

Lessons Learned from the DWR Watershed Resilience Pilot Program

Eric Tsai, DWR

American: Tapash Das and Devyani Kar, Jacobs

Calaveras: Dominic Amador, Woodward and Curran

Pajaro: Adam Witt and Levi Brekke, Stantec and Brian Lockwood, PV Water

Russian: Chris Delaney, Sonoma Water and Tapash Das, Jacobs

Ventura: Elizabeth Simon (Stantec)

April 20, 2026

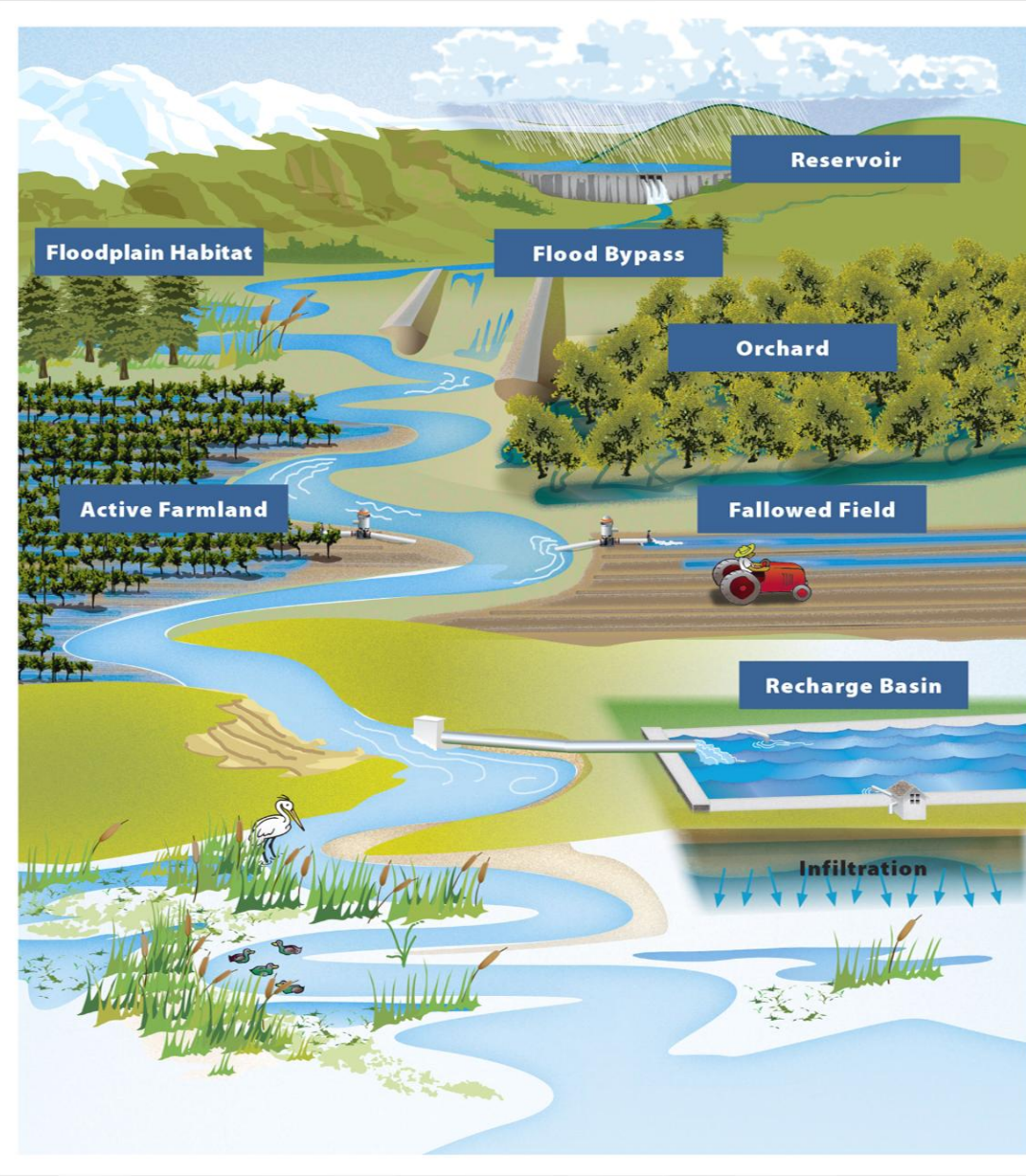


California Water Plan: Advancing Administration Themes

Climate Urgency



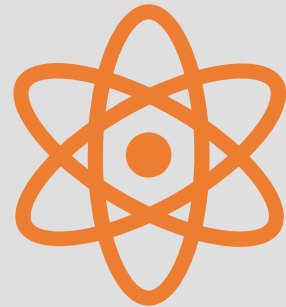
Watershed Resilience



Equity in Water Management



Watershed Resilience Program Intent and Outcomes



Program Intent

Empower local water leaders with the capacity to prepare for climate change impacts across water sectors at the watershed scale



Equity

Build and support inclusive and diverse watershed networks



Climate Science

Inform sound resilience planning with quantitative climate vulnerability and adaptation analysis



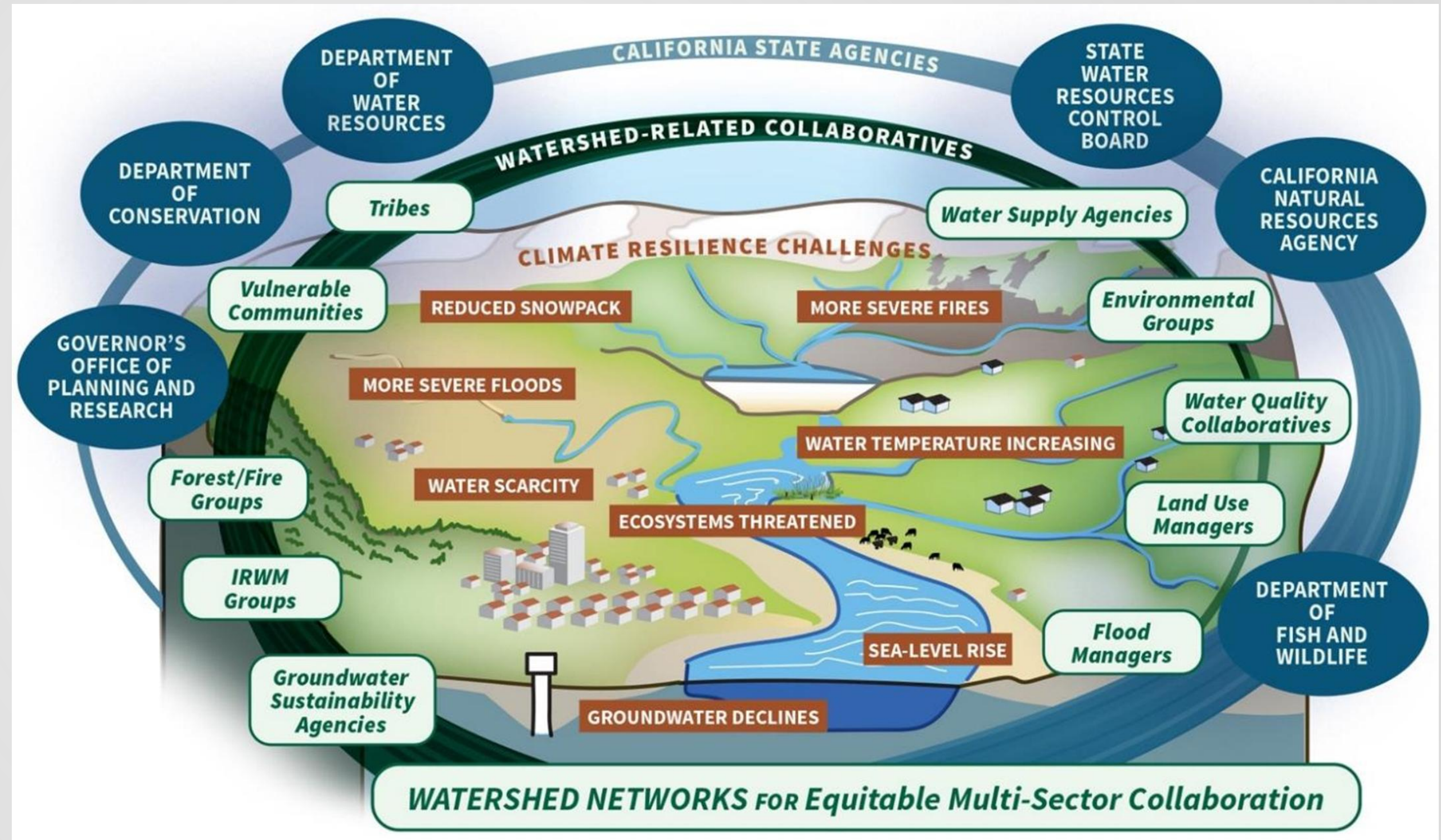
Scale

Incentivize planning on a hydrologically appropriate scale, from headwaters to groundwater basins



Watershed Networks

Update 2023 underscores the importance of supporting programs to incentivize robust watershed-specific climate vulnerability analyses and adaptation plans, followed by investments in multi-sector collaborations and solutions at the watershed- and regional scale



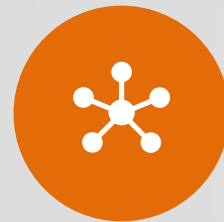
2024 Watershed Resilience Pilot Program Awards

Watersheds	Lead Agency	Award
American River	Regional Water Authority	\$2M
Calaveras River	Stockton East Water District	\$2M
Pajaro River	Pajaro Valley Water Management Agency	\$2M
Russian River	Sonoma Water Agency	\$2M
Ventura River	Ventura RCD	\$2M



Pilot Project Scope of Work Outline

Task 1a: Define Watershed



Task 1b: Identify Community Participation Gaps

Task 1c: Build Inclusive Networks



Task 2: Explore Climate Hazards



Task 3: Assess Climate Vulnerabilities and Risks



Task 4: Develop and Evaluate Adaptation Strategies for Projects



Task 5: Develop Implementation Strategy



Task 6: Develop Performance Tracking Metrics



Task 7: Develop Watershed Resilience Plan

Pilot Schedule: June 2024 to April 2026



From Vulnerability to Resilience: Adapting Water Management in California's American, Bear, and Cosumnes Watersheds

Devyani Kar, PhD and Tapash Das, PhD, Jacobs



Jacobs

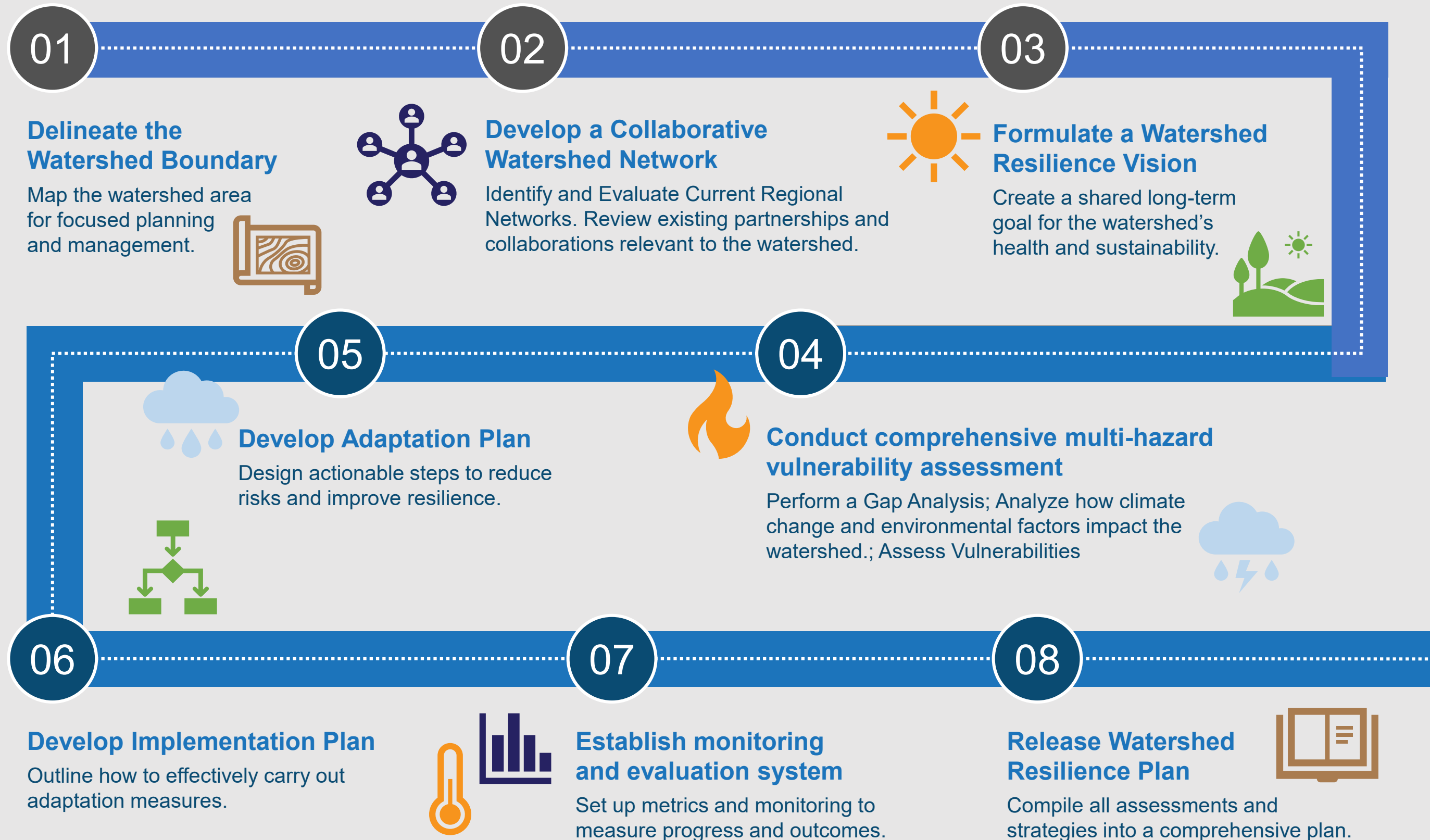

valley vision
Community Inspired Solutions

 **Khadam**
CONSULTING

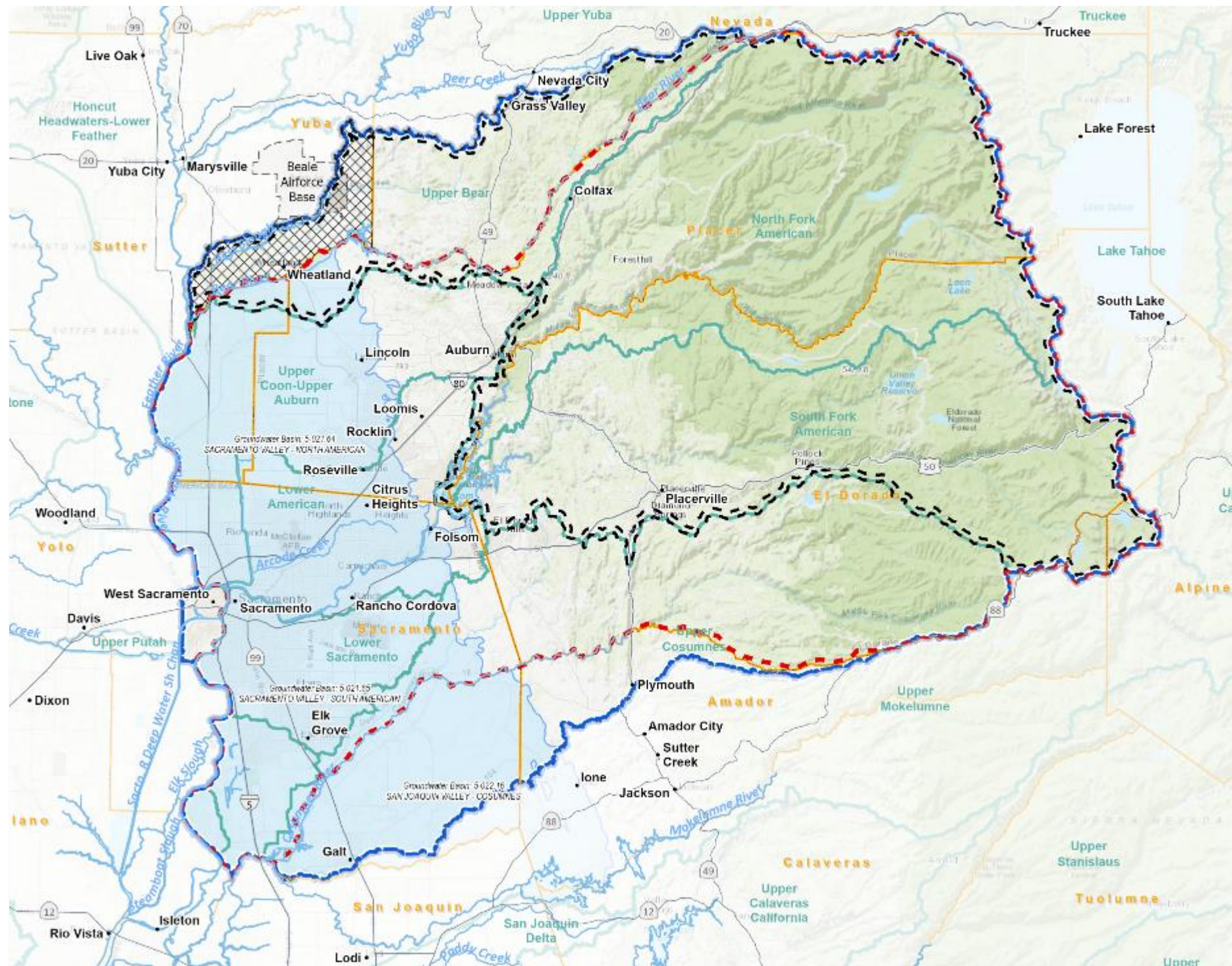


RWA
Regional Water Authority
BUILDING ALLIANCES IN
NORTHERN CALIFORNIA

Pilot Roadmap



Pilot Project Area



Pilot Project Area

- Hydrologic watersheds of the American, Bear, and Cosumnes Rivers
- Eastside tributaries to the Sacramento River

Watershed Network

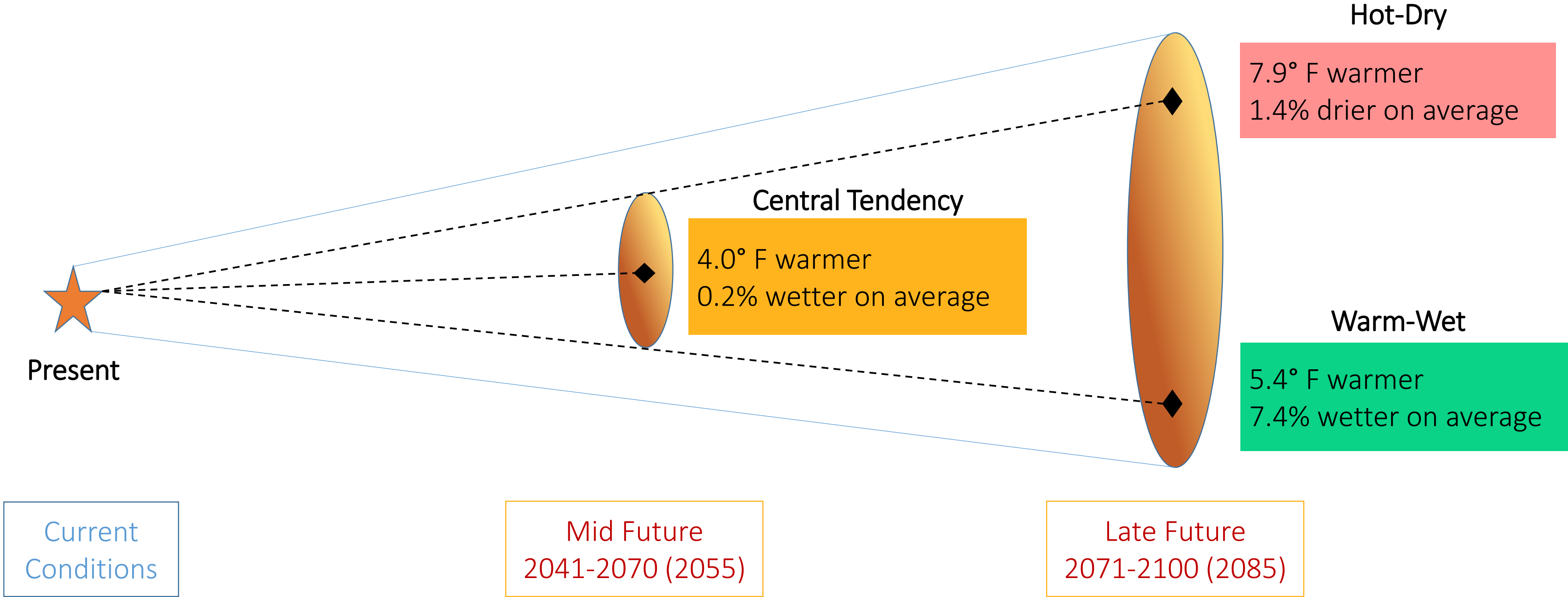


Quantitative Vulnerability Assessment

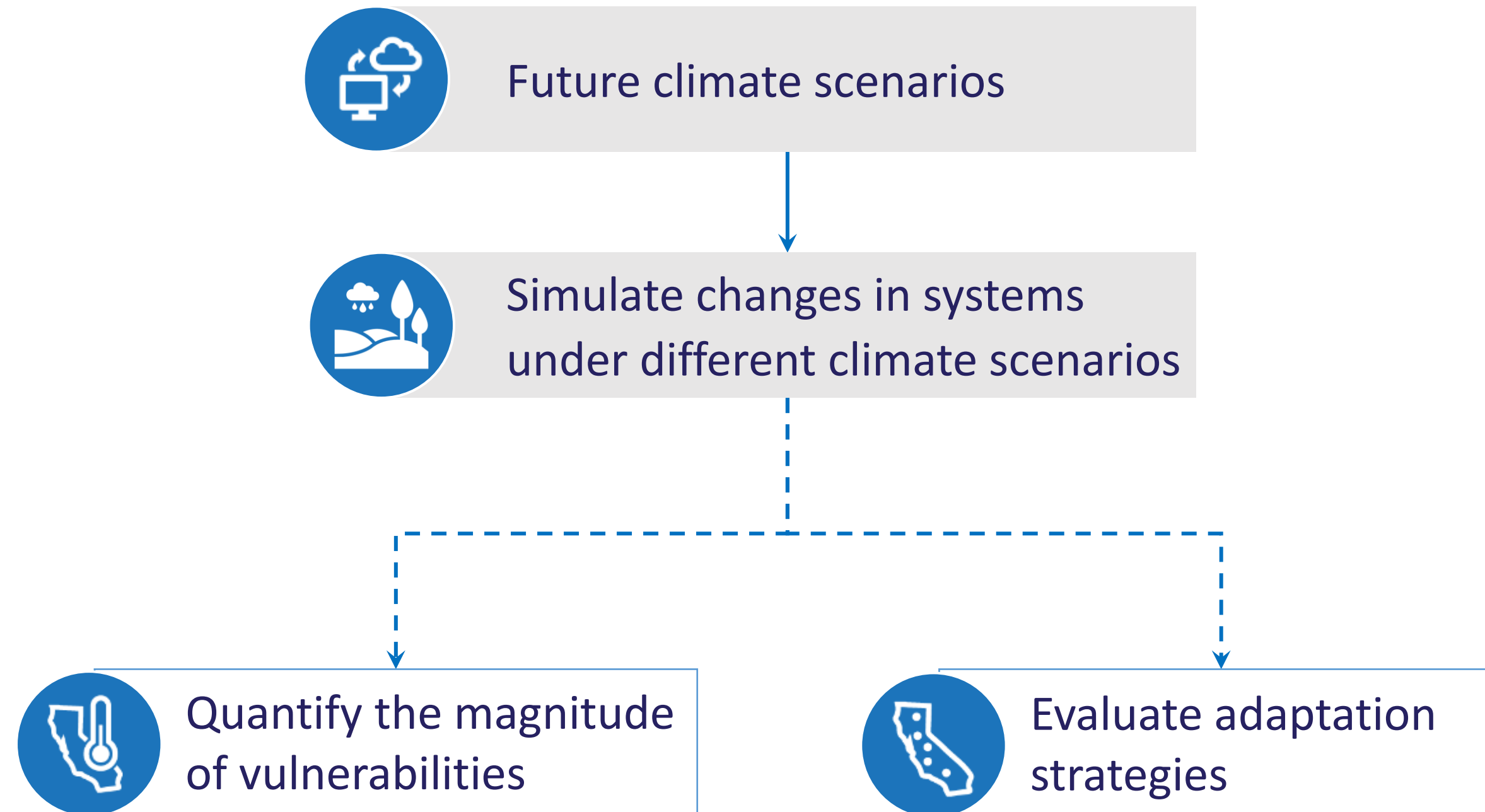
Analytical Tools & Key Quantitative Metrics

	Sectors	Hydrology (VIC)	System Operations (CalSim 3)	Water Temperature (HEC-5Q)	Key Metrics Example
1	Surface Water Supply	◆	◆		- Reservoir storage levels
2	Groundwater Supply				- Groundwater basin storage - Groundwater Sustainability Plans results
3	Flood Management	◆	◆		- Reservoir flood releases - CVFPP 2022 Update results
4	Ecosystem		◆	◆	- River temperature - River flows and habitat
5	Water Quality			◆	- River temperature
6	Recreation	◆	◆		- Reservoir storage levels - Snowpack conditions
7	Hydropower		◆		- Energy generation from reservoir operations
8	Agriculture		◆		- Surface water & groundwater supply metrics

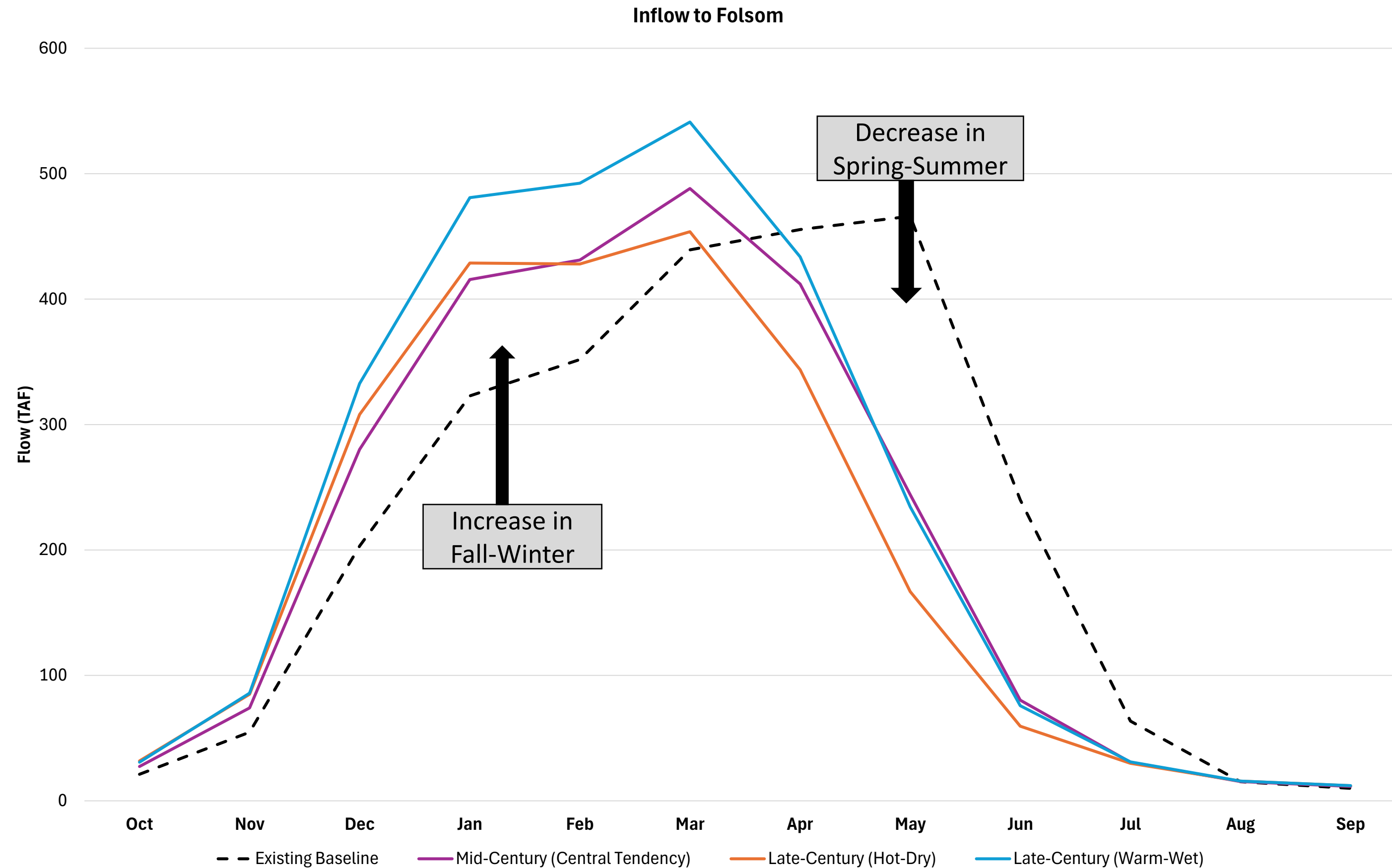
Climate Scenarios for Quantitative Assessment



Quantitative Assessment Approach



American River Streamflow Hydrograph



Groundwater Supply

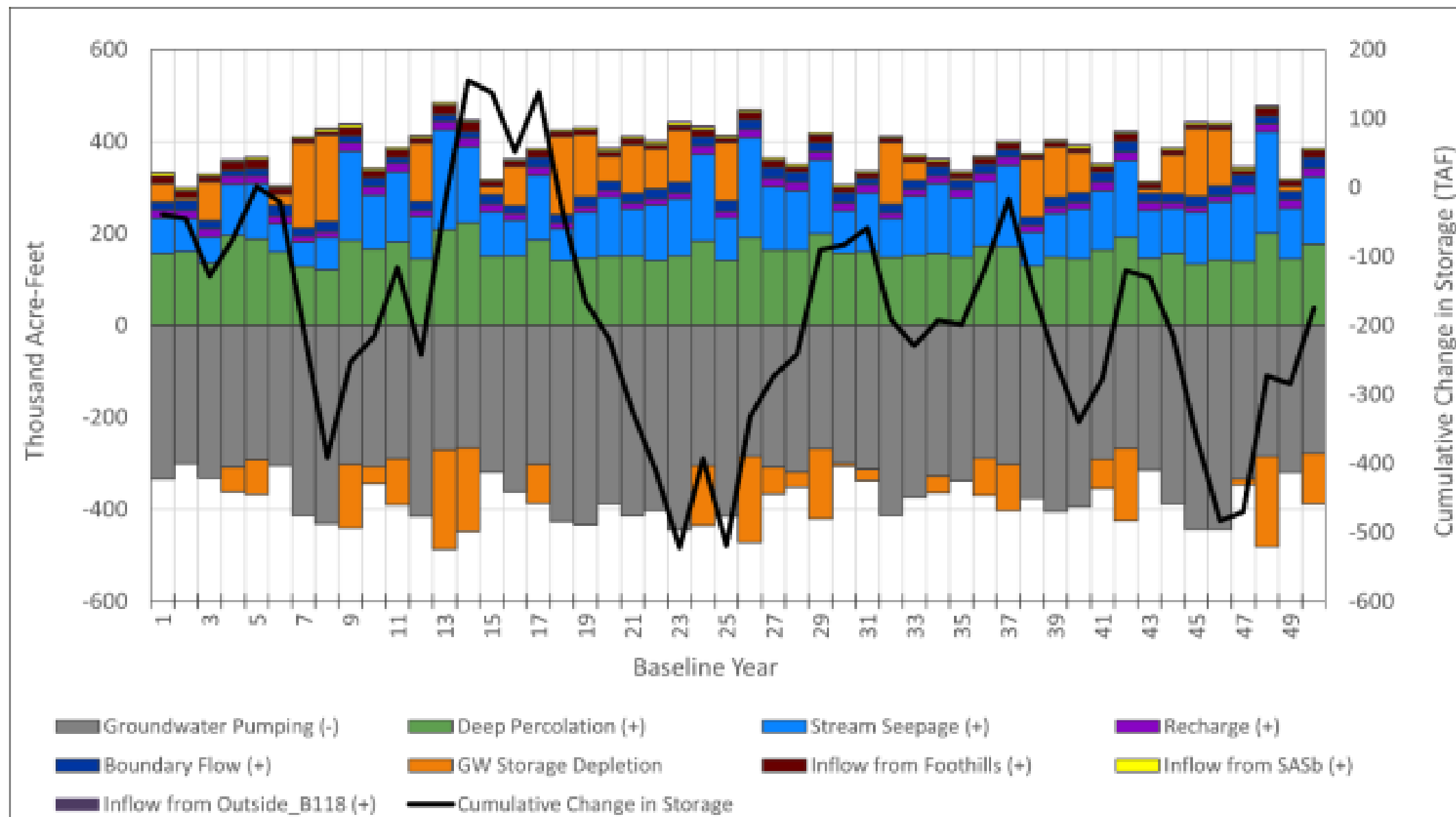
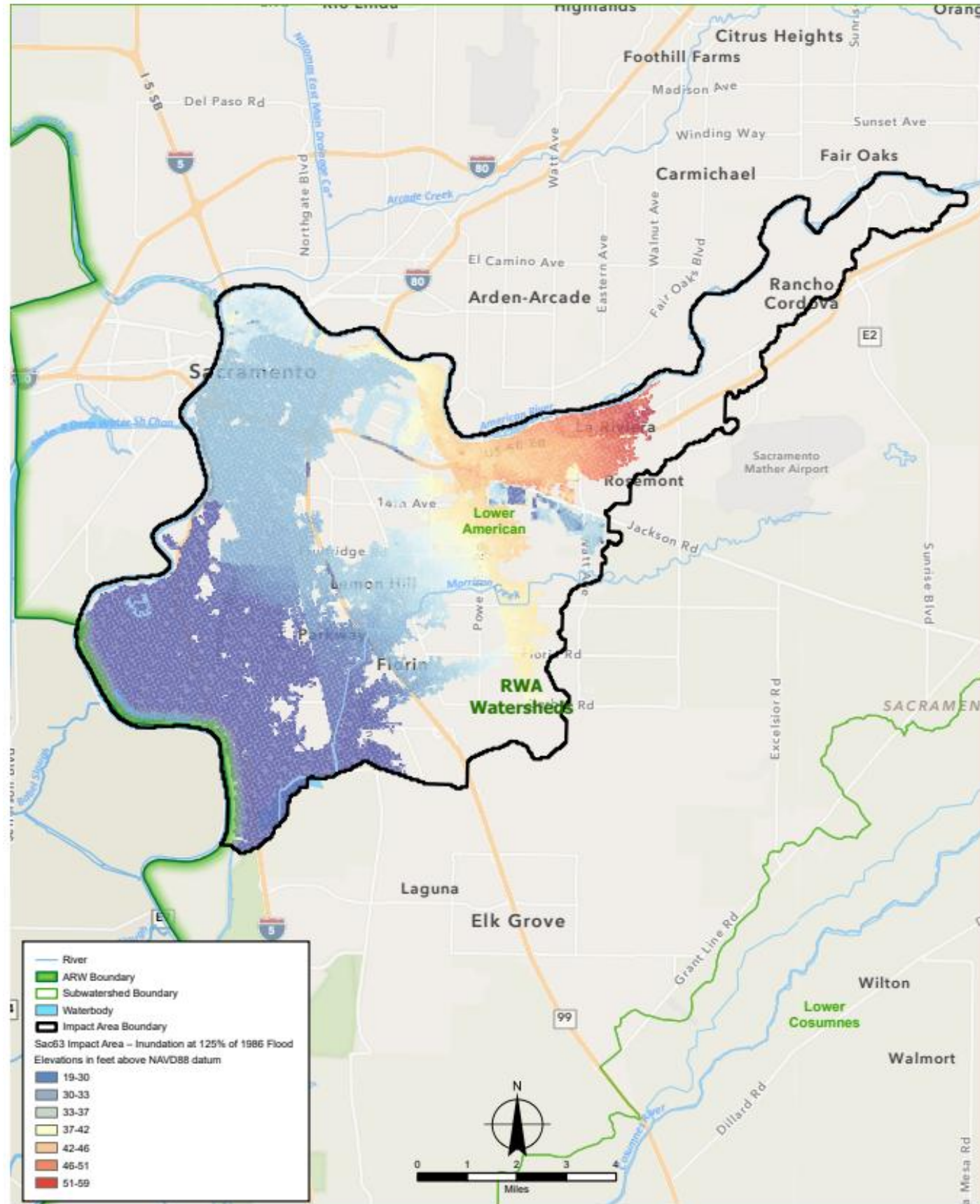


Figure 5-41: Annual Groundwater Budget and Cumulative Change in Storage – North American Subbasin, Projected Conditions Baseline with Climate Change

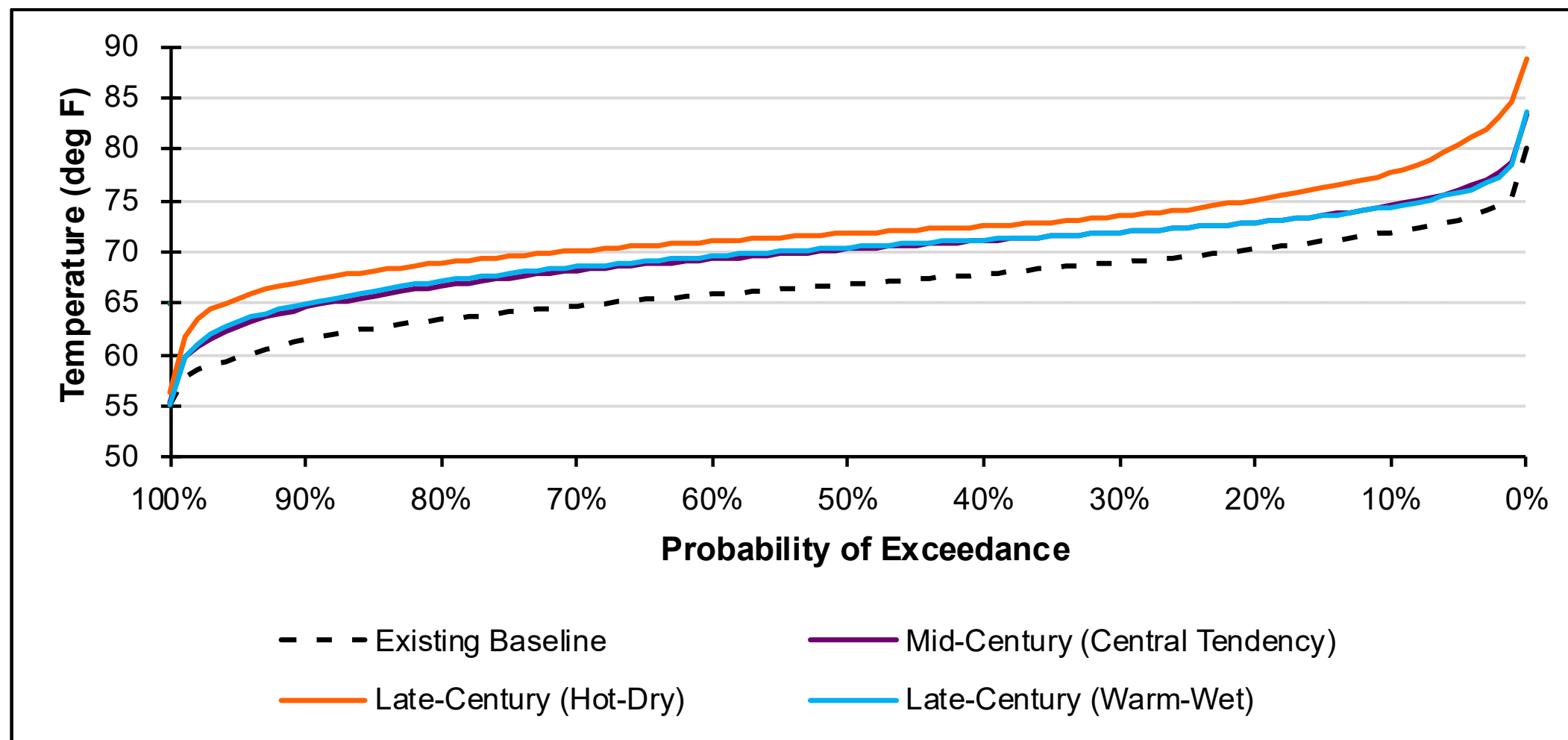
Key Findings

- Future conditions tend to include larger declines in GW storage due to:
 - Less groundwater recharge due to lower precipitation
 - Increased groundwater pumping due to warmer temperatures increasing agricultural demands
- Larger declines in GW storage increase risk of access to GW for beneficial uses

Flood Management



- Water surface elevations from breach on American River
- Inundation estimates provided from DWR FLO-2D model results used for 2022 CVFPP Updates
- Water from the American River flows in a southwest direction and pools against the Sacramento River Levee
- Sample inundation provides for Impact Area SAC63 for 125% of 1986 Flood, roughly a 125-year event

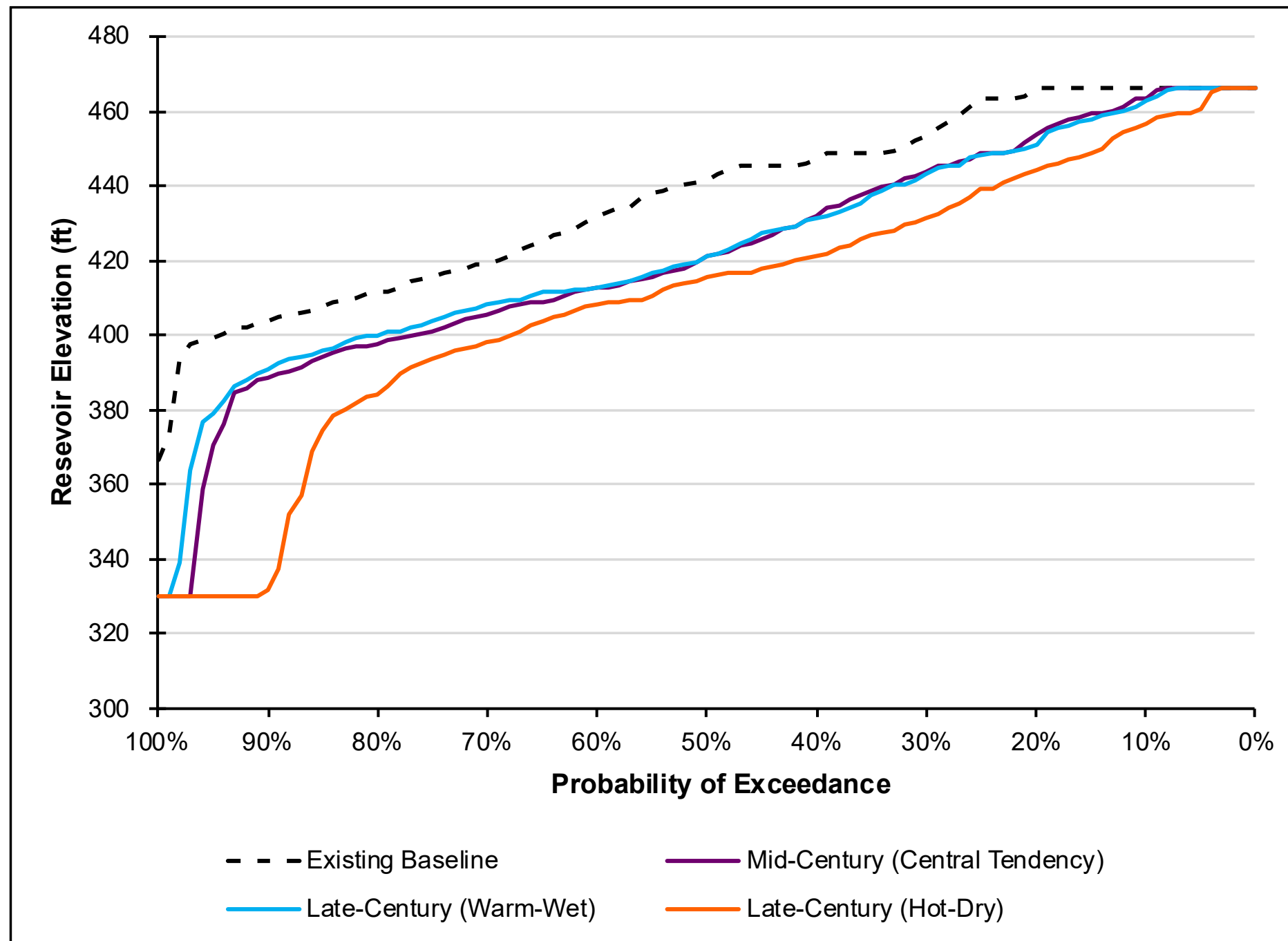


Watt Avenue Bridge Daily Temperature Exceedance
(May 15-September 30).

Key Findings

- Reduced spring/summer flows and higher winter peaks.
- Temperature exceedances for salmonid habitat increase (up to 28%).
- Climatic Water Deficit increases by 30%
- Wildfire probability increases by 60%.

Recreation

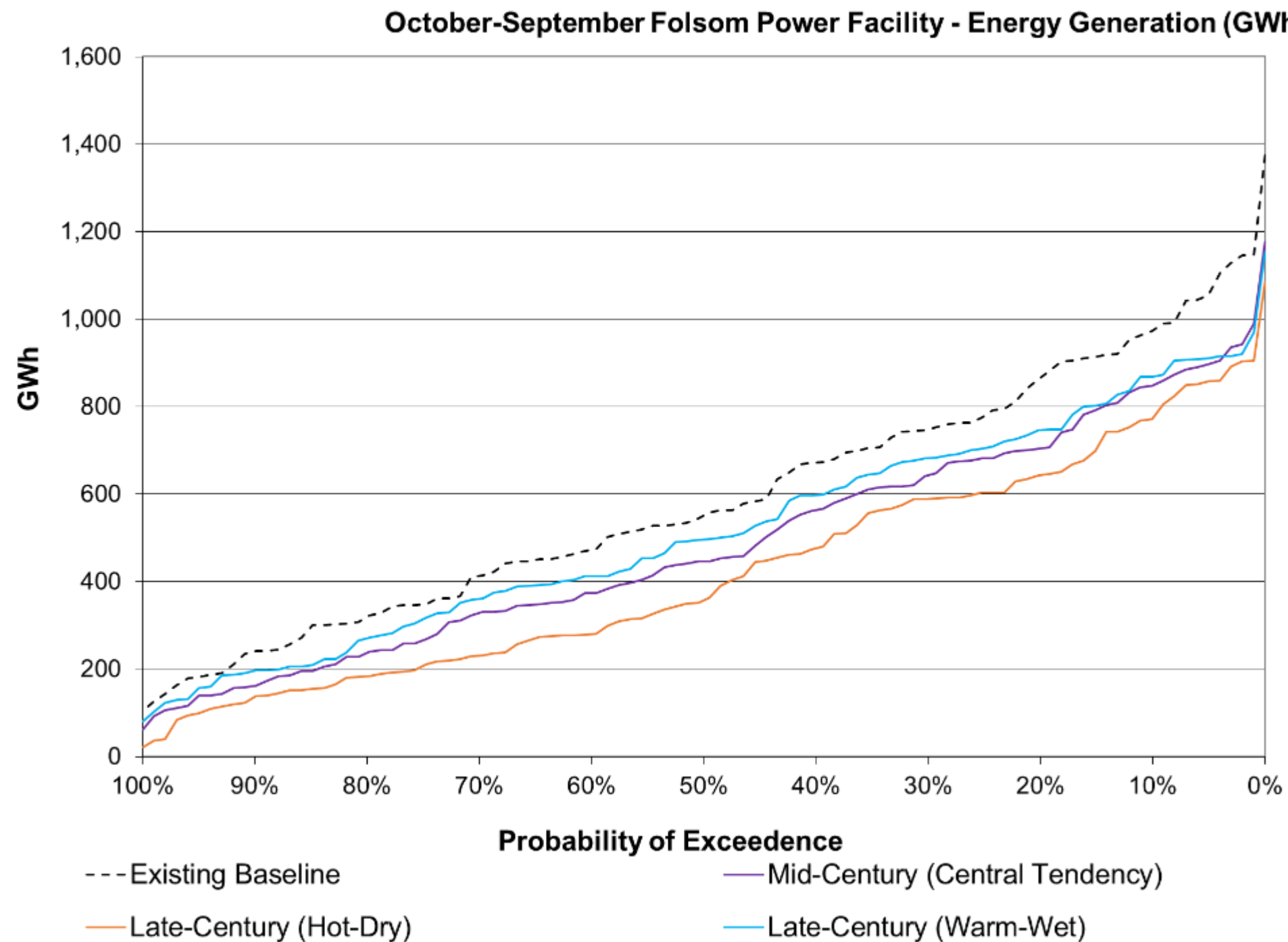


Key Findings

- Lake access for boating decreases: Folsom boat access decreases 3–14%.
- River recreation quality declines in drier scenarios.
- Snow-based recreation season shortens due to reduced snowpack. (April 1 SWE decreases up to 80%)

Folsom Lake Monthly Water Surface Elevation (May-September).

Hydropower



Key Findings

- Long-term annual energy generation from hydropower at Folsom decreases by 13–29%.
- Most reservoirs in the American River watershed include reductions to storage levels and energy capacity.
- Late-Century HD include the least annual net energy generation in the study area

Total Annual Energy Generation at Folsom Exceedance of Probability.

Characterizing Climate Vulnerabilities

Mid-Century Median Projected Conditions



Snowpack
60% less volume



Snowpack Melting
2-4 weeks earlier



Rainfall vs Snow
20-40% more rainfall



Lower American River
9% less flows



Groundwater Reliance
11% increase



Extreme Heat Days
20 more per year (>100°F)



Wildfires
17% more frequent



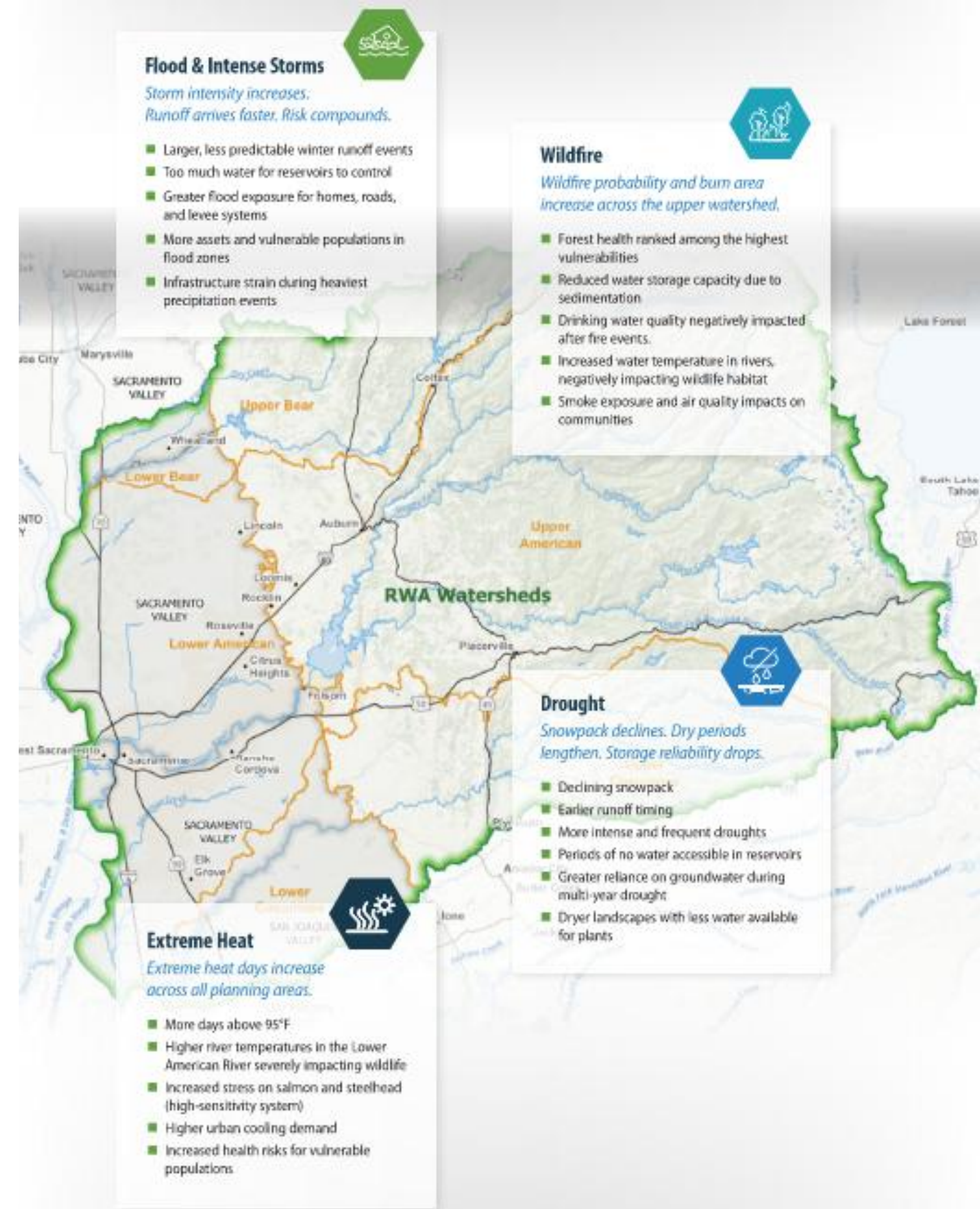
River Temperature
3-5°F higher in summer



Extreme Precipitation
15% more intense

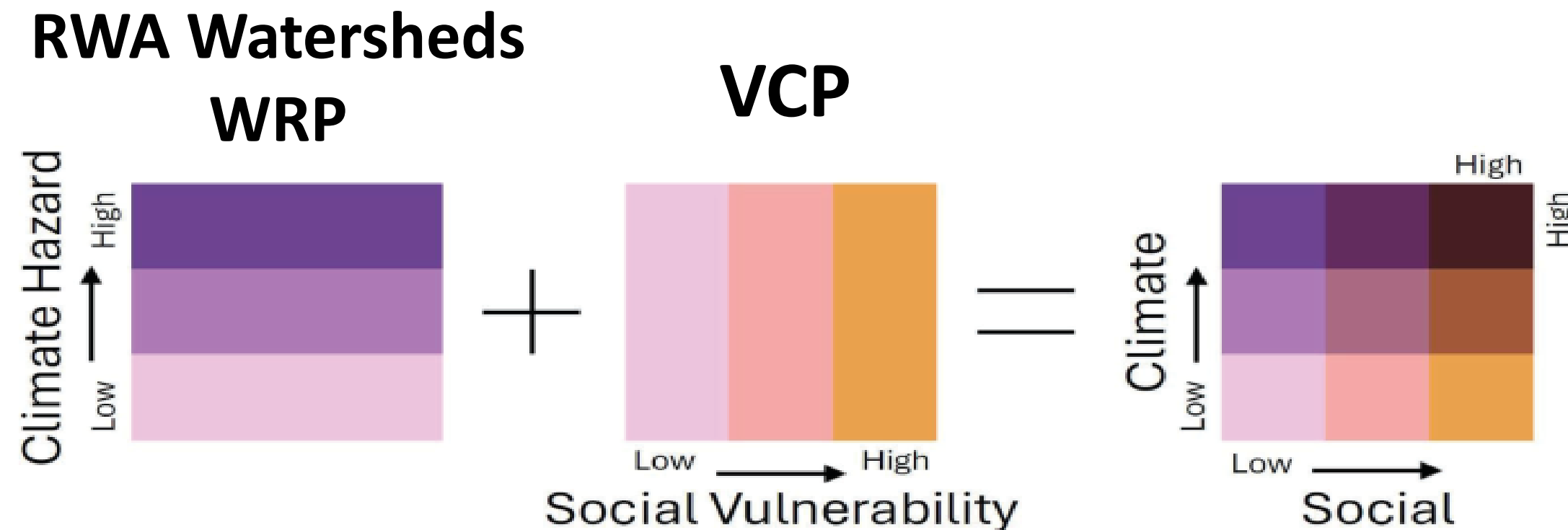


Flood Risk
19% higher
100-year peak flows



Equity Lens – VCP Analysis

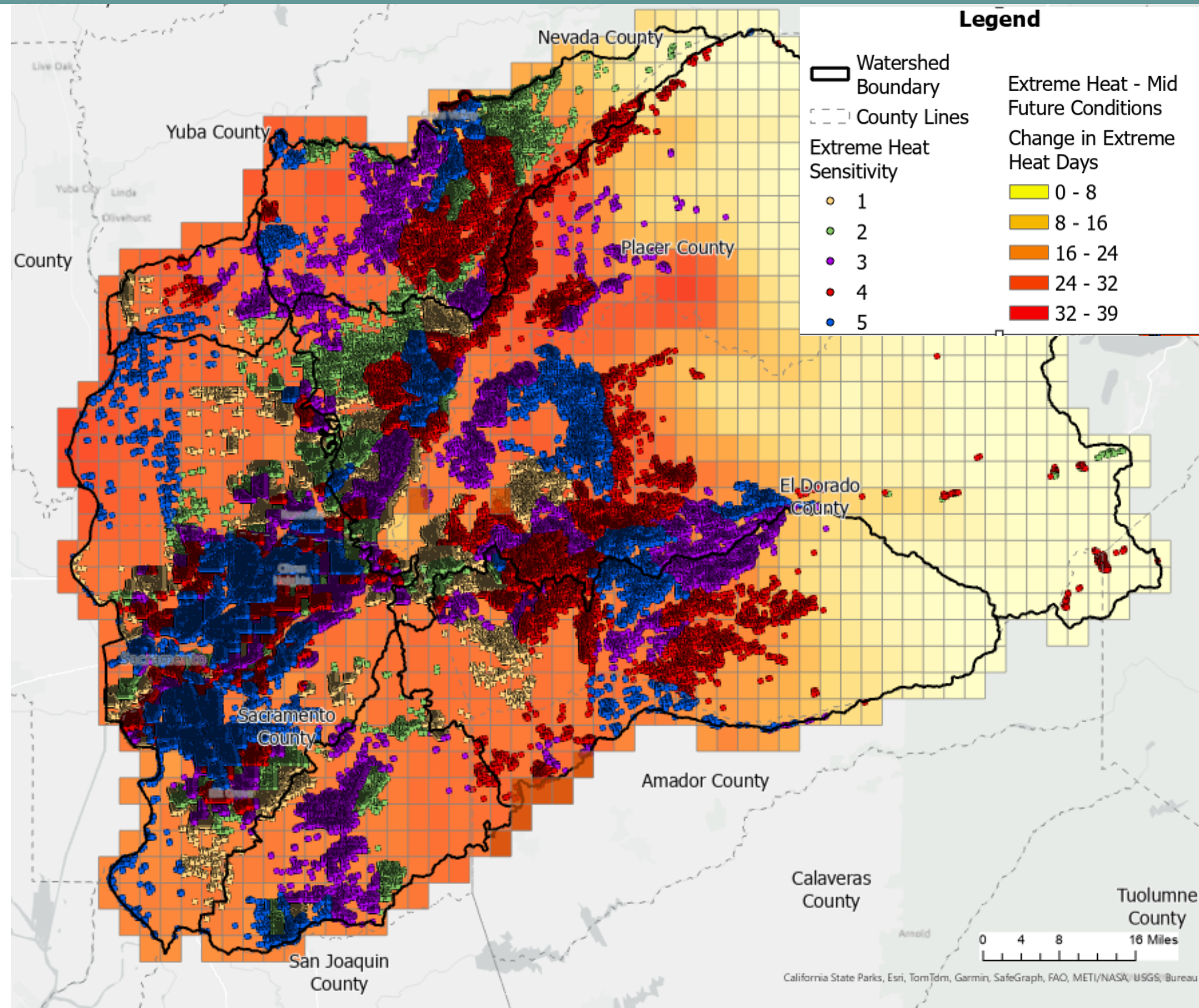
Vulnerable Communities Platform



- Vulnerable Communities Platform is a state equity assessment tool released by Office of Land Use and Climate Innovation
- First climate change focused equity assessment tool in the State (Cal Enviro Screen focuses on pollution burdens)
- Intended to support state investment decision-making, including adaptation planning, statewide initiatives, and programs under the 2024/2025 climate bond (Prop 4).

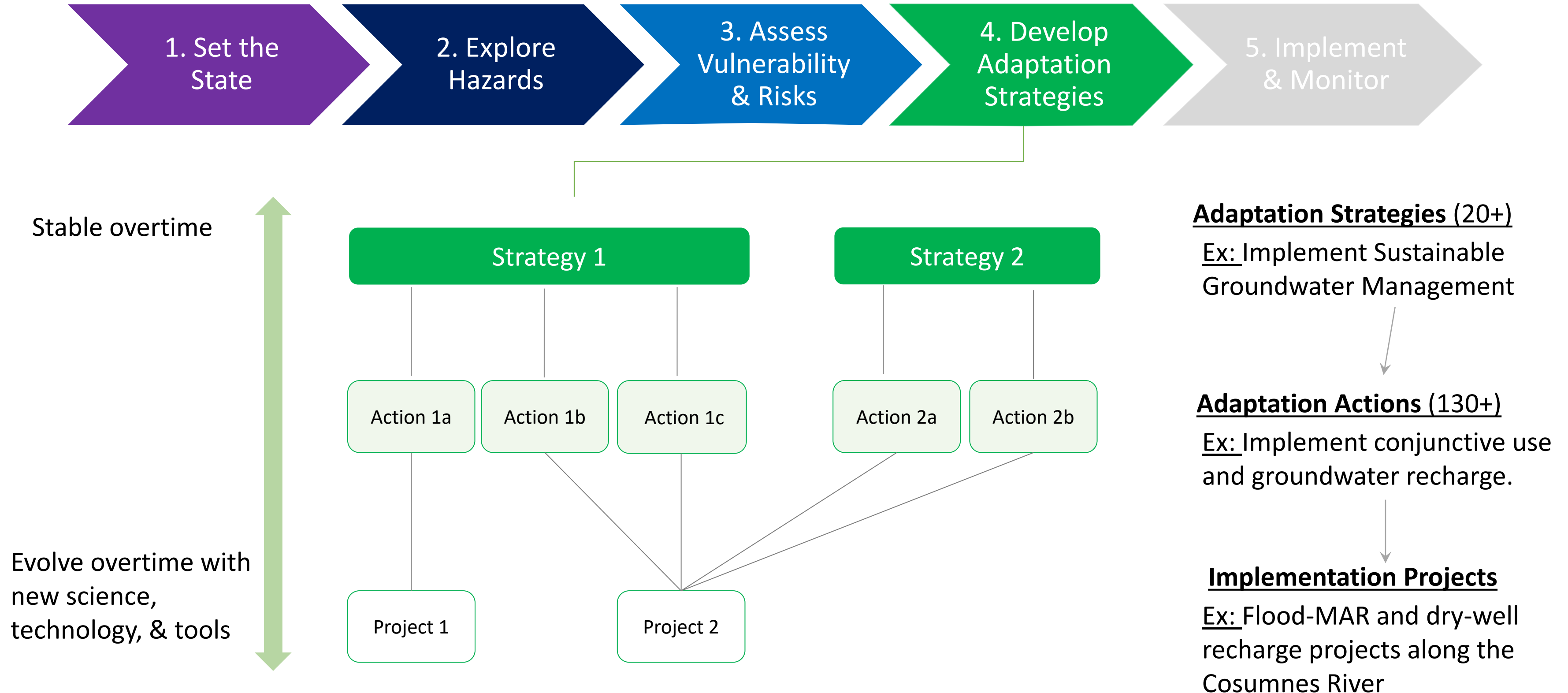
Population Impacts - Extreme Heat: 'Mid-Future'

- 'Extreme Heat' Days are defined as >95deg F"
- ~65% of the area is exposed to the greatest increase in extreme heat.
- Over 97% of population resides in areas exposed to the greatest increase in extreme heat days
- >20% of this population is in the highest heat sensitivity category



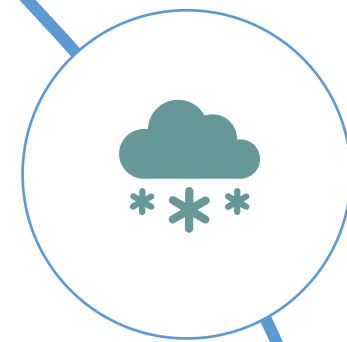
Adaptation Strategies & Actions

Adaptations Framework

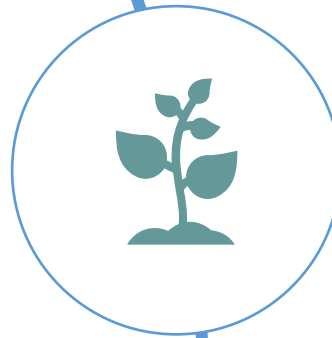


Development of Adaptations

**Targeted to address
key vulnerability
drivers**



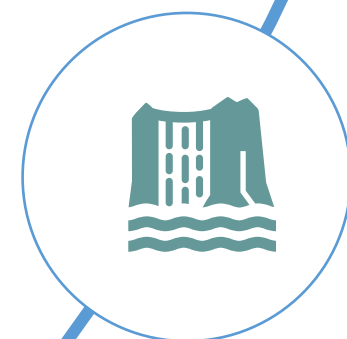
Climate hazards (drought, heat, snowpack loss, intense storms, shifting runoff, wildfire)



Ecological capacity constraints (forest, habitat, and species health)



Socio-economic capacity constraints (community and agricultural resilience)



Built infrastructure capacity constraints (aging systems, reservoirs, levees)

Implementation Plan

Project Evaluation Framework:

Establishes how projects advance from concept to implementation. We have evaluated projects based on the following:

- Alignment with adopted adaptation strategies
- Contribution to climate risk reduction and resilience
- Readiness and feasibility
- Funding alignment
- Community and institutional support



RWA Watersheds Website

[Program](#)[Participate](#)[Progress](#)[Connect](#)[News](#)[Plan](#)[English](#)

Building Resilience Together: The Future of the RWA Watersheds

(American, Cosumnes, and Bear Rivers)

Welcome to the RWA Watersheds Resilience site — your hub for collaboration, innovation, and action. Here, we're working together to address climate challenges, protect vital water resources, and create a sustainable future for our communities and ecosystems.

Closing – Thank you!

For additional information, please visit our website (<https://rwawatershedsresilience.com/>) or contact:

- Devyani Kar, Jacobs – devyani.kar@jacobs.com
- Jim Peifer, RWA - jpeifer@rwah2o.org
- Ryan Ojakian, RWA - rojakian@rwah2o.org
- Tapash Das, Jacobs – tapash.das@jacobs.com



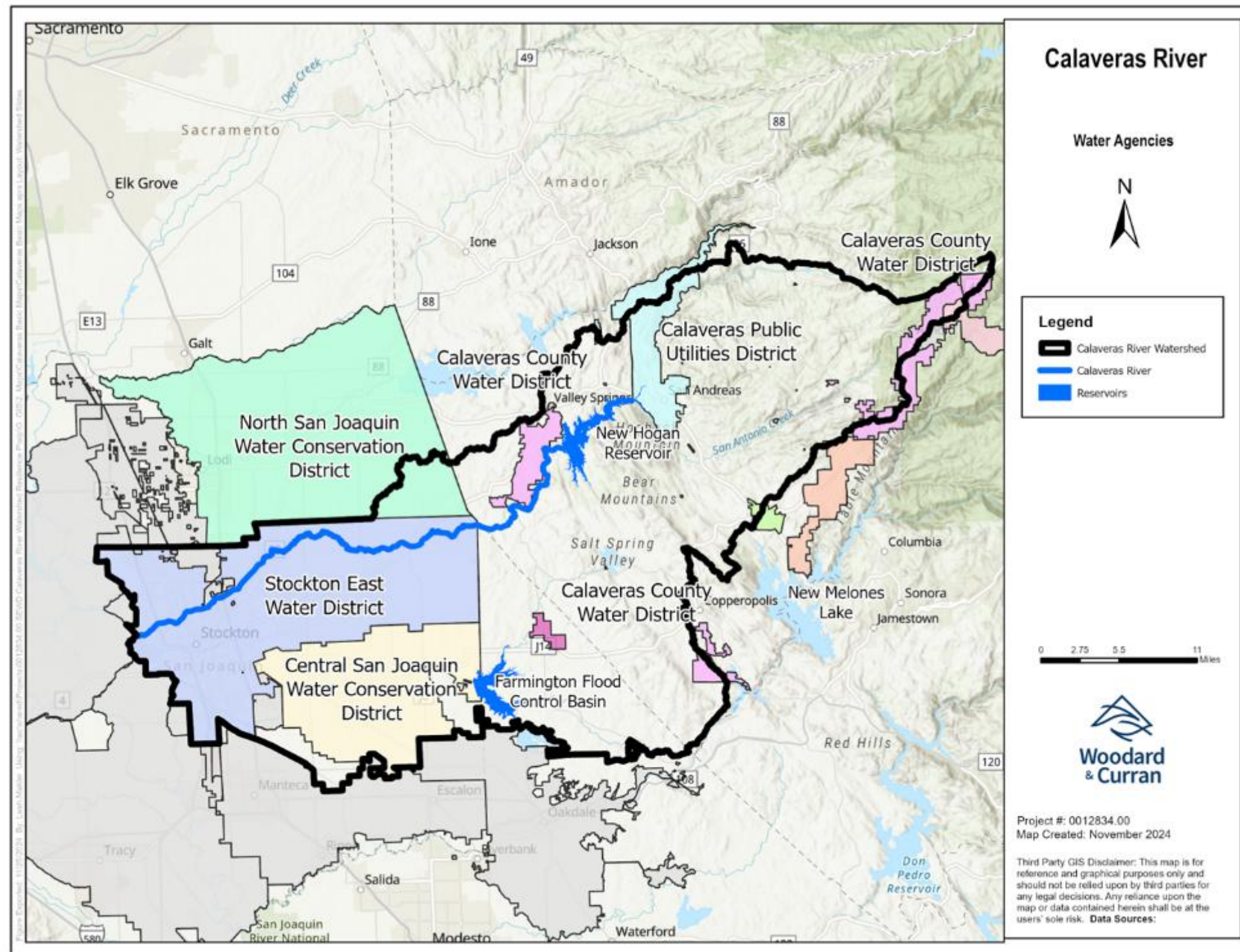


Calaveras River Watershed Resilience Plan

California Water Environment Modeling Forum
Presented by: Dominick Amador
April 20, 2026



Developing the Watershed Resilience Plan



Plan Focus:

Technical Analysis
Watershed Engagement

Watershed Delineation

represents a combination of
hydrologic and **operational**
boundaries

Analytical Framework

Hydrologic Modeling

Risk Area	Impact
Direct Impacts	Hydrology
	Water Demand
Flood	Flood Space Management
	In-Stream Flood Conditions
Water Supply	Surface Water
	Groundwater Use
	Supplemental Supplies
Groundwater Basin	Groundwater Storage
	Groundwater Levels
	Interconnected Surface Water
	Inter-Watershed Dynamics

Environmental Modeling

Risk Area	Impact
Wildfire	Footprint
	Intensity
	Ecosystem
	Water Resources
	Community Safety
Surface Water Quality	Environmental Water Quality

Qualitative Analysis

Risk Area	Impact
Economy	Agriculture
	Urban
	Forestry & Recreation

Integrated Hydrologic Modeling

Local Model Integration

Precipitation

Evapotranspiration

Stream Flow

Surface Water Operations

Climate Vulnerability

Reservoir Operations

Land Surface System

Stream System

Groundwater System

Adaptation Strategies

Surface Water Infrastructure and Expansion Projects

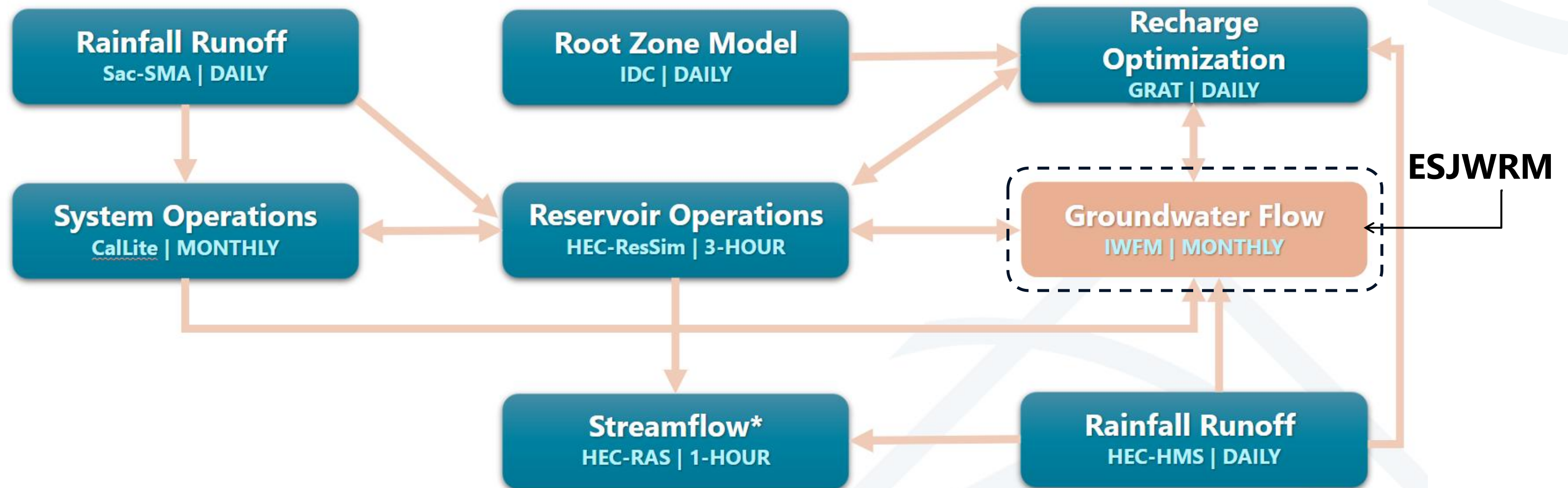
Forecast-Informed Reservoir Operations

Flood-Managed Aquifer Recharge

Land and Fire Risk Management

Watershed Modeling and the Integrated Toolset

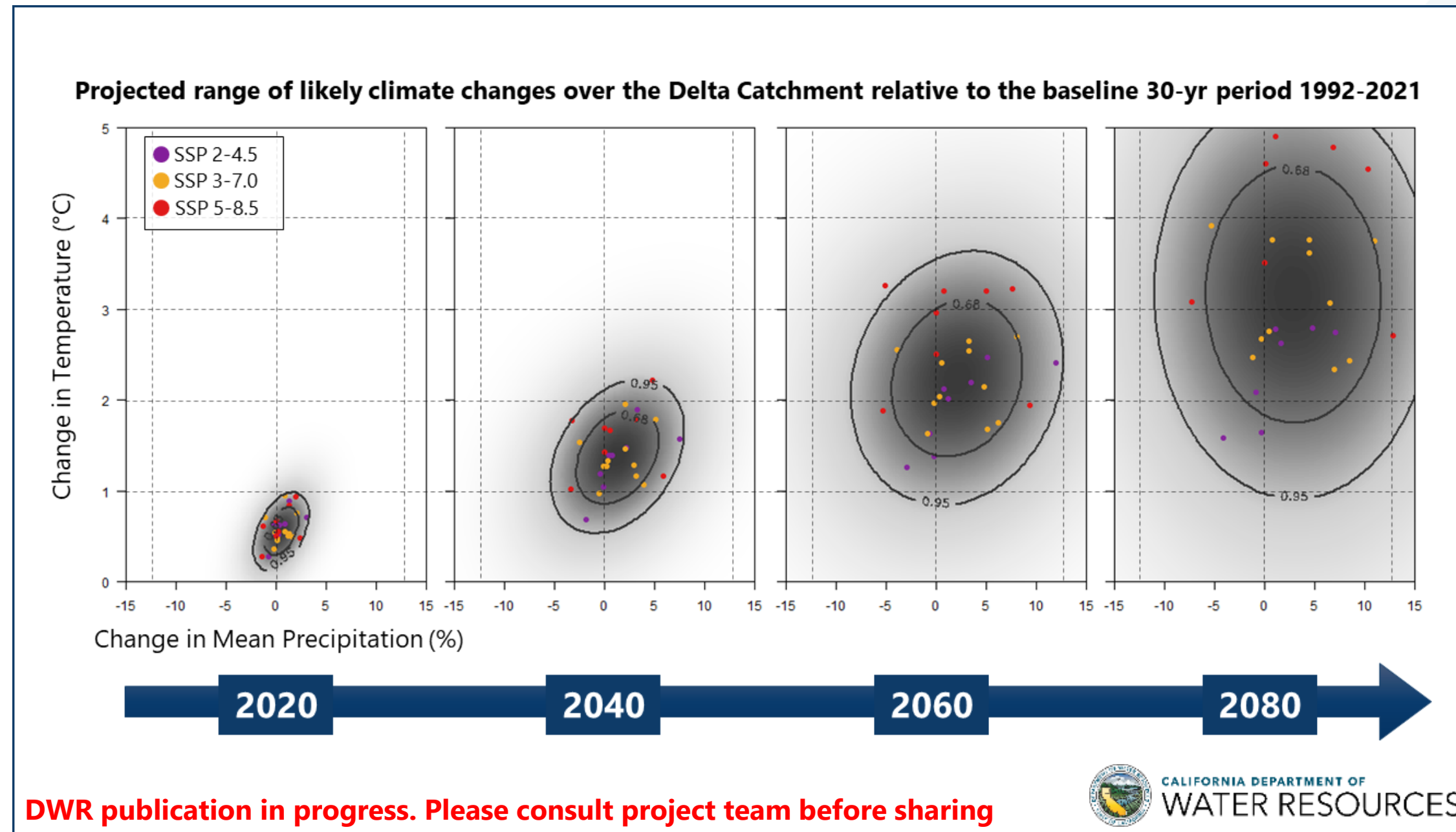
- ▶ Integrated ESJWRM model (used for GSP) into DWR's "headwaters to groundwaters" integrated modeling toolset
 - Updated evapotranspiration, surface water operations and stream dynamics
 - Modeled baseline and climate scenarios to assess vulnerability and adaptation



Climate Modeling

Stochastic Modeling

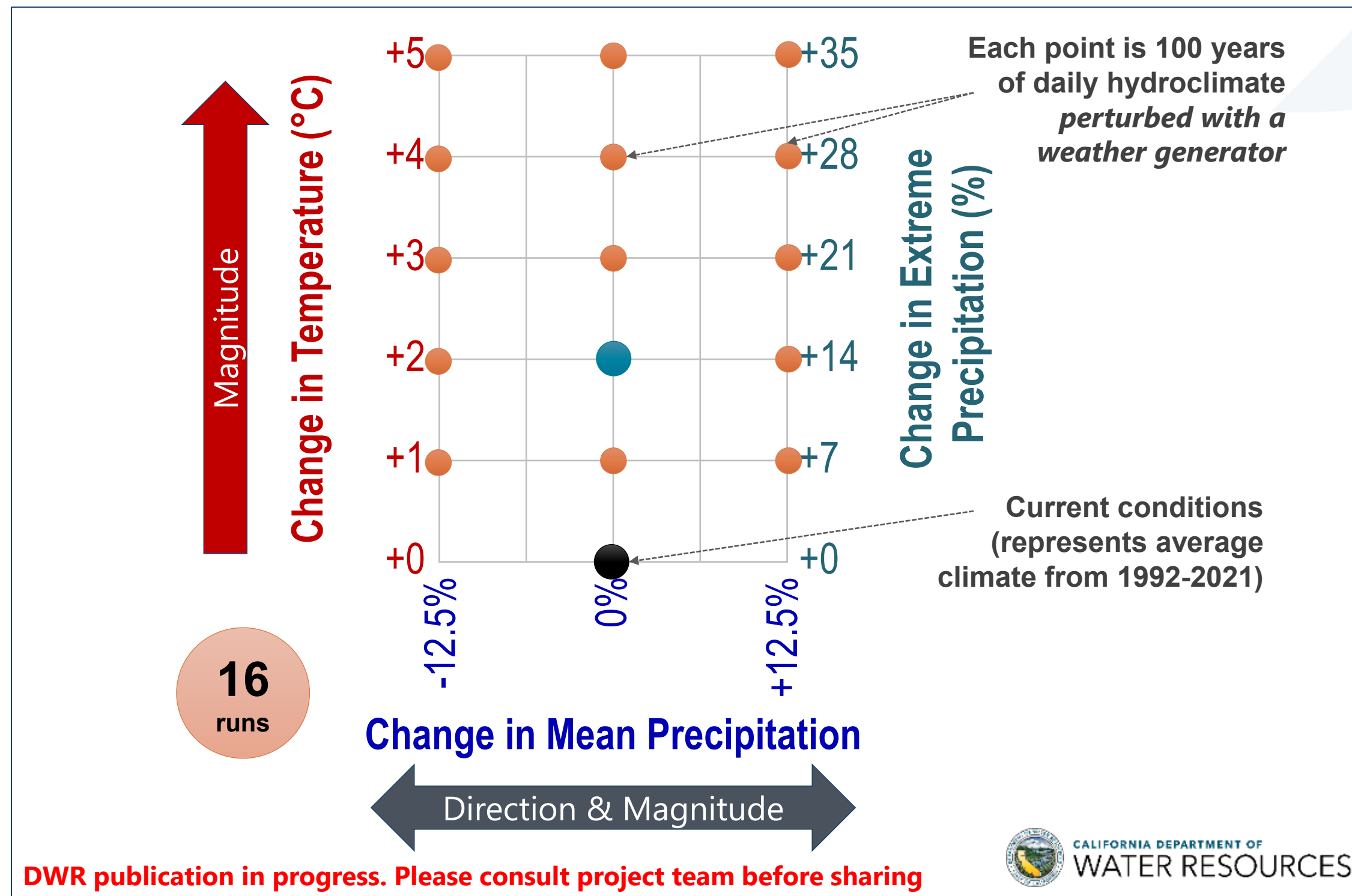
- ▶ Acknowledges global climate uncertainty
- ▶ Simulates a wide range of future climates/weather
- ▶ Identifies operational sensitivity at many levels
- ▶ Supports adaptive management



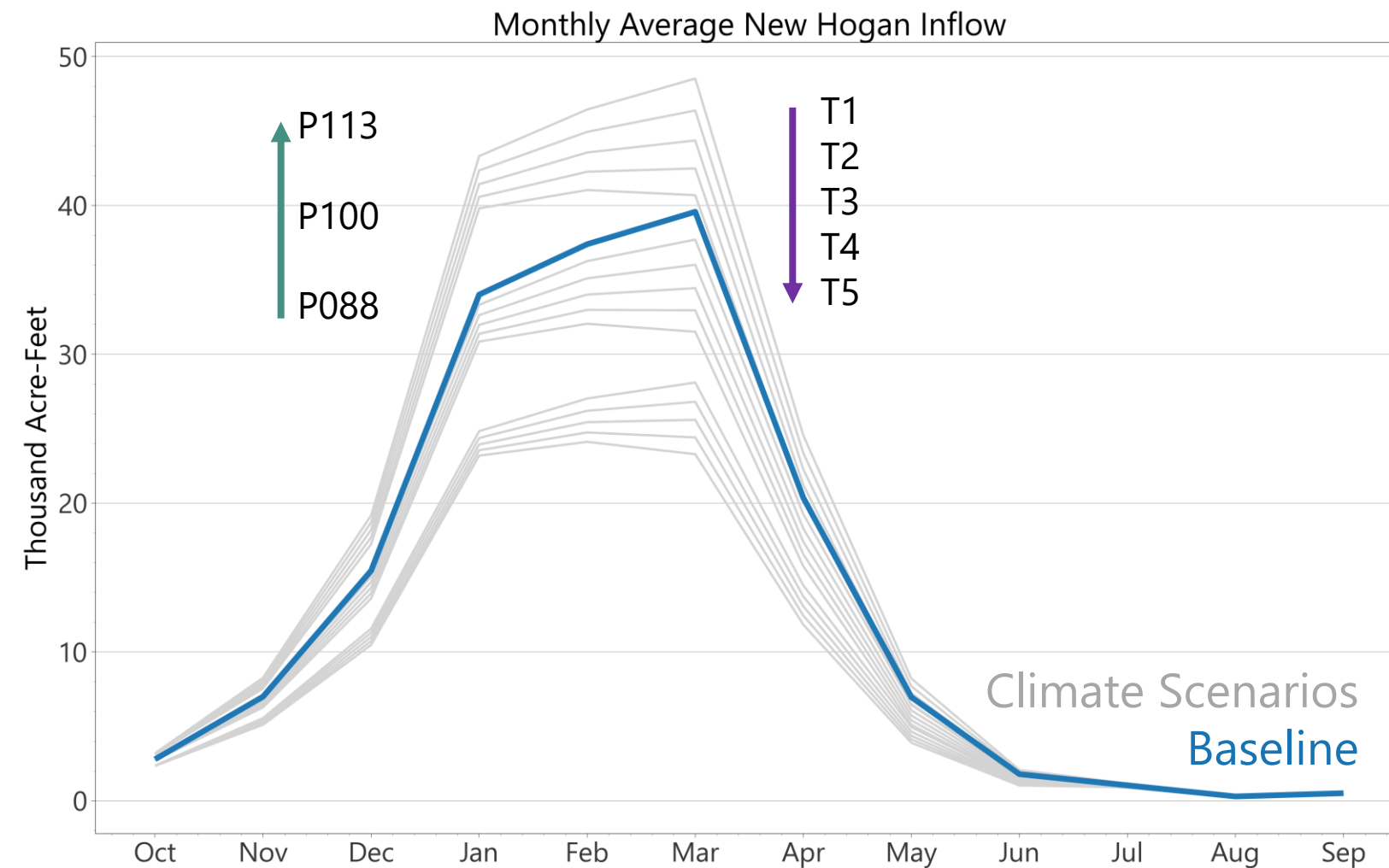
Stochastic Modeling

Stochastic Modeling

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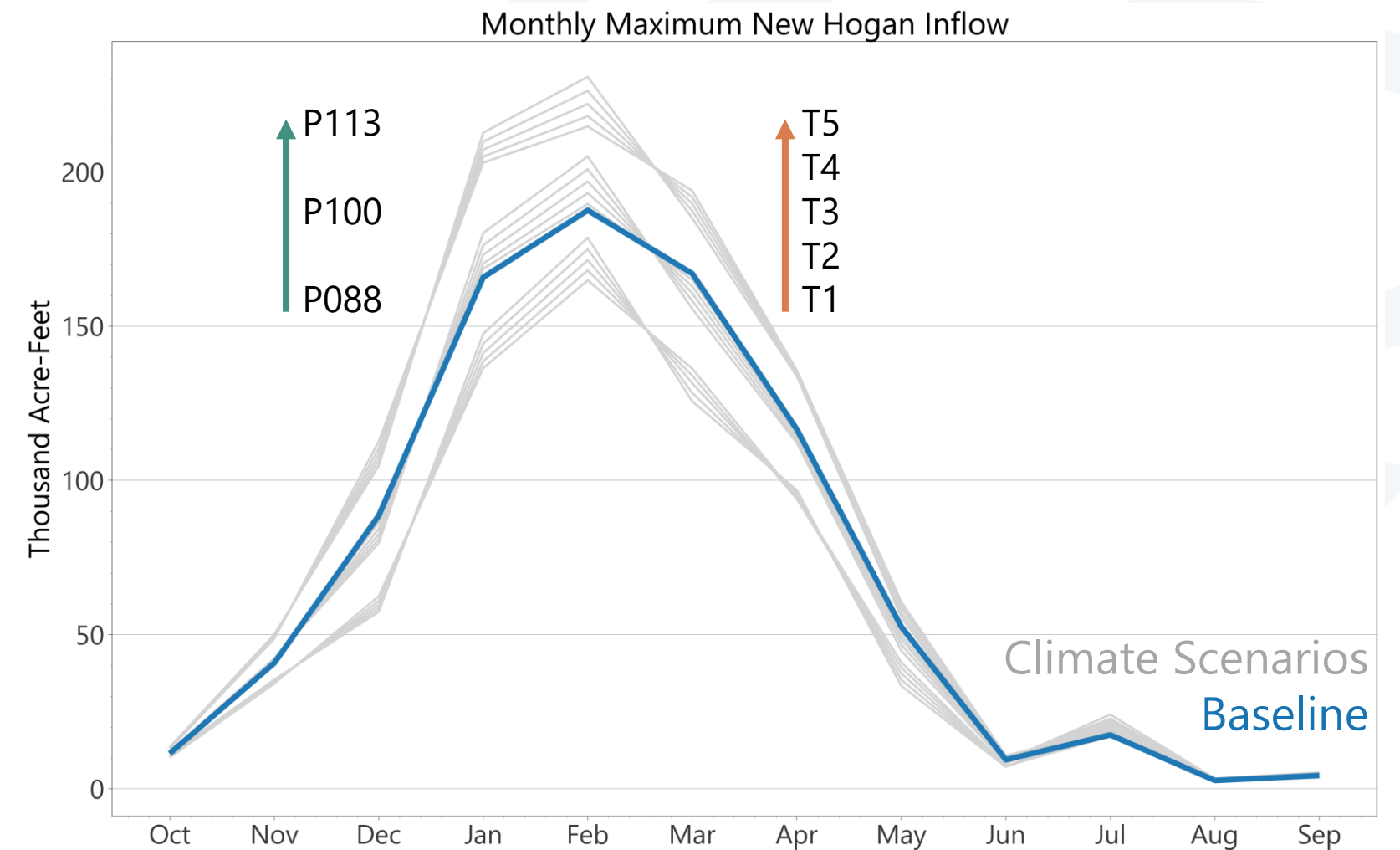


Reservoir Conditions



► Water Supply (Average Inflow):

- Decreases with higher temperatures
- Due to ET/storage in the upper watershed



► Flood Risk (Maximum Inflow):

- Increases with higher temperature
- Due to more extreme precipitation events

Groundwater Budget

Baseline vs +2°C

Stream-Aquifer Interaction

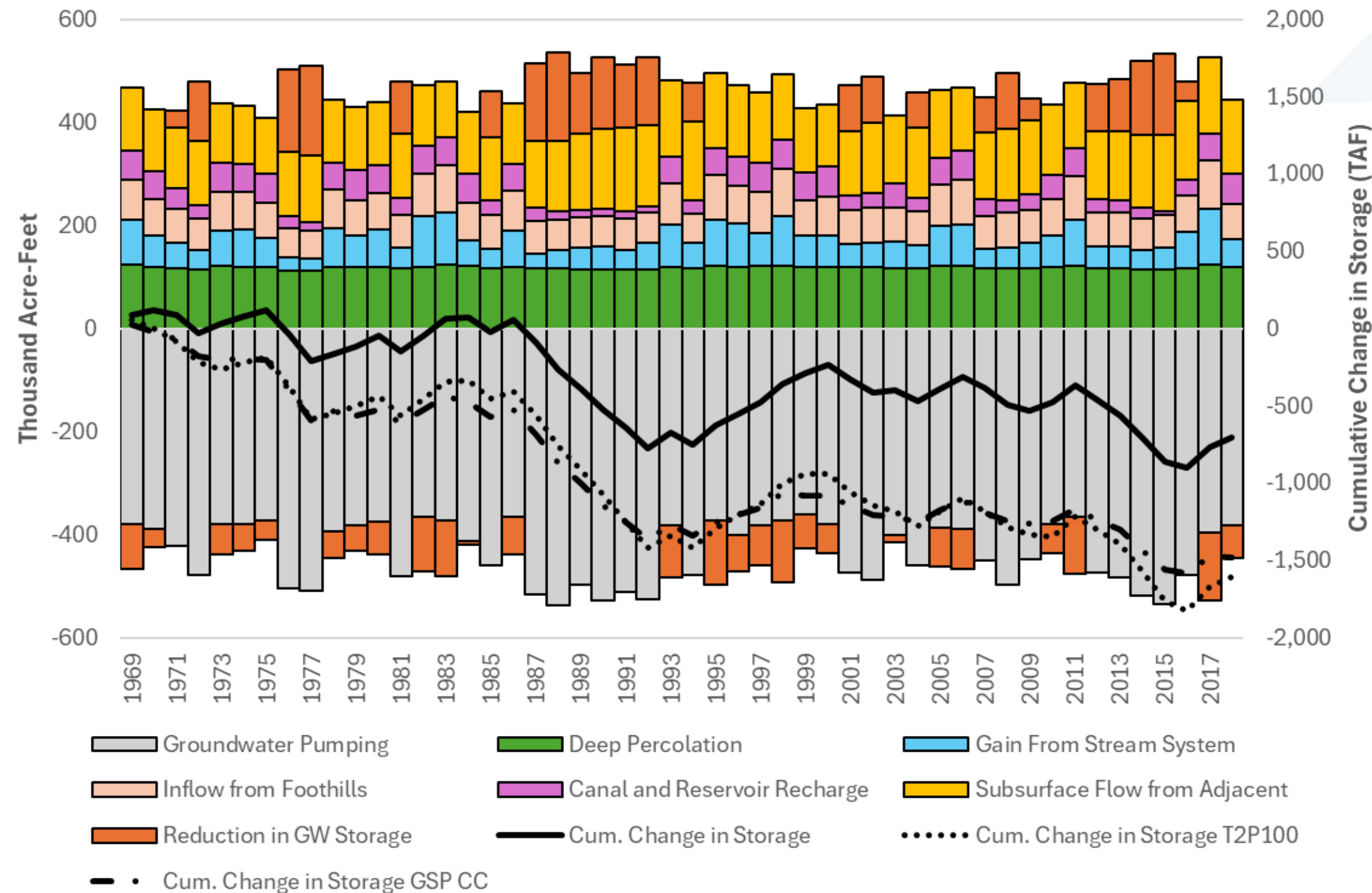
- ▶ TOP100 58,800 AFY
- ▶ T2P100 63,600 AFY
- ▶ **Difference +4,800AFY**

Subsurface Flow

- ▶ TOP100 131,900 AFY
- ▶ T2P100 150,500 AFY
- ▶ **Difference +18,600 AFY**

Reduction in Storage

- ▶ TOP100 14,100 AFY
- ▶ T2P100 32,000 AFY
- ▶ **Difference +17,900 AFY**



Groundwater Budget

Baseline vs +2°C

Stream-Aquifer Interaction

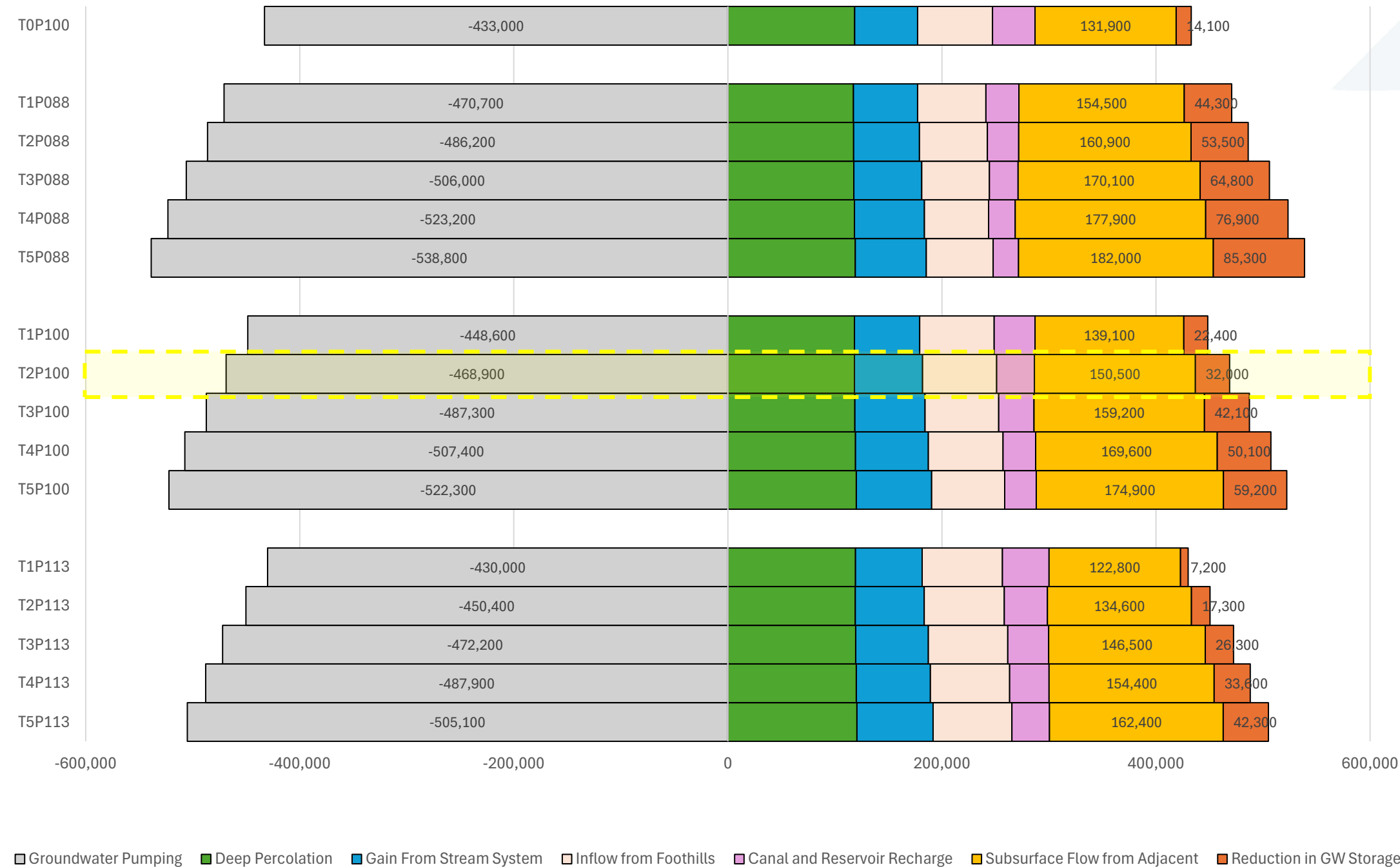
- ▶ T0P100 58,800 AFY
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Subsurface Flow

- ▶ T0P100 131,900 AFY
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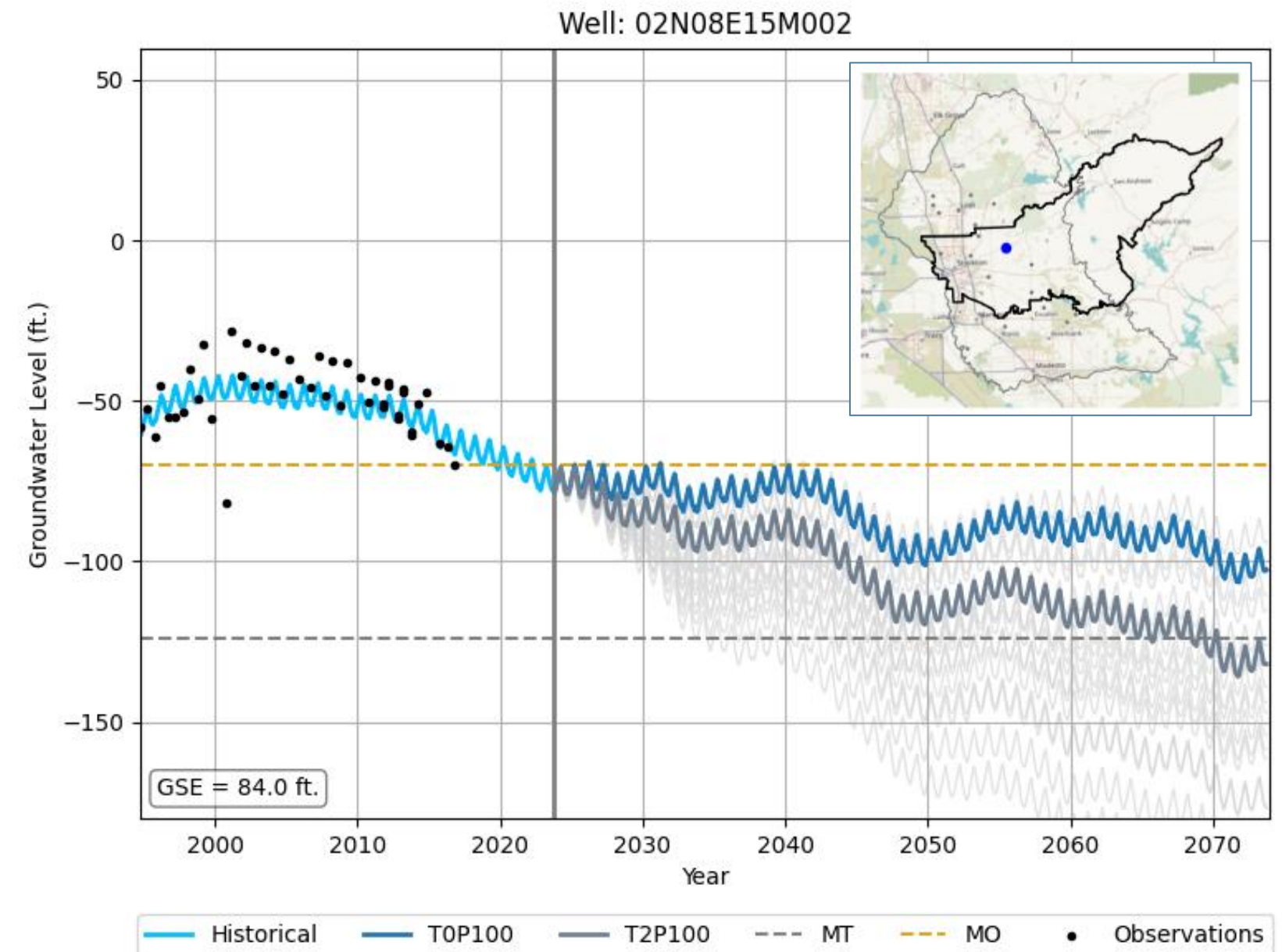
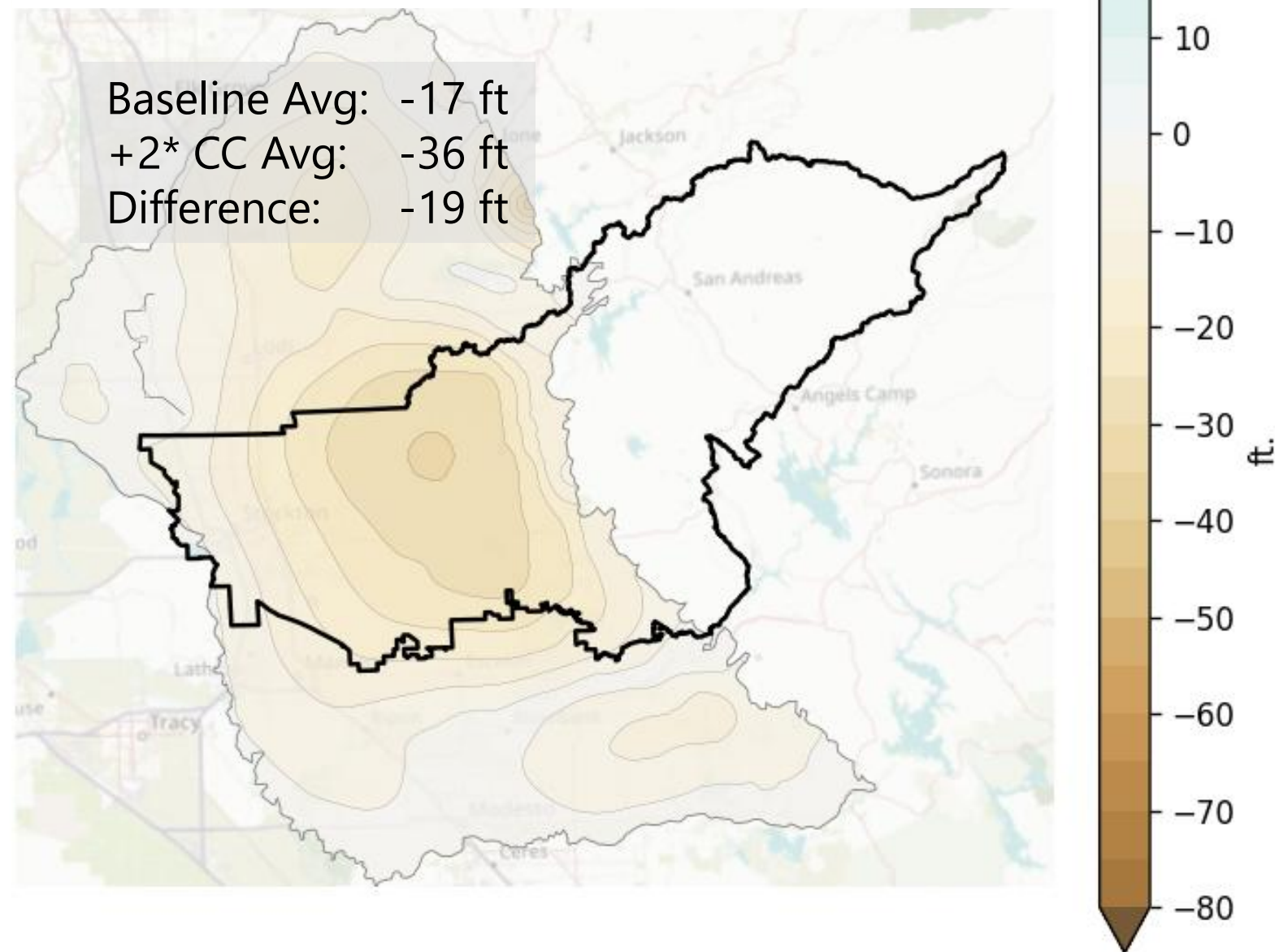


Calaveras Watershed Resilience Plan

Climate Change Impacts

Change in GWL after 50-year Simulation

Temperature = +2* Precipitation = 100%



Modeling Assumptions – Projects

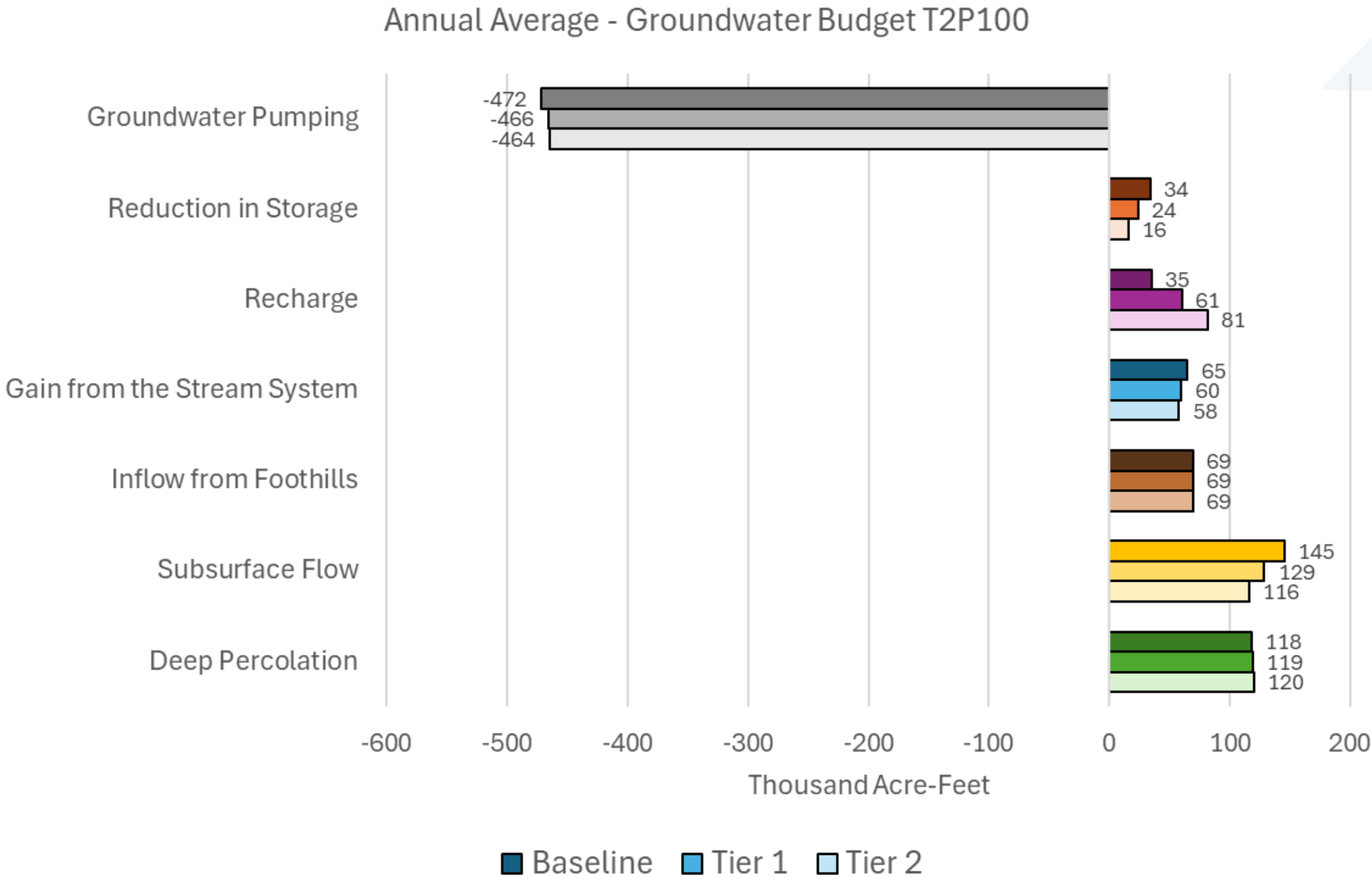
Project Name	Water Source	Recharge Type	Tier 1	Tier 2	Project Capacity	Tier 2 Avg Yield	
						T0P100	T2P100
Reg-02 & Clements pipeline (Ph1 + Ph2)	Calaveras WAFR	Direct	X	X	18,000	9,400	7,900
	Calaveras Contract	In-Lieu	X	X	1,500	800	700
Surface Water Expansion	Calaveras and Stanislaus	In-Lieu	X	X	13,500	7,000	6,000
West Groundwater Recharge Basin	Calaveras and Stanislaus	Direct	X	X	16,000	8,300	7,100
Flood-MAR	Calaveras WAFR	Direct	X	X	20,800	10,900	9,200
Beckman ASR Well	Mokelumne	Direct	X	X	300	200	100
West Linden Project	Calaveras and Mokelumne	Direct	X	X	11,600	6,000	5,100
Reg-03	Spills	Direct	X	X	1,000	500	400
Reg-05	Spills	Direct	X	X	300	200	100
Demartini Pipeline	Calaveras WAFR	Direct		X	3,100	1,600	1,400
	Calaveras Contract	In-Lieu		X	800	400	300
Houston Pipeline	Calaveras Contract	Direct		X	2,200	1,200	1,000
	Calaveras Contract	In-Lieu		X	1,200	600	500
Mosher Pipeline	Calaveras Contract	Direct		X	1,400	700	600
	Calaveras Contract	In-Lieu		X	500	200	200
Mosher Creek Recharge Basin	Calaveras Contract and WAFR	Direct		X	19,300	8,300	6,900
East Mosher Creek Recharge Area	Calaveras Contract and WAFR	Direct		X	16,600	7,100	5,900
Total					128,100	63,400	53,400

Tier 1

Tier 2

Model Results – T2P100

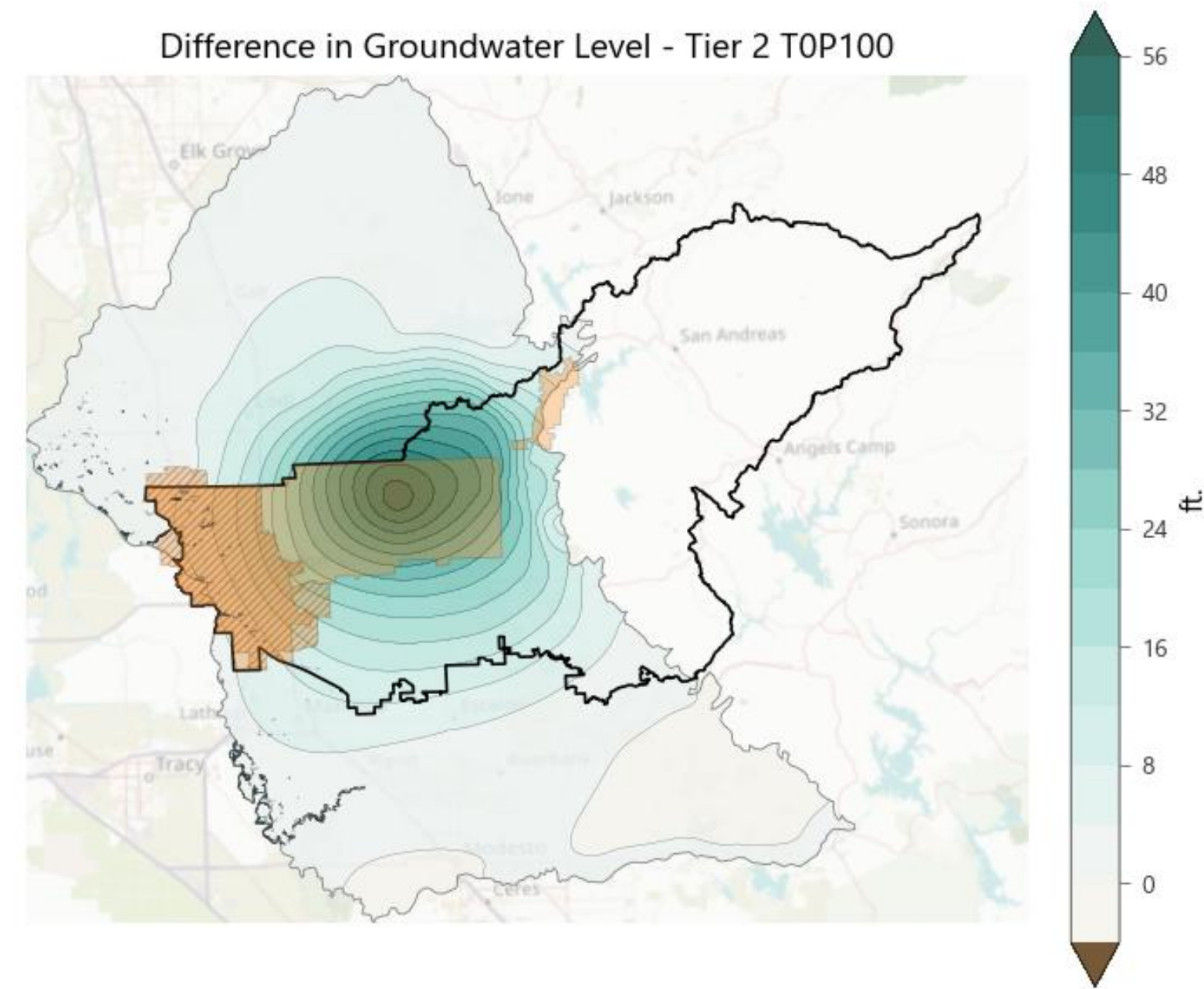
Project Impact + Climate Change Impact



Component	Tier 1 Change (AFY)	Tier 2 Change (AFY)
Projects Yield	31,800	53,400
Deep Percolation	+1,000	+1,500
Inflow from foothills	0	0
Boundary Conditions	-800	-1,300
Recharge	+25,300	+46,200
Groundwater Pumping	-6,000	+7,600
Gain from Stream	-5,200	-7,500
Subsurface flow from adjacent areas	-16,400	-29,000
Change in GW storage	+10,000	+17,800

Groundwater Level Contours

Difference in GWLs after 50-year simulation period



Comparison against Baseline and Climate Scenario (ft.)

Climate Change	Scenario	Calaveras Watershed	Non-District	SEWD	CCWD	City of Stockton	GDE
T0P100	No-Action	0	0	0	0	0	0
T0P100	Tier 1	+11	+9	+15	+6	+6	+4
T0P100	Tier 2	+21	+16	+27	+13	+10	+6
T2P100	No-Action	-20	-20	-20	-9	-11	-8
T2P100	Tier 1	-9	-11	-6	-3	-6	-5
T2P100	Tier 2	0	-5	+6	+2	-2	-3

Summary and Key Findings

Key Climate Change Risk



Increased water demand (+3.8%)
Evapotranspiration (+3.2%)



No change in average precipitation (+0%)
Increased extreme precipitation (+14%)



Greater flood risk (+3%)
Reduced surface water deliveries (-13%)



Reduced aquifer storage (-117%)
groundwater levels (-20 feet)



Wildfire risk concentrated in upper watershed

Adaptation Strategies Make a Difference

Water Supply Reliability

- 8,800 AFY of surface water

Groundwater Sustainability

- 55,000 AFY of recharge
- 18,000 AFY of increase storage

Wildfire Intensity and Erosion

- Reduces burn probability (24%)

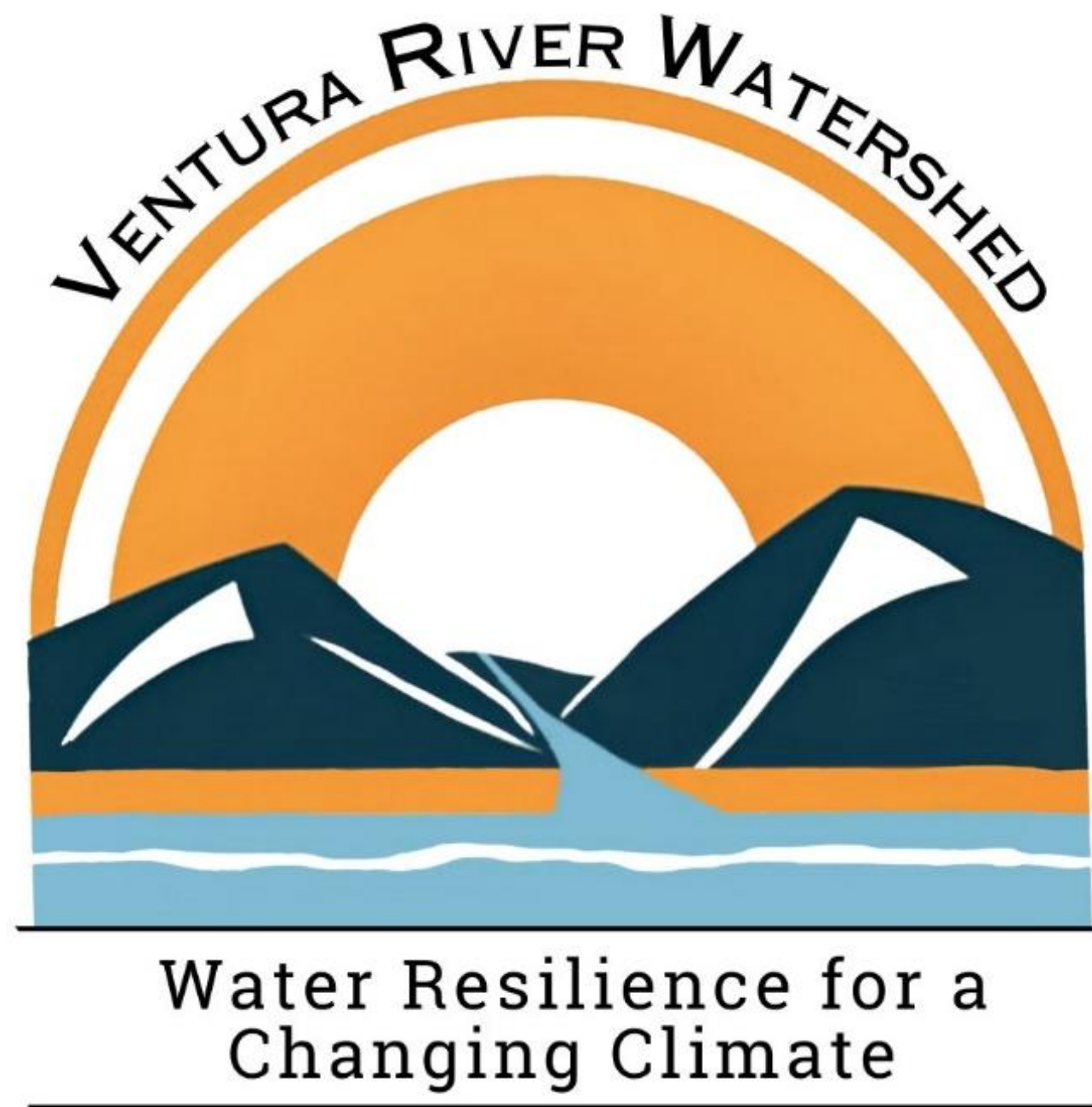
Flood Risk

- Reduces peak daily flows (44%)



Calaveras River Watershed Resilience Plan

April 20, 2026



Ventura River WRP

LESSONS LEARNED FROM LEVERAGING
EXISTING MODELS AND COMMUNITY
EXPERIENCE TO EXAMINE CLIMATE
RESILIENCE OPPORTUNITIES

Watershed Overview

Population

- 43,800 people

Area

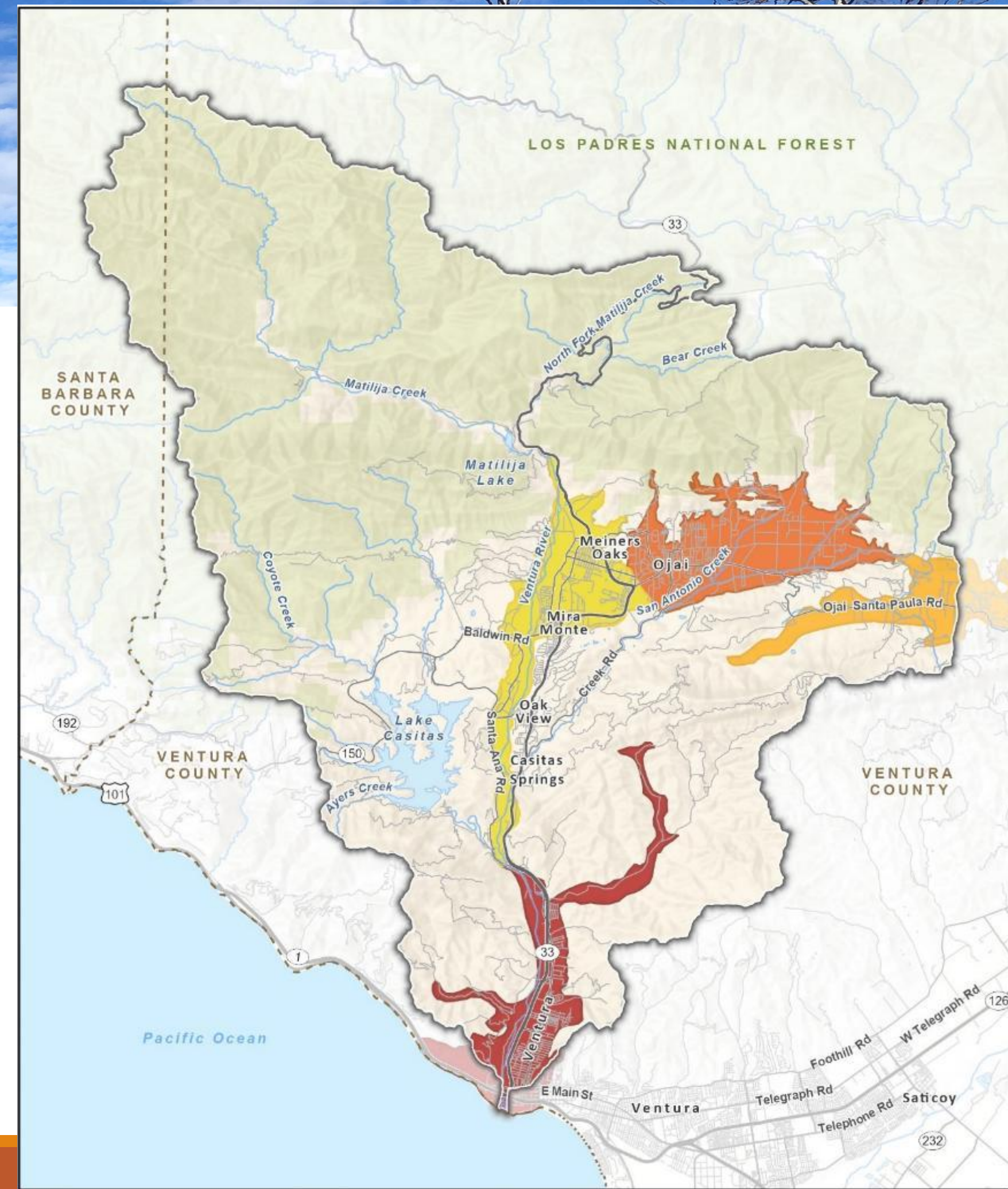
- 226 sq mi

Elevation

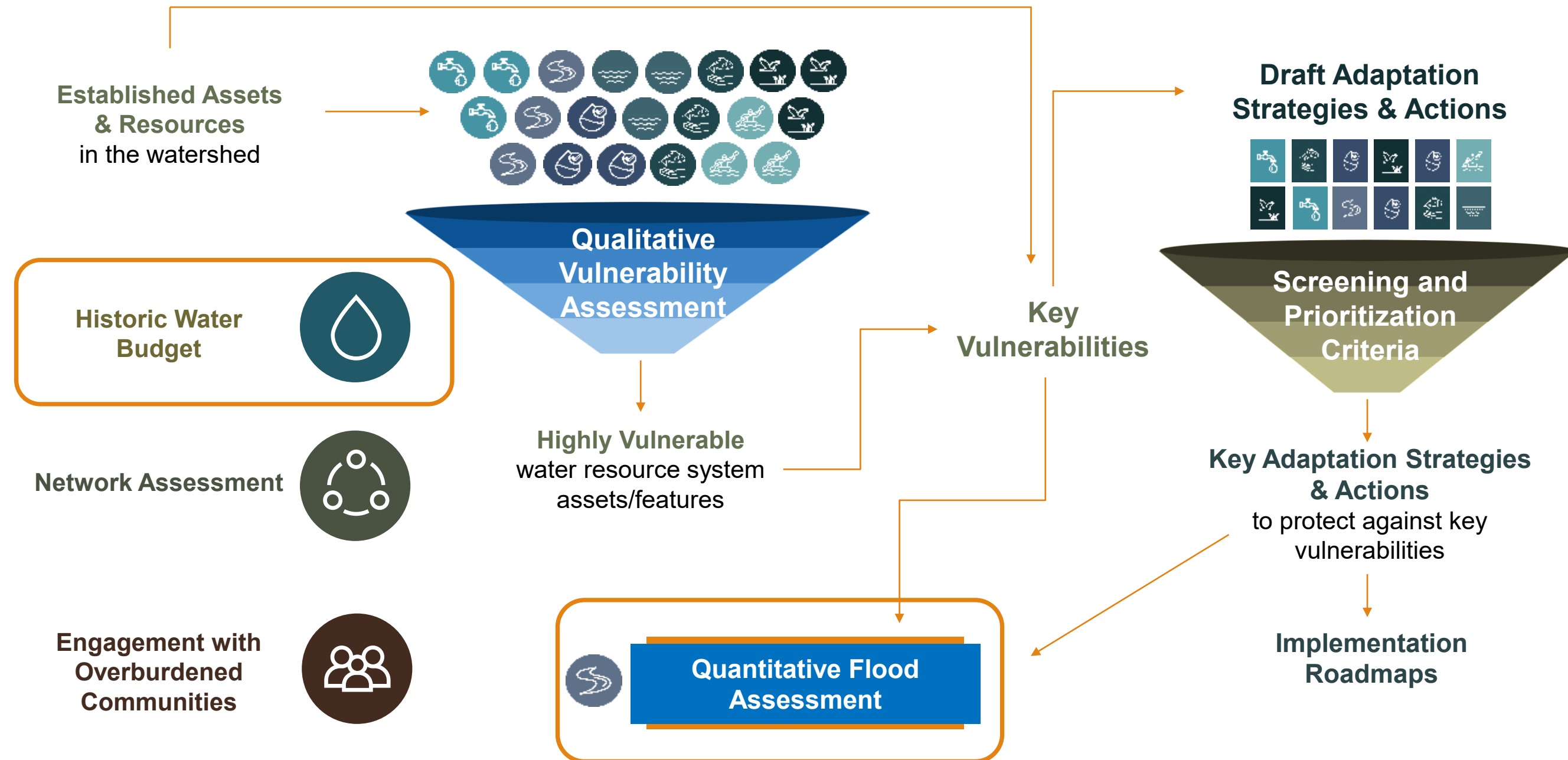
- Highest: 6,010 ft
- Lowest: sea-level

Jurisdictions

- Forest Service: 47.7%
- Counties: 49.1% Ventura, 3.9% Santa Barbara
- Cities: 1.9% Ojai, 1.2% Ventura



Project Overview



Ventura's Approach

Recent Historical Water Budget

- GSFLOW outputs mapped to water budget components
- Future studies could analyze pre-development historical, future climate, etc.

Flood Assessment: sophisticated runoff analysis

- VIC hydrologic projections
- Hydraulic interpretation in case studies

Contributions

- Demonstrated use of data that was not accessible before
- Developed and distilled new data products for the watershed
- Coalesced watershed around adaptation ideas in a non-regulatory environment

Existing Models

State Models

- **Climate projections -> CCCA5 LOCA2-Hybrid CMIP6**
- **Hydrologic projections -> CCCA5 VIC**
- **Costal storm projections -> CoSMoS**

Local Models

- GW & SW models
- **Integrated GW-SW models -> GSFLOW**
- **Hydraulic models -> FEMA HEC-RAS**
- Sediment transport models
- Water supply models

→ **Historical Water Budget**

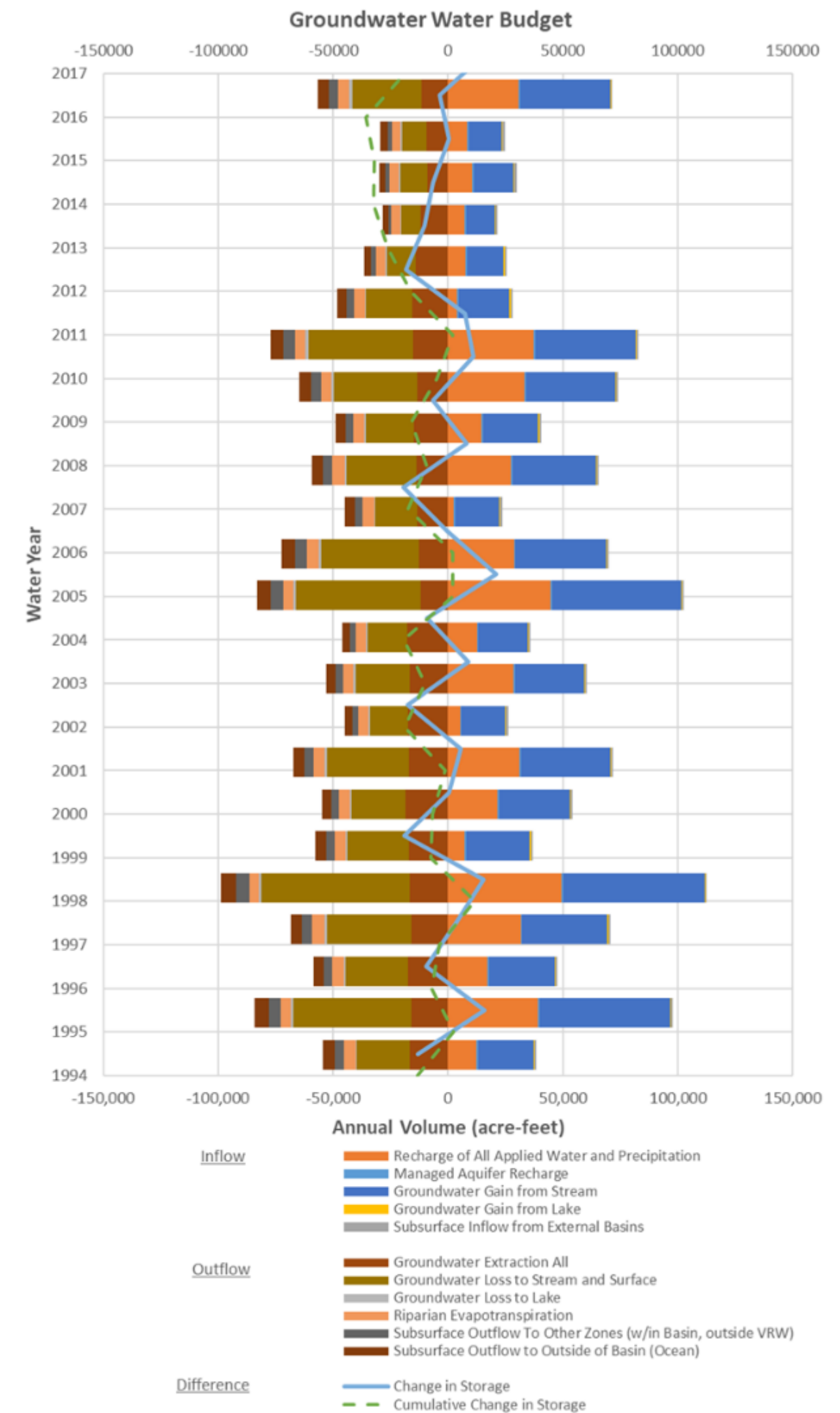
Historical Water Budget

Recent-Historical Water Budgets

- Total
- Land
- Surface water
- Groundwater
 - 4 groundwater subbasins

Method

- Group GSFLOW output variables by water budget component
- Synthesize vulnerabilities & relate to adaptation strategies



Flow Type	Origin/ Destination	Component
Inflow	Between Systems	Recharge of Applied Water
Inflow	Between Systems	Recharge of Precipitation
Inflow	Between Systems	Managed Aquifer Recharge
Inflow	Between Systems	Groundwater Gain from Stream
Inflow	Between Systems	Groundwater Gain from Lake
Inflow	Between Systems	Conveyance Seepage
Inflow	Into Zone	Subsurface Inflow
Inflow	Into Zone	Water Release Caused by Land Subsidence
Inflow	<i>Total Inflow</i>	
Outflow	Between Systems	Groundwater Extraction
Outflow	Between Systems	Stored Water Extraction
Outflow	Between Systems	Groundwater Loss to Stream
Outflow	Between Systems	Groundwater Loss to Lake
Outflow	Out of Zone	Subsurface Outflow
Outflow	Out of Zone	Groundwater Export
Outflow	Out of Zone	Stored Water Export
Outflow	<i>Total Outflow</i>	
Storage Change	Change in Groundwater Storage	

Example Water Budget Components

Flow Type	Water Budget Component	GSFLOW Output Variable(s)
Inflow	Recharge of Applied Water and Precipitation	RechargeUnsat2Sat_Q
Inflow	Managed Aquifer Recharge	<i>Calculated OWTS Recharge¹</i>
Inflow	Groundwater Gain from Stream	SFR_To_GW (LIST_File)
Inflow	Groundwater Gain from Lake	LAK_To_GW (LIST_File)
Inflow	Conveyance Seepage	N/A
Inflow	Subsurface Inflow	GHB_In (LIST_File)
Inflow	Water Release from Land Subsidence	N/A
Outflow	Groundwater Extraction	NetWellFlow_Q
Outflow	Stored Water Extraction	N/A
Outflow	Riparian Evapotranspiration	SatET_Q
Outflow	Groundwater Loss to Stream	GW_To_SFR (LIST_File)
Outflow	Groundwater Loss to Lake	GW_To_LAK (LIST_File)
Outflow	Subsurface Outflow ¹	NetBoundaryFlow2Sat_Q
Outflow	Subsurface Outflow to Ocean	CHD_Out (LIST_File)
Outflow	Groundwater Export	N/A
Outflow	Stored Water Export	N/A
	Change in Storage	Sat_S

Note:

1. Onsite Wastewater Treatment System (OWTS) flow reflected as MAR quantity. Calculation from VRW GW-SW Model post-processed GSFLOW output files.

Key:

N/A = Not applicable: Water budget components are not included because their flows are either negligible in the Ventura River Watershed or cannot be represented in GSFLOW.

Not used: The Water Budget Components defined in the DWR Water Budget Handbook as “Within System” are not applied (i.e. “not used”), as use would lead to double-counting of flows within the water budget.

Example Water Budget Components

Adaptation Strategies

Characteristic / Vulnerability	Description	Adaptation Measure(s)	Strategy(ies)
Primary water source dependency	The watershed relies on precipitation as its main water source, creating vulnerability under climate change	Diversify water sources	2.3
Limited water storage	Storage capacity is constrained by geology and topography; Lake Casitas is the only major reservoir	Expand water storage and conservation programs	2.2, 2.3
Interconnected water systems	Groundwater and surface water are highly interconnected and jointly used by many users	Improve equitable water resource management	1.3, 2.2
Variable groundwater recharge	Recharge depends on water-year type; aquifers have limited storage	Infiltrate elevated runoff to increase recharge where feasible	1.2, 4.2
Limited managed aquifer recharge	Recharge is currently limited to supply from a wastewater treatment system	Diversify and expand infiltration and recharge opportunities	1.2, 4.2
Major water outflows	Significant losses from evapotranspiration	Reduce inefficient water use (e.g., invasive species, overwatering, water-intensive plants)	1.4, 2.2, 6.1, 6.2, 6.3
Major water outflows	Significant losses from discharge to ocean	Increase permeable areas (e.g., parks, green infrastructure, infiltration basins) where feasible	3.2, 4.2, 5.1

Existing Models – Lessons Learned

Statewide Models

- Climate projections -> CCCA5 LOCA2-Hybrid CMIP6
- Hydrologic projections -> CCCA5 VIC
- Coastal storm projections -> CoSMoS

Local Models

- GW & SW models
- Integrated GW-SW models -> GSFLOW
- Hydraulic models -> FEMA HEC-RAS
- Sediment transport models
- Water supply models

Advantages:

leverage previous work

Challenges:

not duplicating planned/ongoing work, but complementing

Existing Models

Statewide Models

- Climate projections -> CCCA5 LOCA2-Hybrid CMIP6
- Hydrologic projections -> CCCA5 VIC
- Coastal storm projections -> CoSMoS

→ Hydrologic Projections

Local Models

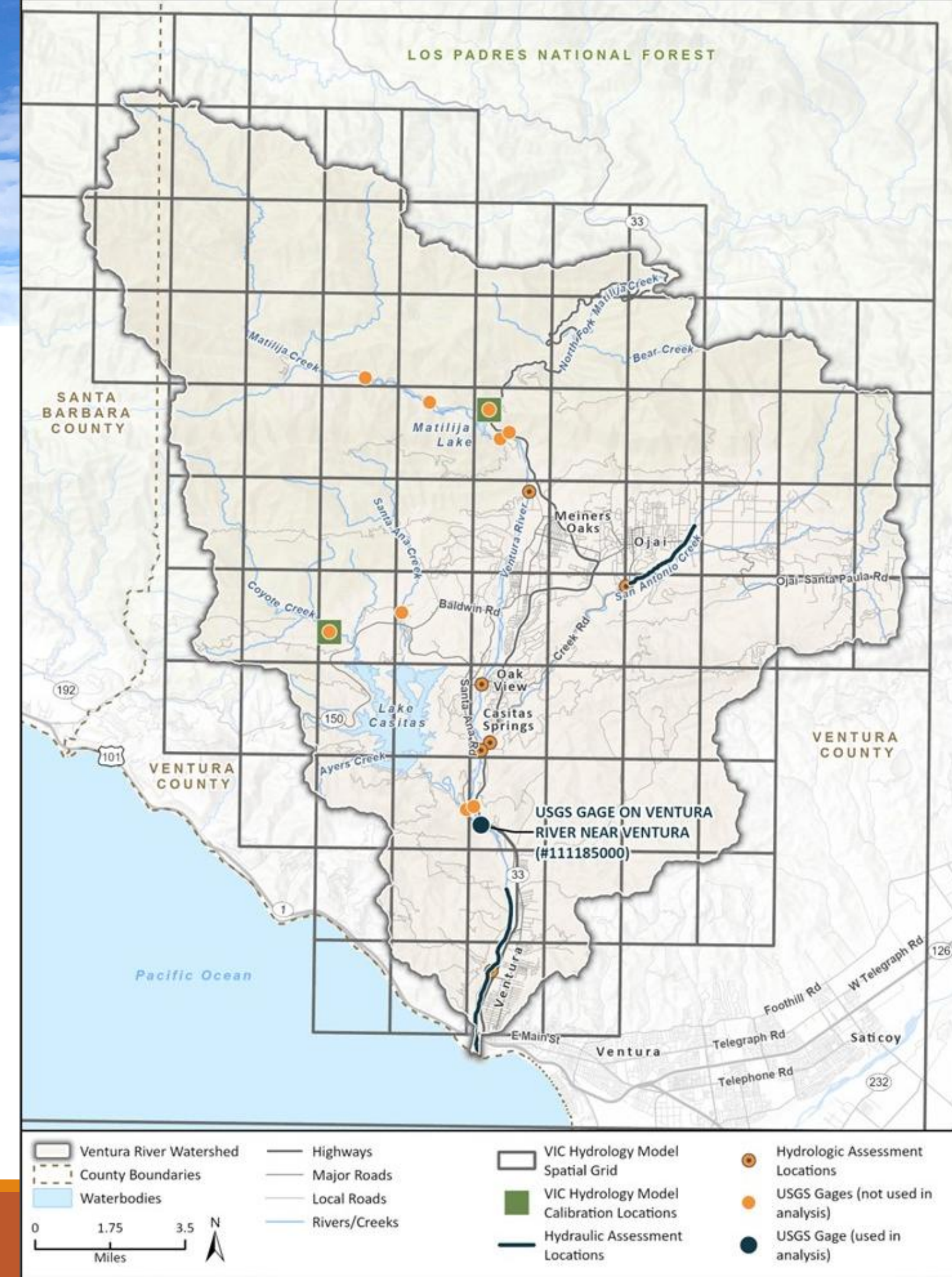
- GW & SW models
- Integrated GW-SW models -> GSFLOW
- Hydraulic models -> FEMA HEC-RAS
- Sediment transport models
- Water supply models

→ Hydraulic Assessment

Flood Assessment

Assessment Locations

- 1 representative stream gauge
- 6 hydrologic assessment locations
- 2 hydraulic assessment locations
- 2 projected future periods

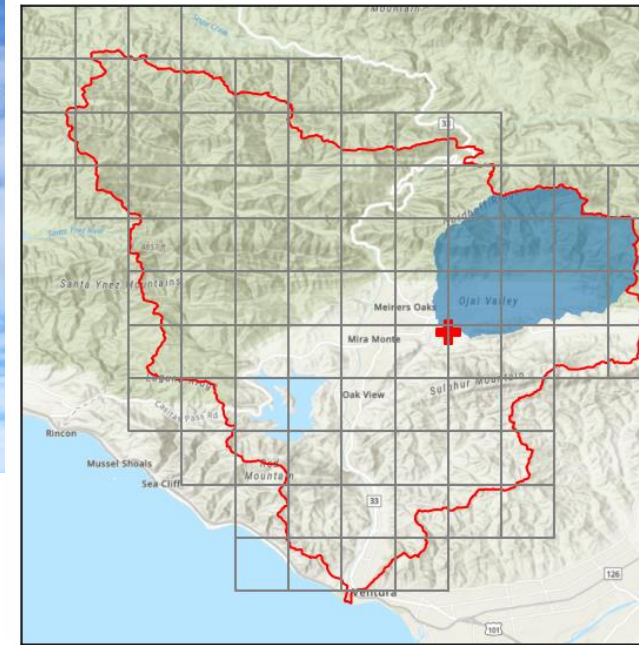


Hydrologic Projections

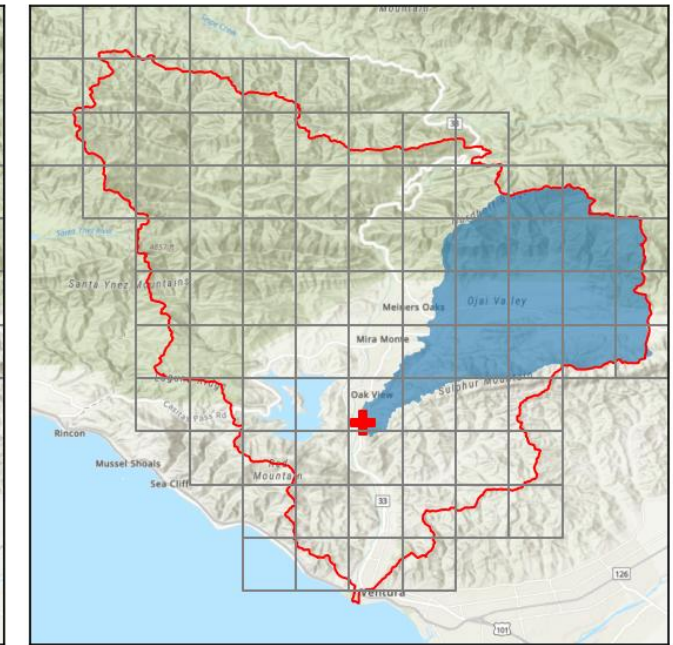
6 locations

- Span upper and lower watershed locations
- Flood response varies with catchment size
- Smaller upstream catchments show larger % increases

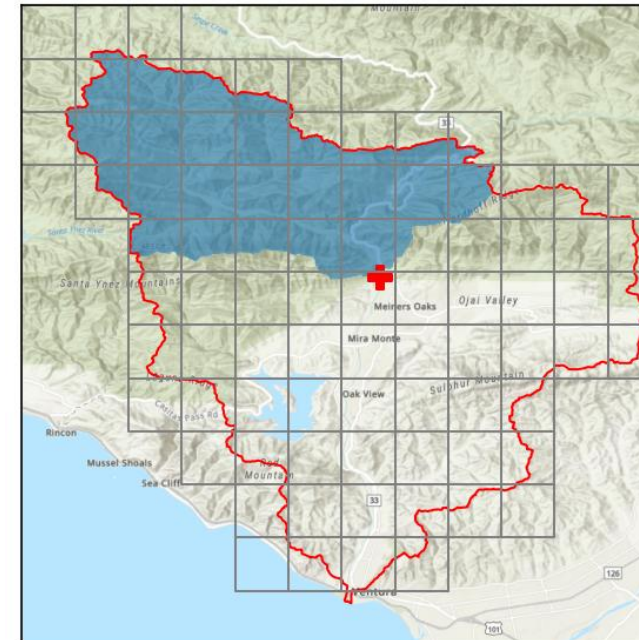
San Antonio Creek



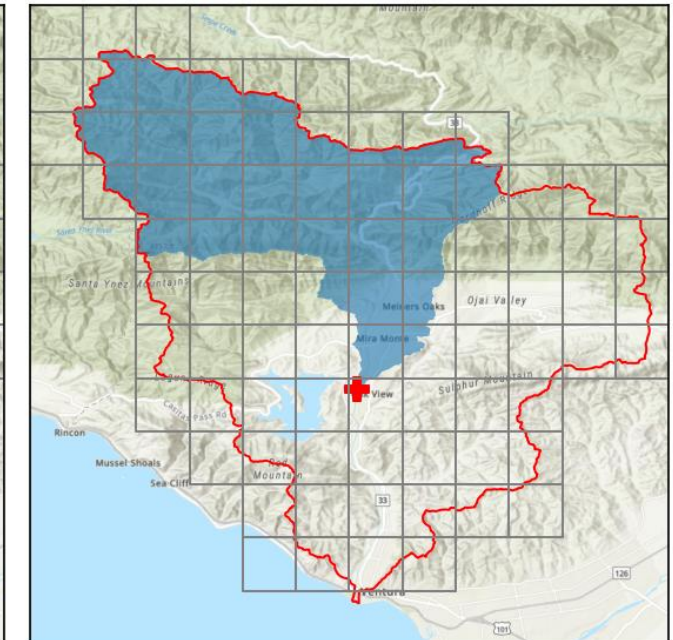
San Antonio Creek near Ventura River Confluence



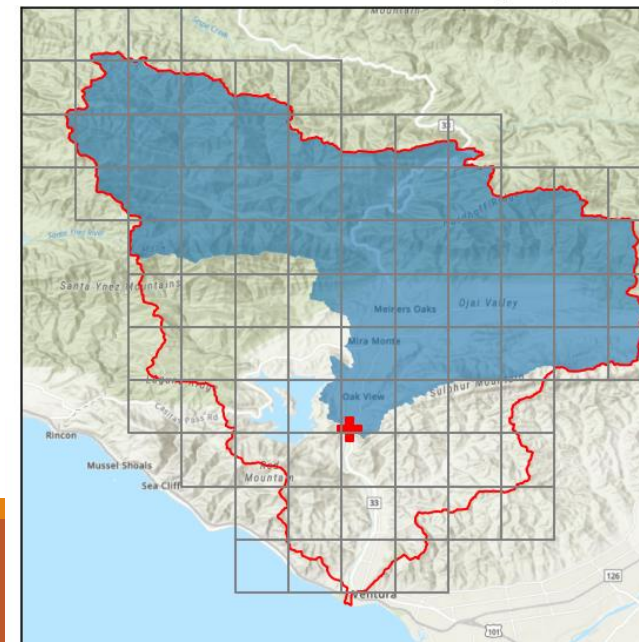
Ventura River at Robles Diversion



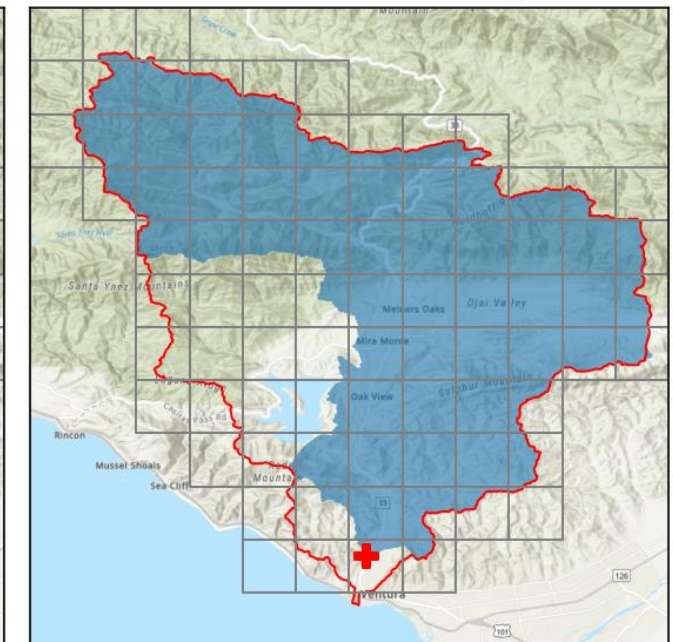
Ventura River at Santa Ana Blvd



Ventura River near Casitas Springs



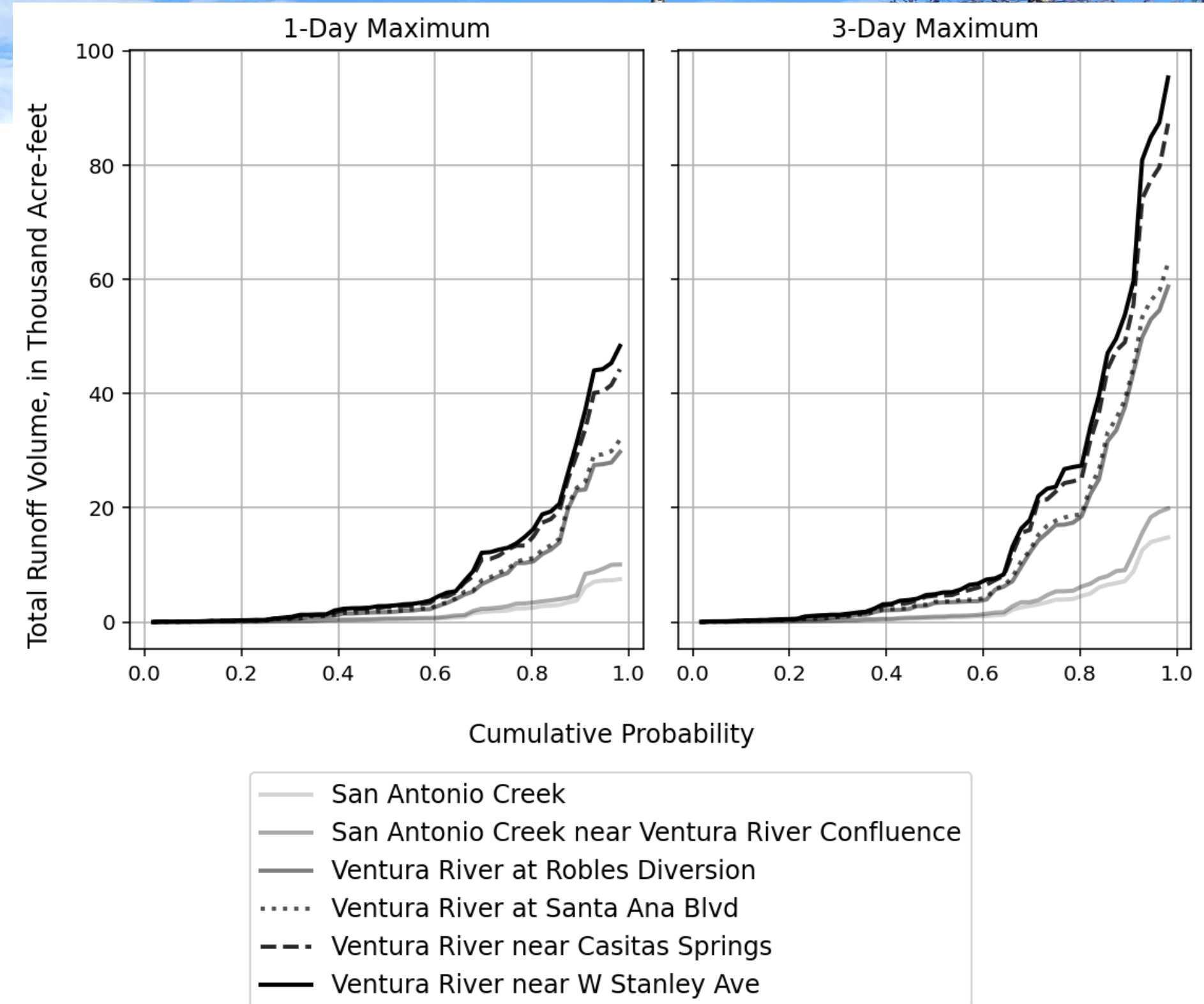
Ventura River near W Stanley Ave



Hydrologic Projections

6 locations

- Span upper and lower watershed locations
- Flood response varies with catchment size
- Smaller upstream catchments show larger % increases



Runoff Change Analysis

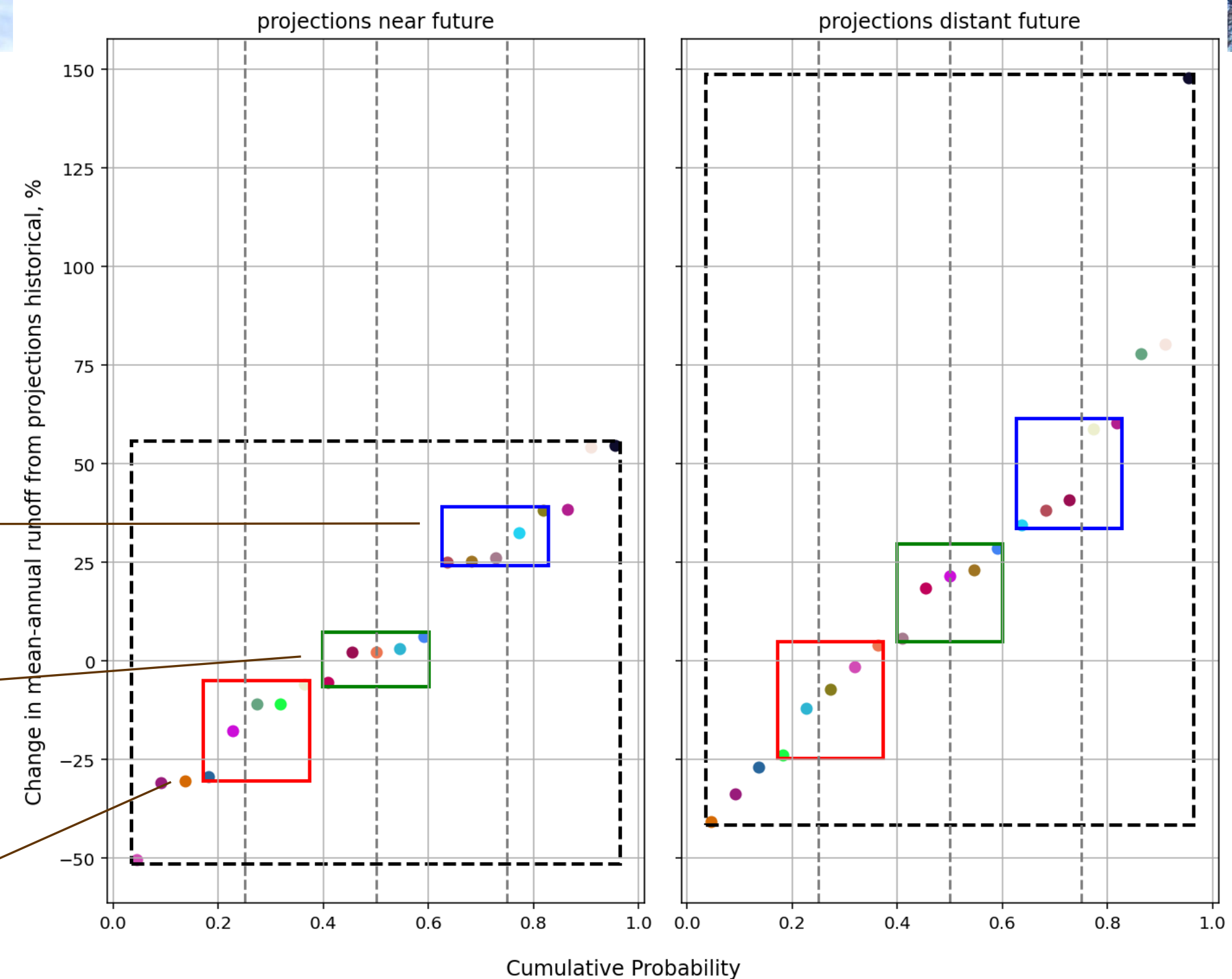
Methods

- Distinguished between near & distant-future periods
- Analyzed groups of projections to emphasize trends
- Analyzed different sampling methods

High

Medium

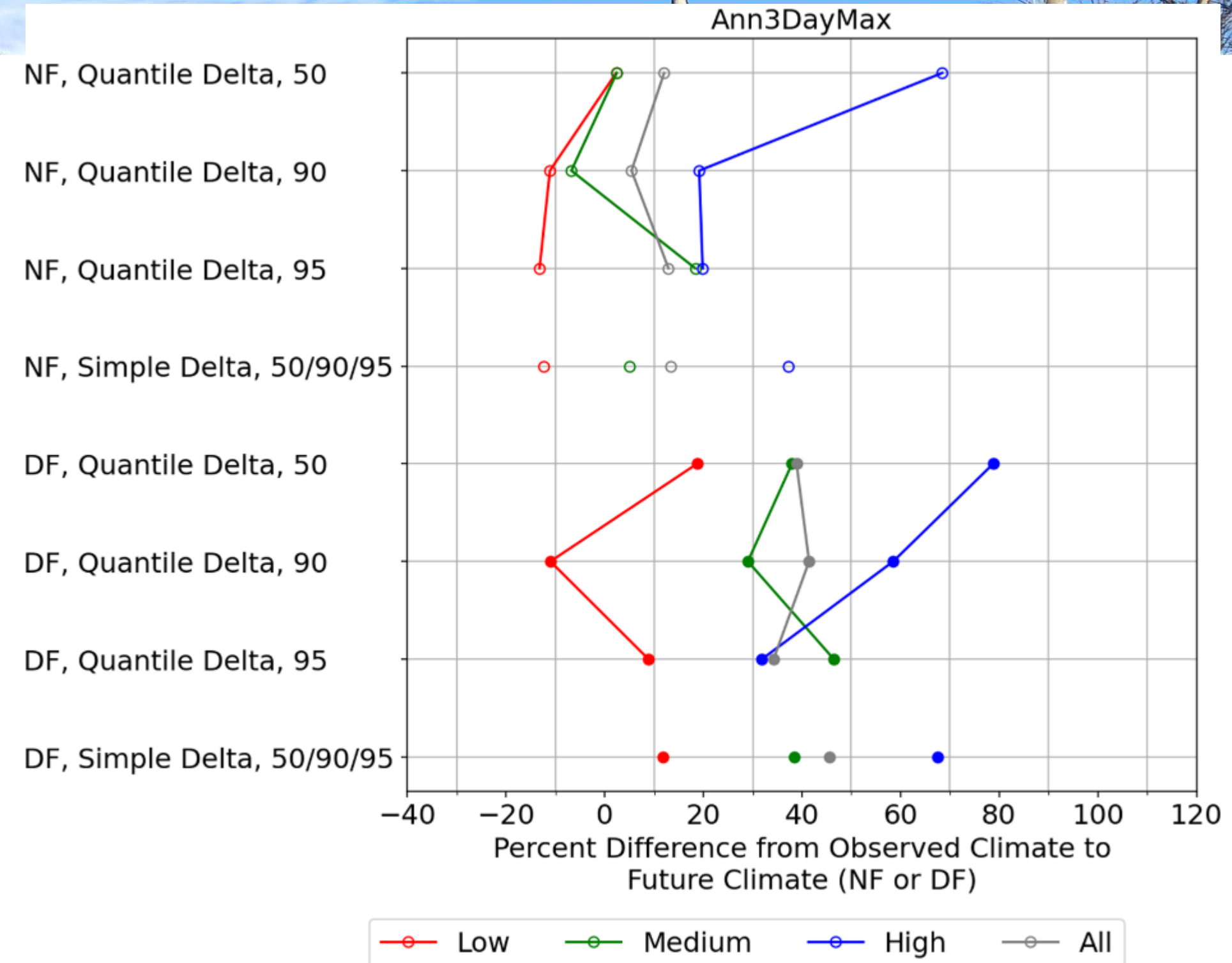
Low



Runoff Change Analysis

Methods

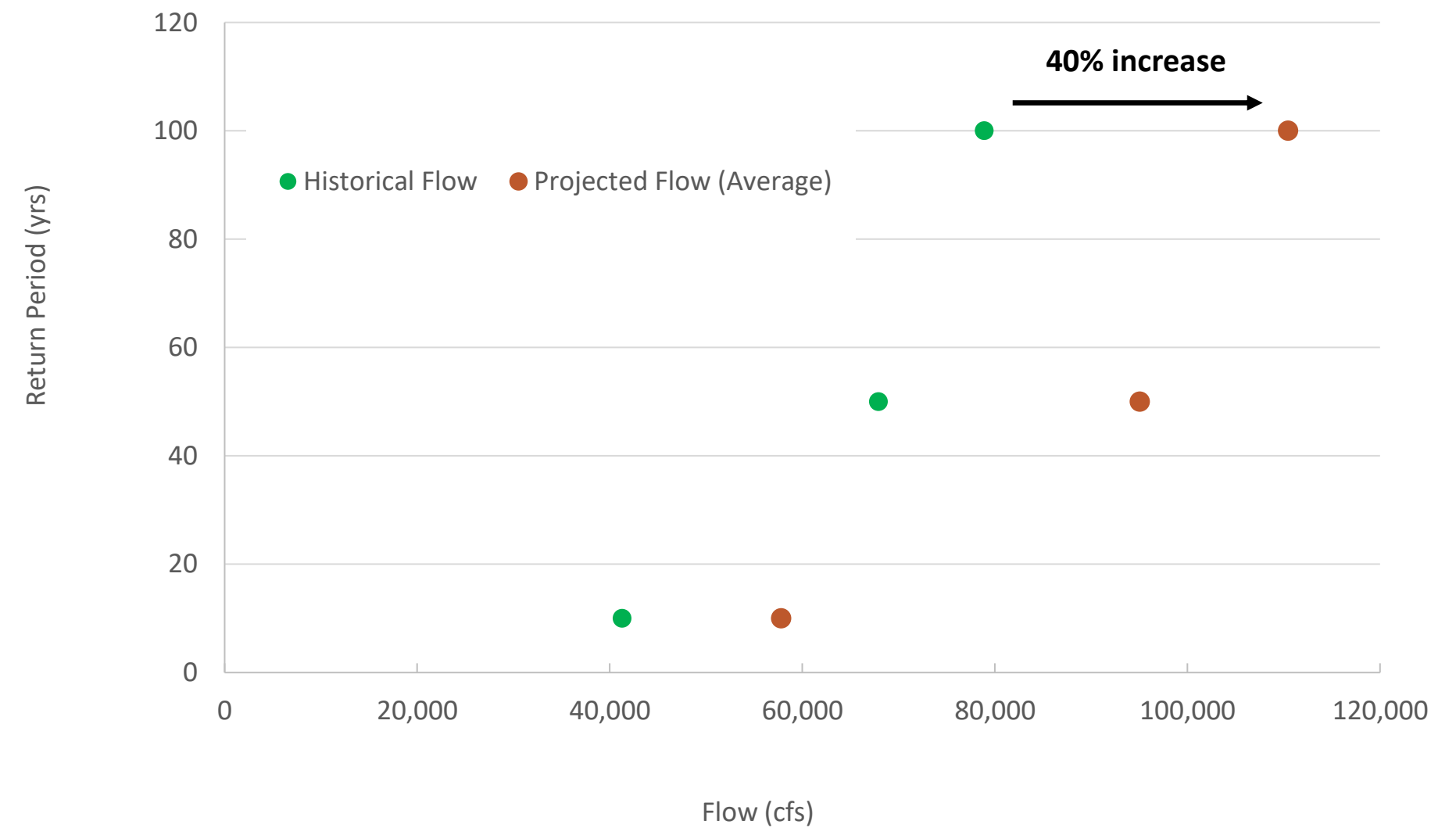
- Distinguished between near & distant-future periods
- Analyzed groups of projections to emphasize trends
- Analyzed different sampling methods



Hydraulic Analysis

Interpretation of hydrologic projections

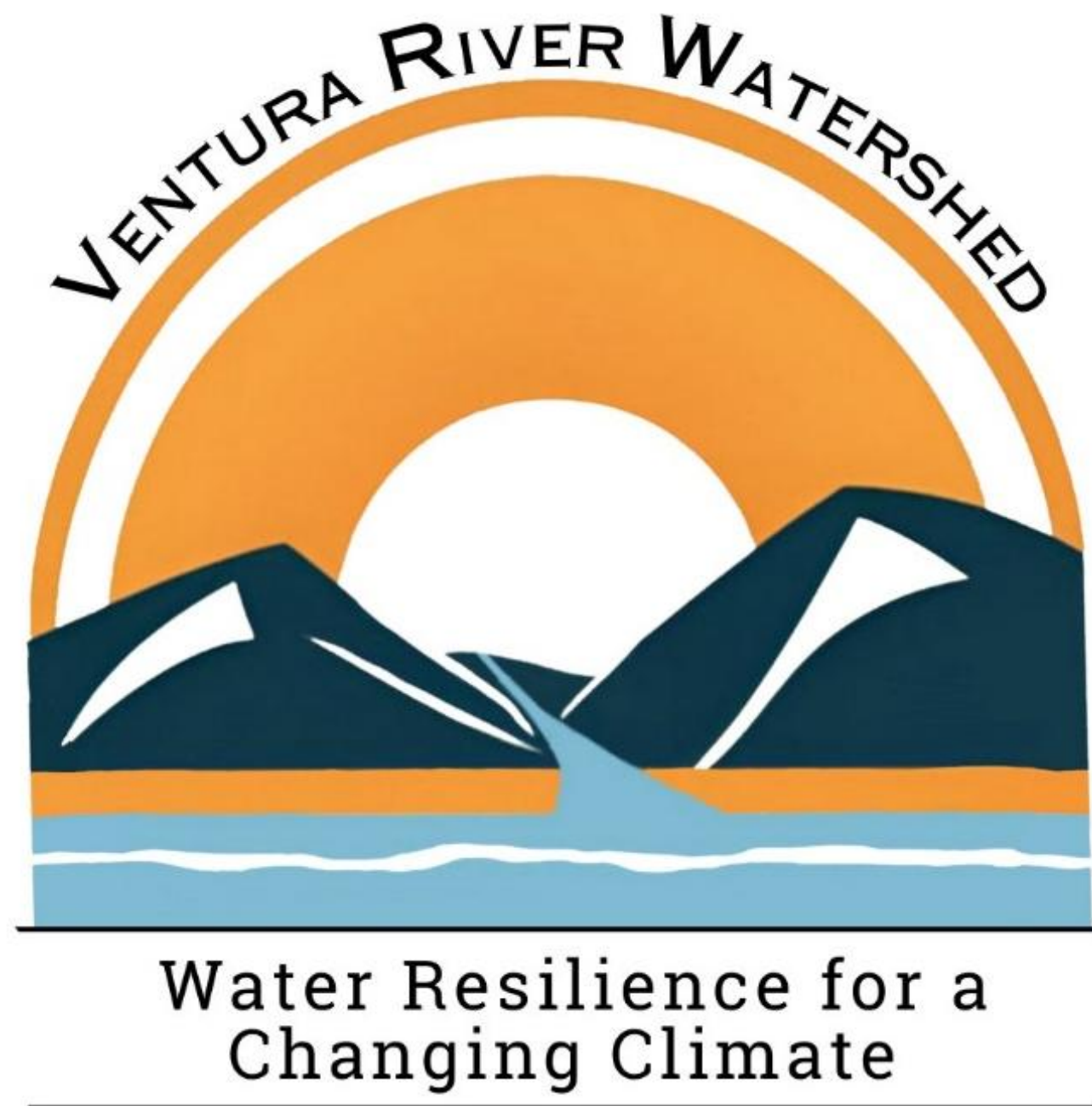
- Utilized stage-discharge relationships
- Leveraged existing FEMA models



Lower watershed example location

Key Characteristic / Vulnerability	Description	Adaptation Measure(s)	Strategy(ies)
Increasing peak flow magnitude	Annual peak flow events are projected to increase in magnitude by the end of the century	Modernize infrastructure design criteria to address increased runoff	4.1
Elevated flood depths	Flood depths are expected to increase in areas adjacent to rivers during flood events	Mitigate flood impacts in developed areas via non-structural adaptation	4.2
Consistent timing of flow events	Peak flow timing (winter and early spring) and duration are expected to remain relatively consistent	Pursue managed recharge or increase natural recharge potential where feasible	4.2
Increasing flood vulnerability	Overall vulnerability to flooding is projected to increase significantly by the end of the century	Refine emergency response plans	7.2

Adaptation Strategies



Ventura River WRP

LESSONS LEARNED FROM LEVERAGING
EXISTING MODELS AND COMMUNITY
EXPERIENCE TO EXAMINE CLIMATE
RESILIENCE OPPORTUNITIES