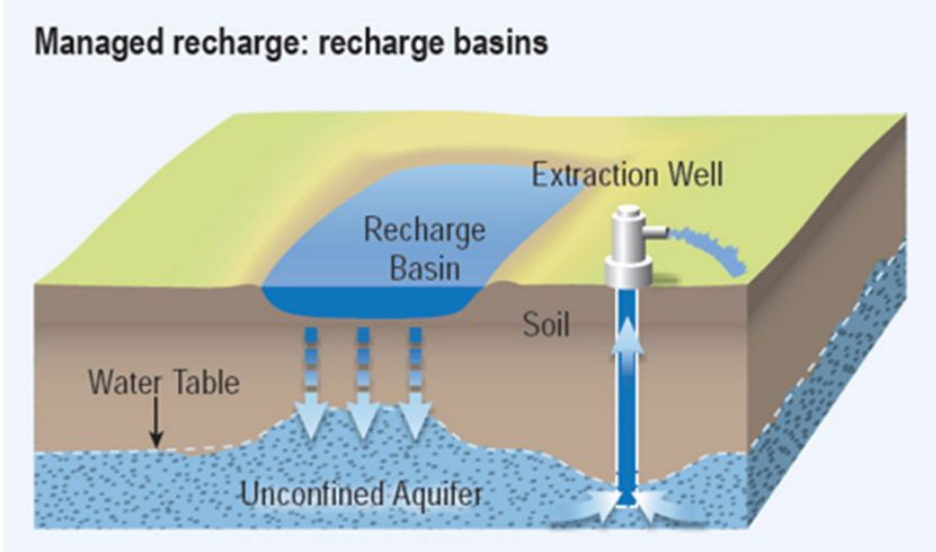
IMPORTED SUPPLIES: STATE WATER PROJECT (SWP)

Imported Water

- 50% of demands in average year
- Annual variability
  - Precipitation (rain, snow, runoff)
  - Pumping capacity (California Delta)
  - Water quality
  - Environmental regulations (wildlife)
- SCV Water Contracted Amount
  - 95,200 AF/Yr – 100%
- Wet years stored in dry year reserves like banking programs

IMPORTED SUPPLIES: WATER BANKING PROGRAMS

- Management Tool
  - Store water in wet years
  - Recover water in dry years
  - Located in the Central Valley
- Used to maximize the State Water Project supplies
- Critical dry year water supply

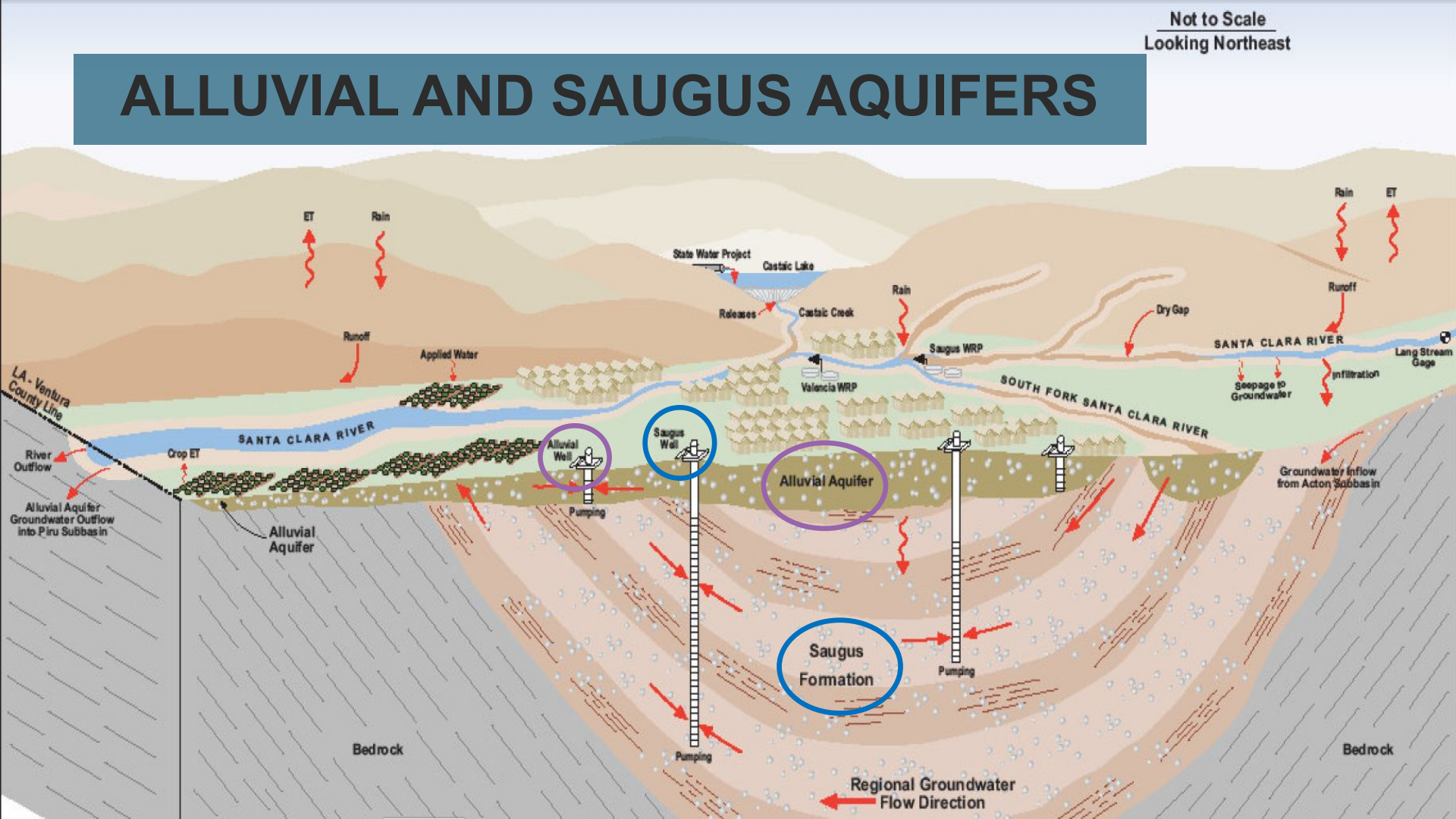


LOCAL SUPPLIES: GROUNDWATER

- Local water source
- 50% of demands in the average year
- Vital in dry years & emergencies
- Some wells require treatment
  - Perchlorate
  - PFAS & PFOA

SCV WATER

ALLUVIAL AND SAUGUS AQUIFERS



LOCAL SUPPLIES: RECYCLED WATER

Local Water Supply

Reclaimed Water

Year-round supply

Used only for irrigation

- Identified by purple pipes

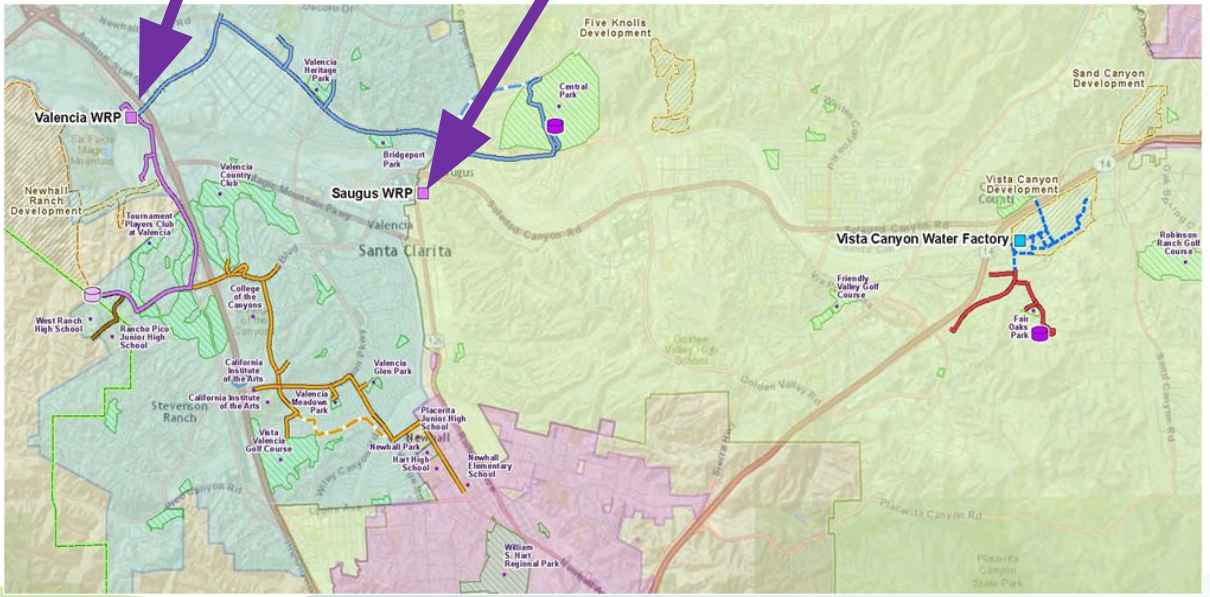
Recycled Water Planning

SCV WATER

RECYCLED WATER

Recycled Water Planning

- Recycled Water use began in 2003
- Current Reuse – 475 AFY
- Replacement for potable use



SCV WATER

VALLEY-WIDE WATER DEMAND

RESIDENTIAL

- Single Family Residential
- Multifamily Residential
- Indoor Water Use
  - Kitchen
  - Bathroom
  - Toilets
  - Showers
- Irrigation
- Leaks
- Other

Use ~ 62.9%

COMMERCIAL

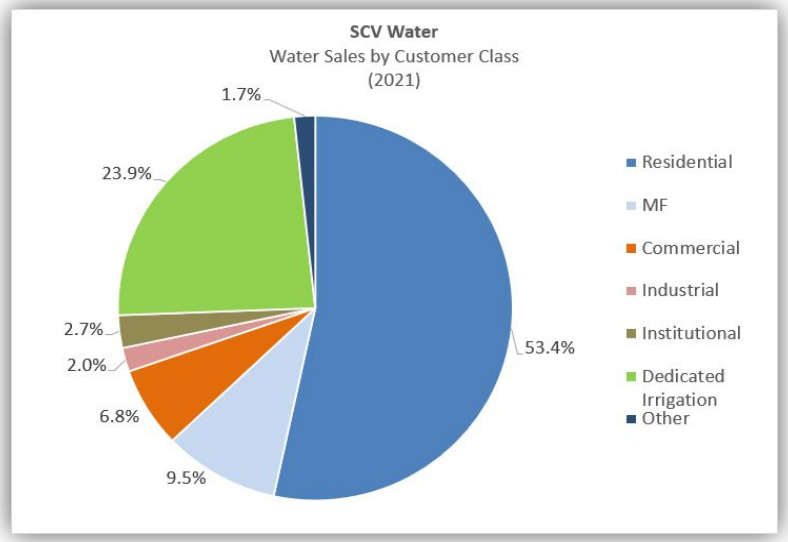
- Businesses
- Hospitals
- Schools
- Restaurants
- Car Washes
- Industrial Process Water
- Restroom
- Irrigation
- Leaks
- Other

Use ~ 13.2%

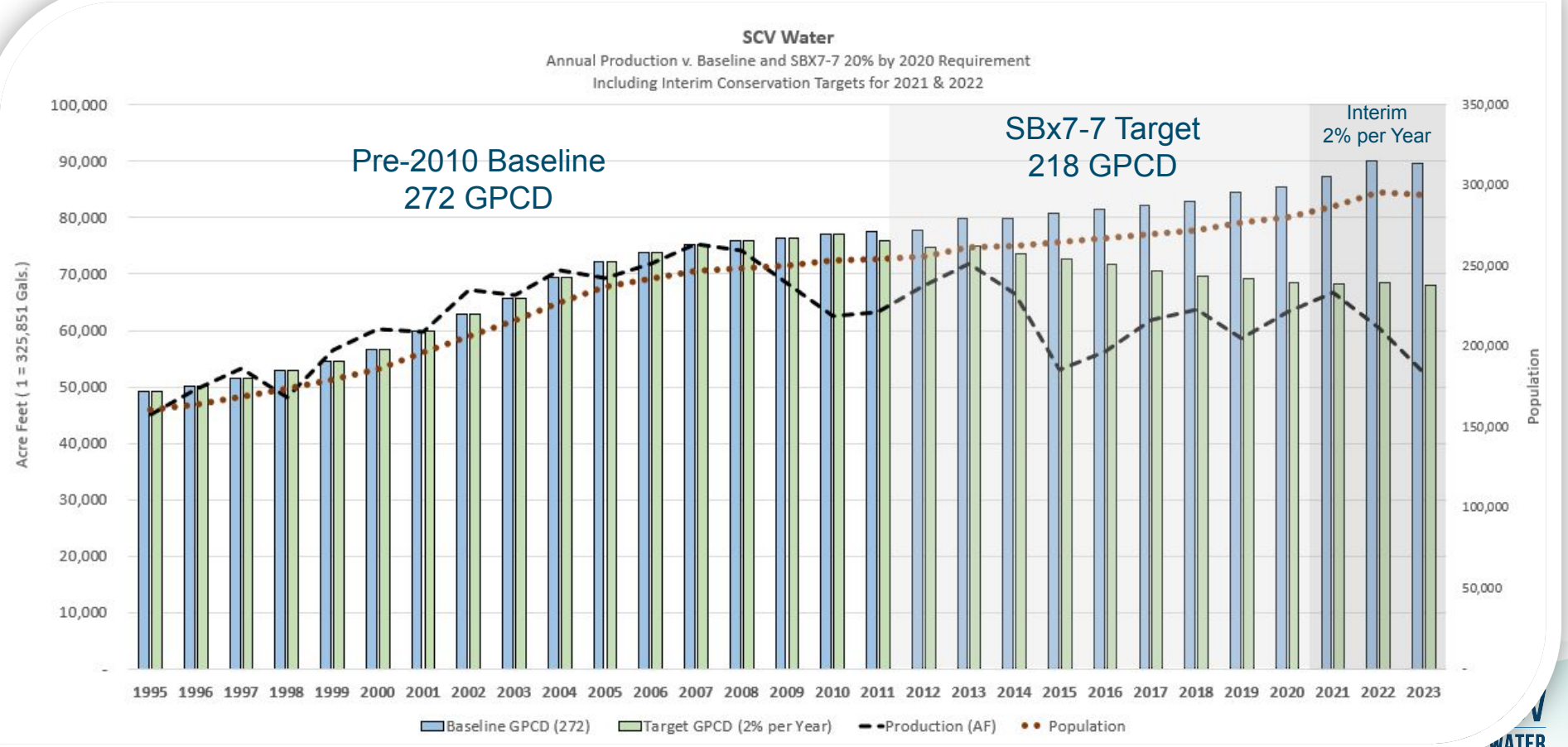
URBAN LANDSCAPES

- Parks
- LMDs
- HOAs
- CIDs
- Commercial Associations
- Irrigation
- Leaks
- Other

Use ~ 23.9%



VALLEY-WIDE WATER DEMAND




SAFE CLEAN WATER PROGRAM

PROGRAM MISSION

CAPTURE IT
Increase water supply

CLEAN IT
Reduce volume of trash that reaches waterways and the ocean

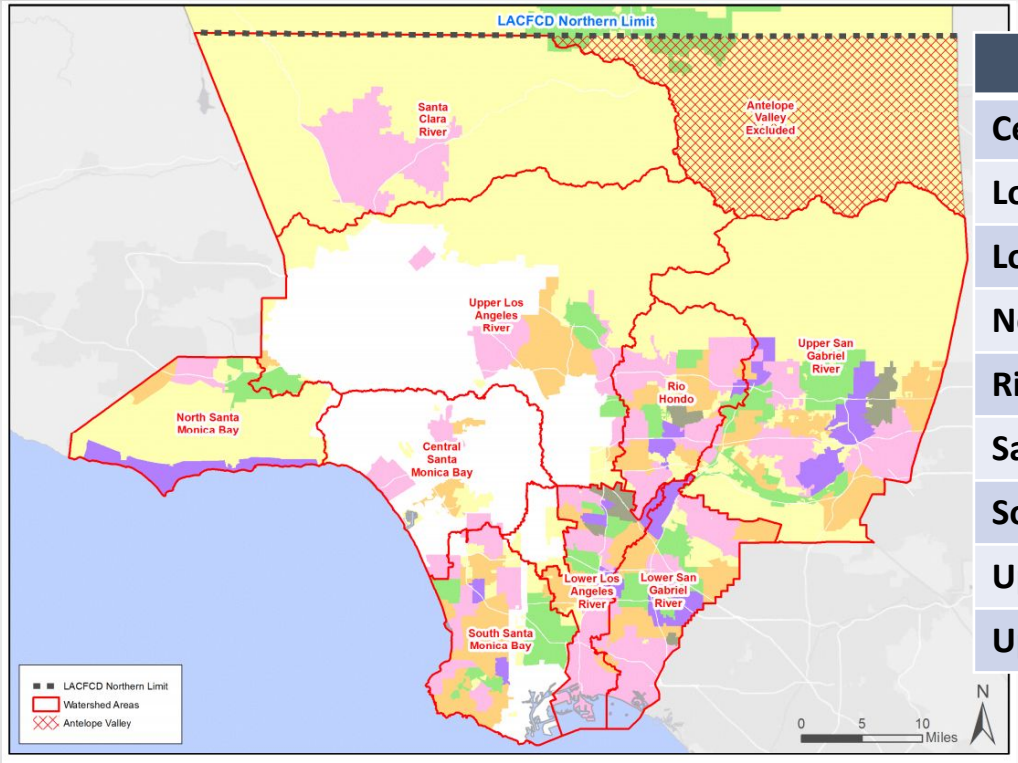
MAKE IT SAFE
Eliminate toxins and chemicals from our waterways

MAKE IT FOR EVERYONE
Provide community benefits

SCWP WATERSHED AREAS

SAFE CLEAN WATER PROGRAM

Regional Program



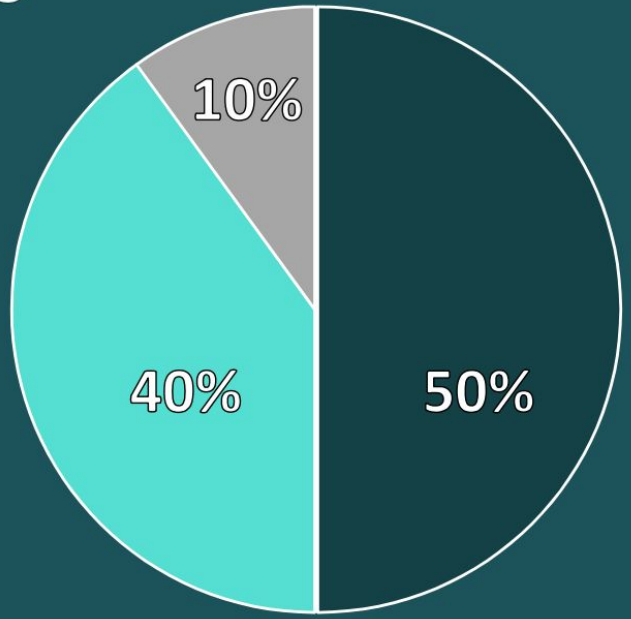
WATERSHED AREA	ANNUAL RETURN
Central Santa Monica Bay	$17.8 Million
Lower Los Angeles River	$12.8 Million
Lower San Gabriel River	$16.7 Million
North Santa Monica Bay	$1.8 Million
Rio Hondo	$11.5 Million
Santa Clara River	$6.0 Million
South Santa Monica Bay	$18.4 Million
Upper Los Angeles River	$38.6 Million
Upper San Gabriel River	$18.9 Million

Public Works
LOS ANGELES COUNTY

Program Details

Special Parcel tax

- 2.5 cents per square foot of impermeable area
- Watershed-based projects
- Local & Regional Projects



Regional Program

(50% ~ $142.5M annually)

Municipal Program

(40% ~ $114M annually)

District Program

(10% ~ $28.5M annually)

Total Program: Approx. $285M annually

WATERSHED COORDINATOR ROLE

1

Project Guide

Identify parties with project ideas & guide them through the SCWP

2

Connector

Gather input on community needs that SCW projects can help fulfill

3

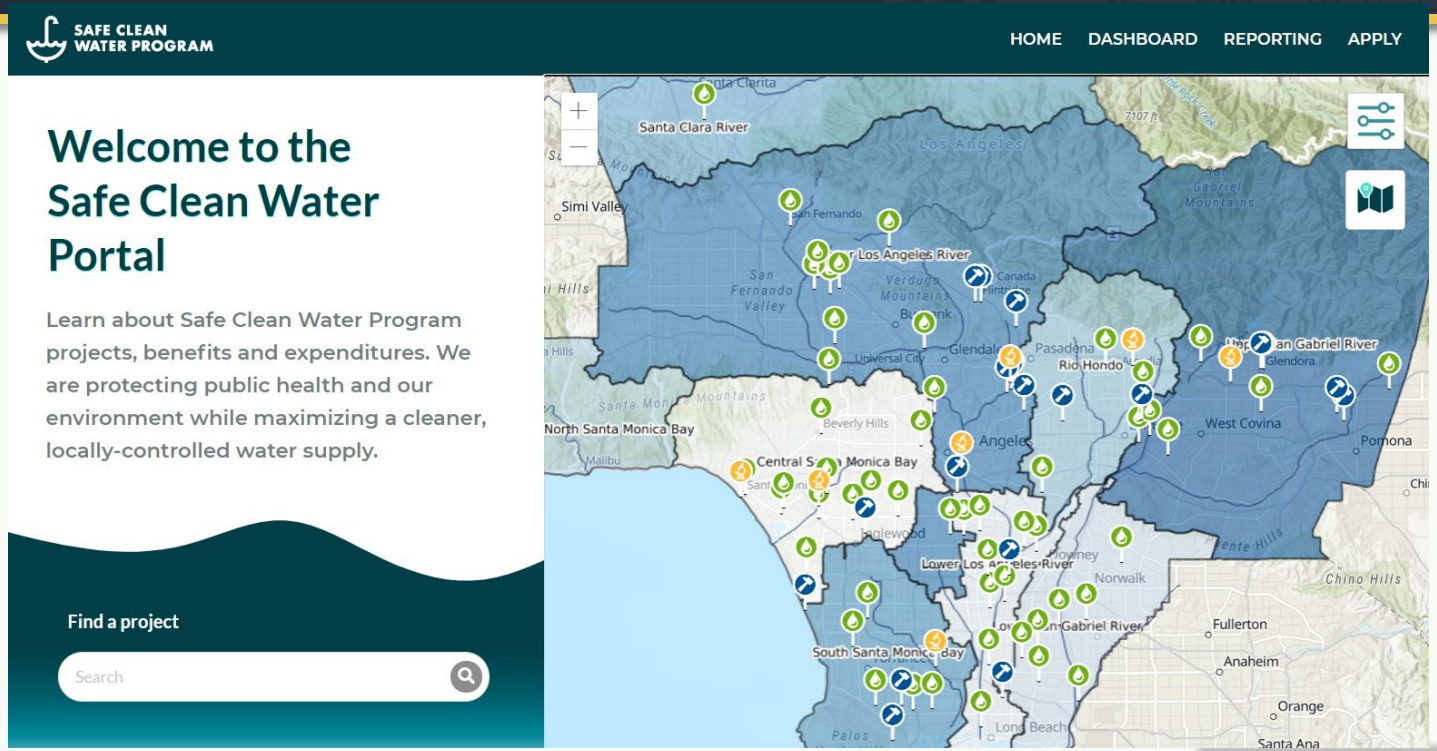
Educator

Raise public awareness about SCWP and projects in communities

+

Inform community about how they can voice their input

SCW Portal



Public Works
LOS ANGELES COUNTY

Local Project Highlight

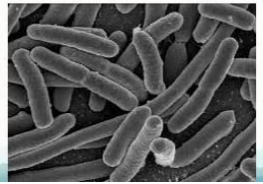
CITY OF SANTA CLARITA

VIA PRINCESSA PROJECT

RISK: Bacteria in Runoff Imperils Water Quality

The Problem: The upper Santa Clara River Watershed is plagued by an extremely high level of bacteria in the runoff water. According to the Los Angeles Sanitation Department, the bacteria is caused by excessive levels of pet waste runoff in our water.

Bacteria → Cost: millions of dollars



SCV "Clean It Up" Campaign

The pet waste is coming from parks and communal spaces (where people are not using appropriate pet waste bags to pick up after their pets). Additionally, such high levels of bacteria point to pet waste being left in backyards which results in a serious stormwater runoff problem.

According to the Environmental Protection Agency website:

* Pet waste decays, using up dissolved oxygen and releasing compounds that are harmful to fish and other animals that rely on water.

* Pet waste contains nutrients that can cause excessive algae growth in a water river or lake, upsetting the natural balance.
* Pet waste contributes to bacterial contamination of our rivers, lakes and streams.
* Our stormwater and urban runoff flow into our aquifer, the source of approximately 60% of our usable (including drinking) water in the area

SIERRA CLUB

https://angeles.sierraclub.org/santa_clarita_valley_group/santa_clarita_valley_clean_it_up_campaign_contest

SIERRA CLUB
CALIFORNIA

Home | About Us | News & Pubs | Issues | Get Involved

Water

Preserving a Precious Resource

Sierra Club California volunteers and staff have been a constant reminder to legislators, state agencies, local water agencies, and industrial water users that the state's water resources require careful, environmentally sensitive management.

Placerita Creek Watershed

Objectives

- Define watershed area (focus on area east of western PCNC boundary)
- Establish understanding of current watershed situation
- Begin discussion of how to preserve PCNC features and habitats through potentially more extreme drought and rainy periods

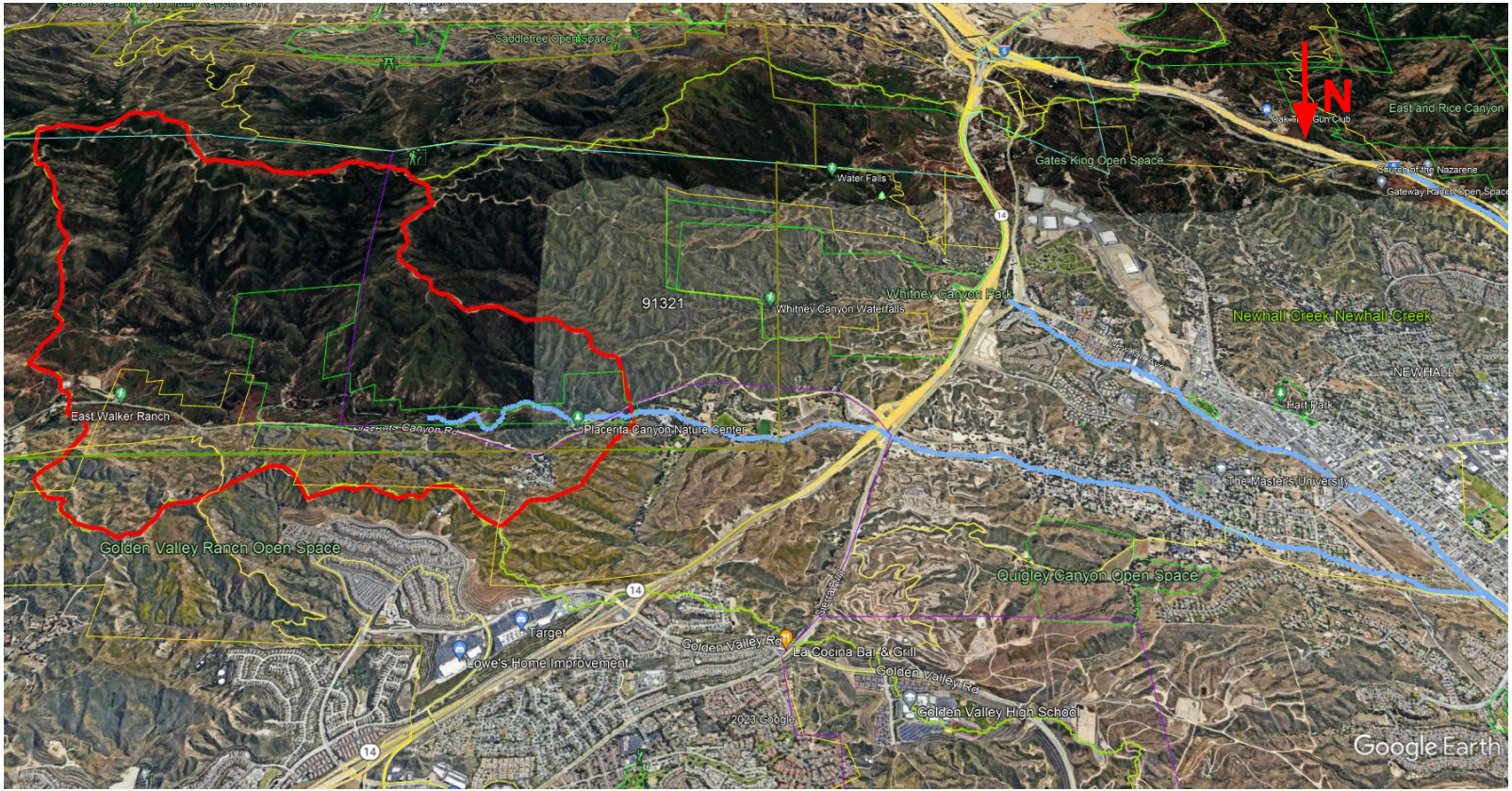
Outline

- Placerita Creek Watershed Identification and Highlights
- PCNC Water Needs
- PCNC Water Trends
- Interdependency of Geology, Botany, and Hydrology
- PCNC Sustainability

Placerita Creek Watershed

Looking South

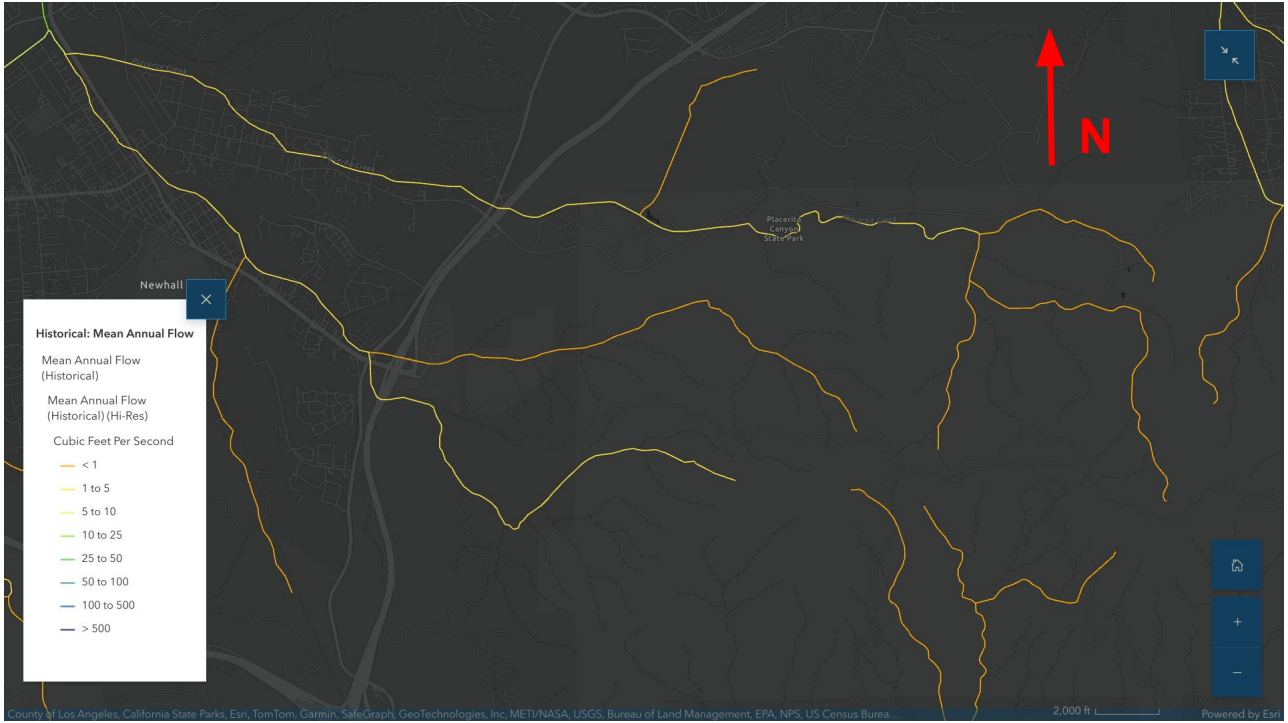
Exits into Newhall Creek at Railroad & 16th



USDA/USFS Streamflow Metrics

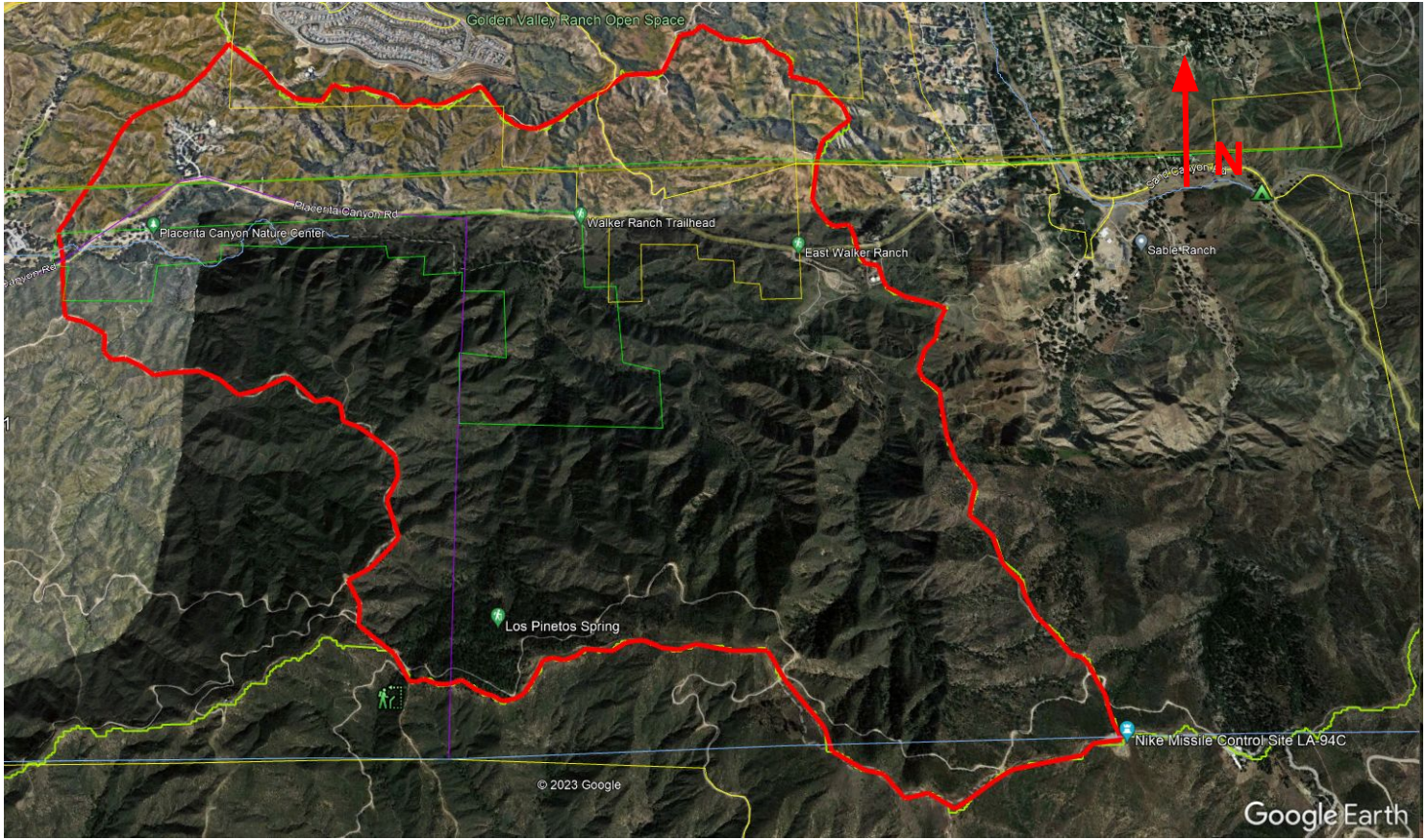
Placerita Creek Mean Annual Flow <1 ft^3/sec

https://www.fs.usda.gov/rm/boise/AWAE/projects/modeled_stream_flow_metrics.shtml



Upper Placerita Creek Watershed Area

- Placerita Creek is an intermittent stream
- Focus on area ending at western PCNC boundary
- 4.6 sq. miles
- 2,944 acres
- Los Pinetos Spring identified in Google Maps & Earth
- Oak Woodlands grouped in a few areas

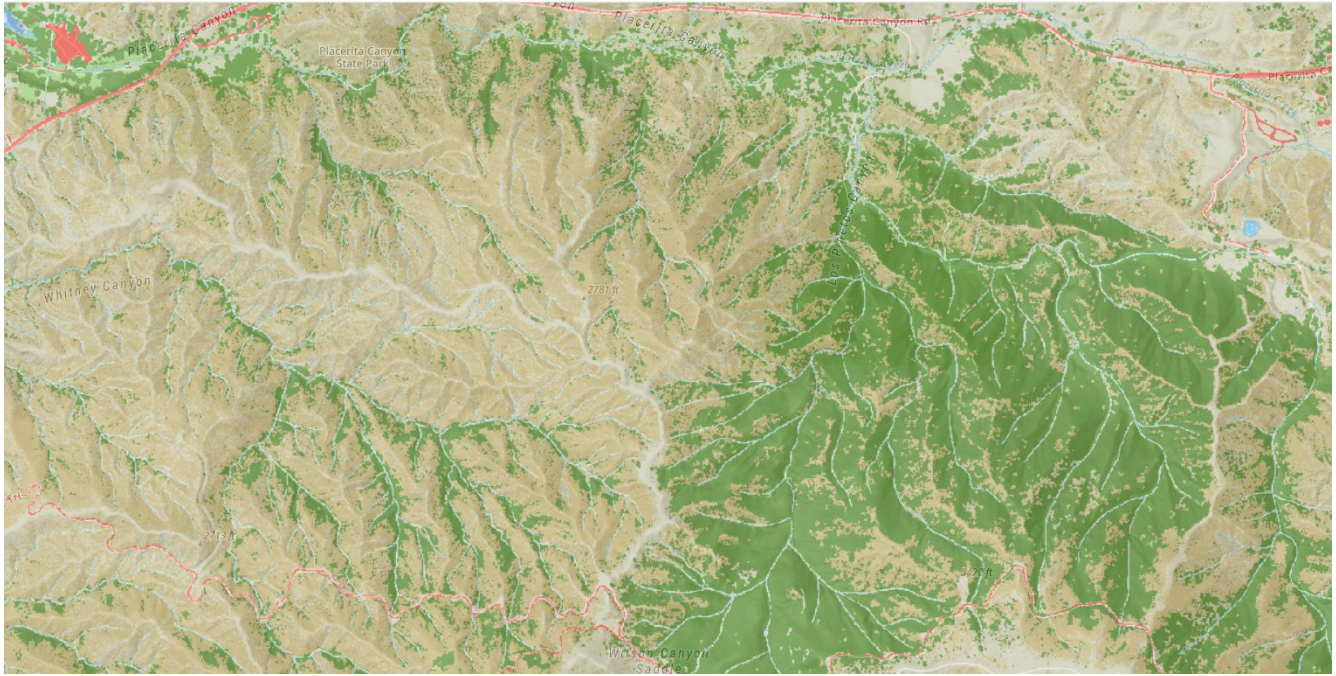


Vegetation Shows Where Water Goes

EnviroAtlas One Meter-scale Urban Land Cover (MULC) Data

EPA's land cover classification based on USDA NAIP 2016

EnviroAtlas (https://www.epa.gov/enviroatlas)



2011 Placerita Creek Exploration

The Rattler

In This Issue:

- Donations Listings
- 3-Spine Stickleback
- Hunt for Lost Treasure
- Time Capsule

Placerita Canyon Nature Center
50 Years of Nature Education
PCNCA's Mission Statement
To inspire a passion, awareness and respect for the environment, and to preserve and protect for future generations the history and ecosystem of Placerita Canyon.
November/December 2011

Three main tributaries:

- *East Walker Ranch*
- *Los Pinetos Canyon*
- *Golden Valley Fork*

The Search for the Source of Placerita Creek – Part 1

By Ron Kraus

In the days of the Roman Empire, to search for the source of the Nile was a euphemism for undertaking a lost, cause. The ancient explorers did not have the expertise or technology to complete such a mission. The upper reaches of the Nile included disease-infested swamps and ferocious tribesmen. The source of the Nile remained a mystery until the 1860's when British explorers finally sorted it all out.

I have empathy for those early explorers, as the source of Placerita Creek has eluded me for three years. In November of 2008 I became interested in finding it after an unusually heavy early season storm dumped several inches of rain in the area. When the waters receded the creek bed was covered with a black oily film from Walker Ranch all the way down to the nature center and beyond. I followed the creek up to where it meets Los Pinetos Canyon (the Waterfall Trail) and noticed that the black oily stuff did not come down from there. Instead, it was coming from the tributary that branches out to the east and leads up to what was then called the SDI Property, now known as the East Walker Ranch Open Space. I made a mental note of the situation and went on to other things.

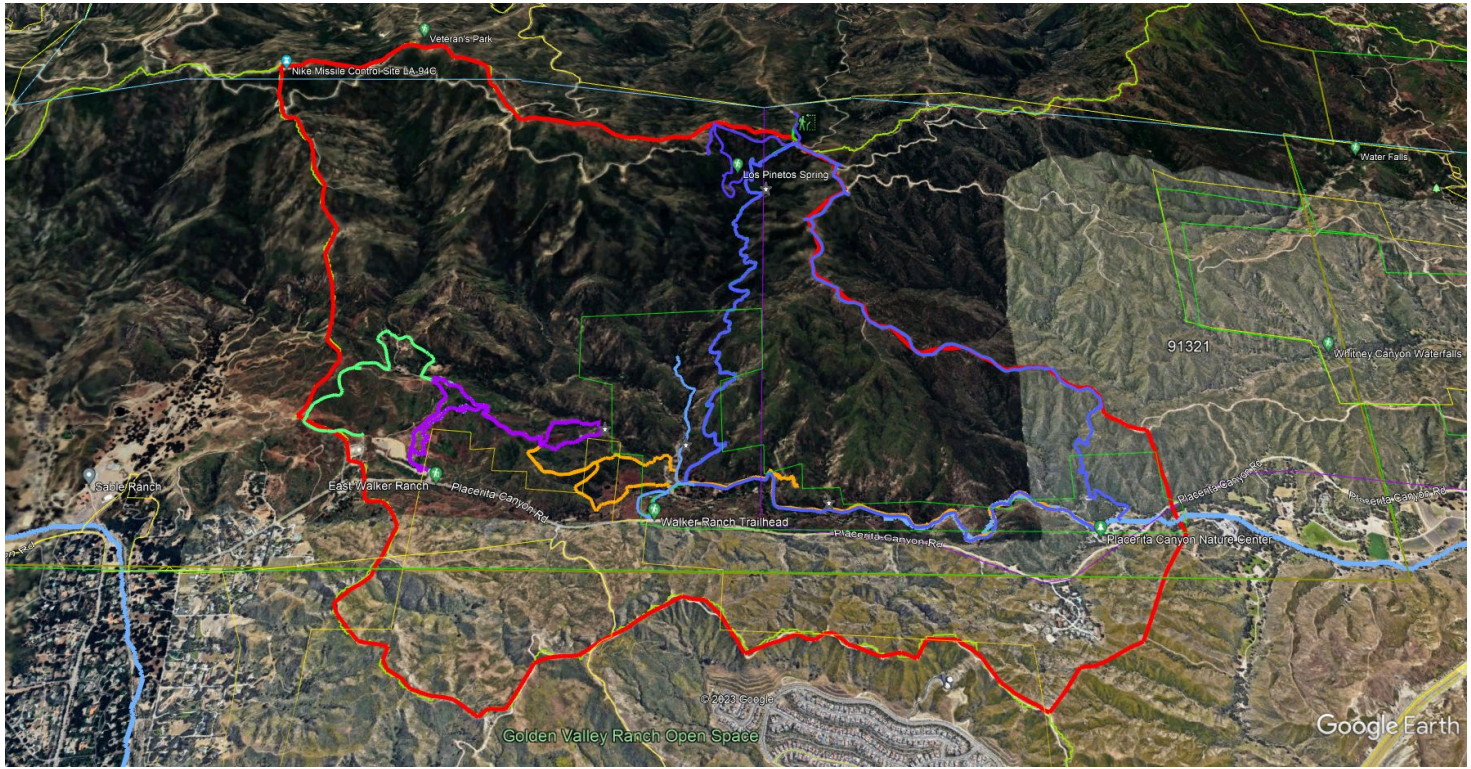
But I couldn't get that oily stuff out of my mind. Where did it come from? What was it? So I again began exploring the different tributaries that lead into Placerita Creek. Although there are many little side canyons that drain into the creek as you walk up the Canyon Trail towards Walker Ranch, they only run right after a rain and don't contribute that much to the total flow. After studying maps and conducting several exploratory hikes, I thought I finally had figured it out.

There are three primary tributaries that feed into Placerita Creek and they all converge near the same spot at Walker Ranch. The first is what I'll call the Golden Valley Fork. It drains the Golden Valley Open Space from the creeks and canyons in the vicinity of the Walker Homestead House ruins on the north side of Placerita Canyon Road. This is the first of the three tributaries that dries up in the spring, so it is not the main source. This tributary meets the main creek at the dip crossing on the dirt road leading down from the Walker Ranch parking lot on Placerita Canyon Road.

The second source is Los Pinetos Canyon. This is the stream that feeds the waterfall on the Waterfall Trail. The Los Pinetos Trail follows it up the mountain to it's head at Wilson Canyon saddle. This stream usually runs longer than the Golden Valley Fork, so I consider it to be the secondary source of Placerita Creek.

The tributary that provides the most flow into Placerita Creek is the aforementioned unnamed canyon that leads eastward up into the East Walker Ranch Open Space. It runs late into the spring and has a relatively high flow. I followed it from the spot it meets Los Pinetos Creek at Walker Ranch to the ruins of the old SDI buildings at East Walker Ranch and found that it forks up south into the Angeles National Forest. This is where the black oily stuff was coming from. It turned out to be ash and soot that had washed down the creek after the Sayre Fire in November of 2008.

Recent Upper Placerita Creek Watershed Exploration



'Water Walks' Tracks

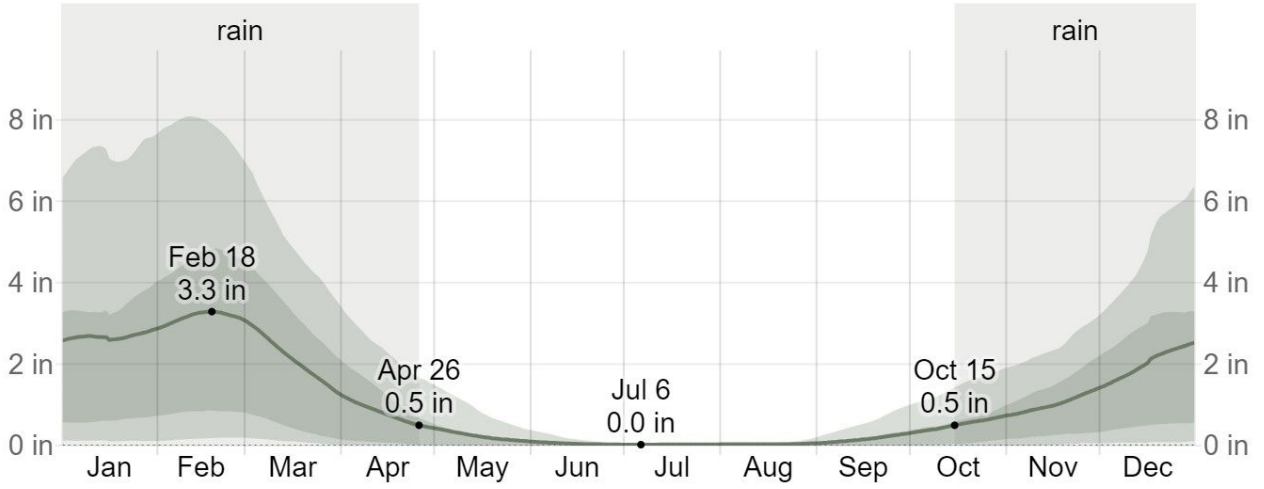
Stars indicate observed springs

Total Water Input

Precipitation

- Average rainfall yields 1,007,201,987 gallons or 3,091 acre-feet
  - Castaic Lake holds 350,000 acre-feet at full capacity

Centralized Water Usage?



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall	2.6″	3.3″	2.1″	0.8″	0.2″	0.0″	0.0″	0.0″	0.1″	0.5″	1.0″	2.0″

From Weatherspark.com

NASA's MERRA-2 Modern-Era Retrospective Analysis

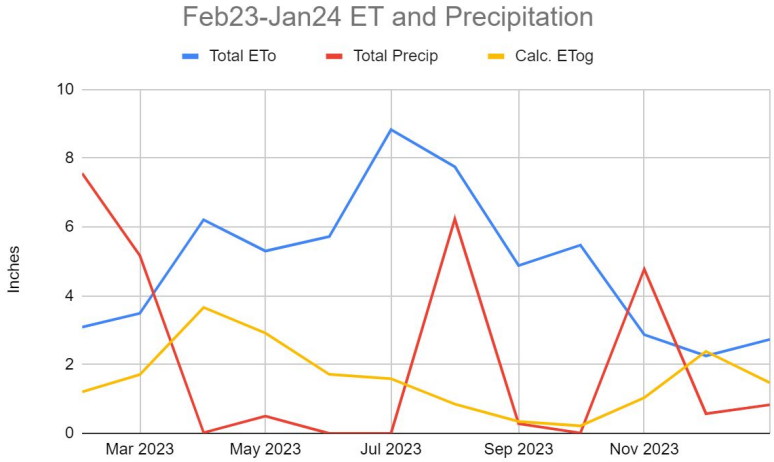
Average Annual Rainfall = 12.6 inches

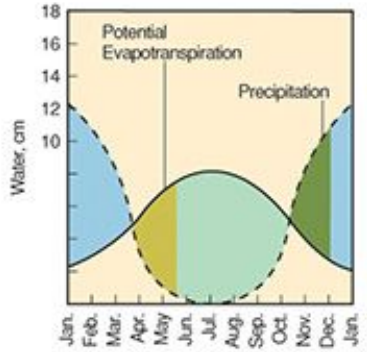
Evaporation and Transpiration

Evapotranspiration = process by which water is transferred from the land to the atmosphere by evaporation from the soil and other surfaces and by transpiration from plants

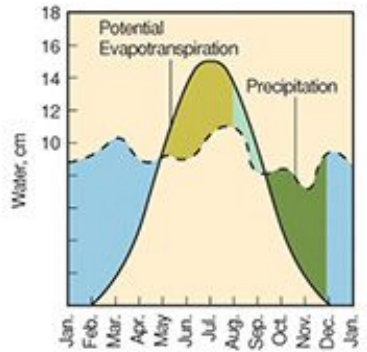
ETo = estimate of the evapotranspiration of a large field of cool-season grass that is well watered and 4–7 inches tall

Oak Woodland averages about 33% of ETo





Chaparral (winter rainy season) – Berkeley, California



Temperate deciduous forest – Seabrook, New Jersey

Hans & Cassidy. © Cengage Learning

Local ETo

Station 204 is at the SCVWA Rio Vista Water Treatment Plant

ETo Calculated from several measurements

California Irrigation Management Information System (CIMIS)

CIMIS Monthly Report

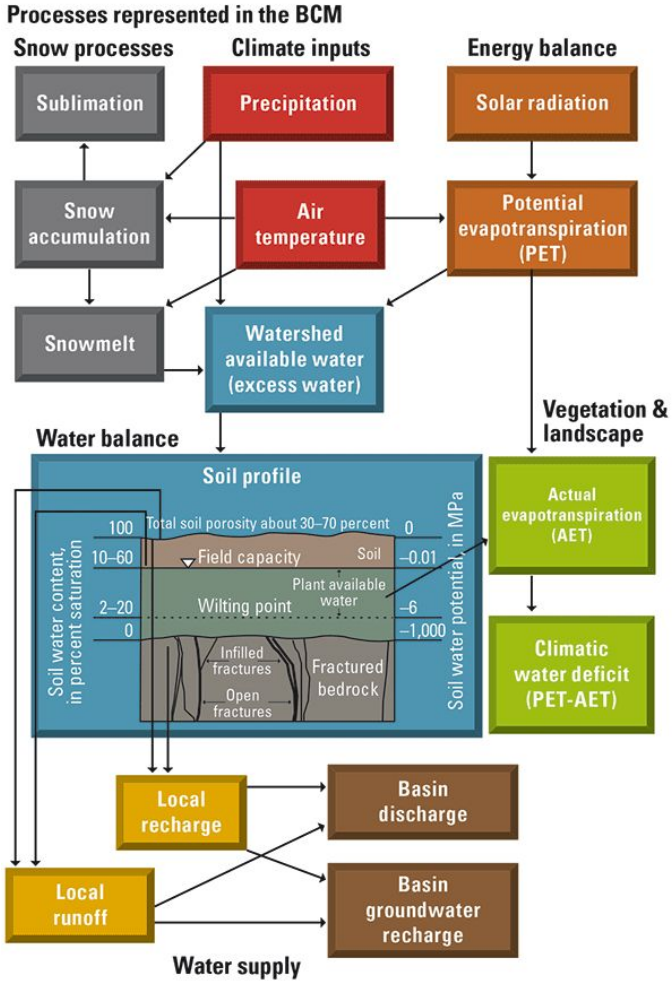
Rendered in ENGLISH Units.
February 2023 - January 2024
Printed on Friday, February 2, 2024

Santa Clarita - Los Angeles Basin - Station 204

Month Year	Total ETo (in)	Total Precip (in)	Avg Sol Rad (Ly/day)	Avg Vap Pres (mBars)	Avg Max Air Temp (°F)	Avg Min Air Temp (°F)	Avg Air Temp (°F)	Avg Max Rel Hum (%)	Avg Min Rel Hum (%)	Avg Rel Hum (%)	Avg Dew Point (°F)	Avg Wind Speed (mph)	Avg Soil Temp (°F)
Feb 2023	3.09	7.56	333 K	5.4	62.5 K	38.9 K	49.8 K	68	30	47 K	27.3 K	5.8 K	48.8 K
Mar 2023	3.49	5.17 K	392 K	8.5 K	61.6 K	42.1 K	50.7 K	85	45	67 K	39.0 K	5.1	52.4 K
Apr 2023	6.21 K	0.02	609 K	9.4	75.9 K	47.4	60.6	77	31	52	41.5	4.9 K	58.7 K

Basin Characterization Model (BCM)

- U.S. Geological Survey (USGS) modeling tool that integrates climate data with rigorously developed regional and local environmental data to understand the hydrologic response to climate change and the effects on regional and local watersheds and landscapes
- Water-balance modeling tools can provide the types of information managers require to develop climate-change coping strategies:
  - Watershed recharge and runoff quantification—to assess water availability, seasonality, and extremes at the land surface.
  - Climatic water deficit estimation—to assess irrigation demand or landscape stress (climatic water deficit is the amount of water plants would use if it were available).
  - Spatial distribution of hydrologic processes in watersheds— for resource planning and infrastructure development.
- BCM used for Placerita Creek watershed for trend analysis on following pages
  - Michelle Stern, USGS Hydrologist, Watershed Sciences - California Water Science Center

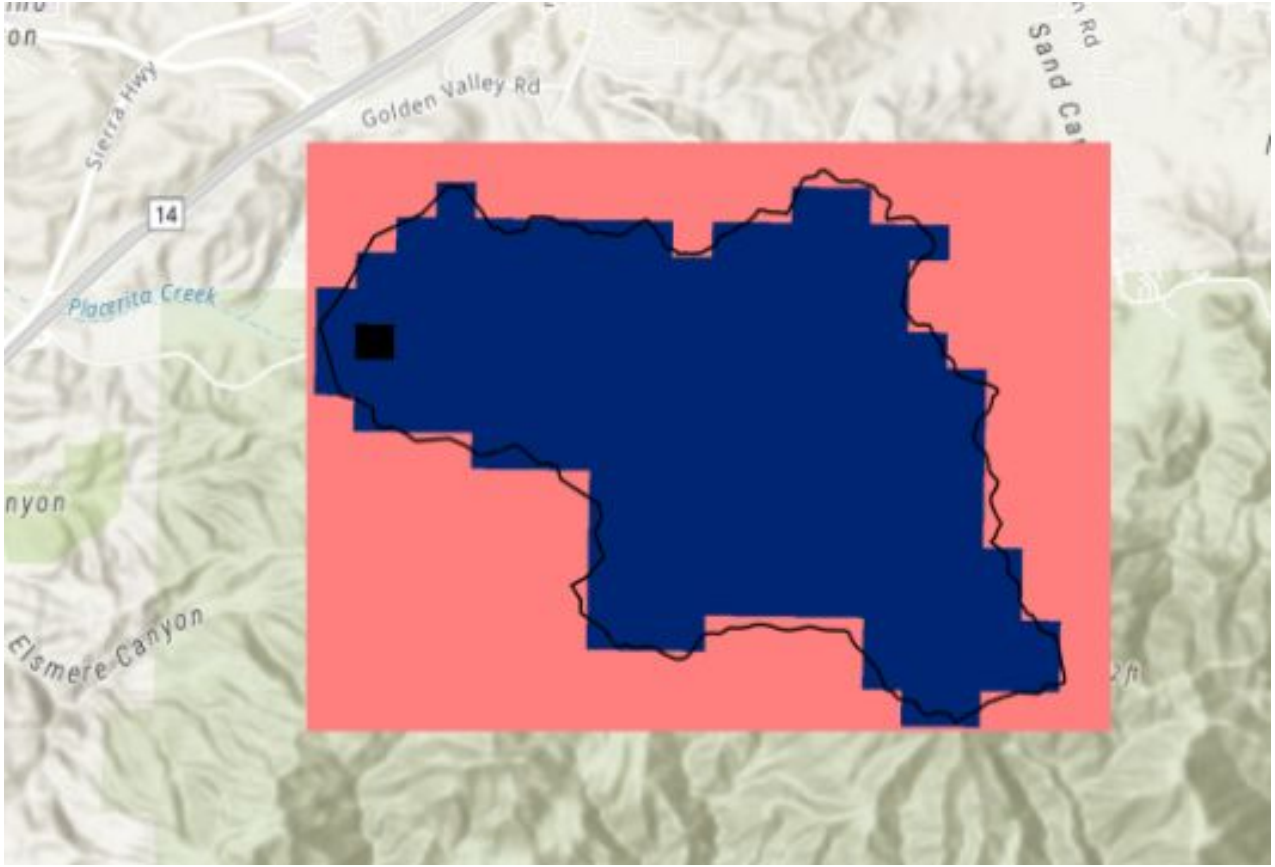


BCM Applied to Placerita

Google Earth KMZ file provided to USGS

Blue area = Upper Placerita Creek Watershed

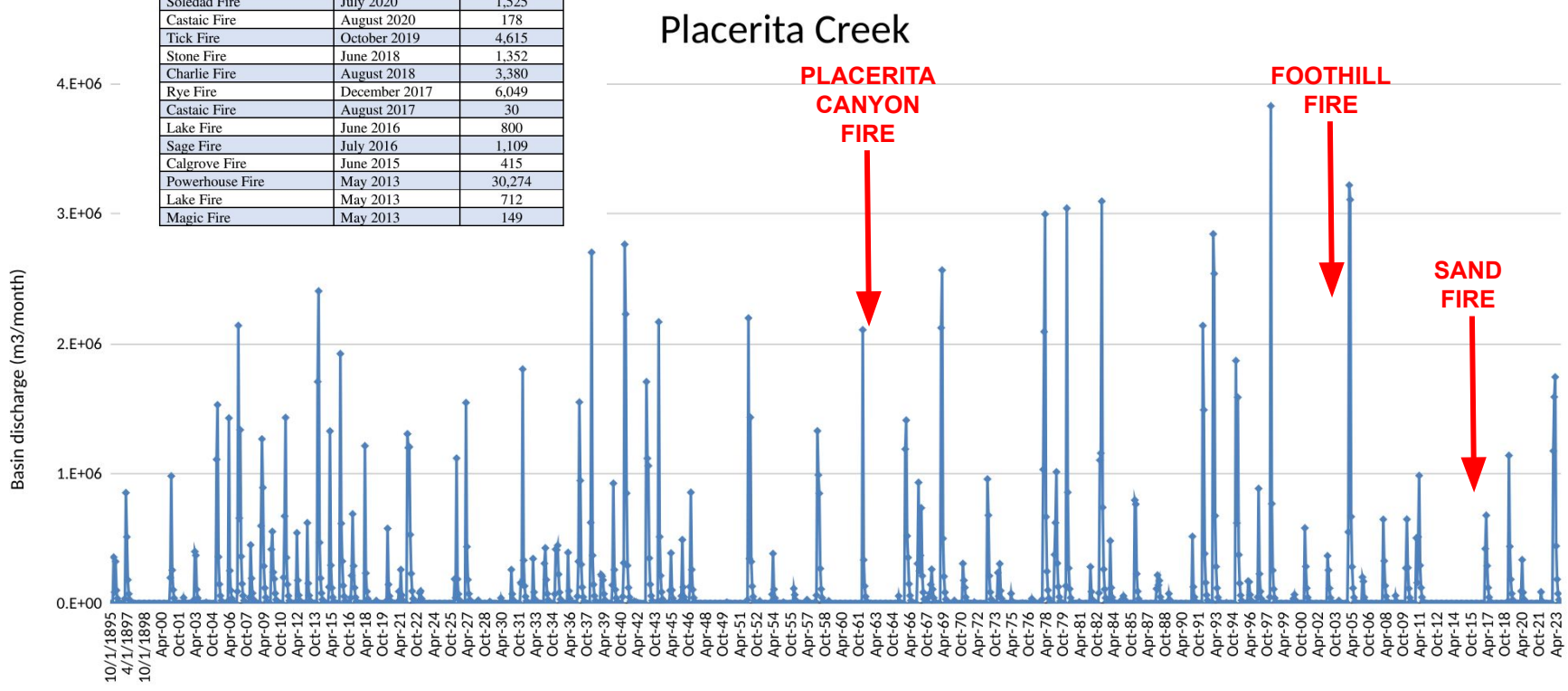
Black square = Picnic Oak Woodlands



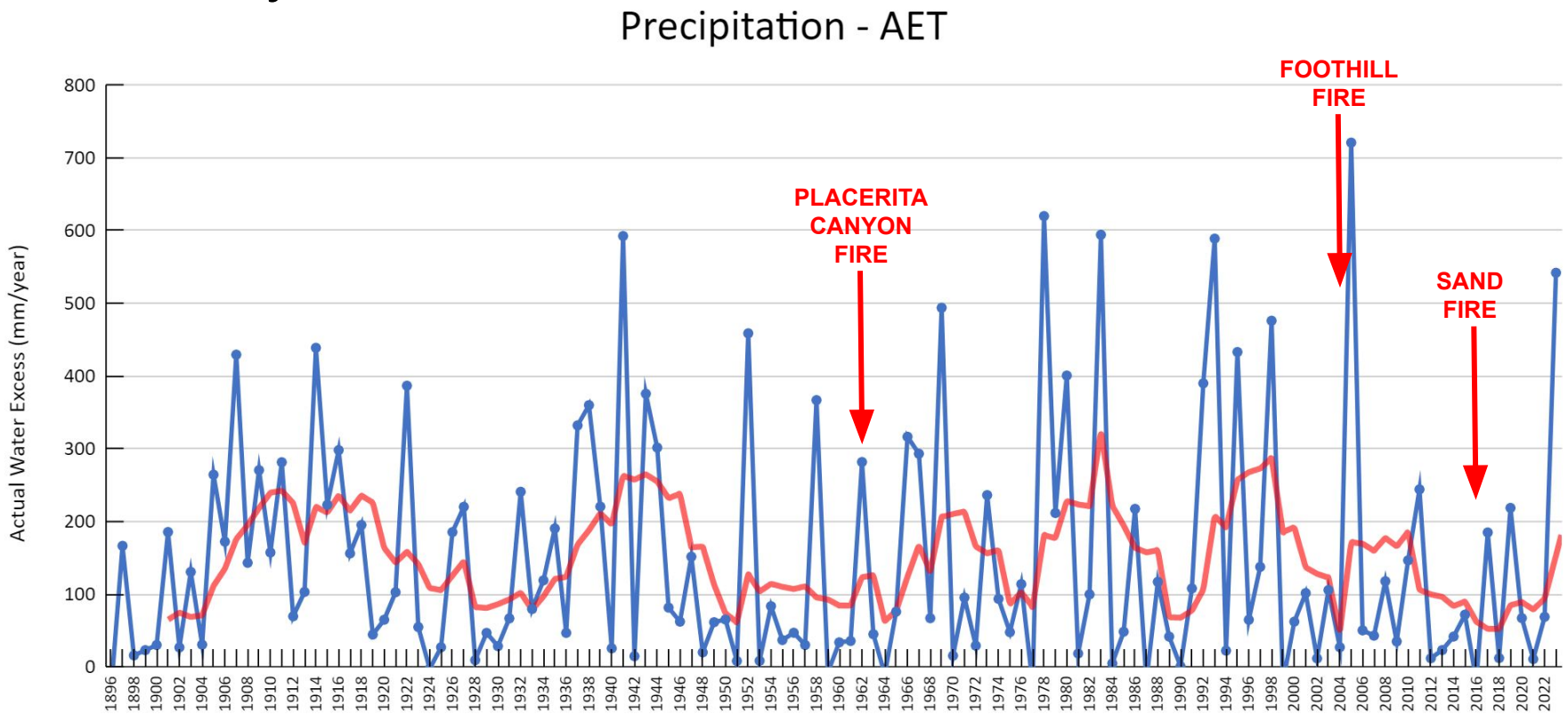
BCM Calculated Historical Placerita Creek Flow

TABLE 12. Santa Clarita Wildfires

Fire Name	Date	Acres Burned
North Fire	April 2021	650
Soledad Fire	July 2020	1,525
Castaic Fire	August 2020	178
Tick Fire	October 2019	4,615
Stone Fire	June 2018	1,352
Charlie Fire	August 2018	3,380
Rye Fire	December 2017	6,049
Castaic Fire	August 2017	30
Lake Fire	June 2016	800
Sage Fire	July 2016	1,109
Calgrove Fire	June 2015	415
Powerhouse Fire	May 2013	30,274
Lake Fire	May 2013	712
Magic Fire	May 2013	149



Placerita Dryness Index



6-year trailing average

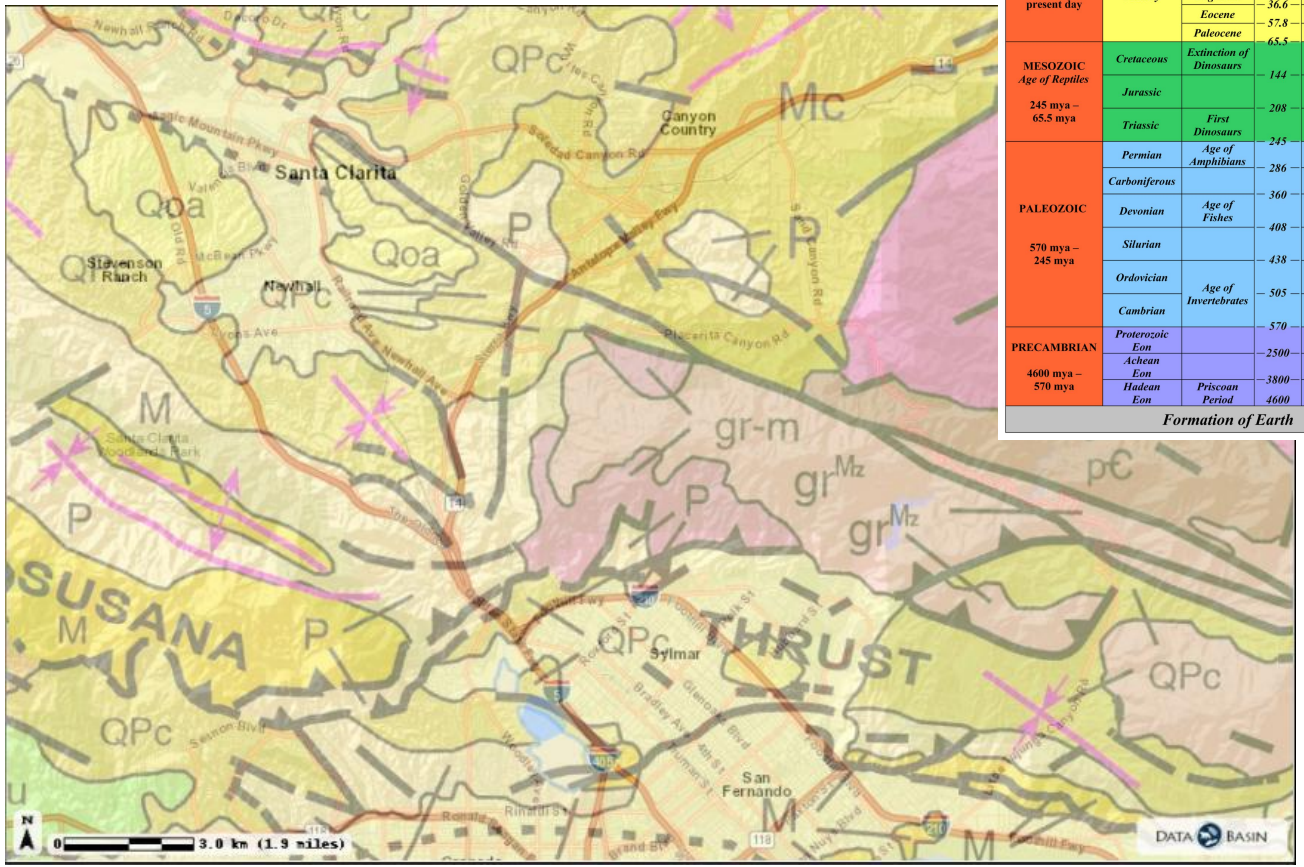
PCNC Area is Geologically Complex

Q: sedimentary rocks (Pleistocene-Holocene) - Alluvium, lake, playa, and terrace deposits

QPc: Nonmarine (continental) sedimentary rocks (Pleistocene-Holocene) - Pliocene and/or Pleistocene sandstone, shale, and gravel deposits

gr-m: Mixed rocks (Mesozoic to pre-Cambrian) - mostly gneiss and other metamorphic rocks injected by granitic rocks.

grMz: Plutonic rocks (Mesozoic) - Mesozoic granite, quartz monzonite, granodiorite, and quartz diorite.



Geological Time Scale

ERA	PERIOD	EPOCH / AGE	Million Years Ago	EVENTS
CENOZOIC *Age of Mammals* 65.5 mya – present day	*Quaternary*	*Holocene*	*Today*	Ice Age ends Humans are dominant
		Pleistocene	*0.01*	Earliest Humans appear Ice Age begins
	Tertiary	*Pliocene*	*1.6*	Hominids (human ancestors) appear
		Miocene	*5.3*	Grass becomes widespread
		Oligocene	*23.7*	Mammals are dominant
		Eocene	*36.6*	Eocene – Oligocene extinction event
		Paleocene	*57.8*	First large mammals appear
MESOZOIC *Age of Reptiles* 245 mya – 65.5 mya	*Cretaceous*	*Extinction of Dinosaurs*	*65.5*	K-T extinction event Earth looks closer to present-day Flowering plants appear
	Jurassic		*144*	First Birds appear Pangaea splits into Laurasia, Gondwanna Dinosaurs are dominant
	Triassic	*First Dinosaurs*	*208*	Pangaea cracks First mammals appear Reptiles are dominant
PALEOZOIC 570 mya – 245 mya	*Permian*	*Age of Amphibians*	*245*	Permian – Triassic extinction event Pangaea forms
	Carboniferous		*286*	First reptiles appear First large cartilaginous fishes appear
	Devonian	*Age of Fishes*	*360*	Late Devonian extinction event First land animals appear First amphibians appear
	Silurian		*408*	First land plants appear First jawed fishes appear First insects appear
	Ordovician	*Age of Invertebrates*	*438*	Ordovician – Silurian extinction event First vertebrates appear
	Cambrian		*505*	End Botomian extinction event First fungi appear Trilobites are dominant
PRECAMBRIAN 4600 mya – 570 mya	*Proterozoic Eon*		*570*	First soft-bodied animals appear First multicellular life appear
	Achean Eon		*2500*	Photosynthesizing cyanobacteria appear First unicellular life appear
	Hadean Eon	*Priscoan Period*	*3800*	Atmosphere and oceans form Oldest rocks form as Earth cools
Formation of Earth			*4600*	

Geological Considerations

Artesian Spring

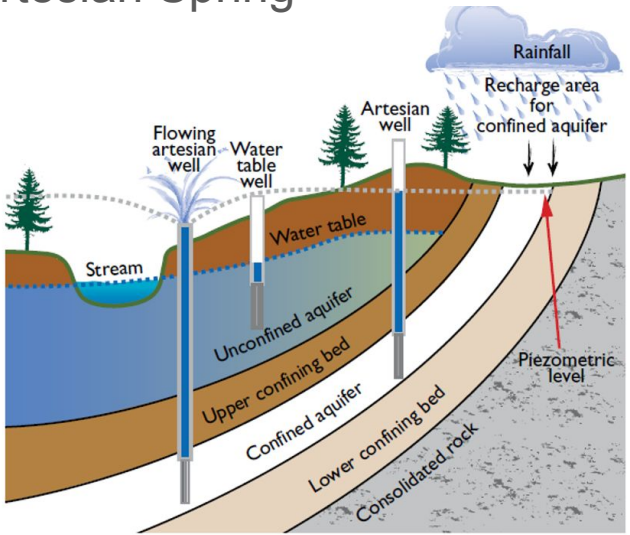
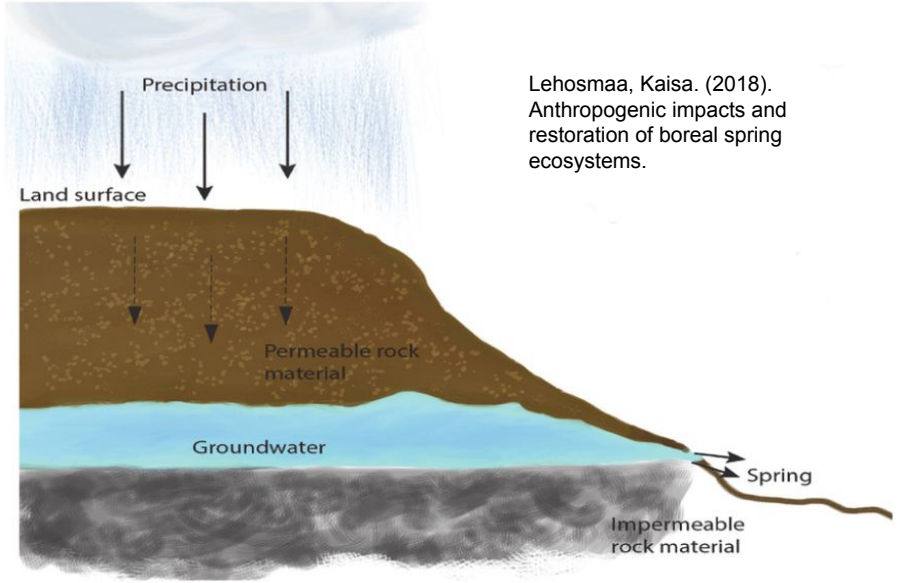


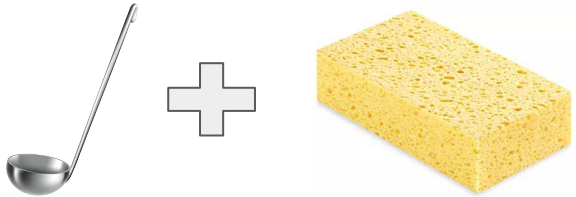
Figure 1. Geological and topographical controls affecting artesian and flowing artesian wells.

Canyon Trail 'Oil Spring'

Gravity Spring



Lehosmaa, Kaisa. (2018). Anthropogenic impacts and restoration of boreal spring ecosystems.



Los Pinetos Spring

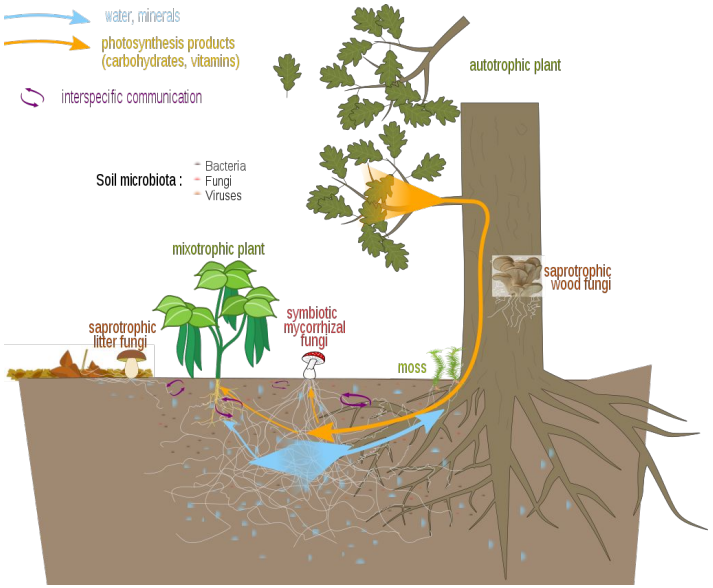
Botanical Considerations

Root Depth

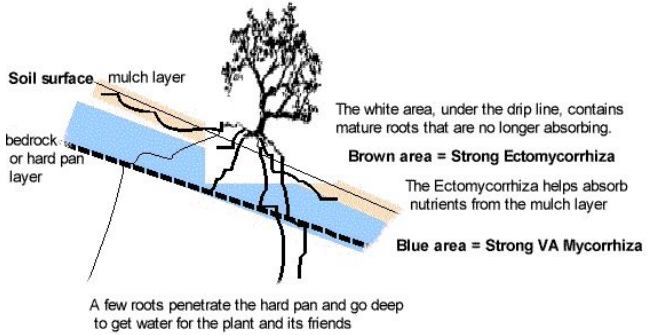
- Coast Live Oak root depth about 36 feet (> tree height)
- Canyon Live Oak roots seen at 24 feet
- Canyon live oak codominant with bigcone Douglas-fir often within a matrix of chaparral vegetation

Water Needs

- Hairy Ceanothus: Annual: 5" - 155", Summer: 0.15" - 3"
- Coast Live Oak: Annual: 6" - 67", Summer: 0.14" - 3"



Las Pilitas



…Douglas fir and ponderosa pine were both better than the spruce and subalpine fir at minimizing water loss, helping them cope with the drought. They did this by opening their stomata for only a few hours in the morning when the dew was heavy. In these early hours, trees sucked carbon dioxide in through the open pores to make sugar, and in the process, transpired water brought up from the roots. By noon, they slammed their somata closed, shutting down photosynthesis and transpiration for the day.
— *Finding the Mother Tree*, Suzanne Simard

Oaks are extremely resilient trees…have two distinct, but critical, adaptations to drought …form both arbuscular and ectotrophic mycorrhizae…also have deep roots.
— *How Oaks Respond to Water Limitation*, Michael F. Allen, Proceedings of the seventh California oak symposium: managing oak woodlands in a dynamic world, 2015

Picnic Oak Woodlands

Let's Look at our Oaks (Picnic Area)

About 200 Oaks within Hillside Trail and Parking Lot

About 1000 sq. ft./oak

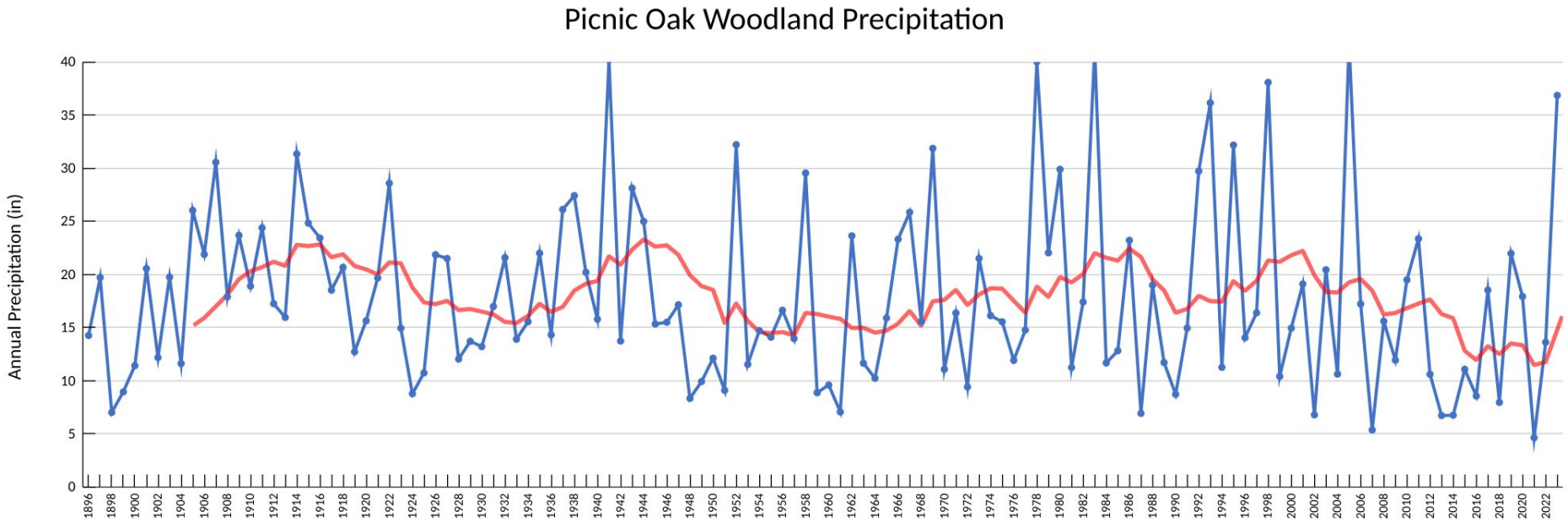
Need about 600,000 gallons a year

At an average of 12" rainfall per year, this area will get 1.5 million gallons

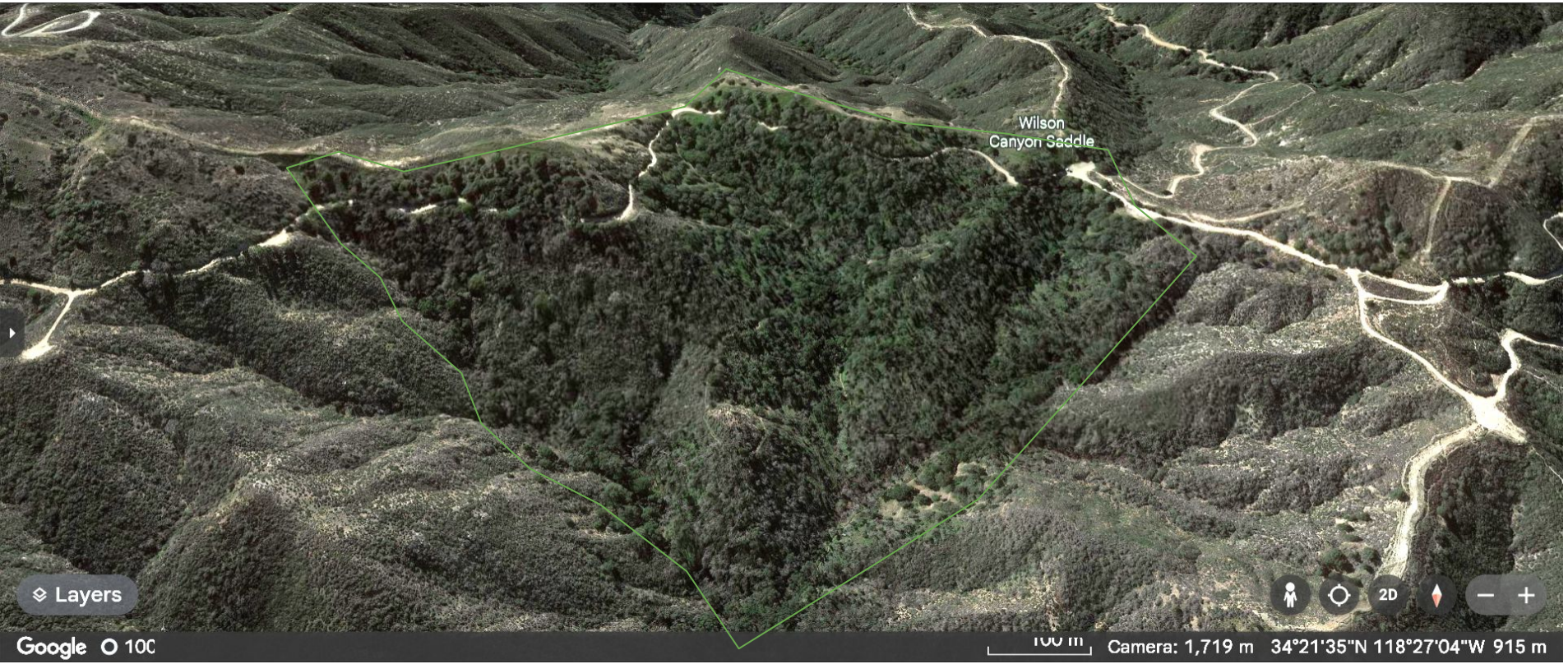
So…if we captured all the rainfall and got at least 5" rainfall in a year, then the Oaks will live!

On average, each Oak covers a 35 foot diameter circle

BCM Picnic OW Precipitation History



Los Pinetos Spring Area



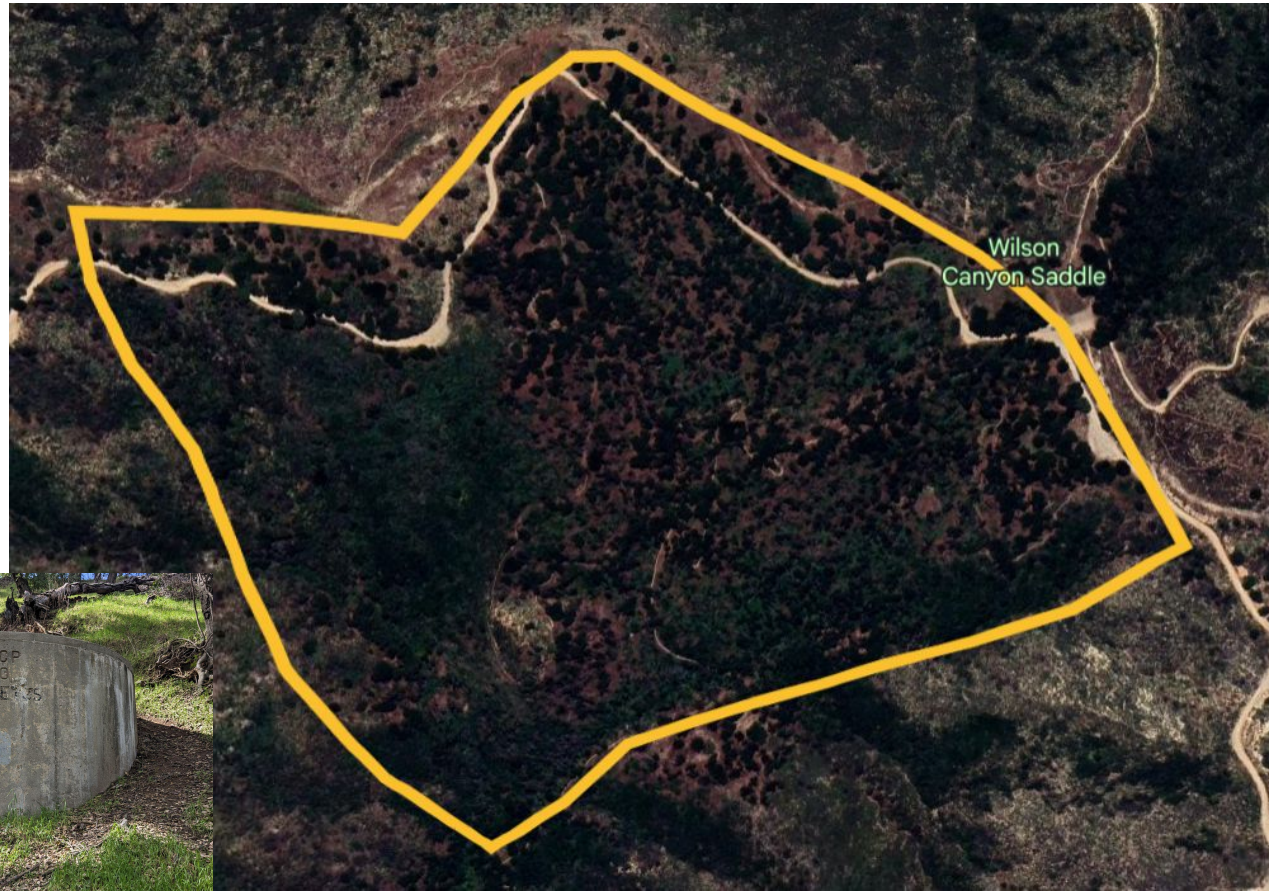
Los Pinetos Oak Woodland

About 4M sq. ft.

About 4000 Oaks

Need to keep about 12M gallons

Get about 30M gallons during 12” year



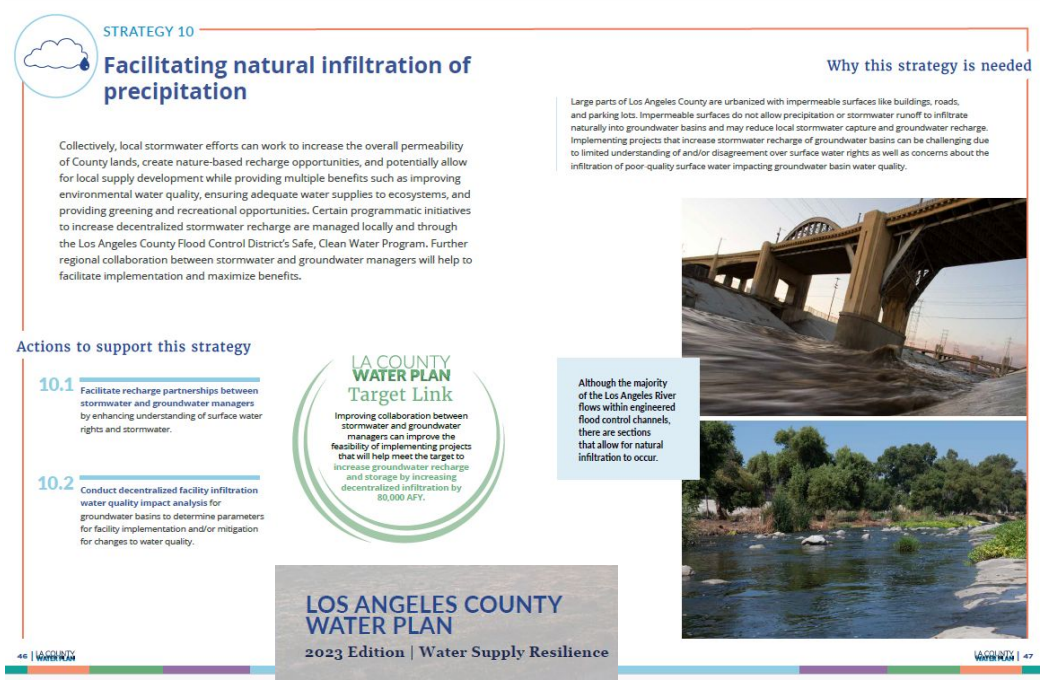
High-Level Agency Strategies

California WATER COMMISSION

Potential State Strategies for Protecti Communities and Fish and Wildlife in the Event of Drought

1. Scale Up Groundwater Recharge
2. Conduct Watershed-level Planning to Reduce Drought Impacts to Ecosystems
3. Better Position Communities to Prepare for and Respond to Drought Emergencies
4. Support Improved Coordination, Information, and Communication in Drought and Non-drought Years

January 2024



STRATEGY 10

Facilitating natural infiltration of precipitation

Collectively, local stormwater efforts can work to increase the overall permeability of County lands, create nature-based recharge opportunities, and potentially allow for local supply development while providing multiple benefits such as improving environmental water quality, ensuring adequate water supplies to ecosystems, and providing greening and recreational opportunities. Certain programmatic initiatives to increase decentralized stormwater recharge are managed locally and through the Los Angeles County Flood Control District's Safe, Clean Water Program. Further regional collaboration between stormwater and groundwater managers will help to facilitate implementation and maximize benefits.

Actions to support this strategy

10.1 Facilitate recharge partnerships between stormwater and groundwater managers by enhancing understanding of surface water rights and stormwater.

10.2 Conduct decentralized facility infiltration water quality impact analysis for groundwater basins to determine parameters for facility implementation and/or mitigation for changes to water quality.

LA COUNTY WATER PLAN Target Link

Improving collaboration between stormwater and groundwater managers can improve the feasibility of implementing projects that will help meet the target to increase groundwater recharge and storage by increasing decentralized infiltration by 80,000 AFY.

Why this strategy is needed

Large parts of Los Angeles County are urbanized with impermeable surfaces like buildings, roads, and parking lots. Impermeable surfaces do not allow precipitation or stormwater runoff to infiltrate naturally into groundwater basins and may reduce local stormwater capture and groundwater recharge. Implementing projects that increase stormwater recharge of groundwater basins can be challenging due to limited understanding of and/or disagreement over surface water rights as well as concerns about the infiltration of poor-quality surface water impacting groundwater basin water quality.

Although the majority of the Los Angeles River flows within engineered flood control channels, there are sections that allow for natural infiltration to occur.

LOS ANGELES COUNTY WATER PLAN

2023 Edition | Water Supply Resilience

46 | LA COUNTY WATER PLAN

LA COUNTY WATER PLAN | 47

2005 PCNC Strategic Plan Summary

This plan reportedly was championed by the park superintendent and supported by the PCNCA.

Vision

Connecting People with Nature

Mission

To inspire a passion, awareness and respect for the environment, and to preserve and protect for future generations the history and ecosystem of Placerita Canyon.

2023 Los Angeles County Strategic Plan Summary

Vision

To be a world-class parks and recreation organization.

Mission

- Serve as stewards of parklands.
- Build healthy and resilient communities.
- Advance social equity and cohesion.

SCV Water - Water Planning Strategies

AGENCY
VISION

EXEMPLARY WATER MANAGEMENT FOR A HIGH QUALITY OF LIFE IN THE SANTA CLARITA VALLEY.

AGENCY
MISSION

PROVIDING RESPONSIBLE WATER STEWARDSHIP TO ENSURE THE SANTA CLARITA VALLEY HAS RELIABLE SUPPLIES OF HIGH-QUALITY WATER AT A REASONABLE COST.

PLANNING EFFORTS

For More Information Go To:
https://yourscvwater.com/your-water/plans-and-reports

SCV WATER

Section Overview: Risks/Concerns & Response Actions

Objectives

- Identify risks in meeting high-level goals or achieving strategies
- Summarize specific response actions/projects currently under way or planned

Risk List

- Impact of Climate Change
- Water Quality Maintenance
- Groundwater Sustainability
- Potable Water Reliability
- Extended Drought Imperils Key Ecosystems
- Excessive Rain Causes Heavy Damage
- Bacteria in Runoff Imperils Water Quality
- Non-native Plants Rob Water

WATERSHED RISKS/CONCERNS & RESPONSE ACTIONS

SCV WATER

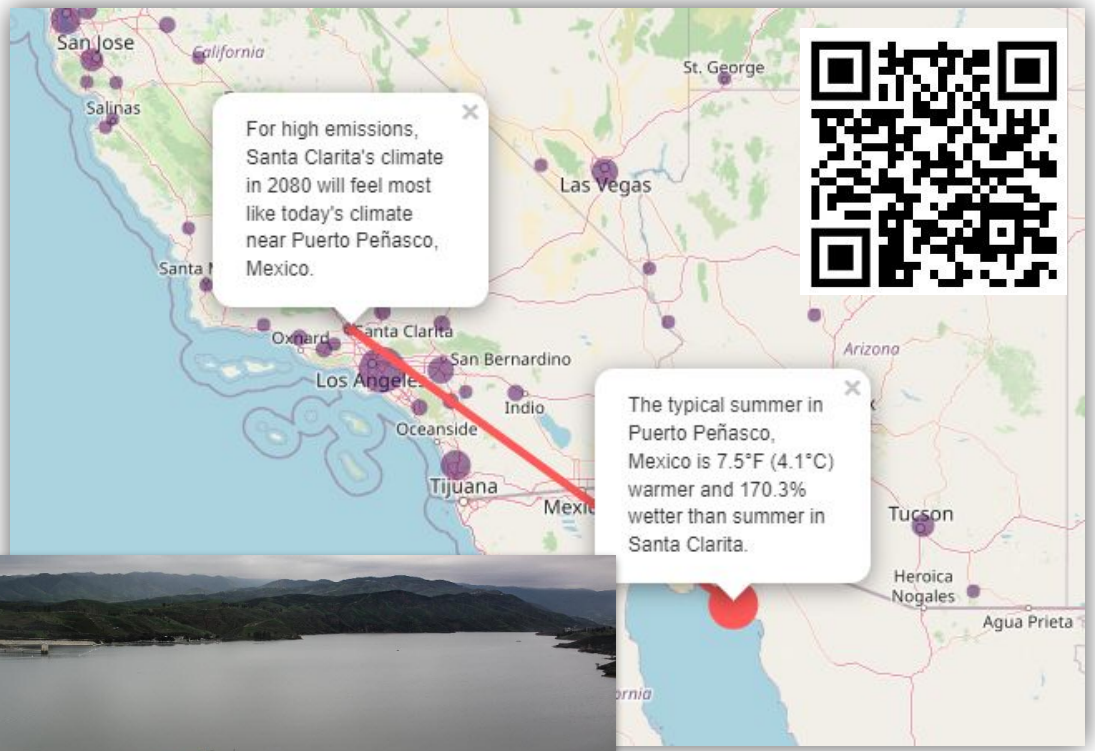
CLIMATE CHANGE

Potential Climate Change Risks:

- Aridification
- Increase in Extremes
  - Wetter Wets
  - Hotter Hots
- Increase in Drought Cycles and Intensity
- Increase in Temperature
- Increase in Evapotranspiration Rates
- Increase in Growing Season
- Decrease in Supply Reliability
- Decrease in Weather Certainty

Response Actions:

- Water Resilience Initiative (WRI)
- Expanding water supply portfolio
- Conservation

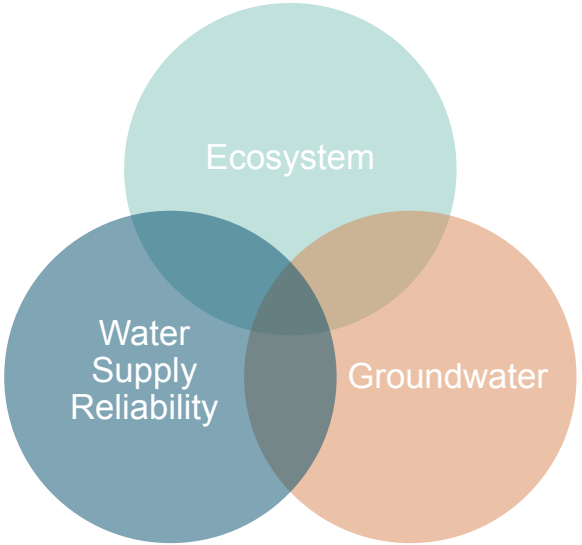


Source:
https://fitzlab.shinyapps.io/cityapp/

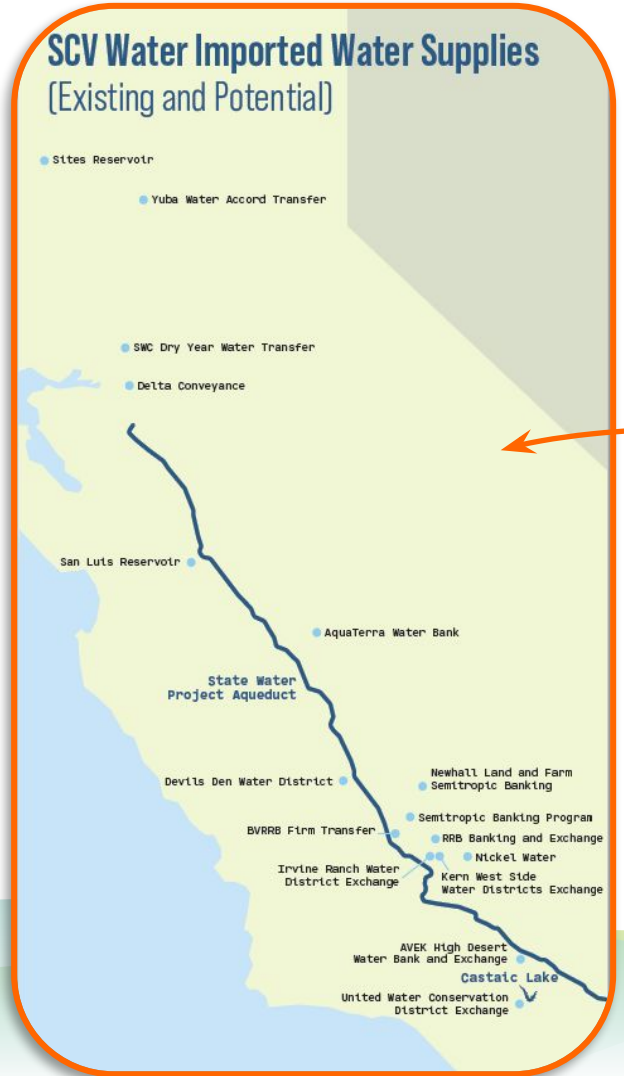
WATER RESILIENCE INITIATIVE (WRI)

- Initiative Evaluates:
  - SWP (& others)
  - Groundwater
  - Watersheds (including the Santa Clara River (SCR) Watershed)

- State of California is facing challenges:
  - Water supply
  - Protection of natural ecosystems
  - Balancing the needs of diverse water users

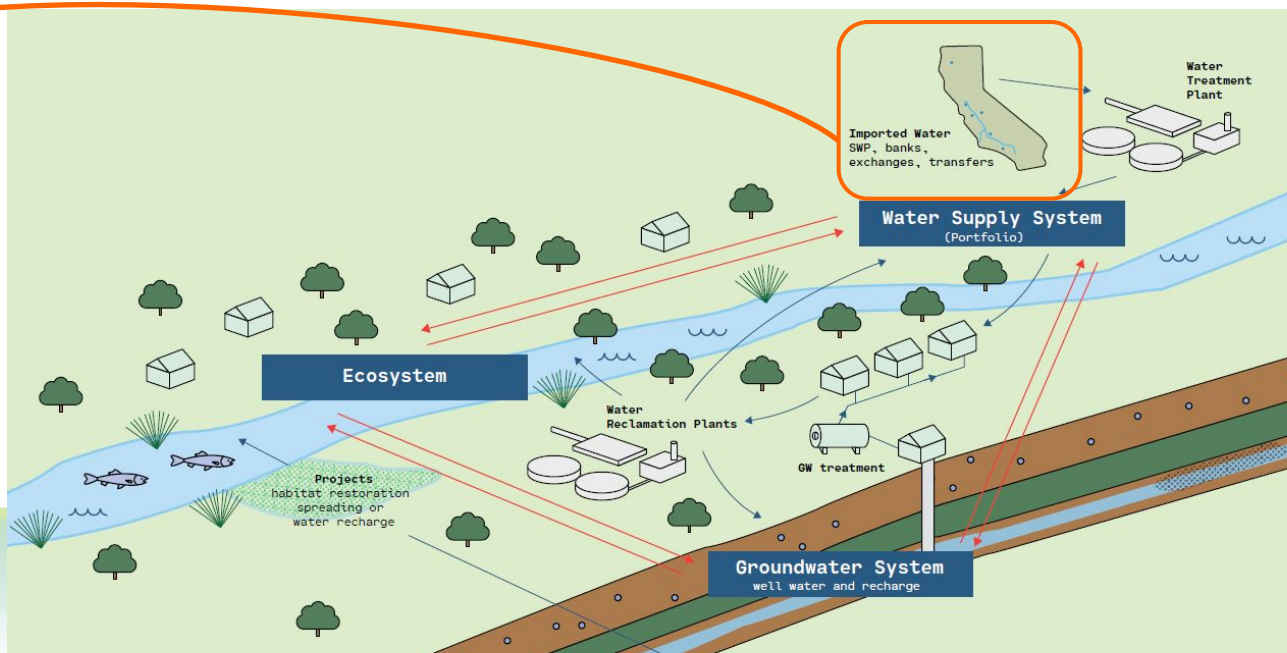


SCV WATER



WRI - RESPONSE ACTIONS

- Diversified our water supply portfolio
- Continue to update our management of imported and local supplies to plan for potential risks and constraints such as:
  - Contamination
  - Sensitive species and habitat
  - Variability in climate impacting imported supplies



WRI – RESPONSE ACTIONS (CONT.)

- Conservation
  - Implementation of Water Use Efficiency Standards
    - Plumbing Code (ex: Model Water Efficient Landscape Ordinance (MWELO))
  - Conservation measures, especially during drought
- New Water Supplies:
  - ↑ storage via new groundwater recharge & extraction facilities
    - Incorporates sensitive habitat conservation
  - Investment in new, non-local supplies
  - Upgrade Water Reclamation Plants & distribution system - ↑ Recycled Water supplies
- Ecosystem:
  - Permanent program for removal of invasive species (ex: Arundo)
  - Program to plant trees along the sensitive areas of the Santa Clara River
  - Development of partnerships with downstream users

WATER QUALITY

Risks:

- Contamination
  - Physical (aesthetics)
  - Biological (bacterial, viral)
  - Chemical (inorganic & organic)
    - PFAS & Perchlorate
  - Radiological (usually minimal)

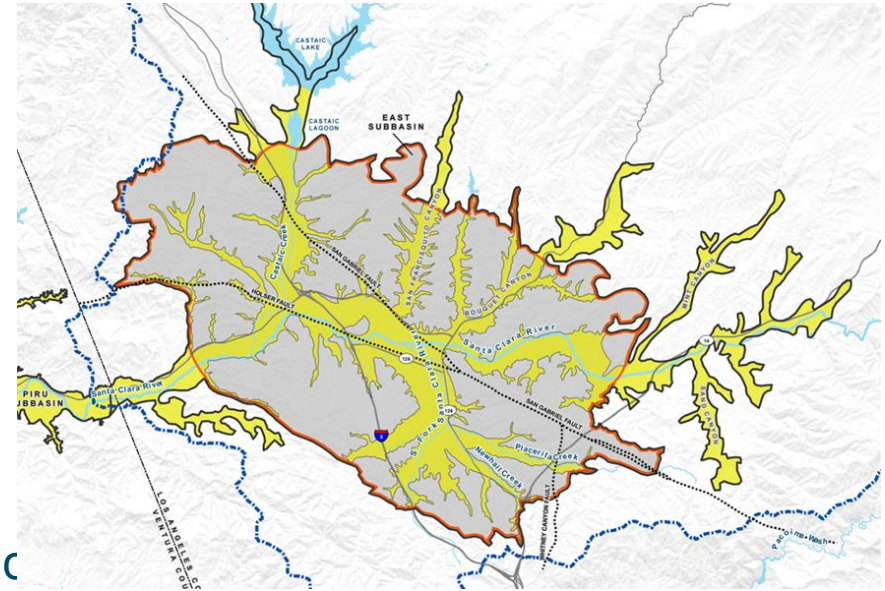
Response Actions:

- Drinking Water Source Assessment and Protection (DWSAP) Program
- Monitoring of Surface Water, Groundwater, & Distribution System
  - Ranging from every 4 hours, daily, weekly, monthly, quarterly, annually
- Water treatment enhancements (new PFAS/Perchlorate treatment plants)
- Maintaining good chlorine residual
- Cycling tanks or adding mixers (ensure water isn't stagnant)
- Using Reservoir Management Systems
- Unidirectional Flushing (when not in drought)

SCV WATER

Groundwater Basin Management

- Groundwater Sustainability Plan developed by SCV Water, Stakeholders, and others
- GSA has *basin management criteria* relating to (but not limited to):
  - depletion of groundwater,
  - depletion of surfac water, &
  - water quality



SCV WATER CONSERVATION PROGRAMS

Supporting a Sustainable Community

SCV WATER

What do drought-tolerant / water-efficient landscapes look like?

What do drought-tolerant / water-efficient landscapes look like?

Benefits of a Sustainable Landscape

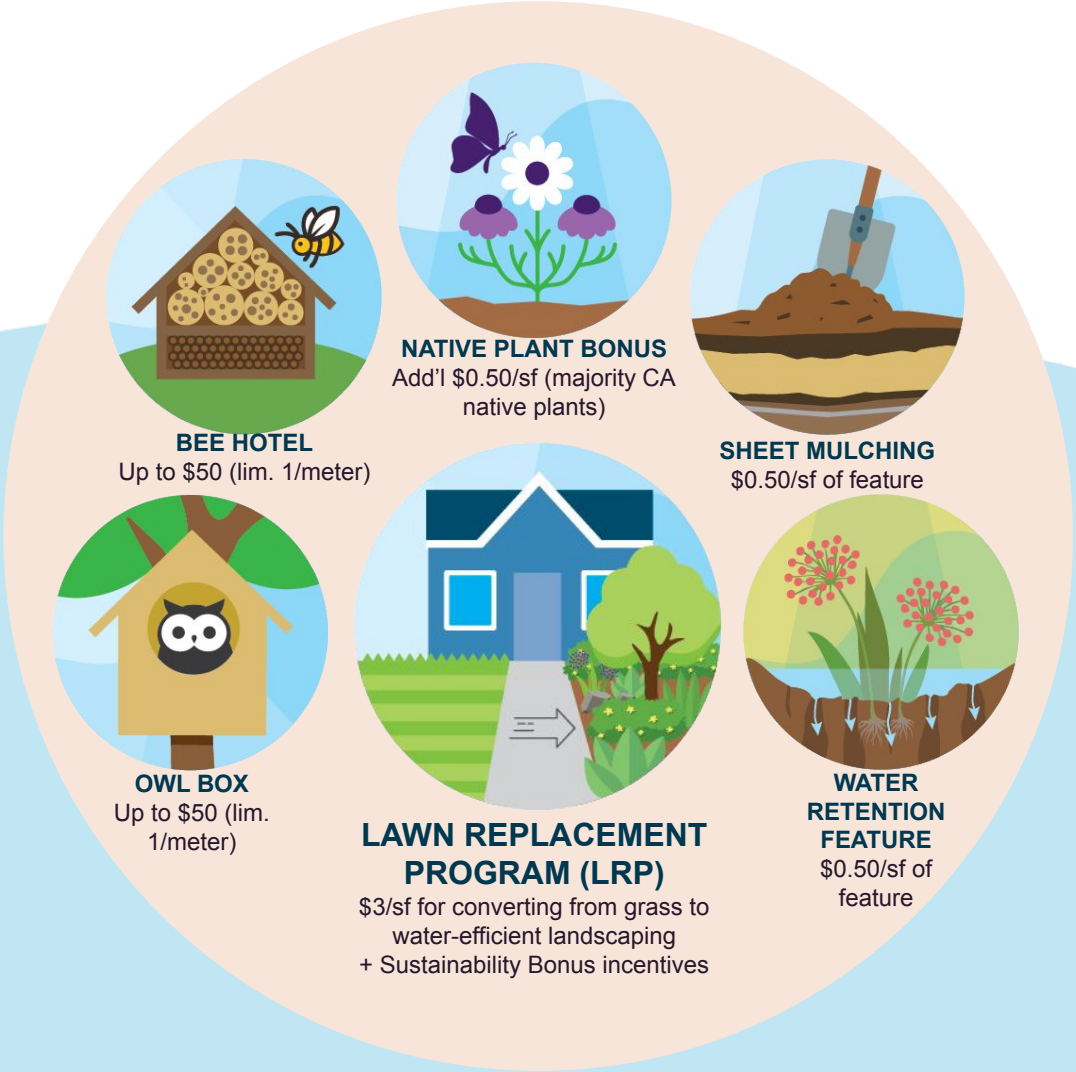
- Financial Savings
  - Less water use = lower water bills
  - Past projects: savings of 40-60% for converted area
- Converting to water efficient landscaping can increase property values up to 11-15%
- Landscape Resiliency
  - Able to withstand future droughts and mandatory water shortage measures

RESIDENTIAL LAWN REPLACEMENT PROGRAM (LRP)

- $3/sf for converting from grass to water-efficient landscaping
- **+ Sustainability Bonus incentives**
- **+ Irrigation Efficiency upgrades**

yourscvwater.dropletprograms.com

LRP Sustainability Bonus Incentives



SCV WATER
SERVICE • COMMUNITY • VALUE

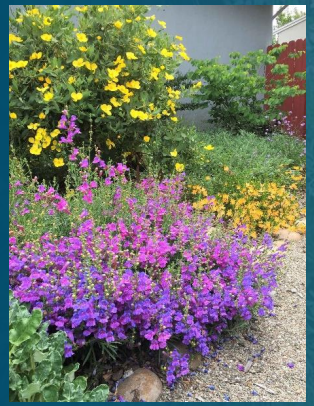
DESIGN ASSISTANCE (OPTIONAL)

Rebate: $150

One of the landscape designers we've partnered with can help you with your design plans

REBATE TRANSFER REQUEST (OPTIONAL)

- Fill out a Rebate Transfer Request form to have the rebate paid directly to the contractor at completion of the project
  - Helps reduce out-of-pocket costs



LRP RULES & REQUIREMENTS

yourscvwater.dropletprograms.com

- Must be a SCV Water customer
- Must be living grass
- Does not incentivize previously completed projects
- Pre- and post-inspection required
- Must accept Notice to Proceed
- Eligible Areas: front, side, & backyard
- At least 50% plant coverage at maturity
- Artificial turf & hardscapes are not funded
- Partial lawn removal & multiple phases allowed
  - Must be in full zones (with at least 50% grass)
  - Min. project size: 100 sf (ex: parkways)
  - Max. project size: 2,500 sf per phase
    - Up to 5,000 sf/year (max. 20,000 sf total)
- Use Drip or HE nozzles (requires smart controller & pressure regulation.
  - All HE Nozzles must be listed on SCV Water's Qualified Products List
- Cannot convert landscape back within 10 years

IRRIGATION EFFICIENCY REBATES
(STANDALONE OR COMBINED WITH LRP)

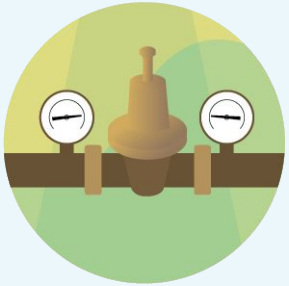
SCV WATER
SERVICE • COMMUNITY • VALUE

Smart Controllers
Up to $150

Drip Conversion
$0.75/sf

HE Nozzles
100% of purchase price
up to $12

Pool Cover
Up to $200



Master Pressure Regulation
75% of purchase price
(limit 1/meter)

Pressure Regulating Valves
75% of purchase price

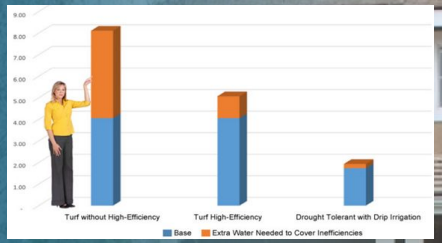
Pressure Regulating Bodies w/ Check Valves
Up to $10 ea.

Rain Barrel
Up to $75/ea.
(limit 2/meter)

SCV WATER

RESOURCES

- WaterSmart Workshop
  - $20 bill credit
- Online rebate estimator tool
- Top 100 SCV-Friendly Plant Guide
- Homeowner & Professional Landscaper Sustainable Landscape Care Guides
- “Garden Smarter” publication
- “How to Conserve” Videos
- santaclaritagardens.com
- Online plant selection tool
- Example gardens & testimonials
- Coming Soon:
  - List of LRP-trained landscape contractors, designers, and nurseries
  - Garden design “templates” with plant lists



ADDITIONAL SERVICES

Free Home Check-Ups

- Leak check
- Indoor evaluation
- Irrigation inspection
- Rebate eligibility & information
- Water Efficiency Kit

Free Water Efficiency Kit

RISK: Extended Drought Imperils Key Ecosystems

Past:

- What did we do?

Future:

- Placerita Canyon Natural Resource Management Plan
- Awareness of aridity index/water deficit trend
- Oak Surveys

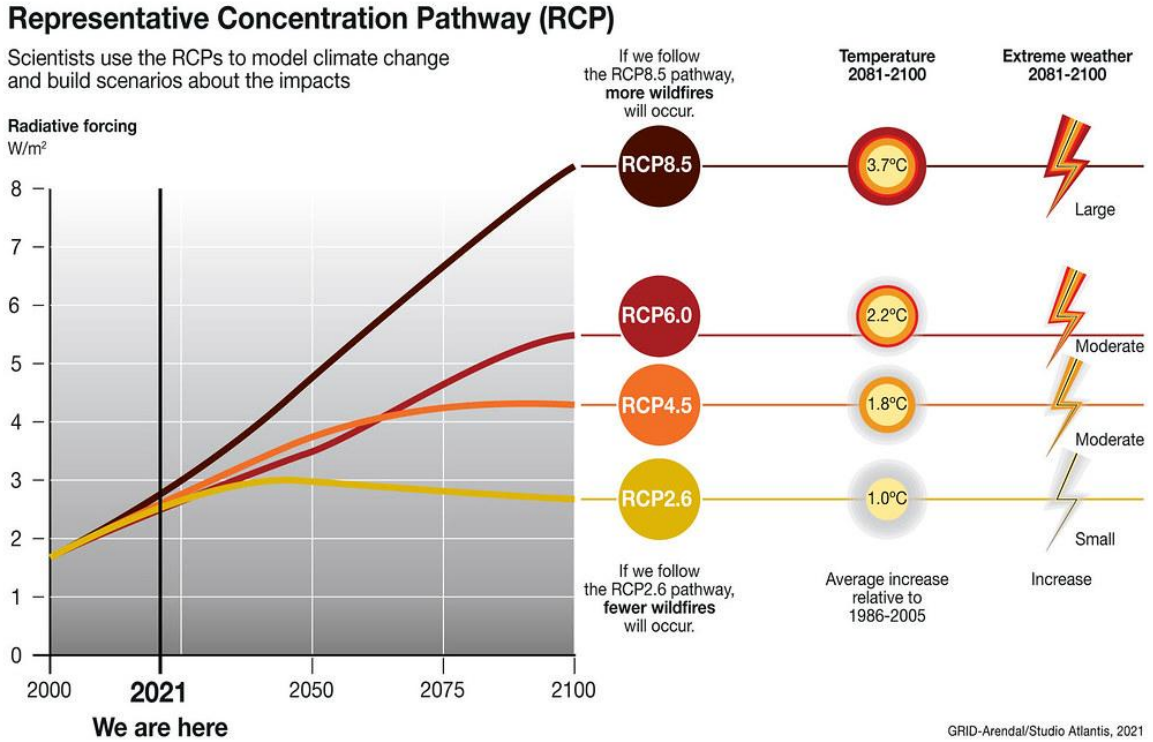
Climate Change Impact?

Extended drought = low ETs for prolonged period…how long can Oak Woodlands sustain low ET?

Extended excessive rain = erosion = infrastructure and tree loss?

How to protect against both?

Indicator species?



Understanding Our Natural Resources

How can we ensure the sustainable use of our natural resources?

Development of Natural Resource Management Plan

- Each Natural Area will have one
- A biological priority for LA County
- In the planning phase for Placerita Canyon
- Interest in docent/volunteer feedback and participation

Resource Management Plan (RMP) Overview

Los Angeles County Natural Areas Mission

- Stewardship and Sustainability

What is a RMP and why do we need one?

Incorporates an Ecosystem Management/Adaptive Management strategy

- Includes:
  - Overview
  - General description of Placerita Canyon
  - Natural Resources
  - Cultural Resources
  - Management Goals and Objectives
  - Management Implementation

RMP: Natural Resources

This section discusses:

- Vegetation communities
- Vegetation dynamics
- Wildlife habitats
- Wildlife movement corridor/habitat fragmentation
- Sensitive species

Contains the results of:

- Research (literature review)
- Site assessments
- Surveys (general and focused)

What's in store for Placerita Canyon?

Surveys!

Tentative Plan: Placerita Canyon Pilot Program

1. Create a tree survey team
2. Go thru training
3. Get into the field
    a. ID trees
    b. Tags tree
    c. Conduct habitat assessments and tree health surveys
4. Analyze data
5. Repeat annually to observe trends over time

Stay tuned! More details to come

RISK: Excessive Rain Causes Heavy Damage

Damage to trails and ecosystems

Past

- Riprap above Lower Oak Woodland Picnic area
- LA County ‘diversion channels’ on Canyon Trail
- Boy Scouts installation of railroad ties on upper Hidden Trail

Future

- LA County ‘diversion channels’ on lower Hidden Trail (utilize ‘flood plain’?)
- Rate and rank areas for protection?
- ??

RISK: Non-native Plants Rob Water

Arundo draws excessive SCR water

Non-native PCNC water gluttons?

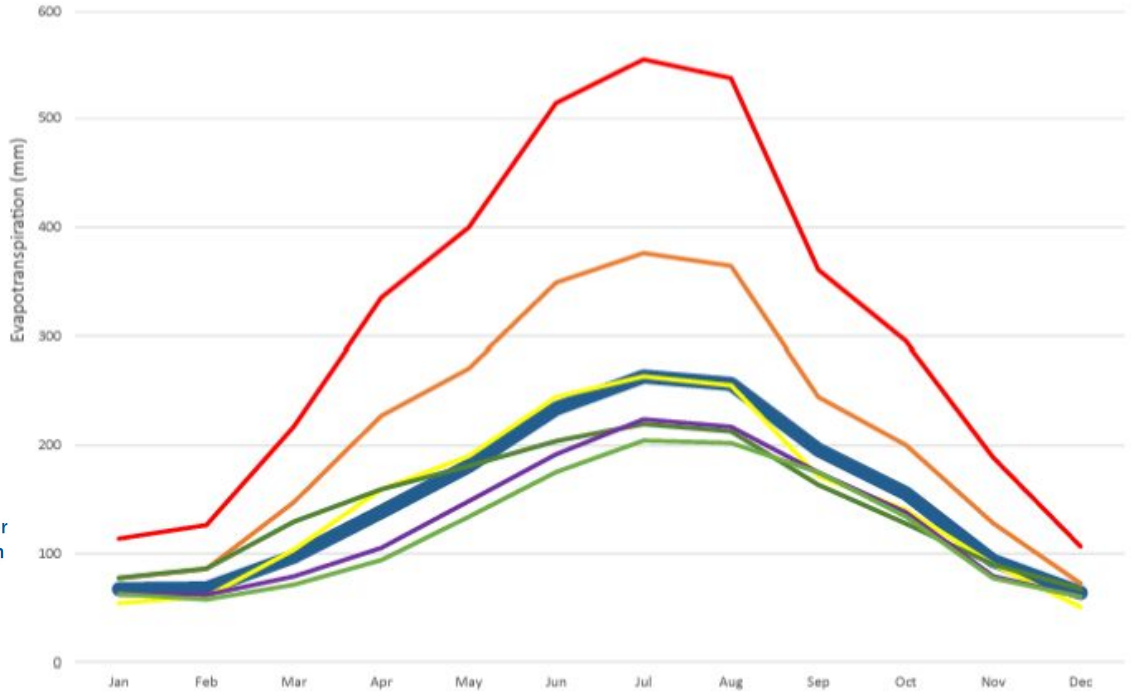


FIGURE 3-32

Evapotranspiration Demand Curves for Native and Nonnative Species

Development of a Numerical Groundwater Flow Model for the Santa Clara River Valley East Groundwater Subbasin

LEGEND

- Amalgam of 30% *Arundo*, 40% cottonwood, 30% willow
- Estimated *Arundo* (median of TNC values)
- Reference surface (grass)
- Large-stand willow
- Estimated *Arundo* (mean of TNC values)
- Large-stand permanent wetland
- Large-stand cottonwood

NOTE

Santa Clara River Valley East Groundwater Subbasin Groundwater Sustainability Plan

January 2022

Page 1239, Appendix G

Next Steps?

Add PCNC as Groundwater Dependent Ecosystem monitoring site?

How to establish and monitor Oak health?
- Habitat Assessment
- Oak Surveys

Support development of Placerita Canyon Resource Management Plan

Research low-cost creek flow measurement methods

Review Placerita Creek BCM predictions using upcoming RCP projections

Continue ‘Water Walks’

Develop Watershed Learning Modules?

Continued Trail Erosion Control

Support our Colleagues!
- TreePeople: San Francisquito Chaparral Restoration (March 23, 30 at 8:30am)
- SCVWA Academy (Summer 2024), Strategic Plan Review (March 25 at 6pm)
- SCWP Santa Clara River WASC Meeting (April 18 at 1pm)
- RMP and Oak Surveys

Summary/Group Discussion

- Placerita Creek is our treasure!
- There may be ways to monitor watershed health
- Please discuss your ideas on our future hikes!!

A HUGE THANK YOU TO AMANDA, JULIA, SANDRA, AND CRISTHIAN!!