



...A United Voice for the Santa Ana River Watershed

OWOW Steering Committee Members

Brenda Dennstedt, Convener | SAWPA Commissioner
T. Milford Harrison, SAWPA Commissioner
Vicente Sarmiento, Orange County Supervisor
Karen Spiegel, Riverside County Supervisor
Jesse Armendarez, San Bernardino County Supervisor
James Hessler, Altman Plants

Garry W. Brown, Orange County Coastkeeper
William Ruh, Regional Water Quality Control Board
Deborah Robertson, Mayor, City of Rialto
Wes Speake, Councilmember, City of Corona
Nicholas Dunlap, Mayor Pro Tem, City of Fullerton

THIS MEETING WILL BE CONDUCTED IN A HYBRID FORMAT, OFFERING BOTH VIRTUAL PARTICIPATION AND IN-PERSON ATTENDANCE, PROVIDING AN OPPORTUNITY FOR PUBLIC COMMENT. ALL VOTES TAKEN WILL BE CONDUCTED BY ORAL ROLL CALL.

Meeting Access Via Computer (Zoom):	Meeting Access Via Telephone:
<ul style="list-style-type: none"> https://sawpa.zoom.us/j/86063847782 	<ul style="list-style-type: none"> 1 (669) 900-6833
<ul style="list-style-type: none"> Meeting ID: 860 6384 7782 	<ul style="list-style-type: none"> Meeting ID: 860 6384 7782

**REGULAR MEETING OF THE
OWOW STEERING COMMITTEE
SAWPA, 11615 STERLING AVENUE, RIVERSIDE, CA 92503**

THURSDAY, MARCH 28, 2024 – 11:00 A.M.

AGENDA

- CALL TO ORDER | PLEDGE OF ALLEGIANCE (Brenda Dennstedt, Convener)**
- ROLL CALL**
- PUBLIC COMMENTS**

Members of the public may address the Committee on items within the jurisdiction of the Committee; however, no action may be taken on an item not appearing on the agenda unless the action is otherwise authorized by Government Code §54954.2(b).

Members of the public may make comments in-person or electronically for the Committees' consideration by sending them to publiccomment@sawpa.gov with the subject line "Public Comment". Submit your electronic comments by 5:00 p.m. on Wednesday, March 27, 2024. All public comments will be provided to the Chair and may be read into the record or compiled as part of the record. Individuals have a limit of three (3) minutes to make comments and will have the opportunity when called upon by the Committee.

- ITEMS TO BE ADDED OR DELETED**

Pursuant to Government Code §54954.2(b), items may be added on which there is a need to take immediate action and the need for action came to the attention of the Santa Ana Watershed Project Authority subsequent to the posting of the agenda.



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5. CONSENT CALENDAR

All matters listed on the Consent Calendar are considered routine and non-controversial and will be acted upon by the Committee by one motion as listed below.

A. APPROVAL OF MEETING MINUTES: NOVEMBER 16, 2023.....5
Recommendation: Approve as posted.

B. GRANT ADMINISTRATION UPDATE9
Recommendation: Approve as posted

6. BUSINESS ITEMS

A. GRANT FUNDED PROJECT HIGHLIGHTS: REPLENISH BIG BEAR PROJECT (SC#2024.1).....31
Presenter: Marie Jauregui
Recommendation: Receive and file.

B. INTEGRATED CLIMATE ADAPTATION AND RESILIENCY PROGRAM REGIONAL RESILIENCE PLANNING AND IMPLEMENTATION GRANT PROGRAM AWARD AND DEVELOPMENT OF THE SANTA ANA RIVER WATERSHED CLIMATE ADAPTATION AND RESILIENCE PLAN (SC#2024.2)..... 51
Presenter: Rachel Gray
Recommendation: Receive and file.

C. OVERVIEW OF HEADWATERS RESILIENCY PARTNERSHIP AND FOREST FIRST JOINT PRESENTATION BETWEEN SAWPA AND SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT (SC#2024.3) 69
Presenter: Rachel Gray
Recommendation: Receive and file.

D. WEATHER MODIFICATION PILOT PROGRAM UPDATE (SC#2024.4).....97
Presenter: Rachel Gray
Recommendation: Receive and file.

7. GENERAL MANAGER REPORT

8. CHAIR’S COMMENTS/REPORT

9. COMMITTEE MEMBERS’ COMMENTS

10. REQUEST FOR FUTURE AGENDA ITEMS

11. ADJOURNMENT



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PLEASE NOTE:

Americans with Disabilities Act: Meeting rooms are wheelchair accessible. If you require any special disability related accommodations to participate in this meeting, please contact (951) 354-4220 or zramirez@sawpa.gov. Notification at least 48 hours prior to the meeting will enable staff to make reasonable arrangements to ensure accessibility for this meeting. Requests should specify the nature of the disability and the type of accommodation requested.

Materials related to an item on this agenda submitted to the Committee after distribution of the agenda packet are available for public inspection during normal business hours at the SAWPA office, 11615 Sterling Avenue, Riverside, and available at www.sawpa.org, subject to staff's ability to post documents prior to the meeting.

Declaration of Posting

I, Zyanya Ramirez, Executive Assistant II for the Santa Ana Watershed Project Authority declare that on March 21, 2024, a copy of this agenda has been uploaded to the SAWPA website at www.sawpa.gov and posted at the SAWPA office, 11615 Sterling Avenue, Riverside, California.

2024 OWOW Steering Committee Regular Meetings

Fourth Thursday of Every Other Month (January, March, May, July, September, November)
 (Note: All meetings begin at 11:00 a.m., unless otherwise noticed, and are held at SAWPA.)

January 1/25/24 Regular Committee Meeting [cancelled]	March 3/28/24 Regular Committee Meeting
May 5/23/24 Regular Committee Meeting	July 7/25/24 Regular Committee Meeting
September 9/26/24 Regular Committee Meeting	November 11/21/24* Regular Committee Meeting*

* Meeting date adjusted due to conflicting holiday.

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...A United Voice for the Santa Ana River Watershed

OWOW STEERING COMMITTEE
REGULAR MEETING MINUTES
November 16, 2023

Committee Members	
<u>Santa Ana Watershed Project Authority Representatives</u>	
Brenda Dennstedt, Convener, Western Municipal Water District	Present
T. Milford Harrison, San Bernardino Valley Municipal Water District	Present
<u>County Supervisor Representatives</u>	
Vicente Sarmiento, Orange County Board of Supervisors	Absent
Karen Spiegel, Riverside County Board of Supervisors	Absent
Jesse Armendarez, San Bernardino County Board of Supervisors	Present
<u>County Municipal Representatives</u>	
Deborah Robertson, Mayor, City of Rialto	Absent
Wes Speake, Councilmember, City of Corona	Present
Nicholas Dunlap, Mayor Pro Tem, City of Fullerton	Absent
<u>Business Community Representative</u>	
James Hessler, Director of West Coast Operations, Altman Plants	Present
<u>Environmental Community Representative</u>	
Garry W. Brown, President, Orange County Coastkeeper	Present
<u>Regional Water Quality Control Board Representative</u>	
William Ruh, Regional Water Quality Control Board	Present
Others Present	
<u>SAWPA COMMISSIONERS:</u>	Bruce Whitaker, Gil Botello
<u>SAWPA STAFF:</u>	Edina Goode, Ian Achimore, Jeff Mosher, John Leete, Marie Jauregui, Pete Vitt, Rachel Gray, Sara Villa, Zyanya Ramirez
<u>OTHERS PRESENT:</u>	Andrew D. Turner, Lagerlof LLP; Christy Suppes, Orange County Public Works; June Hayes, San Bernardino Valley Municipal Water District; Lisa Haney, Orange County Water District; Mallory O'Connor, Western Municipal Water District; Manuel Escamilla, County of Orange; Thomas Crowley, City of Rialto; Toyasha Sebbag, City of Rialto

The OWOW Steering Committee meeting was called to order at 11:05 a.m. by Brenda Dennstedt, Convener, at the Santa Ana Watershed Project Authority, 11615 Sterling Avenue, Riverside, CA 92503.



1. **CALL TO ORDER | PLEDGE OF ALLEGIANCE**

2. **PUBLIC COMMENTS**

There were no public comments; there were no public comments received via email.

3. **ITEMS TO BE ADDED OR DELETED**

4. **CONSENT CALENDAR**

A. **APPROVAL OF MEETING MINUTES: JULY 27, 2023**

Recommendation: Approve as posted.

B. **AMEND ONE WATER ONE WATERSHED PLAN UPDATE 2018 FOR STORMWATER PLAN PROJECTS (SC#2023.7)**

Recommendation: Approve as posted.

C. **PROPOSITION 84 AND 1 PROJECT STATUS**

Recommendation: Approve as posted.

MOVED, approve the Consent Calendar.

Result:	Adopted by Roll Call Vote
Motion/Second:	Rue/Speake
Ayes:	Armendarez, Brown, Dennstedt, Harrison, Hessler, Ruh
Nays:	None
Abstentions:	None
Absent:	Sarmiento, Spiegel, Robertson, Dunlap

5. **BUSINESS ITEMS**

D. **CALIFORNIA WATER PLAN UPDATE 2023 PUBLIC REVIEW DRAFT (SC#2023.8)**

Ian Achimore provided a presentation titled California Water Plan Update 2023 Public Review Draft, contained in the agenda packet pages 47-61.

The California Department of Water Resources (DWR) periodically updates the California Water Plan (Plan), mandated by Water Code Section 10005(a), to assess the state's water resources and demands. The latest iteration focuses on key themes: climate resiliency, equity, and watershed resiliency. Notably, it introduces the Watershed Resilience Program, funded by a \$161 million budget over four years, aimed at enhancing watershed climate resilience through grants for drought resilience and climate risk assessment on a watershed basis. SAWPA submitted a comment letter on the Plan. Currently, DWR seeks to fund pilot "watershed networks" to inform the development of a State-wide version of this grant program, further enhancing local water resource and climate planning efforts.

The final version of the Plan is said to be released by the end of 2024. DWR staff have recently stated that pilot watersheds will be announced after the final Plan is released. Jeff Mosher added that although the Santa Ana River Watershed would be an ideal region for the pilot project, SAWPA has not been able to gain insight on whether the Watershed is of interest.

This item was for discussion purposes; no action was taken on Agenda Item No. 5.A.

E. **GRANT FUNDED PROJECT HIGHLIGHTS**



Marie Jauregui provided a presentation titled Grant Funded Project Highlights contained in the agenda packet on pages 63-76. A status update of the following projects was presented:

- Proposition 84 – Integrated Watershed Projection Program
- Proposition 84 SARCCUP
- Proposition 1 Round 1 Ground water Replenishment System Final Expansion
- Proposition 1 Round 1 Raitt & Myrtle Park

This item was for discussion purposes; no action was taken on Agenda Item No. 5.B.

F. WATERSHED-WIDE BASIN MONITORING PROGRAM TASK FORCE UPDATE (SC#2023.9)

Ian Achimov provided a presentation titled Watershed-Wide Basin Monitoring Program Task Force Update, contained in the agenda packet on pages 79-96.

In accordance with the Santa Ana Basin Plan, as outlined in its 2004 Plan Amendment, the Basin Monitoring Program Task Force convened to address key monitoring-related tasks mandated by the Santa Ana Regional Water Quality Control Board (Regional Water Board). Acting under the administration of SAWPA since the approval of a task force agreement in 2004, the Task Force encompasses over twenty members from across the watershed, combining funding and staff resources to fulfill the requirements of the Basin Plan Amendment. These efforts are directed towards aiding individual dischargers with regulatory permit compliance and facilitating watershed-wide collaboration and water quality reporting for the Regional Water Board.

The Task Force has drafted a Basin Plan amendment package for the Regional Board's April 2024 Board Meeting. Their next steps include implementing surface water and groundwater work plans, addressing data gaps over the next five years, and implementing a "Special Study" over the next several years.

This item was for discussion purposes; no action was taken on Agenda Item No. 5.C.

G. INTEGRATED CLIMATE ADAPTATION AND RESILIENCY PROGRAM REGIONAL RESILIENCE PLANNING AND IMPLEMENTATION GRANT PROGRAM (SC#2023.10)

Rachel Gray informed the Committee that SAWPA applied for the Integrated Climate Adaptation and Resiliency Program Regional Resilience Planning and Implementation Grant Program and results will be available in December.

This item was for discussion purposes; no action was taken on Agenda Item No. 5.D.

H. WEATHER MODIFICATION UPDATE

Rachel Gray updated the Committee on the Weather Modification Pilot Program, which was launched on November 14, 2023. Currently, the program is actively monitoring the current weather conditions to identify suitable opportunities for cloud seeding. As of now, no cloud seeding has been conducted. SAWPA staff is collaborating closely with Flood Control districts to assess potential flood risks.



Additionally, Melissa Bustamonte, SAWPA's Communication Specialist, has developed a comprehensive communications strategy for the program. This includes managing the program's dedicated webpage (<https://sawpa.gov/santa-ana-river-watershed-weather-modification/>), disseminating informational materials to local agencies for distribution to their constituents, and addressing public inquiries and comments.

This item was for discussion purposes; no action was taken on Agenda Item No. 5.E.

6. GENERAL MANAGER REPORT

Mr. Mosher informed the Committee that SAWPA staff are working with the General Managers, and eventually with the SAWPA Commission, to discuss and plan for future funding opportunities for the region.

7. CHAIR'S COMMENTS/REPORT

Convener Dennstedt reported that a former OWOW Steering Committee member, Thomas Evans' wife passed away and a memorial service will be held for her in Riverside on November 17. She also noted that former Western Board Member, Al Lopez was appointed to the Regional Water Control Board and asked that a letter be sent to congratulate him.

8. COMMITTEE MEMBERS' COMMENTS

Committee member Speake requested that the minutes from July 27, 2023 reflect that he is from the City of Corona not the City of Norco.

9. REQUEST FOR FUTURE AGENDA ITEMS

There were no comments.

10. ADJOURNMENT

The meeting ended at 11:47 a.m.

APPROVED: March 28, 2024

Brenda Dennstedt, Convener

Attest:

Zyanya Ramirez, Executive Assistant II



Proposition 1 Status Update

Steering Committee Meeting
Agenda Item No. 5.B.
Marie Jauregui
Project Manager
March 28, 2024



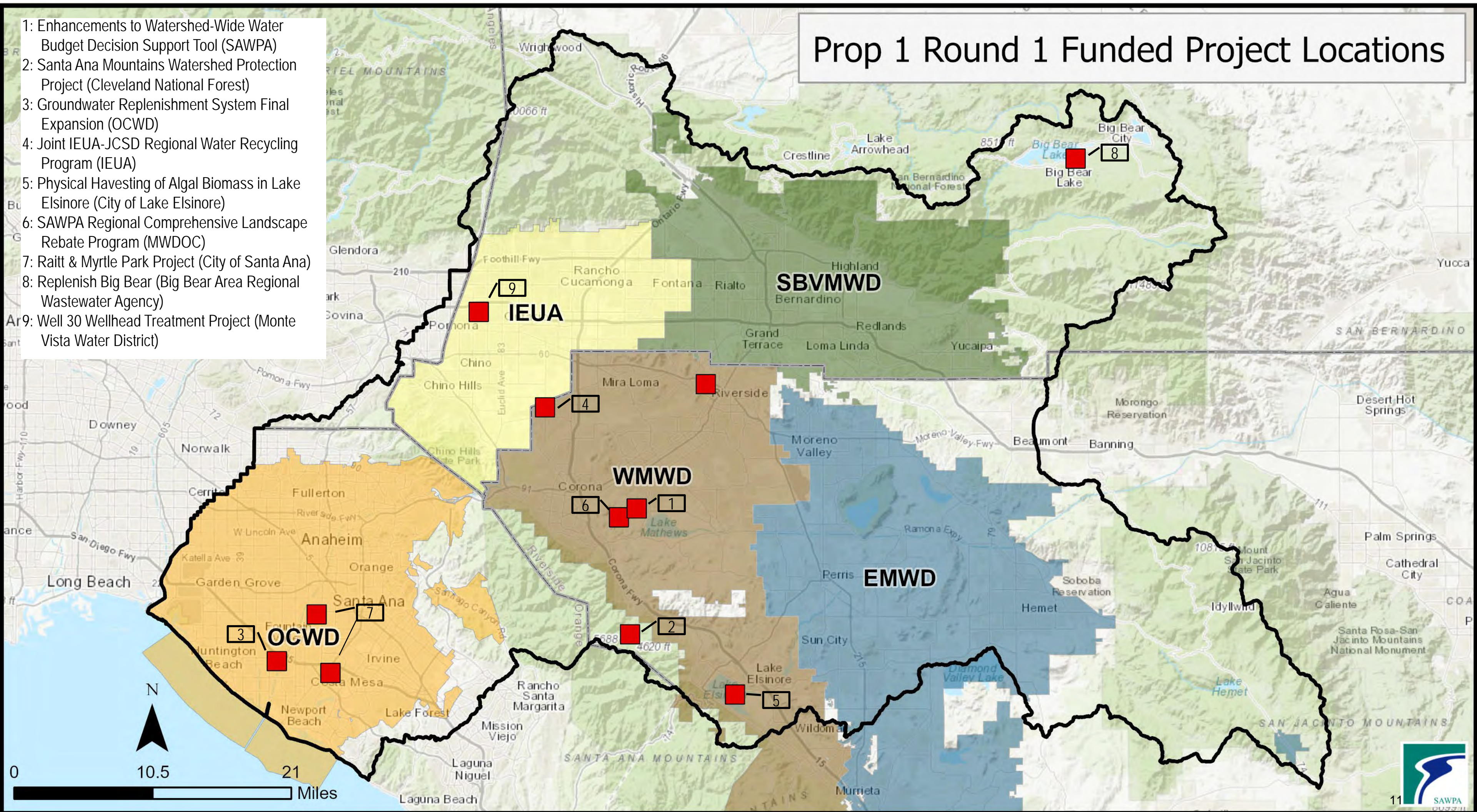
Proposition 1

Round 1 Implementation

January 2015 – December 2025

Prop 1 Round 1 Funded Project Locations

- 1: Enhancements to Watershed-Wide Water Budget Decision Support Tool (SAWPA)
- 2: Santa Ana Mountains Watershed Protection Project (Cleveland National Forest)
- 3: Groundwater Replenishment System Final Expansion (OCWD)
- 4: Joint IEUA-JCSD Regional Water Recycling Program (IEUA)
- 5: Physical Harvesting of Algal Biomass in Lake Elsinore (City of Lake Elsinore)
- 6: SAWPA Regional Comprehensive Landscape Rebate Program (MWDOC)
- 7: Raitt & Myrtle Park Project (City of Santa Ana)
- 8: Replenish Big Bear (Big Bear Area Regional Wastewater Agency)
- 9: Well 30 Wellhead Treatment Project (Monte Vista Water District)



Proposition 1

Round 1 Implementation Status Update

Project Name	Project Description	Water Supply Reliability	Groundwater Recharge	Treat / Convey Wastewater	Multipurpose Flood & Stormwater	Ecosystem / Wetland Protection / Restoration	DAC	Benefits Large Area of Watershed	Drinking Water Treatment	Public Education Component	Non-point Source Pollution	Fisheries Restoration / Protection	Removal of Invasive Non-Native Species
Enhancements to Watershed-Wide Water Budget Decision Support Tool (SAWPA)	The project (decision support tool) will create water budgets based on efficiency at the customer and retail water agency scale through the collection of aerial imagery, weather data, and other information.	x						x		x			
Santa Ana Mountains Watershed Protection Project (Cleveland National Forest)	The project will establish approximately 650 acres of strategically located topographic and roadside fuel breaks on National Forest System lands along North Main Divide Road and the Trabuco Community Defense within the Santa Ana Mountains and watershed.				x	x	x	x				x	

Proposition 1

Round 1 Implementation Status Update

Project Name	Project Description	Water Supply Reliability	Groundwater Recharge	Treat / Convey Wastewater	Multipurpose Flood & Stormwater	Ecosystem / Wetland Protection / Restoration	DAC	Benefits Large Area of Watershed	Drinking Water Treatment	Public Education Component	Non-point Source Pollution	Fisheries Restoration / Protection	Removal of Invasive Non-Native Species
Groundwater Replenishment System Final Expansion (OCWD)	The project provides capacity to treat contaminated groundwater pumped from two plumes, recycles approximately 30 million gallons per day (mgd) of secondary-treated wastewater currently discharged to the ocean, and reduces salt load to the groundwater basin by 10,000 tons per year by replacing imported water with high quality and low total dissolved solids advanced treated water	x	x	x		x	x	x	x	x	x	x	

Proposition 1

Round 1 Implementation Status Update

Project Name	Project Description	Water Supply Reliability	Groundwater Recharge	Treat / Convey Wastewater	Multipurpose Flood & Stormwater	Ecosystem / Wetland Protection / Restoration	DAC	Benefits Large Area of Watershed	Drinking Water Treatment	Public Education Component	Non-point Source Pollution	Fisheries Restoration / Protection	Removal of Invasive Non-Native Species
Joint IEUA-JCSD Regional Water Recycling Program (IEUA)	This project is a collaborative effort between the Inland Empire Utilities Agency and the Jurupa Community Services District to increase recycled water use and groundwater recharge in the Chino Basin.	x	x	x				x					
Physical Harvesting of Algal Biomass in Lake Elsinore – Pilot Study (City of Lake Elsinore)	This decision support tool is designed to determine the feasibility of improving water quality in Lake Elsinore through physical removal of algal biomass. The feasibility and cost-effectiveness of potential removal strategies will be evaluated.			x		x	x	x		x	x	x	

Proposition 1

Round 1 Implementation Status Update

Project Name	Project Description	Water Supply Reliability	Groundwater Recharge	Treat / Convey Wastewater	Multipurpose Flood & Stormwater	Ecosystem / Wetland Protection / Restoration	DAC	Benefits Large Area of Watershed	Drinking Water Treatment	Public Education Component	Non-point Source Pollution	Fisheries Restoration / Protection	Removal of Invasive Non-Native Species
Regional Comprehensive Landscape Rebate Program (MWDOC)	This Project targets public agency, residential, commercial, industrial, and institutional landscapes throughout the entire Santa Ana River Watershed.	x			x		x	x		x	x		
Raitt & Myrtle Park (City of Santa Ana)	This project features the construction of a 1,600-square-foot bioretention basin with no underdrain and a large subsurface infiltration gallery in a new 1.18-acre park.	x	x		x	x	x			x	x		

Proposition 1

Round 1 Implementation Status Update

Project Name	Project Description	Water Supply Reliability	Groundwater Recharge	Treat / Convey Wastewater	Multipurpose Flood & Stormwater	Ecosystem / Wetland Protection / Restoration	DAC	Benefits Large Area of Watershed	Drinking Water Treatment	Public Education Component	Non-point Source Pollution	Fisheries Restoration / Protection	Removal of Invasive Non-Native Species
Replenish Big Bear (BBARWA)	The project will add approximately 1,870 AFY of water to Stanfield Marsh Wildlife and Waterfowl Preserve, providing a consistent water source to sustain habitat and increase educational opportunities for the community and visitors.	x	x	x	x	x	x	x		x			
Well 30 Wellhead Treatment Project (MVWD)	The Project involves constructing an ion exchange and a granular activated carbon wellhead treatment system to remove nitrates, perchlorate, and 1,2,3-trichloropropane present in the groundwater supply.	x	x				x	x	x				

Proposition 1

Round 1 Implementation Status Update

Project Name	Agency	Grant Amount	Required Funding Match	Additional Cost Share	Total Project Cost	% Grant Billed
Project 1 Enhancements to Watershed-Wide Water Budget Decision Support Tool	SAWPA	\$ 500,000	\$ 864,354	\$ 364,354	\$ 1,728,708	46%
Project 2 Santa Ana Mountains Watershed Protection Project	Cleveland National Forest	\$ 497,998	\$ 0	\$ 732,144	\$ 1,230,142	46%
Project 3 Groundwater Replenishment System Final Expansion	OCWD	\$ 3,589,553	\$ 10,000,000	\$ 2,694,545	\$ 16,284,098	100%
Project 4 Joint IEUA-JCSD Regional Water Recycling Program	IEUA	\$ 2,617,970	\$ 16,555,000	\$ 13,937,030	\$ 33,110,000	0%

Proposition 1

Round 1 Implementation Status Update

Project Name	Agency	Grant Amount	Required Funding Match	Additional Cost Share	Total Project Cost	% Grant Billed
Project 5 Physical Harvesting of Algal Biomass in Lake Elsinore – Pilot Program	City of Lake Elsinore	\$ 297,000	\$ 0	\$ 0	\$ 297,000	3%
Project 6 Regional Comprehensive Landscape Rebate Program	MWDOC	\$ 2,767,344	\$ 2,787,218	\$ 0	\$ 5,554,562	100%
Project 7 Raitt & Myrtle Park	City of Santa Ana	\$ 1,670,000	\$ 0	\$ 246,500	\$ 1,916,500	90%
Project 8 Replenish Big Bear	BBARWA	\$ 4,563,338	\$ 0	\$ 36,853,662	\$ 41,417,000	40%
Project 9 Well 30 Wellhead Treatment	MVWD	\$ 3,431,225	\$ 9,980,024	\$ 3,400,000	\$ 16,811,249	100%



Proposition 1

Round 2 Implementation

May 2022 – December 2027

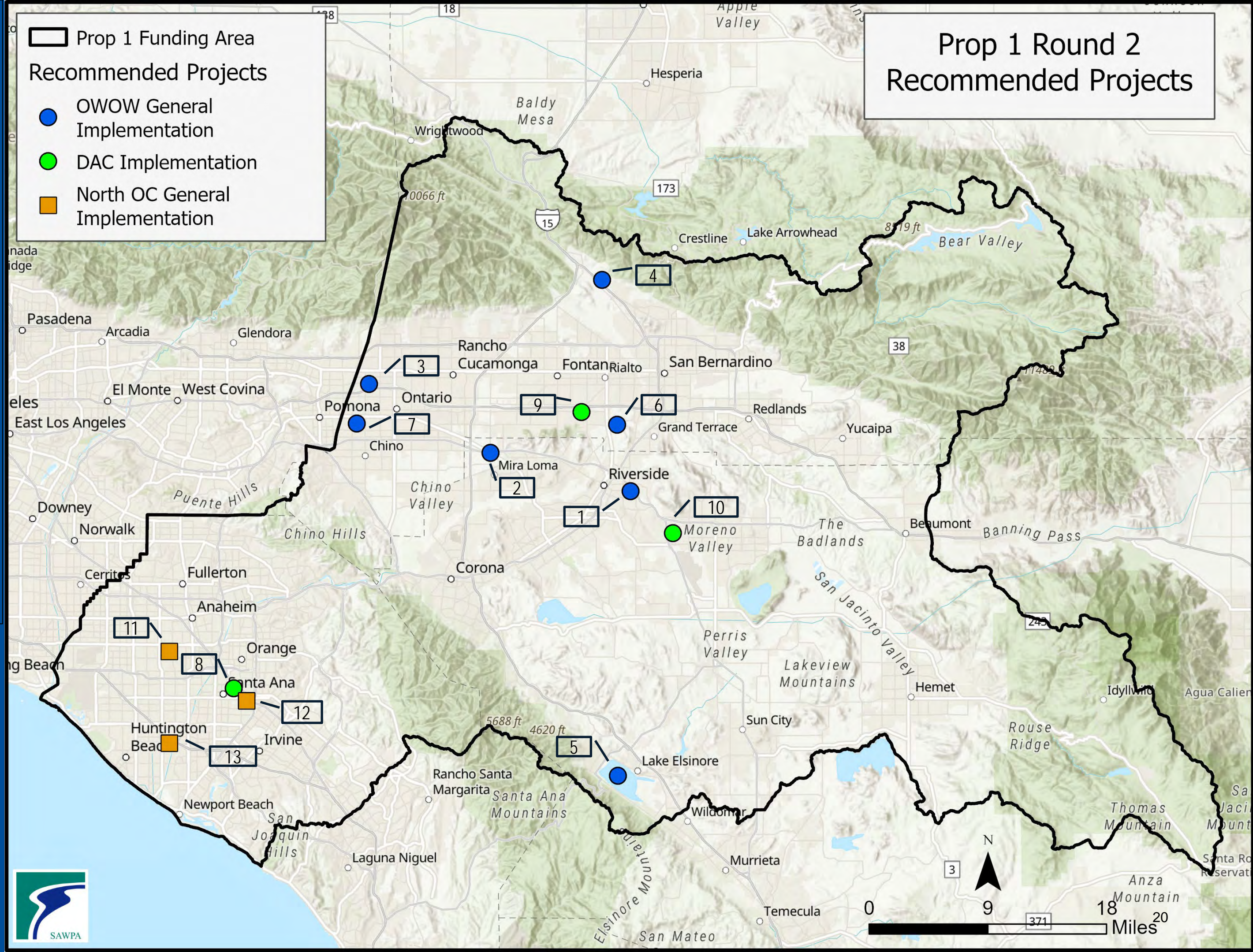
- 1: Santa Ana River Watershed Weather Modification Pilot Project Santa Ana River Watershed Weather Modification Pilot Project (SAWPA)
- 2: Etiwanda Intervalley Water Quality and Water Resiliency Project Phase-1A (JCSD)
- 3: Wellhead Nitrate Treatment for Wells 4 & 27 (MVWD)
- 4: Cable Creek Basin (Upper) (SBCFCD)
- 5: Lake Elsinore Algae Harvesting and Nutrient Removal Pilot Project (LESJWA)
- 6: Lake Rialto Habitat Management and Community Open Space Project (City of Rialto)
- 7: Well 2 Replacement (MVWD)
- 8: New Washington Well Project (City of Santa Ana)
- 9: Water Quality: Lead Service Line Replacements in the Bloomington DAC (WVWD)
- 10: Box Springs Mutual Water Company Well Improvement Project (Box Springs MWC)
- 11: Orange County Regional PFAS Groundwater Treatment Program (OCWD)
- 12: Santa Ana Zoo Stormwater Capture and Diversion Project (City of Santa Ana)
- 13: Making Conservation an Orange County Way of Life (MWDOC)

Prop 1 Funding Area

Recommended Projects

- OWOW General Implementation
- DAC Implementation
- North OC General Implementation

Prop 1 Round 2 Recommended Projects



Proposition 1

Round 2 Implementation Status Update

Project Name	Project Description	Water Supply	Water Quality	Greenhouse Gas	Habitat	Flood Protection	DAC	Watershed Wide
Santa Ana River Watershed Weather Modification Pilot Project (SAWPA)	Decision support tools to model regional water management strategies to account for climate change and other changes in regional demand and supply projections	x	x	x				x
Etiwanda Intervalley Water Quality and Water Resiliency Project Phase-1A (JCSD)	The goal of the project is to establish reliable local groundwater sources and to meet CVWD's and JCSD's projected water demands. The project will provide greater water supply, higher water quality and resilience, and reduced greenhouse gases	x	x	x				
Wellhead Nitrate Treatment for Wells 4 & 27 (MVWD)	This project would provide wellhead 1,2,3- Trichloroporpene (TCP) treatment for Well 4 and Well 27 in MVWD's pressure Zone 1	x	x					
Cable Creek Basin (Upper) (SBCFCD)	The Project includes a proposed debris detention basin at the existing Cable Creek Spreading Grounds that will reduce the 100-year peak discharge from Cable Creek. The project will also serve as a sedimentation basin and stormwater recharge/detention basin.	x				x		

Proposition 1

Round 2 Implementation Status Update

Project Name	Project Description	Water Supply	Water Quality	Greenhouse Gas	Habitat	Flood Protection	DAC	Watershed Wide
Lake Elsinore Algae Harvesting and Nutrient Removal Pilot Project (LESJWA)	The Project will demonstrate the use of algae harvesting using HFT to treat water in Lake Elsinore.		X		X			
Rialto Habitat Nature Center Project (City of Rialto)	The Project will involve construction of Lake Rialto, which will provide an estimated 41 acre-feet of seasonal storage. The surrounding area will be public open space, and the project will provide opportunities for passive recreation, educational programming, and public outreach.		X	X	X			
Well 2 Replacement (MVWD)	MVWD will install a replacement well for Well #2. The associated tank will be recoated and the booster station will be upgraded. MVWD will also install a packaged ion exchange system to reduce nitrate contamination.	X	X					
New Washington Well Project (City of Santa Ana)	The Project will involve drilling a new well and installing the well to distribution system mechanical piping and electrical equipment.	X	X				X	

Proposition 1

Round 2 Implementation Status Update

Project Name	Project Description	Water Supply	Water Quality	Greenhouse Gas	Habitat	Flood Protection	DAC	Watershed Wide
Water Quality: Lead Service Line Replacements in the Bloomington DAC (WVWD)	The Project will address water quality directly by eliminating sources of lead by removing lead service lines and fittings.	x	x				x	
Box Springs Mutual Water Company Well Improvement Project (Box Springs MWC)	The project will involve constructing a test well to identify high-quality water zones.	x	x				x	
Orange County Regional PFAS Groundwater Treatment Program (OCWD)	The project will alleviate the negative impact of drought on Orange County water supplies through an advanced treatment process of ion exchange to remove PFAS. Two ion exchange well-head treatments will be implemented at Garden Grove Well 19 and Santa Ana Well 31. The treated groundwater from Wells 19 and 31 will be disinfected and delivered to the existing drinking water distribution systems.	x	x	x				

Proposition 1

Round 2 Implementation Status Update

Project Name	Project Description	Water Supply	Water Quality	Greenhouse Gas	Habitat	Flood Protection	DAC	Watershed Wide
Santa Ana Zoo Stormwater Capture and Diversion Project (City of Santa Ana)	The Project will involve construction of subsurface stormwater infiltration systems at the Santa Ana Zoo.	x	x	x	x	x		
Making Conservation an Orange County Way of Life (MWDOC)	This project incentivizes residential, commercial, industrial, and institutional water users to increase water efficiency indoors and outdoors	x	x	x	x			

Proposition 1

Round 2 Implementation Status Update

Project Name	Agency	Grant Amount	Funding Match	Total Project Cost	% Grant Billed
Santa Ana River Watershed Weather Modification Pilot Project	SAWPA	\$ 861,400	\$ 861,400	\$ 1,722,800	0%
Etiwanda Intervalley Water Quality and Water Resiliency Project Phase-1A	JCSD	\$ 2,954,213	\$ 40,337,402	\$ 66,280,001	0%
Wellhead Nitrate Treatment for Wells 4 & 27	MVWD	\$ 2,533,492	\$ 4,000,000	\$ 6,950,000	0%
Cable Creek Basin (Upper)	SBCFCD	\$ 2,521,678	\$ 11,086,993	\$ 20,000,000	0%
Lake Elsinore Algae Harvesting and Nutrient Removal Pilot Project	LESJWA	\$ 1,500,000	\$ 1,645,632	\$ 3,247,007	0%
Rialto Habitat Nature Center Project	City of Rialto	\$ 2,149,748	\$ 2,403,566	\$ 8,011,886	0%
Well 2 Replacement	MVWD	\$ 2,006,311	\$ 5,388,765	\$ 9,274,999	0%
New Washington Well Project	City of Santa Ana	\$ 3,394,743	\$ 0	\$ 10,341,684	0%
Water Quality: Lead Service Line Replacements in the Bloomington DAC	WVWD	\$ 315,000	\$ 0	\$ 390,000	0%

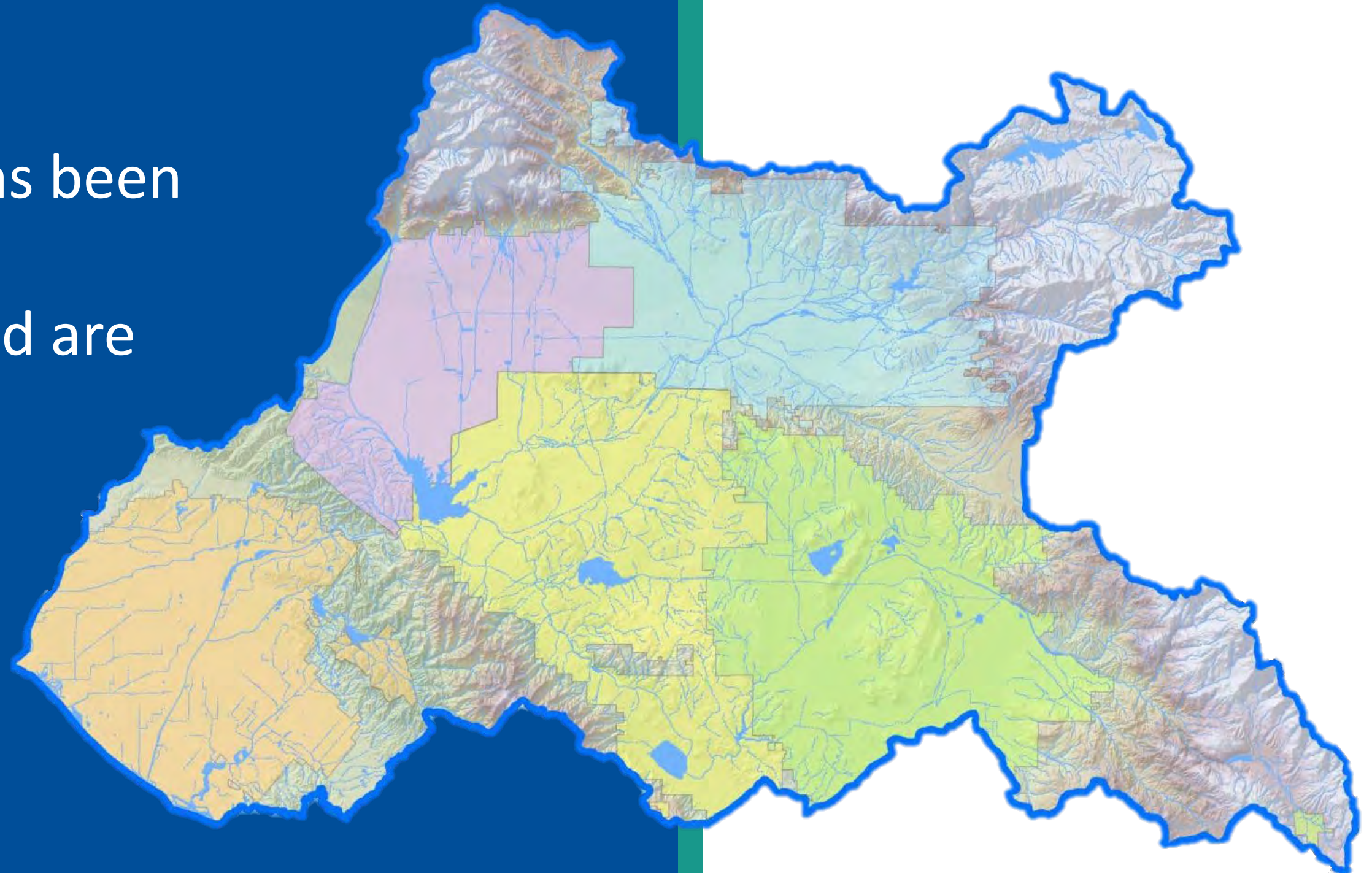
Proposition 1

Round 2 Implementation Status Update

Project Name	Agency	Grant Amount	Funding Match	Total Project Cost	% Grant Billed
Box Springs Mutual Water Company Well Improvement Project	Box Springs MWD	\$ 1,885,257	\$ 0	\$ 1,893,000	0%
Orange County Regional PFAS Groundwater Treatment Program	OCWD	\$ 4,200,000	\$ 5,500,000	\$ 11,100,000	0%
Santa Ana Zoo Stormwater Capture and Diversion Project	City of Santa Ana	\$ 2,603,525	\$ 1,146,475	\$ 5,000,000	0%
Making Conservation an Orange County Way of Life	MWDOC	\$780,275	\$ 1,391,600	\$ 2,783,200	0%

Proposition 1 Round 2 Implementation

- Grant Funding Contract has been sent to the Agencies
- Agency comments received are under review with Legal Counsel



Questions?

Thank You

Marie Jauregui
Santa Ana Watershed Project Authority
Office (951) 354-4248
marie@sawpa.gov
sawpa.gov



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OWOW STEERING COMMITTEE MEMORANDUM NO. 2024.1

DATE: March 28, 2024

TO: OWOW Steering Committee

SUBJECT: Grant Funded Project Highlights: Replenish Big Bear Project (Awarded Proposition 1 Round 1 Funds)

PREPARED BY: Marie Jauregui, Project Manager

RECOMMENDATION

Receive and file.

DISCUSSION

Through the Proposition 1 Round 1 IRWM grant agreement, which provided approximately \$23M in grant funding to the Santa Ana River Watershed, the Big Bear Area Regional Wastewater Agency (BBARWA) was awarded \$4,563,338 for their Replenish Big Bear Project (project).

The project includes planning, design, and construction of advanced treatment upgrades at the BBARWA wastewater treatment plant (WWTP), approximately 7 miles of pipeline for product water, and a new pump station in Bear Valley. The upgraded WWTP serves Big Bear Valley, which the State has designated as a “disadvantaged community” per their U.S. Census data mapping tool. The project is expected to add a water supply source to the community, and water to Stanfield Marsh Wildlife and Waterfowl Preserve, providing a consistent water source to sustain habitat and increase educational opportunities for the community and visitors.

David Lawrence, P.E., BBARWA’s General Manager will provide a project status update to the OWOW Steering Committee.

CRITICAL SUCCESS FACTORS

- Leverage existing information for the benefit of SAWPA, its members, and other stakeholders.
- Active participation of a diverse group of stakeholders representing counties, cities, and water districts, as well as the private sector and the regulatory, environmental, and environmental justice communities who integrate the different interests in the watershed beyond political boundaries. Ensuring all perspectives are heard and valued.
- Distribution of benefits from the implementation of all integrated water resources management activities across the watershed in a fair and equitable fashion. Recognition that upstream conditions affect downstream water quality and quantity.
- OWOW criteria and values are transparent to watershed-wide stakeholders.
- A strong reputation and sufficient capacity within SAWPA staff for strategic facilitation, planning, communication, leadership and community engagement.

RESOURCE IMPACTS

None.

Attachments:

1. PowerPoint Presentation

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REPLENISH
— *Big Bear* —

Presented by
David Lawrence
March 28, 2024
Agenda Item No. 6.A.



REPLENISH
— *Big Bear* —

- **Program Overview and Benefits**
- **IRWM Grant Funding Supporting**
 - **Pilot Study**
 - **Environmental Review Process**
- **Next Steps**



REPLENISH
— *Big Bear* —

Program Overview and Benefits



Local Water Challenges

- Natural precipitation is the Valley's only source of water.
- Drought and low lake levels threaten water supply, economy, and ecosystem.
- The local water cycle is broken: All the Valley's wastewater is discharged outside of the watershed.



Broken Water Cycle

Santa Ana
River
Watershed



Over
36 Billion
gallons of water
exported since
1980

Replenish Big Bear Program Overview



With High Lake Level

Downstream Releases

Flow from Marsh

Replenish Big Bear Lake

120 AFY

New Water Source for Bike Park

2,200 AFY

Replenish Stanfield Marsh

Peaks

Peak Flows to Lucerne Valley for Irrigation

2,200 AFY

New Purified Water Source

Future Option

Replace Shay Pond Water Source

120 AFY

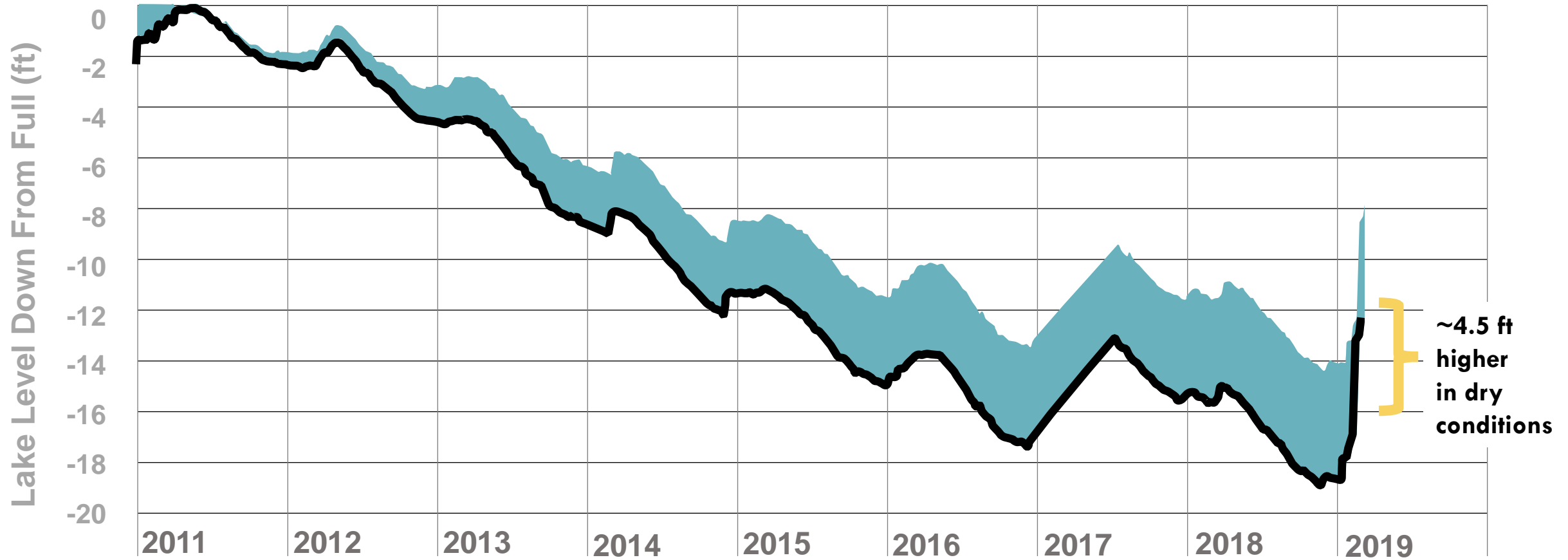
Replace Irrigation Water Source

380 AFY

Replenish Groundwater Basin

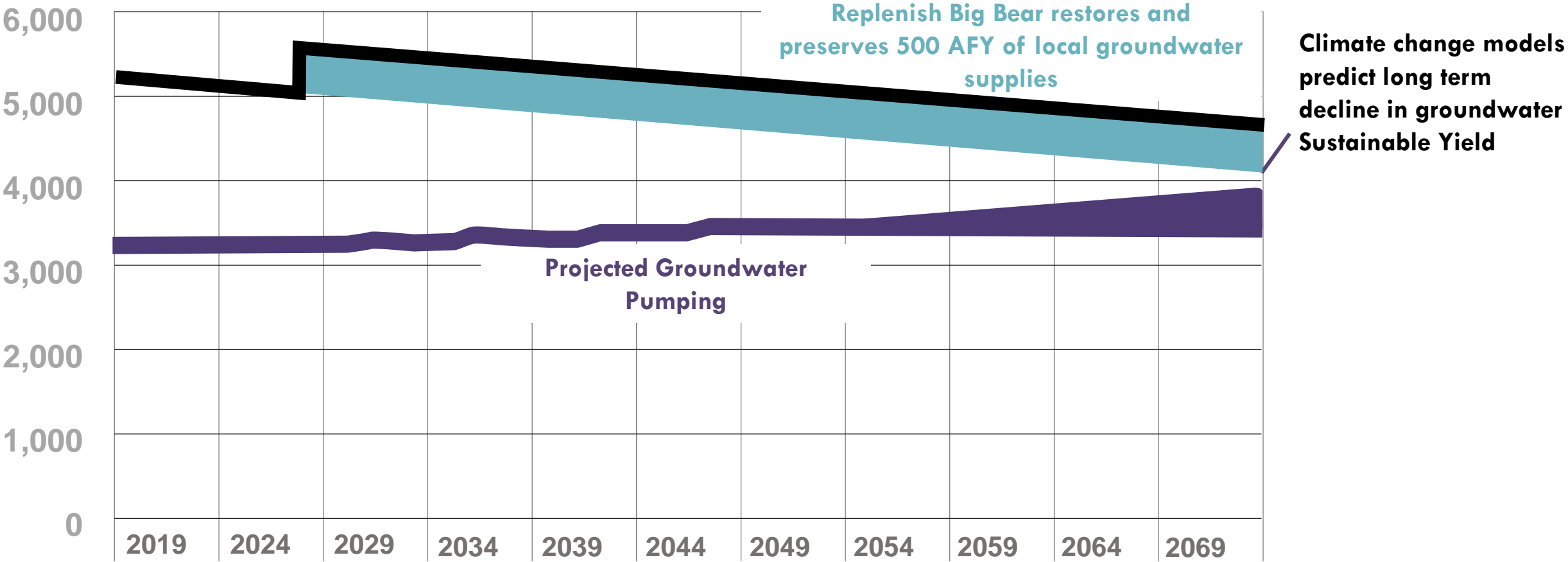
Lake level benefits are greatest during dry periods

- Historic Lake Level
- Estimated Project Lake Level



New Water Source Enhances Groundwater Sustainability

- Projected Sustainable Yield
- Sustainable Yield with Project

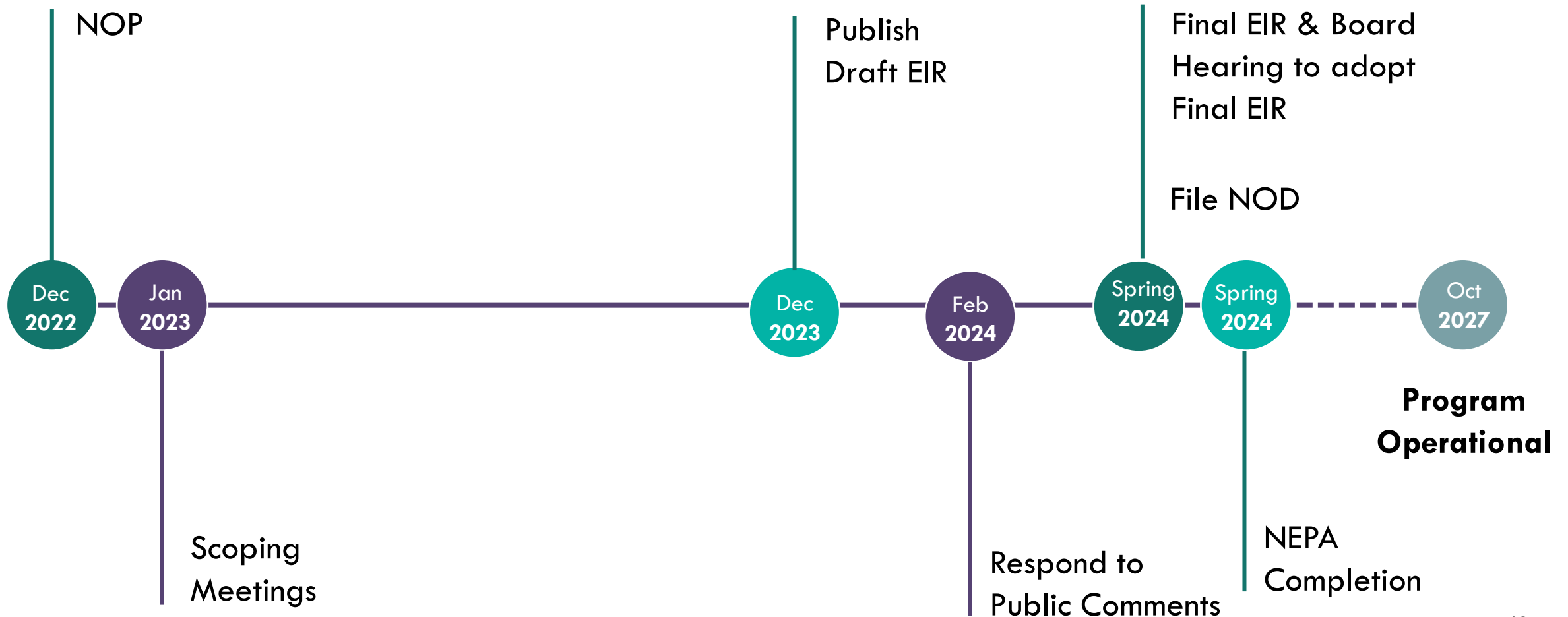




REPLENISH
— *Big Bear* —

Environmental Documentation

Environmental Documentation Milestones





REPLENISH
— *Big Bear* —

Pilot Study

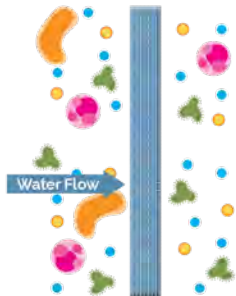
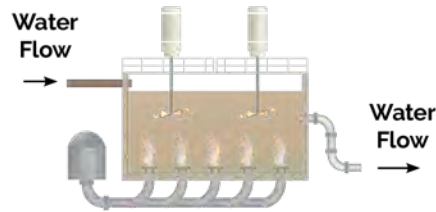


REPLENISH
— Big Bear —

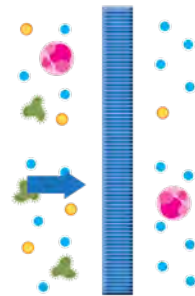
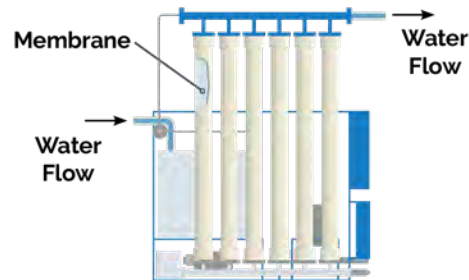
Advanced Purification Facility

The existing BBARWA Wastewater Treatment Plant (WWTP) will be supplemented with a full advanced treatment facility with a capacity of 2.2 MGD, capable of producing up to 2,210 AFY. Multiple treatment processes will use the best available technology to produce purified water that meets or exceeds all State and Federal water quality standards to protect public health and the environment.

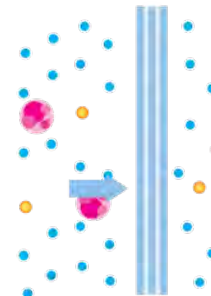
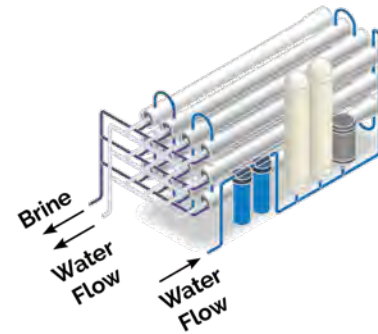
Nutrient Removal



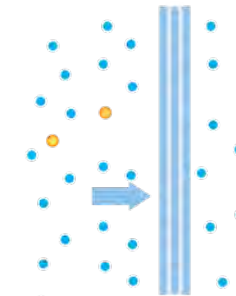
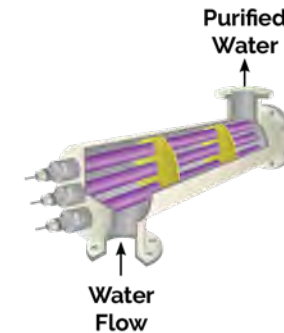
Ultra Filtration



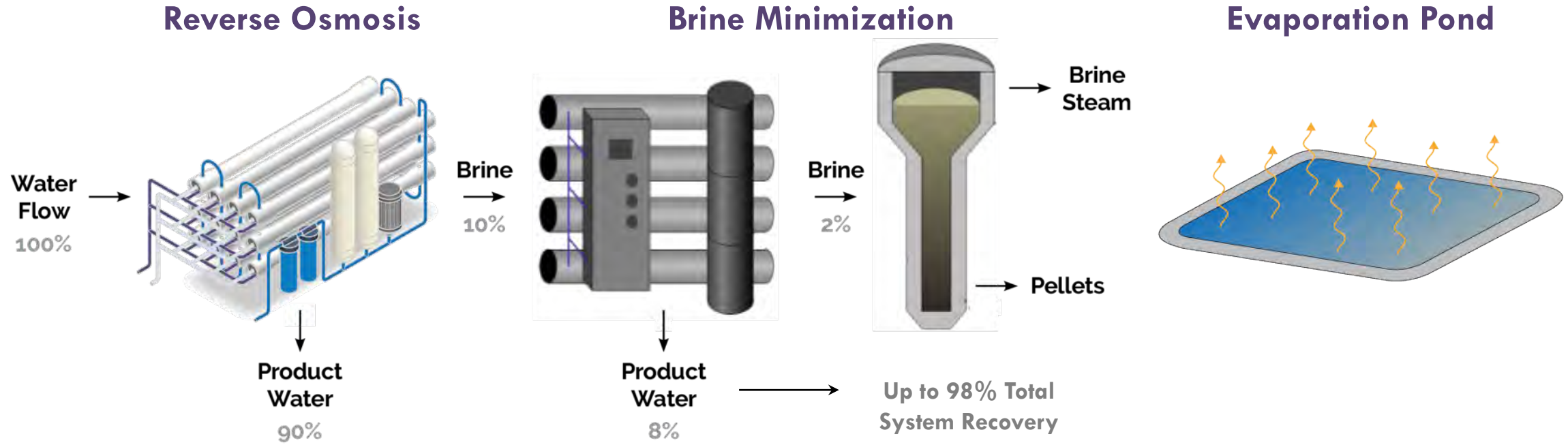
Reverse Osmosis (RO)



UV Disinfection & Advanced Oxidation Process



Proposed Brine Management Facilities



Brine Reduction and Evaporation

The Reverse Osmosis process produces a liquid brine concentrate that requires disposal. A Desalter system will use an additional RO process to reduce the liquid brine volume and a Pellet Reactor that will produce solid pellets for disposal or reuse. The remaining brine will be evaporated onsite using solar evaporation ponds.

Pilot Plan - Goals



Demonstrate process performance for site-specific wastewater conditions to regulatory agencies



Confirm the proposed treatment process as a viable design approach to meet the target treatment levels

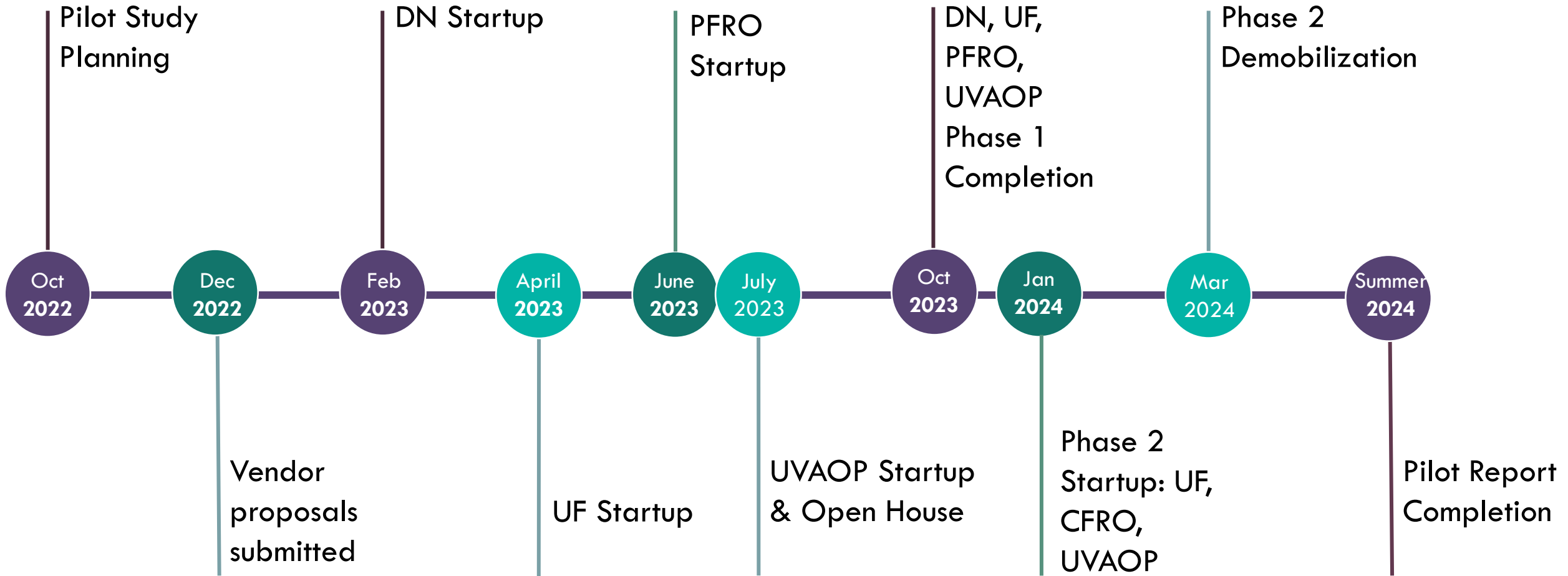


Quantify total system recovery for product water to inform brine management solution



REPLENISH
— Big Bear —

Pilot Plan Timeline



BBARWA hosted an Open House for more than 240 residents on July 19, 2023!



Big Bear Grizzly Thursday, July 27, 2023 3

Replenish tour draws hundreds

Community support for groundwater sustainability project is high

By Ryan Orr
For the Grizzly

A tour of the pilot equipment for the Replenish Big Bear water treatment project at the Big Bear Area Regional Wastewater Authority drew more than 240 residents July 19.

The event included informational booths from project partners the Big Bear Community Services District and Big Bear Lake Department of Water and Power.

With tacos on the bill of fare and tables and chairs shaded by parking lot solar panels, residents filtered through the pilot facility housing the entire Replenish Big Bear process on a miniature scale. General Manager David Lawrence was there to explain the process to residents who passed by, supplemented by poster boards describing the intricate treatment process from reverse osmosis to ultraviolet disinfection.

No pictures were allowed inside the facility, as some of the equipment on display was proprietary to the companies working with BBARWA on the project.

Lawrence said upon completion, expected in 2027, the facility will be about 100 times the scale of the pilot facility.

"The feedback on the project was supportive. Most concerns centered around the project completion timeline of January 2027 and the purpose and size of the pilot facility," Lawrence said.

"The pilot facility is a demonstration (mini-version) of what will be constructed and it ensures that we can meet regulatory requirements before constructing the actual plant."

Those regulatory requirements, mandated by the Santa Ana Regional Water Quality Control Board, added millions to the already steep \$70 million-plus project price tag.

As residents exited the pilot facility, they saw three jugs containing different water samples: influent coming into the plant, tertiary treated water coming out of the plant and into Replenish Big Bear, and effluent that came out of the project fully treated. Lawrence repeated to tour goers that even the water that comes out of the tap doesn't meet the standards to be discharged into Big Bear Lake. The water coming out of the Replenish project does. It is above drinking water standards, he said.

"Being able to discuss the groundwater sustainability piece of this project with members of our community was very important to us," said Bridgette Burton, BBARWA's senior management analyst and the lead on Replenish Big Bear.

"Sustaining up to 20% of our groundwater supply is the biggest benefit this project

BBARWA General Manager David Lawrence describes the treatment process of Replenish Big Bear to residents who attended an open house to provide onlookers with more information. Photo credit: Ryan Orr

WATER CONT. ON PAGE 4

Next Steps



REPLENISH
— Big Bear —

SPRING 2024

Certify the
environmental
documents

SUMMER 2024

Complete the
Pilot Report
and Basis of
Design
Validation
Report

SUMMER 2024

Initiate the Final
Design of the
advanced water
purification
facility and
pipeline to
Stanfield Marsh

CONTINUED

Continue
pursuing state
and federal
funding and
financing

Thank You

TO OUR FUNDING PARTNERS



REPLENISH
— *Big Bear* —



Funding for this project has been provided in full or in part from the Water Quality, Supply, and Infrastructure Improvement Act of 2014 and through an agreement with the State Department of Water Resources.

Funding for the project has also been provided by the Environmental Protection Agency and the United States Bureau of Reclamation.

OWOW STEERING COMMITTEE MEMORANDUM NO. 2024.2

DATE: March 28, 2024

TO: OWOW Steering Committee

SUBJECT: Integrated Climate Adaptation and Resiliency Program Regional Resilience Planning and Implementation Grant Program Award and Development of the Santa Ana River Watershed Climate Adaptation and Resilience Plan

PREPARED BY: Rachel Gray, Water Resources and Planning Manager

RECOMMENDATION

Receive and file.

DISCUSSION

As presented in the July 27, 2023, and November 16, 2023, OWOW Steering Committee meetings, staff is developing a strategy to supplement the One Water One Watershed (OWOW) Plan with a Regional Climate Adaptation and Resilience Plan (Plan). The Plan would define watershed-scale climate risks and vulnerabilities, develop climate adaptation strategies, develop a portfolio of planned and potential resiliency projects, connect the equity outcomes for underrepresented communities, and strengthen broad-based partnerships that advance shared interests across the watershed.

Staff applied for grant funding, alongside the Soboba Band of Luiseno Indians (Soboba) and the Inland Southern California Climate Collaborative (ISC3), from the Governor's Office of Planning and Research for the Integrated Climate Adaptation and Resiliency Program Regional Resilience Planning and Implementation Grant Program and was chosen to receive grant funding. Together, the applicants plan to execute the implementation of watershed resilience through the development of the Santa Ana River Watershed Climate Adaptation and Resilience Plan (SARWCARP).

The project's regional partnership has been structured to achieve our vision of a better-connected network of stakeholders that is equipped with the understanding and ability to develop and implement multi-benefit climate adaptation strategies across the watershed. To summarize:

- SAWPA (lead applicant) brings a proven track record of working with public agencies in the region; developing, tracking, and implementing large-scale grant programs; and supporting integrated water resources management in the SARW.
- ISC3 (co-applicant) brings a proven track record of connecting and building the capacity of local government, utilities, and CBOs across the region.
- Soboba (co-applicant) brings a proven track record supporting integrated water resources management planning and engaging with tribal communities.
- CBOs will support the applicants by coordinating and conducting engagement across the watershed. These CBOs bring unique engagement experiences in their watershed typologies.

These partners will incorporate a range of stakeholder and community perspectives and build networks for collaborative implementation strategies. The planning process will be guided by two groups: the Watershed Resilience Technical Advisory Committee (WRTAC) and the Watershed Resilience Community Advisory Panel (WRCAP). This structure is designed to ensure that stakeholders are involved across all phases of the Plan development. During the vulnerability assessment phase, the WRTAC will work to incorporate stakeholder input on existing studies and an analysis of the climate risks (i.e., extreme heat, extreme weather, drought, and wildfire). During the adaptation analysis phase, the WRTAC will work to incorporate stakeholder input on identifying existing or potential options, programmatic approaches, and prioritization criteria. The WRCAP will play a similar role through direct community engagement. Both groups will support implementation planning by ensuring that the right combination of stakeholders and partners are incorporated into resilience portfolios.

CRITICAL SUCCESS FACTORS

- Leverage existing information for the benefit of SAWPA, its members, and other stakeholders.
- Active participation of a diverse group of stakeholders representing counties, cities, and water districts, as well as the tribal communities and the regulatory, community-based, and environmental justice communities who integrate the different interests in the watershed beyond political boundaries. Ensuring all perspectives are heard and valued during the development of the regional climate adaptation and resilience plan.
- SAWPA has a strong reputation and sufficient capacity within SAWPA staff for strategic facilitation, planning, communication, leadership and community engagement.
- Supplement the OWOW Plan with the Santa Ana River Watershed Climate Adaptation and Resilience Plan (SARWCARP).

RESOURCE IMPACTS

The Santa Ana River Watershed Project Authority has been selected as a Round 1 Grantee for the Regional Resilience Grant Program (RRGP) award of \$644,190 for the Santa Ana River Watershed Climate Adaptation and Resilience Plan. There will be no financial impact on member agencies except for staff time in responding to SAWPA staff information requests.

Attachments:

1. PowerPoint Presentation
2. Award Notification



SANTA ANA WATERSHED
PROJECT AUTHORITY

Round 1 Regional Resilience Grant Program Award - SARWCARP

OWOW Steering Committee | Agenda Item No. 6.B.

March 28, 2024

Rachel Gray

Water Resources and Planning Manager

ICARP Regional Resilience Grant Program (RRGP)



ICARP

INTEGRATED CLIMATE ADAPTATION & RESILIENCY PROGRAM

Governor's Office of Planning and Research (OPR) Integrated Climate Adaptation and Resiliency Program (ICARP)

RRGP funds effort to:

- ✓ Review climate risks
- ✓ Identify climate resilience priorities
- ✓ Build capacity
- ✓ Implement projects that respond to a region's greatest climate risks

Vision:

Advance the implementation of **watershed resilience** in the Santa Ana River watershed through the development of a **Regional Climate Adaptation and Resilience Plan**



Drought



Extreme Heat



Flooding



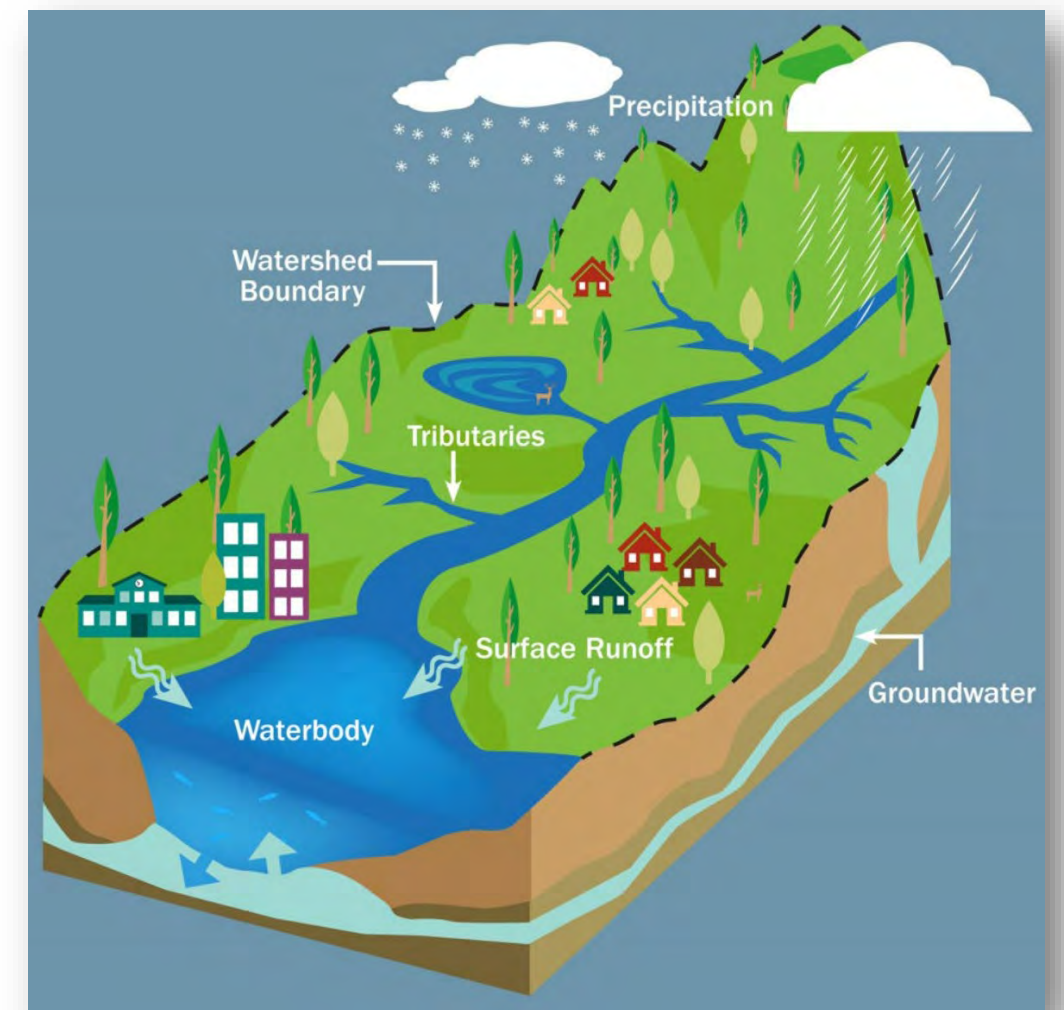
Sea Level Rise



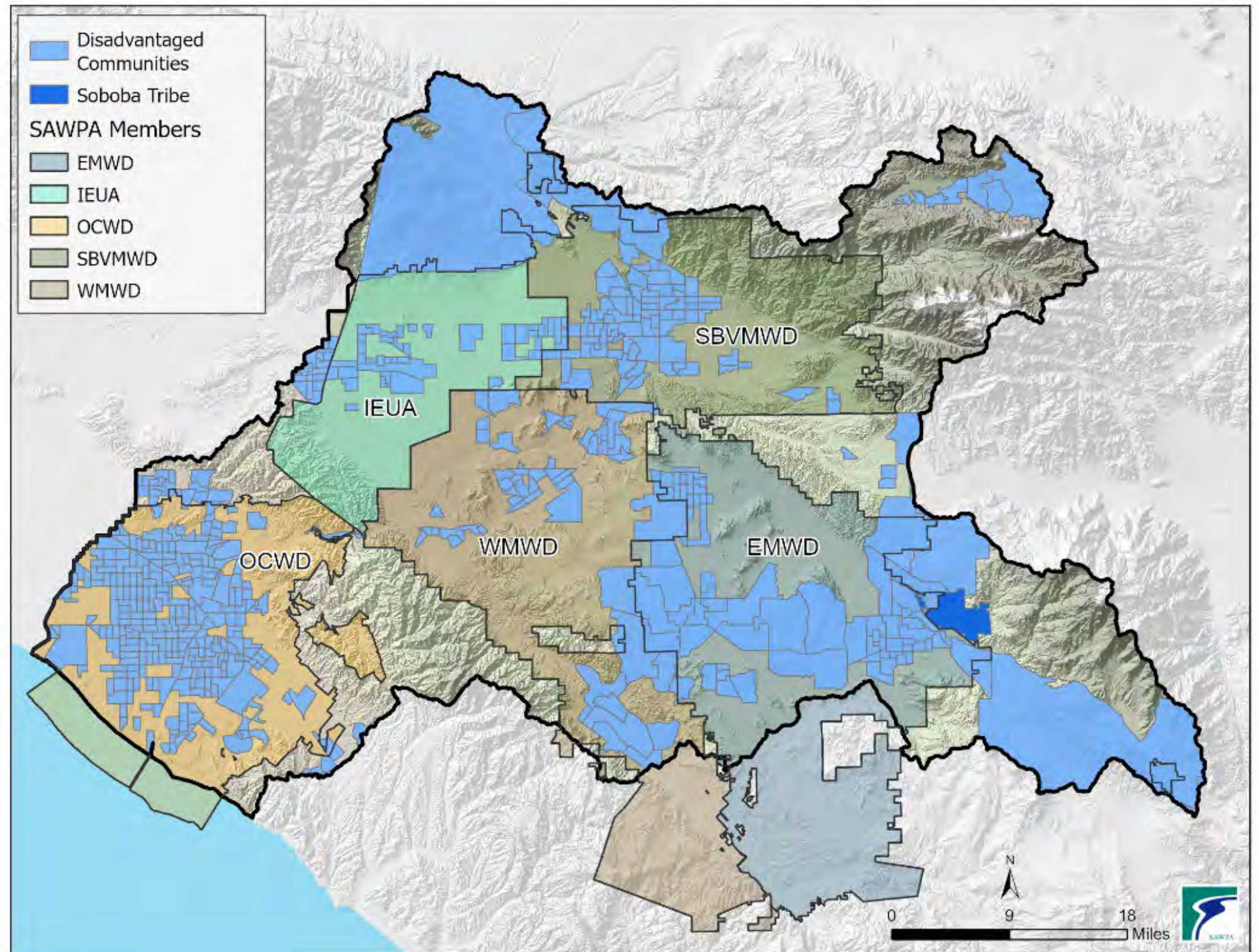
Wildfire

Award

SAWPA with Co-Applicants, Soboba Band of Luiseño Indians and the Inland Southern California Climate Collaborative, have been awarded a total of \$644,190 through the Governor's Office of Planning and Research (OPR) to develop the Santa Ana River Watershed Climate Adaptation and Resilience Plan (SARWCARP).



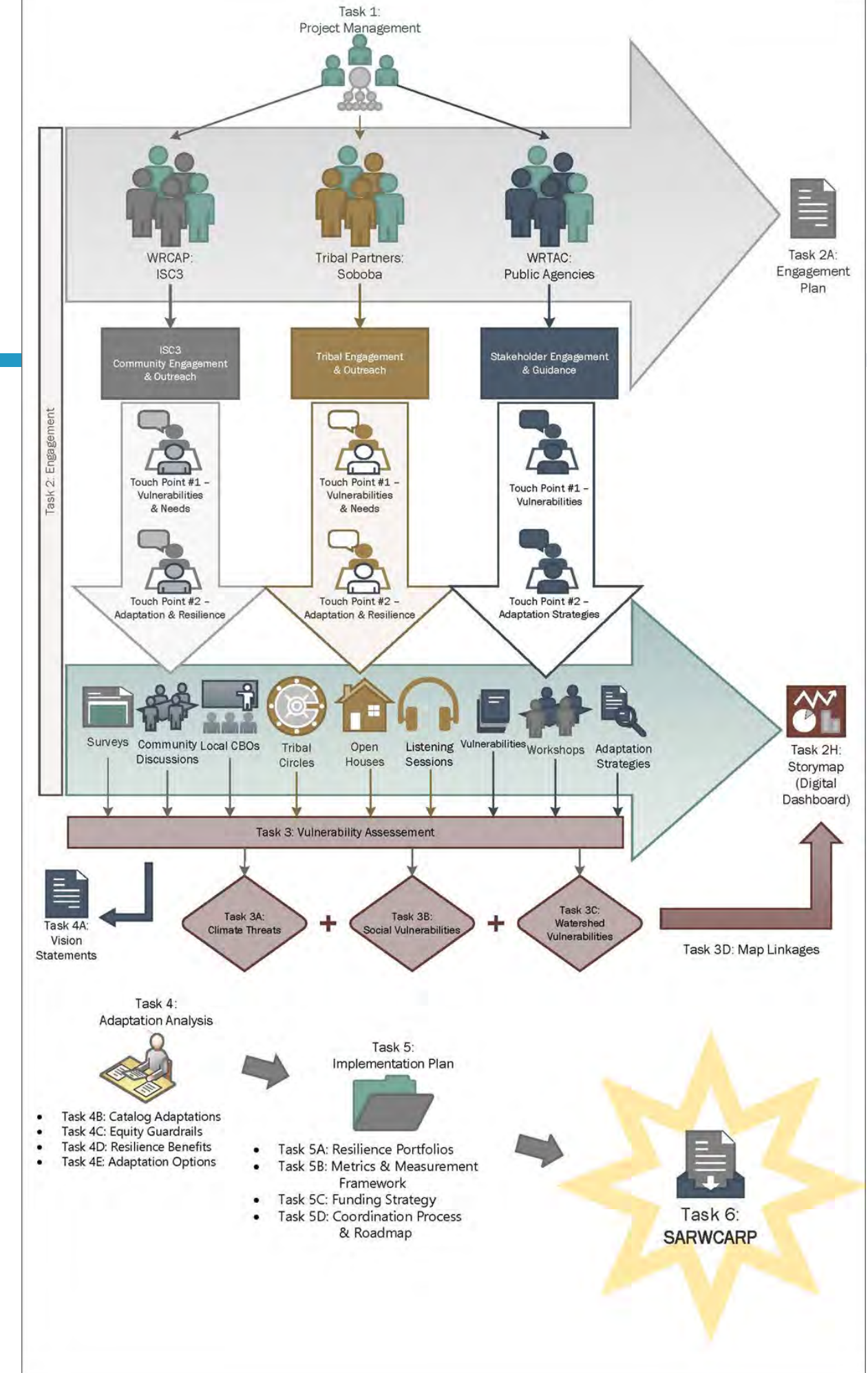
**51% of
SAWPA's
service area
population is
'Low Income'¹**



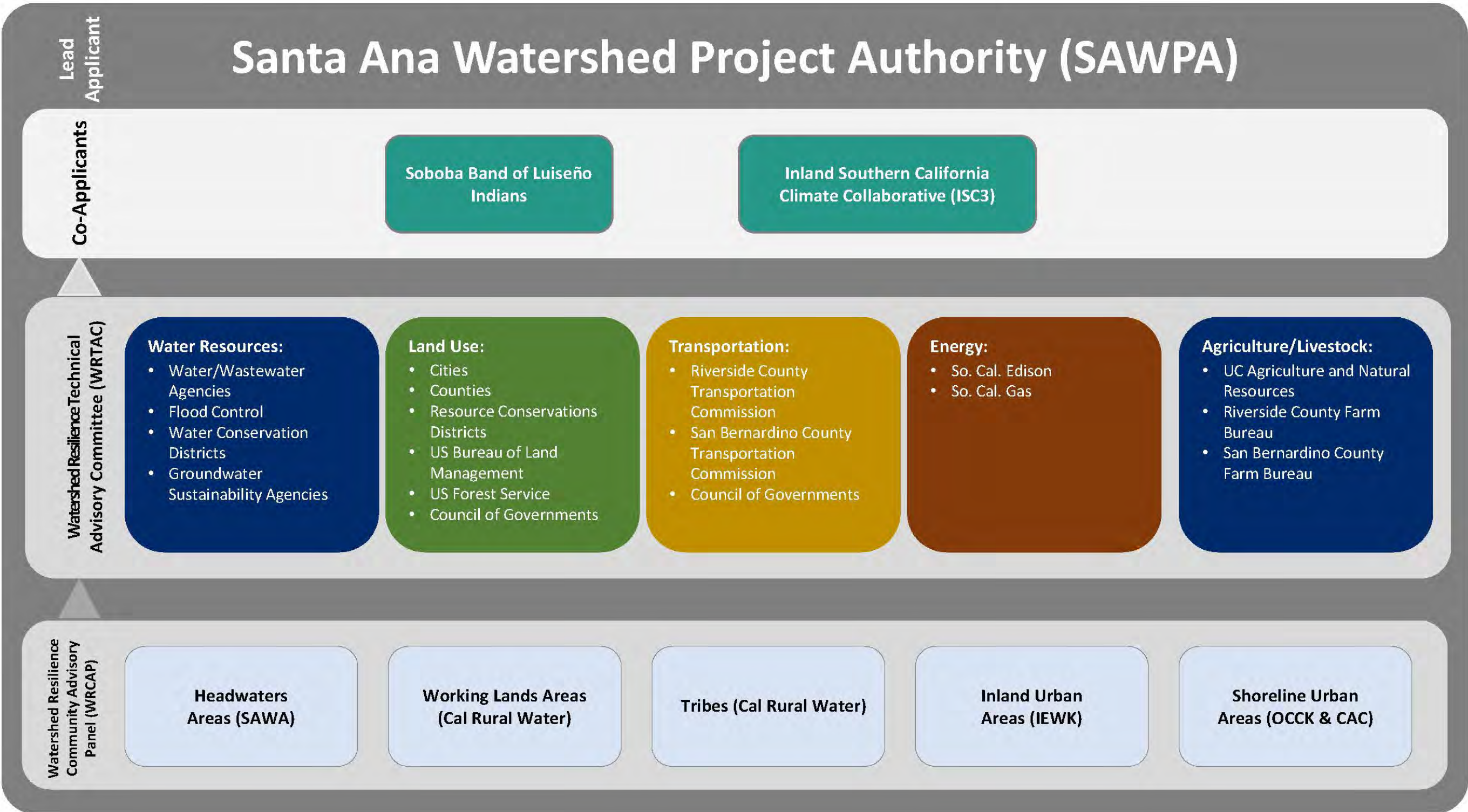
¹“Low Income” census tracts are below 80% of the statewide median income, or below the threshold designated as low-income by the HCD [Revised 2021 State Income Limits](#).

Co-Applicants & Roles

- Soboba Band of Luiseño Indians (Soboba):
 - Tribal Perspective and Tribal Engagement
- Inland Southern California Climate Collaborative (ISC3):
 - Community Perspective
 - Stakeholder and Community Engagement
 - Facilitate Watershed Resilience Community Advisory Panel (WRCAP)



Stakeholder Engagement Roadmap



Engagement

Community and Stakeholder Engagement

- Organizations
- Schedule
- Outreach Tools
- WRCAP:
 - Track and guide engagement activities,
 - Evaluate the prioritization criteria for adaptation options,
 - Guide the incorporation of equity criteria into the adaptation portfolios, and
 - Ensure that CBOs are effectively integrated into the implementation plan.
- WRTAC:
 - Guide planning process
 - Technical guidance on touchpoints

Who does the project serve?

How will the project serve, benefit, or represent any vulnerable and/or disadvantaged communities (DACs)?

Include vulnerable populations or community-based organizations representing vulnerable populations

What is the project's regional partnership structure?

Vulnerabilities

Vulnerability Assessment

- Characterize Climate Threats by Typologies:
 - Headwaters
 - Working Lands Areas
 - Tribes
 - Inland Urban
 - Shoreline Urban
- Assess the climate change vulnerabilities of communities, critical infrastructure, and ecosystem.
- Identify areas that experience disproportionate climate change risk.
- Identify linkages between community and watershed vulnerabilities: shared interest and mutual benefit.
- Outcome: Climate threats and vulnerabilities of different stakeholders.

What are the community's needs and priorities?

What are the region's greatest current and future climate risks?

Consider and address the current, most pressing inequities the communities face, while building resilience in built, natural, and social systems

Do the priorities consider feasibility, adaptive capacity, and building capacity?

Adaptation

Adaptation Analysis

- Establish watershed resilience vision and goals:
 - Greater collaboration across a wider range of stakeholders
 - Programmatic adaptation investments
 - Maximizing multi-benefit opportunities
 - Implementation of nature-based solutions
- Catalog and characterize physical and policy adaptation
- Develop equity guardrails to measure adaptation actions
- Characterize distribution of resilience benefits across the watershed
- Prioritize set of adaptation options

What are the project's expected short- and long-term outcomes, including its climate resiliency outcomes?

How to address multiple, interconnected regional climate risks using a systematic approach?

How to apply systems-level thinking and problem-solving when developing the project?

Implementation Plan



Implementation Plan

- Resilience Portfolios
- Performance Metrics
- Funding strategy
- Road-map for near-term actions

Concepts into Projects



Risk: Drought

Stormwater Capture
Groundwater Recharge
Water Use Efficiency
Recycled Water



Risk: Flooding

Ecosystem Restoration
Forest Management
Sediment Management
Urban Runoff Management



Risk Sea Level Rise

Desalination
Recharge Area Protection
Groundwater/Aquifer Remediation
Coastal Restoration

Near-Term Tasks

March/April 2024	May 2024	June 2024	July 2024	August/September 2024
<ul style="list-style-type: none">• Grant Agreement (OPR/SAWPA)• Sub-Grantee Agreement:<ul style="list-style-type: none">• SAWPA/Soboba• SAWPA/ISC3	<ul style="list-style-type: none">• MOU• Release RFP• Establish Working Groups:<ul style="list-style-type: none">• WRTAC• WRCAP	<ul style="list-style-type: none">• Consultant Selection and Contracting	<ul style="list-style-type: none">• Work Plan• Engagement Plan	<ul style="list-style-type: none">• First Engagement Touchpoint: Climate Risks and Vulnerabilities

SARWCARP Grant Term Timeline

Year	2024												2025											
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Grant Agreement Execution				█																				
Consultant RFP Posting					█																			
Consultant Proposal Review and Selection						█	█																	
Grant Period Anticipated				█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
SARWCARP Development Process							█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Apply for RRGP Implementation Grants																								█

Thank You

Rachel Gray
Santa Ana Watershed Project Authority
Office (951) 354-4250
rgray@sawpa.gov
sawpa.gov





December 21, 2023

Rachel Gray
rgray@sawpa.org

RE: Award Notification – Regional Resilience Grant Program, Round 1, Planning Grant Award, Santa Ana River Watershed Project Authority, Santa Ana River Watershed Climate Adaptation and Resilience Plan

Dear Santa Ana River Watershed Project Authority and Partners,

The Governor's Office of Planning and Research is pleased to inform you that the Santa Ana River Watershed Project Authority has been selected as a Round 1 Grantee for the Regional Resilience Grant Program (RRGP) award of \$644,190 for the Santa Ana River Watershed Climate Adaptation and Resilience Plan. RRGp provides funding to address local, regional, and tribal climate resilience needs by supporting climate resilient planning and implementation projects at the regional scale. Congratulations on your successful application!

In the coming weeks, RRGp staff will schedule a kick-off meeting to discuss any outstanding issues in your application, as well as review the partnership and grant agreement. Please note, this is a preliminary award and OPR reserves the right to make changes to awards before the agreement is executed.

We ask that you keep the awards announcement confidential until OPR posts the information publicly on our website.

We look forward to our partnership in the coming years. If you have any questions, please contact Dolores Barajas, RRG Program Manager, at dolores.barajas@opr.ca.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Sam Assefa". The signature is fluid and cursive, with a long horizontal stroke at the beginning.

Sam Assefa
Director
Governor's Office of Planning and Research

OWOW STEERING COMMITTEE MEMORANDUM NO. 2024.3

DATE: March 28, 2024

TO: OWOW Steering Committee

SUBJECT: Overview of Headwaters Resiliency Partnership and Forest First Joint Presentation between SAWPA and San Bernardino Valley Municipal Water District

PREPARED BY: Rachel Gray, Water Resources and Planning Manager

RECOMMENDATION

Receive and file.

DISCUSSION

The attached presentation provides an overview of two collaborative efforts between upstream forested land managers and downstream water agencies:

- Forest First: A partnership between SAWPA, the Cleveland National Forest, and the San Bernardino National Forest, and
- Headwaters Resiliency Partnership: A collaborative between San Bernardino Valley Municipal Water District (SBVMWD), Inland Empire Resource Conservation District (IERCD), the National Forest Foundation, SAWPA, California State University of San Bernardino, the San Bernardino National Forest, and a growing list of other entities.

Forest First

Forest First Program began through discussions led by SAWPA in 2010 and subsequent signing of a 2011 MOU with SAWPA and the two national forests in the Santa Ana River Watershed – the Cleveland National Forest (CNF) and San Bernardino National Forests (SBNF). National Forests are often compared to their federal cousin, National Parks. According to the National Forest Foundation, “While National Parks are highly vested in preservation, barely altering the existing state, National Forests are managed for many purposes—timber, recreation, grazing, wildlife, fish and more.” National forests are managed by federal employees within the U.S. Forest Service, an agency under the umbrella of the Department of Agriculture.

The MOU calls for regular coordination between SAWPA and the two national forests and sharing updates related to water resource projects that affect or occur near/within the national forests. The MOU states that any mutually beneficial projects funded by the national forests, SAWPA, and other downstream water agencies shall be the subject of separate funding-related agreements. Two separate agreements have been signed to date; these include two Integrated Regional Water Management (IRWM) grant agreements approved by the OWOW Steering Committee. The agreements have provided two grants to the national forests as shown in Table 1 below. SAWPA will also collaborate with the national forests on climate adaptation and resilience strategies in the headwaters of the Santa Ana River Watershed.

Table 1: Forest First Related Funding Agreements

Grant	Project Name	Project Lead	Grant Amount/Total Cost (Rounded)
Prop 84 IRWM	Forest First: Increase Stormwater Capture and Decrease Sediment Loading Through Forest Ecological Restoration	SBNF	G: \$1,000,000 TC: \$5,600,000
Prop 1 IRWM	Santa Ana Mountains Watershed Protection Project	CNF	G: \$500,000 TC: \$1,200,000

Headwaters Resiliency Partnership

The Headwaters Resiliency Partnership (focused on the San Bernardino Mountains and possibly the San Jacinto Mountain area) has been led by SBVMWD and IERCD since late 2020. The first formal meeting with U.S. Forest Service staff took place in February 2021 and on May 4, 2021, the SBVMWD Board of Directors announced the formal establishment of the new, ongoing Headwaters Resilience Partnership (HRP) with the goal of identifying regional solutions to confront the worsening challenges with water supply and natural resources currently faced in forest headwaters.

Priority issues for the HRP include supporting activities like fuels reduction and wildfire prevention; community preparation for wildfire response; ecological health and function of the headwater streams; native species habitat, including minimum flow and aquatic organism passage; and promoting education and responsible recreation on our public forest lands. The HRP has regular leadership meetings between water agencies and SBNF who manage the San Bernardino Mountains as well as the San Jacinto Mountain area and has developed a strategic planning document.

Through its strategic planning effort, the HRP is committed to working with partners to:

- Develop and maintain a partnership to streamline efforts and pool resources.
- Identify, implement, and adaptively manage projects and priority areas to reduce the likelihood and intensity of catastrophic wildfires, floods, erosion, and disturbances.
- Restore and adaptively manage priority areas impacted by natural and human-caused disturbances in a manner that will allow them to be more resilient to future disturbances.
- Monitor the effectiveness of management tactics and conditions across the Inland Empire mountains and foothills to inform future decision-making.
- Foster career pathways for the next generation of professionals and assist with recruitment for those career pathways.
- Drive evidence-based decision-making and proactive risk management.
- Build and maintain trust by being collaborative, transparent, and resourceful partners through effective communication and engagement.

Through the implementation of these strategies, the HRP's goal is to secure the long-term health and resilience of the headwater region of the Santa Ana River Watershed.

CRITICAL SUCCESS FACTORS

- Successful implementation of an integrated regional water resource plan that reflects the watershed management needs of the public and the environment.
- Data and information needed for decision-making is available to all.

RESOURCE IMPACTS

None.

Attachments:

1. PowerPoint Presentation

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Forest First and Headwaters Resiliency Partnership Overview

OWOW Steering Committee

Rachel Gray

Agenda Item No. 6.C.

Water Resources and Planning Manager

March 28, 2024

Two Collaboratives Covered in Presentation

- Forest First: A partnership between SAWPA, the Cleveland National Forest, and the San Bernardino National Forest, and
- Headwaters Resiliency Partnership: A collaborative between San Bernardino Valley Municipal Water District (SBVMWD), Inland Empire Resource Conservation District (IERCD), the National Forest Foundation, SAWPA, California State University of San Bernardino, the San Bernardino National Forest, and a growing list of other entities.

Information About Forest Land Managers

- National Forests are often compared to their federal cousin, National Parks.
- According to the National Forest Foundation, “While National Parks are highly vested in preservation, barely altering the existing state, National Forests are managed for many purposes—timber, recreation, grazing, wildlife, fish and more.”
- National forests are managed by federal employees within the U.S. Forest Service, an agency under the umbrella of the Department of Agriculture.
- CAL FIRE also manages fourteen Demonstration State Forests which serve as a “living laboratory to for how to care for California’s timberlands” (none in this watershed).

Santa Ana River Watershed

- Approx. 30% of watershed managed by Forest Service
- Estimated that 90% of the annual precipitation falls on headwaters
- Two National Forests within watershed – the Cleveland and San Bernardino.



Forest First

- Forest First program began through discussions led by SAWPA in 2010 and was memorialized by the signing of a 2011 MOU with SAWPA and the Cleveland National Forest (CNF) and San Bernardino National Forests (SBNF).
- The MOU calls for regular coordination between SAWPA and the two national forests and sharing updates related to water resource projects that affect or occur near/within the national forests.
- The MOU states that any mutually beneficial projects funded by the national forests, SAWPA and other downstream water agencies shall be the subject of separate funding-related agreements.



Separate Forest First Funding Agreements

Two separate agreements have been signed to date; these include two Integrated Regional Water Management (IRWM) grant agreements approved by the OWOW Steering Committee.



Grant	Project Name	Project Lead	Grant Amount/Total Cost (Rounded)
Prop 84 IRWM	Forest First: Increase Stormwater Capture and Decrease Sediment Loading Through Forest Ecological Restoration	SBNF	G: \$1,000,000 TC: \$5,600,000
Prop 1 IRWM	Santa Ana Mountains Watershed Protection Project	CNF	G: \$500,000 TC: \$1,200,000

Next Steps for Forest First

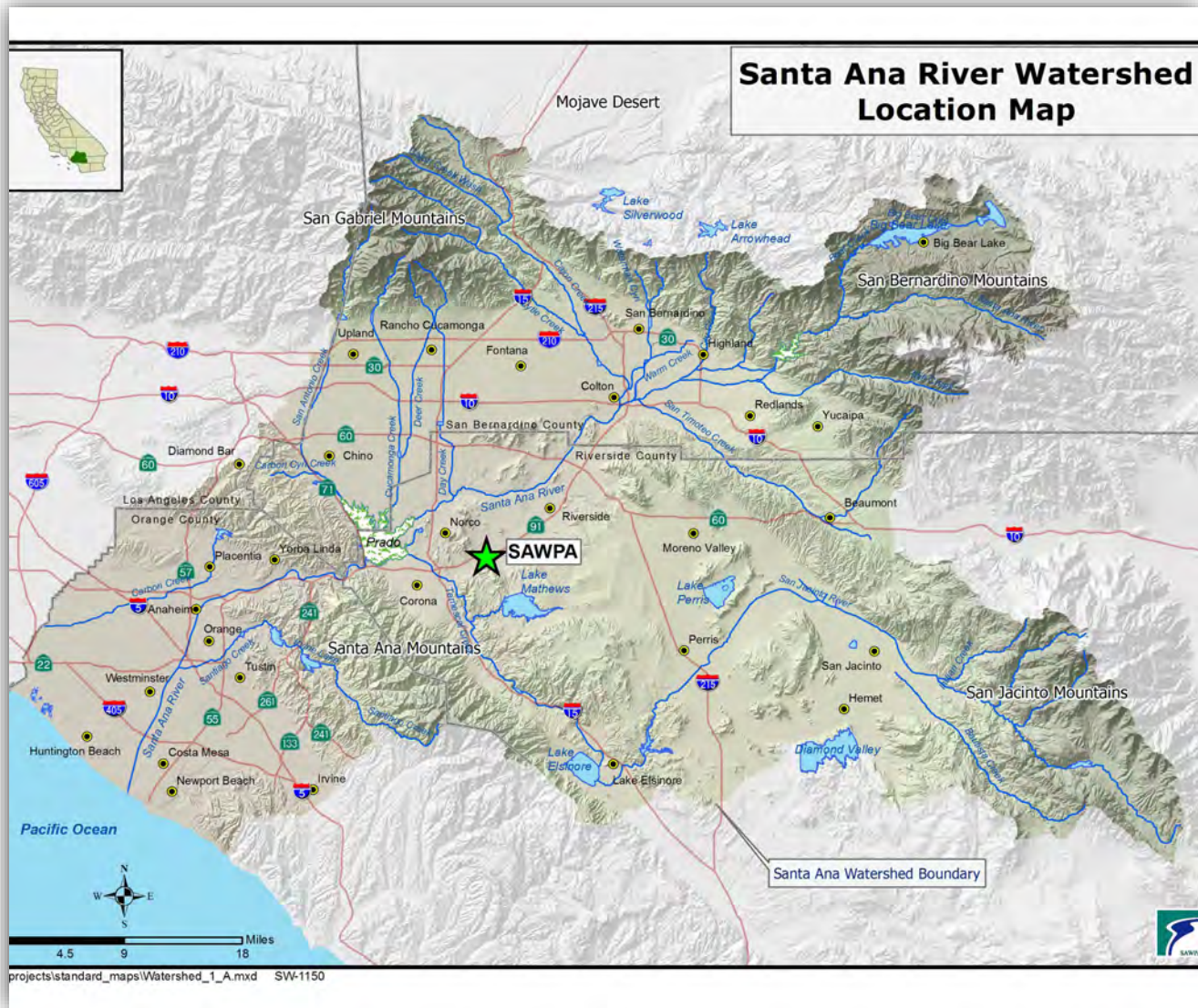
- Continue to coordinate with both national forests to find mutual beneficial projects.
- Engage with forest service on regular operations and monitoring efforts such as stream water quality and aerial imagery.
- Bring other potential partners to the table such as downstream water agencies and municipalities.
- Collaborate with both national forests during development of the Santa Ana River Watershed Climate Adaptation and Resilience Plan

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Headwaters Resiliency Partnership



A REGIONAL WATER AGENCY
SINCE 1954



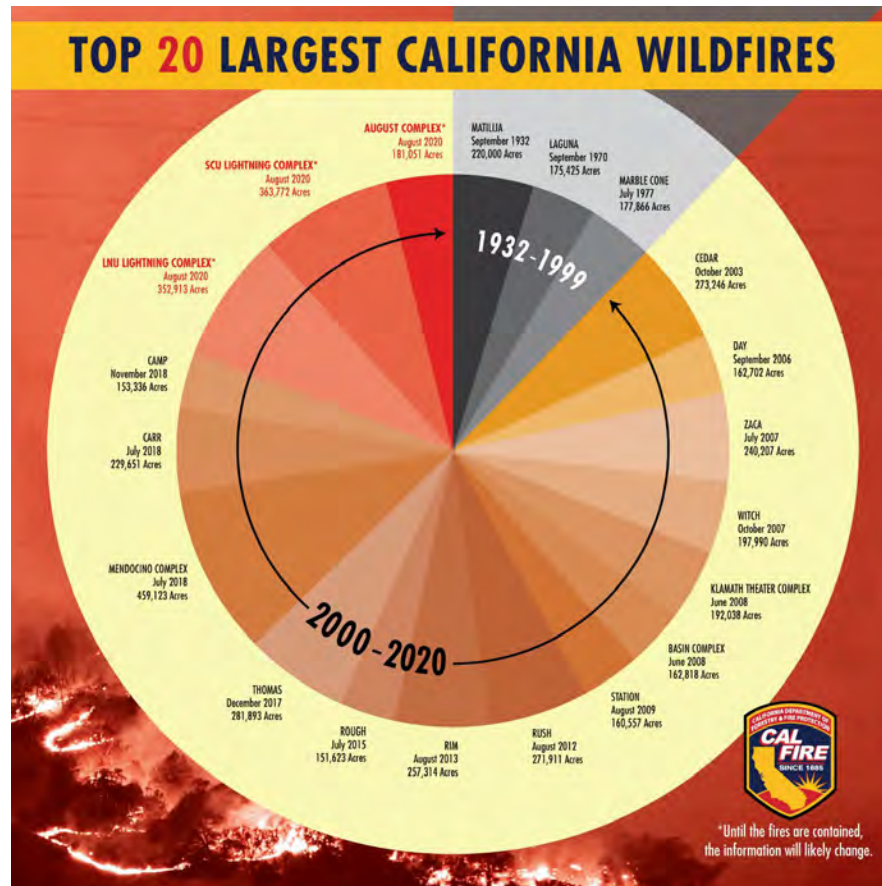
Overview

- Why the interest in headwaters management?
- How did the partnership get started?
- Who's currently involved?
- What have we been up to?
- What's next?

https://sawpa.gov/wp-content/uploads/2019/09/1_1150_Watershed_1_A.jpg



Why the interest in headwaters management?



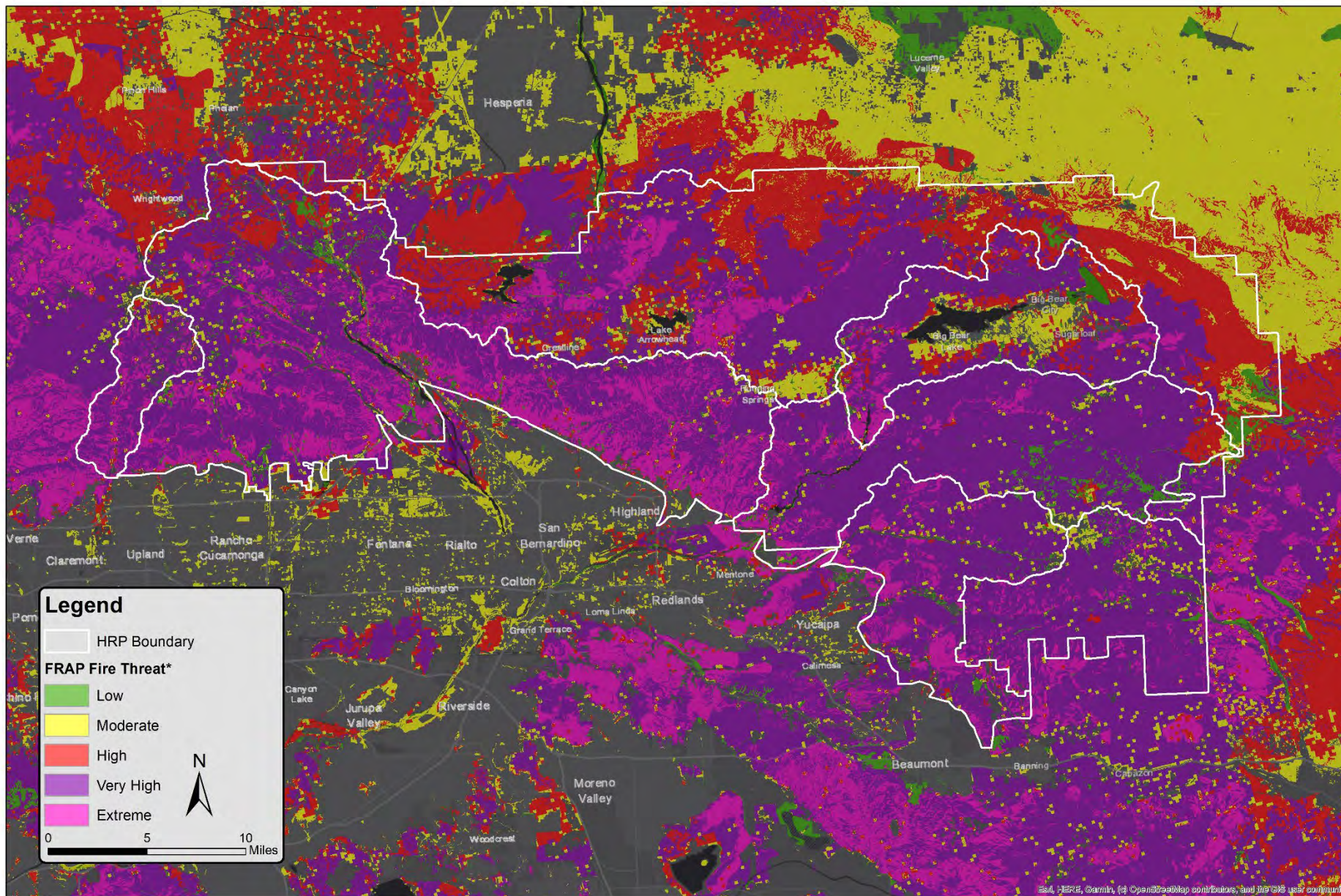
<https://www.facebook.com/CALFIRE/photos/a.157450722389/10158648726452390/>

2020 Fire Season ([CA's Wildfire and Forest Resilience Action Plan](#))

- Five of six largest fires in CA's modern history burning at the same time
- More than 2x the record number of acres burned (more than 4,000,000 acres)



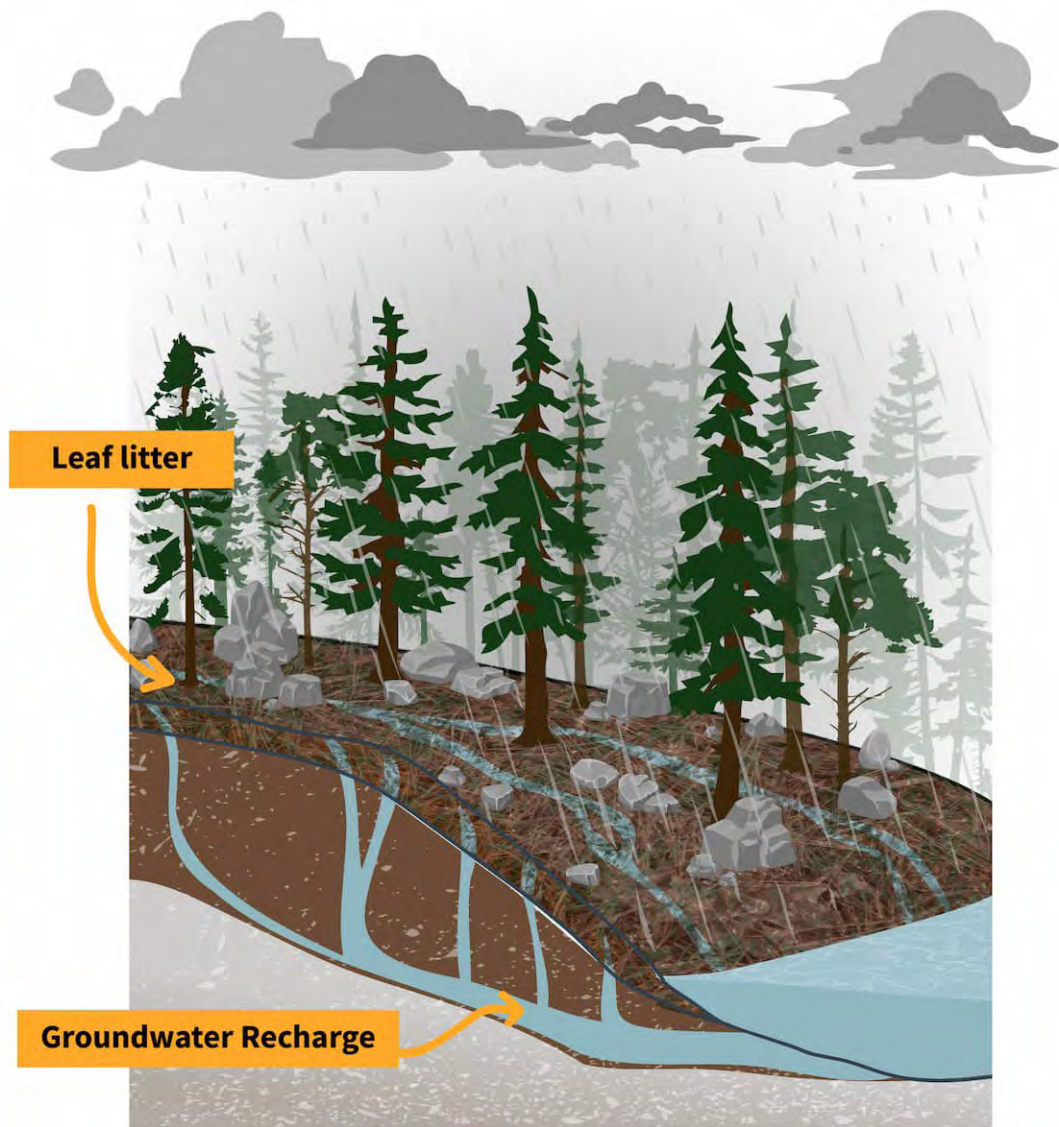
Fire Risk



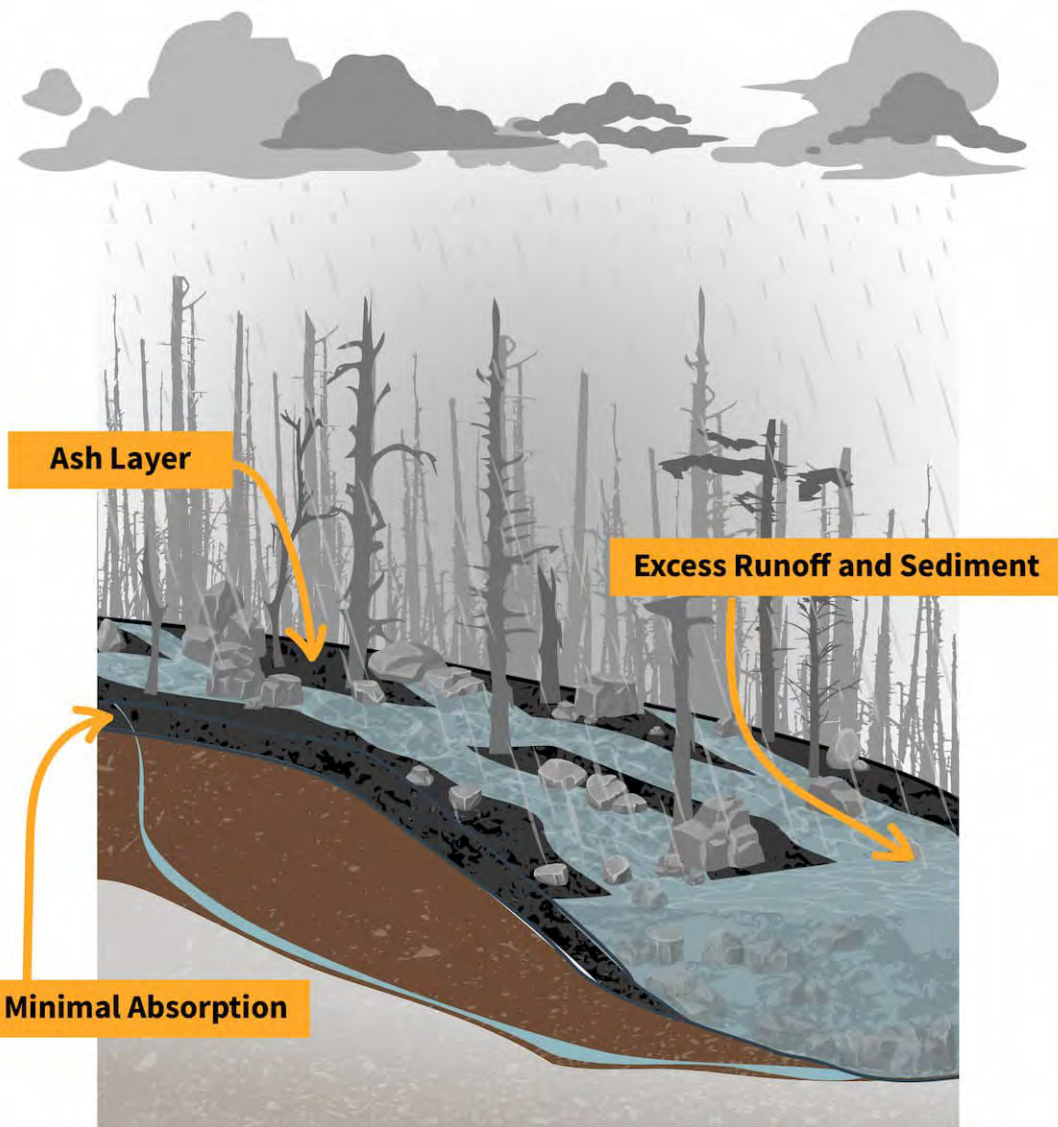
Climate change is making temperatures rise and increasing wildfire risk.



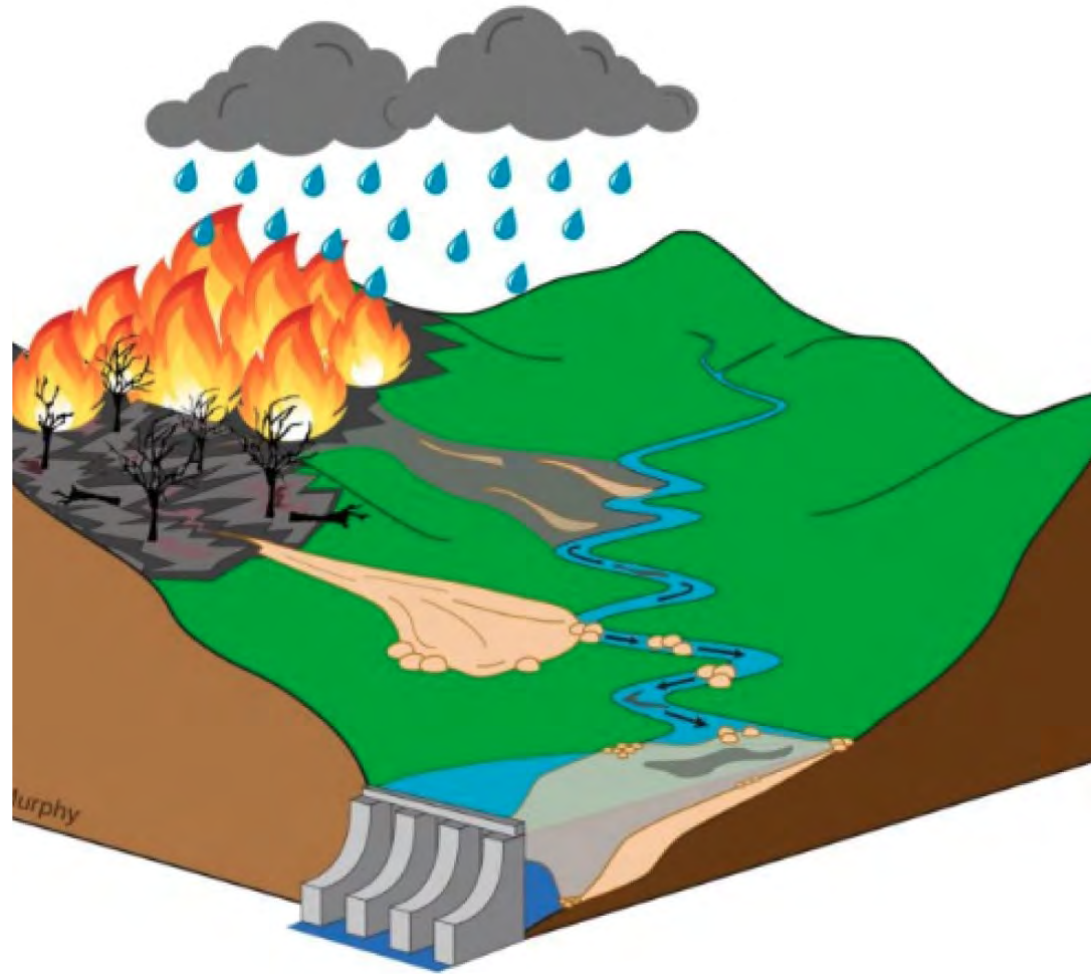
<https://www.ijc.org/en/western-wildfires-put-water-systems-risk-pollution>



[https://labs.waterdata.usgs.gov/visualizations/fire-hydro/index.html/#/](https://labs.waterdata.usgs.gov/visualizations/fire-hydro/index.html#/)



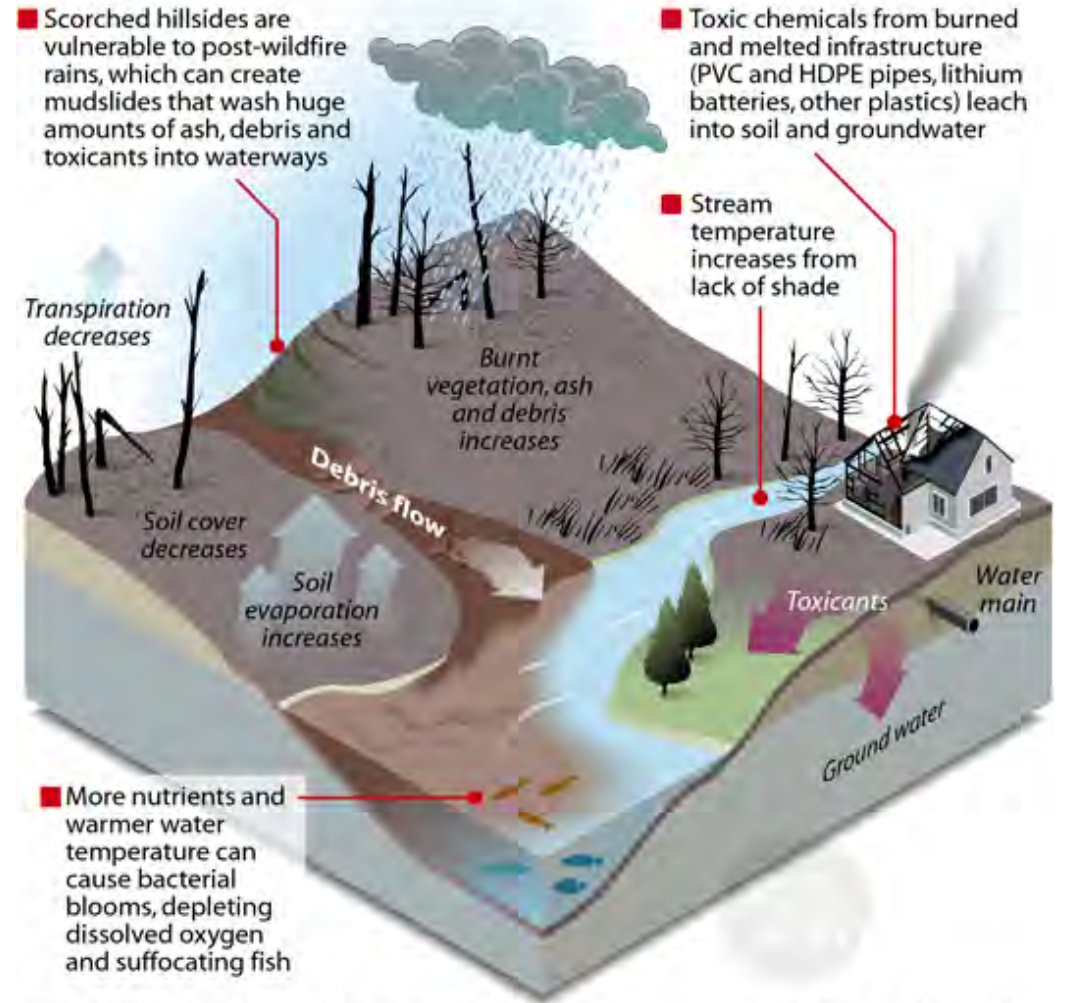
[https://labs.waterdata.usgs.gov/visualizations/fire-hydro/index.html/#/](https://labs.waterdata.usgs.gov/visualizations/fire-hydro/index.html#/)



<https://www.kunc.org/science/2019-09-24/how-wildfires-may-muck-up-the-west-s-reservoirs>

How Wildfires Can Negatively Impact Water Quality

Intense fires cause chemical reactions that release metals, nutrients and other toxicants into the soil. Subsequent rains can wash these contaminants into rivers and reservoirs, which can negatively affect wildlife, agriculture and humans. Here are some examples:



SOURCES: Water Quality Australia; Purdue University

PAUL HORN / InsideClimate News

Why the interest in headwaters management?

Approximately 2/3 of our local water supply comes from our local mountains and foothills

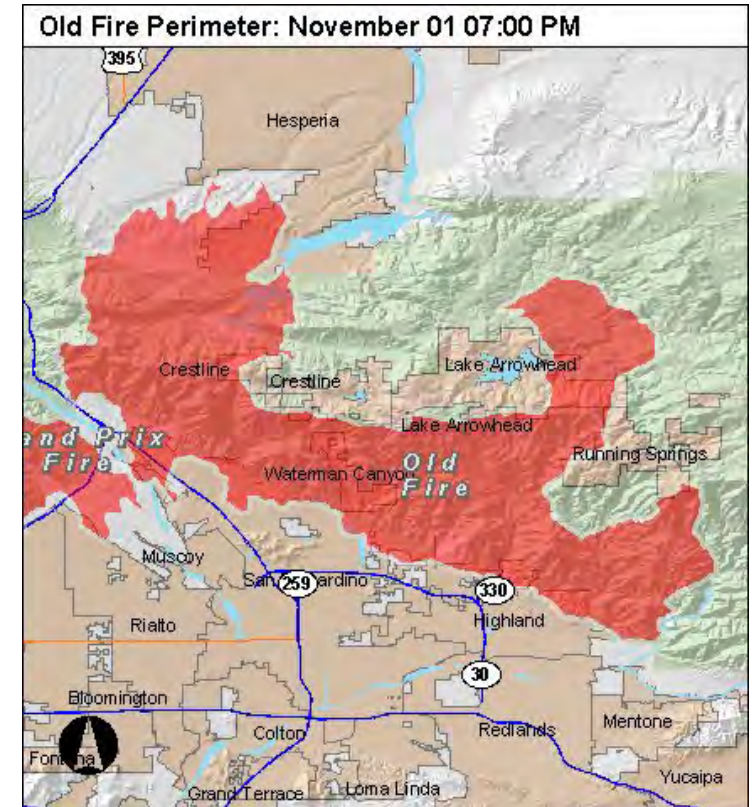
Upwards of \$450 million of groundwater recharge infrastructure planned in the Upper SAR HCP

Ability to recharge relies on:

- Functional infrastructure
- Water quality
- Successful implementation of the HCP's Conservation Strategy

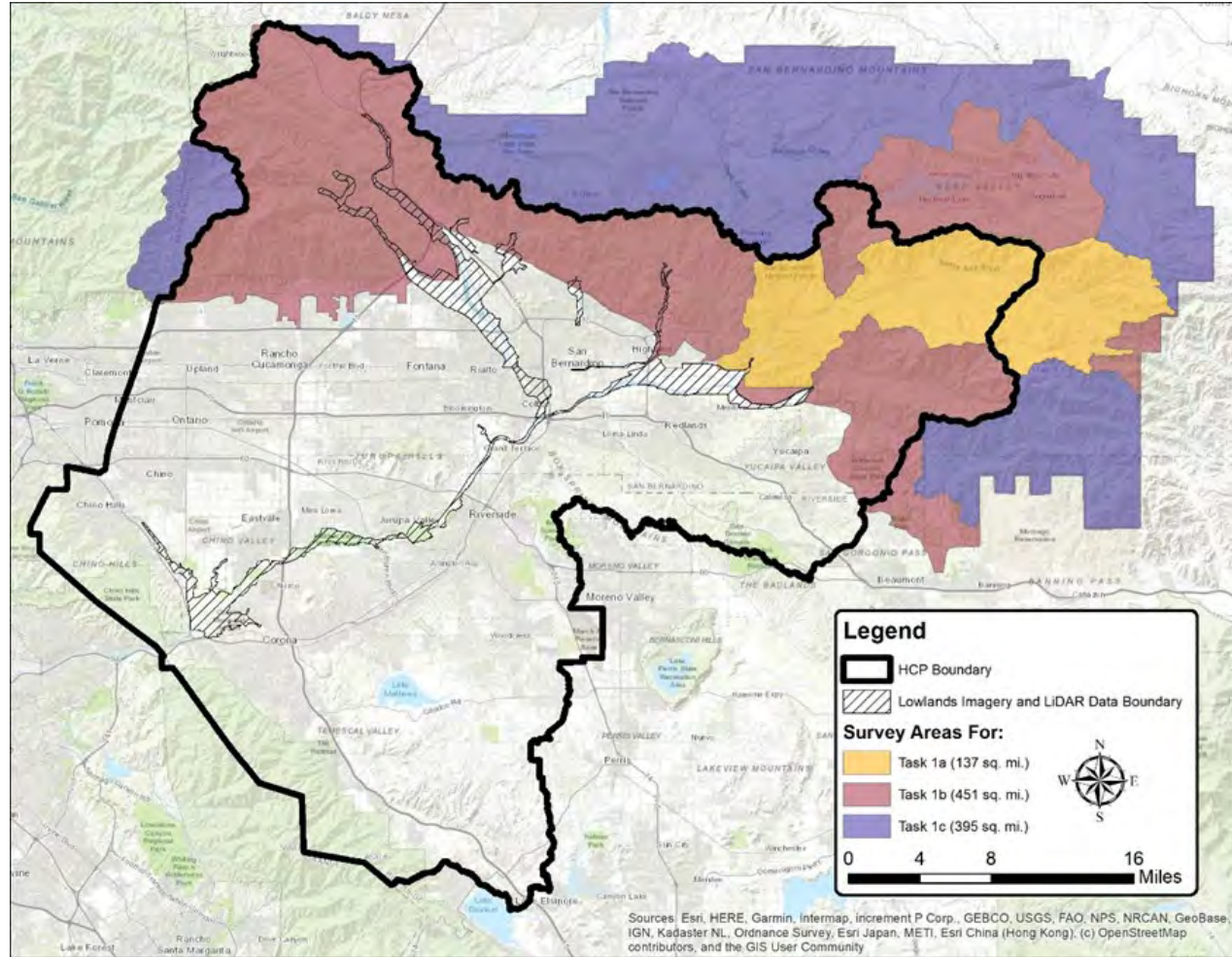


Image provided by Mary Ann Dickinson



Map provided by Mary Ann Dickinson

How did the partnership get started?



Who is currently involved?

- San Bernardino Valley Municipal Water District
- Inland Empire Resource
- USDA Forest Service
- Cal Fire
- National Forest Foundation
- Santa Ana Watershed Project Authority
- Southern California Mountains Foundation
- California State University San Bernardino



- San Bernardino Valley Water Conservation District
- Southern California Edison
- Inland Empire Community Foundation
- San Bernardino Mountains Land Trust
- Save Our Forests Association
- Sierra Club
- Interested Citizens

What have we been up to?

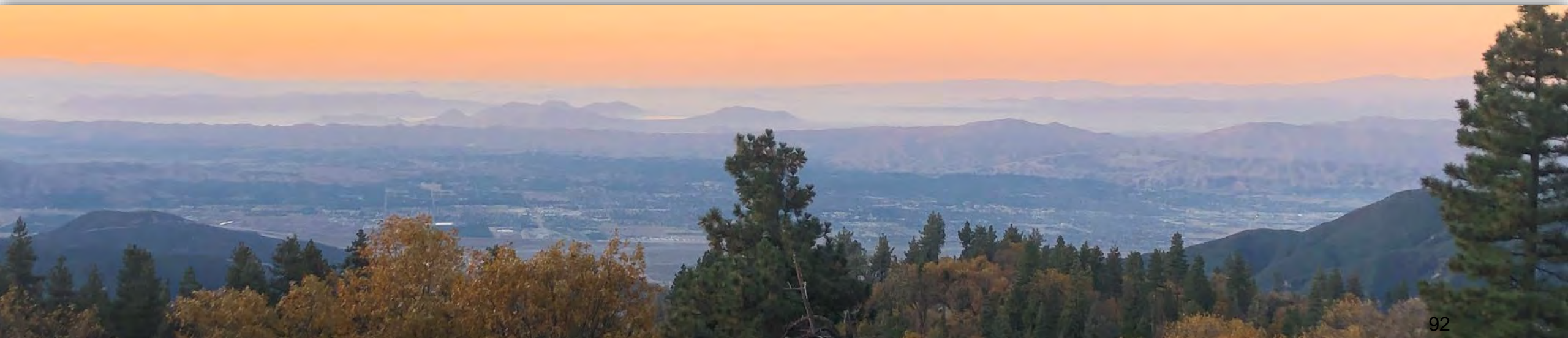
- Platform for collaboration
- Regular coordination at multiple organizational levels across numerous organizations
- Biochar demonstration
- Grant making
- Facilitator RFQ
- Marketing and outreach products
- Monitoring plan development
- Regional priority planning
- Strategic plan development



Strategic Plan Development

Our *mission* is to work collaboratively across jurisdictional boundaries to promote healthy and resilient ecosystems and communities in the San Bernardino Mountains and Foothills.

Our *vision* for the future is a headwaters region where collaborative relationships and partner expertise are leveraged across jurisdictional boundaries and aligned with regional priorities to promote healthy and resilient ecosystems and communities.



Strategic Plan Development

Our *strategies* are to work with our partners to...

- Develop and maintain a collaborative to streamline efforts and pool resources.
- Identify, implement, and adaptively manage measures to reduce the likelihood and intensity of catastrophic wildfire.
- Restore and adaptively manage areas impacted by disturbances like catastrophic wildfire, flood, and landslides in a manner that will allow them to be more resistant and resilient to future disturbances.
- Monitor effectiveness of management tactics and conditions across the San Bernardino Mountains and Foothills to inform future decision making.
- Develop career pathways for the next generation of professionals.
- Drive evidence-based decision making and proactive risk management.
- Build and maintain trust by being a collaborative, transparent, and resourceful partner through effective communication and engagement.

What's next?

- Facilitator
- Charter development
- Reach out to new partners
- FY 24/25 work plan
- 5-Year work plan
- Funding strategies
- Finalize monitoring plan
- Outreach and education
- Capacity assistance
- Planning, implementing, and adaptively managing projects



Rx Burning



Mechanical Treatments



Shaded Fuel Break



Fell, Pile & Burn



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SINCE 1954

Please contact Chris Jones
(chrisj@sbrvmwd.com) with any
questions. Thank you!!!

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OWOW STEERING COMMITTEE MEMORANDUM NO. 2024.4

DATE: March 28, 2024

TO: OWOW Steering Committee

SUBJECT: Santa Ana River Watershed Weather Modification Pilot Program Update

PREPARED BY: Rachel Gray, Water Resources and Planning Manager

RECOMMENDATION

Receive and file.

DISCUSSION

On July 19, 2022, the Santa Ana Watershed Project Authority (SAWPA) Commission authorized an award of contract with North American Weather Consultants Inc. to conduct the Santa Ana River Watershed Weather Modification Pilot Program operations. Subsequently, the SAWPA Commission authorized an award to the Board of Regents of the Nevada System of Higher Education on behalf of the Desert Research Institute (DRI) for the independent validation of the Santa Ana River Watershed Weather Modification Pilot Program.

The Pilot Program is a four-year project spanning the four winter seasons starting in 2023 and running between November 15 and April 15 for each season. The operations are based on past work described in the SAWPA Feasibility Study published in 2020, updated seeding site analysis, and reflects requirements from CEQA, and comments from SAWPA member agency staff and other stakeholders. The focus of the pilot will be on seeding the four target areas identified in the feasibility study surrounding the watershed with an emphasis on increasing snow precipitation.

Since the start of the project in August 2022, site access agreements have been secured with eleven (11) project sponsors to locate the fifteen (15) ground-based cloud seeding units. Preliminary and final biological surveys were conducted in July and October 2023, respectively, site improvements, equipment installation, and operator training occurred in October 2023. Concurrently, an Operations Plan documenting project communication, operational criteria for cloud seeding, and suspension criteria for the program was developed. A SAWPA Communications Plan documenting communication with SAWPA Member Agencies, local funding partners, stakeholders, and the public, was prepared and includes outreach and communication materials. The pilot project began on November 15, 2023.

SAWPA is also coordinating the Pilot Program planning with DRI on the validation component of the project. DRI will be conducting an independent review of the cloud seeding pilot operations and validating the increases in precipitation and stream flows.

CRITICAL SUCCESS FACTORS

- Successful implementation of an integrated regional water resource plan that reflects the watershed management needs of the public and the environment.
- Data and information needed for decision-making is available to all.

RESOURCE IMPACTS

In April 2023, SAWPA was notified by the Department of Water Resources (DWR) that the SAWPA Santa Ana River Weather Modification Pilot Program will receive a grant valued at \$861,400 under the Proposition 1 Round 2 funding program. Local funding has been secured totaling \$94,000. Project operations and validation study costs are budgeted and reflected in the FYE 23-24, FYE 24-25, FYE 25-26 and FYE 26-27 SAWPA Budgets.

Attachments:

1. PowerPoint Presentation



Santa Ana River Weather Modification Pilot Program Status Update

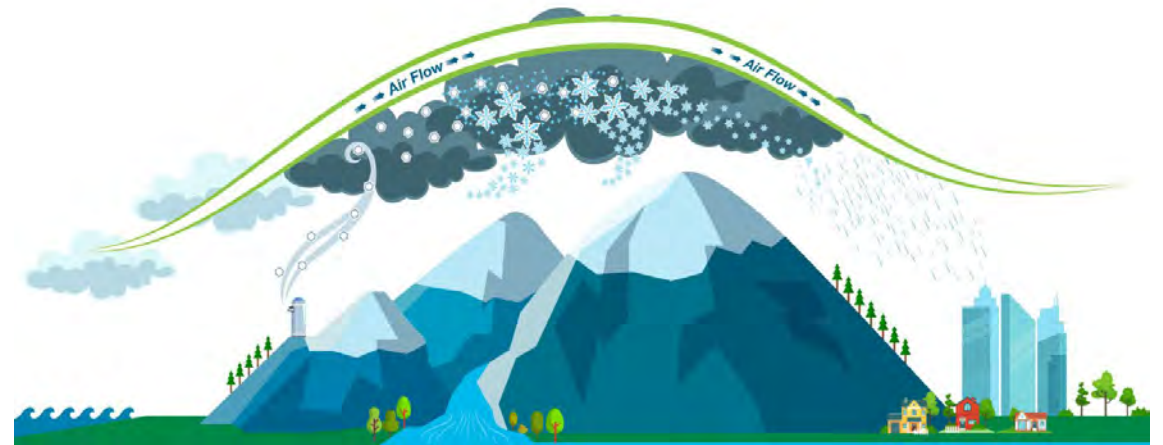
Agenda Item No. 6.D.

Rachel Gray

Water Resources and Planning Manager

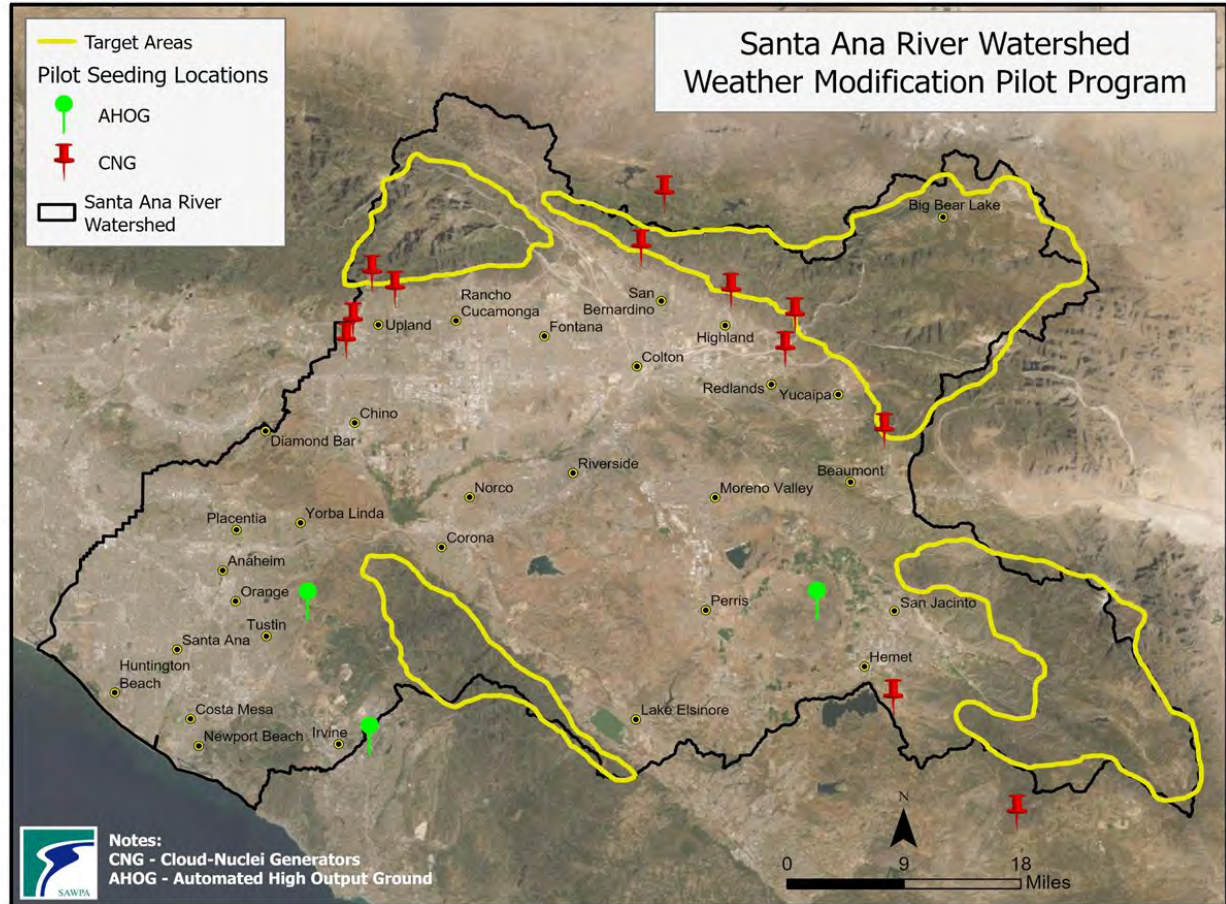
Presentation Overview

- Background Information
 - Pilot Program Overview
 - Funding
- Operations
 - Summary of Cloud Seeding Operations
 - Notifications
 - Summary of Past Storms
- Validation
- Communications Plan
- Program Schedule



Pilot Project Overview

- Pilot Program
 - 4-year study
 - 4 Target Areas (NW, NE, SW, SE)
 - Use of ground-seeding units (15)
 - Use of Validation Study to assess increases in precipitation
 - Communications Plan
- Pilot Program Operator
 - North American Weather Consultants (NAWC)



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Funding

SAWPA Member Agencies

Big Bear City Community Services District

Big Bear Lake Department of Water & Power

Chino Basin Water Conservation District

City of Corona Utilities Department

City of Santa Ana Municipal Utility Services

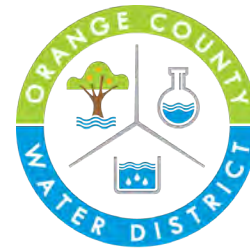
Lake Elsinore and San Jacinto Watersheds Authority

San Antonio Water Company

San Geronio Pass Water Agency



SAN GORGONIO PASS WATER AGENCY
Established 1961



SINCE 1933



Powered by water. Driven by service.



A REGIONAL WATER AGENCY SINCE 1954



Pilot Funding

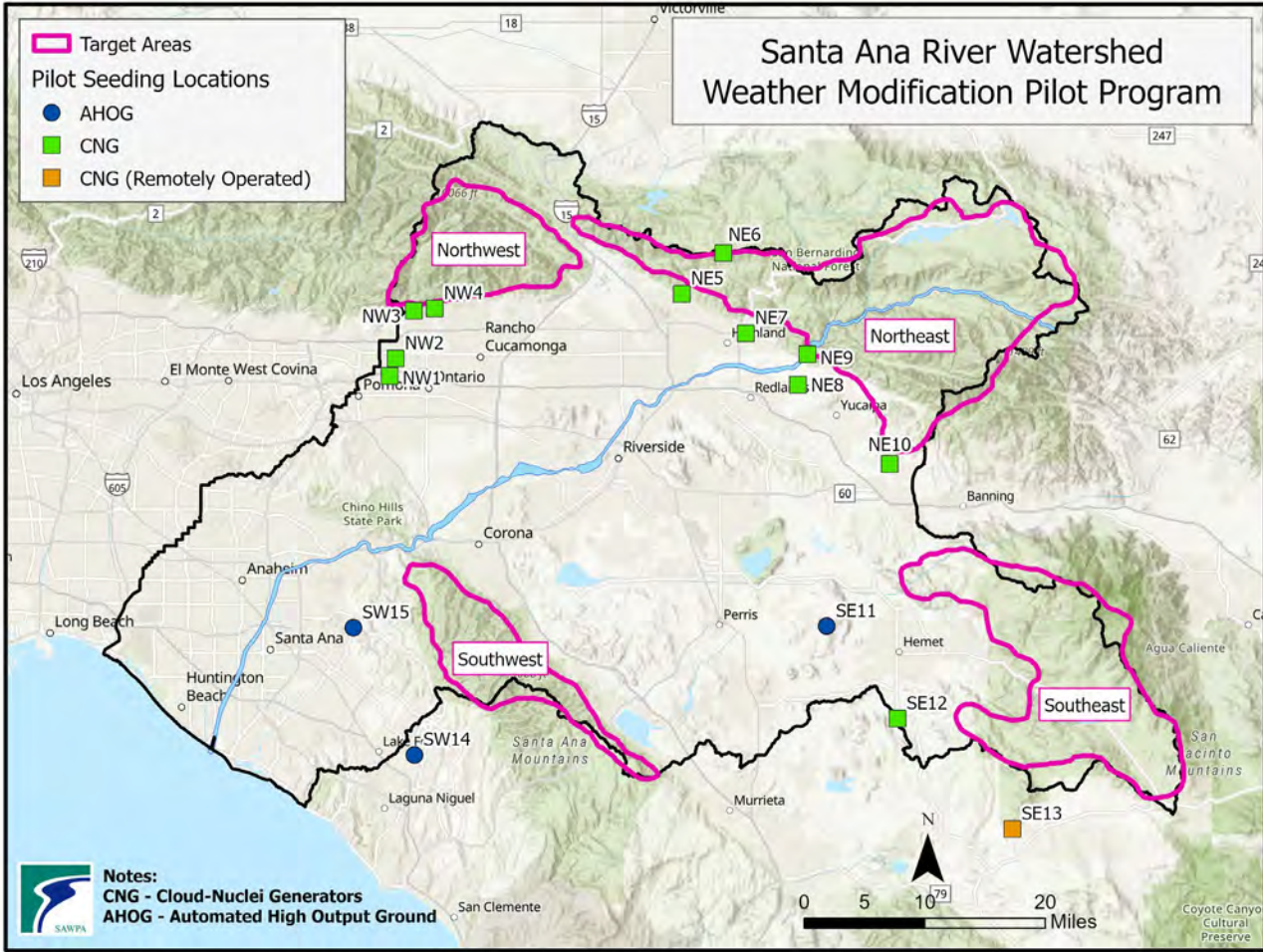
Source	Amount
Prop 1 Round 2 Grant (DWR)	\$861,400
SAWPA (IEUA, WMWD, EMWD, SBVMWD, OCWD)	\$691,000
Local Funding Partners:	
<ul style="list-style-type: none"> • Big Bear City Community Services District • Big Bear Lake Department of Water & Power • Chino Basin Water Conservation District • City of Corona Utilities Department • City of Santa Ana Municipal Utility Services • Lake Elsinore and San Jacinto Watersheds Authority • San Antonio Water Company • San Geronimo Pass Water Agency 	\$94,000
Total (4 years)	\$1,646,400



Operations

Cloud Seeding Ground-Based Unit Locations

Site (15)	Sponsors (11)
Northwest	
NW1	Chino Basin Water Conservation District
NW2	
NW3	San Antonio Water Company
NW4	
Northeast	
NE5	City of San Bernardino MWD
NE6	Private Landowner
NE7	San Bernardino Valley MWD
NE8	San Bernardino Valley Water Conservation District
NE9	
NE10	San Gorgonio Pass Water Agency
Southeast	
SE11	Eastern Municipal Water District
SE12	
SE13	Private Landowner
Southwest	
SW14	El Toro Water District
SW15	East Orange County Water District



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Example Sites



SW14: ETWD



NE10: SGPWA



NW2: CBWCD

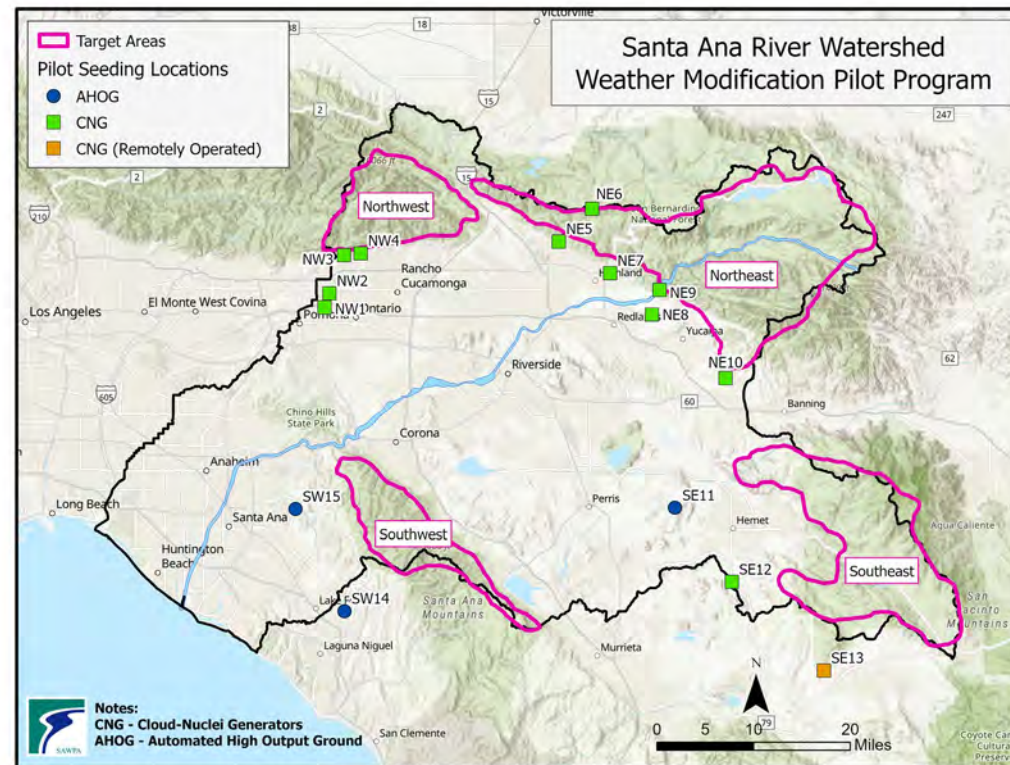
Key Timeline

Task	Completion Date or Time Period
Seasonal Program Start	November 15, 2023
Notifications to Fire Department	December 2023 – January 2024
Seasonal Program Operational Period	November 15, 2023 – April 15, 2024
Seasonal Program End	April 15, 2024
Seasonal Equipment Collection Deadline	May 30, 2024
Draft Seasonal Report Delivered	June 1, 2024

Rainfall for February 2-9 Storms (Not Seeded)

NW Target (rainfall-inch)		
	Feb 2-9	Total
Middle Fk Lytle Ck	15.48	15.48
Lytle Crk RAWS	14.64	14.64
Deer Creek Dam	12.40	12.40
San Sevaine	9.45	9.45
Wrightwood FS	7.39	7.39
Wrightwood	5.66	5.66
Mormon Rock RAWS	6.75	6.75
Upper Day Cyn	5.31	5.31
Mt Baldy	2.96	2.96
	Average	8.89

SW Target (rainfall-inch)		
	Feb 2-9	Total
Santiago Pk 5638	11.81	11.81
Horsethief/Rice Cyn	10.79	10.79
Leach/Dickey Cyn	10.11	10.11
Upper Harding Cyn	8.86	8.86
Holy Jim Cyn	8.03	8.03
McVicker Cyn	8.03	8.03
Indian Cyn	7.88	7.88
Coldwater Cyn	7.52	7.52
El Cariso	6.97	6.97
El Cariso RAWS	6.63	6.63
Santa Rosa Plateau	6.17	6.17
Modjeska Cyn	5.94	5.94
Santiago Creek	5.67	5.67
Fremont Cyn RAWS	5.38	5.38
Silverado Motorway	3.85	3.85
Santiago Pk 5660	3.55	3.55
Upper Silverado Cyn	2.17	2.17
	Average	7.02



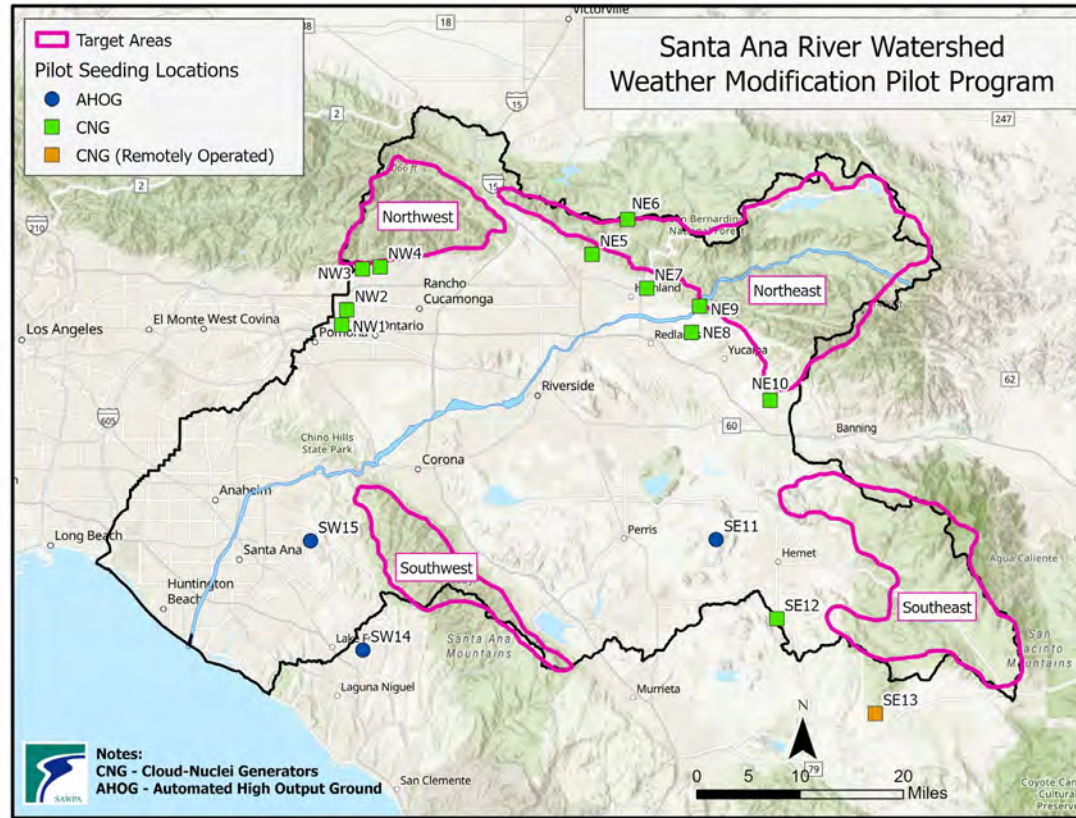
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NE Target (rainfall-inch)		
	Feb 2-9	Total
Beaumont 4NNE	4.58	4.58
Oak Creek Cyn	7.79	7.79
Oak Glen WS	7.28	7.28
Cable Cyn	6.18	6.18
Bernina Drive	12.00	12.00
Panorama Pt	11.88	11.88
Manzanita Flats	8.93	8.93
Cedar Glen	8.11	8.11
Crest Park	7.68	7.68
Deep Creek	7.56	7.56
Running Springs FS	6.67	6.67
Heaps Peak RAWS	5.98	5.98
Wildwood Cyn	5.59	5.59
Fawnskin	4.45	4.45
Big Bear Lake	4.06	4.06
Fawnskin RAWS	3.97	3.97
Heart Bar	3.22	3.22
Converse RAWS	2.47	2.47
	Average	6.58

SE Target (rainfall-inch)		
	Feb 2-9	Total
Upper Tahquitz Crk	3.50	3.5
Thomas Mtn	4.07	4.07
Vista Grande RAWS	5.02	5.02
Poppet Flat RAWS	5.00	5
Allandale	3.50	3.5
Pine Cove Dutch Flat	3.31	3.31
Vista Grande	4.37	4.37
Keenwild RAWS	4.29	4.29
Anza RAWS	1.51	1.51
Pine Cove Rocky Pt	1.66	1.66
Snow Crk 7N Idyll	5.15	5.15
	Average	3.76

Snowfall for February 2-9 Storms (Not Seeded)

NW Target: Feb 2-9 (snow-inch)	
Mt Baldy Notch	56
Mountain High	52
Mt Baldy Parking Lot	35
Wrightwood	20
Average	41



NE Target: Feb 2-9 (snow-inch)	
Snow Valley	97
Bear Mtn Summit	74
Green Valley Lake	64
Barton Flats	46
Arrowbear Lake	37
Running Springs	37
Forest Falls	36
Lake Arrowhead	34
Big Bear City Yard	30
Big Bear Moonridge	24
Angelus Oaks	20
Oak Glen	18
Average	43

SE Target: Feb 2-9 (snow-inch)	
Mt San Jacinto LV	24
Pine Cove	19
Average	22

Suspension Criteria

Flood

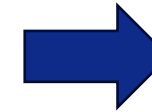
- Warm storm rain on snow
- Freezing level is >8,000 feet
- Quantitative precipitation forecast is > 3 inches in 24 hours

Burn Scars

- Threat of debris flow
- Coordinate with flood control districts

Severe Weather

- Winter storm warnings
- Flash flood warnings
- Severe thunderstorm warnings
- Sustained winds more than 30 mph at the sites



Real-Time Considerations:

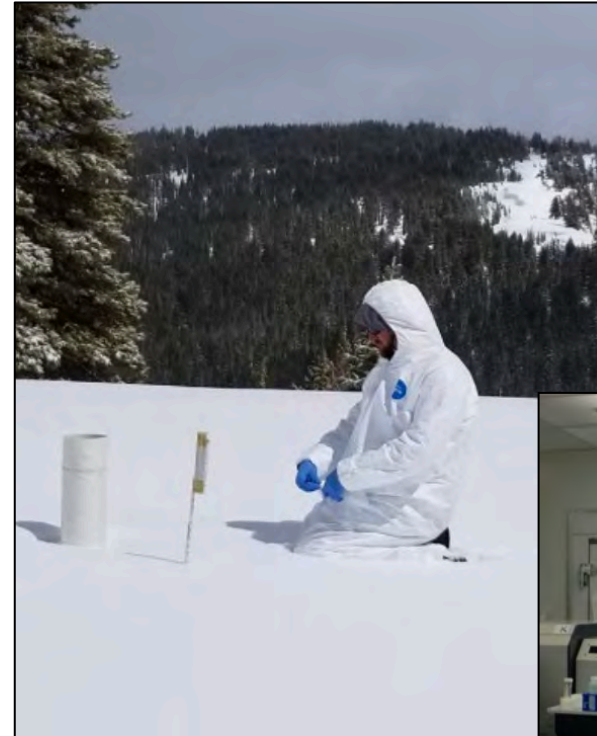
1. Input from FCDs on potential for flooding and mud slides/debris flows.
2. Consecutive Storms
3. Input from WWTPs



Validation

Cloud Seeding Independent Validation

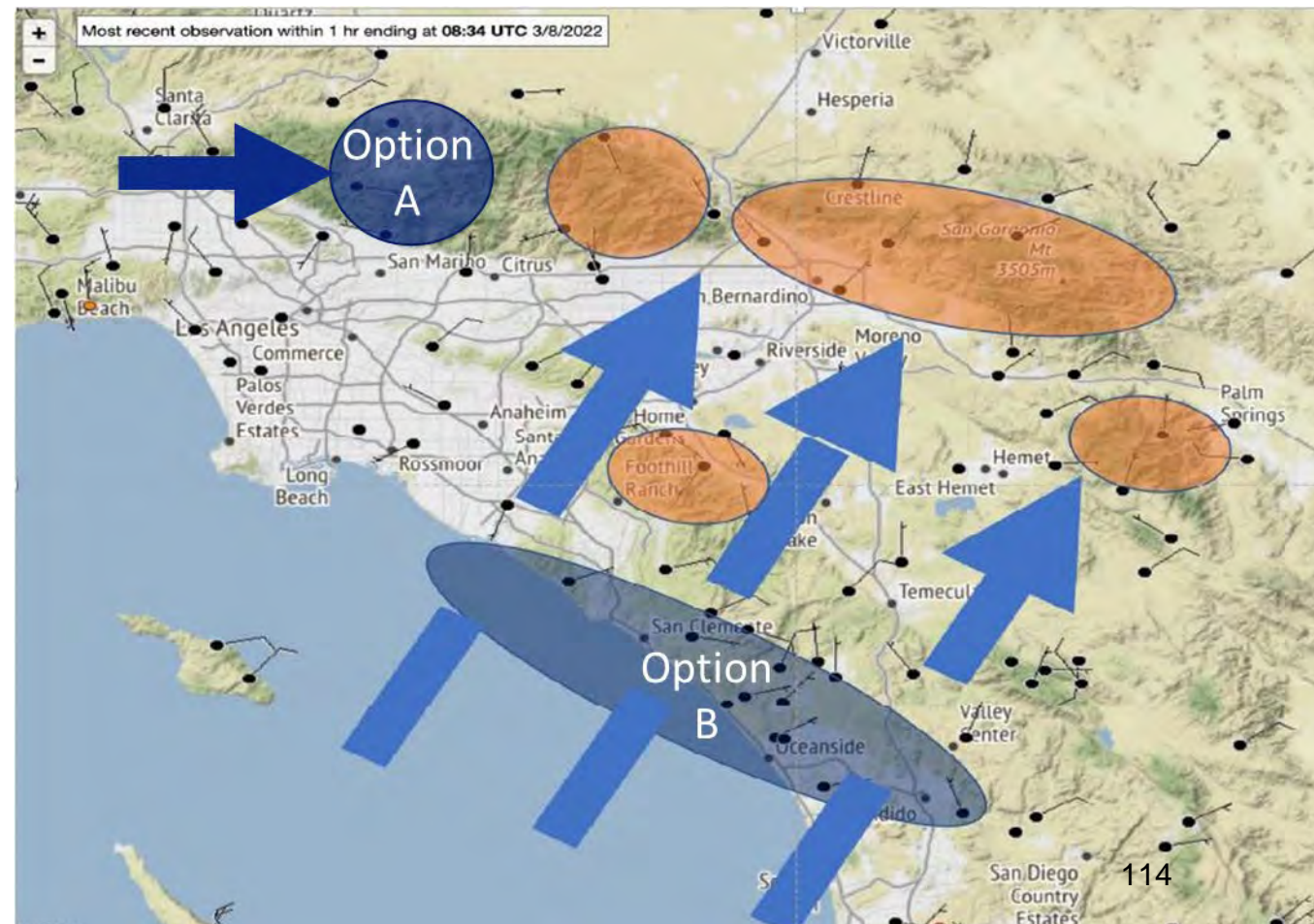
- Validation Consultant
 - Desert Research Institute (Reno, NV)
- Purpose
 - Verify deposition of silver iodide
 - Verify increases in precipitation and stream flows
 - Evaluate increases by target areas in watershed
 - Review of operations
 - Review of suspension criteria



Validation Study Approach (4-Year Study)

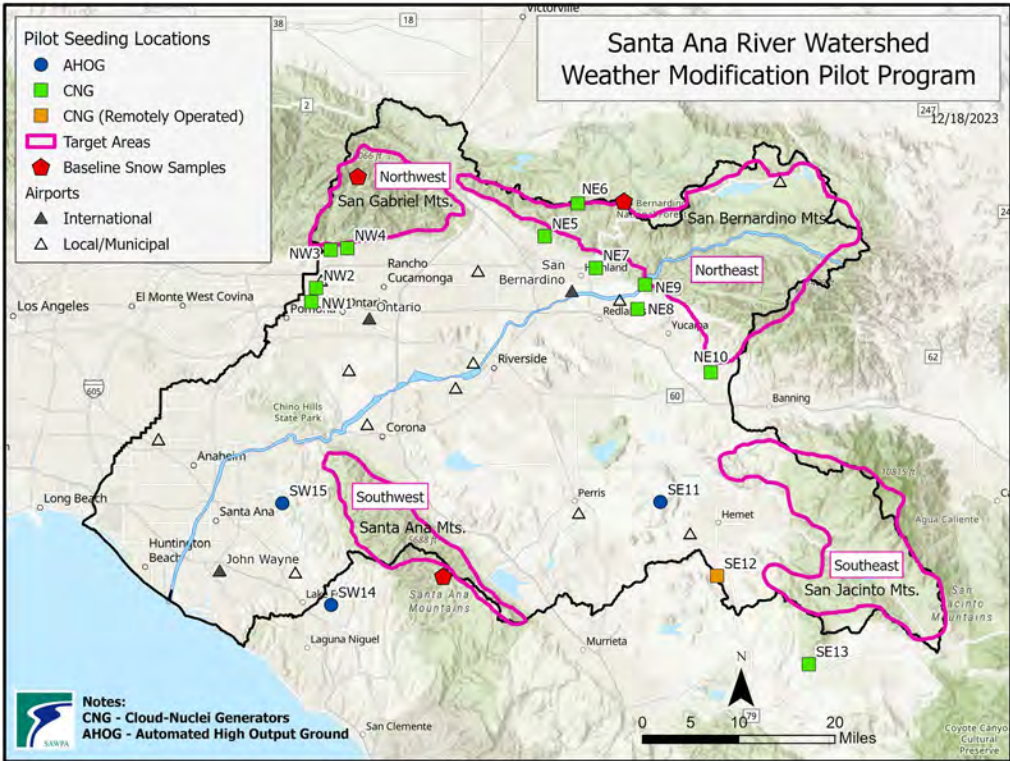
- Verify deposition
 - Measure elemental **silver** in snow before and after cloud seeding
- Verify increases in precipitation
 - Compare “Target Areas” to “Control Areas”
 - Two options: A and B

Control Area Options:



DRI Tasks

- Collected Baseline Snow Samples
- Collected Seeded Snow Samples
- Snow-Water Equivalent:
 - Assessing precipitation as rainfall and snowfall
- Target/Control Statistical Analysis:
 - Identify rain stations
 - Identify snow data
- Runoff: assessing locations of stream gauges



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Communications

Summary of Communications

SAWPA staff has boosted outreach efforts to raise awareness of the Pilot Program. Activities include:

- Installation of Pilot Program signs at six site unit locations.
- SAWPA’s Pilot Program’s webpage has been updated with a contact section for inquiries, presentation requests, and mailing list subscriptions.
- Staff distributed a press release in early January following the initial cloud seeding events
- Established email address (weathermodification@sawpa.gov) for public questions.
- Developed a cloud seeding event chart, accessible on SAWPA’s website, which is updated after seeding events.
- Staff is planning a site unit tour in April for funding partner Big Bear Lake Department of Water and Power.

Month/Year	Start	End	Target Area(s)
December 2023	12/21/2023	12/22/2023	NW, NE, SW, and SE
	12/29/2023	12/30/2023	NW, NE, SW, and SE
January 2024	1/3/2024	1/3/2024	NW, NE, SE
	1/20/2024	1/21/2024	NE, SE, SW
	1/21/2024	1/22/2024	NE, SE, SW
February 2024	2/1/2024	2/1/2024	NW, NE, SE
	2/20/2024	2/21/2024	NW and NE
March 2024	3/6/2024	3/7/2024	NW, NE, SW, and SE

*Last updated: March 19, 2024

Cloud Seeding Event Chart

Pilot Program Site Signage

**Santa Ana River Watershed
Weather Modification Pilot Program**

IMPLEMENTED BY
Santa Ana Watershed Project Authority

FUNDED UNDER
**The Water Quality, Supply, and Infrastructure
Improvement Act of 2014**

ADMINISTERED BY
**Integrated Regional Water Management Grant Program California
Department of Water Resources**

November 2023 - April 2027

Scan the QR code or go to sawpa.org to stay updated on the latest news and updates regarding the Pilot Program.

For questions and comments:
weathermodification@sawpa.org

Custom Door Hangers

WEATHER MODIFICATION PILOT PROGRAM IN YOUR NEIGHBORHOOD

Cloud seeding taking place 11/2023 to 11/2027

What is the Weather Modification Pilot Program?

In 2020, the Santa Ana River Watershed Project Authority (SAWPA) conducted a study on the economic and technical feasibility of implementing a weather modification program, also known as cloud seeding, to increase water supply in the region. Based on the results of the study, SAWPA will now conduct a 4-year Weather Modification Pilot Program to gather data to validate the program and determine the long-term feasibility for implementation in the Santa Ana River Watershed.

Why Cloud Seeding

Cloud seeding is a type of weather modification used to increase the amount of the precipitation, including snow or rain, during the storm season. This process works through releasing particles of silver iodide into clouds when storms occur, which increases the chances of droplet condensation by 5-15 percent.

What to Expect

If you just received this door hanger you should expect to see temporary smoke and hear occasional humming, noise throughout the duration of the Pilot Program - but only during storm events. While smoke can be expected to be visible coming from the ground-based seeding units, this does not pose as a fire hazard. **Cloud seeding is safe and has been studied for decades.**

How Cloud Seeding Works

Storms come into the watershed region bringing in moist air over the mountains, which cool and forms clouds composed of supercooled water droplets. Silver iodide particles mixed with acetone are vaporized and released into the atmosphere using ground based seeding systems. Silver iodide particles rise into cold, high-altitude air; moisture in the air condenses to form ice crystals on the particles. As the ice crystals form and grow in the clouds, they become large enough to fall to the ground as ice, snow, or rain.

On-Site Work

Work is being performed by SAWPA's contractor. An operations work truck may be occasionally present in your neighborhood throughout the duration of the Pilot Program.

Learn More

Scan the QR code below or visit sawpa.org for additional information.

If you have any questions about the Weather Modification Pilot Program, please call (951) 840-0230 or email weathermodification@sawpa.org

Pilot Program Contact Section

Online Contact

For more information or to request a presentation, please submit the form below:

Name: Last Name:

Email:

Message:

Submit

SANTA ANA WATERSHED PROJECT AUTHORITY

Media Contact
Melissa Bustamante
mbustamante@sawpa.org
(951) 840-0230

FOR IMMEDIATE RELEASE
January 9, 2024

Santa Ana Watershed Project Authority Begins First Year of Cloud Seeding Pilot Program to Increase Local Water Supply

Riverside, CA – The Santa Ana Watershed Project Authority (SAWPA) conducted the first cloud seeding event of the Santa Ana River Watershed Weather Modification Pilot Program during recent storms in late December and early January. The Pilot Program, launched in November 2023, is intended to evaluate the effectiveness of enhancing local water supplies through cloud seeding in the region. If shown to be effective, cloud seeding can enhance the watershed resilience of the Santa Ana River Watershed by increasing snow and rainfall from storms by 5-15 percent in targeted areas.

The Santa Ana River Watershed, spanning portions of Riverside, San Bernardino, and Orange Counties, plays a vital role in supporting diverse ecosystems, providing water resources, and offering recreational opportunities to millions of residents. Recognizing the importance of enhancing and preserving this valuable natural resource, SAWPA initiated the Pilot Program to provide an additional source of water supply to adapt to the impacts of climate change risks and help sustain the health of the watershed.

SAWPA collaborated closely with local water agencies, government agencies, and community stakeholders on planning and implementing the 4-year Pilot Program targeting areas across the watershed. The cloud seeding program involves the release of silver iodide particles from ground-based units during storm events to increase ice and snow formation in clouds resulting in additional precipitation. Cloud seeding was performed during three storms during the last week of December and first week of January.

Over a 4-year period, cloud seeding will be validated as a tool in advancing water supply reliability for the region by enhancing our local supplies. The additional water produced through cloud seeding would support natural habitat and be captured by existing stormwater infrastructure that is critical to recharging local groundwater aquifers used for water supply.

"These initial cloud seeding events represent a milestone for the Santa Ana River Watershed Weather Modification Pilot Program," said Jeff Meador, General Manager for SAWPA. "The program underscores the commitment of SAWPA to evaluate new local water supplies. If proven viable through this pilot study, cloud seeding could help support a more sustainable future for the environment and communities in the Santa Ana River Watershed."

The Pilot Program is a 4-year evaluation and validation effort that will allow SAWPA to investigate the increase in water supply from cloud seeding and the potential benefits for the region. SAWPA will monitor and evaluate the program's implementation, ensuring that the efforts align with the project's objectives and the needs of the region.

Press Release



Pilot Program Schedule

Pilot Program Schedule

Task	2023				2024					
	Mar	Apr-Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Project Operations & Demobilization										
Project Validation										
Review NAWC Operations										
Snow Chemistry										
Baseline Snow Samples										
Seeded Snow Samples										
Lab Analysis and Report										
Snow Water Equivalent										
Target-Control Evaluation										
Stream Flow Analysis										
Surface Water Modeling Contract Award										



Questions